

# Public Document Pack



To: Councillor Houghton, Convener; Councillor Laing, Vice Convener; and Councillors Grant, Boulton, Cooke, John, McLellan, Alex Nicoll and Yuill.

Town House,  
ABERDEEN 17 June 2021

## **CITY GROWTH AND RESOURCES COMMITTEE**

The Members of the **CITY GROWTH AND RESOURCES COMMITTEE** are requested to meet in the **Council Chamber - Town House** on **THURSDAY, 24 JUNE 2021 at 2.00 pm.**

FRASER BELL  
CHIEF OFFICER - GOVERNANCE

### **B U S I N E S S**

#### **NOTIFICATION OF URGENT BUSINESS**

1.1 Notification of Urgent Business

#### **DETERMINATION OF EXEMPT BUSINESS**

2.1 Determination of Exempt Business

#### **DECLARATIONS OF INTEREST**

3.1 Declarations of Interest (Pages 5 - 6)

#### **DEPUTATIONS**

4.1 Deputations

## **MINUTE OF PREVIOUS MEETING**

- 5.1 Minute of Previous Meeting of 11 May 2021 - For Approval (Pages 7 - 24)

## **COMMITTEE PLANNER**

- 6.1 Committee Planner (Pages 25 - 42)

## **NOTICES OF MOTION**

- 7.1 Notice of Motion by Councillor Jennifer Stewart, the Depute Provost - St Joseph's School Nursery

That the City Growth and Resources Committee:-

- (1) Notes Aberdeen City Council's Early Learning and Childcare Delivery Plan objectives which help meet the Council's commitment to expand funded early learning and childcare from 600 hours to 1,140 hours across the City;
- (2) Notes the expansion of ELC requires an investment in our Early Years Estate as well as an investment in staffing to ensure the Council are providing high quality provision that meets the needs of children and families in all localities; and
- (3) To instruct the Chief Officer – Finance, following consultation with relevant officers, to include within the 2022/23 budget pack an outline business case including the feasibility and capital and revenue costs of increasing the number of full-time places at St Joseph's School Nursery to 47 including possible options including the redevelopment of Bishop's House or an on-site new build.

## **REFERRALS FROM COUNCIL, COMMITTEE AND SUB COMMITTEES**

- 8.1 Referrals from Council, Committees or Sub Committees

## **BUDGETS**

- 9.1 There are No Reports Under this Heading

## **SERVICE DELIVERY**

- 10.1 There are No Reports Under this Heading

## **CITY GROWTH AND STRATEGIC PLACE PLANNING**

- 11.1 Aberdeen Low Emission Zone - Preferred Option - COM/21/149 (Pages 43 - 530)
- 11.2 Update on Spaces for People Interventions - COM/21/154 (Pages 531 - 584)
- 11.3 Investor Ready Propositions - COM/21/155 (Pages 585 - 600)
- 11.4 Feasibility of a Food & Crafts Market - Rubislaw Terrace Gardens - COM/21/159 (Pages 601 - 608)

## **PROPERTY AND ESTATES**

- 12.1 There are No Reports Under this Heading

## **EXEMPT / CONFIDENTIAL BUSINESS**

- 13.1 Disposal of Former Office and Training Centre, Frederick Street - RES/21/148 (Pages 609 - 616)
- 13.2 Countesswells Development - Primary School (1) - RES/21/156 (Pages 617 - 638)
- 13.3 Contracts, Terms and Conditions - Aberdeen Performing Arts - RES/21/153 (Pages 639 - 650)

EHRIA's related to reports on this agenda can be viewed at  
[Equality and Human Rights Impact Assessments](#)

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## **DECLARATIONS OF INTEREST**

You must consider at the earliest stage possible whether you have an interest to declare in relation to any matter which is to be considered. You should consider whether reports for meetings raise any issue of declaration of interest. Your declaration of interest must be made under the standing item on the agenda, however if you do identify the need for a declaration of interest only when a particular matter is being discussed then you must declare the interest as soon as you realise it is necessary. The following wording may be helpful for you in making your declaration.

I declare an interest in item (x) for the following reasons .....

*For example, I know the applicant / I am a member of the Board of X / I am employed by...* and I will therefore withdraw from the meeting room during any discussion and voting on that item.

### **OR**

I have considered whether I require to declare an interest in item (x) for the following reasons ..... however, having applied the objective test, I consider that my interest is so remote / insignificant that it does not require me to remove myself from consideration of the item.

### **OR**

I declare an interest in item (x) for the following reasons ..... however I consider that a specific exclusion applies as my interest is as a member of xxxx, which is

- (a) a devolved public body as defined in Schedule 3 to the Act;
- (b) a public body established by enactment or in pursuance of statutory powers or by the authority of statute or a statutory scheme;
- (c) a body with whom there is in force an agreement which has been made in pursuance of Section 19 of the Enterprise and New Towns (Scotland) Act 1990 by Scottish Enterprise or Highlands and Islands Enterprise for the discharge by that body of any of the functions of Scottish Enterprise or, as the case may be, Highlands and Islands Enterprise; or
- (d) a body being a company:-
  - i. established wholly or mainly for the purpose of providing services to the Councillor's local authority; and
  - ii. which has entered into a contractual arrangement with that local authority for the supply of goods and/or services to that local authority.

### **OR**

I declare an interest in item (x) for the following reasons.....and although the body is covered by a specific exclusion, the matter before the Committee is one that is quasi-judicial / regulatory in nature where the body I am a member of:

- is applying for a licence, a consent or an approval
- is making an objection or representation
- has a material interest concerning a licence consent or approval
- is the subject of a statutory order of a regulatory nature made or proposed to be made by the local authority.... and I will therefore withdraw from the meeting room during any discussion and voting on that item.

## CITY GROWTH AND RESOURCES COMMITTEE

ABERDEEN, 11 May 2021. Minute of Meeting of the CITY GROWTH AND RESOURCES COMMITTEE. Present:- Councillor Lumsden, Convener; Councillor Grant, Vice-Convener; and Councillors Boulton, Cooke, Laing, McLellan (as substitute for Councillor McRae), Alex Nicoll, Yuill and Wheeler.

The agenda and reports associated with this minute can be found [here](#).

Please note that if any changes are made to this minute at the point of approval, these will be outlined in the subsequent minute and this document will not be retrospectively altered.

### DETERMINATION OF EXEMPT BUSINESS

1. The Convener proposed that the Committee consider items 13.1 (Site 16, Lang Stracht – Demolition and Disposal Update), 13.2 (Chapel Street Car Park - Offer to Purchase), 13.3 (Pinewood - Amendment to Sale Contract Update May 2021), 14.1 (Council Financial Performance, Quarter 4, 2020/21 - Exempt Appendix), 14.2 (Procurement Workplan and Business Cases - Capital – Exempt Appendices), 14.3 (Roads and Transport Related Budget Programme 2021 - 2022 – Exempt Appendices), 14.4 (Results of Report on the Feasibility of an Aberdeen Region Greenport Bid - Exempt Appendix) and 14.5 (Aberdeen Market and Union Street Central - Exempt Appendix) with the press and public excluded from the meeting.

#### **The Committee resolved:-**

in terms of Section 50(A)(4) of the Local Government (Scotland) Act 1973, to exclude the press and public from the meeting during consideration of the above items so as to avoid disclosure of information of the classes described in the following paragraphs of Schedule 7(A) to the Act:- articles 18, 19 and 20 (paragraph 9); articles 21 and 24 (paragraph 6); article 22 (paragraph 8); article 23 (paragraph 10); and article 25 (paragraphs 6, 8 and 9).

### DECLARATIONS OF INTEREST

2. Members were requested to intimate any declarations of interest in respect of the items on today's agenda, thereafter the following were intimated:-

- (1) Councillor Yuill declared an interest in item 13.3 (Pinewood - Amendment to Sale Contract Update May 2021) by virtue of him being an Aberdeen City Council appointed member of Robert Gordon's College Board of Governors. He considered that the nature of his interest required him to leave the meeting and he therefore took no part in the consideration of this item;
- (2) Councillor Cooke declared an interest in item 12.3 (Beach Masterplan Review) by virtue of him being an Aberdeen City Council appointed Director of Sport Aberdeen. He indicated that He considered that the nature of his interest did not require him to leave the meeting, therefore he remained in the meeting throughout; and

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- (3) the Convener declared an interest in the agenda, by virtue of him being a newly elected Member of the Scottish Parliament. He considered that the nature of his interest did not require him to leave the meeting, therefore he remained in the meeting throughout.

### MINUTE OF PREVIOUS MEETING OF 3 FEBRUARY 2021- FOR APPROVAL

3. The Committee had before it the minute of its previous meeting of 3 February 2021, for approval.

**The Committee resolved:-**

to approve the minute as a correct record.

### COMMITTEE PLANNER

4. The Committee had before it the Committee Business Planner prepared by the Chief Officer – Governance.

**The Committee resolved:-**

- (i) to remove item 5 (Aberdeen Coastal Management) from the planner for the reasons outlined therein;
- (ii) to transfer item 7 (Cooperative Development Funding) to the Operational Delivery Committee Planner for the reasons outlined therein;
- (iii) in relation to item 10 (Living Wall), to retain this item on the planner for the timebeing;
- (iv) to note the reason for the reporting delay in relation to item 16 (Joint Integrated Mortuary Project), item 17 (Prosperity Fund), item 26 (Developer Obligations - Asset Plans) and item 46 (Proposals for Investment for Works at Riverbank School to Accommodate the Relocation of St. Peter's School);
- (v) in relation to item 26 (Developer Obligations - Asset Plans), to request that the Chief Officer – Strategic Place Planning circulate a Service Update to all members of the Committee; and
- (vi) to otherwise note the content of the Committee Planner.

### COUNCIL FINANCIAL PERFORMANCE, QUARTER 4, 2020/21 - RES/21/111

5. The Committee had before it a report by the Director of Resources which provided the full year actual financial position of the Council against budget for the financial year 2020/21, including:-

- General Fund and Housing Revenue Account (HRA) revenue and capital accounts; and



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- Common Good Revenue Account and Balance Sheet.

### **The report recommended:-**

that the Committee –

- (a) note the unaudited final outturn position for financial year 2020/21 as detailed in Appendix 1;
- (b) note that the General Fund has recorded a surplus of £0.415m for the year 2020/21, which has been added to the uncommitted working balance, which remains in line with the Reserves Policy;
- (c) note that the Housing Revenue Account has recorded a surplus of £0.500m for the year, in line with budget and increasing the uncommitted working balance for use in future years;
- (d) note that the Common Good has recorded an operating deficit of £0.273m for the year, which is better than the approved use of cash reserves. After capital receipts are included cash balances increased by £4.1m and remain in line with recommended levels;
- (e) approve the various transfers for 2020/21, between Council Reserves and Earmarked sums for the General Fund, Housing Revenue Account, Common Good and Statutory Funds as at 31 March 2021, as detailed in Appendix 1;
- (f) approve the reprofiling of the 2021/22 – 2024/25 capital programmes to take account of the year end position and that the outcome of this is incorporated into the 2021/22 Quarter 1 reporting;
- (g) delegate authority to the Chief Officer – Finance, following consultation with the Chief Officer – Capital and Convener of City Growth & Resources Committee, to vire budgets between projects within the Council's New Schools and Zero Waste Programmes contained in the Capital Programme, to reflect the outcomes of external procurement exercises being carried out and allow award of relevant contracts;
- (h) note the write off of historic school meal debts accounted for within the accounts for 2020/21, as described in Section A of Appendix 2;
- (i) consider and approve the writing off of further debt described in Section B of Appendix 2; and
- (j) note that the unaudited Annual Accounts for 2020/21 will be presented to Audit, Risk and Scrutiny Committee on 12 May 2021, along with the Annual Governance Statement and Remuneration Report.

### **The Committee resolved:-**

- (i) to approve the recommendations; and
- (ii) to thank the Chief Officer – Finance and all officers who contributed in the preparation of the report.

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### **FLEET REPLACEMENT PROGRAMME - OPE/21/100**

6. The Committee had before it a report by the Chief Operating Officer which sought approval of the updated Fleet Replacement programme for 2021/22.

**The report recommended:-**

that the Committee –

- (a) approve the phase 1 Fleet Replacement Programme for 2021/22 (as detailed in Appendix A of the report) and notes that a phase 2 Fleet Replacement Programme for 2021/22 will be submitted to a future meeting of this committee;
- (b) instruct the Chief Officer - Corporate Landlord in consultation with Chief Officer - Operations and Protective Services and Chief Officer - Strategic Place Planning to report to a future meeting of this committee with a programme of infrastructure improvements to support increased numbers of electric vehicles within the council fleet, and
- (c) delegate authority to the Chief Officer – Operations & Protective Services, following consultation with the Head of Commercial and Procurement Services and Chief Officer – Finance, to consider and approve procurement business cases for vehicles and plant for the purposes of Procurement Regulation 4.1.1.2; and thereafter to procure appropriate works and services, and enter into any contracts necessary for the vehicles without the need for further approval from any other Committee of the Council.

**The Committee resolved:-**

to approve the recommendations.

### **PROCUREMENT WORKPLAN AND BUSINESS CASES - CAPITAL - COM/21/109**

7. The Committee had before it a report by the Director of Resources, which presented a procurement workplan where capital expenditure was included for the Commissioning Function to Committee for review and sought approval of the total estimated expenditure for the proposed contracts as contained in the Procurement Business Cases appended to the report.

**The report recommended:-**

that the Committee –

- (a) review the workplan as detailed in the Appendices;
- (b) approve the procurement business cases, including the total estimated expenditure for the proposed contracts; and
- (c) approve the direct awards of contract where there are special circumstances outlined in the respective procurement business cases which justify not issuing a tender or calling off from a framework agreement.

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**The Committee resolved:-**

to approve the recommendations.

**PERFORMANCE MANAGEMENT FRAMEWORK REPORT – CITY GROWTH AND RESOURCES - CUS/21/103**

8. With reference to article 8 of the minute of the previous meeting of 3 February 2021, the Committee had before it a report by the Director of Customer Services, which outlined the status of key performance measures relating to City Growth and Resources cluster activities.

**The report recommended:-**

that the Committee note the report and the performance information contained within the Appendix.

**The Committee resolved:-**

to approve the recommendation.

**ROADS AND TRANSPORT RELATED BUDGET PROGRAMME 2021 - 2022 - OPE/21/096**

9. The Committee had before it a report by the Chief Operating Officer which sought approval of specific schemes for 2021/22 and additional provisional programmes for 2022/23, and brought forward proposals for spending the administration's 2018 budget for road improvements in the capital programme, all of which were vital and business critical.

**The report recommended:-**

that the Committee –

- (a) approve the schemes listed in the appendices as the detailed proposals for expenditure within each budget heading;
- (b) instruct the Chief Officer - Operations and Protective Services in consultation with the Head of Commercial and Procurement Services, to undertake or instruct appropriate procedures in accordance with the council's procurement regulations to procure the works referred to in the exempt appendices for the roads capital budget programme for the financial year 2021/22 and award contracts relating thereto; and
- (c) note that officers continue to work with contractors on the financial implications and delivery of the programme in 2020/21 and implications for future works, as a result of the COVID-19 virus requiring changing work practices, lack of suppliers and resources across the full programme of projects.

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**The Committee resolved:-**

- (i) to approve the recommendations;
- (ii) to note the decision from the Council meeting on 10 March 2021 which instructed the Chief Officer – Operations and Protective Services, in conjunction with the Chief Officer – Capital to bring forward the proposals to spend the remaining £6.6 million of the additional £10 million roads investment as part of the Council budget in 2018 to advance the delivery of roads improvements included in the capital programme; and
- (iii) that officers clarify the accuracy of the roads repairs kilometre figures in appendices T and U and circulate a response to all members of the Committee via email.

**PRINTFIELD 10 PROJECT AND DENIS LAW STATUE RELOCATION - COM/21/104**

**10.** The Committee had before it a report by the Chief Officer – City Growth which provided details on the Printfield 10 Project and the feasibility of siting the bronze Denis Law statue in the proximity of Provost Skene’s House.

**The report recommended:-**

that the Committee –

- (a) note the details of the Printfield 10 Project, and the original proposal which was attached to the report for information;
- (b) approve the preferred delivery method for the public art pieces of the Printfield 10 Project from the options contained within section 3.7 – 3.11 of the report; and
- (c) approve the location and change of ownership of the bronze Denis Law statue from the options contained within section 3.15 and 3.16, and the associated costs detailed in section 4 of the report.

Councillor Copland was in attendance as a Ward Member and spoke in support of the project, particularly option 1 at 3.7 in the report.

**The Committee resolved:-**

- (i) to note the details of the Printfield 10 Project, and the original proposal which was attached to the report for information;
- (ii) to agree to defer all options as outlined in the report. Instruct the Chief Officer - City Growth to work with the Denis Law Legacy Trust and representatives of the St Joseph Church and community representatives to bring forward to the August committee meeting of the City Growth and Resources Committee a feasibility study outlining timescales and costs for the delivery of the murals as outlined in paragraph 3.5 of the report; and
- (iii) to agree to move forward with siting the bronze Denis Law statute subject to 50% of the total costs being met by the Denis Law Legacy Trust, and, subject to those costs being met, agree Location 2 for the statue, which would encourage people to linger longer and strengthen links to Provost Skene’s House.

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### INTERNATIONAL TRADE PLAN 2021 - 2022 - COM/21/110

11. The Committee had before it a report which sought approval for international trade priorities for 2021-22 and for associated travel expenditure.

**The report recommended:-**

that the Committee –

- (a) approve the international trade and investment key priority markets for 2021 - 2022;
- (b) approve the travel expenditure to fulfil the agreed travel plan based on identified key priority markets and as detailed below:-
  - (1) one elected member plus one officer to visit Barranquilla, Columbia for the purposes of MOU fulfilment;
  - (2) one elected member plus one officer to visit Villahermosa and Ciudad del Carmen for the purposes of MOU fulfilment;
  - (3) one elected member plus one officer to visit Macae, Brazil for the purposes of MOU fulfilment;
  - (4) the Lord Provost plus one officer to visit newest WECP partner city Ulsan, South Korea;
  - (5) the Lord Provost plus two officers to attend the WECP Annual General Meeting in Dammam, Saudi Arabia;
  - (6) the Lord Provost plus one officer to attend CERAWEEK in Houston USA;
  - (7) the Lord Provost and one officer to visit Ufa, Russia, 19th-24th October (Media-Cultural Forum) and a potential related visit to St Petersburg, Russia, for the purposes of engaging with a potential new WECP member;
  - (8) potential visits by one elected member and one officer to the emerging new markets of Nigeria, Angola, Vietnam and Singapore;
  - (9) an elected member and one officer to attend the Council of Peripheral Maritime Regions (CPMR) Political Bureau and General Assembly;
  - (10) an elected member and one officer to attend three meetings of the North Sea Commission (NSC) Executive Committee and three meetings of the Transport Group, locations to be confirmed; and
- (c) delegate authority to the Chief Officer - City Growth to authorise necessary and appropriate travel and associated expenditure, provided the cost of such travel does not exceed the budgets set out in section 4 of the report and provided that any guidance and advice related to international travel and Covid-19 is adhered to and travel is in line with current Council travel policies.

**The Committee resolved:-**

to approve the recommendations.

### SOCIO-ECONOMIC RESCUE PLAN FINAL UPDATE - COM/21/099

12. With reference to article 11 of the minute of meeting of the Urgent Business Committee of 30 June 2020, the Committee had before it a report by the Chief Officer –

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City Growth which provided a final update on the delivery of the Socio-Economic Rescue Plan 2020/21.

**The report recommended:-**

that the Committee note that the Socio-Economic Rescue Plan actions for 2020/21 are now complete, the successful delivery of this plan, and next steps for any open actions in 2021/22.

**The Committee resolved:-**

- (i) to note the success of the Socio-Economic Rescue Plan and the actions taken during 2020/21 to aid economic recovery within the city of Aberdeen;
- (ii) to note the timetable as set out by the Scottish Government in relation to Covid-19 Protection Levels. Notes that by the 7 June 2021, Aberdeen is on track to be level one and an announcement is to be made by the Scottish Government regarding level zero. Therefore, instructs Chief Officer - Strategic Place Planning in consultation with Public Health Scotland to bring forward a report on the timetable for removal of the Spaces for People initiatives to the next Committee in June taking into consideration any decisions made by this Committee in respect of the City Centre Masterplan and associated reports;
- (iii) to note the successful delivery of this plan and agrees for a report to be submitted to the meeting on 3 November 2021 of this Committee, providing information on the recovery initiatives, including budget allocations, undertaken in 2021/22;
- (iv) to agree to instruct the Chief Officer - City Growth to write to the Implementation Group as outlined at 3.2 of the report thanking them for their support in helping the city Council deliver the Socio-Economic Rescue Plan; and
- (v) to instruct the Chief Officer – City Growth to engage with businesses and other interested parties seeking to establish the feasibility for a local food and crafts market in the vicinity of Rubislaw Terrace Gardens and to report back to the next meeting of this Committee detailing options for potential implementation in Summer 2021 in consultation with the Depute Provost.

### **UPDATE ON SUPPORT TO BUSINESSES FOR OUTDOOR TRADING - RES/21/112**

**13.** With reference to article 3 of the minute of meeting of the Urgent Business Committee of 12 April 2021, the Committee had before it a report by the Director of Resources which provided an update on arrangements to support businesses reopening, particularly in relation to trading on outdoor spaces.

**The report recommended:-**

that the Committee –

- (a) note the decisions made on temporary outdoor trading requests by Officers following the Urgent Business Committee on 12 April 2021 (Appendices 1 and 2 of the report); and

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- (b) in recognition of the ongoing difficulties for businesses caused by Covid-19, continue to instruct the Chief Officer - Capital, following consultation with the Chief Officer - Strategic Place Planning and the Chief Officer - Operations and Protective Services, to determine requests from businesses for outdoor trading, provided that any approvals so granted will be on a temporary basis and subject to any such conditions as the authorising Chief Officer considers appropriate.

**The Committee resolved:-**

to approve the recommendations.

### **RESULTS OF REPORT ON THE FEASIBILITY OF AN ABERDEEN REGION GREENPORT BID - COM/21/121**

**14.** The Committee had before it a report by the Chief Officer – City Growth which provided an update on the results of a feasibility study on a city region freeport/greenport model.

**The report recommended:-**

that the Committee –

- (a) note the high level results of the Feasibility Study on a city region freeport model;
- (b) based on the final prospectus guidance published by the Scottish Government, and the invitation to bid, notes that a decision on whether to bid rests with port operators;
- (c) subject to decision making processes by potential operators, supports the development of a single regional bid from the Aberdeen City Region;
- (d) note that a formal governance is not required at the time of a bid and that the informal steering group involving officers of the Council will continue to assess the case for a bid, if a decision is made to proceed, in the form of an agreed ‘co-operation plan’;
- (e) agree that Aberdeen City Council is represented on any subsequent formal governance at implementation stage if there is a successful bid, and that one of the Council Co-Leaders is the Council’s representative; and
- (f) instruct the Chief Officer - City Growth to report back to this Committee on the development and outcome of any proposals if they progress.

**The Committee resolved:-**

to approve the recommendations.

### **CITY CENTRE MASTERPLAN REVIEW - RES/21/115**

**15.** With reference to article 10 of the minute of the previous meeting of 3 February 2021, the Committee had before it a report by the Director of Resources which provided information on what could be prioritised within the City Centre Master Plan (CCMP) in the short term to support initial economic recovery within the city, and then set out actions to

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progress in the medium and long term which would ensure the CCMP contributed to the medium and long term recovery and growth.

### **The report recommended:-**

that the Committee –

- (a) approve the proposed objectives for the CCMP review set out in paragraph 3.5 of the report, noting that COVID-19 has exacerbated some existing structural changes and there are some emerging structural changes also taking place;
- (b) approve the proposed work plan set out in Appendix 1 which informs the review of the CCMP over the short (year 1), medium (years 2-4) and long term (year 5+);
- (c) instruct the Chief Officer (Corporate Landlord) to support the city's short-term economic recovery from Covid-19, by facilitating the re-opening of existing CCMP projects, in line with Scottish Government guidance; and to prioritise non-capital works across the Council's building stock in order to increase aggregate demand in the local economy;
- (d) instruct the Director of Resources to develop design works for current City Centre interventions on Union Street, West End, George Street and Schoolhill and report outcomes to the City Growth and Resources Committee in August 2021;
- (e) instruct the Chief Officer (Capital) to support the City's short term economic recovery from Covid-19, by accelerating, where possible, the completion and opening of CCMP projects under construction within the next 12 months ensuring a focus on the realisation of the Council's community benefit policy;
- (f) note that the Chief Officer (Operations) has already received an instruction to prioritise road maintenance work programmes with the aim of increasing aggregate demand in the local economy;
- (g) note that the Council's sport and culture ALEOs and Joint Ventures (Sport Aberdeen, Aberdeen Sports Village and Aberdeen Performing Arts) will be re-opening a range of sport and cultural facilities in line with Scottish Government guidance; and that ambitions are for these attractions to be available to support this year's "staycation" market to the city as uncertainty remains around overseas travel;
- (h) instruct the Chief Officer (Governance), in conjunction with Chief Officers (Strategic Place Planning) and (City Growth), to undertake a review and evaluation of all existing powers available to Council in order to drive the return of footfall to the city centre and incentivise city centre living;
- (i) note that the Council will participate in the Scottish Government's cities recovery taskforce via Cllr Laing, as the Council's member in the Scottish Cities Alliance, and that the outcome of the Chief Officers' review and evaluation of existing powers referred to in (h) will be discussed with the taskforce;
- (j) note that the Chief Officer (City Growth) will continue to review the economic trends over the course of the next 6 months as part of Invest Aberdeen's "North East Performs", and to report back to this committee if further medium-term stimulus is required in response to the analysis of economic impact of covid-19 on the city;
- (k) instruct the Director of Resources to develop and undertake engagement exercise with the public, all appropriate partners and stakeholders to seek their views on the



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City Centre Review, what it would take to attract them back to the city centre in the short-term, how the changed travel patterns and reductions in travel experienced throughout the pandemic can be embedded and report the results to the City Growth & Resources Committee in August 2021;

- (l) note that the workplan proposes that the Chief Officer (Strategic Place Planning) use the opportunity of the CCMP Review to ensure it considers environmental intervention into our medium-term plans for the CCMP, given the scale of transition required to achieve net zero by 2045;
  - (m) instruct the Chief Officer (City Growth) to ensure that the CCMP also plays a part in ensuring a “just transition”, as envisaged by the final report from Scottish Government’s Just Transition Commission;
  - (n) instruct Chief Officer (Digital and Technology) to use the CCMP Review to integrate further “smart city thinking” into our medium-term plans for the CCMP, as part of positioning the city as a leader in the knowledge and digital economy;
  - (o) instruct the Director of Resources to use the CCMP review to consider the possibility, post pandemic, of a more fundamental change to how the Aberdeen City Centre operates in the future, be it in response to a seismic permanent rise in home-working and shift to on-line retail or changes to business and consumer confidence on how we approach our leisure time;
  - (p) instruct the Chief Officers (Strategic Place Planning) and (City Growth) to use the CCMP review and the Local Development Plan to ensure that the ambition to secure economic growth by attracting businesses operating in energy transition or low carbon sectors to the city is realised;
  - (q) note that Chief Officer (Strategic Place Planning) will ensure that changing needs of the city are reflected within future iterations of the regional and city spatial and land use plans;
- Funding
- (r) instruct the Director of Resources in consultation with the Convener of City Growth & Resources Committee and Chief Officer (City Growth) to develop bids for potential submission to the following UK and Scottish Government programmes (with deadlines as noted below):

- Scottish Government Placed Based programme (17 June 2021);
- UK Government Levelling Up Fund (18 June 2021);
- UK Government Community Renewal Fund (18 June 2021);
- Scottish Government Green Growth Accelerator Pathfinder (date to be confirmed); and
- Shared Prosperity Fund (date to be confirmed).

### The Committee resolved:-

- (i) to approve recommendations (a) to (m) and (o) and (q);
- (ii) to instruct the Director of Resources to carry out a review of the Aberdeen City Centre Master plan Objectives and their associated workstreams as contained within the 2015 approved Masterplan and to report back findings to the City Growth

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- and Resources Committee on 10 August 2021 and also to report back on the Phase 1 and 2 projects contained within the city centre masterplan as approved in 2015;
- (iii) to instruct the Chief Officer - City Growth and the Communication and Marketing Manager to use the CCMP Review to integrate further “smart city thinking” into our medium-term plans to develop and undertake engagement exercise with the public, all appropriate partners and stakeholders to seek their views on the City Centre Review, what it would take to attract them back to the city centre in the short-term, how the changed travel patterns and reductions in travel experienced throughout the pandemic can be embedded and report the results to the City Growth & Resources Committee in August 2021, as part of the CCMP report detailing how best the city can be a leader in the digital economy;
- (iv) to instruct Chief Officer - City Growth to use the CCMP review and the Local Development Plan to ensure that the ambition to secure sustainable inclusive economic growth by attracting businesses operating in energy transition or low carbon sectors to the city is realised;
- (v) to instruct the Director of Resources in consultation with the Convener and Vice Convener of City Growth & Resources Committee and Convener of the Capital Programme Committee and the Chief Officer (City Growth) to develop bids for potential submission to the following UK and Scottish Government programmes (with deadlines as noted below):-
- Scottish Government Placed Based programme (17 June 2021);
  - UK Government Levelling Up Fund (18 June 2021);
  - UK Government Community Renewal Fund (18 June 2021);
  - Scottish Government Green Growth Accelerator Pathfinder (date to be confirmed); and
  - UK Shared Prosperity Fund (date to be confirmed);
- (vi) to agree the Aberdeen City Centre Master Plan is a regeneration blue print that is transforming the City Centre while conserving its proud heritage;
- (vii) to agree the Aberdeen CCMP was shaped following an extensive public consultation and was unanimously approved at Full Council in June 2015;
- (viii) notwithstanding any decision taken by Committee in respect of item 12.2 on the agenda, agrees to instruct the Director of Resources to carry out a review and visioning exercise on the streetscape and infrastructure works for the whole length of Union Street and to report back the outcomes to the August 2021 Committee; and
- (ix) to instruct the Chief Officer - Strategic Place Planning to review the City Centre Living Strategy and informed by the CCMP review bring forward Aberdeen Planning Guidance to support the City Centre in line with the Local Development Plan.

### **ABERDEEN MARKET AND UNION STREET CENTRAL - RES/21/127**

**16.** With reference to article 10 of the minute of the previous meeting of 3 February 2021, the Committee had before it a report by the Director of Resources which set out

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potential options for the purchase and redevelopment of Aberdeen Market and former BHS retail unit, together with reimagining public realm in the associated central section of Union Street.

### **The report recommended:-**

that the Committee –

- (a) agree the outline business case for the former site of the Aberdeen Market and former BHS retail unit and agree that this progress to Full Business Case, considering all options to deliver the development including delivery with a development partner and operator and to report the outcome of this to this committee at the earliest opportunity;
- (b) instruct the Chief Officer – Corporate Landlord in consultation with the Chief Officer - City Growth to submit funding applications to support the wider project to the Levelling Up Fund, Nestrans, Sustrans and such other organisations that could support the development;
- (c) instruct the Head of Commercial and Procurement to procure any necessary consultancy, design or implementation work necessary to complete the business case through Hub North Scotland, as identified in the Outline Business Case (OBC);
- (d) to instruct the Chief Officer – Corporate Landlord in consultation with the Chief Officer – Governance to proceed with the purchase of the property and thereafter to enter into a contract to demolish the building, either directly or with a development partner all as identified in the OBC; and
- (e) agree the review and visioning of the central section of Union Street, including stakeholder consultation, and instruct the Director of Resources to report the outcomes to City Growth and Resources Committee in August 2021.

### **The Committee resolved:-**

- (i) to approve the recommendations; and
- (ii) that the Chief Officer – Corporate Landlord circulate a Service Update in terms of the management details and progress of the demolition process.

## **BEACH MASTERPLAN REVIEW - RES/21/118**

**17.** With reference to article 10 of the minute of the previous meeting of 3 February 2021, the Committee had before it a report by the Director of Resources which outlined the specification for a review of the Masterplan to incorporate appropriate surrounding areas, including the area known as the beach; and identified the initial land area that technical feasibility studies would need to be undertaken to inform what the masterplan could accommodate.

### **The report recommended:-**

that the Committee –

- (a) agree the review zone (Figure 1);

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- (b) delegate authority to Instruct the Head of Commercial and Procurement Services to procure and appoint the required consultancy, design or implementation work necessary to complete the technical reviews through Hub North Scotland as covered in paragraph 4.3;
- (c) instruct the Chief Officer – Governance to take any necessary steps to ascertain land ownership within the review zone;
- (d) instruct the Director of Resources to undertake a public survey on the future of the Beach to help formulate the development of the Beach Masterplan; and
- (e) instruct the Director of Resources to report back an update on the output of the technical feasibility studies, public consultation and proposed Beach Masterplan to the City Growth and Resources Committee on the 10th August 2021.

The Convener, seconded by the Vice Convener moved:-

that the Committee –

- (1) approve recommendations (a), (b), (d) and (e); and
- (2) Instruct the Chief Officer – Governance to take any necessary steps to ascertain land ownership within the review zone and to provide a service update on his findings to the June 2021 Committee.

Councillor Nicoll, seconded by Councillor Yuill moved as an amendment:-

that the Committee –

- (1) approve the recommendations, subject to amending recommendation (a) to read “Agree the review zone (Figure 1) and in addition to extend it southwards to include Queens Links Leisure Park, together with the grassed area bounded by Wellington Street, York Place and Beach Esplanade, updating section 4.4 of the report to increase the estimated costs to £1.5M to cover the revised study area as identified above;
- (2) Instruct the Chief Officer – Governance to take any necessary steps to ascertain land ownership within the review zone and to provide a service update on his findings to the June 2021 Committee;
- (3) Instruct the Chief Officer - Corporate Landlord supported by Chief Officer - City Growth to progress discussions with the existing owners/occupiers of the properties at Queens Links Leisure Park as to opportunities to improve accessibility to beach front access from existing and future properties; and
- (4) Instruct the Chief Officer - City Growth to consider funding options that may qualify to support and deliver a beach masterplan and to report back to the committee with the result of those discussions in due course.

On a division there voted:- for the motion (5) – the Convener, the Vice Convener and Councillors Boulton, Laing and Wheeler; for the amendment (4) – Councillors Cooke, McLennan, Nicoll and Yuill.

**The Committee resolved:-**  
to adopt the motion.

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**In accordance with the decision recorded under article 1 of this minute, the following items of business were considered with the press and public excluded.**

**SITE 16, LANG STRACHT – DEMOLITION AND DISPOSAL UPDATE - RES/21/107**

**18.** With reference to article 27 of the minute of the previous meeting of 3 February 2021, the Committee had before it a report by the Director of Resources which provided an update on tender prices and an updated offer for an onward sale of the site albeit this was dependent on further demolition works being undertaken.

**The report recommended:-**

that the Committee –

- (a) note that a revised offer to purchase the site has been received since the last committee, as identified in the report.
- (b) agree to accept the revised offer and instruct the Chief Officer – Governance to conclude the appropriate legal agreement incorporating qualifications as are necessary to protect the Council's interest; and
- (c) note that in order to meet the terms of the revised offer more extensive demolition, site separation and remediation works are required than previously agreed and to therefor instruct the Chief Officer – Corporate Landlord to award the contract to progress a demolition programme for the building incorporating site separation and remediation works.

The Convener, seconded by the Vice Convener, moved:-

that the Committee –

- (1) approve recommendation (a);
- (2) agree not to accept the revised offer and instruct the Chief Officer - Corporate Landlord to award the contract to progress a more extensive demolition programme for the building incorporating site separation and remediation works, estimated at £1.9m, from Capital receipts of £4.394m identified in the quarter 4 report agreed earlier; and
- (3) agree not to sell or market the site without committee approval.

Councillor Nicoll, seconded by Councillor Cooke, moved as an amendment:-

that the Committee approve the recommendations contained within the report.

On a division, there voted:- for the motion (5) – the Convener, the Vice Convener and Councillors Boulton, Laing and Wheeler; for the amendment (3) – Councillors Cooke, McLennan and Nicoll.

**The Committee resolved:-**

to adopt the motion.

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### CHAPEL STREET CAR PARK - OFFER TO PURCHASE - RES/21/109

**19.** The Committee had before it a report by the Director of Resources which advised that the council had been approached by an organisation of an office building in the West End of Union Street to acquire the Chapel Street Car Park to meet potential occupiers' parking requirements.

**The report recommended:-**

that the Committee –

- (a) approve in principle the allocation of 400 spaces in the Chapel Street Car Park, this being conditional upon a long term lease being agreed with the proposed occupier;
- (b) instruct the Chief Officer – Corporate Landlord to continue discussions on the best financial model for the council to deliver this and report back to a future meeting of this Committee; and
- (c) instruct the Chief Officer – Corporate Landlord, on the basis that any lease is agreed to include conditions to support green travel and negotiate a percentage of parking spaces to support EV's/Hybrids with this percentage increasing over the length of the lease.

**The Committee resolved:-**

- (i) to agree not to sell the heritable interest in Chapel Street car park to the organisation outlined in the report;
- (ii) to approve in principle the allocation of 400 spaces in the Chapel Street Car Park at the rental identified in the report (being index linked and excluding VAT) subject to a minimum 15-year lease with the proposed occupier of the building outlined in the report and report back to a future meeting of this Committee not later than November 2021 on progress;
- (iii) to agree that the costs associated with any adjustments or upgrades to the Car Park to accommodate the proposed occupier is met by the organisation outlined in the motion, or the proposed occupier of the organisation outlined in the report;
- (iv) that in the event that a long-term lease is entered into as per (ii) above with the proposed building occupier, instruct the Chief Officer – Operations and Protective Services to implement any required traffic orders; and
- (v) to agree that if a Lease can be agreed with the proposed occupier of the building outlined in the report , officers undertake a consultation exercise to ensure that residents and businesses in the area are not impacted by this decision and if they are what parking measures can be put in place around the area to mitigate this proposed Lease.

### DECLARATION OF INTEREST

**In accordance with article 2 of this minute, Councillor Yuill withdrew from the meeting prior to consideration of the following item of business.**

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**PINEWOOD - AMENDMENT TO SALE CONTRACT UPDATE MAY 2021 - RES/21/123**

**20.** With reference to article 28 of the minute of the previous meeting of 3 February 2021, the Committee had before it a report by the Director of Resources which provided an update in relation to Pinewood.

**The report recommended:-**

that the Committee note that the amendment to the sale contract for the site was agreed in May 2021.

**The Committee resolved:-**

to approve the recommendation.

**COUNCIL FINANCIAL PERFORMANCE, QUARTER 4, 2020/21 - EXEMPT APPENDIX**

**21.** The Committee had before it an exempt appendix relating to the Council Financial Performance, Quarter 4, 2020/21 report. Article 5 of this minute refers.

**The Committee resolved:-**

to note the information contained within the exempt appendix.

**PROCUREMENT WORKPLAN AND BUSINESS CASES - CAPITAL - EXEMPT APPENDICES**

**22.** The Committee had before it exempt appendices relating to the Procurement Workplan and Business Cases report. Article 7 of this minute refers.

**The Committee resolved:-**

to note the information contained within the exempt appendices.

**ROADS AND TRANSPORT RELATED BUDGET PROGRAMME 2021 - 2022 - EXEMPT APPENDICES**

**23.** The Committee had before it exempt appendices relating to the Roads and Transport Related Budget Programme 2021-2022 report. Article 9 of this minute refers.

**The Committee resolved:-**

to note the information contained within the exempt appendices.

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**RESULTS OF REPORT ON THE FEASIBILITY OF AN ABERDEEN REGION GREENPORT BID - EXEMPT APPENDIX**

24. The Committee had before it an exempt appendix relating to the Results of the Report on the Feasibility of an Aberdeen Region Greenport Bid report. Article 14 of this minute refers.

**The Committee resolved:-**

to note the information contained within the exempt appendix.

**ABERDEEN MARKET AND UNION STREET CENTRAL - EXEMPT APPENDIX**

25. The Committee had before it an exempt appendix relating to the Aberdeen Market and Union Street Central report. Article 16 of this minute refers.

**The Committee resolved:-**

to note the information contained within the exempt appendix.

- **COUNCILLOR DOUGLAS LUMSDEN, Convener**



	A	B	C	D	E	F	G	H	I
1	<b>CITY GROWTH AND RESOURCES COMMITTEE BUSINESS PLANNER</b> The Business Planner details the reports which have been instructed by the Committee as well as reports which the Functions expect to be submitting for the calendar year.								
2	<b>Report Title</b>	<b>Minute Reference/Committee Decision or Purpose of Report</b>	<b>Update</b>	<b>Report Author</b>	<b>Chief Officer</b>	<b>Directorate</b>	<b>Terms of Reference</b>	<b>Delayed or Recommended for removal or transfer, enter either D, R, or T</b>	<b>Explanation if delayed, removed or transferred</b>
3			<b>24 June 2021</b>						
4	Performance Management Framework Report – City Growth and Resources	To inform Members of service delivery performance, commitments and priorities relating to City Growth and Resources as reflected within the Council's commissioning intentions and the Council Delivery Plan.		Alex Paterson	Chief Officer – Data and Insights	Customer	2.1.4	R	No report this cycle given that local and national data availability timescale for submission would be limited. PMF reporting to Committee will recommence in August,
5	Aberdeen Low Emission Zone – Preferred Option	The CG&R Committee on 6 February 2020 agreed to instruct the Chief Officer – Strategic Place Planning to undertake public and stakeholder engagement on options for a city centre LEZ encompassing multiple vehicle types and report the outcomes of this process to the Committee in October 2020.  The CG&R Committee on 28/10/20 agreed to instruct the Chief Officer – Strategic Place Planning to report the outcomes of traffic modelling and engagement exercises to this Committee in June 2021.		Will Hekelaar	Strategic Place Planning	Commissioning	3.2		
6	Wellington Road STAG Part 2 Appraisal	The CG&R Committee on 3/2/21 agreed to instruct the Chief Officer – Strategic Place Planning to continue with the Wellington Road Multimodal Corridor Study, ensuring that subsequent appraisal work reflects the decision of this Committee on a preferred option from the External Transportation Links to the Aberdeen South Harbour study, and to report the outcomes of the Wellington Road STAG Part 2 appraisal to this Committee in June 2021		Will Hekelaar	Strategic Place Planning	Commissioning		D	The outcomes of the study are currently under consideration and additional time is required to review the study and develop an optimum solution for this corridor. Defer to 25 August 2021 meeting.
7	Investor Ready Propositions	The CG&R Committee on 3/2/21 agreed to note the content of the report and instruct the Chief Officer – City Growth to report back to the Committee within two cycles on the methodology and approach to bring investor ready proposals to the market, including resource implications and timescales for developing the opportunities described within the various economic and infrastructure strategies.		Lynn Mutch/ Morag McCorkindale	City Growth	Commissioning	3.3		

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	Report Title	Minute Reference/Committee Decision or Purpose of Report	Update	Report Author	Chief Officer	Directorate	Terms of Reference	Delayed or Recommended for removal or transfer, enter either D, R, or T	Explanation if delayed, removed or transferred
2									
8	Information Plaques Relating to Slavery and Slavery Products	The CG&R Committee on 3/2/21 agreed to instruct the Chief Officer - City Growth to report to the City Growth and Resources Committee on the practicalities and projected costs of identifying locations and street names in Aberdeen with links to slavery and slavery products and then erecting appropriate information plaques at each location.		Helen Fothergill	City Growth	Commissioning		D	This is an extensive piece of work. Officers need to assess contents of city plaques (c.120) and Aberdeen street names (3197) for connections to slavery and slavery products to give an indication of costs associated with any new interpretation; plus clear understanding of process, resources and costs to seek and gain permission from property owners where such an interpretation plaque may be placed. For a holistic review considerable resources would need to be applied to this undertaking. Officers believe the report won't be available before summer.
9	Procurement Workplan and Business Cases - Capital	The purpose of this report is to present procurement workplans for each Function to Committee for review and to seek approval of the total estimated capital expenditure for the proposed contracts as required by ACC Procurement Regulations 2021.	There may not be a need to present a report for each meeting, this would be dependant on submission of business cases required.	Mel Mackenzie	Head of Commercial and Procurement	Commissioning	1.1.6	R	There are no Business cases to be submitted for Committee consideration this cycle.
10	Update on Spaces for People interventions	The CG&R Committee on 11/5/21 agreed to note the timetable as set out by the Scottish Government in relation to Covid-19 Protection Levels. Notes that by the 7 June 2021, Aberdeen is on track to be level one and an announcement is to be made by the Scottish Government regarding level zero. Therefore, instructs Chief Officer - Strategic Place Planning in consultation with Public Health Scotland to bring forward a report on the timetable for removal of the Spaces for People initiatives to the next Committee in June taking into consideration any decisions made by this Committee in respect of the City Centre Masterplan and associated reports		David Dunne	Strategic Place Planning	Commissioning	3.2		

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2									
11	Feasibility of a Food & Crafts Market – Rubislaw Terrace Gardens	The CG&R Committee on 11/5/21 agreed to instruct the Chief Officer – City Growth to engage with businesses and other interested parties seeking to establish the feasibility for a local food and crafts market in the vicinity of Rubislaw Terrace Gardens and to report back to the next meeting of this Committee detailing options for potential implementation in Summer 2021 in consultation with the Depute Provost.		Andrew Stephen	City Growth	Commissioning	3.3		
12	Aberdeen Performing Arts - Contract Terms and Conditions	This report provides the Committee with the opportunity to consider a proposal presented by Aberdeen Performing Arts in relation to the provision of pension for their staff who are members of the North East Scotland Pension Fund.		Jonathan Belford	Finance	Resources	1.1		
13	Countesswells Primary	To update members of progress with plans to develop a new primary at countesswells including the situation with developer contributions.	Transferred from the Capital Programme Committee Planner as there were financial implications associated with the project which required a decision from the City Growth and Resources Committee	Stephen Booth	Corporate Landlord	Resources	4.1		
14	Disposal of Former Office & Training Centre, Frederick Street	To advise committee of the offer received at the recent closing date.		Peter Thatcher	Corporate Landlord	Resources	4.1 & 4.4		
15			<b>10 August 2021</b>						
16	Council Financial Performance, Quarter 1, 2021/22	To present the Council's financial position for the quarter.	:	Lesley Fullerton	Finance	Resources	1.1.1		
17			<b>25 August 2021</b>						

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	Report Title	Minute Reference/Committee Decision or Purpose of Report	Update	Report Author	Chief Officer	Directorate	Terms of Reference	Delayed or Recommended for removal or transfer, enter either D, R, or T	Explanation if delayed, removed or transferred
2									
18	Aberdeen to Westhill Transport Corridor Study	The CG&R Committee on 28/10/20 agreed (1) to instruct the Chief Officer – Strategic Place Planning to develop a programme for the delivery of the Low Delivery Package measures, subject to available funding, as detailed in the Action Plan at Appendix 1 and report these back to City Growth and Resources committee for approval; and (2) to instruct the Chief Officer – Strategic Place Planning to develop the Outline Business Case for the Medium/High Delivery Package measures as detailed in the Action Plan at Appendix 1, subject to available funding and report back to the Committee in Summer 2021.		Gregor Whyte	Strategic Place Planning	Commissioning	3.2 & 3.3	R	This work has been absorbed into the draft programme of work submitted as part of Aberdeen City Council's submission to the Scottish Government's Bus Partnership Fund. A report on the outcome of this application is anticipated to be presented to the August meeting of the CG&R Committee.
19	Freeport/Greenport update	The CG&R on 11/5/21 agreed to instruct the Chief Officer - City Growth to report back to this Committee on the development and outcome of any proposals if they progress.	It is expected that a report will be submitted to this meeting.	Jamie Coventry	City Growth	Commissioning			
20	Performance Management Framework Report – City Growth and Resources	To inform Members of service delivery performance, commitments and priorities relating to City Growth and Resources as reflected within the Council's commissioning intentions and the Council Delivery Plan.		Alex Paterson	Chief Officer – Data and Insights	Customer	2.1.4		
21	Queen Street Redevelopment	Council on 6/3/18 agreed to instruct the Chief Officer – City Growth to bring forward an all options business case to the Capital Programme Committee in September 2018 on how best to proceed with Queens Square as part of the next phase of the masterplan.  The CG&R Committee on 28/10/20 agreed to instruct the Director of Resources to procure a development partner to develop options for the redevelopment of the area and report the results back to this Committee.		Sandy Beattie	Finance	Resources			

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2									
22	Bus Partnership Fund Bid	The CG&R Committee on 3/2/21 agreed to instruct the Chief Officer – Strategic Place Planning, to report back to this Committee on the success or otherwise of this bid, on any additional resource requirements to deliver a successful bid and, in consultation with the Chief Officer Governance and Chief Officer Finance, with recommendations for appropriate governance arrangements should the bid be successful, at its meeting on 10 August 2021		Joanna Murray	Strategic Place Planning	Commissioning			
23	Berryden Corridor Project	Council on 10/03/21 agreed (1) to instruct the Chief Officer - Capital to review the Berryden Corridor project and report back to the meeting of City Growth and Resources Committee on 10 August 2021 with updated costs and the implications for the Capital Programme; and (2) to note that by reviewing the Berryden Corridor project this supports the application to the Bus Partnership Fund for bus priority measures		Mike Matheson	Capital	Resources			
24	External Links to Aberdeen South Harbour – Updated Strategic Business Case	Agreement of a Business Case to be submitted to the UK and Scottish Governments to seek approval to progress to the design stage of the project.		Ken Neil	Strategic Place Planning	Commissioning	1.1.4		
25	Procurement Workplan and Business Cases - Capital	The purpose of this report is to present procurement workplans for each Function to Committee for review and to seek approval of the total estimated capital expenditure for the proposed contracts as required by ACC Procurement Regulations 2021.	There may not be a need to present a report for each meeting, this would be dependant on submission of business cases required.	Mel Mackenzie	Head of Commercial and Procurement	Commissioning	1.1.6		
26	Commemorative and Court Plaques Policy	Seeking Committee approval for a revised version of the Council's Commemorative and Court Plaques Policy, last revised in 2002.		Katy Kavanagh	City Growth	Commissioning	2.1.5		
27	Joint Integrated Mortuary Project	Council on 10/03/21 agreed to instruct the Director of Resources to report back to the City Growth and Resources Committee on 11 May 2021 on the negotiations that have taken place to secure a suitable funding package to enable the progression of the Joint Integrated Mortuary project	This was due at the 11/5/2021 meeting, however officers decided to withdraw the report and defer until August Committee meeting to enable sufficient time for a robust financial delivery solution to be developed.	Sandy Beattie	Finance	Resources	3.2 & 3.3		



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2									
30	City Centre Masterplan	The CG&R Committee on 11/5/21 agreed (1) to instruct the Director of Resources to carry out a review of the Aberdeen City Centre Master plan Objectives and their associated workstreams as contained within the 2015 approved Masterplan and to report back findings to the City Growth and Resources Committee on 10 August 2021 and also to report back on the Phase 1 and 2 projects contained within the city centre masterplan as approved in 2015; (2) instruct the Chief Officer - City Growth and the Communication and Marketing Manager to use the CCMP Review to integrate further "smart city thinking" into our medium-term plans to develop and undertake engagement exercise with the public, all appropriate partners and stakeholders to seek their views on the City Centre Review, what it would take to attract them back to the city centre in the short-term, how the changed travel patterns and reductions in travel experienced throughout the pandemic can be embedded and report the results to the City Growth & Resources Committee in August 2021, as part of the CCMP report detailing how best the city can be a leader in the digital economy		Sandy Beattie/ Richard Sweetnam/ David Ewen	Corporate Landlord	Resources			
31	Review and Visioning Exercise on the Streetscape and Infrastructure Works for the whole length of Union Street	The CG&R Committee on 11/5/21 agreed that notwithstanding any decision taken by Committee in respect of item 12.2 (Market/Union Street) on the agenda, agrees to instruct the Director of Resources to carry out a review and visioning exercise on the streetscape and infrastructure works for the whole length of Union Street and to report back the outcomes to the August 2021 Committee.		Sandy Beattie	Corporate Landlord	Resources			
32	Beach Masterplan	The CG&R Committee on 11/5/21 agreed to instruct the Director of Resources to report back an update on the output of the technical feasibility studies, public consultation and proposed Beach Masterplan to the City, Growth and Resources Committee on the 10th August 2021		Craig Innes	Head of Commercial and Procurement	Resources			

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2									
33	Covid-19 Discretionary Fund	Seek approval for the disbursement of funding to support local businesses impacted by Covid-19 and update on support provided to date.		Mark Brebner	City Growth	Commissioning	1.1.3		
34			<b>03 November 2021</b>						
35	Condition & Suitability 3 Year Programme	This report seeks approval of an updated 3-year Condition and Suitability (C&S) Programme.		Alastair Reid	Corporate Landlord	Resources	4.1		
36	Performance Management Framework Report – City Growth and Resources	To inform Members of service delivery performance, commitments and priorities relating to City Growth and Resources as reflected within the Council's commissioning intentions and the Council Delivery Plan.		Alex Paterson	Chief Officer – Data and Insights	Customer	2.1.4		
37	Unrecoverable Debt	To advise numbers and values of Council Tax, Non-Domestic Rates, Housing Benefit Overpayments and Rent made unrecoverable during 2020/21 as required in terms of Financial Regulations and approve Non-Domestic Rates write offs in excess of £25,000		Wayne Connell	Chief Officer- Customer Experience	Customer	1.1		
38	Council Financial Performance, Quarter 2, 2021/22	To present the Council's financial position for the quarter.		Lesley Fullerton	Finance	Resources	1.1.1		



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2									
39	Car Parking Framework	The CG&R Committee on 6 June 2019 agreed to note the findings of the SCPR and instruct the Chief Officer – Strategic Place Planning to develop a draft Car Parking Strategy and to report back to this Committee in summer 2020.	This was originally due for the August 2020 meeting, however development of the Car Parking Framework has been delayed due to sensitivities in terms of consulting with members of the public and stakeholders on such an issue during this time, given the disruption that has been caused to residents and businesses and to the city centre economy by the pandemic and ongoing restrictions, and the mixed reaction to the temporary city centre Spaces for People measures. Assuming that the impacts of the pandemic lessen as a vaccine is rolled out, the car parking consultation will be revisited in late 2021.	Will Hekelaar	Strategic Place Planning	Commissioning	3.3		
40	Annual Committee Effectiveness Report	To present the Annual Effectiveness report for the Committee.		Mark Masson	Governance	Commissioning	GD 8.5		
41	Medium Term Financial Strategy	Council on 10/03/21 agreed to instruct the Chief Officer - Finance to refresh the Medium-Term Financial Strategy and report it to the City Growth and Resources Committee on 3 November 2021.		Jonathan Belford	Finance	Resources			
42	Developer Obligations	Council on 10/03/21 agreed that given the significant impact on the development industry in the last 12 months, instruct the Chief Officer - Strategic Place Planning to report to the City Growth and Resources Committee by the end of 2021 on the legally binding developer obligations that have been signed with the Council		David Dunne/David Berry	Strategic Place Planning	Commissioning	3.2		

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2									
43	Socio Economic Rescue Plan	The CG&R Committee on 11/5/21 agreed to note the successful delivery of this plan and agrees for a report to be submitted to the meeting on 3 November 2021 of this Committee, providing information on the recovery initiatives, including budget allocations, undertaken in 2021/22		Ishbel Greig	City Growth	Commissioning			
44	Chapel Street Car Park	The CG&R Committee on 11/5/21 approved in principle the allocation of 400 spaces in the Chapel Street Car Park at the rental identified in the report (being index linked and excluding VAT) subject to a minimum 15-year lease with the proposed occupier of the building outlined in the report and report back to a future meeting of this Committee not later than November 2021 on progress		Stephen Booth	Corporate Landlord	Resources			
45			<b>2022</b>						
46	Review of School Estate	Council on 6/3/18 agreed to instruct the Chief Officer – Corporate Landlord to bring a review of the School Estate report within the next 9 months to the Education Operational Delivery Committee, thereafter to forward the report to the Capital Programme Committee.	Council on 3/3/21 agreed to instruct the Chief Officer - Corporate Landlord to present the finalised School Estate Plan to the Education Operational Delivery Committee in summer 2022. Officers will recommend that the report is thereafter forwarded to the City Growth and Resources Committee.	Stephen Booth / Andrew Jones	Corporate Landlord	Resources	4.1		

	A	B	C	D	E	F	G	H	I
	Report Title	Minute Reference/Committee Decision or Purpose of Report	Update	Report Author	Chief Officer	Directorate	Terms of Reference	Delayed or Recommended for removal or transfer, enter either D, R, or T	Explanation if delayed, removed or transferred
2									
47	Local Authority Bus Services/Controlled Bus Companies	<p>The CG&amp;R Committee on 26/09/19 agreed to instruct the Director of Resources to monitor the sale position of First Aberdeen Limited and report back to the City Growth and Resources Committee on 6 February 2020 with an update on the proposed sale and recommended next steps for the Council.</p> <p>The CG&amp;R Committee on 28/10/20 agreed that given that First Bus has indicated it is no longer for sale, instruct the Chief Officer – Strategic Place Planning to report back to the City Growth and Resources Committee in February 2022 with the steps that would be necessary to establish the setting up by the Council of a municipal bus company as part of the Council's commitment to green energy and net zero and in order to fulfil any obligations under any low emission zone that the Council may wish to implement.</p>		Gale Beattie	Strategic Place Planning	Commissioning	1.1.8 & 3.2		
48	City Centre Multi Storey Blocks - Option Appraisal	Council on 10/03/21 agreed (1) to approve £250,000 from the Housing Capital Programme to undertake a full option appraisal on the city centre multi storey blocks to consider future development and investment opportunities; and (2) to instruct the Chief Officer - Corporate Landlord to report back the outcome from the option appraisal of (1) above to the City Growth and Resources Committee no later than March 2022		Stephen Booth	Corporate Landlord	Resources			
49	Roads and Transport Related Budget Programme 2022 - 2023 (Annual Report)	This report is Business Critical to spend the allocated capital Budget approved at the Council Budget meeting and brings together the proposed roads and transportation programme from the approved Capital Budgets for 2022/2023. This is presented as a provisional programme and Members are asked to approve specific schemes where detailed and the budget headings for the remainder. In addition provisional programmes for 2023/24 and 2024/25 are also included where possible.	To be submitted at the first CG&R meeting following the Council Budget Meeting in March 2022	Doug Ritchie	Operations and Protective Services	Operations			

	A	B	C	D	E	F	G	H	I
	Report Title	Minute Reference/Committee Decision or Purpose of Report	Update	Report Author	Chief Officer	Directorate	Terms of Reference	Delayed or Recommended for removal or transfer, enter either D, R, or T	Explanation if delayed, removed or transferred
2	Developer Obligations - Asset Plans	<p>The CG&amp;R Committee on 26/09/19 agreed to note that the Chief Officer – Strategic Place Planning would undertake the consultation on the draft Asset Plan template as outlined within this report and report the outcomes to a future meeting of this committee.</p> <p>The CG&amp;R Committee on 11/05/2021 agreed that a Service Update be circulated.</p>	Originally due on 11/5/21, however, due to instruction from Council on 10/03/21 "that given the significant impact on the development industry in the last 12 months, to instruct the Chief Officer - Strategic Place Planning to report to the City Growth and Resources Committee by the end of 2021 on the legally binding developer obligations that have been signed with the Council" combined with the ongoing impact of COVID and the work being undertaken looking at community benefit, it is proposed to report back to this committee after that report and any subsequent instructions from City Growth and Resources Committee, and in the interim look at what opportunities there are to combine the asset plans with existing or proposed community engagement to reduce the burden on communities.	David Dunne/David Berry	Strategic Place Planning	Commissioning	3.2		
50	Proposals for Investment for Works at Riverbank School to Accommodate the Relocation of St. Peter's School	Council on 3 March 2020 agreed to instruct the Chief Officer Corporate Landlord to take forward the proposals for investment for works at Riverbank School to accommodate the relocation of St. Peter's School once Riverbank School relocates to the City Growth and Resources Committee on 28 October 2020 with an indicative programme.	Given the Council decision on 10/03/21 (See Column B) a report will now be submitted in late 2022.	Andrew Jones/Maria Thies	Corporate Landlord	Resources	4.1		
51									
52			TBC						

	A	B	C	D	E	F	G	H	I
	Report Title	Minute Reference/Committee Decision or Purpose of Report	Update	Report Author	Chief Officer	Directorate	Terms of Reference	Delayed or Recommended for removal or transfer, enter either D, R, or T	Explanation if delayed, removed or transferred
2									
53	Impact on Aberdeen of Scottish Government Funding	Council on 5/3/18 agreed as part of our commitment to Civic Leadership and Urban Governance instruct the Chief Executive to bring a report to the City Growth and Resources Committee working with partners to include our ALEOs, Aberdeen and Grampian Chamber of Commerce, Aberdeen Burgesses Federation of Small Businesses, Opportunity North East, and Scottish Enterprise to assess the impact on Aberdeen of Scottish Government funding in comparison to the funding received by other local authorities and identify how the council can encourage the Scottish Government to provide a better financial settlement for Aberdeen.		Richard Sweetnam	City Growth	Commissioning	1.1 & 3.2		
54	Schools Business Cases	The EODC on 17/9/19 agreed: (1) Countesswells School - to establish a new primary school on the identified site N7 within the Countesswells development, Aberdeen, subject to approval of the fully costed business case at City Growth and Resources Committee; and (2) Milltimber School - to relocate the existing Milltimber Primary School to a new building on an identified site within the Oldfold Farm development, Aberdeen with effect from August 2021 or as soon as possible thereafter, subject to approval of the fully costed business case at City Growth and Resources Committee.		John Wilson	Capital	Resources	4.1		
55	Marywell to A956 Wellington Road – Cycle Path (RCD5394) 19/20	The CG&R Committee on 6 June 2019 agreed to instruct the Chief Officer – Capital and Chief Officer – Strategic Place Planning to undertake detailed design and cost estimates of the Preferred Route and connections, and to report back to this Committee for approval to construct in due course.	Discussions are continuing with an external funder regarding funding the design stage of the project. Once funding is confirmed the scheme will be progressed by the Roads Projects team	Alan McKay	Capital	Resources	3.2		









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2									
62	Hydrogen Hub Programme	Council on 10/3/21 agreed to note that also included within the General Fund Capital Programme is £19million gross in relation to enhancing the Hydrogen refuelling infrastructure and bus programme within the city and authorise the Chief Officer - City Growth, in consultation with the Head of Commercial and Procurement, to undertake a procurement exercise for the appointment of a partner to deliver the Hydrogen Hub programme and to instruct the Chief Officer - City Growth to report back to the City Growth and Resources Committee on the outcome and progress		Emma Watt	City Growth	Commissioning			
63	Council Housing	Council on 10/03/21 agreed to note that a second tranche procurement exercise is being progressed to seek out further opportunities for developer led proposals and report the outcome of this to a future meeting of the City Growth and Resources Committee and to note that this will exceed the 2,000 houses if successful.		Stephen Booth	Corporate Landlord	Resources			
64	Living Wall	The CG&R Committee on 3/2/2021 agreed to instruct the Chief Officer – City Growth, to investigate alternative ways to deliver a living wall in the city centre and to report back to the May meeting of the Committee.  The CG&R Committee on 11/5/2021 agreed to retain this item on the planner for the timebeing.	A report will be brought back to Committee by officers if and when funding streams become available	Stuart Bews	City Growth	Commissioning			
65	Infrastructure Improvements to support increased numbers of Electric Vehicles within the council fleet	The CG&R Committee on 11/5/21 agreed to instruct Chief Officer - Corporate Landlord in consultation with Chief Officer - Operations and Protective Services and Chief Officer - Strategic Place Planning to report to a future meeting of this committee with a programme of infrastructure improvements to support increased numbers of electric vehicles within the council fleet		Stephen Booth	Corporate Landlord	Resources			

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2									
66	Aberdeen Market - Full Business Case	The CG&R Committee on 11/5/21 agreed the outline business case for the former site of the Aberdeen Market and former BHS retail unit and that this progress to Full Business Case, considering all options to deliver the development including delivery with a development partner and operator and to report the outcome of this to this committee at the earliest opportunity.		Sandy Beattie	Corporate Landlord	Resources			

## ABERDEEN CITY COUNCIL

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<b>COMMITTEE</b>	City Growth and Resources
<b>DATE</b>	24 June 2021
<b>EXEMPT</b>	No
<b>CONFIDENTIAL</b>	No
<b>REPORT TITLE</b>	Aberdeen Low Emission Zone – Preferred Option
<b>REPORT NUMBER</b>	COM/21/149
<b>DIRECTOR</b>	Steve Whyte
<b>CHIEF OFFICER</b>	Gale Beattie
<b>REPORT AUTHOR</b>	Will Hekelaar
<b>TERMS OF REFERENCE</b>	3.2

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### 1. PURPOSE OF REPORT

- 1.1 The purpose of this report is to present Aberdeen’s proposed Low Emission Zone (LEZ) and to gain approval to formally submit the scheme to Scottish Ministers following further consultation on and publication of the proposed scheme, assuming no significant changes to the proposals are required as a result of these processes.

### 2. RECOMMENDATION(S)

That the Committee:

- 2.1 Agree the outcomes of the LEZ option appraisal and that Option 6 (encompassing the proposed LEZ boundary and supporting traffic management requirements as detailed in section 3.1.9) best meets the objectives of the Aberdeen LEZ;
- 2.2 Instruct the Chief Officer – Strategic Place Planning to include consideration of access restrictions at the South College Street / Millburn Street junction within the business case development for Phase 2 of the South College Street Junction Improvement project, and to ensure that the business case includes programming considerations for works delivery in advance of LEZ enforcement commencing;
- 2.3 Agree that 2 years is an appropriate grace period to enable residents, businesses and visitors time to comply with LEZ requirements;
- 2.4 Instruct the Chief Officer – Strategic Place Planning to undertake a further eight-week period of public and stakeholder consultation and engagement on the proposed LEZ boundary and grace period;
- 2.5 Delegate authority to the Chief Officer – Strategic Place Planning, in consultation with the Leader of the Council and the Convenor of the City Growth

and Resources Committee, to publish the proposed LEZ scheme following the consultation period, and to formally submit Aberdeen's LEZ proposal to Scottish Ministers; and

- 2.6 Instruct the Chief Officer – Strategic Place Planning to submit the full financial model for the LEZ to the Council's budget process for 2022/23.

### **3. BACKGROUND**

#### **3.1 LEZ Preferred Option**

- 3.1.1 As was reported to this Committee on 28 October 2020, Aberdeen City Council (ACC) has been developing and appraising options for a LEZ in the City Centre using the National Low Emission Framework (NLEF) appraisal tool, supplemented by STAG (Scottish Transport Appraisal Guidance). An initial Interim NLEF Stage 2 report was completed in June 2020, recommending that 8 options be taken forward for further appraisal, including public and stakeholder consultation and detailed traffic and air quality modelling. These options were:

- Option 1A – Union Street Area, including Denburn Road;
- Option 1B – Union Street Area, excluding Denburn Road;
- Option 2A – Union Street & George Street Area, including Denburn Road;
- Option 2B – Union Street & George Street Area, excluding Denburn Road;
- Option 3A – City Centre Masterplan (CCMP) East including Denburn Road;
- Option 3B – CCMP East excluding Denburn Road;
- Option 4A – CCMP, including Denburn Road; and
- Option 4B – CCMP, excluding Denburn Road.

Plans of the options can be found in the second Interim NLEF Stage 2 Report and Executive Summary which form Appendices 1 and 2 of this report.

- 3.1.2 Consultation took place during September and October 2020 with more than 500 members of the public and organisations engaging. An online questionnaire was supplemented with workshops held with a range of stakeholders, including Community Councils, transport operators and groups with an interest in health, equalities and the environment. A summary of the online consultation outcomes is presented in Appendix 3, with a summary of the outcomes of the stakeholder workshops forming Appendix 4.

- 3.1.3 In the online consultation, respondents were asked to rank options in order of preference, where a ranking of 1 was given to their preferred option and 8 to the least preferred option. Considering the options identified by respondents as their preferred option (given a ranking of 1), there was a clear preference for options at the opposite ends of the scale, with Option 4A (the largest option) receiving the highest number of preferred option votes, closely followed by Option 1A (one of the smallest options), as shown in Figure 1.

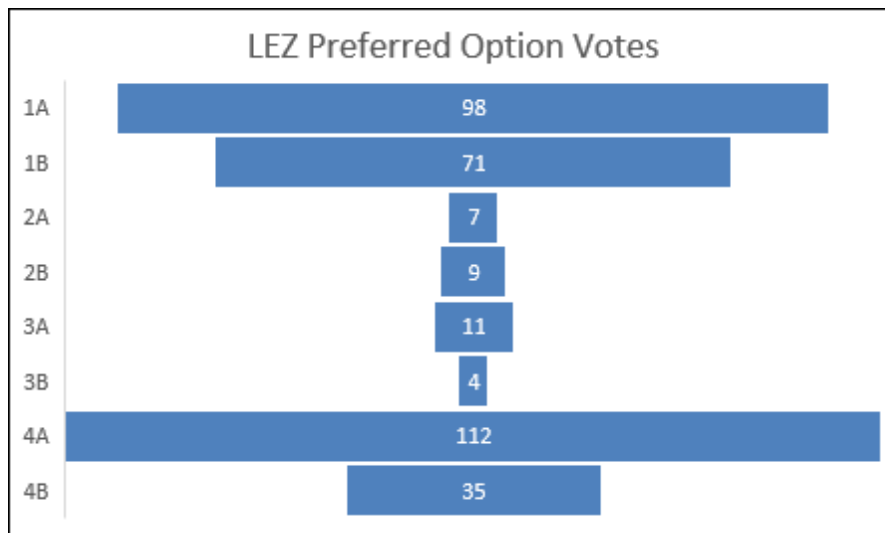


Figure 1: Preferred Option Votes

When considering overall average rankings, Option 1A emerged as the most popular option, with a general preference for the smaller options. Those options excluding Denburn Road from the LEZ area were less well received, with 2B, 3B and 4B being the least acceptable options (Figure 2).

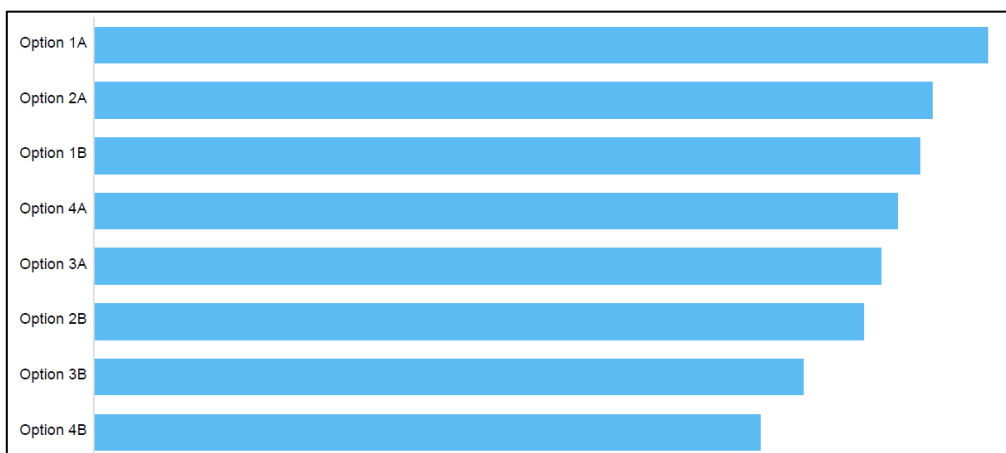


Figure 2: Average Option Rankings

3.1.4 The options were also subject to detailed traffic modelling in the revised City Centre Paramics microsimulation model.

3.1.5 Following an iterative process of option testing, adjustment and appraisal, a preferred option has emerged. This process has been overseen by the Aberdeen LEZ Delivery Group, comprising representatives of ACC, Aberdeenshire Council, Nestrans, NHS Grampian's Public Health Unit, Transport Scotland, SYSTRA (ACC's modelling and appraisal consultants) and SEPA (the Scottish Environment Protection Agency, engaged by Transport Scotland to undertake air quality modelling).

3.1.6 A summary of this process is provided below:

- Options 2B and 3A were sifted out as they are unlikely to cope with future forecast traffic demand without resulting in increased congestion in sometimes sensitive locations. They also have a low level of public acceptability compared to the other options;

- Options 3B and 4B also have relatively low public acceptability and are projected to increase traffic (particularly non-compliant traffic) in the Hutcheon Street / Skene Square area. Nitrogen Dioxide (NO<sub>2</sub>) emissions have been hovering near exceedance levels for a number of years here and any increase in traffic would likely see further breaches of air quality objectives and potentially a new Air Quality Management Area (AQMA) being declared, in obvious contradiction to LEZ objectives;
- The remaining options were then subject to screening against modelled traffic flow changes at 2019 exceedance locations, with Options 1A, 1B and 2A not anticipated to meet the NO<sub>2</sub> objectives without significant additional interventions not historically considered (such as CCMP projects);.
- None of the remaining options aligned fully with the revised North East Scotland Roads Hierarchy. A process then took place to see if these conflicts could be mitigated by traffic management measures and / or revisions of the LEZ boundary;
- In addition, there were concerns about the accessibility of the City Centre under Option 4A, where only 1 City Centre car park would be accessible to non-compliant vehicles, and the resulting implications on social inclusion, the City Centre economy and the large number of residents who would be living in the LEZ area;
- During the option testing and sifting process, a 'hybrid' option, Option 5 (a plan of which is also included within Appendices 1 and 2) was introduced, to combine the benefits of both the smaller and larger options. Option 5:
  - Has a fairly tight boundary (like Option 1A/B) but encompasses more areas of air quality exceedance;
  - Will have less impacts on residents and businesses than 4A;
  - Better maintains accessibility to the wider area for non-compliant vehicles than 4A:
  - Restricts through access for non-complaint vehicles in accordance with the Roads Hierarchy;
  - Better encourages routing choices in line with the Hierarchy;
  - Can cope better at predicted traffic demand levels; and
  - Potentially reduces congestion at key locations compared to the other options.
- Options 4A and 5 therefore proceeded to more detailed appraisal against the LEZ objectives and STAG criteria;
- Option 4A was found to perform less well against some of the criteria, namely accessibility, social inclusion and the economy, particularly in the context of COVID-19 recovery;
- Option 5 therefore emerged as the most promising option and proceeded to further detailed testing. This included consideration of supporting measures to enhance the benefits of the LEZ and reduce any negative impacts on surrounding streets. Again, this necessitated an iterative process of adjustments of the boundary to identify a final option that is feasible and deliverable, that best meets the scheme objectives and which reduces unintended negative impacts in other areas of the City.

3.1.7 However, the traffic and air quality model outputs show that a LEZ alone, under any of the option scenarios, is unlikely to be sufficient to bring all NO<sub>2</sub> exceedance locations in the City Centre AQMA within objective limits – for example, areas of Union Street, King Street and Market Street are anticipated to remain near or over the objective limit even though they are within the LEZ area. The LEZ was therefore tested in combination with the strategic transport elements of the CCMP and it was determined that the objectives of the LEZ could be fully met if delivered in combination with the CCMP project to restrict traffic on the central section of Union Street between Bridge Street and Market Street to buses, taxis and cycles only, with supporting traffic restrictions on Union Terrace and Rose Street (Option 6). Projected air quality impacts of Option 5 (LEZ boundary alone) and Option 6 (LEZ + CCMP project) are provided in Table 1 below.

Table 1: Predicted Impact of LEZ on Air Quality Exceedance Locations

Site	Exceedance Location	Flow Difference to Base		Air Quality Impact	
		Option 5	Option 6	Option 5	Option 6
DT30	335 Union St	5%	-25%		
DT73	61 Skene Square	-8%	-10%		
DT18	14 Holburn St	1%	-14%		
CM2	Union Street	3%	-41%		
DT16	1 Trinity Quay	-7%	8%		
DT77	27 Skene Square	-8%	-10%		
DT11	105 King St	3%	-2%		
DT10	184/192 Market St	-4%	-2%		
DT9	39 Market St	1%	-36%		
DT29	469 Union St	3%	-32%		
DT12	40 Union St	9%	-61%		
DT17	43/45 Union St	9%	-61%		
DT82	7 Virginia Street	-8%	5%		
DT19	468 Union St	3%	-32%		
	NO <sub>2</sub> Levels predicted to be Under Threshold				
	NO <sub>2</sub> Levels predicted to be Near Threshold				
	NO <sub>2</sub> Levels predicted to be Over Threshold				
	NO <sub>2</sub> Levels predicted to be Significantly Over Threshold				

3.1.8 The traffic modelling also indicated that non-compliant traffic displaced by the LEZ could migrate to streets around the periphery of the zone which may be inappropriate for accommodating this additional traffic, specifically Ferryhill Road and Fonthill Road to the south of the LEZ. Various options were tested in the model to mitigate these impacts, including bus gates, junction treatments, banned turns and extensions of the LEZ. The most effective and appropriate intervention to address this issue proved to be access restrictions to and from Millburn Street at its junction with South College Street / Palmertson Place. These were shown to significantly reduce traffic volumes through the Ferryhill area.

3.1.9 The outcome of the modelling and appraisal process is therefore that the preferred LEZ Option (see Figure 3 below) encompasses: the previous Option 5 boundary (with some adjustments to address remaining areas of NO<sub>2</sub> exceedance and to support non-compliant traffic routeing around the LEZ area); restrictions to general traffic (in the form of the CCMP project to restrict access

to the central section of Union Street to bus, taxi and cycle only and additional restrictions on part of Union Terrace and Rose Street); and a revised junction layout at South College Street / Millburn Street with restricted movements to and from Millburn Street.

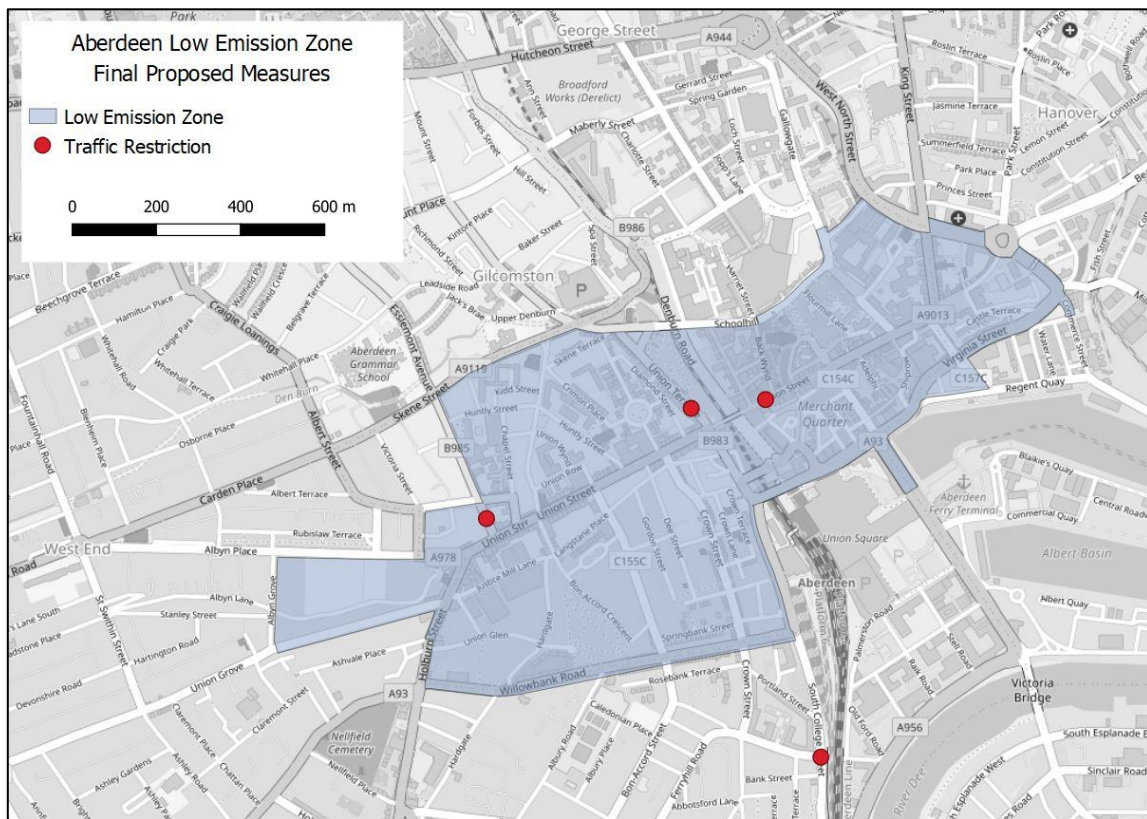


Figure 3: Preferred LEZ Option

3.1.10 The traffic modelling also suggested that the closure of Union Street to general traffic could put additional pressure on the Wellington Place / Springbank Terrace / Willowbank Place corridor, and that this could be addressed by implementing turning restrictions at the Wellington Place / Springbank Terrace / Crown Street junction and the Springbank Terrace / Willowbank Road / Bon Accord Street junction (Figure 4). These are not considered necessary to deliver the proposed LEZ package at this point in time, however movements in this area will be monitored once the LEZ is operational to understand how traffic is using this area and whether these additional restrictions are required.





Figure 4: Potential Future Traffic Management requirements

3.1.11A full description of the option appraisal, sifting and development process is contained within the second interim NLEF Report – the full report is available as Appendix 1, while Appendix 2 forms an Executive Summary. Appendix 5 comprises the LEZ Option Testing Report. A plan of the final preferred LEZ option is included as Appendix 6, along with a schedule of streets that fall within the proposed LEZ boundary. An initial Emissions Analysis Report is included as Appendix 10, and will be developed further as we move towards final scheme proposals.

### 3.2 Grace Periods and Exemptions

3.2.1 It is assumed at this stage that Aberdeen’s LEZ will operate 24hrs a day, 7 days a week and will apply to all vehicles except:

- Those granted a national exemption under [The Low Emission Zones \(Emission Standards, Exemptions and Penalty Charges\) \(Scotland\) Regulations 2021](#) (emergency services; naval, military or air force vehicles; historic vehicles; vehicles for disabled persons, including vehicles being driven by a blue badge holder or with a blue badge holder as a passenger; and showman vehicles); and
- Motorcycles and mopeds – LEZ Guidance recommends that these are scoped out of LEZ schemes unless a local authority can provide justification for their inclusion.

However, by 2024, it is estimated that 86% of cars, 70% of Light Goods Vehicles (LGVs), 93% of Heavy Goods Vehicles (HGVs) and all taxis in Aberdeen will be compliant with the LEZ. This means that drivers of these vehicles can continue driving within the LEZ (apart from areas subject to other traffic restrictions) without penalty.

3.2.2 The legislation governing LEZs requires a grace period between the date the LEZ is formally declared and the date at which enforcement will commence.

This must be a minimum period of 1 year and can be a maximum of 6 years for residents of the LEZ area and 4 years for non-residents. However, draft LEZ Guidance states that: *Given that air quality should be improved in the quickest time possible, application of the minimum grace period (i.e. 1 year) should be regarded as the default unless a rationale can be provided to go beyond this.*

3.2.3 During consultation, the maximum grace periods were the most popular options for both residents and non-residents, although there was significant support for minimum grace periods especially for non-residents.

Length of Grace Period (Residents)	% of respondents selecting this as preferred option
1 year	19.2%
2 years	10.5%
3 years	8.5%
4 years	4.7%
5 years	7.1%
6 years	45.1%

Table 2: Preferred Grace Periods (Residents)

Length of Grace Period (Non - residents)	% of respondents selecting this as preferred option
1 year	34.4%
2 years	6.52%
3 years	6.32%
4 years	47.8%

Table 3: Preferred Grace Periods (Non-Residents)

Additional engagement took place with city centre businesses and bus operators in March and April 2021 to understand their ability to comply with a 1 year grace period. There were understandable concerns around this, especially while businesses continue to struggle with the impacts of the COVID-19 pandemic.

3.2.4 Clearly, the longer the grace period, the more the benefits of the LEZ will be diluted. A balance must be struck, however, between achieving air quality and public health improvements in the quickest possible timescale, and allowing sufficient time for members of the public and businesses to comply with the LEZ in the context of COVID-19 recovery. It is likely that the pandemic has impacted on traditional fleet renewal programmes and the ability of individuals and businesses to upgrade their vehicles or change mode of travel to become LEZ-compliant.

3.2.5 To mitigate this, Transport Scotland has made grants available to individuals and small businesses to support them to upgrade their vehicle or switch to an alternative mode of transport. During 2020/21, £14,000 was awarded to individuals and £12,500 to businesses in Aberdeen. Funding has also been made available to bus operators to retrofit older vehicles to become LEZ-compliant, although to date no major bus operator in Aberdeen has had a successful application to this fund. It is anticipated that these funding streams will also be made available in 2021/22.

3.2.6 On that basis, it is considered a grace period of 2 years for both residents and non-residents is appropriate and strikes a balance between improving air quality and public health in the quickest possible timescale and being sympathetic to the ongoing impacts of COVID-19 on residents and businesses.

3.2.7 Local authorities also have the power to grant and renew time-limited exemptions (of up to one year) for certain vehicles or types of vehicle and to temporarily suspend the LEZ for events of national or local significance.

### 3.3 COVID-19 Uncertainties

3.3.1 In recognition of the uncertainties around the medium to long-term impacts of COVID-19 on traffic levels and transport behaviour, Transport Scotland commissioned research to better understand these uncertainties and how policies to address these could interface with LEZ proposals. Four plausible futures were identified, reflecting varying degrees of economic recovery and the permanency of changes initiated by the pandemic. This Scenario Planning exercise concluded that the impact of the LEZs will vary between each city depending on their specific traffic levels and fleet composition, but LEZs will nevertheless protect city centres by preventing non-compliant vehicles from entry and reducing emissions compared to pre-LEZ levels. The LEZ Post-COVID Uncertainty Report is included as Appendix 8.

3.3.2 This work has helped to identify ACC's preferred LEZ option and further sensitivity testing of the option was undertaken to ensure that the LEZ remains relevant in all plausible future scenarios and robust to variations in network conditions that may occur in a post-pandemic world (see Appendix 5).

### 3.4 Next Steps

3.4.1 In accordance with LEZ Regulations, the Council is required to undertake further consultation and engagement on the proposed LEZ boundary and incorporate any relevant feedback prior to formal publication of proposals. It is proposed to undertake an eight-week period of consultation and engagement on the preferred option boundary between June and August 2021. Following consultation, the Council is required to publish the proposed scheme and allow 28 days for any objections to the scheme to be submitted.

3.4.2 A number of Traffic Regulation Orders (TROs) must be successfully progressed in order to deliver the traffic management requirements of the proposed option package shown in Figure 3. Should the recommendations of this report be agreed, these will be taken forward by officers under delegated powers, with any objections reported to the Operational Delivery Committee for consideration. A schedule of required TROs forms Appendix 7. An indicative programme for the LEZ consultation and publication process and the concurrent TRO process is included as Appendix 9.

3.4.3 Alongside this, a series of supporting assessments will be finalised to better understand the wider impacts of the LEZ and how any negative impacts can be mitigated. These will include Strategic Environmental Assessment (SEA),

Integrated Impact Assessment (IIA) and Business and Regulatory Impact Assessment (BRIA).

- 3.4.4 Assuming a formal examination is not triggered and there are no significant amendments required to the proposed LEZ boundary following consultation and the objection period, it is anticipated that the final scheme will be submitted to Scottish Ministers in late 2021 / early 2022. Should Ministers approve the scheme, ACC should be in a position to formally declare its LEZ by spring 2022.

#### **4. FINANCIAL IMPLICATIONS**

- 4.1 To date, LEZ option appraisal and modelling work has been fully funded by Transport Scotland and Nestrans.
- 4.2 The Council has been awarded £105,000 from Transport Scotland to complete option appraisal work in 2021/22, including consultation and engagement. £240,000 has also been made available from the Scottish Government's Air Quality Action Plan Grant scheme 2021/22 for the delivery of traffic management measures to support the LEZ.
- 4.3 Further capital funding is expected to be made available from Transport Scotland later this year to commence LEZ implementation, namely purchase and installation of Automatic Number Plate Recognition (ANPR) cameras to support LEZ enforcement.
- 4.4 Approving the preferred option for the LEZ will allow the final development of the operating and financial model for the scheme, which will include expected levels of maintenance and management required, and any income from enforcement activities.
- 4.5 It should be noted that the Transport (Scotland) Act 2019 states that: *Any monies received from penalty charges in respect of a LEZ scheme can be applied by a local authority only for the purposes of facilitating (directly or indirectly) the achievement of the scheme's objectives.* In essence, any revenue generated through the issuing of fines must be used to cover the ongoing running costs of the LEZ. Should there be any surplus income once these costs are covered, these can be used by the local authority to help achieve scheme objectives, particularly air quality and / or climate change emission reduction activities, and could take the form of further transport improvements in and around the LEZ. If (and only if) any surplus remains after the local authority has made use of it to further the scheme objectives, will this have to be returned to Scottish Ministers.
- 4.6 As identified in 3.2.1, by the time the LEZ becomes operational, it is likely that the majority of vehicles in Aberdeen will be compliant with the LEZ. The Aberdeen Western Peripheral Route (AWPR) should also allow an alternative route for any non-compliant vehicles who would previously have accessed the LEZ area to cross Aberdeen city centre. As such, the LEZ is not expected to generate high levels of income through enforcement activity.

4.7 The full financial model for the LEZ will be prepared and submitted for consideration as part of the Council's budget process for 2022/23.

## 5. LEGAL IMPLICATIONS

5.1 ACC has a legal duty to meet statutory air quality objectives and improve air quality in its AQMAs through the implementation of the Air Quality Action Plan (2011) and associated initiatives.

5.2 Legislation enabling local authorities to declare and enforce LEZs is included within the [Transport \(Scotland\) Act 2019](#). [The Low Emission Zones \(Emission Standards, Exemptions and Penalty Charges\) \(Scotland\) Regulations 2021](#) covers emissions standards for LEZ compliant vehicles (Euro VI/6 for diesel vehicles and Euro IV/4 for petrol vehicles), national exemptions from LEZs (see section 3.2.1), penalty charges and the Penalty Charge Notice (PCN) process which will essentially follow the same process as the Council currently uses for enforcing bus lane violations. [The Low Emission Zones \(Scotland\) Regulations 2021](#) covers the declaration and implementation of LEZs, including consultation, publication of proposals, objections, examinations, approved devices for LEZ enforcement, and the process of amending and revoking schemes.

5.3 There is a risk of objections to the proposed LEZ which will have to be considered prior to submission of the final LEZ proposal to Scottish Ministers. A formal examination may be called should the Council or Scottish Ministers be dissatisfied with one or more elements of the LEZ scheme and believe that such elements should be opened to public scrutiny, comment and review.

5.4 There is also a risk of objections to the supporting TROs generating the need for an inquiry.

## 6. MANAGEMENT OF RISK

Category	Risk	Low (L) Medium (M) High (H)	Mitigation
<b>Strategic Risk</b>	Delivery of a LEZ supports a number of the Council's strategic priorities, particularly in terms of a sustainable economy, a sustainable transport system, the continued health and prosperity of our citizens and a	M	Develop final LEZ scheme, supported by robust modelling and appraisal, and informed by public and stakeholder engagement and impact assessments.

	<p>high-quality environment.</p> <p>Failure to deliver a LEZ where there is evidence of its effectiveness could undermine the Council's ability to realise these aspirations.</p>		
<b>Compliance</b>	<p>ACC could face legal challenge should air quality continue to breach objective limits and insufficient action is taken to address this.</p> <p>Any LEZ may be subject to objection and/or require examination.</p>	M	<p>Develop final LEZ scheme, supported by robust modelling and appraisal, and informed by public and stakeholder engagement and impact assessments.</p> <p>Continue to work with the public and stakeholders to understand and mitigate concerns around a LEZ.</p>
<b>Operational</b>	<p>There may be risks around the operation and enforcement of LEZs.</p>	L	<p>Continue to identify and monitor risks as LEZ moves towards design and delivery.</p>
<b>Financial</b>	<p>Continuing poor air quality could see increasing societal costs arising from pollution-related health complaints.</p> <p>Care needs to be taken that any LEZ ultimately recommended for implementation supports the economic vitality of the city centre.</p> <p>There may be risks associated with the costs of implementing, managing, maintaining and enforcing a LEZ.</p>	M	<p>Develop final LEZ scheme, supported by robust modelling and appraisal, and informed by public and stakeholder engagement and impact assessments.</p> <p>Undertake IIA and BRIA.</p> <p>Continue to work with Transport Scotland and the other LEZ cities to determine the optimum approach to LEZ delivery, management, maintenance and enforcement.</p> <p>Develop full financial model for LEZ.</p>

<b>Reputational</b>	Failure to implement a LEZ when there is evidence of the health benefits of doing so could result in reputational damage should ACC not take sufficient action to improve air quality and the health and wellbeing of our citizens and visitors.	H	Develop final LEZ scheme, supported by robust modelling and appraisal, and informed by public and stakeholder engagement and impact assessments.
<b>Environment / Climate</b>	If a LEZ is not delivered the Council may not meet EU, UK and Scottish Government objective limits for a number of harmful pollutants, and / or local and national targets around carbon emissions reduction.	M	Develop final LEZ scheme, supported by robust modelling and appraisal, and informed by public and stakeholder engagement and impact assessments.

## 7. OUTCOMES

<b><u>COUNCIL DELIVERY PLAN</u></b>		
		<b>Impact of Report</b>
<b>Aberdeen City Local Outcome Improvement Plan</b>		
Prosperous People Outcomes	Stretch	The proposals within this report support the delivery of Stretch Outcome 11 in the LOIP: <i>Healthy life expectancy (time lived in good health) is five years longer by 2026</i> . Poor air quality is known to worsen a number of health conditions, particularly those affecting the heart and lungs, potentially reducing life expectancy for sufferers. A LEZ could improve health and therefore increase life expectancy by reducing concentrations of harmful pollutants.
Prosperous Place Outcomes	Stretch	The proposals within this report support the delivery of Stretch Outcome 14 ( <i>Addressing climate change by reducing Aberdeen's carbon emissions by 42.5% by 2026 and adapting to the impacts of our changing climate</i> ) in that most measures to reduce air pollutants will also reduce carbon emissions. The proposals may also contribute towards the delivery of Stretch Outcome 15 ( <i>38% of people walking and 5% of people cycling as main mode of travel by 2026</i> ) in that traffic levels within the LEZ area may reduce,

	resulting in a safer environment for walking and cycling.
<b>Regional and City Strategies</b>	<p>The proposals in this report support the delivery of the Regional and Local Transport Strategies, both of which aim to deliver a cleaner transport system which results in fewer emissions. Specifically, the RTS 2040 identifies as priorities: <i>No exceedance of WHO safe level of emissions and Reduced carbon emissions to support net-zero.</i></p> <p>They also complement the Council's Net Zero Vision, specifically actions around supporting people to make low-emission lifestyle choices and removing the need for people to purchase petrol or diesel cars or vans. A LEZ is identified as a means of achieving City Centre Regeneration within the supporting Infrastructure Plan.</p> <p>A LEZ will also support delivery of the Council's Air Quality Action Plan and complement the CCMP by contributing to the development of a cleaner and more welcoming city centre for residents and visitors</p>
<b>UK and Scottish Legislative and Policy Programmes</b>	<p>Delivery of a LEZ contributes towards the delivery of the Scottish National Transport Strategy (NTS2) and the Cleaner Air for Scotland (CAFS) Strategy and compliance with European, UK and Scottish Government legislation on Air Quality Standards and Objectives. It also supports the Climate Change (Emissions Reduction Targets) (Scotland) Act which sets targets for a reduction of greenhouse gas emissions. The Transport (Scotland) Act 2019 makes provision for local authorities to introduce and enforce LEZs.</p>

## 8. IMPACT ASSESSMENTS

Assessment	Outcome
<b>Impact Assessment</b>	IIA has been undertaken on this report. Further impact assessments are being undertaken as part of the NLEF process and will be made available to members of the public and stakeholders when available, and submitted to Ministers as part of final scheme proposals.
<b>Data Protection Impact Assessment</b>	Not required at this stage, although will be undertaken as part of implementation of the enforcement camera system.



## 9. BACKGROUND PAPERS

None

## 10. APPENDICES

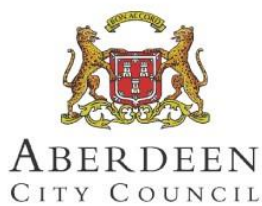
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Appendix 2 – Interim NLEF Stage 2 Report Executive Summary  
Appendix 3 - LEZ Online Consultation Summary Report  
Appendix 4 – LEZ Stakeholder Workshops Summary Report  
Appendix 5 – LEZ Traffic Modelling Report  
Appendix 6 – Plan of Proposed LEZ and Schedule of Streets Included  
Appendix 7 - Schedule of TROs  
Appendix 8 – LEZ Post-COVID Uncertainty Report  
Appendix 9 - LEZ Approval Process  
Appendix 10 – Emissions Analysis Report

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## NATIONAL LOW EMISSION FRAMEWORK – INTERIM STAGE 2 ASSESSMENT



# ABERDEEN LOW EMISSION ZONE

## NATIONAL LOW EMISSION FRAMEWORK – INTERIM STAGE 2 ASSESSMENT

### IDENTIFICATION TABLE

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# 1. INTRODUCTION

## 1.1 National Low Emission Framework – Interim Stage 2 Assessment

- 1.1.1 In September 2017, the Scottish Government, in their [Programme for Government](#), committed to the introduction of Low Emission Zones (LEZs) into Scotland’s four biggest cities (Glasgow, Edinburgh, Aberdeen and Dundee) by 2020. Due to the impact of the COVID-19 pandemic in 2020 and 2021, plans to implement LEZs were temporarily paused with an [indicative timeline](#) for the introduction moved to between February 2022 and May 2022.
- 1.1.2 An LEZ is a scheme under which individuals will be prohibited from driving vehicles which fail to meet specified emissions standards within a designated geographical area in contravention of the terms of the scheme as proposed by a local authority.
- 1.1.3 Low Emission Zones are included in the [Transport \(Scotland\) Act](#) which received Royal Assent in November 2019. The Act provides the legislative framework for Scottish local authorities to design, establish and operate nationally consistent LEZs. It allows the Scottish Government to set consistent national standards for a number of key aspects including emissions, penalties, exemptions and parameters for grace periods. Local authorities will then have the powers to create, enforce, operate or revoke a LEZ in their areas and to design the shape, size and vehicle scope of their low emission zone.
- 1.1.4 The accompanying LEZ Regulations were laid in Parliament in January 2021, thereby allowing Scottish Ministers to set nationally consistent standards (Regulations) on LEZ matters specified in the Act (e.g. emission standards, penalties and exemptions, statutory consultees). There are two sets of regulations for LEZs in Scotland. The [Low Emission Zones \(Emission Standards, Exemptions and Enforcement\) \(Scotland\) Regulations 2021](#) cover the topics of emission standards, exemptions, penalty charge rates, and enforcement. [The Low Emission Zones \(Scotland\) Regulations 2021](#) cover the topics of consultation, publication and representations, examinations, approved devices, accounts and amending or revoking LEZs.
- 1.1.5 An assessment and appraisal process to inform the size and scope of Aberdeen’s LEZ follows the [National Low Emission Framework](#) (NLEF) guidance. The NLEF is “*an air quality-focused, evidence-based appraisal process developed to help local authorities consider transport related actions to improve local air quality, where transport is identified as the key contributor to air quality problems*” (NLEF, 2019).
- 1.1.6 The NLEF is a two stage process consisting of the following elements:
- Stage 1 – Screening
  - Stage 2 – Assessment
- 1.1.7 The NLEF Stage 1 screening should review Aberdeen’s Local Air Quality Management and build an evidence base to assist in the decision of whether a LEZ is appropriate for an Air Quality Management Area (AQMA) and subsequently inform the appraisal and implementation of Aberdeen’s LEZ through the Stage 2 Assessment process. Transport Scotland advised Aberdeen City Council (ACC) that NLEF Stage 1 was not formally required as Aberdeen are committed to delivering a LEZ for the city as a result of the Programme for Government commitment.
- 1.1.8 A first Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework Interim Stage 2 Report, SYSTRA 2020*) was published in June 2020. The report provided an evidence base and policy review from which came the identification of the LEZ objectives and the LEZ options for stakeholder and public consultation and detailed testing through local traffic and air quality models.

- 1.1.9 This second Interim NLEF Stage 2 Assessment Report builds on the first interim report and incorporates findings from public and stakeholder engagement and detailed traffic modelling to identify a final LEZ option for Aberdeen.
- 1.1.10 The final Aberdeen LEZ option identified in this second Interim NLEF Stage 2 Report will then be subject to further stakeholder and public consultation, as set out in the [LEZ Regulations](#). It will also be subject to detailed impact and environmental assessments (Strategic Environmental Assessment, Integrated Impact Assessment, Business and Regulatory Impact Assessment) and be assessed in the National Modelling Framework (NMF) Aberdeen City Air Quality Model before the NLEF process is finalised and a final NLEF Stage 2 Report is prepared. It is expected that these tasks will be complete by autumn 2021.
- 1.1.11 This Interim NLEF Stage 2 Assessment Report is structured as follows:
1. Introduction
  2. Background of Aberdeen's LEZ
  3. The Policy Framework for Aberdeen's LEZ
  4. Air Quality in Aberdeen
  5. National Modelling Framework Scenario Modelling
  6. Objectives of Aberdeen's LEZ
  7. LEZ Option Generation
  8. LEZ Option analysis and emerging options for consultation and detailed modelling
  9. LEZ Public & Stakeholder Engagement
  10. LEZ Traffic Modelling and Appraisal
  11. Final recommended LEZ Option for Aberdeen

## 2. ABERDEEN LOW EMISSION ZONE

### 2.1 Background

- 2.1.1 The [Environment Act 1995](#) requires all local authorities in the UK the statutory duty to undertake an air quality assessment within their area and determine whether they are likely to meet the air quality objectives for a number of pollutants. The process of review and assessment of air quality undertaken by local authorities is set out under the Local Air Quality Management (LAQM) regime.
- 2.1.2 Where the results of the review and assessment process highlight problems in meeting the objectives for air quality, the authority is required to declare an Air Quality Management Area (AQMA). Following the declaration of an AQMA, the local authority is then required to produce an [Air Quality Action Plan](#) (AQAP) which sets out measures that it will implement to work towards achieving the air quality objectives.
- 2.1.3 In 2001 ACC first declared part of the City Centre (Union Street and Market Street) an Air Quality Management Area (AQMA) due to predicted exceedances of the annual mean national air quality objective for nitrogen dioxide (NO<sub>2</sub>). The AQMA has been expanded several times since its declaration and two further AMQAs have since been declared in the city for the Anderson Drive/Haudagain roundabout/Auchmill Road corridor and the Wellington Road corridor (Queen Elizabeth Bridge/Balnagask Road).
- 2.1.4 Chapter 4 details the development of the AQMAs in Aberdeen and its current air quality issues and concludes the focus of the NLEF appraisal for Aberdeen's LEZ should be the city centre AQMA, as shown in Figure 2.1.



Figure 2.1: Aberdeen City Centre AQMA for NO<sub>2</sub> and PM<sub>10</sub>

- 2.1.5 The AQAP provide the mechanism by which local authorities, in collaboration with national agencies and others, will state their intentions for working towards the air quality objectives using the powers they have available. ACC's AQAP includes a series of measures that they will introduce in pursuit of the Air Quality Standards (AQS). The principal aim of the AQAP is to minimise the effects of air pollution on human health within the local authority area using all reasonable measures, within reasonable time frames, and by working towards achieving the AQS.

2.1.6 Despite improvements in air quality since the introduction of the AQAP, there remain several locations in the AQMA where exceedances of emissions exist and where the AQS are not being met. The number of exceedances of the NO<sub>2</sub> annual mean objective has decreased from 11 in 2018 to 8 in 2019. The [2020 Air Quality Annual Progress Report \(APR\) for Aberdeen City Council](#), contains the latest (2019) information on air quality in Aberdeen and is summarised in Chapter 4

2.1.7 A LEZ, and any associated measures are therefore being introduced in the city to accelerate Aberdeen's required compliance with the AQS.

## 2.2 Legislative Framework and operation of a LEZ

2.2.1 Low Emission Zones are included in the [Transport \(Scotland\) Act 2019](#) which received Royal Assent in November 2019. The Act provides the legislative framework for Scottish local authorities to design, establish and operate nationally consistent LEZs. It allows the Scottish Government to set consistent national standards for a number of key aspects including emissions, penalties, exemptions and parameters for grace periods. Local authorities have the powers to create, enforce, operate or revoke a LEZ in their areas and to design the shape, size and vehicle scope of their low emission zone.

2.2.2 The accompanying LEZ Regulations were laid in Parliament in January 2021, thereby allowing Scottish Ministers to set nationally consistent standards (Regulations) on LEZ matters specified in the Act (e.g. emission standards, penalties and exemptions, statutory consultees). There are two sets of regulations for LEZs in Scotland. The [Low Emission Zones \(Emission Standards, Exemptions and Enforcement\) \(Scotland\) Regulations 2021](#) cover the topics of emission standards, exemptions, penalty charge rates, and enforcement. [The Low Emission Zones \(Scotland\) Regulations 2021](#) cover the topics of consultation, publication and representations, examinations, approved devices, accounts and amending or revoking LEZs.

2.2.3 The Transport (Scotland) Act 2019 [section 6\(4\)\(a\)](#) provides the powers to specify LEZ emission standards for vehicles in the Regulations and allows all Scottish LEZs to operate to a consistent national level. A person may not drive a vehicle on a road within a LEZ unless that vehicle meets the specified emission standard. Vehicles that fail to comply with the LEZ emission standard will be subject to LEZ enforcement measures once any LEZ grace period has ended. The LEZ emission standards are:

- Euro VI emission standards for buses, coaches and heavy good vehicles with diesel engines, with retrofitted vehicles to this standard also being acceptable (Euro VI vehicle registrations from 2013)
- Minibuses, large vans, taxis and cars are set at the Euro 6 for diesel and Euro 4 for petrol vehicles (Euro 6 diesel vehicle registrations in 2015, Euro 4 petrol vehicles in 2006).
- Euro 3 for Motorcycles and Mopeds

2.2.4 [Section 6\(4\)\(a\)](#) of the Transport (Scotland) Act 2019 enables exemptions to be set consistently across Scotland. ACC will have no ability to vary or choose from the national LEZ exemptions listed in [Regulation 3](#) of the LEZ Regulations and outlined in Table 2.1. ACC are therefore required to operate their LEZ in compliance with the exemption list, so that there is national consistency in its application.

**Table 2.1 : National LEZ Exemptions**

Vehicle type of classification	Description
Emergency Vehicles	For or in connection with the exercise of any function of: the Scottish Ambulance Service, the Scottish Fire and Rescue Service, Her Majesty's Coastguard, and the National Crime Agency.
Military Vehicles	Vehicles belonging to any of Her Majesty's forces; or used for the purposes of any of those forces
Vehicles of Historic Interest	Vehicles which are 30 years old or older, are no longer in production and historically preserved or maintained
Vehicles for Disabled Persons	Vehicles registered with a 'disabled' or 'disabled passenger vehicles' tax class Vehicles being used for the purposes of the 'Blue Badge Scheme'.
Showman Vehicles	Highly specialised vehicles used for the purposes of travelling showmen, where the vehicle is used during the performance, used for the purpose of providing the performance or used for carrying performance equipment.

2.2.5 The Transport (Scotland) Act 2019 requires a LEZ to specify a grace period before penalty enforcement of the scheme. [Section 15](#) details the scope and time-limits of the grace period. The grace period applicable to non-residents must expire:

- not less than 1 year after it (LEZ declaration) begins, and
- not more than 4 years after it begins.

2.2.6 The grace period applicable to residents (whose registered address is inside the zone) must expire not more than 2 years after the expiry of the grace period applicable to non-residents.

2.2.7 [Section 6\(4\)\(a\)](#) of the Transport (Scotland) Act 2019 enables penalty charges to be set, based on the vehicle class, and sets out the circumstances in which penalty charges can be subject to a discount or surcharges or to escalate the penalties over time. The LEZ [Regulation 4](#) and [Schedule 4](#) has set 'tiers' of penalties based on a pre-set number of Penalty Charge Notices (PCNs) being issued. The tier structure is outlined in Table 2.2

**Table 2.2 : Proposed penalty charge structure for a non-compliant, non-exempt vehicles in a LEZ**

Vehicle Category / Tier	Tier				
	1	2	3	4	5
Car, Taxi and Private Hire	£60	£120	£240	£480	£480
Minibus	£60	£120	£240	£480	£960
Light goods vehicles	£60	£120	£240	£480	£480
Bus or Coach	£60	£120	£240	£480	£960
Heavy goods vehicles	£60	£120	£240	£480	£960
Motorcycle or Mopeds	£60	£120	£240	£480	£480
Special purpose vehicles	£60	£120	£240	£480	£480

2.2.8 [Section 8](#) of the Transport (Scotland) Act 2019 also enables the enforcement of LEZ schemes. The LEZ will be enforced through Automatic Number Plate Recognition (ANPR) cameras with the LEZ Regulations [Schedule 6](#) detailing the approved devices.

## 2.3 National Low Emission Framework & National Modelling Framework

2.3.1 The [National Low Emission Framework \(NLEF\)](#) guidance, published in January 2019, states that NLEF *is an air quality-focused, evidence-based appraisal process developed to help local authorities consider transport related actions to improve local air quality, where transport is identified as the key contributor to air quality problems* (NLEF, 2019).



- 2.3.2 The guidance states that the aim of the NLEF is to improve local air quality in areas where Scottish Air Quality Objectives (AQOs) are exceeded, or likely to be exceeded, and transport is identified as the key contributor. Local authorities that have declared AQMAs should have regard to the NLEF when developing their air quality action plans and Low Emission Zones.
- 2.3.3 The NLEF appraisal process provides a consistent approach that can be applied across Scotland to inform decisions on transport-related actions to improve local air quality. It is designed to support local authorities in considering transport-related issues in the context of local air quality management and help develop evidence to support consideration of the introduction of an LEZ as an appropriate option to improve air quality.
- 2.3.4 It is intended to be a two stage process consisting of screening and assessment. The initial screening stage should be completed by local authorities that have identified air quality problems (where transport is the primary cause) and declared an AQMA.
- 2.3.5 As the Scottish Government is committed to delivering a LEZ in Scotland's four biggest cities (Glasgow, Edinburgh, Dundee and Aberdeen) through its Programme for Government, the NLEF Stage 1 screening was not utilised to determine if a LEZ is required in Aberdeen but used to review Aberdeen's Local Air Quality Management and build an evidence base to inform the appraisal and implementation of Aberdeen's LEZ through the Stage 2 Assessment process. The NLEF Stage 1 process is therefore used as a tool to build a suitable evidence base to assess all potential LEZ options.
- 2.3.6 NLEF Guidance describes the following key steps that should be undertaken as part of the Stage 2 Assessment:
1. Define the objectives for the potential LEZ
  2. Assess the impact of potential LEZ options with regard to air quality using the National Modelling Framework Aberdeen City Model
  3. Identify the preferred option, including consideration of geographical extent and scope of vehicles to be included
  4. Stakeholder input and consultation
  5. Consider the wider impacts of the preferred option (e.g. traffic and air quality modelling, Strategic Environmental Assessment, Equality Impact Assessment)
- 2.3.7 An Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework Interim Stage 2 Report, SYSTRA 2020*) was published in June 2020 and detailed the identification of the LEZ objectives and a set of LEZ options (steps 1-3) for stakeholder and public consultation, detailed testing through local traffic and air quality models and wider impact assessments of the preferred option (steps 4-5). The first Interim Stage 2 Report did not include results from the consultation period or the detailed testing.
- 2.3.8 At Stage 2, the National Modelling Framework (NMF) supports the identification of the scope and key contributors to air quality issues and provides the evidence to help assess potential benefits of transport-related actions to address those issues, with a focus on the introduction of an LEZ. The NMF Aberdeen City Air Quality Model has been utilised to provide high level impacts from the inclusion of particular vehicles types in a LEZ and to inform the appraisal process of the emerging LEZ options.
- 2.3.9 It should be noted that SEPA, who develop and run the National Modelling Framework (NMF) Aberdeen City Air Quality Model, were subject to a cyber-attack in late 2020 and detailed NMF analysis is delayed and cannot currently be utilised in the final LEZ option assessment at this stage. Any final LEZ option will however be assessed in the NMF prior to submission to Scottish Ministers, subject to the availability of the NMF Aberdeen City Model.

- 2.3.10 This second Interim NLEF Stage 2 Assessment Report builds on the first interim report and incorporates findings from public and stakeholder engagement and detailed traffic modelling to identify a final LEZ option for Aberdeen.
- 2.3.11 The final LEZ option identified in the second Interim NLEF Stage 2 Report will then be subject to further stakeholder and public consultation, as set out in the [LEZ Regulations](#). It will also be subject to detailed impact and environmental assessments (SEA, IIA, BRIA) and be assessed in the NMF Aberdeen City Air Quality Model before the NLEF process is finalised and a final NLEF Stage 2 Report is prepared. It is expected that these tasks will be complete by autumn 2021.

## **2.4 Covid-19 pandemic**

- 2.4.1 Due to the impact of the COVID-19 pandemic in 2020 and 2021, plans to implement LEZs were temporarily paused with an indicative timeline for the introduction moved to between February 2022 and May 2022. The LEZ Leadership Group, which includes Scottish Ministers and representatives from Glasgow City Council, The City of Edinburgh Council, Dundee City Council, Aberdeen City Council, Public Health Scotland and SEPA, agreed the [indicative timeframe](#) to introduce LEZs across Scotland's four largest cities.
- 2.4.2 It is recognised that the Covid-19 pandemic has had an unprecedented impact on society, including on the wider environment and the economy. Transport Scotland and ACC recognise that the Covid-19 pandemic may significantly influence future travel demand and in turn emissions attributed to road transport. Transport Scotland commissioned a study to consider the uncertainty over what travel will look like after the Covid-19 pandemic has ended. Outcomes from this study are summarised in Chapter 14 and used to inform the final LEZ Option.
- 2.4.3 In light of the difficulties faced by many throughout 2020 and 2021, particularly, in the context of an Aberdeen city centre LEZ, city businesses and bus operators, ACC were keen to understand the level of support for the introduction of a LEZ in the city post pandemic and gauge the impact the pandemic may have had on businesses and bus operators in preparing for its introduction. As a result, additional consultation on this issue was undertaken in March 2021, with the outcomes summarised in Chapter 11 and used to inform the final LEZ Option detail.

### 3. POLICY FRAMEWORK

#### 3.1 Introduction

3.1.1 Activities relating to monitoring and management of air quality in Scotland are primarily driven by European (EU) legislation. It is therefore important to review EU legislation and its influence on UK and Scottish air quality policy. A review of Scottish air quality legislation and regulations will set out the specific context in which the delivery of Aberdeen’s Low Emission Zone will be delivered.

3.1.2 Low Emissions Zones positioning in the EU, UK and Scottish legislation is shown in Figure 3.1

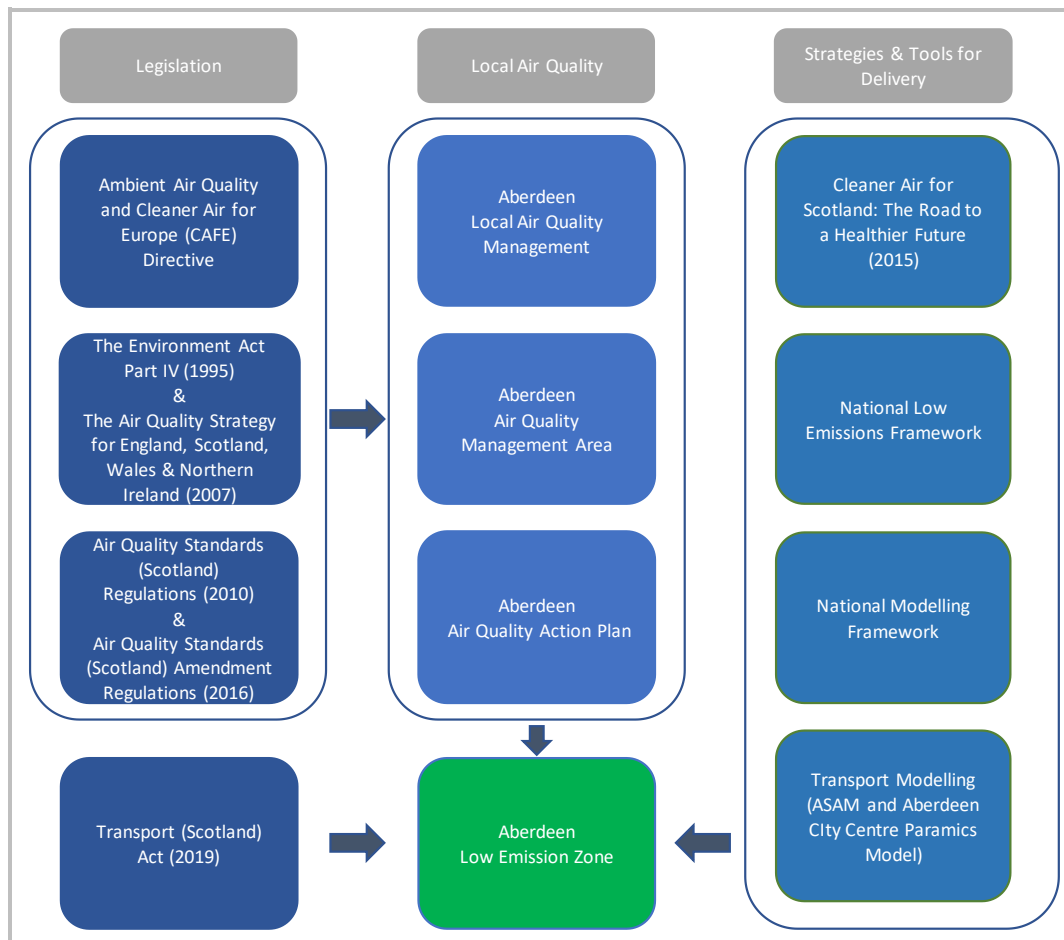


Figure 3.1 : Low Emission Zones Legislation

3.1.3 There are also a number of related national, regional and local policies and strategies that can influence and be influenced by, the delivery of Aberdeen’s Low Emission Zone. Many of these policies and strategies are focused on transportation issues, and may help contribute to overall improvements in air quality in Aberdeen’s AQMAs.

#### 3.2 Air Quality Legislation

##### European Air Quality Legislation

3.2.1 The **Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive** ([2008/50/EC](https://eur-lex.europa.eu/eli/dir/2008/50/ec/oj)) establishes air quality objectives for improving human health and environmental quality up to 2020. It also specifies ways of assessing these and of taking any corrective action if the standards are not met. The directive includes the following key elements:

- Thresholds, limit values and target values are set to assess each pollutant covered by the directive: sulphur dioxide, nitrogen dioxide, particulate matter, lead, benzene and carbon monoxide. National authorities designate specific bodies to carry out these tasks using data collected at selected sampling points.
- Where pollution levels in any particular area are higher than the thresholds, air quality plans must be introduced to correct the situation. These may include specific measures to protect sensitive groups, such as children. If there is a risk that pollution levels may exceed the thresholds, short-term action plans to reduce road traffic, construction works or certain industrial activities, for instance, must be implemented to head off the danger.
- National authorities must ensure that not only the public, but also environmental, consumer and other relevant organisations, including health care bodies and industry federations, are kept informed of the ambient air quality (i.e. the outdoor air) in their area.
- Governments of EU countries must publish annual reports on all the pollutants covered by the legislation.

3.2.2 The air quality objectives defined in CAFE have been assessed and reset at regular intervals. The 2013 **Clean Air Programme for Europe** ([COM\(2013\)918](#)) reconfirmed the EU objectives to achieve full compliance with existing air quality standards across the EU as soon as possible and set objectives for 2020 and 2030. The 2016 **National Emissions Ceiling Directive** ([2016/2284/EU](#)) revised the reduction targets to include new limits that need to be met in 2020 and 2030, and an additional pollutant – fine particulate matter (PM<sub>2.5</sub>).

#### UK Air Quality Legislation

3.2.3 [The Environment Act 1995: Part IV](#) requires the UK government and devolved administrations to produce a national air quality strategy, with the devolved national administrations responsible for meeting EU Directive air quality limit values.

3.2.4 The most recent version of this strategy, [The Air Quality Strategy for England, Scotland, Wales and Northern Ireland](#) (UK Government, 2007), defines the roles of central and local government, Scottish Environment Protection Agency (SEPA), industry, business, transport, individuals and other groups in meeting air quality (EU) limits for the ten main pollutants (particulate matter (PM<sub>10</sub> & PM<sub>2.5</sub>), oxides of nitrogen (NO<sub>x</sub>), ozone (O<sub>3</sub>), sulphur dioxide (SO<sub>2</sub>), Hydrocarbons (PAHs), benzene, 1,3-butadiene, carbon monoxide (CO), lead (Pb), and ammonia (NH<sub>3</sub>)). Local authorities are required to monitor air quality, and for areas where the air quality limits are not met the relevant authority must declare it an Air Quality Management Area (AQMA) and draw up an action plan aimed at reducing levels of the pollutant.

3.2.5 The [Air Quality Standards \(Scotland\) Regulations 2010](#) transpose the Ambient Air Quality and CAFE Directive requirements ([2008/50/EC](#)) into Scottish legislation. These limits are identical across the UK and achievement is a mandatory requirement for Member States. Domestic objectives have also been set under the Environment Act 1995 and these are set out in the [Air Quality \(Scotland\) Regulations 2000](#), the [Air Quality \(Scotland\) Amendment Regulations 2002](#) and the [Air Quality \(Scotland\) Amendment Regulations 2016](#). In contrast to the EU requirements, Scotland has set stricter levels for PM<sub>10</sub> and PM<sub>2.5</sub>. In April 2016, the Scottish Government became the first country in Europe to adopt the WHO recommended guideline value for PM<sub>2.5</sub> of 10 µg/m<sup>3</sup> annual mean.

3.2.6 A summary of the air pollutant limits and guidelines in Scotland is detailed in Table 3.1. Local authorities are responsible for achieving these objectives, and the implementation of this legislation will require all local authorities in Scotland to add PM<sub>2.5</sub> to the list of other air pollutants currently being monitored.

**Table 3.1 : Air Pollutant Limits and Guidelines**

Pollutant	Air Quality Objective	
	Concentration	Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200 µg/m <sup>3</sup> (not to be exceeded more than 10 times a year)	1-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Coarse Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup> (not to be exceeded more than 7 times a year)	24-hour mean
	18 µg/m <sup>3</sup>	Annual mean
Fine Particulate Matter (PM <sub>2.5</sub> )	10 µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350 µg/m <sup>3</sup> (not to be exceeded more than 24 times a year)	1-hour mean
	125 µg/m <sup>3</sup> (not to be exceeded more than 3 times a year)	24-hour mean
	266 µg/m <sup>3</sup> (not to be exceeded more than 35 times a year)	15 minute mean
Benzene	3.25 µg/m <sup>3</sup>	Running annual mean
1,3 Butadiene	2.25 µg/m <sup>3</sup>	Running annual mean
Carbon Monoxide (CO)	10.0 mg m <sup>3</sup>	Running 8-hour mean
Lead	0.25 µg/m <sup>3</sup>	Annual mean

### **Local Air Quality Management**

- 3.2.7 Through the Environment Act 1995 Part IV, all local authorities in the UK are under a statutory duty to undertake an air quality assessment within their area and determine whether they are likely to meet the air quality objectives for a number of pollutants. The process of review and assessment of air quality undertaken by local authorities is set out under the **Local Air Quality Management (LAQM) regime**.
- 3.2.8 Where the results of the LAQM review and assessment process highlight that problems in the attainment of objectives for air quality will arise, the authority is required to declare an **Air Quality Management Area (AQMA)**.
- 3.2.9 Following the declaration of an AQMA, the local authority is then required to produce an **Air Quality Action Plan** which sets out measures that the local authority, and any other key stakeholders, will implement to work towards achieving the air quality objective levels for the pollutants that have exceeded the objectives levels.
- 3.2.10 Full details of Aberdeen City Council's Local Air Quality Management can be found in Chapter 4.

### **Cleaner Air for Scotland: The Road to a Healthier Future**

- 3.2.11 [Cleaner Air for Scotland – The Road to a Healthier Future \(CAFS\)](#) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland's legal responsibilities.
- 3.2.12 A series of actions across a range of policy areas are outlined, including a number of key initiatives:

- A National Low Emission Framework

- A National Modelling Framework
- Adoption of World Health Organization guideline values for particulate matter in Scottish legislation

### ***National Low Emission Framework***

3.2.13 The [National Low Emission Framework \(NLEF\)](#) guidance, published in January 2019, underpins the development of Aberdeen’s LEZ. It is summarised in Chapters 2 and 4.

### ***National Modelling Framework***

3.2.14 The National Modelling Framework (NMF) is a key strand of CAFS which will develop a national, two-tiered modelling approach for air quality within Scotland with the development of Regional and Local air quality models. The NMF aims to standardise data collection requirements, analysis processes and presentation of outputs to provide local authorities with information required to appraise measures for improving urban air quality.

3.2.15 The development of Regional NMF models will support decision-making around placemaking and transport planning in relation to air quality management across city regions.

3.2.16 Local NMF models will represent a standardised approach to modelling air quality for local authorities undertaking a stage two NLEF assessment. The focus will be on identifying detailed traffic-related source apportionment across the appropriate area, with the outputs providing quantitative evidence to support decision-making, including on the potential benefits of introducing LEZs to improve air quality. It is expected that local NMF models will provide a significant proportion of the quantitative evidence required within the NLEF appraisal process, producing outputs and visualisation tools to aid decision-making.

3.2.17 High level scenario testing is undertaken as part of the NLEF Stage 2 Assessment and is detailed in Chapter 5 of this report.

3.2.18 NLEF Guidance suggests a summary of the current NMF Aberdeen City model should be included in Stage 1 screening. This should be informed by the Air Quality Evidence Report, not yet published by SEPA. Given the timeline for the development of the LEZ for Aberdeen and the Stage 2 reporting of the NMF, no summary of the NMF is provided here. Subsequent NLEF Stage 1 Screenings, if required, will be able to provide detail of the NMF Aberdeen City model.

### ***Transport (Scotland) Act***

3.2.19 The [Transport \(Scotland\) Act 2019](#) covers a wide range of transport issues and aims to establish consistent standards across all local authorities in order to tackle existing and future transport problems.

3.2.20 The main provisions include:

- The creation, regulation and enforcement of low emission zones.
- Extending the powers of local authorities to run buses and develop bus partnership plans. The aim is to allow councils to act more flexibly to improve services, either by working with bus companies or by stepping in and running services themselves.
- Extending existing ticketing arrangements and schemes to include connecting services. Scottish Ministers will have the power to set a national technological standard for smart ticketing and set up the National Smart Ticketing Advisory Board.

- A national ban on pavement and double parking and provision to make it easier for local authorities to enforce the ban.
- A regulatory environment which encourages getting road work reinstatements right first time. There will be better information about road works, and a consistent approach to safety at road works sites regardless of who is carrying them out.

3.2.21 The Act received Royal Assent in November 2019.

### **Low Emission Zones**

3.2.22 The [Transport \(Scotland\) Act](#) enables the creation and civil enforcement of low emission zones by local authorities, and will allow the Scottish Government to set consistent national standards for a number of key aspects including, but not limited to, emissions, penalties, certain exemptions and parameters for grace periods for low emission zones.

3.2.23 As detailed in the Act, a low emission zone is a scheme under which individuals driving vehicles which fail to meet specified emission standards will be prohibited from driving those vehicles in contravention of the terms of the scheme as proposed by a local authority within a designated geographical area. Typically, where a registered keeper of a vehicle breaches this rule, a penalty charge will be payable unless the vehicle is exempt (noting that drivers of car club and hire cars will also be considered too).

3.2.24 The Act will therefore:

- Provide local authorities with powers to create, enforce, operate or revoke a low emission zone in their area and to design the shape, size and vehicle scope of their low emission zone
- Set specified emission standard for a LEZ
- Allow local authorities to set grace-periods to allow those wishing to drive within the low emission zone an opportunity to upgrade their vehicle to a less polluting model (either by replacing it or having it modified) before penalty charges begin to be applied
- Give local authorities the ability to promote permanent and/or time-limited exemptions from the requirements of a low emission zone, where certain requirements are met to a strict criteria
- Enable Scottish Ministers to specify by regulations the amount of the penalty charge, with the ability to specify different levels of penalty charge depending on, for example, the class of vehicle, the emission standard of the non-compliant vehicle, or whether there are repeated contraventions
- Define how contravention of the low emission zone standards would be handled
- Provide detailed regulations and guidance for local authorities to deliver a consistent approach in how they enforce the new low emission zone requirements
- Set out the rules which will apply to penalty charge notices, such as the form they take, the time allowed for payment, internal review of a notice and/or appeal of the notice to an external adjudicator
- Provide local authorities with powers to create, operate and revoke low emission zones with other councils
- Require local authorities to utilise the money they receive from the enforcement of the new restrictions for ring-fenced purposes, particularly to facilitate the achievement of the low emission zone scheme objectives

## **3.3 National, Regional and Local Policy Review**

### **National Planning Framework 3**

- 3.3.1 [National Planning Framework 3 \(NPF3\)](#) sets out the Scottish Government’s strategy for the long-term development of Scotland’s towns, cities and countryside. It guides Scotland’s development to 2040, setting out strategic development priorities to support the Scottish Government’s central purpose - sustainable economic growth.
- 3.3.2 Aberdeen and its region are recognised by NPF3 as having a key role as a driver of economic activity and growth within Scotland, where it is recognised that Aberdeen, a key driver for the economy, continues to exceed what may be expected from its population size.
- 3.3.3 In order to develop this potential, it is considered that there is the need to ensure that:
- The City Investment Plan sets out an ambition “to maintain Aberdeen’s position as one of the world’s key energy capitals and to maximize its growth potential and diversification into other sectors”
  - Investment in new or improved infrastructure reflects economic development priorities and the need to support sustainable growth
- 3.3.4 To further build on Aberdeen’s improvements, the NPF3 strategy for the City is to:
- Explore opportunities from the oil and gas reserves West of Shetland, from decommissioning and deployment of offshore renewables
  - Ensure the economic significance of the region is recognised through the need for infrastructure capacity enhancement in the city such as Aberdeen Harbour, Aberdeen Western Peripheral Route (AWPR) and Aberdeen Airport
  - Continue to improve the quality of urban living within the City and create a low carbon place
  - Further develop connectivity to maintain good internal, national and global connections
- 3.3.5 The implementation of a Low Emission Zone in Aberdeen may indirectly help the city achieve NPF3 targets on the quality of urban living in Aberdeen. In January 2020, the Scottish Government announced the early engagement period for NPF4 was commencing and cognisance should be of the emerging themes from NP4 as timescales for the delivery of a LEZ allow.

### **National Transport Strategy 2**

- 3.3.6 The [National Transport Strategy 2 \(NTS2\)](#) for Scotland was published in February 2020 and *advocates a Vision for Scotland's transport system, that will help create great places - a sustainable, inclusive, safe and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors* (National transport Strategy 2, Scottish Government, 2020).
- 3.3.7 NTS 2 is underpinned by four priorities and associated outcomes:
- Reduce inequalities
    - Provide fair access to services we need
    - Be easy to use for all
    - Be affordable for all
  - Takes climate action
    - Help deliver a net-zero target
    - Adapt to the effects of climate change
    - Promote greener, cleaner choices
  - Help deliver inclusive economic growth
    - Get people and goods where they need to get to



- Be reliable, efficient and high quality
- Use beneficial innovation
- Improve health and wellbeing
  - Be safe and secure for all
  - Enable us to make healthy travel choices
  - Help make our communities great places to live

3.3.8 Overarching all the key priorities, policies and outcomes is the NTS2 approach to the Sustainable Travel Hierarchy in decision making by promoting walking, wheeling, cycling, public transport and shared transport options in preference to single occupancy private car use for the movement of people. NTS2 also promotes efficient and sustainable freight transport for the movement of goods, particularly the shift from road to rail, and improved journey times and connections, to tackle congestion and lack of integration and connections in transport.

3.3.9 The NLEF also has a correlation to the NTS2 key strategic outcomes, which has a particular focus on reducing emissions to tackle climate change, air quality, health improvement, along with cross-over to elements such as congestion and accessibility.

3.3.10 Implementation of a Low Emission Zone in Aberdeen through the NLEF can help the city achieve the required outcomes from the NTS2.

#### ***Strategic Transport Projects Review (STPR)***

3.3.11 The [Strategic Transport Projects Review \(STPR\)](#), published in December 2008, sets out the Scottish Government's 29 transport investment priorities over the period to 2032.

3.3.12 The STPR supports both the National Planning Framework and the delivery of the strategic outcomes identified in the National Transport Strategy.

3.3.13 STPR has 29 interventions that aim to make a positive contribution towards the Scottish Government's Purpose and Objectives with a number of interventions– rail enhancement between Aberdeen, Inverness and the Central belt, park & choose and access strategies, as well as the delivery of the Aberdeen Western Peripheral Route (AWPR) – having the potential to directly impact on Aberdeen traffic patterns and air quality.

3.3.14 These and wider STPR interventions, such as *Strategic Park & Ride/Park & Choose Strategy, Further Electrification of the Strategic Rail Network, Integrated Ticketing and Rail Enhancements in the East of Scotland* may have an indirect benefit on Aberdeen's air quality by moving road trips to other modes of transport.

3.3.15 In 2018, the Scottish Government announced STPR2 that will review all interventions in STPR and identify potential transport investment in Scotland over the next 20 years. In February 2021 Transport Scotland published [Phase 1 recommendations and associated impact assessment progress reports](#) . It will be important to ensure that the development of Aberdeen's LEZ takes cognisance of any development in STPR2.

### **Regional Plans and Policies**

#### ***Aberdeen City and Shire Strategic Development Plan***

3.3.16 The approved 2020 [Aberdeen City and Shire Strategic Development Plan](#) sets out the vision, principles and objectives for the region and provides the context for the preparation of the Aberdeen and Aberdeenshire Local Development Plans. The 2020 Aberdeen City and Shire Strategic Development Plan was approved by Scottish Ministers in August 2020.

- 3.3.17 The vision of the Plan is for Aberdeen and Aberdeenshire to be an even more attractive, prosperous and sustainable European city region and an excellent place to live, visit and do business. To contribute to the Scottish Government's central purpose of increasing sustainable economic growth, a number of key aims are defined:
- provide a strong framework for investment decisions which will help to grow and diversify the regional economy in a sustainable manner
  - promote the need to use resources more efficiently and effectively whilst protecting and where appropriate enhancing our assets
  - take on the urgent challenges of climate change
- 3.3.18 To support these main aims, the plan also aims to:
- make sure the area has enough people, homes and jobs to support the level of services and facilities needed to maintain and improve the quality of life
  - protect and, where appropriate, enhance our valued assets and resources, including biodiversity, the historic and natural environment and our cultural heritage
  - help create and support sustainable mixed communities, and the provision of associated infrastructure, which will meet the highest standards of placemaking, urban and rural design, and cater for the needs of the whole population
  - encourage opportunities for greater digital connectivity across the City Region
  - make the most efficient use of the transport network, reducing the need for people to travel and making sure that walking, cycling and public transport are attractive choices
- 3.3.19 The Plan identifies four strategic growth areas which will be the main focus for development in the area up to 2040. Aberdeen City is one of these strategic growth areas. A City Centre Transformation Zone is identified by this Plan to build on existing work undertaken by the City Centre Masterplan and Delivery Programme (see below) and the Business Improvement District.
- 3.3.20 The plan introduces a wide range of transport measures to either tackle existing problems or support the growth defined in the Plan's lifetime. The Plan recognises that while congestion is a key factor, reducing the effect of transport on the environment, including improving air quality is also important. In addition to already committed or complete transport projects such as the Aberdeen Western Peripheral Route (AWPR), improvements to the Haudagain Roundabout and a new bridge over the River Don, improvements proposed specifically by the Plan are:
- Enhanced bus service provision through developing cross city bus services, bus stop review and optimisation of services with new bus priority infrastructure
  - Additional rail station car parking capacity, improved interchange at Inverurie Station and potential new rail stations to the north and south of Aberdeen
  - A range of active travel infrastructure initiatives improving accessibility and a package of behavioural change initiatives encouraging car-sharing, public transport use and active travel
  - Junction and operational efficiency enhancements in Aberdeen City Centre and Wellington Road, Persley Bridge & Parkway, Parkhill, A96, Dyce Drive, and Bridge of Dee corridors
- 3.3.21 The Plan is supported by a number of objectives with several particularly relevant to the introduction of a LEZ in Aberdeen:
- To make sure new development safeguards and, where appropriate, enhances the City Region's historic, natural and cultural assets and is within the capacity of the environment.
  - To be a City Region which:

- takes the lead in reducing the amount of emissions and pollutants released into the environment
- mitigates and adapts to the effects of climate change and changing weather patterns
- limits the amount of non-renewable resources it uses
- supports and protects our biodiversity

3.3.22 Cognisance of the aims, objectives and proposals outlined in the Aberdeen City and Shire Strategic Development Plan that identify the strategic growth areas for housing, employment and associated infrastructure projects has to be taken during the LEZ options development through the NLEF Stage 2 appraisal.

### *The Aberdeen City Region Deal*

3.3.23 The [Aberdeen City Region Deal](#) is a key delivery mechanism for the Region's Economic Strategy. The Deal brings together Aberdeen City and Aberdeenshire councils, the local business community and the UK and Scottish Government to work together to address the challenges currently facing the Region and to capitalise on the substantial opportunities.

3.3.24 In December 2011, the UK government announced its intention to transfer a range of powers to cities and wider city regions, allowing them to play a vital role in the economic recovery of the country. The City Region Deals allow each city region to unlock financial support and powers from national government, giving local bodies greater control over spending and decision-making.

3.3.25 The Aberdeen City Region Deal is seen as the starting point of a long-term improvement programme providing what is possibly the best opportunity in the UK to build further growth into an already successful regional economy. The Deal aims to have far reaching impacts, not just on the economy, but on regional competitiveness, connectivity, infrastructure, housing, employment and lifestyle, all of which are key elements in attracting and retaining the people we will continue to need to power and support the energy sector.

3.3.26 The Aberdeen City Region Deal is valued to be worth £826.2 million over a ten year period. Significant investment is being provided by UK Government (£125m), Scottish Government (£125m), Aberdeenshire Council (£10m), Aberdeen City Council (£10m), the two Universities in Aberdeen (£23,500), Private Sector and other local economic partners (£532.7m).

3.3.27 Key projects supported in the Deal that may influence or be influenced by a LEZ include:

- Harbour Expansion  
The City Region Deal will contribute towards improved external transport links to the new Aberdeen South Harbour (subject to acceptable business case). The investment of up to £25 million in supporting infrastructure is predicated on the delivery of the core harbour expansion project by Aberdeen Harbour Board.
- Strategic Transport Appraisal  
In order to realise the full potential of the area a transport appraisal will take a 20 year strategic view of the transport implications of the investment unlocked by this Deal across all modes including road and rail. The work includes addressing issues at key gateways into Aberdeen; enabling safe, reliable and attractive connections (road and public transport) along key strategic corridors which promote economic growth; tying together transport infrastructure and development planning/management, on a city/region basis; and facilitating the City Centre Masterplan. Nestrans, building on the work started by the City Regional Deal,

continued working on the development of the new Regional Transport Strategy which will look ahead to 2040 and this is now with Scottish Ministers.

- 3.3.28 The development of options for Aberdeen's LEZ may look to share wider common aims of the Aberdeen City Regional Deal to ensure the strategy contributes to improvements in air quality.

***Nestrans Regional Transport Strategy (2013-2035 Refresh and 2040)***

- 3.3.29 The Nestrans Regional Transport Strategy (RTS) was first approved by Scottish Ministers in 2008. The current adopted strategy is a 2013 RTS Refresh and Nestrans have now finalised the next regional transport strategy for the next twenty years, up to 2040. This new [Regional Transport Strategy](#) is currently with Scottish Ministers for consideration.

- 3.3.30 The current adopted [Nestrans Regional Transport Strategy 2013–2035 Refresh](#) was formally approved by the Minister for Transport and Veterans on 16 January 2014. This version of the RTS, sets out the key policies and proposals required to deliver the Vision *of a transport system for the north east of Scotland which enables a more economically competitive, sustainable and socially inclusive society (Nestrans RTS 2013-2035 Refresh, 2014).*

- 3.3.31 The 2013-2035 RTS has four objectives under Economy, Accessibility, Safety & Social Inclusion, Environment and Spatial Planning. With three particularly relevant to Aberdeen's LEZ.

- 3.3.32 **Accessibility, Safety and Social Inclusion:** To enhance choice, accessibility and safety of transport for all in the north east, particularly for disadvantaged and vulnerable members of society and those living in areas where transport options are limited.

- To enhance travel opportunities and achieve sustained cost and quality advantages for public transport relative to the car.
- To reduce the number and severity of traffic related casualties and improve personal safety and security for all users of transport.
- To achieve increased use of active travel and improve air quality as part of wider strategies to improve the health of north east residents.

- 3.3.33 **Environment:** To conserve and enhance the north east's natural and built environment and heritage and reduce the effects of transport on climate, noise and air quality

- To reduce the proportion of journeys made by cars and especially by single occupant cars.
- To reduce the environmental impacts of transport, in line with national targets.
- To reduce growth in vehicle kilometres travelled.

- 3.3.34 **Spatial Planning:** To support transport integration and a strong, vibrant and dynamic city centre and town centres across the north east.

- To improve connectivity to and within Aberdeen City and Aberdeenshire towns, especially by public transport, walking and cycling.
- To encourage integration of transport and spatial planning and improve connections between transport modes and services.
- To enhance public transport opportunities and reduce barriers to use across the north east, especially rural areas.
- To ensure that all new developments and transport infrastructure improvements give consideration to and make provisions for pedestrians and cyclists as an integral part of the design process.

- 3.3.35 The Strategy is expressed through three Sub Strategies, reflecting different ways of achieving the objectives and indicators:
1. Improving external connections between the north east and elsewhere, so tackling the reality and perceptions of location, distance, travel time and peripherality and enhancing the performance of the north east as a location.
  2. Improving internal connections, enhancing the performance of the north east in economic, social and environmental terms.
  3. Strategic policy framework, which indicates areas where measures such as travel awareness, incentives and enforcement can influence travel choice.
- 3.3.36 The Regional Transport Strategy 2040 will set out an integrated approach to meet future transport needs and bring sustainable improvements to transport across the region between for the next 20 years, up to 2040. The development of options for Aberdeen's LEZ must take cognisance of the RTS to ensure the LEZ complements this key regional strategy.
- Nestrans Freight Action Plan 2014 / Freight Distribution Strategy 2018***
- 3.3.37 The Freight action plan sets out how Nestrans and its partners can assist in the delivery of more effective and efficient freight operations, for the wider benefit of the north east of Scotland.
- 3.3.38 The [Freight Distribution Strategy](#) provides a high list of objectives and actions in order to take forward a distribution strategy that will improve major freight movements within Aberdeen and the surrounding region. It's vision is *to enable a freight network for the north east of Scotland that is both economically competitive and sustainable, and that supports a greener, healthier environment for both communities and operators* (Freight Distribution Strategy, Nestrans 2018), covered under three key themes:
- Clean Air
  - Efficient Use of Resources
  - Provision of appropriate and high quality resources.
- 3.3.39 Factors affecting the future Freight movement in Aberdeen includes:
- New Bay of Nigg Harbour activity
  - Congestion in Aberdeen
  - Wellington Road Study – measures to improve HGV efficiency along route
  - AWPR opening
  - City Centre Masterplan
  - Roads Hierarchy
  - LEZ
- 3.3.40 The objectives derived from the strategy include clean air objectives:
- Deliver a routing strategy that ensures freight vehicles are not unnecessarily travelling through Aberdeen City or other towns in the region
  - Encourage the use of low emission freight vehicles in the north east
  - Encourage the use of low carbon last mile solutions for operators and delivery companies
- 3.3.41 Movement of freight vehicles in Aberdeen is likely to be key to the operation of any LEZ for the city and understanding of key freight strategies and consultation with freight representatives will be crucial in shaping the LEZ.

## **Aberdeen Local Transport Strategy 2016-2021**

- 3.3.42 The [Aberdeen Local Transport Strategy](#) (LTS) 2016-2021 has been developed to set out the policies and interventions adopted by Aberdeen City Council to guide the planning and improvement of the local transport network over the next five years.
- 3.3.43 The previous LTS was adopted in 2008 and focussed on delivery of the Aberdeen Western Peripheral Route (AWPR) and the opportunities that this new road capacity would afford to reorganise and improve the use of the City's overall road network. Although the 2008 LTS has come to the end of its intended lifespan much of the content was still considered relevant and would continue to be so going into the period from 2016 to 2021. ACC therefore determined, with the AWPR not yet open at the time, that a fundamental change in the overall policy approach was not required; instead a 'refresh', reflective of changes to national, regional and local policy and circumstances since 2008, was considered appropriate.
- 3.3.44 Given the increasing role of transport in contributing, both positively and negatively, to the health agenda, the vision for the LTS refresh was updated and is now to develop a *sustainable transport system that is fit for the 21st Century, accessible to all, supports a vibrant economy, facilitates healthy living and minimises the impact on our environment.*
- 3.3.45 Taking into account the Scottish Government's strategic objectives (wealthier and fairer, safer and stronger, smarter, greener, healthier) and the City Council's 'smarter mobility' objectives, the five high-level aims have been updated to:
1. A transport system that enables the efficient movement of people and goods.
  2. A safe and more secure transport system.
  3. A cleaner, greener transport system.
  4. An integrated, accessible and socially inclusive transport system.
  5. A transport system that facilitates healthy and sustainable living.
- 3.3.46 The LTS also has a series of outcomes, with associated indicators and targets, to better enable progress to be measured. By 2021 Aberdeen's transport system should have:
- A. Increased modal share for public transport and active travel;
  - B. Reduced the need to travel and reduced dependence on the private car;
  - C. Improved journey time reliability for all modes;
  - D. Improved road safety within the City;
  - E. Improved air quality and the environment; and,
  - F. Improved accessibility to transport for all.
- 3.3.47 The LTS considers transport schemes that are important features of the Strategy and sets these out against a series of high level objectives, relevant to the delivery of a LEZ in Aberdeen:
- **AWPR Objective:** To support the implementation of the Aberdeen Western Peripheral Route (AWPR) and to fully realise the benefits the new road will bring in terms of improving conditions in the City for users of sustainable modes of transport.  
Although the AWPR is now fully open, the above objective is still relevant as the full benefits of the AWPR are still being realised.  
The LTS lists a number of schemes for implementation on key corridors that may influence LEZ option development:
    - Anderson Drive, Bridge of Dee – Haudagain (A92)
      - Circumferential bus route travelling the length of Anderson Drive, with priority at junctions and stops/ interchange facilities along the route

- Improve and increase the number of pedestrian crossings. Introduce pedestrian phases on existing signalised junctions where they do not exist
- Parallel cycle lanes and junction improvements for cyclists
- All roundabouts converted to signals or signalised roundabouts
- Change signal timings to give greater east-west priority
- Upgrade junctions to accommodate large vehicles and to improve their manoeuvrability
- Wellington Road, Queen Elizabeth II Bridge – Charleston (A956)
  - Improve key junctions along the corridor to allow easier manoeuvring of HGVs
- Peterculter – Holburn Junction (A93)
  - Bus or bus/ high-occupancy vehicle (HOV) lane with junction priority, operational for eastbound vehicles only
  - New cycle/ pedestrian/equestrian lane
- Mason Lodge – Hutcheon Street (A944)
  - Pedestrian/cycle route from B9119 junction to Berryden Road
  - Alter signalised roundabout timings
  - Extension of bus lane or conversion of existing bus lane to bus/ HOV lane from bus gate on Lang Stracht to Berryden Road, with junction priority for bus and HOV
  - Signalise roundabouts to give greater east-west priority
- Switchback – Holburn Street (B9119)
  - Extension of existing bus lane or conversion of existing eastbound bus lane to bus/HOV lane to be continuous from A944/ B9119 Switchback junction to Anderson Drive junction, with priority for bus and HOV
  - Junction/ signal changes to allow greater east-west priority

The LTS notes that any scheme listed will require review in light of AWPR opening and publication of further studies such as the Roads Hierarchy Study.

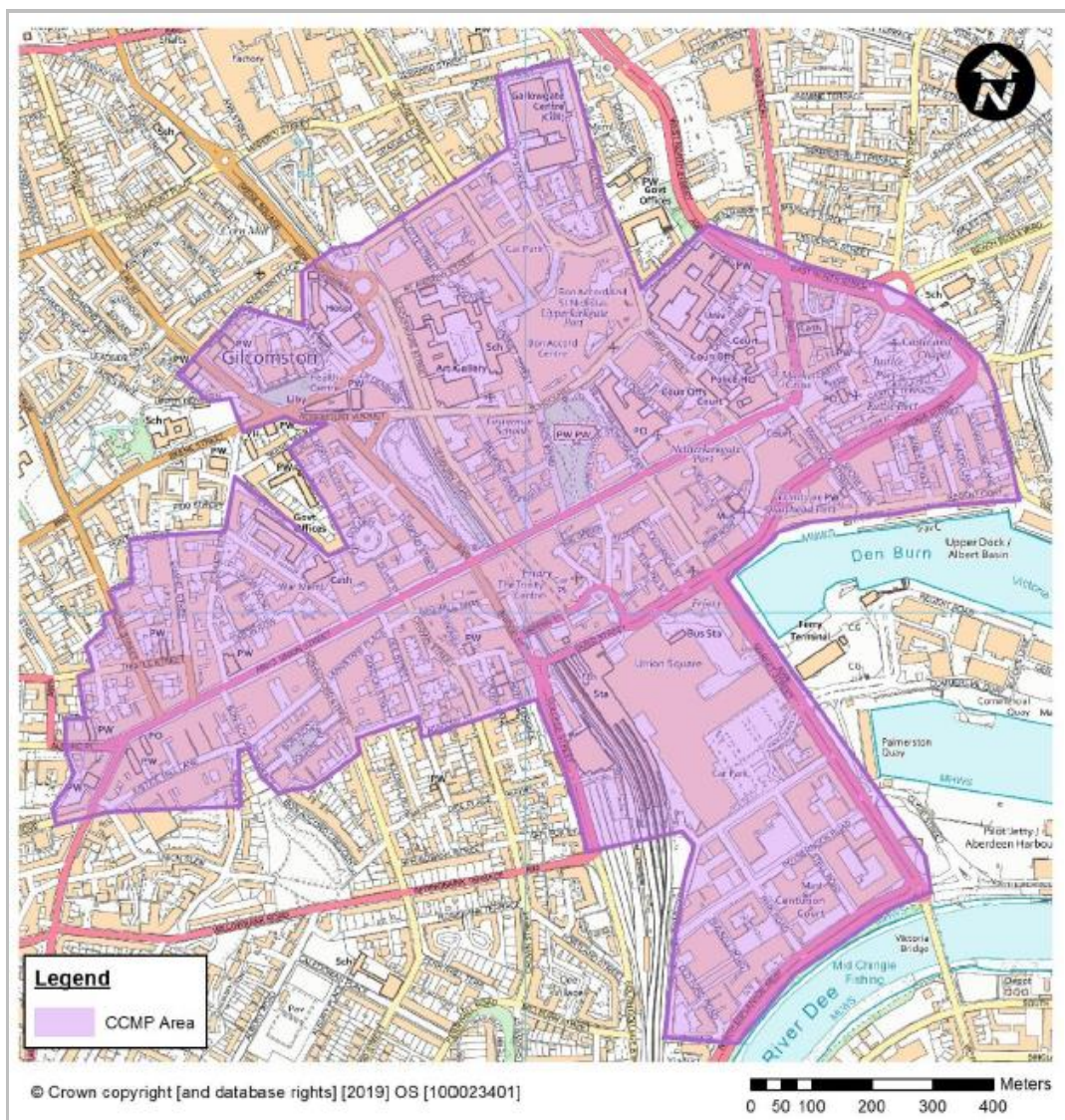
- **Car Parking Objective:** To develop a car parking regime that sustains and enhances the economic vitality of the City Centre and district shopping centres.
- **Air Quality Objective:** To improve air quality across the City, so that the existing Air Quality Management Areas are revoked and no further Air Quality Management Areas are declared.
- **Ultra-Low Emission vehicles Objective:** To facilitate the uptake of ultra-low and low emission vehicles as a contribution towards improving air quality in the City.
- **Climate Change Mitigation and Adaptation Objective:** To contribute to Aberdeen’s carbon emissions targets and develop climate resilient infrastructure.
- **Walking Objective:** To increase the number of people walking, both as a means of travel and for recreation, in recognition of the significant health and environmental benefits it can bring to our citizens.
- **Cycling Objective:** To foster a cycling culture in Aberdeen by improving conditions for cycling in Aberdeen so that cycling becomes an everyday, safe mode of transport for all.
- **Bus Objective:** To increase public transport patronage by making bus travel an attractive option to all users and competitive with the car in terms of speed and cost.

- **Public Realm Objective:** To improve the public realm by prioritising pedestrians, cyclists and public transport with consequent traffic circulation (to enhance environment, aesthetic quality and air quality of the City) for the benefit of shoppers, visitors and residents.

3.3.48 In developing and appraising options for the Aberdeen LEZ it is important to take cognisance of the proposals in the Aberdeen LTS, and any internal updates since 2016, as it guides the planning of and improvements to the local transport network that may directly influence or be influence by a LEZ.

**Aberdeen City Centre Masterplan**

3.3.49 The [Aberdeen City Centre Masterplan](#) (CCMP) was approved by ACC in June 2015. It outlines a 25-year development strategy for the city centre designed to support economic growth by transforming Aberdeen as a place to live, visit, work and do business. Figure 3.2 details the CCMP boundary.



**Figure 3.2 : CCMP (& SUMP) Boundary (Source ACC)**

3.3.50 A key focus of the CCMP is that the city centre should become a destination, with access to it by active travel and sustainable modes becoming more attractive with the car playing a smaller role.

3.3.51 The £1 billion vision outlines 50 economic, environmental and social projects. A number of these have a transport focus, and form an integral part of the future road network



within the city centre. Further detail on the CCMP transport projects can be found on: <https://aberdeencitycentremasterplan.com/projects>

3.3.52 Figure 3.3 summarises the proposed vehicular access and restrictions for the full strategy.

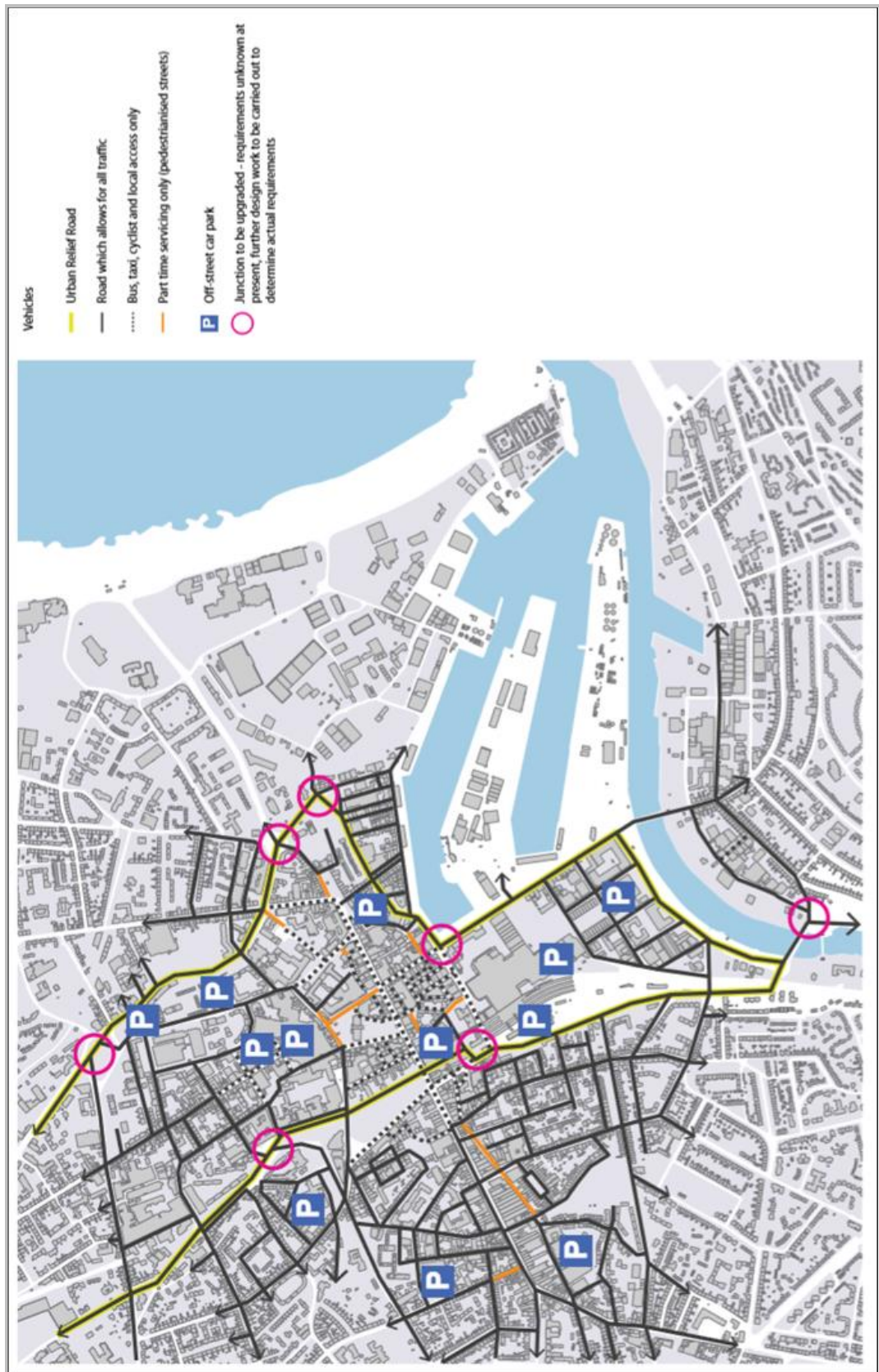


Figure 3.3 : Aberdeen City Centre Masterplan – Proposed Vehicular Access (Source: BDP, June 2015)

3.3.53 A transport assessment and traffic modelling study was undertaken by SYSTRA (then SIAS; *Aberdeen City Masterplan Testing – Phase 2 & 3, SIAS Ref: TPXACCM1/77954, April 2016*) in 2016 to review the CCMP transport interventions in order to identify infrastructure that

would be required to support the interventions and also to develop an optimum programme of delivery.

3.3.54 The findings suggested that a reduction in general peak traffic levels of 20% is required to enable the transportation and public realm objectives relating to pedestrian, cycle and bus movement in the city centre, as illustrated in the Figure 3.4 below. The report notes that modal shift from private vehicles to sustainable modes will be required in order to allow the network to operate satisfactorily.

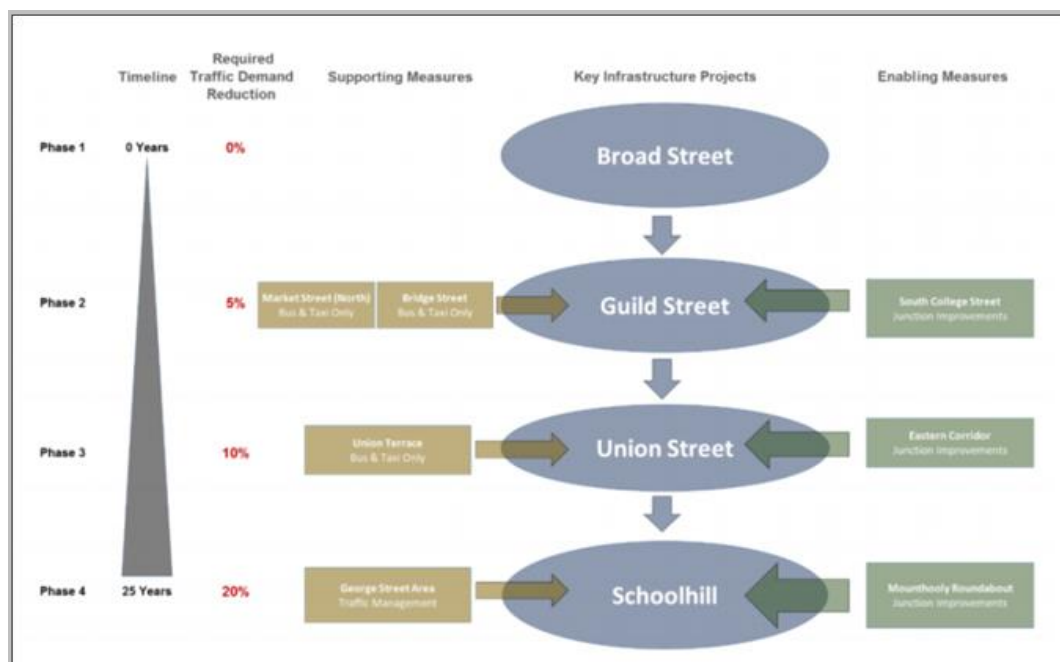


Figure 3.4 : City Centre Masterplan – Proposed Programme of Delivery (Source: ACC)

3.3.55 The report detailed the optimum delivery programme for the CCMP proposals identified through the testing process and the reasoning for the implementation order being proposed, and cognisance should be taken of this when developing LEZ options and undertaking detailed appraisal. The recommendations of the report were approved at the Council Committee meeting on 11 May 2016 and the optimum programme for CCMP delivery can be summarised as follows:

1. Broad Street 'Bus Only' or 'Road Closure' – **Key Infrastructure Project**
  - Interventions have minimal impact on the rest of the network and do not require a traffic demand reduction to be able to operate.
  - 'Bus only' has the least impact on the travelling public.
  - **Note: Broad Street is now a pedestrian-priority space, shared with cyclists and buses ([CCMP Broad Street](#))**
2. Bridge Street 'Bus & Taxi Only'
  - Required to facilitate Guild Street proposals.
3. Market Street (North) 'Bus & Taxi Only'
  - Reduces traffic demand on Union Street (which is required when Guild Street is restricted).
  - Required to facilitate Guild Street proposals.
4. South College Street Junction - enabling measure
  - Capacity improvements essential prior to the implementation of key east-west routes (Guild Street & Union Street).

- Traffic patterns at South College Street directly affected by the north-south traffic throughput at Denburn Road.
  - **Note: South College Street junction improvement designs and Compulsory Purchase Orders (CPOs) have been approved by ACC ([South College Street Improvements](#))**
- 5. Guild Street 'Bus & Taxi Only' – **Key Infrastructure Project**
  - Requires network traffic demand reduction of approximately 5%.
  - Requires Bridge Street and Market Street interventions to already be in place.
  - Guild Street has a lower impact on the surrounding road network than the Union Street project. In addition, if Union Street was restricted first, significant congestion would occur on Guild Street.
- 6. Eastern Corridor Improvements
  - Union Street and Guild Street interventions both result in a significant relocation of traffic to the Eastern Corridor. Improved junction capacity is required through the Eastern Corridor (at Commerce Street/Virginia Street and Commerce Street/Beach Boulevard) prior to the implementation of both of these interventions. The Eastern Corridor enabling measures proposals are therefore required prior to the implementation of Union Street interventions but could be considered earlier.
- 7. Union Terrace 'Bus & Taxi Only'
  - Interventions required in advance of the Union Street intervention to prevent significant levels of displaced traffic routing along Schoolhill. This would improve the operation of Public Transport in this area.
- 8. Union Street 'Bus & Taxi Only' – **Key Infrastructure Project**
  - With above interventions already in place, this measure requires network traffic demand reduction of approximately 10%.
  - Requires Broad Street and Union Terrace interventions in place to protect Schoolhill from significant increases in traffic.
- 9. Mounthooly Roundabout Improvements
  - Forms part of the George Street area traffic management proposals but is also required to maximise the operation of the eastern corridor.
  - Can be considered before or after Union Street interventions are implemented.
- 10. George Street Traffic Management Interventions
  - Wide area traffic management required around George Street area (south of Hutcheon Street) to restrict through traffic but retain car park access. Required as part of the Schoolhill closure intervention.
- 11. Schoolhill 'Closure' – **Key Infrastructure Project**
  - With above interventions already in place, this measure requires network traffic demand reduction of approximately 20%.
  - Schoolhill closure would force high volumes of traffic through the John Street and Maberly Street corridors.

3.3.56 This delivery programme is now subject to change, given the AWPR opening and the expected changes in traffic flow in the city as a result. SYSTRA is currently examining the

traffic flow patterns between pre and post AWPR to inform any programme changes and it is expected that the CCMP phases and programme will be subject to further traffic model analysis using the 2019 Aberdeen City Centre Paramics Traffic Model (see 3.3.73 below). The CCMP contains a number of key proposals to change the strategic and local traffic movements in Aberdeen and these have been broadly approved by elected members. In May 2021 the [City Growth and Resources Committee](#) instructed a review of the CCMP. It is considered crucial that any LEZ option does not directly contradict the CCMP proposals and where additional mitigation is identified as being required as part of any LEZ option, the mitigation is informed by an updated and fully tested delivery programme for the CCMP.

### **North East Scotland Roads Hierarchy Study**

3.3.57 ACC and regional partners Nestrans and Aberdeenshire Council commissioned The [North East Scotland Roads Hierarchy Study](#) to *update the city's roads hierarchy to provide a system that reflects the new role of the city centre (as a destination) and makes the most effective use of the Aberdeen Western Peripheral Route (AWPR) for distributing traffic around the city to the most appropriate radial route to reduce the extent of cross-city traffic movements* (AECOM, May 2019).

3.3.58 The aims of the Roads Hierarchy study is to update the city's road hierarchy in order to:

- Support the effective distribution and management of traffic around the city;
- Develop a network that makes best use of the Aberdeen Western Peripheral Route (AWPR) by taking advantage of the newly freed up road capacity within the City to lock in the benefits of the investment by giving more priority to sustainable transport journeys
- Facilitate delivery of transport elements of the Aberdeen City Centre masterplan (CCMP) by providing a means of reducing through traffic in the city centre, reflecting the role of the city centre as a destination rather than a through route for traffic; and
- Form a basis for identifying future transport priorities for the city, along with the Regional and Local Transport Strategies and ongoing City Region Deal (CRD) Strategic Transport Appraisal.

3.3.59 Four option packages were developed from an option sifting and validation exercise:

- **Do-Minimum Package:**  
Committed Schemes & City signage as per signing framework developed by ACC (for post-AWPR routing)
- **City Hierarchy Package:**  
Proposed new roads hierarchy (Figure 3.5 and Figure 3.6)
- **Road Space Re-allocation Package:**  
Proposed new Roads hierarchy with additional intervention to reduce capacity for general traffic between the north, south, and west of the city centre
- **Access Only Package:**  
Proposed new Roads hierarchy with high level intervention to restrict general traffic between the north, south, and west of the city centre

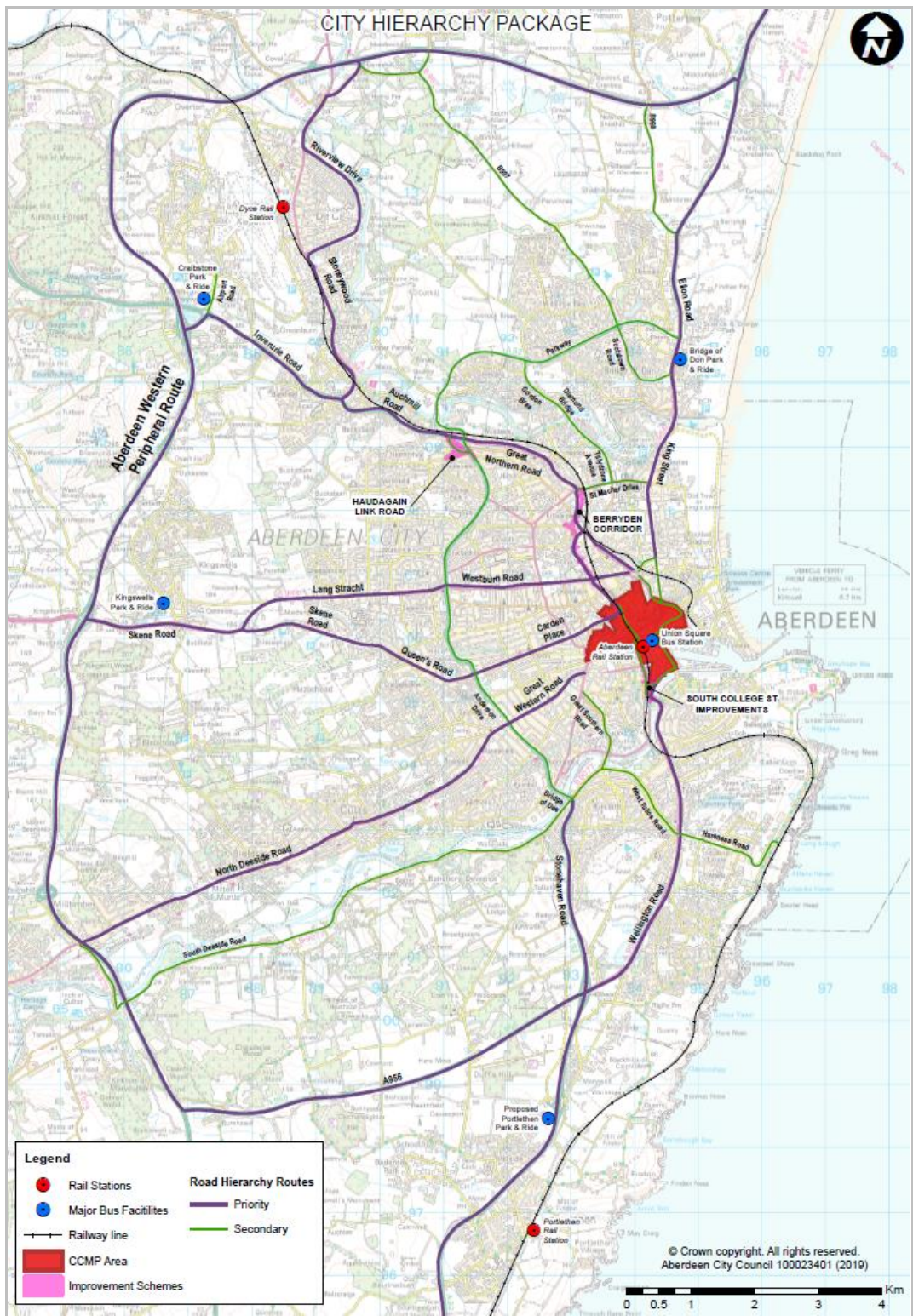
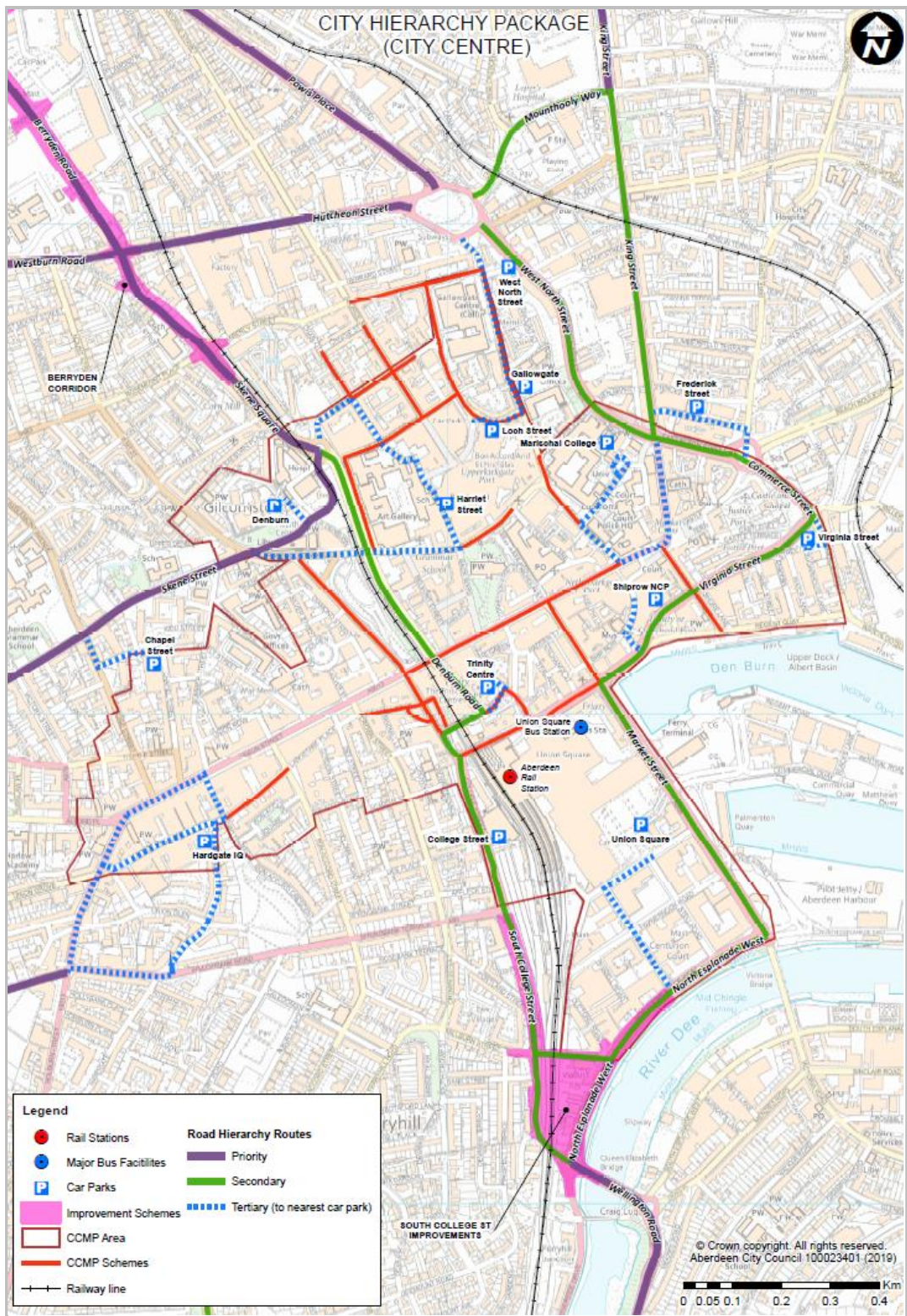


Figure 3.5 : Proposed City Hierarchy Package (Source: ACC, 2020)



**Figure 3.6 : Proposed City Hierarchy Package – City Centre (Source: ACC, 2020)**

3.3.60 The Roads Hierarchy Study was approved by Aberdeen City Council City Growth and Resources committee in 2019 and the committee instructed officers to implement the proposed changes on an incremental basis. Instead of adopting one of the individual packages, it was agreed that the optimum approach would involve elements of each of the packages, subject to further feasibility and design work.

3.3.61 The changes to the roads hierarchy will significantly influence strategic and local traffic movements in Aberdeen. As with the CCMP, it is considered crucial that any LEZ option does not directly contradict the Road Hierarchy Study and takes cognisance of the approved measures. The option development for the LEZ must recognise the planned declassification of A and B class streets in the city centre, changed to reflect the fact that

they are no longer considered primary traffic routes or through routes in the context of the AWPR and CCMP with traffic not signed to use these routes unless going to a specific destination.

- 3.3.62 The Do-minimum and City hierarchy packages are proposed to be implemented during the 20 year plan for the CCMP and SUMP and it is anticipated that some signage and road numbering changes will be completed during 2020. The individual projects that comprise the high levels intervention packages (Road Space Re-allocation and Access Only packages) are now subject to further feasibility and design work via multimodal corridor studies of priority and secondary routes, with the city centre elements considered as part of the SUMP.

### ***Aberdeen City Sustainable Urban Mobility Plan***

- 3.3.63 The [Aberdeen Sustainable Urban Mobility Plan](#) (SUMP) was developed by Aberdeen City Council to identify transport interventions that could be delivered to help realise certain city centre elements of the revised hierarchy and complement and expand upon city centre transport interventions identified in the CCMP.

- 3.3.64 The vision of the SUMP is *a city centre transport network that enhances accessibility and permeability by those walking, cycling and using public transport and which contributes to wider aspirations to deliver a safe, sustainable and economically buoyant city centre with an enhanced sense of place* (Aberdeen SUMP, ACC December 2019).

- 3.3.65 The vision is supported by the following objectives:
1. Support delivery of the CCMP by contributing to the regeneration of the city centre and developing a network of streets that prioritise the movement of people over the movement of vehicles, whilst maintaining necessary and efficient access for business and industry.
  2. Minimise the adverse environmental impacts of transport in the city centre and incorporate green infrastructure into new transport schemes wherever practicable.
  3. Ensure that the city centre is accessible to, and safe for, all and is resilient to the effects of climate change.
  4. Encourage and enable more walking and cycling in the city centre, particularly through the provision of more and better infrastructure.
  5. Improve the public transport experience to, from and within the city centre, particularly in terms of achieving shorter and more reliable journey times.
  6. Improve connectivity between key destinations in and around the city centre by sustainable modes of transport.
  7. Support and encourage all vehicular journeys within the city centre to be undertaken in low emission vehicles.
  8. Raise awareness of opportunities for travel to, from and within the city centre by clean and sustainable forms of transport, including the potential for multimodal journeys.

- 3.3.66 The following outcomes are anticipated:
1. A more pedestrian- and cycle-friendly city centre;
  2. A city centre that prioritises the movement of people over the movement of vehicles;
  3. Improved air quality in the city centre;
  4. Reduced carbon dioxide (CO<sub>2</sub>) emissions;
  5. A city centre that is accessible to all;
  6. A safer city centre;
  7. Increased mode share for active travel to, from and within the city centre;
  8. Increased mode share for public transport to, from and within the city centre;
  9. Shorter public transport journey times and improved journey time reliability through the city centre; and

10. An increase in the proportion of vehicular journeys in the city centre undertaken by low-emission or emission-free vehicles.

3.3.67 The SUMP outlines a number of key infrastructure improvements and supporting measures to help realise its vision and objectives and these are closely aligned with CCMP proposals. The SUMP has been approved by elected members and it is considered important that any LEZ option does not directly contradict the SUMP proposals and, as with the CCMP, where additional mitigation is identified as being required as part of any LEZ option, that option should be informed by the SUMP interventions.

#### ***Aberdeen Sub Area Model (ASAM)***

3.3.68 There is a three tier hierarchy of transport models in Scotland. Transport Scotland, via Land Use and Transport Integration in Scotland (LATIS), has developed national Land Use (TELMoS) and Transport (TMfS) models. These are supported by regional transport models and there are currently regional models covering Aberdeen & Shire, Glasgow, Edinburgh and Inverness city regions. The final tier is local traffic models and there are a number of such models within the Aberdeen City and Shire area.

3.3.69 The Aberdeen Sub Area Model (ASAM) is a strategic multi-modal transport model covering the main roads and public transport networks within Aberdeen and Aberdeenshire (and parts of Moray and Angus).

3.3.70 The model was originally developed in 2002 to support the design and appraisal of the AWPR and was last updated in 2014. With the AWPR fully open in February 2019, there was a requirement to update the base model to reflect the resultant change in traffic and travel patterns.

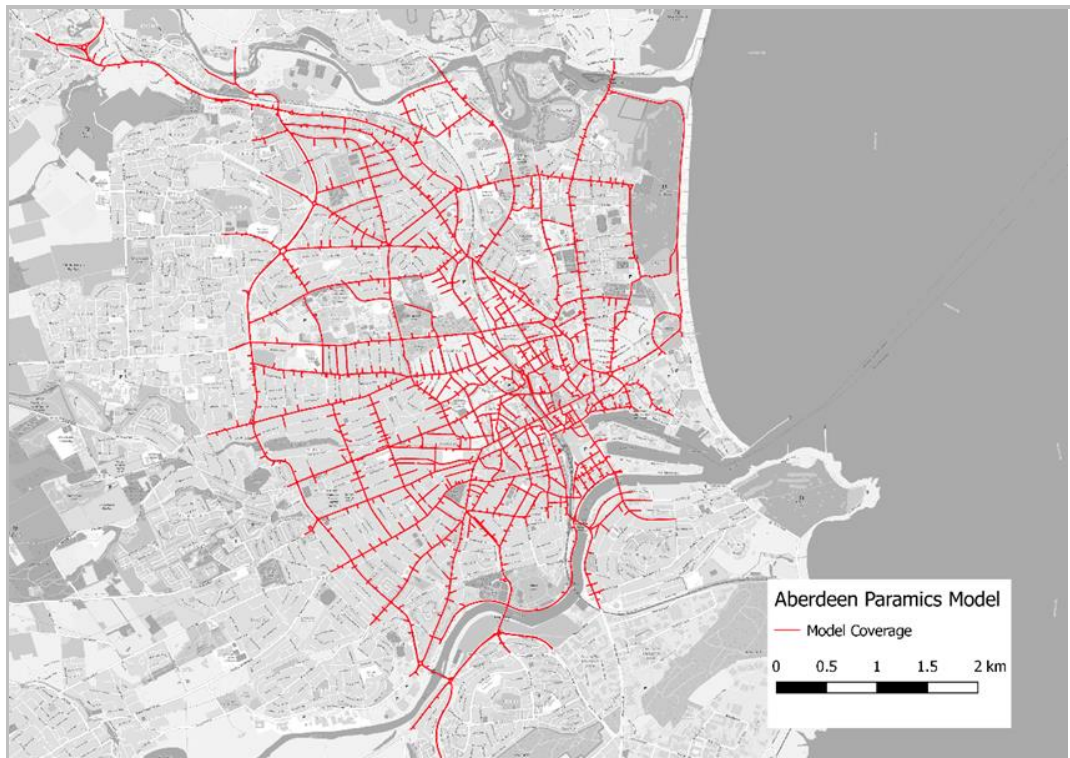
3.3.71 A 2019 ASAM model is therefore currently being developed to provide detailed evidence to consider options for a number of North East projects and inform the necessary stages of the business case development. The ASAM19 will inform and assess future iterations of the statutory Regional Transport Strategy and Development Plans.

3.3.72 Although currently under development, consideration will be given as to how ASAM19 can support the development of the LEZ in Aberdeen. The previous ASAM variant (ASAM14) is available for use in the interim if required to support the LEZ development prior to ASAM19 being available.

#### ***Aberdeen City Centre Microsimulation Model***

3.3.73 In 2019, Aberdeen City Council commissioned the development of a traffic microsimulation model of Aberdeen City Centre for the purpose of assessing road network options associated with the development of a LEZ in Aberdeen. The initial Base Model development (ACCPM19) is detailed in the report '*Aberdeen City Centre Paramics Model Upgrade 2019*' (SYSTRA Ref: GB01T19F42/2, October 2020). The ACCPM19 road network description is shown in Figure 3.7.





**Figure 3.7 : ACCPM19 – Network Coverage**

3.3.74 The ACCPM19 is capable of assessing a range of transport interventions associated with the implementation of the Low Emission Zone in Aberdeen City Centre, as identified through this study, along with traffic management measures related to assessment of any future city centre developments. Outputs from the ACCPM19 will contribute to the evidence base required appraisal of LEZ options (See Chapters 12 and 14). It is anticipated that the implementation of the LEZ will not be undertaken in isolation but form part of a package of measures to reduce traffic and prioritise the movement of sustainable transport modes, including elements of the SUMP, revised network hierarchy, and City Centre Masterplan proposals.

3.3.75 The ACCPM19 will be utilised as part of a suite of models to quantify the impact of LEZ options considered. The suite of models each have a role in the assessment as follows:

- ACCPM19 - Traffic Impacts (flows, journey times, bus journey times, queueing)
- ASAM – Public transport demand, wider traffic impacts, longer-term land-use impacts in city centre and wider area, longer-term changes in trip making patterns
- Air Quality Model (SEPA) – NMF AQ model scenarios, using outputs from the ACCPM from relevant scenarios where required.

***Aberdeen Air Quality Model (National Modelling Framework)***

3.3.76 The Scottish Environmental Protection Agency (SEPA) undertake air quality modelling on behalf of Transport Scotland, under the National Modelling Framework (NMF) as detailed in paragraph 3.2.14 above.

3.3.77 Traffic Data collated in May 2019 was used to update the existing 2017 Aberdeen ADMS (Atmospheric Dispersion Modelling System) air pollution model. The model update was undertaken in 2019 to include the impact of the AWPR. As noted in Section 3.3.75, traffic outputs from the City Centre Microsimulation model (traffic flows & speeds) are fed into the ADMS, which then converts the data into traffic emission levels throughout the modelled network.

3.3.78 The NMF forms a crucial strand of evidence in developing options for Aberdeen LEZ. High level scenario testing is undertaken as part of the NLEF Stage 2 Assessment and is detailed in Chapter 5.

### 3.4 Committed Infrastructure

3.4.1 It is important that any major committed infrastructure for Aberdeen City Centre is considered when developing options for Aberdeen's LEZ. The following current infrastructure is proposed for the City Centre:

- [South College St Junction Improvements project](#) – Due to be in place by Autumn 2021
- [Berryden Corridor Improvements](#) - Originally proposed for completion by 2020, now expected 2023
- [Union Terrace Gardens](#) – Completion proposed by late 2021/early 2022

3.4.2 These committed infrastructure projects, along with any others that may be committed by ACC in the interim period between writing and model testing, such as the committed roads hierarchy changes, will be included as part of a future year Reference Case traffic model. This will ensure that any benefits or dis-benefits to traffic volumes, speeds or air quality from the infrastructure are reflected in any LEZ option testing required as part of the detailed appraisal (see Chapter 9 for details).

### 3.5 Committed Developments

3.5.1 As with committed infrastructure, it is important that cognisance is taken of any committed developments that might impact on air quality and in turn influence the shape of any LEZ.

3.5.2 There is currently one potential development at Broadford Works, Maberly Street, where approval was granted in September 2016 for a major mixed use development on a brownfield site close to the city centre and the Berryden corridor. The proposed development comprises 890 residential units (apartments for rent and student accommodation), cafes and bars, a nursery and office, retail and leisure facilities and 400 car parking spaces. The development has the potential to increase congestion and adversely affect air quality both in the vicinity of the proposed residential properties and the wider area. An air quality assessment was undertaken as part of a previous planning application and did not predict a significant adverse impact or risk of exceedance of the air quality objectives, however the 2016 application was approved subject to a further air quality assessment. The condition also requires mitigation measures should there be a significant adverse impact on air quality. At the time of writing, there is currently no further progress, to date, with this development.

### 3.6 Current ACC/Nestrans Studies

3.6.1 Existing studies in and around Aberdeen city centre have the potential to complement the development of a LEZ and vice versa and it is important that consideration is taken of current studies to ensure this is the case, where possible. ACC and Nestrans studies currently being undertaken include:

- Electric Vehicle (EV) Framework was approved at the [City Growth and Resources Committee in February 2021](#) and outlines where future EV infrastructure should be located as well as what additional supporting actions the council and partners could deliver in order to support the further take up and accelerate the take up of EVs
- Several multi-modal transport studies:
  - Wellington Road Corridor in the south of Aberdeen. Option development and modelling was undertaken in 2019, with option appraisal following thereafter.

This will be supported by public and stakeholder engagement at key stages of the process with a STAG Stage 2 due to be complete in 2021.

- A944/B9119 Westhill to Aberdeen City Centre. A STAG-based option appraisal was completed in 2020 and will be subject to more detailed appraisal and design work in 2021 and 2022
- Park and Ride from Ellon to Robert Gordon University (via Ellon Road, King Street, City Centre, Holborn Street). A STAG-based option appraisal due for completion 2021.
- Several STAG based options appraisal due for completion in 2022 including A96 Inverurie to Aberdeen, A947 Dyce to Aberdeen, A93 Banchory to Aberdeen
- Aberdeen to Laurencekirk Multimodal Study with Case for Change completed

## 4. AIR QUALITY IN ABERDEEN

### 4.1 Introduction

4.1.1 The National Low Emission Framework (NLEF) is used to build a suitable evidence-base to assess all potential LEZ options against. NLEF is a two stage process consisting of the following elements:

- Stage 1 – Screening
- Stage 2 – Assessment

4.1.2 This chapter details the Stage 1 Screening of Aberdeen’s LAQM and builds an evidence base to assist in the appraisal and implementation of Aberdeen’s LEZ through the NLEF Stage 2 Assessment.

4.1.3 NLEF Guidance describes the following key steps that should be undertaken as part of the Stage 1 Screening exercise:

- Review of information on the main sources of poor air quality and other contributing factors within each AQMA.
- Analysis of existing data including air quality, traffic and environmental data as well as information on existing and future action planning measures across all local authority functions which seek to address or are likely to contribute to improving air quality
- Conduct the NLEF stage one screening process
- Record the results of the screening process and the decision as to whether proposed measures are sufficient or whether any AQMA requires to progress to a stage two assessment.

4.1.4 NLEF guidance states that there is no requirement for local authorities to collect new data or information during the screening stage of the appraisal process. Existing air quality information, including data produced as part of the annual review and assessment process and air quality action plans, should be used in the screening assessment. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. As of 2016, a requirement of LAQM process is the delivery of Annual Progress Reports (APR) to summarise the work being undertaken by the local authority to improve air quality and report any progress that has been made. The APRs provide extensive detail on existing air quality issues in Aberdeen, the level of success from the LAQM measures and provide a key source of information for the NLEF process.

4.1.5 As such, this chapter will review and collate data and information from the following sources:

- [Air Quality Action Plan 2011](#) (Aberdeen City Council, January 2011)
- [2019 Air Quality Annual Progress Report](#) (APR) for Aberdeen City Council (Aberdeen City Council, June 2019)
- [2020 Air Quality Annual Progress Report](#) (APR) for Aberdeen City Council (Aberdeen City Council, June 2020)

4.1.6 The results and findings of the [2019 APR](#) (note, the 2019 APR reports on the 2018 air quality monitoring dataset) was summarised in the first interim NLEF Stage 2 Report (June 2020) and the subsequent LEZ option development and analysis was undertaken utilising this 2018 air quality dataset. The [2020 APR](#) (2019 air quality dataset) was published in June 2020, after the first interim NLEF Stage 2 Report had been finalised. The 2019 air quality monitoring dataset is now summarised in this chapter, after the 2018 summary,

and is shown to be comparable to 2018 data confirming the focus of the LEZ remains the same.

## 4.2 Aberdeen Air Quality Management Area

4.2.1 In 2001 ACC declared part of the City Centre (Union Street and Market Street) an Air Quality Management Area (AQMA) due to predicted exceedances of the annual mean national air quality objective for nitrogen dioxide (NO<sub>2</sub>). The AQMA was extended in 2003 to include adjoining roads. In 2004, the Detailed Assessment indicated potential exceedances of the annual mean objective for particulate matter (PM<sub>10</sub>) and an AQMA was declared for PM<sub>10</sub> covering the same area. In 2005 the AQMA for NO<sub>2</sub> and PM<sub>10</sub> was further extended to include additional adjoining city centre roads.

4.2.2 Two further AQMAs were declared in 2008, again due to exceedances of the NO<sub>2</sub> and PM<sub>10</sub> annual mean objectives, for the Anderson Drive/Haudagain roundabout/Auchmill Road corridor and the Wellington Road corridor (Queen Elizabeth Bridge/Balnagask Road), the latter also including the 24 hour mean objective for PM<sub>10</sub>.

4.2.3 The City Centre AQMA and the Anderson Drive AQMA were further amended in 2018 and the three current AQMAs for NO<sub>2</sub> and PM<sub>10</sub> as declared by ACC are shown in Figure 4.1 to Figure 4.3.



Figure 4.1: Aberdeen City Centre AQMA for NO<sub>2</sub> and PM<sub>10</sub>



Figure 4.2 : Anderson Drive AQMA for NO<sub>2</sub> and PM<sub>10</sub>



Figure 4.3 : Wellington Road AQMA for NO<sub>2</sub> and PM<sub>10</sub>

### 4.3 Air Quality Action Plan

Ongoing monitoring of NO<sub>2</sub> and PM<sub>10</sub> concentrations in Aberdeen since ACC first declared an AQMA in the city in 2001 confirmed the need for continuance of the AQMAs and the legal requirement on ACC to publish the [Air Quality Action Plan \(Aberdeen City Council, January 2011\)](#).

4.3.1 The AQAP showed NO<sub>2</sub> concentrations in excess of the mandatory annual mean limit value existed at a number of the main roads and junctions in Aberdeen. The main areas of concern, where concentrations were well in excess of the annual mean limit value,

were Haudagain roundabout, Union Street, and Market Street. Exceedances of the hourly averaged limit value were also measured on Union Street and Market Street. The AQAP also confirmed PM<sub>10</sub> concentrations were in excess of the Scottish annual mean objective at numerous locations including Market Street, Union Street and Wellington Road. At the time of publishing in 2011, the AQAP suggested that in the most polluted areas, traffic emission reductions of the order of 50-75% would be required for compliance with the mandatory NO<sub>2</sub> annual mean limit value.

4.3.2 The AQAP summarised the source apportionment work carried out by ACC in 2009 and 2010 to assess the source contribution to overall pollutant concentrations. Source apportionment studies of oxides of nitrogen (NO<sub>x</sub>) and PM<sub>10</sub> highlighted the following key findings:

- For NO<sub>x</sub>, road traffic is the greatest single contributor, whereas for PM<sub>10</sub> background sources account for the greatest proportion of total emissions.
- With regards to NO<sub>x</sub>, cars, despite making up the greatest proportion of the traffic, are generally responsible for the least emissions. However for PM<sub>10</sub>, cars are responsible for a far greater proportion of the total emissions.
- The results for Union Street indicate that for NO<sub>x</sub>, buses are the single greatest contributor (65%), but for PM<sub>10</sub> the bus contribution is smaller (34%), and the car contribution is greatest (44%).
- For Wellington Road, HGV emissions contribute to the greatest extent, and to a lesser extent the same is true for Market Street.
- For the Haudagain roundabout, cars contribute more significantly to the total, particularly with regards PM<sub>10</sub> and PM<sub>2.5</sub>.

4.3.3 The 2011 AQAP recommended a number of measures, grouped into 6 categories, to improve air quality. The majority are concerned with reducing the impact of transport emissions, identified as the main cause of the air quality problem in Aberdeen, and are detailed in Table 4.1.

**Table 4.1 : 2011 AQAP Measures**

Ref.	2011 AQAP Measure
1	MODAL SHIFT & INFLUENCING TRAVEL CHOICE
1.1	Increase Bus Use
1.2	Improve Cycling & Walking Provision
1.3	Travel Plans
1.4	Improve public awareness of air quality issues
1.5	Car Clubs / Car Pool Schemes
1.6	Crossrail
1.7	Rail Freight
2	LOWER EMISSIONS & CLEANER VEHICLES
2.1	Green Vehicle procurement & Fuel/Charging Infrastructure
2.2	Eco-driving
2.3	Emissions Testing & Idling Enforcement
2.4	Taxis
2.5	Low Emission Zone
3	ROAD INFRASTRUCTURE
3.1	Pedestrianisation
3.2	Road Building / Junction Alterations
4	TRAFFIC MANAGEMENT
4.1	Intelligent Transport System (ITS)
4.2	High Occupancy Vehicle (HOV) Lane
4.3	Freight and Commercial Vehicle Access
5	PLANNING & POLICIES
5.1	Produce Supplementary Planning Guidance
5.2	Integration of AQAP with Local Transport Strategy (LTS) and Regional Transport Strategy (RTS)
5.3	Integration of AQAP with Health and Transport Action Plan (HTAP)
5.4	Road Hierarchy
5.5	Car Parking Policies
5.6	National Lobbying
6	NON-TRANSPORT MEASURES
6.1	Control Biomass Installations
6.2	Industry Permitting
6.3	Tree Planting
6.4	Shipping

4.3.4 Since the introduction of the AQAP in 2011 there has been significant reductions in traffic emissions. The APRs provide detailed updates on the implementation of the proposed measures and appraise their delivery and impact in improving air quality in the AQMAs. The NLEF guidance advises the AQAP measures already implemented by the local authority and their expected impacts on the levels of AQO exceedance should be reviewed during the NLEF Stage 1 Screening. However, as this has been comprehensively undertaken by Aberdeen City Council in the 2020 APR (and in previous years), this task is not undertaken in detail in this NLEF Stage 1 Report. Instead, cognisance of the implemented measures is taken when undertaking the LEZ option development and appraisal.

#### **4.4 Analysis of 2018 Air Quality Monitoring Data**

4.4.1 The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. As of 2016, a requirement of the LAQM process is the delivery of Annual Progress Reports (APR) to summarise the work being undertaken by the local authority to improve air quality and report any progress that has been made.

4.4.2 The APRs provide extensive detail on existing air quality issues in Aberdeen, the level of success from the proposed LAQM measures and provide a key source of information for the NLEF evidence base and LEZ option development process. ACC have produced APRs for 2016 to 2019 and the results and findings of the [2019 Air Quality Annual Progress Report \(APR\) for Aberdeen City Council](#) are summarised here.



4.4.3 It should be noted that the 2019 APR reports on the 2018 (full calendar year) air quality monitoring dataset and, at the time of writing the first interim NLEF Stage 2 Report (June 2020), it was the most up to date fully ratified dataset. The 2020 APR is now available and summarised in Section 4.5 below.

4.4.4 ACC undertook automatic (continuous) monitoring at 6 sites during 2018:

- Union Street
- Market Street
- Anderson Drive
- Wellington Road
- King Street
- Errol Place

4.4.5 The automatic monitoring sites at Union Street, Market Street, Anderson Drive and Wellington Road are located within AQMAs.

4.4.6 ACC undertook non-automatic (passive diffusion tube) monitoring of NO<sub>2</sub> at 70 sites during 2018. All monitoring site locations (continuous and passive) are shown in Figure 4.4.



Figure 4.4 : ACC 2018 Monitoring Locations

**Nitrogen Dioxide (NO<sub>2</sub>)**

4.4.7 The 2019 APR provided the full ratified and adjusted 2018 dataset for monthly means for automatic monitoring sites and diffusion tubes.

4.4.8 The report states all automatic monitoring site data in 2018 was comparable to 2017 levels and that concentrations at all automatic sites were below the annual mean air

quality objective of 40 µg/m<sup>3</sup>, the first time this has occurred in the last 5 years. Data from the diffusion tube network suggest that exceedances of the annual mean objective occurs in the city centre AQMA and the Anderson Drive AQMA.

4.4.9 Nitrogen dioxide levels at monitoring locations outside the AQMAs remain well below the annual mean objective except for Skene Square where diffusion tube data suggest levels continue to be just below/on the threshold of the annual mean objective. Major transportation infrastructure measures with an anticipated completion date in 2023 will be implemented around Berryden Road and the Skene Square area to improve travel connectivity, reduce congestion and impact on air quality at this location. An air quality assessment undertaken in 2017 predicted the scheme would not lead to exceedances of the air quality objectives outside the existing AQMAs.

4.4.10 The locations where 2018 annual mean concentrations of NO<sub>2</sub> are recorded as greater than 36 µg/m<sup>3</sup> is detailed in Table 4.2 alongside the annual mean concentrations recorded from 2014 to 2017. Note concentrations greater than 36 µg/m<sup>3</sup> are presented as locations that may be in risk of future exceedance. The cells highlighted in grey are the locations where the AQO of 40 µg/m<sup>3</sup> was exceeded.

**Table 4.2 : Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup>**

Site ID	Site Name/Location	AQMA	Annual mean NO <sub>2</sub> concentration (µg/m <sup>3</sup> )				
			2014	2015	2016	2017	2018
DT11	105 King Street	City Centre	55.3	54.4	51.1	48.1	48.0
DT10	184/192 Market Street	City Centre	53.9	56.1	54.1	47.6	47.0
DT9	39 Market Street	City Centre	57.5	50.9	50.2	47.9	46.0
DT29	469 Union Street	City Centre	57.9	58.2	48.8	42.7	45.0
DT12	40 Union Street	City Centre	51.3	49.8	48.9	45.9	44.0
DT17	43/45 Union Street	City Centre	55.0	51.8	46.7	42.8	44.0
DT82	7 Virginia Street	City Centre	0.0	0.0	0.0	0.0	44.0
DT39	819 Great Northern Road	Anderson Dr	63.8	54.2	47.4	45.4	43.0
DT30	335 Union Street	City Centre	53.4	50.9	46.5	41.9	41.0
DT19	468 Union Street	City Centre	51.4	53.3	45.4	40.9	40.0
DT33	16 East North Street	City Centre	44.5	46.4	43.1	40.4	40.0
DT73	61 Skene Square	No	0.0	0.0	0.0	39.7	40.0
CM5	Wellington Road	Wellington Rd	48.0	40.0	46.0	39.0	39.0
DT18	14 Holburn Street	City Centre	47.5	50.2	48.5	41.6	39.0
CM2	Union Street	City Centre	47.0	46.0	43.0	40.0	38.0
DT16	1 Trinity Quay	City Centre	48.6	45.4	43.8	37.4	37.0
DT25	21 Holburn Street	City Centre	40.5	50.3	42.8	37.1	37.0
DT77	27 Skene Square	No	0.0	0.0	0.0	0.0	37.0
DT22	104 King Street	City Centre	45.2	44.1	39.3	36.2	36.0
<b>Total No. Sites &gt; 40 µg/m<sup>3</sup></b>			<b>16</b>	<b>15</b>	<b>15</b>	<b>11</b>	<b>9</b>

source: 2019 Air Quality Annual Progress Report (APR) for Aberdeen City Council

4.4.11 In total, there are 9 locations where annual mean concentrations of NO<sub>2</sub> exceed the AQO of 40 µg/m<sup>3</sup> and a further 10 sites where annual mean concentrations of NO<sub>2</sub> exceed 36 µg/m<sup>3</sup>. Table 4.2 shows that the total number of exceedance locations in the city have reduced each year from 2014 (16 locations) to 2018 (9 locations).

4.4.12 Figure 4.5 shows the locations where annual mean concentrations of NO<sub>2</sub> were recorded as greater than 36 µg/m<sup>3</sup> in 2018.

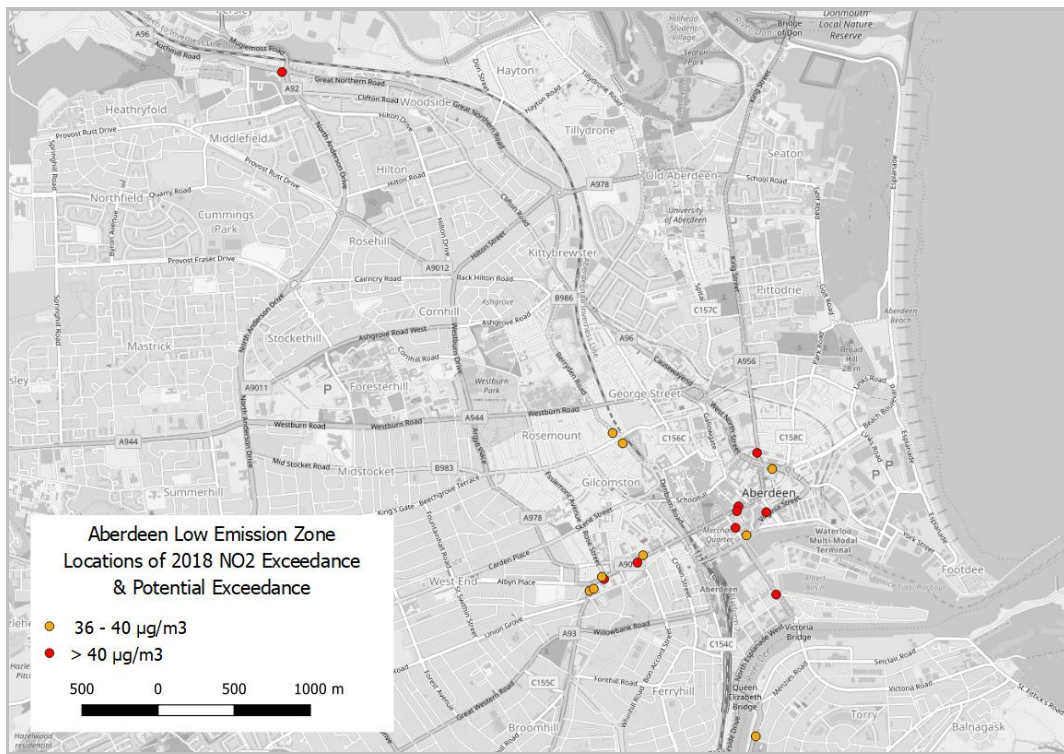


Figure 4.5: 2018 Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup> (City Wide)

4.4.13 The primary exceedance locations of NO<sub>2</sub> are shown to be within the city centre AQMA as shown in detail in Figure 4.6



Figure 4.6 : 2018 Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup> (City Centre AQMA)

4.4.14 The 2019 APR also compares the continuous monitored NO<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year and reports that no exceedances of the hourly mean objective were identified at automatic monitoring locations in 2018.

### ***Particulate Matter (PM<sub>10</sub>)***

- 4.4.15 The 2019 APR reports that no exceedances of the PM<sub>10</sub> annual mean objective (18 µg/m<sup>3</sup>) or 24 hour mean objective (50 µg/m<sup>3</sup> not to be exceeded more than 7 times per year) were observed at any of the continuous monitoring sites in 2018. The 24 hour mean objective has been met at all monitoring sites for the last 3 years.
- 4.4.16 Due to compliance with the 24 hour mean objective in the Anderson Drive AQMA for a number of years the AQMA order for this area was amended in October 2018 to remove the 24 hour mean.

### ***Particulate Matter (PM<sub>2.5</sub>)***

- 4.4.17 As of the 1st of April 2016, the Scottish Government introduced the World Health Organisation guideline value for PM<sub>2.5</sub> into Scottish legislation with an annual mean objective 10µg/m<sup>3</sup> to be achieved by 2020. Scottish local authorities are now required to include PM<sub>2.5</sub> in the LAQM review and assessment process.
- 4.4.18 There are 5 continuous monitoring sites measuring PM<sub>2.5</sub> levels in Aberdeen City and no exceedances of the annual mean were recorded at any of the continuous monitoring sites in 2018.

## **4.5 Analysis of 2019 Air Quality Monitoring Data**

- 4.5.1 The summary below shows the area of focus for the LEZ in Aberdeen (the city centre AQMA) remains the same, when assessed using either 2018 or 2019 datasets with the general trends in air quality observed to shown to be comparable.

### ***Nitrogen Dioxide (NO<sub>2</sub>)***

- 4.5.2 The 2020 APR provided the full ratified and adjusted 2019 dataset for monthly means for automatic monitoring sites and diffusion tubes.
- 4.5.3 The report states all automatic monitoring site data in 2019 was comparable to 2017 and 2018 levels and that concentrations at all automatic sites were below the annual mean air quality objective of 40 µg/m<sup>3</sup> for the second year running. Generally, NO<sub>2</sub> levels monitored across the Aberdeen were marginally lower than previous years. The report states data from the diffusion tube network was comparable to 2017 and 2018 and that exceedances of the annual mean objective occurs in the city centre AQMA only.
- 4.5.4 As in 2018, 2019 NO<sub>2</sub> levels at monitoring locations outside the AQMAs remain well below the annual mean objective except for Skene Square where diffusion tube data suggest levels continue to be just below the threshold of the annual mean objective. Major transportation infrastructure measures with an anticipated completion date in 2023 will be implemented around Berryden Road and the Skene Square area to improve travel connectivity, reduce congestion and impact on air quality at this location.
- 4.5.5 The locations where 2019 annual mean concentrations of NO<sub>2</sub> are recorded as greater than 36 µg/m<sup>3</sup> is detailed in Table 4.2 alongside the annual mean concentrations recorded from 2015 to 2018. Again, concentrations greater than 36 µg/m<sup>3</sup> are presented as locations that may be in risk of future exceedance. The cells highlighted in grey are the locations where the AQO of 40 µg/m<sup>3</sup> was exceeded.

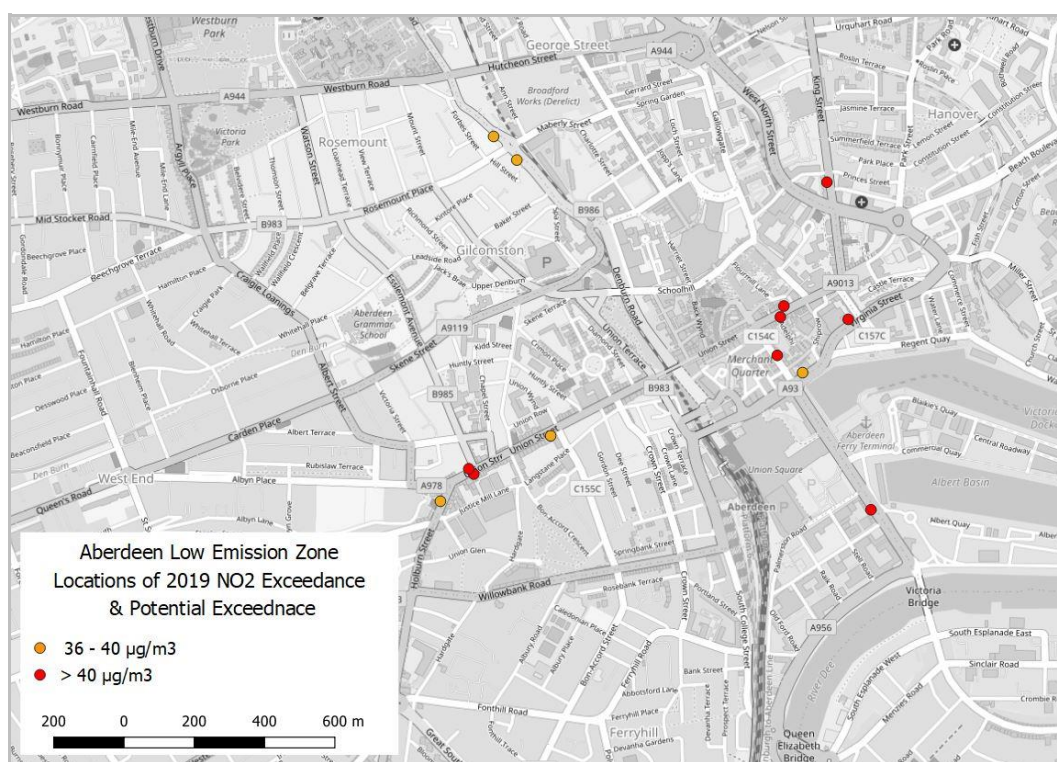
**Table 4.3 : Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup>**

Site ID	Site Name/Location	AQMA	Annual mean NO <sub>2</sub> concentration (µg/m <sup>3</sup> )				
			2015	2016	2017	2018	2019
DT10	184/192 Market Street	City Centre	56.1	54.1	47.6	47.0	47.0
DT11	105 King Street	City Centre	54.4	51.1	48.1	48.0	45.0
DT9	39 Market Street	City Centre	50.9	50.2	47.9	46.0	44.0
DT12	40 Union Street	City Centre	49.8	48.9	45.9	44.0	43.0
DT17	43/45 Union Street	City Centre	51.8	46.7	42.8	44.0	43.0
DT19	468 Union Street	City Centre	53.3	45.4	40.9	40.0	43.0
DT29	469 Union Street	City Centre	58.2	48.8	42.7	45.0	42.0
DT82	7 Virginia Street	City Centre	0.0	0.0	0.0	44.0	42.0
DT30	335 Union Street	City Centre	50.9	46.5	41.9	41.0	39.0
DT18	14 Holburn Street	City Centre	50.2	48.5	41.6	39.0	39.0
DT16	1 Trinity Quay	City Centre	45.4	43.8	37.4	37.0	39.0
DT73	61 Skene Square	No	0.0	0.0	39.7	40.0	38.0
DT77	27 Skene Square	No	0.0	0.0	0.0	37.0	38.0
DT39	819 Great Northern Road	Anderson Dr	54.2	47.4	45.4	43.0	37.0
CM2	Union Street	City Centre	46.0	43.0	40.0	38.0	36.0
DT33	16 East North Street	City Centre	46.4	43.1	40.4	40.0	35.0
CM5	Wellington Road	Wellington Rd	40.0	46.0	39.0	39.0	35.0
DT25	21 Holburn Street	City Centre	50.3	42.8	37.1	37.0	35.0
DT22	104 King Street	City Centre	44.1	39.3	36.2	36.0	34.0
<b>Total No. Sites &gt; 40 µg/m<sup>3</sup></b>			<b>15</b>	<b>15</b>	<b>11</b>	<b>9</b>	<b>8</b>

source: 2020 Air Quality Annual Progress Report (APR) for Aberdeen City Council

4.5.6 In total, there are 8 locations where annual mean concentrations of NO<sub>2</sub> exceed the AQO of 40 µg/m<sup>3</sup> (down 1 from 2018) and a further 7 sites where annual mean concentrations of NO<sub>2</sub> exceed 36 µg/m<sup>3</sup> (down 3 from 2018). Table 4.2 shows that the total number of exceedance locations in the city are continuing to reduce each year. From 2018, there are three locations where annual mean concentrations of NO<sub>2</sub> have increased in 2018, namely 468 Union Street (DT19), 1 Trinity Quay (DT16) and 27 Skene Square (DT77).

4.5.7 Figure 4.7 shows the locations where annual mean concentrations of NO<sub>2</sub> were recorded as greater than 36 µg/m<sup>3</sup> in 2019.



**Figure 4.7: 2019 Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup> (City Wide)**

- 4.5.8 The 2020 APR also compares the continuous monitored NO<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, *not to be exceeded more than 18 times per year* and reports that no exceedances of the hourly mean objective were identified at automatic monitoring locations in 2019, in line with 2018.

#### **Particulate Matter (PM<sub>10</sub>)**

- 4.5.9 The 2019 APR reports that no exceedances of the PM<sub>10</sub> annual mean objective (18 µg/m<sup>3</sup>) or 24 hour mean objective (50 µg/m<sup>3</sup> not to be exceeded more than 7 times per year) were observed at any of the continuous monitoring sites in 2018. This is in line with 2018 where the 24 hour mean objective has been met at all monitoring sites for the last 4 years.

#### **Particulate Matter (PM<sub>2.5</sub>)**

- 4.5.10 There are 5 continuous monitoring sites measuring PM<sub>2.5</sub> levels in Aberdeen City and no exceedances of the annual mean were recorded at any of the continuous monitoring sites in 2019, in line with 2018.

### **4.6 Focus of Aberdeen's LEZ**

- 4.6.1 The observed 2018 and 2019 air quality data (detailed in Section 4.4 and 4.5) clearly demonstrate that the City Centre AQMA experiences the highest number of exceedances and the highest level of exceedances for the NO<sub>2</sub> objective.

- 4.6.2 In 2018 there was one exceedance of the NO<sub>2</sub> objective in the Anderson Drive AQMA, at Haudagain roundabout but this has fallen below the legal threshold in 2019 for the first time since monitoring began in 2009. Transport studies also highlight the committed Haudagain Roundabout improvement scheme is anticipated to address congestion issues at this location with expected positive benefits for air quality. There are no current exceedances of the air quality legal limits in the Wellington Road AQMA.

- 4.6.3 The current observed air quality data has therefore identified that a LEZ may be an appropriate tool to tackle air quality problems for the Aberdeen City Centre AQMA only and this is therefore the focus of the NLEF appraisal for Aberdeen's LEZ.

### **4.7 LEZ Vehicle Compliance in Aberdeen**

- 4.7.1 Transport Scotland commissioned Automatic Number Plate Recognition (ANPR) surveys in May 2019 to inform the characteristics of the vehicle fleet in Aberdeen. Each surveyed vehicle type was identified in the DVLA database to classify the following characteristics:

- Vehicle make and model
- Fuel type
- Euro class
- CO2 Band
- Actual CO2 emission value

- 4.7.2 This information allowed detailed modelling of the vehicle fleet in the Aberdeen NMF air quality model. The data also identifies the proportion of vehicles considered compliant or non-compliant with the LEZ regulations. This information is crucial in developing and appraising options for a LEZ as it informs the total number of vehicles required to find alternative routes to avoid the LEZ penalty and can help identify whether a particular option is feasible or not.

- 4.7.3 In line with the Transport (Scotland) Act, the vehicle compliance for LEZ is:

- Euro 6/VI for diesel vehicles
- Euro 4/IV for petrol vehicles

- Euro 6/VI for heavy-duty diesel engine vehicles including older retrofitter vehicles improved to Euro 6/VI standard

4.7.4 The proportion of non-compliant vehicles in Aberdeen, based on 2019 survey data is shown in Table 4.4.

**Table 4.4 : LEZ non-compliant vehicle proportions**

Fuel Type	Car	LGV	HGV
Non-compliant diesel	26.3%	59.7%	27.0%
Non-compliant petrol	3.9%	0.1%	0.0%
Total non-compliant	30.3%	59.8%	27.0%

4.7.5 It should be noted that if and when a LEZ is enforced in Aberdeen, the total number of non-compliant vehicles is likely to have reduced, primarily due to normal fleet improvements as drivers replace their vehicles but also from potential behaviour changes such as a switch to more sustainable modes of transport and increased working from home practices. Although difficult to accurately predict the level of compliance of Aberdeen’s future vehicle fleet, SEPA will utilise the UK Government’s Emission Factor Toolkit (EFT) to best forecast compliance levels in any future year modelling using the NMF. All detailed modelling of LEZ options in the traffic and air quality modelling will therefore adopt forecast predictions of compliance. The levels of adopted future vehicle compliance is summarised in Chapter 12.

## 5. THE NATIONAL MODELLING FRAMEWORK

### 5.1 Introduction

- 5.1.1 The Cleaner Air for Scotland Strategy (CAFS) provided a commitment to develop a National Modelling Framework (NMF) to provide a standardised approach to modelling air quality to support the consideration of LEZs in Scotland. The NMF ensures that the analysis and generation of evidence to support decision-making in the LEZ development process is consistent across those local authorities undertaking a NLEF Stage 2 assessment.
- 5.1.2 The NMF air quality modelling is undertaken by SEPA who support local authorities throughout a Stage 2 assessment and the LEZ decision-making process. Modelling results presented in this report have therefore been provided by SEPA in line with the NMF. Full details of the development and applications of the NMF Aberdeen City Air Quality Model will be published in a NMF evidence report, currently in preparation by SEPA.
- 5.1.3 It should be noted that the existing Aberdeen NMF Model currently focuses on modelled NO<sub>x</sub> and NO<sub>2</sub> as the key pollutant of interest for Aberdeen. Other pollutants, such as PM<sub>10</sub>, PM<sub>2.5</sub> or CO<sub>2</sub> will be modelled at a later date if required. As noted in Chapter 4, there are no recorded monitored exceedances of PM<sub>10</sub> or PM<sub>2.5</sub> in the 2018 air quality data for Aberdeen however any reduction in NO<sub>2</sub> as a result of the LEZ will also result in a reduction in PM<sub>10</sub> or PM<sub>2.5</sub>. Analysis of only NO<sub>x</sub> and NO<sub>2</sub> modelled outputs from the Aberdeen NMF Model are therefore considered suitable for this stage in the development of Aberdeen's LEZ.
- 5.1.4 The base year for the Aberdeen NMF Model is 2019 as it has been developed using detailed traffic data and vehicle emission factors for 2019 for the road network shown in Figure 5.1. An annual-average traffic speed is assigned to each road link in the model, and applies to all vehicle types on that stretch of road using speed information derived from Automatic Traffic Counter data and Speed Limit information. During the development of the model, the observed annual average NO<sub>2</sub> concentrations from six automatic monitor and 70 diffusion tube locations in the city (Figure 5.1.), as published in the *2019 Annual Progress Report for Aberdeen City Council (ACC, June 2019)* were compared to the model predictions at these locations to evaluate model performance. The model shows reasonable agreement with most monitors for 2018. Based on the information shown in the maps/plots below, monitoring data from a subset of the diffusion tubes and automatic monitors located in the City Centre were selected for further analysis (as detailed in Section 5.2).
- 5.1.5 Figure 5.1 shows the extents of the Aberdeen NMF model and modelled annual average NO<sub>2</sub> (µg/m<sup>3</sup>) concentrations at the automatic monitors (squares) and diffusion tubes (crosses) for the 2019 base run. Concentrations below the 40µg/m<sup>3</sup> objective are marked in blue and those exceeding 40µg/m<sup>3</sup> standard are shown in pink.



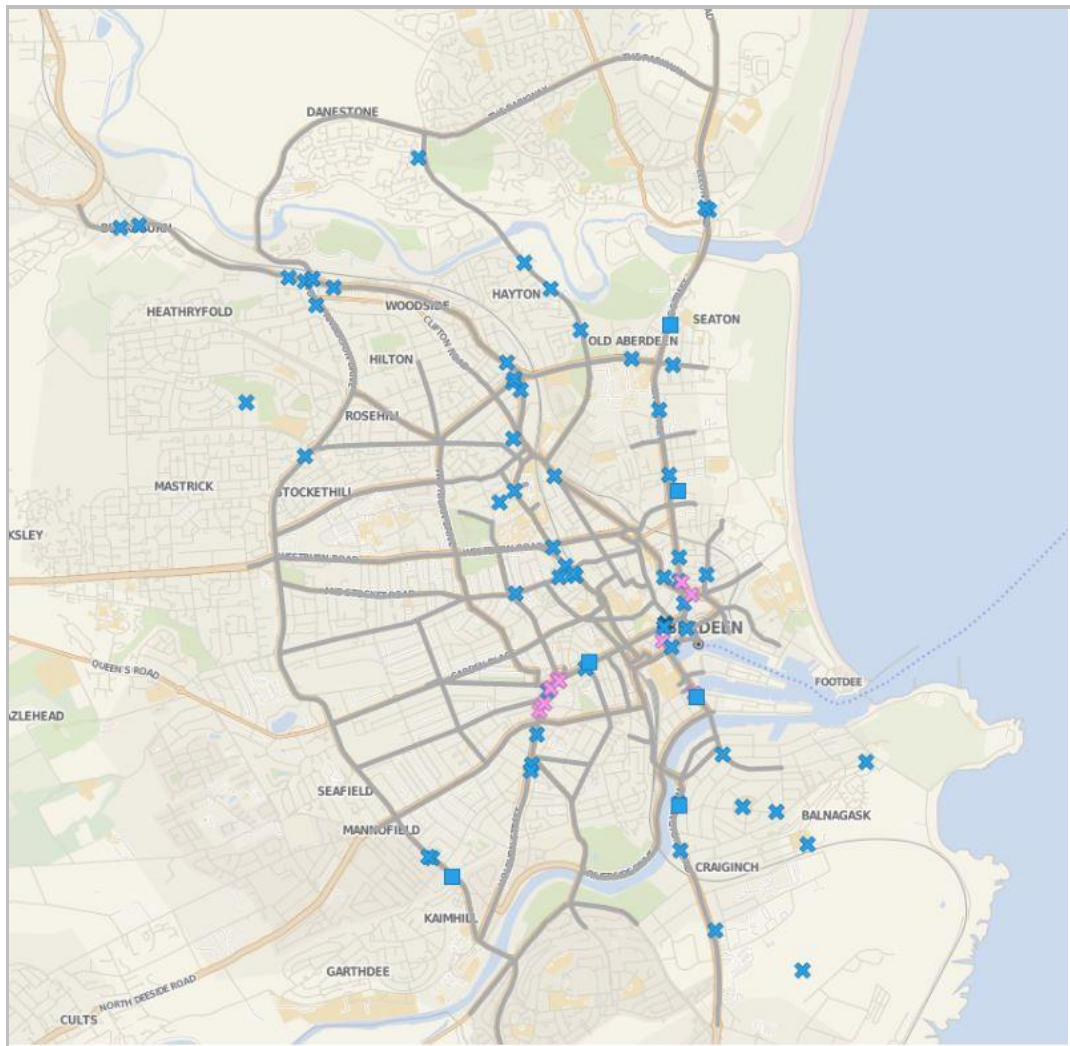


Figure 5.1 : NMF Aberdeen City Model monitoring locations(source: NMF Spotfire App)

5.1.6 The LEZ emission standards under The Transport (Scotland) Act are Euro VI/6 for all diesel vehicles and Euro 4 for petrol vehicles. The Aberdeen NMF Model has been run for five high level LEZ scenarios to estimate likely changes to air quality to inform the option generation process. For each scenario the fleet has been adjusted for the specified vehicle type to bring it up to a 100% compliance with the LEZ standard with the Euro class mix for the other vehicle types remaining unchanged as follows:

- Scenario 1 – All buses Euro VI
- Scenario 2 – All diesel cars Euro 6
- Scenario 3 – All HGVs Euro VI
- Scenario 4 – All LGVs Euro 6
- Scenario 5 – All petrol cars Euro 4

5.1.7 By running these scenarios, the impact of any smaller LEZ option area and any combination of vehicle type restrictions can be inferred for its likely impacts on air quality and this is critical in the LEZ option development and appraisal process. In theory, any number of potential LEZ options can be assessed using a combination of the five scenarios.

5.1.8 In support of the NLEF appraisal, two streams of analysis have been undertaken for all five high level model scenarios and presented in the Sections below:

- model predictions with observed data gathered at the ‘real world’ automatic monitors and diffusion tubes located in the city centre (Figure 5.1)
- model predictions at more than 4000 roadside points located across the whole of the city (Figure 5.5)

## 5.2 Analysis of NO<sub>2</sub> at Automatic Monitors and Diffusion Tubes Locations

5.2.1 The Aberdeen NMF Model was run to predict the annual average NO<sub>2</sub> concentrations at all of the automatic monitoring and diffusion tubes sites (Figure 5.1) across the city to assess the air quality situation in 2019 (base run) and then run again for each of the 5 scenarios above. The percentage reduction in total network wide modelled NO<sub>2</sub> between each scenario and the 2019 base run was then calculated. The reductions in NO<sub>2</sub> vary by location and are dependent on factors such as total vehicle flow and proportions of vehicle types on specific modelled links. To illustrate this, the minimum, average and maximum percentage modelled reductions in NO<sub>2</sub> across all automatic monitoring and diffusion tube site locations has been calculated for each scenario and is presented in Table 5.1. The range of percentage reductions at all 2018 exceedance locations is also presented in Table 5.2.

Table 5.1 : Min, Ave and Max percentage reduction by vehicle type

Vehicle Type	% reduction in modelled NO <sub>2</sub> from 2019 Base NMF		
	Minimum	Average	Maximum
Bus	-1.7%	-6.3%	-14.7%
Diesel Car	-0.9%	-2.2%	-4.0%
HGV	-0.5%	-1.7%	-4.6%
LGV	-0.3%	-0.9%	-1.5%
Petrol Car	0.0%	-0.1%	-0.1%

5.2.2 The high level Aberdeen NMF Model results show that if all buses in Aberdeen were of Euro VI standard there would be an average 6.3% predicted reduction in total network wide NO<sub>2</sub> across all on-street monitoring locations and that this reduction is greater than any other individual vehicle type. The impact of this reduction varies between a 1.7% and 14.7% reduction depending on model location.

5.2.3 The restriction of diesel cars in a network wide scenario results in an average 2.2% decrease in total network wide modelled NO<sub>2</sub>, in line with the bus reduction, and this reduction varies between 0.9% and 4.0% depending on model location.

5.2.4 The addition of HGVs to a network wide scenario results in an average 1.7% reduction in modelled NO<sub>2</sub> while the introduction of LGVs results in an average 0.9% reduction in modelled NO<sub>2</sub>. The addition of petrol cars predicts average reductions of less than approximately 0.1%.

5.2.5 Comparisons of modelled NO<sub>2</sub> at on-street monitoring locations and at modelled roadside points indicates that improvements to engine types of Aberdeen's bus fleet will bring the biggest improvements to air quality in Aberdeen and that improvements to all vehicle types, particularly to diesel cars and HGVs, will contribute to air quality improvements.

## 5.3 Modelled reduction in NO<sub>2</sub> applied to 2018 observed air quality data

5.3.1 As noted above, modelled NO<sub>2</sub> levels at all of Aberdeen's automatic monitoring stations and diffusion tube sites were extracted for the five scenarios and the percentage change from the base run was then calculated. To understand the impact the inclusion of a particular vehicle type may have as part of any LEZ option, the percentage changes were applied to the corresponding observed on-street levels from the 2018 air quality dataset as reported by ACC in the 2019 Annual Progress Report (Aberdeen City Council, June 2019).

5.3.2 The 2019 APR reports on the 2018 air quality monitoring dataset and at the time of this NMF analysis (in first interim Stage 2 Report) it was the most recent fully ratified dataset available. The 2019 air quality dataset is now available and as noted in Chapter 4, this dataset was shown to be comparable to 2018 data. The NMF analysis presented in this

chapter is therefore considered valid and there is no requirement to undertake further NMF modelling using the 2019 dataset at this stage.

5.3.3

The observed 2018 locations of exceedance (greater than the 40 µg/m<sup>3</sup>) in annual mean concentrations of NO<sub>2</sub> are detailed in Table 5.2 and shown in Figure 12.5. Note all locations with annual mean concentrations greater than 36 µg/m<sup>3</sup> are also presented as they are considered to be within a 10% margin of error range from on-street monitoring data therefore are potential locations that may be in exceedance of the legal limit. The percentage reduction in modelled NO<sub>2</sub> per scenario at these locations for the five scenarios are shown in Table 5.2.



Figure 5.2 : Locations of 2018 Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup>

Table 5.2 : Modelled % reduction in NO<sub>2</sub> (NMF All Roads Scenarios)

Site ID	Site Name	2018 Observed	2019 Modelled (Base)	Sc1 Bus	Sc2 Diesel Car	Sc3 HGV	Sc4 LGV	Sc5 Petrol Car
DT11	105 King St	48	29.8	-3%	-1%	-1%	0%	0%
DT10	184/192 Market St	47	41.8	-5%	-3%	-5%	-2%	0%
DT9	39 Market St	46	42.1	-13%	-3%	-2%	-1%	0%
DT29	469 Union St	45	43.6	-13%	-4%	-1%	-1%	0%
DT12	40 Union St	44	45.1	-15%	-3%	-1%	-1%	0%
DT17	43/45 Union St	44	28.8	-3%	-1%	-1%	0%	0%
DT82	7 Virginia St	44	30.5	-2%	-1%	-1%	0%	0%
DT30	335 Union St	41	27.3	-3%	-1%	-1%	0%	0%
DT19	468 Union St	40	40.1	-11%	-3%	-1%	-1%	0%
DT33	16 East North St	40	40.1	-3%	-3%	-4%	-1%	0%
DT73	61 Skene Sq	40	33.2	-5%	-3%	-1%	-1%	0%
DT18	14 Holburn St	39	26.7	-2%	-1%	-1%	0%	0%
CM2	Union St	38	37.5	-11%	-3%	-1%	-1%	0%
DT16	1 Trinity Quay	37	33.0	-3%	-2%	-2%	-1%	0%
DT25	21 Holburn St	37	42.2	-8%	-4%	-1%	-1%	0%
DT77	27 Skene Sq	37	27.6	-2%	-1%	-1%	0%	0%
DT22	104 King St	36	41.6	-8%	-3%	-4%	-1%	0%

5.3.4

It should be noted, prior to any analysis of the results in Table 5.2, that all results are based on modelled predictions and there may be some model locations where modelled NO<sub>2</sub> does not closely match observed NO<sub>2</sub>. The reason for this and the considered

suitability of the model as a tool to assess the impact of LEZs will be detailed in SEPA's NMF evidence report. Whilst the above analysis is useful exercise and guide to the impact of each vehicle in a LEZ, the approach is subject to the uncertainties in the modelling and diffusion tube measurements. Whilst the model is considered to be performing well it does not mean that there will be good agreement between modelled and observed annual average NO<sub>2</sub> concentrations at all locations. This can be due to many reasons including uncertainties due to fleet composition, traffic speed, complex air flow patterns and other factors that the model is unable to replicate due to street detail that is not incorporated in the model.

5.3.5 Of particular note here is predicted reduction in modelled NO<sub>2</sub> at adjacent monitoring locations, for example 40 Union Street and 43/45 Union Street. Observed annual mean NO<sub>2</sub> levels are relatively close (both sites 44µg/m<sup>3</sup>) but the model predicts reductions of 15% at 40 Union Street and 3% at 43/45 Union Street for the bus only scenario. These sites are located close together but at opposite sides of Union Street with similar bus movements and therefore the modelled reduction would be expected to be similar. Analysis of NMF Base NO<sub>2</sub> shows the modelled NO<sub>2</sub> at 40 Union Street closely reflects observed levels (within 3%) but that modelled NO<sub>2</sub> at 43/45 Union Street is approximately 30% lower than observed. At other locations where modelled NO<sub>2</sub> in the base run does not closely match observed, the predicted reductions in NO<sub>2</sub> by vehicle type are similarly low. It can therefore be suggested for these results that each vehicle type may bring greater reductions in NO<sub>2</sub> than shown in Table 5.2 for some locations, however no adjustments are made for this observation.

5.3.6 The percentage reductions in modelled NO<sub>2</sub> in the five scenarios was then applied to the 2018 observed dataset to inform the likely impact of a LEZ on existing exceedance locations and assist the LEZ development process with the results shown in Table 5.3.

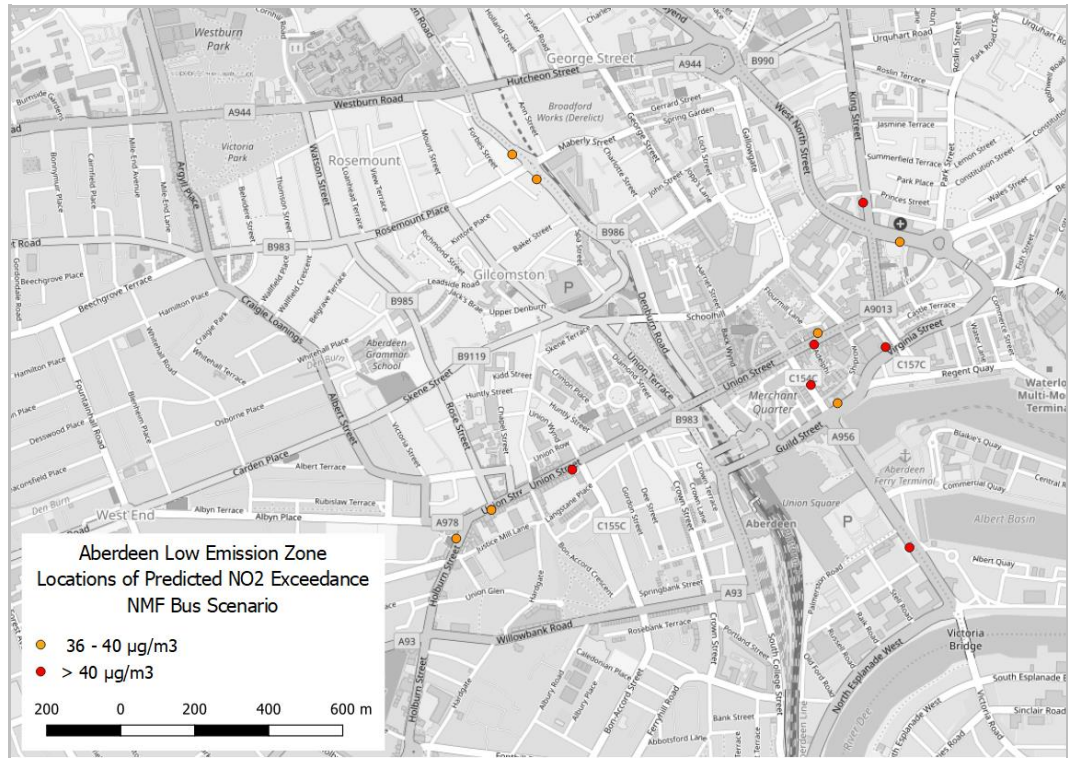
**Table 5.3 : Modelled % reduction in NO<sub>2</sub> applied to 2018 observed data (µg/m<sup>3</sup>)**

Site Name	2018 Observed	Sc1 Bus	Sc2 Diesel Car	Sc3 HGV	Sc4 LGV	Sc5 Petrol Car
105 King St	48	46.8	47.5	47.4	47.8	48.0
184/192 Market St	47	44.7	45.6	44.8	46.3	47.0
39 Market St	46	40.1	44.8	45.3	45.5	46.0
469 Union St	45	39.3	43.4	44.5	44.5	45.0
40 Union St	44	37.5	42.7	43.4	43.5	44.0
43/45 Union St	44	42.9	43.6	43.6	43.8	44.0
7 Virginia St	44	43.3	43.5	43.4	43.8	44.0
335 Union St	41	39.9	40.6	40.8	40.9	41.0
468 Union St	40	35.6	38.7	39.6	39.6	39.9
16 East North St	40	38.7	39.0	38.5	39.6	39.9
61 Skene Sq	40	38.1	39.0	39.6	39.6	39.9
14 Holburn St	39	38.2	38.5	38.8	38.9	39.0
Union St	38	34.0	37.0	37.6	37.7	38.0
1 Trinity Quay	37	36.0	36.3	36.2	36.7	37.0
21 Holburn St	37	33.9	35.5	36.4	36.5	37.0
27 Skene Sq	37	36.2	36.5	36.8	36.8	37.0
104 King St	36	33.2	35.1	34.6	35.6	36.0

5.3.7 Grey cells in Table 5.3 show locations where the modelled reductions do not predict a sufficient reduction in NO<sub>2</sub> for observed levels to fall below 40 µg/m<sup>3</sup>. Yellow cells show locations where levels of NO<sub>2</sub> are predicted to be between 36 µg/m<sup>3</sup> and 40 µg/m<sup>3</sup>.

5.3.8 The high level Aberdeen NMF Model results above show that improving the bus fleet to Euro VI standard buses in Aberdeen brings the largest reduction in network wide NO<sub>2</sub>, and that this reduction is significantly more than any other individual vehicle type. Table 5.3 shows however, that 6 sites do not have a sufficient reduction in NO<sub>2</sub> to fall below 40

$\mu\text{g}/\text{m}^3$  and a further 7 sites are calculated to have between  $36 \mu\text{g}/\text{m}^3$  and  $40 \mu\text{g}/\text{m}^3$ . These locations are shown in Figure 5.3.



**Figure 5.3 : Locations of predicted NO<sub>2</sub> greater than 36  $\mu\text{g}/\text{m}^3$  – Bus only**

5.3.9 All other individual vehicle type scenarios result in smaller percentage reductions in NO<sub>2</sub> concentrations. However, the reductions from each individual scenario can be combined to explore the additional percentage reductions that could be achieved from a multi-vehicle LEZ, with the following specific scenarios examined:

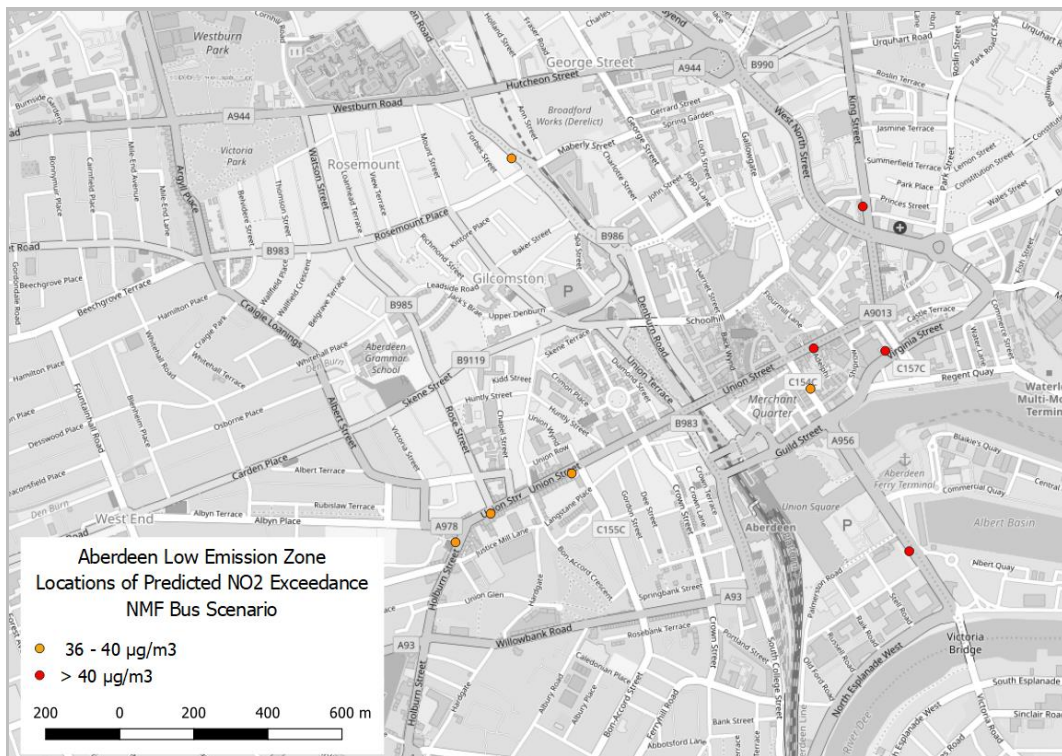
- Bus and Diesel Car
- Bus, Diesel Car and HGV
- Bus, Diesel Car, HGV and LGV
- All vehicles (Bus, Diesel Car, HGV, LGV and Petrol Car Euro 4)

5.3.10 The calculated percentage reductions from the combined scenarios, applied to the 2018 observed dataset are shown in Table 5.4

**Table 5.4 : Combined modelled % reduction in NO<sub>2</sub> applied to 2018 observed data (µg/m<sup>3</sup>)**

Site Name	2018 Observed	Bus Only	Bus & Diesel Car	Bus, Diesel Car & HGV	Bus, Diesel Car, HGV & LGV	All Vehicles
105 King St	48.0	46.8	46.3	45.7	45.5	45.5
184/192 Market St	47.0	44.7	43.3	41.2	40.5	40.4
39 Market St	46.0	40.1	38.9	38.2	37.7	37.6
469 Union St	45.0	39.3	37.7	37.2	36.6	36.6
40 Union St	44.0	37.5	36.3	35.7	35.2	35.1
43/45 Union St	44.0	42.9	42.5	42.1	41.9	41.9
7 Virginia St	44.0	43.3	42.8	42.2	42.0	41.9
335 Union St	41.0	40.0	39.5	39.3	39.2	39.2
468 Union St	40.0	35.6	34.3	33.9	33.4	33.4
16 East North St	40.0	38.7	37.7	36.2	35.7	35.7
61 Skene Sq	40.0	38.1	37.1	36.7	36.4	36.3
14 Holburn St	39.0	38.2	37.8	37.6	37.4	37.4
Union St	38.0	34.0	33.0	32.6	32.2	32.2
1 Trinity Quay	37.0	36.0	35.3	34.5	34.2	34.2
21 Holburn St	37.0	33.9	32.5	31.9	31.4	31.4
27 Skene Sq	37.0	36.2	35.8	35.6	35.4	35.4
104 King St	36.0	33.2	32.3	30.9	30.5	30.5

5.3.11 The combined modelled percentage reductions show that the addition of diesel cars to the bus only scenario predicts an additional 2 sites will fall below 40 µg/m<sup>3</sup> but that there will be 4 locations where NO<sub>2</sub> is predicted to be remain above 40 µg/m<sup>3</sup>. The subsequent addition of HGVs, LGVs and finally petrol cars does not result in any additional locations predicted to fall below 40 µg/m<sup>3</sup>. The remaining exceedance locations from these scenarios is shown in Figure 5.4.

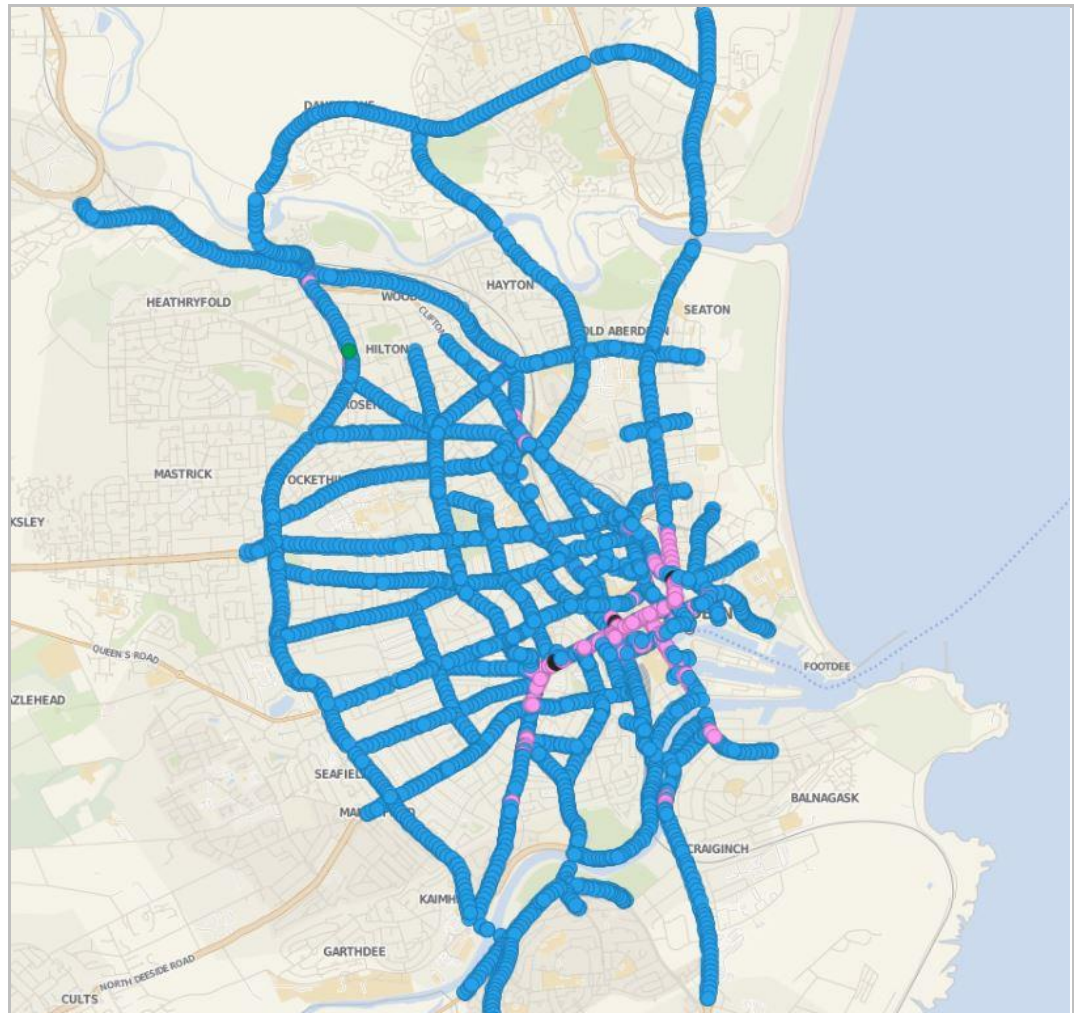


**Figure 5.4 : Locations of predicted NO<sub>2</sub> greater than 36 µg/m<sup>3</sup> – Bus & diesel car**

## 5.4 Analysis of Modelled NO<sub>2</sub> at Model Roadside Locations

5.4.1 In addition to the analysis of modelled NO<sub>2</sub> reduction at the monitoring locations, the Aberdeen NMF Model also predicts NO<sub>x</sub> and NO<sub>2</sub> levels at more than 4000 roadside points across the road network. These have been set up along the pavement edge along both sides of every road link in the model as shown in Figure 5.5. This network of ‘virtual

monitoring locations' allows the potential benefits to air quality to be assessed over a larger area of the city than that represented by the current monitoring locations. Figure 5.5 below shows the output from the base run for 2019 and provides a picture of current air quality across the whole of the city. Each roadside point is represented by a coloured dot, with the colour indicating modelled annual average NO<sub>2</sub> concentrations. Concentrations below the 40µg/m<sup>3</sup> objective are marked in blue and those exceeding 40µg/m<sup>3</sup> standard are shown in pink. Those points exceeding 55µg/m<sup>3</sup> are shown in black.



**Figure 5.5 : Modelled roadside annual average NO<sub>2</sub> (µg/m<sup>3</sup>) concentrations (2019 base NMF Model).**

- 5.4.2 Comparing the total number of roadside points where NO<sub>2</sub> levels are greater than 40µg/m<sup>3</sup> for each scenario provides an indication of the likely improvement each scenario has on predicted levels of NO<sub>2</sub>. This information is key to identifying LEZ options. The total number of roadside points where NO<sub>2</sub> is greater than 40µg/m<sup>3</sup> for the Aberdeen NMF Model base run and each model scenario are summarised in Table 5.5

**Table 5.5 : Roadside points with modelled NO<sub>2</sub> > 40µg/m<sup>3</sup>**

NMF Scenario	Total No. of RPs Citywide	RPs > 40µg/m <sup>3</sup> Citywide	% difference from Base
Base	4089	226	-
All Buses at Euro VI	4089	119	-47%
All Diesel Cars at Euro 6	4089	175	-23%
All HGVs at Euro VI	4089	187	-17%
All LGVs at Euro 6	4089	205	-9%
All Petrol Cars > Euro 4	4089	224	-1%
All Vehicles to LEZ Standard	4089	24	-89%

5.4.3 The model predicts that if all buses were Euro VI standard, there would be a 47% reduction in modelled roadside points where NO<sub>2</sub> is predicted to be greater than 40µg/m<sup>3</sup>. Bringing all vehicles to LEZ standard, there would be a 89% reduction modelled roadside points where NO<sub>2</sub> is predicted to be greater than 40µg/m<sup>3</sup>. The modelling therefore shows that an all vehicle LEZ would result in a significant reduction in NO<sub>2</sub> but this would not result in all modelled locations falling below the legal limit of 40µg/m<sup>3</sup>.

5.4.4 The city centre currently experiences the highest number of NO<sub>2</sub> exceedances scattered throughout the area and the highest levels of exceedance. The predicted annual average NO<sub>2</sub> concentrations at several roadside points exceed 55 µgm<sup>-3</sup> with the highest predicted NO<sub>2</sub> concentration of 64.60 µgm<sup>-3</sup> at a roadside point located on King Street. Figure 5.6, Figure 5.7 and Figure 5.8 demonstrate the modelled improvement in air quality for the 2019 baseline (Figure 5.6), a fully compliant bus fleet (Figure 5.7) and the scenario where all vehicle types achieve the LEZ standard (Figure 5.8). Each roadside point is represented by a coloured dot, with the colour indicating modelled annual average NO<sub>2</sub> concentrations. Concentrations below the 40µg/m<sup>3</sup> objective are marked in blue and those exceeding 40µg/m<sup>3</sup> standard are shown in pink. Those points exceeding 55µg/m<sup>3</sup> are shown in black.



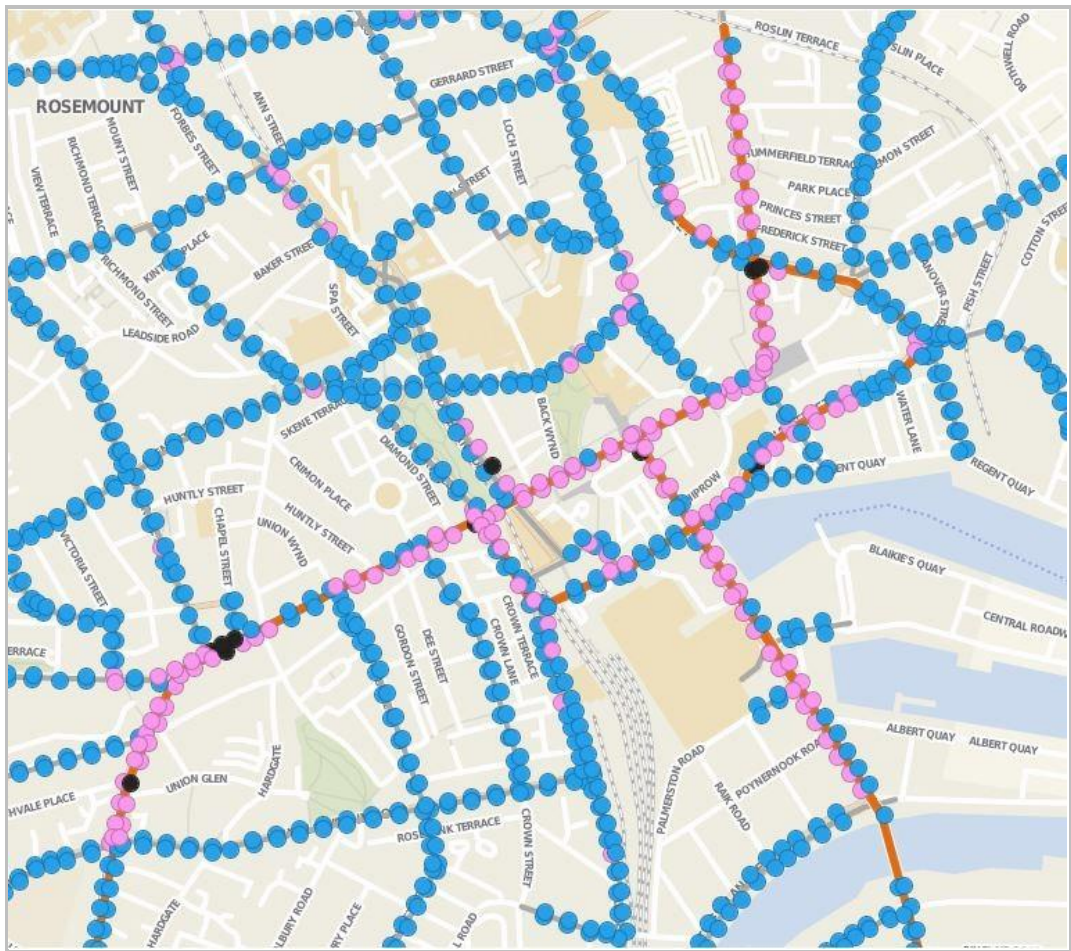


Figure 5.6 : Modelled roadside annual average NO<sub>2</sub> ( $\mu\text{g}/\text{m}^3$ ) concentrations (2019 base NMF Model)

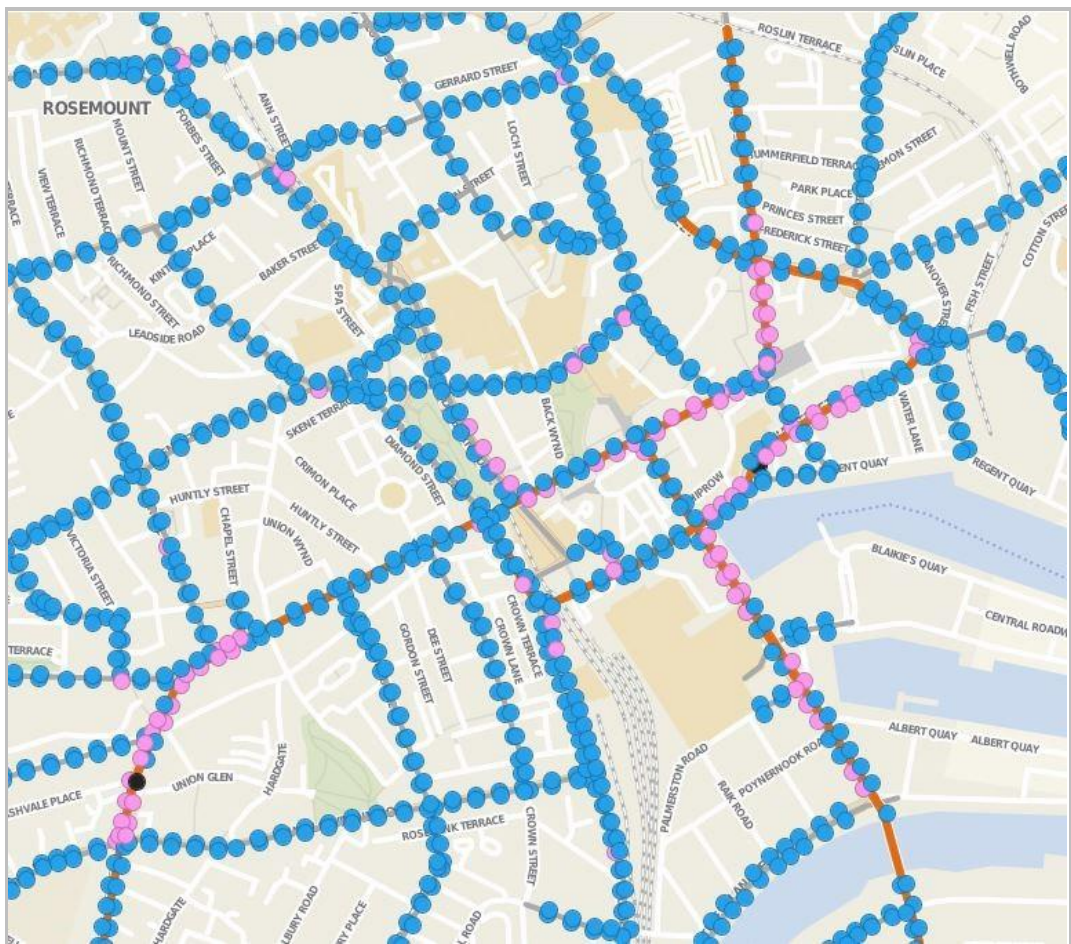


Figure 5.7 : Modelled roadside annual average NO<sub>2</sub> ( $\mu\text{g}/\text{m}^3$ ) concentrations (100% Bus Scenario)

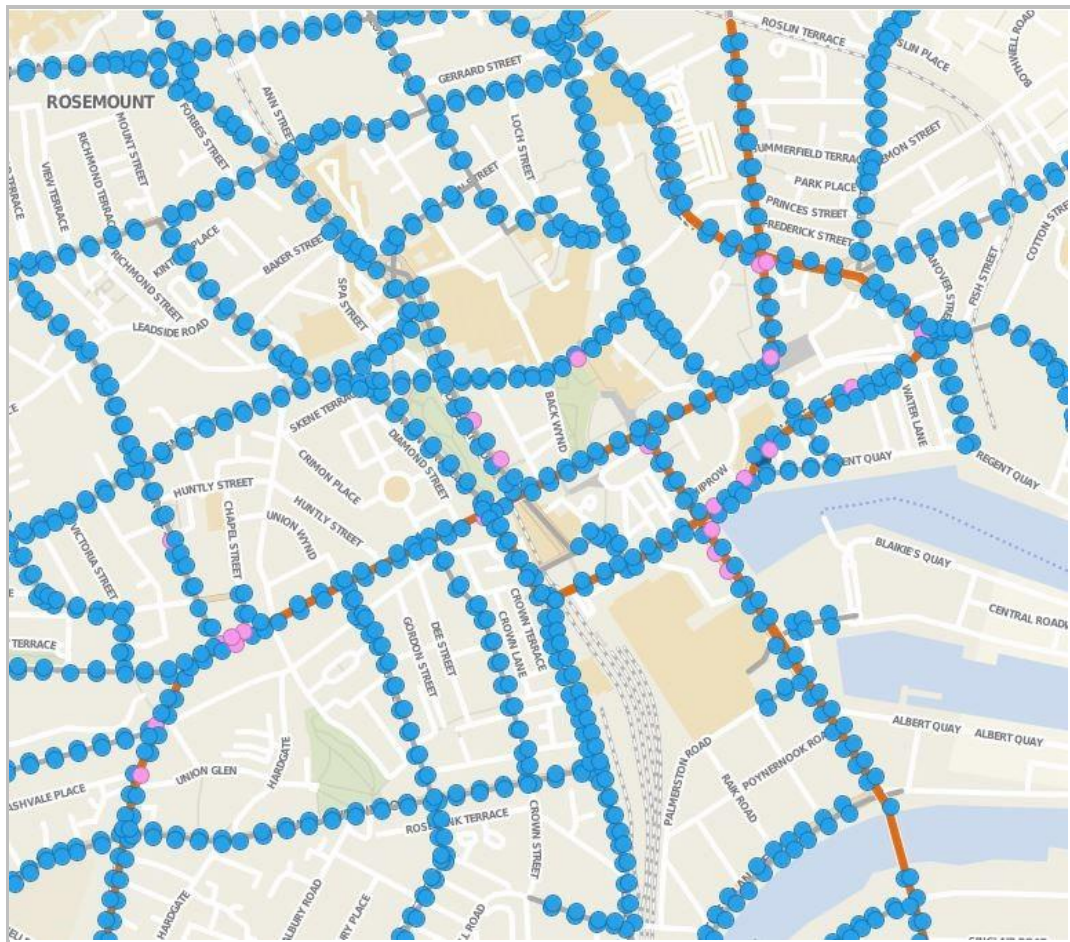


Figure 5.8 : Modelled roadside annual average NO<sub>2</sub> (µg/m<sup>3</sup>) concentrations (All Vehicle Scenario)

5.4.5

The Aberdeen NMF model has been used to explore the relative contribution of different vehicle sources to the annual average total NO<sub>x</sub> concentration at the roadside points. Figure 5.9 highlights the road links (in black) where the predicted contribution to total NO<sub>x</sub> for buses exceeds 40% and is higher than the contribution from the other vehicle types for the base run. Virtually all of Union Street is highlighted with between 40% and 60% of total NO<sub>x</sub> originating from this vehicle type. Diesel cars and LGVs are the next major contributors to the annual average total NO<sub>x</sub> along these roads with diesel cars contributing 30% NO<sub>x</sub>. HGVs and petrol cars make much smaller contributions to the annual average total NO<sub>x</sub>.

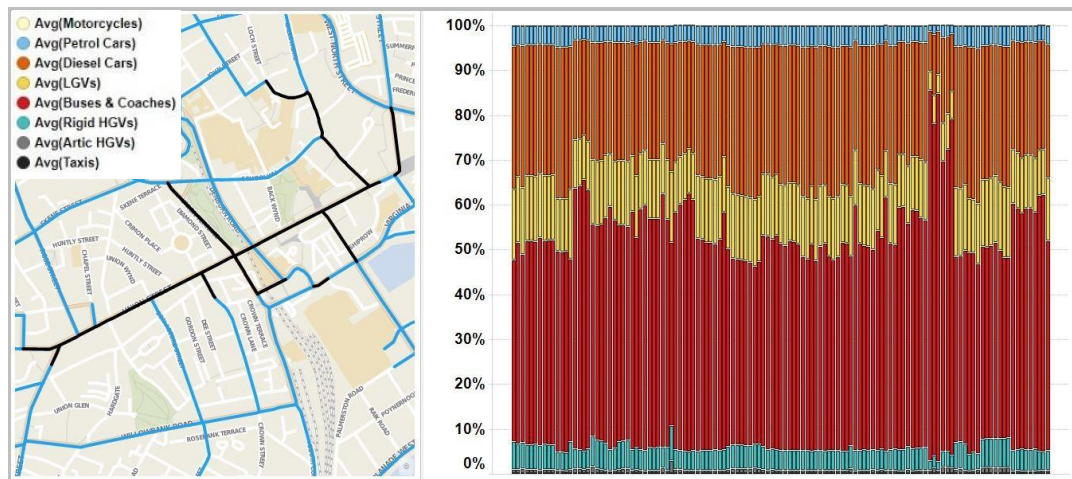


Figure 5.9 : Links (in black) where predicted contribution to NO<sub>x</sub> by buses is > 40% (base run)

5.4.6

In contrast, Figure 5.10 below shows a selection of roads highlighted (black) located in the city centre where the fleet composition differs to that on Union Street with diesel cars the

dominant source of NO<sub>x</sub> (>40%) followed by LGVs (20%) with a reduced contribution from buses. HGVs make a more significant contribution to annual average total NO<sub>x</sub> (20%) particularly along roads such as Virginia Street and Market Street that provide access to the harbour area.

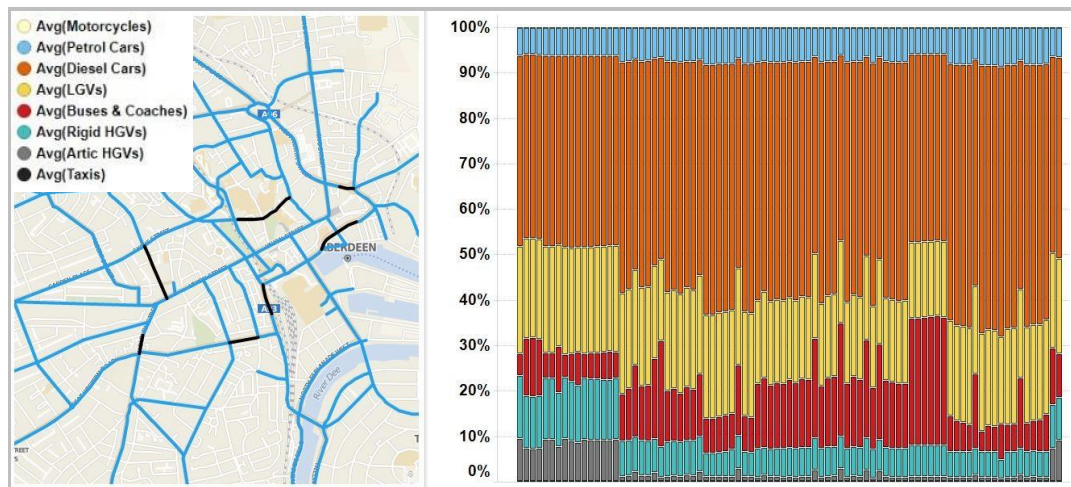


Figure 5.10 : Links (in black) where predicted contribution to NO<sub>x</sub> by diesel cars is > 40% (base run)

## 5.5 Key findings from the NMF High Level Scenario Testing

- 5.5.1 The City Centre AQMA, in particular the Union Street, Holburn Street and King Street corridor currently experiences the highest number of NO<sub>2</sub> exceedances. The biggest emitters along these roads through the city centre are buses. These streets are lined with high buildings that can be described as narrow and deep “street canyons” which can trap air pollution close to ground level.
- 5.5.2 The high level Aberdeen NMF Model results show that should all buses meet the Euro VI standard, this would bring the largest single reduction in NO<sub>2</sub> network-wide and that this reduction is significantly more than any other vehicle type would provide. This suggests that a LEZ for Aberdeen is likely to have to include buses in order for a LEZ to achieve its air quality objective.
- 5.5.3 When applying modelled NO<sub>2</sub> reductions from the bus only scenario to 2018 observed exceedance locations however, the Aberdeen NMF Model predicts there to be 6 locations still exceeding 40 µg/m<sup>3</sup> and a further 7 sites between 36 µg/m<sup>3</sup> and 40 µg/m<sup>3</sup>. This result suggest that while a Euro VI bus fleet would bring the largest reduction in NO<sub>2</sub>, this alone is not sufficient in addressing all exceedances in Aberdeen.
- 5.5.4 Whilst buses dominate emissions along the Union Street, Holburn Street and King Street corridor diesel cars are the primary contributors to annual average total NO<sub>x</sub> elsewhere. LGVs are the third largest contributor with other Goods Vehicles adding smaller amounts. By combining the percentage reduction in NO<sub>2</sub> from all vehicles being of LEZ standard, it can be inferred that an all vehicle LEZ does not bring a sufficient enough reduction in NO<sub>2</sub> to allow a LEZ alone to tackle all air quality exceedances. It can therefore be suggested at this stage, prior to any LEZ option development that a LEZ for Aberdeen will have to include all vehicle types and have to be delivered with traffic management measures if all exceedances of the air quality objectives are to be addressed.

## 6. KEY EVIDENCE TO INFORM ABERDEEN'S LEZ DEVELOPMENT

### 6.1 Introduction

6.1.1 The assessment and appraisal process to develop Aberdeen's LEZ is following the [National Low Emission Framework](#) (NLEF) guidance, a two stage process consisting of the following elements:

- Stage 1 – Screening
- Stage 2 – Assessment

6.1.2 The NLEF Stage 1 screening should review Aberdeen's Local Air Quality Management and build an evidence base to assist in the decision of whether a LEZ is appropriate for an AQMA and subsequently inform the appraisal and implementation of Aberdeen's LEZ through the Stage 2 Assessment process. Transport Scotland have advised Aberdeen City Council (ACC) that the NLEF Stage 1 is not formally required as Aberdeen are committed to delivering a LEZ for the city, as a result of the Scottish Government commitment.

6.1.3 While no formal screening outcome is required, the key stage of compiling the evidence base to support the LEZ option development and appraisal has been undertaken in Chapters 1.1.9, 4 and 5. It is crucial to Stage 2 of the NLEF appraisal that there is full understanding of the existing air quality problems in Aberdeen and that all relevant regional and local plans, policies and strategies that may influence or be influenced by a LEZ in Aberdeen have been reviewed.

### 6.2 Key findings from the Evidence Base

6.2.1 There are three existing AQMAs in Aberdeen: the City Centre, Anderson Drive and Wellington Road. Analysis of the current observed air quality dataset confirmed that a LEZ is an appropriate tool to tackle air quality problems for the Aberdeen City Centre AQMA only and this should therefore be the focus of the NLEF option appraisal process.



Figure 6.1: Aberdeen City Centre AQMA for NO<sub>2</sub> and PM<sub>10</sub>

6.2.2 In the city centre AQMA there are 8 locations where observed annual mean concentrations of NO<sub>2</sub> exceed the AQO of 40 µg/m<sup>3</sup> and a further 9 sites where annual

mean concentrations of NO<sub>2</sub> exceed 36 µg/m<sup>3</sup>. The high level NMF air quality modelling results in Chapter 5 show that improving the bus fleet to Euro VI standard buses in Aberdeen brings the largest reduction in network wide NO<sub>2</sub>, and that this reduction is significantly more than any other individual vehicle type. However this improvement is not, in itself, enough to remove all air quality exceedances.

- 6.2.3 Furthermore, the NMF air quality modelling has shown that if all vehicles in Aberdeen (city wide and regardless of potential LEZ options area) were compliant with LEZ emission standards, this measure would also not be enough to address all exceedance locations, although it must be noted that those remaining exceedances are significantly reduced from current levels closer to legal limits.
- 6.2.4 In order to tackle all air quality exceedance locations, it is therefore anticipated that the LEZ should be delivered with additional complimentary traffic management interventions such as junction re-design, bus priority measures or road closures.
- 6.2.5 The Aberdeen City Centre Paramics model (developed as part of the wider LEZ assessment work) is utilised to test the preferred LEZ options and help identify where complimentary measures are required (Chapters 12 to 14).
- 6.2.6 The Aberdeen LEZ and any complimentary traffic management measures should align with the existing transport policy landscape in Aberdeen. As reviewed in Chapter 1.1.9, key Aberdeen policies and strategies that may shape the final LEZ option(s) are:
- Aberdeen Local Transport Strategy (2016)
  - Aberdeen City Centre Masterplan (CCMP)
  - North East Scotland Roads Hierarchy Study
  - Aberdeen City Sustainable Urban Mobility Plan (SUMP)
- 6.2.7 Of particular relevance is the optimum delivery programme for the CCMP proposals identified through a detailed Paramics model testing process in 2016 and the reasoning for the implementation order being proposed. Although the delivery of the CCMP is subject to change, any LEZ option should not contradict the proposals identified by previous studies without providing the rationale for doing so.

## 7. OBJECTIVES OF ABERDEEN LOW EMISSION ZONE

### 7.1 Introduction

7.1.1 NLEF Guidance states that *“the starting point for the stage two assessment process will be to define the objectives for the potential LEZ, taking account of the pollutant(s) of concern and with regard to any available information on source apportionment that identifies particular vehicle types that are a significant contributor to any air quality exceedances”* (NLEF, 2019).

7.1.2 The Aberdeen Low Emission Zone Project Group meeting on 14<sup>th</sup> November 2019 agreed the following principles to help devise the objectives of Aberdeen’s Low Emission Zone:

- The principal aim of the LEZ is to improve air quality in Aberdeen and achieve air quality standards (as specified in the Transport (Scotland) Act)
- An individual health objective should not be set given the difficulty in obtaining baseline health information of the population and measuring any resultant health benefits directly as a result of the LEZ
- Protection of and improvements to health will be an outcome of improvements to air quality
- The introduction of a LEZ should not be to the detriment of the city’s economic or social inclusion objectives
- The LEZ should aim to positively impact on the city economy, access to active travel options and changes in mode-share, city placemaking, social equality, tourism, and sustainable development and the LEZ objectives should reflect this.

7.1.3 The Aberdeen LEZ is required to sit within a well-established transport policy landscape. It is required to complement the vision and objectives of the wider policies and strategies including:

- National Transport Strategy 2
- Regional Transport Strategy 2040
- Aberdeen Local Transport Strategy (2016)
- Aberdeen City Centre Masterplan
- North East Scotland Roads Hierarchy Study
- Aberdeen City Sustainable Urban Mobility Plan

7.1.4 These policies and strategies are detailed in Chapter 3 and it is important that these policies help shape the LEZ objectives and in turn the LEZ option(s).

7.1.5 The Aberdeen LEZ is expected to positively impact on air quality in Aberdeen, thereby enhancing and complimenting common aspirations for the city, namely:

- Improved air quality and the environment
- Enhanced accessibility and permeability for sustainable transport
- A safe and secure transport system
- A transport system that facilitates healthy and sustainable living
- Promotion of the city centre as an accessible destination
- Continued sustainable economic growth in the City

7.1.6 While the objectives for the LEZ can be refined over time to better target emerging issues and policies it is important that the initial LEZ objectives have longevity and be futureproofed to any changes in the LEZ size, scope or location.

## 7.2 Objectives of Aberdeen's Low Emission Zone

7.2.1 Objectives were developed by the Aberdeen LEZ Project Group, comprising representatives of ACC, Aberdeenshire Council, Nestrans, NHS Grampian, Transport Scotland, SEPA and SYSTRA. Two primary objectives were identified to reflect that the principal aim of a LEZ is to improve air quality and a requirement within the Transport (Scotland) Act that a LEZ should contribute towards the climate change targets (towards net zero by 2045) set out in the Climate Change (Scotland) Act 2009.

7.2.2 The objectives for Aberdeen's Low Emission Zone were approved at the City Growth and Resources Committee meeting on 5<sup>th</sup> December 2019, in the light of the context set out above.

7.2.3 Aberdeen's Low Emission Zone will:

**Improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government's statutory air quality objectives.**

**Support climate change targets by reducing road transport's contribution to emissions.**

7.2.4 It is recognised that a LEZ can help realise wider benefits beyond air quality improvement, but that these are influenced by many other factors and not solely or directly attributable to a LEZ. Therefore the following supplementary objectives for Aberdeen's Low Emission Zone have been identified:

- Protect public health and wellbeing;
- Support local and regional transport strategies by contributing to the development of a vibrant, accessible, and safe city centre, where the volume of non-essential traffic is minimised and active and sustainable transport movements are prioritised; and
- Contribute to ongoing transformational change in Aberdeen, helping promote the city as a desirable place to live, visit and invest in.

## 8. LEZ OPTION GENERATION

### 8.1 Introduction

8.1.1 NLEF is objective-led and consistent with the principles of Scottish Transport Appraisal Guidance (STAG). The starting point for the Stage 2 assessment is to define the objectives for the potential LEZ to inform the LEZ option generation, sifting and development. STAG states:

*“The purpose of Option Generation, Sifting and Development is to derive a range of options which should provide the solution/s to meet the Objectives and alleviate the problems identified. It is vital to derive options which fully reflect the range available and at this early phase in the process, this exercise should not be constrained.”*

8.1.2 Chapter 4 identified the existing air quality problems and issues in Aberdeen, and the LEZ objectives have been derived such that any options that satisfy these objectives will address the current air quality issues in the city.

8.1.3 Following STAG principles, an unconstrained option generation exercise is first undertaken to allow all possible options to be considered and open to appraisal. This is likely to result in a large number of potential options that required sifting, refinement and high level appraisal to ensure they were suitable to be progressed to detailed appraisal and testing.

8.1.4 STAG emphasises that option generation, sifting and development should be carried out in a logical, transparent and therefore auditable manner. As such, the steps undertaken for Aberdeen’s LEZ options development are as follows:

- **Option Generation**
  - Define suitable LEZ areas
  - Combine with possible LEZ vehicle restrictions to create long list of LEZ options
- **Option Sifting**
  - Screen against LEZ air quality objective
  - Screen against feasibility, affordability and public acceptability
  - Screen against all LEZ objectives
- **Option Development**
  - Undertake high level qualitative appraisal
  - Define emerging options for detailed appraisal

8.1.5 At suitable stages in the assessment process, options that fail the screening criteria are removed and not progressed in the appraisal process. Prior to starting each appraisal step, and in line with STAG, options can be rationalised at suitable points in the appraisal to give a more succinct set of options. The options remaining at the end of the full high level appraisal process are taken forward for detailed appraisal.

8.1.6 STAG guidance suggests a high level assessment of all options against their feasibility, affordability and public acceptability is undertaken as an initial screening method. However, no assessment against public acceptability or affordability is made at this stage of the interim NLEF appraisal due to the minimal option detail, lack of public consultation (as this stage) and unknown future funding and operating costs. The NLEF appraisal will conclude process will identify a set of detailed options for public and stakeholder consultation, and thereafter an assessment against public acceptability and affordability will be undertaken.

8.1.7 In addition to feasibility, an assessment of the logic of each proposed LEZ option boundary is undertaken as a screening method. Each option is therefore broadly assessed against:



- Feasibility – a preliminary assessment of the feasibility of implementation and operation of an option as well as any cost, timescale or deliverability risks associated with the operation of the option.
- Logical Boundary – consideration of geographically distinct areas to influence the understanding of the LEZ boundary such as key roads and junction and allowance for logical alternative routes for non-compliant vehicles.

8.1.8 Where required, the options are assessed using a seven-point assessment scale, in line with STAG, and as detailed in Figure 8.1. The STAG Technical Database suggests that qualitative information on impacts is all that is required at the option generation and development stage, but where available, quantitative information can be provided, as informed by the NMF results in Chapter 5.

Major negative impacts	Moderate negative impacts	Minor negative impacts	No benefit or impact	Minor benefit	Moderate benefit	Major benefit
---	--	-	0	+	++	+++

Figure 8.1 : STAG Seven-point assessment scale

## 8.2 Areas for a Low Emission Zone

8.2.1 The NLEF guidance states that:

*“The indicative boundary of potential options for consideration should be defined at the outset, taking account of local circumstances. Potentially, more than one boundary may be considered. For example, the AQMA boundary or one which covers just a few streets with the highest concentrations of air pollutants.”*

8.2.2 In accordance with NLEF guidelines, the area for consideration will be informed by:

1. the area of exceedance of air quality objectives and the main sources of pollutants
2. geographically discrete areas, such as a town centre and other areas which are well defined (e.g. within an inner ring road)
3. features that may influence enforcement (e.g. an outer ring-road with junctions leading into exceedance areas, key access points such as bridges)
4. mapped emissions by vehicle type in order to identify areas where options are likely to be most effective. Mapping bus routes, taxi ranks and/or residential and commercial land-uses will be useful.
5. air quality along any such alternative routes to determine if they could be at risk of new exceedances as a result of displaced traffic
6. the potential need to allow vehicles to divert onto alternative routes to avoid the area of the LEZ

8.2.3 The initial option generation exercise will primarily consider points 1 to 4 in the NLEF guidance. Points 5 and 6 will inform the more detailed qualitative appraisal of emerging LEZ options, as described in Chapter 9.

8.2.4 The size and extent of areas should be designed to meet the objectives that have been set for the LEZ but there is likely to be a range of other issues that will require to be considered such as access, traffic management and the effect on surrounding roads and existing ACC strategies, such as the City Centre Masterplan, the Sustainable Urban Mobility Plan and the North East Scotland Roads Hierarchy Study (Chapter 3).

8.2.5 Following this NLEF guidance, the LEZ option generation exercise was started where the potential area of the LEZ was the only consideration. By excluding vehicle restrictions from the exercise, a wide-ranging (and unconstrained) option list could be developed. For

example, an all vehicle LEZ or a bus only LEZ will significantly influence the practicality or feasibility of an LEZ option and in turn the areas that can be considered.

8.2.6 As noted in Chapter 4, the area for a LEZ in Aberdeen focusses on the City Centre AQMA only.

8.2.7 Table 8.1 details all the areas considered and provides a link to a plan of each area detailed in Appendix A.

**Table 8.1 : Aberdeen LEZ areas for consideration**

<b>LEZ Area Option</b>	<b>Description and development narrative</b>
Option 1 <a href="#">Central Union Street</a>	Central section of Union Street from Bridge Street to Market Street. The option cuts the centre of Union Street and although it covers a limited area, it may change through-routing thereby addressing additional areas of air quality concern
Option 2 <a href="#">Union Street</a>	Full length of Union Street. The option targets the key city centre route and the numerous air quality exceedances. It is a key bus corridor and any reduction in traffic resulting from a LEZ may improve air quality and facilitate improvements to bus provision and services.
Option 3 <a href="#">Union Street, Market Street &amp; King Street</a>	Union Street from Bridge Street to King Street, south of East North Street. The option extends Option 1 to capture exceedance locations on Market Street and Union Street and may influence routeing around King Street and East & West North Street
Option 4 <a href="#">Holburn Street, Union Street and King Street</a>	Holburn Street, north of A93 to King Street, south of East North Street. A combination of Option 2 and Option 3, this option targets a key strategic route and adjacent exceedance locations
Option 5 <a href="#">City Centre Core</a>	Holburn Street, north of A93 to King Street, south of East North Street and Market Street, north of Guild Street. Similar to Option 4, the option extends to the south to capture potential exceedance locations on the north end of Holburn Street while potentially influencing the western strategic routeing in the city
Option 6 <a href="#">City Centre AQMA</a>	The option area covers the entire city centre AQMA. The LEZ is focused in the AQMA area and it is considered intuitive for a LEZ to follow an established air quality intervention area
Option 7 <a href="#">City Centre Masterplan</a>	The city centre masterplan is a key ACC policy and the LEZ should complement this. This option has therefore been devised to mirror the established city centre masterplan area
Option 8 <a href="#">City Centre Exceedances</a>	Option 7 (CCMP) does not encompass all exceedance locations and therefore Option 8 is devised as the minimum area covering all exceedances and potential exceedances of the NO <sub>2</sub> annual mean air quality objective

LEZ Area Option	Description and development narrative
Option 9 <a href="#">Holburn Street to Mounthooly roundabout</a>	The option is devised to closely follow the key strategic routes of Holburn St, Willowbank Rd, South College St, Guild St, Virginia St, West North St, Hutcheon St, Skene Sq and Skene St. This allows for viable alternative routes for non-compliant vehicle while covering key exceedance locations
Option 10 <a href="#">Union Street with extended boundary</a>	The option is devised to cover the same exceedances as Union St option (Option 2) but is bound by clearly defined roads to provide viable alternative routes for non-compliant vehicles
Option 11 <a href="#">Westburn Road/Hutcheon St to Willowbank Road</a>	Area bound by Westburn Rd/Hutcheon St, West North St, Virginia St, Guild St, Willowbank Rd, Holburn St, Albert St, Argyll Pl, this option extends Option 10 to the west to include Gilcomston and Rosemount while still being bound by viable alternative routes
Option 12 <a href="#">Westburn Road/Hutcheon St to the River Dee</a>	This option extends Option 11 to the south to capture a wider area including exceedance locations on Market Street
Option 13 <a href="#">City Centre Exceedances with extended boundary</a>	This option is devised to cover all the air quality exceedances as per Option 8 but is bound by clearly defined roads to provide viable alternative routes for non-compliant vehicles
Option 14 <a href="#">City Centre Exceedances with additional extended boundary</a>	The option extends the Option 13 to include Argyll Pl and Albert St and further influence strategic routeing on the western side of the city centre
Option 15 <a href="#">City Centre Masterplan with extended boundary</a>	The option was developed from Option 7 to cover the proposed city centre masterplan area but is bound by clearly defined roads to provide viable alternative routes for non-compliant vehicles
Option 16 <a href="#">City Cordon</a>	Area bounded by the River Don, Anderson Drive and River Dee and devised to provide a wide area option encompassed by these key strategic routes.

8.2.8 At this stage, all areas considered are not fully defined in scope and are open to adjustment and variation as the appraisal process develops. The appraisal process may result in multiple variants of each option that include or exclude some areas or sections of road as details of the impacts of each option emerge.

8.2.9 A high level assessment was made on each of these areas to assess whether they would likely be feasible and logical (as defined in 8.1.7) if adopted as a Low Emission Zone as shown in Table 8.2.

**Table 8.2 : Aberdeen LEZ Area Screening**

LEZ Area	Feasible	Logical	Progress in appraisal
Central Union Street	Yes	No	No
Union Street	Yes	No	No
Union Street, Market Street & King Street	Yes	Yes	Yes
Holburn Street, Union Street and King Street	Yes	No	No
City Centre Core	Yes	No	No
City Centre AQMA	Yes	No	No
City Centre Masterplan	Yes	No	No
City Centre Exceedances	Yes	No	No
Holburn Street to Mounthooly roundabout	Yes	Yes	Yes
Union Street with extended boundary	Yes	Yes	Yes
Westburn Road/Hutcheon St to Willowbank Road	Yes	Yes	Yes
Westburn Road/Hutcheon St to the River Dee	Yes	Yes	Yes
City Centre Exceedances with extended boundary	Yes	Yes	Yes
City Centre Exceedances with additional extended boundary	Yes	Yes	Yes
City Centre Masterplan with extended boundary	Yes	Yes	Yes
Inner City Cordon	No	Yes	No

8.2.10 Eight initial areas are not considered to meet both initial screening criteria and therefore are removed from the appraisal process. Table 8.3 details the LEZ option areas removed and the rationale for doing so.

**Table 8.3 : Aberdeen LEZ areas removed from consideration**

LEZ Area Option	Rationale for rejection
Option 1 <a href="#">Central Union Street</a>	Too limited in scope, may be considered unambitious and unlikely to meet LEZ objectives
Option 2 <a href="#">Union Street</a>	LEZ of Union Street only requires illogical LEZ boundary that would not easily be understood/communicated to public
Option 4 <a href="#">Holburn Street, Union Street and King Street</a>	As the Union Street only option, this area requires an illogical LEZ boundary that would not easily be understood/communicated

LEZ Area Option	Rationale for rejection
Option 5 <a href="#">City Centre Core</a>	Illogical LEZ boundary that would not easily be understood/communicated
Option 6 <a href="#">City Centre AQMA</a>	Illogical LEZ boundary, particularly on the north side though this could be extended to simplify geography
Option 7 <a href="#">City Centre Masterplan</a>	Needs to be better defined to include re-routing options but the adopted boundary is accepted council strategy and therefore forms part of another option
Option 8 <a href="#">City Centre Exceedances</a>	Area to cover all exceedances only with minimal coverage results in illogical boundary being adopted
Option 16 <a href="#">City Cordon</a>	Likely to be difficult to enforce with large residential land-use, many internal-internal LEZ trips, large camera network and not likely to be publicly acceptable.

8.2.11 Eight initial areas are considered to meet both initial screening criteria and therefore progress to the next stage in the appraisal process.

### 8.3 Vehicle Restriction and Air Quality Objective

8.3.1 The eight areas considered potentially suitable as a Low Emission Zone were combined with one vehicle type restriction and assessed against their likely impact on the LEZ air quality objective (objective 1): *To improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government's statutory air quality objectives.*

8.3.2 This assessment is informed by the National Modelling Framework analysis detailed in Chapter 5. As noted, the NMF outputs comparisons assess changes in NO<sub>2</sub> and screening is therefore informed by differences in NO<sub>2</sub> only.

8.3.3 Although the air quality modelling identified that addressing emissions from a single vehicle type is insufficient in tackling all air quality exceedances, this initial appraisal considered only one vehicle restriction at a time to reduce the complexity of impacts and allow a suitable appraisal to be undertaken on the impacts of each vehicle class on its own. Five possible non-compliant vehicles were defined, in line with the high NMF results in Chapter 5, as follows:

- Bus (pre-Euro VI)
- Diesel Car (pre-Euro 6)
- HGV (pre-Euro VI)
- LGV (pre-Euro VI)
- Petrol Car (pre-Euro 4)

8.3.4 The Transport (Scotland) Act defines the national standard of non-compliant vehicle for a LEZ to be Euro VI for diesel HGVs/buses, Euro 6 for diesel vehicles and Euro 4 for petrol vehicles.

8.3.5 The combination of eight option areas and five vehicle type restrictions results in 40 LEZ options at the start of the appraisal process.

8.3.6 A high level appraisal of the 40 LEZ options was undertaken using a seven-point assessment scale against their likely impact on the air quality objective. This appraisal was informed by the NMF results, with a +3 score representing the highest impact option relative to all 40 options listed for appraisal. By restricting non-compliant vehicles from

an area of the city, all 40 potential LEZ options will at least bring a neutral impact on air quality and therefore all options score at least 0 on the seven-point scale. At this stage, the assessment does not include the re-routing of non-compliant vehicles and the potential to move air quality problems outside the LEZ. The assessment of the 40 LEZ options is shown in Table 8.4

**Table 8.4 : Appraisal of area and 1 vehicle restriction**

Ref No.	LEZ Area	LEZ Restriction	AQ Objective
1	Union Street, Market Street & King Street	Bus	+
2	Holburn Street to Mounthooly roundabout	Bus	++
3	Union Street with extended boundary	Bus	++
4	Westburn Road/Hutcheon St to Willowbank Road	Bus	++
5	Westburn Road/Hutcheon St to the River Dee	Bus	++
6	City Centre Exceedances	Bus	++
7	City Centre Exceedances with extended boundary	Bus	++
8	City Centre Masterplan with extended boundary	Bus	++
9	Union Street, Market Street & King Street	Diesel Car	0
10	Holburn Street to Mounthooly roundabout	Diesel Car	0
11	Union Street with extended boundary	Diesel Car	0
12	Westburn Road/Hutcheon St to Willowbank Road	Diesel Car	+
13	Westburn Road/Hutcheon St to the River Dee	Diesel Car	+
14	City Centre Exceedances	Diesel Car	+
15	City Centre Exceedances with extended boundary	Diesel Car	+
16	City Centre Masterplan with extended boundary	Diesel Car	+
17	Union Street, Market Street & King Street	HGV	0
18	Holburn Street to Mounthooly roundabout	HGV	0
19	Union Street with extended boundary	HGV	0
20	Westburn Road/Hutcheon St to Willowbank Road	HGV	0
21	Westburn Road/Hutcheon St to the River Dee	HGV	0
22	City Centre Exceedances	HGV	0
23	City Centre Exceedances with extended boundary	HGV	0
24	City Centre Masterplan with extended boundary	HGV	0
25	Union Street, Market Street & King Street	LGV	0
26	Holburn Street to Mounthooly roundabout	LGV	0
27	Union Street with extended boundary	LGV	0
28	Westburn Road/Hutcheon St to Willowbank Road	LGV	0
29	Westburn Road/Hutcheon St to the River Dee	LGV	0
30	City Centre Exceedances	LGV	0
31	City Centre Exceedances with extended boundary	LGV	0
32	City Centre Masterplan with extended boundary	LGV	0
33	Union Street, Market Street & King Street	Petrol Car	0
34	Holburn Street to Mounthooly roundabout	Petrol Car	0
35	Union Street with extended boundary	Petrol Car	0
36	Westburn Road/Hutcheon St to Willowbank Road	Petrol Car	0
37	Westburn Road/Hutcheon St to the River Dee	Petrol Car	0
38	City Centre Exceedances	Petrol Car	0
39	City Centre Exceedances with extended boundary	Petrol Car	0
40	City Centre Masterplan with extended boundary	Petrol Car	0

8.3.7

The NMF scenario results show that including buses in a LEZ would bring the largest benefit in NO<sub>2</sub> reduction, both in terms of level of reduction and area influenced by improved air quality. A bus only LEZ does not however result in all 2018 NO<sub>2</sub> exceedance locations falling below 40 µg/m<sup>3</sup>, and therefore each bus option scores +2 in the seven-point scale in all options, with the exception of the Union Street, Market Street and King Street option (Ref No .1) that does not capture all city bus services and therefore scores +1. All other options capture all bus routes serving the city centre and therefore the full benefit shown in the NMF results is realised with the remaining options.

- 8.3.8 The NMF scenario results show that the next largest impact on modelled NO<sub>2</sub> is from diesel cars but that their inclusion in a LEZ will bring minor benefit city wide with moderate benefit at certain key locations. A LEZ that only excludes non-compliant diesel cars will not, on its own, bring large enough benefit to be considered a viable stand-alone option. The NMF results infer that those option areas that encompass the majority of exceedance locations (Ref No. 12-16) can be considered to result in a score of +1 (minor benefit). Options that include only some of the exceedance locations are shown to have little impact and score 0.
- 8.3.9 The NMF results show a LEZ with only non-compliant HGVs, LGVs or petrol cars does not, on its own, bring enough benefit to be considered to have a positive score on the seven-point scale and is awarded a neutral score.
- 8.3.10 The NMF results and high level appraisal detailed in Table 8.4 can be summarised as follows:
- Improvements to the bus fleet brings the largest reduction in modelled NO<sub>2</sub> and should be included in any LEZ option for Aberdeen
  - The inclusion of diesel cars (in addition to buses) would allow exceedances to fall closer to air quality standards
  - HGVs, LGVs and petrol cars do not bring sufficient benefit on their own to be included in any LEZ, but do bring some further pollution benefits to an LEZ which includes buses.
- 8.3.11 Based on these conclusions, the list of options containing only one vehicle restriction was adjusted so that each option contained a bus vehicle restriction to reflect a more realistic LEZ for Aberdeen. The options were then re-assessed using the same seven-point assessment against their likely impact on the air quality objective, as shown in Table 8.5.

**Table 8.5 : Appraisal of area and bus focussed vehicle restriction**

Ref No.	LEZ Area	LEZ Restriction	AQ Objective
1	Union Street, Market Street & King Street	Bus	+
2	Holburn Street to Mounthooly roundabout	Bus	++
3	Union Street with extended boundary	Bus	++
4	Westburn Road/Hutcheon St to Willowbank Road	Bus	++
5	Westburn Road/Hutcheon St to the River Dee	Bus	++
6	City Centre Exceedances	Bus	++
7	City Centre Exceedances with extended boundary	Bus	++
8	City Centre Masterplan with extended boundary	Bus	++
9	Union Street, Market Street & King Street	Bus & Diesel Car	+
10	Holburn Street to Mounthooly roundabout	Bus & Diesel Car	++
11	Union Street with extended boundary	Bus & Diesel Car	++
12	Westburn Road/Hutcheon St to Willowbank Road	Bus & Diesel Car	+++
13	Westburn Road/Hutcheon St to the River Dee	Bus & Diesel Car	+++
14	City Centre Exceedances	Bus & Diesel Car	+++
15	City Centre Exceedances with extended boundary	Bus & Diesel Car	+++
16	City Centre Masterplan with extended boundary	Bus & Diesel Car	+++
17	Union Street, Market Street & King Street	Bus & HGV	+
18	Holburn Street to Mounthooly roundabout	Bus & HGV	++
19	Union Street with extended boundary	Bus & HGV	++
20	Westburn Road/Hutcheon St to Willowbank Road	Bus & HGV	++
21	Westburn Road/Hutcheon St to the River Dee	Bus & HGV	++
22	City Centre Exceedances	Bus & HGV	++
23	City Centre Exceedances with extended boundary	Bus & HGV	++
24	City Centre Masterplan with extended boundary	Bus & HGV	++
25	Union Street, Market Street & King Street	Bus & LGV	+
26	Holburn Street to Mounthooly roundabout	Bus & LGV	++
27	Union Street with extended boundary	Bus & LGV	++
28	Westburn Road/Hutcheon St to Willowbank Road	Bus & LGV	++
29	Westburn Road/Hutcheon St to the River Dee	Bus & LGV	++
30	City Centre Exceedances	Bus & LGV	++
31	City Centre Exceedances with extended boundary	Bus & LGV	++
32	City Centre Masterplan with extended boundary	Bus & LGV	++
33	Union Street, Market Street & King Street	Bus & Petrol Car	+
34	Holburn Street to Mounthooly roundabout	Bus & Petrol Car	++
35	Union Street with extended boundary	Bus & Petrol Car	++
36	Westburn Road/Hutcheon St to Willowbank Road	Bus & Petrol Car	++
37	Westburn Road/Hutcheon St to the River Dee	Bus & Petrol Car	++
38	City Centre Exceedances	Bus & Petrol Car	++
39	City Centre Exceedances with extended boundary	Bus & Petrol Car	++
40	City Centre Masterplan with extended boundary	Bus & Petrol Car	++

8.3.12 Clearly all options now bring a higher benefit to air quality with the inclusion of buses in every option. The NMF results infer that the Union Street, Market Street and King Street option (Ref No. 1, 9, 17, 25 & 33) would not impact on a number of key exceedance locations with several bus routes not entering the LEZ area. For this reason, these options are removed from the appraisal process.

8.3.13 The high level appraisal also clearly identifies that a number of scenarios return very similar scores, notably the bus plus HGVs, LGVs and petrol cars. At this stage in the appraisal process, these options can be combined (with diesel cars) to create a set of all vehicle LEZ options with the remaining high level appraisal process considering the combined benefits and dis-benefits of such options. As such, options 17 to 40 are replaced with 7 all vehicle options (with the Union Street, Market Street, King Street option also removed as noted above).

8.3.14 This assessment and subsequent rationalisation results in 21 options progressing to the next stage of the high level appraisal process.



## 8.4 Feasibility and Logic Assessment

8.4.1 A further high level assessment was made on each of the 21 remaining options to assess whether they would likely be feasible and logical if adopted as a Low Emission Zone, with the results shown in Table 8.6. Note, a similar assessment was undertaken at the start of the appraisal process but without any vehicle type restrictions, purely to assess the suitability of a particular LEZ area, whereas the assessment at this stage is informed by each vehicle type restriction. Again, the assessment is made using the seven-point scale and if any one of these criteria scores zero or less the option is not considered suitable to progress in the appraisal process.

8.4.2 Table 8.6 shows the appraisal results of the 21 options against logic and feasibility.

**Table 8.6 : Appraisal against feasibility, affordability and public acceptability**

Ref No.	LEZ Area	LEZ Restriction	Feasible	Logical	Progress in appraisal
1	Holburn Street to Mounthooley roundabout	Bus	+++	++	Yes
2	Union Street with extended boundary	Bus	+++	+	Yes
3	Westburn Road/Hutcheon St to Willowbank Road	Bus	+++	0	No
4	Westburn Road/Hutcheon St to the River Dee	Bus	+++	0	No
5	City Centre Exceedances	Bus	+++	0	No
6	City Centre Exceedances with extended boundary	Bus	+++	0	No
7	City Centre Masterplan with extended boundary	Bus	+++	0	No
8	Holburn Street to Mounthooley roundabout	Bus & Diesel Car	++	++	Yes
9	Union Street with extended boundary	Bus & Diesel Car	++	++	Yes
10	Westburn Road/Hutcheon St to Willowbank Road	Bus & Diesel Car	+	-	No
11	Westburn Road/Hutcheon St to the River Dee	Bus & Diesel Car	+	-	No
12	City Centre Exceedances	Bus & Diesel Car	+	+	Yes
13	City Centre Exceedances with extended boundary	Bus & Diesel Car	+	-	No
14	City Centre Masterplan with extended boundary	Bus & Diesel Car	+	+	Yes
15	Holburn Street to Mounthooley roundabout	All Vehicle	++	++	Yes
16	Union Street with extended boundary	All Vehicle	++	++	Yes
17	Westburn Road/Hutcheon St to Willowbank Road	All Vehicle	+	-	No
18	Westburn Road/Hutcheon St to the River Dee	All Vehicle	+	-	No
19	City Centre Exceedances	All Vehicle	+	+	Yes
20	City Centre Exceedances with extended boundary	All Vehicle	+	-	No
21	City Centre Masterplan with extended boundary	All Vehicle	+	+	Yes

8.4.3 All bus only options are considered fully feasible as they can be enforced either through a network of cameras located on fixed route bus routes. However, five options (Ref No. 3 – 7) are not considered logical options as bus only LEZs due to their geographical extents with all five of these options including areas where no bus services operate. Options 1 and 2 capture 100% of bus routes servicing Aberdeen city centre, and while options 3 – 7 also capture all bus services, they are considered unnecessarily large as bus only options and are not progressed in the appraisal process.

8.4.4 Two bus and diesel car options (Ref No. 8 & 9) score +2 for logic and feasibility. Both options are bounded by major roads allowing for logical mapping and understanding of the option, the ability for non-compliant drivers to route around or away from the LEZ, and provide suitable locations for camera enforcement. Two further options score +1 for logic and feasibility (Ref No. 12 & 14) and both of these options include parts of major roads, cutting them at key junctions to allow suitable alternative routing for non-compliant vehicles. While considered feasible and logical they would likely be more difficult to implement and understand due to their more abstract shape and area coverage.

8.4.5 The remaining three bus and diesel car options score positively for feasibility (all +1) but receive a score of -1 for logic. All three options include areas that are predominately residential, such as Rosemount and Ferryhill, where there are no existing exceedances of the air quality objectives. The areas were devised through the unconstrained option generation process but the addition of private vehicles (diesel cars) to the option mean residents living in the LEZ area will be restricted from using their vehicles if they are non-compliant to tackle an issue that is not specific to their immediate localised area. For this

reason, these options are not considered logical and are not progressed in the option appraisal process.

8.4.6 The seven all vehicle options score similarly to the bus and diesel car options for the same reasons with options 17, 18 and 20 not considered suitable to progress to further appraisal.

## 8.5 LEZ Options for Detailed Appraisal

8.5.1 In line with STAG, options can be rationalised at suitable points in the appraisal to give a more succinct set of options and this is undertaken here with options that return positive scores but display similar characteristics, impacts and benefits.

8.5.2 Both bus only options return the same score for feasibility, primarily due to the fixed route of the bus services and the similar enforcement requirements, while option 1 scores higher in logic appraisal. Analysis of the city centre bus routes show that both options capture the same bus services and that the additional area encompassed by option 2 brings no additional benefit as a LEZ. As such, option 2 is not progressed in the appraisal process as a bus only option.

8.5.3 The feasibility and logic appraisal identifies that the bus and diesel car and all vehicle options return similar scores. At this stage in the appraisal process, these options can be combined to create a set of four all vehicle LEZ options. Should the options progress to detailed appraisal, the impact of individual vehicles included in a particular LEZ will be assessed and this will inform the final vehicle restrictions of the LEZ if it is recommended for consultation.

8.5.4 The high level appraisal and rationalisation of the option list has therefore returned five emerging LEZ options to progress to detailed appraisal. At this stage, and as the number of options has reduced from 40 to 5, the opportunity is taken to rename the option area to a more descriptive and succinct list.

8.5.5 The five emerging options progressed to detailed appraisal, and links to each option drawing, is detailed in Table 8.7.

**Table 8.7 : LEZ option list after feasibility and logic appraisal**

Ref No.	LEZ Option	LEZ Restriction	Drawing Reference
1	Union Street Area	Bus	<a href="#">Appendix B, B1</a>
2	Union Street Area	All Vehicle	<a href="#">Appendix B, B2</a>
3	Union Street & George Street Area	All Vehicle	<a href="#">Appendix B, B3</a>
4	City Centre Air Quality Exceedance	All Vehicle	<a href="#">Appendix B, B4</a>
5	City Centre Masterplan	All Vehicle	<a href="#">Appendix B, B5</a>

# 9. DETAILED LEZ OPTION ANALYSIS

## 9.1 Introduction

9.1.1 The high level appraisal process identified five options that satisfied the LEZ Objectives and were considered feasible and logical.

9.1.2 The NLEF guidance indicates that the LEZ area for consideration will be informed by:

1. the area of exceedance of air quality objectives and the main sources of pollutants
2. geographically discrete areas, such as a town centre, or other areas which are well defined (e.g. within an inner ring road)
3. features that may influence enforcement (e.g. an outer ring-road with junctions leading into exceedance areas, key access points such as bridges)
4. mapped emissions by vehicle type in order to identify areas where options are likely to be most effective. Mapping bus routes, taxi ranks and/or residential and commercial land-uses will be useful
5. air quality along any such alternative routes to determine if they could be at risk of new exceedances as a result of displaced traffic
6. the potential need to allow vehicles to divert onto alternative routes to avoid the area of the LEZ.

9.1.3 The initial option generation exercise (Chapter 8) broadly considered these points, in particular points 1-4. The next stage in the LEZ option development is to consider these in more detail and clearly define the boundary and predicted impacts of each emerging option in order to recommend LEZ Options for detailed traffic and air quality modelling and public and stakeholder consultation.

9.1.4 In defining the detail of each emerging option, it is likely that a number of option variants will result from the process. The five options for detailed appraisal are shown in Table 9.1.

**Table 9.1 : LEZ option for detailed appraisal**

Option Number	LEZ Option	LEZ Restriction	Drawing Reference
1	Union Street Area	Bus	<a href="#">Appendix B, B1</a>
2	Union Street Area	All Vehicle	<a href="#">Appendix B, B2</a>
3	Union Street & George Street Area	All Vehicle	<a href="#">Appendix B, B3</a>
4	City Centre Air Quality Exceedance	All Vehicle	<a href="#">Appendix B, B4</a>
5	City Centre Masterplan	All Vehicle	<a href="#">Appendix B, B5</a>

9.1.5 [Option 1](#) was defined as the most suitable area to capture all bus services and, crucially, be directly expanded in its scope to include all vehicles without changing its boundary to create [Option 2](#). [Option 3](#) extends the proposed LEZ area to the north to include the George Street area and encompass more of the CCMP and SUMP areas while still being defined by geographically visual key routes to give a logical LEZ with viable alternative routes. [Option 4](#) was defined to encompass all locations where annual mean NO<sub>2</sub> were greater than the legal limit (> 40 µg/m<sup>3</sup>). [Option 5](#) mirrors the existing CCMP and SUMP boundaries, with adjustments to allow suitable alternative routes, to provide a LEZ option that fully complements these existing key ACC strategies.

9.1.6 Each option and its variant will be assessed for its likely impact on the local transport network and its likely operational needs. This analysis may result in some of the five

emerging options being considered unsuitable and they will be removed from further appraisal. The option generation and high level sifting identified four potential all vehicle LEZ. Although these cover different areas, there are considerations common to all options:

- Impact on Air Quality
- Re-routeing of non-compliant vehicles
- Access to city centre car parks
- Access to resident and business parking

9.1.7 The high level NMF analysis (Chapter 5) concluded that a LEZ delivered on its own (and of any size and vehicle type restrictions) was not enough, in itself, to tackle all locations of air quality exceedance. To achieve compliance with air quality standards in Aberdeen, complimentary traffic management measures are likely to be required.

9.1.8 NLEF Guidance states that *“it may be more appropriate to address the issue (air quality exceedance) by identifying additional location specific measures to be implemented through the AQAP, potentially through consideration of local transport measures. In this situation, the additional measures should be identified...along with a description of the likely contribution to removing exceedances”*. (NLEF, 2019).

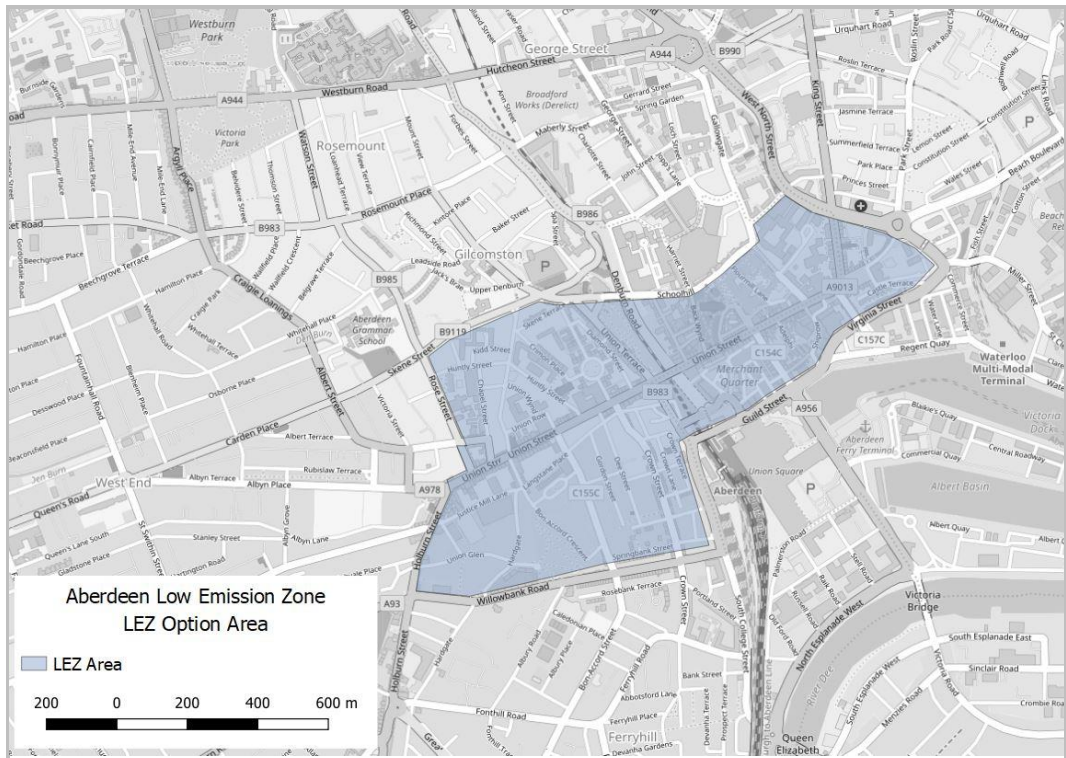
9.1.9 The Aberdeen LEZ and any complimentary traffic management measures should align with the existing transport policy landscape in Aberdeen and each option will be appraised against this. As reviewed in Chapter 3, key Aberdeen policies and strategies that may shape the final LEZ option(s) are:

- Aberdeen City Centre Masterplan (CCMP)
- Aberdeen City Sustainable Urban Mobility Plan (SUMP)
- North East Scotland Roads Hierarchy Study

9.1.10 In line with NLEF Guidance there is a requirement for detailed modelling using the NMF Aberdeen City Air Quality Model and the 2019 Aberdeen City Centre Paramics microsimulation traffic model (ACCPM19). The results from this chapter will inform if the LEZ option(s) to be tested in detail. The ACCPM19 will be utilised to test the preferred LEZ option(s) and help identify where complimentary measures are required.

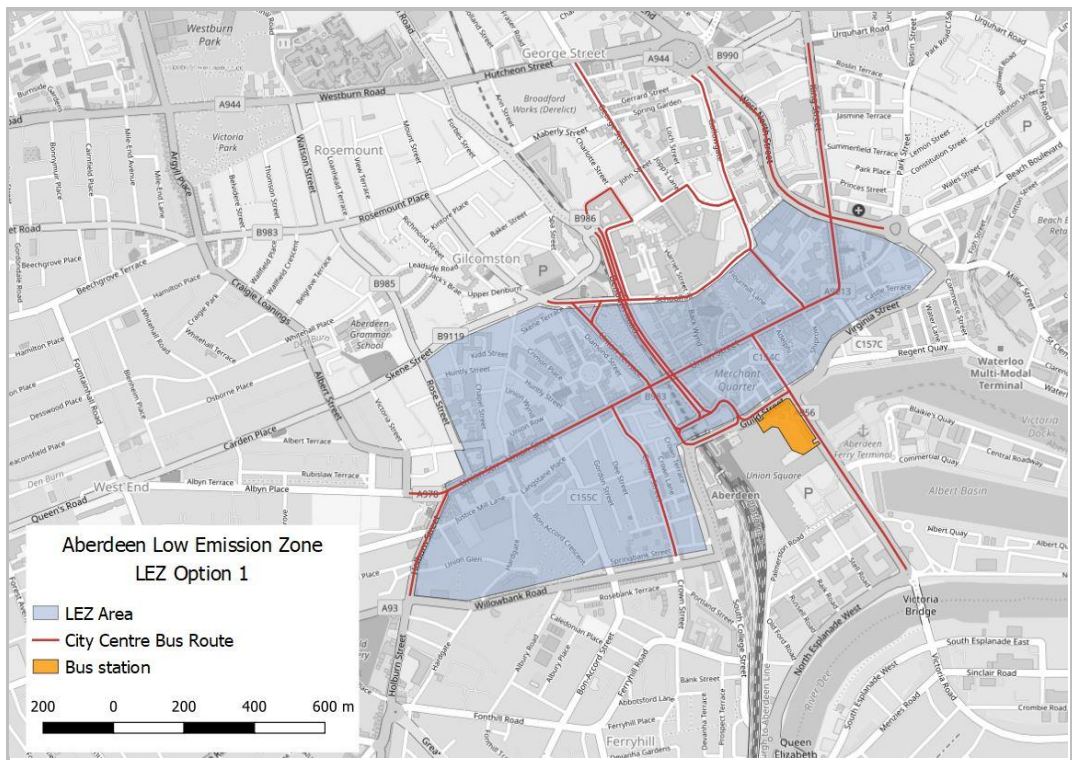
## **9.2 LEZ Option 1: Union Street Area Bus Only**

9.2.1 The option generation exercise identified that an area covering the full length of Union Street and the immediate surrounding area as a suitable area for a bus only LEZ and this is shown in Figure 9.1.



**Figure 9.1 : Option 1 – Union Street Area Bus Only LEZ**

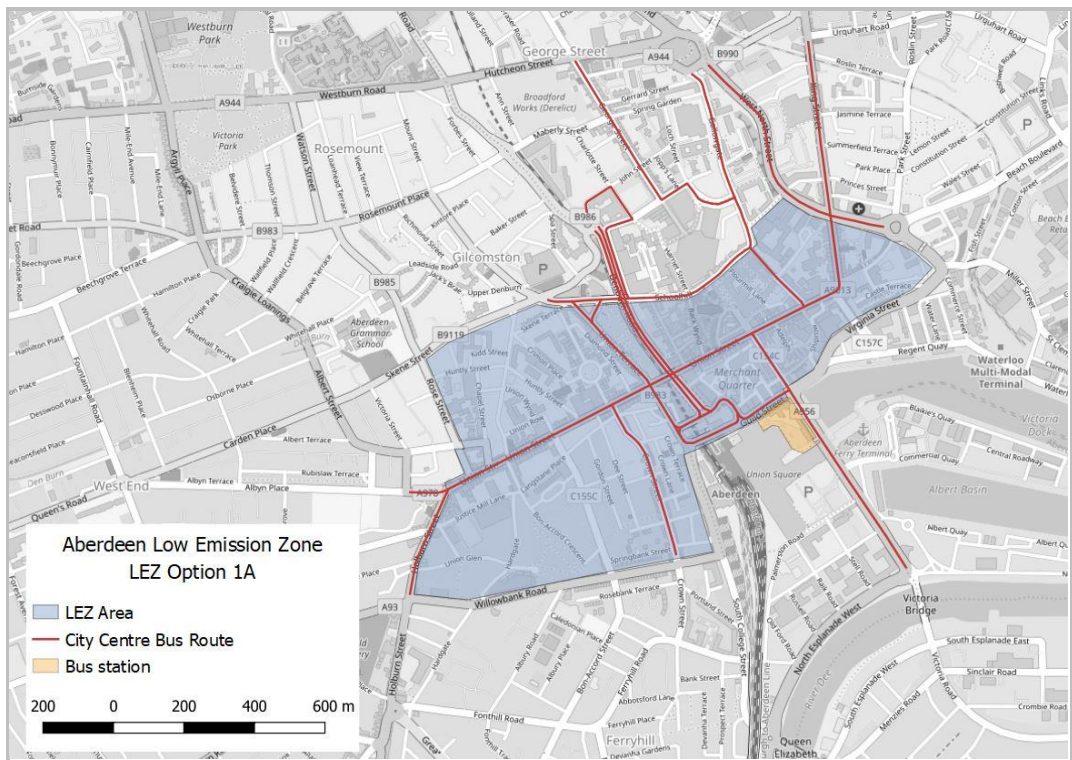
- 9.2.2 As a bus only LEZ, it is important to understand the key bus movements and routes that will be impacted by LEZ Option 1. This analysis was undertaken using SEPA’s bus operator tool that has been developed as part of the NMF using fleet information and data from all local operators to assist with the implementation of Aberdeen’s LEZ. The tool maps all bus routes serving the city and provides frequency and euro class of each timetabled bus service.
- 9.2.3 Analysis of all city bus routes, using SEPA’s bus operator tool, confirmed that the proposed area for Option 1 would capture all scheduled bus services operating in the city. There are 10 key entry and exit points for local bus service routes, as shown in Figure 9.2, on Union Street West, Union Terrace, Crown Street, Denburn Road/Wapping Street, Guild Street/Bridge Street, Market Street, Broadhill Street, Union Street East.



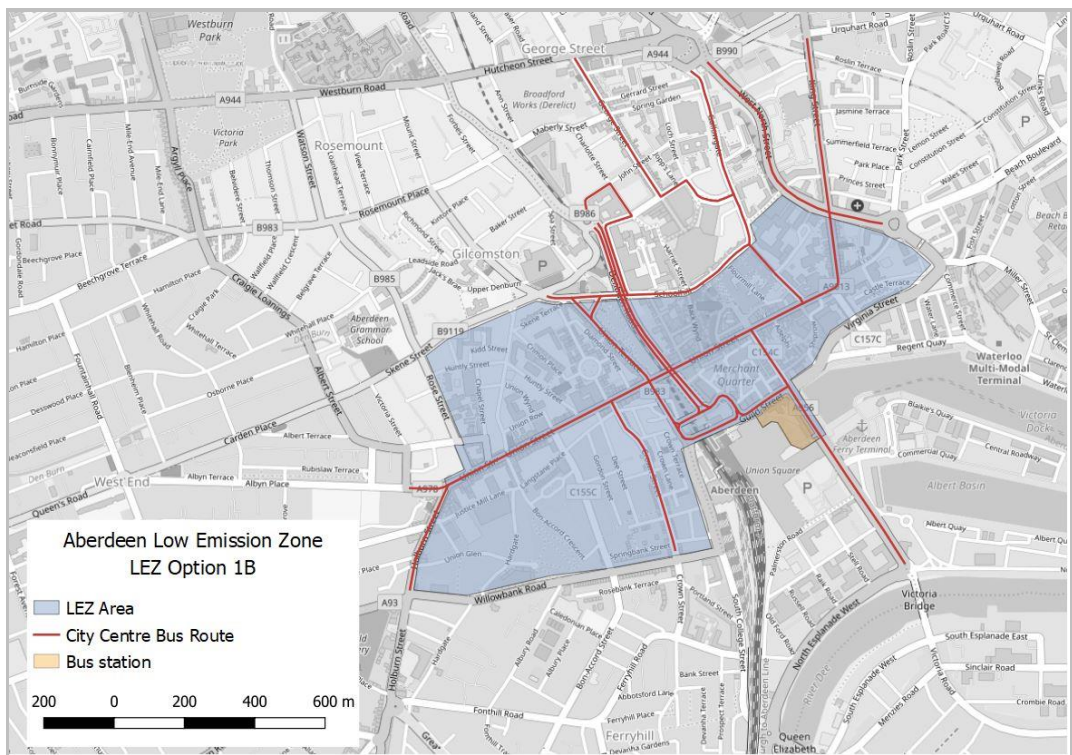
**Figure 9.2 : City Centre Bus Routes**

9.2.4 The initial option area however, does not include Aberdeen Bus Station, located at the corner of Market Street and Guild Street, as shown in Figure 9.2. The bus station has access and egress from Market Street and an exit only on to Guild Street however analysis of bus services that operate at the bus station shows that all local services and the majority of inter-city services to and from the bus station route though the proposed LEZ area, via Union Street and Market Street (north of Guild St) or Denburn Road. It may however be desirable to alter the initial LEZ option area to include the bus station, to ensure that operators do not alter service routes such that they can avoid the LEZ but maintain access to the bus station. Conversely, it may be desirable to exclude the bus station to allow strategic bus services that connect Aberdeen with other regions to serve Aberdeen without being impacted by LEZ restrictions, however this would require the alteration of routes as all current strategic services route via Union Street and Market Street (north) to access the bus station. Consultation with bus operators will be crucial to provide further information on the acceptability of such options. Cognisance of the access arrangements to the bus station must be considered for any LEZ that includes bus restrictions.

9.2.5 There are two possible bus only LEZ option variants that include one access (Option 1A) or both accesses (Option 1B) for Aberdeen bus station is shown in Figure 9.3 and Figure 9.4



**Figure 9.3 : Option 1A – Union Street Area Bus Only LEZ including Guild Street bus station exit**



**Figure 9.4 : Option 1B – Union Street Area Bus Only LEZ including Bus Station**

9.2.6

The entry/exit locations shown in Figure 9.2 could possibly serve as locations for LEZ camera enforcement and signage, however it is likely that there will also be a requirement to have camera coverage on all entry and exit points to the proposed LEZ area to capture non-timetabled services buses such as tour buses, community buses or school buses. Aberdeen train station is situated adjacent to the bus station and its main access points may be impacted by this bus only LEZ option. While this will not impact non-bus vehicles from drop-off, pick-up or parking, it will potentially impact non-timetabled rail replacement bus services and consultation with Network Rail and ScotRail will be important to understand their needs and any potential operational impacts.

9.2.7 Analysis of the NMF high level scenario modelling shows that improving the bus fleet to Euro VI brings about the largest single difference in tackling exceedances of the air quality standards. The predicted reductions in NO<sub>2</sub>, as informed by the 2019 NMF Base scenario, are shown in Table 9.2. Grey cells show locations where the modelled reductions do not predict a sufficient reduction in NO<sub>2</sub> for observed levels to fall below 40 µg/m<sup>3</sup>. Yellow cells show locations where levels of NO<sub>2</sub> are predicted to be between 36 µg/m<sup>3</sup> and 40 µg/m<sup>3</sup>.

**Table 9.2 : Predicted Reduction in 2018 NO<sub>2</sub> Levels (Annual Mean/µg/m<sup>3</sup>) – Option 1**

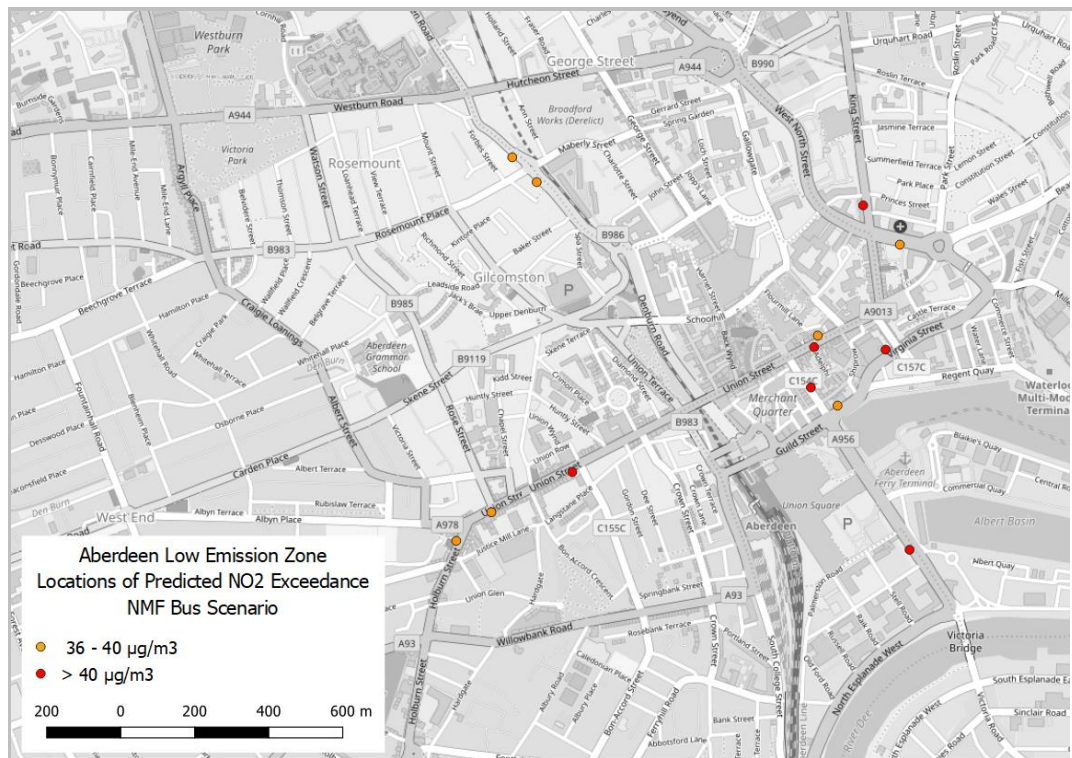
Site ID	Site Name	2018 Observed NO <sub>2</sub>	% NO <sub>2</sub> reduction	Option 1 predicted NO <sub>2</sub>
DT11	105 King Street	48	-3%	47
DT10	184/192 Market Street	47	-5%	45
DT9	39 Market Street	46	-13%	40
DT29	469 Union Street	45	-13%	39
DT12	40 Union Street	44	-15%	38
DT17	43/45 Union Street	44	-3%	43
DT82	7 Virginia Street	44	-2%	43
DT30	335 Union Street	41	-3%	40
DT19	468 Union Street	40	-11%	36
DT33	16 East North Street	40	-3%	39
DT73	61 Skene Square	40	-5%	38
DT18	14 Holburn Street	39	-2%	38
CM2	Union Street	38	-11%	34
DT16	1 Trinity Quay	37	-3%	36
DT25	21 Holburn Street	37	-8%	34
DT77	27 Skene Square	37	-2%	36
DT22	104 King Street	36	-8%	33

9.2.8 The NMF analysis shows that Option 1 does not tackle all air quality exceedances and the predicted locations of air quality exceedances of annual mean for NO<sub>2</sub> remaining if all buses are of Euro VI standard is shown in Figure 9.5.

9.2.9 The options was devised to capture all bus services operating in the city and as an individual bus service would be required to be compliant to enter the LEZ area, the benefit in reduced emissions from each vehicle will be seen across the entire bus network as each bus travels along its timetabled route (i.e. outside and inside the LEZ area).

9.2.10 That the option does not encompass all exceedance locations therefore is not the critical factor in defining the bus only option area but rather that the area captures all bus services, which Option 1 is shown to do.





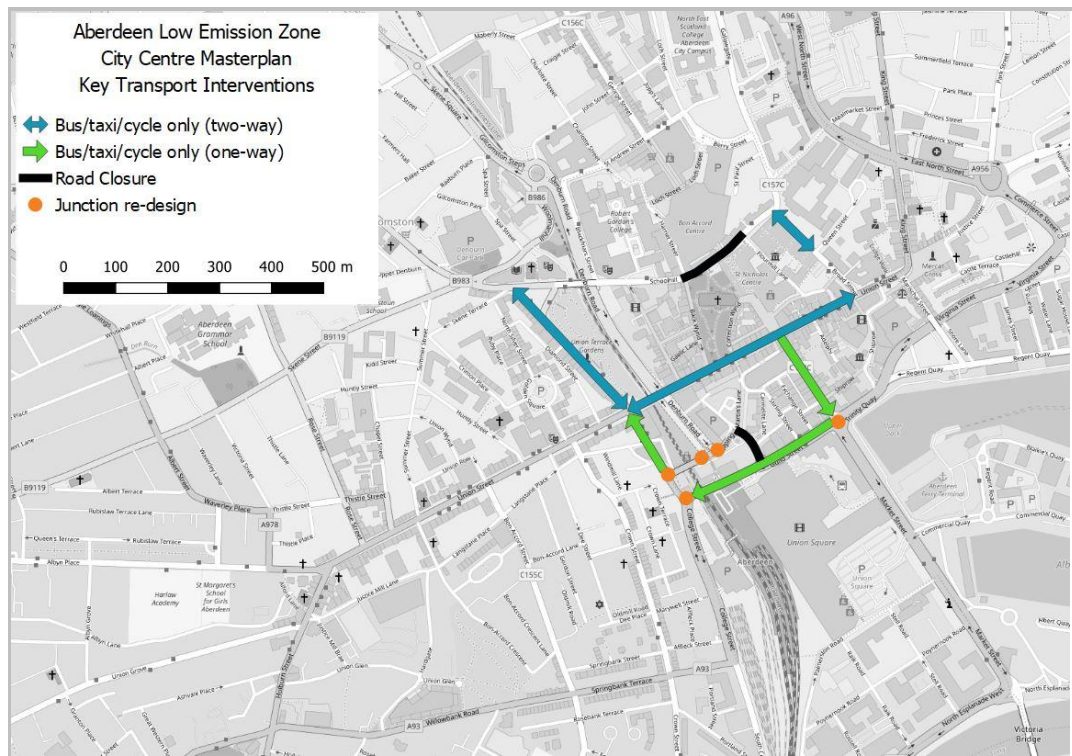
**Figure 9.5 : Locations of predicted NO<sub>2</sub> greater than 36 µg/m<sup>3</sup> – NMF bus only scenario**

9.2.11 The NMF analysis has also shown that an all vehicle LEZ does not address all the remaining exceedances and that further traffic management interventions are required to deliver a complimentary package to address all air quality exceedances (see Section 9.3 below). As noted, these interventions should take cognisance of existing ACC strategies, including the City Centre Masterplan (CCMP) and Roads Hierarchy Study. The City Centre Masterplan is the key ACC strategy for Aberdeen City Centre development and it proposes a number of transport interventions to improve bus movements in the city, as shown in Figure 9.6. It is recommended that detailed traffic and air quality modelling is undertaken in the first instance to show if delivering a bus only LEZ (improving all bus services to Euro VI standard) together with complimentary mitigation addresses additional air quality exceedances.

9.2.12 It is therefore important that any bus only LEZ option does not contradict the public transport proposals in the City Centre Masterplan and does not result in future difficulties in delivery of either the LEZ or Masterplan proposals. The City Centre Masterplan proposal for improvements to public transport accessibility include the reclassification of the following roads to bus, taxi and cycle only:

- Phase 1: Broad Street between Schoolhill and Queen Street (now on-street and bus/cycle only)
- Phase 2: Market Street between Union Street and Guild Street
- Phase 2: Guild Street between Market Street and Bridge Street
- Phase 2: Bridge Street between Wapping Street and Union Street
- Phase 3: Union Street between Crown Street and King Street

9.2.13 A summary of these interventions and the optimum phased delivery is provided in the policy framework review in Chapter 3. Traffic model testing in 2016 (*Aberdeen city Centre Masterplan Testing – Phase 2 & 3, April 2016, SIAS Ref. 77953*) also concluded CCMP Phase 2 proposals should be delivered with the re-design and optimisation of key junctions and the closure of Wapping Street between the Trinity Centre car park and Guild Street, forming an area known as Station Gateway.



**Figure 9.6 : City Centre Masterplan – Key Transport Interventions**

9.2.14 The remaining locations of exceedances in Option 1 with 100% of buses at Euro VI are shown above. However it is considered highly likely that the addition of the Phase 2 and/or Phase 3 CCMP measures to Option 1 would reduce levels of NO<sub>2</sub> on Union Street and Market Street, north of Guild Street, to levels below the legal limits due to the decreased traffic flow on these routes (as bus, taxi and cycle only corridors). However, the 2016 Testing Report concluded this would significantly increase traffic volumes on adjacent strategic routes, such as Virginia Street and West and East North Street, thereby potentially increasing NO<sub>2</sub> (and other pollutant) levels. It is therefore essential that the traffic model testing programme is designed to fully quantify these assumptions to inform the final NLEF appraisal of LEZ options.

9.2.15 While it is not crucial to the operation of a bus only LEZ, it is considered desirable where possible, that its area encompasses the key CCMP public transport proposals. The initial option developed during the option generation exercise (Figure 9.1.) does not include Guild Street, a key public transport location and focus of the CCMP, and as such, is removed from further appraisal and not recommended for testing or consultation.

9.2.16 Based on the above bus route analysis, consideration of Aberdeen bus station location and cognisance of the City Centre Masterplan proposals, two options are considered as viable LEZ bus only options to be progressed in the appraisal process:

- Option 1A – Union Street Area including Guild Street and bus station exit
- Option 1B – Union Street Area including Guild Street, Market Street and Aberdeen bus station

### 9.3 All Vehicle LEZ – Impacts on Air Quality and Emissions

9.3.1 Analysis of the NMF high level scenario modelling concluded that an all vehicle city-wide LEZ (i.e. regardless of area size) would not directly address all locations of NO<sub>2</sub> annual mean exceedances (Chapter 4). The four all vehicle LEZ options identified during the option generation exercise do not cover a city-wide area and therefore their impacts on air quality exceedances will be different but impacts of each scenario can be inferred from the same high level NMF results.

9.3.2 The predicted reductions in annual mean NO<sub>2</sub> levels resulting from Option 2, 3, 4 and 5, as informed through the NMF high level scenario modelling, are shown in Table 9.3. Grey cells show locations where the modelled reductions do not predict a sufficient reduction in NO<sub>2</sub> for observed levels to fall below 40 µg/m<sup>3</sup>. Yellow cells show locations where levels of NO<sub>2</sub> are predicted to be between 36 µg/m<sup>3</sup> and 40 µg/m<sup>3</sup>. Note that this analysis does not include the impacts on NO<sub>2</sub> levels resulting from any rerouting of non-compliant vehicles that may occur in each option. It should also be noted that these locations are single monitoring (automatic monitors or diffusion tube) locations and may represent a small or large area of exceedance. Modelling the impacts on these monitoring locations and adjacent model kerbside locations (as described in Chapter 5) gives a clearer demonstration of the extend of the exceedance area and any recommended options resulting from this detailed appraisal will undergo detailed traffic and air quality modelling to fully quantify the impacts on air quality, including the impacts from rerouting of non-compliant vehicles.

**Table 9.3 : Predicted Reduction in 2018 NO<sub>2</sub> Levels (Annual Mean µg/m<sup>3</sup>) – Options 2 to 5**

Site ID	Site Name	2018 Observed NO <sub>2</sub>	Predicted NO <sub>2</sub> Levels			
			Option 2	Option 3	Option 4	Option 5
DT11	105 King Street	48	48.0	48.0	45.5	45.5
DT10	184/192 Market Street	47	47.0	47.0	40.4	40.4
DT9	39 Market Street	46	37.6	37.6	37.6	37.6
DT29	469 Union Street	45	36.6	36.6	36.6	36.6
DT12	40 Union Street	44	35.1	35.1	35.1	35.1
DT17	43/45 Union Street	44	41.9	41.9	41.9	41.9
DT82	7 Virginia Street	44	44.0	44.0	41.9	41.9
DT30	335 Union Street	41	39.2	39.2	39.2	39.2
DT19	468 Union Street	40	33.4	33.4	33.4	33.4
DT33	16 East North Street	40	40.0	40.0	35.7	35.7
DT73	61 Skene Square	40	40.0	40.0	40.0	40.0
DT18	14 Holburn Street	39	39.0	39.0	39.0	37.4
CM2	Union Street	38	32.2	32.2	32.2	32.2
DT16	1 Trinity Quay	37	37.0	37.0	34.2	34.2
DT25	21 Holburn Street	37	37.0	37.0	37.0	31.4
DT77	27 Skene Square	37	37.0	37.0	37.0	37.0
DT22	104 King Street	36	36.0	36.0	30.5	30.5
<b>Number of receptors inside LEZ option</b>			<b>7</b>	<b>7</b>	<b>13</b>	<b>15</b>
<b>% Reduction from 2018 observed levels</b>			<b>-6.0%</b>	<b>-6.0%</b>	<b>-9.4%</b>	<b>-10.4%</b>

9.3.3 Option 2 and Option 3 encompass 7 monitoring locations and do not include the two highest observed NO<sub>2</sub> diffusion tube concentrations (105 King Street and 184/192 Market Street). Option 4 includes 13 out of 17 monitoring locations of NO<sub>2</sub> exceedance and Option 5 includes 15 monitoring locations with both options encompassing the 10 highest diffusion tube concentrations of NO<sub>2</sub>.

9.3.4 In all four all vehicle LEZ options, the NMF predicts there to be four monitoring locations where annual mean levels of NO<sub>2</sub> will exceed the limit of 40 µg/m<sup>3</sup>, however in Option 2 and Option 3, only Site DT17 43/45 Union Street is located inside the proposed LEZ area and therefore the three sites outside the area are unchanged. Options 4 and 5 encompass all four remaining exceedance locations, and although NO<sub>2</sub> levels drop, they still exceed 40 µg/m<sup>3</sup>.

**Key Point:** The NMF results therefore suggest that no matter what the shape and vehicle included in the LEZ area, the same air quality exceedances will remain and that the wider impacts of each option must be considered to assess their suitability as LEZ options.

**9.4 All Vehicle LEZ - Vehicle Routeing and Non-Compliant Vehicles**

9.4.1 A key consideration for a LEZ is the impact of non-compliant vehicle rerouting that can result from restrictions in entering the LEZ area. Aberdeen’s road network is such that all the proposed all vehicle LEZ options would impact a number of key strategic movements through the city. The key routes in the city centre that are likely to be impacted by all of the four proposed LEZ options are shown in Figure 9.7. On each route, the total two-way 12 hour (07:00-19:00) flow for Cars, light goods vehicles (LGVs) and heavy goods vehicles (HGVs) is presented in Table 9.5, alongside the corresponding non-compliant vehicles, at intervals along each route. The key routes identified are existing key routes and do not account for any reclassification as defined in the Roads Hierarchy Study. The impact of the proposed changes to Aberdeen’s road hierarchy on each LEZ option is examined in Section 9.9.

9.4.2 The analysis undertaken in this section examines the approximate total number of non-compliant vehicles currently on-street based on 2019 traffic survey data. The proportion of non-compliant vehicles city-wide in Aberdeen is calculated using the ANPR analysis as detailed Section 4.6.1 and summarised in Table 9.4.

**Table 9.4 : LEZ non-compliant vehicle proportions city-wide in Aberdeen**

Fuel Type	Car	LGV	HGV
Non-compliant diesel	26.3%	59.7%	27.0%
Non-compliant petrol	3.9%	0.1%	0.0%
Total non-compliant	30.3%	59.8%	27.0%

9.4.3 It should be noted that if and when an all vehicle LEZ is enforced in Aberdeen, the total number of non-compliant vehicles is likely to have reduced, primarily due to normal fleet improvements as drivers replace their vehicles but also from potential behaviour changes resulting from the act of implementation and associated awareness raising of a LEZ. This could include a switch to more sustainable modes of transport and increased working from home practices. Although very difficult to accurately predict the level of compliance of Aberdeen’s future vehicle fleet, SEPA utilise the UK Government’s Emission Factor Toolkit (EFT) to best forecast compliance levels in any future year modelling using the NMF. All detailed modelling of LEZ options in the traffic and air quality modelling will therefore adopt forecast predictions of compliance but at this stage of the NLEF appraisal, only the current levels of non-compliant vehicles, using existing data, are assessed, and cognisance of this should be taken when interpreting the data.

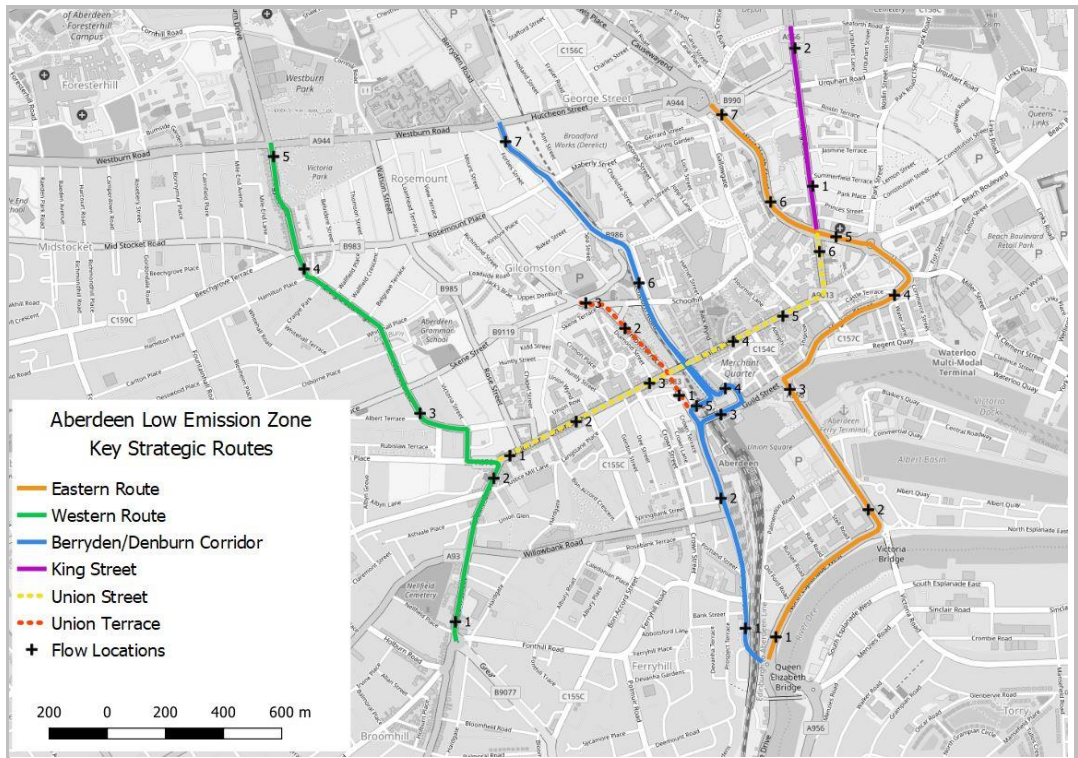


Figure 9.7 :Aberdeen City Centre Key Routes

Table 9.5 : Aberdeen City Centre Key Routes – Total Two-Way Traffic Flow (07:00-19:00)

Route	Location	All Vehicles				Non-compliant vehicles			
		Car	LGV	HGV	Total	Car	LGV	HGV	Total
Western Corridor	1	9598	1312	340	11250	2906	784	92	3782
	2	10008	1346	356	11710	3030	805	96	3931
	3	962	72	8	1042	291	43	2	336
	4	5782	648	168	6598	1750	387	45	2183
	5	7352	829	178	8359	2226	496	48	2769
Denburn Corridor	1	8935	1335	470	10740	2705	798	127	3630
	2	10035	1368	478	11881	3038	818	129	3985
	3	7106	795	382	8283	2151	475	103	2730
	4	7740	930	378	9048	2343	556	102	3001
	5	8116	986	346	9448	2457	590	93	3140
	6	10669	1335	265	12269	3230	798	72	4100
	7	11660	1569	987	14216	3530	938	266	4734
Eastern Corridor	1	14906	2338	1557	18801	4513	1398	420	6331
	2	16932	3391	2733	23056	5126	2028	738	7891
	3	19415	3385	2750	25550	5878	2024	742	8644
	4	14062	2360	1781	18203	4257	1411	481	6149
	5	11155	1736	1581	14472	3377	1038	427	4842
	6	8955	1350	698	11003	2711	807	188	3707
	7	11048	1579	905	13532	3345	944	244	4533
Union Street	1	10268	1425	268	11961	3108	852	72	4033
	2	8164	1189	334	9687	2472	711	90	3273
	3	8705	1369	385	10459	2635	819	104	3558
	4	8708	1373	1489	11570	2636	821	402	3859
	5	6895	1121	489	8505	2087	670	132	2890
	6	7125	1137	508	8770	2157	680	137	2974
Union Terrace	1	2687	351	209	3247	813	210	56	1080
	2	4836	691	256	5783	1464	413	69	1946
	3	5966	569	95	6630	1806	340	26	2172
King Street	1	6181	1127	1275	8583	1871	674	344	2889
	2	6205	1105	1178	8488	1878	661	318	2857

9.4.4

The impacts on vehicle routing for each of the four all vehicle LEZ options will be different and each option will be looked at in turn in Section 9.5 and Section 9.6. This may inform changes to the option boundary and ultimately provide rationale for recommending an option or not for detailed testing. All references to vehicle numbers in the analysis below is two-way 12 hour flow between 07:00 and 19:00.

- 9.4.5 The Western route (Holburn Street to Argyll Place) and Eastern route (North Esplanade West, Market Street, Virginia Street, Commerce Street, West North Street) and King Street are not included in the proposed Option 2 and Option 3 areas. The Eastern Route and King Street is encompassed in the Option 4 and Option 5 areas and Option 5 also includes the Western Route. In all options, regardless of whether a route is inside or outside the LEZ area, all routes are likely to experience a change in traffic flow from non-compliant vehicles for all or part of the routes shown.
- 9.4.6 In all LEZ options, the level of this change depends on a two key factors:
- the level of access to and from Denburn Road (central route) as controlled by the LEZ boundary and permitted by the LEZ option restrictions (detailed in Section 9.5)
  - the route and destination of trips on internal routes and at the key access points of the LEZ, particularly on high volume routes such as Union Street, Bridge Street/Union Terrace and Market Street (detailed in Section 9.6)
- 9.4.7 All LEZ options progressed to detailed testing using the Paramics traffic model will undertake full analysis of non-compliant rerouting. To inform this appraisal of the LEZ options prior to traffic model availability, the likely impact of changes in routeing or destinations of non-compliant vehicles can be assessed through analysis of 2019 traffic survey data.

## **9.5 All Vehicle LEZ – Denburn Road Access**

- 9.5.1 The inclusion or exclusion of Denburn Road is key to the operation and impact of each LEZ option. Denburn Road is a north-south dual carriageway running below the city centre, rather than through it, with very little placemaking value and reduced likelihood to the public from emission exposure (i.e. no adjacent pedestrian walkway). It may therefore be considered suitable to exclude Denburn Road from a LEZ to provide an alternative route for non-compliant vehicles, moving them from locations of current high pollution levels and public exposure. Conversely however, it is recognised that a desired impact of a LEZ would be to remove non-compliant vehicles completely from key routes in the city and not provide an alternative route to accommodate them. Each all vehicle option therefore is examined in turn to assess the likely impacts of Denburn Road being included or excluded in the option area, as informed by the 2019 traffic survey data detailed in Table 9.5 above. The analysis is based on existing (2019) traffic volumes and does not account for any changes to levels of vehicle compliance when a LEZ is likely to be enforced (e.g. in 3 or 4 years), for the reasons noted above, with detailed traffic and air quality modelling incorporating fleet projections in all LEZ options taken forward for testing.
- 9.5.2 Denburn Road runs north-south below Union Street between Guild Street and Woolmanhill/Skene Square and can be either be included or fully or partially excluded from each LEZ, depending on the exact geometry area boundary. Traffic data shows there to be approximately 3000 to 4000 non-compliant vehicles (cars, LGVs and HGVs) on Denburn Road in 2019, between Woolmanhill and Guild Street. If Denburn Road is included in a LEZ option, these non-compliant vehicles will be required to choose alternative routes (assuming they remain on the network), such as the Eastern and Western routes, and this may increase congestion and pollution levels on these and other routes and may lead to increased locations of air quality exceedance.
- 9.5.3 Option 2, covering the Union Street Area, and its key strategic routes and access points, is shown in Figure 9.8 and Option 3, covering the Union Street and George Street Area, and its key strategic routes and access points, is shown in Figure 9.9. Option 3 extends the Option 2 area to the north to encompass the George Street area but essentially Option 3 and Option 2 are bound by the same key routes and have many of the same key internal routes.

9.5.4

Option 2 and Option 3, as originally derived, will prevent all non-compliant vehicles from using Denburn Road.

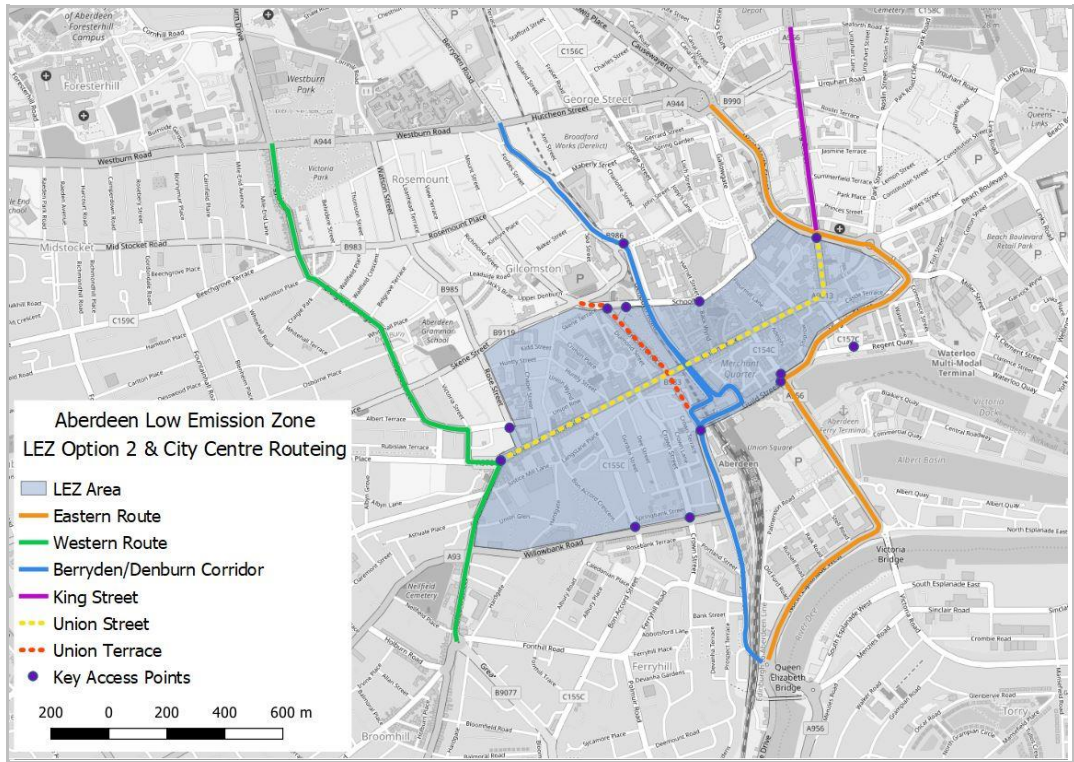


Figure 9.8 : Option 2 Key Routes and Access Points

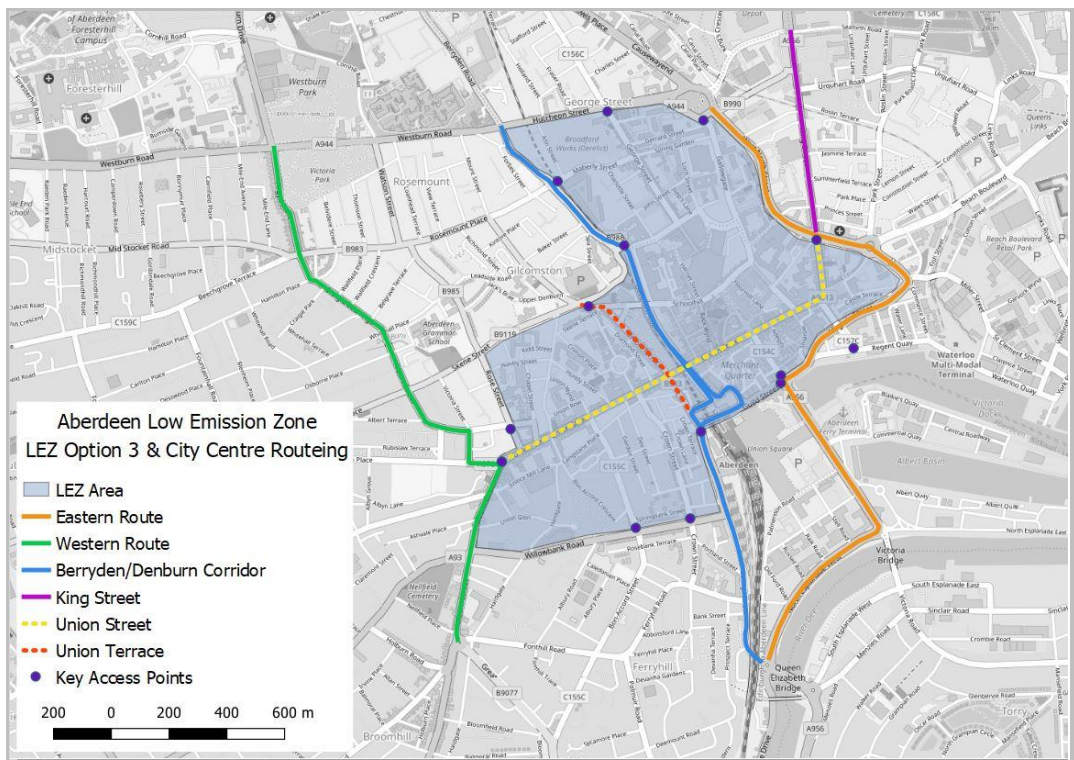


Figure 9.9 : Option 3 Key Routes and Access Points

9.5.5

There are two option variants that could provide full or partial access on Denburn Road and reduce the impact of any rerouting non-compliant vehicles. Option 2B, in Figure 9.10, excludes the Guild Street, Bridge Street, Wapping Street gyratory to provide full northbound and southbound movements on Denburn Road, as per the current road network. Option 3B, in Figure 9.11, can be defined to similarly exclude the gyratory and provide full northbound and southbound movements on Denburn Road.

9.5.6

In both Option 2B and Option 3B, this would mean that no non-compliant vehicles would be required to reroute from Denburn Road to alternative routes and the corridor may provide additional accessibility required by the restrictions to routes inside the LEZ (e.g. Union Street)

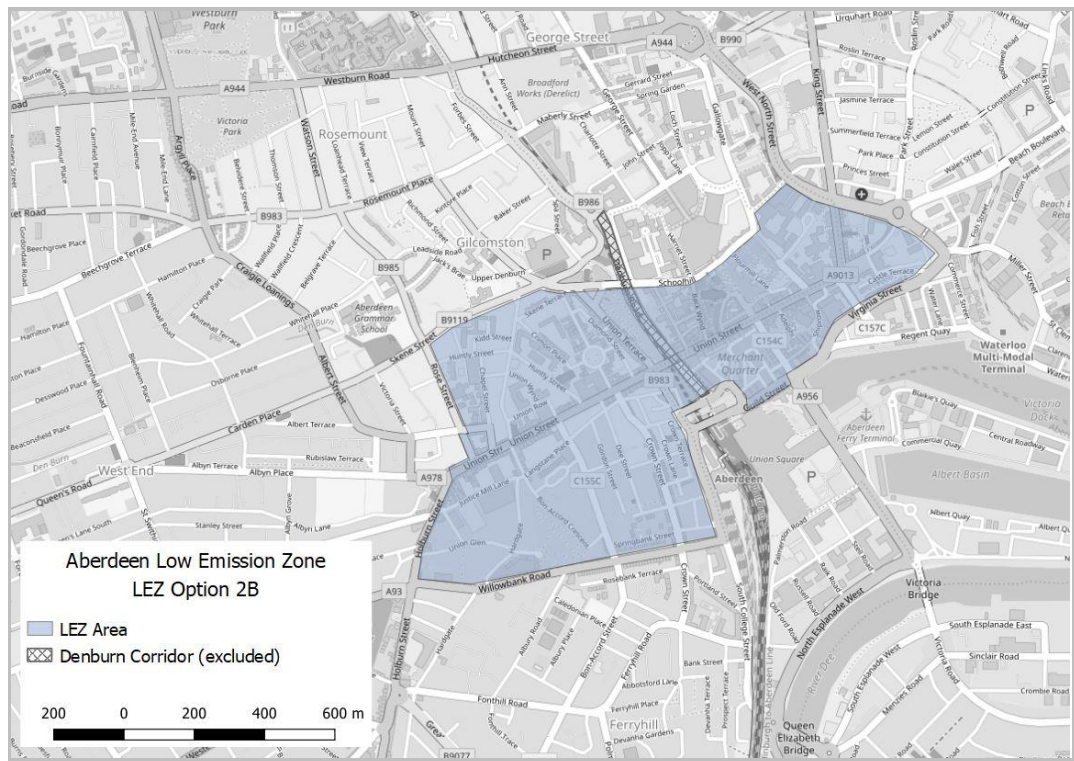


Figure 9.10 : Option 2B – NB & SB Denburn Road access (All Vehicle LEZ)

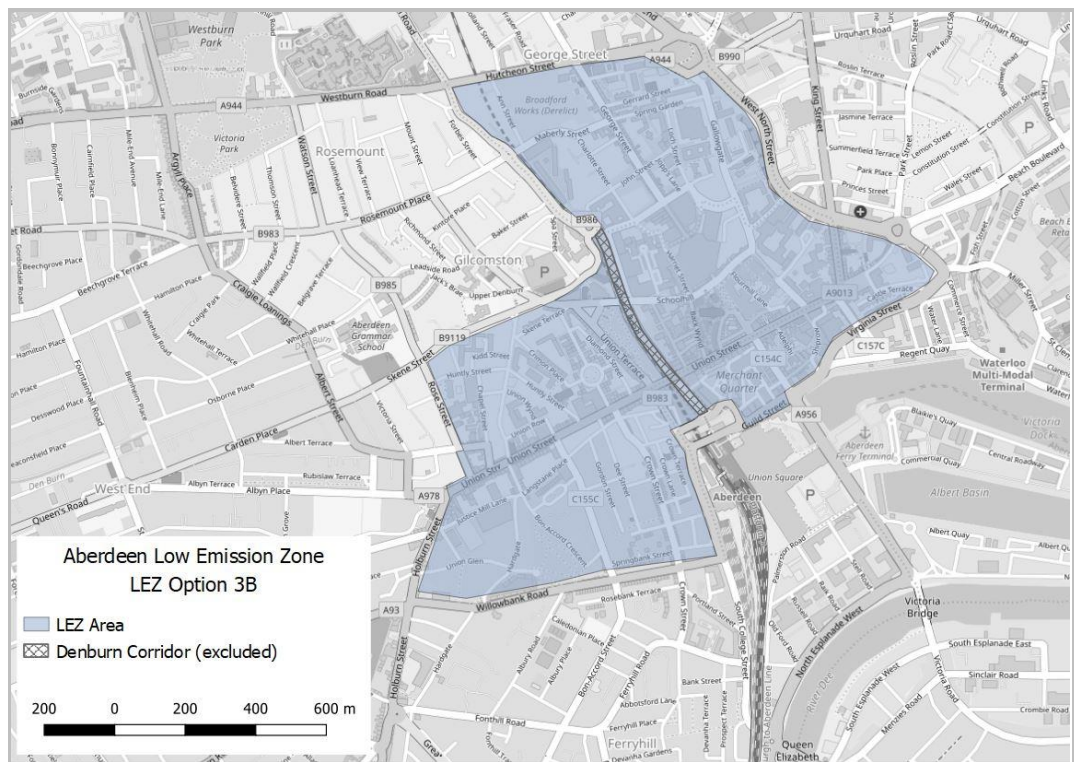


Figure 9.11 : Option 3B – NB & SB Denburn Road access (All Vehicle LEZ)

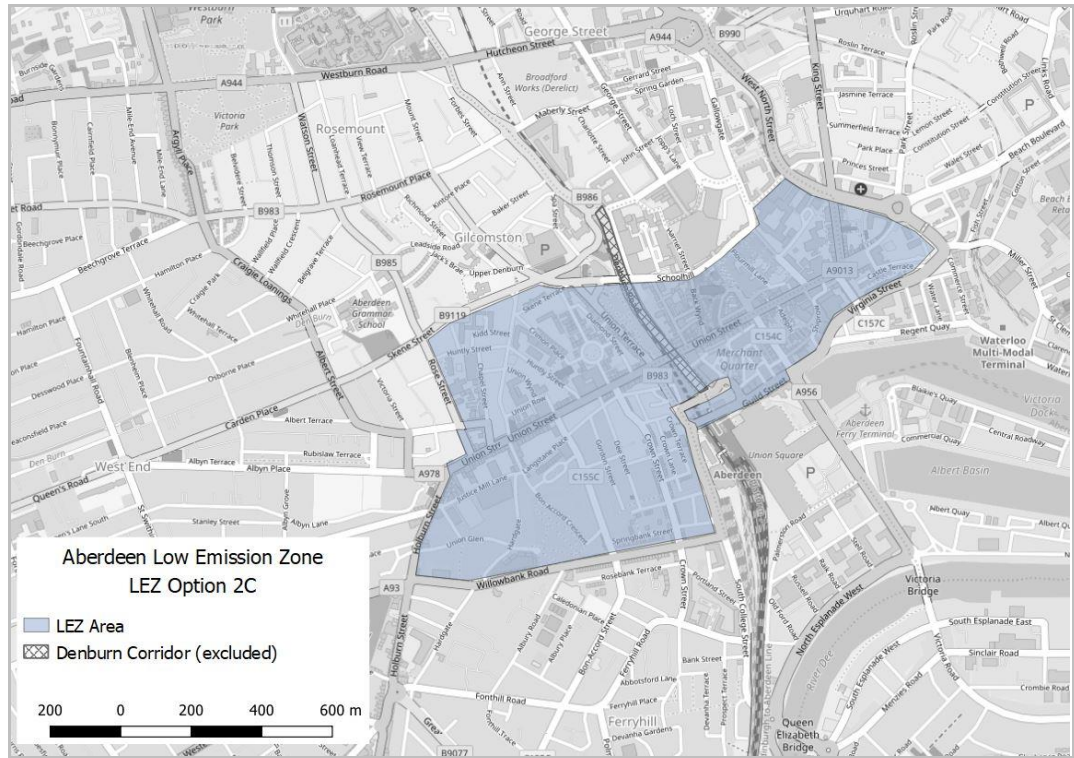
9.5.7

A different option variant, Option 2C, in Figure 9.12, and Option 3C, in Figure 9.13, could exclude only Bridge Street and Wapping Street between Bridge Street and the Trinity Centre car park to allow northbound access to Denburn Road from the wider network while providing continued all direction access to the Trinity Centre car park and possibly local access to minor streets.

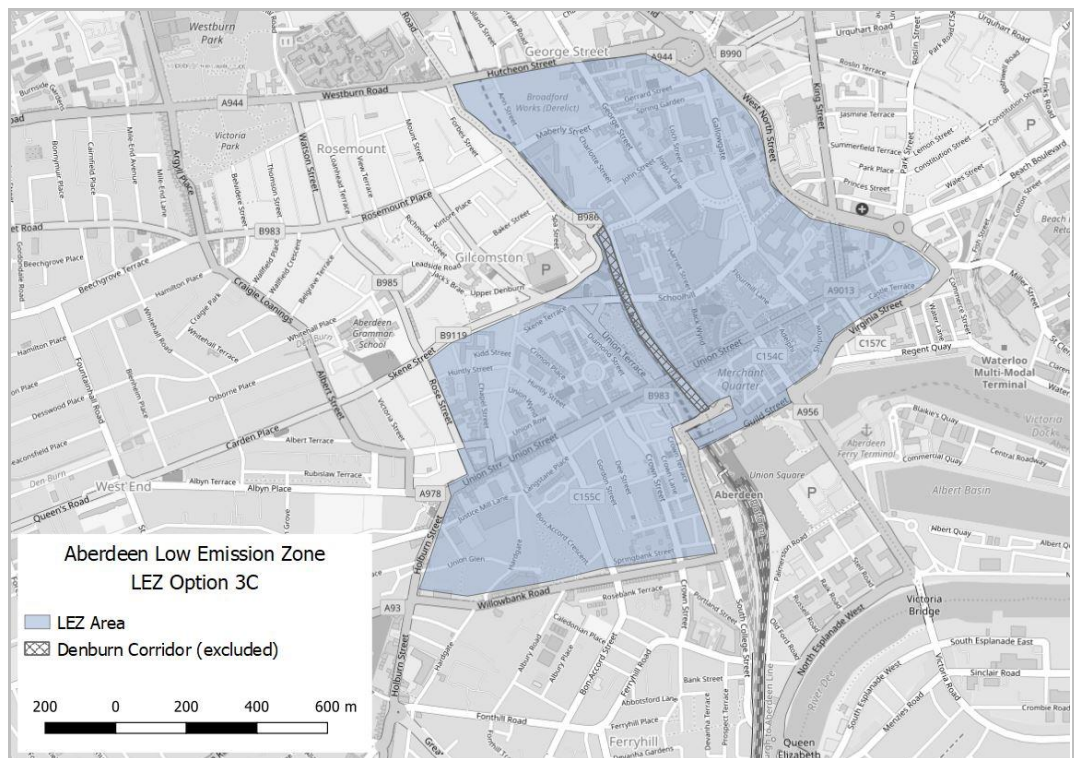


9.5.8

It may be possible to re-design the junction operations at the Bridge Street/Wapping Street and Denburn Road/Wapping Street junctions to allow southbound access from Denburn Road to South Market Street. This would likely require reductions in traffic flow and alterations to priorities at these and other adjacent junctions as was tested in 2016 CCMP testing programme (*Aberdeen city Centre Masterplan Testing – Phase 2 & 3, April 2016, SIAS Ref. 77953*). Any proposed junction changes will require new detailed traffic modelling using the update Paramics traffic to assess the feasibility of such a change together with the introduction of a LEZ and forecast levels of vehicle compliance.



**Figure 9.12 : Option 2C – NB & partial SB Denburn Road access (All Vehicle LEZ)**



**Figure 9.13 : Option 3C – NB & partial SB Denburn Road access (All Vehicle LEZ)**

9.5.9 Option 4, was devised to provide a LEZ option that encompassed all existing air quality exceedance locations in the Aberdeen city centre and is shown in Figure 9.14 with the key strategic routes and access points.

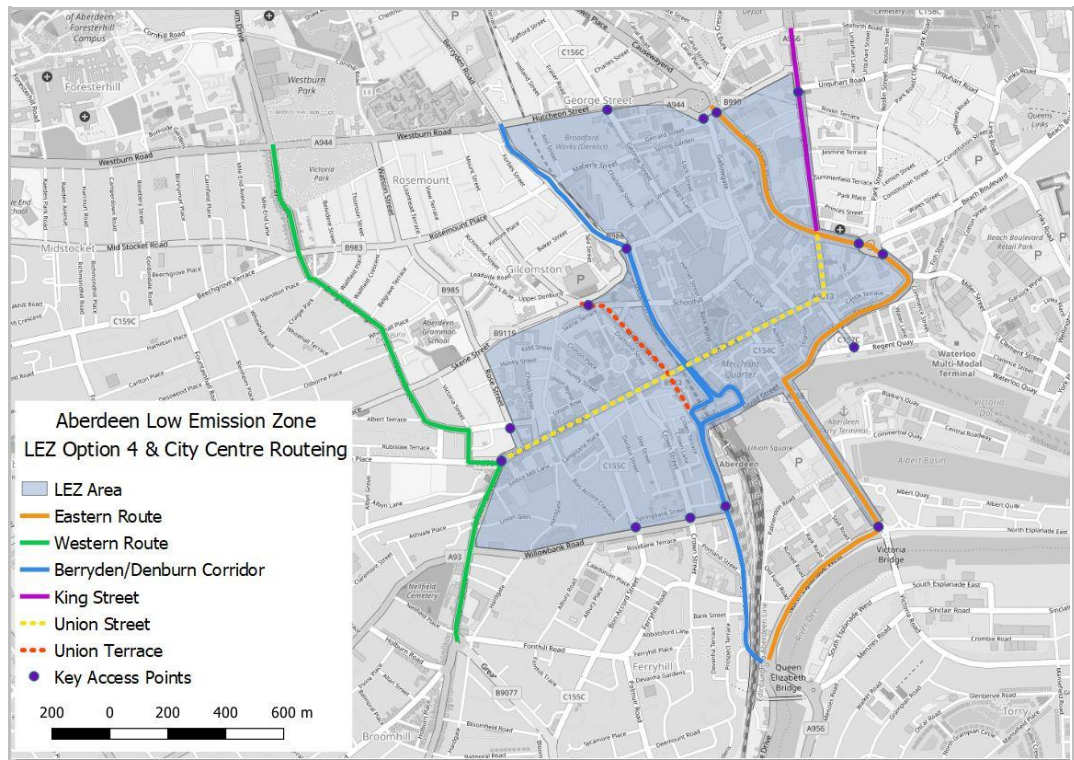


Figure 9.14 : Option 4 Key Routes and Access Points

9.5.10 Option 5, was devised to provide a LEZ option that closely aligned with the City Centre Masterplan boundary and encompassed all existing air quality exceedance locations in the Aberdeen city centre and is shown in Figure 9.15, with the key strategic routes and access points.

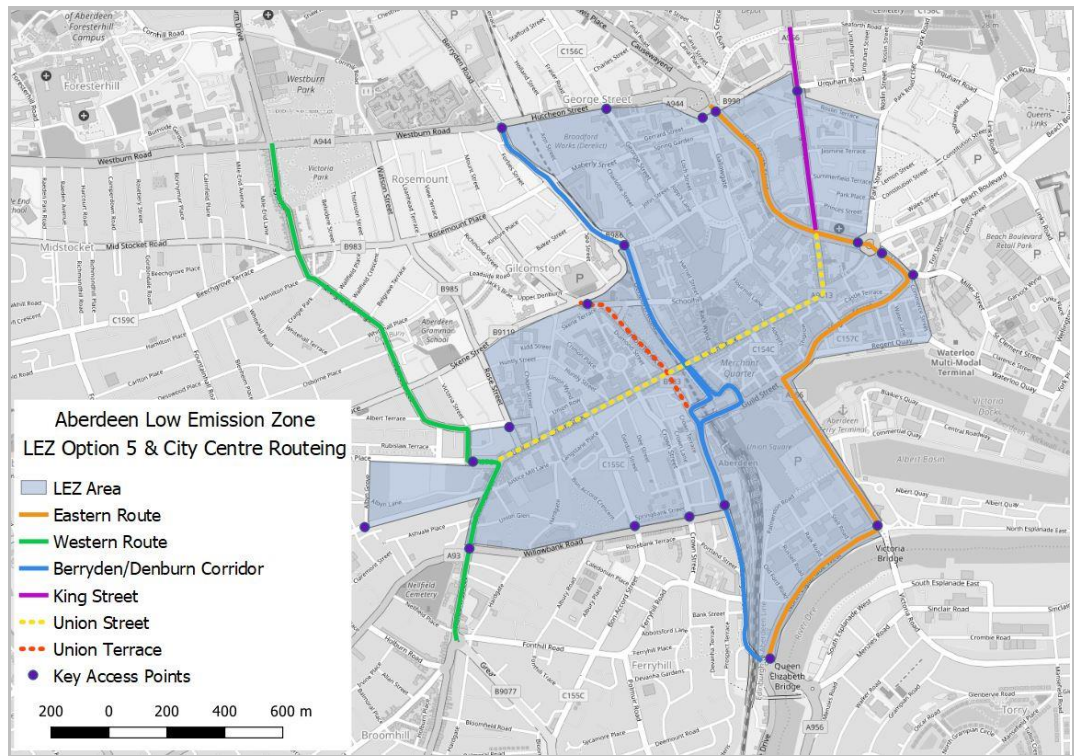
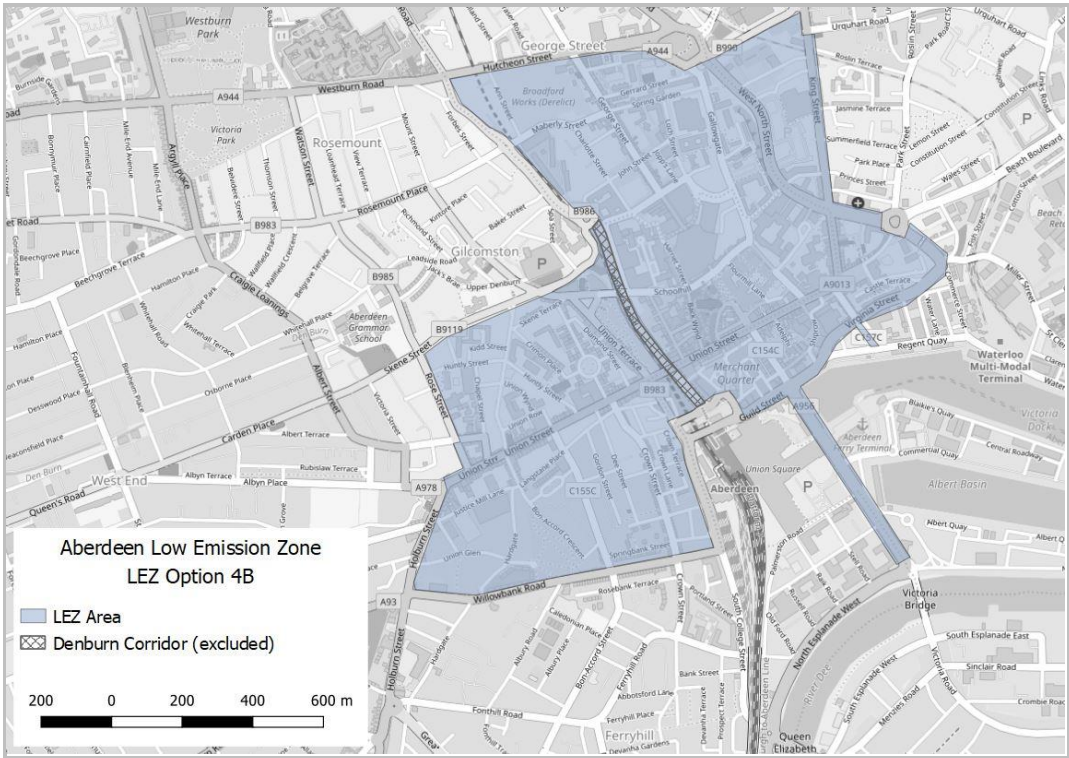


Figure 9.15 : Option 5 Key Routes and Access Points

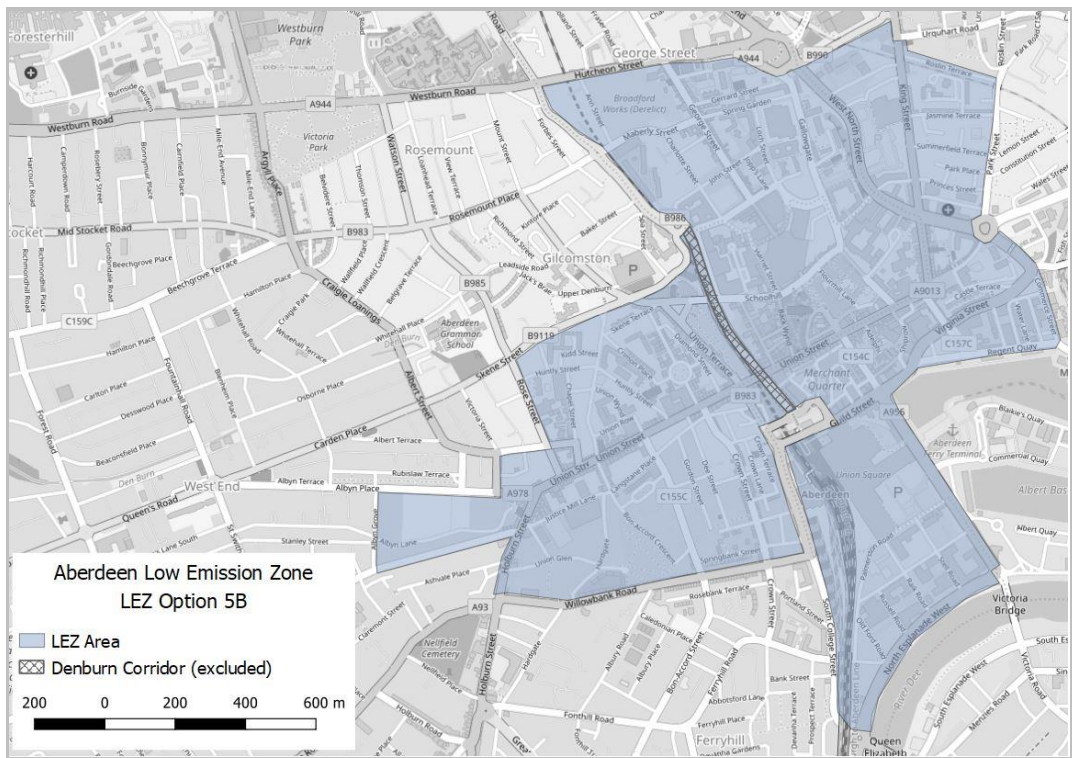
- 9.5.11 Option 4 and Option 5 extend the Option 3 area to the east and south to include West North Street, King Street (south of Urquhart Road), Commerce Street, Virginia Street and Market Street.
- 9.5.12 Option 5 covers a similar area to Option 4 but extends further west to include the north of Holburn Street and south to include North Esplanade West.
- 9.5.13 In Option 4 and Option 5, the Eastern route (North Esplanade, Market Street, Virginia Street, Commerce Street North West Street) is included in the option area and traffic data analysis shows this is a high volume route with between 10,000 and 26,000 vehicles (total all vehicle two-way flow between 07:00 and 19:00) recorded at chosen locations along the length of the route. Both options encompass King Street, another key high volume route with approximate 8500 vehicles (total all vehicle two-way flow between 07:00 and 19:00) recorded along the length of the route.
- 9.5.14 These options do not offer any option variants to exclude the Eastern Route or King Street and therefore all non-compliant vehicles will be required to reroute to alternative routes. The number of non-compliant vehicles, recorded in 2019, on the Eastern Route range from approximately 3,400 to 8,600 vehicles and approximately 2,800 on King Street (total two-way flow between 07:00 and 19:00) between all surveyed locations. As there are no strategic routes to the east, non-compliant vehicles will be required to route via a viable route to the west. Where they route will depend on the level of access to and from Denburn Road (central route) as controlled by the LEZ boundary and permitted by the LEZ option restrictions.
- 9.5.15 As with Options 2 and 3, Denburn Road can be fully or partial excluded from Option 4 and Option 5, depending on the exact geometry of the option. Option 4 and Option 5 as originally derived, will prevent all non-compliant vehicles from using Denburn Road. As noted, traffic data shows there to be approximately 3000 to 4000 non-compliant vehicles on Denburn Road, between Woolmanhill and Guild Street, at 2019 compliance levels. If Denburn Road is included in the LEZ, these non-compliant vehicles will also be required to choose alternative route.
- 9.5.16 In Option 4, with the Eastern Route not available, the Western Route and other local western roads, will likely experience a significant increase in vehicles numbers. In Option 5, the Eastern Route and the Western Route, using Holburn Street, will not be viable alternatives for non-compliant vehicles and therefore adjacent local roads further to the west of the city centre are likely to experience a significant increase in vehicles numbers.
- 9.5.17 Although it is not possible to accurately quantify this increase and identify the exact routes used or forecast the levels of vehicle compliance without detailed traffic and air quality modelling, both LEZ Option 4 and Option 5 are likely to result in relatively high volumes of non-compliant vehicle rerouting. 2019 traffic data suggest up to approximately 12,000 non-compliant vehicles could be rerouted from the identified key routes as a result of Option 4 and up to approximately 18,000 non-compliant vehicles could be rerouted as a result of Option 5, if the options include Denburn Road. Again, it should be noted that the numbers of non-compliant vehicles are based on 2019 data and do not account for fleet renewal or changes to trip choice or mode, a level of analysis to be undertaken through detailed modelling as required.

**Key Point:** The anticipated significant rerouting and localised increase in traffic volumes associated with Option 4 and Option 5 (assumptions based on existing 2019 non-compliant vehicles) is likely to increase congestion and pollution levels and may lead to additional locations of air quality exceedance to the west of Aberdeen city centre. In Option 5, all key routes are included and therefore there may be a wider strategic rerouting of non-compliant vehicles (e.g. using North Anderson Drive) that can be quantified through wider traffic modelling as required.

- 9.5.18 The 2019 traffic survey data also reflects that both King Street and the Eastern Route are key strategic routes for HGVS with between 10% and 15% of all vehicles recorded as HGVs. This compares to average HGV proportions on the Western Route and Denburn Road of approximately 2% and 4% respectively. A key contributor to the HGV levels on the Eastern Route and King Street is Aberdeen Harbour and associated industrial land use, located south and east of Commerce Street, Virginia Street and Market Street. It is assumed that continued access to these locations for HGVs will be required and cognisance of this must be taken when considering the final LEZ option. It is anticipated that the majority of non-compliant HGVs would be replaced by compliant vehicles if the harbour area was included in any LEZ option and it is crucial that engagement with affected operators and business is undertaken to inform the full impacts of any LEZ in Aberdeen.
- 9.5.19 There are two option variants, similar to the Option 2 and Option 3 variants, that could provide full or partial access on Denburn Road and reduce the impact of rerouting non-compliant vehicles. By allowing access to Denburn Road however, it is likely that this route will see an increase in non-compliant vehicles rerouting from the Eastern Route
- 9.5.20 Option 4B, in Figure 9.16, and Option 5B, in Figure 9.17, exclude the Guild Street, Bridge Street, Wapping Street gyratory to provide full northbound and southbound movements on Denburn Road, as per the current road network. This would mean that no non-compliant vehicles would be required to reroute from Denburn Road to an alternative route and the corridor would provide alternative routes for non-compliant vehicles no longer able to use the Eastern Route.



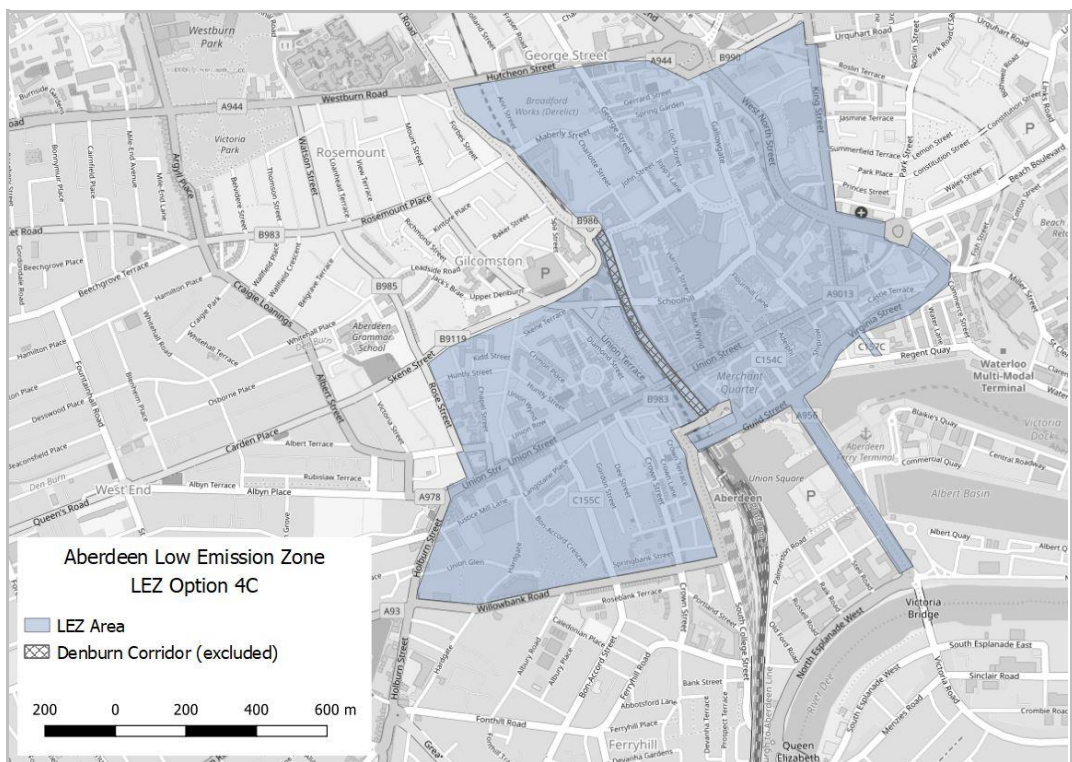
**Figure 9.16 : Option 4B – NB & SB Denburn Road access (All Vehicle LEZ)**



**Figure 9.17 : Option 5B – NB & SB Denburn Road access (All Vehicle LEZ)**

9.5.21

Option 4C, Figure 9.18, and Option 5C, Figure 9.19, excluded only Bridge Street and Wapping Street between Bridge Street and the Trinity Centre car park and would allow northbound access to Denburn Road from the wider network while providing continued all direction access to the Trinity Centre car park. As noted for Option 2C and 3C, it may be possible to re-design the junction operations at the Bridge Street/Wapping Street and Denburn Road/Wapping Street junctions to allow southbound access from Denburn Road to South Market Street, as tested in 2016 CCMP testing programme (*Aberdeen city Centre Masterplan Testing – Phase 2 & 3, April 2016, SIAS Ref. 77953*).



**Figure 9.18 : Option 4C – NB & partial SB Denburn Road access (All Vehicle LEZ)**

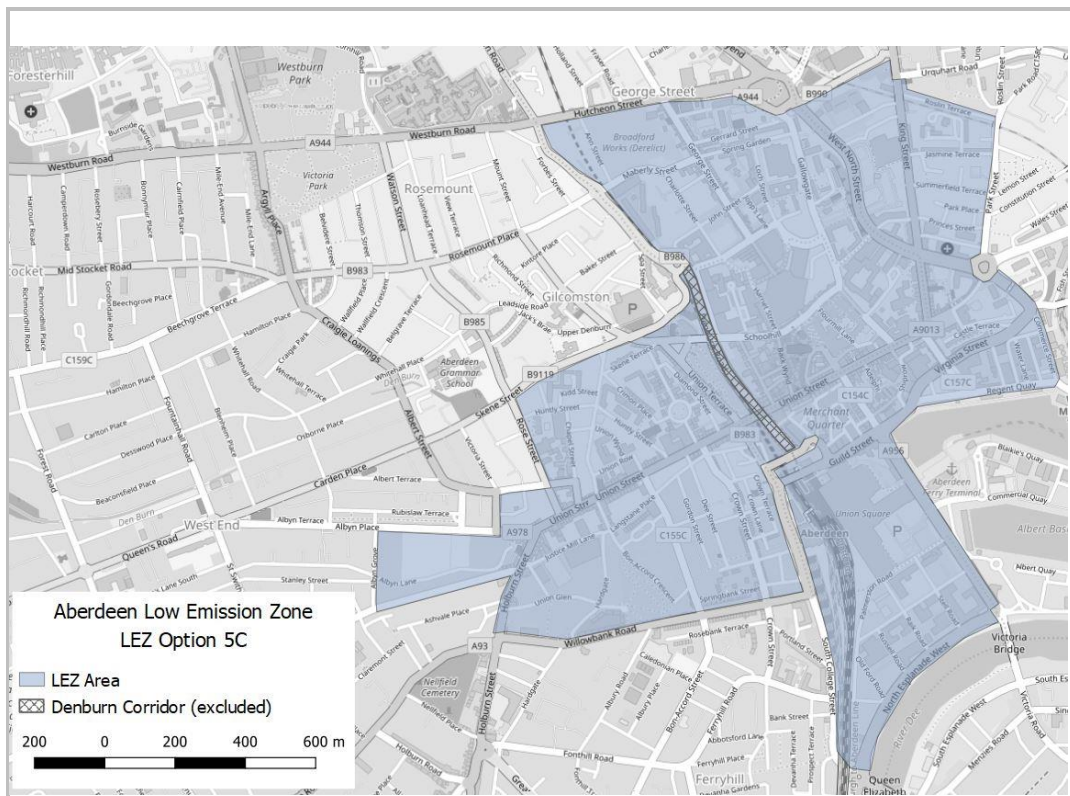


Figure 9.19 : Option 5C – NB & partial SB Denburn Road access (All Vehicle LEZ)

**Key Point:** In Option 4B/C and Option 5B/5C, the increased volume of non-compliant vehicles likely on Denburn Road and Skene Square (assumptions based on existing 2019 non-compliant vehicles), rerouted from the Eastern Route, may lead to an exceedance of the air quality standards on Skene Square where there are two monitoring locations that currently (2018 data) have annual mean NO<sub>2</sub> levels close to 40 µg/m<sup>3</sup>. To fully understand the impacts on air quality, detailed modelling and fleet compliance forecasts are required should these options be recommended for further testing.

9.5.22 The analysis of traffic flows and Denburn Road access has identified a number of all vehicle LEZ option variants, though it should be noted that at this stage of the appraisal process their suitability as final LEZ is options is still to be fully examined. Table 9.6 summaries the identified LEZ option variants.

**Table 9.6 : LEZ Options 2- 5: Option Variants**

Option	Option Description	Variant	Variant Description
Option 2A	Union Street Area	Includes Denburn Road	No access for non-compliant vehicles
Option 2B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles
Option 2C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access
Option 3A	Union Street & George Street Area	Includes Denburn Road	No access for non-compliant vehicles
Option 3B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles
Option 3C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access
Option 4A	City Centre Air Quality Exceedance Area	Includes Denburn Road	No access for non-compliant vehicles
Option 4B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles
Option 4C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access
Option 5A	City Centre Masterplan Area	Includes Denburn Road	No access for non-compliant vehicles
Option 5B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles
Option 5C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access

## 9.6 All Vehicle LEZ – Internal Routeing and Access

9.6.1 In addition to the external and through routes identified in the Denburn Road analysis above, there are a number of internal key routes and access points in each LEZ option that will be impacted by the introduction of a LEZ.

9.6.2 As in Table 9.5 above, the analysis undertaken in this section examines the approximate total number of non-compliant vehicles currently on-street based on 2019 traffic survey data. The proportion of non-compliant vehicles city-wide in Aberdeen is calculated using the ANPR analysis as detailed Section 4.6.1 and summarised in Table 9.4. Again, it should be noted that if and when an all vehicle LEZ is enforced in Aberdeen, the total number of non-compliant vehicles is likely to have reduced, primarily due to normal fleet improvements as drivers replace their vehicles but also from potential behaviour changes such as a switch to more sustainable modes of transport and increased working from home practices. At this stage of the interim NLEF appraisal, only the current levels of non-compliant vehicles, using existing data, are assessed, and cognisance of this should be taken when interpreting the data. The LEZ options that progress to detailed testing will be subject to the same analysis but on an agreed predicted future year compliance level, as agreed with ACC and SEPA.

9.6.3 Union Street is entirely internal to all LEZ option areas. It currently operates as a key strategic route in the city and all LEZ options will significantly impact on vehicles on this route. 2019 traffic data (detailed in Table 9.5 above) shows there to be approximately 3000 to 4000 existing non-compliant vehicles on Union Street at assessed locations along its length. Further interrogation of individual junction turn count data suggests that the majority of traffic use the full length of Union Street as a route to other locations in the city, as opposed to using it to access parking or services, although this cannot be confirmed at this stage. It is therefore assumed that non-compliant vehicles currently utilising Union Street will change to alternative routes, such as part of the eastern and western routes or, depending on the exact boundary of the LEZ, Denburn Road if an LEZ is enforced.

9.6.4 In addition to the key routes through and inside the option area, there are a number of key access points where vehicles currently enter the proposed area. At these locations, where traffic surveys information is available, analysis of traffic flows has been undertaken.

9.6.5 Analysis of traffic volumes at key access points for Option 2 (all variants) is detailed in Table 9.7 and Figure 9.8.

**Table 9.7 : Option 2 – Traffic Flow Analysis at Key Access Points (12 hour all vehicle flow)**

Site Name	Direction	12-Hour Flow				No. of Non-compliant vehicles			
		Car	LGV	HGV	Total	Car	LGV	HGV	Total
Union Street (west)	In	3996	634	263	4893	1210	379	71	1660
	Out	3129	503	245	3877	947	301	66	1314
Marischal Street	In	400	80	17	497	121	48	5	174
	Out	1142	248	51	1441	346	148	14	508
Market Street	In	1278	244	356	1878	387	146	96	629
	Out	1887	343	179	2409	571	205	48	825
Guild Street	In	2674	312	131	3117	810	187	35	1031
	Out	3120	376	523	4019	945	225	141	1311
Bridge Street	In	5851	740	248	6839	1771	442	67	2281
	Out	4097	516	222	4835	1240	309	60	1609
Crown Street	In	1283	157	18	1458	388	94	5	487
	Out	1689	260	25	1974	511	155	7	674
Bon-Accord Street	In	1662	219	29	1910	503	131	8	642
	Out	2025	284	37	2346	613	170	10	793
Union Street (east)	In	5768	772	198	6738	1746	462	53	2261
	Out	4383	607	172	5162	1327	363	46	1736
Rose Street	In	0	0	0	0	0	0	0	0
	Out	2823	342	43	3208	855	204	12	1071
Union Terrace	In	2088	279	47	2414	632	167	13	812
	Out	2763	372	55	3190	836	222	15	1074
Back Wynd	In	717	103	22	842	217	62	6	285
	Out	0	0	0	0	0	0	0	0
Denburn Road	In	4967	600	104	5671	1504	359	28	1891
	Out	5702	735	161	6598	1726	439	43	2209

9.6.6 In total, across all 2019 surveyed locations on the border of the proposed Option 2 LEZ area, there are currently approximately 36,000 vehicles/12,000 non-compliant vehicles that enter the zone and approximately 39,000 vehicles/13,000 non-compliant that exit the zone over a 12 hour period (07:00 – 19:00).



9.6.7 Analysis of traffic volumes at key access points for Option 3 (all variants) is detailed in Table 9.8 and Figure 9.9.

**Table 9.8 : Option 3 – Traffic Flow Analysis at Key Access Points (12 hour all vehicle flow)**

Site Name	Direction	12-Hour Flow				No. of Non-compliant vehicles			
		Car	LGV	HGV	Total	Car	LGV	HGV	Total
Union Street (west)	In	3996	634	263	4893	1210	379	71	1660
	Out	3129	503	245	3877	947	301	66	1314
Marischal Street	In	400	80	17	497	121	48	5	174
	Out	1142	248	51	1441	346	148	14	508
Market Street	In	1278	244	356	1878	387	146	96	629
	Out	1887	343	179	2409	571	205	48	825
Guild Street	In	2674	312	131	3117	810	187	35	1031
	Out	3120	376	523	4019	945	225	141	1311
Bridge Street	In	5851	740	248	6839	1771	442	67	2281
	Out	4097	516	222	4835	1240	309	60	1609
Crown Street	In	1283	157	18	1458	388	94	5	487
	Out	1689	260	25	1974	511	155	7	674
Bon-Accord Street	In	1662	219	29	1910	503	131	8	642
	Out	2025	284	37	2346	613	170	10	793
Union Street (east)	In	5768	772	198	6738	1746	462	53	2261
	Out	4383	607	172	5162	1327	363	46	1736
Rose Street	In	0	0	0	0	0	0	0	0
	Out	2823	342	43	3208	855	204	12	1071
Rosemount Viaduct	In	3282	301	54	3637	994	180	15	1188
	Out	2682	264	51	2997	812	158	14	984
Denburn Road	In	4967	600	104	5671	1504	359	28	1891
	Out	5702	735	161	6598	1726	439	43	2209
Malberly Street	In	2586	468	65	3119	783	280	18	1080
	Out	743	120	16	879	225	72	4	301
George Street	In	2112	317	40	2469	639	190	11	840
	Out	2281	363	47	2691	691	217	13	920
Gallowgate	In	5280	535	406	6221	1598	320	110	2028
	Out	4712	460	398	5570	1426	275	107	1809

9.6.8 In total, across all 2019 surveyed locations on the border of the proposed Option 3 LEZ area, there are currently approximately 48,000 vehicles/16,000 non-compliant vehicles that both enter the zone and exit the zone over a 12 hour period.

## 9.6.9

Analysis of traffic volumes at key access points for Option 4 (all variants) is detailed in Table 9.9 and Figure 9.14.

**Table 9.9 : Option 4 – Traffic Flow Analysis at Key Access Points (12 hour all vehicle flow)**

Site Name	Direction	12-Hour Flow			No. of Non-compliant vehicles				
		Car	LGV	HGV	Total	Car	LGV	HGV	Total
Commerce Street	In	6473	1087	653	8213	1960	650	176	2786
	Out	6083	1009	555	7647	1842	603	150	2595
Marischal Street	In	400	80	17	497	121	48	5	174
	Out	1142	248	51	1441	346	148	14	508
Market Street	In	7827	1546	1327	10700	2370	924	358	3652
	Out	8995	1720	1384	12099	2723	1028	374	4125
South College Street	In	5874	817	247	6938	1778	489	67	2333
	Out	4161	551	231	4943	1260	329	62	1651
Crown Street	In	1283	157	18	1458	388	94	5	487
	Out	1689	260	25	1974	511	155	7	674
Bon-Accord Street	In	1662	219	29	1910	503	131	8	642
	Out	2025	284	37	2346	613	170	10	793
Union Street (West)	In	5768	772	198	6738	1746	462	53	2261
	Out	4383	607	172	5162	1327	363	46	1736
Rose Street	In	0	0	0	0	0	0	0	0
	Out	2823	342	43	3208	855	204	12	1071
Rosemount Viaduct	In	3282	301	54	3637	994	180	15	1188
	Out	2682	264	51	2997	812	158	14	984
Denburn Road	In	4967	600	104	5671	1504	359	28	1891
	Out	5702	735	161	6598	1726	439	43	2209
Maberly Street	In	2586	468	65	3119	783	280	18	1080
	Out	743	120	16	879	225	72	4	301
George Street	In	2112	317	40	2469	639	190	11	840
	Out	2281	363	47	2691	691	217	13	920
Gallowgate	In	5280	535	406	6221	1598	320	110	2028
	Out	4712	460	398	5570	1426	275	107	1809
West North Street	In	5028	710	434	6172	1522	425	117	2064
	Out	6020	869	471	7360	1822	520	127	2469
King Street	In	3004	531	600	4135	909	317	162	1389
	Out	3201	574	578	4353	969	343	156	1468
East North Street	In	2705	508	400	3613	819	304	108	1231
	Out	5817	784	503	7104	1761	469	136	2366

## 9.6.10

In total, across all 2019 surveyed locations on the border of the proposed Option 4 LEZ area, there are currently approximately 71,000 vehicles/24,000 non-compliant vehicles that enter the zone and approximately 76,000 vehicles/25,600 non-compliant vehicles that exit the zone over a 12 hour period.

9.6.11 Analysis of traffic volumes at key access points for Option 5 (all variants) is detailed in Table 9.10 and Figure 9.15.

**Table 9.10 : Option 5 – Traffic Flow Analysis at Key Access Points (12 hour all vehicle flow)**

Site Name	Direction	12-Hour Flow				No. of Non-compliant vehicles			
		Car	LGV	HGV	Total	Car	LGV	HGV	Total
Commerce Street	In	6473	1087	653	8213	1960	650	176	2786
	Out	6083	1009	555	7647	1842	603	150	2595
Castle Terrace	In	1678	435	200	2313	508	260	54	822
	Out	3415	739	393	4547	1034	442	106	1582
Market Street	In	7827	1546	1327	10700	2370	924	358	3652
	Out	8995	1720	1384	12099	2723	1028	374	4125
North Esplanade West (E)	In	6625	1189	1006	8820	2006	711	272	2988
	Out	5632	1050	1000	7682	1705	628	270	2603
North Esplanade West (W)	In	7114	1257	1035	9406	2154	752	279	3185
	Out	7210	1266	1041	9517	2183	757	281	3221
South College Street	In	5874	817	247	6938	1778	489	67	2333
	Out	4161	551	231	4943	1260	329	62	1651
Crown Street	In	1283	157	18	1458	388	94	5	487
	Out	1689	260	25	1974	511	155	7	674
Bon-Accord Street	In	1662	219	29	1910	503	131	8	642
	Out	2025	284	37	2346	613	170	10	793
Holburn Street	In	5507	689	215	6411	1667	412	58	2137
	Out	4848	688	175	5711	1468	411	47	1926
Union Grove	In	1221	147	41	1409	370	88	11	469
	Out	1890	209	66	2165	572	125	18	715
Alford Place	In	4561	557	142	5260	1381	333	38	1752
	Out	3670	450	152	4272	1111	269	41	1421
Rose Street	In	0	0	0	0	0	0	0	0
	Out	2823	342	43	3208	855	204	12	1071
Rosemount Viaduct	In	3282	301	54	3637	994	180	15	1188
	Out	2682	264	51	2997	812	158	14	984
Denburn Road	In	4967	600	104	5671	1504	359	28	1891
	Out	5702	735	161	6598	1726	439	43	2209
Maberly Street	In	2586	468	65	3119	783	280	18	1080
	Out	743	120	16	879	225	72	4	301
George Street	In	2112	317	40	2469	639	190	11	840
	Out	2281	363	47	2691	691	217	13	920
Gallowgate	In	5280	535	406	6221	1598	320	110	2028
	Out	4712	460	398	5570	1426	275	107	1809
West North Street	In	5028	710	434	6172	1522	425	117	2064
	Out	6020	869	471	7360	1822	520	127	2469
King Street	In	3004	531	600	4135	909	317	162	1389
	Out	3201	574	578	4353	969	343	156	1468
East North Street	In	2705	508	400	3613	819	304	108	1231
	Out	5817	784	503	7104	1761	469	136	2366

9.6.12 In total, across all 2019 surveyed locations on the border of the proposed Option 5 LEZ area, there are currently approximately 98,000 vehicles/33,000 non-compliant vehicles that enter the zone and approximately 104,000 vehicles/35,600 non-compliant vehicles that exit the zone over a 12 hour period.

9.6.13 In all options, a large proportion of recorded vehicles will enter and exit the zone in one “trip” (i.e. routeing through the entire zone on key routes such as Union Street or Denburn Road if included) and are therefore double-counted. There are also likely to be a number of other possible routes through the zone where double-counting occurs (e.g. Crown Street to Union Terrace). Although not possible to quantify with existing data (see Sections 9.7 and 9.8 below), there will also be a large number of vehicles that enter the proposed zone, park and access services and then exit the zone at a later time.

9.6.14 It is therefore not possible at this stage to accurately quantify the total number of non-compliant vehicle trips that will be required to reroute as a result of each proposed LEZ option and the total number rerouting will vary depending on option boundaries and key included routes. The proportion of non-compliant vehicles in Aberdeen at the time of enforcement of an all vehicle LEZ is also unknown and as noted likely to be smaller than existing 2019 recorded levels. However, using the available data, the following estimations can be made on the total number non-compliant vehicles impacted by each LEZ option based on 2019 traffic survey data:

- Option 2: Greater than 10,000 non-compliant vehicles per day
- Option 3: Greater than 10,000 non-compliant vehicles per day
- Option 4: Greater than 15,000 non-compliant vehicles per day
- Option 5: Greater than 15,000 non-compliant vehicles per day

**Key Point:** Current observed NO<sub>2</sub> levels on Holburn Street, Trinity Quay, West North Street and Skene Square (currently between 36 µg/m<sup>3</sup> and 40 µg/m<sup>3</sup>) suggest an increase in non-compliant vehicles at these locations, and possible others, will likely lead to additional exceedances of the NO<sub>2</sub> annual mean and therefore any LEZ option that moves significant numbers of non-compliant vehicles to these locations is likely be considered unsuitable in isolation. However if delivered with targeted interventions it may be possible to improve vehicle flow and reduce congestion to mitigate against any increases. As noted it is therefore crucial that detailed traffic modelling, with suitable non-compliant fleet projections is undertaken to provide evidence of the impacts of the LEZ and identify supporting mitigation that will be required.

## 9.7 Access to City Centre Car Parks

9.7.1 Key to understanding the routing and volume of trips impacted by the proposed LEZ are the routes and destinations of trips on the road network. Aberdeen city centre is a major trip attractor and generator with multiple land uses and city centre car parks are a key start and end point for vehicle trips to and from the city centre. The primary car park locations and their capacities are shown in Figure 9.20.



Figure 9.20 : Aberdeen City Centre Car Park Locations and Capacities

9.7.2 The city centre car parks are contained in all four all vehicle LEZ options to varying degrees and therefore there will be impacts on the wider city routing as non-compliant vehicles adjust their routes to utilise a car park outside any proposed LEZ. Table 9.11 lists the main city centre car parks and their capacity, with an indication whether each car park is contained within all LEZ option variants. Note, Options A include Denburn Road and therefore include the Trinity Centre car park and, in Option 4A and 5A, College Street car park. Options B and C provide access to Denburn Road and in turn access to the Trinity Centre and College Street car parks.

9.7.3 Clearly Option 2, covering the smallest area, contains the fewest car park spaces and has over 70% of listed spaces available for compliant and non-compliant vehicles to utilise. It is expected that Option 2 will result in non-compliant vehicles that currently utilise a car park inside the LEZ area choosing a different car park but it is assumed that there will be sufficient capacity at car parks outside the LEZ area to accommodate these vehicles. As expected, as each option area increases in size, the availability of car park spaces reduces. Option 4A and Option 5A contain over 80% of all listed spaces and there may not be capacity at car parks outside the proposed LEZ areas for non-compliant vehicles.

9.7.4 The final LEZ option will require a supporting car parking strategy to ensure there is sufficient capacity for compliant and non-compliant vehicles. ACC are currently compiling car park capacity data and, if available, will inform the final NLEF appraisal, and in turn be used to inform any parking strategy. This data will allow an assessment of the capacity of car parks outside a proposed LEZ boundary to accommodate non-compliant vehicles that currently park inside a proposed LEZ boundary.

**Table 9.11 : City Centre Car Parks and LEZ Area**

Car Park	Capacity	Car Park Located Inside LEZ Option Area (Y/N)							
		2A	2B/C	3A	3B/C	4A	4B/C	5A	5B/C
Chapel Street	500	Y	Y	Y	Y	Y	Y	Y	Y
Trinity Centre	397	Y	N	Y	N	Y	N	Y	N
Ship Row	365	Y	Y	Y	Y	Y	Y	Y	Y
IQ Car Park	260	Y	Y	Y	Y	Y	Y	Y	Y
Marishal College	100	Y	Y	Y	Y	Y	Y	Y	Y
Summer Street	25	Y	Y	Y	Y	Y	Y	Y	Y
Union Square	1200	N	N	N	N	Y	Y	Y	Y
Bon Accord (Loch Street)	770	N	N	Y	Y	Y	Y	Y	Y
College Street	456	N	N	N	N	Y	N	Y	N
Bon Accord (Harriet Street)	400	N	N	Y	Y	Y	Y	Y	Y
Denburn Car Park	325	N	N	N	N	N	N	N	N
Lime Street	250	N	N	N	N	N	N	N	N
West North Street	160	N	N	Y	Y	Y	Y	Y	Y
Frederick Street	150	N	N	N	N	N	N	Y	Y
Gallowgate	138	N	N	Y	Y	Y	Y	Y	Y
Crombie Road	60	N	N	N	N	N	N	N	N
Church Street	50	N	N	N	N	N	N	N	N
Virginia Street	46	N	N	N	N	N	N	Y	Y
Fonthill Road	8	N	N	N	N	N	N	N	N
<b>Total Spaces Inside LEZ Area</b>	<b>5660</b>	<b>1647</b>	<b>1250</b>	<b>3115</b>	<b>2718</b>	<b>4771</b>	<b>3918</b>	<b>4967</b>	<b>4114</b>
<b>% Spaces Inside LEZ Area</b>	<b>-</b>	<b>29%</b>	<b>22%</b>	<b>55%</b>	<b>48%</b>	<b>84%</b>	<b>69%</b>	<b>88%</b>	<b>73%</b>

9.7.5 As part of the extensive traffic survey data collection required to inform the development of the Aberdeen Paramics traffic model, Automatic Number Plate Recognition surveys (ANPR) were undertaken at 17 “external” locations on key routes in and out of Aberdeen city centre and at 11 city centre car park locations as shown in Figure 9.21.



**Figure 9.21 : ANPR Survey Locations**

9.7.6 Travel patterns to and from city centre car parks can be informed by the ANPR data and used to build up a picture of route choice to these key locations and the potential impact on routing that the proposed all vehicle LEZ may have. The external ANPR survey locations were split into 3 sectors, North, South and West, as shown in Figure 9.21, and the total proportion of trips from these sectors to each car park was calculated, as detailed in Table 9.12.

**Table 9.12 : External ANPR Site to City Centre Car Park Distribution**

Car Park	Car Park Sector	Car Park Capacity	Sector where journey originating		
			North	South	West
Bon Accord (Loch Street)	North	770	16%	4%	6%
Bon Accord (Harriet Street)	North	400	3%	2%	6%
Denburn Car Park	North	325	9%	4%	9%
West North Street	North	160	5%	2%	2%
Gallowgate	North	138	11%	3%	8%
Union Square	South	1200	30%	55%	35%
College Street Car Park	South	456	7%	13%	11%
Trinity Centre	South	397	9%	8%	8%
Ship Road	South	365	2%	3%	2%
Chapel Street Car Park	West	500	8%	4%	12%
IQ Car Park	West	260	1%	0%	1%

9.7.7 Table 9.12 highlights a number of travel pattern trends. In particular it is clear that trips entering from one side of the city route across the city to access all car parks. For example, the data shows the Union Square car park is most commonly used car park by vehicles from all three sectors. The Union Square car park is relatively modern, has the largest capacity in the city and is linked to the Union Square shopping centre and train station and it is therefore expected to be a main attractor of trips.

9.7.8 As detailed in Table 9.11, the Union Square car park is located inside all variants of LEZ Options 4 and 5 and therefore will not be accessible to non-compliant vehicles. In all variants of Option 2 and Option 3, Union Square is outside the proposed LEZ area and is

located to the south of Union Street. In Option 2 and Option 3, routes for non-compliant vehicles originating from the south sector of the city will not be impacted by any LEZ. Trips from the west or the north sectors that choose to route to Union Square via Berryden Road and/or Denburn Road would be impacted by all current variants of Option 2 and 3. Non-compliant would be required to find alternative routes such as the A96/West North Street/Commerce Street/Virginia Street.

9.7.9 Union Square shopping centre is also the location of Shop Mobility Aberdeen and cognisance of this should be taken when defining a final LEZ option area. Those who require access to such services should still be able to do so without discrimination, and having a non-compliant vehicle should not be a reason to stop access to a vital service. [Regulation 3](#) of the LEZ Regulations states vehicles for disabled persons, either disabled tax class registered or used with the Blude Badge Scheme, will be exempt from penalty charges and will therefore be able to access this particular services. Consideration of those that do not meet this (or other) exemption criteria will be considered when defining the final preferred LEZ option and through the supporting integrated impact assessment.

9.7.10 Table 9.13 shows the volume of traffic routing inbound to the city centre car parks by sector. The numbers provided are the total vehicles recorded over a 12 hour period (07:00-19:00). The table also shows the resultant volume of car parking traffic which is routing across the city centre to destinate in the car park of choice.

**Table 9.13 : Inbound to Car Park Trips (12hr 07:00 – 19:00)**

Sector	Car Parks						Total Parking	Cross City	
	North Car Parks		South Car Parks		West Car Parks			(Veh)	%age
North	506	43%	558	48%	103	9%	1,167	661	57%
South	244	16%	1,192	79%	70	5%	1,506	314	21%
West	282	31%	509	56%	113	13%	904	791	88%
<b>Total</b>	<b>1,032</b>	<b>29%</b>	<b>2,259</b>	<b>63%</b>	<b>286</b>	<b>8%</b>	<b>3,577</b>	<b>1,766</b>	<b>49%</b>

9.7.11 Table 9.14 provides a similar set of results but for traffic routing from the city centre car parks.

**Table 9.14 : Outbound to Car Park Trips (12hr 07:00 – 19:00)**

Car Parks	Sector						Total Parking	Cross City	
	North		South		West			(Veh)	%age
North Car Parks	605	47%	344	27%	334	26%	1,283	678	53%
South Car Parks	336	22%	902	60%	271	18%	1,509	607	40%
West Car Parks	108	37%	92	31%	94	32%	294	200	68%
<b>Total</b>	<b>1,049</b>	<b>34%</b>	<b>1,338</b>	<b>43%</b>	<b>699</b>	<b>23%</b>	<b>3,086</b>	<b>1,485</b>	<b>48%</b>

9.7.12 The analysis shows that approximately half of all the car parking traffic routes across the city centre area to destinate in the car park of choice. The same proportion applies to traffic exiting these car parks.

9.7.13 In real terms, this equates to over 1,700 vehicles inbound and 1,500 vehicles outbound which are routing across the city centre in the weekday 12 hour period. It is highly likely that these figures would be significantly higher at the weekend or through holiday periods. These figures are also based solely upon the data collated, therefore the actual figures are likely to be higher.

9.7.14 The introduction of a LEZ will restrict the number of car park spaces available for non-compliant vehicles and will also result in rerouting of non-compliant vehicles. The above analysis suggests that if car parking traffic can be encouraged to park in the sector of origin, i.e. the nearest car park(s) to their route into the city centre, then this will reduce the volume of traffic routing across the core area of the city centre. This may potentially be of benefit when introducing a LEZ and mitigating its likely routeing changes.

**Key Point:** The final LEZ option will require a supporting car parking strategy in order to discourage routing across the city centre area. This would need to be supported by an integrated pedestrian signing strategy, together with a longer term placemaking strategies such as the City Centre Masterplan, to encourage greater utilisation of public transport, park and ride, walking and cycling.

## 9.8 Residential and Business Access to a LEZ

9.8.1 Residential property and business, retail and industrial land use are other main generators of trips in Aberdeen city centre. Aside from analysing city centre car park usage and travel patterns, it is difficult to quantify the total numbers of daily trips made to and from a particular LEZ area by those living, working or providing a service in the proposed LEZ area. Trips that travel to and from these land uses for such purposes are likely to still be required to make the same trip if an LEZ is in place. If they currently use a non-compliant vehicle to make this trip then either their movements, mode or vehicle type compliance is likely to change as a result of the LEZ.

9.8.2 One indicator of trips that currently start or end their trip in the proposed LEZ area is parking permit data. In Aberdeen, a person is entitled to a resident or business parking permit if their property or business is within a controlled parking zone. At the time of writing, historic (2012) is the only dataset available for such analysis. Analysis of historic data is considered relevant as the total number of residents or business spaces in the city centre is unlikely to have changed significantly in the city centre. Table 9.15 details the total number of parking permits (in 2012), both residential and business, that are located in each all vehicle LEZ option, alongside the proportion of all ACC permits inside each option.

**Table 9.15 : Parking Permit per LEZ Option (2012 Figures)**

Option	All Vehicles		Non-compliant vehicles	
	No. of Permits	% of ACC permits	No. of Permits	% of ACC permits
Option 2	903	8%	273	3%
Option 3	1287	12%	390	4%
Option 4	1407	13%	426	4%
Option 5	1575	15%	477	4%

9.8.3 The non-compliant figure is calculated from observed levels of non-compliant vehicles in Aberdeen in 2019 where 30% of all cars are calculated to be non-compliant (see analysis in Section 4.6.1). For example, LEZ Option 2 covers 6 parking zones (fully and partially) and the total number of resident and business permits issued by ACC in 2012 was 903. Applying the compliance factor, it is estimated that between 250 and 300 vehicles with parking permits would be non-compliant in 2019 and be required to park outside the LEZ area to avoid penalty.

9.8.4 There are also likely to be wider impacts on residents and businesses inside a LEZ area, such as access for both personal and business deliveries or infrequent visitors to a property or business. It is important that engagement with those likely to be impacted by any proposed LEZ is undertaken so any impacts can be understood and be used to inform the final LEZ option. It is also possible that residents and businesses inside any LEZ could be given additional grace periods to comply with LEZ restrictions, a decision that will be informed by the emerging guidelines and regulations as well as the modelling and consultation exercises.

9.8.5 There are key routes for commercial vehicles (e.g. LGVs and HGVS) inside the city centre that are either fully or partially encompassed by the proposed LEZ options areas, such as Union Street (for delivery) and Market Street, Virginia Street, Commerce Street, West and



East North Street (Eastern Route) and King Street. A key contributor to the relatively high proportion of HGV (as noted in Section 9.5 on the Eastern Route and King Street) is Aberdeen Harbour and associated industrial land use, located south and east of Commerce Street, Virginia Street and Market Street. It is assumed that continued access to these locations for HGVs will be required and cognisance of this must be taken when considering the final LEZ option. Option 4 and Option 5 include the full length of this key Eastern Route. The options were devised to capture air quality exceedances along the route, however this means that there is no option that captures the majority of air quality exceedances while providing full access to Aberdeen Harbour (from Market Street) and Union Square, two key land uses in the city centre area. It is anticipated that the majority of non-compliant HGVs would be replaced by compliant vehicles if the harbour area was included in any LEZ option (for harbour businesses to continue to operate) and it is crucial that engagement with affected operators and business is undertaken to inform the full impacts of any LEZ in Aberdeen. In addition to industrial land uses around the harbour area, ferry services to Orkney and Shetland are located here, with access from Market Street. It may be deemed unsuitable to enforce an LEZ that would penalise those using a vital service. Further consideration of Aberdeen Harbour access is made in Section 9.12.

**Key Point:** The final LEZ option will be required to address the requirements of residents and business impacted by the introduction of a LEZ to the area where they live, work, trade or do business. Actions such as communication strategies and consideration of additional grace periods for residents and businesses of the zone must form part of the final package.

## 9.9 Existing Aberdeen City Council Strategies

9.9.1 The Aberdeen LEZ and any complimentary traffic management measures should align with the existing transport policy landscape in Aberdeen. As reviewed in Chapter 3, key Aberdeen policies and strategies that may influence or be influence by the final LEZ option(s) are:

- Aberdeen City Centre Masterplan (CCMP)
- Aberdeen City Sustainable Urban Mobility Plan (SUMP)
- North East Scotland Roads Hierarchy Study

9.9.2 Each strategy is crossed checked against the remaining four LEZ options to ensure there is not significant contradictions. Although there will be differences, it is crucial that the introduction of a LEZ does not contradict or interrupt the implementation of these existing key ACC policies.

### **Aberdeen City Centre Masterplan (CCMP) and Sustainable Urban Mobility Plan (SUMP)**

9.9.3 The CCMP was approved by ACC in June 2015 and it outlines a 25-year development strategy for the city centre designed to support economic growth by transforming Aberdeen as a place to live, visit, work and do business. The SUMP was developed by ACC to identify transport interventions that could be delivered to help realise certain city centre elements of the revised hierarchy and complement and expand upon city centre transport interventions identified in the CCMP. Figure 9.22 outlines the CCMP and SUMP boundary.

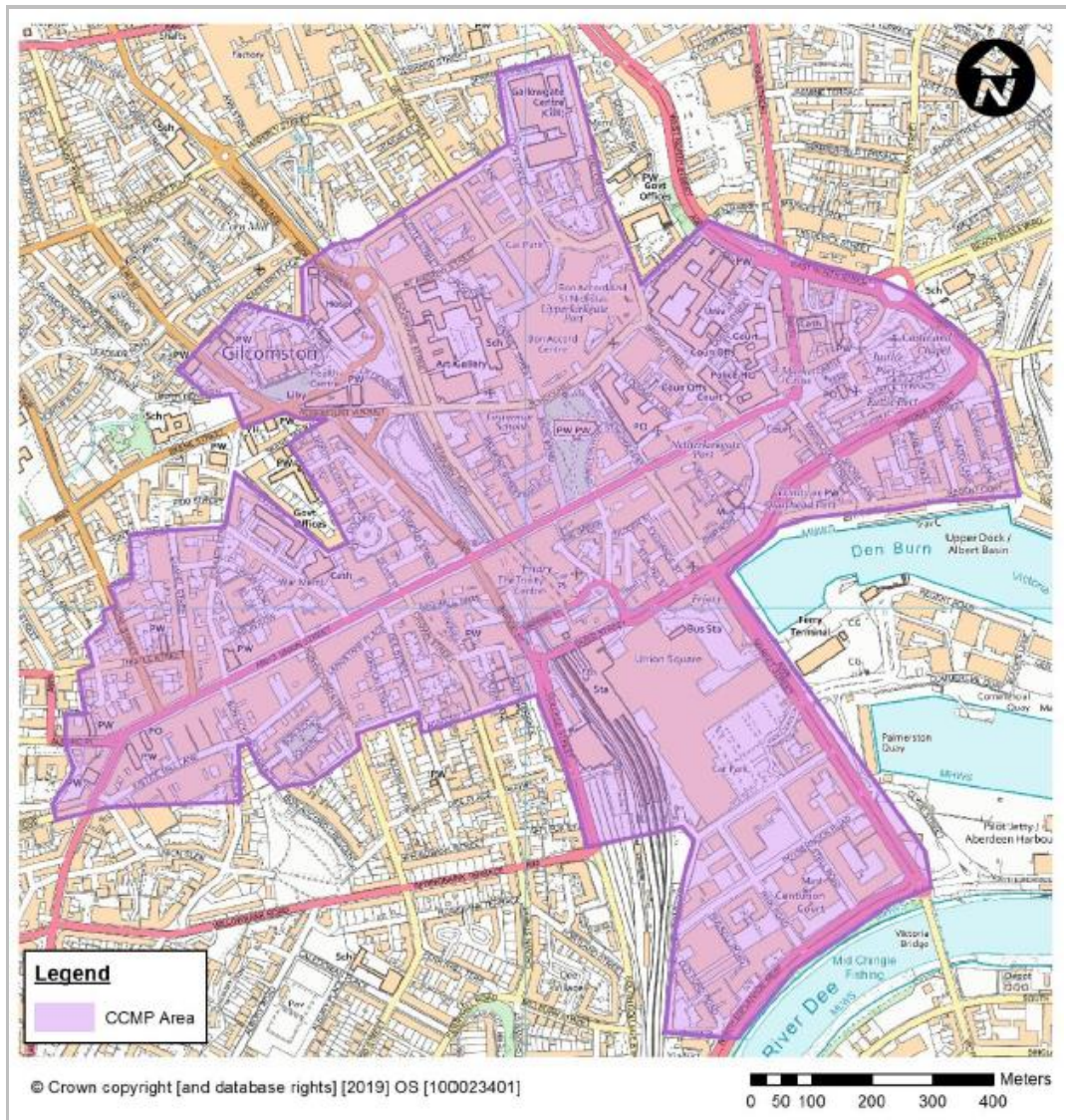
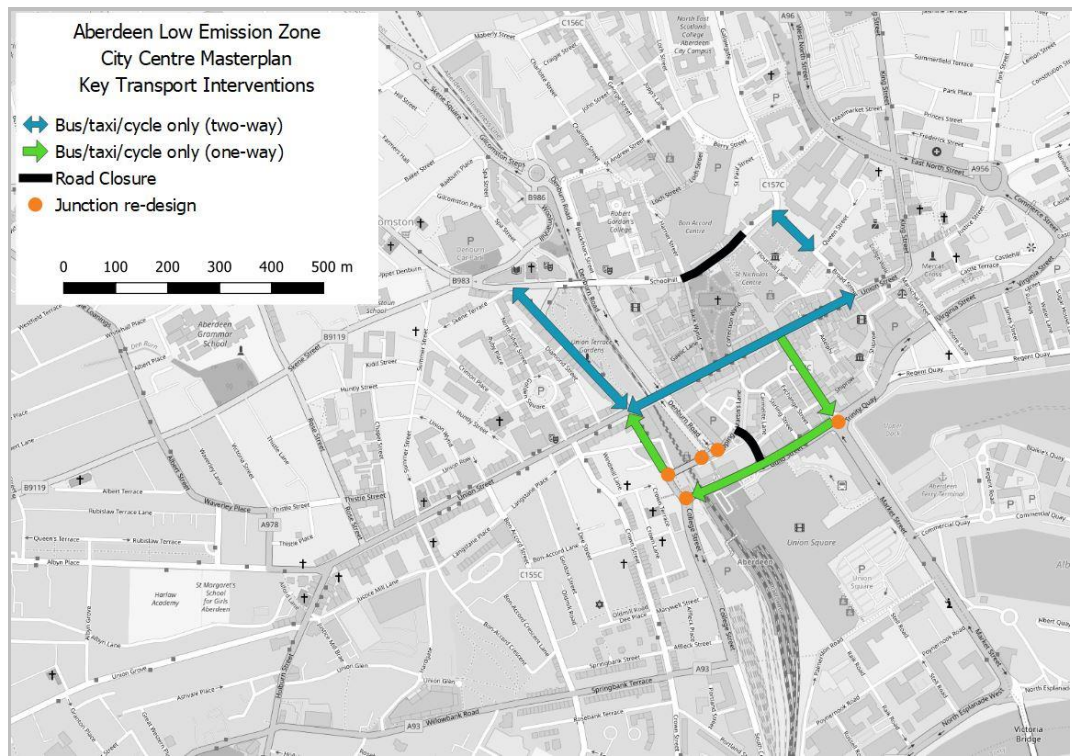


Figure 9.22 : CCMP & SUMP Boundary (Source ACC)

9.9.4 As noted throughout the detailed assessment, a transport assessment and traffic modelling study was undertaken by SYSTRA (then SIAS; *Aberdeen City Masterplan Testing – Phase 2 & 3, SIAS Ref: TPXACCM1/77954, April 2016*) in 2016 to review the CCMP transport interventions with the key tested interventions shown in Figure 9.23. A summary of these interventions and the optimum phased delivery is provided in the policy framework review in Chapter 3.



**Figure 9.23 : City Centre Masterplan – Key Transport Interventions**

- 9.9.5 The 2016 testing report details significant impacts on vehicle rerouting if all phases of the CCMP are delivered but that these can be accommodated in the current road network with a 20% reduction in city centre traffic volumes together with targeted junction improvements along key strategic corridors.
- 9.9.6 In the work to develop the 2019 Aberdeen City Centre Paramics Model, comparisons between 2019 traffic levels and 2012 traffic levels (from which original future year forecasts were based) suggests there to be a 5% to 10% reduction in traffic volumes and therefore the future year modelling is very likely to have overestimated the future traffic demand within the city centre. It is clear there is a requirement to re-assess the CCMP measures in the new 2019 Aberdeen City Centre model with updated future year projections.
- 9.9.7 Analysis of current traffic flows and non-compliant vehicles has identified that the introduction of a LEZ will also result in significant rerouting of non-compliant vehicles and recommends that further detailed Paramics traffic modelling is undertaken to fully understand this.
- 9.9.8 The NMF air quality analysis suggests it highly likely that the addition of the Phase 2 and/or Phase 3 CCMP measures to any LEZ Option would reduce levels of NO<sub>2</sub> on Union Street and Market Street, north of Guild Street, to levels below the legal limits due to the decreased traffic flow on these routes (as bus, taxi and cycle only corridors). However, as concluded in the 2016 testing report, this would significantly increase traffic volumes on adjacent strategic routes, such as Virginia Street and West and East North Street, thereby potentially increasing NO<sub>2</sub> (and other pollutant) levels.
- 9.9.9 In addition to the impacts predicted by current and historic modelling (by both air quality and traffic models) are the behavioural impacts of introducing a LEZ such as the encouragement for modal shift or existing trips no-longer being made. It is therefore important that all modelling takes cognisance of the potential reduction in overall private car trip numbers on the road network.
- 9.9.10 Combining the likely impacts of the LEZ and CCMP interventions, it is clear that many factors must be considered when detailed modelling of the LEZ options is undertaken and

it is crucial that a structured modelling programme is developed and agreed between SYSTRA, ACC and SEPA at the outset of the modelling.

**Key Point:** Chapter 14 summarises the outcomes from the detailed traffic modelling, including model testing of the CCMP. At this stage however (prior to modelling being undertaken), each remaining LEZ option is assessed against its likely compatibility with the CCMP interventions tested in 2016 and shown in Figure 9.23.

9.9.11 Option 1, a bus only LEZ option, and the key transport interventions in the CCMP are shown together in Figure 9.24 (Option 1A). The majority of the interventions target improvements on key public transport routes such as Union Street and the compatibility of Option 1A and Option 1B (including the bus station) and the CCMP interventions are discussed in Section 9.2 above.

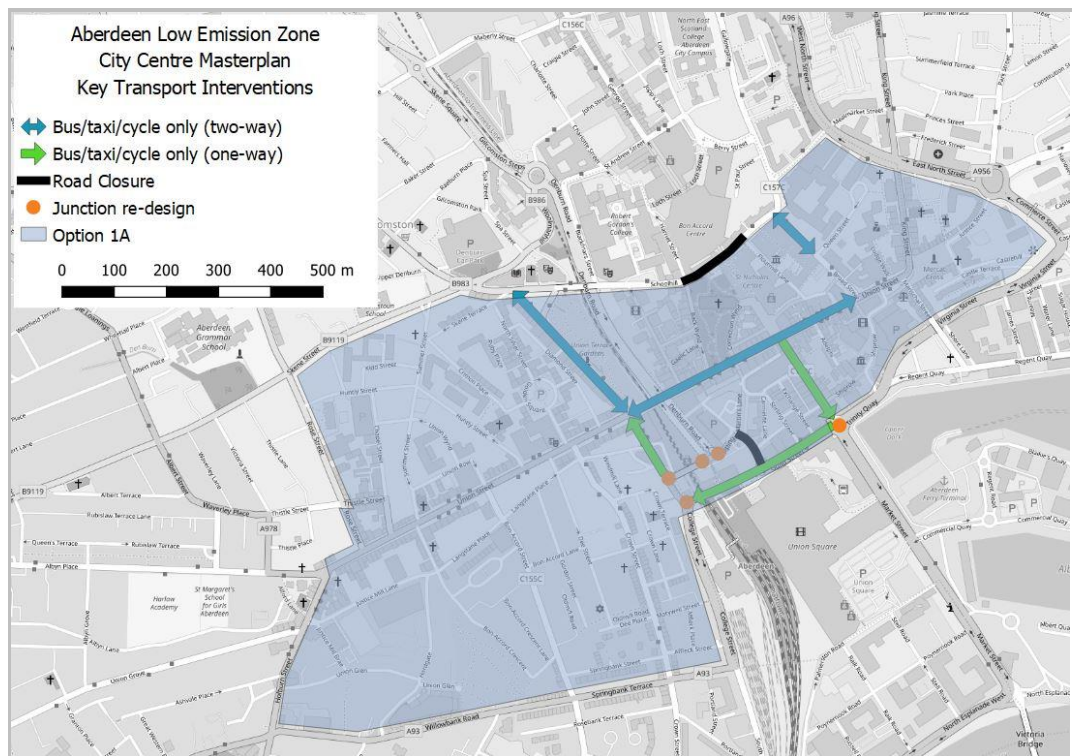
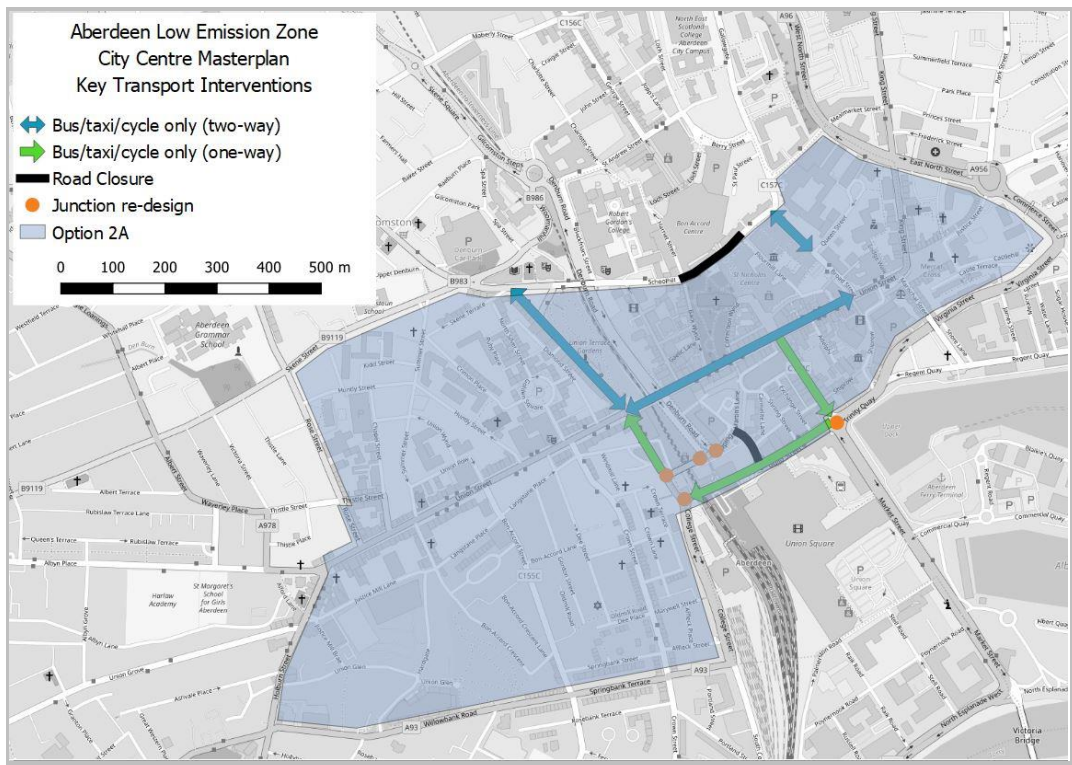
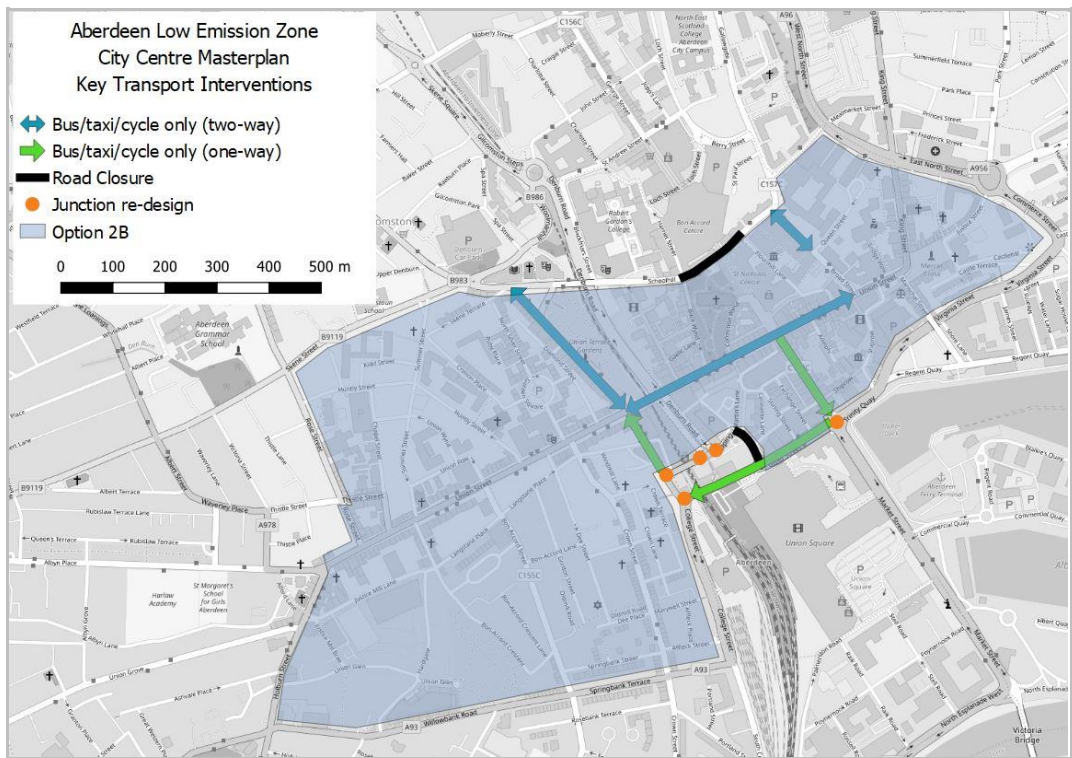


Figure 9.24 : CCMP & LEZ Option 1A

9.9.12 The detailed appraisal of Option 2, Option 3, Option 4 and Option 5 has identified 3 variants with varying access to Denburn Road at the gyratory with Wapping Street, Carmelite Street, Guild Street and Market Street. Consistent across all options, the three Denburn Road variants for Option 2 are shown in Figure 9.25 (Option 2A), Figure 9.26 (Option 2B) and Figure 9.27 (Option 2C).



**Figure 9.25 : CCMP & LEZ Option 2A (no Denburn Road access)**



**Figure 9.26 : CCMP & LEZ Option 2B (NB & SB Denburn Road access)**

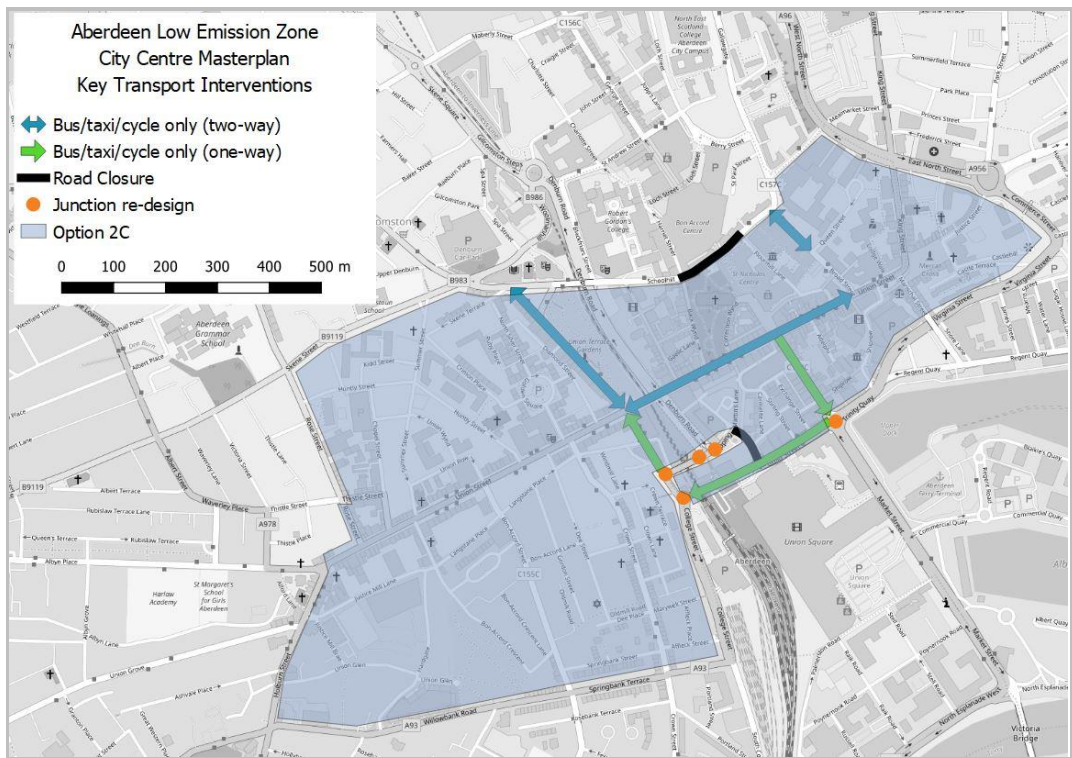


Figure 9.27 : CCMP & LEZ Option 2C (SB Denburn Road access)

9.9.13

Without consideration of the CCMP proposals, all three options are deemed workable as LEZs in isolation. Considered with the CCMP proposals, variant A remains viable and if delivered with junction re-design and the closure of Carmelite Street would allow access for compliant vehicles only to Denburn Road. Variants B and C both in theory deliver the same outcome when considered with the CCMP proposal as, if delivered with junction re-design and the closure of Carmelite Street would provide access for both compliant and non-compliant vehicles to and from Denburn Road via South College Street. The boundaries however do not align with the CCMP proposals and can be logically re-defined as one option variant, named Option 2D and shown in Figure 9.28 below.

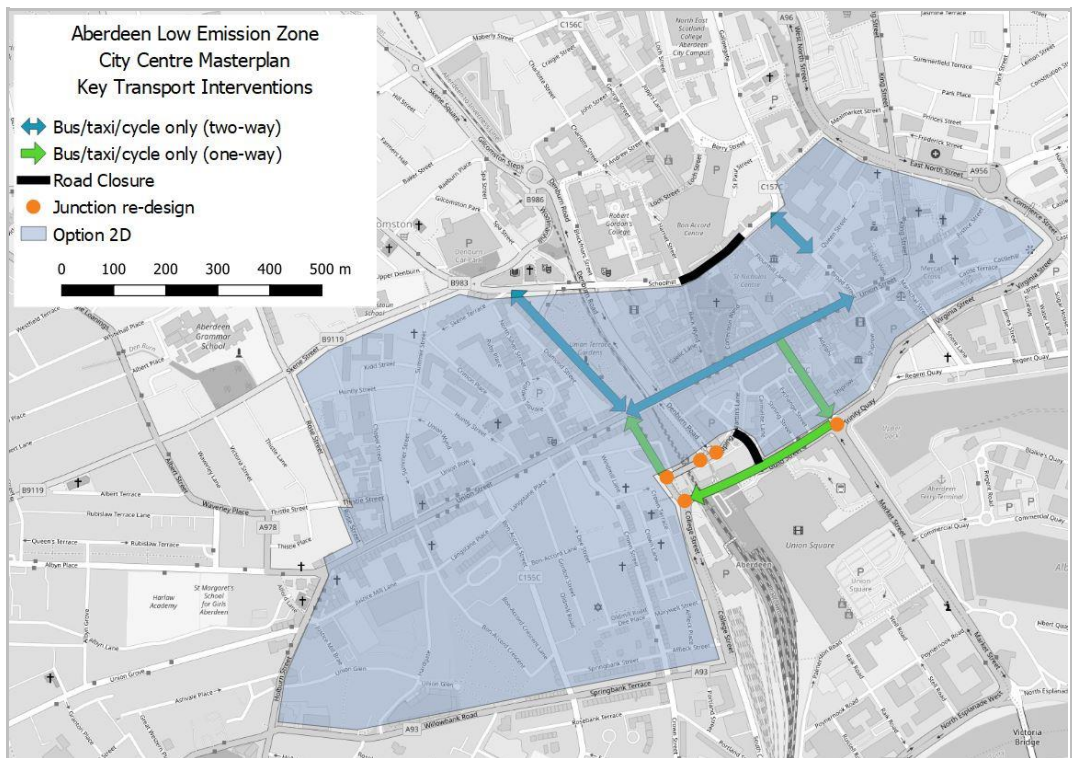


Figure 9.28 : CCMP & LEZ Option 2D (NB & SB Denburn Road access)

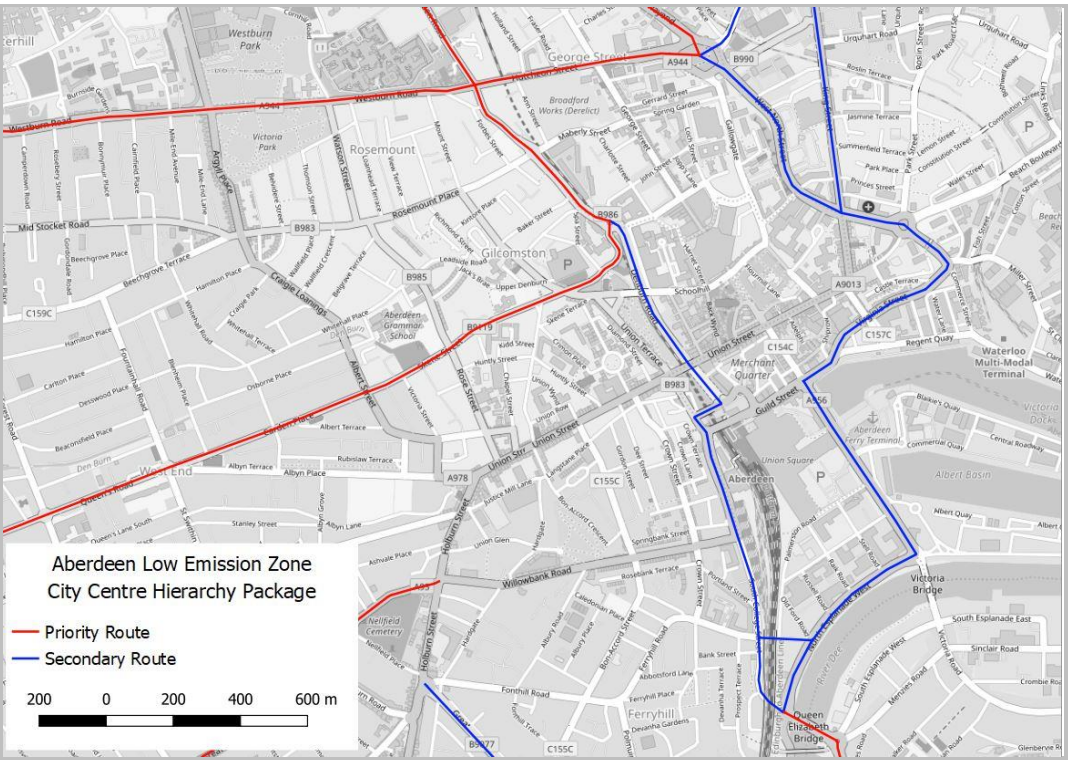
9.9.14 Option 2D (and the equivalent Option 3D, Option 4D and Option 5D) could be delivered with the current road network with Carmelite Street open and the gyratory operating as it currently does or it can be delivered with the CCMP proposals including junction re-design to allow full northbound and southbound access via South College Street for all vehicle types.

9.9.15 Upon consideration of the key CCMP transport interventions there are two option variants of Option 2, Option 3, Option 4 and Option 5 that can therefore be progressed in the appraisal process:

- Option variant A – no non-compliant access to Denburn Road (Figure 9.25)
- Option variant D – full access to Denburn Road (Figure 9.28)

**North East Scotland Roads Hierarchy Study**

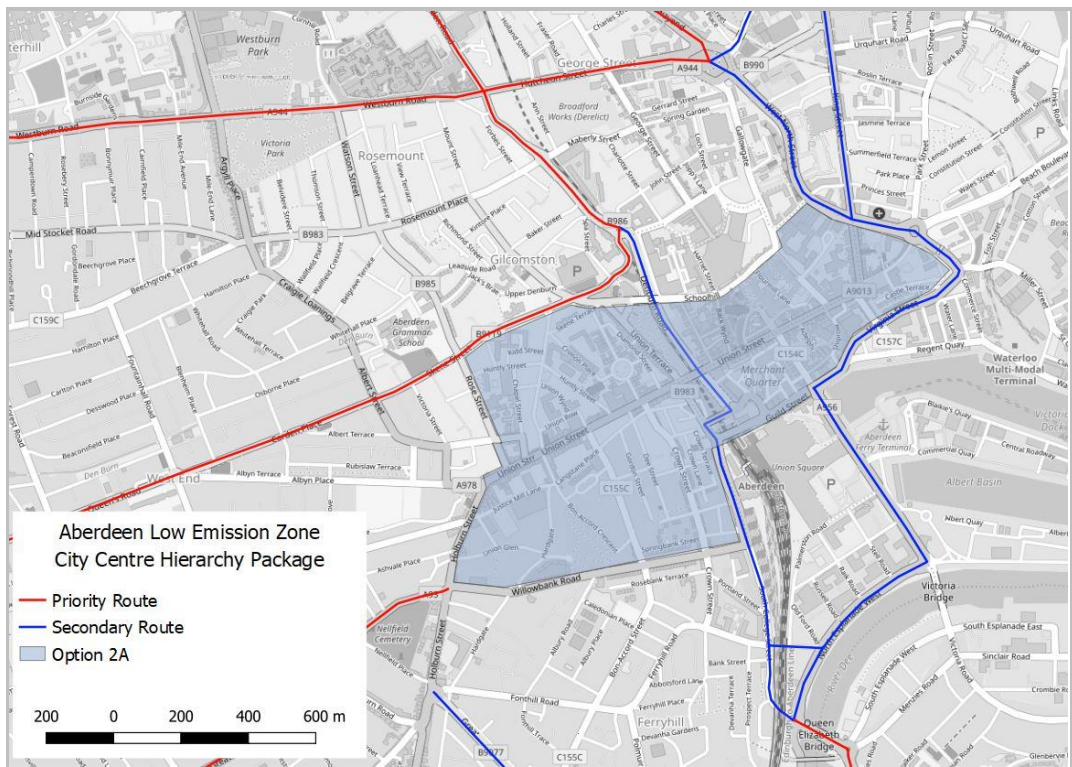
9.9.16 ACC and regional partners Nestrans and Aberdeenshire Council commissioned The North East Scotland Roads Hierarchy Study, as detailed in Section 3.3. The City Centre Hierarchy Package recommended changes to the classification of roads in the city with the approved priority, optional priority and secondary routes shown Figure 9.29.



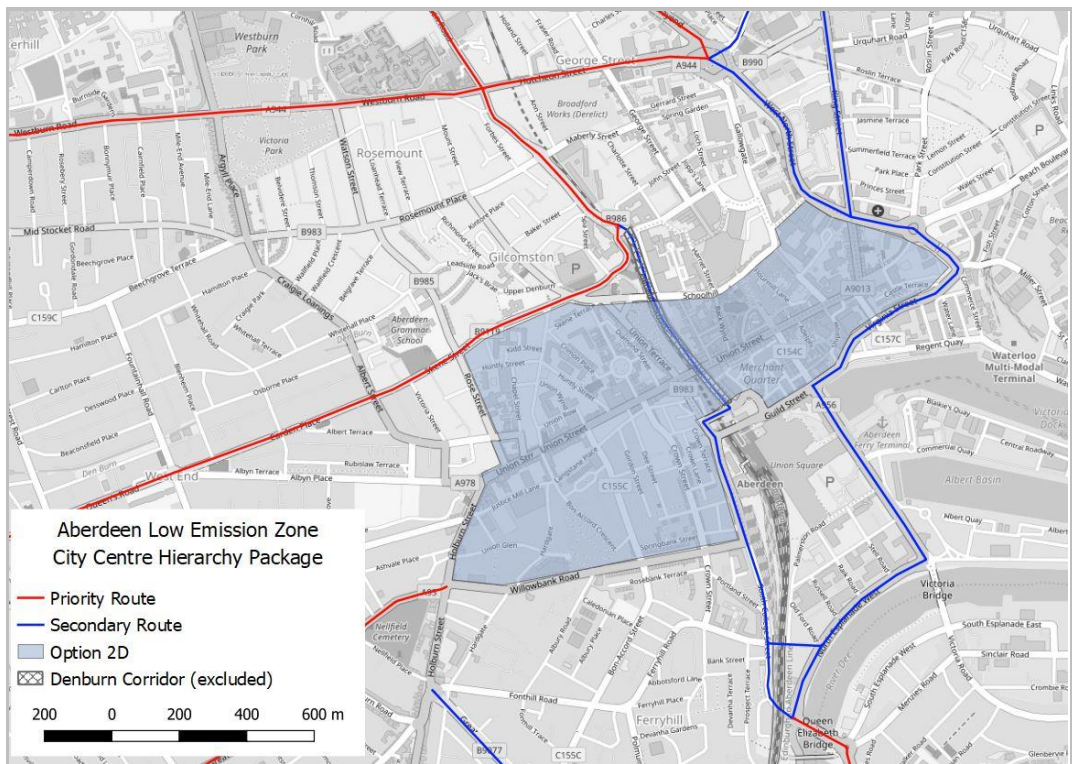
**Figure 9.29 : City Centre Hierarchy Package**

9.9.17 While there is no requirement for a LEZ option to be bound by particular class or category of road, it is considered important, in the context of Aberdeen’s changes to the road hierarchy, that the LEZ area aligns with the new hierarchy. It may be considered a useful method to enhance the message of the changes to the hierarchy, especially if no priority routes are included inside the LEZ area, such that the LEZ (or the city centre) is not an area to be driven through but rather a destination: a key message for Aberdeen.

9.9.18 Comparisons between the CCMP and the LEZ options conclude there to be two option variants for each for each of the all vehicle LEZ: including or excluding Denburn Road. Option 2A, including Denburn Road, and Option 2D excluding Denburn Road, together with the proposed City Centre Hierarchy Package, are shown in Figure 9.30 and Figure 9.31.



**Figure 9.30 :Option 2A (including Denburn Road) and City Centre Hierarchy Package**



**Figure 9.31 : Option 2D (excluding Denburn Road) and City Centre Hierarchy Package**

9.9.19

Option 2A and Option 2D do not include any priority routes and are bound on the eastern extent by a key north-south secondary routes. Option 2A includes the key secondary route of Denburn Road and analysis of 2019 traffic flow suggest there are currently up to 4000 non-compliant vehicle per day that could reroute to the eastern secondary route or potentially some re-classified minor routes to the west, such as Holburn Street to Argyll Place (and likely some other adjacent minor routes). As noted traffic and air quality modelling is required to fully quantify the total number of non-compliant vehicles in the LEZ opening year of enforcement and the impacts any shift of non-compliant vehicles has



on congestion and air quality and at this stage of the NLEF appraisal, with the information available, both option variants are considered viable.

9.9.20 Option 3A and Option 3D are bound by similar priority and secondary routes and both are also considered viable options to be taken forward for detailed testing. Option 3D is shown in Figure 9.32.

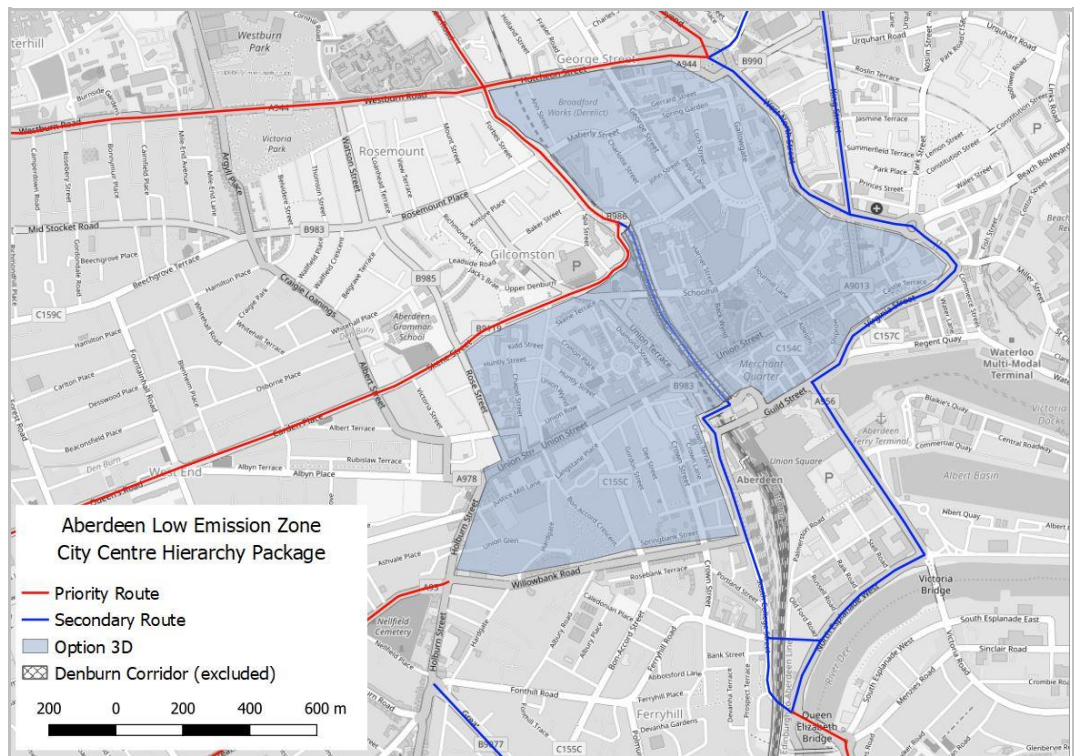
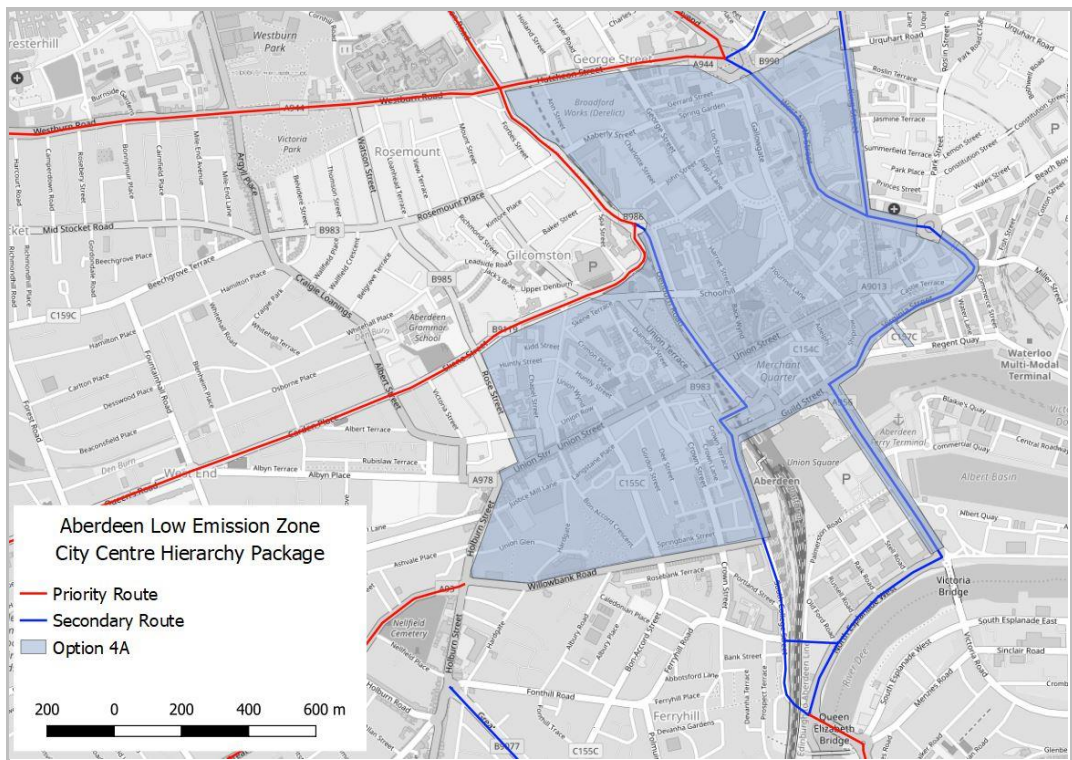


Figure 9.32 : Option 3D (excluding Denburn Road) and City Centre Hierarchy Package

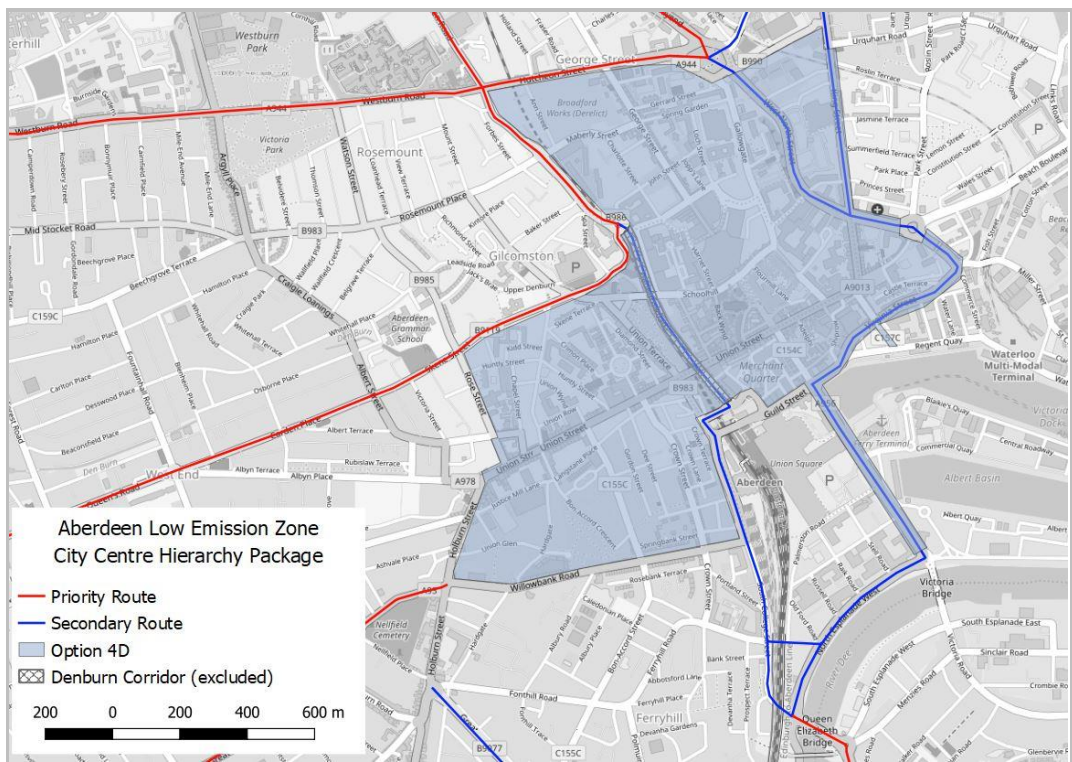
9.9.21 Option 4 (A and D) and Option 5 (A and D) both extend their proposed LEZ boundaries to the east to include the proposed secondary route of Market Street/Virginia Street/Commerce Street/East and West North Street (Eastern Route), as shown in Figure 9.33 (4A), Figure 9.34 (4D), Figure 9.35(5A) and Figure 9.36 (5D).

**Key Point:** Option 4A and Option 5A include two key secondary routes (Denburn Road & the Eastern Route) and analysis of 2019 traffic data suggest there are currently over 15,000 non-compliant vehicle per day that could reroute to western secondary routes (and likely some adjacent minor routes). Although the total number of non-compliant vehicles is likely to be less than currently observed in the opening year of LEZ enforcement, there is still likely to be a high volume of rerouting non-compliant vehicles and it may therefore be considered unsuitable to progress an LEZ option that moves potentially thousands of non-compliant vehicles on to roads of a lower classification, with less capacity and likely closer proximity to residential properties.

9.9.22 Option 4D and Option 5D allows for non-compliant vehicle access to Denburn Road and as noted in the vehicle routing analysis, the increased volume of non-compliant vehicles likely on Denburn Road and Skene Square (from the Eastern Route) may lead to an exceedance of the air quality standards on Skene Square where there are two monitoring locations that currently (2018 data) have annual mean NO<sub>2</sub> levels close to 40 µg/m<sup>3</sup>. The new Roads Hierarchy proposes Skene Square is classed as a Priority Route following the completion of Berryden Corridor improvements (Section 3.4) and this is likely to impact traffic flow and volumes on Denburn Road and Skene Square and therefore Option 4D and Option 5D (excluding Denburn Road) cannot be excluded at this stage until full modelling of the LEZ options with this, and other road improvements schemes.



**Figure 9.33 : Option 4A (including Denburn Road) and City Centre Hierarchy Package**



**Figure 9.34 : Option 4D (excluding Denburn Road) and City Centre Hierarchy Package**

9.9.23

Option 5 variants also extend south to include the forthcoming South College Street improvement scheme, linking South College Street and North Esplanade West. The new Roads Hierarchy proposes the priority route from the south extends to the new junction on North Esplanade West and therefore it is considered appropriate to adjust the area of Option 5 such that it bounds the new link between the two key routes, as reflected in Figure 9.35(5A) and Figure 9.36 (5D) below.

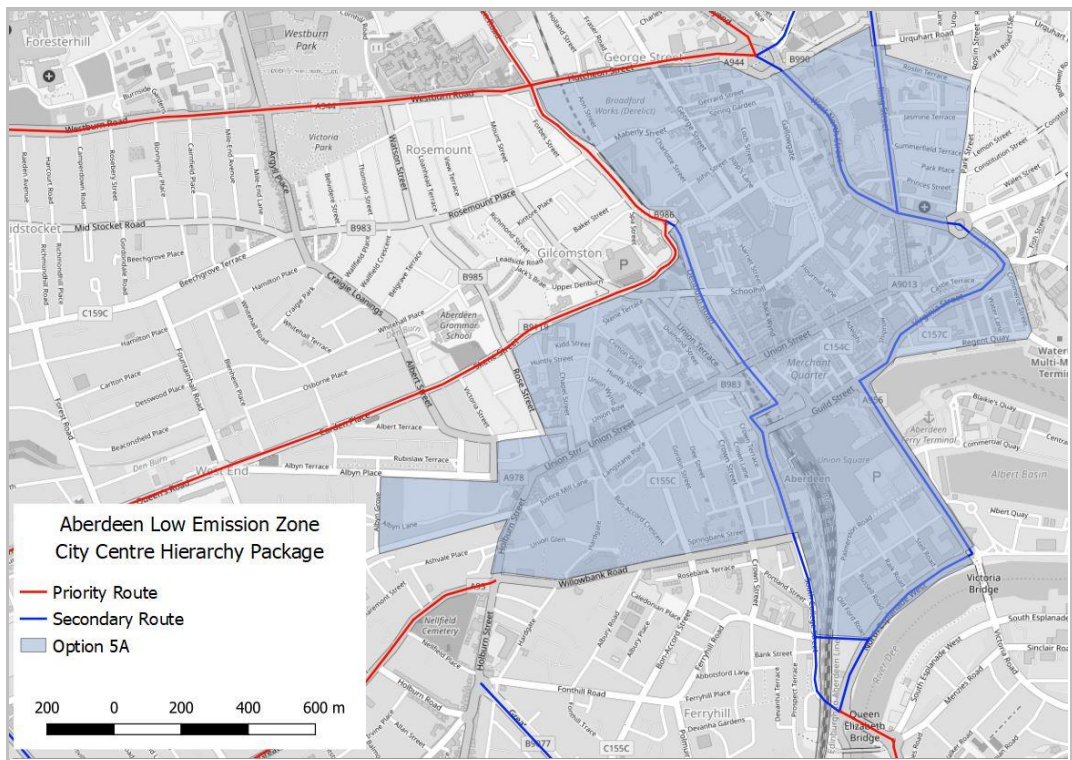


Figure 9.35 : Option 5A (including Denburn Road) and City Centre Hierarchy Package

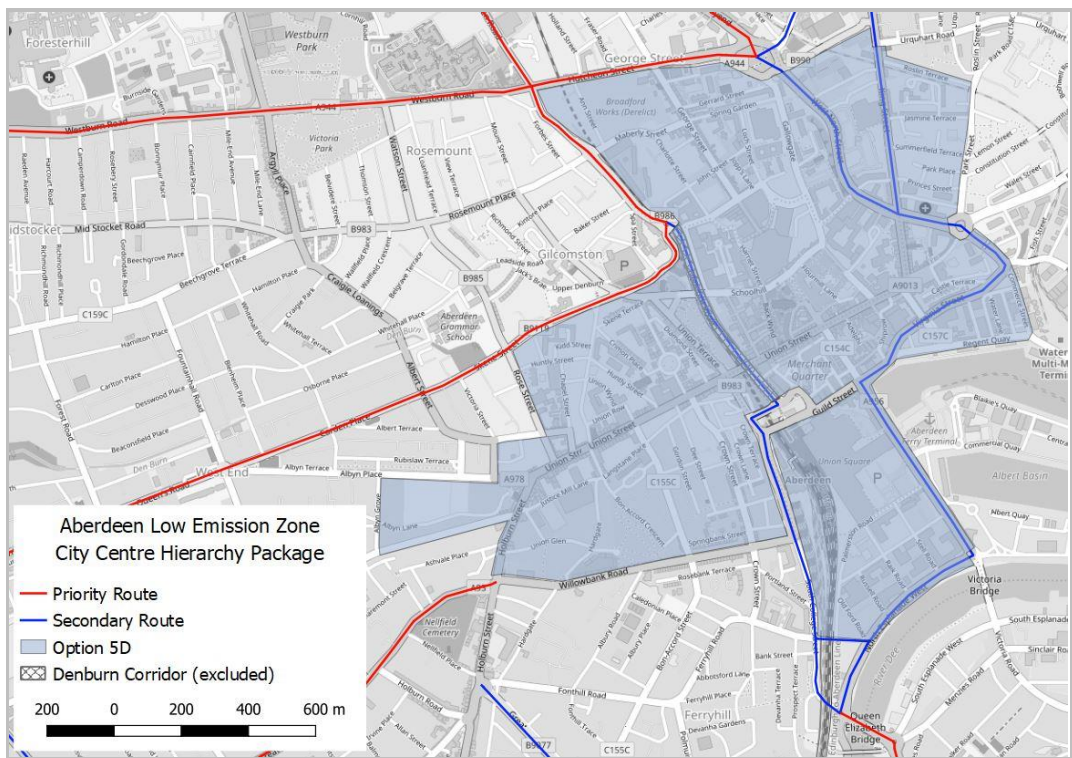


Figure 9.36 : Option 5D (excluding Denburn Road) and City Centre Hierarchy Package

**Key Point:** All LEZ options are bound by a number of tertiary or unclassified routes such as Willowbank Road and Rose Street. Analysis should be undertaken to quantify the impact of any non-compliant vehicles choosing to route around the LEZ area by utilising these and other tertiary routes. If traffic and air quality modelling shows there to be a high number non-compliant vehicles on these routes, this will likely have to be mitigated against using the LEZ signing strategy or possible physical interventions.

## 9.10 Summary of LEZ Options

9.10.1 The appraisal of the five LEZ options has identified a number of possible variants and as the appraisal has progressed, some of these variants have been shown to be unsuitable while additional variants have been identified. Table 9.6 in Section 9.5 summarised the identified option variants (Option 2A/B/C to Option 5 A/B/C) resulting from the key strategic routing analysis. Further appraisal of these options against existing ACC strategies has shown some variants do not compliment these strategies and further variants were identified that better align with the CCMP, SUMP and the proposed roads hierarchy changes. All LEZ option variants identified thus far and an indicator of each option to be progressed in the appraisal process is shown in Table 9.16

**Table 9.16 : LEZ Option Variants**

Option	Option Description	Variant	Variant Description	Option Progressed?
Option 1A	Union Street Area (bus only)	Excludes bus station	Includes Guild Street and bus station exit to Guild Street	Yes
Option 1C		Includes bus station	Includes Guild Street, Market Street and bus station (including both accesses)	Yes
Option 2A	Union Street Area (all vehicle)	Includes Denburn Road	No access for non-compliant vehicles	Yes
Option 2B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	No
Option 2C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access	No
Option 2D		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	Yes
Option 3A	Union Street & George Street Area	Includes Denburn Road	No access for non-compliant vehicles	Yes
Option 3B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	No
Option 3C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access	No
Option 3D		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	Yes
Option 4A	City Centre Air Quality Exceedance Area	Includes Denburn Road	No access for non-compliant vehicles	Yes
Option 4B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	No
Option 4C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access	No
Option 4D		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	Yes
Option 5A	City Centre Masterplan Area	Includes Denburn Road	No access for non-compliant vehicles	Yes
Option 5B		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	No
Option 5C		Partially excludes Denburn Road	Full NB & partial SB access for non-compliant vehicles. Opportunity for junction re-design to allow full SB access	No
Option 5D		Excludes Denburn Road	Full NB & SB access for non-compliant vehicles	Yes

9.10.2 The remaining LEZ options at this stage of the appraisal process can be summarised as follows:

- Option 1 – two variants of the bus only option
  - Variant A excludes the bus station, but includes the exit to Guild Street
  - Variant B includes the entire bus station and both access on Guild Street and Market Street.
- Options 2 – 5 – two variants of the all vehicle options
  - Variant A includes Denburn Road and therefore does not allow access to Denburn Road for non-compliant vehicles
  - Variant B excluded Denburn Road and allows full access to Denburn Road for compliant and non-compliant vehicles

**9.11 Appraisal Against Low Emission Zone Objectives**

9.11.1 As detailed in Chapter 7, there are two key objectives for Aberdeen’s Low Emission Zone as follows:

- Improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government’s statutory air quality objectives.
- Support climate change targets by reducing road transport’s contribution to emissions.

9.11.2 In recognition that a LEZ can help realise wider benefits beyond air quality improvement, three supplementary objectives for Aberdeen’s Low Emission Zone have been identified:

- Protect public health and wellbeing;
- Support local and regional transport strategies by contributing to the development of a vibrant, accessible, and safe city centre, where the volume of non-essential traffic is minimised and active and sustainable transport movements are prioritised; and
- Contribute to ongoing transformational change in Aberdeen, helping promote the city as a desirable place to live, visit and invest in.

9.11.3 NLEF is objective-led and consistent with the principles of STAG and therefore a qualitative appraisal of the LEZ options against the key LEZ objectives is undertaken using the seven-point assessment scale. If a LEZ option does not satisfy the LEZ objectives for Aberdeen’s LEZ they are removed from the appraisal process and not recommended for detailed testing

9.11.4 The results of this assessment are shown in Table 9.17 with the justification described below. Table 9.17 shows all the all vehicle LEZ options (Option 2 to 5) score positively against the LEZ objectives. Option 1, the bus only option scores positively on the two key objectives (1 and 2) and objective 3, to protect public health and wellbeing. It is shown however, to score neither positively or negatively against objectives 4 and 5, as described below.

**Table 9.17 : Option appraisal against all LEZ objectives**

Option No.	LEZ Area	Aberdeen LEZ Objective				
		1	2	3	4	5
1A/B	Union Street Area (bus only)	++	+	+	0	0
2A/D	Union Street Area (all vehicles)	++	+	+	+	+
3A/D	Union Street & George Street Area	++	+	+	+	+
4A/D	City Centre Air Quality Exceedance Area	++	+	+	+	+
5A/D	City Centre Masterplan Area	++	+	+	+	+

**Objective 1: Improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government’s statutory air quality objectives**

9.11.5 Section 9.2 (bus only) and Section 9.3 (all vehicle) detail the expected reductions in NO<sub>2</sub> provided by each option, as inferred by the NMF high level scenario results. The NMF results show that the inclusion of buses in a LEZ for Aberdeen would bring the single largest benefit to air quality but there would still be areas of exceedance within the city. In the all vehicle options, the NMF predicts there to be a further reduction in levels of NO<sub>2</sub> but again there will be a number of locations where the annual mean levels of NO<sub>2</sub> will exceed the legal limit of 40 µg/m<sup>3</sup>.

9.11.6 As a bus only option, Option 1 was devised to capture all bus services operating in the city and as a service is required to be compliant to enter the LEZ area, the benefit in reduced emissions from each vehicle will be seen across the entire bus network as each bus travels

along its timetabled route. That the option does not encompass all exceedance locations therefore is not the critical factor in defining the bus only option area but rather that the area captures all bus services, which Option 1 is shown to do. For these reasons, Option 1 scores positively against Objective 1.

9.11.7 Option 2 and Option 3 do not encompass all exceedance locations while Option 4 and Option 5 capture all exceedance locations. Although the NMF predicts a greater reduction in NO<sub>2</sub> levels in both Option 4 and Option 5 by approximately 4% the NMF analysis (Chapter 5) concludes that all options will bring similar improvements to NO<sub>2</sub> and is therefore given a consistent positive score against Objective 1 for Aberdeen's LEZ.

9.11.8 As noted throughout the detailed appraisal, it is recognised that additional traffic management interventions will be required to be delivered with a LEZ in Aberdeen to ensure all of the Scottish Government's statutory air quality objectives are met. Detailed modelling will ensure that these interventions are targeted to address existing air quality exceedance locations and that the introduction of a LEZ, and associated measures, do not adversely create additional areas of exceedance.

### **Objective 2: Support climate change targets by reducing road transport's contribution to emissions**

9.11.9 Transport is the UK's largest emitter of greenhouse gases and the introduction of a LEZ in Aberdeen may contribute towards an increase in the number of low-emission vehicles or encourage additional modal shift towards active travel and public transport in Aberdeen and the wider Aberdeenshire area. This increase in lower emission vehicles is likely to increase as years progress and drivers replace their vehicles. A LEZ will restrict the number of the higher emitting non-compliant vehicles from its boundary and may also influence behavioural changes in the wider driving population. It is considered therefore that all LEZ options will, by their nature, reduce the contribution of road transport to emissions.

9.11.10 While the introduction of a LEZ in Aberdeen will help create a more modern cleaner bus fleet and a more attractive city to walk and cycle in with lower pollution levels, as concluded in the NMF analysis (Chapter 5), the combination of a LEZ with CCMP and SUMP interventions and planned improvements to the bus network infrastructure, including wider studies addressing key city bus and cycle corridors, is likely to help promote greater usage of sustainable modes of transport.

9.11.11 The LEZ is one measure that will contribute to the wider effort of ACC to increase efficiency of the transport system thereby reducing transport's contribution to emissions and is it considered that all LEZ options score positively against Objective 2 of Aberdeen's LEZ.

### **Complementary Objectives**

9.11.12 Each option is shown to reduce emissions in Aberdeen, including those locations where exceedance are likely to remain. A LEZ delivered with additional traffic management measures will likely further reduce the level of emissions in the city.

9.11.13 All LEZ options will proportionately increase the number of lower emitting vehicles in the city centre and contribute to a positive change to Aberdeen's environment. This is particularly true of the city centre where there is high pedestrian activity and where buses may dwell at bus stops for longer or wait at signal controlled junctions with their engines running. These factors may contribute to a city where walking and cycling is considered a more attractive mode of transport and an increase in active travel choices may result from these options. Additionally, a bus fleet that contains more modern vehicles that are likely to be more comfortable to travel on and have better facilities may promote a shift to this more sustainable travel mode, reducing the number of private vehicles on the road

network and contributing to an overall improved environment that may in turn incentivise more active and sustainable travel choices.

- 9.11.14 It is considered therefore that all LEZ options will contribute positively towards the LEZ satisfying Objective 3, to protect public health and wellbeing.
- 9.11.15 Each all vehicle LEZ option is shown to be compatible with the key ACC strategies (CCMP, SUMP and Roads Hierarchy) and the additional indirect impacts of each LEZ option show a LEZ will contribute and support the wider transport strategies of ACC, thereby satisfying Objective 4 of Aberdeen's LEZ. A LEZ designed to complement these existing strategies will allow a LEZ to contribute to reducing the volume of non-essential traffic thereby helping Aberdeen become a safe, vibrant and accessible city centre.
- 9.11.16 As a bus only option, Option 1 was shown to compliment Aberdeen's CCMP where its boundary did not contradict the key public transport proposals in the policy. On its own however, a bus only LEZ is unlikely to contribute, either positively or negatively, to other key policies, such as the proposed changes to the roads hierarchy and reducing strategic trips through the city centre. Option 1 therefore scores neutrally against Objective 4.
- 9.11.17 Improvements to the wider Aberdeen environment realised from a LEZ alone, and in combination with other complementary measures, will contribute to making Aberdeen a more attractive place to live, study and visit and in the longer term, this may lead to the creation of jobs, services and investment that will drive an improved city economy for all. The improved environment and the "green tourist" may increase visitors to the city and continue its transformational change. In the short term, the all vehicle LEZ options that may change the trip choice of non-compliant private and commercial vehicles to Aberdeen, particularly the city centre, may initially be viewed as detrimental to the city economy and may reduce overall person trips to the city centre. While a reduction in non-compliant vehicles impacts positively on the environment and the attractiveness of the city, there may be a short term negative impact on the city economy and therefore creation of jobs and services. Throughout the lifetime of the LEZ however it is anticipated that each LEZ option will positively impact on the city's health and wellbeing, help develop a vibrant, accessible, and safe city centre and contribute to ongoing transformational change in Aberdeen. It is considered therefore that the all vehicle LEZ options will contribute positively towards the LEZ satisfying Objective 5.
- 9.11.18 While a bus only LEZ, Option 1, will bring forward an improved bus fleet for the city, it is unlikely to contribute, either positively or negatively, to a wider transformational change in Aberdeen and the option therefore scores neutrally against Objective 5.

## **9.12 Refinement of LEZ Options**

- 9.12.1 The option appraisal in Sections 9.2 to 9.11 have informed the suitability of each LEZ option that emerged from the high level option generation exercise detailed in Chapter 8. This has led to a number of option variants being considered and a several key observations can be made to refine the proposed option list before presenting the recommended options for consultation and modelling.
- 9.12.2 Option 1, the bus only LEZ, and Option 2, an all vehicle LEZ, cover approximately the same geographical area with slight distinctions accounting for the identified option variants and after detailed appraisal, both are considered to be workable LEZ options. In the appraisal of these options against the LEZ objectives however, Option 1 is not considered to fully satisfy all objectives. As noted in the appraisal of the LEZ options against the LEZ objectives, any option that fails to fully satisfy all objectives should be removed from further appraisal and detailed testing. Option 1, and its variants, are therefore removed from the appraisal process at this stage.

- 9.12.3 It is important to note that all remaining all vehicle options could, in theory, operate as a bus only LEZ if required, perhaps as part of a phased introduction of any LEZ. The removal of the single bus only option therefore does not necessarily preclude the possibility of Aberdeen introducing a bus only LEZ if desired. It is also possible that any option could be adjusted further to ensure the bus station is included or excluded from a final LEZ area, with all remaining options either bordering the bus station or encompassing it fully. Consultation with bus operators will be required to provide further information on any desire to include or exclude the bus station from the final LEZ option.
- 9.12.4 In defining the boundary of the all vehicle LEZ options, it was apparent that each option could include or exclude Denburn Road. Analysis of existing traffic data showed there are currently between 3000 and 4000 non-compliant vehicles on Denburn Road. While the number of non-compliant vehicles on the road network is likely to reduce by the opening year of a LEZ, it is assumed that of the non-compliant vehicles that remain on the road network many would reroute via East & West North Street/Commerce Street/Virginia Street, with some likely to route to the west via Holburn Street, if Denburn Road is included in the LEZ.
- 9.12.5 In Option 2 and Option 3, the Eastern Route (East & West North Street/Commerce Street/Virginia Street/Market Street) is not included in the option boundary and it remains a feasible alternative route for any non-compliant vehicles and therefore both option variants for Options 2 and 3 are considered viable.
- 9.12.6 Option 4 and Option 5 encompass the Eastern Route and therefore non-compliant vehicles from Denburn Road would also not be permitted to route via this route. Analysis of 2019 traffic data shows there to be currently between 3,000 and 9,000 non-compliant vehicles on the Eastern Route and any remaining non-compliant vehicles at the time of LEZ enforcement would be required to reroute to an alternative route further west. If access to the Denburn Road corridor is not available for non-compliant vehicles it is possible that the alternative routes to the west would not operate satisfactorily and be liable to increases in congestion and emissions. The Roads Hierarchy package recommended that the western corridors be downgraded in priority and no longer be considered priority or secondary routes. If Option 4A and 5A (including Denburn Road) result in a large number of non-compliant vehicles shifting to these western routes the options may not be considered compatible with this key ACC strategy. Despite this possibility, both Option 4A and Option 5A are recommended to progress to detailed testing to quantify the level of any rerouting of these LEZ options that effectively restrict the north-south movement of non-compliant vehicles across the city.
- 9.12.7 As noted in the air quality analysis, existing levels of NO<sub>2</sub> on the Denburn Road corridor at Skene Square suggest any large increase in non-compliant vehicles would likely result in new exceedances in NO<sub>2</sub> on the corridor. While excluding Denburn Road from Option 4D and Option 5D and allowing non-compliant vehicles from the Eastern Route to utilise the corridor may result in an increase in vehicle emissions on the corridor, these options cannot be removed at this stage until full modelling is undertaken. The opening of the Berryden Corridor improvements (Section 3.4) is also likely to impact traffic flow and volumes on Denburn Road and Skene Square and therefore to fully quantify any rerouting and understand the impact of such road improvements schemes, detailed traffic and air quality modelling is required. Option 4D and Option 5D therefore remain as options to be progressed for further appraisal and testing.
- 9.12.8 The option appraisal suggest that Option 4 and Option 5 are likely to have similar impacts on the local road network and air quality. As noted, Option 4 and Option 5 include the key Eastern Route, however this means that there is no option that captures the air quality exceedances on the Eastern Route while providing full access to Aberdeen Harbour (from Market Street) and Union Square, two key land uses in the city centre area. The southern extend of Option 4 is to the junction of Market Street/North Esplanade West/Victoria



Bridge. Here, the junction would require reconfiguration to operate as a viable LEZ as it currently operates as left turn only from North Esplanade West, meaning non-compliant vehicles would be forced into the LEZ without the final opportunity to route away and avoid penalty (a key consideration of any LEZ). While junction reconfiguration is possible, given the similar impacts and coverage of Option 5, it is proposed that the southern boundary of Option 4 is altered such that it extends only to the junction of Market Street/Commercial Quay/Union Square. This would significantly differentiate Option 4 from Option 5 and offer an option that provides access for non-compliant vehicles to Aberdeen Harbour and Union Square.

- 9.12.9 When assessing the access to Aberdeen Harbour, it was noted that Option 5, by following the CCMP boundary, also does not allow access for non-compliant vehicles to the Aberdeen Harbour area around Regent Quay, south of Virginia Street. Conversely, Option 4 does allow full access to the Regent Quay area but the boundary, following the route of Virginia Street, means that there is a risk non-compliant vehicles could be penalised by entering the LEZ without a viable opportunity to avoid the area. For Option 4, further analysis and consultation would be required to provide access to businesses in the Aberdeen Harbour area but restrict movements of non-compliant vehicles to/from Virginia Street itself to prevent inadvertent penalisation.
- 9.12.10 With the updated boundaries for Option 4 and Option 5 (both variants) it can be summarised that Option 4 provides access for non-compliant vehicles to Aberdeen Harbour while Option 5 does not. Both options do not impact the accessibility of compliant vehicles to Aberdeen Harbour.
- 9.12.11 The updated LEZ options after the above refinement considerations are presented in detail in Chapter 10.

## 10. RECOMMENDED LEZ OPTIONS

### 10.1 LEZ Options for consultation and detailed model testing

10.1.1 The NLEF Appraisal recommends that four main LEZ options be taken to wider consultation and detailed model testing undertaken using the NMF air quality model and the Paramics microsimulation traffic model.

10.1.2 The analysis demonstrated that from these four options there are two possible variants to each option. To provide a concise and understandable list for detailed testing and subsequent consultation, the LEZ option numbering is reset and are as follows:

- Option 1A – Union Street Area, including Denburn Rd (Figure 10.1)
- Option 1B – Union Street Area, excluding Denburn Rd (Figure 10.2)
- Option 2A – Union Street & George Street Area, including Denburn Rd (Figure 10.3)
- Option 2B – Union Street & George Street Area, excluding Denburn Rd (Figure 10.4)
- Option 3A – CCMP East including Denburn Rd (Figure 10.5)
- Option 3B – CCMP East excluding Denburn Road (Figure 10.6)
- Option 4A – CCMP, including Denburn Rd (Figure 10.7)
- Option 4B – CCMP, excluding Denburn Rd (Figure 10.8)

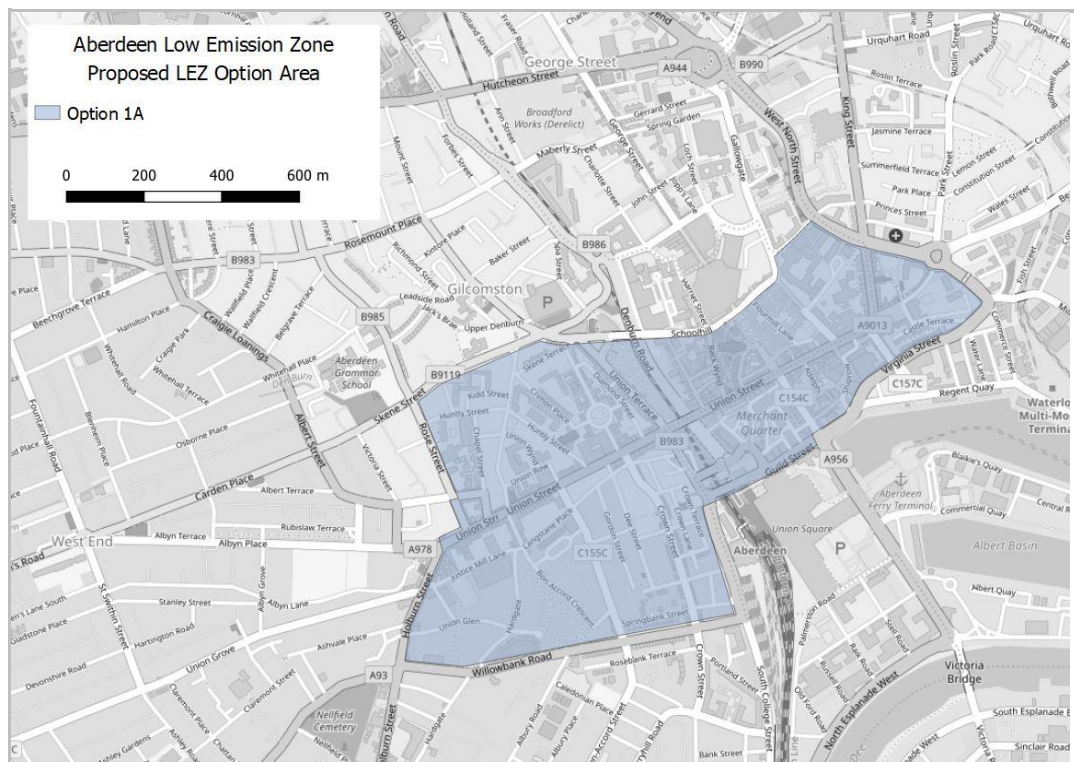
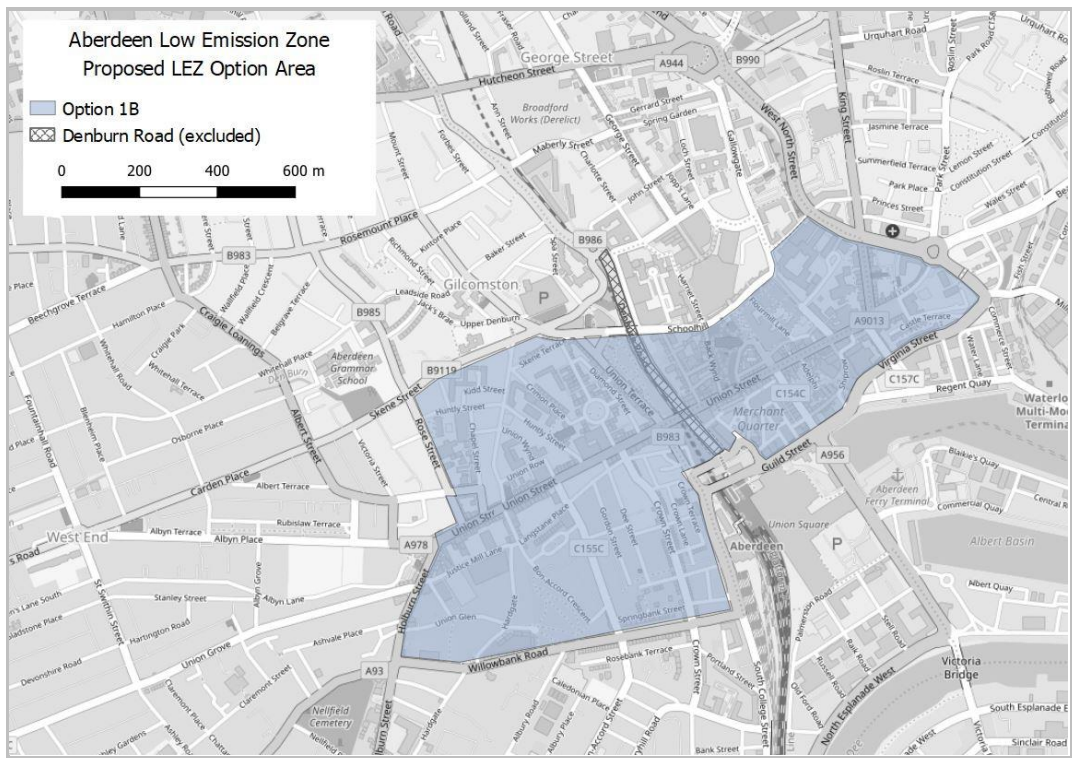
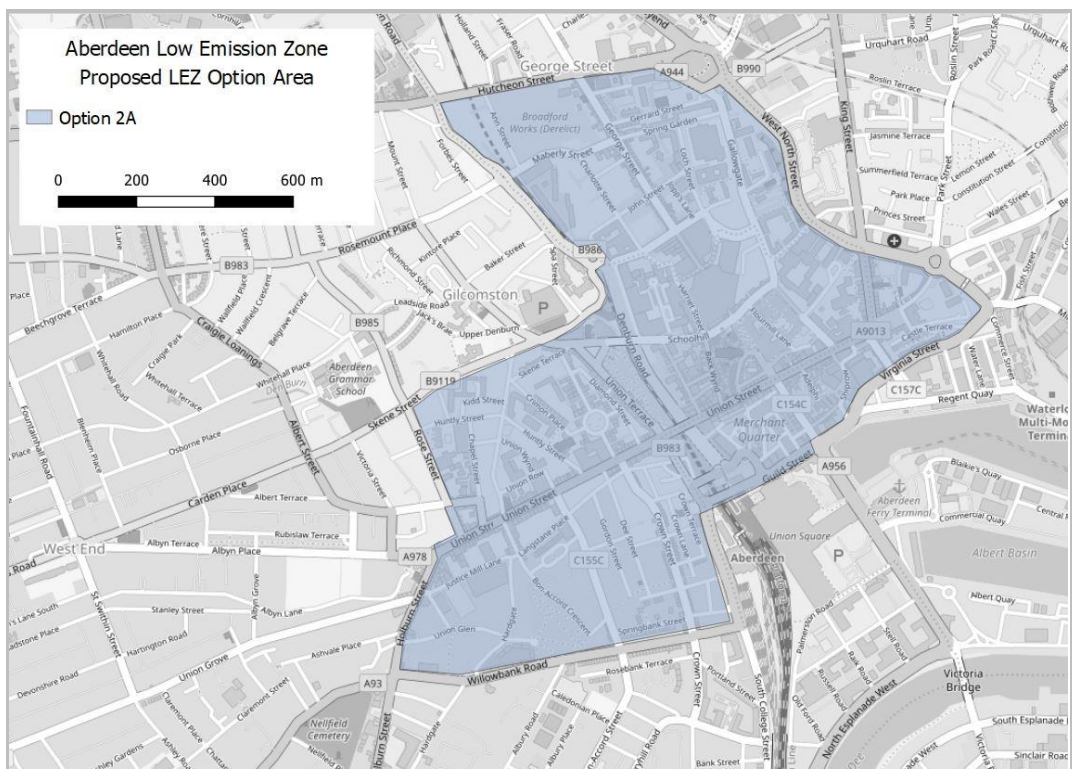


Figure 10.1 : Option 1A – Union Street Area, including Denburn Road



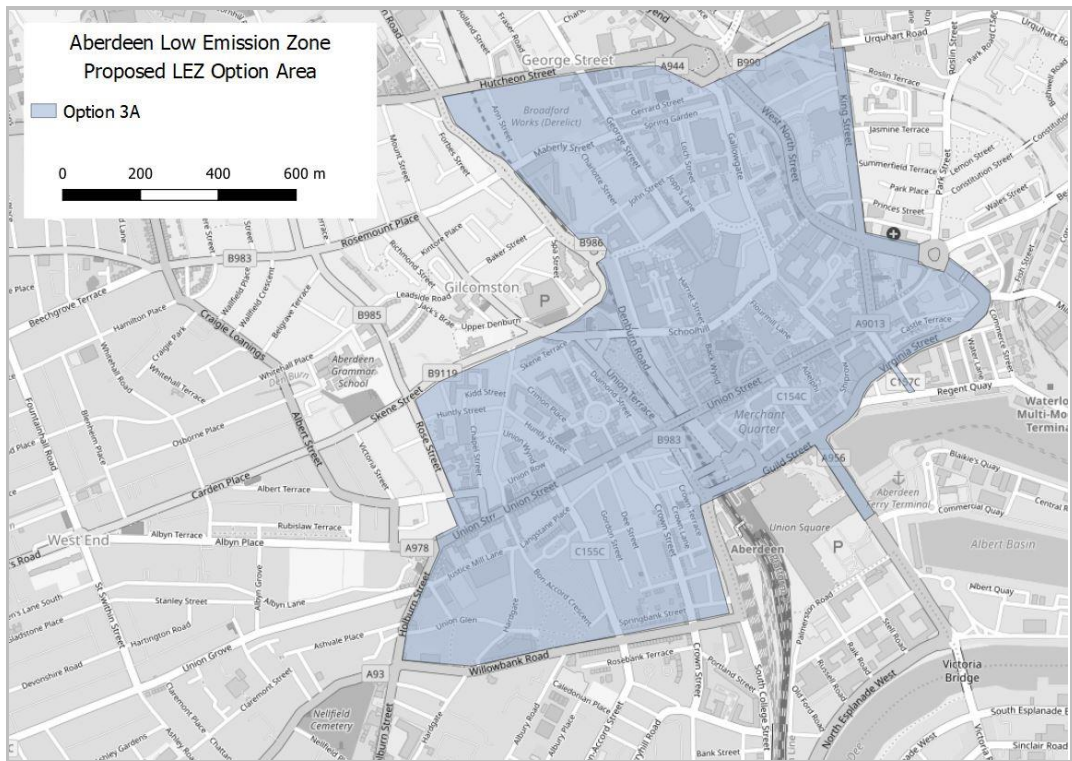
**Figure 10.2 : Option 1B – Union Street Area, excluding Denburn Road**



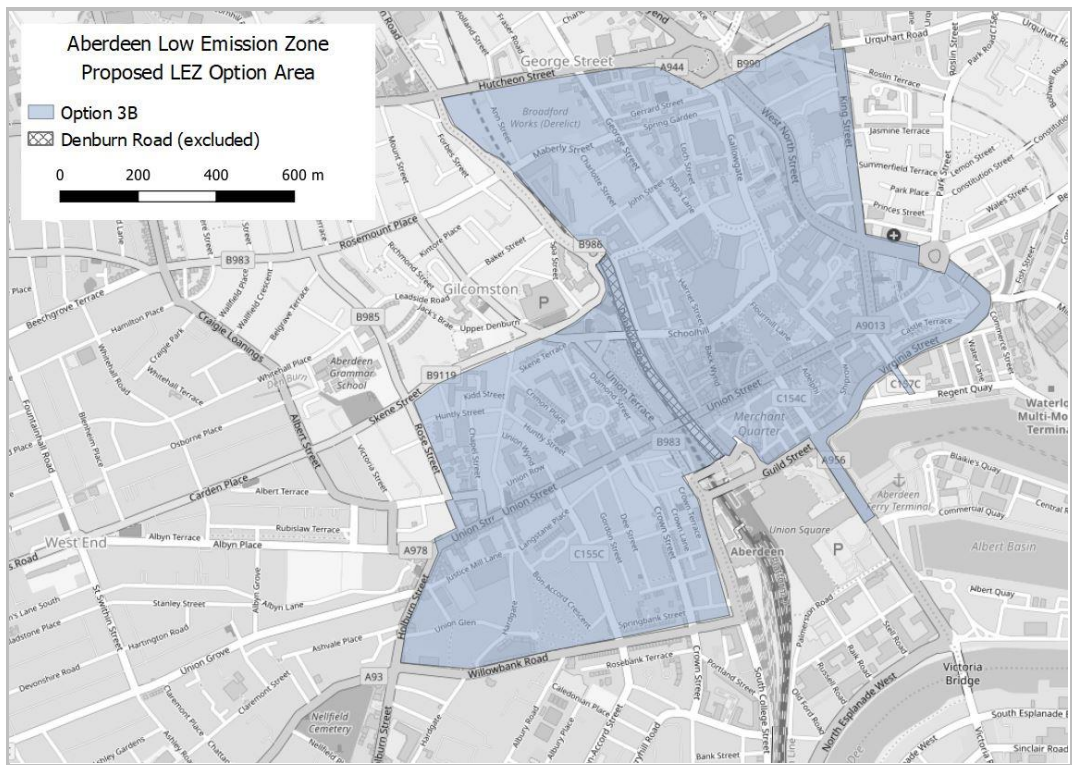
**Figure 10.3 : Option 2A – Union Street and George Street Area, including Denburn Road**



**Figure 10.4 : Option 2B – Union Street and George Street Area, excluding Denburn Road**



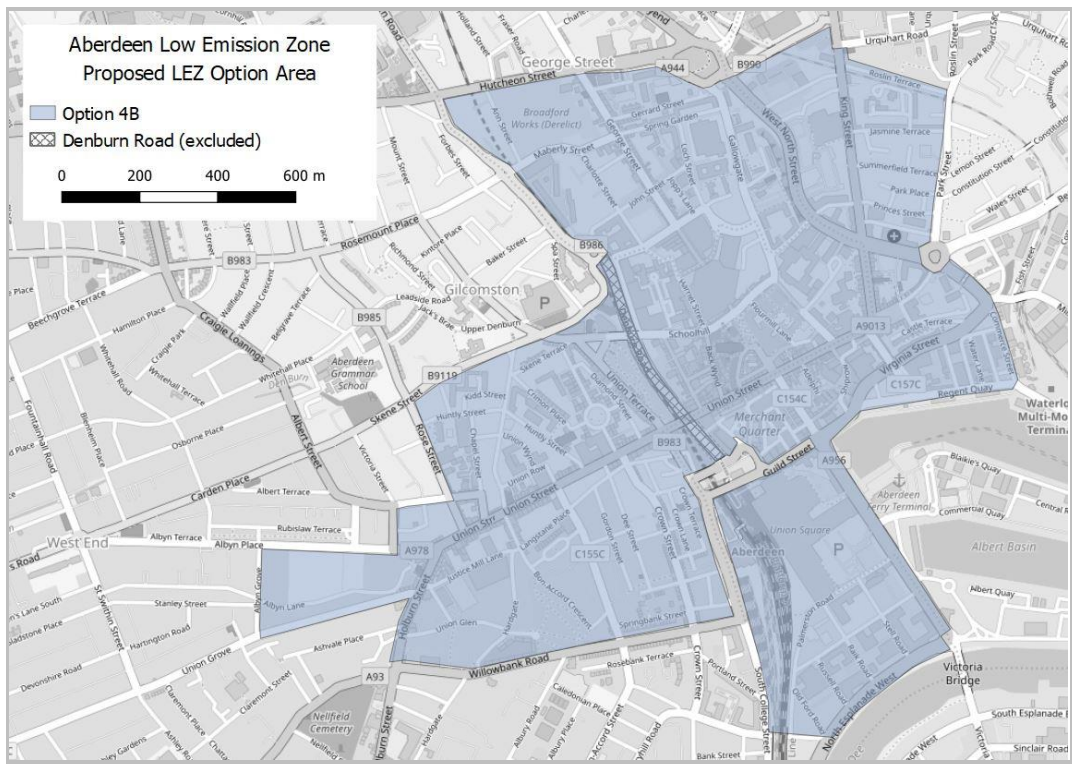
**Figure 10.5 : Option 3A – City Centre Masterplan East, including Denburn Road**



**Figure 10.6 : Option 3B – City Centre Masterplan East, excluding Denburn Road**



**Figure 10.7 : Option 4A – City Centre Masterplan, including Denburn Road**



**Figure 10.8 : Option 4B – City Centre Masterplan, excluding Denburn Road**

## 11. LEZ PUBLIC AND STAKEHOLDER ENGAGEMENT

### 11.1 Introduction

11.1.1 Upon completion of the Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework Interim Stage 2 Report, SYSTRA 2020*) ACC undertook a consultation exercise on the eight identified LEZ Options, as detailed in Chapter 10. The consultation took the form of an online public survey and online workshops with key (and statutory) stakeholders. The outcomes from the consultation period are reported in the City Growth and Resources Committee Report, June 2021 and summarised here.

11.1.2 The LEZ Options presented for consultation were:

- Option 1A – Union Street Area, including Denburn Rd (Figure 10.1)
- Option 1B – Union Street Area, excluding Denburn Rd (Figure 10.2)
- Option 2A – Union Street & George Street Area, including Denburn Rd (Figure 10.3)
- Option 2B – Union Street & George Street Area, excluding Denburn Rd (Figure 10.4)
- Option 3A – CCMP East including Denburn Rd (Figure 10.5)
- Option 3B – CCMP East excluding Denburn Road (Figure 10.6)
- Option 4A – CCMP, including Denburn Rd (Figure 10.7)
- Option 4B – CCMP, excluding Denburn Rd (Figure 10.8)

### 11.2 Public Consultation

11.2.1 An online public survey ran for six weeks from 14 September 2020 to 25 October 2020 and was administered by ACC. Consultation responses were also accepted by email to the Council's Transport Strategy address.

11.2.2 The survey received 506 responses with a further 10 received by email. Of the 506 responses received, 488 (96.5%) were from individuals, 18 (3.6%) were from businesses

11.2.3 Those organisations responding to the online questionnaire were:

- First Aberdeen Limited
- Stagecoach Bluebird
- Blacks of Brechin
- Royal Mail Group
- Road Haulage Association
- The Shore Porters Society
- Leiths (Scotland) Ltd
- Scottish Enterprise
- City Gate Aberdeen Ltd.
- HEAT (no further information provided)
- Friends of the Earth Scotland
- Asthma UK and British Lung Foundation Partnership
- British Heart Foundation Scotland
- Electric Vehicle Association Scotland
- Low Carbon Vehicle Partnership
- Rosemount and Mile End Community Council
- Cults, Bieldside and Milltimber Community Council
- Paths for All

11.2.4 The majority of respondents (77.9%) were regular car drivers in the city centre, with 46.4% walking in the city centre, and 32.8% using the bus to access the city centre. Smaller proportions were noted for cycling (20.8%), the train (12.5%), taxi (9.1%), motorcycle

(5.9%) and van (3.4%). Users of all main modes of transport in the city centre were therefore represented in the survey results.

11.2.5 The survey included questions seeking to discover respondents' views on LEZs in general and:

- 48.4% of respondents supported the general principle of LEZs
- 40.9% were not in favour of LEZs
- 10.3% were unsure

11.2.6 Specifically asked about the introduction of a LEZ in Aberdeen to address air quality problems in the city, 43.9% of respondents were supportive of a LEZ and 42.6% were not supportive of a LEZ in the city.

11.2.7 In terms of those who responded in support of LEZs, main themes were:

- Recognition of the beneficial health impacts
- Recognition of the environmental benefits
- Appreciation that LEZs can contribute to improved quality of places and quality of life
- Appreciation that LEZs can improve the city centre
- Recognition that LEZs can have wider benefits in terms of encouraging more sustainable transport choices
- Evidence from elsewhere testifying to the success of LEZs

11.2.8 In terms of those expressing concern about, or objections to, a LEZ, the main issues raised related to:

- The impacts on individuals, particularly the financial implications, especially given that the impacts of the COVID-19 pandemic may be felt for some time;
- Concerns that the less affluent members of society will be disproportionately impacted
- Concerns about the impacts on the disabled if not granted exemption from the LEZ
- Concerns about the impacts of proposals on the future health and prosperity of the city centre
- Concern that the LEZ could simply move traffic, and resulting congestion and emissions, elsewhere
- Concern about the current scope of the LEZ, whether it was correct to address all vehicle types, whether the emissions standards being proposed are justified and whether the impacts of the harbour should be considered
- A perception that this is simply a revenue-generating scheme
- Scepticism that the problem in Aberdeen is such that these measures are required

11.2.9 Respondents were asked specifically about their views on the eight LEZ options defined in the Interim NLEF Stage 2 Report. Firstly, they were asked to provide their views on the advantages and disadvantages of each option before being asked to rank each option in order of preference.

11.2.10 Considering the options identified by respondents as their preferred option, there was a clear preference for the options at the extreme ends of the scale, with Option 4A (22%) receiving the most preferred option votes overall, followed by Option 1A (19%). Combining all the rankings given in each response, the smallest option, Option 1A emerged as the most popular and Option 4B the least popular.

11.2.11 Respondents were asked what they thought were appropriate grace periods for residents and non-residents. The maximum allowable grace periods were the most popular (45% for residents and 47% for non-residents) although there is significant support for the minimum grace period (19% for residents and 34% for non-residents).



11.2.12 Asked to provide further responses in an open question, a strong theme to emerge in the public consultation was that a LEZ must not be delivered in isolation but must be supported by complementary measures to ensure it achieves its objectives and maximises the benefits. Measures identified include:

- Improving the public transport offering and park and ride opportunities;
- Improving active travel routes;
- Increasing car parking opportunities around the zone;
- Increasing electric vehicle charging opportunities;
- Improving roads around the zone;
- Working with businesses to further improve the city centre; and
- Financial support for vehicle upgrades.

11.2.13 Email responses were received from the following:

- Aberdeen Cycle Forum;
- Aberdeen Friends of the Earth;
- Enterprise Holdings;
- Federation of Small Businesses;
- Hammerson;
- Logistics UK;
- Robert Gordons College;
- UPS;
- A group of MSPs representing the Orkney and Shetland islands;
- One individual.

11.2.14 The main points raised by email respondents match closely those raised within the online survey. These include:

- The need for a LEZ to be integrated with other improvements, such as general traffic reduction measures, an improved sustainable transport offering and Mobility as a Service (MaaS);
- Concerns about the economic implications, particularly for city centre businesses;
- Concerns about the accessibility of key sites for non-compliant vehicles;
- Concerns about the impact on those travelling to Aberdeen from Orkney and Shetland who have no option but to arrive and depart from the ferry terminal;
- Concerns about the displacement of traffic and emissions;
- Concerns that the impacts of AWPR and COVID are not reflected in the modelling undertaken to date;
- Concerns that the impacts of shipping emissions are not being considered;
- A split between those who feel that proposals do not go far enough in scope and ambition, and those who believe the LEZ should be as small as possible;

### 11.3 Stakeholder Consultation

11.3.1 A range of workshops with key stakeholders were held concurrently with the live public survey dates during September and October 2020. Five workshops were held in total and the format involved a presentation by a member of the Aberdeen LEZ Delivery Group on the Interim NLEF Stage 2 Report findings and the recommended LEZ options, followed by a questions and answer session. The stakeholders represented at the workshops were as follows:

- Bus industry representatives:
  - Stagecoach East Scotland, First Bus, Bains Coaches and the Confederation of Passenger Transport (CPT)
- Local freight industry representatives
- Aberdeen Harbour

- Community Councils:
  - George Street, Rosemount and Mile End, Castlehill and Pittodrie
- Environmental/interest groups
  - Friends of the Earth, Aberdeen Cycle Forum, Asthma UK and British Lung Foundation Partnership, Aberdeen Environment Forum
- Taxi representatives

11.3.2 No business representatives attended the planned business workshops, despite several attempts to contact business groups and their members. This was considered likely a result of the current impact the Covid-19 pandemic is having on businesses. ACC recognise the importance of the business community and a further business workshop was organised for April 2021 (as part of the focussed Covid-19 consultation in Section 11.4 below), where representatives from Union Square shopping centre and Aberdeen & Grampian Chamber of Commerce attended.

11.3.3 The City Growth and Resources Committee Report summarises the outcomes from each individual workshop, with the key themes noted across all workshops as follows:

- No stakeholder expressed views against the LEZ. Some stakeholders made the point of expressing support for a LEZ while others stated they were accepting that a LEZ was to be introduced
- The LEZ should not create problems elsewhere in the city, whether this is new air quality exceedances or increased congestion. If required, the LEZ should be delivered with complementary measures to ensure this does not happen.
- Grace periods, particularly for residents of the LEZ and those on a lower income/income support, should be as long as possible.
- Exemptions are needed for certain vehicles (mobility vehicles, vintage vehicles etc.)
- Bus and coach operators are in a very difficult financial position due to the impact of Covid-19 and will not be able to ensure all vehicles meet LEZ standards if current level of income continues. There is a need for a collective understanding of the difficulties faced by the industry when deciding on the date and impact of the implementation and enforcement of the LEZ.
- The majority of HGVs will be compliant by 2022, 7/8 year cycle on vehicles (i.e. based on 7 years from 2015 (Euro VI introduction)).
- The LEZ should not be implemented in isolation and needs to be part of a wider delivery programme for the city

## 11.4 Focussed Covid-19 Consultation

11.4.1 In response to the Covid-19 pandemic the national LEZ Leadership Group announced in May 2020 a temporary pause in plans to implement LEZs across Scotland. Plans were formally resumed in August 2020 and a new indicative timescale for the introduction of LEZs was published, that aims to see their introduction between February and May 2022.

11.4.2 It is recognised that the Covid-19 pandemic has had an unprecedented impact on society, including on the wider environment and the economy. Transport Scotland and ACC recognise that the Covid-19 pandemic may significantly influence future travel demand and in turn emissions attributed to road transport. Transport Scotland commissioned a study to consider the uncertainty over what travel will look like after the Covid-19 pandemic has ended, and this is summarised in Chapter 14.

11.4.3 In light of the difficulties faced by many throughout 2020 and 2021, particularly, in the context of a Aberdeen city centre LEZ, city businesses and bus operators, ACC were keen to understand the level of support for the introduction of a LEZ in the city post pandemic and gauge the impact the pandemic may have had on businesses and bus operators in preparing for its introduction.

11.4.4 ACC have consulted with bus operators in the city regularly throughout the LEZ process and have kept them up to date with ongoing proposals for the city's LEZ. Given the importance of bus compliance to the success of any LEZ, the operators (First Bus, Stagecoach and Bains Coaches) were approached in March 2021 and asked to complete a short questionnaire, comprising the following questions:

- What would LEZ enforcement in 2023 mean for your organisation and operations in Aberdeen?
- What will your level of fleet compliance to Euro VI standards be in 2023?
- Will you have to reduce services to meet a 2023 LEZ enforcement date?
- Would applying an additional year grace period before enforcement (to 2024) provide the opportunity for your full Aberdeen fleet to meet the required LEZ standards?
- What are your views on other vehicles being included in the LEZ and if they are included what length should the grace period be?

11.4.5 Key findings from the bus operator questionnaire were:

- The two main operators (First and Stagecoach) confirmed their full bus fleet entering the proposed LEZ area will not be Euro VI compliant by the end of the 2023 minimum grace period under current investment plans
- The impacts from the pandemic on passenger numbers is significantly hampering the ability to invest in new vehicles (and therefore meet compliance levels by 2023)
- The early enforcement of a LEZ may result in a reduction in services or a rerouting of services away from the LEZ area
- Any additional grace period (from the minimum of 2023) would allow time to plan fleet investment to meet LEZ requirements
- Private cars must be included to ensure the bus is not unfairly penalised
- Any grace period should be the same for all vehicles

11.4.6 If bus operators need to reduce or reroute services as a direct result of the LEZ, the city centre may become inaccessible to some city residents that depend on bus services to access the city. For those accessing the city who have a choice between bus or car access, service changes may push more to using private cars.

11.4.7 The business community has been significantly impacted by the Covid-19 pandemic, with many shops and services required to close or provide reduced service due to Government restrictions. As noted above, no business representatives attended the autumn 2020 workshops, and given the importance the business community to the implementation of any LEZ in the city, a further business workshop was organised for April 2021 where representatives from Union Square shopping centre and Aberdeen & Grampian Chamber of Commerce attended, with key themes captured in Section 11.3 above.

## 11.5 Scotland Wide Consultation

11.5.1 In 2017, Transport Scotland facilitated a public consultation, *Building Scotland's Low Emission Zones*, to inform development of the Transport (Scotland) Act 2019 and the draft National Low Emissions Framework (NLEF). In total, 967 responses were received ([Consult.gov.scot](https://www.consult.gov.scot)) and key findings are published on the Low Emission Zone Scotland website as follows:

- 95.5% supported the principle of low emission zones to help protect public health by improving air quality in Scotland
- 62.3% of respondents agreed with the proposed minimum mandatory Euro class specification for vehicle compliance
- 86.3% of respondents agreed that low emission zone exemptions should be consistent across all Scottish local authorities

- 11.5.2 Transport Scotland also facilitated the [Scotland Low Emission Zone Consultation on Regulations and Guidance 2019-2020](#). It sought responses about key aspects of LEZ regulations and guidance, particularly emission standards, exemptions and penalty charges.

## **11.6 Statutory Consultation**

- 11.6.1 As noted above, the statutory consultees include SEPA, NatureScot and Historic Environment Scotland. As part of the overarching NLEF process, a Strategic Environmental Assessment (SEA) is being undertaken in parallel to the NLEF option appraisal process (this Interim NLEF Stage 2 Report). Through the SEA, ACC are required to seek the views from these statutory consultees. Full details of this consultation will be included in the final SEA Environmental Report which will be summarised in the final NLEF Stage 2 Report.

## **11.7 Key Outcomes from Consultation of LEZ Options**

- 11.7.1 The consultation showed that the introduction of a LEZ in Aberdeen is generally evenly supported and not supported, however the public responses do show an awareness of the potential benefits for the introduction of a LEZ in the city.
- 11.7.2 A consistent theme across the consultation exercises was the belief that the LEZ should be integrated with other improvements, such as general traffic reduction measures or an improved sustainable transport offering. Similarly there was recognition that the LEZ should not create new congestion or air quality problems in the city. Both these views were taken into consideration in the option development process and the subsequent traffic model analysis.
- 11.7.3 Bus operators have been significantly impacted by the Covid-19 pandemic and are not likely to be able to suitably invest in their fleets to meet a 2023 enforcement date. A 2024 enforcement date or later would provide more a realistic timeline to meet LEZ compliance. Across the consultation exercises, there was considerable support for the longest possible grace period to be applied although there was also notable support for the shortest grace period to apply.
- 11.7.4 Although the consultation did not conclude that any of the 8 LEZ options can be ruled out at this stage, support for any options that excluded Denburn Road was low.

## 12. LEZ TRAFFIC MODELLING AND SIFTING OF OPTIONS

### 12.1 Introduction

12.1.1 In 2019, Aberdeen City Council commissioned the development of a traffic microsimulation model of Aberdeen City Centre for the purpose of assessing road network options associated with the development of a LEZ in Aberdeen.

12.1.2 The initial Base Model development (ACCPM19) is detailed in the report '*Aberdeen City Centre Paramics Model Upgrade 2019*' (SYSTRA Ref: GB01T19F42/2, October 2020). The ACCPM19 road network description is shown in Figure 12.1.

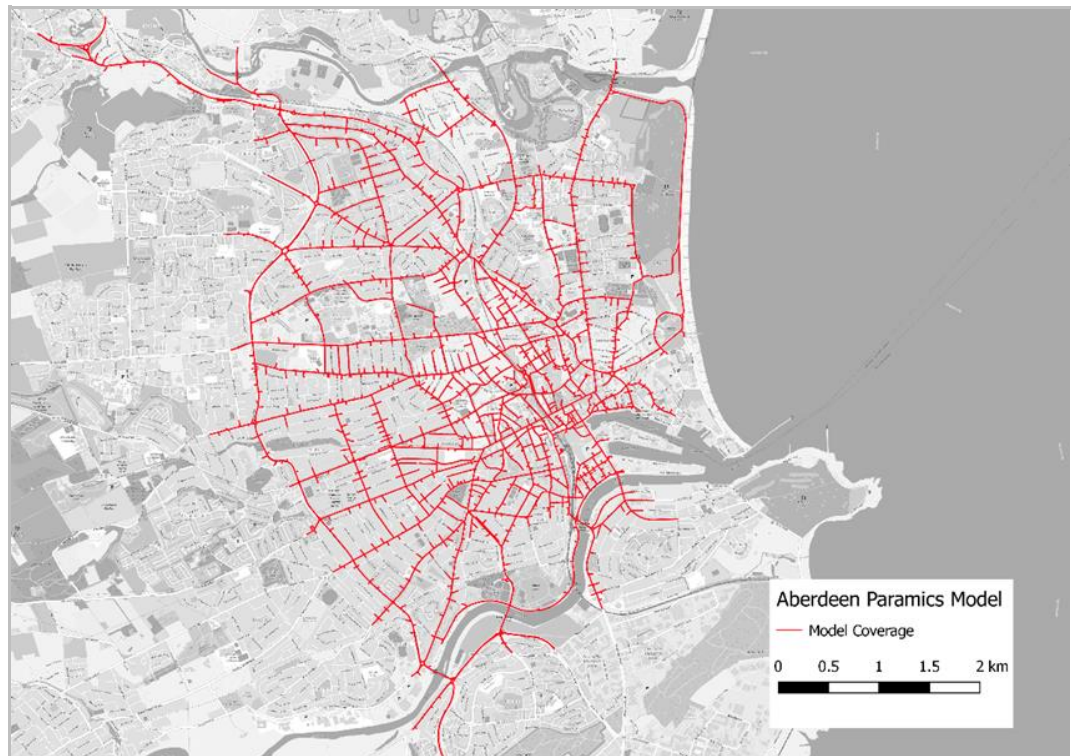


Figure 12.1 : ACCPM19 – Network Coverage

12.1.3 The subsequent development of the 2024 Reference Case Model, from which the LEZ scenarios have been assessed, is detailed in the report '*Aberdeen City Centre: Future Year (2024) Model Development Report*' (SYSTRA, Ref: GB01T20D62/1, December 2020).

12.1.4 For the purposes of this report, the Aberdeen City Centre traffic model, against which all testing will be undertaken, will be deemed the ACCPM24.

12.1.5 The eight LEZ boundary options detailed in Chapter 10 (LEZ options 1A to 4B) formed the initial model test scenarios.

12.1.6 This chapter first outlines the development of each of the LEZ option models before assessing the impact that each LEZ has on the Aberdeen road network. The assessment allows for the total number of LEZ options to be reduced if they are shown to negatively impact on network traffic conditions or known air quality exceedance locations. The assessment is summarised below with full details provided in the accompanying '*LEZ Option Testing Report*' (SYSTRA Ref: GB01T20D62/2, May 2021). Those options that remain after the initial assessment are progressed to option refinement (Chapter 13) and detailed modelling (Chapter 14).

## 12.2 Model Development of LEZ scenarios

12.2.1 The higher tier strategic traffic model, ASAM14 (Aberdeen Sub Area Model), was utilised to provide the strategic impact of the future committed developments and infrastructure proposals on the ACCPM24 network. The model includes planning data from the TELMoS14 Land-Use model and both City and Shire Councils (reflecting the 2018 Strategic Development Plan). This resulted in an uplift of **6 to 8%** over the 2019 traffic levels being applied to the ACCPM24. ASAM14 was also utilised to identify the strategic impact of the LEZ scenarios.

12.2.2 In line with the other Scottish LEZ cities, a series of assumptions were required to model the impact of a LEZ on the traffic network. These include:

- 2024 Fleet Composition – Derived by SEPA / ANPR Data (Table 12.1)
- Mode Shift Assumption - No consideration of mode shift from private vehicles to bus, cycle, or taxi as a direct result of the LEZ implementation
- LEZ Adherence Level – 100% of non-compliant vehicles adhere to the LEZ restriction i.e. no non-compliant vehicles can enter the LEZ area
- All buses and taxis are assumed to be compliant
- All cars, LGV's and HGV's that are non-compliant will divert around the LEZ boundary
- All buses, LGVs, HGVs, and Taxis that originate or destinate within the LEZ area are assumed to be compliant
- All cars that originate or destinate within the LEZ are assumed to be compliant, with the exception of off-street car parking, where non-compliant cars were relocated to car parks out-with the LEZ area.

12.2.3 The future forecast of the fleet composition was derived by SEPA using the 'Emission Factor Toolkit, Version 8' (EFT) for national fleet. The change in vehicles compliance predicted from the EFT between 2019 and 2024 was applied to local fleet compliance levels observed in Aberdeen in 2019, as detailed in Table 12.1.

**Table 12.1 : Aberdeen Fleet Compliance Prediction to 2024**

Source	Emissions	Year	Car (%)	LGV (%)	HGV (%)
EFT National Data	Non Compliant	2019	24.6	43.68	24.6
EFT National Data	Compliant	2019	75.41	56.32	75.4
EFT National Data	Non Compliant	2024	8.14	14.09	4.9
EFT National Data	Compliant	2024	91.86	85.91	95.1
EFT National Data	Non Compliant % Change 2019-2024	-	-16.45	-29.59	-19.70
EFT National Data	Compliant Change % 2019-2024	-	16.45	29.59	19.70
ANPR 2019	Non Compliant	2019	30.3	59.8	27
	Compliant	2019	69.7	40.2	73
<b>Projected 2024</b>	<b>Non Compliant</b>	<b>2024</b>	<b>13.85</b>	<b>30.21</b>	<b>7.30</b>
	<b>Compliant</b>	<b>2024</b>	<b>86.15</b>	<b>69.79</b>	<b>92.70</b>

12.2.4 Vehicle compliance to the LEZ adherence levels have been modelled with a 16% increase in compliant cars, 30% increase in compliant LGV's and 20% increase in compliant HGV's for 2024 compared to the observed fleet proportions in 2019 (as detailed in Section 4.7).

12.2.5 The traffic modelling also considered the impact to car parking for non-compliant vehicles under each LEZ boundary option. Some city centre car parks will be within the proposed LEZ area. This will result in a likely relocation of non-compliant cars to car parks outside the LEZ area. The scale of traffic relocation will be different for each LEZ boundary.

12.2.6 Table 12.2 details the Car Park implications for non-compliant vehicles in each of the eight LEZ scenarios.

**Table 12.2 : Car Park Availability for Non-Compliant Cars**

Ref.	Name	Capacity	Max % full	1A	1B	2A	2B	3A	3B	4A	4B
1	Chapel Street	500	55%	x	x	x	x	x	x	x	x
2	Denburn	325	53%	✓	✓	✓	✓	✓	✓	✓	✓
3	Bon Accord (Loch St)	990	61%	✓	✓	x	x	x	x	x	x
4	Bon Accord (Harriet St)	400	66%	✓	✓	x	x	x	x	x	x
5	College Street	456	68%	✓	✓	✓	✓	✓	✓	x	x
6	Ship Row	365	30%	x	x	x	x	x	x	x	x
7	Gallowgate	138	88%	✓	✓	x	x	x	x	x	x
8	West North Street	160	69%	✓	✓	✓	✓	x	x	x	x
9	Trinity Centre	397	63%	x	✓	x	✓	x	✓	x	✓
10	Union Square	1200	61%	✓	✓	✓	✓	✓	✓	x	x
11	IQ Car Park	260	64%	x	x	x	x	x	x	x	x
12	Frederick Street	150	55%	✓	✓	✓	✓	✓	✓	x	x
13	Beach Boulevard Retail Park / Esplanade	1900	49%	✓	✓	✓	✓	✓	✓	✓	✓
No. of City Centre Car Parks available for Non Compliant Vehicles (Excl. Beach Boulevard)			12	8	9	5	6	4	5	1	2
Total spaces (Excl. Beach Boulevard)			5341	3819	4216	2291	2688	2131	2528	325	722
% of Total Spaces Available				72%	79%	43%	50%	40%	47%	6%	14%
x	Car Park Available for Compliant Vehicles Only										
✓	Car Park Available for all Traffic										

12.2.7 As the number of car parks available to non-compliant vehicles decreases, then the volume of traffic re-allocated to car parks on the outskirts of the city centre increases.

12.2.8 For Option 4A and 4B, the volume of traffic that would need to reallocate from the city centre area to the limited remaining available off-street car parks was deemed unreasonable and unworkable (by ACC). In this case, a proportion of the non-compliant car parking vehicles were re-assigned as compliant vehicles.

12.2.9 In Option 4A and 4B therefore, the percentage of non-compliant car park vehicles was re-adjusted until the total number of re-distributed non-compliant vehicles was similar to the other scenarios. Instead of an 86% car compliance level, this was increased to a 95% car compliance level for car parking traffic.

### 12.3 Development of additional LEZ Boundary - Option 5

12.3.1 From the initial option model assessment process, there was clear evidence that further consideration of potential boundary options could be undertaken which would combine the benefits of both the smaller scale LEZ options (i.e. Option 1A) and the large scale LEZ options (i.e. Option 4A) and also reduce their disbenefits.

12.3.2 The process of developing a further boundary scenario, included the following considerations:

- Ability for the transport network to cater for traffic displacement
- Requirement to displace non-compliant traffic away from the city centre area and onto pertinent routes of a suitable standard and with no existing air quality issues
- Maximise the influence on non-compliant vehicles within the city centre to improve air quality
- Retain a reasonable degree of accessibility for all vehicle fleet (both compliant and non-compliant)
- Limit the number of residential properties within the LEZ area

12.3.3 The proposed additional LEZ Option 5, was based on a hybrid of Option 1A and 4A, and includes the following variations to Option 1A shown in Table 12.3.

**Table 12.3 : LEZ Option 5 Boundary Detail**

Detail	Rationale
LEZ covers Union Street Area, including Denburn Road	Area derived from NLEF Process
LEZ covers Union Street Area, excluding Denburn Road	Area derived from NLEF Process
Extension of 1A to Holburn St	All LEZ scenarios show traffic increase through the west end of Union Street and particularly the north-south route of Holburn St up through Albert St and Argyle Place. Extending the LEZ through the west end of Union Street will cut this cross city routing option for non-compliant traffic. Note: May need to consider subsequent impact through St. Swithen St / Fountainhill Rd corridor
Extension of 1A to A93 Willowbank Road	Traffic flow increases through this route in all LEZ options as a result of diversion of non-compliant traffic. Corridor has been de-classified as part of Network Hierarchy review so not appropriate route for this traffic. Will need to consider the impact through Ferryhill Rd area, but may need weighed up benefits of a LEZ extension or other TM measures through this corridor.
Extension of 1A to Littlejohn St	Where Littlejohn St is on the periphery of the LEZ, some traffic congestion occurs through the junction onto West North Street
Extension of 1A to Upperkirkgate	In Options 1A/1B, Schoolhill is on the periphery of the LEZ, resulting in slight increases in traffic flow through this corridor. This is not an appropriate route to carry additional traffic (and higher emission traffic).
Extension of 1A to Harbour Corridor (East North St/Commerce St/ Virginia St/ Trinity Quay/Market St	Congestion issues occur through this corridor when it is open to all traffic. The CCCMP measures may be able to partially or fully address this issue. However, it would be prudent, in the first instance, to assess the impact of restricting access through this corridor for non-compliant vehicles with a small scale LEZ boundary.
Combination of 1A - 1G	Full restriction of city centre <u>through</u> traffic to non-compliant vehicles

12.3.4 When the above boundary variations to Option 1A are considered together (see Figure 12.2 below), this LEZ area has the effect of restricting all non-compliant vehicles from routing through the city centre area (as in Option 4A), but critically, it does not restrict access to the city centre (car park options still available, as in Option 1A). This is consistent with other policies and aspirations for Aberdeen City Centre.

12.3.5 The proposed boundary for Option 5 also intersects all key approach routes into the city centre thereby having an impact on the volume of non-compliant traffic in the city centre on a much wider scale than the boundary itself.



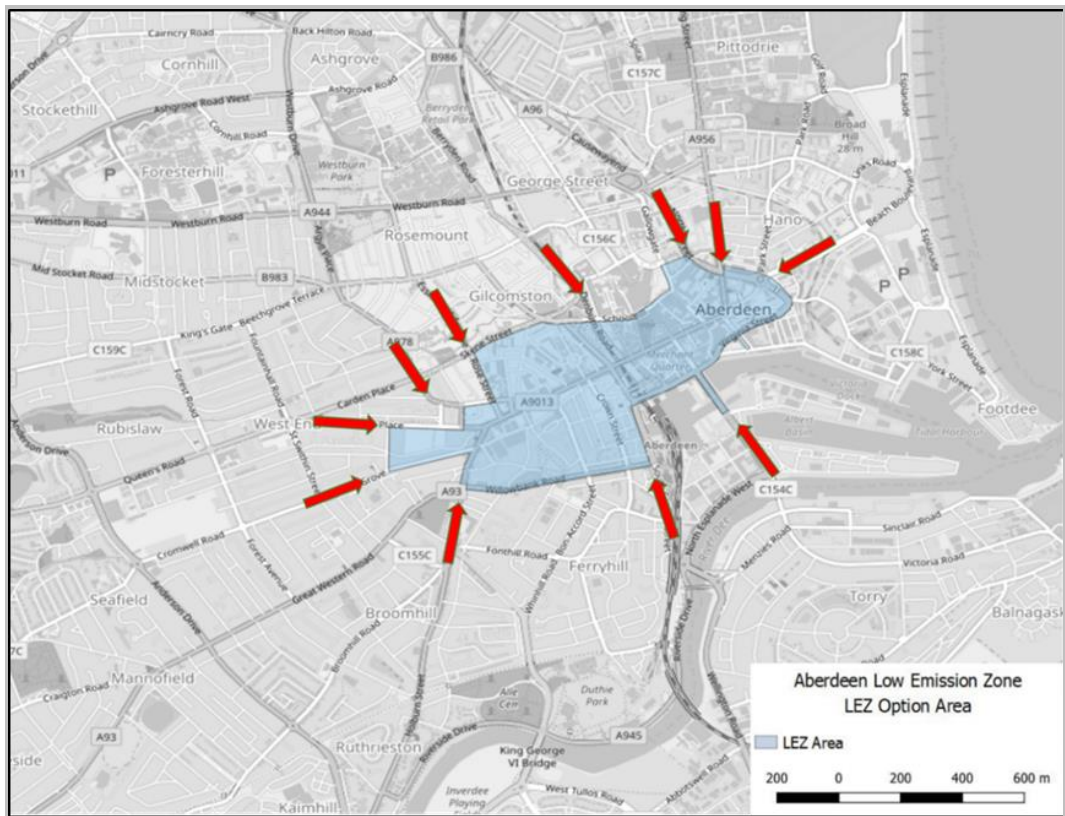


Figure 12.2 : LEZ Option 5

12.3.6 The rationale for the proposed LEZ Option 5 was presented to the ACC LEZ Delivery Group on in February 2021. ACC subsequently agreed to consider this option for further assessment alongside the other eight LEZ scenarios.

## 12.4 LEZ Boundary Option Sifting

12.4.1 The model appraisal of each of the LEZ scenarios included consideration of:

- Traffic Demand Level that the model was able to run at
- Traffic flow changes at the 2019 NO<sub>2</sub> exceedance locations
- Alignment to proposed future Network Hierarchy
- Car Park Accessibility
- Residential Impact of LEZ boundary

12.4.2 The outcomes from the sifting of the LEZ options is provided here with full details found in the *LEZ Option Testing Report (SYSTRA Ref: GB01T20D62/2, May 2021)*.

### **Model Network Demand Level**

12.4.3 One of the primary criteria for the assessment of each LEZ test scenario was to identify the level of traffic demand that the model could run in each peak period. For example, if a model ran at 80% demand, then this suggests that there would need to be a 20% reduction in the 2024 traffic levels (or 13% reduction on 2019 levels) within the city centre to enable the network to operate without significant congestion and network instability.

12.4.4 The 2024 future year traffic models include approximately 7% predicted growth over the 2019 Baseline traffic levels in the PM Peak. It could therefore be considered that models running at 95% demand is equivalent to a small level of traffic growth on the 2019 baseline traffic demand (i.e. 2% traffic growth from 2019). In addition, due to the potential impact of the COVID-19 pandemic, a zero growth future is also a plausible future.

12.4.5 In the LEZ option testing, there are two network scenarios that do not meet either the 95% or 100% demand levels, namely LEZ boundary Option 2B and 3A, which were shown to run at 80% and 90% demand respectively in the PM period, representing a reduction in traffic demand from the 2019 baseline. Table 12.4 shows the demand level that each LEZ test scenario was able to run at in each period.

**Table 12.4 : Network Demand Level**

Peak Period	LEZ Boundary Options								
	1A	1B	2A	2B	3A	3B	4A	4B	5
AM	100%	100%	100%	100%	100%	100%	95%	95%	100%
IP	100%	100%	100%	100%	100%	100%	100%	100%	100%
PM	95%	100%	95%	80%	90%	95%	95%	95%	95%

12.4.6 For this reason (with full details provided in the Model Testing Report), **LEZ Options 2B and 3A** are omitted from further consideration at this stage.

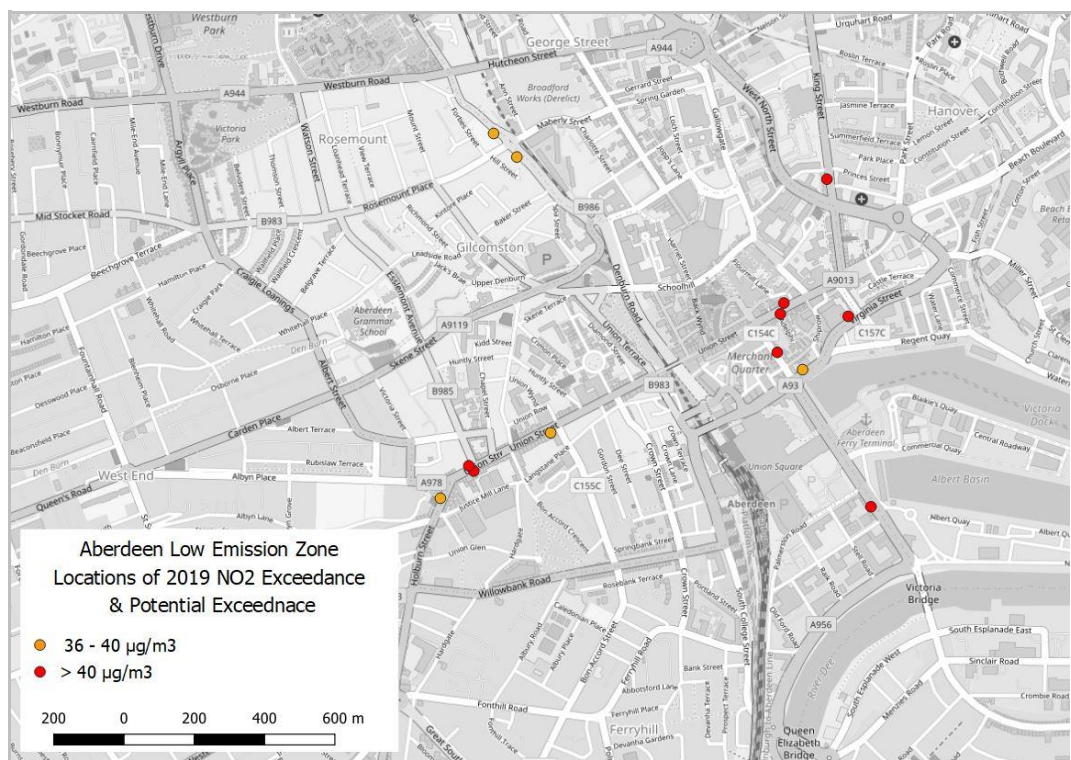
**Table 12.5 : LEZ Sifting Outcome (Step 1)**

LEZ Boundary Options								
1A	1B	2A	<del>2B</del>	<del>3A</del>	3B	4A	4B	5

**NO<sub>2</sub> Exceedance Locations**

12.4.7 As detailed in Chapter 4, ACC undertook non-automatic (passive diffusion tube) monitoring of NO<sub>2</sub> at 70 sites during 2019 as part of the air quality monitoring Annual Progress Reporting (APR).

12.4.8 In total, there are 8 locations where annual mean concentrations of NO<sub>2</sub> exceed the AQO of 40µg/m<sup>3</sup> and a further 6 sites where the annual mean concentrations of NO<sub>2</sub> exceed 36 µg/m<sup>3</sup>. Figure 12.3 shows the locations where annual concentrations of NO<sub>2</sub> were recorded as greater than 36 µg/m<sup>3</sup> in 2019.



**Figure 12.3 : Locations of 2019 Annual Mean Concentration of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup>**

12.4.9 Each of the LEZ boundary options encompasses the majority of the locations detailed in Figure 12.3. Table 12.6 details the exceedance / potential exceedance locations that are directly inside each of the LEZ boundary options.

**Table 12.6 : LEZ coverage of NO<sub>2</sub> air quality exceedance locations**

Site	Exceedance Location	Exceedance Location Within LEZ ?						
		1A	1B	2A	3B	4A	4B	5
DT30	335 Union St	✓	✓	✓	✓	✓	✓	✓
DT73	61 Skene Square	✗	✗	✗	✗	✗	✗	✗
DT18	14 Holburn St	✗	✗	✗	✗	✓	✓	✗
CM2	Union Street	✓	✓	✓	✓	✓	✓	✓
DT16	1 Trinity Quay	✗	✗	✗	✓	✓	✓	✗
DT77	27 Skene Square	✗	✗	✗	✗	✗	✗	✗
DT11	105 King St	✗	✗	✗	✗	✓	✓	✗
DT10	184/192 Market St	✗	✗	✗	✗	✓	✓	✗
DT9	39 Market St	✓	✓	✓	✓	✓	✓	✓
DT29	469 Union St	✓	✓	✓	✓	✓	✓	✓
DT12	40 Union St	✓	✓	✓	✓	✓	✓	✓
DT17	43/45 Union St	✓	✓	✓	✓	✓	✓	✓
DT82	7 Virginia Street	✗	✗	✗	✓	✓	✓	✗
DT19	468 Union St	✓	✓	✓	✓	✓	✓	✓

12.4.10 The locations detailed above that are outside the LEZ boundary can still be influenced by the impact of the LEZ scheme and the impact of each boundary option on each of the exceedance / potential exceedance locations forms the next stage of the option sifting process.

**NO<sub>2</sub> Exceedance Locations – Denburn Road Variation**

12.4.11 The LEZ boundary options 1B, 3B and 4B exclude Denburn Road from the LEZ area. The traffic model testing has shown that this has the effect of increasing (non-compliant) traffic through the Denburn corridor and through Skene Square to the Hutcheon Street junction. There are two key issues with this occurrence:

- Skene Square includes two locations where there are potential NO<sub>2</sub> exceedances
- Additional traffic demand through Skene Square adds pressure to a critical pinch point on the network – Berryden Road/Hutcheon Street junction. This junction, even with capacity improvements from the Berryden Corridor Improvement proposals (Section 3.4), shows junction capacity issues through the model testing. It is known from parallel testing that further traffic restrictions within the city centre area (from CCMP) will put further pressure on this junction.

12.4.12 A review of the model traffic flows through Skene Square corridor was undertaken for each of the LEZ boundary options that exclude Denburn Road from the LEZ . Table 12.7 provides a summary of the 12 hour flow comparisons between the LEZ scenario options and the 2019 Base model. Note the 2019 Base model is used for all flow comparisons for consistency with the 2019 observed air quality dataset.

**Table 12.7 : Skene Square Flow Change (12-hr Flow)**

Site	Exceedance Location	Op 1B		Op 3B		Op 4B	
		Flow Diff	%	Flow Diff	%	Flow Diff	%
DT73	61 Skene Sq.	-375	-2%	1892	12%	1208	8%
DT77	27 Skene Sq.	-371	-2%	1884	12%	1214	8%

12.4.13 Table 12.7 shows that for Option 3B, there is predicted to be an increase in traffic flow in the region of 12% over the 2019 baseline. For Option 4B, this increase is observed to be in the region of 8%. These traffic increases will likely include a more concentrated proportion of non-compliant traffic as they seek an alternative viable route through the city centre with the eastern route of Market Street, Virginia Street, Commerce Street and West North Street restricted for non-compliant vehicles.

- 12.4.14 As the Berryden Rd/Skene Square/Woolmanhill corridor is a priority route into the city centre, there are no other network proposals, as part of the CCMP or other, that would likely result in a decrease in traffic flow though this corridor of a scale greater than these increases.
- 12.4.15 The option to allow non-compliant traffic to route through Denburn Road does therefore not comply with other city centre strategies and is highly likely to increase the NO<sub>2</sub> emission levels at Skene Square.
- 12.4.16 Option 1B does not show the same increases in traffic flows through Skene Square as 3B and 4B, primarily due to the smaller LEZ area impacting fewer vehicles.
- 12.4.17 Due to the predicted increases in traffic flow (of non-compliant vehicles) and resultant congestion through the Skene Square corridor as well as the potential impact on NO<sub>2</sub> emissions along this corridor, **LEZ Options 3B and 4B** are omitted from consideration at this stage.

**Table 12.8 : LEZ Sifting Outcome (Step 2)**

LEZ Boundary Options										
1A	1B	2A	<del>2B</del>	<del>3A</del>	<del>3B</del>	4A	<del>4B</del>	5		

***NO<sub>2</sub> Exceedance Locations – Detailed Assessment***

- 12.4.18 As detailed in Chapter 5, high level scenario testing using the baseline Aberdeen National Modelling Framework (NMF) Air Quality Model concluded that improving the city bus fleet to LEZ compliant standard (Euro VI) will bring the single biggest reduction in NO<sub>2</sub> levels and that buses therefore must be included in an Aberdeen LEZ. The NMF quantified the impact that an all compliant bus scenario would have on the NO<sub>2</sub> emission levels city wide and at the 2019 exceedance/potential exceedance locations. Table 12.9 shows the predicted NO<sub>2</sub> levels for each location, under the assumption that all buses have been upgraded to a compliant LEZ emission level.
- 12.4.19 The NMF scenario test results show that if all buses are compliant with LEZ vehicle emission standards, there would still likely be four 2019 exceedance locations where NO<sub>2</sub> levels would be greater than 40µg/m<sup>3</sup> and a further nine locations where the NO<sub>2</sub> is near to this maximum allowable level, as shown in Table 12.9 .

**Table 12.9 : Annual Mean Concentrations of NO<sub>2</sub> greater than 36µg/m<sup>3</sup>**

Site	Exceedance Location	Observed 2019 NO <sub>2</sub> (µg/m <sup>3</sup> )	% Reduction in modelled NO <sub>2</sub>	Bus Compliant Predicted NO <sub>2</sub> (µg/m <sup>3</sup> )
DT30	335 Union St	39.0	-2.4%	38.0
DT73	61 Skene Square	38.0	-4.8%	36.2
DT18	14 Holburn St	39.0	-2.1%	38.2
CM2	Union Street	36.0	-10.5%	32.2
DT16	1 Trinity Quay	39.0	-2.7%	37.9
DT77	27 Skene Square	38.0	-2.2%	37.2
DT11	105 King St	45.0	-2.5%	43.9
DT10	184/192 Market St	47.0	-4.9%	44.7
DT9	39 Market St	44.0	-12.8%	38.4
DT29	469 Union St	42.0	-12.7%	36.7
DT12	40 Union St	43.0	-14.8%	36.6
DT17	43/45 Union St	43.0	-2.5%	41.9
DT82	7 Virginia Street	43.0	-1.6%	42.3
DT19	468 Union St	42.0	-11.0%	37.4

12.4.20 The figures presented in Table 12.9 are critical when considering the traffic model flow changes in the LEZ option test scenarios.

12.4.21 Table 12.10 provides a traffic flow percentage difference comparison between the remaining LEZ scenarios and the 2019 Base Model at each of the exceedance locations in the network. The data is based upon the 12 Hr model flows\*.

12.4.22 For absolute clarity, this comparison is between a 2024 future year scenario with a LEZ and a 2019 Base scenario. The traffic flow differences therefore include the influence of background traffic growth as well as the impact of the LEZ.

\* Where the model only runs at 95% demand Options 1A, 2A, 4A and 5), the traffic flows have been factored to 100% to enable a like for like comparison with the Base Model

**Table 12.10 : Traffic Flow Analysis at Air Quality Exceedance Locations**

Site	Exceedance Location	% Flow Change from 2019 Baseline				
		1A	1B	2A	4A	5
DT30	335 Union St	-1%	0%	0%	-2%	5%
DT73	61 Skene Square	-8%	-2%	-8%	-4%	-8%
DT18	14 Holburn St	9%	5%	7%	-6%	1%
CM2	Union Street	1%	0%	1%	-3%	3%
DT16	1 Trinity Quay	11%	10%	16%	-9%	-7%
DT77	27 Skene Square	-8%	-2%	-8%	-4%	-8%
DT11	105 King St	16%	13%	11%	-3%	3%
DT10	184/192 Market St	11%	7%	14%	-8%	-4%
DT9	39 Market St	-4%	-5%	-3%	-3%	1%
DT29	469 Union St	0%	-1%	-1%	-3%	3%
DT12	40 Union St	10%	10%	7%	1%	9%
DT17	43/45 Union St	10%	10%	7%	1%	9%
DT82	7 Virginia Street	13%	10%	16%	-4%	-8%
DT19	468 Union St	0%	-1%	-1%	-3%	3%

12.4.23 Table 12.10 shows that there are traffic flow increases observed at seven of the exceedance locations in Options 1A, 1B and 2A. It is also evident that there isn't a significant difference between each of these three scenarios.

- 12.4.24 For Option 4A, the LEZ area covers all of the exceedance locations and therefore the traffic flows have reduced as a result of non-compliant vehicles being excluded from these locations. The comparisons show that Option 4A results in traffic flows reducing to a level below the 2019 Baseline at the 2019 exceedance locations.
- 12.4.25 It can be seen from Table 12.10 that traffic flow changes around the exceedance areas in Option 5 are a closer match to 2019 Baseline than Option 1A,1B and 2A, due to the extension of the LEZ area to include the key radial routes in Option 5. Whilst there is an increase in traffic observed on Union Street (East), this is within the boundary of the LEZ, therefore this traffic increase will be all compliant vehicles.
- 12.4.26 In lieu of Air Quality modelling available at this point in the assessment, in order to predict the emission level changes for each scenario, a methodology was adopted using the traffic model flow outputs and the NMF predicted NO<sub>2</sub> reductions detailed in Table 12.9.
- 12.4.27 The methodology applied considered the following information:
  - Model Traffic flow changes between 2024+LEZ model and the 2019 Base model
  - Impact to NO<sub>2</sub> levels when all buses are compliant
  - Consideration whether exceedance locations were inside or outside the LEZ area
- 12.4.28 Table 12.11 details the predicted impact of the LEZ options on the air quality exceedance locations. These results are presented as coloured banding, representing the predicted impact to the NO<sub>2</sub> levels.

**Table 12.11 : Predicted Impact of LEZ on Air Quality Exceedance Locations**

Site	Exceedance Location	Predicted Air Quality Impact				
		1A	1B	2A	4A	5
DT30	335 Union St	Green	Green	Green	Green	Green
DT73	61 Skene Square	Green	Green	Green	Green	Green
DT18	14 Holburn St	Red	Red	Red	Green	Green
CM2	Union Street	Green	Green	Green	Green	Green
DT16	1 Trinity Quay	Red	Red	Red	Green	Green
DT77	27 Skene Square	Green	Green	Green	Green	Green
DT11	105 King St	Purple	Purple	Purple	Yellow	Red
DT10	184/192 Market St	Purple	Purple	Purple	Yellow	Yellow
DT9	39 Market St	Green	Green	Green	Green	Green
DT29	469 Union St	Green	Green	Green	Green	Green
DT12	40 Union St	Yellow	Yellow	Green	Green	Green
DT17	43/45 Union St	Red	Red	Yellow	Yellow	Red
DT82	7 Virginia Street	Purple	Purple	Purple	Yellow	Yellow
DT19	468 Union St	Green	Green	Green	Green	Green
	NO <sub>2</sub> Levels predicted to be Under Threshold	Green	Green	Green	Green	Green
	NO <sub>2</sub> Levels predicted to be Near Threshold	Yellow	Yellow	Green	Green	Green
	NO <sub>2</sub> Levels predicted to be Over Threshold	Red	Red	Yellow	Yellow	Red
	NO <sub>2</sub> Levels predicted to be Significantly Over Threshold	Purple	Purple	Purple	Yellow	Yellow

- 12.4.29 Table 12.11 shows a very similar pattern to the traffic flow changes detailed in Table 12.10. Where traffic flows are predicted to increase significantly, and particularly at locations outside the LEZ boundary, then there is a high degree of certainty that the NO<sub>2</sub> levels will not improve.
- 12.4.30 For options 1A,1B, and 2A, due to the scale of the LEZ, many of the exceedance areas are not positively influenced by the LEZ, in terms of traffic flow levels or improvements in the fleet (due to removal of non-compliant vehicles).

- 12.4.31 Option 4A, where the boundary covers all the exceedance areas, is anticipated to positively impact on the emission level at each of the exceedance locations, though it can be seen from Table 12.11 that at four locations, the exceedance levels are likely to be still near the AQO of 40µg/m<sup>3</sup>.
- 12.4.32 For Option 5, the majority of the exceedance locations are predicted to be under the exceedance threshold. The Union Street (Site DT17) location is anticipated to be close to or slightly above the AQO of 40µg/m<sup>3</sup>, even though it is inside the LEZ area. This suggests that further mitigation may be required to reduce traffic levels within the LEZ area, should this option be progressed.
- 12.4.33 In addition, the NO<sub>2</sub> level on King Street is predicted to be above the threshold in Option 5. This could be an issue as there are no clear measures within the package of mitigation in the CCMP which would obviously impact on traffic flows at this location.
- 12.4.34 Further analysis of the traffic flows on King Street in Option 5 showed that almost zero percent of traffic on this route southbound was non-compliant, confirming that even though the Option 5 LEZ boundary does not include the King Street exceedance locations, non-compliant traffic and therefore NO<sub>2</sub> levels at this location are influenced by the LEZ.
- 12.4.35 Also in Option 5, Holburn Street and Virginia Street are predicted to be near the exceedance threshold, however these locations are also within the LEZ boundary and therefore NO<sub>2</sub> levels are not expected to reach the threshold. Market Street (Site DT10 – South end of Market St) is outside the LEZ, but like King Street, is heavily influenced by the LEZ boundary further north on Market Street, where there is no through route for non-compliant vehicles. Only non-compliant vehicles routing to the Harbour area or Union Square would potentially route along this section of Market Street.
- 12.4.36 A parallel study on the City Centre Masterplan indicates that the proposed traffic interventions within the core area of the city centre will significantly reduce traffic levels through key routes of Union Street and Market Street (among others), but may not provide a significant reduction to traffic demand levels along King Street or the harbour route of Virginia Street and Trinity Quay.
- 12.4.37 Therefore, without significant additional interventions not historically considered, the LEZ Options 1A, 1B and 2A are not anticipated to meet the objectives of the scheme.
- 12.4.38 Due to the limited impact of **Option 1A, 1B and 2A** on the observed NO<sub>2</sub> emission locations, these options are no longer considered.

**Table 12.12 : LEZ Sifting Outcome (Step 3)**

LEZ Boundary Options								
<del>1A</del>	<del>1B</del>	<del>2A</del>	<del>2B</del>	<del>3A</del>	<del>3B</del>	4A	<del>4B</del>	5

**12.5 Outcome From LEZ Sifting Process**

12.5.1 From the option sifting process detailed in this chapter, ACC agreed to take LEZ boundary Options 4A and 5 forward for further appraisal of their suitability, as shown in Figure 12.4 and Figure 12.5.

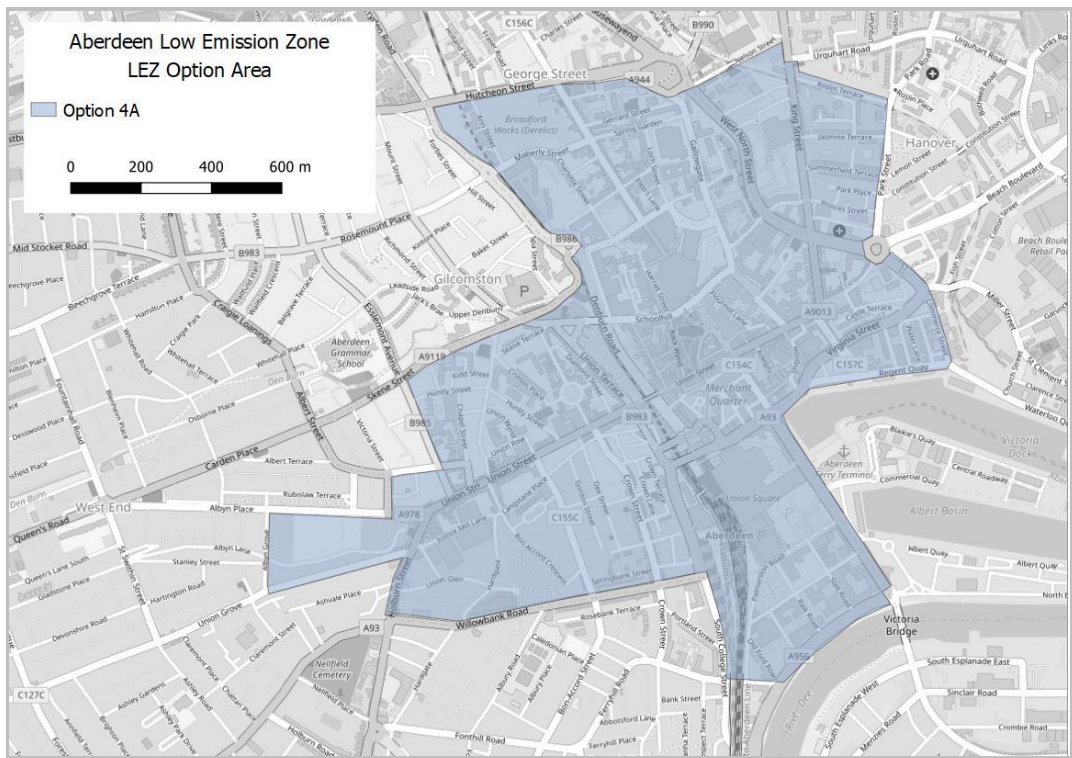


Figure 12.4 : LEZ Option 4A

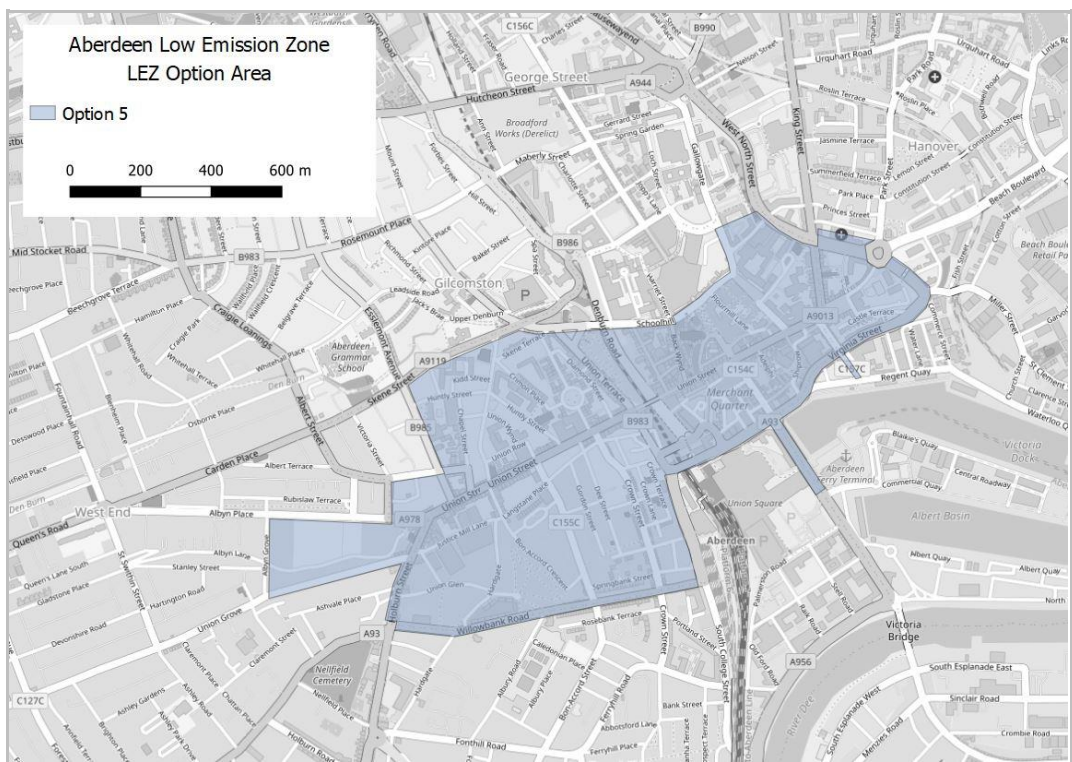


Figure 12.5 : LEZ Option 5



## 13. LEZ OPTION APPRAISAL

### 13.1 Introduction

13.1.1 The NLEF option development process (Chapters 8 to 10) identified eight potential LEZ options for consultation and model testing. Initial testing in the Aberdeen City Centre traffic model (ACCPM24) identified a further option (Option 5) that incorporated elements of existing options (namely Options 1A and 4A). The ACCPM24 was used to assess the impact each of the nine options had on network traffic conditions and on traffic volumes at existing air quality exceedance locations.

13.1.2 As detailed in Chapter 12 above, Option 4A and Option 5 met the sifting criteria and are considered suitable to be progressed in the NLEF LEZ appraisal process. All other options identified up to this stage in the process are removed from consideration.

13.1.3 The NLEF is objective-led and consistent with the principles of Scottish Transport Appraisal Guidance (STAG). The LEZ option generation, sifting and development process and subsequent consultation and reporting undertaken through the NLEF closely mirrors that of the STAG Pre-Appraisal Stage. Following NLEF due process and initial traffic model analysis, two LEZ options remain. To ensure their continued suitability as LEZ options a further appraisal exercise, aligned with the principles of STAG Part 1 Appraisal, is now undertaken. It is important to note that NLEF does not require a full STAG Appraisal to be undertaken. In this chapter, the STAG principals are simply utilised to provide structure to appraise the suitability of the two remaining options.

13.1.4 The LEZ option appraisal (and STAG Part 1 Appraisal) concentrates on the following areas:

- An appraisal of the likely impact of options against LEZ Objectives
- An appraisal of the likely impact of options against the STAG Criteria;
- An appraisal of the fit of options with established policy directives; and
- An appraisal of the feasibility, affordability and likely public acceptability of options.

### 13.2 Appraisal against LEZ Objectives

13.2.1 In line with STAG a qualitative appraisal of the LEZ options against the LEZ objectives (defined in Chapter 7) is undertaken using the seven-point assessment scale.

13.2.2 Option 4A, one of the original eight options, was appraised against LEZ objectives in Chapter 9 to ensure its suitability to progress to consultation and testing.

13.2.3 Option 5, devised during the initial traffic model testing had not previously been appraised against the LEZ objectives. The area covered by Option 5 is similar to Option 1A/B (appraised in Chapter 9), however it also crucially restricts city centre through traffic of non-compliant vehicles (as in Option 4A) while providing access to the majority of city centre car parks for non-compliant vehicles (unlike Option 4A).

13.2.4 The results of the seven-point assessment is shown in Table 13.1, with justification described below.

**Table 13.1 : Option appraisal against LEZ objectives**

LEZ Option	Aberdeen LEZ Objective				
	1	2	3	4	5
4A	++	+	+	+	+
5	++	+	+	++	++

**Objective 1: Improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government’s statutory air quality objectives**

- 13.2.5 Section 12.4 shows that Option 4A encompasses all NO<sub>2</sub> exceedance locations in Aberdeen and that as a result of the LEZ restricting non-compliant vehicles from entering the LEZ area, traffic volumes at these locations reduces from 2019 Baseline levels. In the absence of emissions or air quality modelling at this stage, it can be inferred that the removal of the most polluting vehicles from existing exceedance locations will bring improvements to NO<sub>2</sub> levels.
- 13.2.6 Option 5 encompasses the majority but not all NO<sub>2</sub> exceedance locations. Those locations captured by Option 5 are expected to see improved levels of NO<sub>2</sub>, as in Option 4A. The analysis in Section 12.4 shows that those locations that remain outside the LEZ are still impacted with flows of non-compliant vehicles generally reducing at these locations as the option targets access to key radial routes through the city. Again, in the absence of emissions or air quality modelling, it can be inferred from the flow comparisons that levels of NO<sub>2</sub> will improve as a result of the introduction of the proposed LEZ option.
- 13.2.7 In both remaining options, although flow analysis points to improvements in NO<sub>2</sub> levels, the NMF analysis (Chapter 5) concluded that exceedances will remain in the city no matter the size or scope of the LEZ. As noted throughout the detailed appraisal, it is recognised that additional traffic management interventions will be required to be delivered alongside a LEZ in Aberdeen to ensure all of the Scottish Government’s statutory air quality objectives are met. Detailed modelling (detailed in the next Chapter) will ensure that these interventions are targeted to address existing air quality exceedance locations and that the introduction of a LEZ, and associated measures, do not adversely create additional areas of exceedance.
- 13.2.8 Through the analysis and modelling undertaken it can be concluded at this stage that both Option 4A and Option 5 positively satisfy LEZ objective 1.

**Objective 2: Support climate change targets by reducing road transport’s contribution to emissions**

- 13.2.9 Transport is the UK’s largest emitter of greenhouse gases and the introduction of a LEZ in Aberdeen may contribute towards an increase in the number of low-emission vehicles or encourage additional modal shift towards active travel and public transport in Aberdeen and the wider Aberdeenshire area. A LEZ will restrict the number of the higher emitting non-compliant vehicles from its boundary and may also influence behavioural changes in the wider driving population. It is considered therefore that both LEZ options will, by their nature, reduce the contribution of road transport to emissions.
- 13.2.10 While the introduction of a LEZ itself in Aberdeen will help create a more modern cleaner bus fleet and a more attractive city to walk and cycle in with lower pollution levels, the combination of a LEZ with CCMP and SUMP interventions and planned improvements to the bus network infrastructure, including wider studies addressing key city bus and cycle corridors, is likely to further help promote greater usage of sustainable modes of transport.
- 13.2.11 The LEZ is one measure that will contribute to the wider effort of ACC to increase efficiency of the transport system thereby reducing transport’s contribution to emissions and is it considered that both LEZ options score positively against Objective 2 of Aberdeen’s LEZ.

## Complementary Objectives

- 13.2.12 Both remaining LEZ options are shown to reduce emissions in Aberdeen, including those locations where exceedance are likely to remain. A LEZ delivered with additional traffic management measures will likely further reduce the level of emissions in the city.
- 13.2.13 Both LEZ options will proportionately increase the number of lower emitting vehicles in the city centre and contribute to a positive change to Aberdeen's environment. This is particularly true of the city centre where there is high pedestrian activity and where buses may dwell at bus stops for longer or wait at signal controlled junctions with their engines running. These factors may contribute to a city where walking and cycling is considered a more attractive mode of transport and an increase in active travel choices may result from these options. Additionally, a bus fleet that contains more modern vehicles that are likely to be more comfortable to travel on and have better facilities may promote a shift to this more sustainable travel mode, reducing the number of private vehicles on the road network and contributing to an overall improved environment that may in turn incentivise more active and sustainable travel choices.
- Option 5 does not encompass as large an area as Option 4A and excludes a large number of residential properties, particularly around the George Street area. A direct result of this will be to reduce the potential financial impact of complying with LEZ restrictions that the introduction of a LEZ could have on those living inside area (compared to Option 4A). Reducing the financial impact of a LEZ will generally support the wellbeing of residents, particularly those from low income households, as its introduction will not place undue pressure on residents to upgrade their non-compliant vehicles.
- 13.2.14 It is considered that both LEZ options will contribute positively towards the LEZ satisfying Objective 3.
- 13.2.15 Both LEZ options have been shown to complement existing local and regional strategies and the impact of each LEZ option will contribute to and support the wider transport strategies of ACC, thereby satisfying Objective 4 of Aberdeen's LEZ. Each option restricts access to key strategic routes for non-compliant vehicles and will contribute to a key ACC objective of reducing the volume of non-essential traffic and helping Aberdeen become a safe, vibrant and accessible city centre. As noted above, the area covered by Option 5 restricts city centre through traffic of non-compliant vehicles (as in Option 4A) while providing access to the majority of city centre car parks for non-compliant vehicles (unlike Option 4A). Option 5 delivers a greater level of access to the city, providing a city open for all whilst restricting the most polluting vehicles from traveling through it and therefore scores higher than Option 4A. Option 4A, whilst positively satisfying the objective will not allow a similar level of access for those in society who rely on an older vehicle to access city centre amenities or services.
- 13.2.16 Improvements to the wider Aberdeen environment realised from a LEZ alone, or in combination with other complementary measures, will contribute to making Aberdeen a more attractive place to live, study and visit and in the longer term, this may lead to the creation of jobs, services and investment that will drive an improved city economy for all. In the short term, Option 4A may change the trip choice of non-compliant private and commercial vehicles to Aberdeen, particularly to the city centre. This may initially be detrimental to the city economy and may reduce overall person trips to the city centre. While a reduction in non-compliant vehicles impacts positively on the environment and the attractiveness of the city, there may be a short term negative impact on the city economy and therefore creation of jobs and services. As noted, Option 5 provides greater access to the city centre for all vehicles and is less likely to see a significant drop in vehicles accessing the city centre amenities and services, providing less initial economic impact on the city. Throughout the lifetime of the LEZ however it is anticipated that both LEZ options will positively impact on the city's health and wellbeing, help develop a vibrant, accessible,

and safe city centre and contribute to ongoing transformational change in Aberdeen and therefore both LEZ options will contribute positively towards the LEZ satisfying Objective 5, with Option 5 scoring higher against the objective.

### 13.3 Appraisal against STAG Criteria

13.3.1 While there is no requirement in the NLEF to appraise LEZ options against the established STAG criteria, it is considered a valuable exercise for the introduction of a LEZ in Aberdeen to ensure the proposed options are robust and contribute to the wider aims of the city. At STAG Part 1 Appraisal, a qualitative assessment should be completed for each option against the STAG Criteria, using a seven point assessment scale, that considers the relative size and scale of impacts. A Part 1 Appraisal should capture the likely impacts of options but detailed appraisal should not be undertaken. The results of the seven-point assessment is shown in Table 13.2, with justification described below.

**Table 13.2 : Option appraisal against STAG Criteria**

LEZ Option	STAG Criteria				
	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion
4A	++	0	-	+	-
5	++	0	+	+	0

#### **Environment**

13.3.2 The environment criteria has been examined through the NMF (Chapter 5) and traffic model analysis (Chapter 12) as well as LEZ Objective 1 above and both remaining options will positively impact on the environment criteria. In addition to the qualitative and quantitative appraisal through this report, the final proposed LEZ for Aberdeen will be subject to a Strategic Environmental Assessment and therefore be fully assessed against environmental baseline data.

13.3.3 The high level NMF analysis concluded that a LEZ delivered on its own (and of any size and vehicle type restrictions) was not enough, in itself, to tackle all locations of air quality exceedance. To achieve compliance with air quality standards in Aberdeen, complimentary traffic management measures are required (as detailed in Chapter 14) and for this reason the LEZ options do not achieve the highest score on the seven-point scale.

#### **Safety**

13.3.4 It is considered unlikely that the introduction of either remaining LEZ will result in an increase in accidents. The final LEZ will be carefully designed to ensure suitable alternative routes and final-choice junctions for non-compliant vehicles to avoid entering the LEZ in a safe manner. Both LEZ options are shown to reduce traffic volumes in the LEZ area as non-compliant vehicles are removed, creating a safer environment in the city centre. The modelling has not yet fully quantified the locations, if any, where traffic flow significantly increases outside the boundary of the LEZ area and in turn increase the likelihood of accidents and this element will be under consideration in the final LEZ option design. On the seven-point scale, both remaining LEZ options therefore score neutrally against the safety criteria.

#### **Economy**

13.3.5 The LEZ in Aberdeen will be enforced through a network of ANPR cameras, in line with the Transport (Scotland) Act 2019. Option 5, which covers a smaller geographical area with a lower number of cameras required, will represent a lower cost option than Option 4A. This is true for both the capital cost per camera and installation and the ongoing maintenance costs to run the enforcement system.

- 13.3.6 Option 4A includes a larger number of residential properties than Option 5. For residents within the LEZ boundaries, there would be a requirement for their vehicles to be fully compliant with the vehicle emission criteria after the defined grace period for enforcement. It is recognised that the larger the LEZ area, the greater or wider impact there will likely be for air quality improvements. However, where a LEZ covers a larger (and more residential) area, the cost of compliance with the LEZ increases. Cost of compliance is a key indicator of the impact of a LEZ and is considered in more detail in the supporting Integrated Impact Assessment (Chapter 16).
- 13.3.7 As detailed in Section 9.7, the inclusion of city centre car parks differs between options. The inclusion of any car park in a LEZ area will result in a likely relocation of non-compliant cars to car parks outside the LEZ area. The scale of traffic relocation is different for each LEZ boundary. Option 5 was designed to allow substantial availability of car parks while restricting through trips of non-compliant vehicles. Option 4 was initially designed to encompass all NO<sub>2</sub> exceedance locations and match the CCMP boundary proposals and in doing so, contains the majority of city centre car parks.
- 13.3.8 For the two remaining LEZ options, the proportion of city centre off-street car parks accessible for non-compliant vehicles is:
- Option 4A – 1 of 12 Car Parks available (6% of total spaces)
  - Option 5 – 8 of 12 Car Parks available (72% of total spaces)
- 13.3.9 Clearly Option 5 retains the most accessibility to the city centre for non-compliant traffic, whilst Option 4 would effectively force non-compliant vehicle drivers to either upgrade their vehicle, travel into the city centre by a different mode or not travel to the city at all. These differences between the LEZ boundary options raise several key implications to consider, including equal opportunity implications (see accessibility and social inclusion) and city economy and resilience implications. The Aberdeen economy, like all urban economies in the UK, has been significantly impacted by the Covid-19 pandemic with significant economic losses incurred by the majority of sectors. Option 5 could be considered compatible with the economic recovery desired for the city, such as maintained access for all modes and an improved environment, and scores positively against the Economy criteria.
- 13.3.10 With its restricted access to car parks, its large cost to residents and business for compliance, and larger (comparative to Option 5) enforcement and running costs, Option 4A does not provide the same opportunities for economic recovery of the city centre and is unlikely to bring economic benefit in the short term. It therefore scores negatively against the Economy criteria.

### ***Integration***

- 13.3.11 As defined in STAG, there are three sub-criteria when considering the Integration criteria. Firstly Transport Integration, where both remaining options will enforce changes in the wider transport network through required compliance with LEZ emission standards. This will especially impact the bus services in the city, where there are current low levels of compliance amongst operators. Consultation with operators suggest that some services may be altered or reduced as a result of the introduction of a LEZ although this can be mitigated against through suitable grace periods and support funding through the Bus Emission Abatement Retrofit Fund (BEAR). As noted above, access to the parking infrastructure of the city differs between options.
- 13.3.12 The introduction of a LEZ in the city is a direct response to the Scottish Government's Programme for Government, is legislated in the Transport (Scotland) Act 2019 and the LEZ option development and appraisal process has followed the NLEF, specifically published to guide local authorities implementing LEZs. Clearly, there is a close correlation between the LEZ and transport and land-use planning guidance, the second sub-criteria of the STAG

Integration criteria. At the inception of the LEZ proposals there were a number of existing key ACC transport and land-use plans that it was critical the LEZ took account of, in particular the North East Scotland Roads Hierarchy Study, the CCMP and the SUMP. These, and other local, regional and national land-use and transport plans are detailed in Chapter 3 and show how a LEZ in Aberdeen relates to wider policies, as per the third sub-criteria of the Integration criteria. The direct compatibility of Option 4 with the key ACC plans and strategies is detailed in Chapter 9.

- 13.3.13 As detailed in Section 9.9, ACC and regional partners Nestrans and Aberdeenshire Council commissioned the North East Scotland Roads Hierarchy Study, which aims to update the cities roads hierarchy to provide a system that reflects the new role of the city centre (as a destination). It is considered important, in the context of Aberdeen's changes to the roads hierarchy, that the LEZ area aligns with the new hierarchy and this is assessed here, informed by the traffic modelling summarised in Chapter 12 above.
- 13.3.14 The modelling highlighted the potential issues of including two new proposed secondary routes within the LEZ area (Denburn Road and Harbour Route). It was noted that non-compliant vehicles re-routing away from these corridors would likely shift to western secondary and minor routes. In LEZ Options 4A and 5, where the explicit west end of Union Street and Alford Place / Holburn Street are included within the LEZ, the initial traffic modelling has shown this has the effect of displacing traffic further out to the Ashley Road and Forrest Avenue corridors.
- 13.3.15 In Option 4A, traffic flow increases were also observed along the southern boundary of the A93 Willowbank Road corridor and/or the parallel east-west corridor of Ferryhill Road. Neither of these routes are likely to be deemed acceptable to carry additional non-compliant vehicles under the revised network hierarchy (A93 Willowbank Road to be downgraded to a tertiary route).
- 13.3.16 The boundary of LEZ Option 5 includes the A93 Willowbank Road corridor. This inclusion has the effect of reducing the total volume of traffic using this route. However, in Option 5, non-compliant traffic migrates to the alternative east-west route of Fonthill Road / Ferryhill Road. Traffic increases were also noted around the west end of Union Street through routes including Ashley Road and Albyn Grove to by-pass the city centre.
- 13.3.17 The traffic model outputs therefore suggest that neither of the remaining LEZ options directly align with the proposed network hierarchy. The conflicts could be mitigated by either traffic management measures or revisions to the LEZ boundary. This is considered further in Chapter 14.
- 13.3.18 Analysis of the performance of the remaining options against air quality exceedances has shown that in order to meet the AQO in the city, the LEZ should be delivered with additional complimentary traffic management interventions such as junction re-design, bus priority measures or road closures. As identified, it is crucial that any interventions align closely with those explicitly defined in the CCMP/SUMP and this is examined in the next chapter.
- 13.3.19 Upon consideration of the above, both remaining options are considered to fit with existing local, regional and national plans, policies and strategies, and therefore score positively against this STAG criteria, but that further work is required to fully satisfy this criteria.

### ***Accessibility and Social Inclusion***

- 13.3.20 As noted in the Integration criteria, it is anticipated that access to bus services will remain the same upon the introduction of either LEZ option but that this is likely to be dependent on continued funding assistance for operators to achieve fleet compliance. If full fleet compliance is not achieved, there is a risk that access to the bus network is reduced as a result of the LEZ introduction.
- 13.3.21 As it has been noted, Option 4A encompasses the majority of city centre car parks and this reduces the opportunities for those who rely on existing older non-compliant vehicles to access services and amenities in the city centre, likely to be those from lower income households. Option 4A also encompasses larger areas of residential properties which raises implications of fairness and equality where residents are forced to comply with the LEZ measures. It should be noted that the Scottish Government, through its 2018 Programme for Government, is committed to help those who will have most difficulty preparing for the introduction of LEZs through various support funds and the Transport (Scotland) Act 2019 allows for additional 2-year grace period to be applied for residents of a LEZ.
- 13.3.22 Option 5 has been shown to impact all NO<sub>2</sub> exceedance locations while providing continued access for non-compliant vehicles to the majority of city centre car parks and does not include significant numbers of residential properties.
- 13.3.23 The final preferred LEZ will be subject to an Integrated Impact Assessment (Chapter 16) where the likely impacts of its introduction on groups such as those with protected characteristics (e.g. age, gender, disability, ethnicity, religion), those vulnerable to falling into poverty (e.g. unemployed, single parents, homeless people, carers and vulnerable families) and geographical communities (e.g. urban, rural, and business communities).
- 13.3.24 At this stage in the appraisal process, Option 4A is considered to score negatively against the Accessibility and Social Inclusion criteria with its potential to restrict access to services and amenities in the city centre and provide no alternative for those who at the moment rely on non-compliant vehicles for their needs. Option 5, as with any LEZ, will impact in some way but through detailed design and suitable mitigation (such as hardship funds), it is anticipated that such impacts can be lessened and for this reason, the option scores neutrally against the criteria.

### **13.4 Appraisal against established Policy Directives**

- 13.4.1 As noted above, the introduction of a LEZ in the city is a direct response to the Scottish Government's Programme for Government, is legislated in the Transport (Scotland) Act 2019 and the LEZ option development and appraisal process has followed the NLEF, specifically published to guide local authorities implementing LEZs. Key local, regional and plans, policies and strategies are detailed in Chapter 3 and show how a LEZ in Aberdeen relates to these established policy directives.

### **13.5 Appraisal of the feasibility, affordability and likely public acceptability of LEZ options**

- 13.5.1 Both remaining LEZ options are considered feasible to be implemented and enforced through a network of ANPR cameras. Although Option 4A covers a larger geographical area, this is not considered a barrier to its feasibility.
- 13.5.2 Option 4A, as noted, will have a higher cost to introduce and enforce and is likely to have a higher cost of compliance for residents and business given its larger area and the land-uses it covers. On the understanding however that any final proposed LEZ option submitted to Scottish Ministers is fully appraised and the appropriate assessments are

undertaken in line with the NLEF, it is anticipated that its introduction will be accepted and fully funded by the Scottish Government. While the ongoing funding responsibility is unclear at this stage, both remaining options are therefore considered affordable in their introduction.

13.5.3 Chapter 11 summarised the findings from the public consultation exercise and showed there to be broad support for the introduction of LEZs. Of the LEZ options consulted on, Option 4A was the clear preferred option, with 22% of respondents favouring the option. Option 5 was not consulted on but was devised through combining elements of Option 4A and Option 1A. Option 1A was the second preferred option during the public consultation, receiving 19% of all preference votes. It is therefore considered likely that Option 5 will be favourably received and it follows that both remaining options are considered publicly acceptable.

## 13.6 Outcomes from LEZ Option Appraisal

13.6.1 The NLEF is objective-led and consistent with the principles of Scottish Transport Appraisal Guidance (STAG). The two remaining LEZ options have been appraisal in line with the principles of STAG Part 1 Appraisal, with the results summarised in Table 13.3.

**Table 13.3 : Summary of LEZ Option Appraisal**

Appraisal Criteria		4A	5
LEZ Objective	1	++	++
	2	+	+
	3	+	++
	4	+	++
	5	+	++
STAG Criteria	Environment	++	++
	Safety	0	0
	Economy	-	+
	Integration	+	+
	Accessibility & Social Inclusion	-	0
Other criteria	Feasibility	Yes	Yes
	Affordability	Yes	Yes
	Public Acceptability	Yes	Yes

13.6.2 The appraisal of the two remaining LEZ options has shown that Option 4A fails to meet the criteria for economy or accessibility and social inclusion. The appraisal identified that there are key issues and implications for Option 4A, namely:

- Alignment with proposed Network Hierarchy
- Access to city centre car parks and implications to city centre economic recovery post Covid-19
- Access to the city centre services and amenities for those who rely on transport made by non-compliant vehicles (particularly impacting vulnerable groups)
- Implications to the large number of residential properties within the LEZ area
- Option 4A will have a higher scheme costs and higher cost of compliance (for residents and businesses)

13.6.3 For these reasons, and in light of the impact of the Covid-19 pandemic to the city, it was agreed with ACC that Option 4A would not be progressed in the NLEF appraisal process. While it is clear that there are also several issues and implications for Option 5, the appraisal concluded that each criteria scores neutral to positive and that further work through detailed modelling (in the next chapter) should be undertaken on Option 5 to identify a final preferred LEZ option for Aberdeen.



## 14. DETAILED LEZ MODELLING

### 14.1 Introduction

14.1.1 The traffic model testing (Chapter 12) and option appraisal process (Chapter 13) identified LEZ Option 5 as the preferred LEZ option boundary. Detailed modelling is now undertaken to further develop the option and define the complementary measures required to address the remaining predicted air quality exceedances and network operational issues identified in the initial LEZ model testing.

14.1.2 The following steps were undertaken in the detailed assessment of Option 5 to develop a preferred final LEZ scheme for Aberdeen which best meets the objectives of the study:

- LEZ air quality improvement supporting measures
- Management of non-compliant traffic
- Finalisation of LEZ boundary
- Model statistics of final proposed LEZ
- Alternative Futures Testing

14.1.3 This chapter summarises the outcomes from the detailed modelling, with full details provided in the accompanying *LEZ Option Testing Report* (SYSTRA Ref: GB01T20D62/2, May 2021).

### 14.2 LEZ Supporting Measures – City Centre Masterplan

14.2.1 High level NMF analysis (Chapter 5) concluded that air quality exceedances will remain in the city no matter the size or scope of the LEZ and, as noted throughout the detailed appraisal and initial modelling, it is recognised that additional traffic management interventions are required to be delivered alongside a LEZ in Aberdeen to ensure all of the statutory air quality objectives (AQO) are met. Any supporting interventions for Aberdeen's LEZ are required to complement other committed network proposals for Aberdeen City Centre to provide a package of measures which will meet the objectives of the LEZ and wider Council objectives for Aberdeen City Centre. These committed proposals include the City Centre Masterplan (CCMP).

14.2.2 The traffic model testing and appraisal has identified a preferred boundary option. The traffic modelling aligned with the outcomes of initial high level NMF analysis and suggests that the LEZ alone is not enough to reduce all NO<sub>2</sub> levels below the AQO of 40µg/m<sup>3</sup> across the city centre area. Table 12.11 showed that 9 of the 14 2019 NO<sub>2</sub> exceedance locations were predicted to be below 40µg/m<sup>3</sup>. Three of the five remaining locations were predicted to be just under the threshold, and two (Site DT11-King Street and Site DT17-Union Street) were predicted to remain above the threshold.

14.2.3 To enable the development of a package of measures to meet the objectives of the LEZ study and satisfy the AQOs, traffic modelling was utilised to identify if any elements of the CCMP not yet implemented would enhance and support the LEZ in meeting the objectives. A separate modelling exercise was therefore undertaken on various elements and projects within the CCMP. This is detailed in the report *City Centre Masterplan Model Testing Report* (Ref: GB01T20D62/3, March 2021). The CCMP model test programme considered the impact of each of the key CCMP projects separately, then in combination with each other. In order to identify which CCMP scheme, or combination of schemes, would best address the remaining predicted exceedance locations, traffic flow changes between the 2019 base model and each of the CCMP test scenarios were compared at each of the exceedance locations. Table 14.1 shows a summary of the traffic flow changes at the NO<sub>2</sub> exceedance locations compared to the 2019 base. The figures provided are the 12 hr percentage flow change from the 2019 baseline in two-way traffic flow.

Table 14.1 : CCMP Scenarios – Exceedance Location Traffic Flow Analysis (% Change from 2019 Base)

Site	Exceedance Location	LEZ Option 5 AQ Impact	CCMP 1	CCMP 2a	CCMP 2b	CCMP 3a	CCMP 3b	CCMP 4a	CCMP 4b	CCMP 5a	CCMP 5b	CCMP 6a	CCMP 6b	CCMP 7a	CCMP 7b
			Full Scheme	Guild St Scheme	Guild St Scheme + Mitigation	Union St Scheme	Union St Scheme + Mitigation	Schoolhill Scheme	Schoolhill Scheme + Mitigation	Schoolhill Scheme + Mitigation	Guild St & Union St Scheme + Mitigation	Guild St & Schoolhill Scheme + Mitigation	Guild St & Schoolhill Scheme + Mitigation	Union St & Schoolhill Scheme + Mitigation	Union St & Schoolhill Scheme + Mitigation
DT30	335 Union St		-36%	0%	1%	-36%	-22%	7%	11%	-22%	-28%	1%	6%	-20%	-19%
DT73	61 Skene Square		25%	-3%	-4%	-12%	8%	0%	18%	27%	14%	2%	16%	1%	19%
DT18	14 Holburn St		-14%	13%	14%	-25%	-7%	10%	11%	8%	0%	14%	11%	-5%	-5%
CM2	Union Street		-47%	-7%	-6%	-45%	-35%	9%	9%	-33%	-38%	-5%	1%	-33%	-32%
DT16	1 Trinity Quay		31%	17%	17%	2%	19%	11%	15%	40%	17%	20%	19%	27%	33%
DT77	27 Skene Square		25%	-3%	-4%	-12%	8%	0%	18%	28%	14%	2%	16%	1%	19%
DT11	105 King St		32%	4%	36%	-15%	35%	8%	14%	26%	43%	13%	42%	4%	45%
DT10	184/192 Market St		28%	14%	14%	4%	12%	7%	7%	37%	15%	17%	17%	13%	18%
DT9	39 Market St		-64%	-70%	-70%	-30%	-22%	0%	7%	-63%	-66%	-70%	-70%	-22%	-15%
DT29	469 Union St		-43%	6%	7%	-43%	-29%	9%	9%	-27%	-33%	7%	5%	-29%	-29%
DT12	40 Union St		-85%	-6%	-5%	-57%	-56%	19%	33%	-81%	-83%	-1%	18%	-54%	-51%
DT17	43/45 Union St		-85%	-6%	-5%	-57%	-56%	19%	33%	-81%	-83%	-1%	18%	-54%	-51%
DT82	7 Virginia Street		18%	16%	17%	6%	15%	10%	16%	43%	17%	20%	21%	25%	30%
DT19	468 Union St		-43%	6%	7%	-43%	-29%	9%	9%	-27%	-33%	7%	5%	-29%	-29%
	NO <sub>2</sub> Levels predicted to be Under Threshold														
	NO <sub>2</sub> Levels predicted to be Near Threshold														
	NO <sub>2</sub> Levels predicted to be Over Threshold														
	NO <sub>2</sub> Levels predicted to be Significantly Over Threshold														

14.2.4 The CCMP modelling clearly identified that CCMP test CCMP3a: ‘Union Street Scheme’ was the scenario most likely to address the remaining exceedances, with a significant reduction in traffic flow at the majority of 2019 NO<sub>2</sub> exceedance locations. Importantly, the modelling of the Union Street Scheme showed a reduction in traffic flows through the NO<sub>2</sub> exceedance locations of King Street and Union Street, identified as locations where the LEZ alone would not allow the AQOs to be met.

14.2.5 As a result of the Union Street Scheme, the traffic flows through the harbour route of Trinity Quay and Virginia Street showed a very marginal increase. However this was significantly lower than many of the alternative CCMP scenarios.

14.2.6 The key elements of the Union Street Scheme are:

- Union Street - Bus and Taxi only between Bridge Street and Market Street
- Union Terrace - Bus and Taxi only (potentially south end only)
- Rose Street - Pedestrianised between Union Street and Thistle Street

14.2.7 Figure 14.1 schematically shows the key elements of Union Street CCMP Scheme.

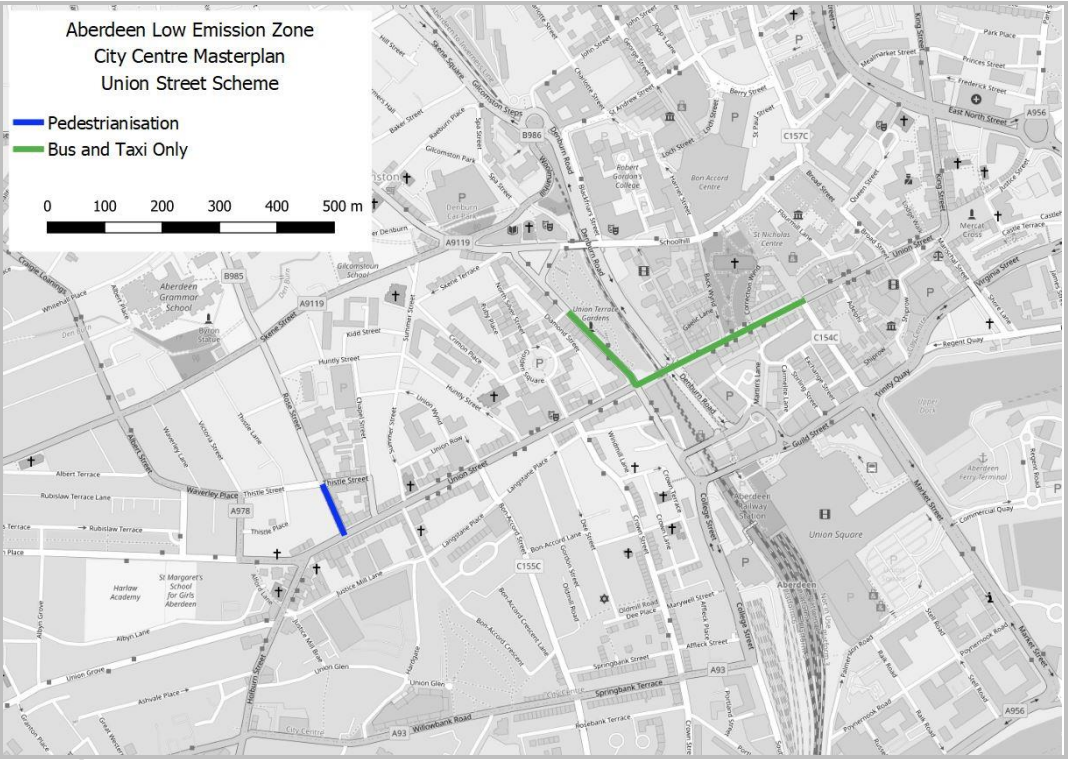


Figure 14.1 : CCMP Union Street Scheme

14.2.8 The rationale for the package of measures associated with the Union Street Scheme are as follows:

- Extensive testing of individual elements of the CCMP in 2016 identified that Union Terrace restrictions were required in combination with the Union Street restrictions to prevent local traffic diversions through Schoolhill / Upperkirkgate.
- With the Union Terrace restriction in place, traffic seeking to route between Union Street and Skene Street utilise Rose Street as a rat run, hence the requirement to restrict this movement to push through routing traffic outside the city centre area
- Rose Street pedestrianisation is identified within the CCMP Master documents. This proposals also has placemaking advantages.

14.2.9 With the CCMP testing identifying the Union Street scheme as the most suitable CCMP element to improve NO<sub>2</sub> exceedance locations, this was modelled in combination with the LEZ Option 5. This combined LEZ & CCMP scenario was named LEZ Option 6.

14.2.10 Table 14.2 provides both the traffic flow difference between Option 5 and Option 6 against the 2019 baseline alongside the resultant predicted air quality impact at the NO<sub>2</sub> exceedance locations. The traffic flow differences are provided as a percentage difference of 12 hour traffic flow compared to the 2019 Base model.

**Table 14.2 : LEZ & CCMP Impact at Air Quality Exceedance Locations**

Site	Exceedance Location	Flow Difference to Base		Air Quality Impact	
		Option 5	Option 6	Option 5	Option 6
DT30	335 Union St	5%	-25%		
DT73	61 Skene Square	-8%	-10%		
DT18	14 Holburn St	1%	-14%		
CM2	Union Street	3%	-41%		
DT16	1 Trinity Quay	-7%	8%		
DT77	27 Skene Square	-8%	-10%		
DT11	105 King St	3%	-2%		
DT10	184/192 Market St	-4%	-2%		
DT9	39 Market St	1%	-36%		
DT29	469 Union St	3%	-32%		
DT12	40 Union St	9%	-61%		
DT17	43/45 Union St	9%	-61%		
DT82	7 Virginia Street	-8%	5%		
DT19	468 Union St	3%	-32%		
	NO <sub>2</sub> Levels predicted to be Under Threshold				
	NO <sub>2</sub> Levels predicted to be Near Threshold				
	NO <sub>2</sub> Levels predicted to be Over Threshold				
	NO <sub>2</sub> Levels predicted to be Significantly Over Threshold				

14.2.11 Table 14.2 shows that the Union Street Scheme has a significant impact on the volume of traffic routing through Union Street, with a 60% reduction in traffic at two of the NO<sub>2</sub> exceedance sites. This also has an additional impact to the volume of traffic approaching Union Street from both Holburn Street and King Street. These traffic reductions will therefore have a direct impact on the air quality figures at these locations.

14.2.12 The Union Street restrictions also result in traffic diversions to other local routes. The harbour routes of Trinity Quay and Virginia Street therefore show a slight increase in traffic volumes due to the restrictions on Union Street. It should be noted that these locations are still within the LEZ boundary and therefore any slight increase in traffic flow will be from lower polluting compliant vehicles and is likely therefore to have a lower detrimental impact on the NO<sub>2</sub> levels. Any increase (and decrease) in NO<sub>2</sub> levels will be quantified through SEPA’s emissions and air quality modelling.

14.2.13 In summary, the addition of the CCMP Union Street Scheme to the proposed LEZ results in traffic reductions through key areas of the city centre network where the LEZ alone is not anticipated to be enough to reduce all NO<sub>2</sub> levels below the AQO of 40µg/m<sup>3</sup>.

The City Centre Masterplan Union Street Scheme has been shown to complement the proposed LEZ and is expected to positively impact on the NO<sub>2</sub> exceedance locations in the city. This combination of the LEZ plus CCMP Union Street Scheme is predicted to significantly reduce the emission levels at all the 2019 observed NO<sub>2</sub> exceedance locations.

SYSTRA therefore recommends that the LEZ and the CCMP Union Street Scheme is viewed as a combined package of measures to meet the objectives of the LEZ.

### 14.3 Management of Non-Compliant Traffic

14.3.1 The proposed LEZ boundary generally fits well with the future network hierarchy proposals, with the exception of a noticeable increase in traffic through the east-west route of Fonthill Road / Ferryhill Road (as summarised in Chapter 13). Increases in non-compliant traffic were also noted around the west end of Union Street through routes including Ashley Road and Albyn Grove to by-pass the LEZ boundary.

14.3.2 The proposed LEZ boundary has the effect of restricting all non-compliant vehicles from routing through the city centre area, but critically, it does not restrict access to the city centre (car park options still available for all traffic). This is consistent with other policies and aspirations for Aberdeen City Centre. However, the detailed model testing has shown that traffic is finding local routes around the periphery of the LEZ but within the boundary of Anderson Drive (See Figure 14.2).

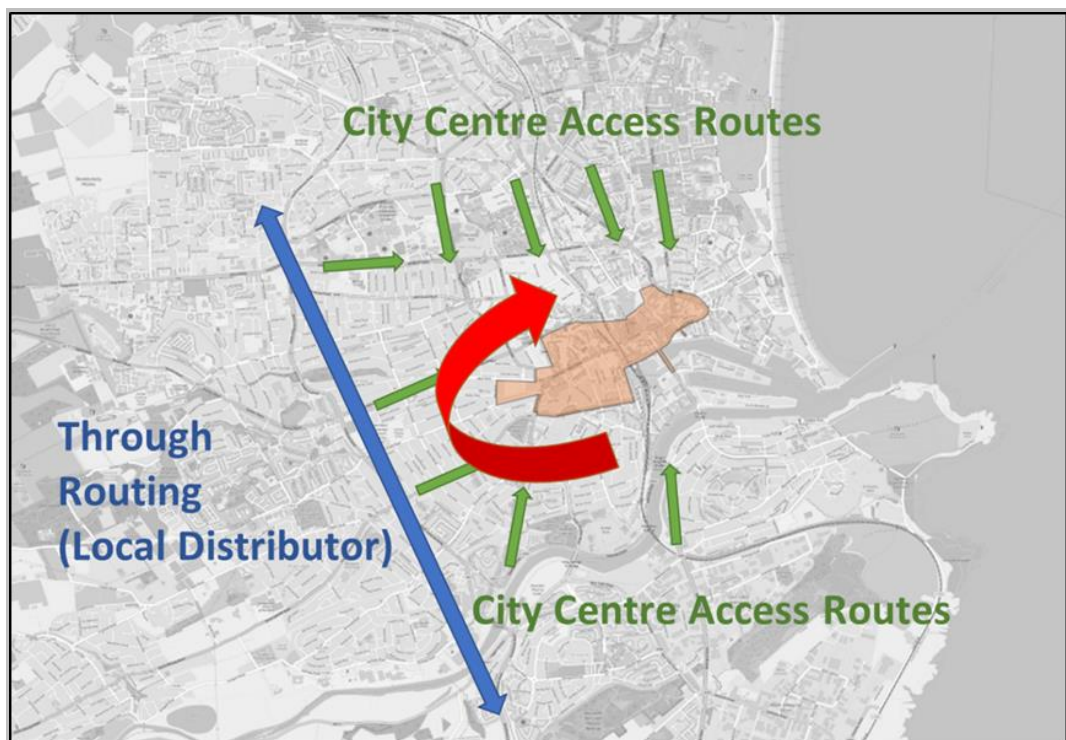


Figure 14.2 : Observed Model Routing of displaced Traffic

14.3.3 Through discussions with ACC, several options were developed to better manage the displacement of traffic around the south and west border of the proposed LEZ. These included:

1. Extension of LEZ boundary to include full South College Street corridor
2. Bus Gate on Ferryhill Road
3. Traffic Management Measures to restrict routing on Ashley Road and Forrest Avenue
4. Revised Milburn Street / South College Street Junction as part of South College Street Improvements – Phase 2

14.3.4 Through model testing of the above options, and in consultation with ACC, the following conclusions were drawn from each option:

1. Extension of LEZ boundary
  - ACC raised an issue with extending the LEZ for a traffic management reason and not for an air quality reason
  - Model testing showed only a slight improvement to traffic volume through Ferryhill Road corridor. A high proportion of the traffic on this corridor was shown to be compliant vehicles and not influenced directly by any LEZ extension. This suggests

that the Union Street measures were also a key factor in the traffic increases through this corridor

- The LEZ extension option would therefore not fully manage traffic displaced from the city centre area and was excluded from further consideration.

## 2. Bus gate on Ferryhill Road

- ACC advised that this was an acceptable consideration but not preferable over alternative proposed measures at Milburn Street / South College Street junction as it is more intrusive than other measures, includes maintenance costs and may not be popular with the general public
- Model testing showed a significant reduction in traffic through the Ferryhill corridor by as much as 95%. However a significant proportion of this traffic was observed to divert through Albury Road to Springbank Terrace, thus retaining traffic routes through the area.

## 3. Traffic management measures through Ashley Road and Forrest Avenue

- Model testing had shown a high volume of traffic routing around the western edge of the LEZ / City Centre area. SYSTRA identified that Ashley Road carried a high proportion of this traffic. Whilst Forrest Avenue was not included within the model, ACC advised that rat-running traffic is also known to use this route in parallel with Ashley Road.
- Model testing showed a significant reduction in traffic on Ashley Road when routing costs were increased (actual traffic management measures not defined at this point).
- Model testing also showed little improvement in traffic routing through the Ferryhill corridor as the restrictions pushed traffic out to Anderson Drive but still left routing between Holburn Street and South College Street through the Ferryhill corridor.

## 4. Revised Milburn Street / South College Street Junction

- The South College Street Scheme is to be implemented in 2022 and is considered as Phase 1 of a two phase programme of works. The first phase involves the creation of a link road between South College Street and North Esplanade West to alleviate traffic congestion at the QEII Bridge roundabout.
- As advised by ACC, a second phase will consider changes to the junctions at either end of QEII Bridge. As part of Phase 2, ACC are also considering restricting access to Milburn Street from South College Street, pending a review of the operation of the junction (post-implementation of Phase 1).
- Following advisement of the traffic modelling impact of the LEZ, ACC advised SYSTRA to consider restricting access to/from Milburn Street to restrict strategic movement through this corridor.
- Model testing was undertaken on a design option (specific design detail will be developed in due course)
- The traffic modelling showed that there was only a small (approx. 10% on average) increase in the two way traffic flow on the Milburn Street corridor in the LEZ scenario compared to the Reference Case.
- This proposal effectively cuts off the Ferryhill corridor as a rat-run and pushes traffic back out to Anderson Drive. It was found to be, on balance, the best solution of the options considered.

The model testing of various proposals to manage traffic displaced from the city centre has identified that a revision to the operation of the Milburn Street / South College Street junction is best placed to address potential rat runs through the south and west border of the LEZ.

Junction changes are required to restrict or prevent strategic traffic (both compliant and non-compliant) routing through Milburn Street and the Ferryhill corridor. Further assessment of the specifics of these measures will be considered by ACC in due course.

#### **14.4 Comment on Future Year Modelling**

- 14.4.1 The Covid-19 pandemic has had a dramatic impact on travel across all modes and specifically travel in Scotland's city centres. To assist in the development of the LEZs across Scotland, Transport Scotland commissioned a study to apply the principals of modelling in considering the uncertainty over what travel will look like after the pandemic has ended.
- 14.4.2 The study set out a framework for embracing uncertainty by consulting with stakeholders on 'what will travel look like post Covid-19'. This framework set out the rationale for any additional modelling required to provide evidence to support the introduction of any LEZ. To assist this process, workshops were held with the local authorities, including ACC, to agree the key metrics to measure against the current LEZ objectives and identify the key disruptors which are likely to have the greatest impact on travel activities within each city centre.
- 14.4.3 A Scenario Planning Process was developed to allow a range of plausible future scenarios to be defined using important and likely disruptors. These scenarios were used as a reference case against which the anticipated LEZ impacts were applied to understand how an LEZ performs in the context of plausible future scenarios.
- 14.4.4 The outcomes from the study are detailed in the *LEZ Post-Covid Uncertainty Summary Note (SYSTRA Ref. GB01T20E86/11024112/005, January 2021)*. The study concluded that the impact of the LEZs will vary between each city depending on their specific traffic levels and fleet composition. Importantly, the LEZ will protect the city centres by preventing non-compliant vehicles from entering them. Whilst the impact of the LEZ may vary across each city in terms of emissions, the outcome is likely to be very similar with the level of emissions limited to a reduced value compared to pre-LEZ levels. The study recommended that sensitivity tests of the final preferred LEZ are undertaken on two further plausible futures, to ensure a robust set of modelling results to inform Aberdeen's LEZ. This analysis is provided in the accompanying *LEZ Option Testing Report' (SYSTRA Ref: GB01T20D62/3, May 2021)*
- 14.4.5 Given the impact Covid-19 is having on trip making, future travel patterns are still uncertain and it is important to note that minor mitigation measures identified in Section 14.3 to support the wider LEZ scheme may be required in one plausible future scenario but not necessarily the another.
- 14.4.6 The traffic modelling undertaken to date is based upon a pre-Covid-19 network and the 'spaces for people' measures currently in place include some of the traffic restrictions proposed as part of the permanent LEZ package of measures (e.g. restrictions on Union Street) . If ACC considers that these temporary measures should remain in place until the LEZ is operational, then the city centre travel patterns, post-Covid-19, will build back up around the current restrictions. This is therefore subtly different to how the modelled traffic patterns are currently constructed and adds a degree of uncertainty to the actual future traffic volumes that the scheme can be assessed against.
- 14.4.7 It is therefore important to utilise the traffic modelling appropriately, and extract the key findings to aid the decision making process, whilst acknowledging that the need for additional mitigation measures can be monitored and reviewed after the wider LEZ scheme is implemented in post-Covid-19 environment.

SYSTRA recognises the current uncertainty in predicting the future city centre travel patterns post-Covid-19. Because of this, SYSTRA recommends that the consideration of additional mitigation measures identified in Section 14.3 as part of the wider LEZ package should be reviewed after the key LEZ elements are implemented to determine if these, or other measures are still required.

## 14.5 Adjustment of LEZ Boundary

14.5.1 As part of the development of the final package of measures proposed for the final preferred LEZ scheme, the boundary of the LEZ itself was reviewed by both SYSTRA and ACC and some minor amendments considered from the original Option 5 as detailed:

- *Ashvale Place / Holburn Street* - The LEZ boundary on Holburn Street requires to be moved from just north of the junction with Willowbank Road to just north of the junction with Ashvale Place. This is to allow non-compliant traffic an exit on Ashvale Place, as it is a one-way eastbound route onto Holburn Street
- *Regent Quay Area* - ACC identified the need to rationalise the LEZ boundary around the Regent Quay area of the network, noting a requirement to retain access to Virginia Street Car Park on Mearns Street for all vehicles. In addition, Regent Quay requires to be excluded from the LEZ as this road is under the jurisdiction of the Harbour Board and not ACC and therefore cannot be included within the LEZ as defined by the Transport (Scotland) Act 2019.
- *East North Street / King Street* – Model testing of the LEZ boundary around the Harbour route of East North Street, Commerce Street and Virginia Street has shown that the combined inclusion of all of these routes within the LEZ boundary reduces the volume of non-compliant traffic significantly on King St, which currently has air quality NO<sub>2</sub> exceedances. The roundabout of East North Street with Beach Boulevard remains outside the LEZ boundary to allow U-turning for non-compliant vehicles on Beach Boulevard and Park Street.
- *Market Street/Union Square/Bus Station* – Consultation with local business stakeholders in April 2021 (Section 11.4) identified that goods delivery access to Union Square shopping centre is from Market Street at the shared access to Aberdeen Bus Station. The boundary of the LEZ on Market Street is therefore adjusted to now extend just north of this access to allow continued access for goods delivery.

14.5.2 The final proposed LEZ boundary is provided in Chapter 15, Figure 15.1.

## 14.6 Model Statistics for Final Proposed LEZ Scheme

14.6.1 The detailed model outputs for the final preferred LEZ option and associated package of measures is provided in the accompanying *LEZ Option Testing Report* (SYSTRA Ref: GB01T20D62/3, May 2021) and summarised here:

### **Model Demand Level**

14.6.2 Through all model testing of the various LEZ options, the maximum percentage demand that the models were able to run at was 95% of the Reference Case Demand.

14.6.3 The 2024 future year traffic models are based upon a high traffic growth scenario and include approximately 7% predicted growth over the 2019 Baseline traffic levels in the PM period. It could therefore be considered that models running at 95% demand is equivalent to a small level of traffic growth on the 2019 baseline traffic demand (i.e. 2% traffic growth from 2019). An alternative way of viewing this is that the LEZ scheme helps to manage the traffic levels through the city centre so that if high growth occurs in the wider



Aberdeen network, the LEZ helps to restrict this level of growth through the city centre areas.

**Predicted Impact of LEZ on Air Quality Exceedance Locations**

14.6.4 Table 14.3 provides a traffic flow percentage difference comparison between the final preferred LEZ option and the 2019 Base Model at each of the exceedance locations in the network. The data is based upon the 12 Hr model flows. The resultant predicted impact on the NO<sub>2</sub> exceedance levels is also provided.

**Table 14.3 : Predicted Impact of Final LEZ Scheme on Air Quality Exceedance Locations**

Site	Exceedance Location	Flow Change from 2019 Baseline Final Option	Predicted Air Quality Impact Final Option
DT30	335 Union St	-24%	
DT73	61 Skene Square	-10%	
DT18	14 Holburn St	-14%	
CM2	Union Street	-40%	
DT16	1 Trinity Quay	6%	
DT77	27 Skene Square	-10%	
DT11	105 King St	2%	
DT10	184/192 Market St	-5%	
DT9	39 Market St	-37%	
DT29	469 Union St	-32%	
DT12	40 Union St	-62%	
DT17	43/45 Union St	-62%	
DT82	7 Virginia Street	5%	
DT19	468 Union St	-32%	
	NO <sub>2</sub> Levels predicted to be Under Threshold		
	NO <sub>2</sub> Levels predicted to be Near Threshold		
	NO <sub>2</sub> Levels predicted to be Over Threshold		
	NO <sub>2</sub> Levels predicted to be Significantly Over Threshold		

14.6.5 The modelling results shows that the predicted traffic flow changes associated with the final proposed LEZ scheme are expected to reduce emissions through each of the NO<sub>2</sub> exceedance locations to the extent that all current exceedances fall below the legal limit, the principal objective of the LEZ. The predicted reduction in NO<sub>2</sub> will be quantified by SEPA through their emissions and air quality modelling work as available.

**Predicted Impact of LEZ Scheme on Network Travel Pattern**

14.6.6 Traffic model flow analysis shows a general trend of traffic reduction through the core area of the city centre with displaced traffic pushed out to Anderson Drive. The LEZ boundary restricts non-compliant traffic from routing through the city centre but retains access to the city centre.

14.6.7 The locations where traffic is diverted generally follow the proposed hierarchy routes. The mitigating measures through Milburn Street help to protect the local areas around Ferryhill Road from the impacts of the displaced traffic. Some other local routing increases are observed within the model but it is important to highlight again the current uncertainty in predicting the future city centre travel patterns post-Covid-19. Because of this, SYSTRA recommends that the consideration of additional mitigation measures as part of the wider LEZ package should be reviewed after the key LEZ elements are implemented to determine if these, or other measures are still required.

14.6.8 From the model testing, SYSTRA would highlight the following corridors as locations where traffic monitoring is undertaken as the network traffic recovers and also after the key elements of the LEZ are implemented:

- Springbank Terrace / Willowbank Road
- Huntly Street
- Chapel Street
- Albyn Place
- Ferryhill Road / Fonthill Road
- Albert Street
- Ashley Road
- Seaforth Road

***Predicted Impact of LEZ Scheme on Aberdeen's Traffic Network***

14.6.9 Model network-wide summary statistics report on the overall network performance of a traffic model. Analysis of the network-wide statistics for the final preferred LEZ option and complementary package of measures suggest:

- The LEZ would result in an increase (<2%) to the average distance travelled for vehicles through the city centre area. The nature of a LEZ together with traffic restrictions through the city centre area will undoubtedly have an impact on the trip distance of some vehicles. This would be a factor when considering Carbon emissions.
- Whilst the modelling suggests that the LEZ scheme would result in an increase (10-15%) on the average time taken for traffic to route through the city centre area, outputs suggest that the volume of traffic queueing would reduce (by approx. 10%) It is assumed that this is due to the removal of traffic from some of the high queue areas within the LEZ area.

14.6.10 Given that the primary objective of a LEZ is to reduce emission levels associated with road traffic by restricting access for certain vehicles to parts of the city, the overall impact to the traffic network is perhaps expected. The model testing has shown however that the proposed measures should significantly improve air quality levels in the city and when delivered together with the proposed CCMP measures, the LEZ also enables ACC to consider improved pedestrian or Public transport measures through the road space created.

## 15. ABERDEEN LEZ OPTION DETAIL

### 15.1 Introduction

15.1.1 The analysis undertaken and summarised in Chapters 11 to 14 has identified a final preferred option for Aberdeen's LEZ, including the package of supporting measures to enable the LEZ to meet its objectives. The next stage of the NLEF process is to define the LEZ Option detail in line with the Transport (Scotland) Act 2019.

15.1.2 [Section 14](#) of the Transport (Scotland) Act 2019 states the required content of a LEZ, namely:

- The zone to which it relates, which must be specified by
  - i. reference to an area on a map, and
  - ii. specifying the roads (or parts of a road) which form part of the zone
- the types of vehicles to which it applies
- the date on which the scheme comes into effect
- the grace periods applicable
- the LEZ objectives

15.1.3 This chapter will provide information on the required content of Aberdeen's LEZ.

### 15.2 Aberdeen LEZ Area

15.2.1 In line with [Section 14](#) of the Transport (Scotland) Act 2019, the final detailed drawing of the Aberdeen LEZ Option is shown in Figure 15.1

15.2.2 The detail presented in Figure 15.1 is considered appropriate for this stage of the Interim Stage 2 Reporting and subsequent submission to Aberdeen City Council Committee and for the consultation period thereafter. However, detailed design work should be undertaken prior to final submission of the Aberdeen LEZ Option to Scottish Ministers that will include aspects such as signage and camera placement and will present a further opportunity to finalise the LEZ boundary. It is anticipated that through the final consultation, locations, accesses or land uses may be identified and require consideration of whether they fall inside or outside the LEZ area.

15.2.3 A list of all roads which form part of the zone, as required by the Transport (Scotland) Act 2019 is included in Appendix C.

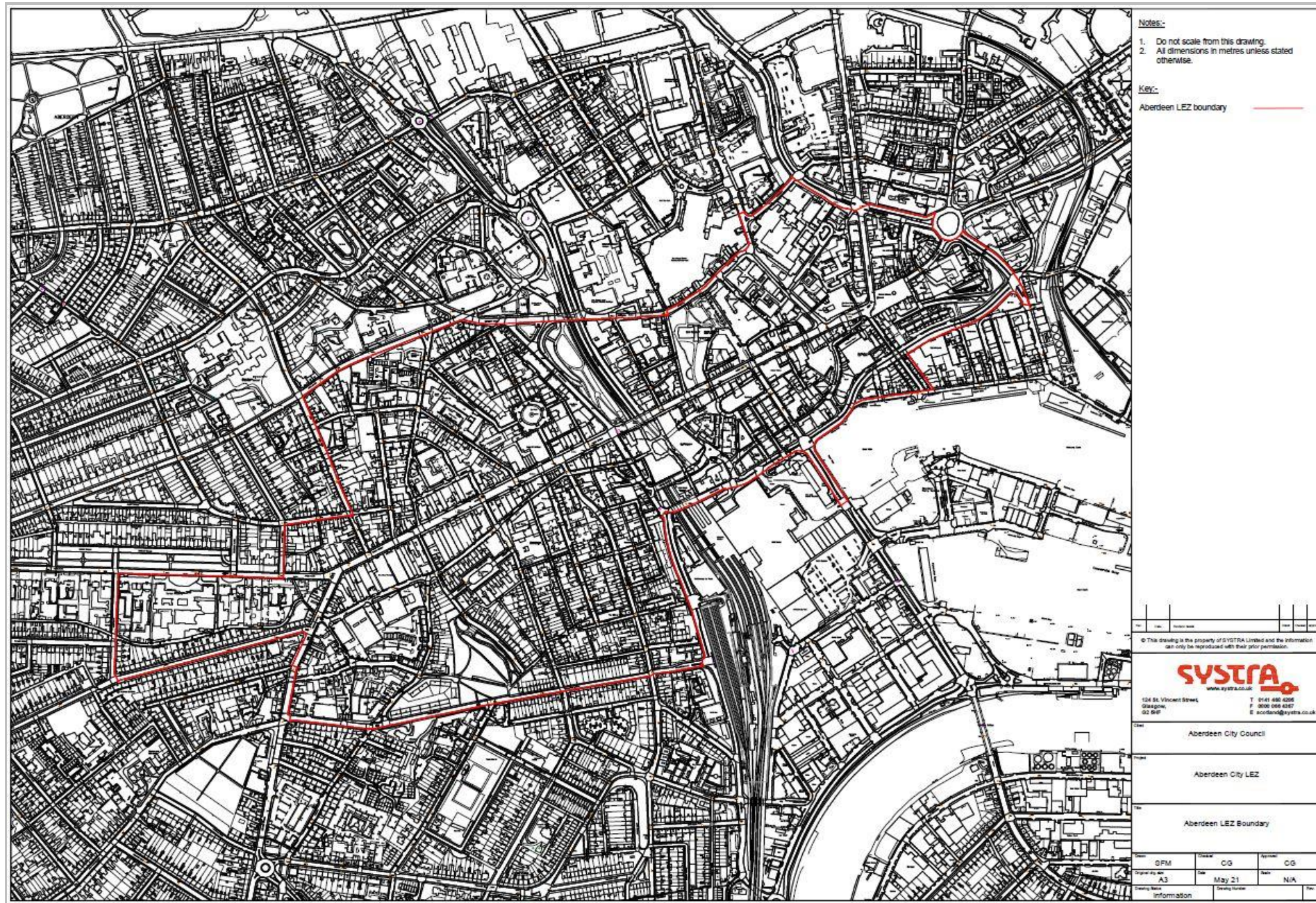


Figure 15.1 : Aberdeen LEZ Option Area

### 15.3 Vehicles types restricted from entering Aberdeen LEZ

15.3.1 The [Low Emission Zones \(Emission Standards, Exemptions and Enforcement\) \(Scotland\) Regulations 2021](#) sets the emission standards for entry to the LEZ without penalty and allows ACC to define which vehicle types are to be restricted from entering the LEZ area.

15.3.2 NLEF Guidance states “*all vehicle types should be considered for inclusion in a LEZ and be assessed as part of the NLEF appraisal process...a single vehicle type or a combination of vehicle types could be subject to the LEZ requirements*” (NLEF, 2019).

15.3.3 The final decision of the vehicles types restricted from entering Aberdeen’s LEZ is informed therefore by NMF Aberdeen air quality modelling, traffic modelling and consultation outcomes as well as enforcement considerations.

15.3.4 Analysis of modelled emission by vehicle type in the NMF Aberdeen Air Quality Model (Chapter 5) concluded that a LEZ in Aberdeen will have to include all vehicle types and have to be delivered with traffic management measures if all exceedances of the air quality objectives are to be addressed.

15.3.5 The traffic modelling assessed LEZ options that restricted all vehicles (buses, diesel cars, HGVs, LGVs and petrol cars) from access to the city centre unless they were compliant with LEZ emission standards. All non-compliant buses, LGVs, taxis and HGVs were assumed to become compliant while non-compliant cars were assumed to remain on the road network and access the city centre by utilising car parks outside the LEZ area. The detailed modelling results show the road network operates with small increases to average journey distance travelled and average journey times. This impact is balanced against the significant predicted reductions in NO<sub>2</sub> levels and traffic flows inside the LEZ area as a result of the introduction of an all vehicle LEZ and complementary traffic management measures.

15.3.6 In addition to evidence from modelling, the wider messaging and publicising of the LEZ is simplified if vehicle restrictions apply to all vehicle types that do not meet LEZ emission standards. It is also noted that the three other cities in Scotland (Glasgow, Dundee and Edinburgh) plan to introduce a LEZ for all vehicles and introducing an all vehicle LEZ for Aberdeen would ensure consistency across the country.

It is proposed that the final Aberdeen LEZ Option applies to all vehicles types as specified in [Regulation 2](#) of the Low Emission Zones (Emission Standards, Exemptions and Enforcement) (Scotland) Regulations 2021.

15.3.7 The LEZ emission standards for Aberdeen LEZ are therefore:

- Euro VI emission standards for buses, coaches and heavy good vehicles with diesel engines, with retrofitted vehicles to this standard also being acceptable (Euro VI vehicle registrations from 2013)
- Minibuses, large vans, taxis and cars are set at the Euro 6 for diesel vehicles and Euro 4 for petrol vehicles (Euro 6 diesel vehicle registrations in 2015, Euro 4 petrol vehicles in 2006).
- Euro 3 for motorcycles and mopeds

15.3.8 Although the model analysis did not consider motorcycles or mopeds (as they are not generally represented in the traffic or air quality model) these are listed in Regulation 2 and are therefore considered applicable to the emissions standards for Aberdeen’s LEZ.

15.3.9 [Section 6\(4\)\(a\)](#) of the Transport (Scotland) Act 2019 set enforcement exemptions consistently across Scotland, with the national LEZ exemptions listed in [Regulation 3](#) of

the LEZ Regulations and outlined in Table 15.1. Aberdeen LEZ will operate in accordance with the exemption list.

**Table 15.1 : National LEZ Exemptions**

Vehicle type of classification	Description
Emergency Vehicles	For or in connection with the exercise of any function of: the Scottish Ambulance Service, the Scottish Fire and Rescue Service, Her Majesty's Coastguard, and the National Crime Agency.
Military Vehicles	Vehicles belonging to any of Her Majesty's forces; or used for the purposes of any of those forces
Vehicles of Historic Interest	Vehicles which are 30 years old or older, are no longer in production and historically preserved or maintained
Vehicles for Disabled Persons	Vehicles registered with a 'disabled' or 'disabled passenger vehicles' tax class Vehicles being used for the purposes of the 'Blue Badge Scheme'.
Showman Vehicles	Highly specialised vehicles used for the purposes of travelling showmen, where the vehicle is used during the performance, used for the purpose of providing the performance or used for carrying performance equipment.

## 15.4 Aberdeen LEZ Package of Measures

- 15.4.1 To enable the development of a package of measures to be delivered as part of the LEZ, traffic modelling was utilised to identify if any elements of the City Centre Masterplan (CCMP) not yet implemented would enhance and support the LEZ in meeting its objectives. The CCMP Union Street Scheme was shown to complement the proposed LEZ and is expected to positively impact on the NO<sub>2</sub> exceedance locations in the city. This combination of the LEZ plus CCMP Union Street Scheme is predicted to significantly reduce the emission levels at all the 2019 observed NO<sub>2</sub> exceedance locations.
- 15.4.2 The model testing of various proposals to manage traffic displaced from the city centre identified that a revision to the operation of the Milburn Street / South College Street junction is best placed to address potential rat runs through the south and west border of the LEZ. Junction changes are required to restrict or prevent strategic traffic (both compliant and non-compliant) routing through Milburn Street and the Ferryhill corridor. Further assessment of the specifics of these measures will be considered by ACC in due course.
- 15.4.3 It is therefore recommended that the LEZ, the CCMP Union Street Scheme and the Milburn Street junction revision is viewed as a combined package of measures to meet the objectives of the LEZ, as shown in Figure 15.2.

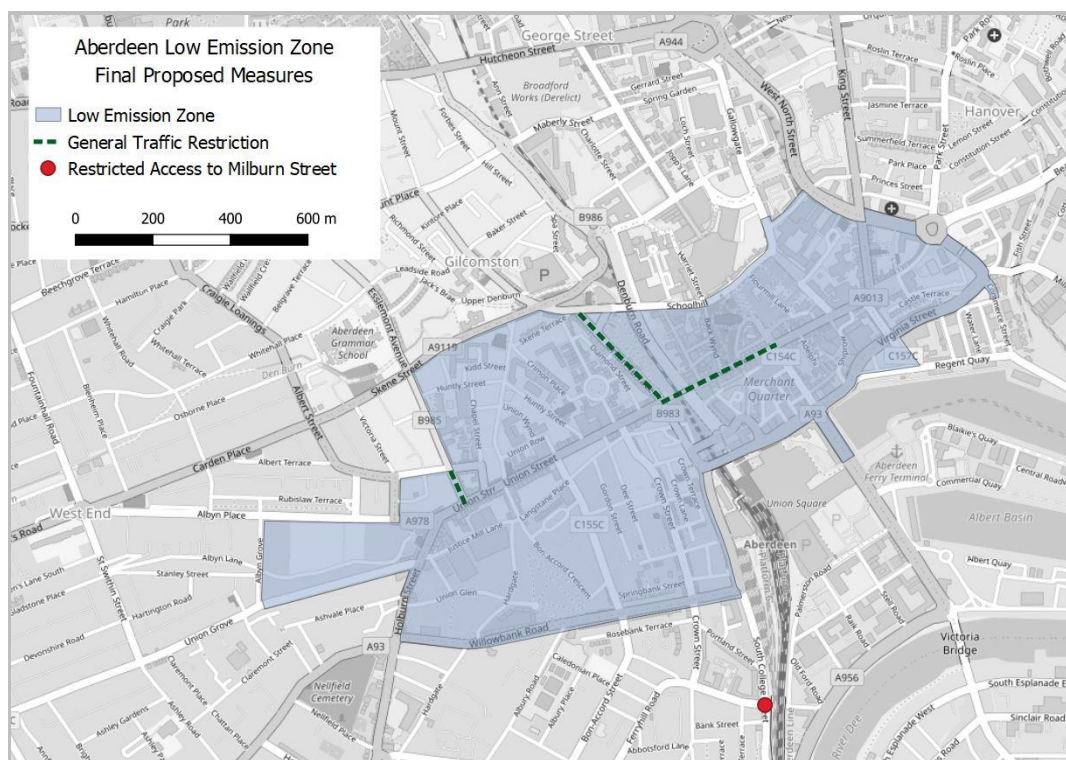


Figure 15.2 : LEZ Supporting Measures

## 15.5 Enforcement of Aberdeen LEZ

15.5.1 ACC will submit its final proposals for the LEZ to Scottish Ministers in late 2021 and, subject to any objection, is required to declare its LEZ by May 2022. While a decision on the final exact date is made, the working assumption for this Interim Stage 2 Report is that ACC will declare the LEZ in May 2022, and that the LEZ will apply to all vehicle types (not meeting LEZ standards) from this date.

15.5.2 The Transport (Scotland) Act 2019 requires a LEZ to specify a grace period before penalty enforcement of the scheme. [Section 15](#) details the scope and time-limits of the grace period. The grace period applicable to non-residents must expire:

- not less than 1 year after it (LEZ declaration) begins, and
- not more than 4 years after it begins.

15.5.3 The grace period applicable to residents (whose registered address is inside the zone) must expire not more than 2 years after the expiry of the grace period applicable to non-residents.

15.5.4 With declaration of Aberdeen’s LEZ in May 2022, the grace period for the LEZ must therefore:

- Not expire before May 2023
- Expire by May 2026 for non-residents
- Expire by May 2028 for residents but can expire from May 2023

15.5.5 To inform the grace period dates, consultation with two key stakeholders, namely bus operators and the business community, was undertaken in March 2021. All bus operators confirmed their full fleet would not be compliant with LEZ emission standards by 2023, the minimum grace period. While a key purpose of any LEZ is to speed up improvements to air quality (through compliance with emission standards) and ACC could enforce the LEZ in 2023, it is considered counter-productive to set a date that bus operators will be unable to meet.

15.5.6 In addition, it is recognised that the Covid-19 pandemic has had an unprecedented impact on society, including on the wider environment and the economy. Cognisance of the difficulties faced by many throughout 2020 and 2021, particularly in the context of a Aberdeen city centre LEZ and its implications for city businesses and bus operators, suggests that a grace period greater than the required minimum is desirable.

15.5.7 A key theme from consultation with key stakeholders was the need for consistency of the grace periods applied to the LEZ enforcement. It is therefore considered important that the grace period should be applicable to all vehicle types from the same date to ensure consistency and ease of enforcement and wider communications. In line with the theme of consistency, it is proposed that residents of the LEZ area are required to comply with the LEZ emission requirements at the same time as non-residents.

**With the above considerations in mind, it is proposed that the grace period for Aberdeen’s LEZ expires in May 2024 for all vehicle types and for residents and non-residents of the zone.**

15.5.8 This represents an additional grace period of two years from the declaration of the LEZ in May 2022.

15.5.9 As context, in May 2024, the approximate age of non-compliant vehicles will be as follows:

- Bus – 11 years or older (including those retrofitted to Euro VI standard)
- HGV – 11 years or older
- Diesel car/van – 9 years or older
- Petrol vehicle – 18 years or older

15.5.10 [Section 8](#) of the Transport (Scotland) Act 2019 enables the enforcement of LEZ schemes. The LEZ will be enforced through Automatic Number Plate Recognition (ANPR) cameras with the LEZ Regulations [Schedule 6](#) detailing the approved devices.

15.5.11 ANPR camera enforcement is currently subject to funding decisions from Transport Scotland and procurement procedures with suppliers. The exact number and location of ANPR cameras is therefore not concluded and will be confirmed in the final NLEF Stage 2 Report and submission to Scottish Ministers.

15.5.12 In line with [Section 18](#) of the Transport (Scotland) Act 2019, it is anticipated that the LEZ will be enforced at all times. [Section 17](#) of the Act does allow for ACC to apply time-limited exemptions to enforcement should it be required, for example for road closures and diversion routes.

## 15.6 Aberdeen LEZ Objectives

15.6.1 Chapter 7 details the development of the objectives of Aberdeen’s LEZ. They are that Aberdeen’s Low Emission Zone will:

**Improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government’s statutory air quality objectives.**

**Support climate change targets by reducing road transport’s contribution to emissions.**

15.6.2 It is recognised that a LEZ can help realise wider benefits beyond air quality improvement, but that these are influenced by many other factors and not solely or directly attributable to a LEZ. Therefore the following supplementary objectives for Aberdeen’s Low Emission Zone have been identified:



- Protect public health and wellbeing;
- Support local and regional transport strategies by contributing to the development of a vibrant, accessible, and safe city centre, where the volume of non-essential traffic is minimised and active and sustainable transport movements are prioritised; and
- Contribute to ongoing transformational change in Aberdeen, helping promote the city as a desirable place to live, visit and invest in.

15.6.3 The objectives were shown to align with key ACC plans, policies and strategies. While at this stage it is not possible to fully quantify the effectiveness of the final Aberdeen LEZ in meeting the LEZ objectives, an appraisal of the option against the LEZ objectives (Chapter 13) concluded that the introduction of the LEZ will not contradict the objectives and it is likely to positively meet the objectives in the future.

## 16. SUMMARY OF NEXT STEPS

### 16.1 Timetable of Aberdeen LEZ

16.1.1 Table 16.1 below presents the proposed timetable from committee submission of the final Aberdeen LEZ presented in this Interim NLEF Stage 2 Report through to full enforcement of the LEZ after the proposed grace period ends.

**Table 16.1 : Timetable towards Aberdeen LEZ enforcement**

Activity	Indicative Date
City Growth and Resources Committee Report recommending final Aberdeen LEZ as defined in this report	June 2021
Statutory Consultation	Summer 2021
Completion of additional impact assessments (IIA, BRIA, SEA)	Autumn 2021
Submission of final LEZ scheme to Scottish Ministers	End 2021
Scottish Minister approval and ACC declaration of Aberdeen LEZ	Spring 2022
Enforcement of Aberdeen LEZ	Spring 2024

### 16.2 Emissions Analysis and the National Modelling Framework

16.2.1 SEPA, who develop and run the National Modelling Framework (NMF) Aberdeen City Air Quality Model, were subject to a cyber-attack in late 2020 resulting in the NMF being temporarily unavailable, with model runs not possible prior to completion of this second Interim NLEF Stage 2 Report. The final Aberdeen LEZ option will however be assessed in the NMF prior to submission to Scottish Ministers (late 2021 as noted above).

16.2.2 As an interim step to inform the likely impact on emissions resulting from the introduction of the LEZ, analysis of emissions based on traffic model outputs using EMIT software is currently being undertaken by SEPA and findings will be incorporated in the NLEF process as available.

### 16.3 Impact Assessments

16.3.1 NLEF guidance advises that as part of the NLEF Stage 2 Assessment, the final Aberdeen LEZ should be subject to detailed impact, equality and environmental assessments to ensure any impacts, beyond improvements to air quality, are fully considered.

16.3.2 In line with Transport Scotland's approach to the national introduction of LEZs, Aberdeen's LEZ will be subject to the following impact assessments:

- Strategic Environmental Assessment (SEA)
- Integrated Impact Assessment (IIA)
- Business and Regulatory Impact Assessment (BRIA)

16.3.3 These assessments are ongoing and it is anticipated that these tasks will be complete prior to the final submission of the Aberdeen LEZ to Scottish Ministers in Autumn 2021.

### 16.4 Statutory Consultation

16.4.1 [Section 11](#) of the Transport (Scotland) Act 2019 states that before a local authority submits its final LEZ proposals to Scottish Ministers for approval, it must consult with:

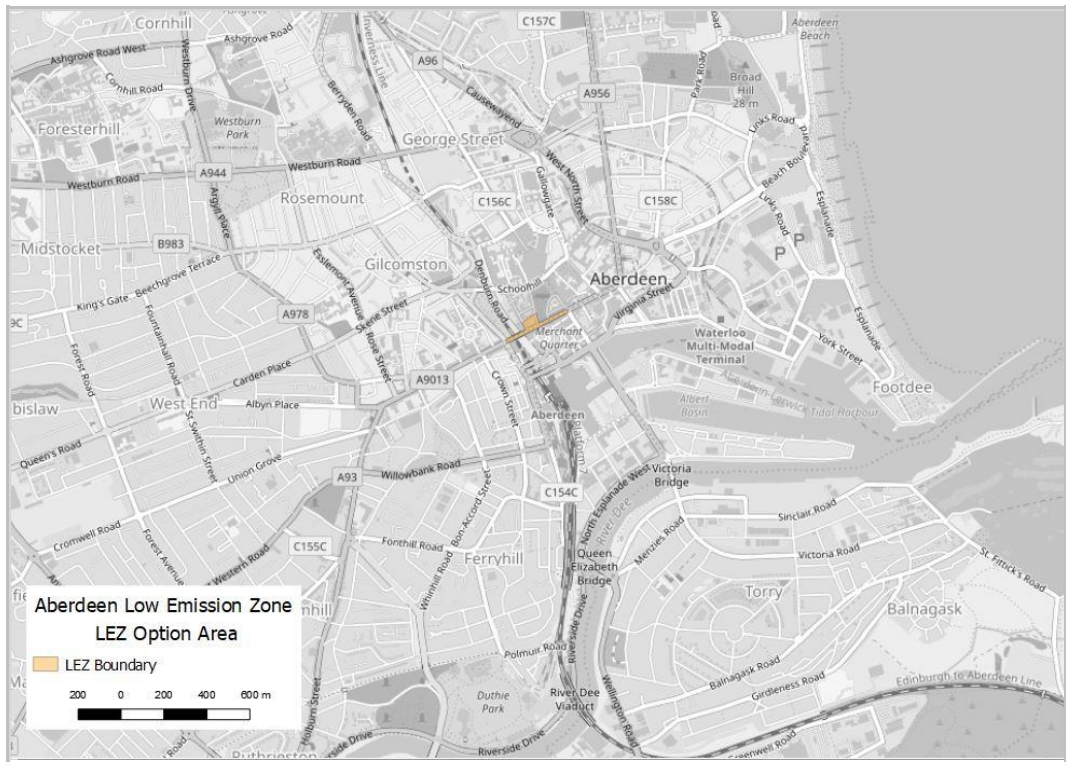
- the Scottish Environment Protection Agency,
- Scottish Natural Heritage (now NatureScot),
- Historic Environment Scotland,
- such persons as the authority considers represent the interests of—
  - i. the road haulage industry,
  - ii. the bus and coach industry,
  - iii. the taxi and private hire car industry,
  - iv. local businesses, and
  - v. drivers, likely to be affected by the proposal,
- such persons as are specified by the Scottish Ministers in regulations
  - i. neighbouring local authorities
  - ii. the Regional Transport Partnership (Nestrans)
  - iii. the local Health Board
- such other persons as the authority considers appropriate

16.4.2 All statutory consultees have been involved in previous consultation and/or are part of the Aberdeen LEZ Delivery Group. However, in line with The Transport (Scotland) Act 2019, consultation on the final Aberdeen LEZ will take place from June 2021. Thereafter, ACC will publish a Report on the consultation findings and, if required, take account of any representations received in the course of the consultation.

16.4.3 Once the consultation findings have been taken into consideration, ACC will publish the final proposed Aberdeen LEZ scheme and, at this time, objections can be made. When the period in which objections can be made has ceased, ACC will publish a report outlining any objections received and its response.

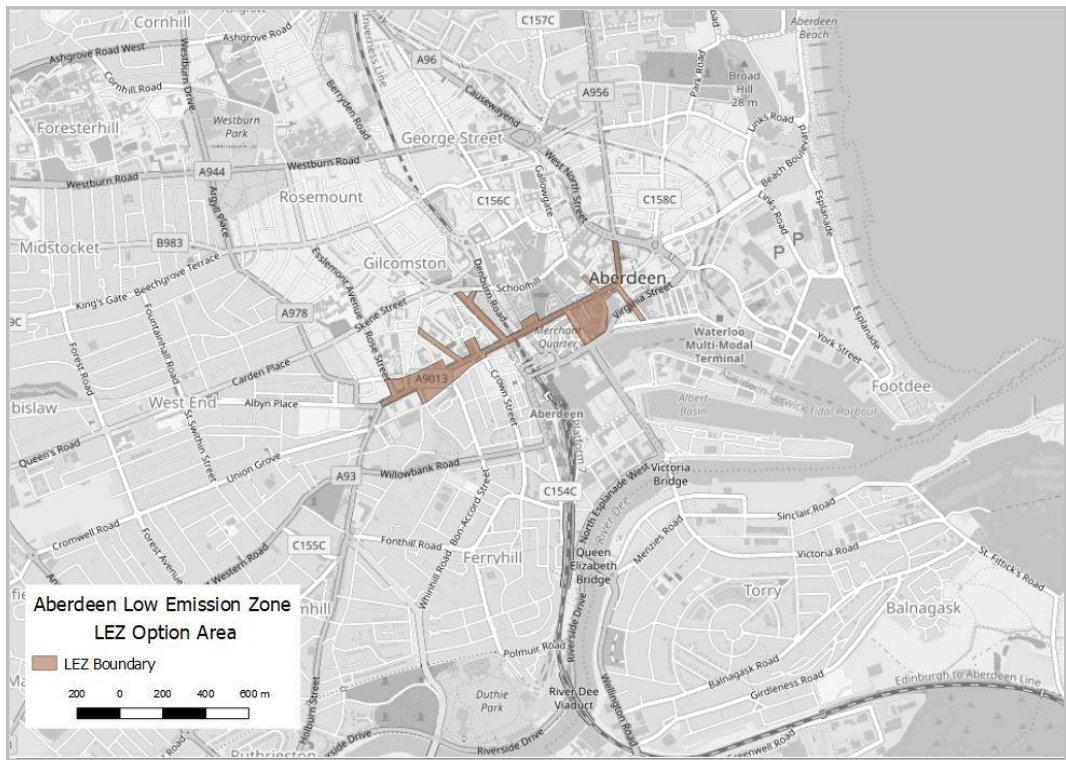
# APPENDIX A – LEZ OPTION AREAS

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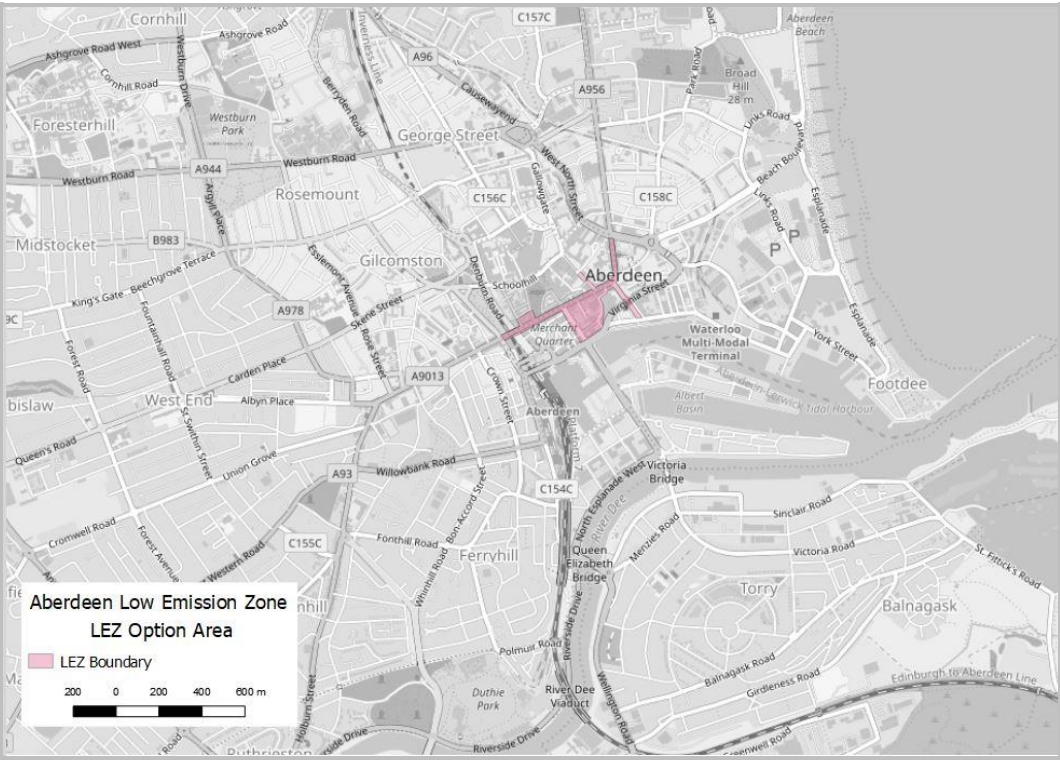


**Figure A.1 : Central Union Street**

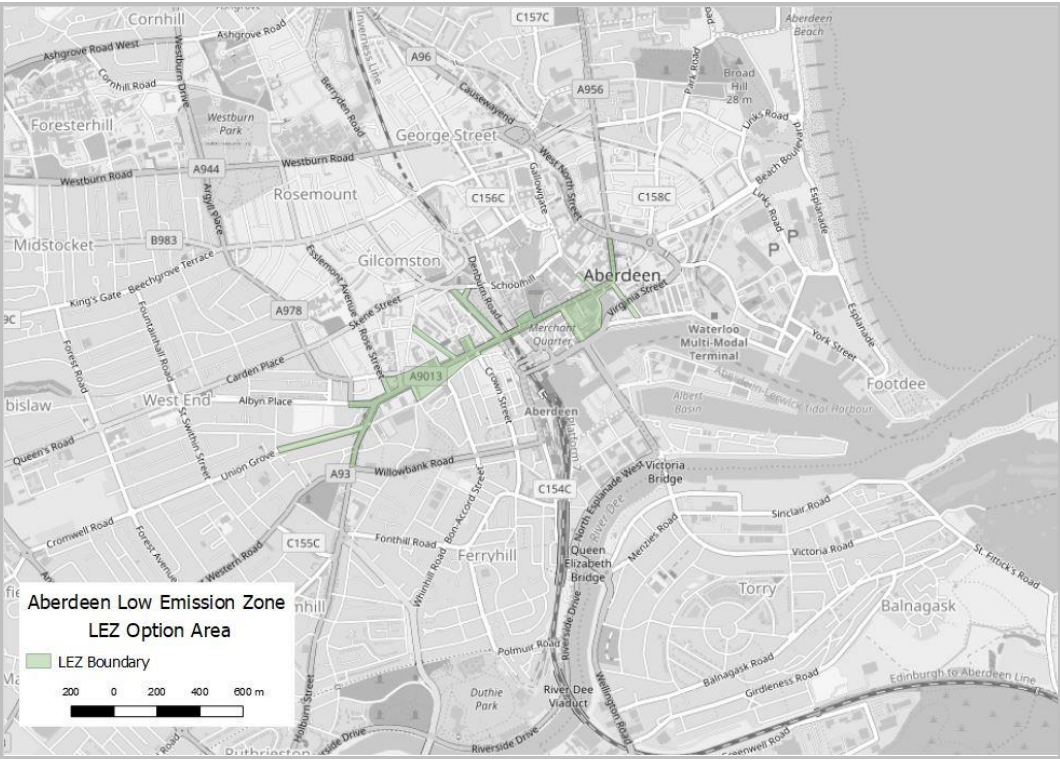
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**Figure A.2 : Union Street**

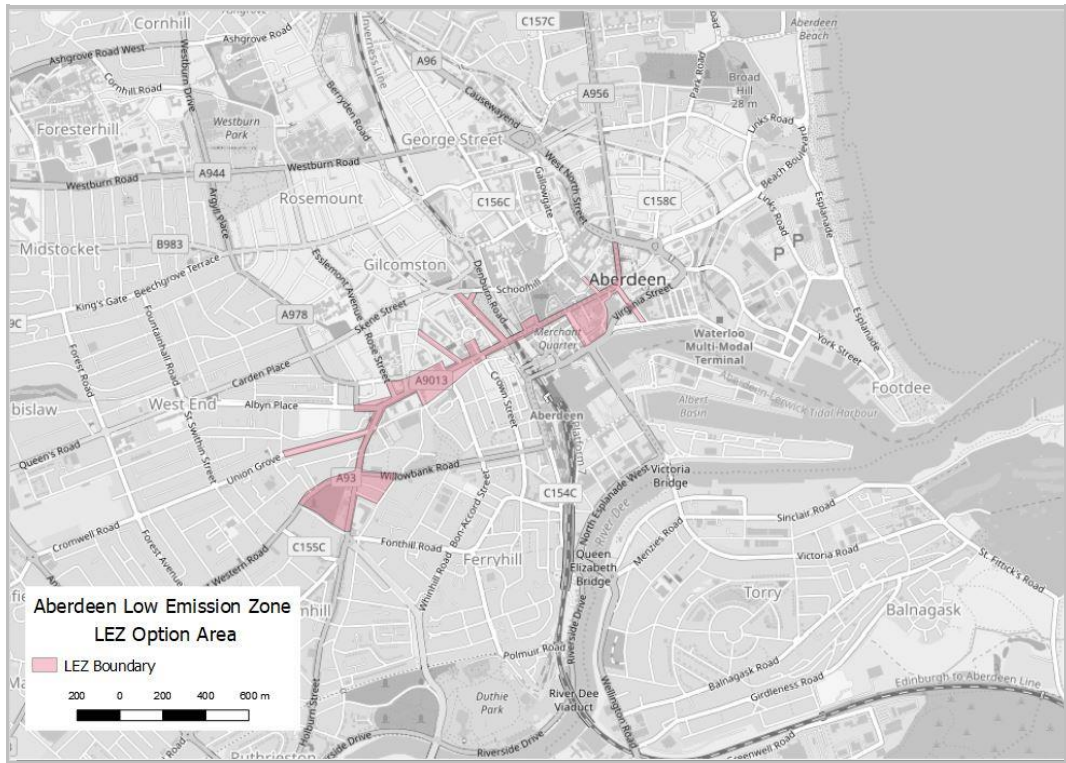


**Figure A.3 : Union Street/Market Street/King Street**



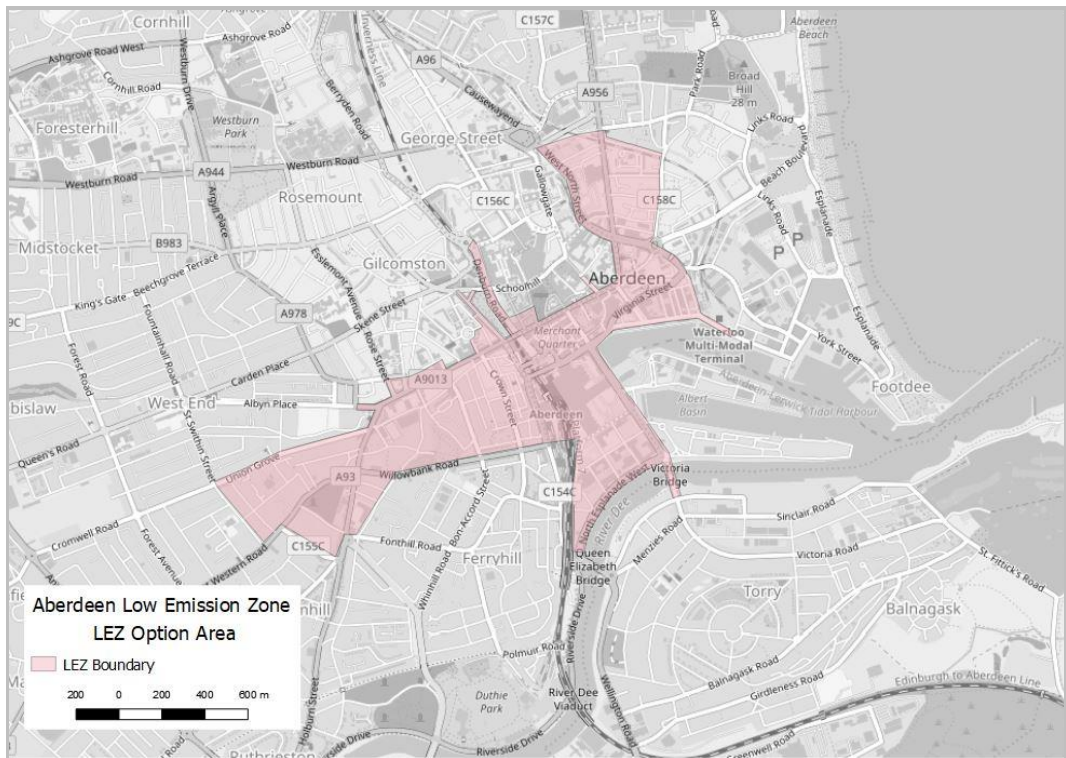
**Figure A.4 : Holburn Street/Union Street/King Street**

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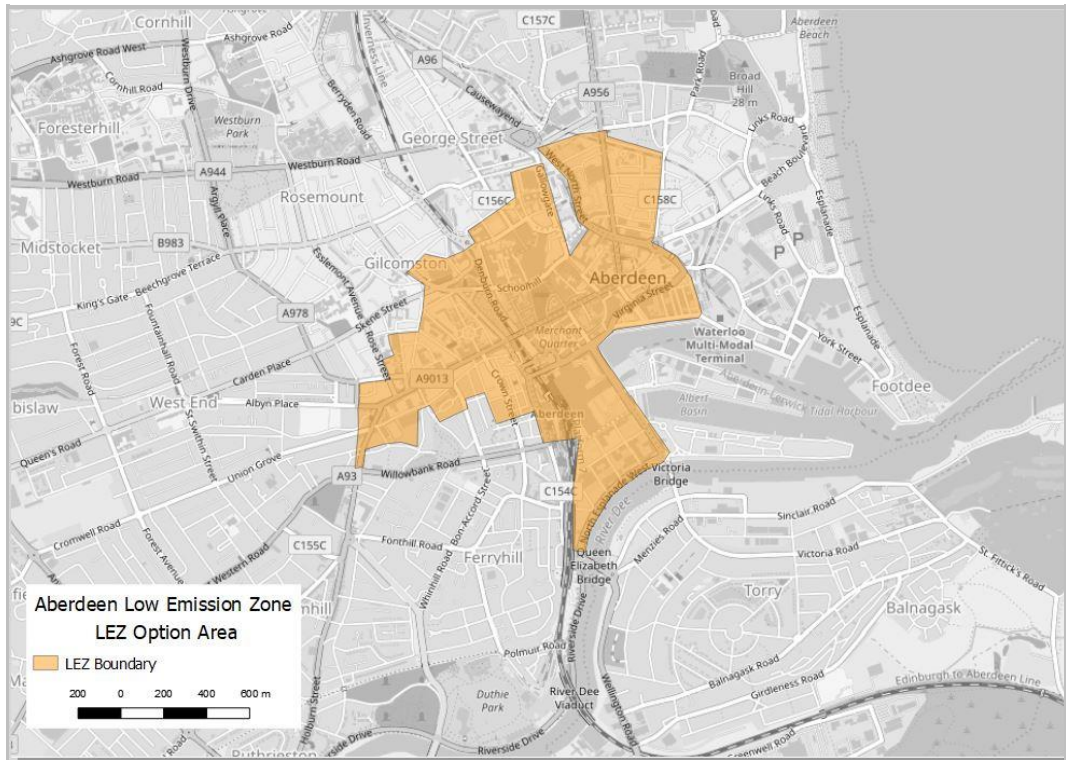
**Figure A.5 : City Centre Core**

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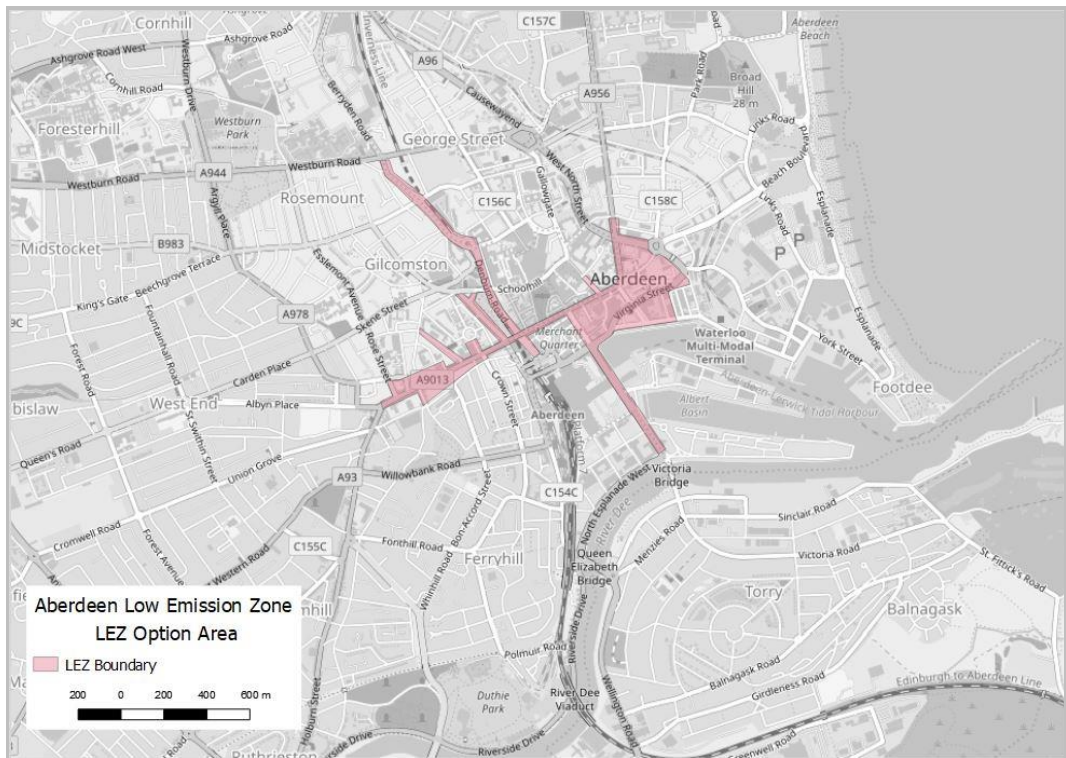
**Figure A.6 : City Centre AQMA**

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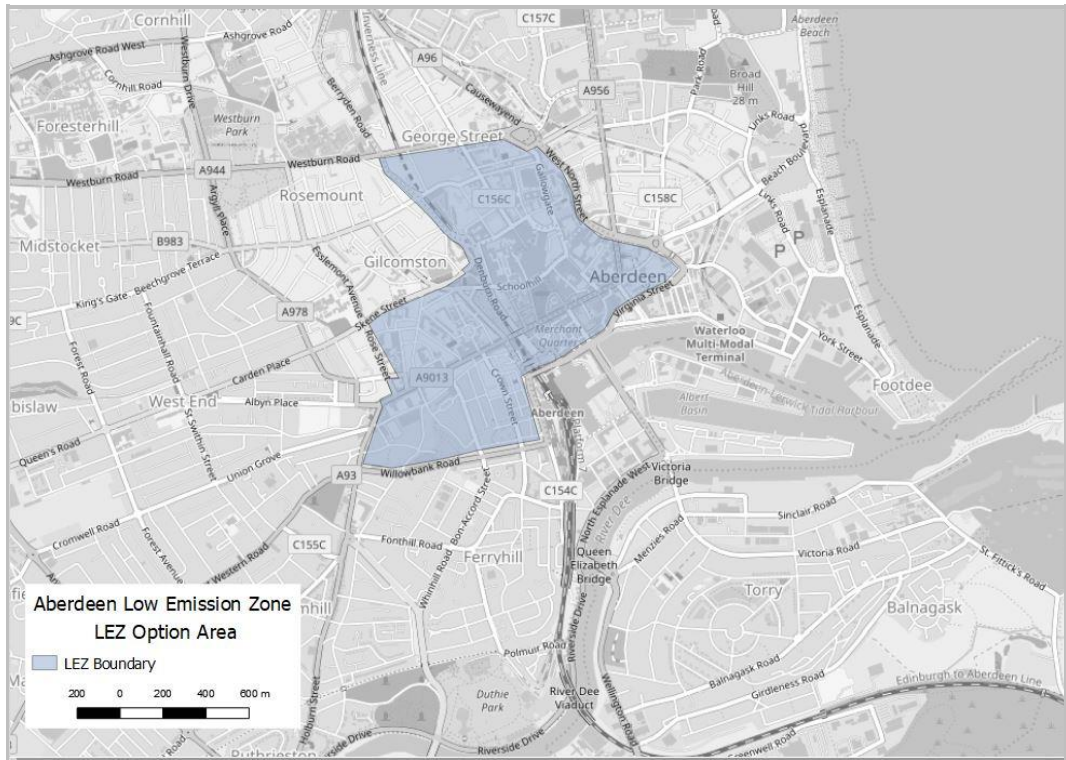
**Figure A.7 : City Centre Masterplan**

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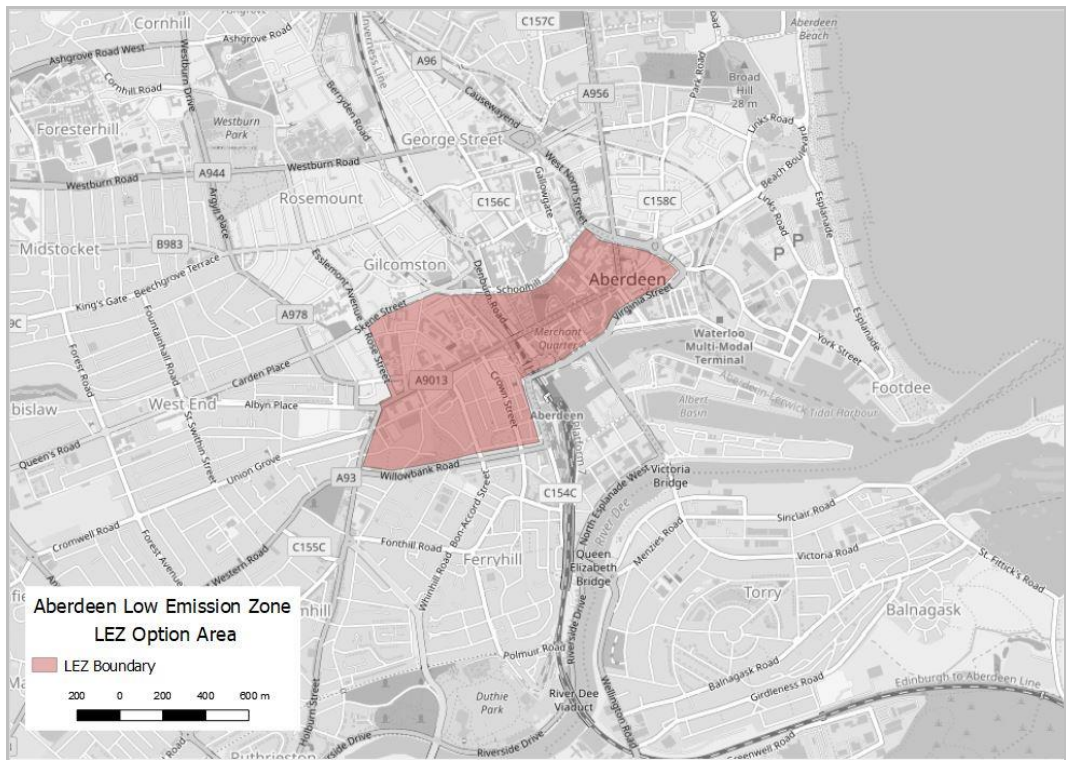
**Figure A.8 : City Centre Exceedances**

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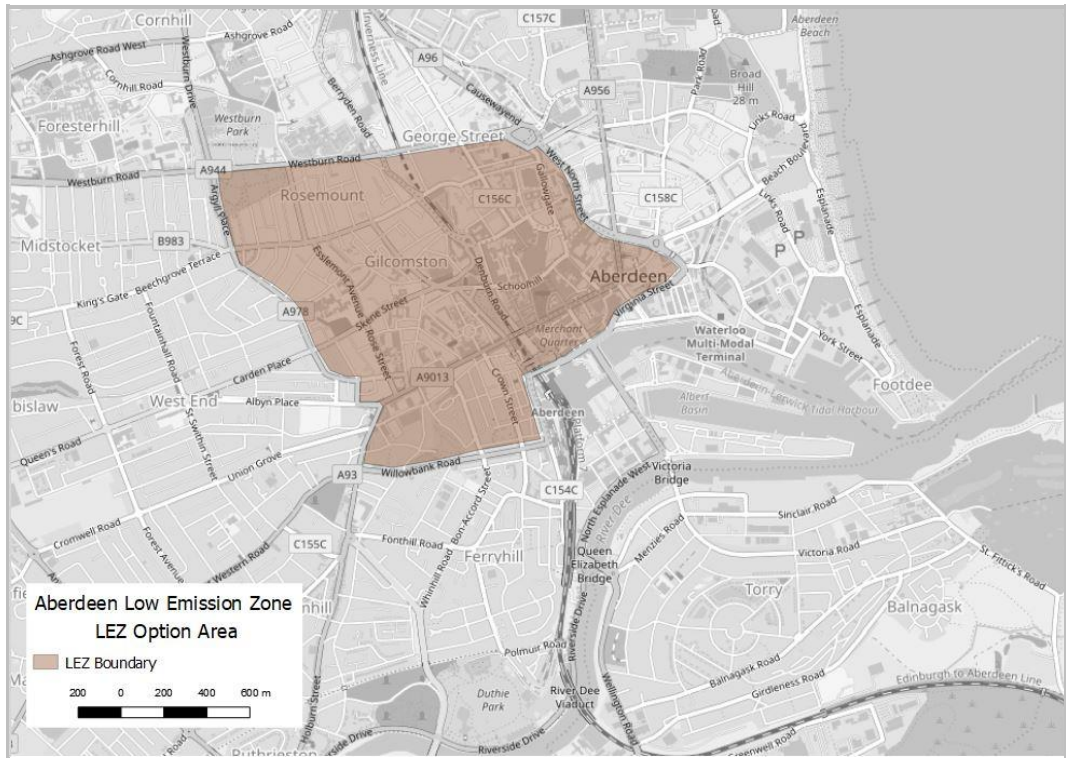
**Figure A.9 : Holburn Street to Mounthooly Roundabout**

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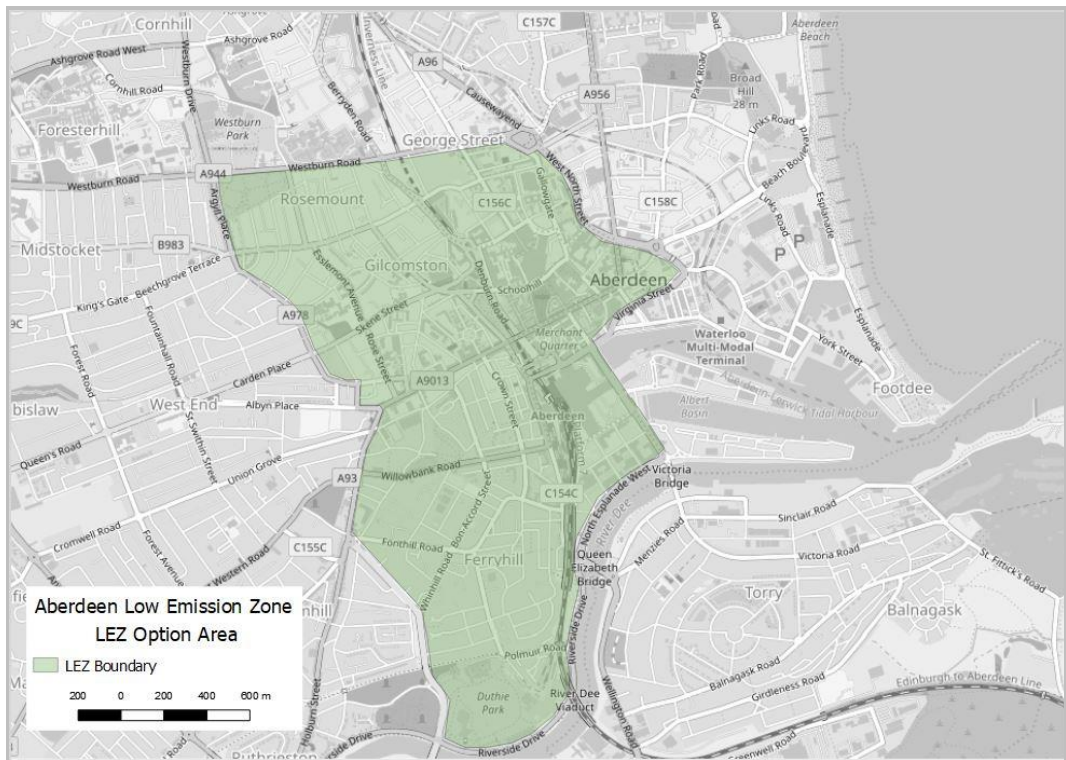


**Figure A.10 : Union Street with extended boundary**

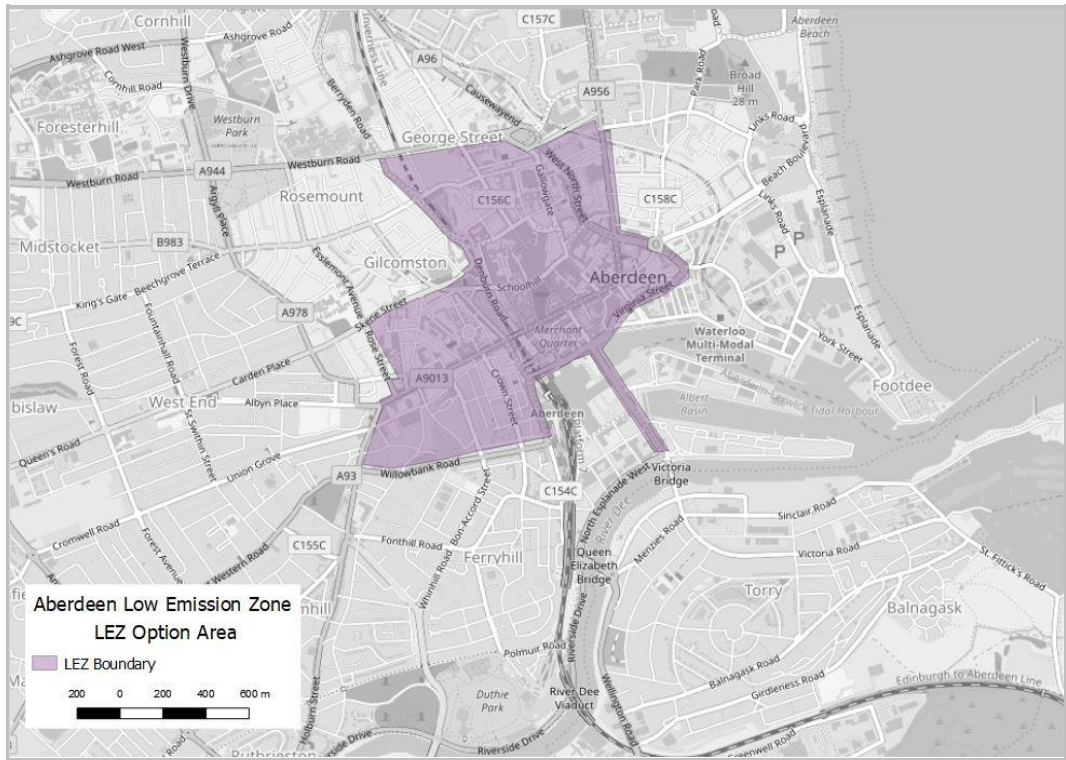




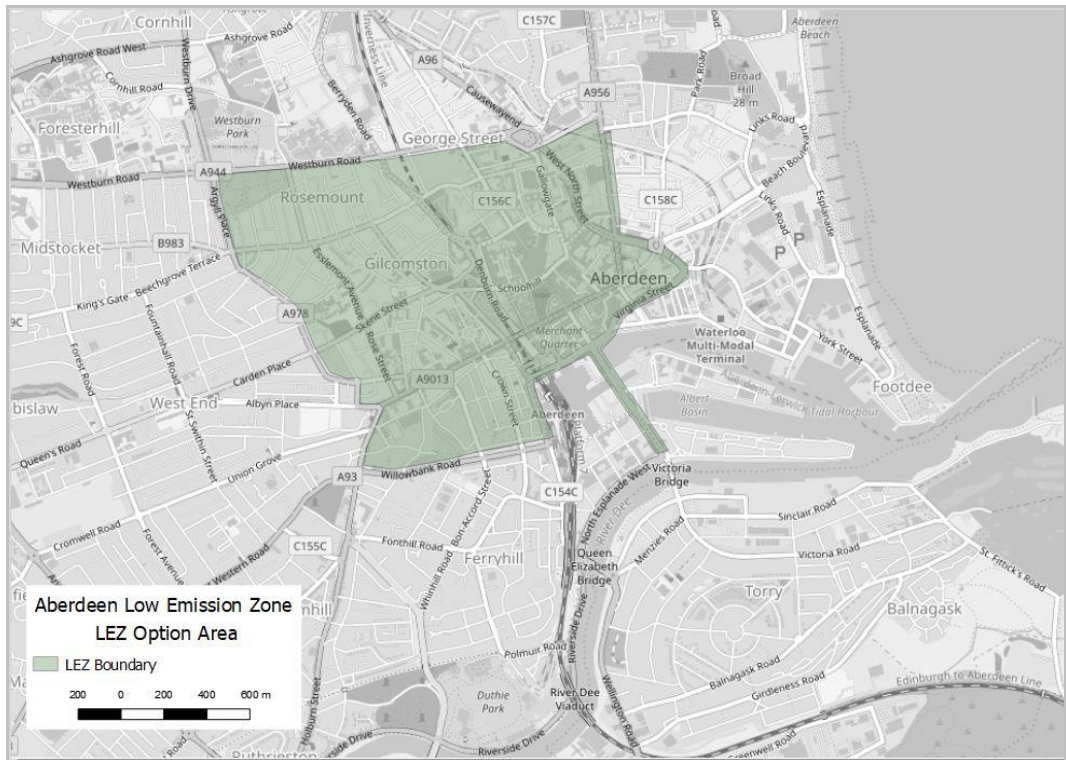
**Figure A.11 : Westburn Road/Hutcheon Street to Willowbank Road**



**Figure A.12 : Westburn Road/Hutcheon Street to River Dee**

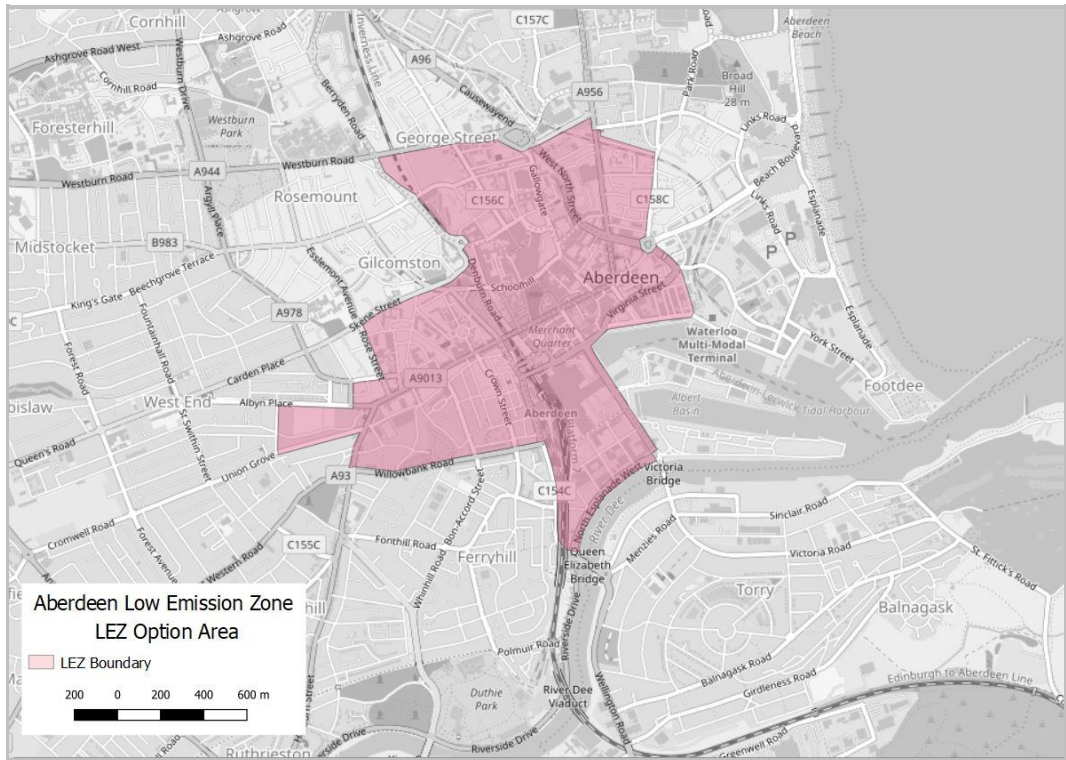


**Figure A.13 : City Centre Exceedances with extended boundary**



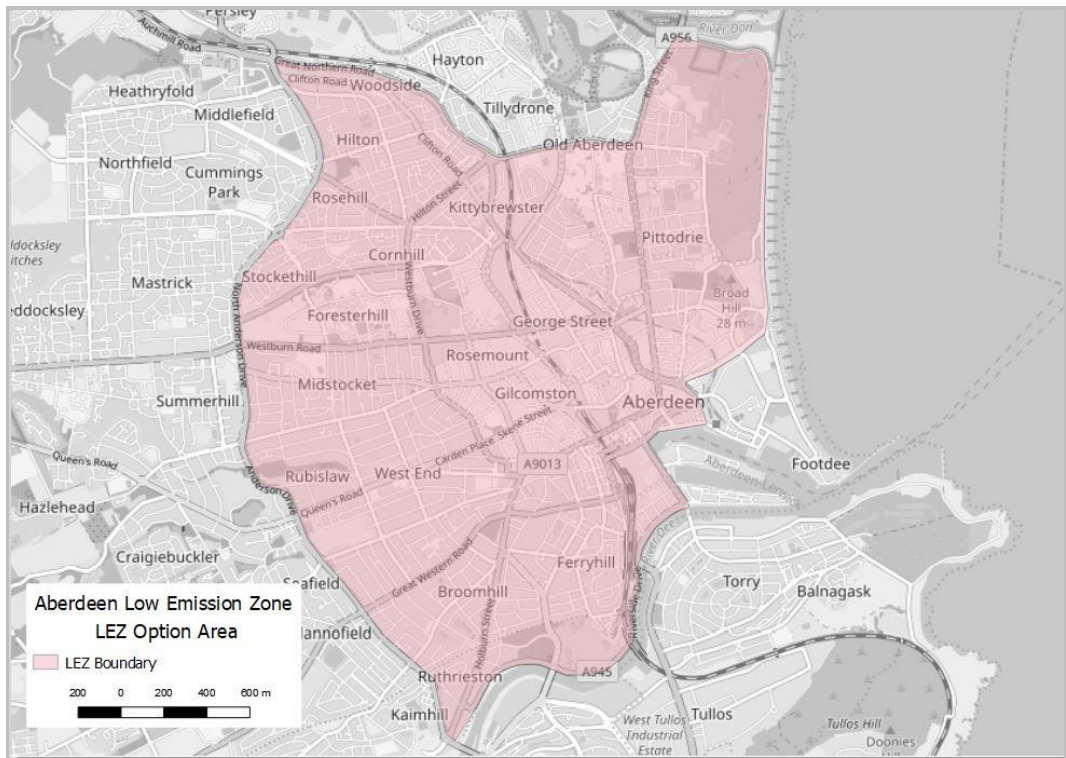
**Figure A.14 : City Centre Exceedances with additional extended boundary**

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**Figure A.15 : City Centre Masterplan with extended boundary**

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**Figure A.16 : Inner City Cordon**

# APPENDIX B – EMERGING LEZ OPTIONS FOR DETAILED APPRAISAL

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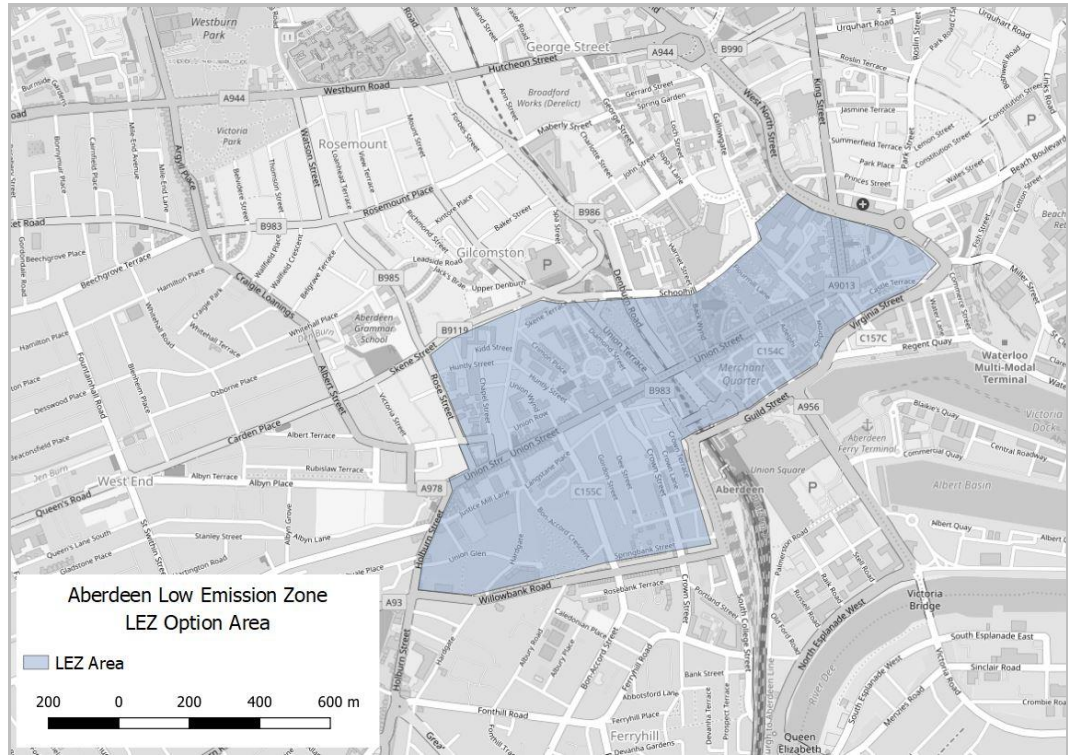


Figure B.1 : Option 1 Union Street Area Bus Only

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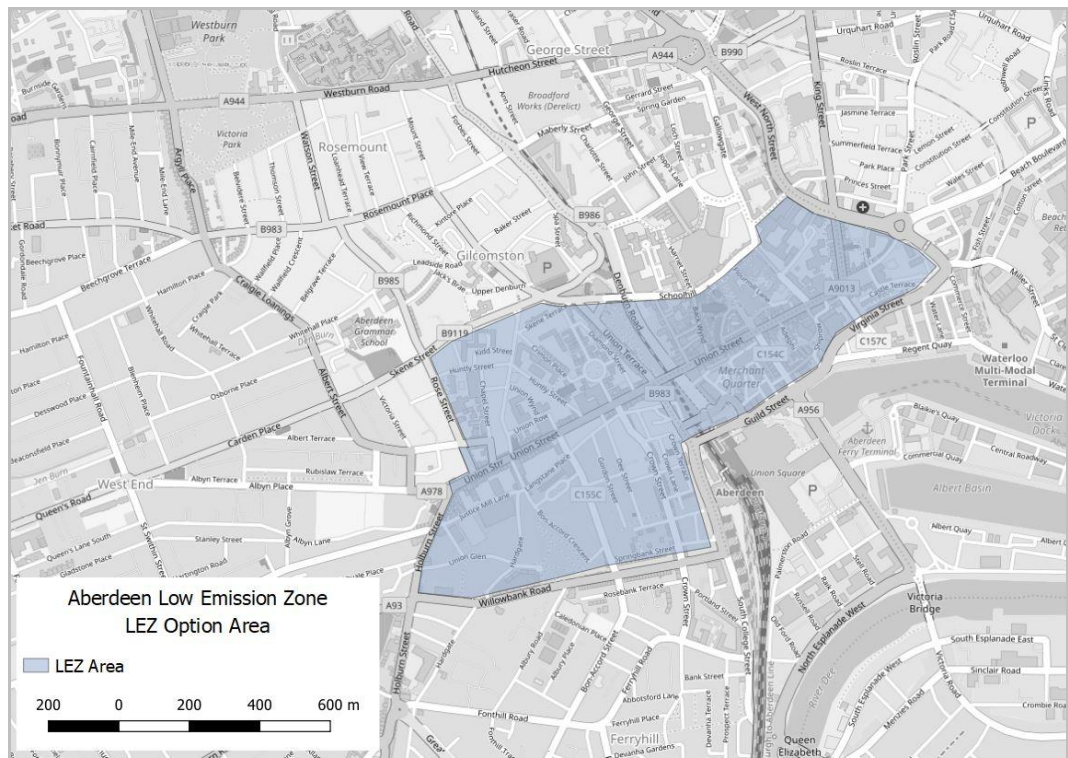
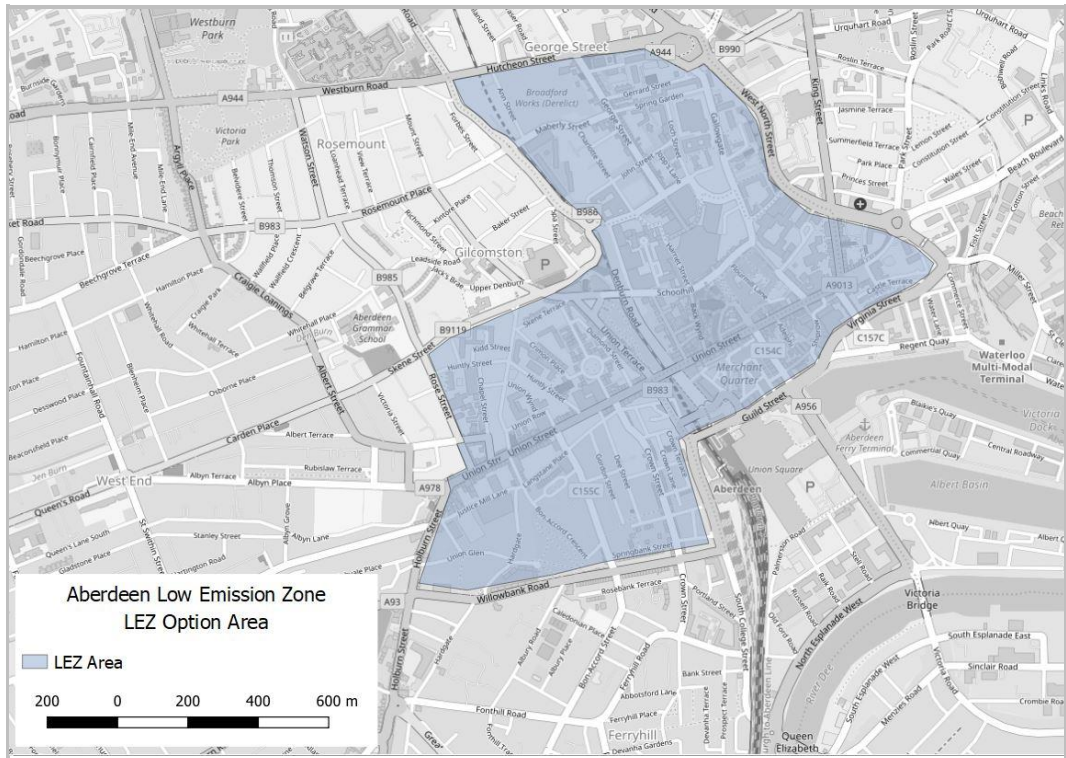


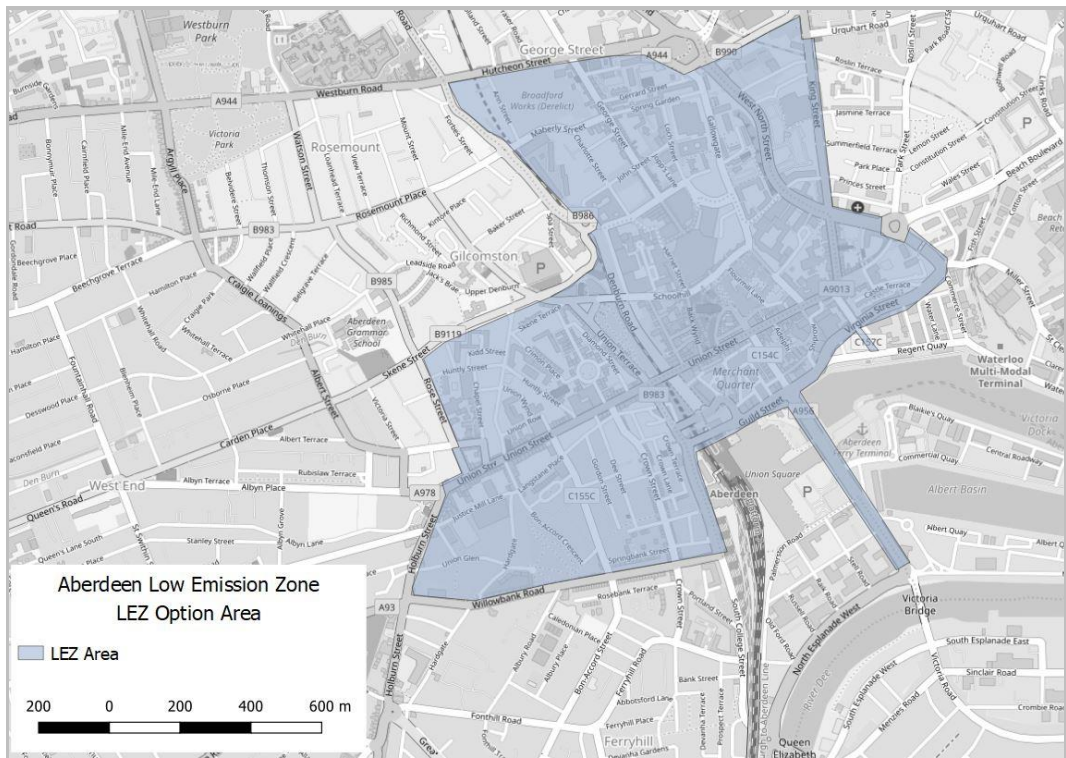
Figure B.2 : Option 2 Union Street Area All Vehicle

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**Figure B.3 : Option 3 Union Street & George Street Area All Vehicle**

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**Figure B.4 : Option 4 City Centre Air Quality Exceedance**

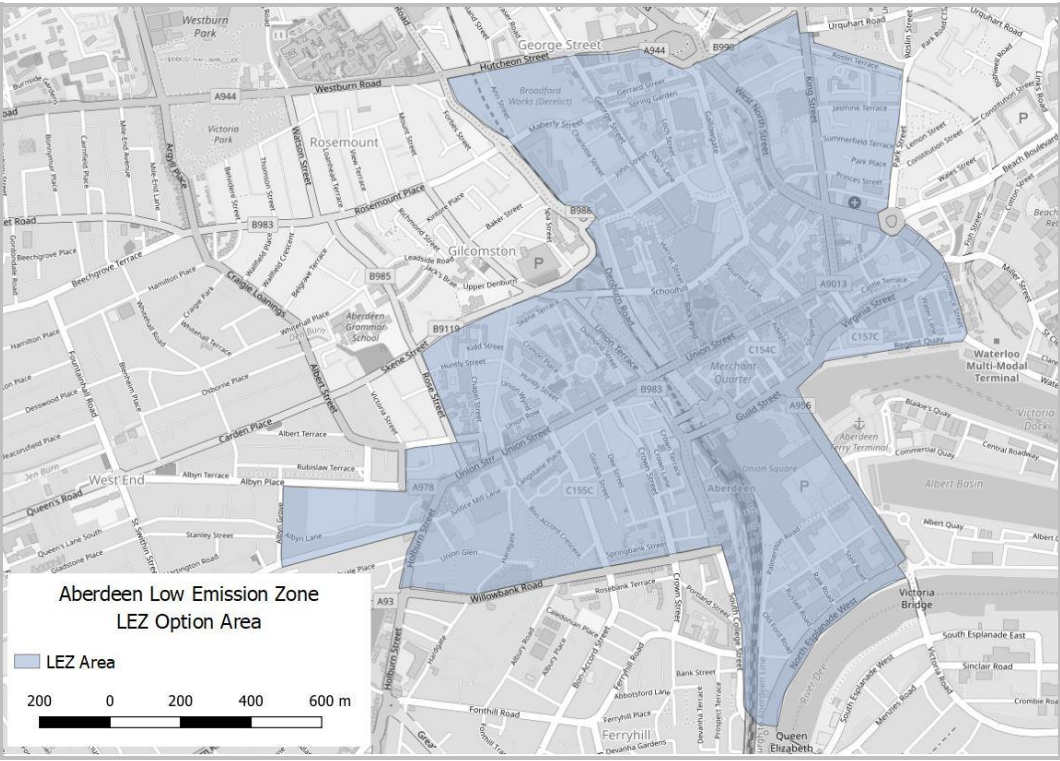


Figure B.5 : Option 5 City Centre Masterplan

## APPENDIX C – ROADS WHICH FORM PART OF ABERDEEN LEZ

A list of all roads which form part of the zone, as required by the Transport (Scotland) Act 2019 is listed below

Road Name	Detail
Academy St	Full length
Adelphi	Full length
Affleck Pl	Full length
Afflect St	Full length
Albany Ct	Full length
Albyn Ln	From Albyn Grove Junction to end of lane by Holburn St
Albyn Pl	From Albyn Pl Junction to Albyn Pl Junction (semi crescent by Harlaw Academy)
Alford Pl	Full length
Back Wynd	Full length
Bath St	Full length
Belmont St	Full length
Board St	Full length
Bom-Accord Cres	Full length
Bom-Accord Cres Ln	Full length
Bon-Accord Ln	Full length
Bon-Accord Square	Full length
Bon-Accord St	Full length
Bon-Accord Terrace	Full length
Bridge Pl	Full length
Bridge St	Full length
Carmelite Ln	Full length
Carmelite St	Full length
Castle St	Full length
Castle Terrace	Full length
Castlehill	Full length
Chapel St	Full length
College St	From Windmill Brae Junction to Wapping St
Commerce St	From Beach Blvd Rdb to Mearns St Junction
Concert Ct	Full length
Correction Wynd	Full length
Craibstone Ln	Full length
Crimon Pl	Full length
Crown Ln	Full length
Crown St	Full length
Crown Terrace	Full length
Dee Pl	Full length
Dee St	Full length
Denburn Rd	Full length
Diamond Ln	Full length
Diamond Pl	Full length
Diamond St	Full length
E Craibstone St	Full length
E Green	Full length

E N St	Full length
Exchange Ln	Full length
Exchange St	Full length
Flourmill Ln	Full length
Gaelic Ln	Full length
Gallowgate	From Upperkirkgate Junction to Littlejohn St Junction
Gilcomstoun Ct	Full length
Golden Square	Full length
Gordon St	Full length
Guild St	Full length
Hadden St	Full length
Hardgate	Full length
Holburn St	From Union St Junction to Ashvale Pl Junction
Huntly St	Full length
Imperial Pl	Full length
Justice Mill Brae	Full length
Justice Mill Ln	Full length
Justice St	Full length
Kidd St	Full length
King St	From Marischal St Junction to W N St Junction
Langstane Pl	Full length
Lindsay St	Full length
Little Belmont St	Full length
Little Chapel St	Full length
Littlejohn St	Full length
Marischal St	Full length
Market St	From Union St Junction to Union Square bus station
Market Stance	Full length
Marywell St	Full length
Minister Ln	Full length
N Silver St	Full length
Netherkirkgate	Full length
Oldmill Rd	Full length
Peacock's Cl	Full length
Poultry Market Ln	Full length
Queen St	Full length
Rennie's Ct	Full length
Rennie's Wynd	Full length
Rose Pl	Full length
Rose St	From Thistle St Junction to Union St Junction
Ruby Ln	Full length
Ruby Pl	Full length
S Silver St	Full length
Schoolhill	From Upperkirkgate to Back Wynd Junction
Shiprow	Full length
Shoe Ln	Full length
Shore Brae	Full length
Shore Ln	Full length
Skene Terrace	Full length
Springbank St	Full length
Springbank Terrace	Full length



St John's Pl	Full length
St Mary's Pl	Full length
St Nicholas Ln	Full length
St Nicholas St	Full length
Stirling St	Full length
Strawberry Bank Parade	Full length
Summer St	Full length
The Green	Full length
Theatre Ln	Full length
Thistle Pl	Full length
Thistle St	From Rose St Junction to Chapel St Junction
Trinity Ln	Full length
Trinity Quay	Full length
Trinity St	Full length
Union Bridge	Full length
Union Glen	From Holburn St Junction to Bon Accord Gardens
Union Glen Ct	Full length
Union Grove	From Albyn Grove Junction to Holburn St Junction
Union Row	Full length
Union St	Full length
Union Terrace	Full length
Union Wynd	Full length
Upprtkirkgate	Full length
Virginia Ct	Full length
Virginia St	Full length
W Craibstone St	Full length
Wapping St	Full length
Weigh-House Square	Full length
Whitehouse St	Full length
Willowbank Rd	Full length
Willowgate Cl	Full length
Windmill Brae	Full length
Windmill Ln	Full length

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**NATIONAL LOW EMISSION FRAMEWORK – INTERIM  
STAGE 2 ASSESSMENT – EXECUTIVE SUMMARY  
REPORT**



# ABERDEEN LOW EMISSION ZONE

## NATIONAL LOW EMISSION FRAMEWORK – INTERIM STAGE 2 ASSESSMENT – EXECUTIVE SUMMARY REPORT

### IDENTIFICATION TABLE

<b>Client/Project owner</b>	Aberdeen City Council
<b>Project</b>	Aberdeen Low Emission Zone
<b>Type of document</b>	National Low Emission Framework – Interim Stage 2 Assessment – EXECUTIVE SUMMARY REPORT
<b>Type of document</b>	Final Report
<b>Date</b>	10/06/2021
<b>Reference number</b>	GB01T19I15/250521
<b>Number of pages</b>	30

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	Approved by	David Murtagh	Principal Consultant	26/05/2021	
2	Author	David Murtagh	Principal Consultant	10/06/2021	Final Document
	Checked by	Callum Guild	Associate	10/06/2021	
	Approved by	Boris Johansson	Director	10/06/2021	

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# 1. INTRODUCTION

## 1.1 Background

- 1.1.1 In September 2017, the Scottish Government, in their [Programme for Government](#), committed to the introduction of Low Emission Zones (LEZs) into Scotland's four biggest cities (Glasgow, Edinburgh, Dundee and Aberdeen) by 2020.
- 1.1.2 Despite improvements in air quality since the introduction of the Aberdeen City Council (ACC) Air Quality Action Plan, there remain several locations in the city where exceedances of emissions exist and where the Air Quality Standards (AQS) are not being met. While the number of exceedances of the nitrogen dioxide (NO<sub>2</sub>) annual mean objective has decreased since annual monitoring began, a LEZ is being introduced in the city to accelerate Aberdeen's required compliance with the AQS.
- 1.1.3 An assessment and appraisal process to inform the size and scope of Aberdeen's LEZ follows the [National Low Emission Framework](#) (NLEF) guidance. The NLEF is "*an air quality-focused, evidence-based appraisal process developed to help local authorities consider transport related actions to improve local air quality, where transport is identified as the key contributor to air quality problems*" (NLEF, 2019).
- 1.1.4 NLEF is a two stage process consisting of Stage 1 Screening and Stage 2 Assessment.
- 1.1.5 The NLEF Stage 1 screening should review Aberdeen's Local Air Quality Management and build an evidence base to assist in the decision of whether a LEZ is appropriate for an Air Quality Management Area (AQMA) and subsequently inform the appraisal and implementation of Aberdeen's LEZ through the Stage 2 Assessment process. Transport Scotland advised Aberdeen City Council (ACC) that NLEF Stage 1 was not formally required as Aberdeen are committed to delivering a LEZ for the city as a result of the Programme for Government commitment.
- 1.1.6 A first Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework Interim Stage 2 Report, SYSTRA 2020*) was published in June 2020. The report provided an evidence base and policy review from which came the identification of the LEZ objectives and the LEZ options for stakeholder and public consultation and detailed testing through local traffic and air quality models.
- 1.1.7 The second Interim NLEF Stage 2 Assessment Report builds on the first interim report and incorporates findings from public and stakeholder engagement and detailed traffic modelling to identify a final LEZ option for Aberdeen.
- 1.1.8 The final Aberdeen LEZ option identified in this second Interim NLEF Stage 2 Report will then be subject to further stakeholder and public consultation, as set out in the [LEZ Regulations](#). It will also be subject to detailed impact and environmental assessments (Strategic Environmental Assessment, Integrated Impact Assessment, Business and Regulatory Impact Assessment) and be assessed in the National Modelling Framework (NMF) Aberdeen City Air Quality Model before the NLEF process is finalised and a final NLEF Stage 2 Report is prepared. It is expected that these tasks will be complete by autumn 2021.
- 1.1.9 **This report summarises the second Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework 2<sup>nd</sup> Interim Stage 2 Report, SYSTRA May 2021*).**

## **1.2 Legislative Framework**

- 1.2.1 Low Emission Zones are included in the [Transport \(Scotland\) Act 2019](#) which received Royal Assent in November 2019. The Act provides the legislative framework for Scottish local authorities to design, establish and operate nationally consistent LEZs.
- 1.2.2 The accompanying LEZ Regulations were laid in Parliament in January 2021, thereby allowing Scottish Ministers to set nationally consistent standards (Regulations) on LEZ matters specified in the Act (e.g. emission standards, penalties and exemptions, statutory consultees). There are two sets of regulations for LEZs in Scotland. The [Low Emission Zones \(Emission Standards, Exemptions and Enforcement\) \(Scotland\) Regulations 2021](#) cover the topics of emission standards, exemptions, penalty charge rates, and enforcement. [The Low Emission Zones \(Scotland\) Regulations 2021](#) cover the topics of consultation, publication and representations, examinations, approved devices, accounts and amending or revoking LEZs.
- 1.2.3 A full review of the plans, policies and strategies that relate to the introduction of a LEZ in Aberdeen is provided in Chapter 3 of the second Interim NLEF Stage 2 Assessment Report. The application of the legislative framework in the context of Aberdeen's LEZ is detailed in Chapter 8 of this summary.

## **1.3 Covid-19 pandemic**

- 1.3.1 Due to the impact of the Covid-19 pandemic in 2020 and 2021, plans to implement LEZs were temporarily paused with an indicative timeline for the introduction moved to between February 2022 and May 2022. The LEZ Leadership Group, which includes Scottish Ministers and representatives from Glasgow City Council, The City of Edinburgh Council, Dundee City Council, Aberdeen City Council, Public Health Scotland and SEPA, agreed the [indicative timeframe](#) to introduce LEZs across Scotland's four largest cities.
- 1.3.2 It is recognised that the Covid-19 pandemic has had an unprecedented impact on society, including on the wider environment and the economy. Transport Scotland and ACC recognise that the Covid-19 pandemic may significantly influence future travel demand and in turn emissions attributed to road transport. Transport Scotland commissioned a study to consider the uncertainty over what travel will look like after the Covid-19 pandemic has ended. Outcomes from this study are used to inform the final LEZ Option.
- 1.3.3 In light of the difficulties faced by many throughout 2020 and 2021, ACC were keen to understand the level of support for the introduction of a LEZ in the city post pandemic and gauge the impact the pandemic may have had on businesses and bus operators in preparing for its introduction. As a result, additional consultation on this issue was undertaken in March 2021, with the outcomes used to inform the final LEZ Option detail.



## 2. OBJECTIVES OF ABERDEEN LOW EMISSION ZONE

### 2.1 Objectives of Aberdeen's Low Emission Zone

2.1.1 Objectives were developed by the Aberdeen LEZ Project Group, comprising representatives of ACC, Aberdeenshire Council, Nestrans, NHS Grampian, Transport Scotland, SEPA and SYSTRA. Two primary objectives were identified to reflect that the principal aim of a LEZ is to improve air quality and a requirement within the Transport (Scotland) Act that a LEZ should contribute towards the climate change targets (towards net zero by 2045) set out in the Climate Change (Scotland) Act 2009.

2.1.2 The objectives for Aberdeen's Low Emission Zone were agreed at the City Growth and Resources Committee meeting on 5<sup>th</sup> December 2019, in the light of the context set out above.

2.1.3 Aberdeen's Low Emission Zone will:

**Improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government's statutory air quality objectives.**

**Support climate change targets by reducing road transport's contribution to emissions.**

2.1.4 It is recognised that a LEZ can help realise wider benefits beyond air quality improvement, but that these are influenced by many other factors and not solely or directly attributable to a LEZ. Therefore the following supplementary objectives for Aberdeen's Low Emission Zone have been identified:

- Protect public health and wellbeing;
- Support local and regional transport strategies by contributing to the development of a vibrant, accessible, and safe city centre, where the volume of non-essential traffic is minimised and active and sustainable transport movements are prioritised; and
- Contribute to ongoing transformational change in Aberdeen, helping promote the city as a desirable place to live, visit and invest in.

### 3. AIR QUALITY IN ABERDEEN

#### 3.1 Introduction

3.1.1 ACC has a legal obligation to regularly review and assess air quality in the city, and to determine whether or not the air quality objectives are likely to be achieved. As of 2016, there is a requirement on ACC to deliver Annual Progress Reports (APR) to summarise the work being undertaken by the local authority to improve air quality and report any progress that has been made.

3.1.2 The APRs provide extensive detail on existing air quality issues in Aberdeen City, the level of success from the Local Air Quality Management (LAQM) measures and provide a key source of information for the NLEF process. ACC have produced APRs for 2016 to 2020. The results and findings of the [2019 APR](#) and [2020 APR](#) have been used to inform the option development and appraisal process for Aberdeen’s LEZ.

3.1.3 A summary of the 2019 air quality data (reported in the [2020 APR](#)) is provided in Section 3.2 below. Detailed analysis of air quality in Aberdeen is reported in the second Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework 2nd Interim Stage 2 Report, SYSTRA May 2021*).

#### 3.2 2019 Air Quality Monitoring Data

3.2.1 ACC undertook automatic (continuous) monitoring at 6 sites and non-automatic (passive diffusion tube) monitoring of NO<sub>2</sub> at 72 sites during 2019. All monitoring site locations (continuous and passive) are shown in Figure 3.1, with a summary of observed individual pollutants described below.



Figure 3.1 : ACC 2018 Monitoring Locations

## Nitrogen Dioxide (NO<sub>2</sub>)

- 3.2.2 The [2020 APR](#) provided the full ratified and adjusted 2019 dataset for monthly means for automatic monitoring sites and diffusion tubes.
- 3.2.3 The report states all automatic monitoring site data in 2019 was comparable to 2017 and 2018 levels and that concentrations at all automatic sites were below the annual mean air quality objective of 40 µg/m<sup>3</sup> for the second year running. Generally, NO<sub>2</sub> levels monitored across Aberdeen were marginally lower than previous years. The report states data from the diffusion tube network was comparable to 2017 and 2018 and that exceedances of the annual mean objective occurs in the city centre AQMA only.
- 3.2.4 2019 NO<sub>2</sub> levels at monitoring locations outside the AQMAs remain well below the annual mean objective except for Skene Square where diffusion tube data suggest levels continue to be just below the threshold of the annual mean objective. Major transportation infrastructure measures with an anticipated completion date in 2023 will be implemented around Berryden Road and the Skene Square area to improve travel connectivity, reduce congestion and impact on air quality at this location.
- 3.2.5 The locations where 2019 annual mean concentrations of NO<sub>2</sub> are recorded as greater than 36 µg/m<sup>3</sup> is detailed in Table 3.1 alongside the annual mean concentrations recorded from 2015 to 2018. The cells highlighted in grey are the locations where the AQO of 40 µg/m<sup>3</sup> was exceeded.

**Table 3.1 : Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup>**

Site ID	Site Name/Location	AQMA	Annual mean NO <sub>2</sub> concentration (µg/m <sup>3</sup> )				
			2015	2016	2017	2018	2019
DT10	184/192 Market Street	City Centre	56.1	54.1	47.6	47.0	47.0
DT11	105 King Street	City Centre	54.4	51.1	48.1	48.0	45.0
DT9	39 Market Street	City Centre	50.9	50.2	47.9	46.0	44.0
DT12	40 Union Street	City Centre	49.8	48.9	45.9	44.0	43.0
DT17	43/45 Union Street	City Centre	51.8	46.7	42.8	44.0	43.0
DT19	468 Union Street	City Centre	53.3	45.4	40.9	40.0	43.0
DT29	469 Union Street	City Centre	58.2	48.8	42.7	45.0	42.0
DT82	7 Virginia Street	City Centre	0.0	0.0	0.0	44.0	42.0
DT30	335 Union Street	City Centre	50.9	46.5	41.9	41.0	39.0
DT18	14 Holburn Street	City Centre	50.2	48.5	41.6	39.0	39.0
DT16	1 Trinity Quay	City Centre	45.4	43.8	37.4	37.0	39.0
DT73	61 Skene Square	No	0.0	0.0	39.7	40.0	38.0
DT77	27 Skene Square	No	0.0	0.0	0.0	37.0	38.0
DT39	819 Great Northern Road	Anderson Dr	54.2	47.4	45.4	43.0	37.0
CM2	Union Street	City Centre	46.0	43.0	40.0	38.0	36.0
DT33	16 East North Street	City Centre	46.4	43.1	40.4	40.0	35.0
CM5	Wellington Road	Wellington Rd	40.0	46.0	39.0	39.0	35.0
DT25	21 Holburn Street	City Centre	50.3	42.8	37.1	37.0	35.0
DT22	104 King Street	City Centre	44.1	39.3	36.2	36.0	34.0
<b>Total No. Sites &gt; 40 µg/m<sup>3</sup></b>			<b>15</b>	<b>15</b>	<b>11</b>	<b>9</b>	<b>8</b>

source: 2020 Air Quality Annual Progress Report (APR) for Aberdeen City Council

- 3.2.6 In total, there are 8 locations where annual mean concentrations of NO<sub>2</sub> exceed the AQO of 40 µg/m<sup>3</sup> (down 1 from 2018) and a further 7 sites where annual mean concentrations of NO<sub>2</sub> exceed 36 µg/m<sup>3</sup> (down 3 from 2018). Table 3.1 shows that the total number of exceedance locations in the city continue to reduce each year. From 2018, there are three locations where annual mean concentrations of NO<sub>2</sub> have increased in 2018, namely 468 Union Street (DT19), 1 Trinity Quay (DT16) and 27 Skene Square (DT77).
- 3.2.7 Figure 3.2 shows the locations where annual mean concentrations of NO<sub>2</sub> were recorded as greater than 36 µg/m<sup>3</sup> in 2019.

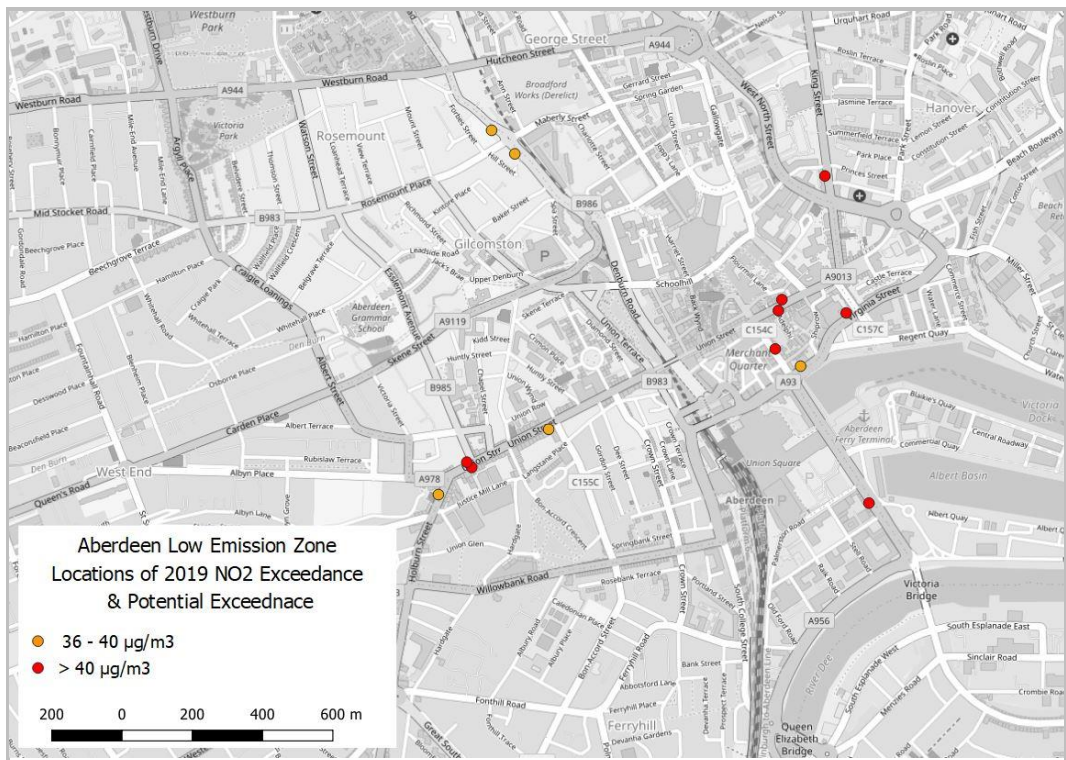


Figure 3.2: 2018 Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup> (City Wide)

3.2.8 The 2020 APR also compares the continuous monitored NO<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, *not to be exceeded more than 18 times per year* and reports that no exceedances of the hourly mean objective were identified at automatic monitoring locations in 2019, in line with 2018.

**Particulate Matter (PM<sub>10</sub>)**

3.2.9 The 2019 APR reports that no exceedances of the PM<sub>10</sub> annual mean objective (18 µg/m<sup>3</sup>) or 24 hour mean objective (50 µg/m<sup>3</sup> not to be exceeded more than 7 times per year) were observed at any of the continuous monitoring sites in 2019. This is in line with 2018 where the 24 hour mean objective has been met at all monitoring sites for the last 4 years.

**Particulate Matter (PM<sub>2.5</sub>)**

3.2.10 There are 5 continuous monitoring sites measuring PM<sub>2.5</sub> levels in Aberdeen City and no exceedances of the annual mean were recorded at any of the continuous monitoring sites in 2019, in line with 2018.

**3.3 Focus of Aberdeen’s LEZ**

3.3.1 Analysis of observed 2019 air quality data demonstrated that the City Centre AQMA captures all recorded instances of exceedances of the NO<sub>2</sub> air quality objectives, with no exceedances outside this area.

3.3.2 In 2018 there was one exceedance of the NO<sub>2</sub> objective in the Anderson Drive AQMA, at Haudagain roundabout but this has fallen below the legal threshold in 2019 for the first time since monitoring began in 2009. Transport studies also highlight the committed Haudagain Roundabout improvement scheme is anticipated to address congestion issues at this location with expected positive benefits for air quality. There are no current exceedances of the air quality legal limits in the Wellington Road AQMA.

3.3.3 The current observed air quality data has therefore identified the focus of the NLEF appraisal of Aberdeen’s LEZ is the Aberdeen City Centre AQMA.

## **4. THE NATIONAL MODELLING FRAMEWORK**

### **4.1 Introduction**

4.1.1 The Cleaner Air for Scotland Strategy (CAFS) provided a commitment to develop a National Modelling Framework (NMF) to provide a standardised approach to modelling air quality to support the consideration of LEZs in Scotland. The NMF ensures that the analysis and generation of evidence to support decision-making in the LEZ development process is consistent across those local authorities undertaking a NLEF Stage 2 assessment.

4.1.2 The NMF air quality modelling is undertaken by SEPA who support local authorities throughout a Stage 2 assessment and the LEZ decision-making process. Modelling results from the NMF are detailed in Chapter 5 of the second Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework 2<sup>nd</sup> Interim Stage 2 Report, SYSTRA May 2021*).

### **4.2 Summary of NMF High Level Scenario Testing**

4.2.1 The City Centre AQMA, in particular the Union Street, Holburn Street and King Street corridor currently experiences the highest number of NO<sub>2</sub> exceedances. The biggest emitters along these roads through the city centre are buses. These streets are lined with high buildings that can be described as narrow and deep “street canyons” which can trap air pollution close to ground level.

4.2.2 The high level Aberdeen NMF Model results show that should all buses meet the Euro VI standard, this would bring the largest single reduction in NO<sub>2</sub> network-wide and that this reduction is significantly more than any other vehicle type would provide. This suggests that a LEZ for Aberdeen will be required to include buses in order for a LEZ to achieve its air quality objective.

4.2.3 When applying modelled NO<sub>2</sub> reductions from the bus only scenario to observed exceedance locations however, the Aberdeen NMF Model predicts there to be 6 locations still exceeding 40 µg/m<sup>3</sup> and a further 7 sites between 36 µg/m<sup>3</sup> and 40 µg/m<sup>3</sup>. This result suggest that while a Euro VI bus fleet would bring the largest reduction in NO<sub>2</sub>, this alone is not sufficient in addressing all exceedances in Aberdeen.

4.2.4 Whilst buses dominate emissions along the Union Street, Holburn Street and King Street corridor, diesel cars are the primary contributors to annual average total (oxides of nitrogen) NO<sub>x</sub> elsewhere. Light goods vehicles (LGVs) are the third largest contributor with other Goods Vehicles adding smaller amounts. By combining the percentage reduction in NO<sub>2</sub> resulting from all vehicles being of LEZ standard, it can be inferred that an all vehicle LEZ does not bring a sufficient enough reduction in NO<sub>2</sub> to allow a LEZ alone to tackle all air quality exceedances. It can therefore be suggested at this stage, prior to any LEZ option development that a LEZ for Aberdeen will have to include all vehicle types and have to be delivered with traffic management measures if all exceedances of the air quality objectives are to be addressed.

## 5. LEZ OPTION GENERATION

### 5.1 Introduction

5.1.1 NLEF is objective-led and consistent with the principles of Scottish Transport Appraisal Guidance (STAG). The starting point for the Stage 2 assessment is to define the objectives for the potential LEZ to inform the LEZ option generation, sifting and development

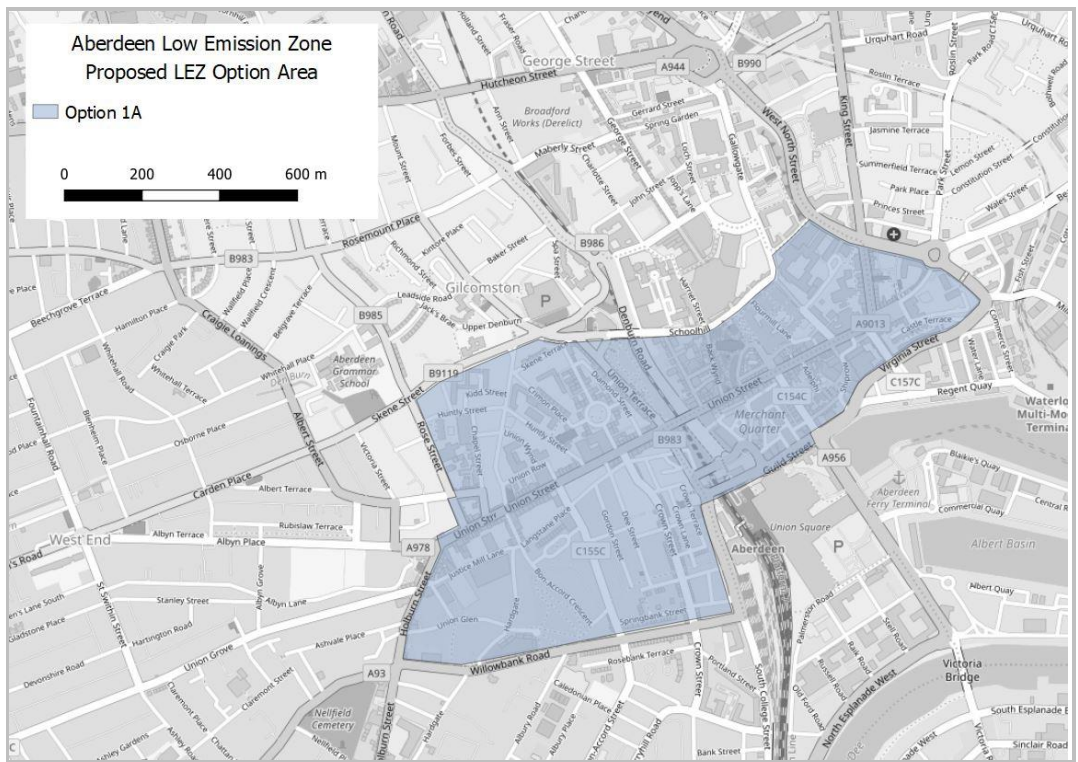
5.1.2 The NLEF process identified the existing air quality problems and issues in Aberdeen, and the LEZ objectives were derived such that any options that satisfy these objectives will address the current air quality issues in the city.

5.1.3 Following STAG principles, an unconstrained option generation exercise was undertaken to allow all possible options to be considered and open to appraisal. This led to a large number of potential options that required sifting, refinement and high level appraisal to filter down to the relevant options to be carried forward to consultation and detailed appraisal and testing. The full option development, sifting, refinement and appraisal process is documented in second Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework 2<sup>nd</sup> Interim Stage 2 Report, SYSTRA May 2021*) and the final outcomes summarised below.

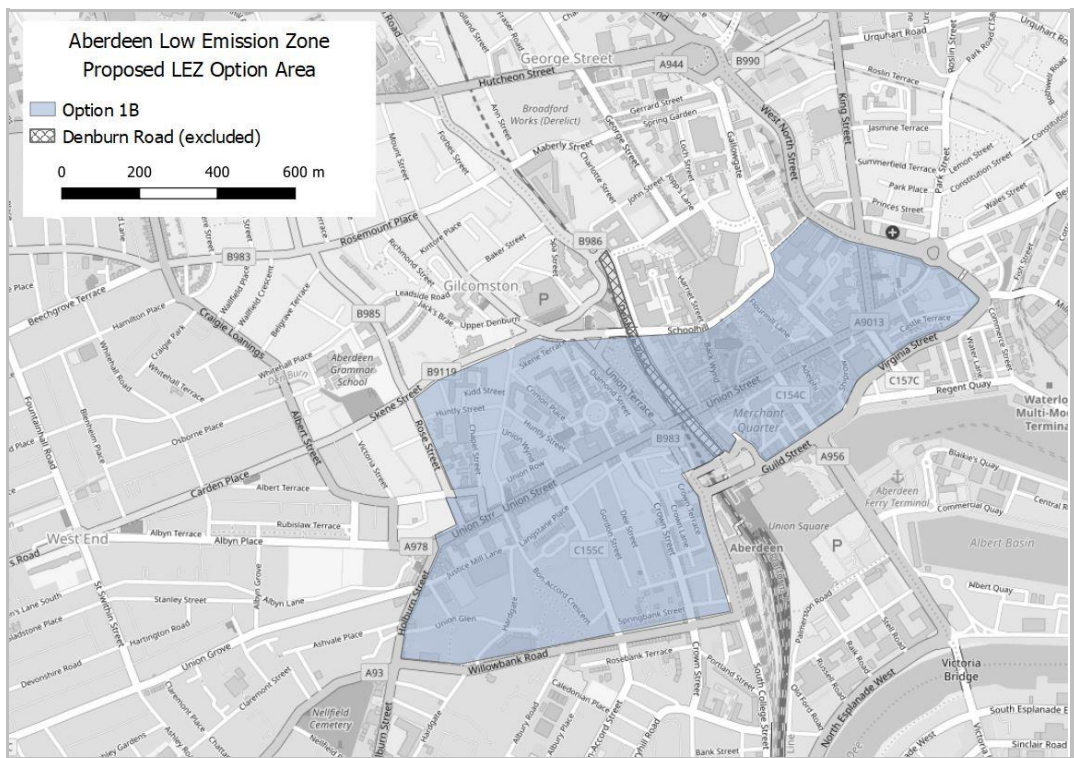
### 5.2 LEZ Options for consultation and detailed model testing

5.2.1 The NLEF Appraisal recommended that four main LEZ options be taken to wider consultation and detailed model testing undertaken using the NMF air quality model and the Paramics microsimulation traffic model. The analysis demonstrated that from the four options there were two possible variants to each option as follows:

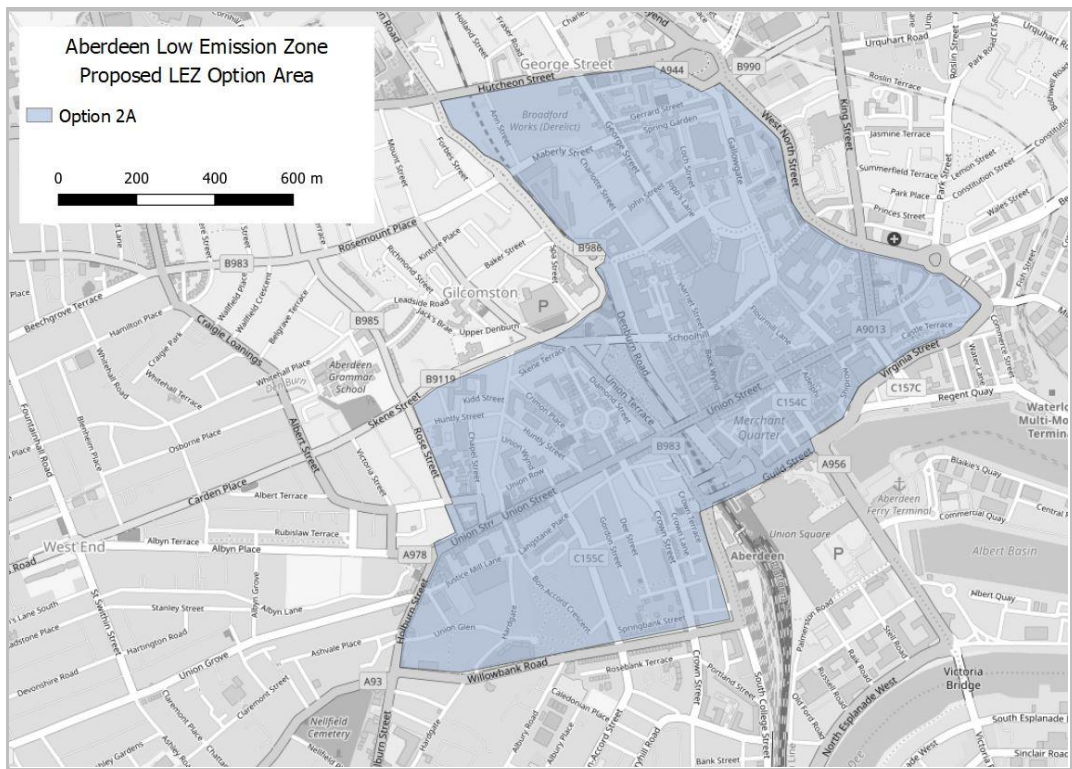
- Option 1A – Union Street Area, including Denburn Rd (Figure 5.1)
- Option 1B – Union Street Area, excluding Denburn Rd (Figure 5.2)
- Option 2A – Union Street & George Street Area, including Denburn Rd (Figure 5.3)
- Option 2B – Union Street & George Street Area, excluding Denburn Rd (Figure 5.4)
- Option 3A – CCMP East including Denburn Rd (Figure 5.5)
- Option 3B – CCMP East excluding Denburn Road (Figure 5.6)
- Option 4A – CCMP, including Denburn Rd (Figure 5.7)
- Option 4B – CCMP, excluding Denburn Rd (Figure 5.8)



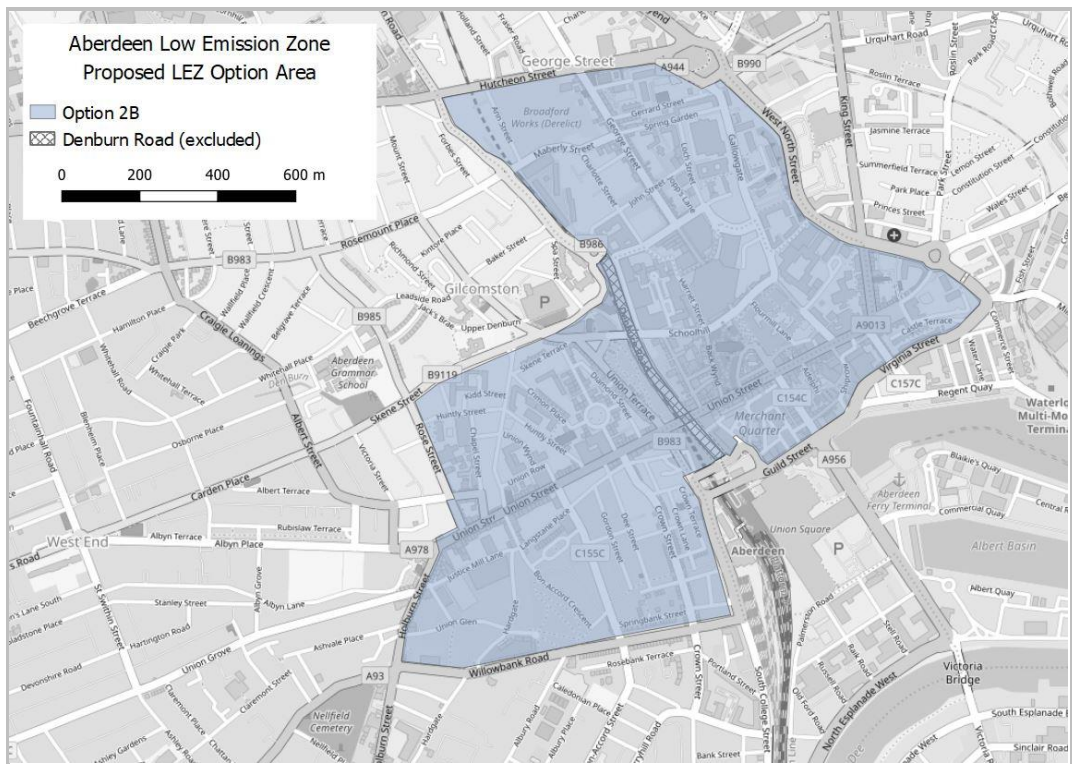
**Figure 5.1 : Option 1A – Union Street Area, including Denburn Road**



**Figure 5.2 : Option 1B – Union Street Area, excluding Denburn Road**

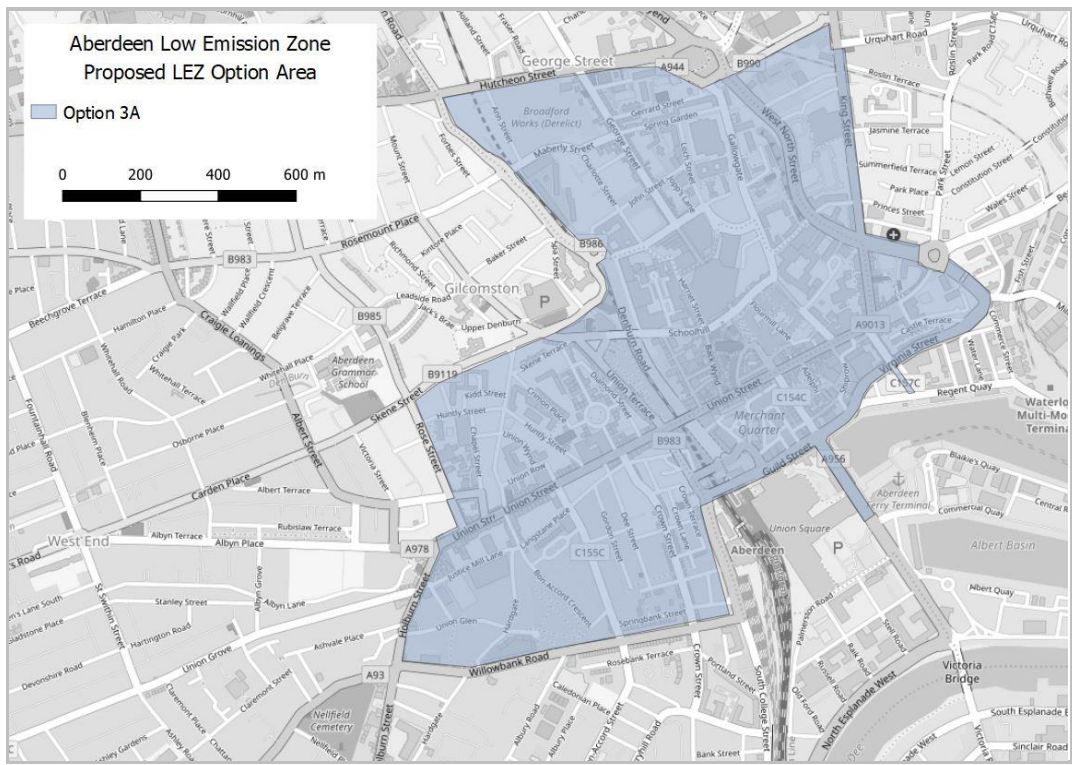


**Figure 5.3 : Option 2A – Union Street and George Street Area, including Denburn Road**

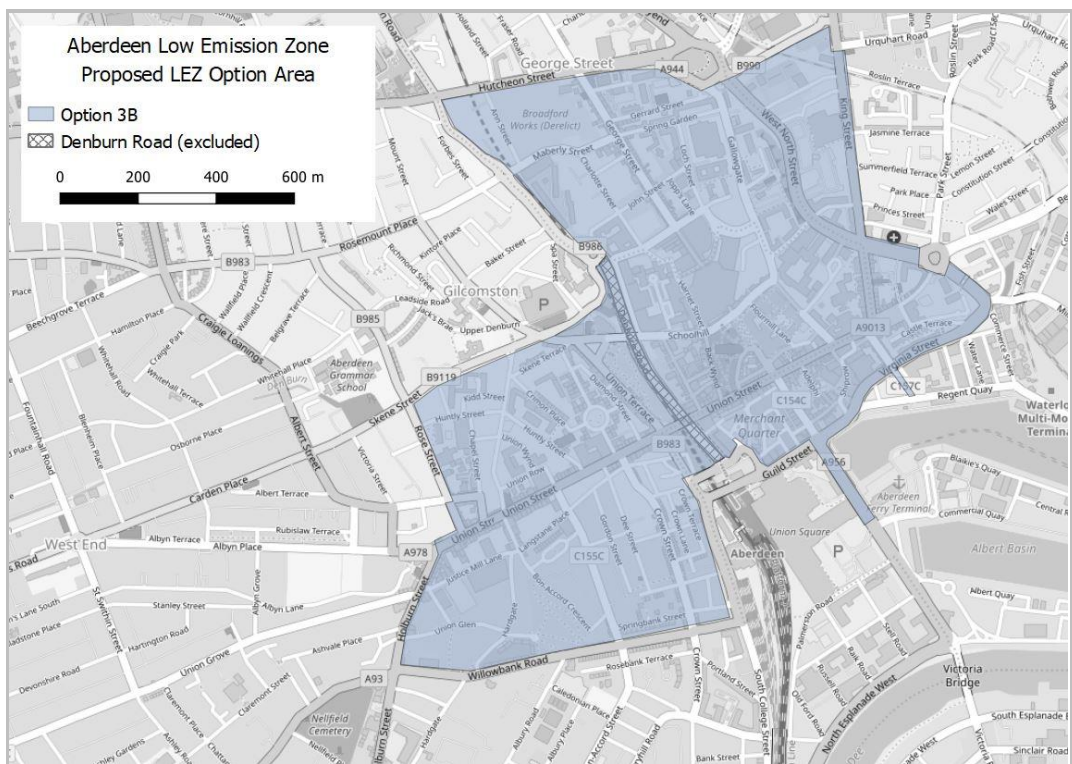


**Figure 5.4 : Option 2B – Union Street and George Street Area, excluding Denburn Road**





**Figure 5.5 : Option 3A – City Centre Masterplan East, including Denburn Road**



**Figure 5.6 : Option 3B – City Centre Masterplan East, excluding Denburn Road**



Figure 5.7 : Option 4A – City Centre Masterplan, including Denburn Road

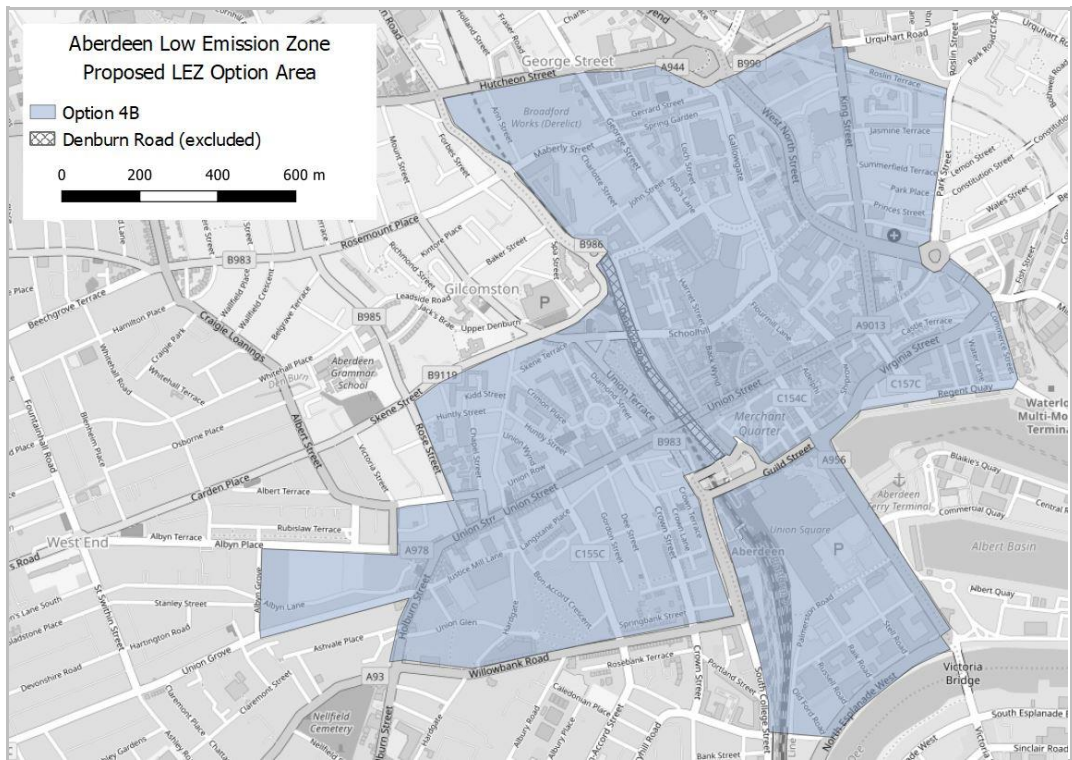


Figure 5.8 : Option 4B – City Centre Masterplan, excluding Denburn Road

## 6. LEZ PUBLIC AND STAKEHOLDER ENGAGEMENT

### 6.1 Introduction

- 6.1.1 Upon completion of the first Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework Interim Stage 2 Report, SYSTRA 2020*) ACC undertook a consultation exercise on the eight identified LEZ Options for consultation detailed in Chapter 5. The consultation took the form of an online public survey and face to face workshops with key (and statutory) stakeholders. The outcomes from the consultation period are reported in the City Growth and Resources Committee Report, June 2021 and summarised in second Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework 2<sup>nd</sup> Interim Stage 2 Report, SYSTRA May 2021*) with key outcomes detailed below.
- 6.1.2 An online public survey ran for six weeks from 14 September 2020 to 25 October 2020 and was administered by ACC. Consultation responses were also accepted by email to the Council's Transport Strategy address. The survey received 506 responses with a further 10 received by email. Of the 506 responses received, 488 (96.5%) were from individuals, 18 (3.6%) were from businesses
- 6.1.3 A range of workshops with key stakeholders were held concurrently with the live public survey dates during September and October 2020. Five workshops were held in total and the format involved a presentation by a member of the Aberdeen LEZ Delivery Group on the Interim NLEF Stage 2 Report findings and the recommended LEZ options, followed by a questions and answer session. The stakeholders represented at the workshops were as follows:
- Bus industry representatives:
    - Stagecoach East Scotland, First Bus, Bains Coaches and the Confederation of Passenger Transport (CPT)
  - Local freight industry representatives
  - Aberdeen Harbour
  - Community Councils:
    - George Street, Rosemount and Mile End, Castlehill and Pittodrie
  - Environmental/interest groups
    - Friends of the Earth, Aberdeen Cycle Forum, Asthma UK and British Lung Foundation Partnership, Aberdeen Environment Forum
  - Taxi representatives.
- 6.1.4 No business representatives attended the planned business workshops, despite several attempts to contact business groups and their members. This was considered likely to be a result that the current Covid-19 pandemic is having on businesses. It is recognised that the Covid-19 pandemic has had an unprecedented impact on society, including on the wider environment and the economy. In light of the difficulties faced by many throughout 2020 and 2021, particularly, in the context of an Aberdeen city centre LEZ, city businesses and bus operators, ACC were keen to understand the level of support for the introduction of a LEZ in the city post-pandemic and gauge the impact the pandemic may have had on businesses and bus operators in preparing for its introduction.
- 6.1.5 As such, a further business workshop was organised for April 2021, where representative from Union Square shopping centre and Aberdeen & Grampian Chamber of Commerce attended. Bus operators in the city have been consulted regularly and kept up to date with ongoing proposals for the city's LEZ and given the importance of bus compliance to the success of any LEZ, the operators were approached in March 2021 and asked to complete a short questionnaire.

## **6.2 Key Outcomes from Consultation of LEZ Options**

- 6.2.1 The consultation showed that the introduction of a LEZ in Aberdeen is generally evenly supported and not supported, however the public responses do show an awareness of the benefits for the introduction of a LEZ in the city.
- 6.2.2 A consistent theme across the consultation exercises was the belief that the LEZ should be integrated with other improvements, such as general traffic reduction measures or an improved sustainable transport offering. Similarly there was recognition that the LEZ should not create new congestion or air quality problems in the city. Both these views are consistent with the approach and outcomes taken through the option development process and the subsequent traffic model analysis.
- 6.2.3 Bus operators have been significantly impacted by the Covid-19 pandemic and are not likely to be able to suitably invest in their fleets to meet a 2023 enforcement date. A 2024 enforcement date or later would provide more a realistic timeline to meet LEZ compliance. Across the consultation exercises, there was considerable support for the longest possible grace period to be applied although there was also notable support for the shortest grace period to apply.
- 6.2.4 Although the consultation did not conclude that any of the 8 LEZ options could be ruled out at this stage, support for any options that excluded Denburn Road was low.

# 7. LEZ TRAFFIC MODELLING AND DETAILED APPRAISAL

## 7.1 Introduction

7.1.1 In 2019, Aberdeen City Council commissioned the development of a traffic microsimulation model of Aberdeen City Centre for the purpose of assessing road network options associated with the development of a LEZ in Aberdeen.

7.1.2 The initial Base Model development (ACCPM19) is detailed in the report ‘Aberdeen City Centre Paramics Model Upgrade 2019’ (SYSTRA Ref: GB01T19F42/2, October 2020). The subsequent development of the 2024 Reference Case Model, from which the LEZ scenarios have been assessed, is detailed in the report ‘Aberdeen City Centre: Future Year (2024) Model Development Report (SYSTRA, Ref: GB01T20D62/1, December 2020).

7.1.3 The 2024 Reference Case model was used as a basis to test the eight LEZ boundary options detailed in Chapter 5 (LEZ options 1A to 4B), with these options forming the initial model test scenarios.

7.1.4 From the initial option model assessment process, there was clear evidence that further consideration of potential boundary options could be undertaken which would combine the benefits of both the smaller scale LEZ options (i.e. Option 1A) and the large scale LEZ options (i.e. Option 4A) and also reduce their disbenefits. The resultant Option 5 is shown in Figure 7.1. The option is shown to intersect all key approach routes into the city centre thereby having an impact on the volume of non-compliant traffic in the city centre on a much wider scale than the boundary itself, while still maintaining access to the majority of city centre car parks.

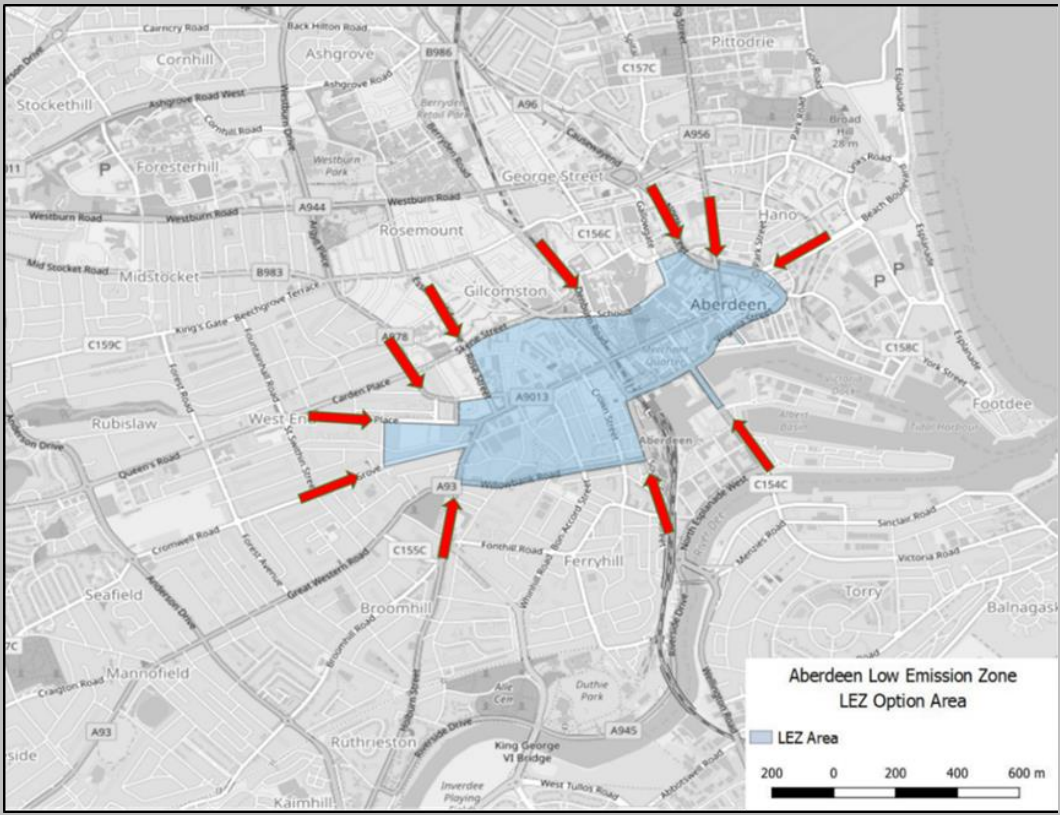


Figure 7.1 : LEZ Option 5

7.1.5 A ‘LEZ Option Testing Report’ (SYSTRA Ref: GB01T20D62/2, May 2021) outlines the development of each of the LEZ option models and assesses the impact the introduction of each LEZ has on the Aberdeen Road network.

**7.2 LEZ Boundary Option Sifting**

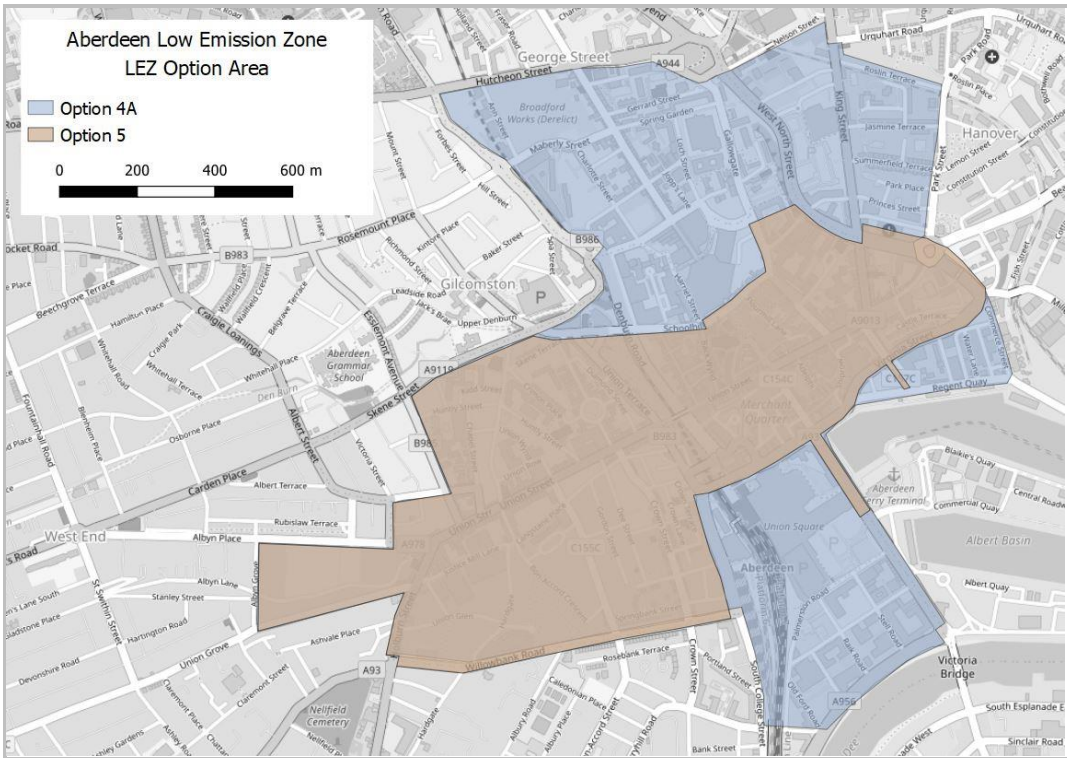
7.2.1 The first step in the modelling assessment allowed for the total number of LEZ options to be reduced if they were shown to negatively impact on network traffic conditions or known air quality exceedance locations. The outcomes of this assessment are summarised below with full details provided in the accompanying *LEZ Option Testing Report*. Those options that remained after this initial assessment were progressed to option refinement (Section 7.3) and detailed modelling (Section 7.4).

7.2.2 The model appraisal of each of the LEZ scenarios included:

- Traffic Demand Level that the model was able to run at
- Traffic flow changes at the 2019 NO<sub>2</sub> exceedance locations
- Alignment to agreed North East of Scotland Roads Hierarchy
- Car Park Accessibility
- Residential Impact of LEZ boundary.

7.2.3 From the option sifting process detailed in the *LEZ Option Testing Report*, ACC agreed to take LEZ boundary Options 4A and 5 forward for further appraisal of their suitability, as shown in Figure 7.2

7.2.4 The initial modelling of these LEZ options highlighted that additional measures were required to fully address all air quality exceedances in the city and, after appraisal of these remaining options (Section 7.3), the supporting measures were identified through further detailed modelling (Section 7.4).



**Figure 7.2 : LEZ Option 4A and Option 5**

**7.3 LEZ Option Appraisal**

7.3.1 The NLEF is objective-led and consistent with the principles of Scottish Transport Appraisal Guidance (STAG). The LEZ option generation, sifting and development process and subsequent consultation and reporting undertaken through the NLEF closely mirrors that of the STAG Pre-Appraisal Stage. Following NLEF due process and initial traffic model analysis, two LEZ options remain, namely Option 4A and Option 5. To ensure their continued suitability as LEZ options a further appraisal exercise, aligned with the principles of STAG Part 1 Appraisal, was undertaken. It is important to note that NLEF does

not require a full STAG Appraisal to be undertaken, the STAG principals were simply utilised to provide structure to appraise the suitability of the two remaining options.

7.3.2 The LEZ option appraisal (and STAG Part 1 Appraisal) concentrated on the following areas:

- An appraisal of the likely impact of options against LEZ Objectives
- An appraisal of the likely impact of options against the STAG Criteria;
- An appraisal of the fit of options with established policy directives; and
- An appraisal of the feasibility, affordability and likely public acceptability of options.

7.3.3 Chapter 13 of the second Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework 2<sup>nd</sup> Interim Stage 2 Report, SYSTRA May 2021*) details the outcomes from the LEZ option appraisal with the results summarised in Table 7.1 below.

**Table 7.1 : Summary of LEZ Option Appraisal**

Appraisal Criteria		4A	5
LEZ Objective	1	++	++
	2	+	+
	3	+	++
	4	+	++
	5	+	++
STAG Criteria	Environment	++	++
	Safety	0	0
	Economy	-	+
	Integration	+	+
	Accessibility & Social Inclusion	-	0
Other criteria	Feasibility	Yes	Yes
	Affordability	Yes	Yes
	Public Acceptability	Yes	Yes

7.3.4 The appraisal of the two remaining LEZ options showed that Option 4A failed to meet the criteria for economy or accessibility and social inclusion. The appraisal identified that there were key issues and implications for Option 4A, namely:

- Alignment with agreed North East of Scotland Roads Hierarchy
- Access to city centre car parks and implications to city centre economic recovery post Covid-19
- Access to the city centre services and amenities for those who rely on transport made by non-compliant vehicles (particularly impacting vulnerable groups)
- Implications to the large number of residential properties within the LEZ area
- Option 4A will have a higher scheme costs and higher cost of compliance (for residents and businesses).

7.3.5 For these reasons, and in light of the impact of the Covid-19 pandemic to the city, it was agreed with ACC that Option 4A would not be progressed in the NLEF appraisal process. While the appraisal showed that there are also several issues and implications for Option 5, the appraisal concluded that each criteria scored neutral to positive and that further work through detailed modelling should be undertaken on Option 5 to identify a final preferred LEZ option for Aberdeen.

## 7.4 Detailed LEZ Modelling

7.4.1 The traffic model sifting (7.2) and option appraisal (7.3) identified LEZ Option 5 as the preferred LEZ option boundary. Detailed modelling was then undertaken to further develop the option and define the complementary package of measures required to

address the remaining predicted air quality exceedances and network operational issues identified in the initial LEZ model testing.

7.4.2 The following analysis was undertaken in the detailed assessment of Option 5 to develop a preferred final LEZ scheme for Aberdeen which best meet the objectives of the study:

- LEZ air quality improvement supporting measures
- Management of non-compliant traffic
- Finalisation of LEZ boundary
- Model statistics of final proposed LEZ.

7.4.3 The NLEF process recognised that additional traffic management interventions are required to be delivered alongside a LEZ in Aberdeen to ensure all of the statutory air quality objectives (AQO) are met. Any supporting interventions for Aberdeen's LEZ are required to complement other committed network proposals for Aberdeen City Centre to provide a package of measures which will meet the objectives of the LEZ and wider Council objectives for Aberdeen City Centre. These committed proposals include the City Centre Masterplan (CCMP) and the changes to the roads hierarchy.

7.4.4 To enable the development of a package of measures to meet the objectives of the LEZ study and satisfy the AQOs, traffic modelling was utilised to identify if any elements of the CCMP not yet implemented would enhance and support the LEZ in meeting the objectives.

7.4.5 The Option 5 LEZ boundary was shown to generally fit well with the agreed revised hierarchy proposals. Option 5 has the effect of restricting all non-compliant vehicles from routing through the city centre area, but critically, it does not restrict access to the city centre (car park options still available for all traffic). This is consistent with other policies and aspirations for Aberdeen City Centre. However, the model analysis highlighted that some traffic was finding local routes around the periphery of the LEZ but within the boundary of Anderson Drive and, through discussion with ACC, several options to manage the displacement of traffic were modelled in detail.

7.4.6 The results from this detailed modelling are summarised in the second Interim NLEF Stage 2 Report, with full details provided in the accompanying *LEZ Option Testing Report* (SYSTRA Ref: GB01T20D62/2, May 2021). The resulting final preferred LEZ Option, incorporating a package of supporting measures that align with other committed network proposal for Aberdeen City Centre, is detailed below in Chapter 8.



## 8. ABERDEEN LEZ OPTION DETAIL

### 8.1 Introduction

8.1.1 The analysis undertaken and summarised in Chapters 5 to 7 has identified a final preferred option for Aberdeen's LEZ, including the package of supporting measures to enable the LEZ to meet its objectives. The next stage of the NLEF process is to define the LEZ Option detail in line with the Transport (Scotland) Act 2019.

8.1.2 [Section 14](#) of the Transport (Scotland) Act 2019 states the required content of a LEZ, namely:

- The zone to which it relates, which must be specified by
  - i. reference to an area on a map, and
  - ii. specifying the roads (or parts of a road) which form part of the zone
- the types of vehicles to which it applies
- the date on which the scheme comes into effect
- the grace periods applicable
- the LEZ objectives

8.1.3 This chapter provides information on the required content of Aberdeen's LEZ.

### 8.2 Aberdeen LEZ Area

8.2.1 In line with [Section 14](#) of the Transport (Scotland) Act 2019, the final detailed drawing of the Aberdeen LEZ Option is shown in Figure 8.1

8.2.2 The detail presented in Figure 8.1 is considered appropriate for this stage of the Interim Stage 2 Reporting and subsequent submission to Aberdeen City Council Committee and for the consultation period thereafter. However, detailed design work should be undertaken prior to final submission of the Aberdeen LEZ Option to Scottish Ministers that will include aspects such as signage and camera placement and will present a further opportunity to finalise the LEZ boundary. It is anticipated that through the final consultation, locations, accesses or land uses may be identified and require consideration of whether they fall inside or outside the LEZ area.

8.2.3 A list of all roads which form part of the zone, as required by the Transport (Scotland) Act 2019 are included in Appendix C of the second Interim NLEF Stage 2 Assessment Report (*Aberdeen Low Emission Zone, National Low Emission Framework 2<sup>nd</sup> Interim Stage 2 Report, SYSTRA May 2021*).

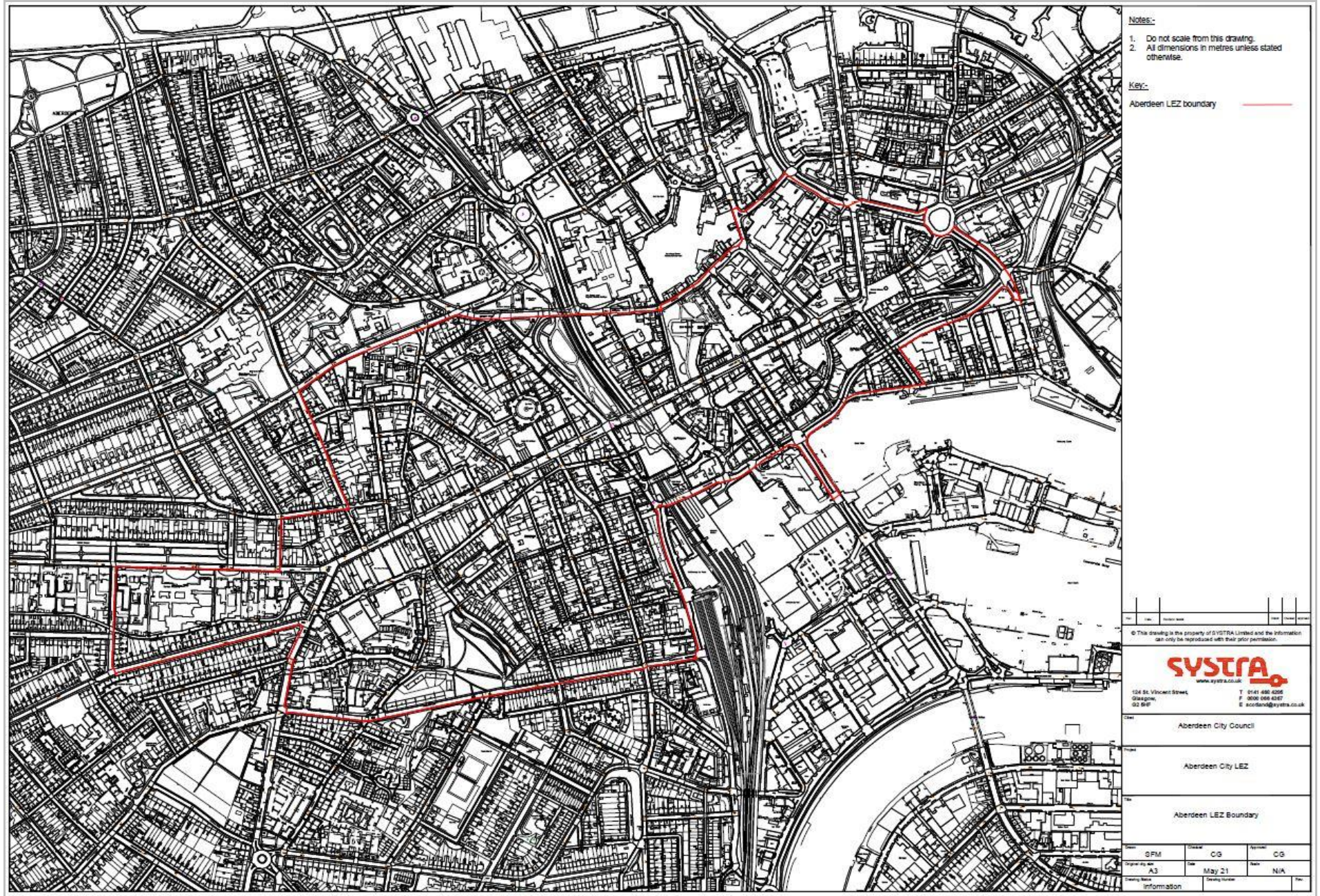


Figure 8.1 : Aberdeen LEZ Option Area

### 8.3 Vehicles types restricted from entering Aberdeen LEZ

8.3.1 The [Low Emission Zones \(Emission Standards, Exemptions and Enforcement\) \(Scotland\) Regulations 2021](#) sets the emission standards for entry to the LEZ without penalty and allows ACC to define which vehicle types are to be restricted from entering the LEZ area.

8.3.2 NLEF Guidance states *“all vehicle types should be considered for inclusion in a LEZ and be assessed as part of the NLEF appraisal process...a single vehicle type or a combination of vehicle types could be subject to the LEZ requirements”* (NLEF, 2019).

8.3.3 The final decision of the vehicles types restricted from entering Aberdeen’s LEZ is informed by NMF Aberdeen air quality modelling, traffic modelling and consultation outcomes as well as enforcement considerations.

8.3.4 Analysis of modelled emission by vehicle type in the NMF Aberdeen Air Quality Model (Chapter 4) concluded that a LEZ in Aberdeen will have to include all vehicle types and have to be delivered with traffic management measures if all exceedances of the air quality objectives are to be addressed.

8.3.5 The traffic modelling assessed LEZ options that restricted all vehicles (buses, diesel cars, HGVs, LGVs and petrol cars) from access to the city centre unless they were compliant with LEZ emission standards. All non-compliant buses, LGVs, taxis and HGVs were assumed to become compliant while non-compliant cars were assumed to remain on the road network and access the city centre by utilising car parks outside the LEZ area. The detailed modelling results show the road network operates with small increases to average journey distance travelled and average journey times. This impact is balanced against the significant predicated reductions in NO<sub>2</sub> levels and traffic flows inside the LEZ area as a result of the introduction of an all vehicle LEZ and complementary traffic management measures.

8.3.6 In addition to evidence from modelling, the wider messaging and publicising of the LEZ is simplified if vehicle restrictions apply to all vehicle types that do not meet LEZ emission standards. It is also noted that the three other cities in Scotland (Glasgow, Dundee and Edinburgh) plan to introduce a LEZ for all vehicles and introducing an all vehicle LEZ for Aberdeen would ensure consistency across the country.

It is proposed that the final Aberdeen LEZ Option applies to all vehicles types as specified in [Regulation 2](#) of the Low Emission Zones (Emission Standards, Exemptions and Enforcement) (Scotland) Regulations 2021.

8.3.7 The LEZ emission standards for Aberdeen LEZ are therefore:

- Euro VI emission standards for buses, coaches and heavy good vehicles with diesel engines, with retrofitted vehicles to this standard also being acceptable (Euro VI vehicle registrations from 2013)
- Minibuses, large vans, taxis and cars are set at the Euro 6 for diesel vehicles and Euro 4 for petrol vehicles (Euro 6 diesel vehicle registrations in 2015, Euro 4 petrol vehicles in 2006).
- Euro 3 for motorcycles and mopeds

8.3.8 Although the model analysis did not consider motorcycles or mopeds (as they are not generally represented in the traffic or air quality model) these are listed in Regulation 2 and are therefore considered applicable to the emissions standards for Aberdeen’s LEZ.

8.3.9 [Section 6\(4\)\(a\)](#) of the Transport (Scotland) Act 2019 set enforcement exemptions consistently across Scotland, with the national LEZ exemptions listed in [Regulation 3](#) of

the LEZ Regulations and outlined in Table 8.1. Aberdeen LEZ will operate in accordance with the exemption list.

**Table 8.1 : National LEZ Exemptions**

Vehicle type of classification	Description
Emergency Vehicles	For or in connection with the exercise of any function of: the Scottish Ambulance Service, the Scottish Fire and Rescue Service, Her Majesty's Coastguard, and the National Crime Agency.
Military Vehicles	Vehicles belonging to any of Her Majesty's forces; or used for the purposes of any of those forces
Vehicles of Historic Interest	Vehicles which are 30 years old or older, are no longer in production and historically preserved or maintained
Vehicles for Disabled Persons	Vehicles registered with a 'disabled' or 'disabled passenger vehicles' tax class Vehicles being used for the purposes of the 'Blue Badge Scheme'.
Showman Vehicles	Highly specialised vehicles used for the purposes of travelling showmen, where the vehicle is used during the performance, used for the purpose of providing the performance or used for carrying performance equipment.

## 8.4 Aberdeen LEZ Package of Measures

- 8.4.1 To enable the development of a package of measures to be delivered as part of the LEZ, traffic modelling was utilised to identify if any elements of the City Centre Masterplan (CCMP) not yet implemented would enhance and support the LEZ in meeting its objectives. The CCMP Union Street Scheme was shown to complement the proposed LEZ and is expected to positively impact on the NO<sub>2</sub> exceedance locations in the city. This combination of the LEZ plus CCMP Union Street Scheme is predicted to significantly reduce the emission levels at all the 2019 observed NO<sub>2</sub> exceedance locations, with the reduction anticipated to bring all locations within AQO limits.
- 8.4.2 The model testing of various proposals to manage traffic displaced from the city centre identified that a revision to the operation of the Milburn Street / South College Street junction is best placed to address potential rat runs through the south and west border of the LEZ. Junction changes are required to restrict or prevent strategic traffic (both compliant and non-compliant) routing through Milburn Street and the Ferryhill corridor. Further assessment of the specifics of these measures will be considered by ACC in due course.
- 8.4.3 It is therefore recommended that the LEZ, the CCMP Union Street Scheme and the Milburn Street junction revision is viewed as a combined package of measures to meet the objectives of the LEZ, as shown in Figure 8.2.

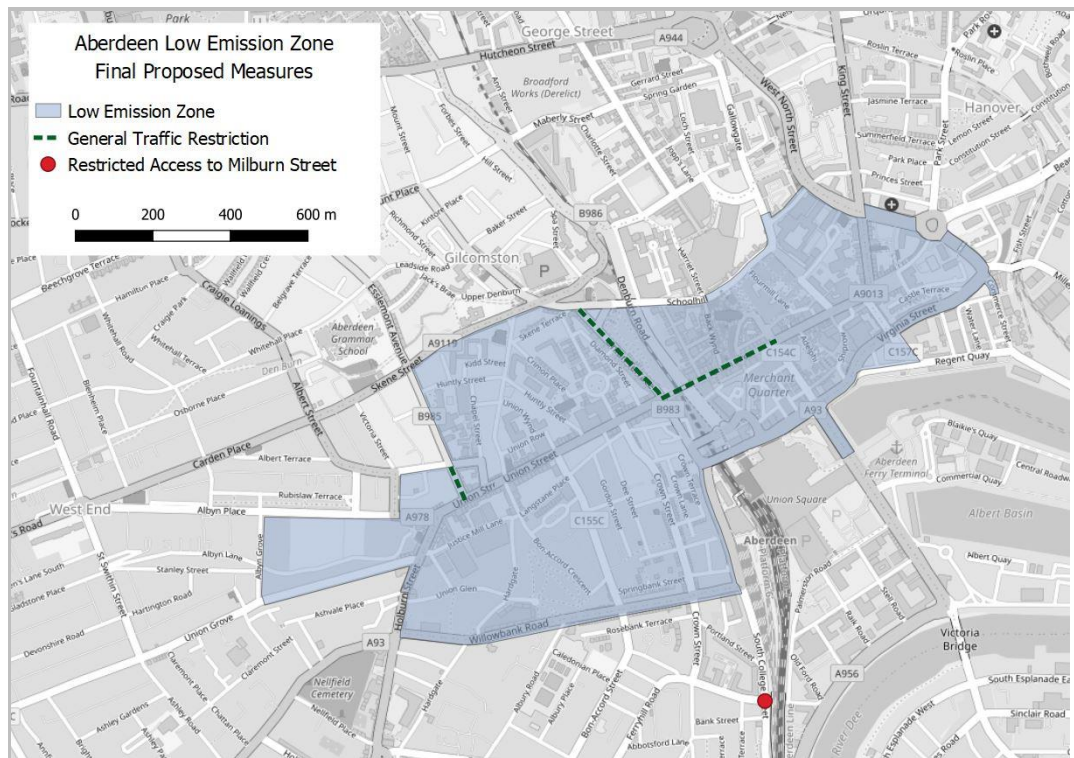


Figure 8.2 : LEZ Supporting Measures

## 8.5 Enforcement of Aberdeen LEZ

- 8.5.1 ACC will submit its final proposals for the LEZ to Scottish Ministers in late 2021 and, subject to any objection, is required to declare its LEZ by May 2022. While a decision on the final exact date is made, the working assumption for this Interim Stage 2 Report is that ACC will declare the LEZ in May 2022, and that the LEZ will apply to all vehicle types (not meeting LEZ standards) from this date.
- 8.5.2 The Transport (Scotland) Act 2019 requires a LEZ to specify a grace period before penalty enforcement of the scheme. [Section 15](#) details the scope and time-limits of the grace period. The grace period applicable to non-residents must expire:
- not less than 1 year after it (LEZ declaration) begins, and
  - not more than 4 years after it begins.
- 8.5.3 The grace period applicable to residents (whose registered address is inside the zone) must expire not more than 2 years after the expiry of the grace period applicable to non-residents.
- 8.5.4 With declaration of Aberdeen’s LEZ in May 2022, the grace period for the LEZ must therefore:
- Not expire before May 2023
  - Expire by May 2026 for non-residents
  - Expire by May 2028 for residents but can expire from May 2023.
- 8.5.5 To inform the grace period dates, consultation with two key stakeholders, namely bus operators and the business community, was undertaken in March 2021. All bus operators confirmed their full fleet would not be compliant with LEZ emission standards by 2023, the minimum grace period. While a key purpose of any LEZ is to speed up improvements to air quality (through compliance with emission standards) and ACC could enforce the LEZ in 2023, it is considered counter-productive to set a date that bus operators will be unable to meet.

8.5.6 In addition, it is recognised that the Covid-19 pandemic has had an unprecedented impact on society, including on the wider environment and the economy. Cognisance of the difficulties faced by many throughout 2020 and 2021, particularly in the context of a Aberdeen city centre LEZ and its implications for city businesses and bus operators, suggests that a grace period greater than the required minimum is desirable.

8.5.7 A key theme from consultation with key stakeholders was the need for consistency of the grace periods applied to the LEZ enforcement. It is therefore considered important that the grace period should be applicable to all vehicle types from the same date to ensure consistency and ease of enforcement and wider communications. In line with the theme of consistency, it is proposed that residents of the LEZ area are required to comply with the LEZ emission requirements at the same time as non-residents.

**With the above considerations in mind, it is proposed that the grace period for Aberdeen's LEZ expires in May 2024 for all vehicle types and for residents and non-residents of the zone.**

8.5.8 This represents an additional grace period of two year from the declaration of the LEZ in May 2022.

8.5.9 As context, in May 2024, the approximate age of non-compliant vehicles will be as follows:

- Bus – 11 years or older (including those retrofitted to Euro VI standard)
- HGV – 11 years or older
- Diesel car/van – 9 years or older
- Petrol vehicle – 18 years or older

8.5.10 [Section 8](#) of the Transport (Scotland) Act 2019 enables the enforcement of LEZ schemes. The LEZ will be enforced through Automatic Number Plate Recognition (ANPR) cameras with the LEZ Regulations [Schedule 6](#) detailing the approved devices.

8.5.11 ANPR camera enforcement is currently subject to funding decisions from Transport Scotland and procurement procedures with suppliers. The exact number and location of ANPR cameras is therefore not concluded and will be confirmed in the final NLEF Stage 2 Report and submission to Scottish Ministers.

8.5.12 In line with [Section 18](#) of the Transport (Scotland) Act 2019, it is anticipated that the LEZ will be enforced at all times. [Section 17](#) of the Act does allow for ACC to apply time-limited exemptions to enforcement should it be required, for example for road closures and diversion routes.

## 9. SUMMARY OF NEXT STEPS

### 9.1 Timetable of Aberdeen LEZ

9.1.1 Table 9.1 below presents the proposed timetable from committee submission of the final Aberdeen LEZ presented in the second Interim NLEF Stage 2 Report through to full enforcement of the LEZ after the proposed grace period ends.

**Table 9.1 : Timetable towards Aberdeen LEZ enforcement**

Activity	Indicative Date
City Growth and Resources Committee Report recommending final Aberdeen LEZ as defined in this report	June 2021
Statutory Consultation	Summer 2021
Completion of additional impact assessments (IIA, BRIA, SEA)	Autumn 2021
Submission of final LEZ scheme to Scottish Ministers	End 2021
Scottish Minister approval and ACC declaration of Aberdeen LEZ	Spring 2022
Enforcement of Aberdeen LEZ	Spring 2024

### 9.2 Emissions Analysis and the National Modelling Framework

9.2.1 SEPA, who develop and run the National Modelling Framework (NMF) Aberdeen City Air Quality Model, were subject to a cyber-attack in late 2020 resulting in the NMF being temporarily unavailable, with model runs not possible prior to completion of this second Interim NLEF Stage 2 Report. The final Aberdeen LEZ option will however be assessed in the NMF prior to submission to Scottish Ministers (late 2021 as noted above).

9.2.2 As an interim step to inform the likely impact on emissions resulting from the introduction of the LEZ, analysis of emissions based on traffic model outputs using EMIT software is currently being undertaken by SEPA and findings will be incorporated in the NLEF process as available.

### 9.3 Impact Assessments

9.3.1 NLEF guidance advises that as part of the NLEF Stage 2 Assessment, the final Aberdeen LEZ should be subject to detailed impact, equality and environmental assessments to ensure any impacts, beyond improvements to air quality, are fully considered.

9.3.2 In line with Transport Scotland's approach to the national introduction of LEZs, Aberdeen's LEZ will be subject to the following impact assessments:

- Strategic Environmental Assessment (SEA)
- Integrated Impact Assessment (IIA)
- Business and Regulatory Impact Assessment (BRIA).

9.3.3 These assessments are ongoing and it is anticipated that these tasks will be complete prior to the final submission of the Aberdeen LEZ to Scottish Ministers in Autumn 2021.

### 9.4 Statutory Consultation

9.4.1 [Section 11](#) of the Transport (Scotland) Act 2019 states that before a local authority submits its final LEZ proposals to Scottish Ministers for approval, it must consult with:

- the Scottish Environment Protection Agency,
- Scottish Natural Heritage (now NatureScot),
- Historic Environment Scotland,
- such persons as the authority considers represent the interests of—
  - i. the road haulage industry,
  - ii. the bus and coach industry,
  - iii. the taxi and private hire car industry,
  - iv. local businesses, and
  - v. drivers, likely to be affected by the proposal,
- such persons as are specified by the Scottish Ministers in regulations
  - i. neighbouring local authorities
  - ii. the Regional Transport Partnership (Nestrans)
  - iii. the local Health Board
- such other persons as the authority considers appropriate.

9.4.2 All statutory consultees have been involved in previous consultation and/or are part of the Aberdeen LEZ Delivery Group. However, in line with The Transport (Scotland) Act 2019, consultation on the final Aberdeen LEZ will take place from June 2021. Thereafter, ACC will publish a Report on the consultation findings and, if required, take account of any representations received in the course of the consultation.

9.4.3 Once the consultation findings have been taken into consideration, ACC will publish the final proposed Aberdeen LEZ scheme and, at this time, objections can be made. When the period in which objections can be made has ceased, ACC will publish a report outlining any objections received and its response, prior to submission to Scottish Ministers in late 2021.



## Appendix 3 – LEZ Online Consultation Summary Report

### Aberdeen Low Emission Zone Public and Stakeholder Consultation

#### 1 Introduction

Public and stakeholder engagement on options for Aberdeen’s Low Emission Zone (LEZ) took place during September and October 2020. This took the form of:

- an online survey available between 14<sup>th</sup> September and 25<sup>th</sup> October hosted by Aberdeen City Council’s preferred consultation platform Citizens Space; and
- a series of stakeholder workshops co-ordinated by SYSTRA, the consultant appointed by the Council for LEZ appraisal and traffic modelling support.

Consultation responses were also accepted via email to the Council’s Transport Strategy address.

This report summarises the responses received to the online survey and via email. 506 responses were received via Citizens Space and 12 via email or letter.

A summary of the outcomes of the stakeholder workshops is provided in a separate report.

#### 2 Citizens Space Questionnaire

##### 2.1 Respondents

Of the 506 responses received, 488 (96.5%) were from individuals, 18 (3.6%) were from businesses.

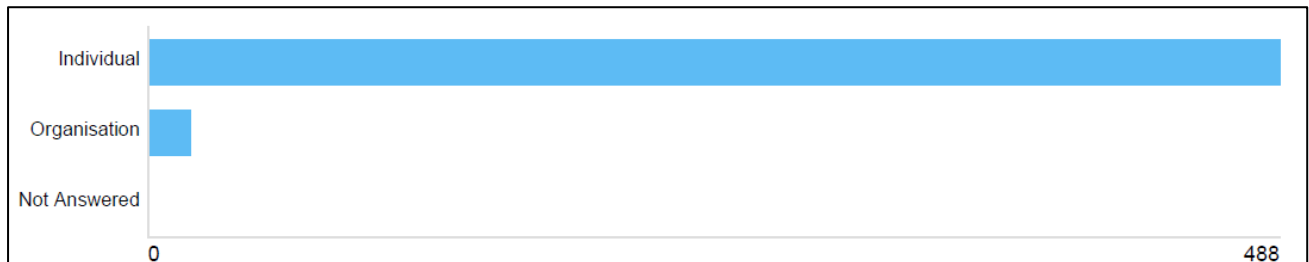


Figure 1: Nature of respondents

Those organisations responding to the online questionnaire were:

- First Aberdeen Limited
- Stagecoach Bluebird
- Blacks of Brechin
- Royal Mail Group
- Road Haulage Association
- The Shore Porters Society
- Leiths (Scotland) Ltd
- Scottish Enterprise
- City Gate Aberdeen Ltd.
- HEAT (*no further information provided*)
- Friends of the Earth Scotland
- Asthma UK and British Lung Foundation Partnership
- British Heart Foundation Scotland
- Electric Vehicle Association Scotland
- Low Carbon Vehicle Partnership

- Rosemount and Mile End Community Council
- Cults, Bieldside and Milltimber Community Council
- Paths for All.

**2.2 Demographic Information (Individual Respondents)**

*Age*

All adult age groups were reasonably well represented in the responses, with perhaps a slight under-representation of the under-24 and significant under-representation of the under 16 age groups.

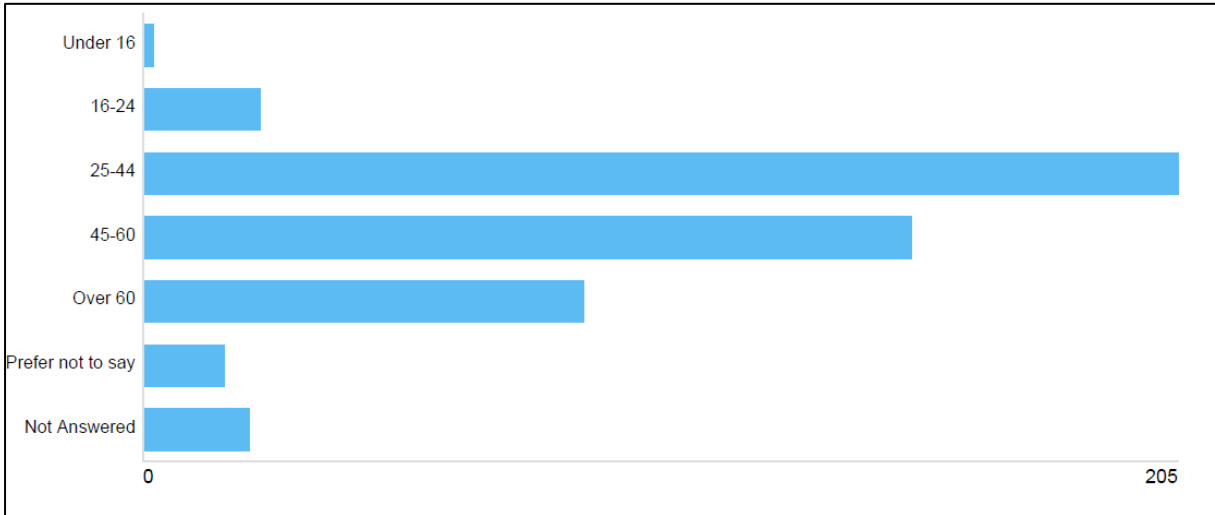


Figure 2: Age of respondents

*Gender*

More males (60.1% of respondents) than females (31.4%) responded to the questionnaire, with 8.5% of respondents choosing not to answer the question.

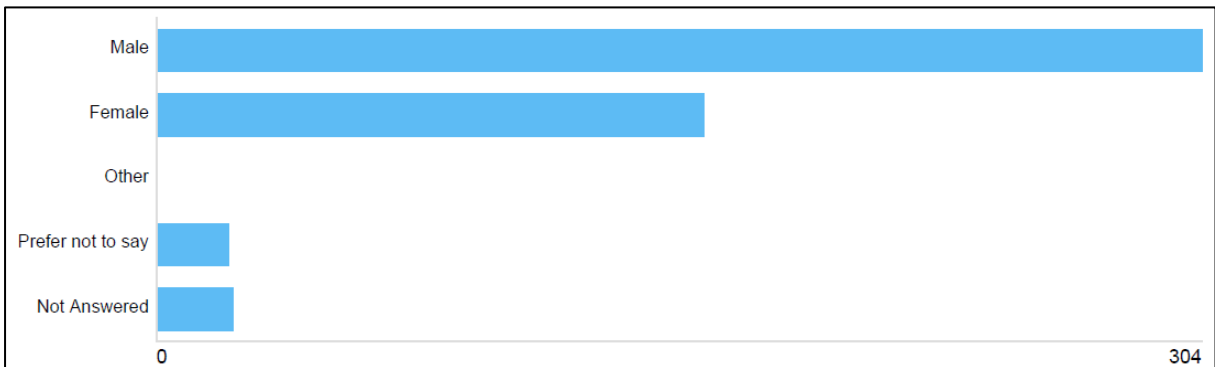


Figure 3: Gender of respondents

*Disability*

7.5% of respondents stated that they have a disability affecting their travel arrangements, while 80.8% did not, with 11.7% of respondents choosing not to answer the question.

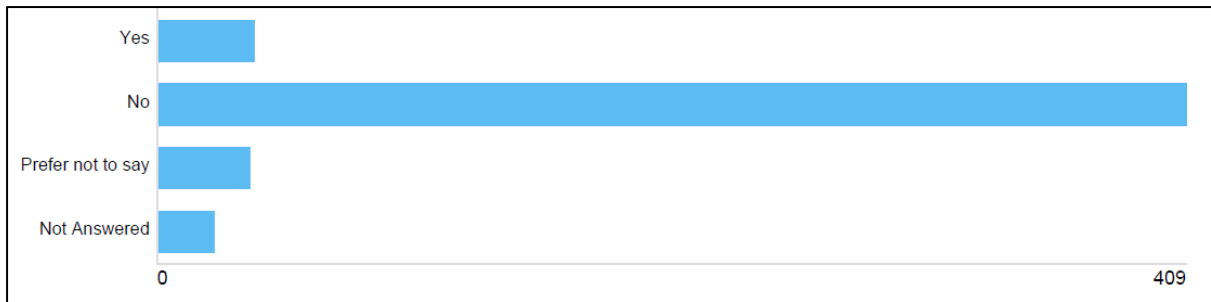


Figure 4: Do respondents have a disability

*When travelling to, from and within Aberdeen city, what modes of transport do you typically use?*

Respondents were asked to select all forms of transport relevant to them.

The majority of respondents (77.9%) were regular car drivers in the city centre, with 46.4% walking in the city centre, and 32.8% using the bus to access the city centre. Smaller proportions were noted for cycling (20.8%), the train (12.5%), taxi (9.1%), motorcycle (5.9%) and van (3.4%). Users of all main modes of transport in the city centre are therefore represented in the survey results.

Other options given by respondents were: heavy goods vehicle, motorhome, historic vehicle, ferry, and Motability scooter.

#### Postcodes

Postcode data was requested to understand the locations of respondents. Unsurprisingly, given the local nature of the proposals, the vast majority of respondents were located in Aberdeen City and Aberdeenshire. Responses were also received however from the following postcode areas: Dundee, Edinburgh, Elgin, Glasgow, Livingstone, Luton, Perthshire, Shetland and Southampton.

### 2.3 Awareness of Air Quality Problems

*Before starting this survey, were you aware of the air quality problems in Aberdeen city centre?*

Awareness of issues of poor air quality in Aberdeen was good with the majority of respondents (71.2%) aware of Aberdeen’s air quality problems. 23.7% were not aware, while 4.9% were not sure.

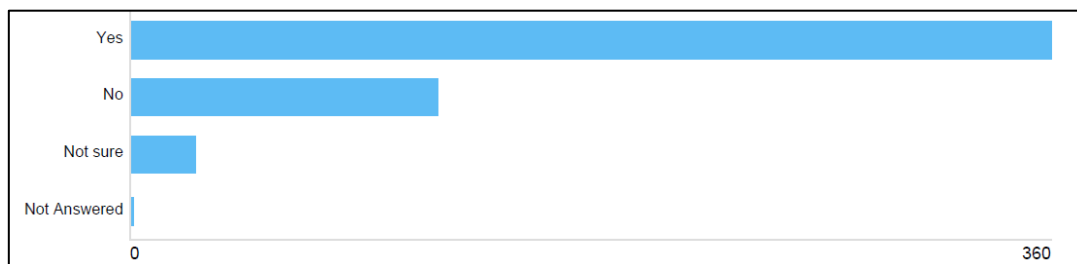


Figure 5: Awareness of air quality problems

### 2.4 Attitudes Towards Low Emission Zones

*Generally, are you in favour of Low Emission Zones to tackle poor air quality?*

Nearly half of the respondents (48.4%) were in favour of LEZs, with 40.9% not in favour and 10.3% unsure.

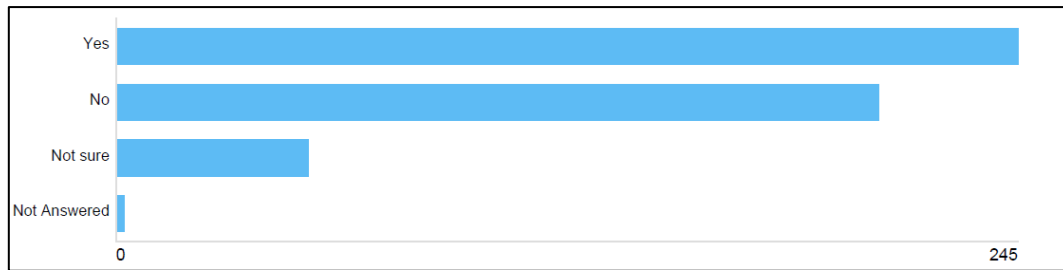


Figure 6: Support for LEZs

Respondents were invited to expand upon their answer to this question. Reflecting the fact that respondents were on the whole more positive than negative on the subject of LEZs, many comments were supportive of the introduction of a LEZ in Aberdeen.

**Please note:** *Italicised sentences in the remainder of the report are comments received in response to open questions in the online questionnaire, in most cases replicated verbatim. They are used as examples to illustrate the main themes emerging in response to the survey questions. Comments from organisations may have been amended slightly to anonymise responses, although please note that responses from organisations have been individually extracted from Citizens Space to be considered fully in the context of affected stakeholder (where appropriate).*

In terms of those in support of LEZs, main themes were:

- Recognition of the beneficial health impacts (*Poor air quality is a significant contributory factor to respiratory and cardiovascular diseases. It is a modifiable risk factor therefore we can and should reduce pollution to improve public health*);
- Recognition of the environmental benefits (*Cars are killing the planet and us, no point arguing when the planets on fire*);
- Appreciation that LEZs can contribute to improved quality places and quality of life (*An LEZ in Aberdeen city centre will improve the experience of visitors to the city (shoppers, tourists, workers etc) but more importantly will improve the lives of those who live there*);
- Appreciation that LEZs can improve the city centre (*Low Emission Zones are a good way of encouraging...more welcoming spaces for people living, working and shopping in the city*);
- Recognition that LEZs can have wider benefits in terms of encouraging more sustainable transport choices (*The LEZ zone and associated reduction in vehicular traffic and pollution in the city centre will encourage more sustainable forms of travel through the city centre and across the city - walking, cycling, public transport and low carbon vehicles*); and
- Evidence from elsewhere testifying to the success of LEZs (*Having lived in Germany for many years, city centres controlled by LEZ were much more pleasant to visit and live. The LEZ compliments pedestrianised city streets well*).

A number of respondents stated that a LEZ should form part of a package of measures to support more sustainable travel behaviour and reduce emissions:

- *This is particularly important for those who live and work in the town centre but has to be part of a general move to encourage walking, cycling and public transport use in the city as a whole;*
- *While the idea seems lovely, it needs to be carried out in conjunction with making sure that public transportation provides a viable alternative;*
- *We note that LEZs may have a role to play in improving local air quality and prioritise vehicle replacements in areas where LEZs are enacted. We also believe there are a number of other ways to reduce transport emissions - such as through the development of electric vehicle charging infrastructure and trialling new low emission solutions such as hydrogen – which could be more effective.*

Some felt that there are better ways to reduce emissions such as improving traffic flow through affected areas (*Improving traffic flow through and round Aberdeen would have greater benefit without negatively impacting businesses in the centre*) or traffic management interventions (*You would be better off changing the road layouts so the city centre isn't a through road*), while others felt that proposals should go further (*We should be reducing total emissions, not just moving them around; Union street and city centre should be fully pedestrianised*).

In terms of those expressing concern about, or objections to, a LEZ, the main issues raised related to:

- The impacts on individuals, particularly the financial implications (*It is also a significant issue for residents within these areas, why should they be forced to change their vehicle, likely at financial penalty to themselves*), especially given that the impacts of the COVID-19 pandemic may be felt for some time (*Unemployment in Aberdeen and Aberdeenshire is on the rise and people cannot afford to change their cars so they can drive in this LEZ*);
- Concerns that the less affluent members of society will be disproportionately impacted (*Typically these schemes negatively impact low income households most as they cannot afford to upgrade cars that are not compliant and are then either banished from town centres or have to pay significant sums to enter the town centre*);
- Concerns about the impacts on the disabled if not granted exemption from the LEZ (*I am registered disabled & on benefit. My car is a 2012 diesel. How would you propose me to get around otherwise?!*);
- Concerns about the impacts of proposals on the future health and prosperity of the city centre (*Now is not the best time to implement this. The city centre is dying on its feet as a result of internet shopping and now covid. It's dying and this will be the final blow. Remember, people visit the town as a day out, as everything can be bought cheaper and more conveniently on the internet*) and local businesses (*Concerned about economic effect on small medium businesses in city centre*);
- Concern that the LEZ could simply move traffic, and resulting congestion and emissions, elsewhere (*Drivers will simply avoid the LEZ by going around the peripheral and greatly intensify the traffic in these areas while at the same time simply shift the problem onto these areas*);
- Concern about the current scope of the LEZ, whether it was correct to address all vehicle types (*Its mostly buses and lorries that cause the pollution. Pollution reducing efforts should be focused on them*), whether the emissions standards being proposed are justified (*We are in favour of Low Emission Zones; however, enforcement based on emissions standards and ANPRs is not a valid or fair method since real-world driving emissions are much higher than laboratory tests indicate*), and whether the impacts of the harbour should be considered (*Not really seeing the point of targeting road vehicles in a city which has the busiest harbour in the UK from which goodness knows how many diesel powered ships enter and exit the harbour area near the town centre*);
- Concern that decisions are being made on outdated evidence, questioning whether the impacts of the Aberdeen Western Peripheral Route (*Since adoption of the WPR the emissions have drastically reduced in the city centre. There needs to be a re-evaluation of the data as it is currently not historical data*) and COVID (*Costs involved may not be appropriate now with reduction in traffic post covid 19*) have been adequately considered;
- A perception that this is simply a revenue-generating scheme (*Its just a money making scheme*); and
- Scepticism that the problem in Aberdeen is such that these measures are required (*Where there is a public health concern I think Low Emission Zones should be considered. I am not convinced however that the levels faced in Aberdeen warrant a Low Emission Zone*).

Given that air quality in Aberdeen city centre exceeds national objectives and EU limit values in a number of areas and the main source of this is road traffic, do you agree that a Low Emission Zone is an appropriate response to this?

29.5% of respondents strongly agreed with a LEZ as a response to air quality issues in Aberdeen, while a further 14.4% agreed. 26.3% strongly disagreed and 16.4% disagreed. 12.7% of respondents were unsure.

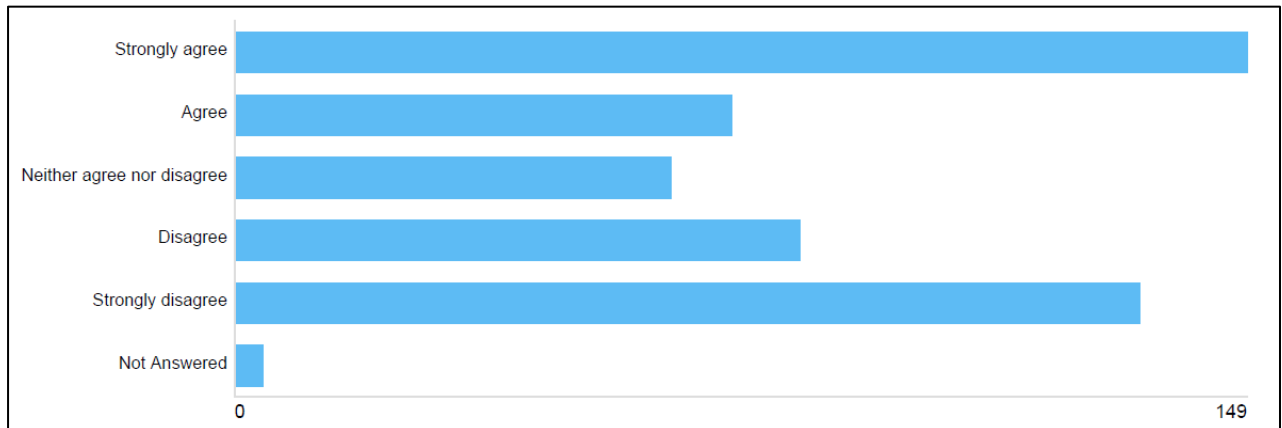


Figure 7: Support for Aberdeen LEZ

Combining responses, there is a near even split between the proportion of respondents supportive (43.9%) and not supportive (42.6%) of a LEZ in Aberdeen. Respondents were invited to expand upon their answer to this question.

In terms of responses supportive of a LEZ, comments were along similar themes to those received for the previous question, in terms of the health and environmental benefits of LEZs (*I feel that given the urgency of the climate emergency and also with COVID exposing the impacts of underlying health conditions, we need to clean up our act and the local scale is the most tangible and perhaps one of the most effective ways to do this. Clean air is a human right!*). Some respondents felt that a response to this issue is long overdue (*A LEZ is not just necessary; it is long overdue*) and / or that LEZ proposals don't go far enough (*This should not only be applied to the city centre, but also to other areas of the city where air pollution is high*).

Some responses suggest that a LEZ is part of the solution but not the whole solution and must be combined with other measures to encourage behaviour change (*I believe it is an appropriate response just now but longer term would like to see removal of traffic in general from the city centre area and more priority given to buses, cyclists and pedestrians; LEZ are a step in the right direction. However, it barely scratches the surface in terms of a sustainable, long term approach*) or to reduce overall traffic (*Low emission zones are a good response but more should be done to reduce all traffic more generally*). Similar to the responses to the previous question many feel that there are other measures that should be put in place prior to or instead of a LEZ such as measures to reduce congestion and improve traffic flow (*A more appropriate response is to remove the congestion in the centre by getting better traffic flow*), and improving active travel (*encouraging people to use alternative transport is also vital. Cycle lanes in Aberdeen are terrible, often impossible to cycle in due to potholes and sunken manhole/drain covers*) and public transport (*Possibly explore making public transport more affordable, with more regular and accurate times*) opportunities.

Again, concern was raised about the impact of a LEZ on the city centre and businesses (*We have an issue with retail in our high streets suffering. Restricting traffic in the city centre will speed up the demise of shops in this area*) and individuals (*This is just a way to make money at the citizens expense*).

*Stopping people moving around the city freely), particularly the disabled (As a disabled pensioner who relies on my car to reach shopping in town with an older car it would appear if I move from my home in the Bridge of Don I will have to pay. You are effectively making me a prisoner and cutting me off from visiting any of the shopping centres) and the less affluent (People on lower incomes may not be able to afford compliant cars and therefore cannot access the city?).*

Comments were received on the scope of the LEZ with some respondents believing that all vehicles should be addressed (*All should be tackled, not just cars; Busses and lorries mostly cause the pollution. Personal cars should be exempt*), while others singled out particular vehicle types for attention (*Ban buses and heavy goods vehicles from the city centre and surrounding areas*).

Similar to the previous questions, concerns were also raised about:

- the potential for a LEZ to simply force traffic and emissions elsewhere (*If you turn the city centre into a LEZ, you will only be diverting high emission vehicles elsewhere possible into residential areas*);
- the timing of LEZs given the disruption resulting from the COVID-19 pandemic (*Too much going on with Covid etc and traffic reduced due to the new system in town*);
- the data being used, in particular whether this is reflective of the opening of the AWPR in 2019 (*Data taken was from before opening of the AWPR*) and any recent changes resulting from the pandemic (*a survey from 2019 on levels of pollution bears no relation to the actual traffic pollution levels during 2020 given the lack of traffic since March and the town centre basically shut off to all traffic for the foreseeable future*);
- the extent of the actual problem in Aberdeen with some scepticism evident (*As mentioned above, I think that the figures are hard to believe, as my experience of Aberdeen City centre, compared to other major cities has cleaner air*) and a feeling that things will improve naturally over time (*Emissions will reduce in time by people replacing their vehicles without the need for another layer of bureaucratic restrictions*).

## 2.5 Views on the LEZ options

### *Option 1A - Advantages*

Respondents were first asked what they believed were the advantages of this option.

One of the main advantages identified was that this option would lead to reduced emissions and improved air quality (*This reduces the pollution risk in the areas where large numbers of people will be walking*). Respondents also identified knock-on effects such as reduced traffic volumes, less noise, safer streets, and consequently a more welcoming urban realm (*This area could be far more pleasant to live, visit and spend time in if this LEZ was implemented*) that could encourage more usage of the city centre.

In terms of the scope of the zone, respondents welcomed the fact that the majority of areas of air quality exceedance are captured by this option (*it covers the most polluted area*), but that accessibility to main destinations such as the main car parks, harbour and ferry terminal are not significantly impacted (*Additionally access to shopping centres like union square still possible by family who need to take the car and have an older car; Cohesive central area and allows lorry traffic from and to the Harbour to use market St, Virginia St and King St without hindrance*).

The fact that this is the smallest area under consideration was seen as an advantage by some, in terms of being the easiest and possibly cheapest option to implement. Respondents noted that this option would have the least impact on local businesses (*Least damage to city*) and the travelling public (*It's a*

*small zone which would not impact as many people; Minimal impact to traffic transiting through the city to get from point A to point B).*

A number of people noted that the area was logical and well-defined and should enable non-compliant drivers to re-route around the area with minimal disruption (*Small area, easy to navigate around the LEZ if your vehicle is not compliant*). Others noted that starting with a smaller boundary could be a stepping stone to the LEZ expanding over time (*First step towards larger roll out*).

A significant volume of respondents stated that they saw no advantages of this option, either because they were against the concept of a LEZ itself (*Aberdeen does not need a low emission zone*) or they felt that the scope of the option was too limited to make much of a difference (*Seems pointless if it's so small*). Again, concerns were raised about the LEZ pushing the problem elsewhere (*It will cause major congestion elsewhere, leading to red zones appearing elsewhere in the city, so in effect achieving nothing but stress and inconvenience to commuters, shoppers etc.*).

#### *Option 1A – Disadvantages*

Many respondents saw no disadvantages with this option.

Conversely, many felt that there were no advantages, either because they were opposed to the concept of a LEZ anyway, or felt that this option is too limited in scope in that it doesn't encompass all problem areas (*it doesn't include Market St from Guild St to Victoria Bridge which is heavily polluted*) so will have minimal impact (*Too small an area to make a difference*).

A number of comments were received on the subject of the economy, particularly concerns that a LEZ would discourage people from visiting the city centre, further contributing to its decline (*City centre trading is already struggling to survive. Anything that reduces the people coming into town would only exacerbate the problem*) and negatively impacting on local businesses (*The businesses in the centre would suffer with a lack of footfall*). Some respondents also thought that restrictions would also drive people away from living in the city centre (*Residents will move out of penalty zones*).

Again, many comments were received that such restrictions would simply drive traffic and emissions elsewhere (*Potentially circuitous routes will end up being used to avoid the zone and may shift the pollution risk to other areas which are more residential / include school areas*), potentially increasing congestion in other areas and perhaps even increasing total emissions overall (*It would create more emissions overall from slower longer journeys*). Concerns were raised about specific areas/streets becoming 'rat runs', particularly residential areas and streets with schools on them.

Again, concerns were raised that it would be the most vulnerable members of society disadvantaged by proposals, particularly the disabled and those unable to afford a newer vehicle (*It will prevent people being able to carry out their jobs if they own non compliant vehicles. It targets the less wealthy worker; So the roads will be available only for those who can afford brand new cars*). Many were also concerned about residential streets being included (*Dee place is a residential street which should not be cut off from the outside world*) and / or took offence at the thought of having their movements restricted (*Thought it was meant to be a free country*). A number of specific areas were mentioned which people felt their accessibility to would be compromised, particularly car parks.

The inclusion of Denburn Road in the LEZ area was also considered a disadvantage by many given that it offers a potential opportunity to avoid the main city centre shopping area (*The downside is that the inclusion of the Denburn Road creates an obstacle for drivers seeking to avoid entering an LEZ*).



Option 1A - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)

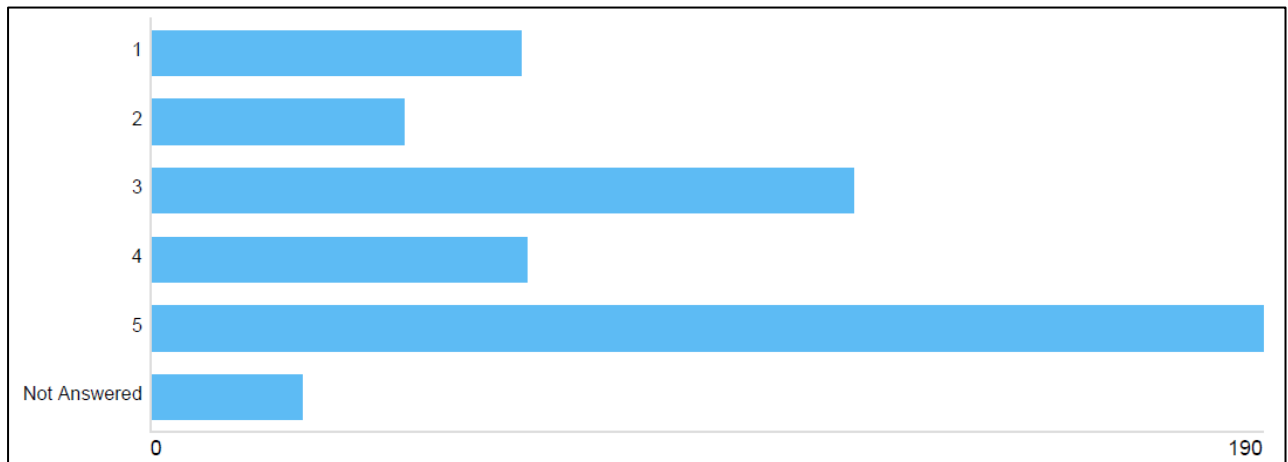


Figure 8: Option 1A Impact

50.2% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 37.6% anticipating a very negative impact), and 21.1% (options 1 and 2) believe this would have a positive impact (with 12.5% anticipating a very positive impact). 23.7% selected option 3, suggesting they anticipated no impacts or a neutral impact.

In terms of those suggesting this option would have negative impacts, a number of these related to personal difficulties or inconveniences likely to arise, such as having to purchase a new car (*i am a low paid keyworker with a 2003 car which i cannot afford to replace*), problems accessing places they want or need to be (*I would no longer be able to get to union square; This option limits my access to my place of work*), including the need to take longer circuitous routes (*Will have to have large lengthy diversion to access family*). Concerns about the impacts on disabled travellers arose again (*As a disabled pensioner who relies on my car to reach shopping in town with an older car it would appear if I move from my home in the Bridge of Don I will have to pay*).

Similar to responses to the other questions, impact on businesses and the city centre was cited as a key issue with many respondents stating that proposals would drive them to shop and spend time elsewhere (*I will no longer use Aberdeen for shopping*) and/or not visit the city centre (*People will continue to shop on line and this could increase if people cannot use their own cars, being footfall and revenue spent in the shops in the town will fall further*). Again, concern was raised that traffic and emissions would simply be displaced elsewhere.

Those anticipating a positive impact cited less pollution and less city centre traffic as key reasons for their answer (*Better air quality is great for me personally, and I work on Union Street, where often the choice is to open the window for cooler air - but bad smells, pollution and noise - or keep the window closed and deal with stuffy air*), while many stated that they would be more likely to visit the city centre more often as a result (*I will be more likely to visit the city centre and spend time on the streets visiting shops, cafes etc*) or believed that the proposals would improve the city centre (*Make going into city centre a nice experience*).

In terms of those who stated this would have a neutral impact, this was largely because respondents' vehicles would already be compliant (*Should not impact me as I believe my cars are above the minimum standards required to enter LEZ*); they don't tend to travel through the area by car anyway (*I rarely visit this area of the city centre*); or could see reasonable alternatives (*It won't make much difference, I would just have to avoid the Denburn*).

### *Option 1B – Advantages*

Given the similarities of this option to Option 1A, many respondents merely referred to their previous comments when providing comments on this option (this was the case throughout the survey, with many respondents merely referring to previous comments as they worked their way through the options). Likewise, some respondents merely provided the same comments for all of the options.

Again, many saw no benefits to this option, either because they oppose the concept of a LEZ or they felt that this option is too limited in scope.

The main benefit raised by respondents was that this option, unlike Option 1A, allows access along the Denburn corridor, keeping a city centre through-route open for all vehicles and reducing potential impacts elsewhere (*This allows cars that are not compliant to still have through access. Not having Denburn and Guild St included means that surrounding roads that aren't in the LEZ and can't handle larger amounts of traffic will not be negatively impacted by the introduction of the LEZ; Leaving a north-south corridor close to the city centre open seems a highly practical option which could reduce the stress on many motorists who do not wish to engage in great detours around the city centre in order to head north or south. It links very well with South College Street, which is a route many people coming into Aberdeen from the south may wish to take*). There is a sense that this improves accessibility to key destinations, such as Union Square and the railway station, compared to Option 1A.

Respondents also noted that it was a clear and logical area (*Relatively easily demarcated, less chance of confusion*), while some welcomed the fact that it was a small zone that could still have a big impact on emissions, while reducing negative impacts on businesses, or which could act as a stepping stone to development of a larger zone in the future (*Although this option only covers a limited area it could form a core LEZ which will have scope for expansion into adjacent areas at a later date*). Again, respondents noted that this was likely to be the easiest option to implement but could still bring benefits.

### *Option 1B – Disadvantages*

Similar to Option 1A many respondents saw this option as too limited to have any real impact (*too small an area to make a difference*) and noted that key exceedance locations were not covered by this option (*Market Street was recorded to have one of the highest levels of air pollution in the city. I think that taking these roads out of zone would mean no changes to the air quality over this whole area*). In contrast to some of the comments in the previous section welcoming the exclusion of Denburn Road, some respondents to this question queried the impact of this or suggested this undermined the concept of a LEZ (*Whats the point in having a major road polluting through the centre of a low emission zone; Allowing non-compliant vehicles to use Denburn Road and Guild Street would undermine the whole intent behind introducing a low emission zone. Air pollution in these areas affects Union Street, and would continue to damage the health of those who live and work there. This is an unacceptable option in my opinion*). There was also a concern that this would make Denburn Road and Guild Street much busier. Similar to the responses to previous questions, other potential disadvantages noted included: impact on businesses and the city centre; potential for traffic and emissions to be displaced elsewhere, to more sensitive areas; impacts on the disabled and less affluent; and personal inconvenience, in terms of it being harder to access a particular destination.

*Option 1B - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)*

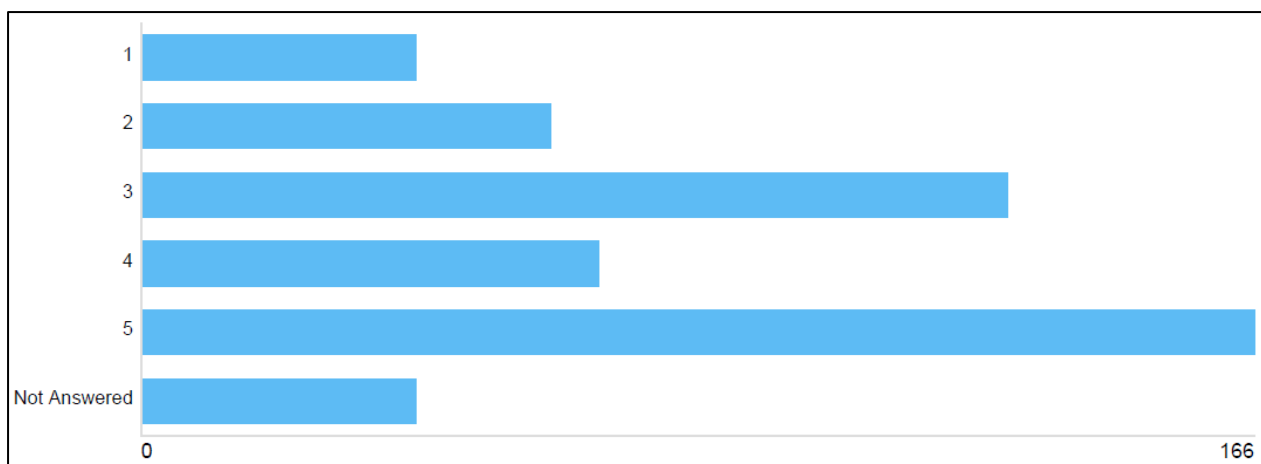


Figure 9: Option 1B Impact

46.3% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 32.8% anticipating a very negative impact), and 20.2% (options 1 and 2) believe this would have a positive impact (with 8.1% anticipating a very positive impact). 25.5% selected option 3, suggesting they anticipated no impacts or a neutral impact.

In common with the responses to the previous option, those anticipating a positive impact cited the anticipated health benefits of cleaner air.

In terms of those suggesting this option would have negative impacts, comments again related to: negative impacts on businesses; people choosing to avoid the city centre as a result; impacts on current travel habits and accessibility of certain destinations; concerns about the cost of upgrading vehicles; concerns that the option is not enough to improve pollution and health; and the potential for traffic to increase on adjacent routes, potentially causing problems elsewhere.

On the subject of the exclusion of the Denburn Road / Guild Street corridor from the LEZ, opinion was split between those welcoming the fact that this would still allow a route through the city centre (*Provides better options for passing through the city centre*) and those questioning whether this would simply make this corridor more unpleasant than it already is (*Walking along Guild Street is bad enough now. It would not be improved by having traffic which couldn't use Union Street added to it*).

In terms of those who stated this would have a neutral impact, again this was on the basis of already having a compliant vehicle or not frequenting the areas under consideration.

#### Option 2A – Advantages

Many saw no advantages to this option, noting that it does not address any additional sites of air quality exceedances beyond options 1A and 1B.

Many welcome the increase in scope of the LEZ beyond Option 1A/1B, noting that this would bring even greater air quality improvements (*The larger the exclusion area the better for our environment*). Many welcomed the extension into wider shopping and residential areas, with particular benefits for George Street (*This is great, as it begins to take in a far greater area of residential and mixed use buildings. It could also help to make George Street a more desirable shopping street, after years of neglect; Still easy to implement but covers the high density built environment better by including the George Street area*). Some respondents noted that the zone was clear (*Easily demarcated*) and allowed for easy re-routing of non-compliant vehicles (*The main 'circular' routes are still available. So vehicles can avoid entering the LEZ more easily*).

### Option 2A – Disadvantages

A number of respondents did not see any disadvantages with this option.

One of the key disadvantages noted in relation to this option was that it is not large enough to fully address the problem, and some key areas of emissions are excluded (*However, historic hot spots for pollution are not included in the road. West North Street and King Street in particular have had persistent air quality issues. Aberdeen's Low Emission Zone must, at least include areas where we know air pollution is worst in the city*). Some felt that the LEZ does not go far enough in addressing the root cause of problems (*We need to deter people from bring their cars into the centre of cities completely, not just cause minor inconvenience*).

Conversely, many comments were received that this option is too large, further restricts access to key destinations (*This includes lots of the city centre parking*) and encompasses large residential areas (*More residential areas now covered, reducing transport options for many more people*). Many recognised that it does not encompass any more exceedance locations than the first option (*There are currently no significant air quality issues in the George St area or additional proposed area from option 1 so, from an air quality perspective, I can't see the benefit of this option above option 1 so the additional impacts may be to little benefit*).

Given that this option, compared to Option 1, extends into significant residential areas in and around George Street, the impacts on residents who may be forced to purchase a compliant vehicle (*personal ownership of vehicles that are not compliant would be an issue for residents in the area*) was raised as a concern. Again it was suggested that proposals disproportionately impact the less well-off and those with disabilities. The additional businesses that this option would encompass, especially smaller local businesses in the area was likewise a concern (*I think this would have a very detrimental effect on businesses in George Street which is already really suffering*).

Similar to the responses to other questions, negative impacts on the economy and the city centre were raised, as was concern about the potential displacement of congestion and emissions, and a recognition that LEZ needs supporting active travel and public transport improvements to be successful.

*Option 2A - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)*

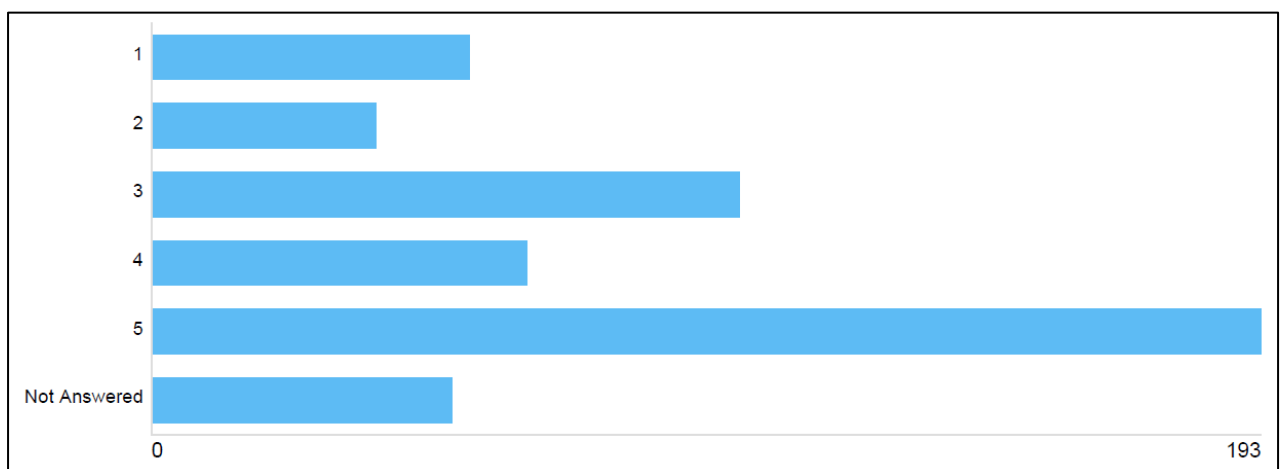


Figure 10: Option 2A Impact

51.0% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 38.1% anticipating a very negative impact) and 18.6% (options 1 and 2) believe this would have a positive impact (with 10.9% anticipating a very positive impact). 20.2% selected option 3, suggesting they anticipated no impact or a neutral impact.

As with previous questions, positive impacts were anticipated in terms of cleaner air and a healthier environment.

Those neutral on the option again stated that they tended not to use these streets or already had a compliant vehicle.

In terms of negative impacts, the same issues occur again as in previous comments:

- economic impact, especially with the extension into the George Street area;
- respondents stating that they would avoid using the city centre;
- concerns about the displacement of traffic and emissions, with particular concerns that traffic will be moved to narrow, residential streets that are not able to cope with this increase (*Increased flow of Non LEZ compliant cars on Westburn Drive, Argyll Place and Craigie Loanings*);
- a greater impact on residents now the boundary extends into the George Street area (*I live on Maberly St and this zone would mean I would need to buy a new car (which I can't currently afford due to Covid!) to be able to access my own home and parking space by car*); and
- restrictions on the ability of people and businesses to access the city centre.

#### *Option 2B - Advantages*

The main advantage identified for this option, compared to 2A, was that the Denburn Road / Guild Street corridor remains open for all vehicles. People welcomed a north-south route through the city centre being maintained as well as full accessibility to key destinations such as the rail station.

Other advantages cited were again the air quality and health benefits, and the fact that this option covers a sizeable area (*My preferred option. The zone is reasonably big so will have a good impact on air quality. There are good alternatives for people to circumnavigate the zone without adding to congestion and defeating the purpose of the zone. The zone covers some popular parking and shopping areas which will encourage both businesses and the public to use lower emission vehicles.*)

Again, a number of respondents stated that there are no advantages to this options, largely on the basis that they object to LEZs in any form.

#### *Option 2B – Disadvantages*

Again, many respondents saw no disadvantages with this option.

While many respondents commented that the scope of the zone was a disadvantage, this was split between:

- those who thought the area too extensive (*Much too large an area*), takes in a large residential area (*Too much of George St residential area covered*), and restricts access to a number of city centre car parks; and
- those who stated that the area is not extensive enough (*Too small - minimal effect*) and misses key pollution hotspots (*It doesn't cover all areas where there is a problem, so again seems pointless*).

The exclusion of Denburn Road and Guild Street was also noted as a disadvantage by a number of respondents (*This will reduce the potential for behavioural change by maintaining routing for polluting vehicles; allowing car fumes into the middle of the LEZ, thus negating much of its effectiveness*).

A number of respondents thought that this option was potentially confusing to drivers (*Seems like the shape will be confusing for motorists to remember where is covered*).

As with previous questions, respondents again expressed concerns about:

- impacts on businesses and the city centre;
- negative impacts on accessibility for the less affluent and mobility impaired;
- displaced traffic and emissions, especially along the Berryden corridor.

*Option 2B - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)*

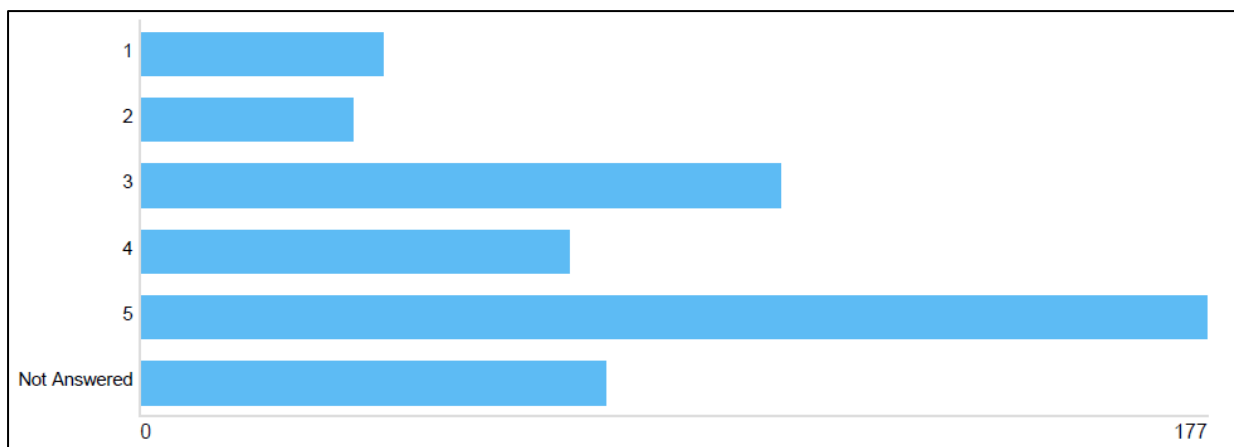


Figure 11: Option 2B Impact

49.0% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 35.0% anticipating a very negative impact), and 14.8% (options 1 and 2) believe this would have a positive impact (with 7.9% anticipating a very positive impact). 21.0% selected option 3, suggesting they anticipated no impact or a neutral impact.

Again, positive impacts on air quality and health were anticipated.

In terms of those who felt the impact would be neutral, this tended to be because they did not frequent the area or already have a compliant vehicle.

In terms of negative impacts these again tended to be around: the need to buy a new car; impacts on regular journeys; impacts on business operations (*It would severely impact me being able to run my business as I only travel to my clients by car due to the nature of my business and the heavy, fragile equipment that I use*); impact on local businesses and the city centre; and the potential to increase congestion and emissions elsewhere, especially Berryden.

### Option 3A - Advantages

Aside from cleaner air, the main advantages of this option identified by the responses were in relation to its scope in terms of

- it covering a wider area than previous options (*LEZ now covers more area, which is great, the bigger the area the better; The wider the perimeter of the zone the better - lets get these*

*vehicles off our roads for the sake of our environment*) and additional air quality exceedance locations, such as King Street and Market Street;

- Alignment with the City Centre Masterplan area (*Great idea to match the master plan area - gives a good succinct vision for the future: Uses an existing defined area*); and
- Maintaining full accessibility to key destinations such as Union Square, the Harbour and the beach.

Many respondents stated that they saw no advantages to this option, presumably as they do not agree with the concept of LEZs at all.

### *Option 3A – Disadvantages*

The main disadvantage identified was in relation to this option covering too large an area and a perception that this will be extremely disruptive, in terms of requiring lengthy detours to key destinations (*Bigger area means it gets more and more difficult for commuters to get from one side of the LEZ to the other. This coupled with all the one way systems we have because of COVID-19, can cause total chaos*), or making such destinations inaccessible to non-compliant vehicles, particularly the main shopping centres and their car parks (*I guess that all of union square will end up inside the LEZ. Preventing me from ever visiting there again*), the rail and bus stations, the beach, the harbour area and ferry terminal (*This will completely devastate trade associated with the harbour and will also have an extremely detrimental impact on trade and travel for the Orkney and Shetland islands*).

A number of respondents expressed concern that more and more main roads are included in this option, such as King Street and West North Street, and the number of routes available to non-compliant vehicles is much reduced (*not enough alternative routes*). Concerns were again expressed about the displacement of traffic and emissions, especially to residential West End streets and to the beach area. Displacement of heavy goods vehicles (HGVs) emerges as a particular concern, especially as options starts to impact on the accessibility of the harbour.

Conversely a number of comments were received that the LEZ is still not large enough (*Still not a big enough area to really make the emission reductions needed*) and still doesn't encompass heavily polluted areas such as the whole of Market Street (*In my view if an LEZ is going to be introduced (which I strongly believe it should) it should cover as much ground as possible. Given the work that goes into setting up an LEZ it seems a wasted opportunity to leave untouched Market Street South. Furthermore, it seems to me that people who feel inconvenienced by the LEZ are more likely to accept this if they can see that it is actually tackling the problem that Aberdeen has with poor air quality (whether through first hand experience or through scientific analyses following the implementation)*).

The potential for confusion amongst drivers was again noted, as was the need for supporting measures in order for a LEZ to be successful particularly improved public transport offering and improved opportunities for switching to electric vehicles.

Again, comments were received in terms of the economic impacts, especially on the harbour, and personal impacts in terms of the cost of new vehicles, impacts on the disabled, less affluent and rural communities, and difficulties accessing workplaces and other key destinations.

*Option 3A - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)*

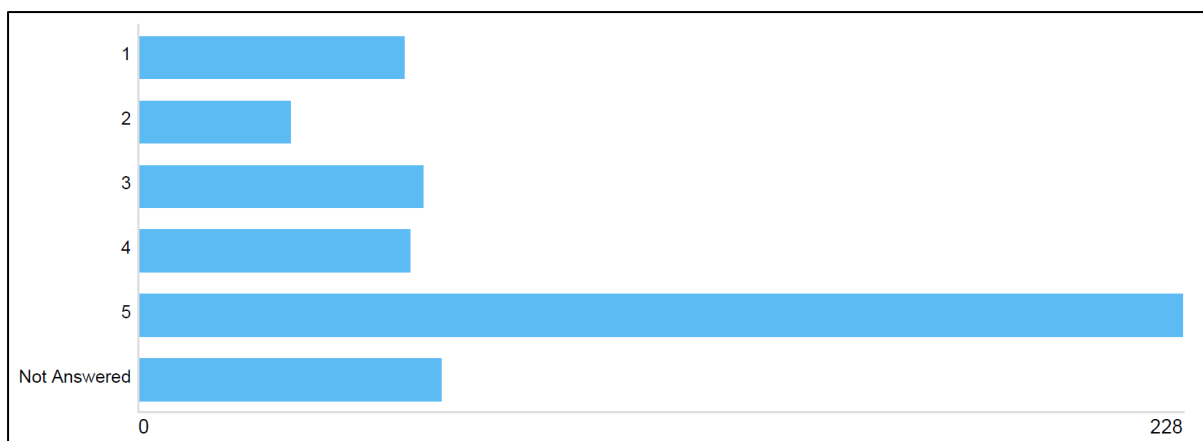


Figure 12: Option 3A Impact

56.7% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 45.1% anticipating a very negative impact), and 18.0% (options 1 and 2) believe this would have a positive impact (with 11.5% anticipating a very positive impact). 12.3% selected option 3, suggesting they anticipated no impact or a neutral impact.

Again, positive impacts were anticipated in terms of cleaner air and public health, and negative impacts in terms of accessibility of key destinations and longer journey times; cost implications of purchasing a new vehicle; impacts on businesses, especially those around the Harbour; and confusion for people trying to get round the area. Again there were contrasting comments around this option being too large or too small.

#### Option 3B – Advantages

The main advantage identified for this option was its contrast to option 3A, in terms of the Denburn corridor remaining open to all vehicles. Many respondents welcomed that this still offered a north-south route through the area for non-compliant vehicles which could soften some of the negative impacts of the LEZ (*Not closing off the north-south corridor of Denburn Road could help the city centre economically and with regard to future development. It also eases the stress on motorists by maintaining a route north and south close to centre, avoiding major detours of the centre*). Some also commented that keeping the corridor open maintained accessibility to key destinations such as the station and Union Square. At the other end of the spectrum, many felt that this corridor should be included (*I can't really see why exempting Guild St & Denburn would be advantageous*). In contrast, some mentioned the scope of this option as one of its advantages, noting that it covers a wider area and many exceedance locations (*A large area that would benefit many people living in it*).

Again, many respondents commented that there were no advantages to this option.

#### Option 3B – Disadvantages

Respondents were split between those who felt that the scope is too big, encroaching onto residential areas and limiting car parking opportunities for non-compliant vehicles, and those who felt it was too small and excluded key pollution hotspots.

The exclusion of Denburn Road and Guild Street was noted as a disadvantage as much as an advantage, with respondents feeling that such an exclusion undermined the whole LEZ (*The exclusion of Denburn Road and Guild Street doesn't make sense. To be effective, the zone should cover a large area, and be clear to all road users. These exclusions would undermine the zone's effectiveness, and*



would lead to higher traffic of non-compliant vehicles around the edge of the zone; Guild Street is the first street which bus and rail passengers leaving the station on foot meet - therefore high emission vehicles on this street aren't desirable).

Similar to the responses to previous questions, comments were received in relation to: displacement of traffic and emissions to sensitive, residential areas; impacts on the less affluent and disabled; impacts on personal journeys and accessibility; and the economic impacts especially as these options start to impact upon access to the harbour (*We are concerned that access to the port from northern and western approaches will be impeded by this option. Re-routing freight unnecessarily via a southern approach to the port unnecessarily increases journey distances and time, and potentially creates congestion and increased emissions. This option should be dropped*).

*Option 3B - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)*

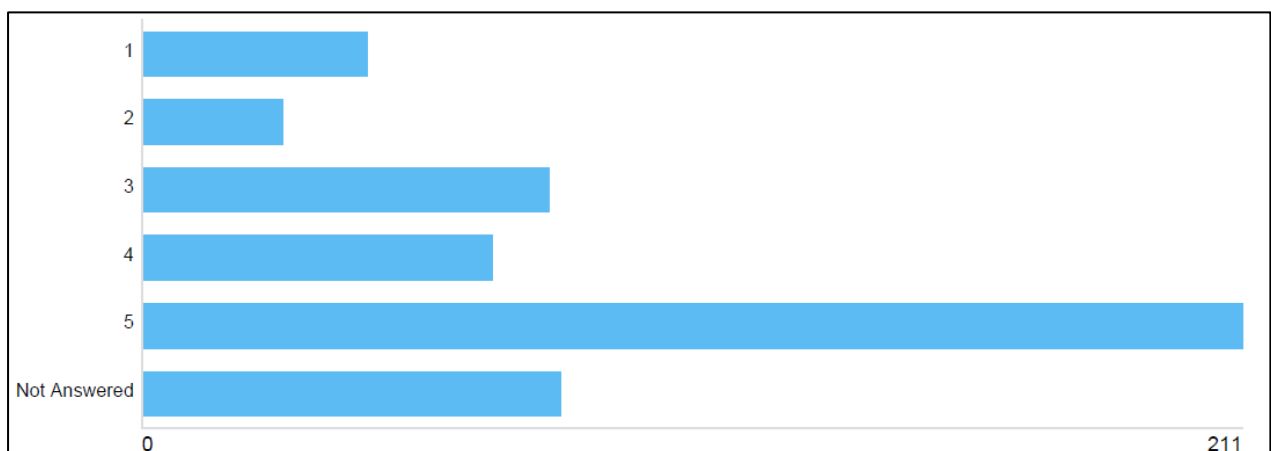


Figure 13: Option 3B Impact

54.9% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 41.7% anticipating a very negative impact) and 13.8% (options 1 and 2) believe this would have a positive impact (with 8.5% anticipating a very positive impact). 15.4% selected option 3, suggesting they anticipated no impact or a neutral impact.

Comments on this question follow similar themes to previous comments in terms of: air and health benefits; accessibility of homes, workplaces and other destinations; impacts on businesses and the city centre economy, especially in terms of maintaining full access to the Harbour; and displacement effects.

#### Option 4A – Advantages

The main advantage cited of this option by respondents was its size and scope compared to other options. There was significant support for this as the largest option under consideration, and the one which addresses all city centre pollution exceedances (*It gives the greatest area of relief from the toxic levels of pollution. As this covers the largest area it would make the most positive impact. I think that maybe the largest area would see less non compliant vehicles travel by the edges. This is the best option. You should do it. It would be a good thing for Aberdeen to do for the environment*), with many stating in the text that this is their preferred option (*This is the best option, and is really ambitious*).

It was noted that this option could result in additional benefits, not just an improvement in air quality (*This is a comprehensive option, covering many of the ongoing hotspots for air pollution problems in*

*Aberdeen. It is large enough to lead to the changes we need to see - modal shift in the city centre, fleet turnover, lower overall traffic levels. It would reduce air pollution, leading to public health benefits for the city. It could also have an impact on reducing climate emissions, and making the city centre a better place to spend time for residents, workers, and visitors), although it was noted that the benefits would be maximised with the concurrent delivery of complementary measures (There is a great opportunity for Aberdeen City Council to introduce this zone, as outlined in Option 4A, alongside a range of other travel measures, such as active travel infrastructure, pavement widening, bus gates, and pedestrianisation).*

At the other end of the spectrum, a number of respondents saw no advantages of this option.

#### *Option 4A – Disadvantages*

A number of respondents felt the LEZ is still not big enough, with some commenting that the north-west of the city centre is still not captured.

Conversely, a number of comments that this option is too big, noting that many residential areas are covered and that access to key destinations such as city centre car parks, the harbour and the beach will be affected for non-compliant vehicles (*Could make the whole city centre inaccessible for certain people*). Some respondents suggested that, while this option may be too large as a first step, it could be something to work towards in the future.

Again, negative impacts on the city centre economy and local businesses are anticipated and concerns increase in proportion with the increasing scale of the options. This is certainly the case now that Option 4 impacts all routes around Aberdeen Harbour (*This will destroy commerce associated with the harbour; The inclusion of Aberdeen Harbour and Union Square could prove challenging in terms of compliance from the freight sector and bus operators*).

Likewise, concerns about the displacement of vehicles and emissions increase as the scope of options increase (*The expansion of the area covered means that the issues identified in my earlier responses would be exacerbated. It would shunt a third of vehicles, or thereabouts, to other streets nearby. It would also mean that those vehicles were corralled into the Denburn car park, with no access to Loch St or Harriet St. I cannot help thinking that this would concentrate fumes there, as well as making it more difficult for any segment of society less able to afford a new vehicle to access the town centre; Displaced traffic (and potentially a lot more of it) would be pushed further out into residential streets - the St Swithin St/Ashley Rd, Willowbank areas are not suited to lots of traffic. Bridge of Dee is a potential bottleneck*).

Similar personal disadvantages were foreseen as previous sections (cost, accessibility of key destinations, impacts on mobility impaired and less affluent) as well as a suggestion that this might be confusing for users to navigate.

An additional key theme emerging from this option is the impact on those travelling to Aberdeen via ferry from the islands (*It will mean people coming from Shetland or Orkney via the ferry will be immediately be impacted by the LEZ. The islands tend to have older vehicles and as such may not be within the exclusion list and so people who are already significantly disadvantaged by the cost of ferry and air transport will now be hit once more*).

A number of respondents stated that there were no disadvantages with this option or felt that the benefits outweighed the disadvantages (*This option would cause the greatest inconvenience to road*

users and businesses. However when dealing with a serious issue such as air pollution we have to be willing to accept inconvenience and adapt).

*Option 4A - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)*

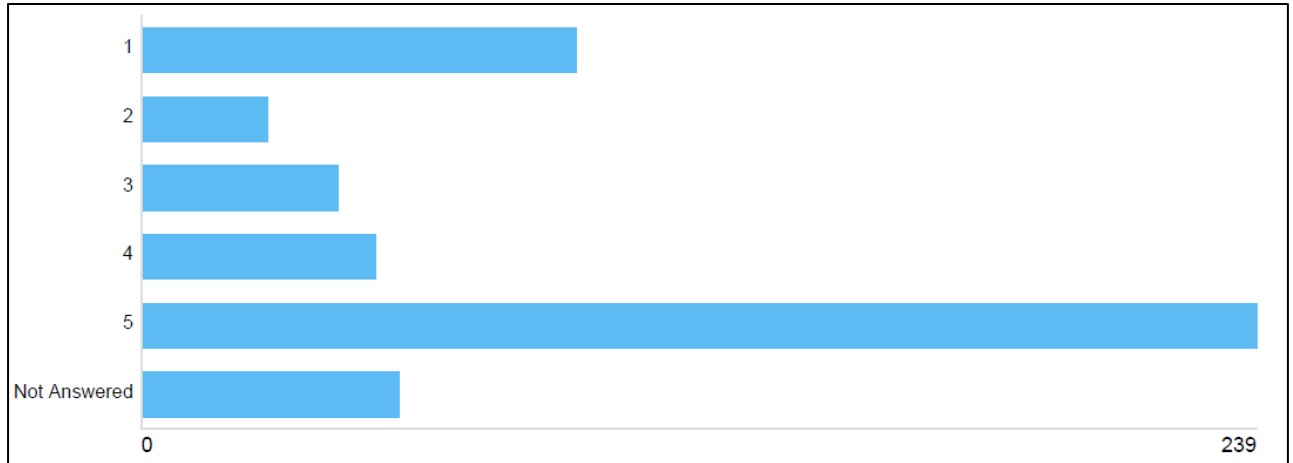


Figure 14: Option 4A Impact

57.1% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 47.2% anticipating a very negative impact) and 23.7% (options 1 and 2) believe this would have a positive impact (with 18.3% anticipating a very positive impact). 8.3% selected option 3, suggesting they anticipated no impact or a neutral impact.

Again, similar impacts were identified as had been for the other options (in terms of economic impacts, displacement and personal disadvantages, although, commensurate with the scale of this option, additional positive impacts were noted such as this potentially acting as a catalyst for wider improvements in terms of economic regeneration (*A pleasant city centre environ will attract businesses back into the heart of the city*) and reduced traffic volumes.

#### *Option 4B – Advantages*

The main advantage identified was in comparison with 4A, in terms of respondents welcoming that this option allows access through the city centre for non-compliant vehicles via the Denburn (*fairer to allow some older vehicles a route through the city centre*) and maintains full accessibility to key destinations such as the station.

Again, many respondents welcome the scope and size of this option, recognising that this will bring the greatest air quality benefits, although many expressed a preference for Option 4A on the grounds that its scope is even greater.

Many respondents see no advantages with this option.

#### *Option 4B – Disadvantages*

Similar to the responses to other 'B' options, the exclusion of Denburn Road and Guild Street from the LEZ is seen as a major disadvantage, potentially undermining any benefits of the LEZ. Again, there was a split in opinion in terms of this option being considered too big by some and too small by others. Again, displacement, business and economy impacts and personal impacts were noted.

Some people saw no disadvantages of this option.

*Option 4B - How do you think this option will impact on you either individually or as a business, on a scale of 1-5 (where 1 means a very positive impact and 5 a very negative impact?)*

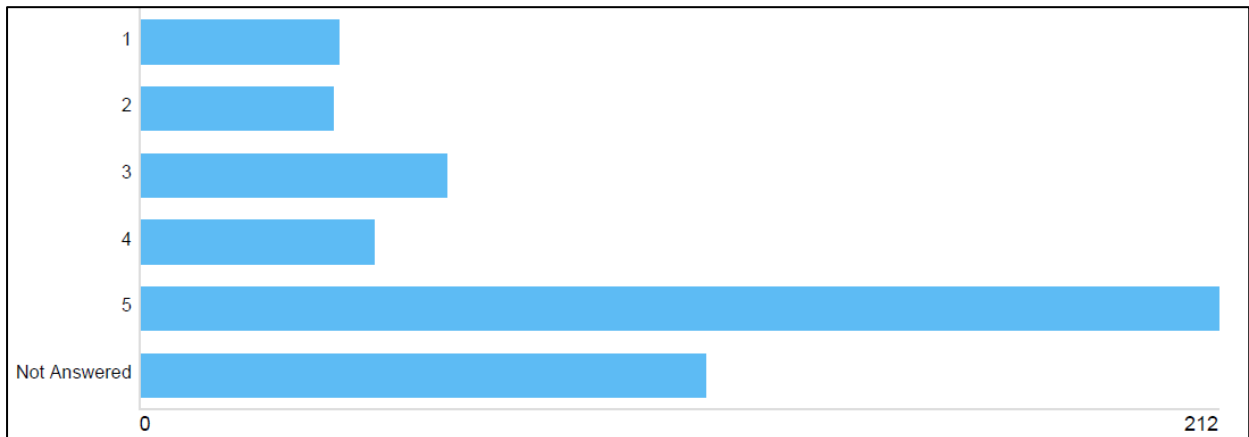


Figure 15: Option 4B Impact

51.0% (combining those selecting options 4 and 5) of respondents believed this would have a negative impact (with 41.9% anticipating a very negative impact) and 15.2% (options 1 and 2) believe this would have a positive impact (with 7.7% anticipating a very positive impact). 11.9% selected option 3, suggesting they anticipated no impact or a neutral impact.

The main impacts noted were again around the economy, displacement and personal disadvantages.

## 2.6 Option Ranking

Having considered all the LEZ options and their potential impacts, respondents were asked to rank them in order of preference (where 1 was the most preferred option and 8 the least preferred option).

Considering the options identified by respondents as their preferred option (given a rating of 1), there is a clear preference for the options at the extreme ends of the scale, with Option 4A receiving the most preferred option votes overall.

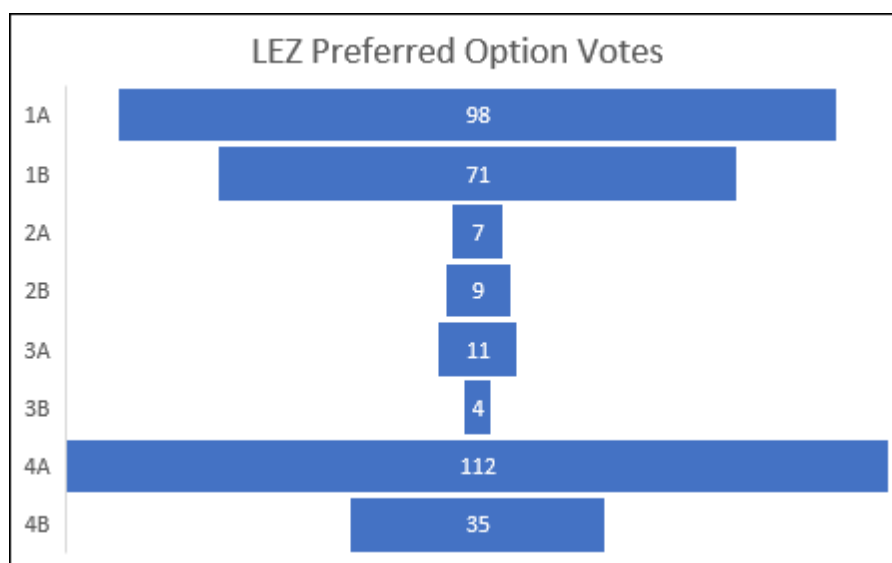


Figure 16: Preferred Option Votes

Combining all the rankings for each of the options, the smallest option, 1A, emerges as the most popular option overall, with 4B the least popular. Looking at the rankings as a whole, there is a general preference for the smaller options (with 1A, 1B and 2A being the top 3 options), while those options excluding the Denburn and Guild Street areas from the LEZ were less well received, with 2B, 3B and 4B being the least acceptable options.



Figure 17: Combined Option Rankings

## 2.7 Grace Periods

Respondents were asked what they thought were appropriate grace periods for residents and non-residents. The maximum allowable grace periods were the most popular although there is significant support for the minimum grace period, especially for non-residents.

Length of Grace Period (Residents)	% of respondents selecting this as preferred option
1 year	19.2%
2 years	10.5%
3 years	8.5%
4 years	4.7%
5 years	7.1%
6 years	45.1%

Table 1: Preferred Grace Periods (Residents)

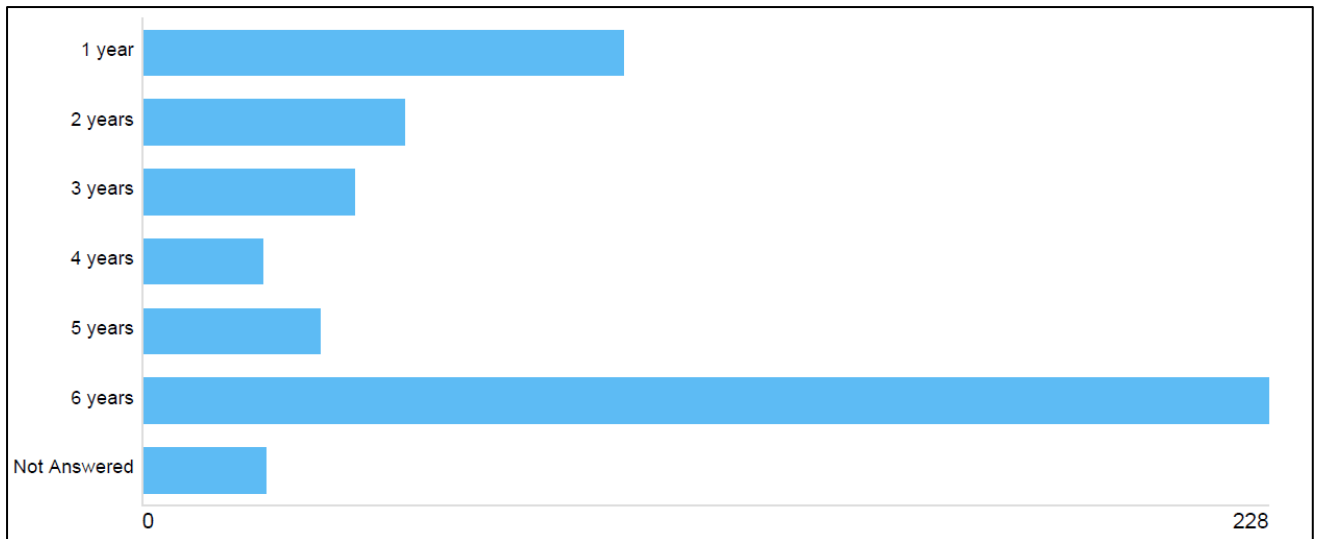


Figure 18: Preferred Grace Periods (Residents)

Length of Grace Period (Non - residents)	% of respondents selecting this as preferred option
1 year	34.4%
2 years	6.52%
3 years	6.32%
4 years	47.8%

Table 2: Preferred Grace Periods (Non-Residents)

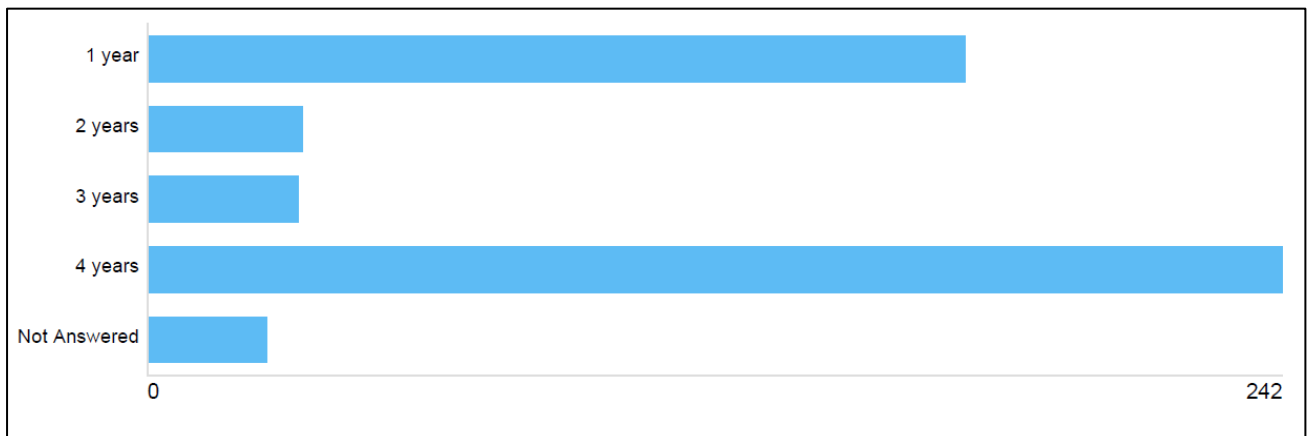


Table 19: Preferred Grace Periods (Non-Residents)

## 2.8 Additional Comments

The final question in the survey was an open question, allowing respondents to make any final points about LEZs and the options presented.

Some people used this section to express their opposition to a LEZ, saying it is not required or that the Council and Government should be using resources elsewhere. Many questioned whether the impacts of the opening of the AWPR and COVID are being factored into considerations, and whether the impacts of an operational harbour in the city centre are being taken into account.

A number of suggestions were provided for what the Council could do to improve air quality as an alternative to a LEZ:

- Improving road layouts and traffic management;

- Improving the public transport offering;
- Pedestrianisation;
- Improving the cleanliness of the bus fleet;
- Public transport and active travel improvements;
- Incentivising fleet improvement rather than restricting access;
- Increasing 20pmh zones; and
- Discouraging through traffic.

In terms of those in favour of LEZ, comments were received stating that plans should be rolled out as quickly as possible and extended even further with some calling for the Council to be even more ambitious, but with a reiteration that the LEZ must be easily understood by the general public.

A strong theme to emerge in the responses to this question was that a LEZ must not be delivered in isolation but must be supported by complementary measures to ensure it achieves its objectives and maximises the benefits. Measures identified include:

- Improving the public transport offering and park and ride opportunities;
- Improving active travel routes;
- Increasing car parking opportunities around the zone;
- Increasing electric vehicle charging opportunities;
- Improving roads around the zone;
- Working with businesses to further improve the city centre; and
- Financial support for vehicle upgrades.

Again, similar comments about the economic impacts, personal impacts and displacement were received in relation to this question.

A number of comments were received in relation to grace periods with a split between those favouring the minimum (*Grace periods should be as short as possible to drive reductions in carbon emissions as radically as possible. The nation has declared a climate emergency, we need to act like it*) and maximum (*If plans that include the George St area is introduced (as well as any LEZ's that include a larger residential area), a significant grace period will be needed for residents in those areas. The coronavirus situation has negatively impacted the livelihoods of many people in Aberdeen and it's unfair on residents who might not be able to afford a new car just now, or for a couple of years due to job loss or lost income*).

### **3 Email Responses**

Email or letter responses were received from the following:

- Aberdeen Cycle Forum;
- Aberdeen Friends of the Earth;
- Enterprise Holdings;
- Federation of Small Businesses;
- Hammerson;
- Logistics UK;
- NHS Grampian Public Health Directorate;
- RAC Motoring Services Ltd.
- Robert Gordons College;
- UPS;
- A group of MSPs representing the Orkney and Shetland islands;
- One individual.

The main points raised by email respondents match closely those raised within the online survey. These include:

- The need for a LEZ to be integrated with other improvements, such as general traffic reduction measures, an improved sustainable transport offering and Mobility as a Service (MaaS);
- Concerns about the economic implications, particularly for city centre businesses;
- Concerns about the accessibility of key sites for non-compliant vehicles;
- Concerns about the impact on those travelling to Aberdeen from Orkney and Shetland who have no option but to arrive and depart from the ferry terminal;
- Concerns about the displacement of traffic and emissions;
- Concerns that the impacts of AWPR and COVID are not reflected in the modelling undertaken to date;
- Concerns that the impacts of shipping emissions are not being considered;
- A split between those who feel that proposals do not go far enough in scope and ambition, and those who believe the LEZ should be as small as possible.

#### 4 Summary of Key Themes

Clearly, while a lot of support for LEZs has been expressed in the questionnaire and email responses, many respondents have quite negative attitudes to the introduction of a LEZ in Aberdeen, or at the very least have valid concerns that they would like to see addressed as the option appraisal process continues. These concerns are summarised in the table below, along with some information about how the Council and partners are addressing these as we move towards the identification of a preferred LEZ option.

Area of Concern	Response
The impacts of the opening of the AWPR on traffic has not been considered	<p>The air quality modelling undertaken to date used 2018 air quality data as this was the most up to date information available at the time. Interim 2019 data suggested little change in air quality in the city centre following opening of the AWPR therefore this approach was considered valid at the time.</p> <p>A new City Centre Paramics traffic model has recently been developed to predict the traffic and air quality implications of the LEZ options, and this is a 2019 model, based on traffic counts undertaken after the opening of the AWPR. It is the outputs from this model that will be used to predict the future impacts of the different LEZ scenarios as we continue through the appraisal process.</p>
The impacts of COVID-19 on travel habits and patterns have not been considered	<p>There is considerable uncertainty over the long-term impacts of COVID-19 on future transport and traffic behaviours and Transport Scotland and all the LEZ cities recognise that this must be addressed as we progress through the LEZ assessment and development process.</p> <p>Work has been commissioned by Transport Scotland on behalf of the LEZ cities to identify plausible future scenarios for a post-COVID world, and this is currently underway. The likelihood and potential impacts of these various scenarios will be considered, and a judgement made as to whether or not any change in approach to LEZ planning is required as a result.</p>



<p>The impacts of the Spaces for People measures have not been considered</p>	<p>The models can only include infrastructure changes that are committed to be permanently in place by the anticipated LEZ opening year. The Spaces for People measures are temporary changes in response to the COVID-19 pandemic and there is no commitment to make these permanent, therefore they do not form part of the modelling considerations. Should any new permanent road changes be introduced in the proposed LEZ area, these will be factored into the modelling.</p>
<p>Concerns that a LEZ will move traffic, congestion and emissions elsewhere</p>	<p>Clearly, this would be contrary to the aims and objectives of the LEZ therefore the likely impacts of non-compliant vehicles re-routing to avoid the LEZ will be modelled within the traffic model and the outcomes of this will feed into the option appraisal process. It is unlikely that an option that results in significant volumes of traffic moving to inappropriate roads outside the LEZ will perform well in subsequent stages of the appraisal. In cases where some displacement is anticipated to occur, the model will help determine what form of mitigation (in the form of traffic management measures) will be required to ensure the majority of traffic remains on appropriate streets.</p>
<p>Concerns about the scope of the LEZ options in terms of size and vehicles encompassed</p>	<p>LEZ options focus on the city centre as this is where air quality exceedances are largely concentrated.</p> <p>Various LEZ options were considered at the outset of the option appraisal process but were sifted out on numerous grounds including public and stakeholder acceptability. In order to be acceptable and stand up to scrutiny when proposals are presented to Elected Members and Scottish Ministers, the LEZ must be proportionate to the scale of the problem and look to achieve immediate air quality objectives without incurring significant negative impacts on the city (especially in areas where air pollution is currently within accepted limits) and its people and businesses.</p> <p>The current city centre options are of various sizes and scopes so that we can understand the impacts of the different options on city centre residents, businesses and other users.</p> <p>It has not yet been determined which classes of vehicles will be included or excluded from Aberdeen's LEZ. This will be informed by ongoing traffic and air quality modelling.</p> <p>The LEZ ultimately recommended for implementation will be that which best meets air quality (and wider) objectives, while minimising negative impacts.</p>
<p>Differences in opinion between the inclusion / exclusion of Denburn Road and Guild Street</p>	<p>The Council accepts that there will be different advantages and disadvantages of each approach and this is clearly reflected in the consultation findings. As well as the consultation responses, the decision on which option to implement will be informed by the traffic and air quality modelling which will enable a better understanding of the likely traffic and air quality impacts of each of the options.</p>
<p>Implications on the less affluent members of society who may have difficulty changing transport mode or</p>	<p>Support is available from Transport Scotland for households and small businesses within a 20km radius of a planned LEZ. The LEZ Support Fund will financially support eligible households on specific means-tested benefits, with a grant to move away from</p>

<p>purchasing a compliant vehicle.</p>	<p>older petrol and diesel vehicles. Further information is available from <a href="#">the Energy Saving Trust</a>.</p> <p>Furthermore, the Legislation requires grace periods between the declaration of a LEZ and enforcement commencing to allow residents and businesses sufficient time to consider how they can best comply with a LEZ.</p>
<p>Concerns over the impacts on the city centre economy and local businesses</p>	<p>See above in terms of support available to small businesses and the requirement for grace periods before LEZ enforcement will commence.</p> <p>The Council believes a less polluted city centre will result in a more pleasant and attractive environment for people and businesses and, if accompanied by complementary transport improvements (see below), can act as a catalyst for more people visiting and spending time in the city centre. Evidence from similar schemes elsewhere in the world show that such changes can be delivered to the benefit of the city centre economy, rather to its detriment. The majority of businesses responding to the consultation supported the principle of a LEZ, provided it is delivered in the correct way - ongoing dialogue with businesses will be required as the LEZ moves to design and delivery. An Economic Impact Assessment will be undertaken if deemed necessary.</p>
<p>The need for complementary measures to support a LEZ</p>	<p>The Council agrees that a LEZ delivered in isolation will be insufficient to address all transport and air quality concerns in the city centre. We see the LEZ as one piece of a much wider transport jigsaw and recognise that various other measures are required to achieve the city centre transformation we aspire to, including: continued delivery of City Centre Masterplan and Sustainable Urban Mobility Plan projects to devote more space to walking, cycling and public transport in the centre; implementation of the revised Roads Hierarchy, particularly enhanced active travel and bus priority on radial corridors to and from the city centre; continued expansion of the Aberdeen Car Club; delivery of the Hydrogen Strategy and further deployment of hydrogen buses on our streets; and continued roll out of electric vehicle charging infrastructure,</p>
<p>Implications on accessibility of the city centre for disabled travellers</p>	<p>A possible exemption from LEZs for blue badge holders is being considered at national level and was consulted upon by Transport Scotland as part of the emerging LEZ Regulations and Guidance. An Equalities Impact Assessment will be undertaken prior to the delivery of the LEZ.</p>
<p>Implications on the accessibility of key destinations for all users</p>	<p>Please see the above in terms of complementary measures to improve accessibility to the city centre for non-car and low-emission forms of transport, the support available for people and businesses to switch to compliant vehicles or alternative modes, and grace periods.</p> <p>Clearly the different sizes of options will have varying impacts and these will be taken account of as we continue through the option appraisal process.</p> <p>The vast majority of private cars will be LEZ compliant in any case (around 70% in 2019) and accessibility for these users will not be compromised.</p>

<p>Emissions from the Harbour are not included within the analysis</p>	<p>Harbour emissions have been included in the air quality modelling. The results show that nitrogen oxides (NOx) originating from shipping makes a small contribution to total NOx with road traffic and background sources making much larger contributions. Therefore, whilst emissions from shipping do contribute to existing exceedances in the city centre, and to the total regional emissions, they are localised and for roads that are remote from the harbour the contribution from shipping is negligible. Therefore, it is considered that road traffic is the main source of emissions and should remain the focus for air quality improvements in the future. Generally the impacts from shipping are less than 5% of the total ambient nitrogen dioxide (NO<sub>2</sub>) concentration.</p>
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## 5 Next Steps

As mentioned in section 4, the various LEZ options are now being tested in the transport and air quality models to better understand the likely traffic and air quality impacts of each. This will also take account of the outcomes of the COVID-19 scenario testing.

Assuming the current approach to LEZ planning is still considered valid, the outcomes of the consultation exercise will be combined with the modelling outputs to inform completion of the National Low Emission Framework (NLEF) Stage 2 Appraisal which is anticipated to culminate in a preferred LEZ option. This will be reported to Elected Members in spring/summer 2021, and thereafter the LEZ will undergo detailed design and further engagement.

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### SUMMARY TABLE

<b>Client</b>	Aberdeen City Council
<b>Project</b>	Aberdeen Low Emission Zone
<b>Title of Document</b>	Notes on Stakeholder Workshops
<b>Date</b>	27/10/2020
<b>Reference number</b>	GB01T19I15/071020
<b>Number of pages</b>	5

## 1. INTRODUCTION

- 1.1.1 SYSTRA has been commissioned by Aberdeen City Council (ACC) to provide support with stakeholder engagement activities for its Low Emission Zone (LEZ) proposals, which has primarily involved engaging virtually with a range of key stakeholder groups. In parallel to the stakeholder consultation, ACC is leading an online public consultation exercise.
- 1.1.2 This note provides a summary of the activities undertaken and the key questions and themes emerging from the stakeholder engagement.
- 1.1.3 SYSTRA organised seven virtual stakeholder workshops in October 2020, held using Microsoft Teams. A summary of the workshop groups and number of attendees is provided in Table 1.1.

**Table 1.1 : Aberdeen LEZ Stakeholder Workshops – October 2020**

Workshop Group	Date	Number of Attendees
Taxi & Private Hire Consultation Group	07/10/2020	11
Community Council	07/10/2020	5
Business Community (1)	13/10/2020	0
Business Community (2)	13/10/2020	0
Freight & Aberdeen Harbour	14/10/2020	6
Environmental, Health & Equalities Groups	15/10/2020	5
Bus & Coach Operators	21/10/2020	7
<b>Total No. of Stakeholders Consulted:</b>		<b>34</b>

- 1.1.4 As shown in the summary table, no stakeholders from the business community attended either workshop, despite several attempts to contact business groups and their members. This is perhaps understandable given the current impact the Covid-19 pandemic is having on businesses. The Federation of Small Businesses (FSB) circulated the invite to their members and did offer to attend themselves, but with no other attendees the session was cancelled and the FSB provided feedback through the online consultation survey. It should

be noted that there will be further opportunities for businesses in Aberdeen to take part in engagement workshops as the plans for Aberdeen's LEZ develop.

- 1.1.5 At all stakeholder workshops, SYSTRA gave a 20-minute presentation on current air quality issues in Aberdeen, the problems that a LEZ will try to address and the emerging LEZ options.

## **2. NOTES FROM THE STAKEHOLDER WORKSHOPS**

### **2.1 Taxi and Private Hire Consultation Group 07/10/20**

- 2.1.1 SYSTRA presented to 11 attendees including representatives from the taxi trade, taxi licensing, Police Scotland, council fleet and enforcement officers and elected council members.

- 2.1.2 After the presentation, the group chair opened for questions and comments, as summarised below.

- A general point was made that a taxi can be no older than 10 years old in order to hold a taxi license in the city. This would mean from 2025, all taxis will be registered vehicles from 2015 onwards, the introduction date of the Euro 6 diesel cars.
- Will the LEZ be delivered with complementary measures such as bus/taxi/cycle gates or traffic calming measures?
- Will there be exemptions for events such as, for example, Armed Forces Day on Union Street?
- Concern was expressed that older people are likely to have older vehicles and some of the larger options cover residential areas making it difficult to escape punishment for living in the LEZ area.
- Concern was expressed that introducing and/or expanding a LEZ area will push air quality issues and other problems (e.g. traffic congestion) elsewhere.
- With city centre traffic volumes changing in the last few months, how is the LEZ development addressing changes from Covid-19?
- What is the penalty charge and could those that use LEZ area most get passes (e.g. taxis)?
- Will plant traffic (e.g. diggers/tractors/road maintenance) be exempt as specialist vehicles?

### **2.2 Community Council Meeting 07/10/20**

- 2.2.1 A joint session was organised and was attended by five representatives from George Street, Rosemount and Mile-end and Castlehill & Pittodrie Community Councils.

- 2.2.2 After the initial SYSTRA presentation, there were a number of queries and comments, as summarised below.

- The community groups were supportive of a LEZ in principle with a specific point made that they were pleased to be engaged with at this stage and welcomed being involved in some part of shaping the LEZ. One representative wanted to thank the Council for involving them.
- After viewing the proposed option areas, it was noted there are a number of schools (and other sensitive areas) surrounding the proposed LEZ areas. There has to be certainty that introducing a LEZ doesn't move the problems elsewhere, particularly past these sensitive areas.
- Have emissions from the harbour been taken into account in the analysis?

- Are there exceptions for mobility buses and/or blue disability badges.
- Why is Option 2 needed – including George Street and surrounding areas – what is the benefit as there are no additional exceedances in this area?
- Concern was expressed of the impact on equality from the introduction of the LEZ, will it adversely impact those less well off?

## **2.3 Freight Meeting 14/10/20**

2.3.1 The session was attended by six members of the freight & road haulage community and Aberdeen Harbour.

2.3.2 After the presentation, the meeting was opened to questions and comments, as summarised below.

- A general view was expressed that a LEZ is coming and hauliers will have to deal with it accordingly. The biggest impact on hauliers (and all drivers) would be Options 3 and 4, with the inclusion of Market Street and the Eastern Route and Aberdeen Harbour access.
- It was noted that the maximum age of HGVs on the road is (generally) 7/8 years old. After this time, vehicles become too expensive to maintain and operate. There followed a discussion that by 2022, when the LEZ will (likely) be declared, 7 years takes you back to 2015 and the introduction of Euro VI standard. It is therefore likely that the vast majority of HGVs on the network will be compliant by 2022 and certainly the case a few years thereafter. Any non-compliant vehicles would likely then be strategically withdrawn from LEZ areas and re-deployed (if needed) to non LEZ areas.
- Have emissions from the harbour been taken into account in the analysis?
- Aberdeen Harbour is supportive of the LEZ measures and explained they are also progressing their own initiatives to improve air quality inside the harbour premises. They noted that it will be important to maintain access but echoed the view that 2022 should allow time for the majority of vehicles to be compliant.
- Concern was raised that if all vehicles are compliant (as will happen eventually), there might still be exceedances. Would the LEZ become ineffectual and would additional measures need to be introduced?

## **2.4 Environmental, Health and Equalities Groups 15/10/20**

2.4.1 There were six attendees at this session from Friends of the Earth, Aberdeen Cycle Forum, Asthma UK and British Lung Foundation Partnership, plus one freight operator (missed freight meeting).

2.4.2 After the initial SYSTRA presentation, there were a number of comments and questions, as summarised below.

- All representatives were supportive of a LEZ in Aberdeen with FoE stating a preference for Option 4A (as recorded in online survey).
- Why is the north west area of the city centre not included (e.g. Rosemount and Gilcomston)?
- What further modelling is being undertaken, is this the same as other cities and if not, is Aberdeen behind?
- Concerns were raised that if Skene Square is not included then non-compliant vehicles will be drawn to this route..
- Option 2, expanding to include the George Street area, does not include any further exceedances, why is it an option?

- In addition to Option 2 not including any further exceedances, it was noted that George Street area has high volume of social housing. What would be in place to support people living here? This led to wider discussion about grace periods and the balance of enforcing a LEZ and not adversely impacting those unable to adapt.
- Why is there no mention of Particulates in the presentation?
- What other engagement has happened to date and are there plans for further engagement?
- How will the LEZ be enforced?
- From the freight operator, it was noted that the AWPR is the main route that they utilise from Aberdeenshire to locations throughout the country. It was also noted that their fleet is predominately Euro VI so at the moment there are no major concerns about LEZ enforcement in 2022 (or thereafter with grace periods).

## **2.5 Bus Operators 21/10/20**

2.5.1 The meeting was attended by representatives from First, Stagecoach and CPT. The invite was extended to Bains Coaches (who were unable to attend) and to the wider coach industry (through CPT).

2.5.2 A key point made by CPT and echoed by all operators who are utilising the Scottish Government Covid-19 support grants that run until mid-January. The grants cover the cost of running a certain level of service but the operators cannot make profit. It is very uncertain what the future holds. Additional funding will help cover costs thereafter but it cannot last indefinitely. In addition, coach operators (i.e. non-timetabled) are not receiving any financial help and many vehicles bought recently (Euro VI complaint) are on finance and will likely be repossessed if no help materialises/customers do not return. The issue is very live and clarity is needed for all. For all bus and coach operators, investment cannot currently be made and therefore fleet improvements have stopped. At the moment, operators will not have the ability to improve fleets to ensure all buses LEZ complaint by 2022. There must be a collective understanding (from Council/Transport Scotland/Ministers) of the difficulties faced by the industry and while supportive of a LEZ in principle, operators should not be forced to take action they simply cannot afford at present.

2.5.3 There were also a number of comments and questions, as summarised below.

- What will term “resident” mean when defining grace periods? Could it be used for a business with premises outside the LEZ area but which serves it regularly and/or provides a valuable service for its residents?
- Glasgow has/had a stepped approach to introducing 100% compliance, can this be done in Aberdeen?
- Concern was expressed that a number of the proposed areas skirt current congested locations on the network and it must be ensured that a LEZ does not make traffic conditions worse for buses. Is this being taken into account?

## **2.6 Key themes from engagement**

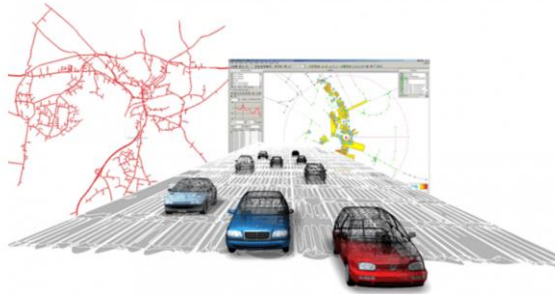
2.6.1 At each workshop session, several questions and themes were consistently discussed and similar points were made:

- No stakeholder expressed views against the LEZ. Some stakeholders made the point of expressing support for a LEZ while others stated they were accepting that a LEZ was to be introduced; the LEZ option development process and eight options seemed reasonable at this stage.



- The LEZ should not create problems elsewhere in the city. Whether this is new air quality exceedances or increased congestion. If required, the LEZ should be delivered with complementary measures to ensure this does not happen.
- Grace periods, particularly for residents of the LEZ and those on a lower income/income support, should be as long as possible.
- Exemptions are needed for certain vehicles (mobility vehicles, vintage vehicles etc.)
- Bus and coach operators are in a very difficult financial position due to the impact of Covid-19 and will not be able to ensure all vehicles meet LEZ standards if current level of income continues. There is a need for a collective understanding of the difficulties faced by the industry when deciding on the date and impact of the implementation and enforcement of the LEZ.
- The majority of HGVs will be compliant by 2022, 7/8 year cycle on vehicles (i.e. based on 7 years from 2015 (Euro VI introduction)).

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## LEZ OPTION TESTING REPORT



# SYSTRA

# ABERDEEN LEZ MODEL TESTING

## LEZ OPTION TESTING REPORT

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## 1. INTRODUCTION

### 1.1 Study Brief

- 1.1.1 SYSTRA Ltd (SYSTRA) was commissioned by Aberdeen City Council in August 2019 for professional services to develop a microsimulation model of Aberdeen City Centre to assess road network options associated with the development of a Low Emission Zone (LEZ) in Aberdeen.
- 1.1.2 This technical note outlines the development and model testing of LEZ model scenarios, as defined by ACC and in conjunction with the Aberdeen *National Low Emission Framework – Interim Stage 2 Assessment Report* (SYSTRA, Ref: GB01T19I15/281119, 01/06/20).

### 1.2 Background

- 1.2.1 The initial Base Model development is detailed in the report '*Aberdeen City Centre Paramics Model Upgrade 2019*' (SYSTRA Ref: GB01T19F42/2, 13/10/2020) and the development of the 2024 Reference Case Model, from which the LEZ scenarios have been assessed, is detailed in the report '*Aberdeen City Centre: Future Year (2024) Model Development Report*' (SYSTRA, Ref: GB01T20D62/1, 18/12/20).
- 1.2.2 For the purposes of this report, the 2024 future year Aberdeen City Centre traffic model, which all testing will be undertaken, will be deemed the '*ACCPM24*'.

### 1.3 Purpose of Report

- 1.3.1 This report provides the traffic model testing of LEZ options for Aberdeen and considers these scenarios in combination with other committed proposals for Aberdeen to provide a package of measures which will meet the objectives of the LEZ and wider Council objectives for Aberdeen City Centre.

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## 2. MODEL DEVELOPMENT OF LEZ SCENARIOS

### 2.1 2024 Reference Case Model (ACCPM24)

- 2.1.1 The development and operational assessment of the LEZ options was to be undertaken using the ACCPM24. This future reference case model scenario includes all committed infrastructure and development content due to be completed by 2024.
- 2.1.2 ASAM14 was utilised to provide the strategic impact of the future committed developments and infrastructure proposals on the ACCPM24 network. This includes planning data from the TELMoS14 model and City and Shire Councils (reflecting the 2018 Strategic Development Plan).
- 2.1.3 A resultant uplift of **6 to 8%** over the 2019 traffic levels is included within the ACCPM24. This results in an approximate 20% increase in the number of queuing vehicles on average.
- 2.1.4 The prediction of a 6-8% traffic growth over 5 years is considered a ‘high growth’ in the context of Aberdeen City Centre. Historical future year growth predictions for Aberdeen included a 9% growth between 2012 and 2017, then reducing by 4% by 2023 due to the opening of the AWPR. In reality, the impact of the opening of the AWPR and the downturn in the oil industry between 2014-2018 resulted in an overall traffic network shrinkage compared to 2012.
- 2.1.5 High traffic growth predictions are developed from the aspirational development growth detailed in the local and regional development plans. They are effectively a worst case scenario in terms of the volume of traffic in the network.
- 2.1.6 The ACCPM24 therefore includes high traffic growth and fleet compliance improvements that were derived before the COVID-19 Pandemic. This is still a plausible future, but not the only one. Further consideration of plausible futures and uncertainty, in light of the COVID-19 pandemic is detailed in Chapter 9 of this report.

The ACCPM24 model includes between 6 and 8% traffic growth from the 2019 Base Model traffic levels.

### 2.2 Initial LEZ Options from NLEF Appraisal

- 2.2.1 The Interim NLEF Stage 2 Appraisal recommended that four LEZ boundary options be assessed through the traffic modelling. Within each of these options, a variant was also to be considered relating to Denburn Road and whether this corridor is included within the LEZ boundary or essentially runs outside the LEZ area.
- 2.2.2 The LEZ options are detailed as follows:
  - Option 1A – Union St Area, including Denburn Rd
  - Option 1B – Union St Area, excluding Denburn Rd
  - Option 2A – Union St & George St Area, including Denburn Rd
  - Option 2B – Union St & George St Area, excluding Denburn Rd
  - Option 3A – CCMP East, including Denburn Rd

- Option 3B – CCMP East, excluding Denburn Rd
- Option 4A – CCMP, including Denburn Rd
- Option 4B – CCMP, excluding Denburn Rd.

2.2.3 [Appendix A](#) shows the boundary associated with each of these eight LEZ options.

## 2.3 Strategic Assessment of LEZ Impact on City Centre

2.3.1 Prior to the detailed assessment of the eight LEZ boundary options in the ACCPM24, additional input was required from the higher tier strategic Aberdeen Sub Area Model (ASAM). The current ASAM14 (2014 Base) 2024 Reference Case Models have been used to identify any strategic impact of the LEZ proposals. This impact is then fed into the ACCPM24, to allow an operational assessment of the scheme options.

2.3.2 Whilst there are differences in the LEZ boundaries of the eight options, it is noted that the key strategic differences between the options is the inclusion of Denburn Rd within 4 options, and the inclusion of the West North St corridor within 4 options. From this, 3 scenarios were considered for assessment within ASAM as follows:

- Boundary A - Neither Denburn Rd or West North St with LEZ restriction (As per LEZ area 1B)
- Boundary B – West North St within LEZ restriction (As per LEZ area 3A)
- Boundary C – Denburn Rd & West North St within LEZ restriction (As per LEZ area 3B).

2.3.3 Within the three ASAM scenarios, it was assumed that all traffic originating or destinating within the LEZ would be compliant. The key output requirement from the ASAM scenario testing was to assess whether traffic would re-route away from the LEZ at a more strategic level, i.e. at route choice locations out-with the extents of the ACCPM24.

2.3.4 [Appendix B](#) provides a visual representation of the traffic flow differences between the ASAM LEZ Test Boundary A, B and C compared against the 2024 Reference Case.

2.3.5 The figures in **Appendix B** show that:

- for Boundary A there is little difference in strategic routing to the Reference Case
- For Boundary B there is an increase in traffic routing through Denburn Road and through Skene Square. There is also some rerouting out to Anderson Drive
- For Boundary C there is an increase in traffic routing along Anderson Drive but also through the area around the west end of Union Street and Ferryhill.

2.3.6 The trip matrices for the three ASAM LEZ scenarios were cordoned to the ACCPM24 model extent. The cordoned trip matrix totals for the three scenarios were almost identical to the 2024 Reference Case, suggesting that all the traffic diversion from the LEZ scheme was captured within the ACCPM24 cordon area.

2.3.7 The demand difference between each of the LEZ test scenarios and the Reference Case were applied to each of the ACCMP24 as follows:

Table 1. Correlation between ASAM LEZ scenarios and ACCPM24 LEZ scenarios

LEZ Test	Denburn Rd Restriction	West North St Restriction	ASAM Scenario
1A	Yes	No	Boundary A
1B	No	No	Boundary A
2A	Yes	No	Boundary A
2B	No	No	Boundary A
3A	Yes	Yes	Boundary C
3B	No	Yes	Boundary B
4A	Yes	Yes	Boundary C
4B	No	Yes	Boundary B

## 2.4 LEZ Assumptions For Microsimulation Modelling

- 2.4.1 Following discussions with ACC, Transport Scotland, and modelling teams from the other Scottish LEZ cities, a series of assumptions were made to allow modelling of the impact of an LEZ on the traffic network. Table 2 and Table 3 summarise the key considerations and the assumptions applied to each of the four cities, with a rationale provided for the Aberdeen LEZ modelling.

**Table 2. LEZ Modelling Assumptions (Part 1)**

Element	Detail	City					Comments relating to Aberdeen
		Edinburgh	Dundee	Glasgow	(Proposed)		
<b>Fleet Composition - Observed</b>	(Compliant / non compliant)	Derived by SEPA / ANPR Data	Derived by SEPA / ANPR Data	Derived by SEPA / ANPR Data	Derived by SEPA / ANPR Data	Detailed in Section 2.5	
<b>Fleet Composition - Opening Year</b>	Consideration of fleet composition change by opening year	Yes	No	Yes	Yes	Detailed in Section 2.5	
<b>Mode Shift Assumption</b>	Consideration of mode shift from vehicles to bus or cycle or taxi as a direct result of the LEZ implementation	None	None	None	None	Mode shift as a direct result of the implementation of a LEZ is difficult to quantify. The three other cities have assumed that no mode shift occurs so that a worst case scenario can be modelled, in terms of impact of traffic re-routing away from the LEZ and if there is potential for a new AQ exceedance to occur elsewhere.	
<b>LEZ adherence level</b>	Percentage of non-compliant vehicles that adhere to the LEZ restriction	100%	100%	100%	100%	Assume that all non-compliant vehicles do not cross LEZ boundary. Again, this allows the modelling of a worst case scenario	
<b>Traffic Routing Through LEZ</b>	Consideration of what vehicle types will require to divert away from the LEZ area	Buses	All compliant	All compliant	All compliant	All compliant	All buses to be compliant by full LEZ opening date (whether through TRC or not)
		HGVs	All non-compliant vehicles re-route	no through traffic	All non-compliant vehicles re-route	All non-compliant vehicles re-route	All non-compliant HGVs will re-route away from LEZ. Dundee LEZ has no through routing so this doesn't apply
		LGVs	All non-compliant vehicles re-route	no through traffic	All non-compliant vehicles re-route	All non-compliant vehicles re-route	All non-compliant LGVs will re-route away from LEZ. Dundee LEZ has no through routing so this doesn't apply
		Taxis	All non-compliant vehicles re-route	no through traffic	All non-compliant vehicles re-route	All non-compliant vehicles re-route	All non-compliant Taxi's will re-route away from LEZ. Dundee LEZ has no through routing so this doesn't apply. In Aberdeen Model, taxi's are modelled as a vehicle proportion of all cars, so not possible to separate them out anyway



**Table 3. LEZ Modelling Assumptions (Part 2)**

Element	Detail		Edinburgh	Dundee	Glasgow	Aberdeen (Proposed)	Comments relating to Aberdeen
<b>Traffic Originating / Destinating within LEZ</b>	Consideration that vehicles currently originating / destinating within the LEZ will divert to out with the LEZ	Cars	None	Yes - Car Park revised destination	None	Yes - Car Park revised destination	Glasgow & Edinburgh has taken the simplest approach for modelling. Dundee LEZ has no through routing traffic to consider, therefore gave more consideration to internal parking. Some non compliant traffic was assumed to move from CP within the LEZ to those just outside the LEZ. For the Aberdeen modelling, car park re-allocation was undertaken -Detailed in Section 2.6
		Buses	All compliant	All compliant	All compliant	All compliant	All buses to be compliant by full LEZ opening date (whether through TRC or not)
		HGV's	All compliant	All compliant	All compliant	All compliant	The assumption across all cities is that all HGV's destinating or originating within the LEZ area will have prior knowledge of the LEZ and either update the fleet accordingly or only utilise fleet vehicles that are compliant for this trip
		LGV's	All compliant	All compliant	All compliant	All compliant	The assumption across all cities is that all LGV's destinating or originating within the LEZ area will have prior knowledge of the LEZ and either update the fleet accordingly or only utilise fleet vehicles that are compliant for this trip. This is potentially an overestimation of fleet change for small business vans etc. However, if a business cannot access the LEZ due to their vehicle not being compliant, the likelihood is that another business would undertake this trip with a compliant vehicle.
		Taxi's	All compliant	All compliant	All compliant	All compliant	The assumption across all cities is that all taxis destinating or originating within the LEZ area will have prior knowledge of the LEZ and either update their vehicle accordingly or will be replaced by a taxi driver whose vehicle is compliant. Funding is available for taxi drivers to upgrade their vehicle
<b>LEZ Model Options</b>	No. of LEZ options brought forward for model testing		1	3	2	8	From NLEF process, there are 4 LEZ boundary options with a variation to Denburn Road in each option
<b>Total Model Test Options</b>			3 (2 variations in infrastructure)	3 - No infrastructure variation measures proposed	4 (includes 2 fleet projections: 2020 and 2023)	Multiple, including various CCMP measures considered	The inclusion of assessing the CCMP infrastructure phases together with the LEZ options creates a matrix of model test scenarios to consider. This is detailed in Chapter 4

## 2.5 Fleet Compliance

- 2.5.1 The future forecast of fleet composition was derived by SEPA using the 'Emission Factor Toolkit, Version 8' (EFT) for national fleet. This methodology for deriving the proportion of compliant and non-compliant vehicles (to a LEZ) was utilised by all four city studies. However, there is general consensus that this methodology may result an overestimation of the potential fleet compliance level by 2024.
- 2.5.2 To address this, for the Aberdeen LEZ modelling, the change in vehicle compliance predicted from the EFT was applied to actual local fleet compliance levels observed in 2019 through ANPR traffic surveys.
- 2.5.3 Table 4 shows the EFT fleet compliance changes between 2019 and 2024 and the application of this to the Aberdeen observed fleet.

**Table 4. Aberdeen Fleet Compliance Prediction to 2024**

Source	Emissions	Year	Car (%)	LGV (%)	HGV (%)
EFT National Data	Non Compliant	2019	24.6	43.68	24.6
EFT National Data	Compliant	2019	75.41	56.32	75.4
EFT National Data	Non Compliant	2024	8.14	14.09	4.9
EFT National Data	Compliant	2024	91.86	85.91	95.1
EFT National Data	Non Compliant % Change 2019-2024	-	-16.45	-29.59	-19.70
EFT National Data	Compliant Change % 2019-2024	-	16.45	29.59	19.70
ANPR 2019	Non Compliant	2019	30.3	59.8	27
	Compliant	2019	69.7	40.2	73
<b>Projected 2024</b>	<b>Non Compliant</b>	<b>2024</b>	<b>13.85</b>	<b>30.21</b>	<b>7.30</b>
	<b>Compliant</b>	<b>2024</b>	<b>86.15</b>	<b>69.79</b>	<b>92.70</b>

- 2.5.4 Table 4 shows that the EFT predicts a 16% increase in car compliance (to the LEZ adherence levels) by 2024. For Aberdeen, this equates to a compliance level of 86% from a 2019 level of 70%.

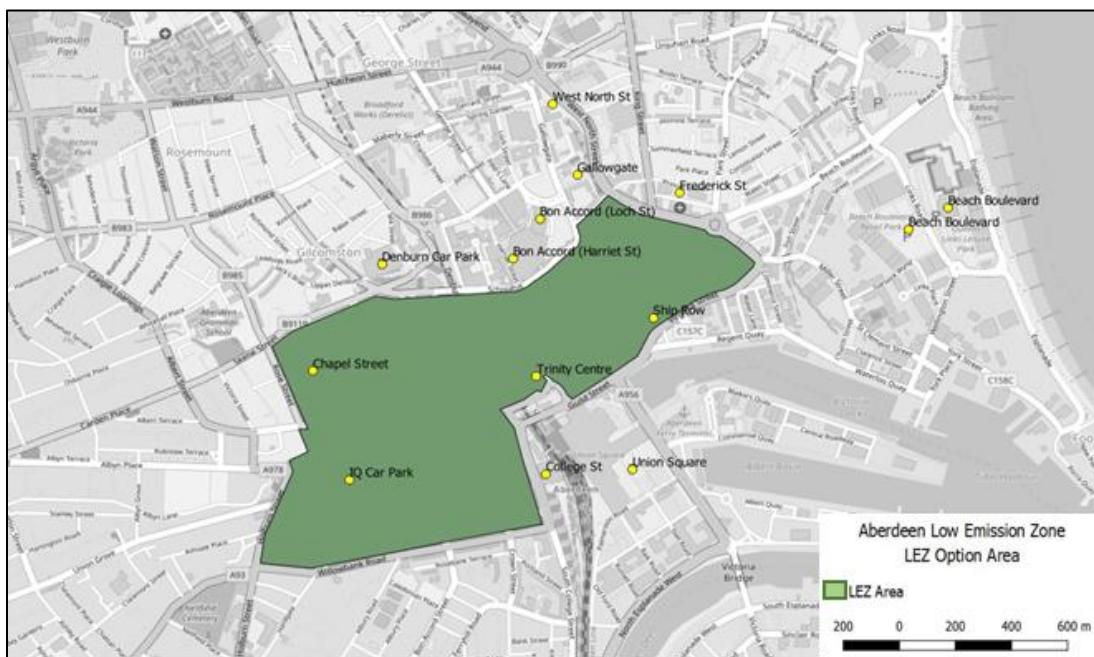
Vehicle compliance levels applied in the ACCPM24 include a 16% increase in Car compliance, 30% increase in LGV compliance, and 20% increase in HGV compliance between 2019 and 2024.

- 2.5.5 It should be noted that the above fleet prediction changes to 2024 is only one plausible outcome following the COVID-19 pandemic. Further consideration of plausible futures and uncertainty, in light of the COVID-19 pandemic is detailed in Chapter 9 of this report.

## 2.6 City Centre Car Parking within LEZ

- 2.6.1 The traffic modelling has also considered the impact to car parking for non-compliant vehicles under each LEZ boundary option.

- 2.6.2 Some city centre car parks will be within the proposed LEZ area. This will result in a likely relocation of non-compliant cars to car parks out-with the LEZ area. The scale of traffic relocation will be different for each LEZ boundary.
- 2.6.3 For example, LEZ Option 1B will include 3 City Centre Car Parks, namely Chapel Street, IQ (Hardgate), and Ship Row, as per Figure 1 (Note: Trinity Centre CP is still accessible for non-compliant vehicles when Denburn Rd is not in the LEZ).



**Figure 1. LEZ Option 1B / City Centre Car Parks**

- 2.6.4 As the scale of the LEZ boundary increases, the number of city centre car parks available for non-compliant vehicles reduces. Figure 2 shows the network coverage of LEZ Option 4A. In this case, only the Denburn Car Park is available for non-compliant vehicles.

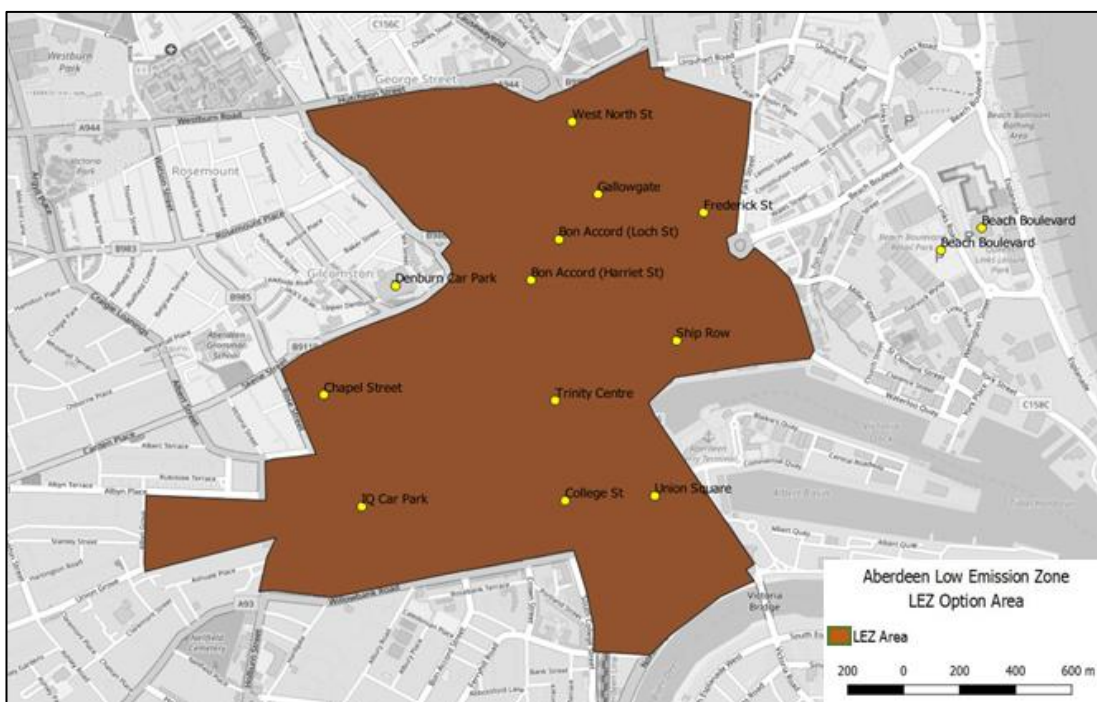


Figure 2. LEZ Option 4A / City Centre Car Parks

2.6.5 As observed in Figure 1 and Figure 2, the Beach Boulevard Retail Car Parks are highlighted. On advice from ACC, these private car parks were to be included within the relocation of non-compliant traffic, as a likely outcome of parking restrictions within the city centre may be that non-compliant vehicles park in these available free parking areas on the outskirts of the city centre.

2.6.6 Table 5 details the Car Park implications for non-compliant vehicles in each of the eight LEZ scenarios.

Table 5. Car Park Availability for Non-Compliant Vehicles

Reference	Name	Capacity	Max % full	1A	1B	2A	2B	3A	3B	4A	4B	
1	Chapel Street	500	55%	x	x	x	x	x	x	x	x	
2	Denburn	325	53%	✓	✓	✓	✓	✓	✓	✓	✓	
3	Bon Accord (Loch St)	990	61%	✓	✓	x	x	x	x	x	x	
4	Bon Accord (Harriet St)	400	66%	✓	✓	x	x	x	x	x	x	
5	College Street	456	68%	✓	✓	✓	✓	✓	✓	x	x	
6	Ship Row	365	30%	x	x	x	x	x	x	x	x	
7	Gallowgate	138	88%	✓	✓	x	x	x	x	x	x	
8	West North Street	160	69%	✓	✓	✓	✓	x	x	x	x	
9	Trinity Centre	397	63%	x	✓	x	✓	x	✓	x	✓	
10	Union Square	1200	61%	✓	✓	✓	✓	✓	✓	x	x	
11	IQ Car Park	260	64%	x	x	x	x	x	x	x	x	
12	Frederick Street	150	55%	✓	✓	✓	✓	✓	✓	x	x	
13	Beach Boulevard Retail Park / Esplanade	1900	49%	✓	✓	✓	✓	✓	✓	✓	✓	
No. of City Centre Car Parks available for Non Compliant Vehicles (Excl. Beach Boulevard)				12	8	9	5	6	4	5	1	2
Total spaces (Excl. Beach Boulevard)				5341	3819	4216	2291	2688	2131	2528	325	722
% of Total Spaces Available					72%	79%	43%	50%	40%	47%	6%	14%

x Car Park Available for Compliant Vehicles Only  
✓ Car Park Available for all Traffic

- 2.6.7 As the number of car parks available to non-compliant vehicles decreases, then the volume of traffic re-allocated to car parks on the outskirts of the city centre increases.
- 2.6.8 For Option 4A and 4B, the volume of traffic that would need to reallocate from the city centre area to the limited available off street car parks was deemed unreasonable and unworkable (by ACC). In this case, a proportion of the non-compliant car parking vehicles were re-assigned as compliant vehicles.
- 2.6.9 In Option 4a and 4B therefore, the percentage of non-compliant car park vehicles was re-adjusted until the total number of re-distributed non-compliant vehicles was similar to the other scenarios. Instead of an 86% car compliance level, this was increased to a 95% car compliance level for car parking traffic.
- 2.6.10 Table 6 summarises the volume of non-compliant traffic re-assigned from within the LEZ area in each scenario.

**Table 6. Volume of Non-Compliant Car Park Traffic Re-assigned from within LEZ**

Option	AM Period			IP Period			PM Period		
	To	From	Total	To	From	Total	To	From	Total
1A	99	9	108	108	106	214	76	198	274
1B	78	8	86	39	48	88	40	134	174
2A	185	25	211	276	285	561	165	421	587
2B	164	24	188	207	227	435	129	358	487
3A	198	30	228	290	304	594	184	457	641
3B	176	29	205	222	246	469	148	393	541
4A*	99	15	114	171	160	331	137	242	379
4B*	91	14	105	147	140	287	125	219	344

\* Cars assumed to be 95% compliant instead of 86% compliant

The Option 4 LEZ scenarios includes a higher proportion of compliant vehicles than the other options, to limit the volume of non-compliant vehicles seeking to park around the LEZ area. This is based upon the broad assumption that the very limited car parking options for non-compliant vehicles in this Option would encourage a higher uptake of vehicle compliance. [or “would result in less reallocation of parking trips with some replacement of non-compliant vehicles with compliant vehicles parking inside the proposed LEZ area assumed”.]

## 2.7 Traffic Signal Optimisation

- 2.7.1 Within each of the LEZ test models, it was necessary to review the timings of the signalised junctions to try to replicate the optimisation of signal phasing and timings that would occur within the real-time SCOOT system (Split Cycle Offset Optimisation Technique). This was a necessary modelling consideration to try to accommodate the changes in traffic demand and flow patterns around the city centre area arising from the application of each LEZ to the model network.

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### 3. LEZ OPTION ASSESSMENT

#### 3.1 Introduction

- 3.1.1 The primary criteria for the assessment of each LEZ test scenario was to identify the level of traffic demand that the model could run in each peak period. For example, if a model ran at 80% demand, then this suggests that there would need to be a 20% reduction in the 2024 traffic levels (or 13% reduction on 2019 levels) within the city centre to enable the network to operate without significant congestion and network instability.
- 3.1.2 In parallel with the demand level assessment, model flow plots have been collated which show geographically where traffic is displaced within each of the LEZ scenarios.
- 3.1.3 Locations where network congestion and capacity issues have been noted are also detailed in the following sections

#### 3.2 Model Network Demand

- 3.2.1 Table 7 shows the demand level that each LEZ test scenario was able to run at in each peak.

**Table 7. LEZ Options - Network Demand Level**

		LEZ Boundary Options							
Peak Period		1A	1B	2A	2B	3A	3B	4A	4B
AM		100%	100%	100%	100%	100%	100%	95%	95%
IP		100%	100%	100%	100%	100%	100%	100%	100%
PM		95%	100%	95%	80%	90%	95%	95%	95%

- 3.2.2 These high level test results suggest that the smaller cordon of LEZ Option 1B is the only scenario that can cater for the full forecast traffic demand levels in the ACCPM24. The results also suggest that the PM Peak is the critical peak period.
- 3.2.3 Further analysis of the PM Peak runs shows the number of model runs that gridlock in each scenario, (out of a total of 5 model runs).
- 3.2.4 Note: If the number of successful runs were at least 4 out of 5, this was deemed a successful run at that demand level.

**Table 8. LEZ Options – PM Peak Model Run Success Rate**

		LEZ Boundary Options							
Network Demand Level		1A	1B	2A	2B	3A	3B	4A	4B
100% Demand		3 of 5	4 of 5	1 of 5	0 of 5	0 of 5	0 of 5	1 of 5	3 of 5
95% Demand		5 of 5	5 of 5	4 of 5	0 of 5	2 of 5	5 of 5	5 of 5	4 of 5
90% Demand		-	-	-	1 of 5	5 of 5	-	-	-
85% Demand		-	-	-	0 of 5	-	-	-	-
80% Demand		-	-	-	5 of 5	-	-	-	-

- 3.2.5 Table 7 and Table 8 show that the LEZ boundary Option1B is the only clear option which could run at the full predicted 2024 traffic demand levels. Option 4B shows similar results, but this

option also has AM peak issues, and critically, includes different assumptions on the level of compliant vehicles in the network.

### 3.3 Model Flow Plots

- The model flow difference plots provided in [Appendix C](#) show the traffic flow differences between the ACCPM24 and the LEZ Test Scenario.
- Blue bars represent a decrease in traffic flows, Red bars represent an increase in traffic flows
- The results are presented for the PM Peak Period 16:00-19:00 as this is the critical operational period, as demonstrated above
- In addition, the black circles represent junctions or corridors in the model that display high levels of congestion and result in the model network failure at higher demand levels
- It is important to note that the model flow difference plots have been generated from model runs at the same demand level. For example, if the LEZ option runs at 95% demand, the flow plots have been compared against the ACCPM24 at 95% demand. This approach provides more clarity in the image to clearly show the locations where traffic has increased / decreased as a result of the LEZ. A reduced percentage demand level achieved by the LEZ scenario is still a primary consideration when reviewing these flow plots.

### 3.4 LEZ Options 1A to 4B – Results Summary

#### *Option 1A* ([link to Figure 1A](#))

- Model runs at 95% of predicted 2024 demand in the PM peak , but shows potential to be able to run at full demand
- Small LEZ area allows 8 of 12 City Centre Car Parks to still be available for non-compliant vehicles
- Small LEZ area has the least impact on residential properties within the LEZ boundary
- Congestion issues occur:
  - Harbour Route (West North Street) as non-compliant vehicles divert around the periphery of the LEZ area
  - West end of Union Street (LEZ periphery)
  - Argyll Place / Craigie Loanings corridor
- Some traffic increases conflict with network hierarchy proposals i.e. Willowbank Rd and Ferryhill area
- With the Denburn Link within the LEZ, this reduces the pressure on the Berryden Rd / Hutcheon St junction, compared with 1B
- Some re-routing shown around north and south routes along River Dee.

#### *Option 1B* ([link to Figure 1B](#))

- Model runs at 100% of predicted 2024 demand in all peaks
- Residential area coverage as per Option 1A
- Small LEZ area allows 9 of 12 City Centre Car Parks to still be available for non-compliant vehicles



- Congestion issues occur:
  - Harbour Route (West North Street) as non-compliant vehicle divert around the periphery of the LEZ area. This includes the junction of Guild Street / Market Street
  - Additional congestion around Mounthooly Roundabout and King St / Mounthooly Way, compared to Option1A
  - Some congestion around the north end of Berryden Rd (Powis Terrace junction) and at the 6 roads roundabout
  - Note: Denburn Road open to all traffic does not appear to help the network operation.

#### **Option 2A ([link to Figure 2A](#))**

- Model runs at 95% of predicted 2024 demand in the PM peak
- LEZ area extended through George Street area to Hutcheon Street, resulting in fewer Car Parks available for non-compliant traffic (5 of 12)
- LEZ area extension will impact on residential properties around the George Street Area
- Congestion issues occur:
  - Harbour Route (West North Street through Virginia St and Market Street) as non-compliant vehicles divert around the periphery of the LEZ area. This is more pronounced compared to Option 1A, potentially due to the additional volume of non-compliant vehicles routing to alternative car parks as well as the additional displacement from the George Street area
  - Powis Terrace and 6 Roads Roundabout as per Option 1A
  - Argyle Place / Craigie Loanings corridor
- Some traffic increases conflict with network hierarchy proposals i.e. Willowbank Rd and Ferryhill area
- With the Denburn Link within the LEZ, this reduces the pressure on the Berryden Rd / Hutcheon St junction, compared with 2B
- Overall, there are more congestion locations and a higher scale of congestion compared to Option 1, this is due to the larger LEZ area combined with more non-compliant traffic re-routing from Car Parks that are now within the LEZ.

#### **Option 2B ([link to Figure 2B](#))**

- Model runs at 80% of predicted 2024 demand in all peaks
- Residential area coverage as per Option 2A
- Mid-sized LEZ area allows 6 of 12 City Centre Car Parks to still be available for non-compliant vehicles
- Congestion issues occur:
  - Harbour Route (West North Street through Virginia St and Market Street) as non-compliant vehicles divert around the periphery of the LEZ area. This is more pronounced compared to Option 1B, potentially due to the additional volume of non-compliant vehicles routing to alternative car parks as well as the additional displacement from the George Street area
  - As Denburn Road is open to all traffic, this creates congestion issues further north at the Berryden Road / Hutcheon Street junction and Woolmanhill Roundabout

- Some traffic increases conflict with network hierarchy proposals i.e. Willowbank Rd, Ferryhill area, and Rosemount Place
- Overall, there are more congestion locations and a higher scale of congestion compared to Option 1, this is due to the larger LEZ area combined with more non-compliant traffic re-routing from Car Parks that are now within the LEZ.

### **Option 3A ([link to Figure 3A](#))**

- Model runs at 90% of predicted 2024 demand in the PM peak
- LEZ area extended through West North Street and the South end of King Street resulting in fewer Car Parks available for non-compliant traffic (4 of 12)
- LEZ area extension will impact on residential properties between West North Street and King Street
- Congestion issues occur:
  - Harbour Route (West North Street through Virginia St and Market Street). Even with the removal of non-compliant vehicles from this corridor, congestion issues remain in the network. It may be that mitigation to control the flow of traffic through this corridor is required in any LEZ option (e.g. the CCMP proposed mitigation for this location)
  - West end of Union Street (and wider to Skene St, St Swithen St etc) – this area becomes congested due to non-compliant traffic seeking a route north-south through the city centre as the harbour route and Denburn route is not available in this scenario
- Option 3 starting to show an increase in traffic routing away from the city centre completely (via Anderson Drive) as routing options become more limited
- The lack of car parking options within the city centre area for non-compliant vehicles results in more traffic routing around the city centre area.

### **Option 3B ([link to Figure 3B](#))**

- Model runs at 95% of predicted 2024 demand in the PM peak
- LEZ area extension will impact on residential properties around the George Street Area as per Option 3A
- Mid-sized LEZ area allows 5 of 12 City Centre Car Parks to still be available for non-compliant vehicles
- Congestion issues occur:
  - Harbour Route (West North Street through Virginia St and Market Street). Even with the removal of non-compliant vehicles from this corridor, congestion issues remain in the network. It may be that mitigation to control the flow of traffic through this corridor is required in any LEZ option (e.g. the CCMP proposed mitigation for this location)
  - As Denburn Road is open to all traffic, this creates congestion issues further north at the Berryden Road / Hutcheon Street junction and also Mounthooly Roundabout
- Some traffic increases conflict with network hierarchy proposals i.e. Willowbank Rd, Ferryhill area, Skene St, Cairncry Rd/ Back Hilton Rd etc.
- Overall, there are more congestion locations and a higher scale of congestion compared to Option 1, this is due to the larger LEZ area combined with more non-compliant traffic re-routing from Car Parks that are now within the LEZ.

#### **Option 4A ([Link to Figure 4A](#))**

- Model runs at 95% of predicted 2024 demand in the AM and PM peak
- LEZ area extended through Rail Station, Union Square, and the North Dee Quarter resulting very few car parks available for non-compliant traffic (1 of 12)
- LEZ area extension will impact on properties between Guild Street and North Esplanade West
- This scenario requires an assumption of a higher car compliance level compared to the other scenarios, due to the very limited parking available for non-compliant cars originating/destination in the city centre
- Congestion issues occur:
  - Some issues through the Harbour Route (Guild St / Market St and Mounthooly Rdbt)
  - Significant re-routing occurs through residential areas to the west of the city centre as non-compliant traffic routes around available corridors
- Option 4 also starting to show an increase in traffic routing away from the city centre completely (via Anderson Drive) as routing options become more limited
- The lack of car parking options within the city centre area for non-compliant vehicles results in more traffic routing around the city centre area
- A clear advantage of Option 4 over smaller LEZ options is the lesser impact on key junctions around the harbour route (West North St / Beach Boulevard).

#### **Option 4B ([Link to Figure 4B](#))**

- Model runs at 95% of predicted 2024 demand in the AM and PM peak
- LEZ area extension as per Option 4A
- Large LEZ area allows only 2 of 12 City Centre Car Parks to still be available for non-compliant vehicles
- This scenario requires an assumption of a higher car compliance level compared to the other scenarios, due to the very limited parking available for non-compliant cars originating/destination in the city centre
- Congestion issues occur:
  - Some issues through the Harbour Route (Guild St / Market St, West North St / Beach Boulevard Rdbt)
  - As Denburn Road is open to all traffic, this creates congestion issues further north at the Berryden Road / Hutcheon Street junction and Woolmanhill Rdbt
- Some traffic increases conflict with network hierarchy proposals i.e. Willowbank Rd, Ferryhill area, Skene St, Westburn Drive etc.
- Overall, the large LEZ area does not improve the congestion issues within the network. There are still some routing options through the city centre which carry all the non-compliant traffic, resulting in junction capacity issues through these corridors.

### **3.5 Conclusions to Initial LEZ Option Assessment**

- 3.5.1 From the traffic model testing, the model outputs show that increased traffic flows around the LEZ boundary contribute to the various congestion issues and network failure of the model.

3.5.2 Comparing the LEZ options, the results suggest that where the LEZ boundary encompasses sections of key routes through the city centre area, this has a positive impact on the levels of traffic and congestion in that specific area or further out along that arterial route. Examples of this include:

- Denburn Road (for Berryden/ Hutcheon St junction)
- Harbour Corridor (East North St/Commerce St/Virginia St/Trinity Quay).

3.5.3 This initially suggests that larger LEZ boundaries, which intersect more of these routes, will allow the network to operate. However, the larger proposed LEZ boundaries create additional issues for car parking availability as well as a higher impact on residents living within the LEZ area. In addition, the larger LEZ areas have so far not shown any network wide operational benefits over the smallest LEZ area\*.

\*Note: None of the tested LEZ scenarios restrict all arterials into/from the City Centre.

## 4. OPTION SIFTING

### 4.1 Introduction

4.1.1 From the initial four LEZ options (plus the Denburn Rd variant) derived through the NLEF appraisal process, model testing has shown congestion issues may occur to different degrees in the network, depending upon the scale and coverage of the LEZ boundary.

4.1.2 Consideration of the ability for the network to be able to operate is one of the key factors in filtering the LEZ options down to a preferred scenario. The key factors which have been considered as part of the option sifting process include:

- Network Demand Level & Congestion Areas
- Impact through Exceedance Locations
- Alignment with revised North East Scotland Roads Hierarchy
- Car Park Accessibility Impact
- Impact to residential properties within LEZ area.

4.1.3 This chapter details the rationale behind the option sifting process.

### 4.2 NO<sub>2</sub> Exceedance Locations

4.2.1 Nitrogen Dioxide (NO<sub>2</sub>) is released into the atmosphere when fuels are burned, for example petrol or diesel in car engines.

4.2.2 There is evidence that high levels of NO<sub>2</sub> can inflame the airways in our lungs and, over a long period of time, affect how our lungs work. The concentration of NO<sub>2</sub> is measured in micrograms in each cubic metre of air (µg/m<sup>3</sup>).

4.2.3 The UK Government has set air quality objectives for NO<sub>2</sub> in their Air Quality Strategy that adopts legislation set out by the European Union (EU). The UK Air Quality Objective (AQO) sets an annual limit value of 40µg/m<sup>3</sup> for concentration of NO<sub>2</sub> in the air.

4.2.4 As detailed in the Interim NLEF Stage 2 Report, ACC undertook non-automatic (passive diffusion tube) monitoring of NO<sub>2</sub> at 70 sites during 2019 as part of the air quality monitoring Annual Progress Reporting (APR).

4.2.5 In total, there are 8 locations where annual mean concentrations of NO<sub>2</sub> exceed the AQO of 40µg/m<sup>3</sup> and a further 6 sites where the annual mean concentrations of NO<sub>2</sub> exceed 36 µg/m<sup>3</sup>.

4.2.6 Figure 3 shows the locations where annual concentrations of NO<sub>2</sub> were recorded as greater than 36 µg/m<sup>3</sup> in 2019.

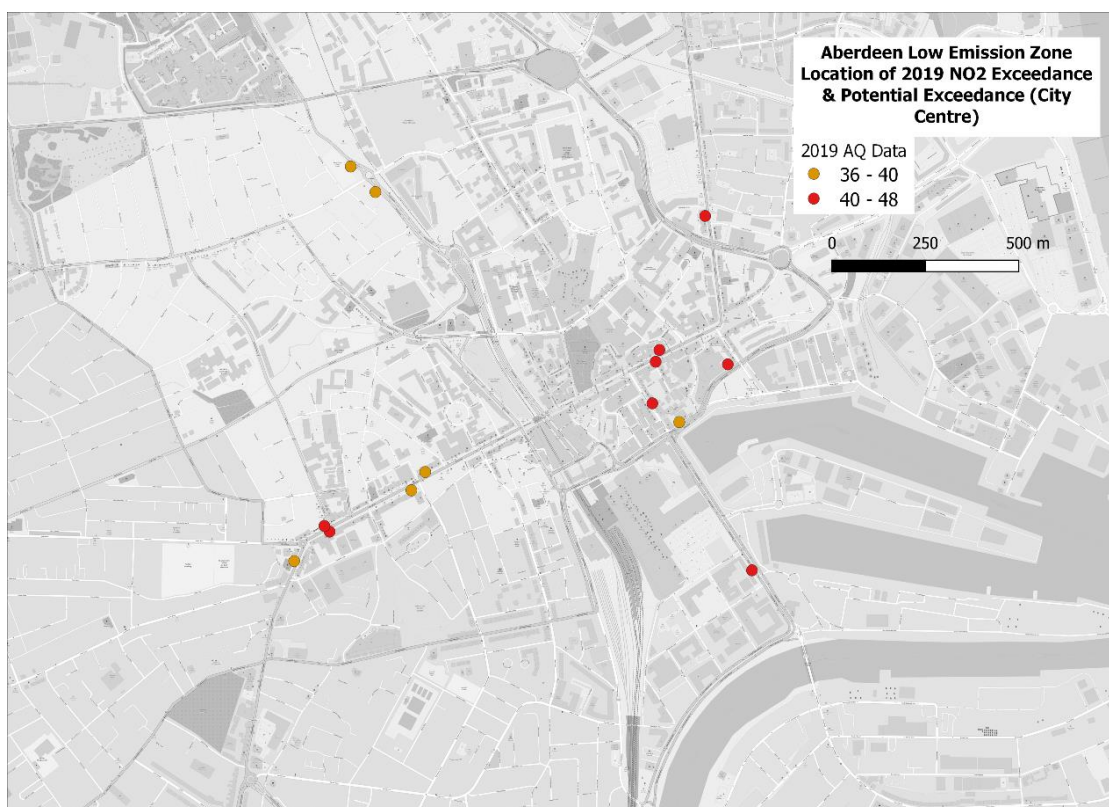


Figure 3. Locations of 2019 Annual Mean Concentrations of NO<sub>2</sub> greater than 36 µg/m<sup>3</sup> (City Centre AQMA)

4.2.7 Each of the LEZ boundary options encompassed the majority of the locations detailed in Figure 3. Table 9 details the exceedance / potential exceedance locations that are directly within each of the LEZ boundary options.

Table 9. LEZ Coverage of Air Quality Interest Locations

Site	Exceedance Location	Exceedance Location Within LEZ ?					
		1A	1B	2A	3B	4A	4B
DT30	335 Union St	✓	✓	✓	✓	✓	✓
DT73	61 Skene Square	✗	✗	✗	✗	✗	✗
DT18	14 Holburn St	✗	✗	✗	✗	✓	✓
CM2	Union Street	✓	✓	✓	✓	✓	✓
DT16	1 Trinity Quay	✗	✗	✗	✓	✓	✓
DT77	27 Skene Square	✗	✗	✗	✗	✗	✗
DT11	105 King St	✗	✗	✗	✗	✓	✓
DT10	184/192 Market St	✗	✗	✗	✗	✓	✓
DT9	39 Market St	✓	✓	✓	✓	✓	✓
DT29	469 Union St	✓	✓	✓	✓	✓	✓
DT12	40 Union St	✓	✓	✓	✓	✓	✓
DT17	43/45 Union St	✓	✓	✓	✓	✓	✓
DT82	7 Virginia Street	✗	✗	✗	✓	✓	✓
DT19	468 Union St	✓	✓	✓	✓	✓	✓

4.2.8 The locations detailed above that are out-with the LEZ boundary can still be influenced by the impact of the LEZ scheme. The impact of each boundary option on each of the exceedance / potential exceedance locations will form part of the option sifting process. This is detailed further in the following sections.

### 4.3 Network Demand Level

- 4.3.1 The 2024 future year traffic models include approximately 7% predicted growth over the 2019 Baseline traffic levels in the PM Peak. It could therefore be considered that models running at 95% demand is equivalent to a small level of traffic growth on the 2019 baseline traffic demand (i.e. 2% traffic growth from 2019). In addition, due to the potential impact of the COVID-19 pandemic, a zero growth future is also a plausible future.
- 4.3.2 In the LEZ option testing, there are two network scenarios that do not meet either the 95% or 100% demand levels.
- 4.3.3 As detailed in Tables 7 and 8, each of the model scenarios were able to run at 95% demand, with the exception of boundary Option 2B and 3A, which could only run at 80% and 90% demand respectively, representing a reduction in traffic demand from the 2019 baseline traffic.
- 4.3.4 Option 2B also allows non-compliant traffic to route through Denburn Road. There are other implications to the Denburn Road exclusion from the LEZ that are detailed in the following sections.
- 4.3.5 Option 3A is similar in scale to Option 4 but critically does not include coverage of the west end of Union Street within the LEZ area. As noted in Chapter 3, this creates congestion due to non-compliant traffic seeking a route north-south through the city centre as the harbour route and Denburn route is not available in this scenario.

Due to the required demand level being lower than 2019 baseline in order for the networks to operate, LEZ Boundary **Options 2B and 3A** are omitted from consideration at this stage.

### 4.4 Denburn Road Variation

- 4.4.1 The remaining LEZ boundary options 1B, 3B and 4B exclude Denburn Road from the LEZ area. The traffic model testing has shown that this has the effect of increasing (non-compliant) traffic through the Denburn corridor and through Skene Square to the Hutcheon Street junction. There are two key issues with this occurrence:
- Skene Square includes 2 locations where there are potential NO<sup>2</sup> exceedances
  - Additional traffic demand through Skene Square adds pressure to a critical pinch point on the network – Berryden Road/ Hutcheon Street junction. This junction, even with capacity improvements from the Berryden Corridor Improvement proposals, shows junction capacity issues through the model testing. It is known from parallel testing that further traffic restrictions within the city centre area (from CCMP) will put even more pressure on this junction.

4.4.2 A review of the model traffic flows through Skene Square corridor was undertaken for each of the remaining LEZ boundary options. Table 10 provides a summary of the 12 hour flow comparisons between the LEZ scenario options and the 2019 Base model. Note the 2019 Base model is used for all flow comparisons for consistency with the 2019 observed air quality dataset.

**Table 10. Skene Square Flow Change (12 Hr flows)**

Exceedance		Op 1A		Op 1B		Op 2A		Op 3B		Op 4A		Op 4B	
Site	Location	Flow Diff	%	Flow Diff	%	Flow Diff	%	Flow Diff	%	Flow Diff	%	Flow Diff	%
DT73	61 SkeneSquare	-1297	-8%	-375	-2%	-1254	-8%	1892	12%	-596	-4%	1208	8%
DT77	27 SkeneSquare	-1299	-8%	-371	-2%	-1260	-8%	1884	12%	-597	-4%	1214	8%

4.4.3 Table 10 shows that for Option 3B, there is predicted to be an increase in traffic flow in the region of 12% over the 2019 baseline. For Option 4B, this increase is observed to be in the region of 8%. These traffic increases will likely include a more concentrated proportion of non-compliant traffic.

4.4.4 As the Berryden Rd/Skene Square/Woolmanhill corridor is a priority route into the city centre, there are no other network proposals, as part of the CCMP or other, that would likely result in a decrease in traffic flow though this corridor of a scale greater than these increases.

4.4.5 The option to allow non-compliant traffic to route through Denburn Road does therefore not comply with other city centre strategies and is highly likely to worsen the NO<sub>2</sub> emission levels at Skene Square.

4.4.6 Option 1B does not show the same increases in traffic flows through Skene Square as 3B and 4B. This is likely to be due to the smaller LEZ area impacting fewer vehicles. Even with a 2% decrease in traffic volume, this option may still not result in a reduction in NO<sub>2</sub> emissions through Skene Square. Further analysis of this option is detailed in the following sections..

Due to the predicted increases in traffic flow (of non-compliant vehicles) and resultant congestion through the Skene Square corridor as well as the potential impact on NO<sub>2</sub> emissions along this corridor, LEZ Boundary **Options 3B and 4B** are omitted from consideration at this stage.

## 4.5 Exceedance Location Review

4.5.1 The locations where 2019 annual mean concentrations of NO<sub>2</sub> are recorded as greater than 36µg/m<sup>3</sup> is detailed in Table 11. Concentrations greater than 36µg/m<sup>3</sup> are presented (in orange) as locations that may be at risk of future exceedance. The cells highlighted in red are the locations where the AQO of 40µg/m<sup>3</sup> was exceeded (current exceedance level).

4.5.2 As detailed in Chapter 4 of the Aberdeen NLEF Report (SYSTRA, Ref: GB01T19I15/281119, 01/06/20), high level scenario testing using the baseline Aberdeen National Modelling Framework (NMF) Air Quality Model concluded that improving the city bus fleet to LEZ compliant standard (Euro VI) will bring the single biggest reduction in NO<sub>2</sub> levels and that buses therefore must be included in an Aberdeen LEZ. The NMF quantified the impact that an all compliant bus scenario would have on the NO<sub>2</sub> emission levels city wide and at the 2019 exceedance/potential exceedance locations. Table 11 therefore also shows the predicted NO<sub>2</sub>



levels for each location, under the assumption that all buses have been upgraded to a compliant emission level.

- 4.5.3 The NMF scenario test results show that if all buses are compliant with LEZ vehicle emission standards, there would still likely be four 2019 exceedance locations where NO<sub>2</sub> levels would be greater than 40µg/m<sup>3</sup> and a further 9 locations where the NO<sub>2</sub> is near to this maximum allowable level.

**Table 11. Annual Mean Concentrations of NO<sub>2</sub> greater than 36µg/m<sup>3</sup>**

Site	Exceedance Location	Mean NO <sub>2</sub> 2019 (µg / m <sup>3</sup> )	Impact of Bus Compliant	Bus Compliant Mean NO <sub>2</sub> (µg / m <sup>3</sup> )
DT30	335 Union St	39.0	-2.4%	38.0
DT73	61 Skene Square	38.0	-4.8%	36.2
DT18	14 Holburn St	39.0	-2.1%	38.2
CM2	Union Street	36.0	-10.5%	32.2
DT16	1 Trinity Quay	39.0	-2.7%	37.9
DT77	27 Skene Square	38.0	-2.2%	37.2
DT11	105 King St	45.0	-2.5%	43.9
DT10	184/192 Market St	47.0	-4.9%	44.7
DT9	39 Market St	44.0	-12.8%	38.4
DT29	469 Union St	42.0	-12.7%	36.7
DT12	40 Union St	43.0	-14.8%	36.6
DT17	43/45 Union St	43.0	-2.5%	41.9
DT82	7 Virginia Street	43.0	-1.6%	42.3
DT19	468 Union St	42.0	-11.0%	37.4

- 4.5.4 The figures presented in Table 11 are critical when considering the traffic model flow changes in the LEZ option test scenarios.

- 4.5.5 Table 12 provides a traffic flow percentage difference comparison between the remaining LEZ scenarios and the 2019 Base Model at each of the exceedance locations in the network. The data is based upon the 12 Hr model flows\*.

- 4.5.6 For absolute clarity, this comparison is between a 2024 future year scenario with a LEZ and a 2019 Base scenario. The traffic flow differences therefore include the influence of background traffic growth as well as the impact of the LEZ.

\*Where the model only runs at 95% demand, the traffic flows have been factored to 100% to enable a like for like comparison with the Base Model.

**Table 12. Traffic Flow Analysis at Air Quality Exceedance Locations**

Site	Exceedance Location	Flow Change from 2019 Baseline			
		1A	1B	2A	4A
DT30	335 Union St	-1%	0%	0%	-2%
DT73	61 Skene Square	-8%	-2%	-8%	-4%
DT18	14 Holburn St	9%	5%	7%	-6%
CM2	Union Street	1%	0%	1%	-3%
DT16	1 Trinity Quay	11%	10%	16%	-9%
DT77	27 Skene Square	-8%	-2%	-8%	-4%
DT11	105 King St	16%	13%	11%	-3%
DT10	184/192 Market St	11%	7%	14%	-8%
DT9	39 Market St	-4%	-5%	-3%	-3%
DT29	469 Union St	0%	-1%	-1%	-3%
DT12	40 Union St	10%	10%	7%	1%
DT17	43/45 Union St	10%	10%	7%	1%
DT82	7 Virginia Street	13%	10%	16%	-4%
DT19	468 Union St	0%	-1%	-1%	-3%

4.5.7 Table 12 shows that there are traffic flow increases observed at seven of the exceedance locations in Options 1A, 1B and 2A. It is also evident that there isn't a significant difference between each of these three scenarios.

4.5.8 It should also be noted that four of the seven locations where traffic flows have increased in options 1A, 1B and 2A are locations that are out-with the LEZ area (See Table 9).

4.5.9 For Option 4A, the LEZ area covers all of the exceedance locations and therefore the traffic flows have reduced as a result of non-compliant vehicles being excluded from these locations. The comparisons show that Option 4A results in traffic flows reducing to a level below the 2019 Baseline.

4.5.10 In lieu of Air Quality modelling available at this point in the assessment, in order to predict the emission level changes for each scenario, a methodology was adopted using the traffic model outputs and the NMF NO<sub>2</sub> outputs detailed in Table 11.

4.5.11 The methodology applied considered the following information:

- Model Traffic flow changes between 2024+LEZ model and the 2019 Base model
- Impact to NO<sub>2</sub> levels when all buses are compliant
- Consideration whether exceedance locations were inside or outside the LEZ area.

4.5.12 Table 13 details the predicted impact of the LEZ options on the air quality exceedance locations. These results are presented as coloured banding, representing the predicted impact to the NO<sub>2</sub> levels.

**Table 13. Predicted Impact of LEZ on Air Quality Exceedance Locations**

Site	Exceedance Location	Predicted Air Quality Impact			
		1A	1B	2A	4A
DT30	335 Union St	Green	Green	Green	Green
DT73	61 Skene Square	Green	Green	Green	Green
DT18	14 Holburn St	Red	Red	Red	Green
CM2	Union Street	Green	Green	Green	Green
DT16	1 Trinity Quay	Red	Red	Red	Green
DT77	27 Skene Square	Green	Green	Green	Green
DT11	105 King St	Purple	Purple	Purple	Yellow
DT10	184/192 Market St	Purple	Purple	Purple	Yellow
DT9	39 Market St	Green	Green	Green	Green
DT29	469 Union St	Green	Green	Green	Green
DT12	40 Union St	Yellow	Yellow	Green	Green
DT17	43/45 Union St	Red	Red	Yellow	Yellow
DT82	7 Virginia Street	Purple	Purple	Purple	Yellow
DT19	468 Union St	Green	Green	Green	Green

	NO <sub>2</sub> Levels predicted to be Under Threshold
	NO <sub>2</sub> Levels predicted to be Near Threshold
	NO <sub>2</sub> Levels predicted to be Over Threshold
	NO <sub>2</sub> Levels predicted to be Significantly Over Threshold

- 4.5.13 Table 13 shows a very similar pattern to the traffic flow changes detailed in Table 12. Where traffic flows are predicted to increase significantly, and particularly at locations out-with the LEZ boundary, then there is a high degree of certainty that the NO<sub>2</sub> levels will not improve.
- 4.5.14 For options 1A,1B, and 2A, due to the scale of the LEZ, many of the exceedance areas are not positively influenced by the LEZ, in terms of traffic flow levels or improvements in the fleet (due to removal of non-compliant vehicles).
- 4.5.15 Only Option 4A, which boundary covers all the exceedance areas, is anticipated to positively impact on the emission level at each of the exceedance locations. Even so, it can be seen from Table 13 that at four locations, the exceedance levels are likely to be still near the AQO of 40µg/m<sup>3</sup>.
- 4.5.16 The exceedance location assessment strongly indicates that the smaller LEZ areas assessed do not address many of the exceedance issues identified in the local network.
- 4.5.17 A parallel study on the City Centre Masterplan indicates that the proposed traffic interventions within the core area of the city centre will significantly reduce traffic levels through key routes of Union St and Market St (among others), but will not provide significant reduction to traffic demand levels along King Street or the harbour route of Virginia St and Trinity Quay.

4.5.18 Therefore, without significant additional interventions not historically considered, the LEZ Options 1A, 1B and 2A are not anticipated to meet the objectives of the scheme.

Due to the limited impact of **Option 1A, 1B and 2A** on the observed NO<sub>2</sub> emission locations, these options were no longer considered.

4.5.19 Additional implications of the LEZ boundary options were reviewed and are detailed in the following sections:

### 4.6 Alignment with Network Hierarchy

4.6.1 ACC and regional partners Nestrans and Aberdeenshire Council commissioned the North East Scotland Roads Hierarchy Study, which aims to update the cities roads hierarchy to provide a system that reflects the new role of the city centre (as a destination). The revised network hierarchy around the city centre area is shown in Figure 4.

4.6.2 It is considered important, in the context of Aberdeen’s changes to the roads hierarchy, that the LEZ area aligns with the new hierarchy. This is also detailed in Section 8.9 of the NLEF Report (*National Low Emission Framework – Interim Stage 2 Assessment Report -SYSTRA, Ref: GB01T19I15/281119, 01/06/20*).



**Figure 4. City Centre Network Hierarchy Package**

4.6.3 The NLEF Report also highlights the potential issues of including two secondary routes within the LEZ area (Denburn Road and Harbour Route) . The report noted that non-compliant

vehicles re-routing away from these corridors would likely shift to western secondary and minor routes. The model flow difference plots (Appendix C), show a migration of traffic to the west end on Union Street and into the local routes between Union Street and Anderson Drive.

- 4.6.4 In Option 4, where the explicit West end of Union Street and Alford Place / Holburn Street are included within the LEZ, this has the effect of displacing traffic further out to the Ashley Rd and Forrest Avenue corridors.
- 4.6.5 In each of the LEZ options, traffic flow increases are observed along the southern boundary of the Willowbank Road corridor and/or the parallel east-west corridor of Ferryhill Road, Neither of these routes are likely to be deemed acceptable to carry additional non-compliant vehicles under the revised network hierarchy (the former A93 Willowbank Road has been downgraded to a tertiary route).
- 4.6.6 The traffic model outputs therefore suggest that none of the remaining LEZ options directly align with the proposed network hierarchy. The conflicts could be mitigated by either traffic management measures or revisions to the LEZ boundary. This is considered further in Section 4.10.

## 4.7 Car Park Accessibility

- 4.7.1 As detailed in Table 5 (Section 2.6), some city centre car parks will be within the proposed LEZ area. This will result in a likely relocation of non-compliant cars to car parks outside the LEZ area. The scale of traffic relocation is different for each LEZ boundary.
- 4.7.2 For the LEZ options, the proportion of City Centre Off-street car parks accessible for all vehicles is:
  - Option 1A – 8 of 12 Car Parks available (72% of total spaces)
  - Option 1B – 9 of 12 Car Parks available (79% of total spaces)
  - Option 2A – 5 of 12 Car Parks available (43% of total spaces)
  - Option 2B – 6 of 12 Car Parks available (50% of total spaces)
  - Option 3A – 4 of 12 Car Parks available (40% of total spaces)
  - Option 3B – 5 of 12 Car Parks available (47% of total spaces)
  - Option 4A – 1 of 12 Car Parks available (6% of total spaces)
  - Option 4B – 2 of 12 Car Parks available (14% of total spaces).
- 4.7.3 The smallest LEZ area (Option 1A/1B) will retain the most accessibility to the city centre for all traffic fleet, whilst Option 4 would effectively force non-compliant vehicle drivers to either upgrade their vehicle, travel into the city centre by a different mode or not travel to the city at all. These differences between the LEZ boundary options raise several key implications to consider, including:
  - equal opportunity implications
  - City Centre economy and resilience implications
  - Wider air quality implications.

## 4.8 LEZ Boundary – Residential Consideration

- 4.8.1 For residents within the LEZ boundaries, there would be a requirement for their vehicles to be fully compliant to the emission restrictions after the defined grace period for enforcement. It is recognised that the larger the LEZ area, the greater or wider impact there will likely be for air quality improvements. However, where a LEZ covers residential areas, this also raises implications to equal opportunities where residents are forced to comply with the LEZ measures. It should be noted that the Scottish Government, through its 2018 Programme for Government, committed to help those who will have most difficulty preparing for the introduction of LEZs through various support funds and the Transport (Scotland) Act 2019 legislation allows for additional 2-year grace period to be applied for residents of a LEZ.
- 4.8.2 The LEZ options identified in the Interim NLEF Stage 2 Report included residential areas that do not contain air quality exceedance locations. These options were developed to capture key trip generators, such as car parks. For example, Option 2 extended the Option 1 (Union Street) area to include Gallowgate and Bon Accord car parks but to do so, Option 2 also had to include all residential properties in the Gallowgate/George Street area. The Interim NLEF Stage 2 Report concluded that these options should be tested in the traffic model to assess their wider impacts on air quality and provide evidence for the inclusion or exclusion of residential areas with no current air quality issues.

## 4.9 Decision on Remaining Option

- 4.9.1 Whilst the option sifting process results in only Option 4A remaining, there remain key issues and implications for this large area LEZ scenario as identified above and in the NLEF Interim Stage 2 Report, namely:
- Alignment with revised NE Scotland Roads Hierarchy
  - Implications to accessibility to city centre car parks
  - Implications to the large number of residential properties within the LEZ area
  - Ability for the network to operate at full 2024 network demand
  - Assumptions that Option 4 would incentivise more people to convert their non-compliant vehicle compared to the alternative LEZ options.
- 4.9.2 From the option sifting process, there was clear evidence that further consideration of potential boundary options could be undertaken which would combine the benefits of both the smaller scale LEZ options (i.e. Option 1A ) and the large scale LEZ options (i.e. Option 4A) and also reduce their disbenefits.

## 4.10 Revised LEZ Boundary Considerations – Option 5

- 4.10.1 The process of developing a further boundary scenario, included the following considerations:
- Ability for the transport network to cater for traffic displacement
  - Requirement to displace non-compliant traffic away from the city centre area and onto pertinent routes of a suitable standard and with no existing air quality issues
  - Maximise the influence on non-compliant vehicles within the city centre to improve air quality
  - Retain a reasonable degree of accessibility for all vehicle fleet (both compliant and non-compliant)

- Limit the number of residential properties within the LEZ area.

- 4.10.2 As noted in Section 3.4, and although it has been discounted for its limited impact on NO<sub>2</sub> emission, Options 1A/1B were shown to be the most likely scenario to be able to cater for the displacement of non-compliant traffic from the LEZ. From the initial model testing, congestion issues were identified at locations in all LEZ boundary options as concentrations of non-compliant traffic routed around the LEZ area.
- 4.10.3 To address this issue, several variations to the LEZ Option 1A boundary were considered, with a view to enabling a better management of traffic around the LEZ boundary. These variations should also assist in reducing congestion areas around the city centre.
- 4.10.4 In addition, changes to the extent of the boundary were also considered based upon the conflict between the modelled traffic flow increases recorded and the network hierarchy.
- 4.10.5 Table 14 details the boundary variations to the LEZ Option 1A and the rationale behind each.

**Table 14. LEZ Area Revisions**

Detail	Rationale
LEZ covers Union Street Area, including Denburn Road	Area derived from NLEF Process
Extension of 1A to Holburn St	All LEZ scenarios show traffic increase through the west end of Union Street and particularly the north-south route of Holburn St up through Albert St and Argyll Place. Extending the LEZ through the west end of Union Street will cut this cross city routing option for non-compliant traffic. Note: May need to consider subsequent impact through St. Swithin St / Fountainhill Rd corridor
Extension of 1A to A93 Willowbank Road	Traffic flow increases through this route in all LEZ options as a result of diversion of non-compliant traffic. Corridor de-classified as part of Network Hierarchy review so not appropriate route for this traffic. Will need to consider the impact through Ferryhill Rd area, but may need weight up benefits of a LEZ extension or other traffic management measures through this corridor.
Extension of 1A to Littlejohn St	Where Littlejohn St is on the periphery of the LEZ, some traffic congestion occurs through the junction onto West North Street
Extension of 1A to Upperkirkgate	In Options 1A/1B, Schoolhill is on the periphery of the LEZ, resulting in slight increases in traffic flow through this corridor. This is not an appropriate route to carry additional traffic (and higher emission traffic).
Extension of 1A to Harbour Corridor (East North St /Commerce St / Virginia St / Trinity Quay / Market St	Congestion issues occur through this corridor when it is open to all traffic. The CCCMP measures may be able to partially or fully address this issue. However, it would be prudent, in the first instance, to assess the impact of restricting access through this corridor for non-compliant vehicles with a small scale LEZ boundary.
Combination of Above	Full restriction of city centre <u>through</u> traffic to non-compliant vehicles

- 4.10.6 When the above boundary variations to Option 1A are considered together (deemed Option 5 – see Figure 5 below), this LEZ area has the effect of restricting all non-compliant vehicles from routing through the city centre area, but critically, it does not restrict access to the city centre (Car Park options still available). This is consistent with other policies and aspirations for Aberdeen City Centre.
- 4.10.7 The proposed boundary for Option 5 also intersects all key approach routes into the city centre, therefore it has an impact on the volume of non-compliant traffic in the city centre on a much wider scale than the boundary itself.

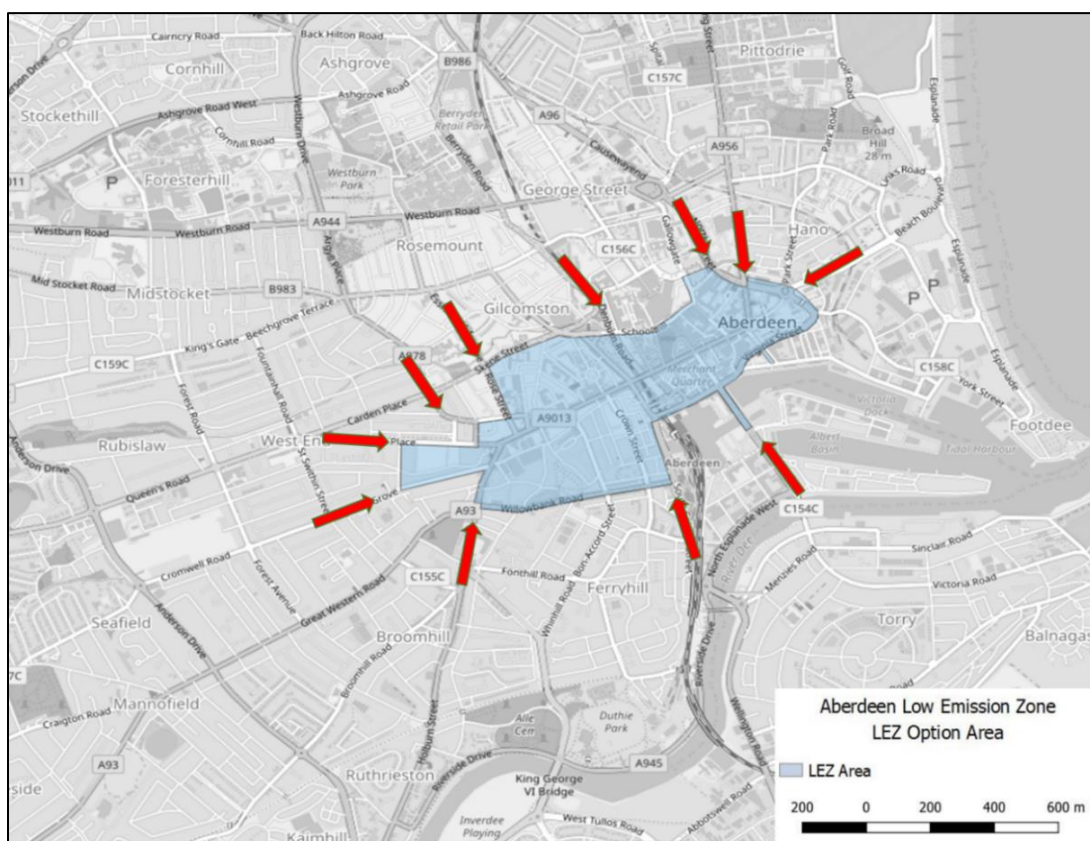


Figure 5. LEZ Option 5

- 4.10.8 The rationale for the proposed LEZ Option 5 was presented to ACC on Monday 22<sup>nd</sup> February 2021. ACC subsequently agreed to consider this option for further assessment alongside Option 4A, the final remaining option from the initial 8 LEZ options identified in the Interim NLEF Stage 2 Report.

### 4.11 LEZ Option 5 – Initial Model Findings

- 4.11.1 The model testing assessment carried out for the initial 8 LEZ boundary options was also undertaken for Option 5 and is detailed in the following sections.

#### ***Option 5 - Model Network Demand***

- 4.11.2 Table 15 shows the updated network demand level that each scenario was able to run at. Table 16 presents the number of PM Peak model runs that ran through successfully.



**Table 15. Network Demand Level (Updated)**

Peak Period	LEZ Boundary Options							
	1A	1B	2A	2B	3A	3B	4A	5
AM	100%	100%	100%	100%	100%	100%	95%	100%
IP	100%	100%	100%	100%	100%	100%	100%	100%
PM	95%	100%	95%	80%	90%	95%	95%	95%

**Table 16. PM Peak Model Run Success Rate (Updated)**

Network Demand Level	LEZ Boundary Options							
	1A	1B	2A	2B	3A	3B	4A	5
100% Demand	3 of 5	4 of 5	1 of 5	0 of 5	0 of 5	0 of 5	1 of 5	0 of 5
95% Demand	5 of 5	5 of 5	4 of 5	0 of 5	2 of 5	5 of 5	5 of 5	5 of 5
90% Demand	-	-	-	1 of 5	5 of 5	-	-	-
85% Demand	-	-	-	0 of 5	-	-	-	-
80% Demand	-	-	-	5 of 5	-	-	-	-

4.11.3 Table 15 shows that Option 5 was able to run at the full future year traffic demand level in the AM and Interpeak, but, similar to Option 4A, was able to run at 95% of the future year traffic demand level. Note that 95% demand is equivalent to approximately 2% growth on 2019 levels.

4.11.4 Table 16 also shows that the number of successful model runs in the PM Peak at 95% was 5 out of 5 for both Option 4A and Option 5.

**Option 5 - Model Flow Plots ([Link To Option 5](#))**

4.11.5 The model flow difference plot between the (PM Peak) ACCPM24 and the Option 5 LEZ Test scenario is shown in **Appendix C**.

- Option 5 shows a much lower level of congestion through the core area of the city centre and also through the Harbour route compared to many of the other LEZ options
- Congestion issues are observed to occur through junctions along the Argyll Place corridor and along Hutcheon St at Mounthooly Roundabout
- Some rat running is observed through the Ferryhill area and around the area west of Union Street (Ashley Road, Albyn Grove, St. Swithen St).

**Option 5 - NO<sub>2</sub> Exceedance Locations**

4.11.6 Table 17 provides an updated traffic flow percentage difference comparison between the LEZ scenarios and the 2019 Base Model at each of the exceedance locations in the network. The data is based upon the 12 Hr model flows.

**Table 17. Traffic Flow Analysis at Air Quality Exceedance Locations (Updated)**

Site	Exceedance Location	% Flow Change from 2019 Baseline				
		1A	1B	2A	4A	5
DT30	335 Union St	-1%	0%	0%	-2%	5%
DT73	61 Skene Square	-8%	-2%	-8%	-4%	-8%
DT18	14 Holburn St	9%	5%	7%	-6%	1%
CM2	Union Street	1%	0%	1%	-3%	3%
DT16	1 Trinity Quay	11%	10%	16%	-9%	-7%
DT77	27 Skene Square	-8%	-2%	-8%	-4%	-8%
DT11	105 King St	16%	13%	11%	-3%	3%
DT10	184/192 Market St	11%	7%	14%	-8%	-4%
DT9	39 Market St	-4%	-5%	-3%	-3%	1%
DT29	469 Union St	0%	-1%	-1%	-3%	3%
DT12	40 Union St	10%	10%	7%	1%	9%
DT17	43/45 Union St	10%	10%	7%	1%	9%
DT82	7 Virginia Street	13%	10%	16%	-4%	-8%
DT19	468 Union St	0%	-1%	-1%	-3%	3%

- 4.11.7 It can be seen from Table 17 that the traffic flow changes around the exceedance areas in Option 5 are much better than Option 1A,1B and 2A, due to the extension of the LEZ area to include the key radial routes in Option 5.
- 4.11.8 Whilst there is an increase in traffic observed on Union Street (East), this is within the boundary of the LEZ, therefore this traffic increase will be compliant vehicles.
- 4.11.9 The resultant predicted impact on the NO<sub>2</sub> exceedance areas is provided in Table 18.

**Table 18. Predicted Impact of LEZ on Air Quality Exceedance Locations (Updated)**

Site	Exceedance Location	Predicted Air Quality Impact				
		1A	1B	2A	4A	5
DT30	335 Union St	Green	Green	Green	Green	Green
DT73	61 Skene Square	Green	Green	Green	Green	Green
DT18	14 Holburn St	Red	Red	Red	Green	Green
CM2	Union Street	Green	Green	Green	Green	Green
DT16	1 Trinity Quay	Red	Red	Red	Green	Green
DT77	27 Skene Square	Green	Green	Green	Green	Green
DT11	105 King St	Purple	Purple	Purple	Yellow	Red
DT10	184/192 Market St	Purple	Purple	Purple	Yellow	Yellow
DT9	39 Market St	Green	Green	Green	Green	Green
DT29	469 Union St	Green	Green	Green	Green	Green
DT12	40 Union St	Yellow	Yellow	Green	Green	Green
DT17	43/45 Union St	Red	Red	Yellow	Yellow	Red
DT82	7 Virginia Street	Purple	Purple	Purple	Yellow	Green
DT19	468 Union St	Green	Green	Green	Green	Green

	NO <sub>2</sub> Levels predicted to be Under Threshold
	NO <sub>2</sub> Levels predicted to be Near Threshold
	NO <sub>2</sub> Levels predicted to be Over Threshold
	NO <sub>2</sub> Levels predicted to be Significantly Over Threshold

- 4.11.10 Table 18 shows that the majority of the exceedance locations for LEZ Option 5 are predicted to be under the exceedance threshold.
- 4.11.11 The Union Street (Site DT17) location is anticipated to be near or over the AQO of 40µg/m<sup>3</sup>, even though it is within the LEZ area. This suggests that further mitigation may be required to reduce traffic levels within the LEZ area.
- 4.11.12 In addition, the NO<sub>2</sub> levels on King St are predicted to be above the threshold. This could be an issue as there are no clear measures within the CCMP which would obviously impact on traffic flows at this location.
- 4.11.13 Further analysis of the traffic flows on King Street in Option 5 showed that almost zero percent of traffic on this route southbound was non-compliant confirming that even though the Option 5 LEZ boundary does not include the King Street exceedance locations, non-compliant traffic and therefore NO<sub>2</sub> levels at this location are influenced by the LEZ.
- 4.11.14 Holburn St and Virginia St are predicted to be near the exceedance threshold however, these locations are also within the LEZ boundary, therefore NO<sub>2</sub> levels are not expected to reach the threshold.
- 4.11.15 Finally, Market St (Site DT10 – South end of Market St) is out-with the LEZ, but like King St, is heavily influenced by the LEZ boundary further north on Market Street. Only non-compliant

vehicles routing to the Harbour area or Union Square would potentially route along this section of Union Street, therefore the proportion of compliant vehicles would be very high.

#### ***Option 5 -Alignment with Network Hierarchy***

- 4.11.16 The boundary of LEZ Option 5 includes the Willowbank Road corridor. This inclusion has the effect of slightly reducing the total volume of traffic using this route. This is in contrast to the traffic increases (of non-compliant vehicles) noted in other LEZ options.
- 4.11.17 However, non-compliant traffic has migrated to the alternative east-west route of Fonthill Rd / Ferryhill Road. Traffic increases are also noted around the West end of Union Street through routes including Ashley Road and Albyn Grove to by-pass the city centre.
- 4.11.18 If this LEZ option, and option 4A, are to be considered further, then these rat-run issues would need to be addressed.
- 4.11.19 Aside from the above, the Option 5 LEZ generally fits well with the Network Hierarchy.

#### ***Option 5- Car Park Accessibility***

- 4.11.20 The Option 5 boundary is concise around the city centre area (as per Option 1). The small LEZ area allows 8 of 12 City Centre Car Parks to be available for non-compliant vehicles.

#### ***Option 5 - Residential Consideration***

- 4.11.21 The smaller LEZ area associated with Option 5 has very limited impact on residential properties within the LEZ boundary and is primarily limited to the core city centre area.

### **4.12 Network Summary Statistics For Option 4A and Option 5**

- 4.12.1 Network summary statistics report on the overall network performance of a model. Four key global network statistics that can be extracted from the models are:
  - Total Distance Travelled
  - Average Time Taken
  - Mean Speed
  - Average Number of Vehicles in a Queue.
- 4.12.2 The total distance travelled statistic is based upon the cumulative travelled distance for all vehicles in the model. An increase in the total distance travelled is usually representative of an increase in travel demand.
- 4.12.3 The average time taken statistic is based upon the average time for all trips in the network to make their journey. An increase in this statistic represents a deterioration in the operation of the network.
- 4.12.4 The mean speed statistic represents the average speed for all vehicles in the model network. A decrease in average speed represents a deterioration in the operation of the model network.

4.12.5 The average number of vehicles in a queue is an hourly statistic that collates the total number of queueing vehicles across the network. An increase in the number of vehicles queueing is a good indicator of an increase in congestion within the model network.

4.12.6 Table 19 provides a summary of the first three global statistics for LEZ Options 4A and 5 against ACCPM24. Table 20 provides the results for Average Vehicles in a Queue.

**Table 19. Network Summary Statistics**

Percentage Difference to the Ref Case						
Peak	Percentage demand level	Scenario	Number of Vehicles	Total Distance Travelled (km)	Average Time Taken (hh:mm:ss)	Mean Speed (mph)
AM	95%	2024 Ref Case	78779	259881	00:07:15	16.96
	95%	Option 4A	-0.3%	1.0%	5.5%	-4.0%
	95%	Option 5	-0.4%	1.2%	13.2%	-10.2%
IP	95%	2024 Ref Case	164848	474968	00:05:48	18.53
	95%	Option 4A	-0.9%	0.3%	10.0%	-8.0%
	95%	Option 5	-0.2%	1.4%	5.1%	-3.3%
PM	95%	2024 Ref Case	93788	300136	00:08:05	14.77
	95%	Option 4A	-1.2%	0.4%	13.9%	-10.8%
	95%	Option 5	-0.8%	1.2%	15.9%	-12.0%
12 Hr	95%	<b>2024 Ref Case</b>	<b>337415</b>	<b>1034985</b>	<b>00:07:02</b>	<b>16.75</b>
	95%	<b>Option 4A</b>	<b>-0.9%</b>	<b>0.5%</b>	<b>10.0%</b>	<b>-7.5%</b>
	95%	<b>Option 5</b>	<b>-0.4%</b>	<b>1.3%</b>	<b>12.0%</b>	<b>-8.2%</b>

**Table 20. Average No. Vehicles in a Queue**

Time	Average Number of Vehicles in a Queue (Veh)		
	Ref Case	Op 4A	Op 5
	2024		
07:00:00	11045	8813	9507
08:00:00	12230	10331	10677
09:00:00	10083	8872	9566
10:00:00	9055	7791	7751
11:00:00	9257	8096	8156
12:00:00	9920	8729	8857
13:00:00	10054	9061	9063
14:00:00	9582	8664	8708
15:00:00	10436	9443	9580
16:00:00	12573	11662	12631
17:00:00	14359	13602	15070
18:00:00	11808	11178	12821
<b>Total</b>	<b>130400</b>	<b>116244</b>	<b>122387</b>
% Diff.	-	<b>-11%</b>	<b>-6%</b>

4.12.7 The following comments can be drawn from the global network statistics:

- The increase in global distance travelled in the LEZ scenarios relates to the additional distance that non-compliant traffic requires to route. This is 0.5% for Option 4 and 1.3% for Option 5. Note that there is an assumption of more compliant vehicles in Option 4A than Option 5
- The results for the Average time taken and mean speed suggest that there is a deterioration on the network operation when the LEZ is in place. This is anticipated as the LEZ requires traffic to route further. Option 4A operates slightly better than Option 5
- However the results of the average vehicles in a queue statistic suggest that the LEZ reduces the overall queueing in the network. It is assumed that this is due to the removal of traffic from some of the high queue areas within the LEZ area. Essentially the LEZ dissipates traffic out wider thus reducing overall queueing. Option 4A operates better than Option 5 but both are lower than the ACCPM24.

### 4.13 Outcome From LEZ Sifting Process

From the additional assessment of Option 5, ACC agreed to take LEZ boundary Options 4A and 5 forward for further consideration and assessment.

These two LEZ boundary options were fed back to the NLEF process for further appraisal of their suitability.

The NLEF appraisal concluded that Option 4A did not meet all the criteria for accessibility and inclusion. In addition, in light of the impact of COVID -19 to the city centre economy, it was considered that in LEZ Option 4A, due to the accessibility limitations within this option there would be a higher risk to the economic recovery and resilience of the city centre.

For these reasons, only the LEZ boundary **Option 5** was taken forward for further consideration.

## 5. LEZ SUPPORTING MEASURES – CITY CENTRE MASTERPLAN

### 5.1 Introduction

- 5.1.1 The Aberdeen LEZ is required to complement other committed network proposals for Aberdeen City Centre to provide a package of measures which will meet the objectives of the LEZ and wider Council objectives for Aberdeen City Centre. These committed proposals include the City Centre Masterplan (CCMP).
- 5.1.2 The model testing of the LEZ has identified a preferred boundary option. However, the modelling suggests that the LEZ alone is not enough to reduce all NO<sub>2</sub> levels below the AQO of 40µg/m<sup>3</sup> across the city centre area.
- 5.1.3 To enable the development of a package of measures to meet the objectives of the LEZ study, traffic modelling was utilised to identify if any elements of the City Centre Masterplan not yet implemented would enhance and support the LEZ in meeting the objectives.
- 5.1.4 The approach taken to the traffic modelling was to identify the impact of LEZ and CCMP measures separately, before utilising the model outputs of each study to develop a combined scenario package which is most likely to meet the overall objectives of the LEZ study.
- 5.1.5 A separate modelling exercise was therefore undertaken on various elements and projects within the CCMP. This is detailed in the Report: *City Centre Masterplan Model Testing Report* (Ref: GB01T20D62/3, March 2021).
- 5.1.6 This Chapter details the development of a proposed package of measures combining the proposed LEZ with CCMP infrastructure to best meet the objectives of the LEZ study.

### 5.2 City Centre Masterplan – Project Detail

- 5.2.1 The Aberdeen City Centre Masterplan (CCMP) road infrastructure proposals were initially assessed in the previous Aberdeen City Centre Model (ACCPM12) in 2016 to derive an initial implementation strategy for the full scheme proposals over a 25 year programme. The outcome of this assessment is detailed in Figure 6.

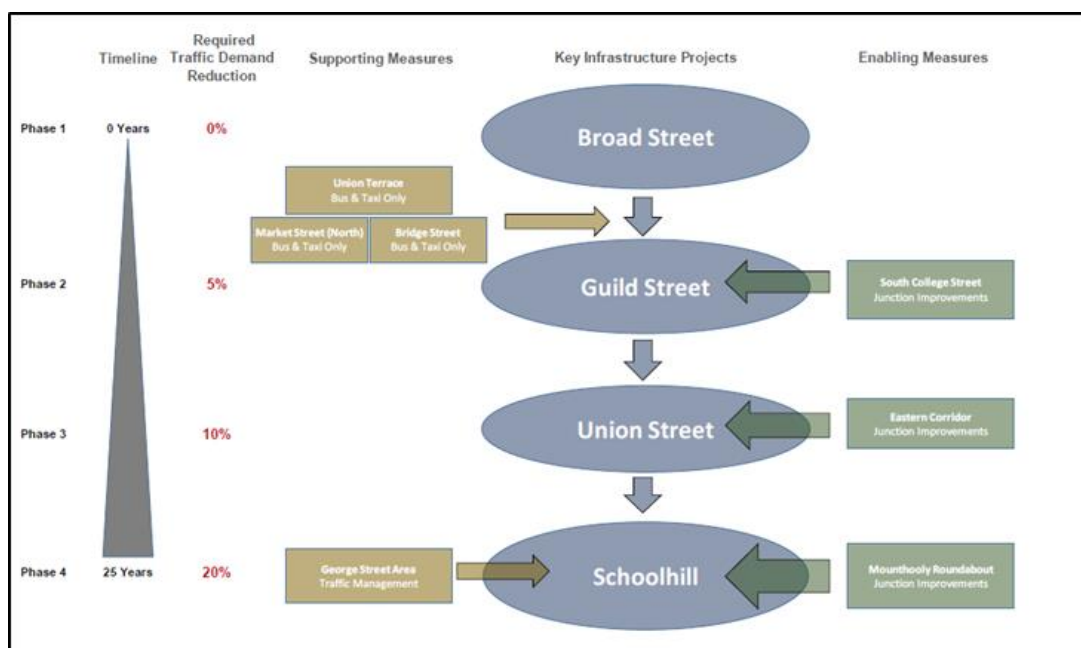


Figure 6. CCMP Proposed Implementation Programme

- 5.2.2 As detailed in Figure 6, there were four key infrastructure projects proposed over a 25 year programme, numbered as Phase 1 to Phase 4. Phase 1 has already been completed (Broad Street Project).
- 5.2.3 Within each Phase of the Masterplan, there are supporting measures and enabling measures proposed. These have been identified through the extensive model testing exercise undertaken in 2016. It was not proposed to reconsider the individual measures making up each of the identified implementation phases, unless they contradict other more recent project proposals (i.e. Road Network Hierarchy Reclassification).
- 5.2.4 The above phasing of the proposed CCMP implementation includes the requirement to gradually reduce traffic demand across the city centre area down by a total of 20% to facilitate the measures proposed.
- 5.2.5 Given that traffic demand and patterns are constantly changing, continual monitoring of the proposed implementation programme is essential. Therefore, under the remit of the current LEZ study, it was important to consider different combinations of ‘projects’ within the overarching CCMP proposals to assess whether the order of the implementation programme could be re-considered. This also highlights if the global traffic demand requirements have deviated from the initial analysis.
- 5.2.6 The 2019 model test programme considered the impact of each of the key City Centre Masterplan (CCMP) projects separately, then in combination with each other. The network mitigation, which was previously identified in the original CCMP project (2016), was assessed separately to gauge the updated impact of the additional measures.
- 5.2.7 The model demand level that each test scenario was able to run at is detailed in Table 21.



**Table 21. CCMP Model Scenarios – Traffic Demand Level Achieved**

Scenario	Detail	Peak Period		
		AM Peak	IP Peak	PM Peak
CCMP1	Full Scheme	90%	90%	85%
CCMP2a	Guild St Scheme	95%	100%	95%
CCMP2b	Guild St Scheme + Mitigation	100%	100%	95%
CCMP3a	Union St Scheme	100%	100%	90%
CCMP3b	Union St Scheme + Mitigation	100%	95%	95%
CCMP4a	Schoolhill Scheme	100%	100%	95%
CCMP4b	Schoolhill Scheme + Mitigation	100%	100%	95%
CCMP5a	Guild St & Union St Scheme	95%	100%	85%
CCMP5b	Guild St & Union St Scheme + Mitigation	95%	100%	85%
CCMP6a	Guild St & Schoolhill Scheme	100%	100%	90%
CCMP6b	Guild St & Schoolhill Scheme + Mitigation	100%	100%	90%
CCMP7a	Union St & Schoolhill Scheme	95%	95%	90%
CCMP7b	Union St & Schoolhill Scheme + Mitigation	95%	95%	90%

- 5.2.8 The results suggest that none of the scenarios would be able to cater for the full 2024 network demand. However, a 95% demand level was achieved in the PM peak for several scenarios. This is essentially equivalent to a 2% background growth on the 2019 observed traffic levels.
- 5.2.9 It should also be noted that the LEZ is only able to run in ACCPM24 at 95% demand. Both the results of the LEZ and the CCMP testing suggest that allowing the traffic volume within the city centre to continue to grow exponentially would make it very difficult to introduce traffic restriction measures in the city centre in the longer term.
- 5.2.10 Assessing network restrictions at 95% of the predicted future demand level still allows the network to operate, but highlights the need for these proposed traffic restrictive measures to be implemented before the traffic demand level gets too high. In essence, the LEZ and the CCMP assist with traffic demand management in the city centre.
- 5.2.11 Whilst some of the above CCMP scenarios did not run at even 95% demand, it is important to note that the LEZ effectively reduces traffic within the city centre area by the re-distribution of non-compliant vehicles.
- 5.2.12 Therefore, the CCMP measure and the LEZ measures do complement each other well, as the LEZ reduces traffic demand around the city centre to enable the CCMP measures to operate, whilst at the same time the CCMP measures further reduce traffic volumes through the areas of air quality concern.

### 5.3 Identification of Required Measures

- 5.3.1 As detailed in Section 4.11, the Option 5 LEZ boundary is anticipated to positively impact on the vast majority of air quality exceedance areas within the city centre. Table 18 showed that 13 of the 18 NO<sub>2</sub> exceedance locations were predicted to be well within the 40µg/m<sup>3</sup> exceedance threshold. Three of the five remaining locations were predicted to be just under the threshold, and two: Site DT11-King St and Site DT17-Union St were predicted to still be over the threshold.

- 5.3.2 In order to identify which CCMP scheme, or combination of schemes, would best address the remaining predicted exceedance locations, traffic flow changes between the 2019 base model and each of the CCMP test scenarios were compared at each of the exceedance locations.
- 5.3.3 It is a logical assumption that where the CCMP is anticipated to result in an increase in traffic flows, then this would subsequently result in an increase in vehicle emissions.
- 5.3.4 Table 22 shows a summary of the traffic flow changes at the 14 NO<sub>2</sub> exceedance locations compared to the 2019 base. The figures provided are the 12 hr percentage flow change from the 2019 baseline in two-way traffic flow.
- 5.3.5 From analysis of the results, it was identified that CCMP test CCMP3a: 'Union St Scheme' was the best scenario to potentially address the remaining exceedances.
- 5.3.6 Traffic modelling of the Union Street Scheme showed a reduction in traffic flows through the NO<sub>2</sub> exceedance locations of King St and Union Street whilst also potentially providing some traffic reductions through Holburn Street.
- 5.3.7 As a result of the Union Street Scheme, the traffic flows through the harbour route of Trinity Quay and Virginia St showed a very marginal increase. However this was significantly lower than many of the alternative CCMP scenarios.

Table 22. CCMP Scenarios – Exceedance Location Flow Analysis (% change from 2019 Base)

Site	Exceedance Location	LEZ Option 5 AQ Impact	CCMP 1	CCMP 2a	CCMP 2b	CCMP 3a	CCMP 3b	CCMP 4a	CCMP 4b	CCMP 5a	CCMP 5b	CCMP 6a	CCMP 6b	CCMP 7a	CCMP 7b
			Full Scheme	Guild St Scheme	Guild St Scheme + Mitigation	Union St Scheme	Union St Scheme + Mitigation	Schoolhill Scheme	Schoolhill Scheme + Mitigation	Guild St & Union St Scheme	Guild St & Union St Scheme + Mitigation	Guild St & Schoolhill Scheme	Guild St & Schoolhill Scheme + Mitigation	Union St & Schoolhill Scheme	Union St & Schoolhill Scheme + Mitigation
DT30	335 Union St		-36%	0%	1%	-36%	-22%	7%	11%	-22%	-28%	1%	6%	-20%	-19%
DT73	61 Skene Square		25%	-3%	-4%	-12%	8%	0%	18%	27%	14%	2%	16%	1%	19%
DT18	14 Holburn St		-14%	13%	14%	-25%	-7%	10%	11%	8%	0%	14%	11%	-5%	-5%
CM2	Union Street		-47%	-7%	-6%	-45%	-35%	9%	9%	-33%	-38%	-5%	1%	-33%	-32%
DT16	1 Trinity Quay		31%	17%	17%	2%	19%	11%	15%	40%	17%	20%	19%	27%	33%
DT77	27 Skene Square		25%	-3%	-4%	-12%	8%	0%	18%	28%	14%	2%	16%	1%	19%
DT11	105 King St		32%	4%	36%	-15%	35%	8%	14%	26%	43%	13%	42%	4%	45%
DT10	184/192 Market St		28%	14%	14%	4%	12%	7%	7%	37%	15%	17%	17%	13%	18%
DT9	39 Market St		-64%	-70%	-70%	-30%	-22%	0%	7%	-63%	-66%	-70%	-70%	-22%	-15%
DT29	469 Union St		-43%	6%	7%	-43%	-29%	9%	9%	-27%	-33%	7%	5%	-29%	-29%
DT12	40 Union St		-85%	-6%	-5%	-57%	-56%	19%	33%	-81%	-83%	-1%	18%	-54%	-51%
DT17	43/45 Union St		-85%	-6%	-5%	-57%	-56%	19%	33%	-81%	-83%	-1%	18%	-54%	-51%
DT82	7 Virginia Street		18%	16%	17%	6%	15%	10%	16%	43%	17%	20%	21%	25%	30%
DT19	468 Union St		-43%	6%	7%	-43%	-29%	9%	9%	-27%	-33%	7%	5%	-29%	-29%

## 5.4 CCMP – Union Street Scheme

5.4.1 The Union Street Scheme is a package of measures within the CCMP, based around proposed restrictions to general traffic through Union Street, between Bridge Street and Market Street

5.4.2 The key elements of the Union Street Scheme are:

- Union St - Bus and Taxi only between Bridge Street and Market Street
- Union Terrace - Bus and Taxi only (potentially south end only)
- Rose St - Pedestrianised between Union St and Thistle St.

5.4.3 Figure 7 schematically shows the key elements of Union Street CCMP Scheme.

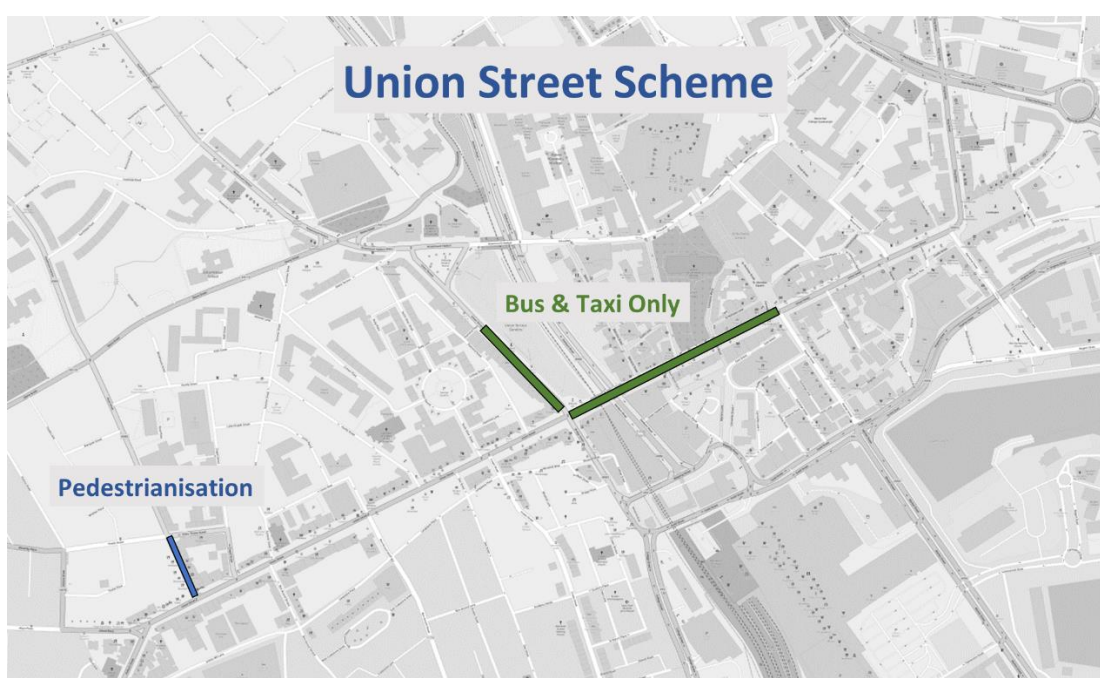


Figure 7. CCMP – ‘Union St Scheme’

5.4.4 The rationale for the package of measures associated with the Union Street Scheme are as follows:

- Extensive testing of individual elements of the CCMP in 2016 identified that Union Terrace restrictions were required in combination with the Union St restrictions to prevent local traffic diversions through Schoolhill / Upperkirkgate
- With the Union Terrace restriction in place, traffic seeking to route between Union St and Skene Street utilise Rose Street as a rat run, hence the requirement to restrict this movement to push through routing traffic out-with the city centre area
- Rose St pedestrianisation is identified within the CCMP Master documents. This proposals also has placemaking advantages.

## 5.5 Model Testing of LEZ with CCMP: Union St Scheme

5.5.1 LEZ Option 5 was utilised to develop the wider package of measures including the CCMP: Union St Scheme. This model scenario including both the Union St Scheme and the LEZ is named Test Option 6 (for the purposes of this report).

### *Option 6 - Model Demand Level*

5.5.2 Table 23 shows the demand level that the test scenarios were able to run at in each peak.

**Table 23. LEZ & CCMP – Network Demand Level**

Peak Period	Scenario		
	CCMP - Union St Scheme	LEZ - Option 5	LEZ+CCMP - Option 6
AM	100%	100%	100%
IP	100%	100%	100%
PM	90%	95%	95%

5.5.3 This high level model test result shows that whilst the Union St Scheme could only be run at 90% of the future year traffic demand, when it was tested in combination with the LEZ, a 95% demand level was attained. This is consistent with the demand level attained for LEZ Option 5.

### *5.5.4 Option 6 - NO<sub>2</sub> Exceedance Locations*

5.5.5 Table 24 provides both the traffic flow difference to the 2019 baseline and the resultant predicted air quality impact at the NO<sub>2</sub> exceedance locations.

5.5.6 The traffic flow differences are provided as a percentage difference of 12 hour traffic flow compared to the 2019 Base model.

Table 24. LEZ & CCMP Impact at Air Quality Exceedance Locations

Site	Exceedance Location	Flow Difference to Base		Air Quality Impact	
		Option 5	Option 6	Option 5	Option 6
DT30	335 Union St	5%	-25%		
DT73	61 Skene Square	-8%	-10%		
DT18	14 Holburn St	1%	-14%		
CM2	Union Street	3%	-41%		
DT16	1 Trinity Quay	-7%	8%		
DT77	27 Skene Square	-8%	-10%		
DT11	105 King St	3%	-2%		
DT10	184/192 Market St	-4%	-2%		
DT9	39 Market St	1%	-36%		
DT29	469 Union St	3%	-32%		
DT12	40 Union St	9%	-61%		
DT17	43/45 Union St	9%	-61%		
DT82	7 Virginia Street	-8%	5%		
DT19	468 Union St	3%	-32%		

	NO <sub>2</sub> Levels predicted to be Under Threshold
	NO <sub>2</sub> Levels predicted to be Near Threshold
	NO <sub>2</sub> Levels predicted to be Over Threshold

5.5.7 Table 24 shows that the Union St Scheme has a significant impact on the volume of traffic routing through Union Street, with a 60% reduction in traffic at two of the NO<sub>2</sub> exceedance sites. This also has an additional impact to the volume of traffic approaching Union St from both Holburn St and King St. These traffic reductions will therefore have a direct impact on the air quality figures at these locations.

5.5.8 The Union St restrictions also result in traffic diversions to other local routes. The harbour routes of Trinity Quay and Virginia Street therefore show a slight increase in traffic volumes due to the restrictions on Union St. It should, however, be noted that these locations are still within the LEZ boundary and therefore any slight increase in traffic flow will have a limited detrimental impact on the NO<sub>2</sub> levels.

5.5.9 In summary, the CCMP -Union St Scheme results in traffic reductions through key areas of the city centre network where measures are required in addition to the LEZ.

The City Centre Masterplan – ‘Union St Scheme’ has shown to complement the proposed LEZ to positively impact on the NO<sub>2</sub> exceedance locations. This combination of the LEZ plus the Union Street Scheme is predicted to significantly reduce the emission levels at all the 2019 observed NO<sub>2</sub> exceedance locations.

SYSTRA therefore recommends that the LEZ and the CCMP- Union St Project is viewed as a combined package of measures to meet the objectives of the LEZ scheme.

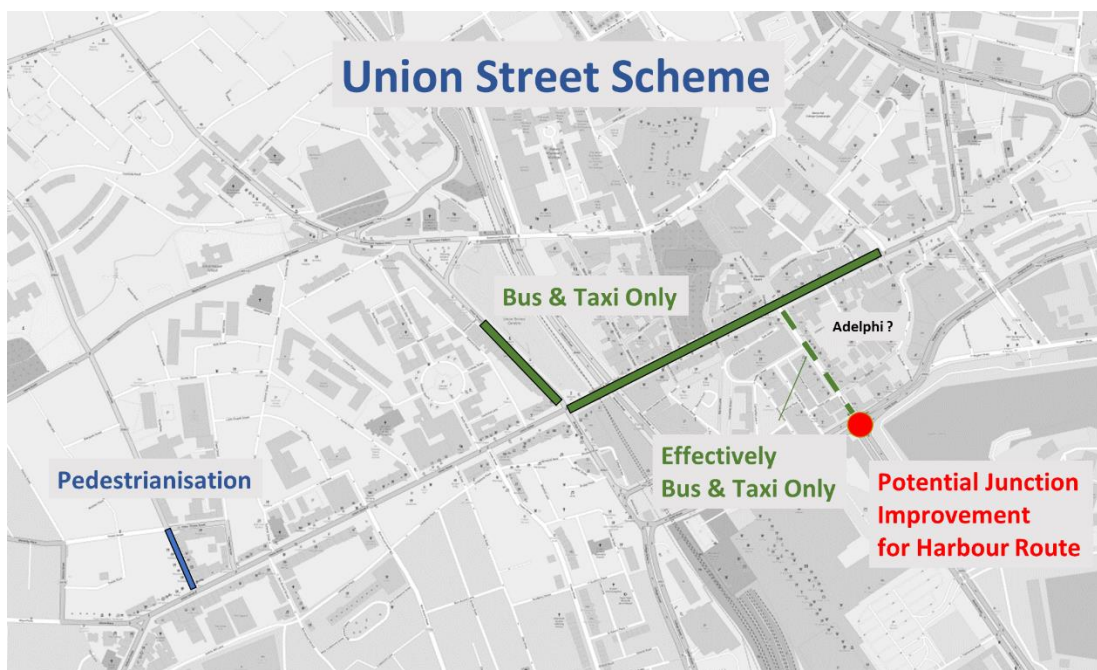
## 5.6 Union Street Scheme: Alternative Traffic Intervention Detail

- 5.6.1 The Aberdeen City Centre Masterplan is a 20 year development strategy which includes significant changes to the operation of the traffic network around the city centre area. Whilst the Masterplan Report (BDP, June 2015) outlines the proposed traffic interventions within the city centre area, ACC view these as outline proposals and are flexible to the changing road space demands and overarching vision for the city centre as the project moves forward over time.
- 5.6.2 As part of the development of a package of measures associated with the LEZ, alternative traffic intervention detail within the Union St scheme was considered. This was primarily split into two elements:

- Extent of the Union Street interventions
- Classification of Vehicle Restrictions on Union Street.

### *Extent of Union Street Restrictions*

- 5.6.3 The proposed Union St restrictions result in traffic diversions to other local routes including the harbour routes of Trinity Quay and Virginia Street. In order to help alleviate the additional traffic volume on the harbour route, consideration was given to extending the restrictions on Union Street from Market Street through to Broad Street (See Figure 8).
- 5.6.4 This extension would effectively result in Market Street (North of Guild Street) operate as a bus and taxi only corridor, which in turn, would allow improved priority for the Harbour route traffic movement at the Guild St / Market St signalised junction.



**Figure 8. Alternative Union Street Restrictions**

- 5.6.5 Model testing of the revised restrictions were undertaken. The modelling showed that the effective closure of Market St (north) and Union St (east of Market St) resulted in a further

increase in traffic on Trinity Quay and Virginia Street. Any signal timing benefit accrued at the Guild St / Market St junction was offset by the increase in traffic displaced to the harbour corridor.

SYSTRA would recommend that, for the LEZ package of measures, the proposed Union Street interventions remain between Bridge Street and Market Street.

### Classification of Vehicle Restrictions on Union Street

- 5.6.6 ACC requested that SYSTRA undertake a high level assessment of various traffic restriction scenarios on Union Street and Union Terrace.
- 5.6.7 Whilst these considerations are not within the remit of the LEZ study, any deviation to the proposed restrictions through the city centre would require to be assessed as part of a final LEZ scheme.
- 5.6.8 The alternative options for the Union Street Scheme restrictions include:
  - Bus only on Union Street and Union Terrace (no Taxis)
  - Full pedestrianisation of Union Street.
- 5.6.9 High level model testing has shown that the alternative restrictions through the city centre do not impact on the demand level that the model is able to run at nor do they impact greatly on the traffic flows around the NO<sub>2</sub> exceedance areas. There are additional considerations within these proposals, especially for the full pedestrianisation option, which would potentially impact the public transport network.
- 5.6.10 SYSTRA have recommended that further work is required to fully assess the implications of the various traffic restriction options through the city centre.
- 5.6.11 Whilst the detail of the restrictions are therefore not fully defined at this point in the study, traffic modelling has shown that restrictions to through-routing general traffic on Union St and Union Terrace would enhance the air quality levels within the city centre when considered in combination with the LEZ.
- 5.6.12 Similarly, the detail of the restrictions proposed for traffic on Rose Street may require further consideration by ACC.

Given the requirement to investigate the level and detail of traffic restrictions in the city centre, and the requirement to gauge wider opinion on the level of restrictions proposed, the restrictions identified through Union Street, Union Terrace, and Rose Street will currently be classified as 'General Traffic Restrictions' within the proposed LEZ package of measures.



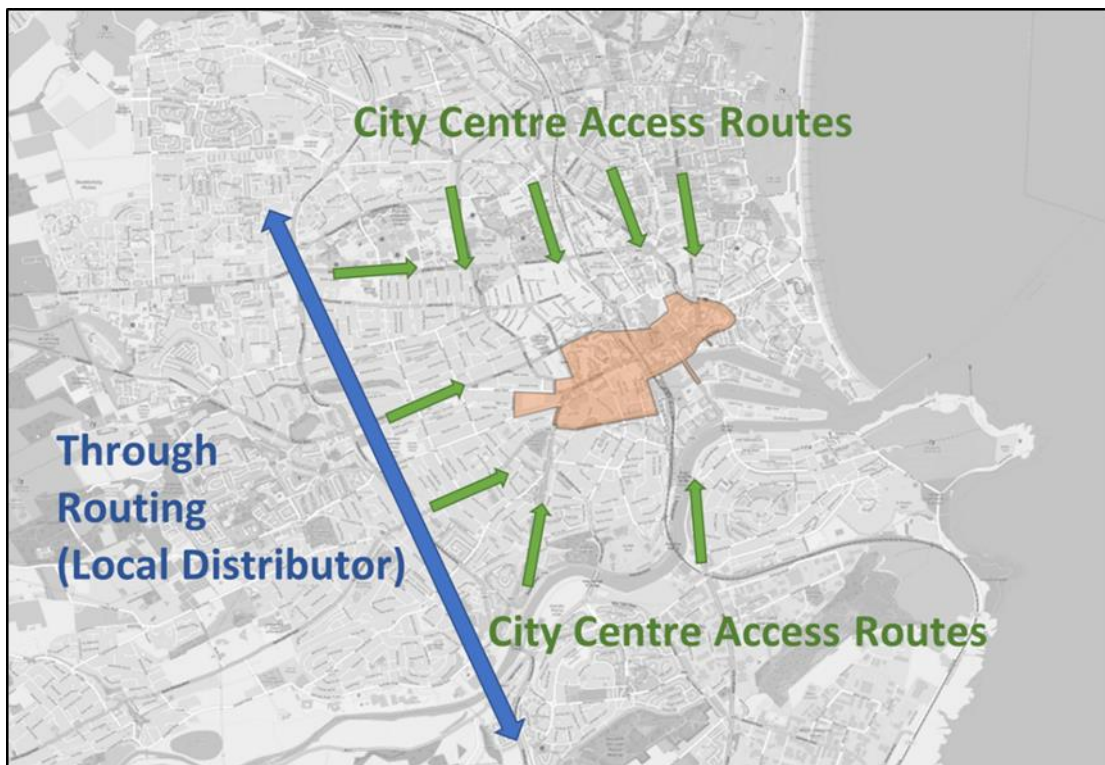
## 6. LEZ SUPPORTING MEASURES – MANAGEMENT OF DISPLACED TRAFFIC

### 6.1 Introduction

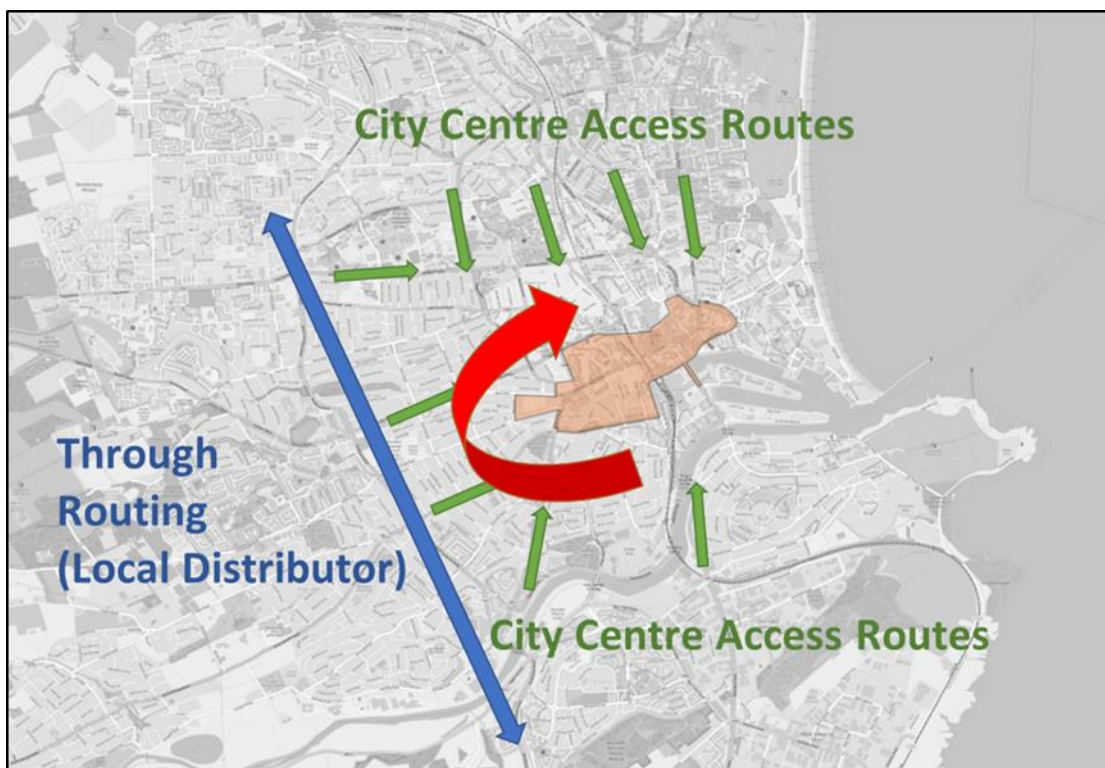
- 6.1.1 The Aberdeen LEZ is required to complement other network proposals for Aberdeen City Centre to provide a package of measures which will meet the objectives of the LEZ and wider Council objectives for Aberdeen City Centre.
- 6.1.2 As detailed in Section 4.11, the proposed LEZ boundary generally fits well with the revised hierarchy proposals, with the exception of a noticeable increase in traffic through the east-west route of Fonthill Road / Ferryhill Road. (Non-compliant) traffic increases were also noted around the west end of Union Street through routes including Ashley Road and Albyn Grove to by-pass the city centre LEZ boundary.
- 6.1.3 This chapter details the model sensitivity testing undertaken to better manage non-compliant traffic displacement from the LEZ.

### 6.2 Management of Non-Compliant Traffic

- 6.2.1 LEZ Boundary Option 5 (&6) has the effect of restricting all non-compliant vehicles from routing through the city centre area, but critically, it does not restrict access to the city centre (car park options still available for all traffic). This is consistent with other policies and aspirations for Aberdeen City Centre.
- 6.2.2 Figure 9 shows the ideal routing strategy for non-compliant vehicles around the city centre. These trips fall into three general categories:
  - Local & strategic non-compliant vehicles routing to/from the city centre – multiple access routes to car parks and roads around the periphery of the LEZ
  - Local non-compliant vehicles routing around the LEZ – local distributor routes (including Anderson Drive) to cater for trips originating and destinating within Aberdeen
  - Strategic non-compliant vehicles routing around the LEZ via the Aberdeen Western Periphery Route (AWPR).
- 6.2.3 The model testing of LEZ Option 5 (&6) has shown that non-compliant traffic (due to the LEZ) and compliant traffic (due to the Union St restrictions) are finding local routes around the periphery of the LEZ but within the boundary of Anderson Drive (See schematic in Figure 10 and model flow plot in Appendix C. [Link To Option 5](#)).



**Figure 9. Ideal Routing Strategy for Displaced Traffic**



**Figure 10. Actual Model Routing of Displaced Traffic**

**6.2.4** Some of the key routes affected by the diversion of traffic around the west end of the LEZ boundary are given in the summary table below. This table shows the traffic flow changes between the ACCPM24 and LEZ Option 6 in the PM Peak Period.

**Table 25. Key Rat Run Areas for LEZ Option 6**

Location	Dir.	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Ashley Rd	SB	544	868	324	59%
Ashley Rd	NB	567	863	297	52%
Albyn Grove	NB	718	1062	345	48%
St Swithin St	SB	773	1124	351	45%
Fonthill Rd	WB	1048	1415	368	35%
Fonthill Rd	EB	746	978	232	31%

### 6.3 Traffic Management Options

6.3.1 Through discussions with ACC, several options were developed to better manage the displacement of traffic around the south and west border of the proposed LEZ. These included:

1. Extension of LEZ boundary to include full South College Street corridor
2. Bus Gate on Ferryhill Road
3. Traffic Management Measures to restrict routing on Ashley Road and Forrest Avenue
4. Revised Milburn St / South College Street Junction as part of South College Street Improvements – Phase 2.

6.3.2 Figure 11 shows the location of these proposals together with the LEZ boundary.

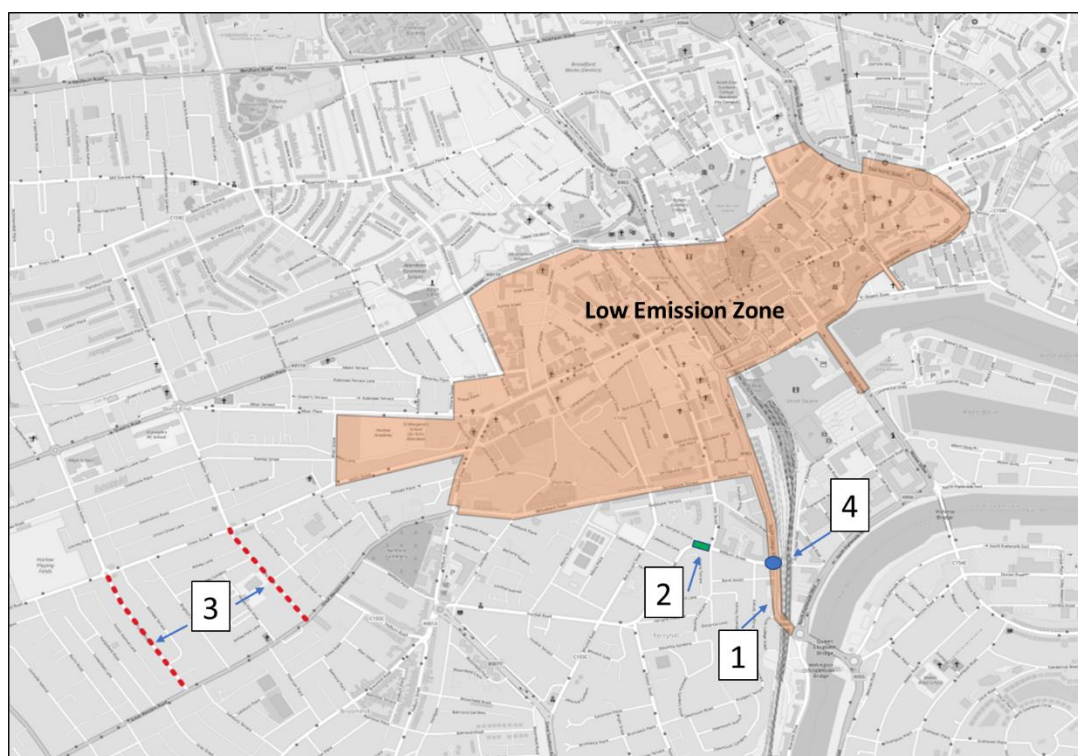


Figure 11. Traffic Management Options

6.3.3 Through model testing of the various options, and in consultation with ACC, the following conclusions were drawn from each option:

1. Extension of LEZ Boundary

- ACC raised an issue with extending the LEZ for a traffic management reason and not for an air quality reason
- Model testing showed only a slight improvement to traffic volume through Ferryhill Road corridor. A high proportion of the traffic on this corridor was actually compliant vehicles. This suggests that the Union St measures were also a key factor in the traffic increases through this corridor
- The LEZ extension option would therefore not fully manage traffic displaced from the city centre area and was excluded from further consideration.

2. Bus Gate on Ferryhill Road

- ACC advised that this was an acceptable consideration but not preferable over alternative proposed measures at Milburn Street / South College Street junction as it is more intrusive than other measures, and includes maintenance costs and may not be popular with the general public
- Model testing showed a significant reduction in traffic through the Ferryhill corridor by as much as 95%. However a significant proportion of this traffic was observed to divert through Albury Road to Springbank Terrace, thus retaining traffic routes through the area.

### 3. Traffic Management Measures through Ashley Road and Forrest Avenue

- Model testing had shown a high volume of traffic routing around the western edge of the LEZ / City Centre area. SYSTRA identified that Ashley Road carried a high proportion of this traffic. Whilst Forrest Avenue was not included within the model, ACC advised that rat-running traffic is also known to use this route in parallel with Ashley Road
- Model Testing showed a significant reduction on traffic on Ashley Road when routing costs were increased (actual traffic management measures not defined at this point)
- Model testing also showed little improvement on traffic routing through the Ferryhill corridor as the restrictions pushed traffic out to Anderson Drive but still left routing between Holburn St and South College Street through the Ferryhill corridor.

### 4. Revised Milburn St / South College Street Junction

- The South College Street Scheme is to be implemented in 2022 and is considered as Phase 1 of a two phase programme of works. The first phase involves the creation of a link road between South College Street and North Esplanade West to alleviate traffic congestion at the QEII Bridge roundabout
- As advised by ACC, a second phase will consider changes to the junctions at either end of QEII Bridge. As part of Phase 2, ACC were also considering restricting access to Milburn St from South College St, pending a review of the operation of the junction (post-implementation of Phase 1)
- Following advisement of the traffic modelling impact of the LEZ, ACC advised SYSTRA to consider restricting access to/ from Milburn St to restrict strategic movement through this corridor
- Model testing was undertaken on a design option (specific design detail will be developed in due course)
- The traffic modelling showed that there was only a small (approx. 10% on average) increase in the two way traffic flow on the Milburn Street corridor in the LEZ scenario compared to ACCPM24
- This proposal effectively cuts off the Ferryhill corridor as a rat-run and pushes traffic back out to Anderson Drive. It was found to be, on balance, the best solution of the options considered.

The model testing of various proposals to manage traffic displaced from the city centre has identified that a revision to the operation of the Milburn St / South College Street junction is best placed to address potential rat runs through the south and west border of the LEZ.

Junction changes are required to restrict or prevent strategic traffic easily routing through Milburn St and through the Ferryhill corridor. Further assessment of the specifics of these measures will be considered by ACC in due course.

## 6.4 Further consideration of Rose Street Pedestrianisation Proposal

- 6.4.1 As detailed in Section 5.4.4, the pedestrianisation of the south end of Rose Street has been identified within the CCMP core proposals. Previous traffic modelling has shown that, when Union Terrace and Broad Street are closed to routing traffic, alternative routes connecting Union St to Skene Street become more attractive alternative routes. This is the primary reason for including Rose St pedestrianisation as part of the Union Street Scheme package of measures.
- 6.4.2 As a sensitivity test, Rose St was re-opened to general traffic to assess the impact of this proposed measure.
- 6.4.3 Figure 12 shows the PM Peak flow difference plots between the two Rose St scenarios and the ACCPM24. Red banding represents traffic flow increases, Blue banding flow reductions.

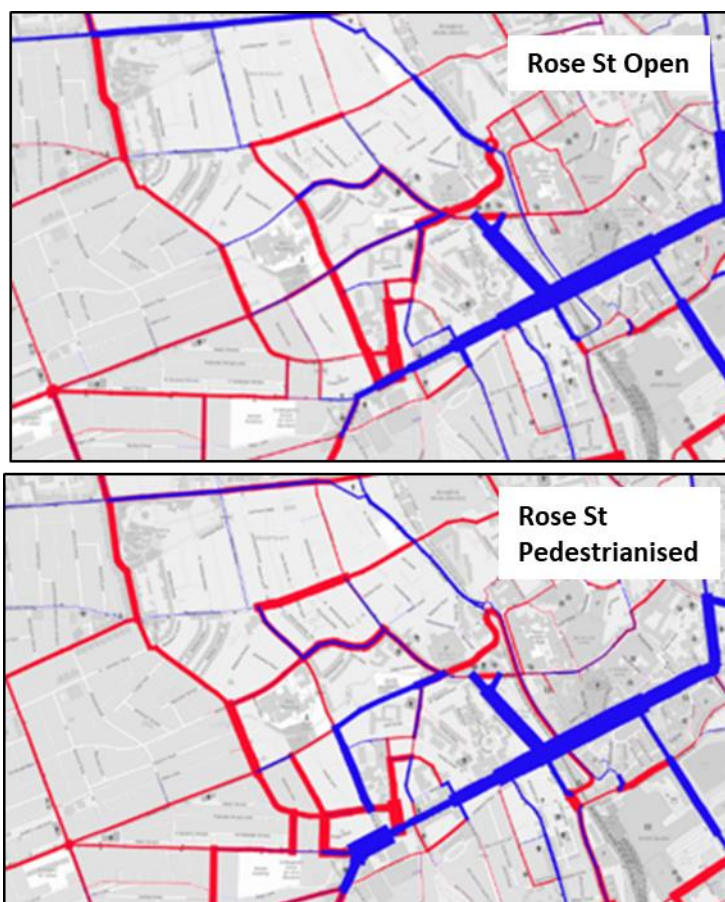


Figure 12. PM Peak Flow Difference Plot for Rose St Variation

- 6.4.4 Table 26 Provides 12 hour traffic flow differences between the two Rose St scenarios and ACCPM24.

**Table 26. Key Traffic Flow Differences for Rose St Restrictions (12 Hr Veh)**

Location	Ref Case (Veh)	Percentage Change from Ref Case	
		Rose St Open	Rose St Pedestrianised
Albyn Place EB	4694	-9%	-27%
Rose St NB	4292	40%	-100%
Albyn Place WB	2962	-11%	89%
Chapel St SB	2843	54%	67%
Albert Street NB	1957	13%	44%
Holburn St NB	6912	-1%	-7%
Holburn St SB	7715	8%	12%
Woolmanhill NB	3415	42%	29%

- 6.4.5 The model testing suggests that by not including the restrictions on Rose St, this allows increased traffic flow through the Rose St corridor and Esslemont Avenue to Skene Street. However, the modelling also suggests that restricting traffic through Rose St diverts some of this traffic though Albyn Place and Albert St.
- 6.4.6 The scale of the traffic rat running may not be as high as the modelling suggests due to the fixed trip nature of the traffic modelling – see comments on this in Section 6.7.
- 6.4.7 What is clear is that the modelling suggests the Rose St restrictions do prevent an increase in rat-running through this corridor as well as placemaking benefits through the retail section of this corridor.
- 6.4.8 SYSTRA would recommend that the volume of traffic on Holburn St through Albyn Place is monitored post-LEZ implementation. If a north-south corridor through this route is established, then further traffic restrictions could be considered. Some of which are detailed in the CCMP and Network Hierarchy reports.

## 6.5 Traffic Management through Springbank Terrace Corridor

- 6.5.1 As noted in Section 6.2, the traffic modelling of LEZ Option 6 (Including Union Street CCMP scheme) has shown that non-compliant traffic (due to the LEZ) and compliant traffic (due to the Union St restrictions) are finding local routes around the periphery of the LEZ but within the boundary of Anderson Drive.
- 6.5.2 The closure of Union Street to general traffic was observed to put additional pressure on the Wellington Place/Springbank Terrace/Willowbank Road corridor. Model observations showed traffic queuing at the junctions of Springbank Terrace / Crown St and Springbank Terrace / Bon Accord St (Figure 13).



**Figure 13. Location of Potential Future Traffic Management Requirements**

- 6.5.3 The cause of the congestion in the model was found to be an increase in right turning traffic at these junctions. As they are both narrow single lane approach junctions, waiting right turning traffic can block other traffic behind it. Model testing has found that by banning all the right turning movements at these junctions, the congestion levels are significantly reduced.
- 6.5.4 Given that this is a relatively minor change in the future year traffic modelling, and the mitigation identified may not necessarily be required under a different future network, ACC are planning to monitor this area of the network once the LEZ is in operation to understand how traffic is using this area and whether these additional restrictions are required.
- 6.5.5 Further comment on future year modelling is provided in Section 6.7.

**6.6 Traffic Diversion Options around Union Street**

- 6.6.1 As part of the current spaces for people measures that have been in place in Aberdeen city centre during the COVID pandemic, the right turn from Union Street to Bridge Street was re-opened to all traffic (See Figure 14). This is normally a banned movement but was opened to allow general traffic a route around the temporary pedestrianised section of Union Street.
- 6.6.2 The allowance of a right turn from Union Street to Bridge Street was not included within the core testing of the LEZ & CCMP measures as it was not explicitly identified as part of the CCMP scheme.

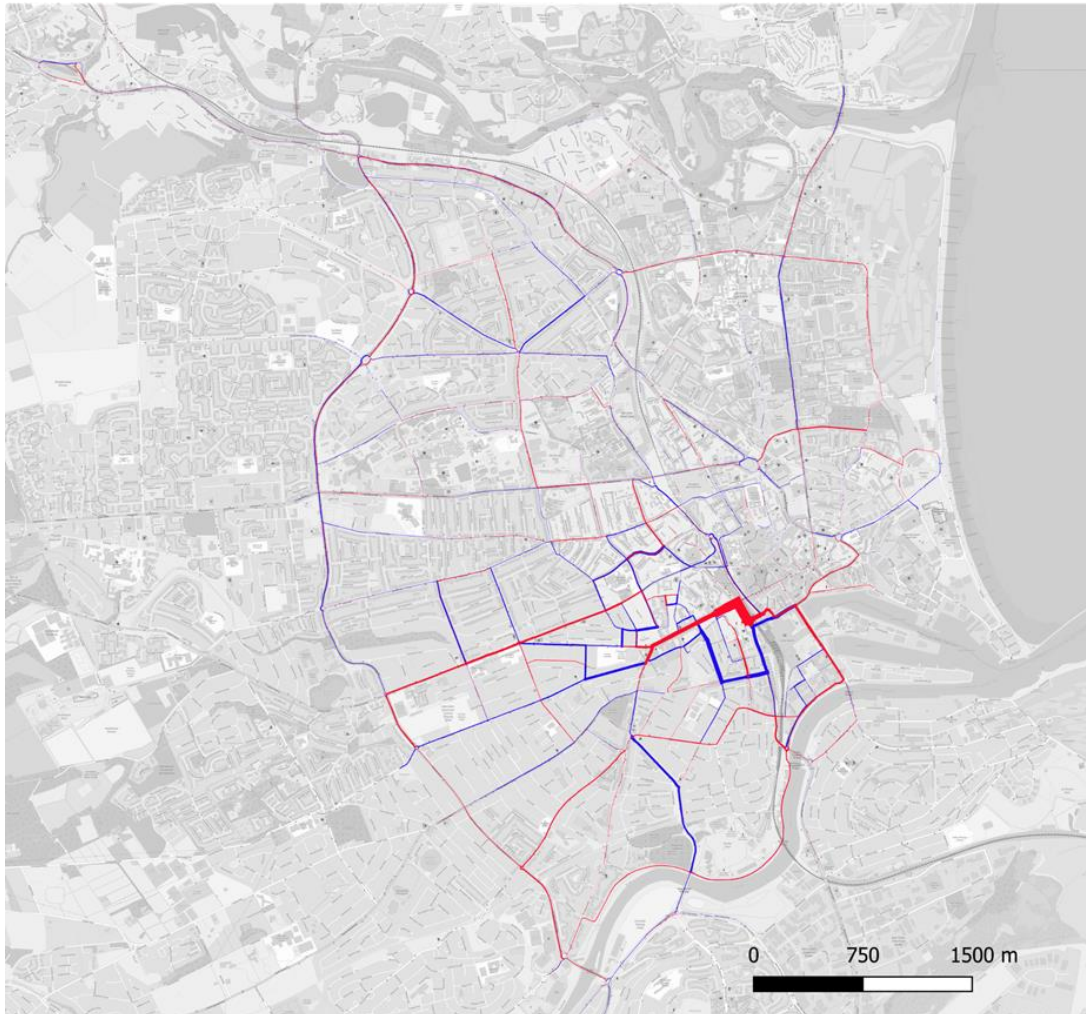


- 6.6.3 ACC have highlighted that allowing this right turn for general traffic provides an exit strategy for vehicles routing along Union Street eastbound on approach to the proposed restrictions between Bridge St and Market Street.
- 6.6.4 From the perspective of the LEZ, the key concern with allowing this movement would be that it potentially allows an alternative east-west route through Union Street to Market Street via Bridge Street and Guild Street. This may not only have a detrimental impact at some of the NO<sub>2</sub> exceedance locations, but also potentially goes against one of the councils key city centre objectives to restrict traffic movement through the city centre. A sensitivity test was therefore undertaken to ascertain the impact of allowing the right turn movement from Union Street to Bridge Street under the LEZ & Union St Scheme (CCMP) scenario.



**Figure 14. Temporary Changes to Traffic Movements on Union St between 2019 and 2020**

6.6.5 Figure 15 shows a PM peak traffic flow difference plot between the LEZ Option 6 and LEZ Option 6 with the right turn from Union St to Bridge St allowed for all vehicles.



**Figure 15. PM Peak Flow Difference Plot (Impact of R/T open on Union St to Bridge St)**

6.6.6 It can be seen from Figure 15 that the opening of the right turn from Union Street to Bridge Street does allow for the creation of an alternative route through the city centre area utilising Bridget Street and Guild Street. Traffic flow increases are also observed through Union Street on the eastbound approach to the Union Street restrictions.

6.6.7 When the right turn movement is banned from Union St to Bridge Street in LEZ Option 6, there is some rat running within the model through Bon Accord St and Springbank Terrace. It can be seen in the above figure that this rat run is lessened when the right turn is allowed.

6.6.8 Table 27 provides the key 12 hour traffic flow comparisons between LEZ Option 6 with and without the right turn allowed from Union St to Bridge Street. The ACCPM24 flows are also provided for reference.

Table 27. 12 Hr Traffic Flow Comparison to ACCMP24

Location	Ref Case		LEZ Option 6F	
	(at 95% demand)	R/T banned	R/T allowed	R/T allowed
	(Veh)	(Veh)	(Veh)	(% Diff to 6F)
Bridge St SB	1845	250	4496	1702%
Union St EB (West of restriction)	4301	2765	4780	73%
Albyn Place EB	4694	3408	4302	26%
Guild St EB	4009	5057	5858	16%
Holburn St NB	6912	6437	7076	10%
Denburn Rd NB	6958	8211	8966	9%
Union St WB (East of restriction)	5128	599	634	6%
Chapel St SB	2843	4740	4994	5%
Springbank Terrace WB	2049	2700	2812	4%
Market St SB	13205	11518	11836	3%
S College St NB (S of Palmerston Pl)	5201	7356	7545	3%
S College St SB (S of Palmerston Pl)	4772	5108	5181	1%
S College St SB (N of Palmerston Pl)	4639	4475	4475	0%
Holburn St SB	7715	8634	8407	-3%
Market St NB	11968	10996	10413	-5%
Bon-Accord St SB	2107	940	872	-7%
Bridge St NB	2317	2630	2436	-7%
Guild St WB	3210	5066	4521	-11%
Bon-Accord St NB	1291	774	689	-11%
Denburn Rd SB	6034	6502	5771	-11%
Union St EB (East of restriction)	5303	702	605	-14%
Albyn Place WB	2962	5596	4736	-15%
S College St NB (N of Palmerston Pl)	7417	9233	7669	-17%
Springbank Terrace EB	3012	6287	4594	-27%
Union St WB (West of restriction)	5171	4331	3144	-27%

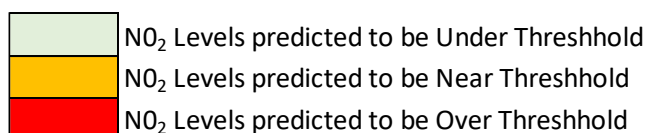
6.6.9 The 12 hour traffic flow table shows a significant increase in traffic through Bridge Street southbound when the right turn from Union St is allowed. Not only is this a considerable increase compared to the alternative scenario, but is also significantly higher than the ACCPM24 Reference Case.

6.6.10 The allowance of the right turn from Union St to Bridge St also has an impact on the volume of traffic routing eastbound on Union St towards Bridge Street with almost double the traffic. This increase can also be traced back through Holburn Street and Albyn Place, and also forwards through Guild Street.

- 6.6.11 There are beneficial impacts of allowing the right turn manoeuvre, traffic flows on some of the potential rat run areas including Springbank Terrace and Albyn Place westbound are reduced.
- 6.6.12 The impact that the allowance of the right turn into Bridge Street has on the NO<sub>2</sub> exceedance locations can be seen in Table 28 below.

**Table 28. Impact of R/T into Bridget St on Air Quality Exceedance Locations**

Site	Exceedance Location	Flow Change from 2019 Base (Veh) LEZ Option 6F		Predicted Air Quality Impact LEZ Option 6F	
		R/T banned	R/T allowed	R/T banned	R/T allowed
DT30	335 Union St	-24%	-15%		
DT73	61 Skene Square	-10%	-8%		
DT18	14 Holburn St	-14%	-4%		
CM2	Union Street	-40%	-30%		
DT16	1 Trinity Quay	6%	6%		
DT77	27 Skene Square	-10%	-8%		
DT11	105 King St	2%	3%		
DT10	184/192 Market St	-5%	-7%		
DT9	39 Market St	-37%	-38%		
DT29	469 Union St	-32%	-23%		
DT12	40 Union St	-62%	-61%		
DT17	43/45 Union St	-62%	-61%		
DT82	7 Virginia Street	5%	5%		
DT19	468 Union St	-32%	-23%		



- 6.6.13 It can be seen in Table 28 that when the right turn into Bridget Street is allowed, the higher traffic flows on Union Street (at DT29 and DT30) are not anticipated to be sufficient enough to bring the exceedance levels back up near the NO<sub>2</sub> compliance limit. The increase in traffic flows on Holburn Street in the model is anticipated to have a slight impact on the NO<sub>2</sub> levels at this location but again, are not anticipated to create NO<sub>2</sub> exceedance levels.
- 6.6.14 To summarise, allowing the right turn from Union St to Bridge Street for all traffic in the model does create an alternative east-west route through the city centre. The LEZ and CCMP restrictions are predicted to still keep the NO<sub>2</sub> levels below the exceedance threshold even if this manoeuvre is allowed for all traffic
- 6.6.15 What is not clear from the traffic model testing is the potential negative impact to air quality on Bridge Street itself and also to public transport which routes through Bridget Street and Guild Street. It is possible that the traffic flows in the model using this right turn manoeuvre are an overestimation of what would occur in reality. This is because the traffic model is a fixed trip matrix and all traffic that originally routed along Union Street must be diverted elsewhere in the network. In reality, some of these trips would not occur through this route

due to the diversions required and also if advanced signing was utilised to advise of city centre restrictions. Also note the comments on modelling in Section 6.7.

- 6.6.16 However, given the wider ACC objective to gradually reduce the volume of traffic routing through the city centre, SYSTRA would recommend that this right turn manoeuvre is not permitted for general traffic (but could be for buses).
- 6.6.17 Careful consideration of advisory signing would therefore be required in advance of Union Street to notify drivers that there was no through route available on Union St. As a final exit option, traffic could divert through Crown Street but it would be anticipated that, due to the advanced signing, the traffic volume would be low at this point.
- 6.6.18 ACC may wish to still consider allowing this manoeuvre for all traffic but it has not been included in subsequent model testing or outputs.

## 6.7 Comment on Future Year Modelling

- 6.7.1 Given the impact Covid-19 is having on trip making, future travel patterns are still uncertain. There is therefore a high degree of variability in the various plausible futures of the city centre traffic network. The plausible futures work undertaken as part of this study assesses the wider, key elements of the LEZ under different travel demand scenarios (See Chapter 8), so it is important to note that minor mitigation measures identified to support the wider LEZ scheme may be required in one plausible future scenario may not necessarily be the another.
- 6.7.2 The traffic modelling undertaken to date is based upon pre-COVID network and the ‘spaces for people’ measures currently in place include some of the traffic restrictions proposed as part of the permanent LEZ package of measures (e.g. restrictions on Union St) . If ACC considers that these temporary measures should remain in place until the LEZ is operational, then the city centre travel patterns, post-Covid, will build back up around the current restrictions. This is therefore subtly different to how the modelled traffic patterns are currently constructed and adds a degree of uncertainty to the actual future traffic volumes that the scheme can be assessed against.
- 6.7.3 It is therefore important to utilise the traffic modelling appropriately, and extract the key findings to aid the decision making process, whilst acknowledging that the need for additional mitigation measures can be monitored and reviewed after the wider LEZ scheme is implemented, post-Covid.

SYSTRA recognises the current uncertainty in predicting the future city centre travel patterns post-COVID. Because of this, SYSTRA recommends that the consideration of additional mitigation measures as part of the wider LEZ package should be reviewed after the key LEZ elements are implemented to determine if these, or other measures are still required.

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## 7. FINALISATION OF LEZ BOUNDARY

### 7.1 Introduction

7.1.1 As part of the development of the final package of measures proposed for the LEZ scheme, the boundary of the LEZ itself was reviewed by both SYSTRA and ACC and some minor amendments considered as detailed in the following section:

### 7.2 LEZ Boundary Detail

#### 1. Ashvale Place / Holburn St

7.2.1 The LEZ boundary on Holburn Street required to be moved from, just north of the junction with Willowbank Road to just north of the junction with Ashvale Place. This is to allow non-compliant traffic an exit on Ashvale Place, as it is a one-way eastbound route onto Holburn St. – See Figure 16.



**Figure 16. Revised LEZ Boundary on Holburn Street**

7.2.2 The revised location of the LEZ on Holburn St does not affect the impact of the LEZ through this corridor.

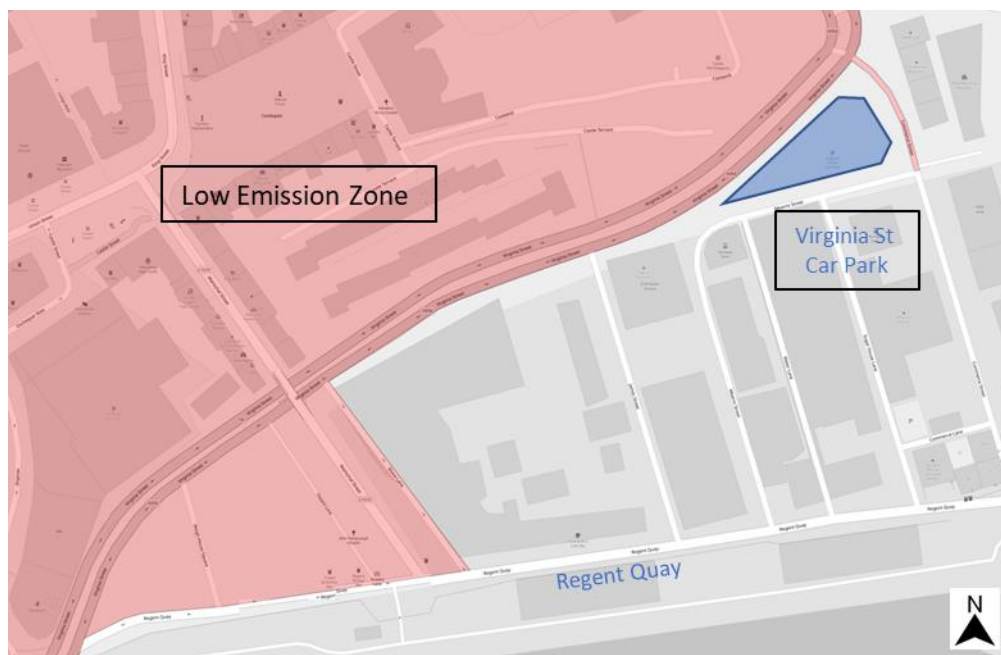
#### 2. Regent Quay Area

7.2.3 ACC identified the need to rationalise the LEZ boundary around the Regent Quay area of the network, noting the following:

- A requirement to retain access to the Virginia St Car Park on Mearns Street for all vehicles

- A requirement for the LEZ to include roads connecting Virginia St to Regent Quay, for operational purposes
- A requirement to limit the number of residential properties affected to a minimum
- Noting the requirement to exclude Regent Quay from the LEZ as this road is under the jurisdiction of the Harbour Board and not ACC, therefore cannot be included within the LEZ.

7.2.4 The LEZ boundary was subsequently revised to take accordance of the above requirements – See Figure 17. This boundary revision was agreed with ACC.



**Figure 17. Revised LEZ Boundary around Regent Quay**

### 3. East North Street / King Street

7.2.5 The LEZ boundary is proposed to include the Harbour route of Virginia St and Commerce St. This will restrict non-compliant vehicles from routing through this corridor and reduce the emissions through the exceedance locations of Trinity Quay, Virginia St and also the South end of Market Street.

7.2.6 The LEZ boundary is proposed to exclude the roundabout of Beach Boulevard / West North Street. This is to allow an exit route for non-compliant vehicles on Beach Boulevard and Park Street (i.e. to undertake a U-turn) – See Figure 18.

7.2.7 The inclusion of East North Street within the LEZ was queried by ACC. The rationale for including East North Street in the LEZ was to further limit the volume of non-compliant vehicles on King Street. If East North Street remains outwith the LEZ, then non-compliant traffic can route between King Street and Park St & Beach Boulevard.

7.2.8 There is a NO<sub>2</sub> exceedance location on King Street which is out-with the LEZ boundary. There is a need to maximise the influence of the LEZ at this location to reduce the emission levels.





Figure 18. LEZ Boundary On East North Street

7.2.9 A sensitivity test was undertaken whereby East North Street was removed from the LEZ.

7.2.10 The test scenarios were deemed:

- Option F1 – Final Proposed LEZ package of measures
- Option F2 – Final Proposed LEZ package of measures – excluding East North St from LEZ.

7.2.11 Table 29 provides a summary of the two-way traffic flows on King Street for each scenario. The table also identifies the volume of compliant and non-compliant traffic separately.

Table 29. Impact on King St of Alternative LEZ Boundary

PEAK	Option F1			Option F2		
	Compliant	Non-Compliant	Total	Compliant	Non-Compliant	Total
AM	1929	1	1929	2001	141	2141
IP	3375	3	3378	3464	271	3734
PM	1915	0	1915	1716	84	1800
12 Hr	7218	4	7221	7180	495	7675

7.2.12 The results suggest that there are almost 500 trips (6%) more on King St in a 12 hr period when East North Street is outwith the LEZ. Critically, these trips are essentially all non-compliant vehicles.

7.2.13 Given the NO<sub>2</sub> exceedance levels on King St, it is therefore recommended that East North Street is retained within the LEZ boundary.

- 7.2.14 This option would require careful signing for non-compliant vehicles on King St as there is no right turn allowed for vehicles on King St to West North Street. Alternative routing would be required for non-compliant vehicles much further north on King St – See Section 7.3.

## 7.3 Exit Strategy for Non-Compliant Vehicles

- 7.3.1 The full LEZ signing strategy is not complete at present. However, the immediate signage around the periphery of the LEZ is required to be considered in line with the finalisation of the LEZ boundary.
- 7.3.2 Transport Scotland are developing guidance and regulations for road signing associated with a LEZ. The advisory signing will include:
- Warning sign to advise that you are entering a LEZ Zone
  - Warning sign to advise that a LEZ is on an approaching route
  - Diversion sign – to avoid LEZ.
- 7.3.3 Table 30 provides an initial consideration of locations where advisory signs will be required to provide an exit for non-compliant vehicles. Note that this list does not include repeat or initial signage that will be required further out from the city centre area.
- 7.3.4 Figure 19 provides a map detailing the location of the initial consideration of LEZ signage for non-compliant vehicles.

**Table 30. Initial Consideration of LEZ Signage for Non-Compliant Vehicles**

Location	Approach	Diversion Route	Comment / Sign Type
1	King St	Mounthooly Way	Diversion Sign
2	West North St	King St	Diversion Sign
3	Park St	Beach Boulevard	Diversion Sign
4	Beach Boulevard	Park St	Diversion Sign
5	Castle Terrace	Cotton St	Diversion Sign
6	Regent Quay / Waterloo Quay	Church St	Diversion Sign
7	Mearns St	Commerce St (South)	Diversion Sign
8	Regent Quay (West)	Regent Quay (East)	Diversion Sign
9	James St	Regent Quay (East)	Diversion Sign
10	Market St	7A: Commercial Quay (for HGV)	Warning & Diversion Sign
		7B: Victoria Bridge/North Esplanade West (for Traffic from Torry)	Diversion Sign
		7C: North Esplanade West / Palmerston Link Road (for Traffic from North Esplanade)	Diversion Sign
11	South College St	Milburn St	Diversion Sign
12	Ferryhill Road into Crown St	-	Warning Sign
13	Fonthill Road into Bon Accord St	-	Warning Sign
14	Fonthill Road into Albury Road	-	Warning Sign
15	Fonthill Road into Hardgate	-	Warning Sign
16	Holburn St	Great Southern Road	Diversion Sign
17	Great Southern Road	Nellfield Place	Diversion Sign
18	Union Grove	Albyn Grove	Diversion Sign
19	Albyn Place	Victoria St	Diversion Sign
20	Thistle St	Rose St	Diversion Sign
21	Rose St into Huntly St	-	Warning Sign
22	Skene St into Rose St	-	Warning Sign
23	Skene St into Summer St	-	Warning Sign
24	Rosemount Viaduct into Skene Terrace	-	Warning Sign
25	Rousemount Viaduct into Union Terrace (both east & west approach)	-	Warning Sign
26	Schoolhill	Harriet St	Diversion Sign
27	Gallowgate	Berry St	Diversion Sign
28	Berry St	Gallowgate	Diversion Sign
29	Woolmanhill (North)	John St or Woolmanhill (East)	Diversion Sign
30	John St	Woolmanhill (North) or Woolmanhill (East)	Diversion Sign
31	Woolmanhill (East)	John St or Woolmanhill (North)	Diversion Sign

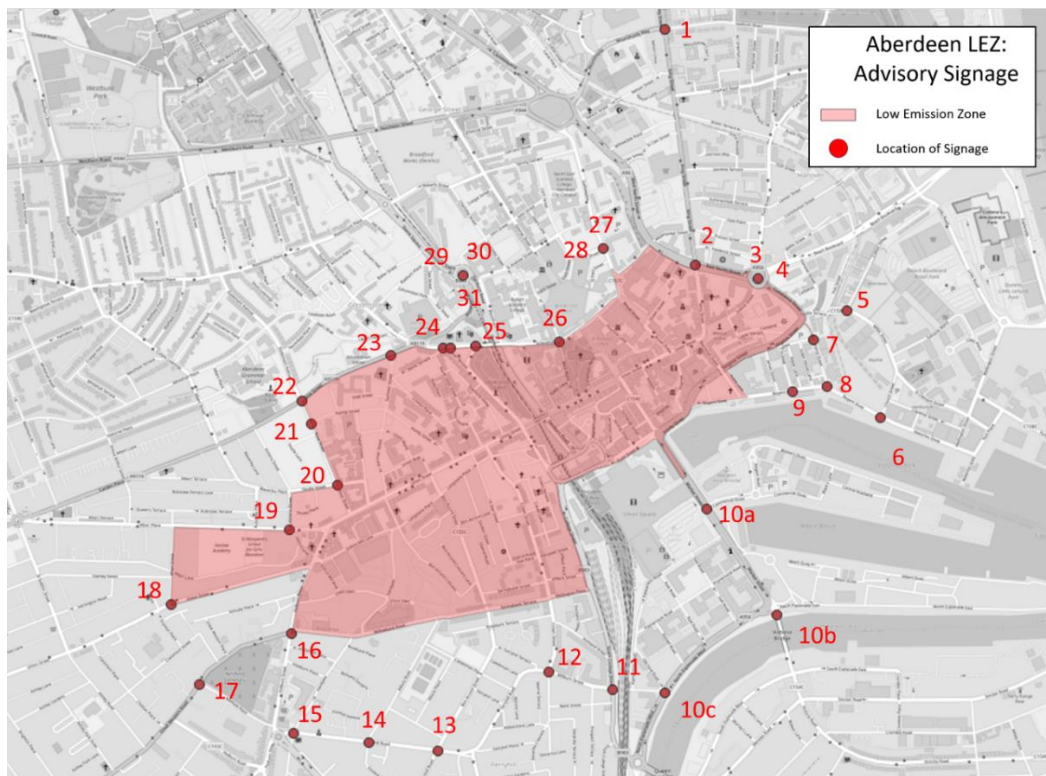


Figure 19. Location of Advisory LEZ Signage (Initial Consideration)

## 8. FINAL PROPOSED LEZ PACKAGE – MODEL RESULTS

### 8.1 Introduction

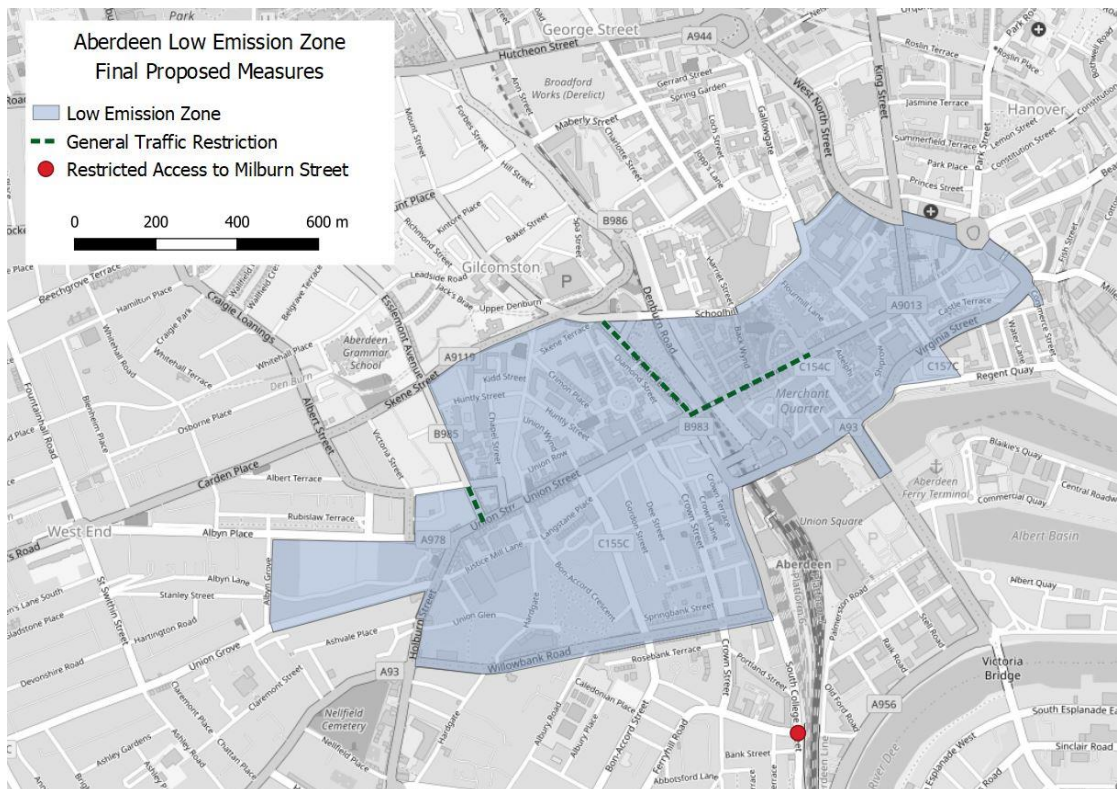
8.1.1 The following section provides a summary of the model outputs for the proposed LEZ Boundary and associated package of measures. The statistics presented include:

- Predicted Impact of LEZ Scheme on Air Quality Exceedance Locations
- Predicted Impact of LEZ Scheme on Traffic Flows through Network
- Predicted Impact of LEZ Scheme on Global Network.

8.1.2 As a reminder, and for the purposes of this report, the following Model Scenario naming has been used:

- **Option 5:** Preferred LEZ Boundary Option
- **Option 6:** LEZ Option 5 & Union Street CCMP Scheme
- **Option F:** Final proposed scheme (Option 6 & revised boundary, & management of non-compliant vehicles as detailed in previous chapters).

8.1.3 The Option F – ‘Final Proposed Scheme’ includes the package of measures shown in Figure 20.



**Figure 20. Final Proposed LEZ Scheme Detail**

## 8.2 Model Demand Level

- 8.2.1 Through all model testing of the various LEZ options, the maximum percentage demand that the models were able to run at was 95% of the ACCPM24 Reference Case Demand.
- 8.2.2 The 2024 future year traffic models are based upon a high traffic growth scenario and include approximately 7% predicted growth over the 2019 Baseline traffic levels in the PM Peak. It could therefore be considered that models running at 95% demand is equivalent to a small level of traffic growth on the 2019 baseline traffic demand (i.e. 2% traffic growth from 2019).

## 8.3 Predicted Impact of LEZ on Air Quality Exceedance Locations

- 8.3.1 Table 31 provides a traffic flow percentage difference comparison between the remaining LEZ scenarios and the 2019 Base Model at each of the exceedance locations in the network. The data is based upon the 12 Hr model flows. The resultant predicted impact on the NO<sub>2</sub> exceedance levels is also provided.
- 8.3.2 For absolute clarity, this comparison is between a 2024 future year scenario (at 95% demand) with the final LEZ scenario and the 2019 Base scenario. The traffic flow differences therefore include the influence of background traffic growth as well as the impact of the LEZ.

**Table 31. Predicted Impact of Final LEZ Scheme on Air Quality Exceedance Locations**

Site	Exceedance Location	Air Quality Impact 2019	Flow Change from 2019 Baseline LEZ Option F	Predicted Air Quality Impact LEZ Option F
DT30	335 Union St	Yellow	-24%	Green
DT73	61 Skene Square	Yellow	-10%	Green
DT18	14 Holburn St	Yellow	-14%	Green
CM2	Union Street	Yellow	-40%	Green
DT16	1 Trinity Quay	Yellow	6%	Yellow
DT77	27 Skene Square	Yellow	-10%	Green
DT11	105 King St	Red	2%	Yellow
DT10	184/192 Market St	Red	-5%	Yellow
DT9	39 Market St	Red	-37%	Green
DT29	469 Union St	Red	-32%	Green
DT12	40 Union St	Red	-62%	Green
DT17	43/45 Union St	Red	-62%	Green
DT82	7 Virginia Street	Red	5%	Yellow
DT19	468 Union St	Red	-32%	Green

	NO <sub>2</sub> Levels predicted to be Under Threshold
	NO <sub>2</sub> Levels predicted to be Near Threshold
	NO <sub>2</sub> Levels predicted to be Over Threshold

- 8.3.3 The above figure shows that the predicted traffic flow changes associated with the final proposed LEZ scheme are predicted to significantly reduce emissions through each of the NO<sub>2</sub> exceedance locations. This is the principal objective of the study.
- 8.3.4 A separate air quality exercise will provide more definitive detail on the emission improvements predicted through the modelling.

#### 8.4 Predicted Impact of LEZ Scheme on Network Traffic Flow

- 8.4.1 The AM Peak, Interpeak and PM Peak flow difference plots provided in [Appendix D](#) show the traffic flow differences between the ACCPM24 and the final LEZ Scenario
- 8.4.2 Blue bars represent a decrease in traffic flows, Red bars represent an increase in traffic flows.
- 8.4.3 The model flow plots show a general trend of traffic reduction through the core area of the city centre with displaced traffic pushed out to Anderson Drive.
- 8.4.4 Some local routing increases are observed within the model but it is important to highlight the comments raised in Section 6.4.4 relating to the difference between the fixed trip nature of the models compared to the potential actuality of traffic levels building back up around the LEZ.
- 8.4.5 The proposed restrictions on Union St, for example, require the modelled displacement of approximately 1500 trips in each direction within the 3 hr PM peak period. This traffic has to be diverted somewhere else in the model network. In reality, traffic erosion is likely to occur if the Union St restrictions (that are currently in place as part of spaces for people) are retained as the network recovers post-COVID.

SYSTRA recognises the current uncertainty in predicting the future city centre travel patterns post-COVID. Because of this, SYSTRA recommends that the consideration of additional mitigation measures as part of the wider LEZ package should be reviewed after the key LEZ elements are implemented to determine if these, or other measures are still required.

- 8.4.6 From the model testing, SYSTRA would highlight the following corridors as areas where traffic monitoring is suggested as the network recovers and also after the key elements of the LEZ are implemented:

- Springbank Terrace / Willowbank Road – and approach roads on Bon Accord St and Crown St
- Huntly Street (Note: already restricted in the model coding)
- Chapel Street
- Albyn Place
- Ferryhill Road / Fonthill Road
- Albert Street

- Ashley Road
- Seaforth Road.

## 8.5 Predicted Impact of LEZ Scheme on Global Network

8.5.1 As detailed in Section 4.12, model network summary statistics report on the overall network performance of a model. Four key global network statistics that can be extracted from the models are:

- Total Distance Travelled
- Average Time Taken
- Mean Speed
- Average Number of Vehicles in a Queue.

8.5.2 The total distance travelled statistic is based upon the cumulative travelled distance for all vehicles in the model. An increase in the total distance travelled is usually representative of an increase in travel demand.

8.5.3 The average time taken statistic is based upon the average time for all trips in the network to make their journey. An increase in this statistic represents a deterioration in the operation of the network.

8.5.4 The mean speed statistic represents the average speed for all vehicles in the model network. A decrease in average speed represents a deterioration in the operation of the model network.

8.5.5 The average number of vehicles in a queue is an hourly statistic that collates the total number of queueing vehicles across the network. An increase in the number of vehicles queueing is a good indicator of an increase in congestion within the model network.

8.5.6 Table 32 provides a summary of the first three global statistics for LEZ Option 6 and the final scheme Option F, against the ACCPM24 Reference Case. Table 33 provides the results for Average Vehicles in a Queue.



Table 32. Network Summary Statistics

Percentage Difference to the Ref Case						
Peak	Percentage demand level	Scenario	Number of Vehicles	Total Distance Travelled (km)	Average Time Taken (hh:mm:ss)	Mean Speed (mph)
AM	95%	2024 Ref Case	78779	259881	00:07:15	16.96
	95%	Option 6	-0.6%	1.5%	25.1%	-18.3%
	95%	Option F	-0.2%	2.3%	17.6%	-12.8%
IP	95%	2024 Ref Case	164848	474968	00:05:48	18.53
	95%	Option 6	-0.6%	1.8%	10.3%	-7.2%
	95%	Option F	-0.5%	1.8%	9.5%	-6.5%
PM	95%	2024 Ref Case	93788	300136	00:08:05	14.77
	95%	Option 6	-1.4%	1.2%	24.0%	-17.2%
	95%	Option F	-1.1%	1.2%	16.5%	-12.1%
12 Hr	95%	<b>2024 Ref Case</b>	<b>337415</b>	<b>1034985</b>	<b>00:07:02</b>	<b>16.75</b>
	95%	<b>Option 6</b>	<b>-0.8%</b>	<b>1.5%</b>	<b>20.6%</b>	<b>-13.9%</b>
	95%	<b>Option F</b>	<b>-0.6%</b>	<b>1.8%</b>	<b>15.0%</b>	<b>-10.3%</b>

Table 33. Average No. Vehicles in a Queue

Time	Average Number of Vehicles in a Queue (Veh)		
	Ref Case	Op 6	Op F
	2024		
07:00:00	11045	9015	8881
08:00:00	12230	10855	10775
09:00:00	10083	9643	9640
10:00:00	9055	7873	7233
11:00:00	9257	8089	7601
12:00:00	9920	8907	8324
13:00:00	10054	9235	8735
14:00:00	9582	9096	8463
15:00:00	10436	10354	9625
16:00:00	12573	12067	11878
17:00:00	14359	14564	13565
18:00:00	11808	12707	11479
<b>Total</b>	<b>130400</b>	<b>122405</b>	<b>116199</b>
% Diff.	-	<b>-6%</b>	<b>-11%</b>

8.5.7 The following comments can be drawn from the global network statistics:

- The increase in global distance travelled in the LEZ scenarios relates to the additional distance than non-compliant traffic requires to route. This is less than 2% on average in the final LEZ model scenario
- The results for the average time taken and mean speed suggest that there is a deterioration on the network operation when the LEZ is in place. This is anticipated

as the LEZ requires traffic to route further. The final Option F operates better than Option 6, due to the improved management of non-compliant vehicles

- However the results of the average vehicles in a queue statistic suggest that the LEZ reduces the overall queueing in the network. It is assumed that this is due to the removal of traffic from some of the high queue areas within the LEZ area. Essentially the LEZ dissipates traffic out wider thus reducing overall queueing. The final Option F operates better than Option 6 and shows over 10% less queueing than the ACCPM24 Reference Case Scenario.

## 9. ALTERNATIVE FUTURES TESTING

### 9.1 Introduction

- 9.1.1 The Covid-19 pandemic has had a dramatic impact on travel across all modes and specifically travel in Scotland’s city centres. For the consideration of an LEZ in the future Aberdeen network, further evidence is required by applying the principals of modelling to consider the uncertainty over what travel will look like after the pandemic has ended. This evidence will help inform decision makers for the LEZ schemes.
- 9.1.2 On Behalf of Transport Scotland, SYSTRA set out a framework for embracing uncertainty by consulting with Aberdeen City Stakeholders on what will travel look like post COVID-19’. This exercise was undertaken for each of the four proposed LEZ cities (Edinburgh, Glasgow, Aberdeen, and Dundee).
- 9.1.3 This framework set out the rationale for any additional modelling required to provide supporting evidence relating to uncertainty which would enhance the acceptability of the modelling work undertaken to date.
- 9.1.4 Detail of the study undertaken and the development of common plausible futures is provided in the SYSTRA briefing Note: *LEZ Post-Covid Uncertainty*, Ref: GB01T20E86/11024112/005, 208/01/21)
- 9.1.5 For each of the four LEZ cities, the four identified plausible futures were considered against the model assessments undertaken to date. From this, to address uncertainty, further sensitivity testing of the LEZ schemes was proposed.
- 9.1.6 Three of the four plausible futures were identified for Aberdeen, these were:
- **Future Scenario SP1: ‘LDP Growth’** The fleet projections follow pre-Covid trends provided by SEPA and the traffic growth is in line with current Local Development Plan Allocations/uptake. This scenario is the future year growth scenario developed as the 2024 Reference Case Model (ACCPM24)
  - **Future Scenario SP2: ‘Economic Downturn’:** Following an economic downturn, the fleet projections are lower than pre-Covid trends provided by SEPA and traffic shrinkage is experienced, similar to the 2010 downturn
  - **Future Scenario SP3: ‘Brave New World’:** The fleet projections follow pre-Covid trends provided by SEPA however behavioural change results in traffic levels remaining consistent with pre-Covid levels.
- 9.1.7 Table 34 details a simplified version of the above plausible future scenarios considered for model testing of the Aberdeen LEZ. The growth and fleet compliance level changes are referred against the 2019 baseline. For example, ‘high growth’ is the 7% traffic growth applied in the 2024 Reference Case Model (ACCPM24), and the ‘increased trajectory’ of the fleet is the increase in compliance levels between 2019 and 2024 (cars increased from 70% compliant to 86% compliant- See Table 4).
- 9.1.8 Within each future scenario, the LEZ will be assessed with and without the proposed CCMP mitigation to understand the extent that this will provide benefit to the air quality levels in the city centre under the alternative future scenarios.

9.1.9 The high growth future scenario SP1 has already been assessed, as detailed in previous chapters, and was shown to require the CCMP mitigation to bring the air quality levels down below the exceedance levels.

**Table 34. Alternative Future Scenarios**

	Future Scenario	Growth	Fleet Compliance	Infrastructure Scenario	
				LEZ	LEZ + CCMP Mitigation
1	LDP Growth	High	Increasing trajectory	Traffic Assessment	Traffic Assessment & Air Quality Assessment
2	Economic Downturn	Shrinkage	No Change	Traffic Assessment	Traffic Assessment
3	Brave New World	Low or none	Increasing trajectory	Traffic Assessment	Traffic Assessment

9.1.10 The above table shows that the full air quality assessment will be undertaken by SEPA on the high growth future scenario SP1 (run at 95% demand) only.

9.1.11 A traffic modelling assessment on the traffic flow changes at the exceedance locations was undertaken on the other future scenarios.

9.1.12 The following sections outline the development of the alternative future traffic models and the subsequent test results.

## 9.2 Development of Alternative Future Model Scenarios

9.2.1 As detailed above, the high growth future scenario SP1 is the 2024 Reference Case (ACCPM24) scenario against which all model testing has been undertaken to date. Although a resultant 7% traffic growth over the 2019 baseline was assigned within the future year model (via background LDP growth from ASAM), the LEZ model scenarios only ran at 95% of the future year demand. This is essentially the equivalent of a 2% increase in traffic demand over the 2019 baseline.

9.2.2 The proportion of demand constraint assigned to the second future scenario ‘SP2’ was derived through an assessment of traffic data during the downturn in the oil industry between 2014 and 2016. This analysis suggested that there was an approx. 7% drop in traffic demand around Aberdeen during this period. It was agreed with ACC a similar drop in traffic demand could be used to represent a plausible economic downturn scenario resulting from the COVID-19 Pandemic.

9.2.3 Therefore, for SP2, the traffic demand assigned in this scenario was 93% of the 2019 baseline traffic demand level (individual peak ranges slightly due to rounding in the trip matrix development).

9.2.4 Associated with an economic downturn, it was considered unlikely the traffic fleet compliant / non-compliant projections would occur to the same level as SP1, therefore the 2019 baseline observed traffic fleet compliant / non-compliant proportions were assigned to this scenario.

- 9.2.5 For SP3, to consider a network where the travel demand remains consistent with pre-COVID levels, the 2019 Base model traffic demand levels were applied. The difference between this scenario and the 2019 Base model is that the proportions of compliant traffic continues to increase on the existing projections applied in SP1.
- 9.2.6 For the model assessment of the proposed LEZ under alternative futures, the actual extent of traffic growth or shrinkage was considered less critical than capturing the direction of travel. Ultimately, the scale of change is not known, but the model testing of various future scenarios allows consideration for the potential impact on a LEZ under different futures.
- 9.2.7 From the above, Table 35 details the trip matrix totals developed for each model scenario.

**Table 35. Traffic Model Matrix Totals for Alternative Future Scenarios**

Scenario	Peak			
	AM (Veh)	IP (Veh)	PM (Veh)	12 Hr (Veh)
2019 Base	79494	165061	95331	339886
2024 Ref Case	85227	177409	101654	364290
% Change	7%	7%	7%	7%
SP1 ' Limited				
Growth'	80926	168497	96544	345967
% Change	2%	2%	1%	2%
SP2 'Economic				
Downturn'	75558	150598	90602	316758
% Change	-5%	-9%	-5%	-7%
SP3 ' Brave New				
World'	79497	165107	95338	339942
% Change	0%	0%	0%	0%

- 9.2.8 The above table shows the trip matrix total differences correlate with the demand level assumptions derived for each scenario: SP1 Includes high 7% growth , but can only run at 95% of this growth, hence a 2% growth. SP2 includes a 5-7% demand constraint associated with an economic downturn, and SP3 is effectively the same traffic demand level as the 2019 Base.
- 9.2.9 Table 4 detailed the traffic fleet compliance levels included in the ACCPM24 Scenario and subsequent LEZ testing. The projected future fleet compliance levels were applied to scenarios SP1 and SP3 and the 2019 observed compliance level was applied to scenario SP2. This is summarise in Table 36 below.

**Table 36. Fleet Compliance Levels for Alternative Future Scenarios**

Scenario	Emissions	Car (%)	LGV (%)	HGV (%)
SP1	Non Compliant	14	30	7
Improved Fleet	Compliant	86	70	93
SP2	Non Compliant	30	60	27
2019 Fleet	Compliant	70	40	73
SP3	Non Compliant	14	30	7
Improved Fleet	Compliant	86	70	93

9.2.10 The resultant number of compliant and non-compliant vehicles for each future scenario is provided in Table 37. The figures shown are the total number of vehicles in the model 12 Hr period (07:00-19:00).

**Table 37. Total Compliant Vehicles for Alternative Future Scenarios**

Scenario	Total Compliant (12 Hr Veh)	Total Non- Compliant (12 Hr Veh)	Total (12 Hr Veh)
SP1 ' Limited Growth'	301617	44350	345967
SP2 'Economic Downturn'	252963	63795	316758
SP3 ' Brave New World'	296492	43450	339942

9.2.11 Table 37 shows that whilst there is fewer vehicles in the network under SP2, the volume of non-compliant vehicles that will be diverted from the LEZ will be higher than SP1, due to the lower traffic compliance level.

9.2.12 As SP1 was only able to run at 95% of the high growth level, SP3 at 100% demand has only marginally less traffic than SP1 at 95% demand, and with similar compliant proportions.

### 9.3 Model Testing of Alternative Future Scenarios

9.3.1 The following section provides a summary of the model outputs for the alternative future scenarios. For consistency with previously detailed model analysis, the statistics presented include:

- Predicted Impact of LEZ Scheme on Air Quality Exceedance Locations
- Predicted Impact of LEZ Scheme on Traffic Flows

#### ***Model Network Demand***

- As noted above, SP1 was only able to run at 95% of the high growth level in the PM peak
- SP2 included approximately 5% less traffic than the 2019 baseline and was able to run at 100% of this demand level in all peaks
- SP3 had the equivalent traffic demand of the 2019 Base Model and was able to run at 100% of this demand level in all peaks

#### ***Predicted Impact of LEZ on Air Quality Exceedance Locations***

9.3.2 Table 38 provides a 12 Hr traffic flow percentage difference comparison between the alternative future LEZ scenarios and the 2019 Base Model at each of the exceedance locations in the network. The data is based upon the 12 Hr model flows.

**Table 38. Alternative Futures: Traffic Flow Impact at Air Quality Exceedance Locations (12 Hr)**

Site	Exceedance Location	% Flow Change from 2019 Baseline				
		SP1 LEZ+CCMP	SP2 LEZ	SP2 LEZ+CCMP	SP3 LEZ	SP3 LEZ+CCMP
DT30	335 Union St	-24%	-12%	-31%	-2%	-26%
DT73	61 Skene Square	-10%	-24%	-23%	-15%	-14%
DT18	14 Holburn St	-14%	-19%	-27%	-9%	-17%
CM2	Union Street	-40%	-18%	-46%	-8%	-42%
DT16	1 Trinity Quay	6%	-21%	-6%	-10%	3%
DT77	27 Skene Square	-10%	-24%	-23%	-15%	-14%
DT11	105 King St	2%	-11%	-18%	-2%	-3%
DT10	184/192 Market St	-5%	-17%	-15%	-12%	-7%
DT9	39 Market St	-37%	-15%	-43%	-13%	-37%
DT29	469 Union St	-32%	-29%	-40%	-19%	-34%
DT12	40 Union St	-62%	-11%	-64%	-3%	-61%
DT17	43/45 Union St	-62%	-11%	-64%	-3%	-61%
DT82	7 Virginia Street	5%	-22%	-7%	-10%	2%
DT19	468 Union St	-32%	-29%	-40%	-19%	-34%

9.3.3 The resultant predicted impact on the NO<sub>2</sub> exceedance levels is also provided in Table 39

**Table 39. Alternative Futures: Predicted Air Quality Impact**

Site	Exceedance Location	Predicted Air Quality Impact				
		SP1 LEZ+CCMP	SP2 LEZ	SP2 LEZ+CCMP	SP3 LEZ	SP3 LEZ+CCMP
DT30	335 Union St					
DT73	61 Skene Square					
DT18	14 Holburn St					
CM2	Union Street					
DT16	1 Trinity Quay					
DT77	27 Skene Square					
DT11	105 King St					
DT10	184/192 Market St					
DT9	39 Market St					
DT29	469 Union St					
DT12	40 Union St					
DT17	43/45 Union St					
DT82	7 Virginia Street					
DT19	468 Union St					

	NO <sub>2</sub> Levels predicted to be Under Threshold
	NO <sub>2</sub> Levels predicted to be Near Threshold
	NO <sub>2</sub> Levels predicted to be Over Threshold

- 9.3.4 Table 38 shows that, for SP2 -‘Economic Downturn’ with the LEZ , there are traffic reductions across each of the NO<sub>2</sub> exceedance locations compared to the 2019 baseline. This is due to a combination of the traffic network shrinkage applied and the LEZ itself. When these changes are considered as a predicted impact to the NO<sub>2</sub> exceedances, the results in Table 39 suggest that the CCMP measures are not necessarily required to further reduce NO<sub>2</sub> levels below the exceedance threshold at this point in time.
- 9.3.5 However, under this economic downturn scenario, the traffic fleet will certainly improve over time whilst there is no guarantee that the traffic levels will rise to a point beyond 2019 levels. As the fleet compliance levels increase, the volume of traffic within the LEZ area will increase thus impacting on the NO<sub>2</sub> emission levels (even although these are complaint vehicles).
- 9.3.6 Under the SP2 ‘Economic Downturn’ scenario, the LEZ plus the CCMP would therefore protect the city centre from the almost certain changes to the fleet compliance levels over time.
- 9.3.7 For SP3- ‘Brave New World’ , Table 38 shows that there are traffic reductions across each of the exceedance locations compared to the baseline (but not to the extent of the reductions observed in SP2). This result is expected as the traffic demand levels in SP3 are the same as the 2019 baseline so the flow changes are a direct result of the LEZ alone. At each of the exceedance areas, there are fewer vehicles due to removal or diversion of non-compliant vehicles.
- 9.3.8 When these changes are considered as a predicted impact to the NO<sub>2</sub> exceedances, the results in Table 39 suggest that there are still locations where NO<sub>2</sub> levels are predicted to be near the exceedance threshold. These locations are consistent with the high growth scenario SP1 which suggested there would be NO<sub>2</sub> exceedances at King St and Union Street (Table 18, Page 41).
- 9.3.9 Whilst the results of SP3-without the CCMP suggest that their would be some locations where the NO<sub>2</sub> levels would be near the threshold, if traffic growth occurs beyond the opening date of the LEZ, then there is a strong possibility that these and other NO<sub>2</sub> levels would increase to a point beyond the exceedance threshold
- 9.3.10 In both alterative futures: SP2 and SP3, the combination of the LEZ and the CCMP measures are predicted to positively impact the NO<sub>2</sub> emission levels at each of the 14 locations of concern.
- 9.3.11 From these results, the proposed LEZ package of measures are predicted to meet the objectives of the study under different future scenarios. Whilst there is the possibility that the CCMP measures may not initially be required to provide additional air quality benefits under certain futures, the CCMP proposals will protect the city centre area from potential future changes to traffic growth and fleet compliance levels.
- 9.3.12 An alternative view on these results is to consider the committed objective to implement the CCMP over the next 15 years. The CCMP carries its own benefits relating to placemaking, sustainable transport and the attraction of the city centre to boost the local economy. The various future scenario tests all suggest that the LEZ reduces traffic levels within the city centre area to facilitate the implementation of key aspects of the CCMP. Therefore, the LEZ and CCMP core measures complement each other to provide the benefits to air quality AND placemaking.



### ***Predicted Impact on Network Traffic Flow***

- 9.3.13 The PM Peak flow difference plots and tables provided in [Appendix E](#) show the traffic flow differences between the ACCPM19 Base Model and the following model scenarios:
- SP1 with LEZ & CCMP
  - SP2 with LEZ & CCMP
  - SP3 with LEZ & CCMP
- 9.3.14 Blue bars represent a decrease in traffic flows, Red bars represent an increase in traffic flows.
- 9.3.15 It can be seen from the flow difference plots and the flow difference table that the general trend of traffic displacement is very similar under each future scenario. In all future scenarios the model flow plots show a general trend of traffic reduction through the core area of the city centre with displaced traffic pushed out to Anderson Drive.
- 9.3.16 The key differences between the alternative future scenarios primarily lies in the extent of change in traffic flow.
- 9.3.17 In general, there is little difference in the traffic flow between SP1 and SP3, due to SP1 only being able to run at 95% of the high future growth scenario and both scenarios having an improved fleet compliance level.
- 9.3.18 For SP2, there are two conflicting factors affecting the traffic flows; the overall traffic demand is lower than the other future scenarios due to the economic downturn, however, the volume of non-compliant traffic displaced from the LEZ area is highest in this scenario (due to the lower fleet compliance level).
- 9.3.19 From this, under SP2, the volume of traffic within the LEZ is lower than other future scenarios, but the volume of traffic outside the LEZ area will therefore vary by location in comparison to the other future scenarios. In general, there are not large differences in key traffic flows between the three future scenario considered.
- 9.3.20 It should be noted however, that the low fleet compliance level will only ever increase over time, so the volume of traffic displaced from the city centre area will reduce over time (assuming background growth does not occur to a similar rate).
- 9.3.21 As noted in the main option testing chapters, some local routing increases are observed within the LEZ model scenario. This occurs to different extents under the various plausible futures assessed.

## **9.4 Summary of Alternative Future Testing of the Proposed LEZ Scheme**

- 9.4.1 From the model testing of alternative future scenarios, the proposed LEZ package of measures are predicted to meet the objectives of the study under the different future scenarios considered. Whilst there is the possibility that the CCMP measures may not initially be required to meet the emission targets under certain futures, the CCMP proposals will protect the city centre area from potential changes to traffic growth or slow improvements to fleet compliance proportions.

- 9.4.2 Until there is more understanding and evidence of the scale and direction of travel of the post-COVID traffic network, there remains uncertainty over the finer details of the impact of the LEZ scheme and therefore the level of requirement of additional mitigating measures as part of the wider LEZ package.
- 9.4.3 SYSTRA would recommend continued monitoring of the traffic network post-COVID to understand the projection of network recovery and fleet change over time. In addition, it is recommended that the network behaviour is also monitored after the key LEZ elements are implemented to determine if the areas identified through modelling , or other locations require additional mitigating measures.
- 9.4.4 An alternative viewpoint on the outcome of the alternative futures model testing is to consider the committed objective to implement the CCMP over the next 15 years. The CCMP carries its own benefits relating to placemaking, sustainable transport and the attraction of the city centre to boost the local economy. The various future scenario model tests all suggest that the LEZ reduces traffic levels within the city centre area to facilitate the implementation of key aspects of the CCMP.

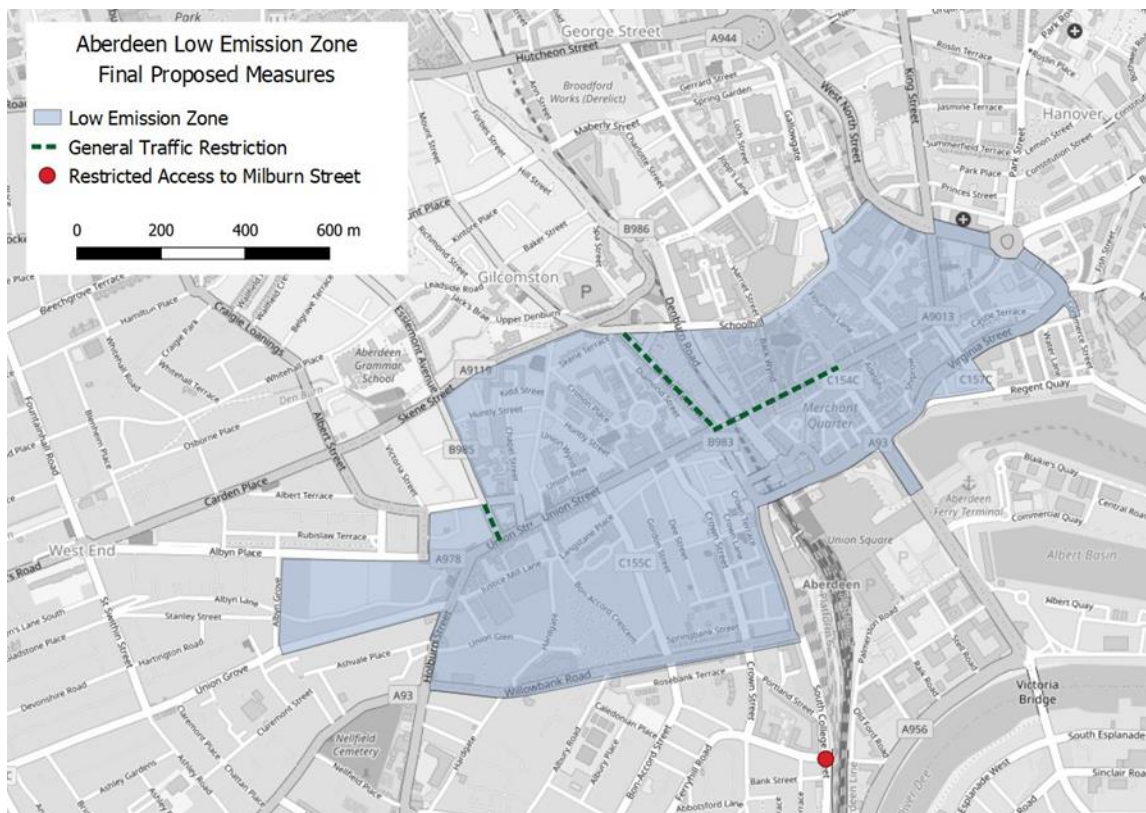
The LEZ and CCMP measures are therefore predicted to work well together to deliver the objectives of the LEZ and wider council objectives for the city centre under varying future traffic outcomes.

## 10. SUMMARY & CONCLUSIONS

### 10.1 Summary

- 10.1.1 SYSTRA Ltd (SYSTRA) was commissioned by Aberdeen City Council in August 2019 for professional services to develop a microsimulation model of Aberdeen City Centre to assess road network options associated with the development of a Low Emission Zone (LEZ) in Aberdeen.
- 10.1.2 This technical note outlines the development and model testing of LEZ model scenarios, as defined by ACC and in conjunction with the Aberdeen *National Low Emission Framework – Interim Stage 2 Assessment Report* (SYSTRA, Ref: GB01T19I15/281119, 01/06/20).
- 10.1.3 The Interim NLEF Stage 2 Appraisal recommended that four LEZ boundary options be assessed through the traffic modelling. As part of the model testing process, a fifth boundary option was developed, based upon the initial assessment of the initial four options.
- 10.1.4 An option appraisal and sifting process was undertaken to filter the LEZ scenarios down to a preferred option. This process included consideration of:
- Network demand level & congestion areas
  - Impact through exceedance locations
  - Alignment with revised network hierarchy
  - Car park accessibility impact
  - Impact to residential properties within LEZ area.
- 10.1.5 A preferred LEZ boundary option was derived from the sifting process. However, modelling suggested that the LEZ on its own was not enough to reduce the NO<sub>2</sub> air quality levels below the AQO of 40µg/m<sup>3</sup> across the city centre area.
- 10.1.6 The Aberdeen LEZ is required to complement other committed network proposals for Aberdeen City Centre to provide a package of measures which will meet the objectives of the LEZ and wider Council objectives for Aberdeen City Centre. These committed proposals include the City Centre Masterplan (CCMP).
- 10.1.7 To enable the development of a package of measures to meet the objectives of the LEZ study, traffic modelling was utilised to identify if any elements of the City Centre Masterplan not yet implemented would enhance and support the LEZ in meeting the objectives.
- 10.1.8 The ‘Union Street Scheme’ within the CCMP was identified as the best combination of CCMP measures to potentially address the remaining air quality exceedances. The Union Street scheme includes general traffic restrictions on Union Street (between Bridge St and Market St) and through Union Terrace.
- 10.1.9 Further network mitigation measures were derived to help manage the non-compliant traffic and general traffic displaced from the city centre area as a result of the LEZ and the Union St / Union Terrace restrictions. Changes to the junction design of the South College Street / Milburn St junction were recommended to restrict access for strategic routing traffic through the Milburn St / Ferryhill corridor.

- 10.1.10 These changes will form part of the South College Street junction improvements: Phase 2. The specifics of the proposed restrictions will be developed following the implementation of Phase 1 in 2022.
- 10.1.11 The proposed boundary of the LEZ was reviewed and revised to take account of operational and advisory signage considerations.
- 10.1.12 The final proposed LEZ scheme includes the package of measures shown in 10.1.12.



**Figure 21. Final Proposed LEZ Scheme**

10.1.13 Due to the uncertainty over what the future traffic network will be, post-COVID, the proposed LEZ Scheme has been tested under alternative future demand scenarios. From the model testing, the proposed LEZ package of measures are predicted to meet the objectives of the study under different future scenarios. Whilst there is the possibility that the CCMP measures may not initially be required to provide additional air quality benefits under certain futures, the CCMP proposals will protect the city centre area from potential future changes to traffic growth and fleet compliance levels.

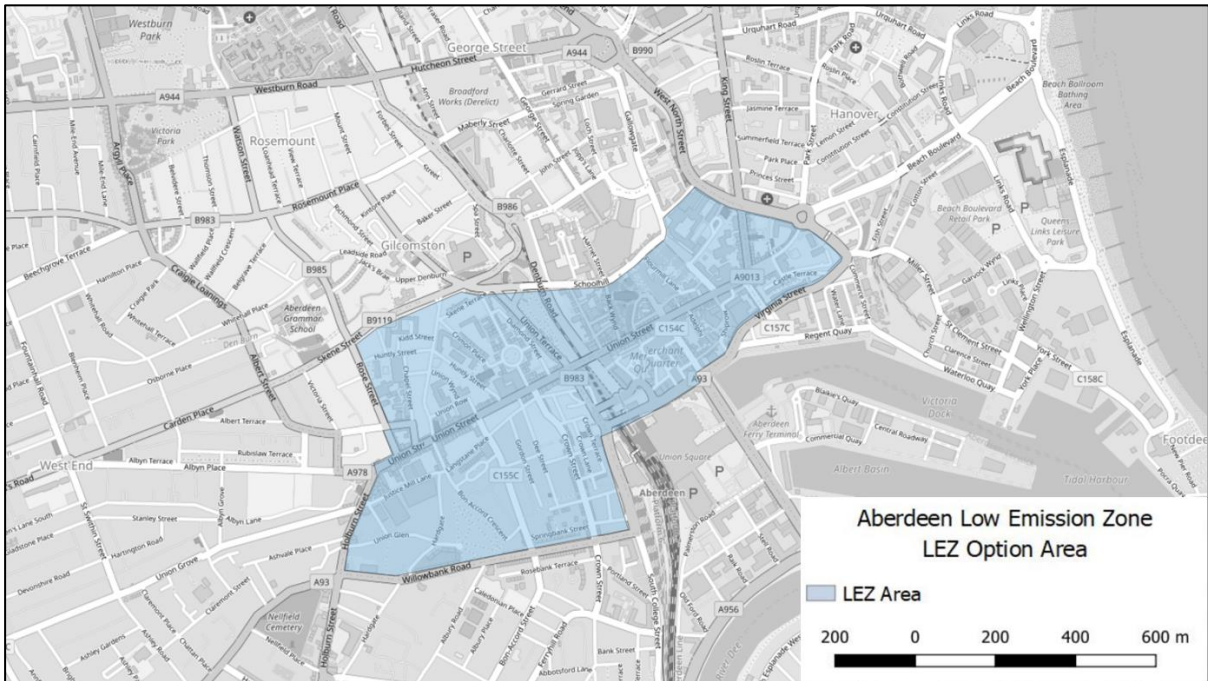
## 10.2 Conclusions

- 10.2.1 Through the NLEF and model testing process, a LEZ scheme has been developed which is anticipated to significantly improve the air quality levels through Aberdeen City Centre.
- 10.2.2 The measures proposed includes other committed proposals for Aberdeen to provide a package of measures which should meet the objectives of the LEZ and wider Council objectives for Aberdeen City Centre.

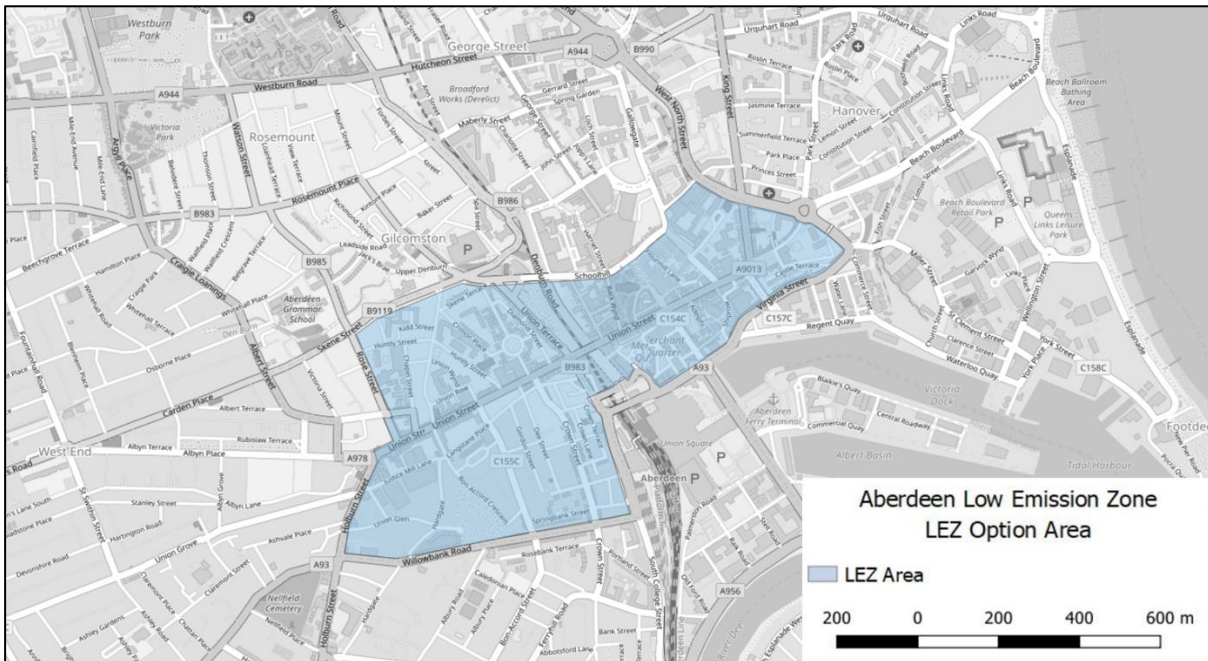
10.2.3 SYSTRA recognises the current uncertainty in predicting the future city centre travel patterns post-COVID. Because of this, SYSTRA recommends that the consideration of additional mitigation measures as part of the wider LEZ package should be reviewed after the key LEZ elements are implemented to determine if these, or other measures are still required.

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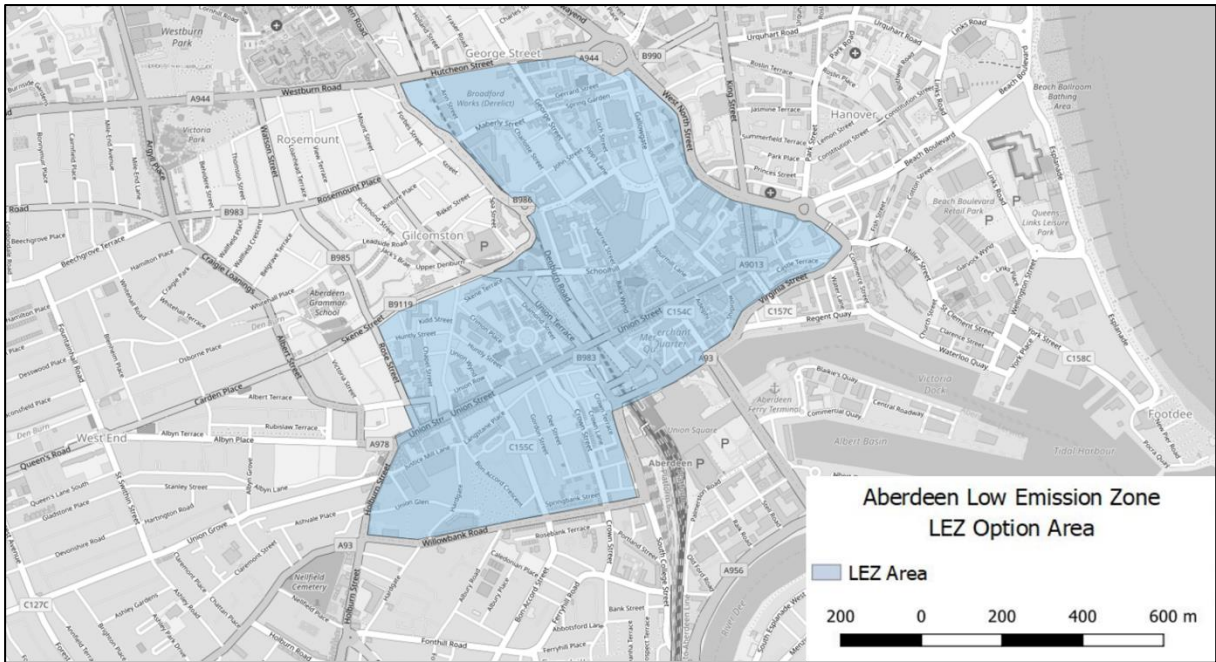
**APPENDIX A: INITIAL LEZ BOUNDARY OPTIONS (FROM NLEF)**



**LEZ Boundary Option 1A**



**LEZ Boundary Option 1B**

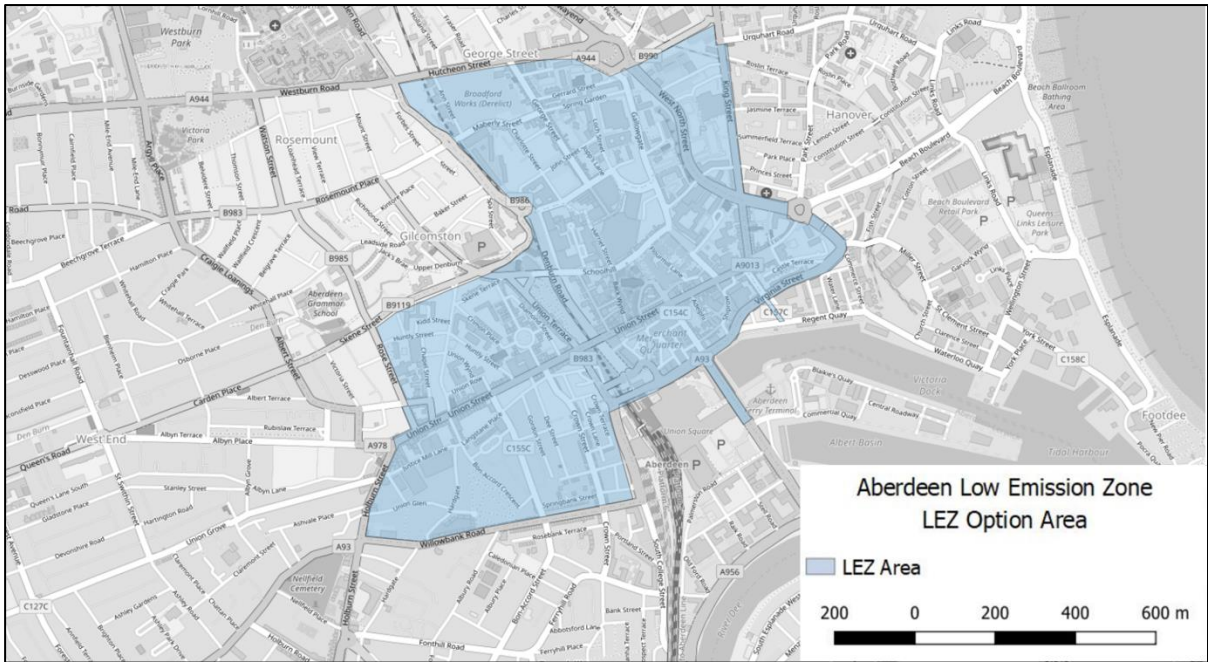


**LEZ Boundary Option 2A**

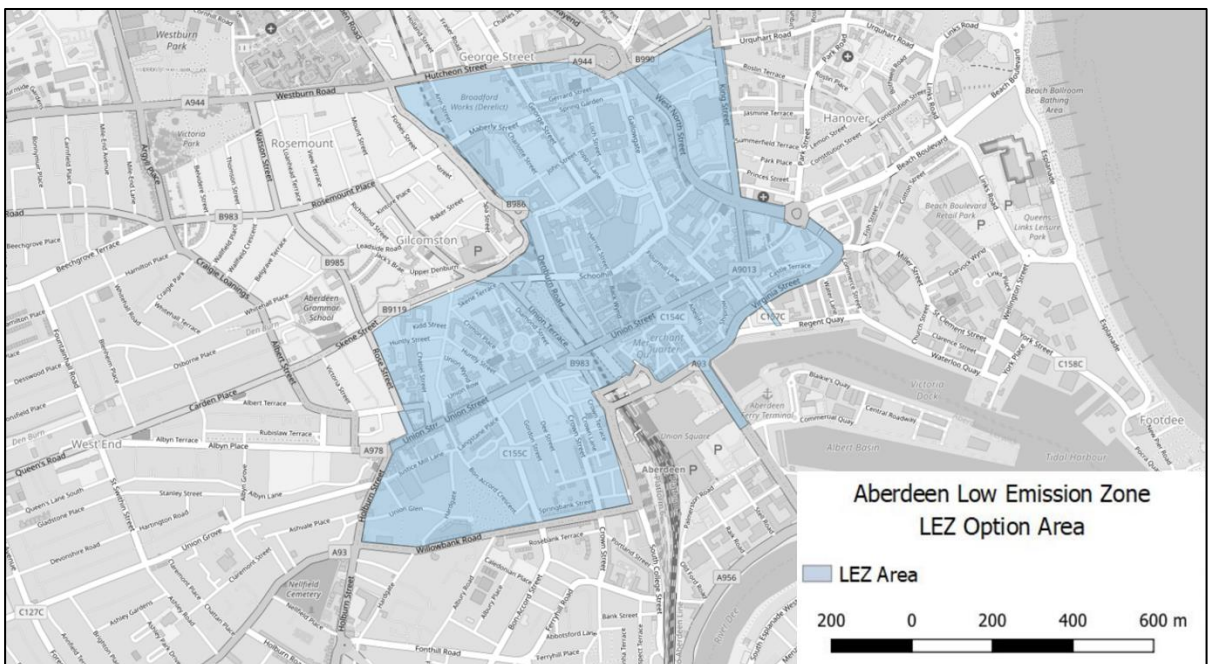


**LEZ Boundary Option 2B**

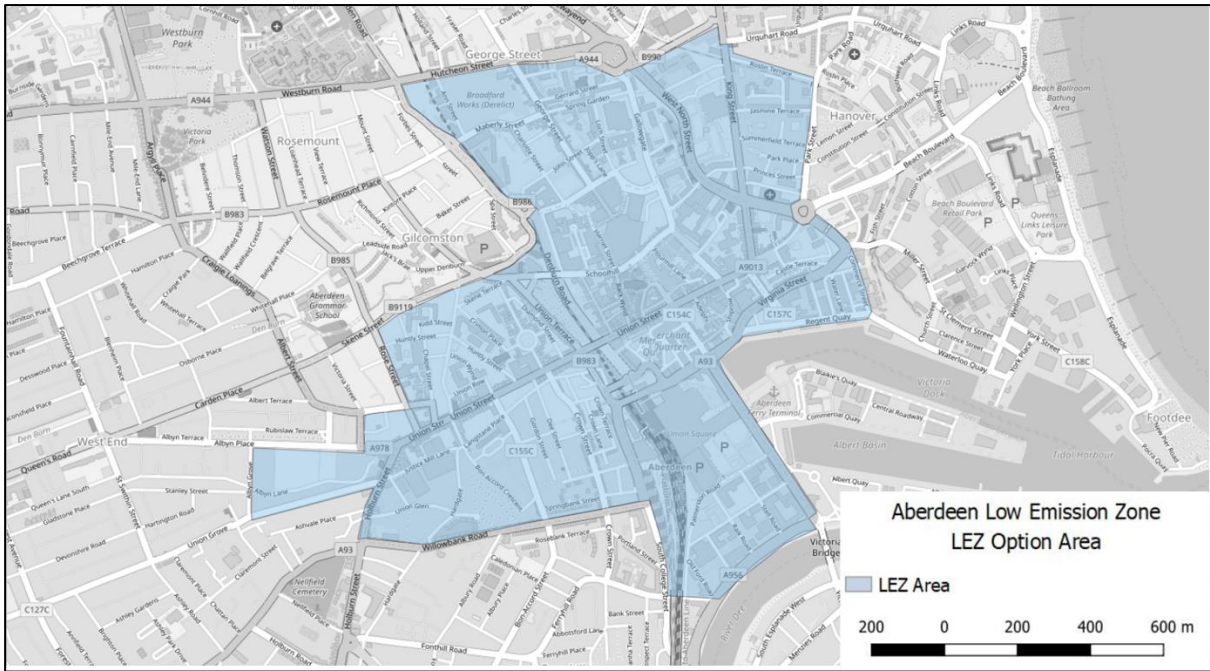




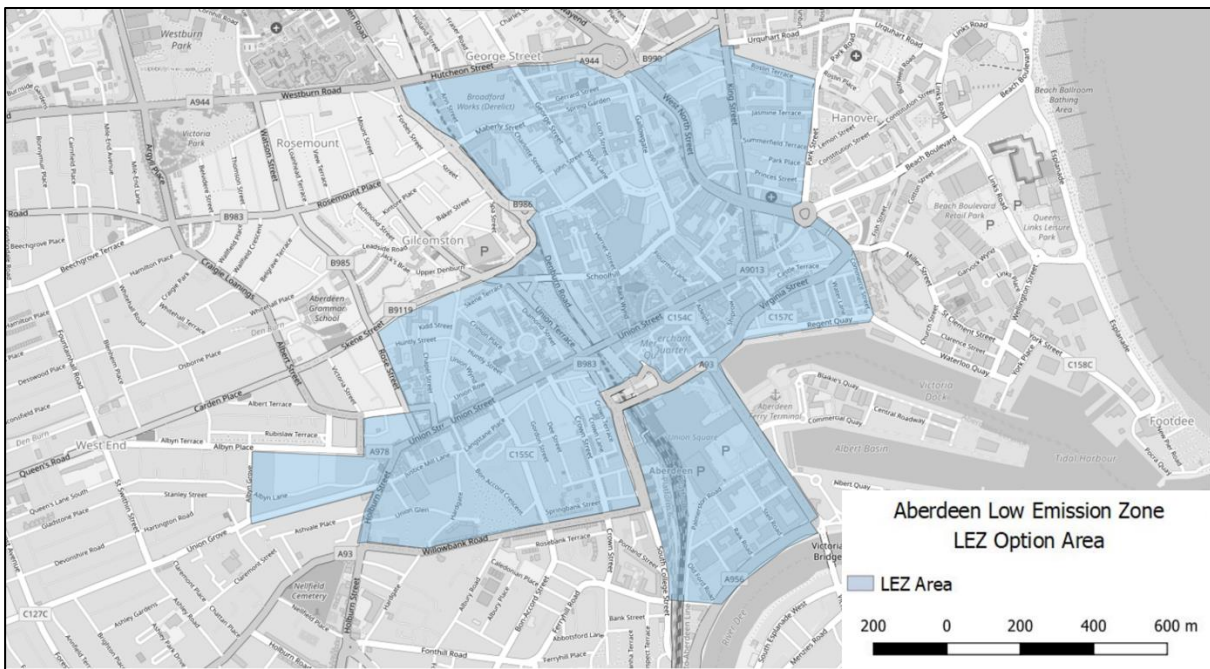
**LEZ Boundary Option 3A**



**LEZ Boundary Option 3B**



**LEZ Boundary Option 4A**

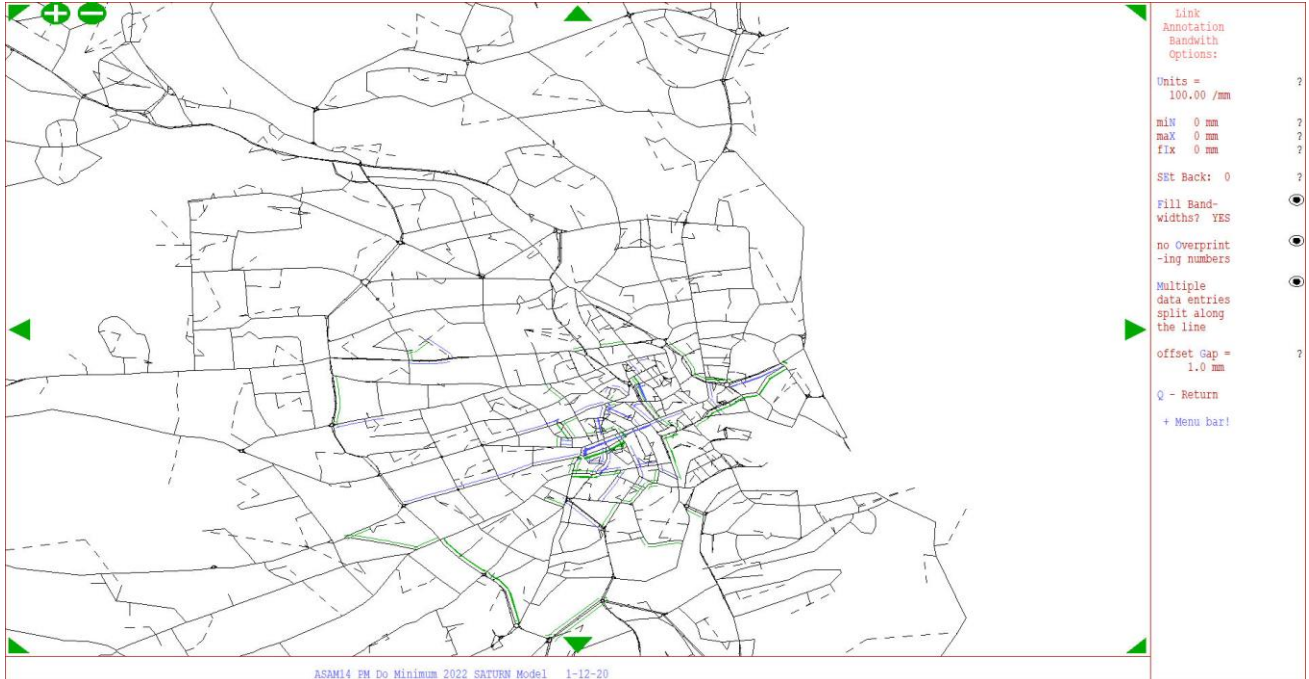


**LEZ Boundary Option 4B**

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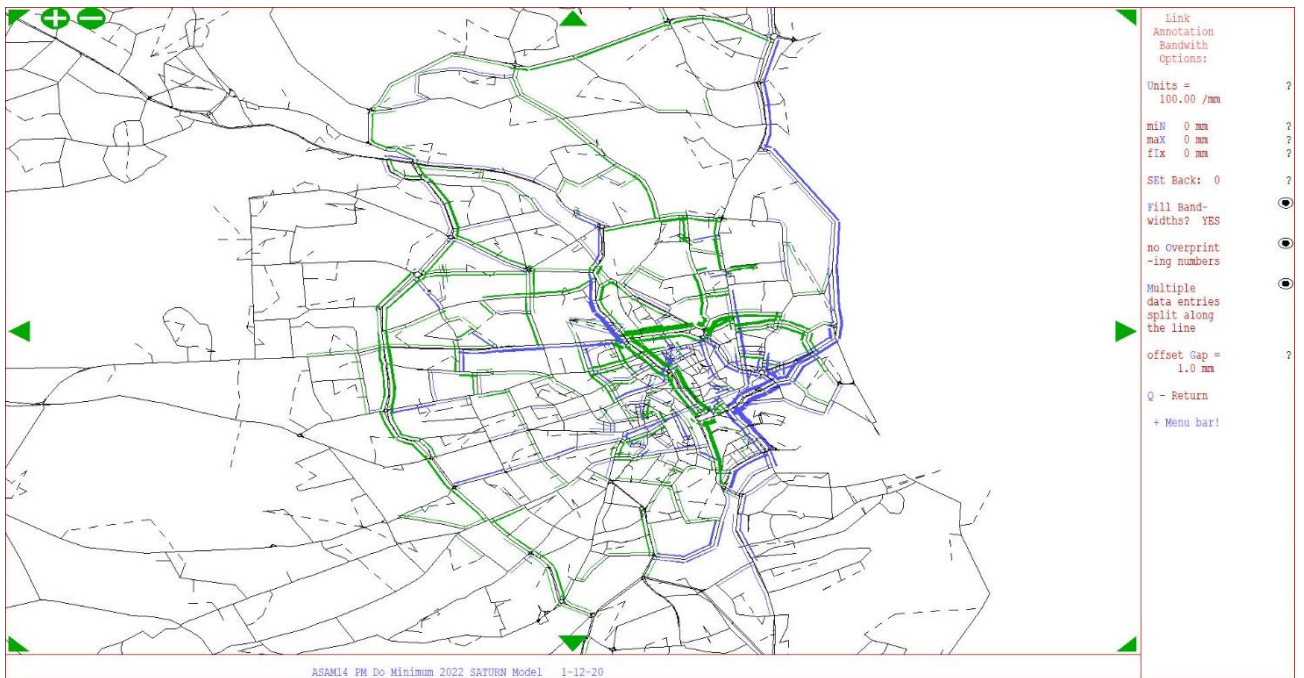
**APPENDIX B – ASAM14 – LEZ FLOW DIFFERENCE PLOTS**

**Boundary A: LEZ Test 1B (Denburn & Harbour Route open to all)**



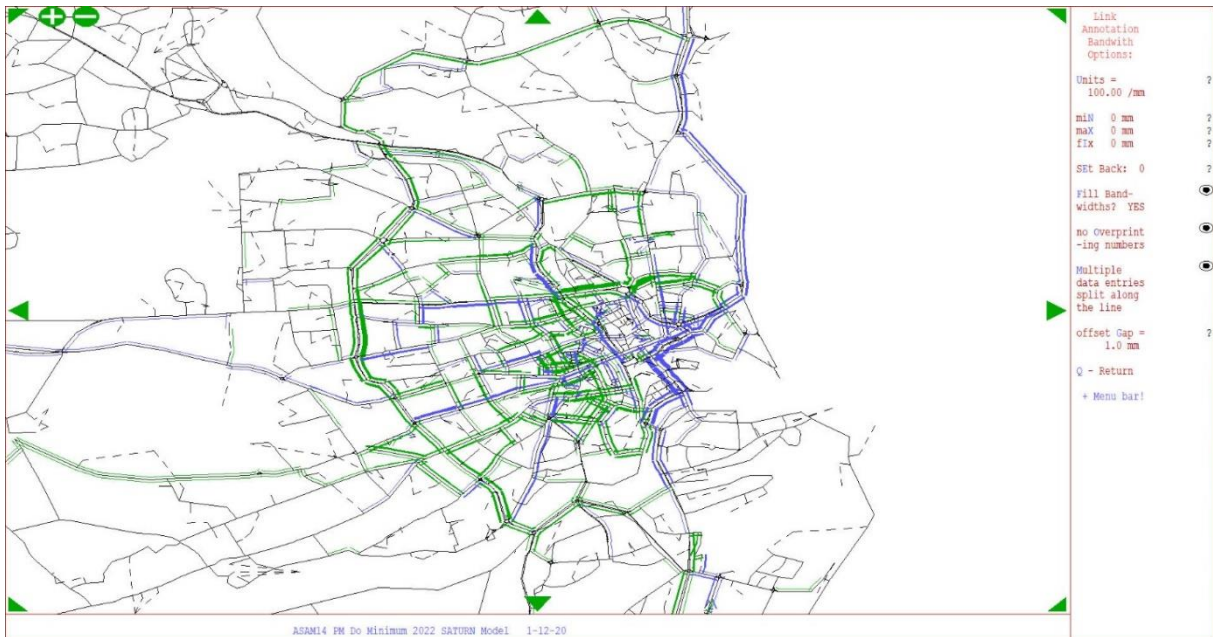
Blue = Traffic Flow Reduction, Green = Traffic Flow Increase

**Boundary B: LEZ Test 3B (Harbour Route Restricted)**



Blue = Traffic Flow Reduction, Green = Traffic Flow Increase

## Boundary C: LEZ Test 3A (Denburn & Harbour Route Restricted)







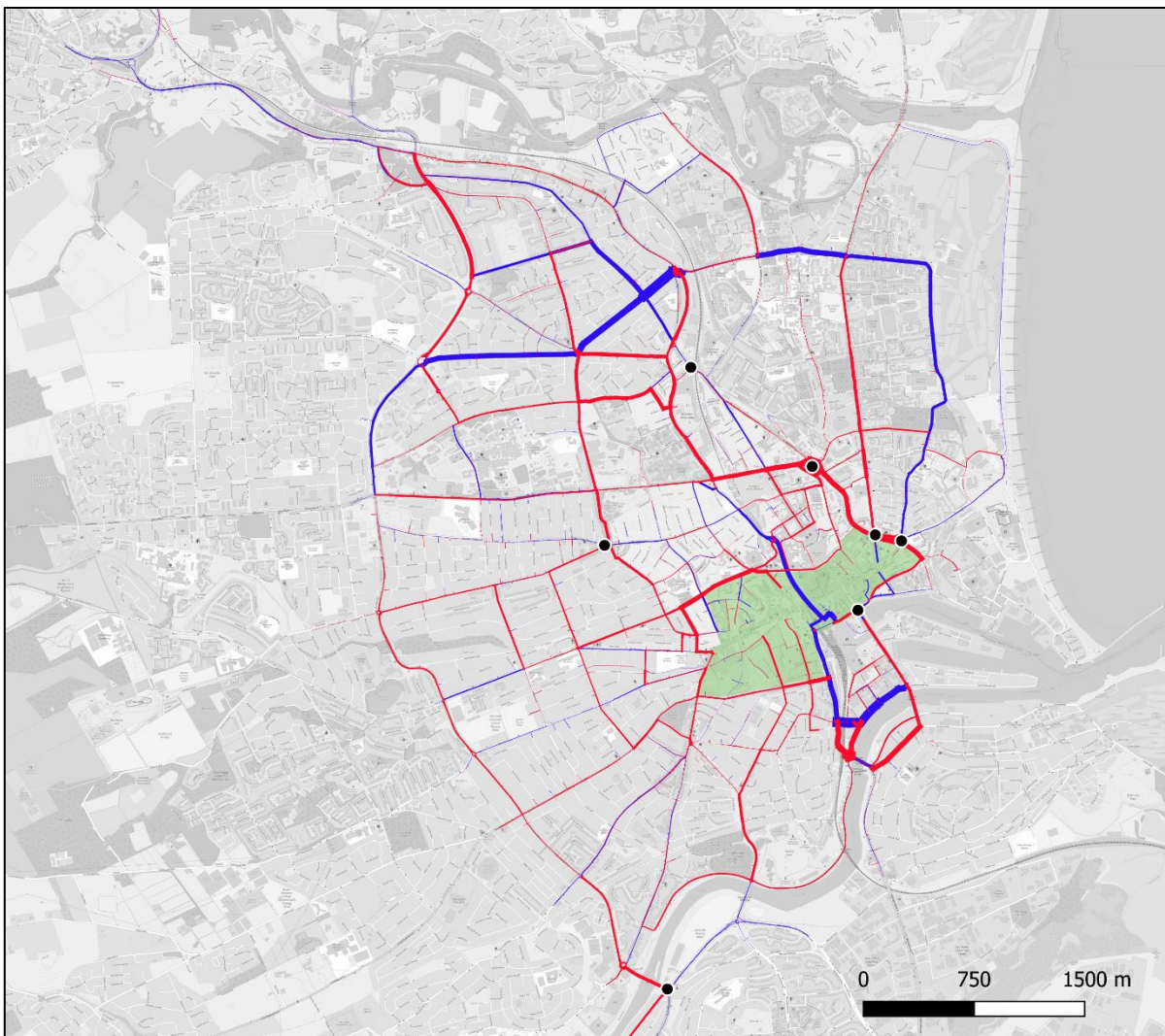
Blue = Traffic Flow Reduction, Green = Traffic Flow Increase

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**APPENDIX C: MODEL TRAFFIC FLOW COMPARISONS**

**Option 1A**

Legend	
	LEZ Area
	Decrease in Traffic Flow from ACCPM24 Reference Case
	Increase in Traffic Flow from ACCPM24 Reference Case
	Congestion Locations



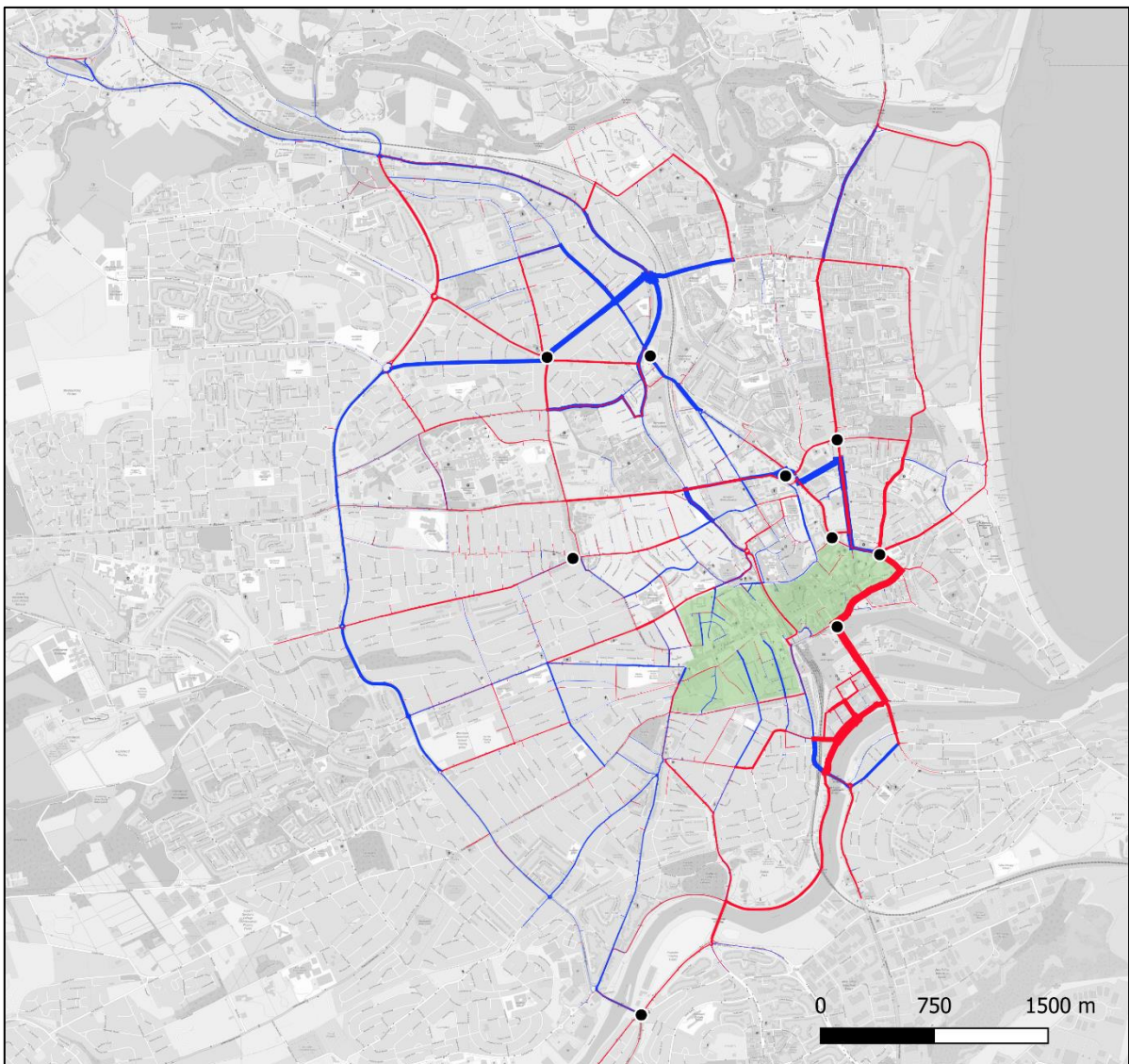
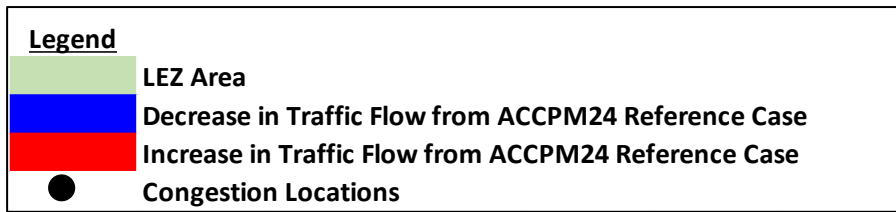
**Option 1A – PM Peak Period (16:00-19:00)**

**Option 1A – PM Peak Period (16:00-19:00)**

Location	Dir.	Ref Case Flow at		Flow Change (Vehicle)	Percentage Change
		95% Demand (Vehicle)	Test Flow (Vehicle)		
Springbank Terrace	EB	801	1022	221	28%
Skene St	WB	1127	1343	216	19%
S College St NB (S of Palmerston Pl)	NB	1607	1891	284	18%
East North St	SB	2290	2681	392	17%
East North St	NB	2142	2484	342	16%
Hutcheon St	EB	1461	1668	207	14%
Commerce St	SB	1938	2171	234	12%
N Esplanade W (S of Palmerston Pl)	SB	2732	3000	268	10%
Hutcheon St	WB	1612	1757	145	9%
Holburn St	NB	1942	2062	120	6%
Virginia St	WB	2027	2133	106	5%
Skene St	EB	1578	1639	61	4%
N Esplanade W (S of Palmerston Pl)	NB	2078	2153	75	4%
Holburn St	SB	2363	2432	69	3%
Commerce St	NB	2627	2677	50	2%
Springbank Terrace	WB	724	738	14	2%
Park Rd	SB	1214	1217	3	0%
Virginia St	EB	3271	3235	-36	-1%
N Esplanade W (N of Palmerston Pl)	NB	2122	2089	-33	-2%
S College St (S of Palmerston Pl)	SB	1638	1611	-28	-2%
S College St (N of Palmerston Pl)	SB	1707	1594	-113	-7%
Denburn Rd	NB	2429	2266	-163	-7%
Park Rd	NB	1642	1491	-152	-9%
S College St (N of Palmerston Pl)	NB	2184	1966	-219	-10%
N Esplanade W SB (N of Palmerston Pl)	SB	3522	3010	-513	-15%
Denburn Rd	SB	1681	1408	-273	-16%

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## Option 1B



Option 1B – PM Peak (16:00-19:00)

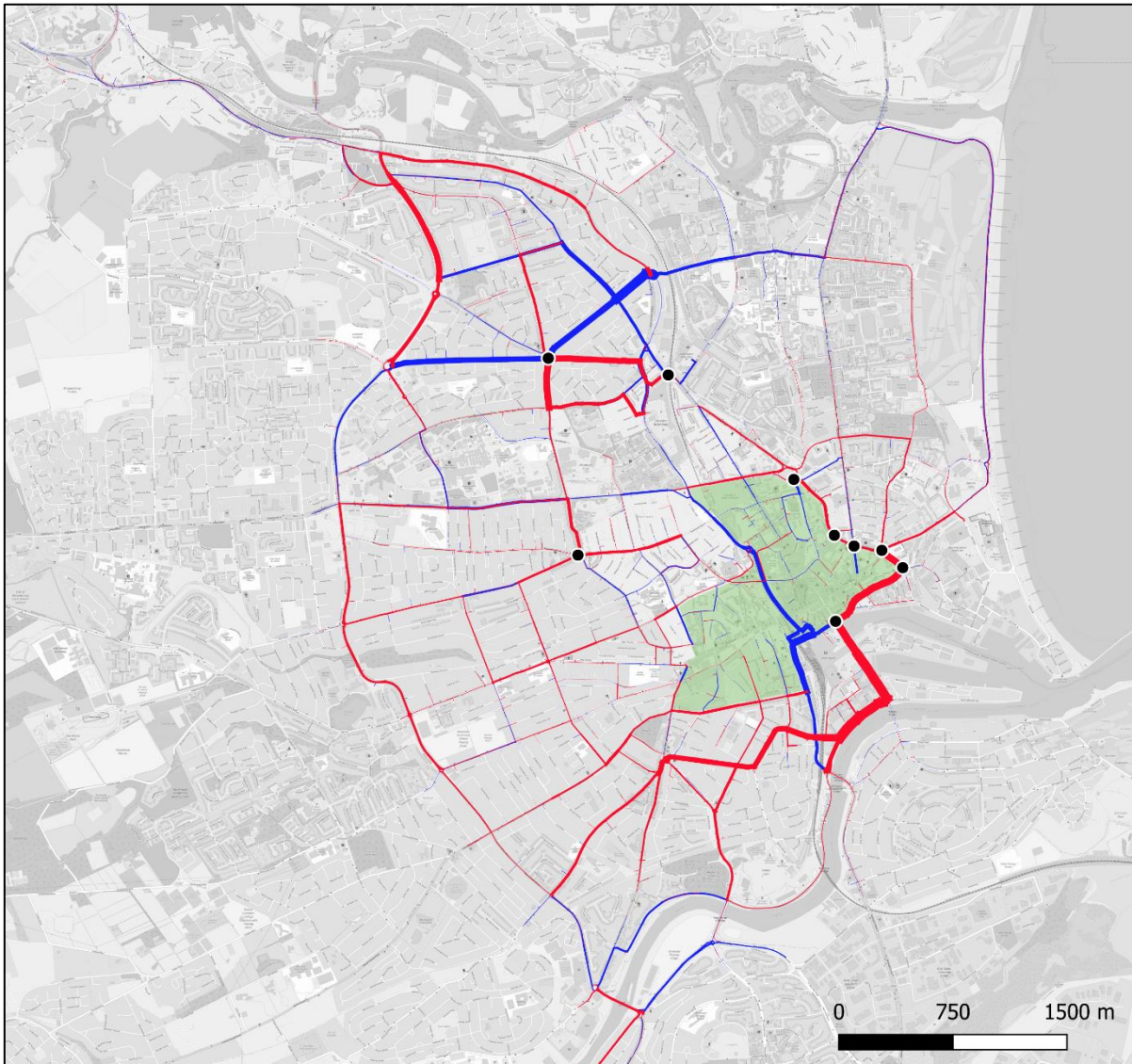
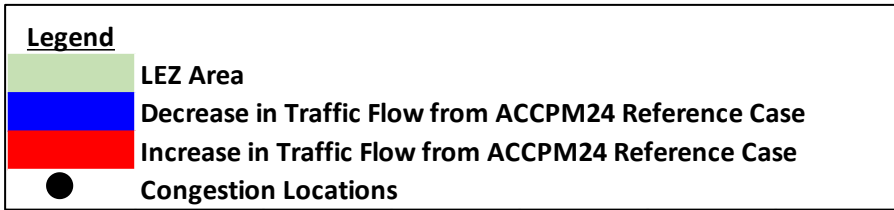
**Option 1B – PM Peak (16:00-19:00)**

Location	Dir.	Ref Case Flow at 100% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Commerce St	NB	2141	2760	619	29%
Virginia St	EB	2716	3433	717	26%
Virginia St	WB	1850	2322	473	26%
N Esplanade W (N of Palmerston Pl)	SB	3101	3792	691	22%
N Esplanade W (S of Palmerston Pl)	SB	2289	2756	467	20%
Commerce St	SB	1945	2223	278	14%
Park Rd	NB	1497	1709	212	14%
N Esplanade W (S of Palmerston Pl)	NB	1998	2263	265	13%
Market St	NB	3454	3889	436	13%
Springbank Terrace	WB	803	900	97	12%
Market St	SB	3075	3431	356	12%
Park Rd	SB	1247	1375	128	10%
N Esplanade W (N of Palmerston Pl)	NB	2155	2297	142	7%
Berryden Rd (Powis Rd Jct)	SB	1704	1811	107	6%
Denburn Rd	SB	1769	1843	74	4%
Springbank Terrace	EB	959	992	33	3%
S College St (N of Palmerston Pl)	NB	2361	2406	45	2%
Hutcheon St	WB	1680	1711	32	2%
Denburn Rd	NB	2561	2595	34	1%
East North St	NB	2281	2311	30	1%
S College St (N of Palmerston Pl)	SB	1879	1859	-20	-1%
S College St (S of Palmerston Pl)	SB	1929	1751	-178	-9%
Berryden Rd (Powis Rd Jct)	NB	1901	1720	-181	-10%
S College St (S of Palmerston Pl)	NB	1897	1712	-186	-10%
Hutcheon St	EB	1660	1496	-164	-10%
East North St	SB	2851	2451	-400	-14%

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## Option 2A



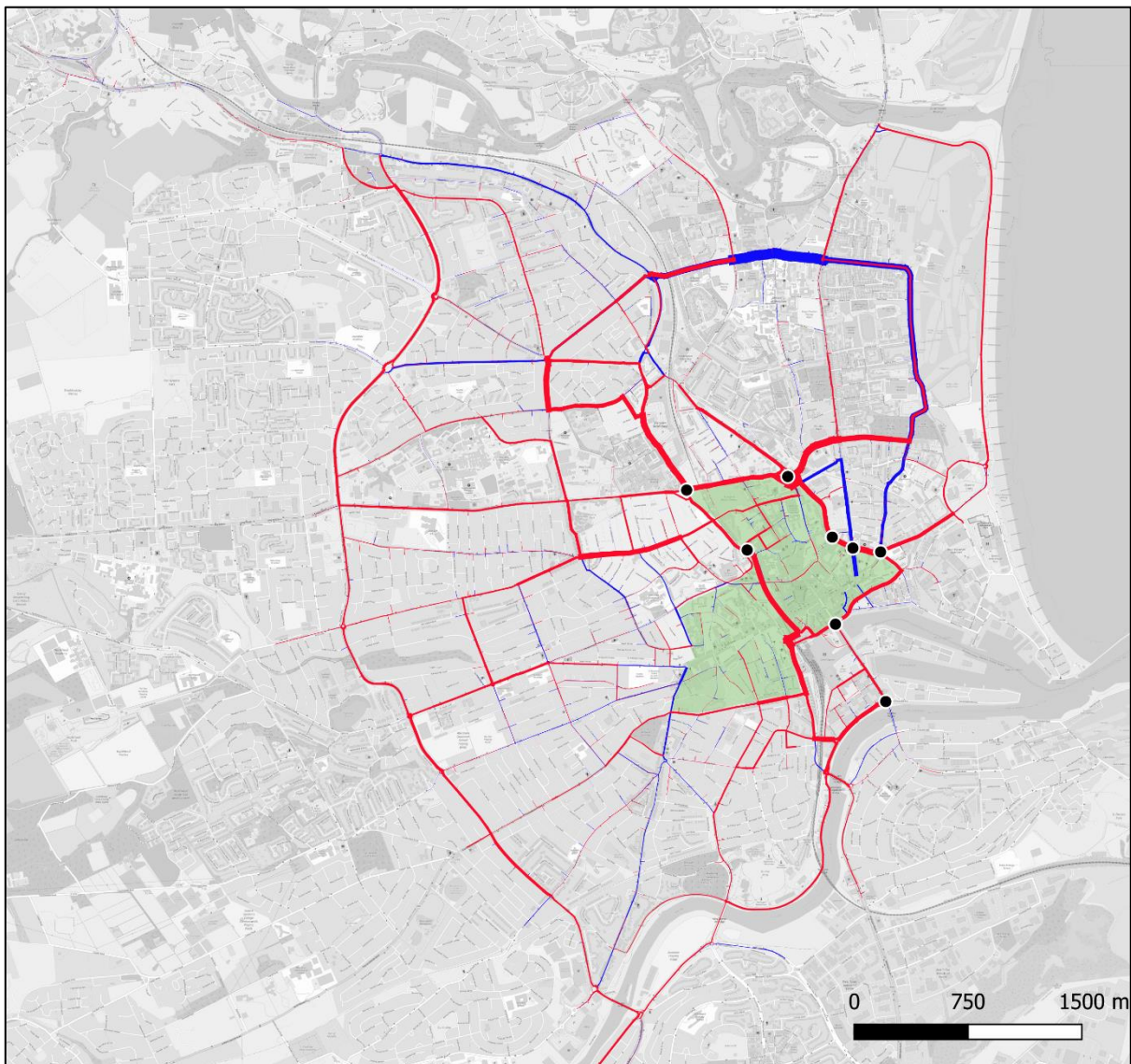
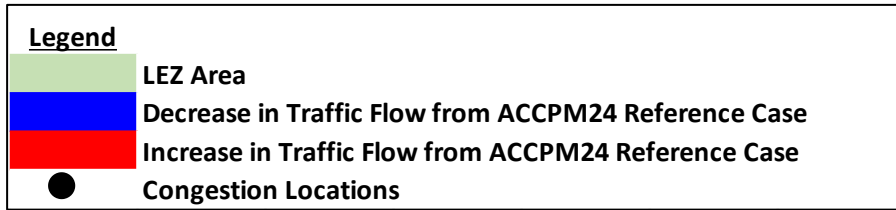
Option 2A – PM Peak (16:00-19:00)

**Option 2A – PM Peak (16:00-19:00)**

Location	Dir.	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Back Hilton Rd	EB	957	1248	291	30%
Fonthill Rd	WB	1048	1302	254	24%
Virginia St	WB	2027	2385	358	18%
Springbank Terrace	EB	801	938	137	17%
Commerce St	SB	1938	2268	331	17%
Market St	SB	3426	3818	393	11%
Beechgrove Ter	EB	1305	1452	147	11%
North Anderson Dr (Haudagain)	SB	3529	3807	278	8%
Hutcheon St	EB	1461	1550	89	6%
Commerce St	NB	2627	2762	135	5%
Virginia St	EB	3271	3436	166	5%
Market St	NB	3735	3868	133	4%
Hutcheon St	WB	1612	1669	57	4%
Fonthill Rd	EB	746	755	9	1%
North Anderson Dr (Haudagain)	NB	5281	5337	57	1%
Springbank Terrace	WB	724	708	-17	-2%
Skene Sq	NB	2989	2917	-73	-2%
Beechgrove Ter	WB	1846	1779	-67	-4%
Berryden Rd (Powis Rd J)	SB	1489	1418	-71	-5%
S College St (N of Palmerston Pl)	NB	2184	2032	-152	-7%
Skene Sq	SB	1797	1663	-134	-7%
Denburn Rd	NB	2429	2222	-207	-9%
Back Hilton Rd	WB	1586	1439	-147	-9%
Berryden Rd (Powis Rd J)	NB	1652	1489	-163	-10%
Denburn Rd	SB	1681	1434	-247	-15%
S College St (N of Palmerston Pl)	SB	1707	1348	-360	-21%

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## Option 2B



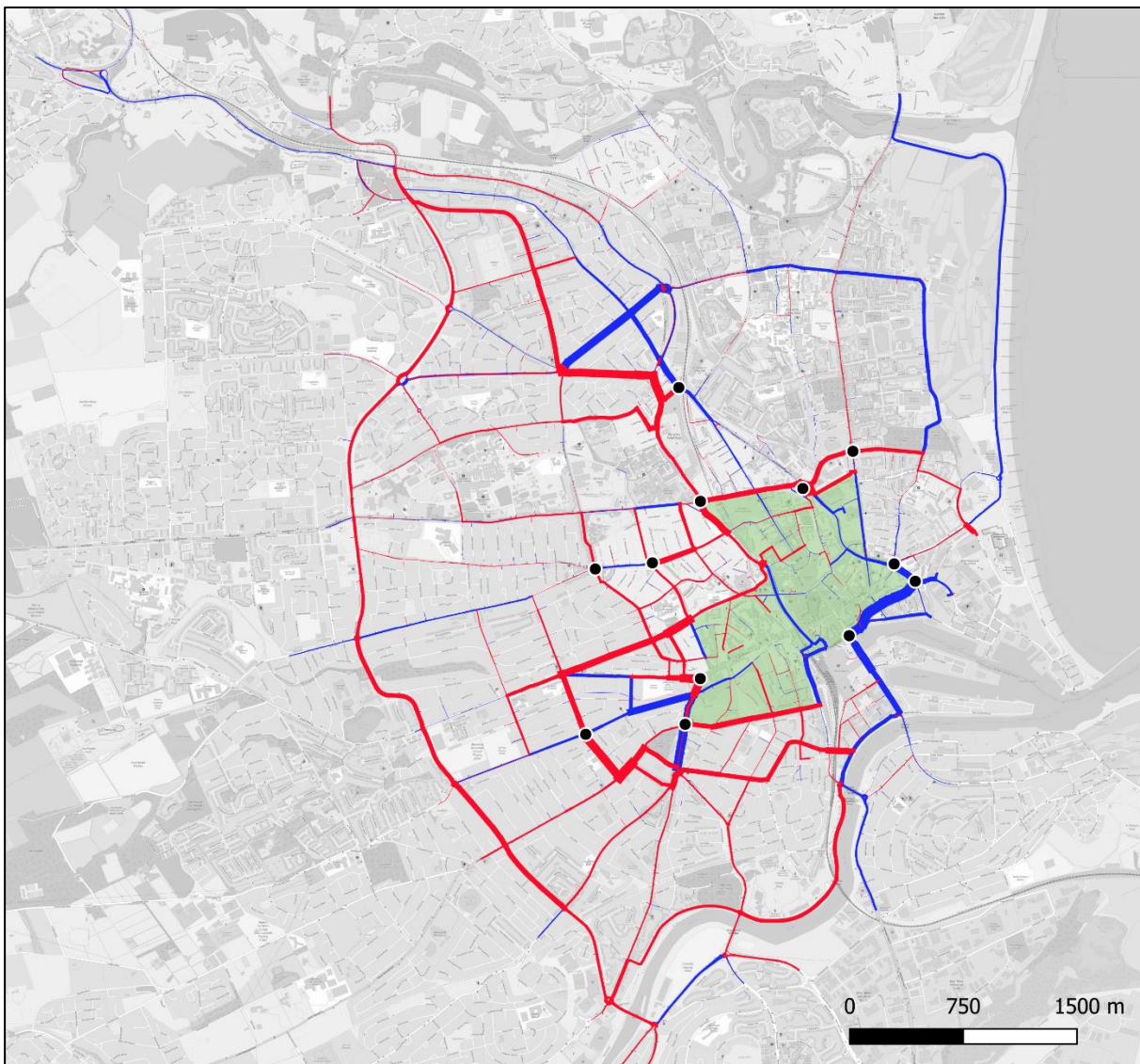
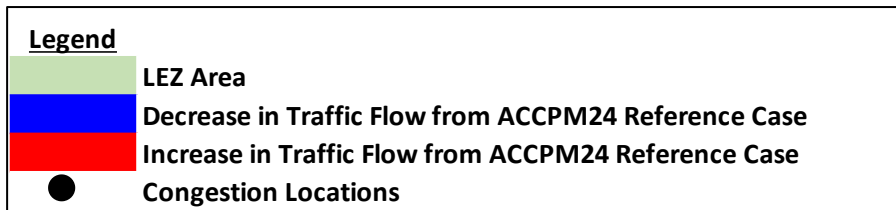
**Option 2B – PM Peak (16:00-19:00)**

**Option 2B – PM Peak (16:00-19:00)**

Location	Dir.	Ref Case Flow at 80% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Mounthooly Way	WB	1119	1399	280	25%
Palmerston Pl	WB	937	1144	207	22%
Rosemount Pl	WB	1185	1413	228	19%
Springbank Terrace	EB	676	788	113	17%
Hutcheon St	WB	1454	1657	203	14%
East North Street	NB	1770	2010	240	14%
Denburn Rd	NB	2030	2236	207	10%
Springbank Terrace	WB	576	633	57	10%
Virginia St	WB	1911	2061	150	8%
Commerce St	SB	1798	1920	122	7%
N Esplanade W (S of Palmerston Pl)	NB	1885	1992	108	6%
N Esplanade W (N of Palmerston Pl)	SB	3356	3525	169	5%
Park Rd	SB	992	1024	32	3%
Virginia St	EB	2911	2989	78	3%
Denburn Rd	SB	1383	1419	36	3%
N Esplanade W (S of Palmerston Pl)	SB	2632	2693	62	2%
Mounthooly Way	EB	1156	1182	26	2%
Hutcheon St	EB	1295	1324	29	2%
Commerce St	NB	2298	2316	18	1%
Palmerston Pl	EB	222	223	1	0%
Rosemount Pl	EB	1051	1051	0	0%
N Esplanade W (N of Palmerston Pl)	NB	1864	1842	-22	-1%
East North Street	SB	1951	1885	-66	-3%
Kings St	SB	1145	1105	-40	-3%
Park Rd	NB	1446	1245	-201	-14%
Kings St	NB	1136	859	-277	-24%

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## Option 3A



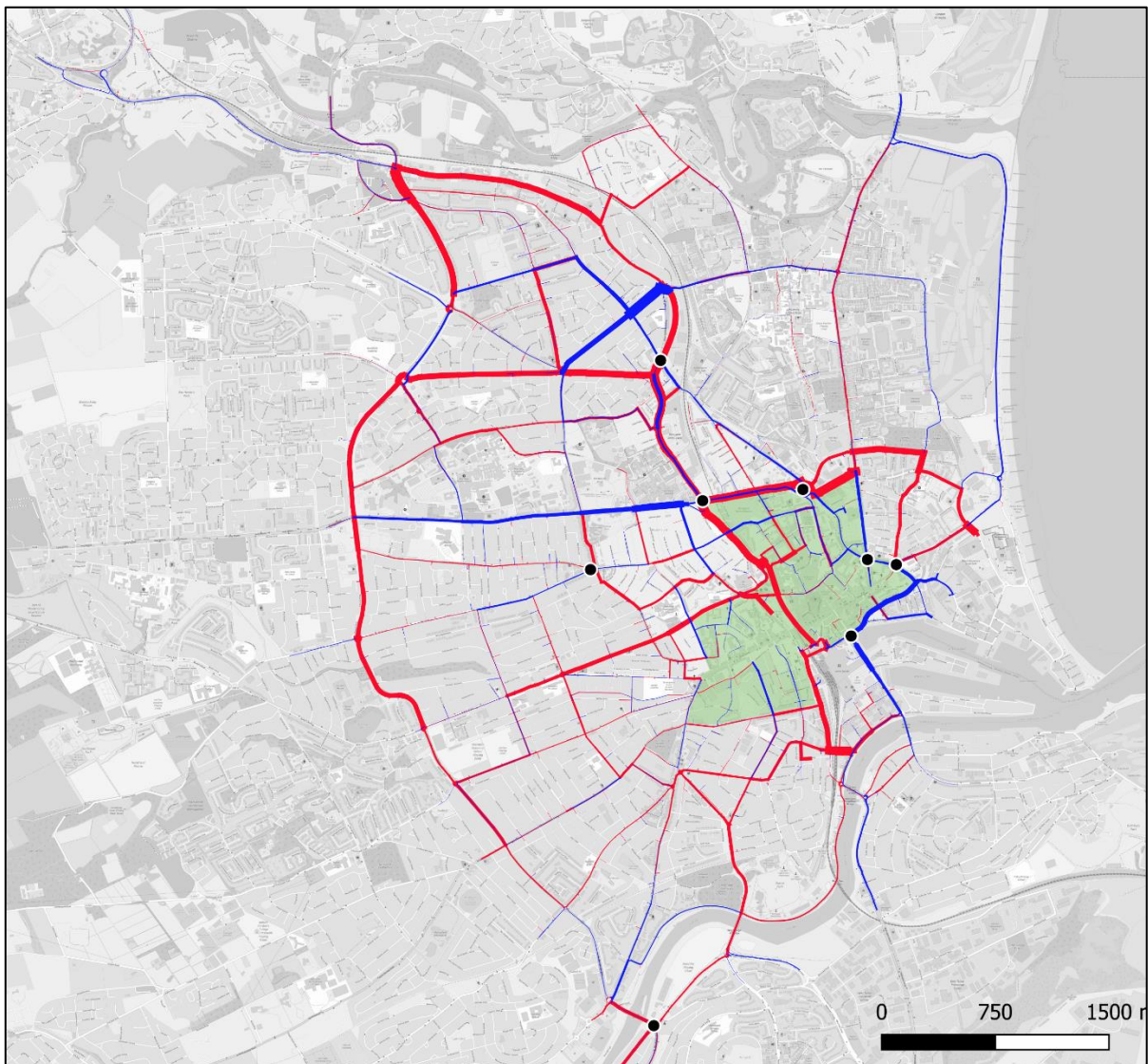
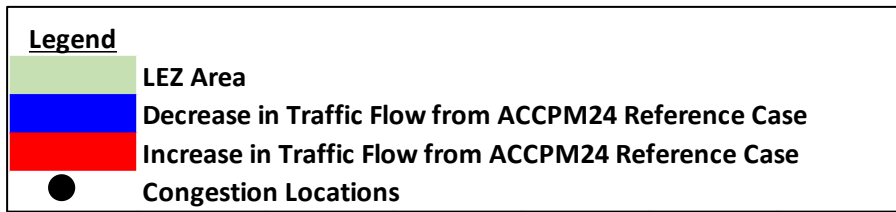
Option 3A – PM Peak (16:00-19:00)

**Option 3A – PM Peak (16:00-19:00)**

Location	Dir.	Ref Case Flow at 90% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Ashley Rd	NB	526	905	379	72%
Back Hilton Rd	EB	873	1232	359	41%
Carden Pl	EB	1030	1338	308	30%
Springbank Terrace	EB	798	1012	214	27%
Fonthill Rd	WB	899	1126	227	25%
Springbank Terrace	WB	655	784	130	20%
Holburn Street (Union St J)	SB	2141	2512	371	17%
Hutcheon St	EB	1400	1635	235	17%
Mounthooly Way	WB	1302	1513	211	16%
Carden Pl	WB	837	954	117	14%
Ashley Rd	SB	494	560	66	13%
Skene Sq	NB	2671	2977	306	11%
South Anderson Dr (Great Western Rd)	NB	2784	3032	249	9%
Fonthill Rd	EB	698	758	60	9%
Back Hilton Rd	WB	1258	1363	105	8%
Mounthooly Way	EB	1305	1411	106	8%
Hutcheon St	WB	1553	1646	93	6%
South Anderson Dr (Great Western Rd)	SB	2879	2986	107	4%
Skene Sq	SB	1687	1724	37	2%
Denburn Rd	NB	2223	2109	-114	-5%
Holburn Street (Union St J)	NB	1649	1541	-108	-7%
S College St (N of Palmerston Pl)	NB	2065	1924	-141	-7%
Denburn Rd	SB	1556	1438	-118	-8%
Commerce St	SB	1930	1783	-147	-8%
Market St	SB	3512	3211	-302	-9%
Market St	NB	3600	3189	-411	-11%
Commerce St	NB	2571	2223	-348	-14%
S College St (N of Palmerston Pl)	SB	1451	1237	-214	-15%

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## Option 3B



**Option 3B – PM Peak (16:00-19:00)**

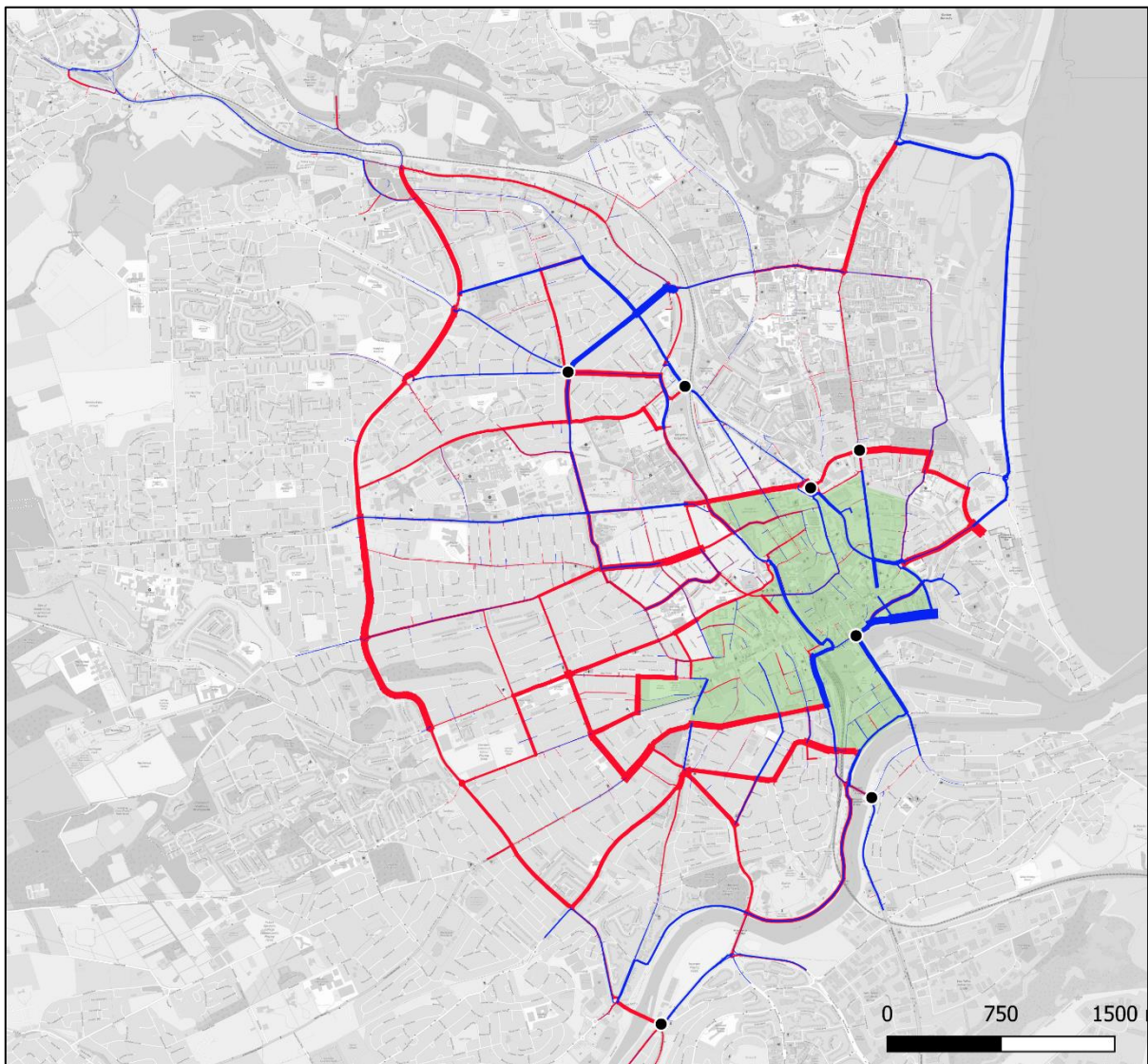
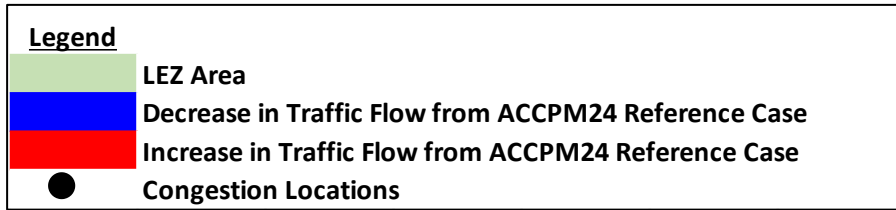
**Option 3B – PM Peak (16:00-19:00)**

Location	Dir.	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Seaforth Rd	EB	737	974	237	32%
Back Hilton Rd	EB	957	1205	248	26%
Berryden Rd (Powis Rd J)	SB	1489	1831	342	23%
Hutcheon St	EB	1461	1747	286	20%
Skene St	WB	1127	1281	154	14%
Carden Pl	EB	1175	1325	150	13%
Springbank Terrace	WB	724	815	91	13%
Ashley Rd	SB	544	607	63	12%
Denburn Rd	SB	1681	1870	189	11%
Skene Sq	NB	2989	3280	291	10%
Seaforth Rd	WB	800	871	71	9%
S College St (N of Palmerston Pl)	NB	2184	2376	192	9%
Fonthill Rd	WB	1048	1136	89	8%
Carden Pl	WB	953	1033	80	8%
Skene Sq	SB	1797	1946	149	8%
Skene St	EB	1578	1693	115	7%
North Anderson Dr (Haudagain)	SB	3529	3760	231	7%
Fonthill Rd	EB	746	791	45	6%
Denburn Rd	NB	2429	2560	132	5%
N Anderson Dr	SB	3609	3804	195	5%
Springbank Terrace	EB	801	843	42	5%
Ashley Rd	NB	567	593	27	5%
S College St (N of Palmerston Pl)	SB	1707	1779	72	4%
N Anderson Dr	NB	3825	3943	119	3%
Back Hilton Rd	WB	1586	1616	31	2%
North Anderson Dr (Haudagain)	NB	5281	5376	96	2%
Berryden Rd (Powis Rd J)	NB	1652	1616	-36	-2%
Virginia St	WB	2027	1927	-101	-5%
Market St	SB	3426	3210	-216	-6%
Hutcheon St	WB	1612	1509	-104	-6%
Westburn Rd	WB	2321	2113	-208	-9%
Market St	NB	3735	3400	-335	-9%
Virginia St	EB	3271	2947	-324	-10%
Westburn Rd	EB	1542	1107	-435	-28%

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## Option 4A



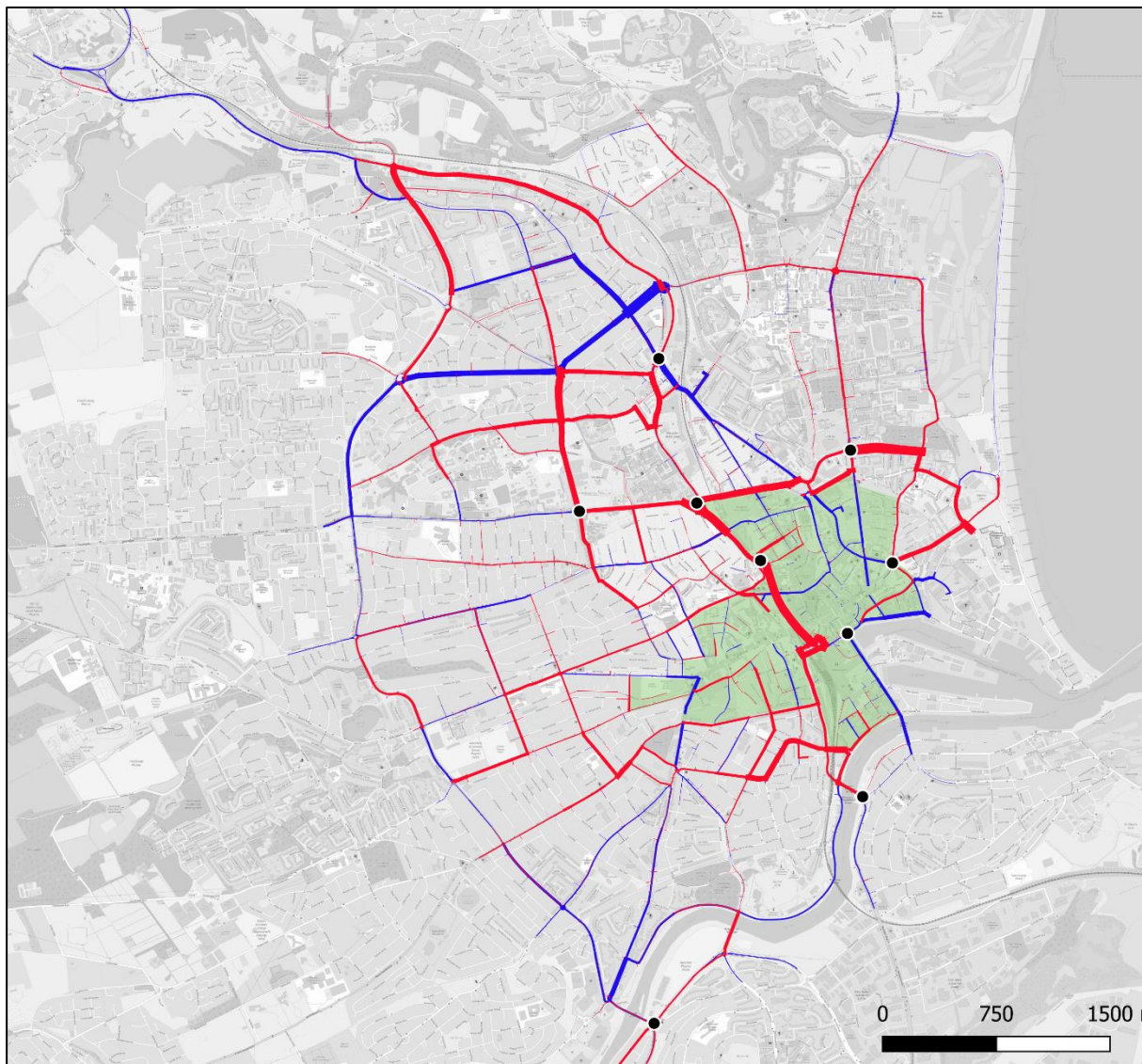
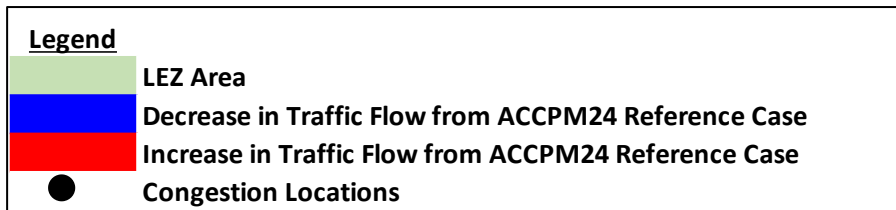
Option 4A – PM Peak (16:00-19:00)

Option 4A – PM Peak (16:00-19:00)

Location	Dir.	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Ashley Rd	NB	567	829	262	46%
Albyn Grove	NB	718	1015	298	41%
Seaforth Rd	EB	737	1017	280	38%
Ashley Rd	SB	544	743	199	37%
Springbank Terrace	EB	801	1026	225	28%
Back Hilton Rd	EB	957	1222	265	28%
Palmerston Pl	WB	991	1216	225	23%
Seaforth Rd	WB	800	960	160	20%
Rosemount Pl	WB	1319	1569	250	19%
Fonthill Rd	WB	1048	1214	166	16%
Hutcheon St	EB	1461	1686	225	15%
N Anderson Dr	SB	3609	3952	343	10%
N Anderson Dr	NB	3825	4055	231	6%
Springbank Terrace	WB	724	766	42	6%
Skene Sq	NB	2989	3143	154	5%
Albyn Grove	SB	905	946	42	5%
Hutcheon St	WB	1612	1683	71	4%
Kings St	SB	1403	1456	53	4%
Commerce St	SB	1938	2000	62	3%
Back Hilton Rd	WB	1586	1605	19	1%
Fonthill Rd	EB	746	750	4	1%
Denburn Rd	NB	2429	2394	-35	-1%
Palmerston Pl	EB	283	278	-5	-2%
Skene Sq	SB	1797	1704	-93	-5%
S College St					
(N of Palmerston Pl)	NB	2184	2064	-121	-6%
Rosemount Pl	EB	1099	1026	-74	-7%
Market St	NB	3735	3417	-319	-9%
Commerce St	NB	2627	2375	-253	-10%
Market St	SB	3426	3017	-409	-12%
Denburn Rd	SB	1681	1446	-235	-14%
Kings St	NB	1390	1113	-277	-20%
S College St					
(N of Palmerston Pl)	SB	1707	1238	-469	-27%
Regent Quay	EB	127	89	-38	-30%
Regent Quay	WB	916	116	-801	-87%

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## Option 4B



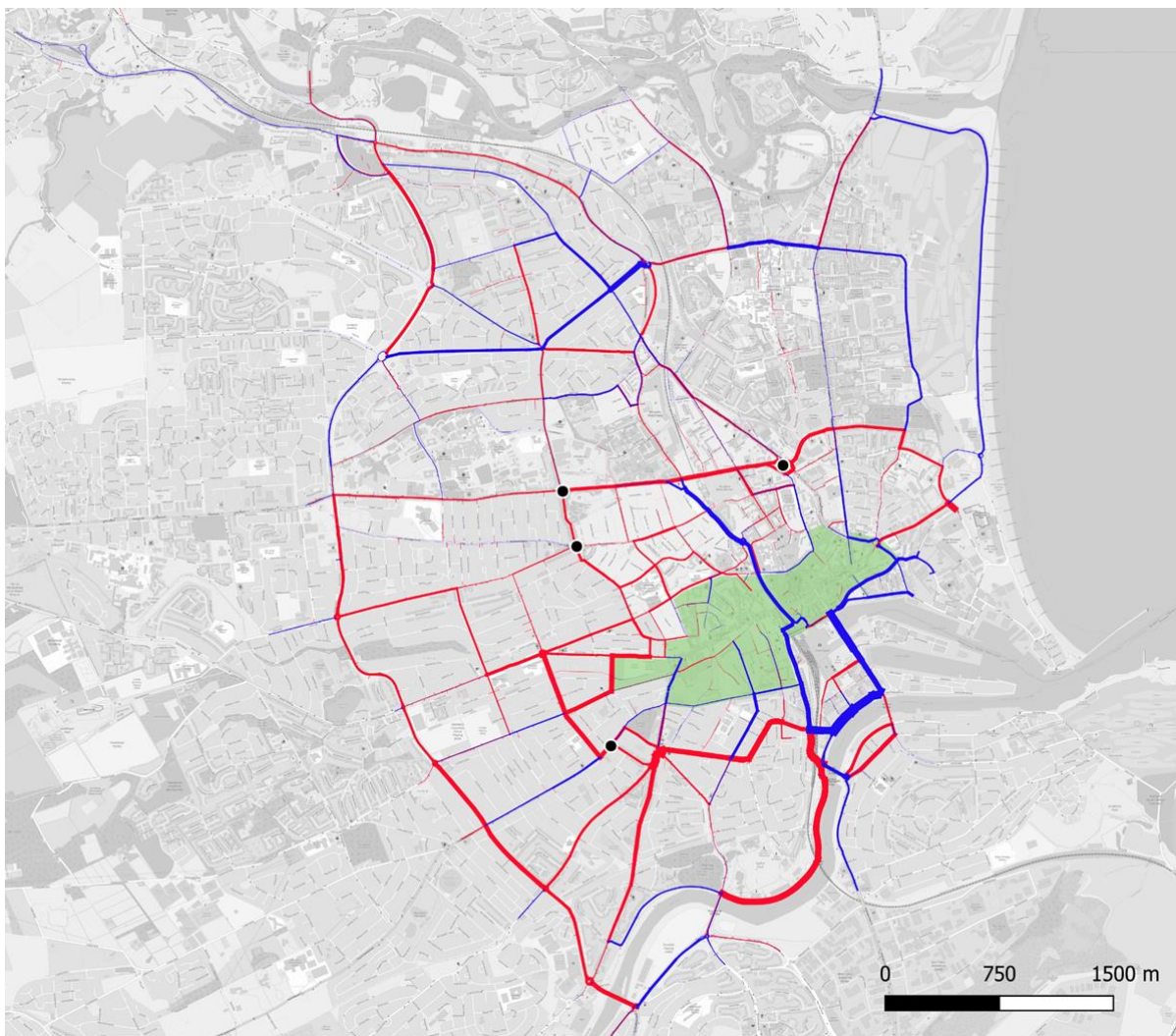
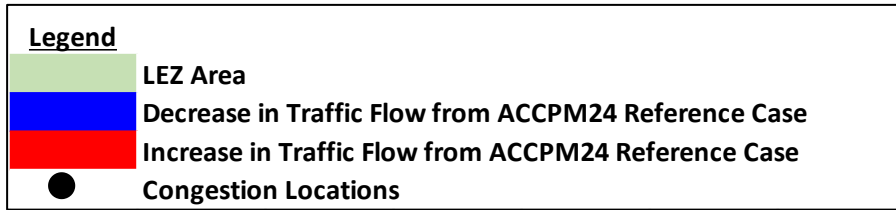
**Option 4B – PM Peak (16:00-19:00)**

**Option 4B – PM Peak (16:00-19:00)**

Location	Dir.	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Seaforth Rd	EB	737	1063	326	44%
Palmerston Pl	WB	991	1241	250	25%
Denburn Rd	SB	1681	2059	379	23%
Skene Sq	SB	1797	2189	392	22%
Ashley Rd	NB	567	673	106	19%
Hutcheon St	EB	1461	1728	267	18%
Back Hilton Rd	EB	957	1118	161	17%
Springbank Terrace	WB	724	842	118	16%
Seaforth Rd	WB	800	928	128	16%
Westburn Dr	SB	1402	1579	177	13%
Springbank Terrace	EB	801	883	82	10%
S College St					10%
(N of Palmerston Pl)	SB	1707	1880	173	
Regent Quay	EB	127	138	11	9%
Denburn Rd	NB	2429	2637	209	9%
S College St					8%
(N of Palmerston Pl)	NB	2184	2366	182	
Ashley Rd	SB	544	581	37	7%
Berryden Rd					6%
(Powis Rd J)	SB	1489	1582	94	
North Anderson Dr					6%
(Haudagain)	SB	3529	3750	222	
Hutcheon St	WB	1612	1689	77	5%
Westburn Dr	NB	2158	2256	98	5%
Kings St	SB	1403	1406	4	0%
North Anderson Dr					-1%
(Haudagain)	NB	5281	5244	-37	
Skene Sq	NB	2989	2966	-24	-1%
Palmerston Pl	EB	283	274	-9	-3%
Market St	SB	3426	3291	-135	-4%
Kings St	NB	1390	1318	-72	-5%
Back Hilton Rd	WB	1586	1491	-95	-6%
Market St	NB	3735	3506	-230	-6%
Berryden Rd					-9%
(Powis Rd J)	NB	1652	1505	-147	
Regent Quay	WB	916	711	-205	-22%

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## Option 5



**Option 5 – PM Peak (16:00-19:00)**



### Option 5 – PM Peak (16:00-19:00)

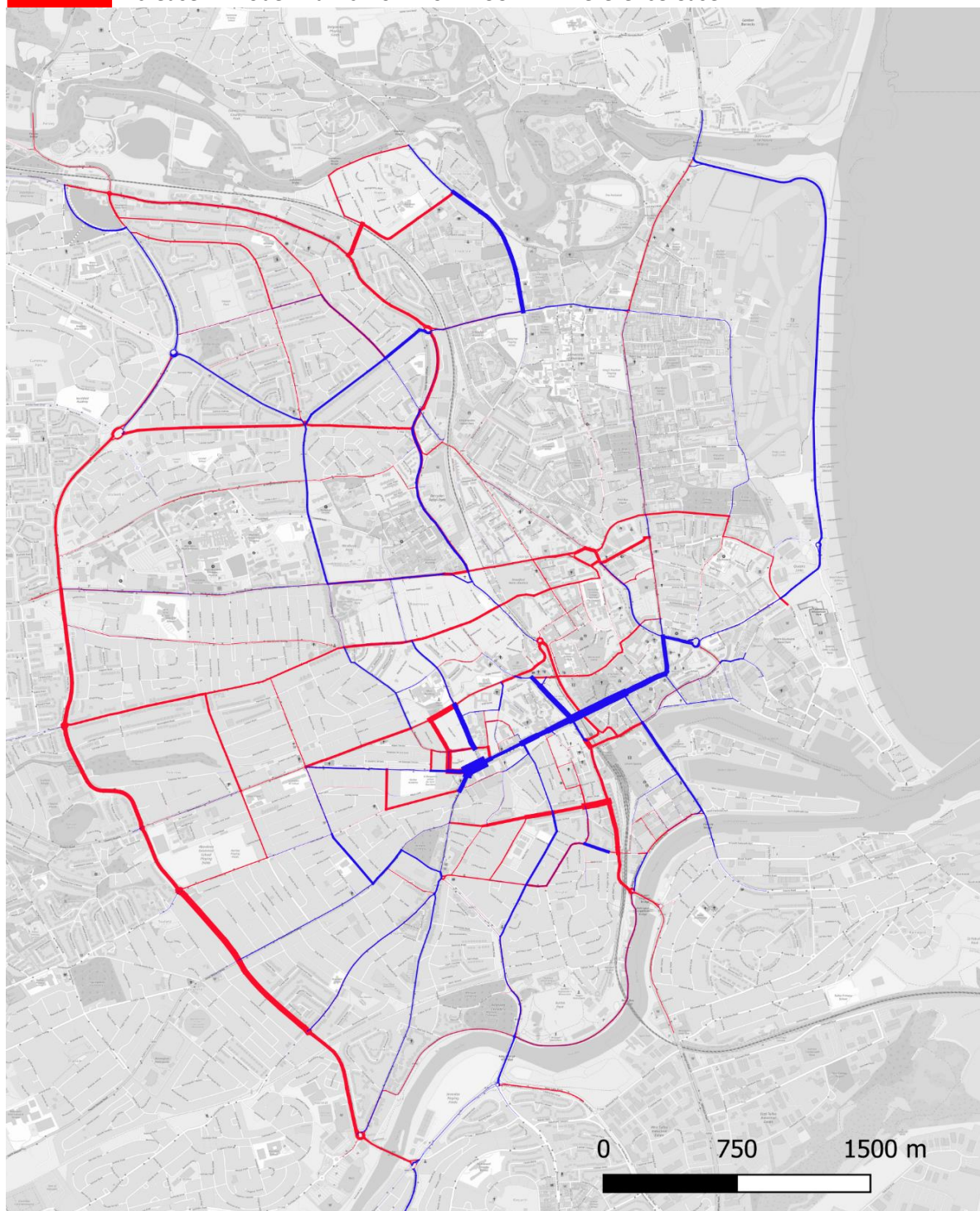
Location	Dir.	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Ashley Rd	SB	544	868	324	59%
Ashley Rd	NB	567	863	297	52%
Albyn Grove	NB	718	1062	345	48%
St Swithin St	SB	773	1124	351	45%
Fonthill Rd	WB	1048	1415	368	35%
S College St (S of Palmerston Pl)	NB	1607	2113	507	32%
Fonthill Rd	EB	746	978	232	31%
Seaforth Rd	EB	737	942	205	28%
Riverside Dr	NB	1726	2164	439	25%
Holburn St	SB	2525	3079	554	22%
Holburn St	NB	1894	2307	413	22%
Seaforth Rd	WB	800	974	174	22%
Hutcheon St	WB	1612	1933	321	20%
Back Hilton Rd	EB	957	1135	178	19%
Hutcheon St	EB	1461	1723	262	18%
Albyn Grove	SB	905	1026	122	13%
St Swithin St	NB	626	691	65	10%
Riverside Dr	SB	2310	2486	176	8%
Back Hilton Rd	WB	1586	1701	115	7%
Springbank Terrace	EB	801	845	44	5%
S College St (S of Palmerston Pl)	SB	1638	1714	76	5%
Skene Sq	SB	1797	1765	-32	-2%
Palmerston Pl	EB	283	277	-6	-2%
Market St	NB	3735	3652	-83	-2%
S College St (N of Palmerston Pl)	SB	1707	1614	-93	-5%
Denburn Rd	SB	1681	1508	-173	-10%
Skene Sq	NB	2989	2616	-373	-12%
Denburn Rd	NB	2429	2097	-331	-14%
N Esplanade W (N of Palmerston Pl)	NB	2122	1830	-291	-14%
Springbank Terrace	WB	724	606	-118	-16%
S College St (N of Palmerston Pl)	NB	2184	1816	-368	-17%
Market St	SB	3426	2734	-691	-20%
N Esplanade W (N of Palmerston Pl)	SB	3522	2654	-868	-25%
Regent Quay	WB	916	662	-254	-28%
Regent Quay	EB	127	85	-41	-33%
Palmerston Pl	WB	991	342	-649	-66%

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## APPENDIX D: FINAL SCHEME - MODEL TRAFFIC FLOWS

### Legend

-  Decrease in Model Traffic Flow from ACCPM24 Reference Case
-  Increase in Model Traffic Flow from ACCPM24 Reference Case





### Final LEZ Scheme – AM Peak (07:00-09:00)

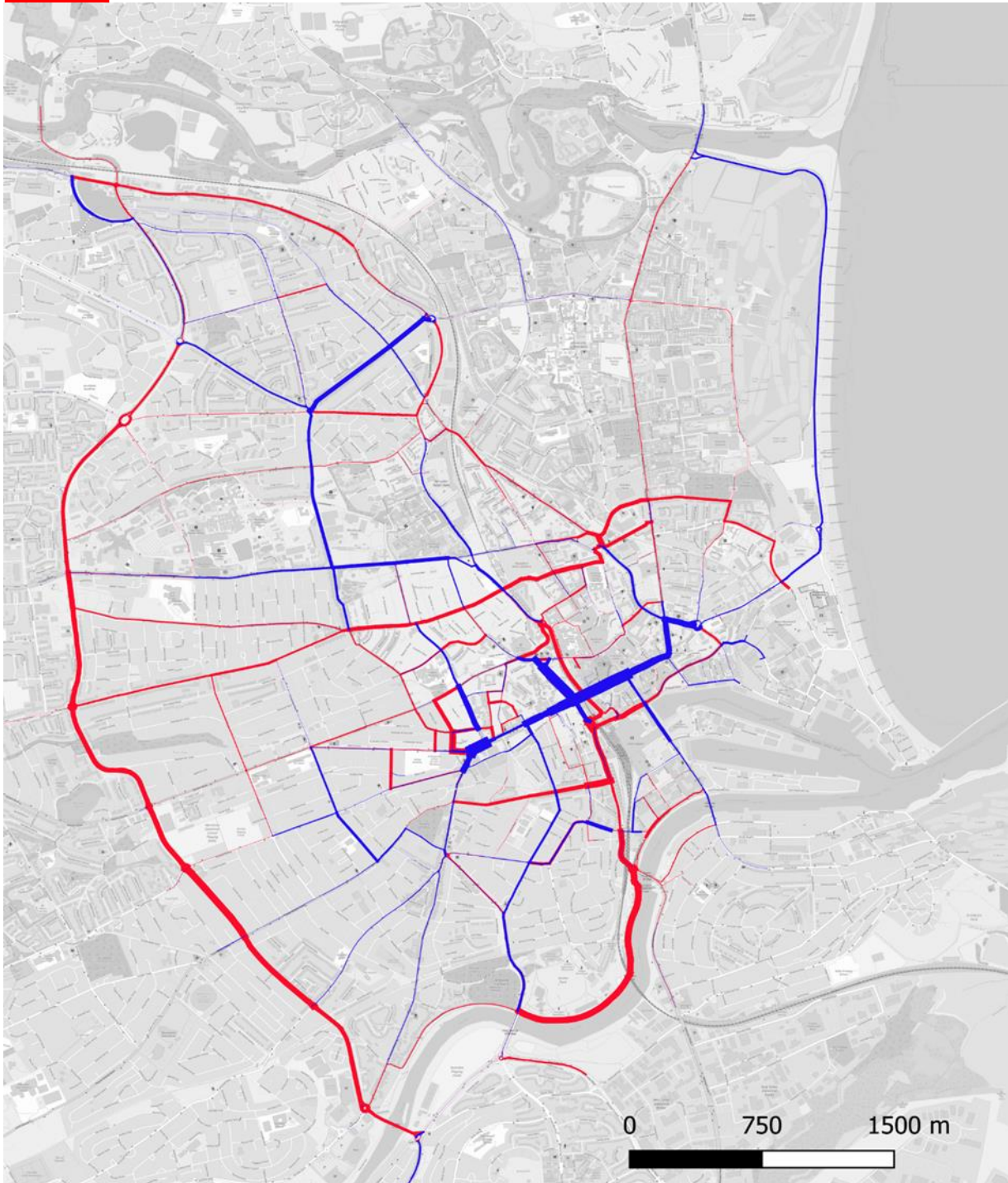
### Final LEZ Scheme – AM Peak (07:00-09:00)

Location	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Albyn Place WB	650	1407	757	116%
Ferryhill Road SB	253	514	260	103%
Willowbank Road EB	540	1025	485	90%
Seaforth Rd EB	331	585	254	77%
Springbank Terrace EB	1036	1517	481	46%
Chapel St SB	733	1057	324	44%
Willowbank Road WB	384	506	121	32%
Albert Street NB	316	412	96	30%
Anderson Dr NB	3058	3956	897	29%
Hutcheon St EB	1027	1275	247	24%
Fonthill Rd WB	538	661	123	23%
Back Hilton Rd EB	1366	1658	292	21%
Springbank Terrace WB	354	425	71	20%
Hutcheon St WB	1117	1304	187	17%
Anderson Dr SB	2691	3077	386	14%
Back Hilton Rd WB	727	807	80	11%
Fonthill Rd EB	465	501	36	8%
Seaforth Rd WB	723	772	49	7%
Ashley Rd SB	294	310	16	5%
Holburn St SB (S of Fonthill Road)	712	747	35	5%
Great Southern Rd NB	1638	1690	52	3%
Great Southern Rd SB	1307	1306	-2	0%
Palmerston Pl WB	551	541	-11	-2%
Westburn Dr NB	1441	1409	-32	-2%
Albert Street SB	461	438	-23	-5%
Palmerston Pl EB	303	268	-36	-12%
Westburn Dr SB	1655	1449	-206	-12%
Holburn St NB (S of Fonthill Road)	685	539	-146	-21%
Regent Quay WB	403	302	-101	-25%
Ferryhill Road NB	581	430	-151	-26%
Kings St SB	1660	992	-668	-40%
Albyn Place EB	1258	722	-536	-43%
Bon-Accord St SB	388	221	-168	-43%
Ashley Rd NB	660	339	-322	-49%
Kings St NB	980	480	-500	-51%
Bon-Accord St NB	533	230	-303	-57%
Regent Quay EB	131	47	-84	-64%
Union St EB	1314	173	-1141	-87%
Union St WB	1300	143	-1158	-89%



## Legend

-  Decrease in Model Traffic Flow from ACCPM24 Reference Case
-  Increase in Model Traffic Flow from ACCPM24 Reference Case





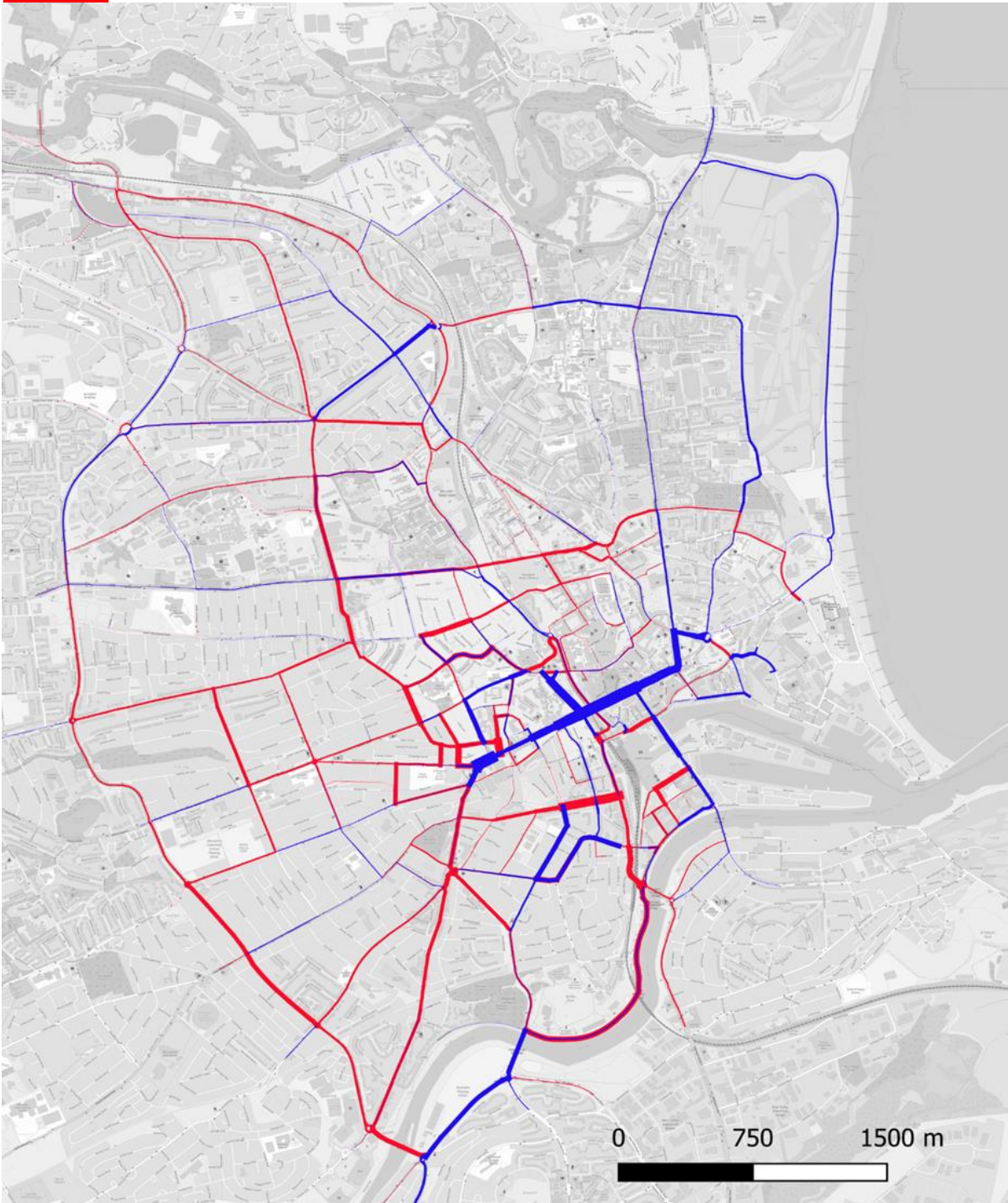
**Final LEZ Scheme – Inter Peak (10:00-16:00)**

**Final LEZ Scheme – Inter Peak (10:00-16:00)**

Location	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Albyn Place WB	1474	2712	1238	84%
Springbank Terrace EB	1229	2065	836	68%
Willowbank Road EB	921	1534	613	67%
Seaforth Rd EB	750	1232	482	64%
Ferryhill Road SB	836	1363	527	63%
Chapel St SB	1198	1817	619	52%
Seaforth Rd WB	1004	1516	512	51%
Willowbank Road WB	750	1059	309	41%
Albert Street NB	1023	1383	359	35%
Back Hilton Rd EB	1354	1746	392	29%
Anderson Dr NB	4997	6349	1352	27%
Back Hilton Rd WB	1986	2426	440	22%
Anderson Dr SB	4835	5818	982	20%
Great Southern Rd SB	2353	2643	290	12%
Fonthill Rd WB	1204	1297	93	8%
Springbank Terrace WB	993	1065	72	7%
Albert Street SB	1176	1255	78	7%
Hutcheon St EB	2663	2734	71	3%
Palmerston Pl EB	221	222	1	1%
Holburn St SB (S of Fonthill Road)	1791	1801	10	1%
Great Southern Rd NB	2548	2451	-98	-4%
Hutcheon St WB	2975	2839	-137	-5%
Holburn St NB (S of Fonthill Road)	1169	996	-173	-15%
Fonthill Rd EB	877	744	-134	-15%
Westburn Dr SB	3371	2853	-518	-15%
Westburn Dr NB	3873	3231	-642	-17%
Regent Quay WB	1185	936	-250	-21%
Palmerston Pl WB	1505	1113	-392	-26%
Albyn Place EB	1969	1456	-514	-26%
Ashley Rd SB	627	444	-183	-29%
Kings St SB	2328	1473	-856	-37%
Ferryhill Road NB	863	506	-357	-41%
Kings St NB	1982	908	-1075	-54%
Bon-Accord St SB	791	360	-432	-55%
Ashley Rd NB	996	446	-550	-55%
Bon-Accord St NB	540	223	-318	-59%
Regent Quay EB	174	56	-118	-68%
Union St EB	2487	348	-2140	-86%
Union St WB	2355	299	-2056	-87%

**Legend**

-  Decrease in Model Traffic Flow from ACCPM24 Reference Case
-  Increase in Model Traffic Flow from ACCPM24 Reference Case

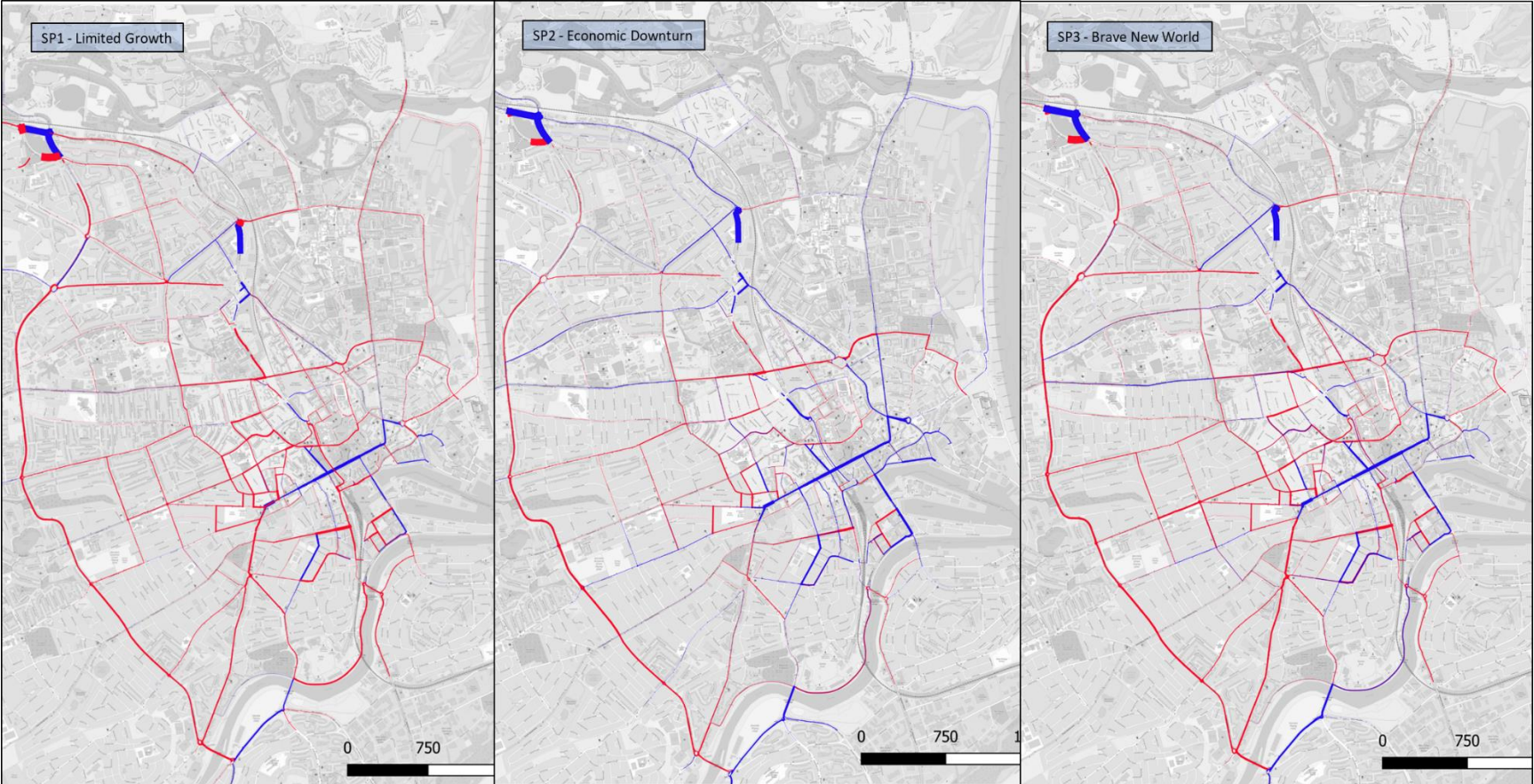


**Final LEZ Scheme – PM Peak (16:00-19:00)**

### Final LEZ Scheme – PM Peak (16:00-19:00)

Location	Ref Case Flow at 95% Demand (Vehicle)	Test Flow (Vehicle)	Flow Change (Vehicle)	Percentage Change
Springbank Terrace EB	597.5	1553.5	956	160%
Chapel St SB	912.5	1866	953.5	104%
Albyn Place WB	838	1476.5	638.5	76%
Willowbank Road EB	519	908.5	389.5	75%
Ferryhill Road SB	897.5	1542	644.5	72%
Albert Street NB	618	1033	415	67%
Bon-Accord St NB	217	321.5	104.5	48%
Willowbank Road WB	465	653	188	40%
Westburn Dr SB	1401.5	1908	506.5	36%
Holburn St SB (S of Fonthill Road)	1333.5	1746.5	413	31%
Back Hilton Rd EB	957	1210	253	26%
Hutcheon St EB	1461	1801.5	340.5	23%
Hutcheon St WB	1612	1962.5	350.5	22%
Fonthill Rd WB	1047.5	1275	227.5	22%
Seaforth Rd WB	800	970.5	170.5	21%
Anderson Dr NB	2945.5	3508	562.5	19%
Great Southern Rd SB	1702	1991	289	17%
Palmerston PI WB	991	1135.5	144.5	15%
Back Hilton Rd WB	1585.5	1813.5	228	14%
Albert Street SB	631.5	712	80.5	13%
Seaforth Rd EB	737	808	71	10%
Springbank Terrace WB	669	717	48	7%
Anderson Dr SB	3174.5	3361	186.5	6%
Great Southern Rd NB	1905.5	1997	91.5	5%
Holburn St NB (S of Fonthill Road)	638	629.5	-8.5	-1%
Westburn Dr NB	2158	2029	-129	-6%
Ashley Rd SB	544	507.5	-36.5	-7%
Albyn Place EB	1466.5	1230	-236.5	-16%
Fonthill Rd EB	746	601	-145	-19%
Ashley Rd NB	566.5	454	-112.5	-20%
Regent Quay WB	916	534	-382	-42%
Palmerston PI EB	282.5	150	-132.5	-47%
Kings St SB	1402.5	722	-680.5	-49%
Kings St NB	1390	626.5	-763.5	-55%
Bon-Accord St SB	927.5	359.5	-568	-61%
Regent Quay EB	126.5	46.5	-80	-63%
Ferryhill Road NB	836.5	301.5	-535	-64%
Union St EB	1501.5	182	-1319.5	-88%
Union St WB	1473	157.5	-1315.5	-89%

APPENDIX E: MODEL TRAFFIC FLOWS – ALTERNATIVE FUTURES (PM PEAK: 16:00-19:00)



**Legend**  
Decrease in Model Traffic Flow from ACCPM24 Reference Case  
Increase in Model Traffic Flow from ACCPM24 Reference Case

Note: Flow changes at Haudagain Rdbt and Berryden Rd to be ignored as this is the impact of the infrastructure measures applied in the future year models.

### Final LEZ Scheme Under Alternative Futures – PM Peak (16:00-19:00)

Location	Number of Vehicles				% Flow Change		
	2019 Base	SP1 LEZ+CCMP	SP2 LEZ+CCMP	SP3 LEZ+CCMP	SP1 LEZ+CCMP	SP2 LEZ+CCMP	SP3 LEZ+CCMP
Willowbank Road EB	405	909	813	910	124%	101%	125%
Back Hilton Rd EB	593	1210	1137	1161	104%	92%	96%
Holburn St SB (S of Fonthill Road)	935	1747	1449	1842	87%	55%	97%
Seaforth Rd EB	440	808	931	830	84%	112%	89%
Seaforth Rd WB	530	971	1147	1001	83%	117%	89%
Hutcheon St EB	1032	1802	1886	1839	75%	83%	78%
Great Southern Rd SB	1149	1991	1815	1885	73%	58%	64%
Broomhill Road WB	776	1323	964	1310	70%	24%	69%
Willowbank Road WB	384	653	545	618	70%	42%	61%
Anderson Dr NB	2109	3508	3567	3566	66%	69%	69%
Fonthill Rd WB	784	1275	1184	1328	63%	51%	69%
S College St NB (N of Palmerston Pl)	1595	2589	2486	2571	62%	56%	61%
Back Hilton Rd WB	1133	1814	1622	1898	60%	43%	68%
Hutcheon St WB	1232	1963	2087	2232	59%	69%	81%
Denburn Rd NB	1686	2678	2265	2525	59%	34%	50%
Virginia St WB	1513	2266	1839	2151	50%	22%	42%
Great Southern Rd NB	1338	1997	1961	1905	49%	47%	42%
Bon-Accord St NB	230	322	323	373	40%	40%	62%
Anderson Dr SB	2421	3361	3895	3419	39%	61%	41%
S College St SB (N of Palmerston Pl)	1188	1643	1288	1559	38%	8%	31%
W N St NB	1593	2145	1851	1996	35%	16%	25%
Broomhill Road EB	804	1078	1057	1081	34%	32%	34%
Holburn St NB (S of Fonthill Road)	475	630	579	691	33%	22%	46%
Virginia St EB	2489	3272	3034	3247	31%	22%	30%
Market St SB	2548	3247	3038	3145	27%	19%	23%
Denburn Rd SB	1295	1648	1486	1585	27%	15%	22%
Ashley Rd SB	404	508	493	685	26%	22%	70%
W N St SB	885	1110	926	1085	25%	5%	23%
E N St SB	1632	1916	1532	1878	17%	-6%	15%
Market St NB	2361	2612	2249	2574	11%	-5%	9%
Fonthill Rd EB	562	601	613	614	7%	9%	9%
E N St NB	1612	1687	1268	1636	5%	-21%	2%
Ashley Rd NB	441	454	604	449	3%	37%	2%
Regent Quay WB	671	534	327	522	-20%	-51%	-22%
Kings St SB	987	722	640	744	-27%	-35%	-25%
Regent Quay EB	66	47	29	43	-29%	-56%	-34%
North Anderson Dr NB (Haudagain)	3897	2629	2543	2664	-33%	-35%	-32%
Kings St NB	959	627	584	601	-35%	-39%	-37%
North Anderson Dr SB (Haudagain)	3615	2353	2279	2419	-35%	-37%	-33%
Bon-Accord St SB	737	360	299	356	-51%	-59%	-52%
Union St EB	1020	182	179	188	-82%	-82%	-82%
Union Terrace NB	488	87	85	82	-82%	-83%	-83%
Union St WB	1071	158	144	156	-85%	-87%	-85%
Union Terrace SB	621	75	85	79	-88%	-86%	-87%

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The SYSTRA logo is rendered in a bold, red, sans-serif typeface. The letters are thick and closely spaced, with a distinctive design where the 'S' and 'Y' are connected at the top, and the 'T' has a unique, slightly curved top bar.



## Appendix 6 – Proposed LEZ



Figure 1: Proposed LEZ Package

Table 1 : Schedule of Streets within Proposed LEZ

<b>Roads within LEZ Boundary</b>	<b>Detail</b>
Academy Street	Full length
Adelphi	Full length
Affleck Place	Full length
Affleck Street	Full length
Albany Court	Full length
Albyn Lane	From Albyn Grove Junction to end of lane by Holburn Street
Albyn Place	From Albyn Place Junction to Albyn Place Junction (semi crescent by Harlaw Academy)
Alford Place	Full length
Back Wynd	Full length
Bath Street	Full length
Belmont Street	Full length
Board Street	Full length
Bom-Accord Crescent	Full length
Bom-Accord Crescent Lane	Full length
Bon-Accord Lane	Full length
Bon-Accord Square	Full length
Bon-Accord Street	Full length
Bon-Accord Terrace	Full length
Bridge Place	Full length
Bridge Street	Full length
Carmelite Lane	Full length
Carmelite St	Full length
Castle Street	Full length
Castle Terrace	Full length
Castlehill	Full length
Chapel Street	Full length
College Street	From Windmill Brae Junction to Wapping Street
Commerce Street	From Beach Boulevard Roundabout to Mearns Street Junction
Concert Court	Full length
Correction Wynd	Full length
Craibstone Lane	Full length
Crimon Place	Full length
Crown Lane	Full length
Crown Street	Full length
Crown Terrace	Full length
Dee Place	Full length
Dee Street	Full length
Denburn Road	Full length

Diamond Lane	Full length
Diamond Place	Full length
Diamond Street	Full length
East Craibstone Street	Full length
East Green	Full length
East North Street	Full length
Exchange Lane	Full length
Exchange Street	Full length
Flourmill Lane	Full length
Gaelic Lane	Full length
Gallowgate	From Upperkirkgate Junction to Littlejohn Street Junction
Gilcomstoun Court	Full length
Golden Square	Full length
Gordon Street	Full length
Guild Street	Full length
Hadden Street	Full length
Hardgate	Full length
Holburn Street	From Union Street Junction to Ashvale Place Junction
Huntly Street	Full length
Imperial Place	Full length
Justice Mill Brae	Full length
Justice Mill Lane	Full length
Justice Street	Full length
Kidd Street	Full length
King Street	From Marischal Street Junction to West North Street Junction
Langstane Place	Full length
Lindsay Street	Full length
Little Belmont Street	Full length
Little Chapel Street	Full length
Littlejohn Street	Full length
Marischal Street	Full length
Market Street	From Union Street Junction to Union Square bus station
Market Stance	Full length
Marywell Street	Full length
Minister Lane	Full length
North Silver Street	Full length
Netherkirkgate	Full length
Oldmill Road	Full length
Peacock's Close	Full length
Poultry Market Lane	Full length
Queen Street	Full length

Rennie's Court	Full length
Rennie's Wynd	Full length
Rose Place	Full length
Rose Street	From Thistle Street Junction to Union Street Junction
Ruby Lane	Full length
Ruby Place	Full length
South Silver Street	Full length
Schoolhill	From Upperkirkgate to Back Wynd Junction
Shiprow	Full length
Shoe Lane	Full length
Shore Brae	Full length
Shore Lane	Full length
Skene Terrace	Full length
Springbank Street	Full length
Springbank Terrace	Full length
St John's Place	Full length
St Mary's Place	Full length
St Nicholas Lane	Full length
St Nicholas Street	Full length
Stirling Street	Full length
Strawberry Bank Parade	Full length
Summer Street	Full length
The Green	Full length
Theatre Lane	Full length
Thistle Place	Full length
Thistle Street	From Rose Street Junction to Chapel Street Junction
Trinity Lane	Full length
Trinity Quay	Full length
Trinity Street	Full length
Union Bridge	Full length
Union Glen	From Holburn Street Junction to Bon Accord Gardens
Union Glen Court	Full length
Union Grove	From Albyn Grove Junction to Holburn Street Junction
Union Row	Full length
Union Street	Full length
Union Terrace	Full length
Union Wynd	Full length
Uppr Kirkgate	Full length
Virginia Court	Full length
Virginia Street	Full length
W Craibstone Street	Full length
Wapping Street	Full length

Weigh-House Square	Full length
Whitehouse Street	Full length
Willowbank Road	Full length
Willowgate Close	Full length
Windmill Brae	Full length
Windmill Lane	Full length

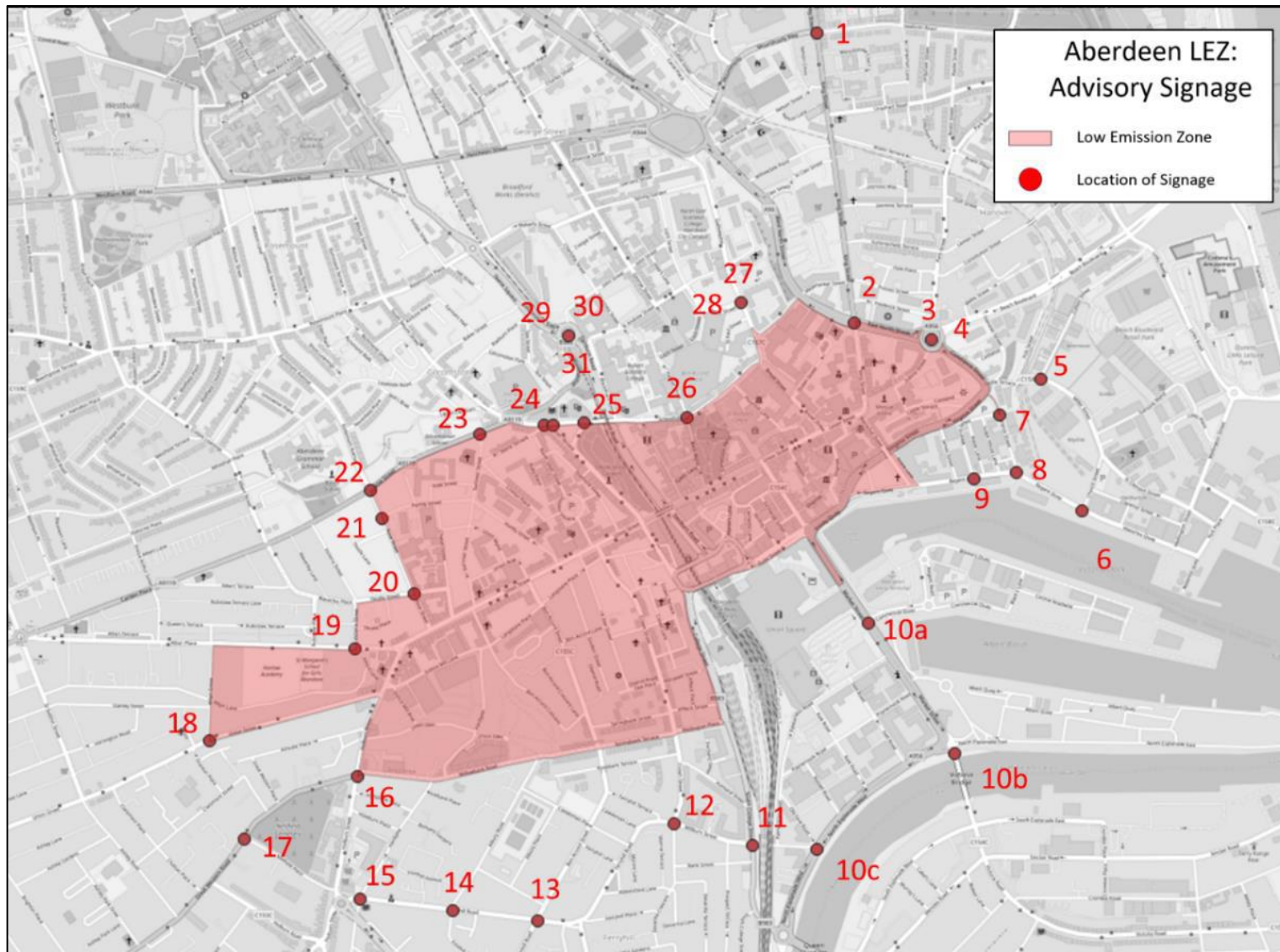


Figure 3: Indicative City Centre LEZ Signage Locations

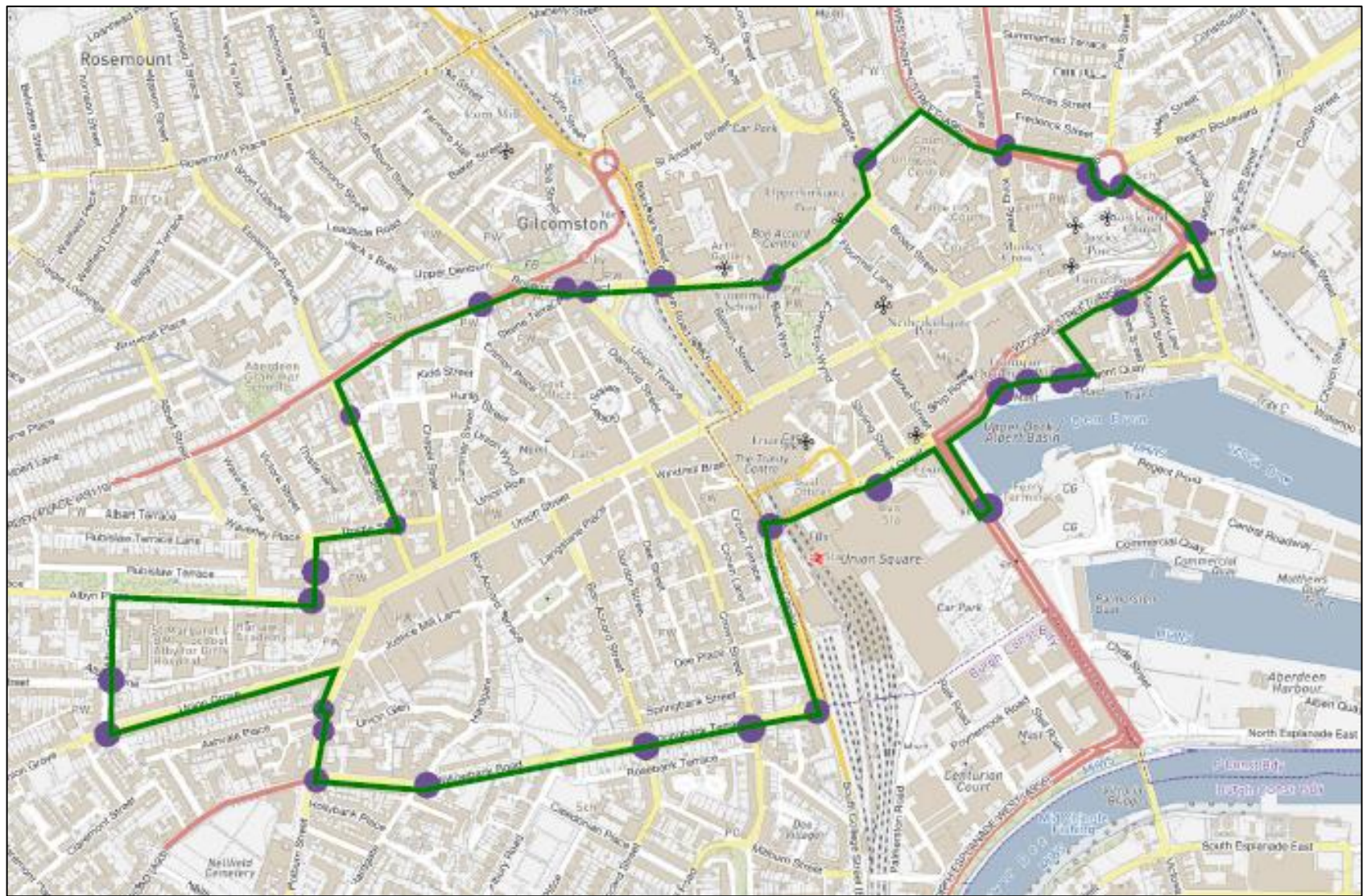


Figure 4: Indicative Enforcement Camera Locations (purple)

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## **Appendix 7 – Traffic Regulation Orders Recommended to Support and Enable LEZ Delivery**

### Union Street – Market Street to Bridge Street

Traffic restricted 7 days a week from 8am – 6pm, with exemptions for “authorised vehicles” namely bus, taxi, cycle, private hire, post office, security, refuse and roads maintenance vehicles.

### Back Wynd

Between Gaelic Lane and Union Street - taxi and cycles only, with access for deliveries 6pm-8am.

### Rose Street

Between Thistle Street and Union Street - prohibition of motor vehicles except for access to off-street parking and for loading.

### Union Terrace

Optimum solution to restrict movement of through-traffic still being determined.

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# BRIEFING NOTE

## LEZ POST-COVID UNCERTAINTY

### LEZ UNCERTAINTY SUMMARY NOTE

#### IDENTIFICATION TABLE

<b>Client/Project owner</b>	Transport Scotland
<b>Project</b>	LEZ Post-Covid Uncertainty
<b>Title of Document</b>	LEZ Uncertainty Summary Note
<b>Type of Document</b>	Briefing Note
<b>Date</b>	28/01/2021
<b>Reference number</b>	GB01T20E86/11024112/005
<b>Number of pages</b>	56

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# 1. EXECUTIVE SUMMARY

## 1.1 Aims and Objectives

- 1.1.1 The Covid-19 pandemic has had a dramatic impact on travel across all modes and specifically travel in Scotland's city centres. As the Low Emission Zone (LEZ) designs are currently progressing across the four cities; Glasgow, Edinburgh, Dundee and Aberdeen, further evidence is required by applying the principals of modelling to consider the uncertainty over what travel will look like after the pandemic has ended. This evidence will help inform decision makers for the LEZ schemes.
- 1.1.2 A key focus is to understand the uncertainty faced by the cities in a post-Covid environment and how policies required to address these could interface with LEZ proposals. The aim is to set out a framework for embracing uncertainty by consulting with stakeholders on 'what will travel look like post COVID-19'. This framework sets out the rationale for any additional modelling required to provide supporting evidence relating to uncertainty which would enhance the acceptability of the modelling work undertaken to date.

## 1.2 Scenario Planning Workshops

- 1.2.1 To assist this process, workshops were held with the respective authorities to agree the key metrics to measure against the current LEZ objectives and Identify the key disruptors which are likely to have the greatest impact on travel activities within each city centre.
- 1.2.2 The agreed output metrics informed from the stakeholder workshops are the change in emissions and traffic volumes as a result of the LEZ. A review of the disruptors for each city combined with the discussions surrounding them within the workshops concluded with a generic list including commute travel demand and changes in fleet composition.

## 1.3 Uncertainty (Scenario Planning)

- 1.3.1 The Scenario Planning Process allows a range of plausible future scenarios to be defined using important and likely disruptors. These scenarios, or a subset of, are used as a reference case where a scheme or in this case, the LEZ, is applied to understand how it performs in the context of each scenario.
- 1.3.2 The impact of the LEZ is quantified by understanding and predicting the impact (quantitative or qualitative) it will have on each scenario. The Scenario Planning Tool quantifies the impact of the LEZ scheme and the metrics from the Scenario Planning Tool are then translated back into an output narrative to complement the input narrative.
- 1.3.3 A total of 40 plausible future scenarios were created which was sifted to four concise scenarios encompassing a range of emissions and trip making relationships shown below. Each scenario provides an insight into what a future could look like in terms of differing outcomes. The narrative which defines the four plausible futures are:
- A1: 'Bounce Back' - Increased commuting and retail travel demand, improved bus operations and more buoyant economy along with a suppressed enthusiasm for compliant vehicles.
  - H4: 'Coping as Best We Can' - A poorly performing economy results in delayed infrastructure investment, a lack of shift to healthier modes and fleet, and a lack of appetite for additional air quality measures

- G1: 'Brave New World' - Following Covid there has been a reduction in office space which has transferred to other uses. With this a general reduction in traffic in the city centre for both commuting and shopping, however the uptake in compliant vehicles continues.
- B4: 'It Could Have Been Worse' - Increased retail travel demand resulting in increased congestion however public appetite for further Air Quality measures, which supports further policy shift towards more sustainable measures including a zero-Carbon fleet.

1.3.4 The outcome of testing the LEZ against each future is summarised below.

- Scenario A1 'Bounce Back': With the introduction of the LEZ the volume of non-compliant vehicles have reduced which has demonstrated a marked improvement in the NOX levels within the city centre however, traffic will re-route around the city centre. The volume of vehicles within the LEZ area has reduced and active travel has increased as a result.
- Scenario H4 'Coping as Best We Can': The LEZ has reduced the emissions within the LEZ area to an acceptable level however there is still re-routeing vehicles. The reduction in vehicular traffic has reduced below current levels however limited active travel increases have been achieved.
- Scenario G1 'Brave New World' & B4 'It Could Have Been Worse': The emission levels are still at acceptable levels with little change as a result of the LEZ scheme.

1.3.5 Whilst the LEZ may achieve a consistent goal in terms of NOX emissions, it is important to understand that the consequences of a LEZ may vary e.g. re-distribution of traffic effects.

## 1.4 Conclusions & Recommendations

1.4.1 This process demonstrates that the impact of the Low Emission Zones will vary between each city depending on their specific traffic levels and fleet composition. But importantly, the LEZ will protect the city centres by preventing non-compliant vehicles from entering them. Whilst the impact of the LEZ may vary across each city in terms of NOX emissions, the outcome is likely to be very similar with the level of emissions limited to a reduced value compared to pre-LEZ levels.

1.4.2 For each of the four LEZ cities, the four identified plausible futures have been considered against the model assessments undertaken to date. From this, to address uncertainty, further sensitivity testing of the proposed LEZ schemes is proposed. Each city has different characteristics and strategies which defines the further testing and the sensitivity tests are to be consistent with the core testing background scenario year (2022-2024).

1.4.3 The objectives of undertaking the proposed sensitivity tests are to provide evidence that the LEZ schemes are robust to variations in network conditions that may occur in a post-pandemic world. Each city may undertake different sensitivity scenarios, but they will have all considered plausible futures under a consistent framework.



## 2. INTRODUCTION

### 2.1 Aims and Objectives

- 2.1.1 The Covid-19 pandemic has had a dramatic impact on travel across all modes and specifically travel in Scotland's city centres. As the Low Emission Zone (LEZ) designs are currently progressing across the four cities; Glasgow, Edinburgh, Dundee and Aberdeen, further evidence is required by applying the principals of modelling to consider the uncertainty over what travel will look like after the pandemic has ended. This evidence will help inform decision makers for the LEZ schemes.
- 2.1.2 Jacobs and SYSTRA have been commissioned by Transport Scotland to prepare a report on key drivers of uncertainty and narratives around plausible futures. A key focus is to understand the uncertainty faced by the cities in a post-Covid environment and how policies required to address these could interface with LEZ proposals. The aim is to set out a framework for embracing uncertainty by consulting with stakeholders on 'what will travel look like post COVID-19'.
- 2.1.3 This framework sets out the rationale for any additional modelling required to provide supporting evidence relating to uncertainty which would enhance the acceptability of the modelling work undertaken to date.

### 2.2 Stakeholder Workshops

- 2.2.1 To assist this process, workshops were held with the respective authorities with the following objectives:
- Agree the key metrics to measure against the current LEZ objectives
  - Identify the key disruptors which are likely to have the greatest impact on travel activities within each city centre.
- 2.2.2 The Dundee, Aberdeen and Glasgow workshops were chaired by Vincent McNally (Transport Scotland) with Boris Johansson and Malcolm Neil (SYSTRA) acting as workshop facilitators. The Edinburgh workshop was chaired by Vincent McNally (Transport Scotland) with Keith Gowenlock and Grant Davidson (Jacobs) acting as workshop facilitators.
- 2.2.3 The team would like to thank all attendees for their participation in what were very constructive and collaborative sessions.
- 2.2.4 Following the workshops, the information received was collated and used to inform a scenario planning exercise. This process defined a series of future scenarios, which were sifted down to a manageable number. The current Low Emission Zone concept was tested against the various futures to understand if the scheme still meets its objectives.
- 2.2.5 The workshop attendees and organisation/groups they were representing are tabulated in Appendix A.
- 2.2.6 The agenda followed the following format:
- Introduction
  - Scene setting
  - Output measures

- Input drivers
- Summing up, reflections and next steps

## 2.3 Scene Setting

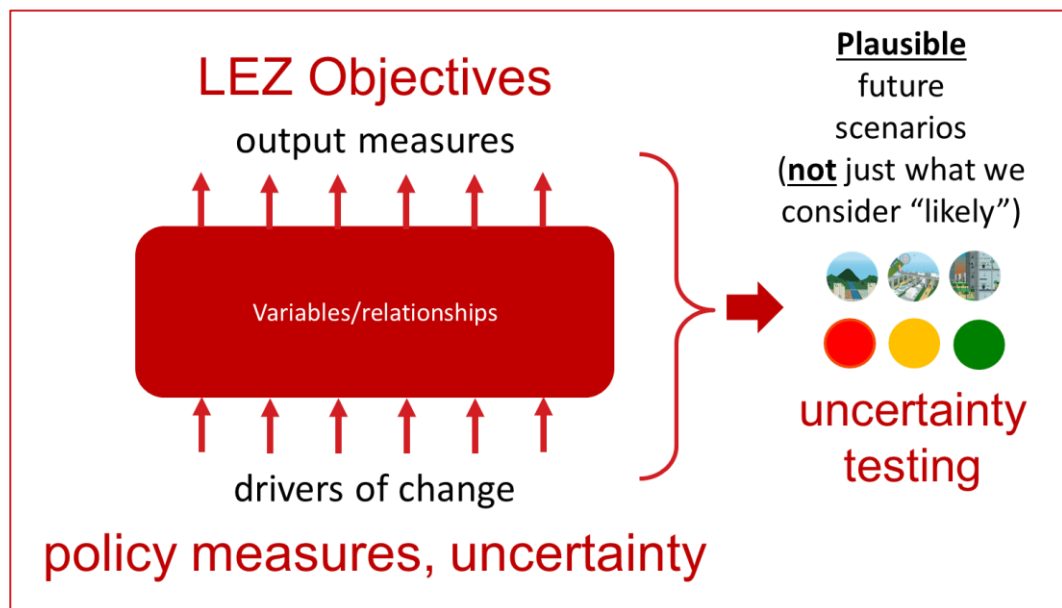
2.3.1 The scene setting to the workshop was provided with an introduction to the objectives of the exercise:

‘To understand:

The issues faced by cities in a post-Covid-19 environment over the next 5 (or so) years  
 How policies required to address this interface with LEZ proposals  
 To inform decision makers and assist with potential future examination’

2.3.2 Throughout the presentation, the following was also highlighted:

- The process is embracing uncertainty by consulting with key stakeholders on ‘what travel could look like post-Covid-19’
- The same questions are being asked across all cities
- A degree of consensus is being sought on the key metrics and disruptors to enable post-Covid plausible future scenarios to be derived, whilst exploring any key variations between the cities that would need to be taken into account.
- Traditional modelling of these futures is too time consuming so a simplified process will be developed
- This process will cut back on the richness of detail but run times are significantly reduced
- Further modelling may or may not be required to investigate impacts of one or more scenarios.



2.3.3 To summarise:

- Input drivers and output measures need to be quantifiable and may reflect proxies for more complex aspects of transport and society



- The scenario planning process's purpose is the development of richer interpretation of future states through stakeholder dialogue
- The process should not feel constrained by a focus upon only the scenario planning process. Focus should be upon the envisaged needs (i.e. the wider process).



## 3. OUTPUT METRICS

### 3.1 Introduction

3.1.1 As an introduction to the first session, workshop attendees were reminded that, for the output metrics:

1. A manageable number of output metrics are needed that best help inform judgement of the consequences of policy measures and contribution towards National Transport Strategy (NTS) outcomes
2. The more output metrics there are, the greater the likely number of input drivers that would be needed
3. Output metrics may themselves be interrelated and ordered – e.g. traffic levels impacting upon air pollution impacting upon public health.

3.1.2 For each workshop the relevant LEZ objectives were presented as a reminder. These objectives are set out in Table 1.



Table 1. LEZ Objectives by City

CITY	OBJECTIVES
Dundee	<p>Primary Objectives:</p> <ul style="list-style-type: none"> <li>● Protect public health through improving air quality in Dundee and achieving air quality compliance for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub></li> <li>● Develop an environment that helps to promote more active and sustainable travel choices in Dundee</li> <li>● Contribute to the ongoing transformational change in Dundee and help promote the city as an inclusive and desirable place to live, invest, visit and learn</li> </ul>
Aberdeen	<p>Primary Objectives:</p> <ul style="list-style-type: none"> <li>● Improve air quality in Aberdeen by reducing harmful emissions from transport and delivering on the Scottish Government’s statutory air quality objectives.</li> <li>● Support climate change targets by reducing road transport’s contribution to emissions.</li> </ul> <p>Supplementary Objectives:</p> <ul style="list-style-type: none"> <li>● Protect public health and wellbeing;</li> <li>● Support local and regional transport strategies by contributing to the development of a vibrant, accessible, and safe city centre, where the volume of non-essential traffic is minimised and active and sustainable transport movements are prioritised; and</li> <li>● Contribute to ongoing transformational change in Aberdeen, helping promote the city as a desirable place to live, visit and invest in.</li> </ul>
Edinburgh	<p>Primary Objectives:</p> <ul style="list-style-type: none"> <li>● Achieve air quality compliance</li> <li>● Use an evidence-based approach to identify interventions that reduce impact of air pollution on human health</li> <li>● Reduce congestion, promote sustainable forms of transport, and achieve placemaking outcomes across Edinburgh</li> </ul>
Glasgow	<p>Primary Objectives:</p> <ul style="list-style-type: none"> <li>● Protect public health through tackling poor air quality in the city centre</li> <li>● Ensure that Glasgow moves more rapidly towards meeting Scottish and EU air quality objectives for nitrogen dioxide and improve air quality standards within the city</li> <li>● Contribute to broader objectives and vision by the City Government to lower vehicle emissions and promote active travel, thereby improving urban liveability and supporting a vibrant and thriving city centre offer to residents, visitors, business and tourists</li> </ul>



3.1.3 The output metrics, identified from the modelling work that had been undertaken to date, were presented at each workshop as detailed in Table 2.

Table 2. Output Metrics

CITY	OBJECTIVES
Dundee, Aberdeen, Edinburgh, Glasgow	<ul style="list-style-type: none"> <li>○ Change in emissions in the LEZ area:               <ul style="list-style-type: none"> <li>● NOX / PM / CO2 (from AQ Modelling)</li> </ul> </li> <li>○ Change to traffic volume (every vehicle classification)</li> </ul>

**3.2 Discussion**

3.2.1 The stakeholders were offered an opportunity to discuss the output metrics which is summarised below for each city workshop. Naturally, the discussion did consider other related topics and the key elements have been summarised in the notes below for completeness.

**Dundee**

*Objectives have climate change element due to changes in the Transport Act. An additional objective was added to help meet the climate change programme.*

*‘Develop an environment that helps promote more active and sustainable travel choices in Dundee and contributes to meeting emission reduction targets set out in Part 1 of the Climate Change (Scotland) Act 2009’.*

*Data collected in Glasgow focused on NOXs and CO2. Initial LEZ objectives was air quality improvements but CO2 is a useful metric. It is important to include traffic volume as well. LEZ objectives are primarily focused on air quality objectives and not necessarily to climate change. The air quality metric is local and Carbon is a globalised metric. The primary focus is the air quality. If we ignore carbon then this could increase as a result changes to the travel patterns.*

*Are we aiming to identify what the outcomes are e.g. high and low? Do we want to identify the future we want? This will be discussed in the disruptors session.*

*We should consider specifically the bus service changes (volumes) and the economic impacts on the city centre. Again this can be discussed in the disruptors session.*

*Could the output measures have layers to enhance the metrics relevance to the LEZ. For example, could we measure the total number of people going into and out of Dundee City Centre e.g. by mode?*

*In summary is that there is no significant change in the metrics proposed.*

**Aberdeen**

*Have we distinguished between the output and outcomes? Yes, we deal with this through the narrative.*



*There is a link between the LEZ and the wider economy. Should there be wider economic measures? Are there specific outputs which relate to the economy? Aberdeen is an international energy city. We need to consider that there may not be a link between economy and traffic volumes, when considering Aberdeen City Centre as a place. Reference to the economy would be covered in the narrative of each scenario.*

*What will a post Covid world look like with the significant reduction in Public transport (PT) usage?. The scenarios will look at plausibility when looking at future scenarios.*

*The city centre is the major pollution hot spot and Aberdeen City Council have been progressing an LEZ scheme. These have been public consultation on different options and hope to committee in 2021 working towards a final scheme in 2022.*

*The assessment is mainly considering the car and HGV vehicle fleet and it is anticipated that this will be an all-vehicle LEZ although other option may be considered.*

*The significant drop in bus patronage levels should be captured within this exercise.*

### **Edinburgh**

*LEZ will be implemented in 2022 with enforcement from 2023. The focus is around a 5 year horizon – 2025, therefore there is a need to consider short / to medium term disruptors.*

*The economic impact – How would this be measured?. Businesses will see the LEZ as detrimental, but more enlightened businesses will see the benefits of a healthy and clean environment. How do we quantify against the measures?. Qualitative survey of businesses.*

*How will footfall be affected?– the number of people coming into the city centre.*

*Annual survey – monitoring the number of people coming into the city centre so that you can understand the wider impacts of LEZ. Success factors – is it being successful in driving people on to bus / active travel? It does need to be a monitoring exercise – work ongoing will help understand success factors.*

*Think about mode split and proportions. Impact of Covid – 50% of employment within region in the city, acceleration in changes in retail. Maybe not quite as busy as before. Might skew impacts of monitoring. i.e. a reduction in footfall is due to Covid and changing retail, not the LEZ.*

*Demand level, Covid has had a significant impact. Do we still need an LEZ, will air quality still be an issue? Need to justify why we are proceeding with an LEZ.*

*Covid scenarios – potential reduced PT.*

*Need to consider fleet composition. Fleet turn-over slowdown so improvements take place more slowly or else a reduced fleet size means the withdrawal of older vehicles. Could go either way.*

*Important to reference a no LEZ scenario.*

*Fleet composition – an output or an input to the different scenarios.*

*Other views from different groups – business, equality.*



*Total travel demand – similar if not more, albeit by different modes.*

*Only a third of particulates come from the exhaust pipe. Diesel and electric cars are heavier, increasing tyre wear. Making the fleet cleaner is important, but there is a need to reduce traffic volumes as well.*

### **Glasgow**

*Should the LEZ parameters be reviewed as a result of the pandemic? If we are successful in reducing emissions to acceptable levels, can the restrictions be extended further? We still need a scheme to implement with the current fleet/emissions. We should consider the future changes and how they impact on the case for the LEZ.*

*LEZ useful to ringfence the City Centre. We need to consider what is throttling the use of new initiatives. Considering normal working patterns, should we look at transition points such as travel hubs and parking strategies?.*

*The LEZ main purpose is to reduce NOX emissions and we need to meet the transport targets. Euro 3 buses will have to be replaced as they cannot be retro-fitted. Meeting Euro 6 bus fleet needs significant investment from the bus companies. The movement towards low emissions targets requires a number of initiatives.*

*Is the LEZ out of date with the new emerging technologies? Do we have the opportunity to move to zero emission zones? Do we review in the future or introduce more stricter restrictions?. At this time, there is no mechanism to introduce zero emission zones although there are discussions on this concept. There is still a case for the LEZ and it is acknowledged that the future is uncertain post-Covid with journeys to work and retail. There is a risk of challenge if uncertainty has not been considered.*

*GCC have been working with the taxi fleet to meet the LEZ requirement. With taxi being small businesses this is a huge investment and they have been hit hard post-Covid. Taxi fleet is needed to transport vulnerable users, so they are essential to the public transport network.*

*Given the unprecedented improvement in air quality during travel restrictions, could we increase the standards that are required to improve air quality?. This improvement could be short lived as the restrictions are lifted.*

*Complimentary measures will be needed to support the LEZ to reduce travel into the city centre. This improves the city centre environment and maintains high air quality.*

- 3.2.2 The resulting output metrics that have been informed from the stakeholder workshops and the consultants involved in the LEZ business case activities are presented in Table 3. This includes Carbon which is a requirement of the Transport Act and recognises the importance of all people including active travel trips travelling into and within the city centres.



Table 3. Output Metrics

CITY	METRICS
Dundee, Aberdeen, Edinburgh, Glasgow	<ul style="list-style-type: none"><li>○ Change in emissions in the LEZ area:<ul style="list-style-type: none"><li>● NOX / PM</li><li>● Carbon</li></ul></li> <li>○ Change to traffic volume:<ul style="list-style-type: none"><li>● Active Travel</li><li>● Cars</li><li>● Taxis</li><li>● LGVs</li><li>● HGVs</li><li>● Buses</li></ul></li></ul>



# 4. INPUT DISRUPTORS

## 4.1 Scene Setting

4.1.1 As an introduction to the second break-out session, workshop attendees were reminded that for the input disruptors:

- The drivers of change of immediate interest are those disruptors that most influence the output measures that we prioritise
- Some disruptors will be external e.g. population change, and others will be internal i.e. within the control or influence of the Council. This process considers more of a spectrum ranging from truly external to ones totally in control of council with many being a combination of both
- Some disruptors will be more uncertain than others
- Some candidate disruptors are themselves a product of others e.g. an increase in e-shopping and an increase in homeworking contribute as drivers of declining person trip rate
- It is helpful to have confidence that some evidence exists concerning how a disruptor’s value has been changing over time to date (and any existing attempts to project forward in time).

4.1.2 The initial list of drivers presented are shown in Table 4.

Table 4. Initial Disruptors

CITY	DISRUPTORS
All 4 Cities	<ul style="list-style-type: none"> <li>● Travel demand to/from existing premises – commute (e.g. reduced employment)</li> <li>● Travel demand to/from existing premises – commute (e.g. more home working)</li> <li>● Car travel demand to/from existing premises - shopping (e.g. more on-line and out-of-town shopping)</li> <li>● Impact on proposed bus fleet upgrades (existing fleet conversions )</li> <li>● Bus users switch to private car</li> <li>● Impact on bus patronage (related to social distancing factors)</li> <li>● Public appetite for Air Quality measures post-Covid?</li> </ul>

## 4.2 Discussion

4.2.1 Throughout the workshops, there were periods of collective discussion on what the future may look like and the associated factors that could influence a particular outcome. In the same vein, there was also an insight into the future which stakeholders wanted to see.

4.2.2 These discussions were important in understanding the sort of futures which appear plausible and the factors, outside transport, which may influence them. Below is a summary of the observations from each group.





## Dundee

*Travel Demand to and from existing premises – commute. It's not just reduced employment it's a change in use or type of shops. There will be change in the city centre but uncertain what form it will take. Within the council, there is a drive to working from home and this has been accelerated and will continue. The type of employment may change .e.g. the percentage of office employment differs across different cities e.g. Edinburgh ~42% and Dundee ~20%. People working from home impacts on footfall in city centre.*

*People who work closer to work will be more inclined to commute and those further away will commute less/work from home more.*

*DCC has an objective to increase the number of people living, working and visiting Dundee. How this materialises is unknown. There could be increased residential within City centres to help improve the vitality of the city centre.*

*We have policies on reducing the need to travel however, now we have lots of people working from home. The question to answer is what do you want the city to look like? There are lots of pushes and pulls.*

*Online shopping could be a significant driver as people want to avoid busy city centres. Less so for the out of town shopping, however, there are out of town food shopping outlets.*

*'Twenty minutes neighbourhood' is a developing concept where people have access to all amenities they need, however, this is not necessarily developed enough to be considered in this exercise.*

*This information will be used to shape the range of plausible futures scenarios, for example, scenarios with high levels to and from existing retail, or the opposite. These will consider the issues discussed through the scenario narrative within this process.*

*One consideration is the number of bus services may reduce within Dundee, so the ability to use the bus could be impacted i.e. the bus network. Bus operations may be more important than the fleet upgrade. Buses are still a major contributor of air pollution.*

*There is a boom in 2<sup>nd</sup> hand car sales just now and in time more people will be able to buy compliant vehicles. People may switch to the private car in the short term but in the longer term it is uncertain.*

*We should be cautious of what disruptors we use because the design life of the LEZ is limited. The earlier years of the post-Covid impacts could include a hangover from Covid impacts for example, social distancing/usage on buses.*

*We should be mindful of the different sectors of the population, specifically more vulnerable people who need to travel and its impact on buses and taxis, for example, considering taxi usage within the disruptors.*

*We should ensure that the plausible scenarios include shift in travel, which is plausible within the time horizons we are considering.*

*Things will not go back to normal after Covid and the future will be different, moving forward.*



*Post Covid, the public appetite will affect the public in different ways, for example, the business community will be against anything that reduces footfall, however local residents may support LEZ's. The relevance of this as a disruptor is it could be used to describe the narrative which will influence the direction of travel.*

*Road user charging has featured in the media due to loss in taxation revenue with the uptake in electric vehicles. Is this not a disruptor?.*

*What are the timescales for this exercise? In 10 years' time an LEZ will not be required. We are trying to consider the impact of uncertainty on the process within the short to medium term e.g. 2-6 years. An outcome will be informing the lifespan of the LEZ.*

*General agreement that we should capture the uncertainty in fleet changes over the period being considered.*

## **Aberdeen**

*The city centre could return to pre-Covid conditions, however, there could be reduced traffic and increased pedestrians in in the city centre. This is accompanied with a change in the city centre economy, however, the focus should be on a vibrant and attractive place to visit which is not car dominated.*

*The City Centre Masterplan (CCMP) may not arrive in time to impact on the LEZ and improve the air quality. Aberdeen is not significantly exceeding air quality levels and it is not clear on the confidence we have on the decision making process.*

*A concern is the strength of the recovery may not be sufficient to realise the vision of the City Centre Masterplan i.e. less people going into the city centre. The policy interventions as a result may not be as radical as is necessary.*

*With an LEZ in place, the city centre could provide a calmer environment with quieter traffic. This results in a better place to visit. The CCMP communication could be strengthened to let everyone know that it is coming.*

*We need to be aware of unintended consequences with online shopping, so the city centre will become more leisure and entertainment based. The change in culture could impact on social inclusion.*

*There still needs to be accessibility to the city centre and Covid has impacted on public transport, which has been an alternative method of access. The long term impact on PT could impact on PT provision and confidence in public transport.*

*Cities will adapt in the post-Covid world. Office working will change and as a result footfall and office rents will fall, which results in potential change in use. The fleet composition would impact on the LEZ. Need to make Aberdeen an attractive place to visit for leisure and retail, noting that it has a regional draw.*

*Nervous of the worst case scenario where traffic levels have return close to pre-Covid levels but this is not reflected in the city centre activity. With increase in online shopping, this could increase delivery trips. If all offices return to normal, what will happen to the trip levels?*

*The long term vision is clear however there may be some short term pain. For the LEZ to work the supporting infrastructure must be in place to support it e.g. bus lanes, cycling.*

## **Edinburgh**

*Changes were happening but Covid has accelerated the process. Increase density of office use.*

*Retail already moving to online but more experiential type offer.*

*May be a city centre renaissance – keen to get back to enjoy the social activities and cultural life that has been missing. What does the city need to do to reflect that?.*

*Not a lot, the city was already geared up to cater for large numbers of people.*

*Place and place management – how do we continue to have a very attractive place for people to be in and how do we continue to manage – a busy animated city centre?.*

*Children and young families tend to go the Fort / Gyle. It's about having a day out. Retail food, cinema in a good environment, easy to access. City centre is a fantastic arena but Princes St is pretty scruffy really and the public realm is poor. Level of bus activity means that on a warm day, air quality really is an issue.*

*Better access – tram and active travel promote it as somewhere good to go and a relaxing experience.*

*Use City Mobility Plan, City Centre Transformation and the LEZ to encourage change. Big chain stores are closing or moving online, there is a need to encourage a broader mix of businesses. Could buildings be specialist stores rather than one big store?.*

*Piece of work around Princes St – what is the right use of the buildings going forward?.*

*Christmas markets could be split up more. Tourism is all so concentrated. Use events to draw people to different parts of the city centre.*

*Create the environment. Deal with busyness of the traffic, dealing with the accessibility, dealing with the air quality, would really underpin the city centre.*

*Way people travel to city centre may change – public transport to leisure.*

*A lot investment is going on the city centre – Edinburgh St James, tram and Haymarket which should help support growth.*

*LEZ is one of the many tools to create the environment that people want to come to the city more attractive.*

*Edinburgh St James with 1,500 spaces is a concern.*

*Traffic diversion – where does it go?. Impact on the LEZ boundary. Better planning within the city centre – interface between traffic and PPZ.*

*Strong policy provision.*

*Improve the environment, if the shops and attractions aren't there people won't go. The LEZ needs to help create a better environment.*

*Tourism is important but need to provide a balance with local residents. City centre needs to remain relevant to everyone, young and old.*

*Night life currently gone but needs to be encouraged to return.*

*Impact on offices and shops.*

## **Glasgow**

*Taxi trade has been decimated by Covid, and this may change the landscape of how the city centre will look like. The city centre will recover to a degree as we are creatures of habit. People may look at alternative methods of travel e.g. active travel, and reallocation of road space, and public transport should support this and provide connectivity to get to and from the city centre.*

*Very uncertain, and beyond the LEZ, reduced vehicle travel in the city centre is needed. The temporary spaces for people measures may become permanent and people will realise that there are alternatives to the private car.*

*Following Covid, there is likely to be a reduced workforce (and resulting office space) in the city centre with more working from home. This space needs to be reallocated to other uses. The knock-on effect of reduced office space will impact on supporting businesses e.g. food retail. There may be a reduction in cars in the city centre, however, there should be more spaces for the disabled. Promoting car clubs in the city to dissuade owning a car.*

*There will be a degree of returning to city centre working. There should be reductions in parking in the city centre and the urban villages. More priority should be given to bus provision especially from the urban villages as they provide a service for the vulnerable. Reductions in bus services would have a disproportionate impact on vulnerable people.*

*The population will not give up their car (ownership) but hopefully for longer journeys. The reallocation of road space (e.g. avenues) will restrict cars but bus service provision is required to maintain the vitality of the city centre.*

*Covid is accelerating what is everyone is trying to achieve in Glasgow.*

*A decline in retail post-Covid with an increased social activity in the city centre. We need to keep the city centre vibrant and easy to get to. Reallocation of road space has helped make progress. Need to get people onto public transport.*

*Following a downturn, there is usually an explosion of activity, for example, the retail centre. The office space will be taken up by others business and finance centres will remain. There will still be residential and the universities will remain. There are more shared surfaces which are not clogging up the network but restricting vehicle movements. Capping the M8 and providing car parking spaces. The city will recover but it will likely be different.*

*Looking towards a Carbon neutral city by 2030. Retail unit may be replaced by start-up companies and a regeneration of the city will be actioned. Transport Hubs will have a massive part to play and innovated approaches to travel within the city and looking at the last mile deliveries.*

*There will be a massive reduction in parking spaces in the city centre e.g. spaces for people impacts. There may be more bus gates, electric vehicle and car club parking. There may be an emissions based parking permit scheme to manage demand to the city centre.*



*Don't want the city centre to back to the way it was. The temporary measures for spaces for people are not attractive, however once they are made permanent they can be made more attractive. The priorities in the future will reflect the travel hierarchy. Difficult decisions ahead for the local authorities. Last mile deliveries and bus service provision are very important. What happens after bus current Covid bus services subsidies are removed? Fearful of the risk to deprived areas and vulnerable people.*

*Should be asking economic development and retail representatives to get the opinion from other organisations. We have input from economic development in other cities and we are seeing common opinions which apply to Glasgow.*

*Considering Covid and climate change the LDP want to deliver an increase in residents within the city. These resident need access to transport so a car free city centre is a challenge. Safe and secure parking hubs outside the centre? Retail and office space will continue in the city centre, especially where money is involved. Young people will be desperate to get back into society.*

*Less traffic, more pedestrianisation and safe route activity within the city. Concerned about more working from home and the effect this will have on the city centre.*

*Higher priority for walking and cycling with spaces for people and cleaner buses in the future with lower private car use.*

### 4.3 Shortlisting of Input Drivers

- 4.3.1 Prior to the workshop, a list of 54 possible input drivers, separated into eight themes, were identified by both SYSTRA and Jacobs staff, who are directly involved in the detailed LEZ modelling and appraisal.
- 4.3.2 This list was circulated to the stakeholders ahead of each workshop, where they were requested to review the list of disruptors and add any they felt were missing, then score each disruptor in terms of likelihood and impact (1-lowest and 10 highest). The purpose of this task was to sift out the most important drivers of uncertainty from the stakeholders' perspectives and present these at the workshop for refinement and confirmation.
- 4.3.3 It was acknowledged that the period in which the current LEZ would remain applicable is uncertain, but limited, given the continued uptake of compliant vehicles within the vehicle fleet. As such, the disruptors should be considered within a three to ten year time horizon.
- 4.3.4 During the workshop, the disruptors presented in Table 5 were agreed. Further post-workshop feedback on the disruptors within the workshop has resulted in the following additions to the list of disruptors:

#### **Dundee**

- Changes to the function of office space (shared offices / hired office space)

#### **Aberdeen**

- Impact on bus patronage (related to social distancing factors)

#### **Edinburgh**

- Changing balance between visitors and residents
- Speed of transition to electric cars, taxis and LGVs

#### **Glasgow**

- No changes proposed

Table 5. Agreed Disruptors

CITY	DISRUPTORS
Dundee	<ul style="list-style-type: none"> <li>● Travel demand to/from existing premises – commute (e.g. reduced employment)</li> <li>● Travel demand to/from existing premises – commute (e.g. more home working)</li> <li>● Car travel demand to/from existing premises - shopping (e.g. more on-line and out-of-town shopping)</li> <li>● Impact on proposed bus fleet upgrades (existing fleet conversions )</li> <li>● Bus users switch to private car</li> <li>● Impact on bus patronage (related to social distancing factors)</li> <li>● Public appetite for air quality measures post-Covid?</li> </ul>
Aberdeen	<ul style="list-style-type: none"> <li>● Travel demand to/from existing premises – commute (e.g. more home working)</li> <li>● Travel demand to/from existing premises – commute (e.g. more internet-based)</li> <li>● Car travel demand to/from existing premises - shopping (e.g. more on-line and out-of-town shopping)</li> <li>● Impact on proposed bus fleet upgrades (existing fleet conversions )</li> <li>● Changes to the function of office space (shared offices / hired office space)</li> <li>● Impact on economy</li> </ul>
Edinburgh	<ul style="list-style-type: none"> <li>● Travel demand – change in commuting patterns (e.g. more home working / internet based)</li> <li>● Car travel demand – change in shopping patterns, convenience and comparison goods (e.g. more on-line and out-of-town shopping)</li> <li>● Changing balance between visitors and residents</li> <li>● Impact on proposed bus fleet investment (including fully electric vehicles e.g. Service 30)</li> <li>● Speed of transition to electric cars, taxis and LGVs</li> <li>● Changes to the function of office space (shared offices / hired office space)</li> </ul>
Glasgow	<ul style="list-style-type: none"> <li>● Impact on proposed bus fleet upgrades (existing fleet conversions )</li> <li>● Increase in new purchase of low carbon vehicles</li> <li>● Decrease in purchase of diesel vehicles</li> <li>● Impact on bus patronage (related to social distancing factors)</li> <li>● Changes to the function of office space (shared offices / hired office space)</li> <li>● Shift in policy (further) towards sustainable/healthier modes (walk/cycle)</li> <li>● Delay on committed infrastructure schemes</li> </ul>

4.3.5 A full list of the disruptors is presented in **Appendix B** along with the average stakeholder scoring. The highlighted scores indicated the highest ranking disruptors which have been considered.



4.3.6 The feedback received on the disruptors has resulted in the following changes to the list of disruptors. The final list of Drivers are presented in the following tables. This list broadly aligns with the scoring in Appendix B:

**Dundee**

- Changes to the function of office space (shared offices / hired office space)
- Impact on proposed bus operations
- Changes in fleet composition

**Table 6. Final Dundee Disruptors**

CITY	DISRUPTORS
Dundee	<ul style="list-style-type: none"> <li>● Travel demand to/from existing premises – commute</li> <li>● Car travel demand to/from existing premises - shopping</li> <li>● Impact on proposed bus operations</li> <li>● Changes in fleet composition</li> <li>● Impact on bus patronage related to social distancing factors</li> <li>● Public appetite for Air Quality measures post-Covid?</li> </ul>

**Aberdeen**

- Impact on bus patronage (related to social distancing factors)
- Impact on wider economy rather than specifically oil

**Table 7. Final Aberdeen Disruptors**

CITY	DISRUPTORS
Aberdeen	<ul style="list-style-type: none"> <li>● Travel demand to/from existing premises – commute</li> <li>● Car travel demand to/from existing premises - shopping</li> <li>● Impact on bus patronage</li> <li>● Impact on proposed bus fleet upgrades</li> <li>● Changes to the function of office space</li> <li>● Impact on wider Aberdeen economy</li> </ul>

**Edinburgh**

**Table 8. Final Edinburgh Disruptors**

CITY	DISRUPTORS
Edinburgh	<ul style="list-style-type: none"> <li>● Travel demand to/from existing premises – commute</li> <li>● Car travel demand to/from existing premises - shopping</li> <li>● Changing balance between visitors and residents</li> <li>● Impact on proposed bus fleet investment</li> <li>● Speed of transition to electric cars, taxis and LGVs</li> </ul>



## Glasgow

- Decrease in new diesel cars not specifically due to Covid but will be maintained.

Table 9. Final Glasgow Disruptors

CITY	DISRUPTORS
Glasgow	<ul style="list-style-type: none"><li>● Impact on proposed bus fleet upgrades</li><li>● Increase in new purchase of low carbon vehicles</li><li>● Decrease in purchase of diesel vehicles</li><li>● Impact on bus patronage</li><li>● Changes to the function of office space</li><li>● Shift in policy (further) towards sustainable/healthier modes</li><li>● Delay on committed infrastructure schemes</li></ul>

## 4.4 Workshop Remarks

- 4.4.1 The general view was that the workshops have been valuable in understanding the factors that are important to each city and the different views shared on how Cities may look post-Covid. It is important that contact with each local authority is maintained throughout the process.

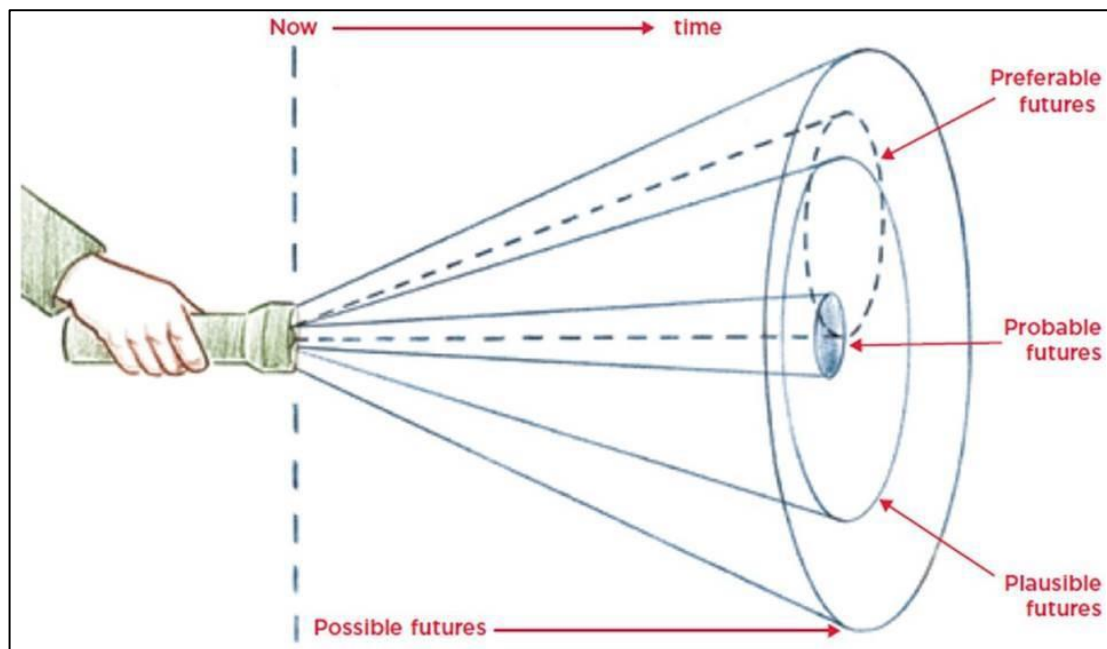




## 5. SCENARIO PLANNING APPROACH

### 5.1 Scenario Planning Principles

- 5.1.1 The high level requirement of the Scenario Planning Process and Tool is to provide a means by which the impacts of the LEZ can be gauged within the context of various uncertain plausible futures.
- 5.1.2 To understand uncertainty within the context of the LEZ, multiple plausible futures were developed with knowledge of the variables and relationships but not necessarily the confidence in the magnitude of the uncertainty. The different types of future that have been considered and where Scenario Planning flourishes is illustrated below<sup>1</sup>.



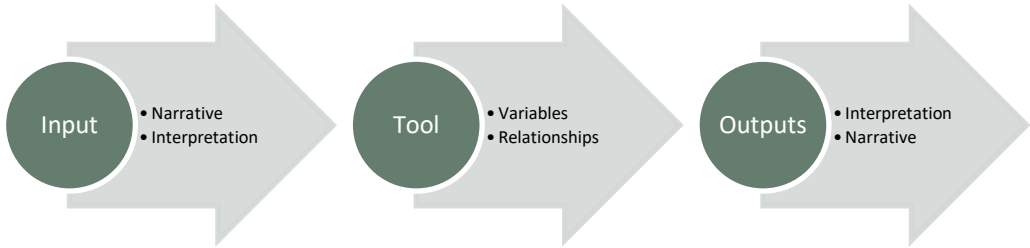
- 5.1.3 The inputs to the Tool i.e. the make-up of the plausible futures, were defined by the uncertainty drivers defined and agreed by the stakeholders. The Tool functions by using information and known relationships from complex models, such as the traffic and urban air quality models, to predict how well (or otherwise) the outputs of a potential LEZ scheme might align with the LEZ objectives.
- 5.1.4 It should be recognised that the Process and Tool attempts to use current understanding and relationships to predict answers to qualitative, future-facing questions. There are different possible approaches that could influence how a Scenario Planning Process and Tool is developed and this is discussed further in the process adopted for the Nation Transport Strategy<sup>2</sup>.
- 5.1.5 The work undertaken to date on the LEZ schemes point towards a '*preferred future*'. Scenario Planning can allow for the identification of those *probable, plausible or possible futures* which overlap with the '*preferred future*'.

<sup>1</sup> Image reproduced from [https://media.nesta.org.uk/documents/dont\\_stop\\_thinking\\_about\\_tomorrow.pdf](https://media.nesta.org.uk/documents/dont_stop_thinking_about_tomorrow.pdf)

<sup>2</sup> <https://www.transport.gov.scot/publication/scenario-planning-process-report/>

## 5.2 Scenario Planning Process and Tool

- 5.2.1 The Scenario Planning Process allows a range of plausible future scenarios to be defined using various important and likely disruptors. Each scenario is defined using a range of inputs (whether quantitative or qualitative) derived from an input narrative which are applied to the Scenario Planning Tool. The Scenario Planning Tool is a simple spreadsheet model that links the inputs and metrics using known relationships. Outputs for each scenario are generated by the tool and these are integrated into the scenario narrative. These scenarios, or a subset of, are used as a reference case where a scheme or in this case, the LEZ, is applied to understand how it performs in the context of each scenario.
- 5.2.2 The impact of the LEZ is quantified by understanding and predicting the impact (again, quantitative or qualitative) it will have on each scenario. The Scenario Planning Tool quantifies the impact of the LEZ scheme and the metrics from the Scenario Planning Tool are then translated back into an output narrative to complement the input narrative.
- 5.2.3 The process, illustrated below provides an opportunity to think through:
  - Who will be impacted on by the LEZ and how will they be affected;
  - Which of the outcomes will the LEZ support
  - Whether the LEZ likely presents any tensions/negative impacts on the outcomes.



- 5.2.4 The process includes an opportunity to document any evidence to support the conclusion that the LEZ will have an impact on the agreed outcomes in the manner intended or if any further detailed modelling is required.
- 5.2.5 The Scenario Planning Tool is designed to complement the work undertaken to date and understand if any further modelling of the LEZ schemes is required to consider uncertainty.



## 6. PLAUSIBLE FUTURES TESTING

### 6.1 Disruptors

- 6.1.1 A review of the disruptors for each city combined with the discussions surrounding them within the workshops confirmed that whilst there were subtle differences between the cities the themes were common. With this in mind, a generic list of disruptors was defined (A to L) which are seen as suitably representative to be used for all the cities. This is presented in Table 10.

**Table 10. Generic Disruptors**

Derived Disruptors (Dundee)	Derived Disruptors (Aberdeen)	Derived Disruptors (Glasgow)	Derived Disruptors (Edinburgh)	Final Generic Disruptors	
Travel demand to/from existing premises – commute	Travel demand to/from existing premises – commute		Travel demand – change in commuting patterns (e.g. more home working / internet based)	Travel demand to/from existing premises – commute	A
Car travel demand to/from existing premises - shopping	Car travel demand to/from existing premises - shopping		Car travel demand – change in shopping patterns, convenience and comparison goods (e.g. more on-line and out-of-town shopping)	Travel demand to/from existing premises - shopping	B
Impact on proposed bus operations				Impact on proposed bus operations	C
Changes in fleet composition	Impact on proposed bus fleet upgrades	Impact on proposed bus fleet upgrades	Speed of transition to electric cars, taxis and LGVs	Changes in fleet composition	D
		Increase in new purchase of low carbon vehicles	Impact on proposed bus fleet upgrades		E
		Decrease in purchase of diesel vehicles			F
Impact on bus patronage related to social distancing factors	Impact on bus patronage	Impact on bus patronage		Impact on bus patronage	G
Public appetite for Air Quality measures post-Covid?				Public appetite for Air Quality measures post-Covid?	H
	Changes to the function of office space	Changes to the function of office space	Changes to the function of office space (shared offices / hired office space)	Changes to the function of office space	I
	Impact on wider Aberdeen economy		Changing balance between visitors and residents	Impact on wider economy	J
		Shift in policy (further) towards sustainable/healthier modes		Shift in policy (further) towards sustainable/healthier modes	K
		Delay on committed infrastructure schemes		Delay on committed infrastructure schemes	L

### 6.2 Output Metrics

- 6.2.1 The output metrics are used to understand the performance of the city centre in each of the plausible future scenarios with consideration of the LEZ objectives. The two broad categories are: emissions and vehicular traffic, which represents the indicators for the LEZ objectives for each city; Aberdeen, Dundee, Edinburgh and Glasgow, presented in Table 1.

## 6.3 Scenario Planning Tool

6.3.1 An important aspect of the tool is that there is a level of judgment when populating inputs and interpreting the outputs. The tool is designed to inform the likely LEZ outcomes, not precisely measure the impact of an LEZ. The tool has been tested in advance of active use to ensure it is producing intuitive results which are credible, coherent and comprehensible. Examples are discussed in Section 5.5.3.

6.3.2 As discussed previously, the structure of the tool comprises three core elements:

- Inputs;
- Impacts; and
- Metrics.

6.3.3 Again, the application of the tool uses these elements to form a more comprehensive structure:

- Plausible Future Inputs;
- Plausible Future Assessment;
- LEZ Inputs; and
- LEZ Future Assessment.

## 6.4 Plausible Scenarios

6.4.1 The most likely disruptors (A to L in Table 10) which will have the biggest impact, are individually scored using a 7 point scale (from -3 to 3) to understand any change will have on emissions and travel demand .

6.4.2 The next stage is to consider the relationships between each disruptors, e.g. what disruptors are linked with other disruptors? For example, changes to travel demand for commuting could be linked with changes to bus operations and travel demand for shopping, amongst others. Table 11 details the proposed relationships (1 denotes a relationship, 0 denotes no plausible relationship) identified between the disruptors which have been used to derived the plausible future scenarios.

6.4.3 An example of the relationships between the disruptors being used to derive plausible scenarios is starting with Disruptor A. Table 11 confirms that A could be linked with B, B is linked with C, C is linked with H. This linkage creates a plausible scenario, with a narrative: *Increased travel demand (commuting) resulting in increased travel demand (shopping), improved bus operations and more buoyant economy.* Different plausible scenarios can be developed from each disruptor or 'Driver' (Driver being the initial disruptor that drives the scenario).



Table 11. Disruptor Relationships

Affector	Affected	A	B	C	D	E	F	G	H	I	J
Variant	Disruptor Relationship = No, 1 = Yes	Increased Travel demand to/from existing premises – commute	Increased Travel demand to/from existing premises – shopping	Reduced proposed bus operations	Improved in fleet composition/compliance level	Impact of social distancing on bus patronage	Improved Public appetite for Air Quality measures post-Covid?	Changes to the function of office space e.g. Reduced office space transferred to residential/Retail	Boyant wider economy	Further Shift in policy towards sustainable/healthier modes	Delay on committed infrastructure schemes
A	Increased Travel demand to/from existing premises – commute	0	1	1	0	0	1	1	0	0	0
B	Increased Travel demand to/from existing premises – shopping	1	0	1	0	0	1	0	0	0	0
C	Reduced proposed bus operations	1	1	0	1	0	0	0	1	1	0
D	Improved in fleet composition/compliance level	0	0	0	0	0	1	0	0	1	0
E	Impact of social distancing on bus patronage	1	1	1	0	0	0	1	1	0	0
F	Improved Public appetite for Air Quality measures post-Covid?	0	0	0	0	0	0	0	0	1	1
G	Changes to the function of office space e.g. Reduced office space transferred to residential/Retail	1	1	1	0	0	1	0	0	1	1
H	Boyant wider economy	1	1	1	1	0	0	0	0	0	1
I	Further Shift in policy towards sustainable/healthier modes	0	0	1	1	0	1	0	0	0	1
J	Delay on committed infrastructure schemes	0	0	0	0	0	1	0	0	1	0



- 6.4.4 A total of 40 plausible future scenarios were created (10 Drivers with 4 variations in direction) with a short descriptive narrative and a corresponding set of input parameter values for each. Each plausible future was fed into the Scenario Planning Tool to confirm the logical nature of their metrics.
- 6.4.5 For example, for Driver A being the primary influence, the 4 scenario variants were:
- **A1: 'Optimistic Outcome'** –  
*A buoyant economy increases travel demand (commuting) resulting in increased travel demand (shopping), improved bus operations and continued investment in network infrastructure improvements*
  - **A2: 'Realistic Downturn'** –  
*Following an economic downturn, decreased travel demand (commuting) resulting in decreased travel demand (shopping), results in reduced bus operations*
  - **A3: 'Placemaking Outcome'**–  
*Post-Covid, decreased travel demand (commuting) results in reduced office space. This change in city centre function from office to retail / residential helps placemaking in the city centre area. From this, the public appetite for air quality measures becomes more important, which may lead to further shift in policy for sustainable transport and fast-tracking of sustainable transport schemes*
  - **A4: 'Alternative Impact of Increase in Commuting'**  
*Increased travel demand (commuting) resulting in normal or increased function of office space (not working at home as much as during COVID). Bus demand (& operations) would be retained with non-compliant buses remaining on the network, resulting in poorer air quality out-with core city centre area. This may force Local Authorities/Government to shift policy further to more healthier modes / improve fleet*
- 6.4.6 The scenario planning tool calculates a score for each scenario, using the 7 point scale score (-3 to 3) for each disruptor.
- 6.4.7 Using the above example Scenario A1, the cumulative impact score was calculated as detailed in Table 12. Note the polarity application (or direction of travel) to the score for each disruptor. The resulta score for scenario A1 was 12 for emissions and 17 for traffic volumes, with a combined total of 29.
- 6.4.8 Each scenario Driver with four plausible future is illustrated in Table 13 along with the respective scoring for emissions and travel volumes.

**Table 12. Example of Scenario Scoring (Scenario A1)**

Polarity	Scenarios	NOX emissions in the LEZ area:	Carbon	Active Travel	Cars	Taxis	LGVs	HGVs	Buses
1	1 Increased Travel demand to/from existing premises – commute	3	1	1	2	1	0	0	0
1	2 Increased Travel demand to/from existing premises - shopping	3	1	1	2	1	0	0	0
-1	3 Reduced proposed bus operations	-2	-1	1	1	1	0	0	-2
1	8 Boyant wider economy	2	1	1	2	1	2	2	1
-1	10 Delay on committed infrastructure schemes	1	1	-2	1	1	0	0	-1
	<b>Sum</b>	<b>9</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>4</b>
	<b>Emissions Total</b>		<b>12</b>						
	<b>Travel Volumes</b>								<b>17</b>



Table 13. Extended List of Plausible Futures

SCENARIO			CUMULATIVE IMPACT		
Scenario Driver	Scenario Detail	Scenario Variant	Emissions	Travel Volumes	TOTAL
A	Increased Travel demand to/from existing premises – commute	A1	12	17	29
		A2	-12	-17	-29
		A3	-12	-1	-13
		A4	9	2	11
B	Increased Travel demand to/from existing premises - shopping	B1	6	13	19
		B2	-7	2	-5
		B3	-12	-16	-28
		B4	-2	5	3
C	Reduced proposed bus operations	C1	-9	2	-7
		C2	1	5	6
		C3	-11	-1	-12
		C4	0	15	15
D	Improved in fleet composition/compliance level	D1	-8	2	-6
		D2	-7	-3	-10
		D3	2	-2	0
		D4	-2	-8	-10
E	Impact of social distancing on bus patronage	E1	3	6	9
		E2	1	-3	-2
		E3	1	8	9
		E4	-11	0	-11
F	Improved Public appetite for Air Quality measures post-Covid?	F1	-6	1	-5
		F2	6	-1	5
		F3	-5	3	-2
		F4	-7	-3	-10
G	Changes to the function of office space e.g. Reduced office space transferred to residential/Retail	G1	-11	-8	-19
		G2	1	0	1
		G3	-5	1	-4
		G4	3	4	7
H	Boyant wider economy	H1	-3	11	8
		H2	2	9	11
		H3	9	18	27
		H4	3	-11	-8
I	Further Shift in policy towards sustainable/healthier modes	I1	-8	2	-6
		I2	-7	-9	-16
		I3	-6	2	-4
		I4	6	-2	4
J	Delay on committed infrastructure schemes	J1	6	-2	4
		J2	-4	0	-4
		J3	-7	-8	-15
		J4	-8	2	-6

6.4.9 Any With-LEZ scenario can then be compared with its corresponding without-LEZ plausible future, to understand the predicted its impact.





6.4.10 In order to sift the above list of plausible scenarios into a more concise set of scenarios which encompass the range of emissions and travel relationships, Figure 1 illustrates the criteria for selection (one scenario for each quadrant).

Emissions	Trips
+	+
+	-
-	+
-	-

Figure 1. Scenario Sifting Criteria

6.4.11 Four short listed scenarios were identified to reflect the different viewpoint in terms of both emissions and trip making i.e. one scenario from each quadrant, (illustrated in Figure 2). The specific scenario selected does not necessarily have to be the worst case in each quadrant, only the direction of travel is important at this stage e.g. low emissions and reduced trips.

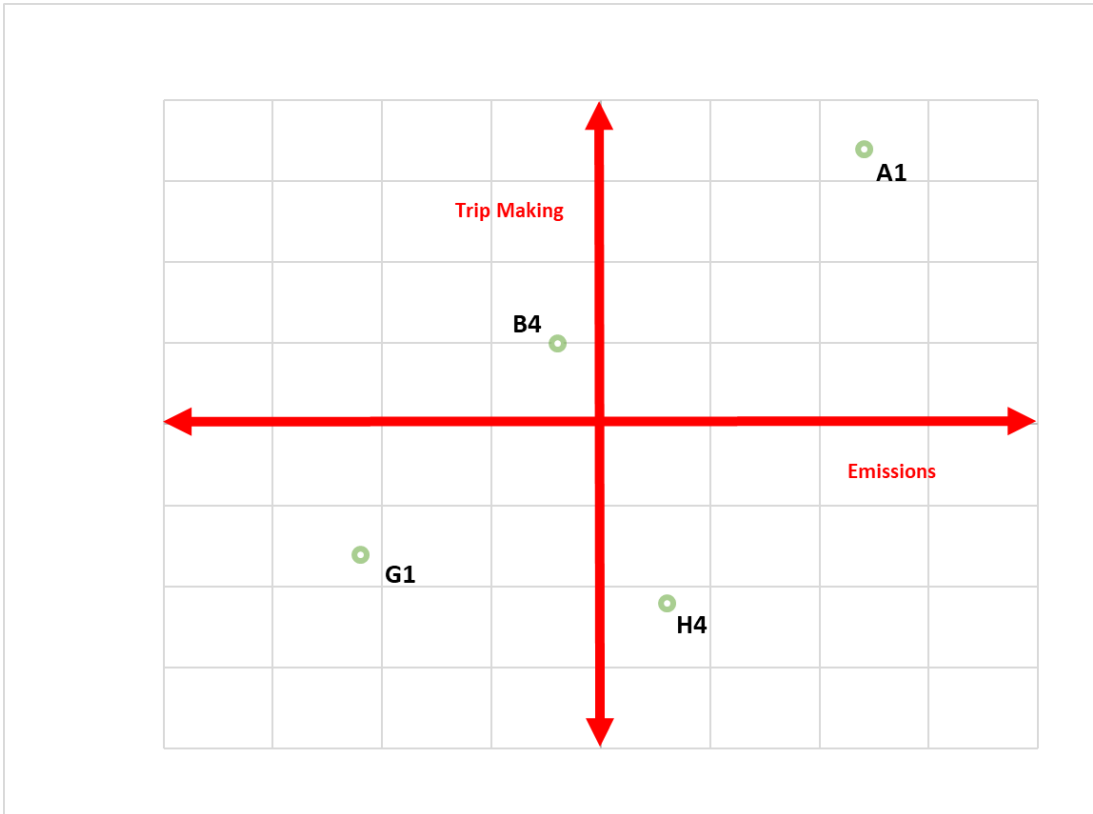


Figure 2. Four Short-listed Futures

6.4.12 The scenario names detailed in Figure 2 correspond with the variants listed in Table 13.

6.4.13 Each scenario provides an insight into what a future could look like in terms of differing outcomes. The narrative which defines the four plausible futures therefore were:

- A1: ‘Bounce Back’ - Increased commuting and retail travel demand, improved bus operations and more buoyant economy along with a suppressed enthusiasm for compliant vehicles.



- H4: 'Coping as Best We Can' - A poorly performing economy results in delayed infrastructure investment, a lack of shift to healthier modes and fleet, and a lack of appetite for additional air quality measures
- G1: 'Brave New World' - Following Covid there has been a reduction in office space which has transferred to other uses. With this a general reduction in traffic in the city centre for both commuting and shopping, however the uptake in compliant vehicles continues.
- B4: 'It Could Have Been Worse' - Increased retail travel demand resulting in increased congestion however public appetite for further Air Quality measures, which supports further policy shift towards more sustainable measures including a zero-Carbon fleet.

6.4.14 Each of the four pre-defined plausible futures have been run through the tool in preparation for testing the LEZ. The performance of each scenario against transport policy has been illustrated in RBG in Figure 3 and Table 14 as follows:

- Red – Negative effect (Score <-1)
- Blue – Neutral i.e. little change (Score of -1 to 1)
- Green – Positive effect (Score >1)

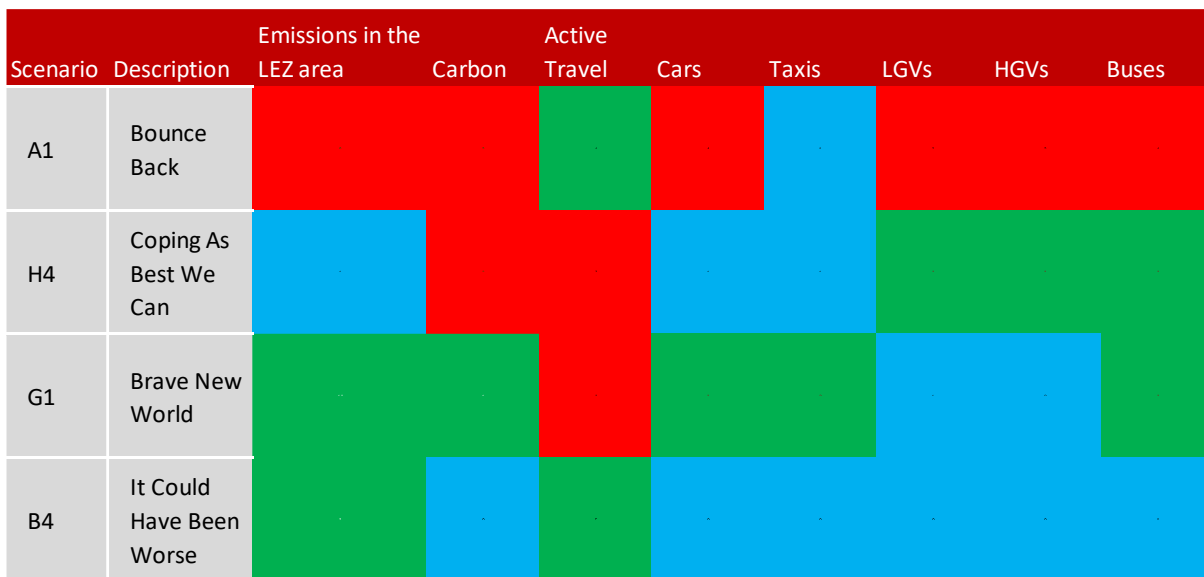


Figure 3. RBG Plausible Without-LEZ Scenarios

Table 14. Plausible Without-LEZ Scoring

Scenario	NOX emissions in the LEZ area:		Active Travel	Cars	Taxis	LGVs	HGVs	Buses
		Carbon						
A1	9	3	4	4	1	2	2	4
H4	1	2	-7	1	1	-2	-2	-2
G1	-10	-1	-3	-2	-2	1	0	-2
B4	-2	0	5	0	0	0	0	0



## 6.5 Testing of LEZ on Different Futures

6.5.1 Following the definition of the without-scheme scenarios, the LEZ scheme will be tested against each scenario. The LEZ Scenario is assumed to deliver the following benefits to the city centres however it is recognised that the impact will vary depending on each scenario:

- Reduction in Emissions
- Increase in Active Travel
- Reduction in car trips
- No change to LGVs, HGVs and Buses (assumed to be compliant)

6.5.2 It is recognised that the LEZ proposals have specific legislation with respect to compliant and non-compliant vehicles. This results in the impact of an LEZ varying depending on each specific scenario.

6.5.3 Table 15 summarises the weighted scoring applied to each of the four scenarios, as a result of the LEZ scheme.

**Table 15. Impact of LEZ on Scenario Scoring**

Scenario	NOX		Active Travel	Cars	Taxis	LGVs	HGVs	Buses
	emissions in the LEZ area:	Carbon						
A1	-9	2	2	-6	-3	-2	-2	0
H4	-2	1	1	-2	-1	0	0	0
G1	-1	0	0	-1	0	-1	-1	0
B4	-1	0	0	-1	0	-1	-1	0

6.5.4 Table 15 shows, for example, that the LEZ will have a significant impact on NOX emissions in scenario A1 (increased travel demand and emissions) but less so in the other scenarios (where trips or emissions are reduced).

6.5.5 The outcome of this testing of the LEZ, results in impacts against emissions and vehicles as illustrated in Figure 4 and Table 16.



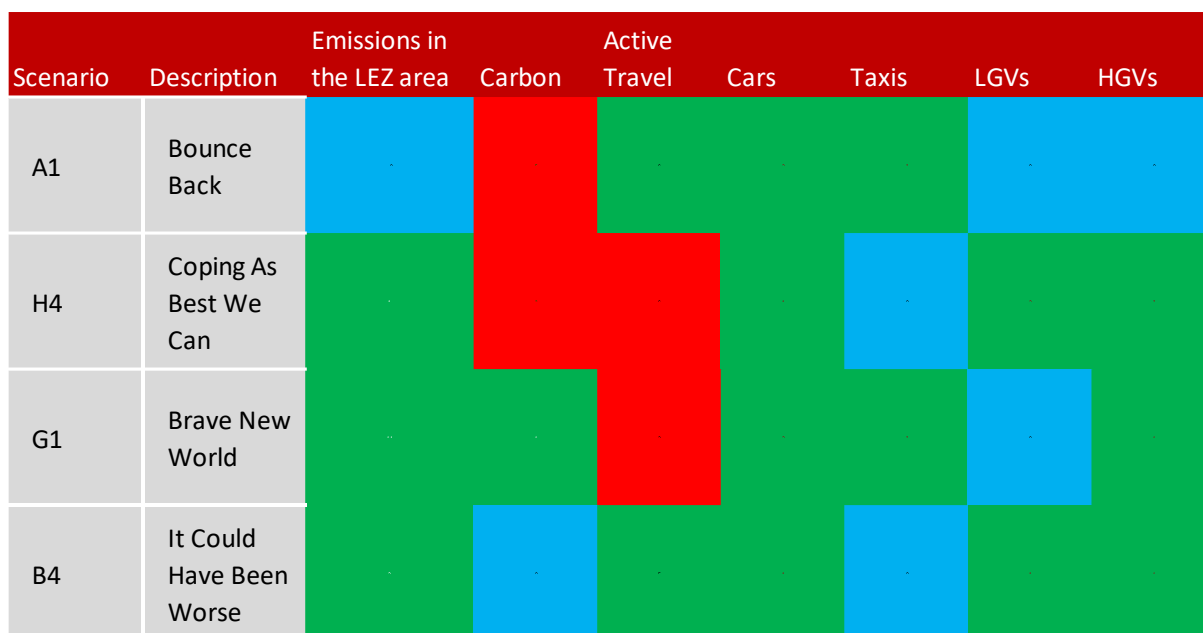


Figure 4. RGB Plausible With-LEZ Futures

Table 16. Plausible With-LEZ Scoring

Scenario	NOX								
	emissions in the LEZ area:	Carbon	Active Travel	Cars	Taxis	LGVs	HGVs	Buses	
A1	0	5	6	-2	-2	0	0	4	
H4	-1	3	-6	-1	0	-2	-2	-2	
G1	-11	-1	-3	-3	-2	0	-1	-2	
B4	-3	0	5	-1	0	-1	-1	0	

6.5.6 The narrative of the outcome of testing the LEZ against each future is summarised below.

- Scenario A1 'Bounce Back': With the introduction of the LEZ the volume of non-compliant vehicles have reduced which has demonstrated a marked improvement in the NOX levels within the city centre however, traffic will re-route around the city centre. The volume of vehicles within the LEZ area has reduced and active travel has increased as a result.
- Scenario H4 'Coping as Best We Can': The LEZ has reduced the emissions within the LEZ area to an acceptable level however there is still re-routeing vehicles. The reduction in vehicular traffic has reduced below current levels however limited active travel increases have been achieved.
- Scenario G1 'Brave New World' & B4 'It Could Have Been Worse': The emission levels are still at acceptable levels with little change as a result of the LEZ scheme.

6.5.7 Whilst the LEZ may achieve a consistent goal in terms of NOX emissions, it is important to understand that the consequences of a LEZ may vary e.g. re-distribution of traffic effects.



## 7. CONCLUSIONS & RECOMMENDATIONS

### 7.1 Conclusions

- 7.1.1 This note sets out the consideration of uncertainty to assist decision makers. Through stakeholder engagement, the most likely disruptors that will have the highest impact have been identified and used to shape plausible futures. In addition, the key metrics have been set out to measure the impact of the LEZ against the objectives.
- 7.1.2 A scenario planning tool has been developed and has explored the scenarios which have resulted in an increase/decrease in emissions and trip making. These scenarios have been used to understand the impact of an LEZ scheme.
- 7.1.3 This process demonstrates that the impact of the Low Emission Zones will vary between each city depending on their specific traffic levels and fleet composition. But importantly, the LEZ will protect the city centres by preventing non-compliant vehicles from entering them.
- 7.1.4 Whilst the impact of the LEZ may vary across each city in terms of NOX emissions, the outcome is likely to be very similar with the level of emissions limited to a reduced value compared to pre-LEZ levels. It is acknowledged that the LEZ will have greater impact in specific future scenarios compared to others, examples of which are discussed below:
- With high levels of compliance and reduced traffic levels, the LEZ may have a limited effect however the LEZ protects the desired outcome with a reduced level of emissions in the city centres. The LEZ does also maintain the momentum of applying legislation to protect the environment.
  - With lower uptake of compliant vehicles, the LEZ provides the mechanism to secure the reduced emissions levels in the future and protect the city centre environment; however, there may be consequences of vehicle re-routeing.
  - With higher traffic levels and the likely increase in volumes of non-compliant vehicles, the LEZ manages the number of non-compliant vehicles entering the city centres, however again there may be consequences of vehicle re-routeing as would be expected of a scheme that prohibits access for non-compliant vehicles.
- 7.1.5 It is acknowledged that where significant traffic re-routing may occur as a result of the LEZ scheme, there may be an increase in the local Carbon footprint. However, this marginal negative consequence of the LEZ proposals should be viewed in the context of the more significant benefits of the scheme for the local air quality.
- 7.1.6 A significant amount of work has been undertaken to date developing models and using one future scenario. The role of the LEZ is clear, as is the understanding of what it may achieve for a city centre, however each future scenario will have varying consequences as a result of the LEZ. To that end, it is suggested that each city should consider modelling alternative scenarios and Section 6.2 sets out potential sensitivity test scenarios that could be considered by each of the four cities.
- 7.1.7 The LEZ objectives across all four cities includes references not only to emissions but other supporting strategies which promote reducing traffic levels, active/sustainable travel, and improving the city centre as a place to visit. This was a consistent theme discussed throughout the consultation workshops and is consider very important when considering uncertainty over what city centres will look like post-Covid. This reiterates the hypothesis that the LEZ should

not be considered in isolation, but is part of an overall strategy to meet the national, regional and local visions for the city centres.

## 7.2 Recommendations

- 7.2.1 For each of the four LEZ cities, the four identified plausible futures (with varying traffic demand and vehicle compliance levels) have been considered against the model assessments undertaken to date. From this, to address uncertainty, recommendations for further sensitivity testing of the proposed LEZ schemes, under alternative future scenarios, are provided.
- 7.2.2 It should be noted that the future network which the primary LEZ model testing has been undertaken ('core testing') varies between each city. For example, Aberdeen LEZ testing has assumed growth to 2024, whereas Dundee and Edinburgh model testing has assumed a baseline network demand level for the scheme assessment.
- 7.2.3 These different compliance and growth assumptions for each city are each valid and robust approaches to the assessment of the LEZ schemes. What is critical, is that each city considers the potential impact of the alternative future scenarios within their assessment.
- 7.2.4 It should also be noted that there are significant differences in the traffic network conditions within each city which have defined the testing strategies to date, and will also define what alternative plausible future scenarios are considered for sensitivity testing. These include:
- Glasgow and Edinburgh LEZ areas include demand management measures to restrict traffic growth (e.g. car parking strategies). Aberdeen and Dundee LEZ areas have capacity to accommodate traffic and economic growth.
  - Dundee and Glasgow LEZ assessments are primarily concerned with the impact of displaced traffic from originating and destinating within the LEZ area. Edinburgh and Aberdeen LEZ assessments include the impact of through routing traffic relocation
  - Dundee LEZ does not need to consider the parallel impact of other proposed infrastructure measures. Glasgow LEZ needs to consider measures which conflict with the impact of the LEZ, whilst Aberdeen LEZ needs to consider complimentary measures.
  - Each city has subtly varying objectives for the LEZ, including the requirement to specifically achieve the air quality compliance levels or more generally to reduce emissions.
- 7.2.5 Tables 17 to 20 outlines the consideration of scenario planning to each of the four cities in turn. Each city list four scenarios which have been derived through this process. The scenarios listed (See 5.4.7) should be modelled using the following guide:
1. Scenario B4 'It Could Have Been Worse': The fleet projections follow pre-Covid trends provided by SEPA and the traffic growth is in line with current Local Development Plan Allocations/uptake.
  2. Scenario H4 'Coping as Best We Can': Following an economic downturn, the fleet projections are lower than pre-Covid trends provided by SEPA and traffic shrinkage is experienced, similar to the 2010 downturn. Where appropriate, reduce bus demand should be accounted for as a sensitivity test, as set out in section 6.2.7.

3. Scenario G1 'Brave New World': The fleet projections follow pre-Covid trends provided by SEPA however behavioural change results in traffic levels remaining consistent with pre-Covid levels.
4. Scenario A1 'Bounce Back': The fleet projections are lower than pre-Covid trends provided by SEPA and the traffic growth continues due to Increased commuting and retail travel demand, similar to Scenario B4.

**Table 17. Scenario Planning Application to Aberdeen LEZ**

Scenario Planning Scenarios			Scenario Detail		Traffic Modelling		
No.	Emmissions	Trips	Fleet Compliance	Traffic Flow	Core Testing	Sensitivity Testing	Rationale
1	-	+	High Level uptake	High Growth	✓		This is the 2024 Ref Case scenario from which the initial 8 LEZ scenarios are to be assessed
2	+	-	Low Level uptake	Network Shrinkage		✓	Supporting evidence
3	-	-	High Level uptake	Low Growth		✓	Supporting evidence
4	+	+	Low Level uptake	High Growth		x	Scenario 1 suggests network capacity issues so any additional traffic demand from a lower compliance level would restrict availability for growth. Therefore, Scenario 4 is not plausible for Aberdeen

**Table 18. Scenario Planning Application to Dundee LEZ**

Scenario Planning Scenarios			Scenario Detail		Traffic Modelling		
No.	Emmissions	Trips	Fleet Compliance	Traffic Flow	Core Testing	Sensitivity Testing	Rationale
1	-	+	High Level uptake	High Growth		x	Scenario 4 is the worst case scenario for Dundee in terms of traffic displacement from the city centre
2	+	-	Low Level uptake	Network Shrinkage		✓	Consideration of a shriking economy and the potential lower benefits of a LEZ
3	-	-	High Level uptake	Low Growth		x	This is an intermediate scenario that would not provide any more information to Scenario 4
4	+	+	Low Level uptake	High Growth	✓		This is the future year scenario that the proposed LEZ options have been tested on to date



**Table 19. Scenario Planning Application to Glasgow LEZ**

Scenario Planning Scenarios			Scenario Detail		Traffic Modelling		
No.	Emmissions	Trips	Fleet Compliance	Traffic Flow	Core Testing	Sensitivity Testing	Rationale
1	-	+	High Level uptake	Pre-COVID Levels	✓		Testing undertaken to date includes traffic growth with a variation in low and high levels of fleet uptake
2	+	-	Low Level uptake	Network Shrinkage		✓	Demand management in Glasgow (via car parking strategies) are likely to restrict growth so lower growth sensitivity testing deemed a plausible scenario
3	-	-	High Level uptake	Low Growth		✓	As per Option 2
4	+	+	Low Level uptake	Pre-COVID Levels	✓		As per Option 1

**Table 20. Scenario Planning application to Edinburgh LEZ**

Scenario Planning Scenarios			Scenario Detail		Traffic Modelling		
No.	Emmissions	Trips	Fleet Compliance	Traffic Flow	Core Testing	Sensitivity Testing	Rationale
1	-	+	High Level uptake	Pre-COVID Levels		x	Not required, as demand management (via car parking strategies) should restrict increased traffic growth
2	+	-	Low Level uptake	Network Shrinkage	✓		As per Option 3 but zero growth tested as opposed to traffic network shrinkage
3	-	-	High Level uptake	Low Growth	✓		Testing undertaken to date includes no growth with a variation in low and high levels of fleet uptake
4	+	+	Low Level uptake	Pre-COVID Levels		x	As per Option 1

- 7.2.6 As detailed in the above tables, there are suggested alternative future scenarios to be considered by each local authority for potential sensitivity testing of their proposed LEZ measures.
- 7.2.7 In addition to the above, a further future scenario (within Scenario 2, with a poorly performing economy) with a potential reduction in public transport service provision. Traffic services may reduce due to a lower patronage resulting from COVID-19 however the magnitude of this may vary by city depending on the local conditions. There is applicable functionality within the public transport element of SEPA's National Framework Air Quality Model. This feature can assess the potential impact to emission levels if the volume of public transport within the LEZ area is reduced from pre-COVID levels. It is proposed that this is the most suitable tool and should be used instead of detailed traffic modelling.
- 7.2.8 In terms of a timeline, these sensitivity tests are proposed to be consistent with the core testing background scenario year (2022-2024). It is recognised that the LEZ adherence criteria will only provide impact to the network for a finite period of time. The consideration of scenario planning is not therefore to consider how the network will change in the longer term, but to consider the potential plausible futures over the short (Post-COVID) to medium term.





7.2.9 The objectives of undertaking the proposed sensitivity tests are to provide evidence that the LEZ schemes are robust to variations in network conditions that may occur in a post-pandemic world. Each city may undertake different sensitivity scenarios, but they will have all considered plausible futures under a consistent framework.



## APPENDIX A

### A.1 Dundee Workshop Attendees

NAME	ORGANISATION
Malcolm Neil	SYSTRA
Grant Davidson	Jacobs
Boris Johansson	SYSTRA
Keith Gowenlock	Jacobs
Christopher Shaw	SYSTRA
Ewan Gourlay	Dundee City Council
Iain Black	Dundee City Council
Tom Stirling	Dundee City Council
John Berry	Dundee City Council
David Gray	Dundee City Council
Jamie Landwehr	Dundee City Council
Vincent McInally	Transport Scotland
Stephen Cragg	Transport Scotland
Colin Gillespie	SEPA
Nicola Ferguson	Dundee City Council
Niall Gardiner	Tactran



## A.2 Aberdeen Workshop Attendees

NAME	ORGANISATION
Malcolm Neil	SYSTRA
William Hekelaar	Aberdeen City Council
Boris Johansson	SYSTRA
Grant Davidson	Jacobs
Keith Gowenlock	Jacobs
Callum Guild	SYSTRA
Tony Maric	Aberdeen City Council
Gale Beattie	Aberdeen City Council
Vincent McNally	Transport Scotland
Colin Gillespie	SEPA
Joanna Murray	Aberdeen City Council
Aileen Brodie	Aberdeen City Council
Paul Finch	Nestrans
Tom Walsh	Aberdeen City Council
Jenny Anderson	Nestrans
Richard Sweetnam	Aberdeen City Council
David Dunne	Aberdeen City Council



### A.3 Edinburgh Workshop Attendees

NAME	ORGANISATION
Grant Davidson	Jacobs
Keith Gowenlock	Jacobs
Vincent McInally	Transport Scotland
Alan McDonald	SEPA
Boris Johansson	SYSTRA
Ewan Kennedy	City of Edinburgh Council
Iain McFarlane	City of Edinburgh Council
David Cooper	City of Edinburgh Council
Gavin Brown	City of Edinburgh Council
Will Garrett	City of Edinburgh Council
Shauna Clarke	City of Edinburgh Council
Andrew Smith	City of Edinburgh Council
Jim Stewart	SEStran



#### A.4 Glasgow Workshop Attendees

NAME	ORGANISATION
Malcolm Neil	SYSTRA
Dom Callaghan	Glasgow City Council
Grant Davidson	Jacobs
Keith Gowenlock	Jacobs
Boris Johansson	SYSTRA
Vincent McInally	Transport Scotland
Julie Robertson	Glasgow City Council
Mic Ralph	Glasgow City Council
Andy MacGibbon	Glasgow City Council
Collin Little	Glasgow City Council
Donald Booth	SPT
Julie Evans	Glasgow City Council
Graeme Dewar	Glasgow City Council
Lewis Douglas	Glasgow City Council
John Sharkey	Glasgow City Council
Andrew Malby	SEPA
Emil Laiolo	Glasgow City Council
Eric Stewart	Glasgow City Council
Chris Shaw	SYSTRA
Gillian Dick	Glasgow City Council
Derek Barry	Glasgow City Council
Paul Morris	Glasgow City Council



## APPENDIX B

### B.1 Dundee Disruptors

Travel Demand		Score Pre-Consultation	Score Post-Consultation
CAR			
●	Travel demand to/from existing premises – commute (e.g. reduced employment)	52	48
●	Travel demand to/from existing premises – commute (e.g. more home working)	62	57
●	Travel demand to/from existing premises – business travel (e.g. economic downturn)	42	40
●	Travel demand to/from existing premises – business travel (e.g. more internet-based)	48	46
●	Travel demand to/from existing city-centre premises - shopping (e.g. economic downturn)	44	44
●	Car travel demand to/from existing premises - shopping (e.g. more on-line and out-of-town shopping)	51	48
●	Travel demand to/from existing premises - other leisure (e.g. economic down-turn and reduced city centre businesses)	38	30
LGV			
●	Increase in volume of LGV on network as a result of increase in on-line shopping	44	43
●	Reduction in volume of LGV on network as a result of economic downturn	24	26
HGV			
●	Reduction in volume of HGV on network as a result of economic downturn	22	25
Taxi			
●	Change in taxi demand due to reduction in bus/rail demand	27	24
●	Change in taxi demand due to reduction in leisure trips	28	26
●	Change in taxi demand due to reduction in business trips	33	32
●	Changes to type of new car due to trip purpose changes	16	18

<b>Fleet Composition</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
PT		
● Impact on rail patronage (related to services and fares)	22	33
● Impact on proposed bus fleet upgrades (existing fleet conversions )	62	55
CAR		
● Increase in New Purchase of Low Carbon Vehicles	33	34
● Decrease in New Purchase of Diesel Vehicles	42	45
● Change in the overall number of people buying new cars	50	36
LGV		
● Increase in EURO 6 new vehicle purchases	25	31
● Change in the overall number of people buying new LGV	37	32
HGV		
● Increase in EURO 6 new vehicle purchases	21	27
● Change in the overall number of people buying new HGV	31	29
● Reduction in volume of HGV on network as a result of economic downturn	25	25

<b>Behavioural Response</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
Walk / Cycle		
● Proportion of people who have changed mode to walk / cycle during COVID period	35	37
● Proportion of people who are walking / cycling now, who will continue to do so, post-covid	18	20
PT		
● Bus users switch to private car	60	54
● Impact on bus patronage (related to social distancing factors)	52	56
● Impact on bus patronage (related to services and fares)	41	45
Rail		
● Rail passengers switch to private car	42	42
● Impact on rail patronage (related to social distancing factors)	28	40
Car		
● Car occupancy levels reduce as people travel in separate cars	42	41
● Car occupancy levels increase as car share increases due to switch from bus / rail	31	36
Taxi		
● Bus and rail passengers switch to Taxi e.g. vulnerable members of the public	20	15

<b>LEZ Concept</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Public appetite for Air Quality measures post covid?	53	42
● Public acceptance post-implementation?	34	35



<b>Travel pattern</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Potential changes to Parking Policy	42	45
● Changes to LGV trips across the whole network (residential deliveries)	39	41
● Changes to the function of office space (shared offices / hired office space)	48	48
● Impact on local University Applications	9	16
● Impact on local airport Patrons	19	24
● Trip frequency changes as a result of trip purposes changing (proportion commute/business vs leisure)	41	44
● Time of day changes as a result of trip purposes changing (proportion commute/business vs leisure)	43	43

<b>National Economy / Policy</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Gov financial incentives to affected industries	31	35
● Potential tax changes (income / VAT) to finance cost of Covid	31	37
● Climate change incentives	44	44
● Brexit	26	33
● Shift in policy (further) towards sustainable/healthier modes (walk/cycle)	48	40

<b>Local Economy / Policy</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Impact on Oil Industry now	21	23
● Impact of Oil industry recovery post 2020	21	25
● Impact on Fishing industry / Harbour Economy	14	13
● Delay on committed infrastructure schemes	32	31
● Delays in committed/assumed LDP development coming forward	33	33
● Shift in policy (further) towards sustainable/healthier modes (walk/cycle)	29	28

<b>Any Further Disruptors?</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● . The supply of diesel, which I believe we are a net importer of?	12	7
● . Trade deals (you reference Brexit, but this not the same thing, we can have Brexit without trade deals)	14	8
● . Price of fuel – reductions in cost of fuel due to global demand reducing can lead to changes in vehicle use	16	9
● . Passenger capacity – public transport may be operating with significantly limited capacity due to physical distancing for some time to come	12	7
● . COVID-19 restrictions and regional differences affecting ability to travel	12	7
● Shift in policy based on cities meeting AQ objectives without LEZ intervention in advance of enforcement phase	0	4





## B.2 Aberdeen Disruptors

Travel Demand		Score Pre-Consultation	Score Post-Consultation
CAR			
●	Travel demand to/from existing premises – commute (e.g. reduced employment)	41	38
●	Travel demand to/from existing premises – commute (e.g. more home working)	61	55
●	Travel demand to/from existing premises – business travel (e.g. economic downturn)	36	32
●	Travel demand to/from existing premises – business travel (e.g. more internet-based)	48	48
●	Travel demand to/from existing city-centre premises - shopping (e.g. economic downturn)	37	35
●	Car travel demand to/from existing premises - shopping (e.g. more on-line and out-of-town shopping)	53	46
●	Travel demand to/from existing premises - other leisure (e.g. economic down-turn and reduced city centre businesses)	25	28
LGV			
●	Increase in volume of LGV on network as a result of increase in on-line shopping	34	36
●	Reduction in volume of LGV on network as a result of economic downturn	33	29
HGV			
●	Reduction in volume of HGV on network as a result of economic downturn	22	22
Taxi			
●	Change in taxi demand due to reduction in bus/rail demand	15	18
●	Change in taxi demand due to reduction in leisure trips	16	18
●	Change in taxi demand due to reduction in business trips	24	26
●	Changes to type of new car due to trip purpose changes	12	14

Fleet Composition		Score Pre-Consultation	Score Post-Consultation
PT			
●	Impact on rail patronage (related to services and fares)	22	27
●	Impact on proposed bus fleet upgrades (existing fleet conversions )	53	55
CAR			
●	Increase in New Purchase of Low Carbon Vehicles	33	32
●	Decrease in New Purchase of Diesel Vehicles	44	40
●	Change in the overall number of people buying new cars	36	31
LGV			
●	Increase in EURO 6 new vehicle purchases	28	30
●	Change in the overall number of people buying new LGV	34	30
HGV			
●	Increase in EURO 6 new vehicle purchases	28	28
●	Change in the overall number of people buying new HGV	27	26
●	Reduction in volume of HGV on network as a result of economic downturn	26	22

<b>Behavioural Response</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
Walk / Cycle		
● Proportion of people who have changed mode to walk / cycle during COVID period	30	30
● Proportion of people who are walking / cycling now, who will continue to do so, post-covid	16	16
PT		
● Bus users switch to private car	42	43
● Impact on bus patronage (related to social distancing factors)	43	48
● Impact on bus patronage (related to services and fares)	31	38
Rail		
● Rail passengers switch to private car	35	34
● Impact on rail patronage (related to social distancing factors)	29	33
Car		
● Car occupancy levels reduce as people travel in separate cars	34	35
● Car occupancy levels increase as car share increases due to switch from bus / rail	22	23
Taxi		
● Bus and rail passengers switch to Taxi e.g. vulnerable members of the public	10	13

<b>LEZ Concept</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Public appetite for Air Quality measures post covid?	42	37
● Public acceptance post-implementation?	32	32

<b>Travel pattern</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Potential changes to Parking Policy	42	39
● Changes to LGV trips across the whole network (residential deliveries)	38	37
● Changes to the function of office space (shared offices / hired office space)	49	46
● Impact on local University Applications	16	17
● Impact on local airport Patrons	32	34
● Trip frequency changes as a result of trip purposes changing (proportion commute/business vs leisure)	45	41
● Time of day changes as a result of trip purposes changing (proportion commute/business vs leisure)	44	40

<b>National Economy / Policy</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Gov financial incentives to affected industries	31	31
● Potential tax changes (income / VAT) to finance cost of Covid	38	36
● Climate change incentives	32	33
● Brexit	37	36
● Shift in policy (further) towards sustainable/healthier modes (walk/cycle)	35	37



<b>Local Economy / Policy</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Impact on Oil Industry now	41	37
● Impact of Oil industry recovery post 2020	37	32
● Impact on Fishing industry / Harbour Economy	26	27
● Delay on committed infrastructure schemes	35	36
● Delays in committed/assumed LDP development coming forward	42	42
● Shift in policy (further) towards sustainable/healthier modes (walk/cycle)	34	30

<b>Any Further Disruptors?</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● The supply of diesel, which I believe we are a net importer of?	8	6
● Trade deals (you reference Brexit, but this not the same thing, we can have Brexit without trade deals)	8	6
● Price of fuel – reductions in cost of fuel due to global demand reducing can lead to changes in vehicle use	9	6
● Passenger capacity – public transport may be operating with significantly limited capacity due to physical distancing for some time to come	7	5
● COVID-19 restrictions and regional differences affecting ability to travel	7	5
● Uncertainty of air quality changes and likelihood and extent of exceedance of air quality objectives	9	6
● Road space reallocation for public transport or active travel (ie infrastructure rather than just policy)	0	6



### B.3 Edinburgh Disruptors

Travel Demand		Score Pre-Consultation	Score Post-Consultation
CAR			
●	Travel demand to/from existing premises – commute (e.g. reduced employment)	17	17
●	Travel demand to/from existing premises – commute (e.g. more home working)	26	26
●	Travel demand to/from existing premises – business travel (e.g. economic downturn)	18	18
●	Travel demand to/from existing premises – business travel (e.g. more internet-based)	24	24
●	Travel demand to/from existing city-centre premises - shopping (e.g. economic downturn)	19	19
●	Car travel demand to/from existing premises - shopping (e.g. more on-line and out-of-town shopping)	24	24
●	Travel demand to/from existing premises - other leisure (e.g. economic down-turn and reduced city centre businesses)	17	17
LGV		0	0
●	Increase in volume of LGV on network as a result of increase in on-line shopping	26	26
●	Reduction in volume of LGV on network as a result of economic downturn	7	7
HGV		0	0
●	Reduction in volume of HGV on network as a result of economic downturn	7	7
Taxi		0	0
●	Change in taxi demand due to reduction in bus/rail demand	24	24
●	Change in taxi demand due to reduction in leisure trips	17	17
●	Change in taxi demand due to reduction in business trips	18	18
●	Changes to type of new car due to trip purpose changes	17	17
		0	0

Fleet Composition		Score Pre-Consultation	Score Post-Consultation
PT			
●	Impact on rail patronage (related to services and fares)	18	18
●	Impact on proposed bus fleet upgrades (existing fleet conversions )	22	22
CAR		0	0
●	Increase in New Purchase of Low Carbon Vehicles	20	20
●	Decrease in New Purchase of Diesel Vehicles	20	20
●	Change in the overall number of people buying new cars	26	26
LGV		0	0
●	Increase in EURO 6 new vehicle purchases	23	23
●	Change in the overall number of people buying new LGV	22	22
HGV		0	0
●	Increase in EURO 6 new vehicle purchases	18	18
●	Change in the overall number of people buying new HGV	14	14
●	Reduction in volume of HGV on network as a result of economic downturn	11	11



	Score Pre-Consultation	Score Post-Consultation
<b>Behavioural Response</b>		
Walk / Cycle		
● Proportion of people who have changed mode to walk / cycle during COVID period	19	19
● Proportion of people who are walking / cycling now, who will continue to do so, post-covid	18	18
PT		
● Bus users switch to private car	26	26
● Impact on bus patronage (related to social distancing factors)	28	28
● Impact on bus patronage (related to services and fares)	18	18
Rail	0	0
● Rail passengers switch to private car	21	21
● Impact on rail patronage (related to social distancing factors)	27	27
Car	0	0
● Car occupancy levels reduce as people travel in separate cars	26	26
● Car occupancy levels increase as car share increases due to switch from bus / rail	14	14
Taxi	0	0
● Bus and rail passengers switch to Taxi e.g. vulnerable members of the public	8	8

	Score Pre-Consultation	Score Post-Consultation
<b>LEZ Concept</b>		
● Public appetite for Air Quality measures post covid?	14	14
● Public acceptance post-implementation?	16	16

	Score Pre-Consultation	Score Post-Consultation
<b>Travel pattern</b>		
● Potential changes to Parking Policy	18	18
● Changes to LGV trips across the whole network (residential deliveries)	28	28
● Changes to the function of office space (shared offices / hired office space)	19	19
● Impact on local University Applications	22	22
● Impact on local airport Patrons	13	13
● Trip frequency changes as a result of trip purposes changing (proportion commute/business vs leisure)	18	18
● Time of day changes as a result of trip purposes changing (proportion commute/business vs leisure)	20	20

	Score Pre-Consultation	Score Post-Consultation
<b>National Economy / Policy</b>		
● Gov financial incentives to affected industries	19	19
● Potential tax changes (income / VAT) to finance cost of Covid	16	16
● Climate change incentives	19	19
● Brexit	18	18
● Shift in policy (further) towards sustainable/healthier modes (walk/cycle)	23	23



<b>Local Economy / Policy</b>	<b>Score Pre-Consultation</b>	<b>Score Post-Consultation</b>
● Impact on Oil Industry now	16	16
● Impact of Oil industry recovery post 2020	14	14
● Impact on Fishing industry / Harbour Economy	20	20
● Delay on committed infrastructure schemes	18	18
● Delays in committed/assumed LDP development coming forward	25	25
● Shift in policy (further) towards sustainable/healthier modes (walk/cycle)	24	24



## B.4 Glasgow Disruptors

Travel Demand	Score Pre-Consultation	Score Post-Consultation
<b>CAR</b>		
● Travel demand to/from existing premises – commute (e.g. reduced	42	36
● Travel demand to/from existing premises – commute (e.g. more	46	41
● Travel demand to/from existing premises – business travel (e.g.	38	33
● Travel demand to/from existing premises – business travel (e.g.	38	34
● Travel demand to/from existing city-centre premises - shopping (e.g.	39	34
● Car travel demand to/from existing premises - shopping (e.g. more	44	39
● Travel demand to/from existing premises - other leisure (e.g.	37	32
<b>LGV</b>		
● Increase in volume of LGV on network as a result of increase in on-lir	34	33
● Reduction in volume of LGV on network as a result of economic dow	16	14
<b>HGV</b>		
● Reduction in volume of HGV on network as a result of economic dow	10	9
<b>Taxi</b>		
● Change in taxi demand due to reduction in bus/rail demand	25	22
● Change in taxi demand due to reduction in leisure trips	38	33
● Change in taxi demand due to reduction in business trips	35	31
● Changes to type of new car due to trip purpose changes	12	10

Fleet Composition	Score Pre-Consultation	Score Pre-Consultation
<b>PT</b>		
● Impact on rail patronage (related to services and fares)	24	23
● Impact on proposed bus fleet upgrades (existing fleet conversions )	54	51
<b>CAR</b>		
● Increase in New Purchase of Low Carbon Vehicles	43	37
● Decrease in New Purchase of Diesel Vehicles	49	42
● Change in the overall number of people buying new cars	42	36
<b>LGV</b>		
● Increase in EURO 6 new vehicle purchases	29	26
● Change in the overall number of people buying new LGV	23	20
<b>HGV</b>		
● Increase in EURO 6 new vehicle purchases	20	18
● Change in the overall number of people buying new HGV	23	20
● Reduction in volume of HGV on network as a result of economic dow	13	13



<b>Behavioural Response</b>	<b>Score Pre-Consultation</b>	<b>Score Pre-Consultation</b>
Walk / Cycle		
● Proportion of people who have changed mode to walk / cycle during	30	28
● Proportion of people who are walking / cycling now, who will continue	28	25
PT		
● Bus users switch to private car	46	44
● Impact on bus patronage (related to social distancing factors)	57	53
● Impact on bus patronage (related to services and fares)	30	30
Rail		
● Rail passengers switch to private car	34	31
● Impact on rail patronage (related to social distancing factors)	30	27
Car		
● Car occupancy levels reduce as people travel in separate cars	34	31
● Car occupancy levels increase as car share increases due to switch from	18	17
Taxi		
● Bus and rail passengers switch to Taxi e.g. vulnerable members of the	19	16

<b>LEZ Concept</b>	<b>Score Pre-Consultation</b>	<b>Score Pre-Consultation</b>
● Public appetite for Air Quality measures post covid?	40	35
● Public acceptance post-implementation?	37	34

<b>Travel pattern</b>	<b>Score Pre-Consultation</b>	<b>Score Pre-Consultation</b>
● Potential changes to Parking Policy	49	46
● Changes to LGV trips across the whole network (residential deliveries)	32	31
● Changes to the function of office space (shared offices / hired office)	54	47
● Impact on local University Applications	15	15
● Impact on local airport Patrons	33	29
● Trip frequency changes as a result of trip purposes changing (proportion)	46	39
● Time of day changes as a result of trip purposes changing (proportion)	49	41

<b>National Economy / Policy</b>	<b>Score Pre-Consultation</b>	<b>Score Pre-Consultation</b>
● Gov financial incentives to affected industries	45	43
● Potential tax changes (income / VAT) to finance cost of Covid	44	37
● Climate change incentives	48	42
● Brexit	46	42
● Shift in policy (further) towards sustainable/healthier modes (walk/cy)	53	47

<b>Local Economy / Policy</b>	<b>Score Pre-Consultation</b>	<b>Score Pre-Consultation</b>
● Delay on committed infrastructure schemes	47	41
● Delays in committed/assumed LDP development coming forward	36	33
● Shift in policy (further) towards sustainable/healthier modes (walk/cy)	40	35
● Impact on Investment	41	40
● Impact on retail	46	47
● Impact on tourism - resident v visitor	37	34





Any Further Disruptors?	Score Pre-Consultation	Score Pre-Consultation
● Increased use of e-transport: e-cargo, e-bikes etc	11	11
● Increased use of sustainable energy generation	15	15
● Business resistance to LEZ measures	15	15
● Leadership commitment	10	10
● Delays / Lack of Policy Impact on Public Health	15	15
● Incentives to Change	1	1
● Leadership Clarity	0	0
● Move towards 20minute neighbourhoods or LTN's	4	4
● Lack of Public Confidence in Government\Local Authorities	0	7
● Current and future car tax levels (£40000=extra 350 per year) &	0	0
● Require improved public transport system to be choice (peak issues f	0	1
● How would current PT cope with required 30% car reduction = 25,000	0	1
● Lack of progress in electric car development (necessity may speed p	0	1



## APPROVAL

Version	Name		Position	Date	Modifications
<b>1</b>	Author	Malcolm Neil/ Grant Davidson/ Callum Guild		18/12/2020	
	Checked by	Keith Gowenlock/Grant Davidson		19/12/2020	
	Approved by	Boris Johansson		21/12/2020	
<b>2</b>	Author	Malcolm Neil/ Grant Davidson/ Callum Guild		20/01/2021	Updated following feedback
	Checked by	Keith Gowenlock/Grant Davidson		20/01/2021	
	Approved by	Malcolm Neil		20/01/2021	
<b>3</b>	Author	Grant Davidson/ Callum Guild		21/01/2021	Updated following comments
	Checked by	Malcolm Neil		22/01/2021	
	Approved by	Malcolm Neil		22/01/2021	
<b>4</b>	Author	Callum Guild		28/01/2021	Updated following comments
	Checked by	Malcolm Neil		28/01/2021	
	Approved by	Malcolm Neil		28/01/2021	
<b>5</b>	Author	Callum Guild		29/01/2021	Executive Summary Added
	Checked by	Malcolm Neil		29/01/2021	
	Approved by	Malcolm Neil		29/01/2021	



## Appendix 9 – LEZ Approval Process

REQUIRED STEPS	1 Consideration of preferred option by Committee	2 Local Authority undertakes consultation on preferred option boundary	3 Local Authority undertakes Traffic Regulation Order (TRO) process	4 Consultation Analysis and Reporting	5 Local authority publishes proposed scheme	6 Objection Period	7 Local authority publishes report on objections	8 Design of final LEZ scheme	9 Consideration of any TRO objections by Committee	10 LEZ scheme submitted to Scottish Ministers for approval	11 Scottish Ministers approve scheme	12 Local authority publishes notice to make final LEZ scheme
NOTES	Following detailed appraisal and modelling, a preferred option is reported to the City Growth and Resources Committee in June 2021.	A local authority making a LEZ must consult with, as a minimum, the statutory consultees outlined in Section 11 of the Transport (Scotland) Act and associated Regulations. Representations received should be received within a period specified by the local authority.	As the Aberdeen LEZ requires changes to traffic management on certain streets to be successful, the TRO process required for these will be undertaken in tandem with consultation and finalisation of the scheme.	Once representations have been made, the Council must to prepare and publish a report detailing the persons consulted and any representations made. The report must indicate how it has taken into account representations received in the course of the consultation.	Once consultation findings have been taken into consideration, the Council can publish their proposed scheme. Local authorities should ensure adequate publicity about the LEZ scheme is given to persons likely to be affected by its provisions.	There is a specified period of time (4 weeks) in which objections can be made to a scheme. Any person can make an objection and objections should be made in writing, outlining the grounds of the objection.	Once the objection period has ceased, the Council must prepare and publish a report outlining: the number of objections received; a summary of the nature of the objections; the Council's response to the objections; and whether it intends to cause an examination to be held.	Adjustments to the LEZ may be required as a result of representations made during the consultation and objection period.	The outcomes of the TRO process will be reported to the November meeting of the Operational Delivery Committee.	The proposed scheme is submitted to Scottish Ministers for approval (as per Section 10 of the Act). The Scottish Ministers will either approve the scheme, request amendments to the scheme, or cause an examination to be held.	Assuming the Scottish Ministers are content with the proposed LEZ, they will approve the scheme.	When a scheme has been approved by the Scottish Ministers, a local authority shall publish a notice to make a LEZ scheme prior to the scheme being made. This triggers the commencement of the grace period.
TO BE ACHIEVED BY WEEK ENDING	25/06/2021											
	02/07/2021											
	09/07/2021											
	16/07/2021											
	23/07/2021											
	30/07/2021											
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22/10/2021							*					
29/10/2021												
05/11/2021												
Late 2021 / Early 2022										*		
Early 2022												
Spring 2022												

★ Potential examination trigger

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# Aberdeen Emissions Analysis Report



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## Main Points to Note

- As a consequence of the cyber-attack that significantly impacted SEPA's internal IT systems, an alternative approach for carrying out the modelling for the development of proposed LEZs was agreed. This focuses on identifying changes to traffic emissions inside and outside the boundary of the proposed LEZ.
- A fully compliant bus fleet (89% Euro VI and 11% Hydrogen) has been included in the analyses described below. A fully compliant bus fleet will bring air quality benefits across the whole of the city.
- Introducing a Low Emission Zone combined with City Centre Masterplan (CCMP) interventions planned for Union Street will reduce total NO<sub>x</sub> emissions by 29% when compared to the 2024 Reference Case.
- The highest concentrations of annual-average NO<sub>2</sub> occur along roads dominated by bus emissions within Aberdeen City Centre. Diesel car emissions dominate other key routes in and out of the City Centre.
- Significant emission reductions occur on key bus routes inside the LEZ boundary where vehicles are required to meet strict exhaust emission standards.
- Although the traffic modelling identified some vehicle displacement around the edge of the LEZ the emissions analysis carried out so far doesn't identify any potential new pollution hotspot areas.
- The traffic model suggests an overall increase in traffic flows along Anderson Drive between Garthdee Roundabout and Kings Gate which is reflected in a 40% increase in NO<sub>x</sub> emissions. Previous AQ model predictions based on a 2019 fleet highlighted that the average annual average NO<sub>2</sub> concentration was 32µg<sub>m</sub><sup>-3</sup> along this section of Anderson Drive.
- The traffic model identifies a slight change in traffic flows on Wellington Road but NO<sub>x</sub> emissions are predicted to fall by approximately 20%.
- Emissions analysis work will continue and further AQ modelling will be carried out during the summer (2021).

## Scope of Report

Air Quality (AQ) modelling in Aberdeen is ongoing as part of the National Modelling Framework (NMF) in support of the Scottish Government's Cleaner Air for Scotland Strategy (CAFS). This report summarises work carried out to calculate tail-pipe emissions of Nitrogen Oxides (NO<sub>x</sub>) using outputs from the Aberdeen traffic model which has been used to inform the planning of a Low Emission Zone (LEZ) for Aberdeen City Council (ACC). This work has been carried out in line with the NMF, which has the aim to deliver a detailed and consistent approach to assessing AQ in Scotland's major cities. This report provides an early indication of where traffic-related emissions are likely to increase or decrease following the implementation of the LEZ.

Earlier reports (Aberdeen's Proposed Low Emission Zone - Interim Report for Aberdeen City Council, 2018; National Low Emission Framework-Interim Stage 2 Assessment, SYSTRA 2020) show that the NMF Aberdeen AQ model performs well when compared against observed AQ data, highlights how fleet composition changes can improve AQ on a city-wide basis and looks at source apportionment for different vehicle sectors. Some of the key findings from this work are included below.

It is important to note that this is an interim report due to technical issues described below. Further detailed AQ modelling will resume during the summer of 2021 to inform the final LEZ design and will focus on the changes in Nitrogen Dioxide (NO<sub>2</sub>) concentrations associated with the changes in traffic patterns summarised below. Particulate Matter (PM) modelling will be included in further work.

## SEPA Cyber Attack – and the Alternative Approach Taken

On Christmas Eve, the Scottish Environment Protection Agency (SEPA) was subject to a serious and complex criminal cyber-attack that significantly impacted our internal systems and our AQ modelling capabilities.

As part of SEPAs recovery plan a phased rollout to restore critical services to re-establish communication in order to continue providing priority regulatory, monitoring, flood forecasting and warning services was initiated. This included the delivery of our NMF obligations to assist in the final assessments of the LEZ options for each city.

Due to SEPAs inability to carry out AQ modelling, an alternative approach to allow for local authorities to report to committee in Spring 2021 was discussed at the LEZ Leadership Group meeting held on the 3<sup>rd</sup> of February 2021. The following steps were recommended by Scottish Government and SEPA on a way forward:

- Continuation of traffic modelling to define a small number of potential LEZ options or a preferred LEZ option for each city.

- SEPA to carry out emissions analysis on the traffic model outputs using the established NMF methodology. This will assess the impact of the LEZ by comparing traffic and emissions between the reference/base case and LEZ scenarios.
- SEPA to continue detailed AQ modelling during the consultation phase over the summer of 2021 to support the local authorities in finalising the preferred LEZ scheme for Ministerial approval.

## **Introduction and Background**

Air quality management activities (including AQ monitoring) in Scotland have been primarily driven by the 2008 European Union Directive on ambient air quality and cleaner air for Europe (Directive 2008/50/EC), which was incorporated into Scottish law through the Air Quality Standards (Scotland) Regulations 2010 and 2016. At a domestic level, the Environment Act 1995 and Regulatory Reform (Scotland) Act 2014 set out the Local Air Quality Management (LAQM) regime to assist local authorities in achieving compliance with legal AQ standards and objectives set to protect human health.

The CAFS Strategy, published in 2015, sets out how Scottish Government and its partner organisations propose to further reduce air pollution and improve AQ to protect human health and fulfil Scotland's legal responsibilities as soon as possible. CAFS provides a clear commitment to the NMF to ensure that a consistent approach to modelling AQ in areas associated with the highest levels of poor AQ in all four major cities is taken. The NMF provides tools and evidence to support the National Low Emissions Framework (NLEF). The NLEF is an evidence-based appraisal process developed to help local authorities consider transport related actions to improve local AQ.

In September 2017, the Scottish Government's Programme for Government committed to the introduction of LEZs in Scotland's four biggest cities (Glasgow, Edinburgh, Aberdeen and Dundee) by 2020, with the first introduced in Glasgow in 2018. With the advent of COVID-19 and the subsequent lock-down restrictions and recovery measures the decision was made to temporarily pause the implementation of LEZs. The Scottish Government have since set a revised timetable for LEZs to be introduced across all four cities between February and May 2022.

CAFS has been subject to a formal review, with an updated strategy (CAFS2) expected to be published shortly in 2021 (to run to 2026). The initial findings of the review identified that Scotland was performing well on AQ, with the major pollutants continuing to fall as a result of actions taken to date. However, the review also recommended that there is more work to be carried out and Scotland must take a precautionary public health approach to further AQ reductions.

## **Emissions Analysis**

A traffic model has been developed by SYSTRA to assess how traffic flows and composition could change in response to the implementation of an LEZ in Aberdeen. The traffic model predicts how non-compliant vehicles could be displaced around the LEZ. The extent of the proposed LEZ is shown in Figure 1.



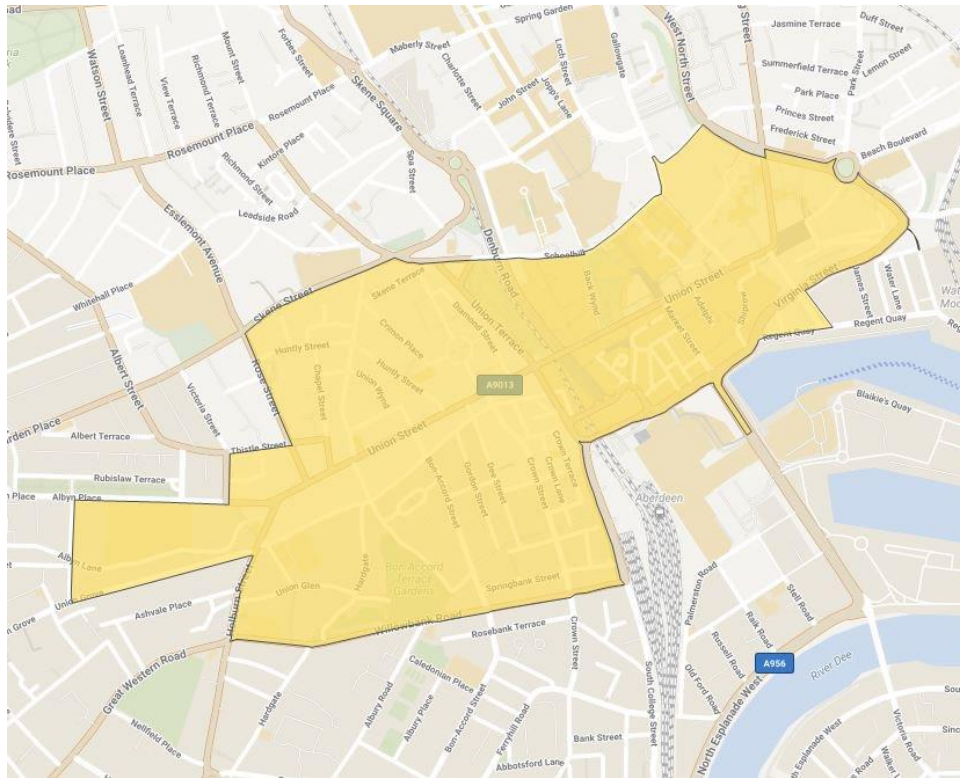


Figure 1. Extent of the proposed LEZ covering the area of Aberdeen City Centre bound between Willowbank Road to Virginia Street to the south, Commerce Street to West North Street to the east, Littlejohn Street to Skene Street to the north and Rose Street to Albyn Grove to the west.

AQ modelling carried out earlier in the NMF process concluded that a LEZ alone is not enough to reduce all exceedances across the City Centre. Aberdeen City Council’s proposed City Centre Master Plan (CCMP) includes several transport related projects. The traffic model was utilised to identify if any elements of the CCMP would reduce traffic further to support the LEZ in meeting its objectives (Figure 2). Traffic modelling sensitivity tests identified that the CCMP Union Street Scheme was shown to complement the proposed LEZ by reducing traffic and associated emissions further within the City Centre. The CCMP Union Street Scheme involves limiting traffic to buses, taxis and pedal cycles only along the sections of Union Street and Union Terrace highlighted in black in Figure 2. As part of the same scheme the southern end of Rose Street will be pedestrianised. Additional testing identified that a revision to the operation of the Milburn Street/South College Street junction will also be required to manage displaced traffic from the City Centre in the area to the south and west of the LEZ and limit the routing of all traffic through the Milburn Street and the Ferryhill corridor.

A comparison has been made between a 2024 ‘Reference’ case (referred to as ‘Reference’ case below) and a 2024 LEZ + CCMP Union Street Scheme scenario (referred to as ‘LEZ scenario’ below).

- ‘Reference’ case traffic flows are based on those observed in 2019 adjusted for 2024 with Committed Developments taken into account. The vehicle fleet

composition for 2024 is based on the predicted trends in national fleet composition/compliance (2019-2024) which was applied to local observed ANPR data gathered in 2019. The bus fleet is fully compliant with the LEZ requirements and comprises 89% Euro VI and 11% hydrogen fuel cell (based on the 2021 fleet) components.

- Traffic flows in the LEZ scenario are based on the 'Reference' case with the added intervention of the LEZ scenario and additional measures which include the CCMP Union Street Scheme and the Milburn Street junction revision.

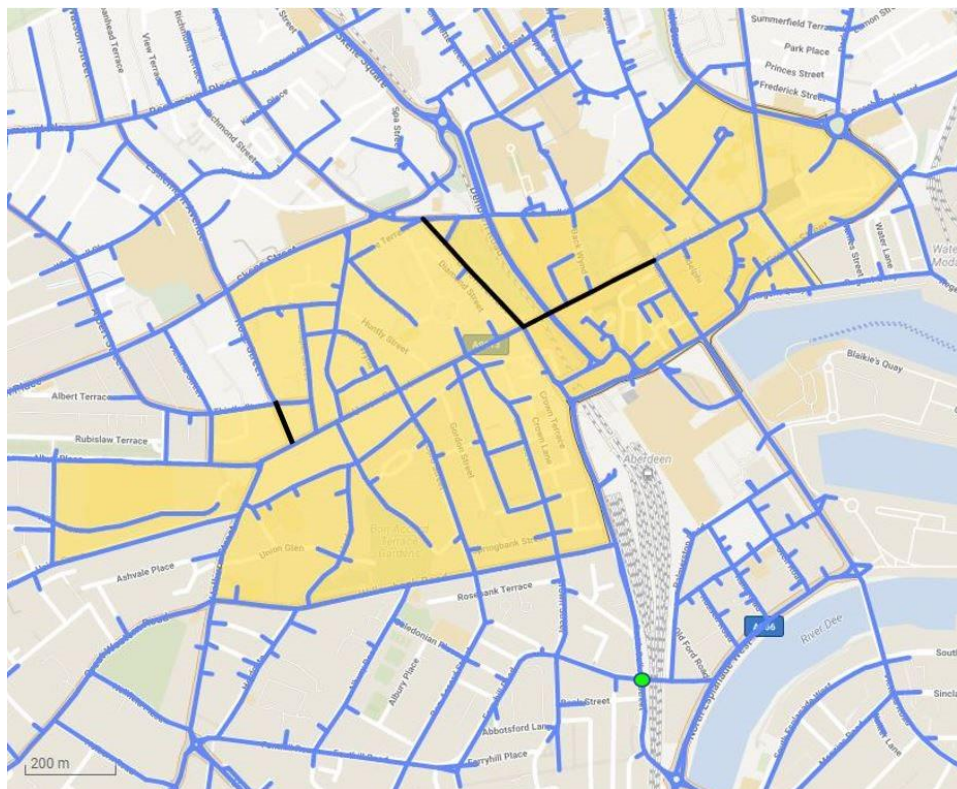


Figure 2. Key elements of the CCMP Union Street Scheme are shown in black and the location of the Milburn Street junction improvements are shown by the green marker. The extent of the LEZ is shown in yellow.

Traffic model outputs were processed to make them compatible with the CERC emissions database tool (EMIT). This included expanding the number of vehicle types in the traffic model outputs into 11 vehicle categories and the conversion of 12 hour traffic flows into 24 hour flows using conversion factors derived from observed traffic data. Emission rates (g/km/s) could then be calculated for every road in the traffic model for the 'Reference' case and LEZ scenario. Comparing emissions between these enables any changes due to the LEZ scenario to be identified.

The EMIT software used contains the latest emission factors from the Emission Factor Toolkit (EFT) version 10.

## **Traffic Pollutants described in this Report**

The focus of the LEZ is on reducing concentrations of total Nitrogen Dioxide (NO<sub>2</sub>). Vehicles directly emit both NO<sub>2</sub> and Nitrogen Oxide (NO) (known as primary NO<sub>2</sub> and primary NO) to the atmosphere. These two pollutants are referred to collectively as Nitrogen Oxides (NO<sub>x</sub>). Once in the atmosphere, they chemically interact with each other in the presence of Ozone (O<sub>3</sub>) and sunlight. When primary NO chemically reacts to form NO<sub>2</sub>, this is known as secondary NO<sub>2</sub>. Due to this chemical interaction, there may not be a direct relationship between an increase in road traffic emissions and NO<sub>2</sub> concentrations.

AQ modelling carried out earlier in the NMF process focused on predicting concentrations of NO<sub>2</sub>, which is how compliance against AQ Standards is assessed. The AQ model was also used to estimate the proportions of vehicle pollution that comes from different vehicle types, e.g. diesel cars vs buses. This type of analysis is usually performed for NO<sub>x</sub>, rather than NO<sub>2</sub>. It is difficult to calculate the breakdown of NO<sub>2</sub> for different vehicles accurately because of the additional component of NO<sub>2</sub> that is created in the atmosphere. Therefore, in this report we focus on total NO<sub>x</sub> emissions from traffic sources to assess emission reductions, whilst further analysis will be conducted to model NO<sub>2</sub> concentrations.

## **Air Quality Model: Pollutant Concentrations**

AQ modelling carried out earlier in the LEZ development phase was used to predict concentrations of NO<sub>2</sub> at a network of regular kerbside points across the city. The pink markers in Figures 3 and 4 show predicted exceedances of the annual average NO<sub>2</sub> limit value of 40µgm<sup>-3</sup> and the small number of black markers show predicted exceedances above 55µgm<sup>-3</sup> based on conditions in 2019. The main areas of exceedance are focused in the City Centre along Union Street, Holburn Street and King Street (these are major bus routes), and Market Street, Virginia Street and Commerce Street.

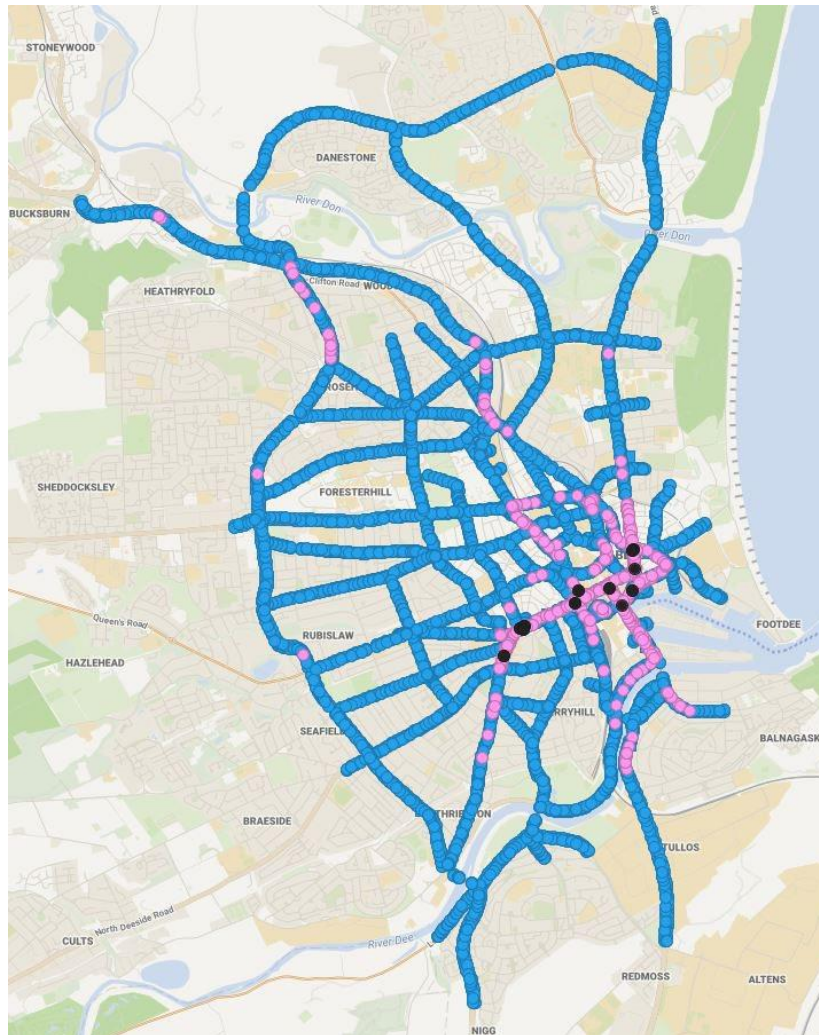


Figure 3. Modelled concentrations of annual-average NO<sub>2</sub> above (pink and black) and below (blue) the objective limit value of 40µg<sup>m</sup>-<sup>3</sup>.

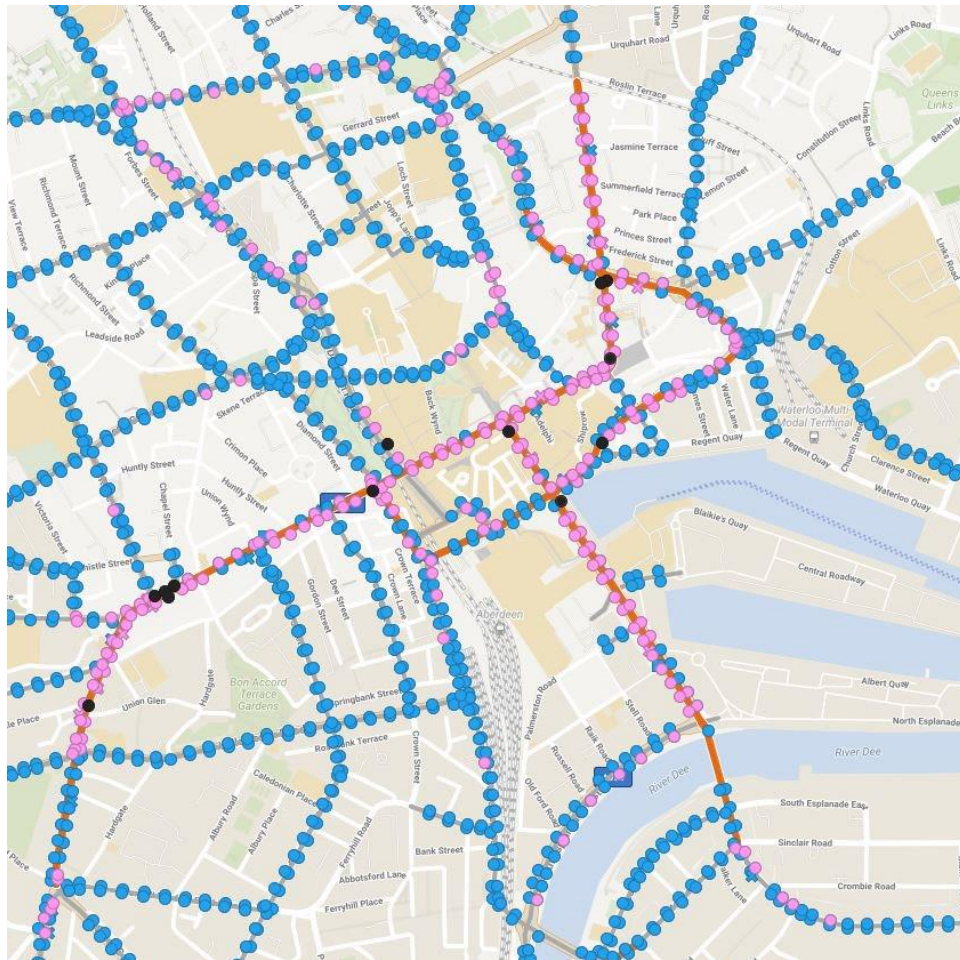


Figure 4. Modelled concentrations of annual-average NO<sub>2</sub> above (pink and black) and below (blue) the objective limit value of 40µg<sup>m</sup>-<sup>3</sup>. The City Centre AQMA is shown in orange.

### EMIT: Emissions by Vehicle Type

During emissions analysis undertaken earlier in the NMF process EMIT was used to estimate the relative contribution to total levels of NO<sub>x</sub> from different types of vehicles. This analysis showed that the greatest contributors to NO<sub>x</sub> across the city are buses and diesel cars. Bus emissions are most dominant on roads inside the City Centre where the highest pollutant concentrations are measured and predicted (Figure 5). Diesel car emissions are dominant on other key routes in and out of the city (Figure 6).

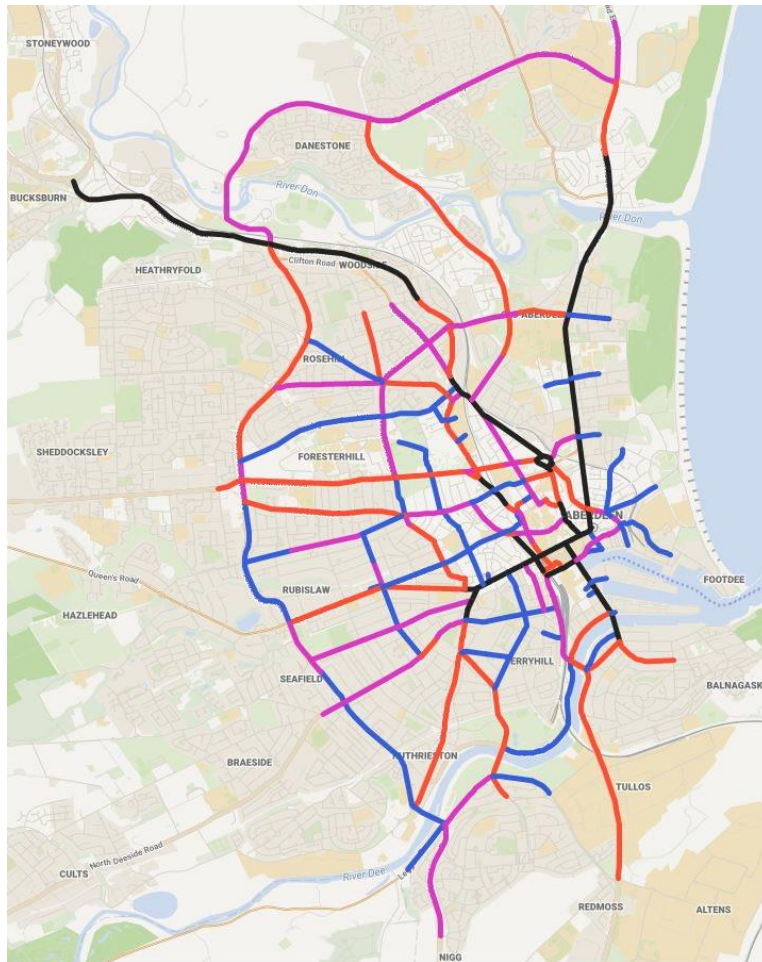


Figure 5. The roads coloured in black are those dominated by bus emissions (highest 25%).

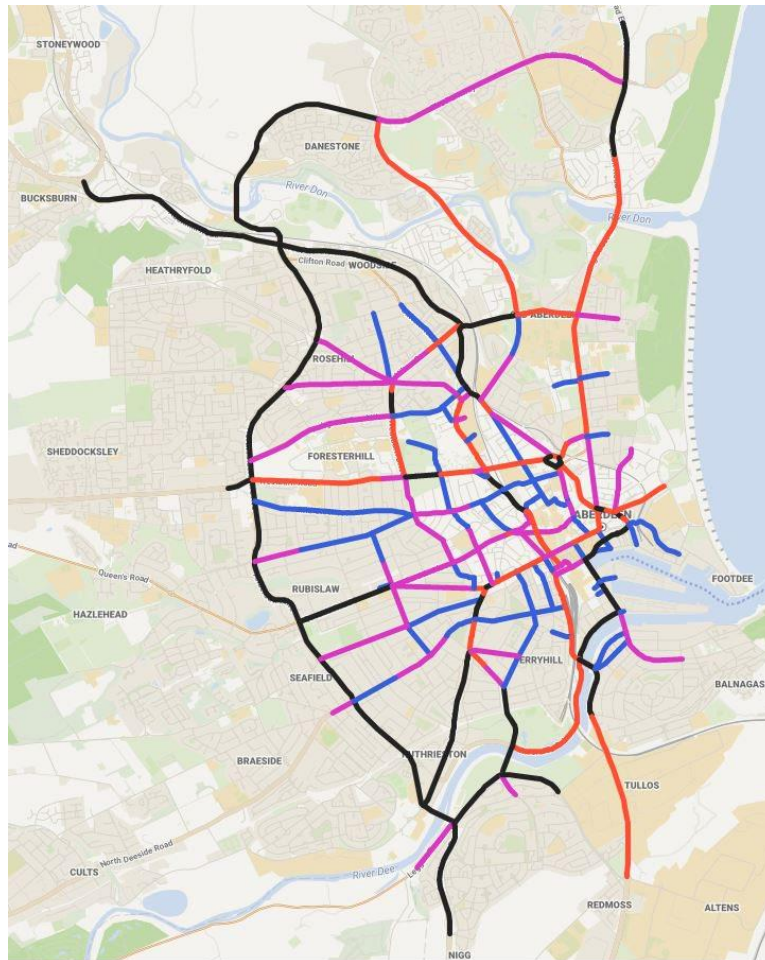


Figure 6. The roads coloured in black are those dominated by diesel car emissions (highest 25%).

## Traffic Model Analysis

The effects of the LEZ + CCMP Union Street Scheme have been investigated both inside and outside of the LEZ boundary. The most significant emission reduction occurs inside the boundary where vehicles are required to comply with LEZ rules. Some vehicles that do not meet the emission standards of the LEZ re-route around the edges of the LEZ boundary. This displacement of non-compliant vehicles has the potential to increase vehicle emissions on these roads.

### *LEZ + CCMP Union Street Scheme*

On the roads highlighted in black in Figure 7 there is a reduction in total NO<sub>x</sub> emissions of over 30%. On key bus routes inside the LEZ there is a significant reduction in NO<sub>x</sub> emissions. For example, on the sections of Union Street where only buses and taxis are permitted as part of the CCMP Union Street Scheme (Figure 1) there is an average reduction of 87% in NO<sub>x</sub> emissions. The bus fleet in 2024 is considered to be fully compliant and therefore this improvement is due to the removal of all other vehicle types, mainly diesel cars and goods vehicles from these roads as part of the CCMP Union Street Scheme. Along the remaining sections of Union Street there is a

reduction in NO<sub>x</sub> emission rates of on average 57% (ranging between 34% and 72%). Along Union Terrace there is a reduction of on average 77% (ranging between 47% and 91%). Many of these roads that see the greatest reduction in emissions in the LEZ scenario coincide with those highlighted in the previous AQ modelling results shown in Figures 3 and 4 where the highest pollutant concentrations are found.

The two charts in Figure 8 show the ranked NO<sub>x</sub> emission rates on all roads covered in the traffic model. They allow the significance of the changes in the NO<sub>x</sub> emission rates between the 'Reference' case (top) and LEZ scenario (bottom) in relation to the maximum NO<sub>x</sub> emission rates to be visualised. Two sections of Union Street (US1 and US2 within the CCMP Union Street Scheme), Market Street (MS), Virginia Street (VS) and King Street (KS) within the proposed LEZ have been highlighted in the map. The corresponding reductions in NO<sub>x</sub> emission rates at these locations in the LEZ scenario are highlighted in the charts. The effect of implementing the traffic restriction on Union Street as part of the CCMP Union Street Scheme on NO<sub>x</sub> emission rates at these locations offers significant reductions across streets previously shown to have some of the highest emission rates and kerbside concentrations in 2019.

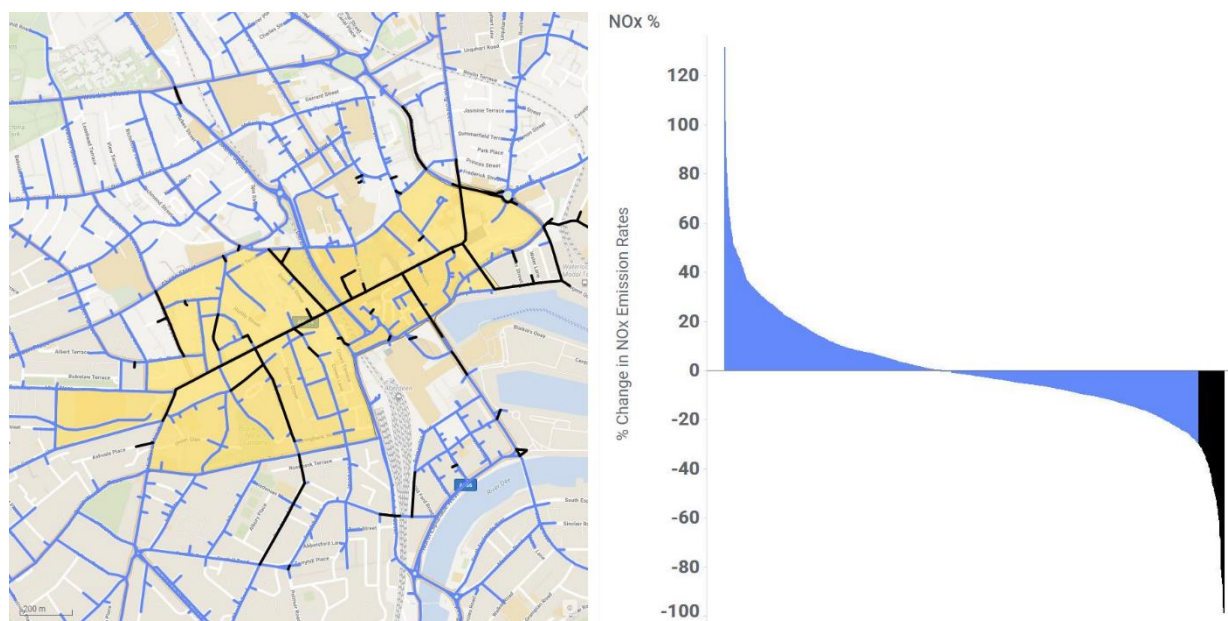


Figure 7. Roads highlighted in black are predicted to see over 30% reduction in NO<sub>x</sub> emissions. These are mostly key bus routes within the City Centre which coincide with high pollutant concentrations and exceedances of the NO<sub>2</sub> annual limit value. The extent of the LEZ is shown in yellow.



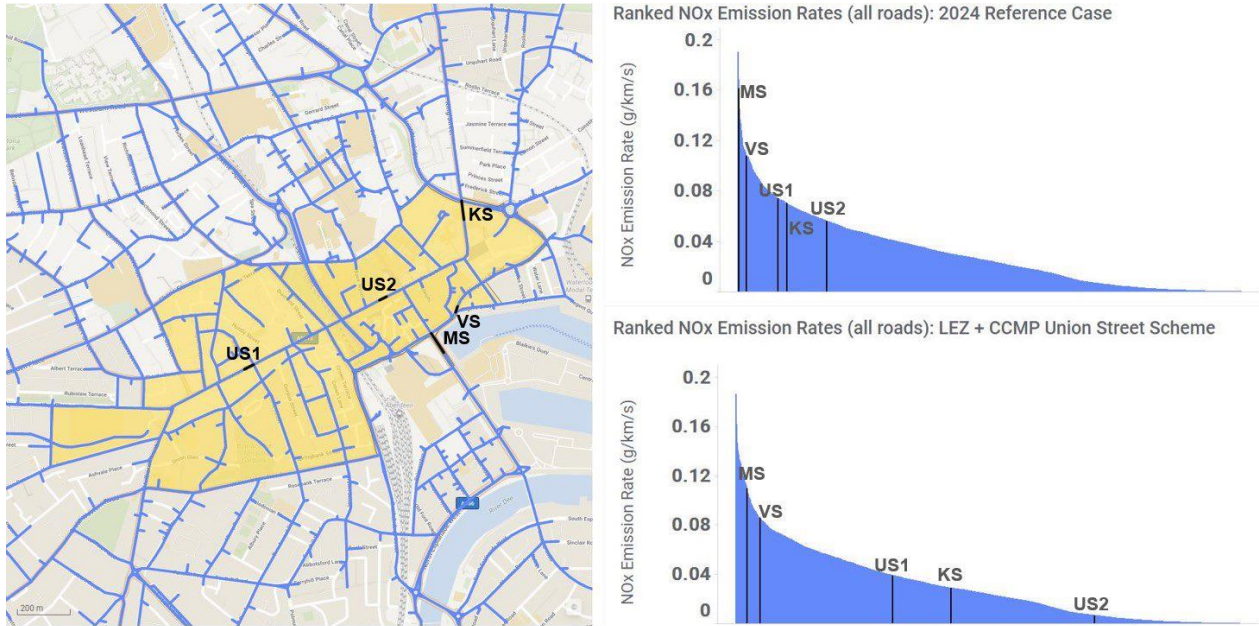


Figure 8. The charts on the right show the NO<sub>x</sub> emission rates on all roads in the traffic model for the 'Reference' case (top) and LEZ scenario (bottom). The changes in NO<sub>x</sub> emission rates on Union Street (US1 and US2), Virginia Street (VS), King Street (KS) and Market Street (MS) are highlighted in black. The extent of the LEZ is shown in yellow.

There are some roads located on the periphery and just outside the proposed LEZ boundary where NO<sub>x</sub> emissions increase following the implementation of the LEZ + CCMP Union Street Scheme. On the roads highlighted in black, on Victoria Street and Thistle Street in Figure 9 there is an increase in NO<sub>x</sub> emissions of over 40%. The two charts in Figure 10 show the corresponding increases in NO<sub>x</sub> emission rates at these locations in the LEZ scenario when compared to the 'Reference' case. These figures highlight that while there may be a large percentage increases in NO<sub>x</sub> emission rates on some roads this can actually correspond to small increases in NO<sub>x</sub> emission rates whilst overall emission rates remain low. The increase in NO<sub>x</sub> emission rates on these roads will be due to an increase in compliant vehicles routing through these areas.



Figure 9. The highlighted sections of Victoria Street (VS1 and VS2) and Thistle Street (TS) see over a 40% increase in NO<sub>x</sub> emissions. The extent of the LEZ is shown in yellow.

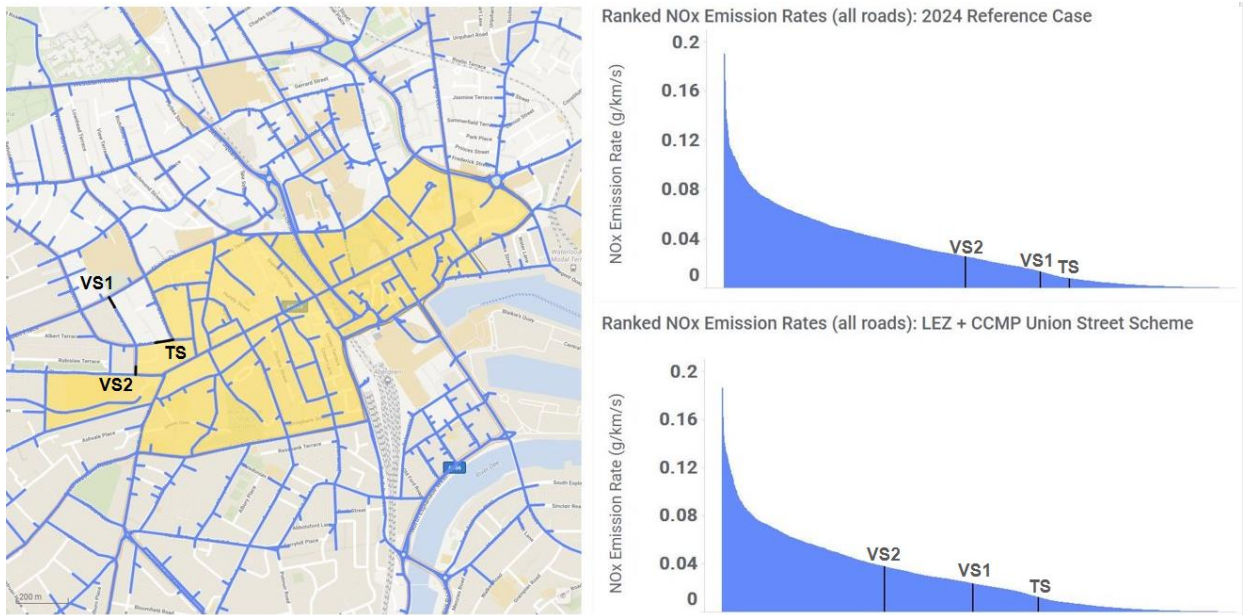


Figure 10. The charts on the right show the NO<sub>x</sub> emission rates on all roads in the traffic model for the 'Reference' case (top) and LEZ scenario (bottom). The changes in NO<sub>x</sub> emission rates on Victoria Street (VS1 and VS2) and Thistle Street (TS) are highlighted in black. The extent of the LEZ is shown in yellow.

### *Market Street to Commerce Street*

Overall, there is a reduction in traffic flows along Market Street, Virginia Street and Commerce Street. Virginia Street, Commerce Street and the section of Market Street highlighted in Figure 11 below are included within the proposed LEZ. The reduced flows combined with the change to

compliant vehicles in the LEZ scenario results in reductions in NO<sub>x</sub> emission rates of up to 30% on the highlighted roads. The two charts in Figure 12 show the corresponding reduction in NO<sub>x</sub> emission rates at these locations in the LEZ scenario when compared to the 'Reference' case.

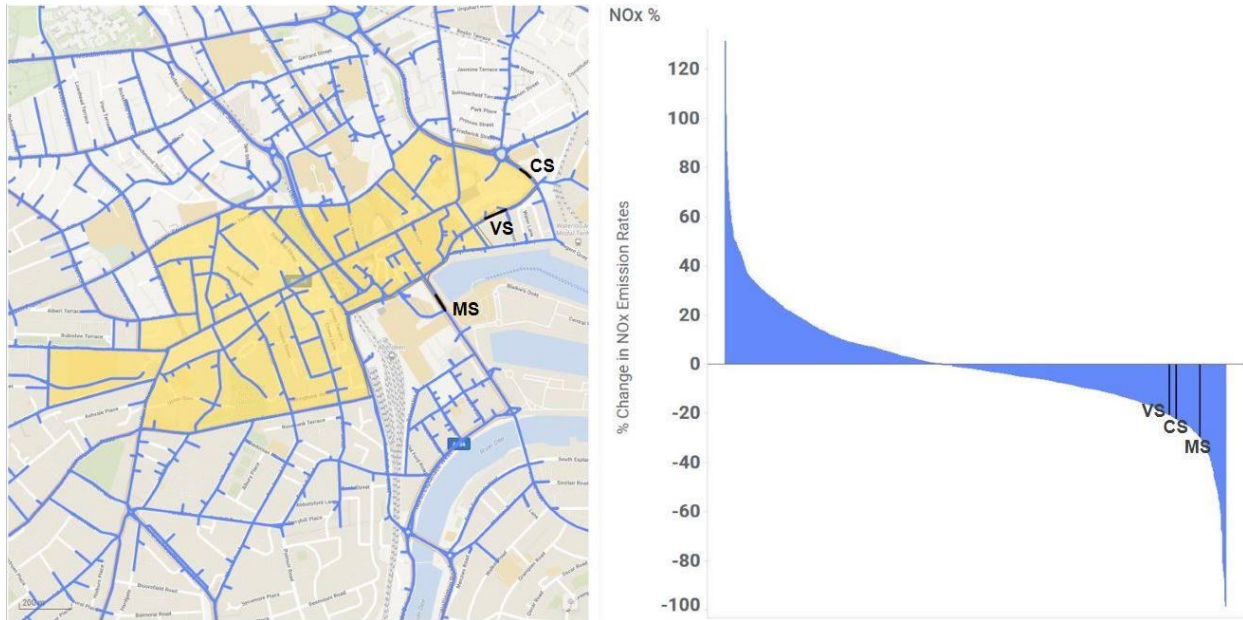


Figure 11. The highlighted sections of Market Street (MS), Virginia Street (VS) and Commerce Street (CS) see over a 40% increase in NO<sub>x</sub> emissions. The extent of the LEZ is shown in yellow.

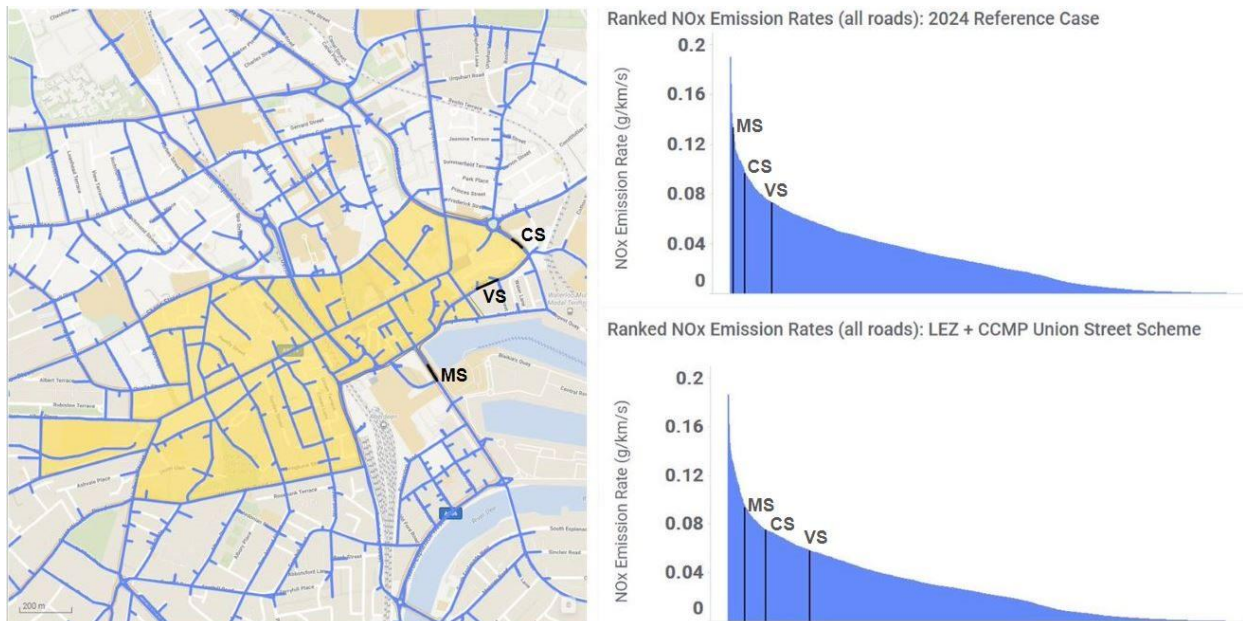


Figure 12. The charts on the right show the NO<sub>x</sub> emission rates on all roads in the traffic model for the 'Reference' case (top) and LEZ scenario (bottom). The reductions in NO<sub>x</sub> emission rates on Market Street (MS), Virginia Street (VS) and Commerce Street (CS) are highlighted in black. The extent of the LEZ is shown in yellow.

### Skene Square

On the roads highlighted in black in Figures 13 and 14 there is a reduction in total NO<sub>x</sub> emissions of up to 25%. The Council recorded that observed NO<sub>2</sub> concentrations were just at or below the 40µgm<sup>-3</sup> objective on Skene Square for 2019. The AQ modelling carried out earlier in the NMF modelling process aligned with the local authority observations with a kerbside annual average NO<sub>2</sub> concentration of 38µgm<sup>-3</sup> (ranging between 30µgm<sup>-3</sup> and 48µgm<sup>-3</sup>) along this road.

The results from the traffic model suggest that there is a predicted 10% reduction in car traffic and a 17% reduction in LGV traffic along Skene Square compared to the 'Reference' case. Therefore, in absolute terms, the reduction in traffic and increase in compliant traffic will result in a decrease in NO<sub>x</sub> emissions and therefore a reduction in annual average NO<sub>2</sub> concentrations along these roads. This will be examined further in future AQ modelling to ensure compliance within these streets. The two charts in Figure 14 show the corresponding reduction in NO<sub>x</sub> emission rates at these locations in the LEZ scenario when compared to the 'Reference' case. Denburn Road was included within the LEZ boundary to minimise the potential for large numbers of non-compliant vehicles to travel north along Skene Square.

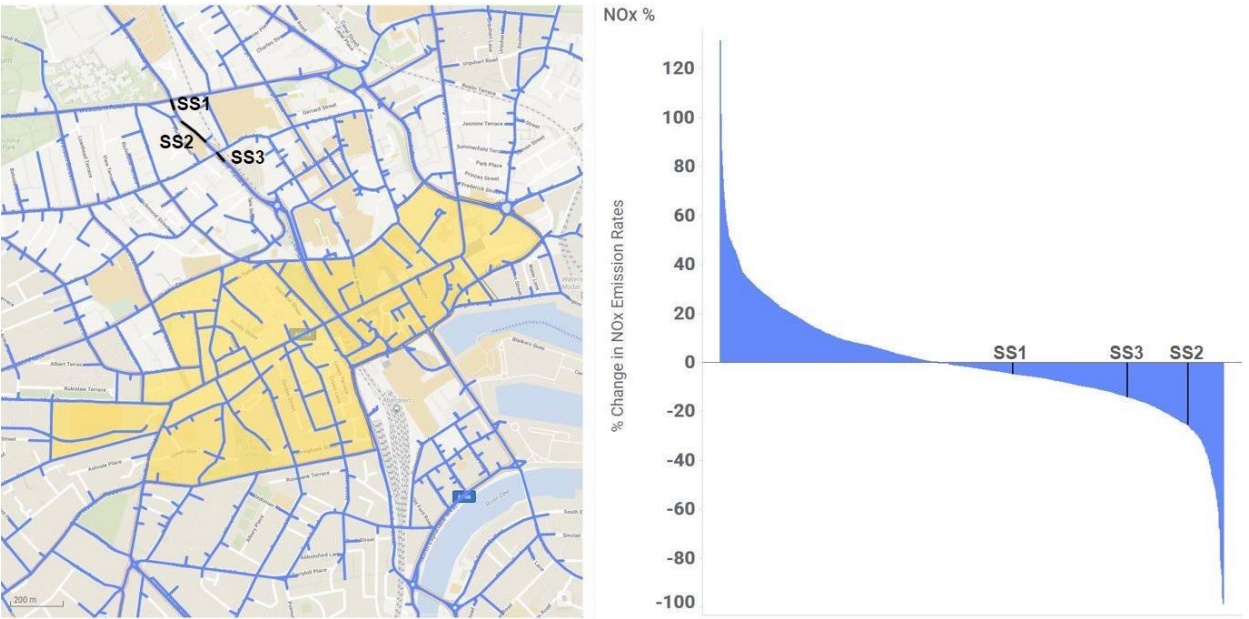


Figure 13. The highlighted sections of Skene Square (SS1 to SS3) (DB) see up to a 25% reduction in NO<sub>x</sub> emissions. The extent of the LEZ is shown in yellow.

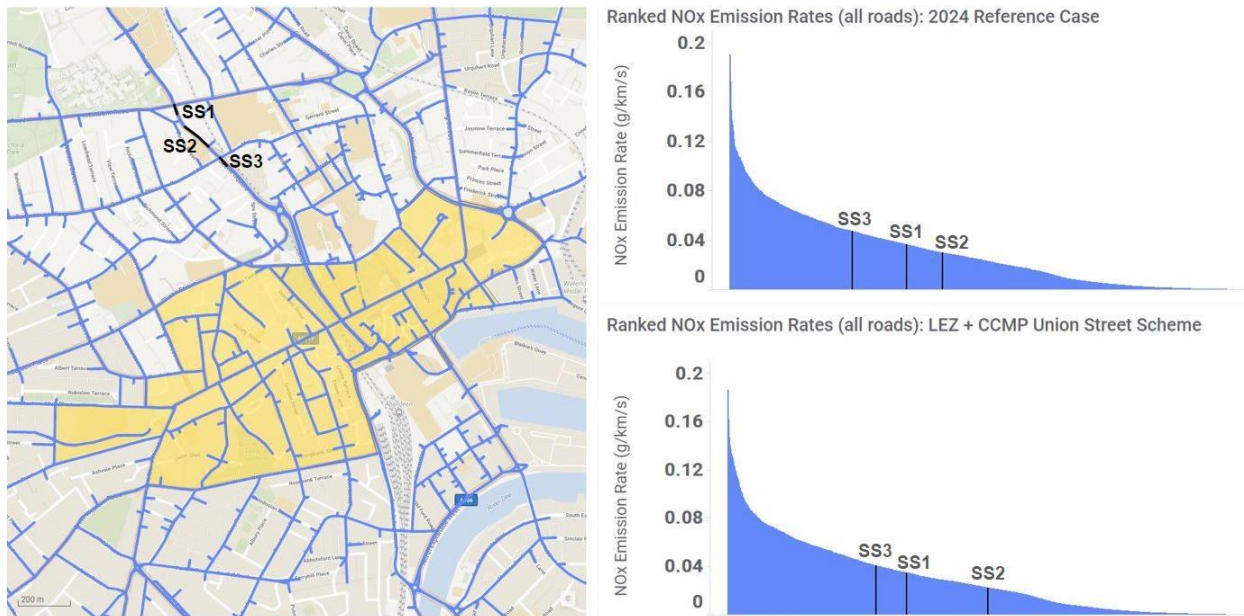


Figure 14. The charts on the right show the NO<sub>x</sub> emission rates on all roads in the traffic model for the 'Reference' case (top) and LEZ scenario (bottom). The reductions in NO<sub>x</sub> emission rates on Skene Square (SS1 to SS3) are highlighted in black. The extent of the LEZ is shown in yellow.

### *Ferryhill Area*

The change in NO<sub>x</sub> emissions for a selection of roads in the Ferryhill area to the south of the proposed LEZ are highlighted in black in Figure 15. Wellington Place is included within the proposed boundary and Ferryhill Road and Millburn Street are both located outside the boundary. The sections of Wellington Place (WP) and Ferryhill Road (FH) show increases in NO<sub>x</sub> emissions of 37% and 21% respectively whilst Millburn Street shows a reduction in NO<sub>x</sub> emissions of 26%. The traffic modelling and emissions analysis suggests that this increase is due to a large number of additional compliant vehicles; 4485 cars and 358 LGVs using this route each day compared to the flows in the Reference case.

The two charts in Figure 16 show the corresponding reduction in NO<sub>x</sub> emission rates at these locations in the LEZ scenario when compared to the 'Reference' case.

In AQ modelling carried out earlier in the NMF process annual average NO<sub>2</sub> concentrations of 32µg<sub>m</sub><sup>-3</sup> (ranging between 29µg<sub>m</sub><sup>-3</sup> and 37µg<sub>m</sub><sup>-3</sup>) were predicted on Wellington Place and concentrations of 29µg<sub>m</sub><sup>-3</sup> (ranging between 28µg<sub>m</sub><sup>-3</sup> and 31µg<sub>m</sub><sup>-3</sup>) were predicted on Millburn Street. We will undertake further AQ modelling to ensure continual compliance within these streets.

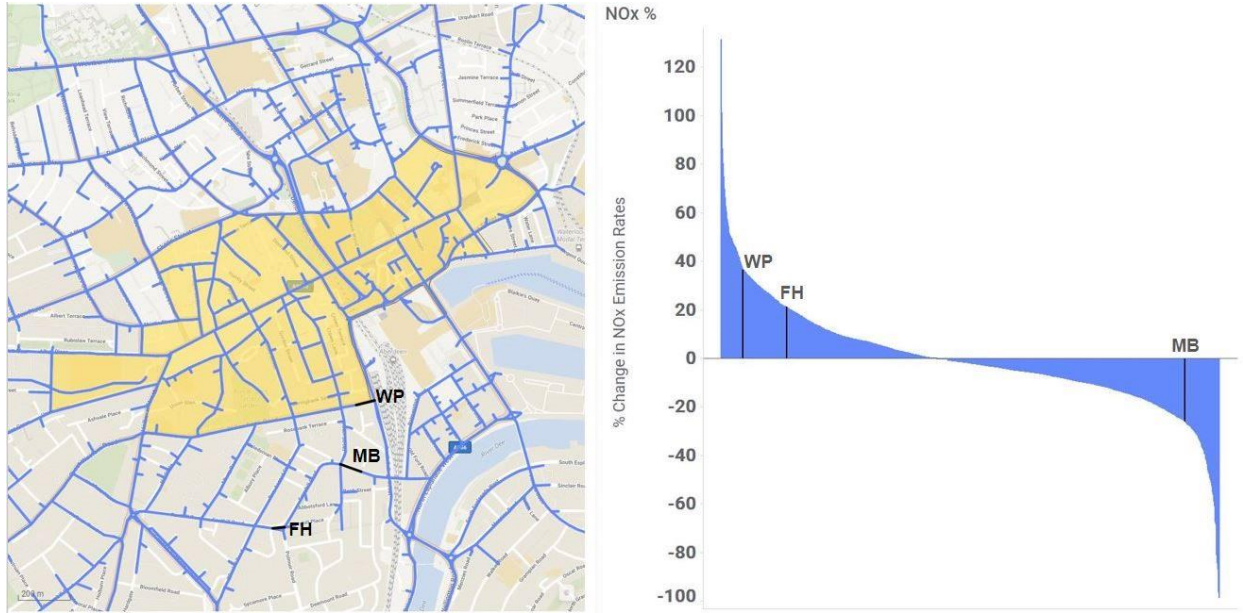


Figure 15. The highlighted sections of Wellington Place (WP), Ferryhill Road (FH) and Millburn Street (MB) to the south of the proposed LEZ show both positive and negative changes in NO<sub>x</sub> emissions. The extent of the LEZ is shown in yellow.

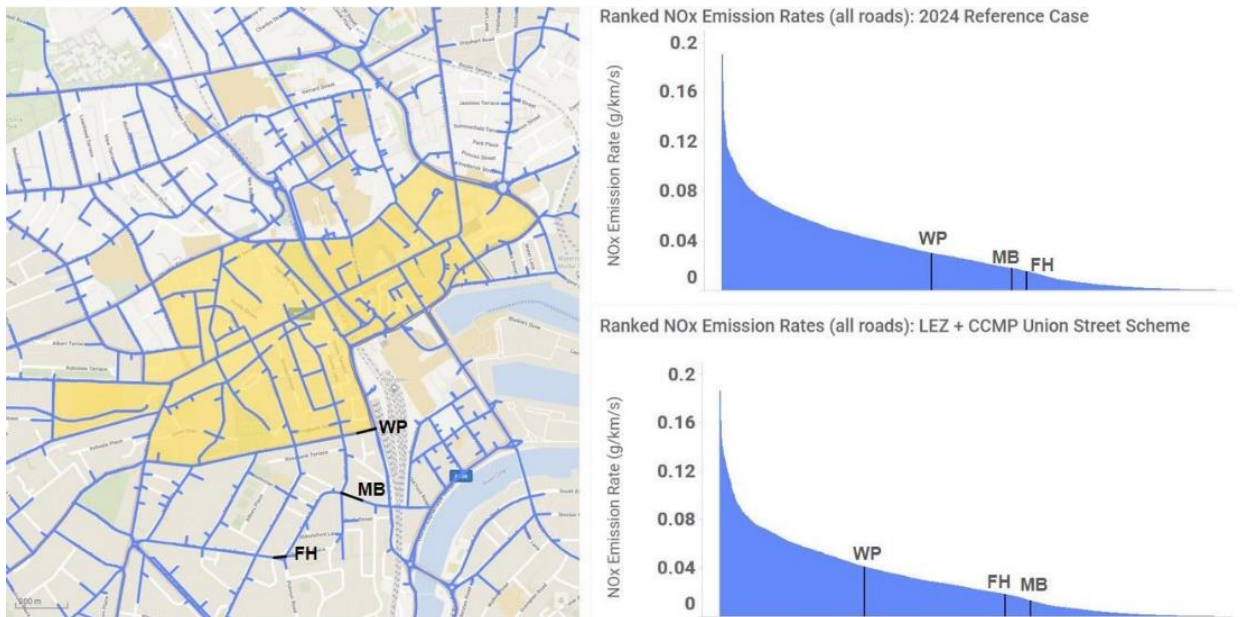


Figure 16. The charts on the right show the NO<sub>x</sub> emission rates on all roads in the traffic model for the 'Reference' case (top) and LEZ scenario (bottom). The change in NO<sub>x</sub> emission rates on Wellington Place (WP), Ferryhill Road (FH) and Millburn Street (MB) to the south of the proposed LEZ are highlighted in black. The extent of the LEZ is shown in yellow.

*Rosemount Place*

Increases in NO<sub>x</sub> emission rates of over 40% occur along Rosemount Place, Maberly Street and Spring Garden (Figures 17 and 18). An increase in NO<sub>x</sub> emission rates of 61% occurs along a stretch of Rosemount Place. Smaller increases in absolute NO<sub>x</sub> emission rates occur along Maberly Street and Spring Garden.

In AQ modelling carried out earlier in the NMF process annual average NO<sub>2</sub> concentrations of 34µgm<sup>-3</sup> (ranging between 28µgm<sup>-3</sup> and 40µgm<sup>-3</sup>) were predicted at kerbside along these roads. The Council recorded that observed NO<sub>2</sub> concentrations were well below the 40µgm<sup>-3</sup> objective (24µgm<sup>-3</sup> and 30µgm<sup>-3</sup>) on Rosemount Place for 2019. Therefore, in absolute terms, the increases in NO<sub>x</sub> emissions are not expected to take them above the 40µgm<sup>-3</sup> objective. This will be examined further in future AQ modelling.

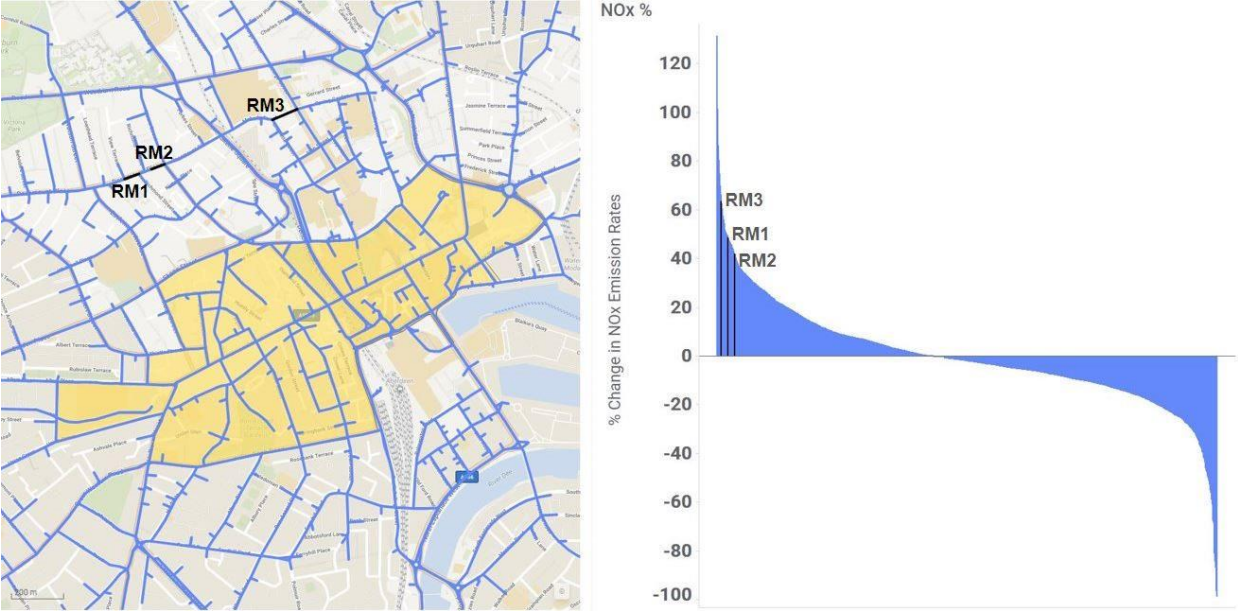


Figure 17. The highlighted sections of Rosemount Place (RM1 to RM3) to the north of the proposed LEZ show positive changes in NO<sub>x</sub> emissions. The extent of the LEZ is shown in yellow.

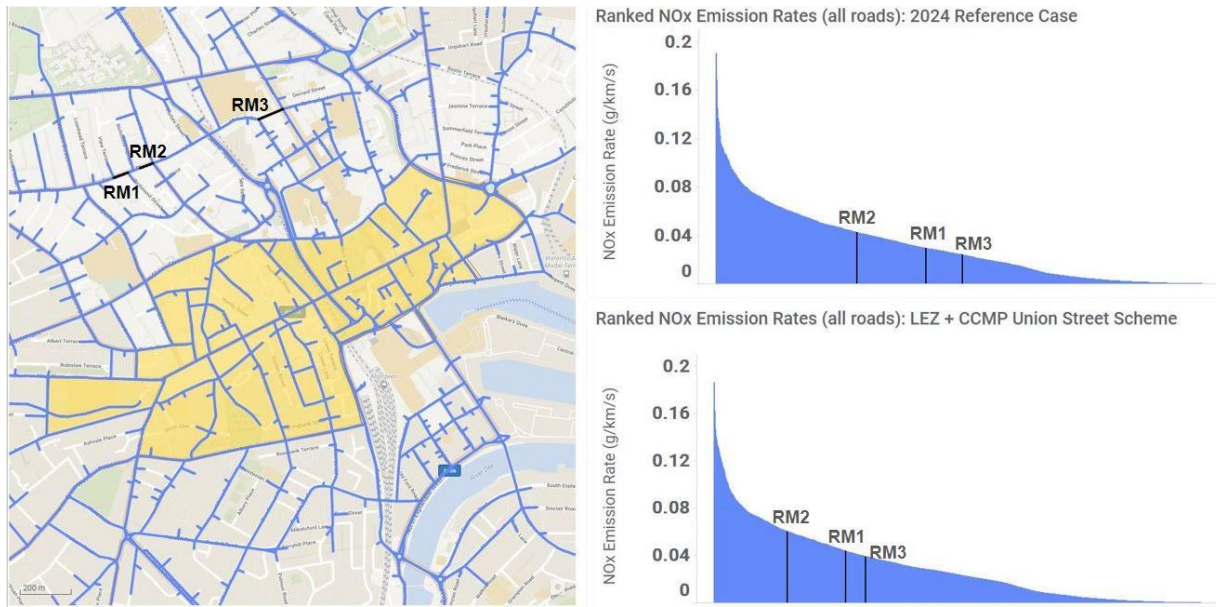


Figure 18. The charts on the right show the NO<sub>x</sub> emission rates on all roads in the traffic model for the 'Reference' case (top) and LEZ scenario (bottom). The change in NO<sub>x</sub> emission rates on Rosemount Place (RM1 to RM3) to the north of the proposed LEZ are highlighted in black. The extent of the LEZ is shown in yellow.

### Anderson Drive AQMA

Increases in NO<sub>x</sub> emission rates of over 40% occur along some sections of Anderson Drive between Garthdee Roundabout and Kings Gate (Figure 19). Car and LGV flows increase by up to 17% (an additional 4200 cars) and 41% (an additional 1200 LGVs) per day respectively on some of the sections. Similarly, Rigid HGV and Articulated HGV flows increase by up to 17% (100 vehicles) and 22% (76 vehicles) per day respectively. The two charts in Figure 20 show the corresponding reduction in NO<sub>x</sub> emission rates at these locations in the LEZ scenario when compared to the 'Reference' case.

The increases are along roads that were predicted to be below the 40µg<sub>m</sub><sup>-3</sup> objective in previous AQ modelling. In 2019 the annual average NO<sub>2</sub> concentration measured at the automatic monitor on Anderson Drive was 17µg<sub>m</sub><sup>-3</sup> and the two diffusion tubes located nearby measured annual average NO<sub>2</sub> concentrations of 24µg<sub>m</sub><sup>-3</sup> and 48µg<sub>m</sub><sup>-3</sup> respectively. AQ model predictions highlighted that the vast majority of kerbside points were below the objective value of 40µg<sub>m</sub><sup>-3</sup> along this section of Anderson Drive was 32µg<sub>m</sub><sup>-3</sup> (ranging between 25µg<sub>m</sub><sup>-3</sup> and 40µg<sub>m</sub><sup>-3</sup>). It is not expected that NO<sub>2</sub> concentrations will increase above the 40µg<sub>m</sub><sup>-3</sup> objective. However, further AQ modelling will assess for continued compliance against the objective.



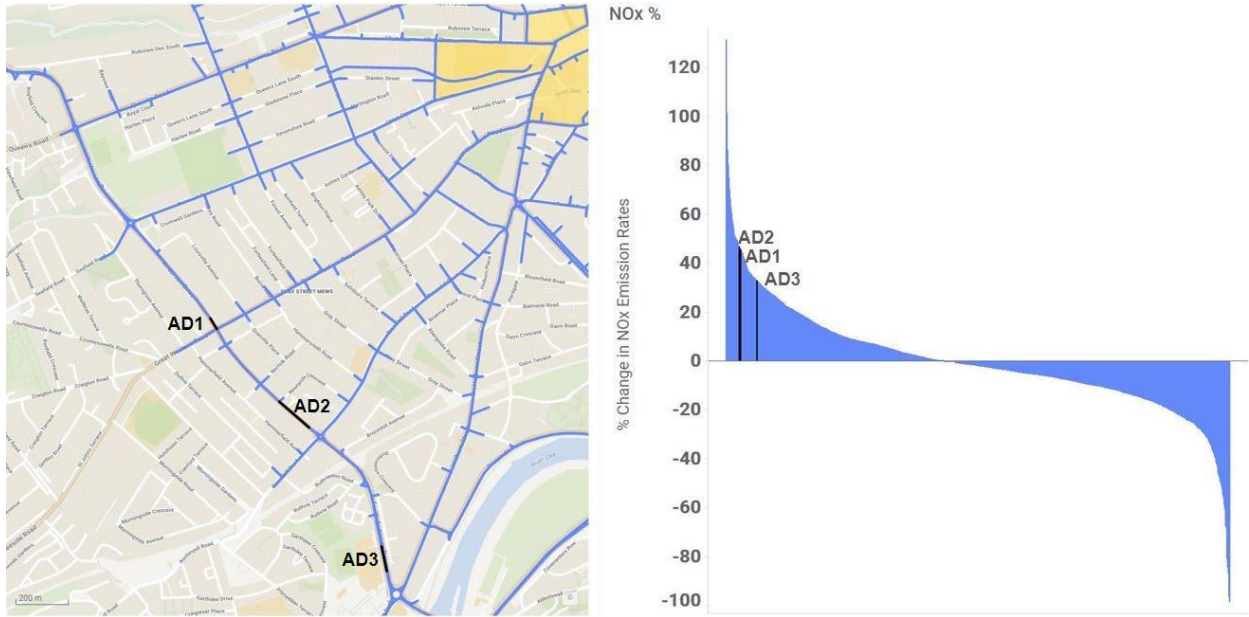


Figure 19. The highlighted sections of Anderson Drive (AD1 to AD3) to the north of the proposed LEZ show positive changes in NO<sub>x</sub> emissions. The LEZ is shown in yellow.

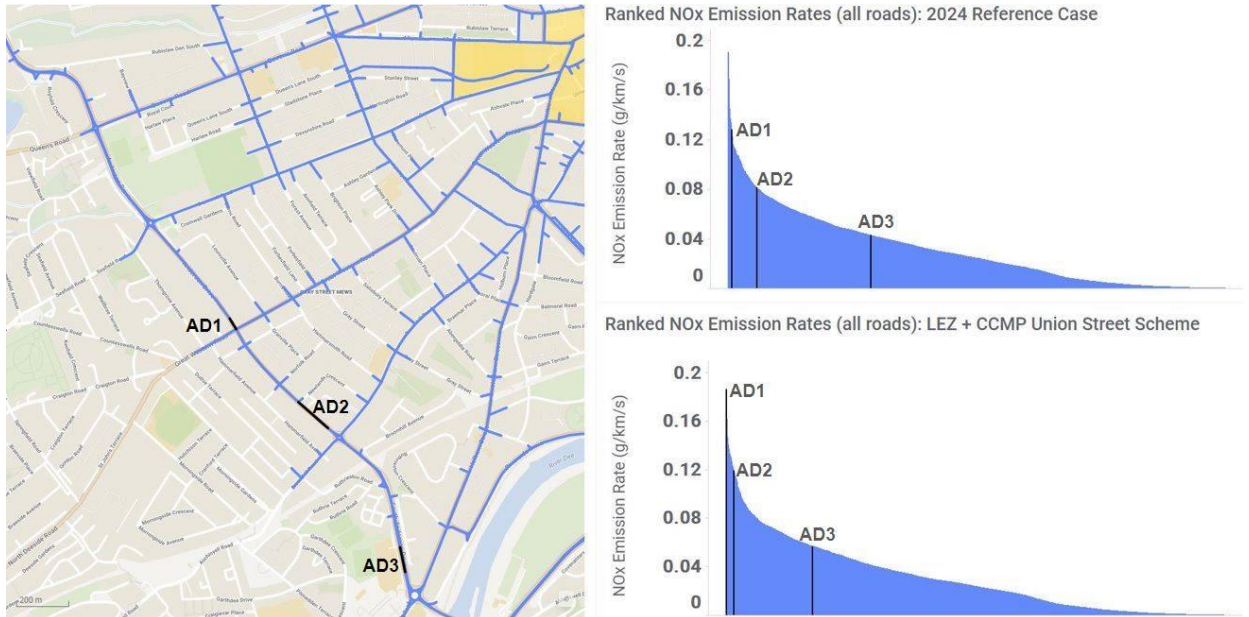


Figure 20. The charts on the right show the NO<sub>x</sub> emission rates on all roads in the traffic model for the 'Reference' case (top) and LEZ scenario (bottom). The change in NO<sub>x</sub> emission rates on Anderson Drive (AD1 to AD3) are highlighted in black. The extent of the LEZ is shown in yellow.

## Wellington Road AQMA

On Wellington Road there is a slight change in traffic flows. However the NO<sub>x</sub> emissions show a general reduction which will have a positive effect upon kerbside annual average NO<sub>2</sub> concentrations (Figure 21).

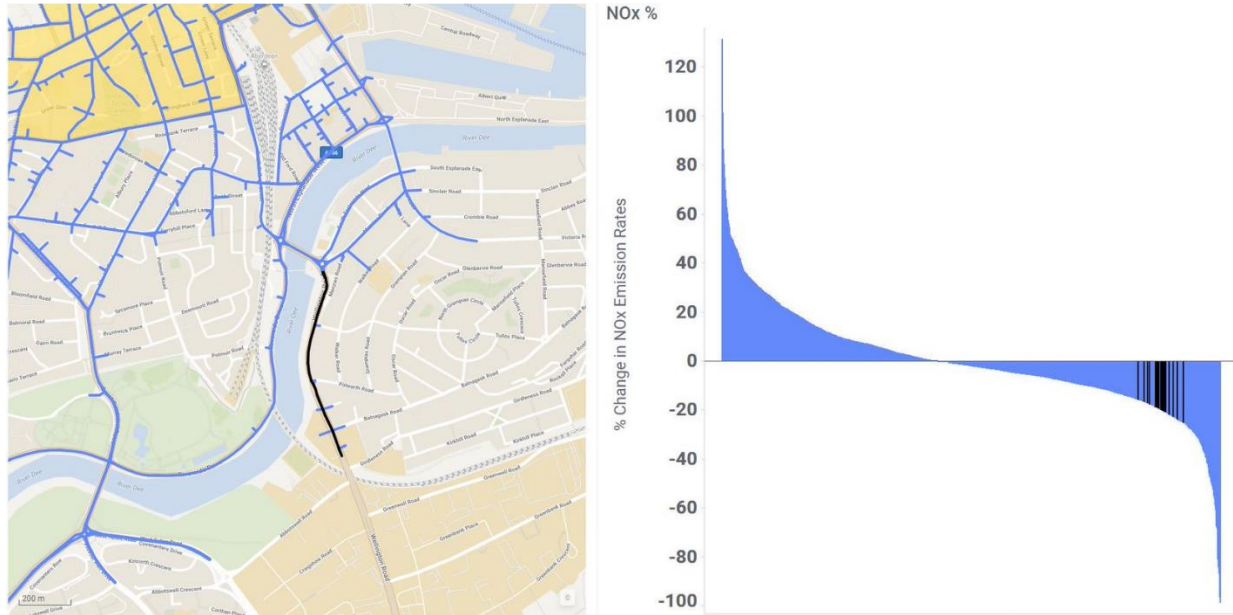


Figure 21. The highlighted sections of Wellington Road to the south of the proposed LEZ show positive changes in NO<sub>x</sub> emissions. The LEZ is shown in yellow.

## Next Steps

The next stage of the analysis will be to process the traffic model outputs for the 2019 Base case. The predicted emission rates for the Base case along with the 2024 'Reference' case and LEZ + CCMP Union Street Scheme scenario described above will form the input for the AQ model to predict kerbside concentrations for each scenario.

Emission rates on each of the traffic model links will be mapped onto the larger air-quality model links. The area covered by the traffic model overlaps the area covered by the AQ model so the roads that have seen increases in traffic flows and emission rates will be covered in the AQ modelling. The results of this modelling will be visualised in a series of interactive maps and charts and made available to the Aberdeen City Council. Specific areas could be modelled in more detail if required. Additional traffic data collection will be necessary to monitor the performance of the LEZ + CCMP Union Street Scheme in the future.

## ABERDEEN CITY COUNCIL

<b>COMMITTEE</b>	City Growth and Resources
<b>DATE</b>	24 <sup>th</sup> June 2021
<b>EXEMPT</b>	No
<b>CONFIDENTIAL</b>	No
<b>REPORT TITLE</b>	Update on Spaces for People Interventions
<b>REPORT NUMBER</b>	COM/21/154
<b>DIRECTOR</b>	Steve Whyte
<b>CHIEF OFFICER</b>	Gale Beattie
<b>REPORT AUTHOR</b>	David Dunne
<b>TERMS OF REFERENCE</b>	3.2

### 1. PURPOSE OF REPORT

- 1.1 The purpose of this report is to set out the current situation with respect to COVID-19 pandemic and to make recommendations in relation to the current Spaces for People interventions.

### 2. RECOMMENDATION(S)

It is recommended that the Committee:-

- 2.1 Note the outcomes of the survey work and data collection done to date, but that due to lockdown restrictions remaining in place until recently (16<sup>th</sup> of April for Level 3 and 17<sup>th</sup> of May Level 2) only limited data was available by the committee report deadline;
- 2.2 Note that the data collection has continued to show increased levels of pedestrians and cyclists using recreational routes and recreational destinations;
- 2.3 Note the recommendations from the Director of Public Health for NHS Grampian that due to the improved public health position and significant vaccination coverage that once the city moves to Level 0 of the Scottish Government's route map, that NHS Grampian would support the phasing out of the neighbourhood interventions at Rosemount, Torry and George Street;
- 2.4 Note that research is being undertaken by the Scottish Government into the need to maintain physical distancing which is expected to report later in the summer;
- 2.5 Note continued support from both Police Scotland and Scottish Fire and Rescue in relation to the interventions, in particular that council officers continue to work with the emergency services to ensure that the interventions do not impact on their service provision;
- 2.6 Note the instructions from City Growth and Resources in relation to the City Centre Masterplan reviews, the BHS and Market Buildings proposals as well as their relationship with Spaces for People measures, and that these are due to be reported to City Growth and Resources Committee in August;

- 2.7 Note the recommendations of the Low Emission Zone report, presented to this committee;
- 2.8 Instruct the Chief Officers of Strategic Place Planning, Capital and Operations and Protective Services that in the context of the above to maintain the current interventions at this time but after the city moves to Level 0 that work commences on removal of the neighbourhood interventions; and
- 2.9 Instruct the Chief Officers of Capital and Operations and Protective Services following consultation with the convener of City Growth and Resources, to agree the sequencing of the removals based on the timetable provided below, that timetable being three weeks to initiate works post instruction, and approximately 13 weeks to remove the interventions.

### **3. BACKGROUND**

- 3.1 At City Growth & Resources Committee on the 11<sup>th</sup> of May 2021 a range of reports and committee instructions were issued to officers to undertake a number of new projects and reviews, focusing on short, medium, and longer-term recovery. The first of these and the genesis of this report, comes from an instruction to the Socio-Economic Rescue Plan. This instruction however must be read in conjunction with a series of other instructions at that same committee which related to projects which overlap with some of the Spaces for People interventions, particularly those in the City Centre. This first instruction sought a report setting out a timetable for the removal of the Spaces for People interventions but taking into consideration the following instructions and decision from that committee.

#### **Socio-Economic Rescue Plan Final Update - COM/21/099**

- (ii) *to note the timetable as set out by the Scottish Government in relation to Covid-19 Protection Levels. Notes that by the 7 June 2021, Aberdeen is on track to be level one and an announcement is to be made by the Scottish Government regarding level 0. Therefore, instructs Chief Officer - Strategic Place Planning in consultation with Public Health Scotland to bring forward a report on the timetable for removal of the Spaces for People initiatives to the next Committee in June taking into consideration any decisions made by this Committee in respect of the City Centre Masterplan and associated reports;*
- 3.2 The next instructions come out of a report on the proposed review of the City Centre Masterplan. These require reports to be brought back to City Growth and Resources in August on a range of proposals including:-
  - Objectives and Workstreams from the CCMP,
  - to undertake a consultation on the CCMP integrating smart city thinking and in particular considering changes travel patterns,
  - to undertake a visioning exercise on the streetscape and infrastructure for Union Street which is currently closed,

#### **City Centre Masterplan Review - RES/21/115**

- (ii) *instruct the Director of Resources to carry out a review of the Aberdeen City Centre Master plan Objectives and their associated workstreams as contained within the 2015 approved Masterplan and to report back findings to the City Growth and Resources Committee on 10 August 2021 and also to report back on the Phase 1 and 2 projects contained within the city centre masterplan as approved in 2015;*
- (iii) *instruct the Chief Officer - City Growth and the Communication and Marketing Manager to use the CCMP Review to integrate further “smart city thinking” into our medium-term plans to develop and undertake engagement exercise with the public, all appropriate partners and stakeholders to seek their views on the City Centre Review, what it would take to attract them back to the city centre in the short-term, how the changed travel patterns and reductions in Committee in August 2021, as part of the CCMP report detailing how best the city can be a leader in the digital economy;*
- (iv) *instruct Chief Officer - City Growth to use the CCMP review and the Local Development Plan to ensure that the ambition to secure sustainable inclusive economic growth by attracting businesses operating in energy transition or low carbon sectors to the city is realised;*
- (viii) *notwithstanding any decision taken by Committee in respect of item 12.2 on the agenda, agrees to instruct the Director of Resources to carry out a review and visioning exercise on the streetscape and infrastructure works for the whole length of Union Street and to report back the outcomes to the August 2021 Committee; and*
- (ix) *instruct the Chief Officer - Strategic Place Planning to review the City Centre Living Strategy and informed by the CCMP review bring forward Aberdeen Planning Guidance to support the City Centre in line with the Local Development Plan*

3.3 The final instruction came out of a report on Aberdeen Market and the central section of Union Street. This instruction requires a separate focused visioning exercise on the central section of Union Street which is currently closed to traffic.

#### **Aberdeen Market and Union Street Central - RES/21/127**

- (v) *to agree the review and visioning of the central section of Union Street, including stakeholder consultation, and instruct the Director of Resources to report the outcomes to City Growth and Resources Committee in August 2021; and*

#### **CONTEXT**

##### **National Context**

3.4 Since the last report to City Growth and Resources in February a number of changes have taken place. Scotland moved to Level 3, of the Scottish Government’s COVID Route Map on the 16<sup>th</sup> of April, Level 2 on the 17<sup>th</sup> of May and Level 1 on 5<sup>th</sup> of June. A number of areas remained in Level 2 at that time

because of levels of infection. The higher rates of infection were also compounded by the introduction of a new variant B.1.617.2 commonly referred to as the Delta variant, and referred to by the Scottish Government as the April-02 variant. This variant which has been implicated in the surge in Glasgow is believed to be around 20-60% more transmissible than the previous dominant Kent strain.

- 3.5 In terms of next steps the Scottish Government moved Aberdeen to Level 1 on the 5<sup>th</sup> of June. After that it is hoped that Scotland can move to Level 0, however the original date of the 28<sup>th</sup> of June may be pushed back by the Scottish Government.
- 3.6 Once Scotland has moved to Level 0 the Scottish Government has committed to review the need to maintain physical distancing measures. The first route map states that this will be later in the summer but again no detail has been provided at this time.
- 3.7 Spaces for People at National Level.  
Discussions with Transport Scotland and Sustrans have not identified the removal of Spaces for People interventions across any of the Scottish Cities. Indeed in Glasgow and Edinburgh a number of schemes continue to be rolled out. It should be noted however that Aberdeenshire have removed of some interventions in their towns.

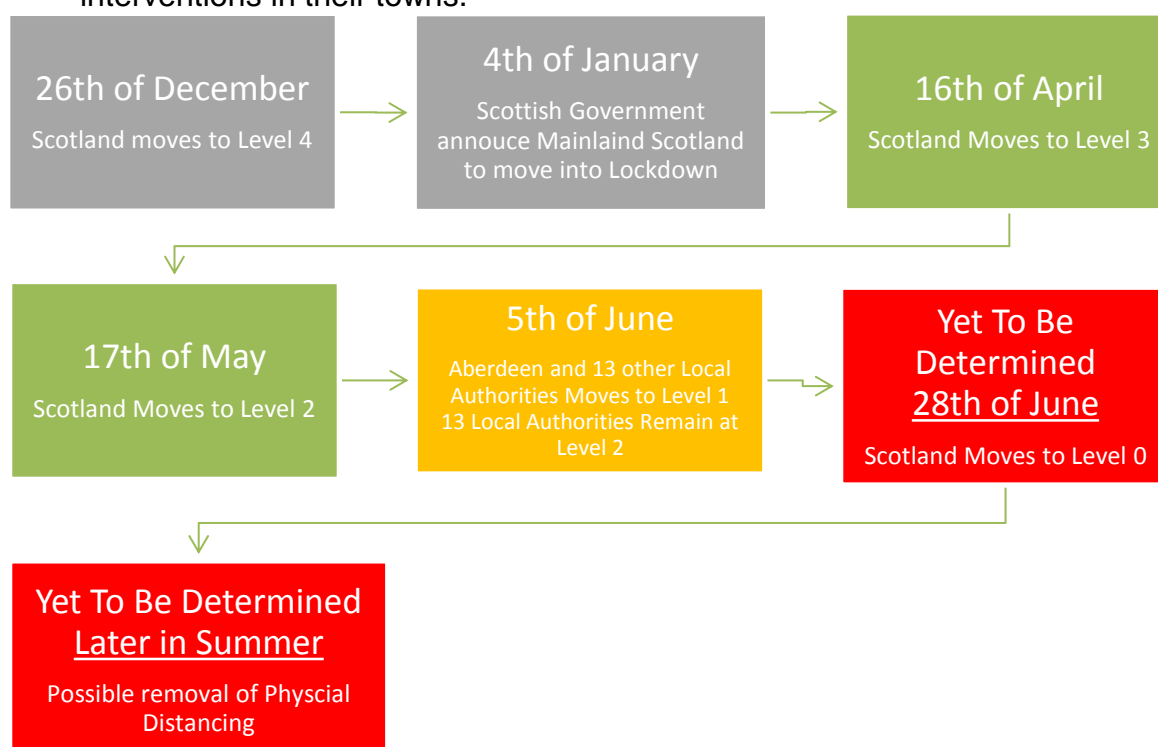


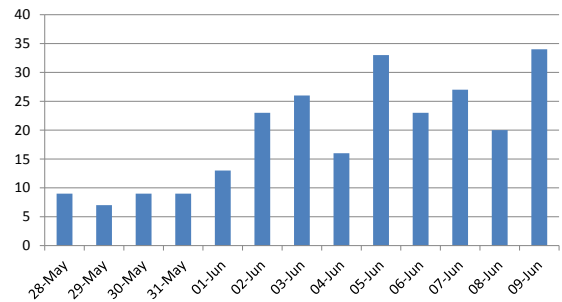
Fig 1 Timeline since the last Committee.

**Public Health – Appendix 2 has an update on this data**

**3.8 Current Position in Grampian and Aberdeen City**

The number of daily cases as of the 9<sup>th</sup> of June has risen to 34 per day from a level of 9 a day at the end of May. This is reflective of the impact of the Delta variant as seen elsewhere across the Scotland. While Aberdeen still remains in a better position than many areas, the trend is nevertheless moving in the wrong direction.

Daily Grampian Covid-19 cases



7 day positive cases in Aberdeen City based on people tested between May 24, 2021 and May 30, 2021

7 day positive cases	7 day positive rate per 100,000 population	7 day test positivity rate
<b>36</b>	<b>15.7</b>	<b>0.7%</b>

7 day positive rate per 100,000 population

\* For neighbourhoods with fewer than 3 cases, we do not show a 7 day rate to protect patient confidentiality.

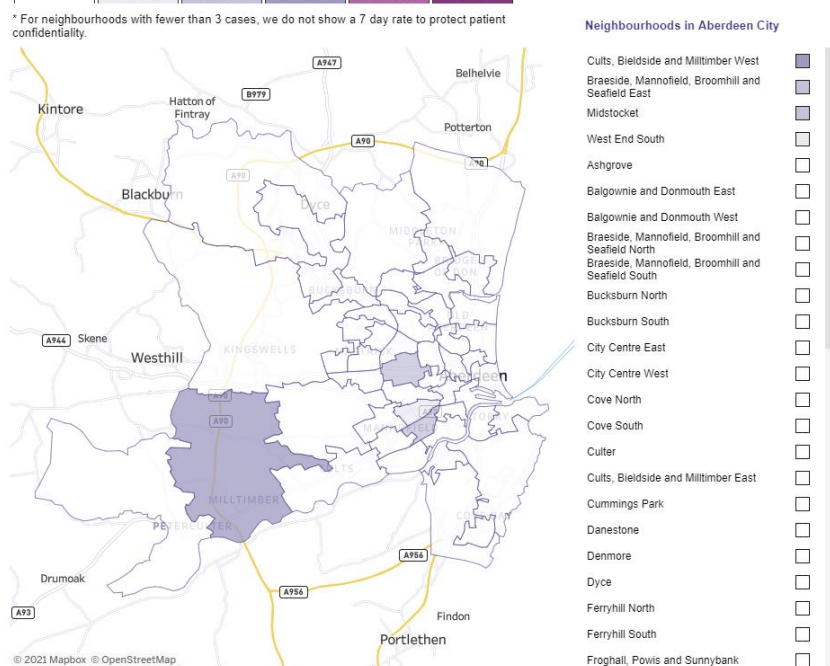


Fig 2. Aberdeen City Infection Rate 24-30<sup>th</sup> of May versus 5-11<sup>th</sup> June.

7 day positive cases in Aberdeen City based on people tested between June 5, 2021 and June 11, 2021

7 day positive cases	7 day positive rate per 100,000 population	7 day test positivity rate
<b>156</b>	<b>68.2</b>	<b>2.4%</b>

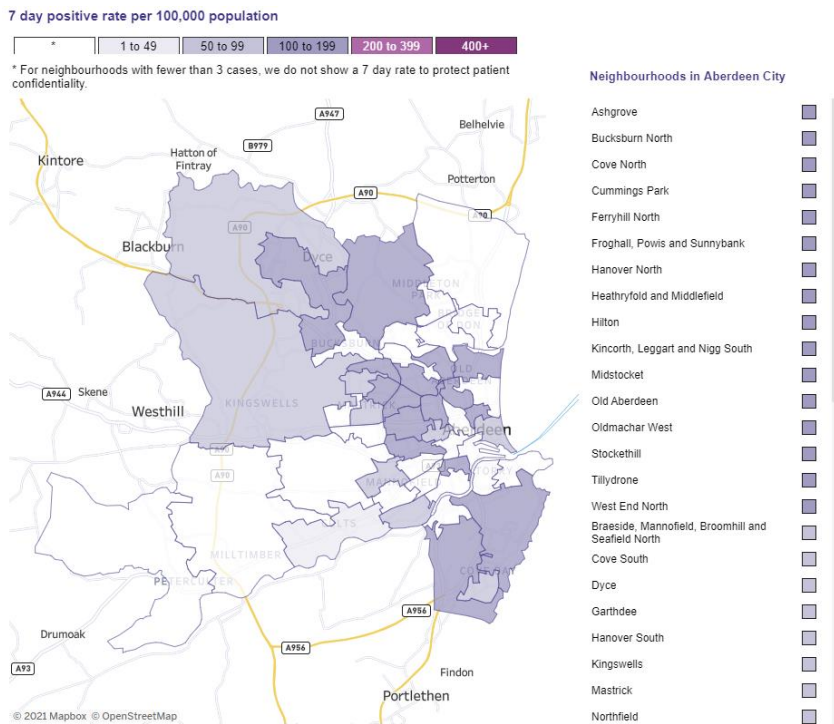


Fig 2(a). Aberdeen City Infection Rate 24-30<sup>th</sup> of May versus 5-11<sup>th</sup> June.

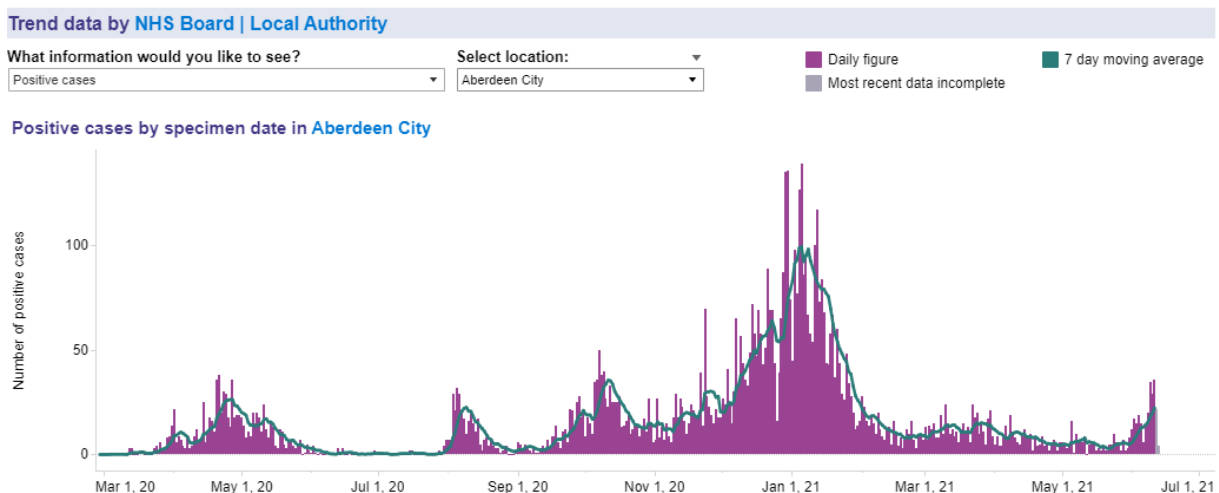


Fig 3. Aberdeen City Infection Rate.

### 3.9 *New Variant, Guidance and Advice*

The new Delta variant of COVID19 is thought to be approximately 60% more transmissible than the original virus and now represents 80% of the cases in Grampian. This is of particular concern as the vaccine, while still effective against this variant, is far more reliant on the second dose.

Emerging evidence also suggests that the Delta variant may be associated with higher rates of hospitalisation.

### 3.10 *Vaccinations*

As of the 21<sup>st</sup> of May, more than 120,000 residents of Aberdeen City had their first dose, representing about (63.5%) with more than 68,000 or (35.9%), being fully vaccinated with their second dose.



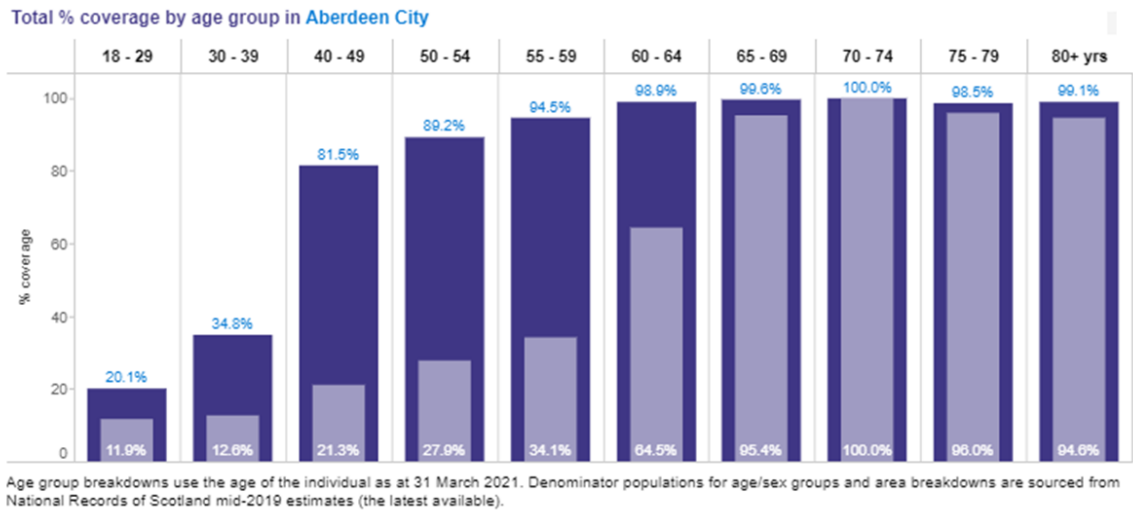


Fig 4. Vaccination Rates.

### 3.11 Government Advice

The Scottish Governments advice remains largely the same, that being outwith lockdown people should:-

- wear a face covering
- avoid crowded places
- clean hands and surfaces regularly
- stay 2m away from other people
- self-isolate and book a test if you have COVID-19 symptoms (new continuous cough, fever or loss of, or change in, sense of smell or taste)
- work from home if possible

More recently the guidance has been broadened to encourage people to take home tests (lateral flow tests) and if this shows a positive result to self isolate and book PCR test.

**Avoid the Three Cs**  
Be aware of different levels of risk in different settings.

World Health Organization  
Western Pacific Region

There are certain places where COVID-19 spreads more easily:

- 1 Crowded places**  
with many people nearby
- 2 Close-contact settings**  
Especially where people have close-range conversations
- 3 Confined and enclosed spaces**  
with poor ventilation

The risk is higher in places where these factors overlap.  
Even as restrictions are lifted, consider where you are going and #StaySafe by avoiding the Three Cs.

**WHAT SHOULD YOU DO?**

- Avoid crowded places and limit time in enclosed spaces.
- Maintain at least 1m distance from others.
- When possible, open windows and doors for ventilation.
- Keep hands clean and cover coughs and sneezes.
- Wear a mask if requested or if physical distancing is not possible.

If you are unwell, stay home unless to seek urgent medical care.

## ONGOING CONSULTATION AND SUPPORT FOR THE PUBLIC, AND BUSINESSES

### Cross Service Support – Guidance for Businesses.

3.12 The cross service group set up to support business at the start of the pandemic has continued to work with business across the city in line with Scottish Government and Chief Planners guidance. This group includes officers from Environmental Health and Trading Standards, Planning, Building Standards, Licensing and Comms, and engages with Police and Emergency Services as necessary.

To date this group has dealt with:-

- Over 100 proposals from businesses for outdoor seating, the majority being independent traders, cafes, restaurants and bars.
- 25 businesses have been in contact about Marquee's.
- Environmental Health and Trading Standards have also provided guidance to businesses that are in operation, in 4,328 cases, reflecting the complex and changing nature of the guidance, and the need to continue to support businesses.
- The *Guide for Businesses on Physical Distancing*, continues to be updated with the last version published in November, it can be found [here](#).
- Additional Guidance on outdoor seating and the use of heaters over the winter has been provided. They can be found [here](#) and [here](#)

3.13 Figure 4 and 5 show the support from Environmental Health and Trading Standards plotted over the year.

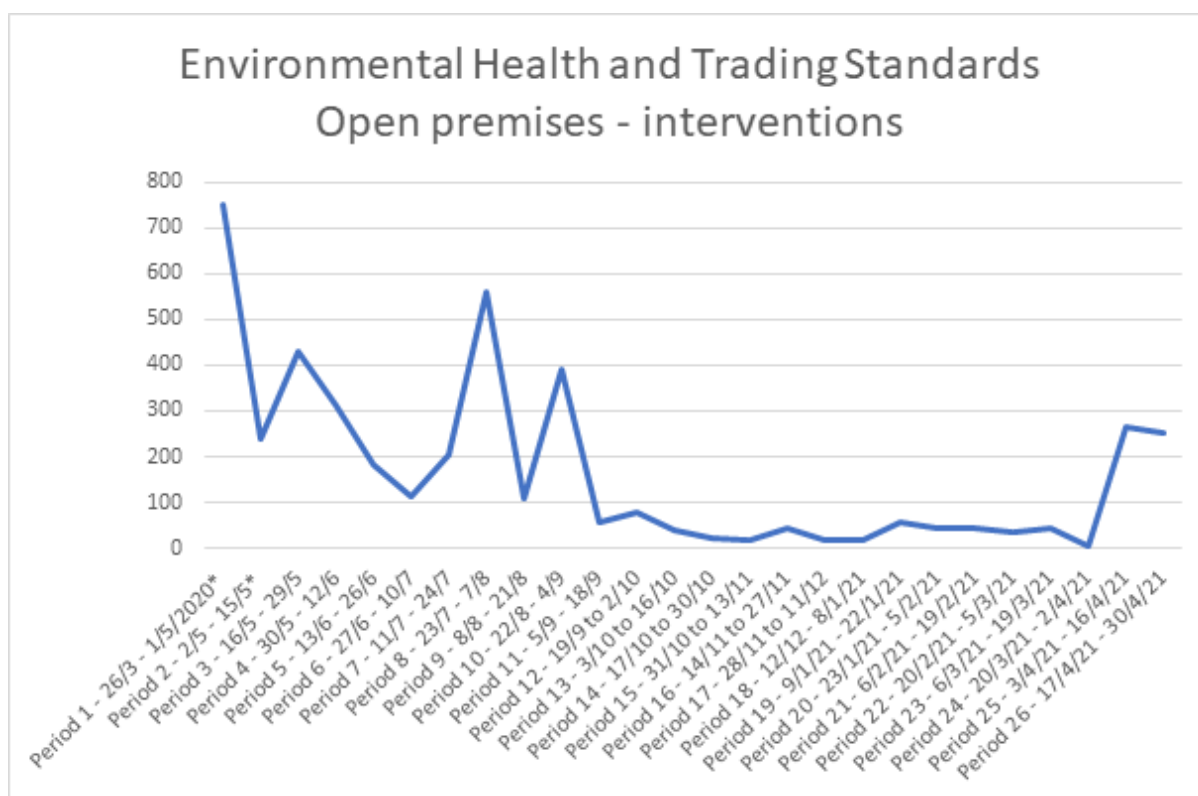


Fig 5. Interventions to provide advice to business on operating in compliance with guidance.

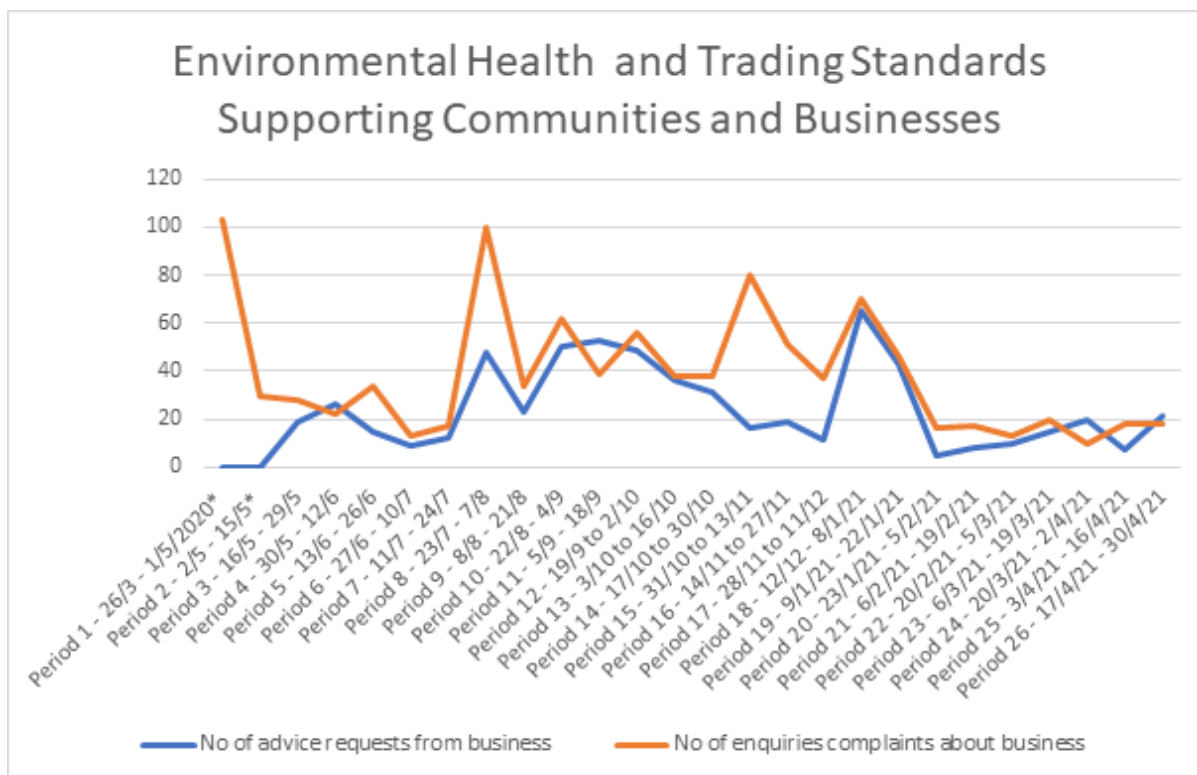


Fig 6. Advice Request from Businesses and Public Enquiries or Complaints about businesses.

3.14 Guidance for the public is also updated where necessary and kept live on the website. This includes:-

- A Physical Distancing Leaflet setting out help and guidance to people on how to stay safe, [here](#).
- A map showing Blue Badge Parking spaces, [here](#).
- A map showing Taxi Rank locations, [here](#).
- A map showing Bus Stop Locations, [here](#).
- A map showing City Centre School drop off and pick up points, [here](#).

### Consultation with Stakeholders

3.15 Consultation continues on a regular basis with stakeholders and there are regular meetings with:-

- Bus operators – A regular specific meeting to discuss technical issues on the network. This is held between all the relevant transport officers in the council and the bus operators.
- Transport user and operators’ group – This includes the Disability Equity Partnership, Cycle Groups and the Bus Operators.
- Taxi operators.
- Business groups.

## SURVEY AND DATA COLLECTION

### Overarching Trends

- 3.16 As noted in the last report and carried forward into this report the changes to restrictions have had a significant impact on travel patterns and these have been reflected in the survey data collected. The challenge that this presents is that periods of lockdown, such as that experienced in the run up to this report are not a fair representation of what a post lockdown travel patterns might look like. That said a number of trends are becoming clear looking at the data over the last two years. It is also notable that during the most recent lockdown levels of travel across all modes did not drop back as much as during the first lockdown.

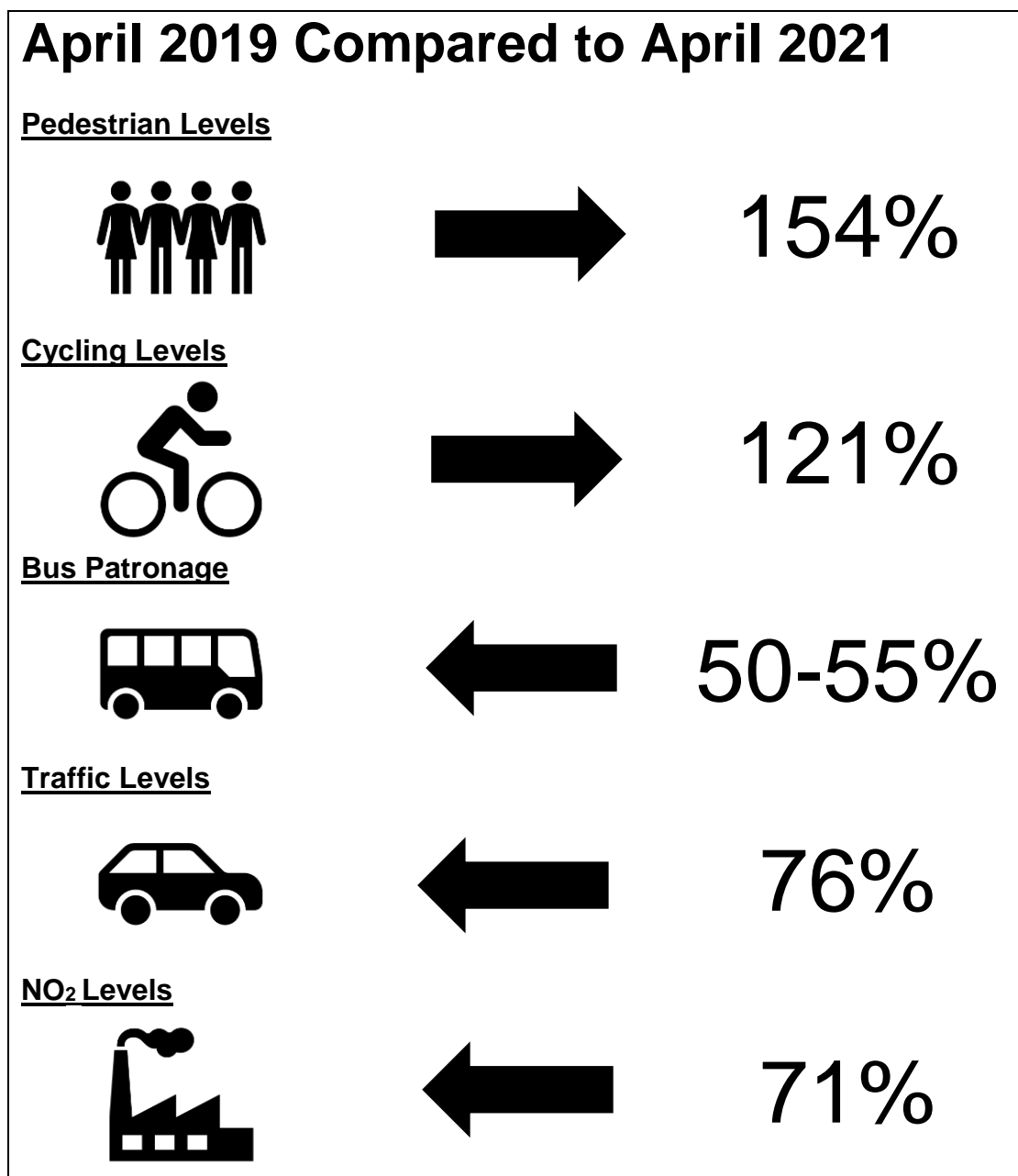


Fig 7. City Wide Transport Figures.

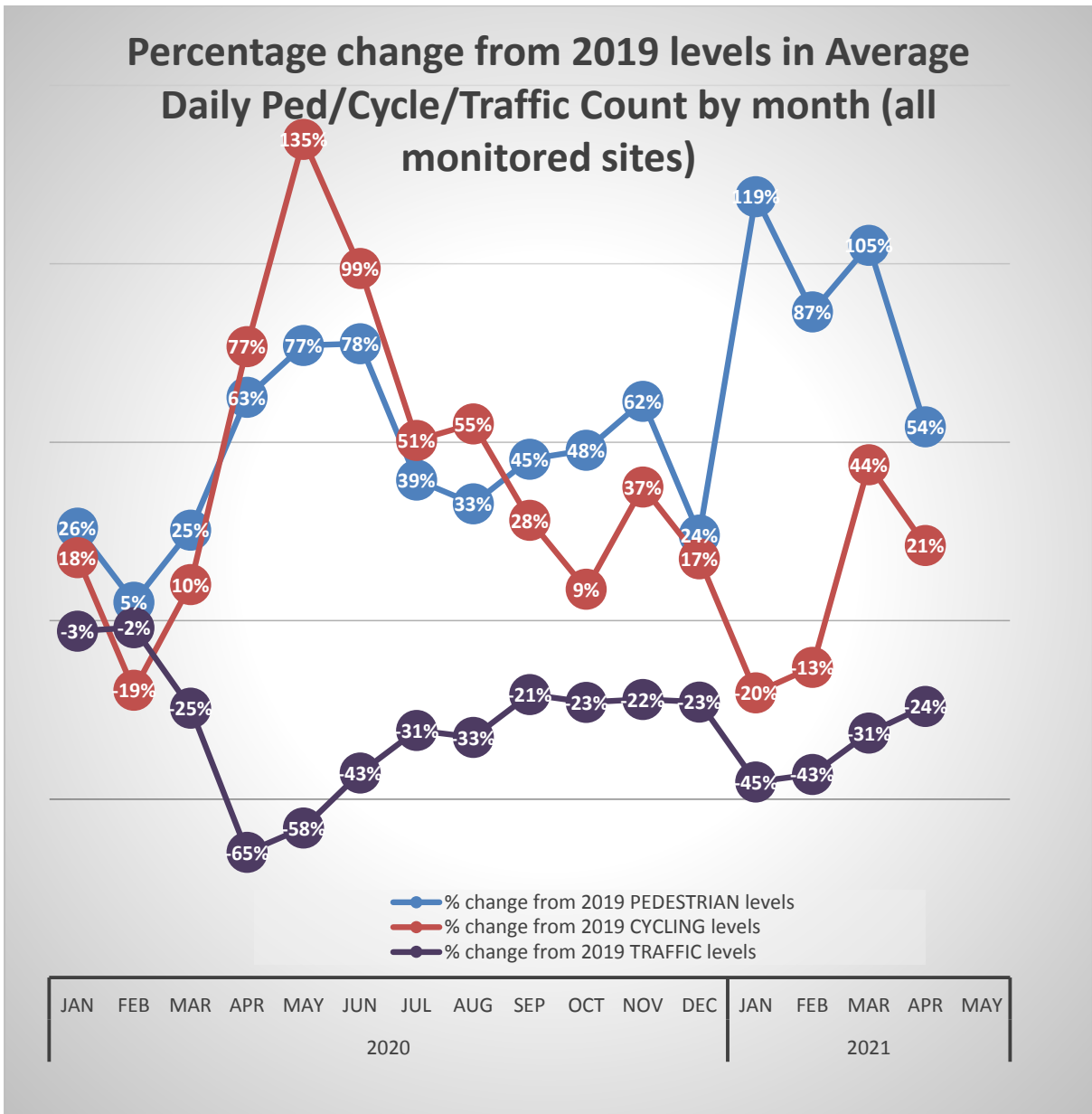


Fig 7(A). City Wide Transport Figures.

As in the last report Figure 6 and 6(a) above shows that walking and cycling have continued to perform significantly above pre pandemic levels, and car usage has remained below 2019 figures. Public transport use is starting to rebound with Bus Patronage back over 50%, and while still considerably down most services in the city are now running at 100% of timetabled services.

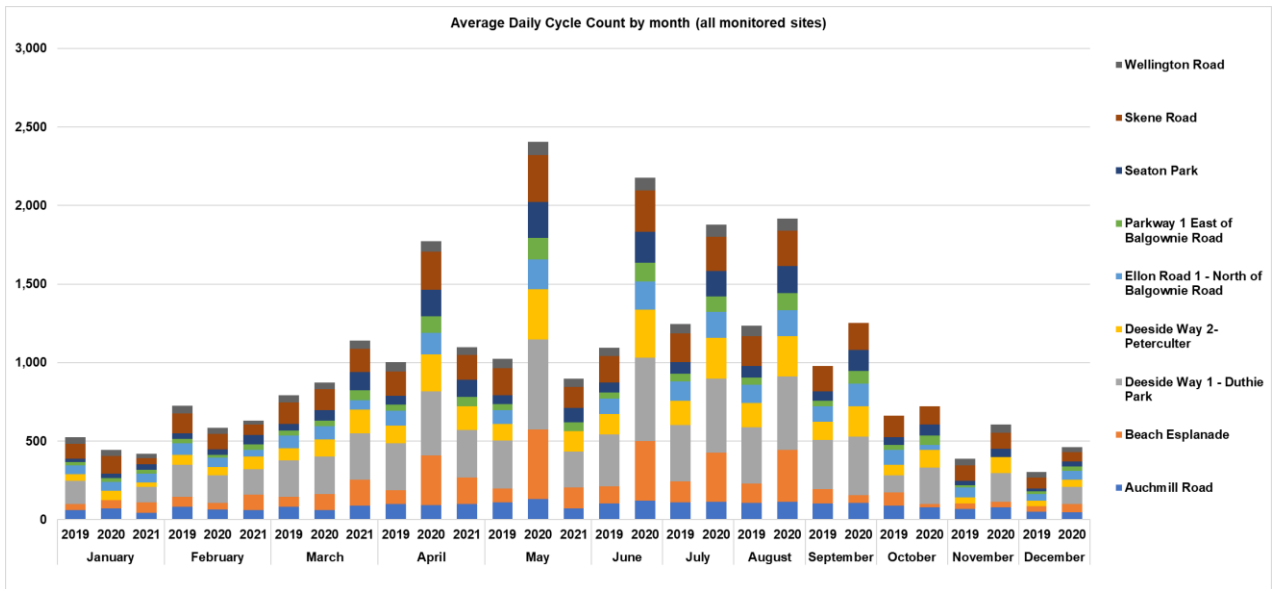


Fig 8. Average Daily Cycle Counts

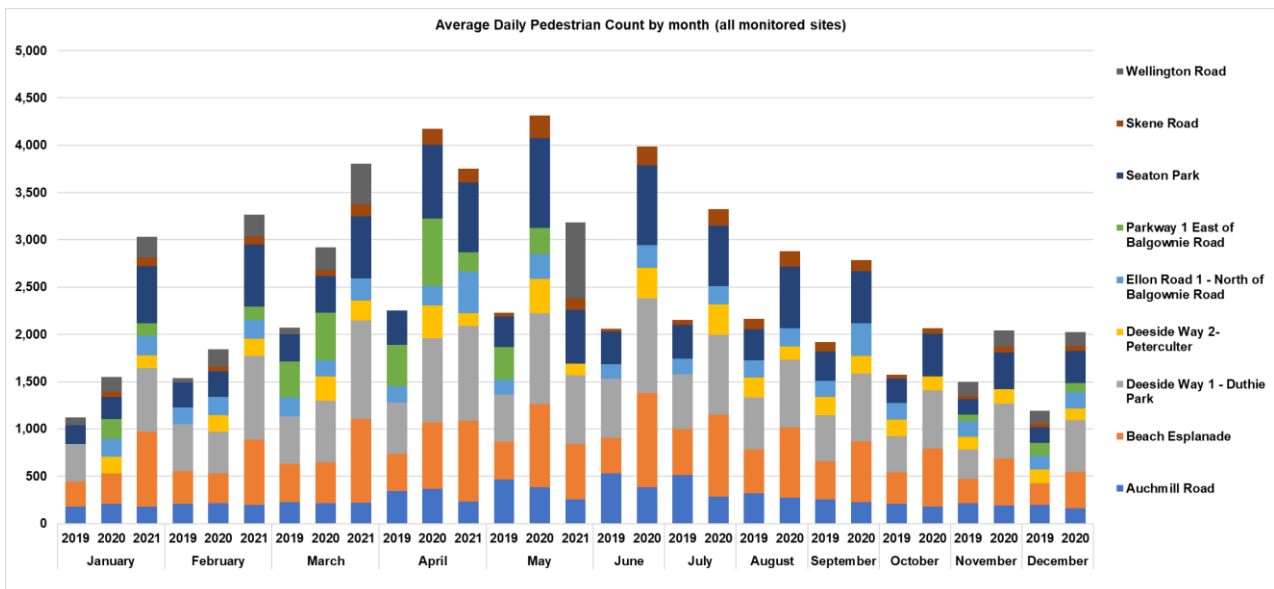


Fig 9. Average Daily Pedestrian Counts

Please note:-

- Sections of the Esplanade were closed from 31st of August 2020 for SfP Active Travel Corridor implementation works.
- Beach Esplanade Counts from September 2020 onwards do not include users of the newly installed bi-directional cycle lane, therefore the stated figure does not include all cycles passing this count site.
- Sections of the Esplanade were closed from 23rd of November 2020 for SfP Active Travel Corridor removal works.

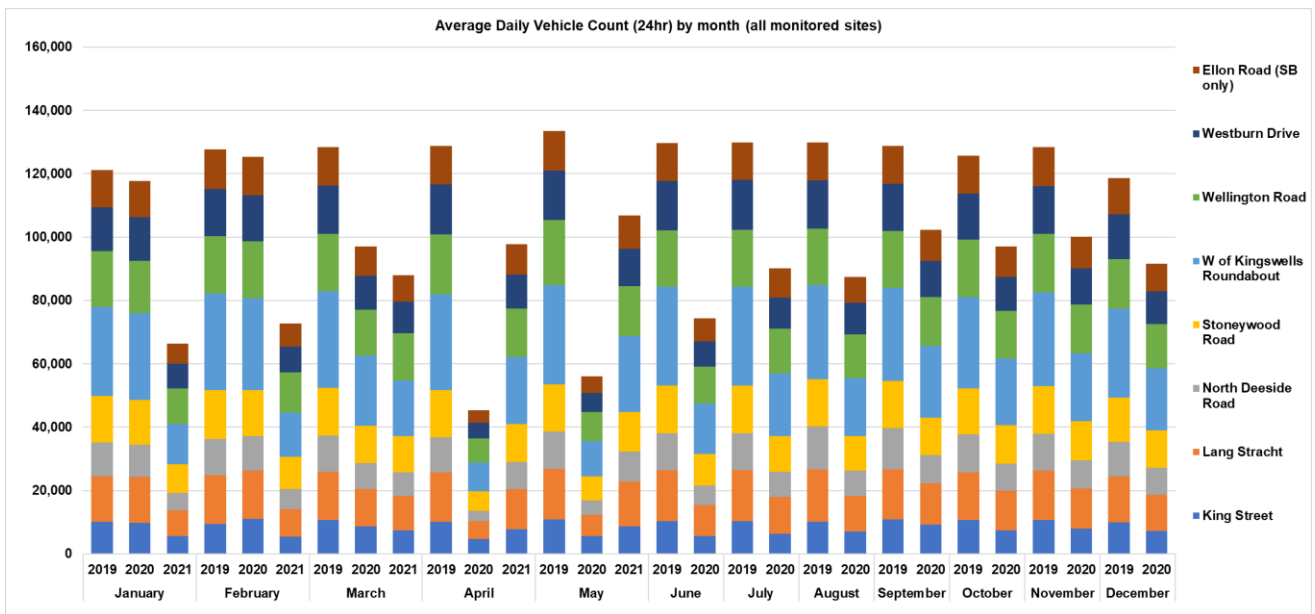


Fig 10. Average Daily Vehicle Counts

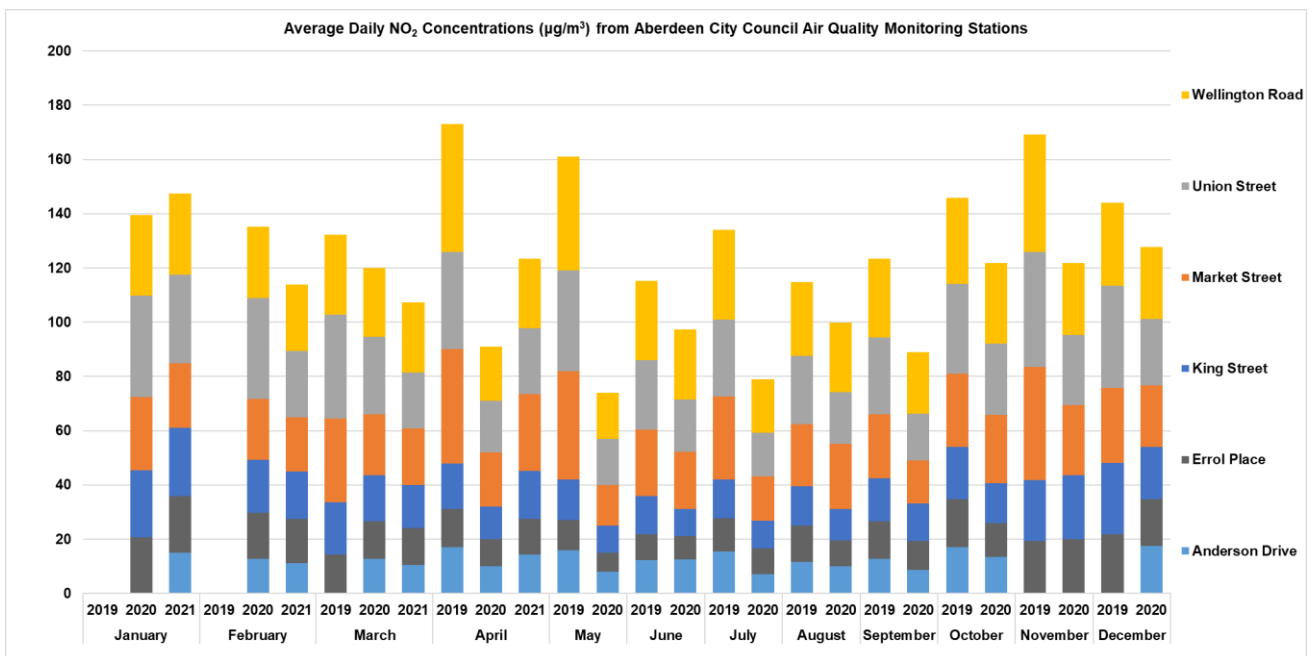


Fig 11. Average Daily NO<sub>2</sub> Concentrations

3.17 The reduction in vehicular traffic has also seen a continued corresponding improvement in air quality. Nitrous Oxide (NO<sub>2</sub>) levels continue to be below the 2019 levels across all sites in March. These falls represented an average reduction of:-

- Union Street — 46%
- Market Street — 33%
- King Street — 17%
- Wellington Road — 13%
- Anderson Drive — N/A
- Errol Place — 6%

Of particular note is both Market Street and Union Street which have both experienced very significant improvements in air quality and are both subject to the proposed Low Emissions Zone due to be introduced in 2022.

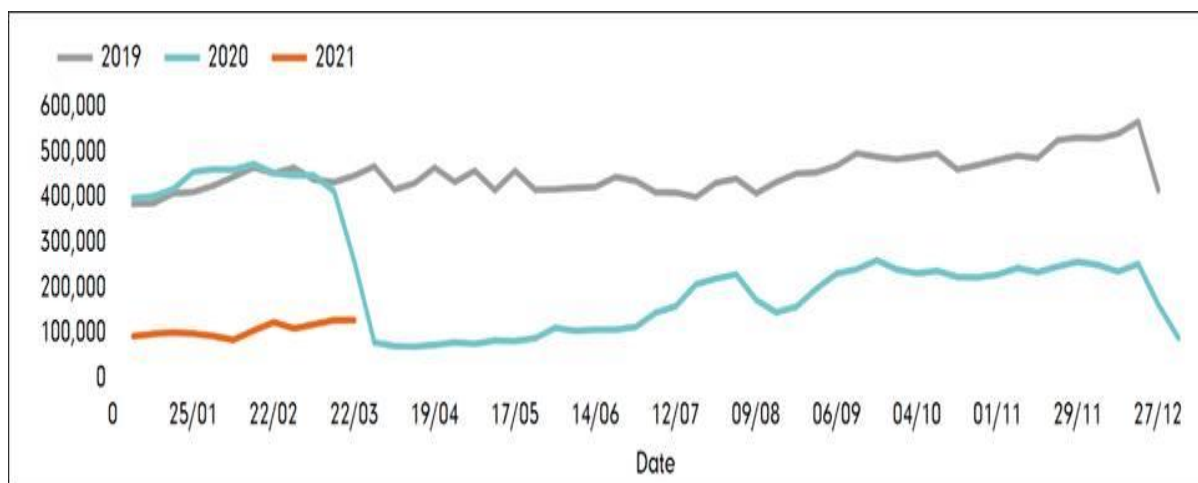


Fig 12. City Centre Footfall – Up to March

3.18 While city centre footfall is still struggling to recover and is still well down on pre lockdown levels, it remains by far the busiest part of the city overall.

### Public Transport

3.19 Across all modes of public transport patronage remains significantly down on pre COVID levels, however recent months has seen a rebound across bus and rail services. In the city bus services are now running to approximately 100% of timetabled services with patronage returning to approx. 50-55% with regional services operating similarly.

3.20 The most recent data from the Transport Scotland for the period May 10<sup>th</sup> to 16<sup>th</sup> plotted against the same period in 2019, shows:-

- Concessionary bus journeys down by 50% (previously down by 70%)
- Rail journeys down by 65% (previously down by 90%)
- Ferry journeys down by 55% (previously down by 80%)
- Air journeys down by 80% (previously down by 75%)

While these are national figures the concessionary bus journeys are broadly in line with Aberdeen's experience. Similarly the slow return of patronage across all services is reflective of the north east.



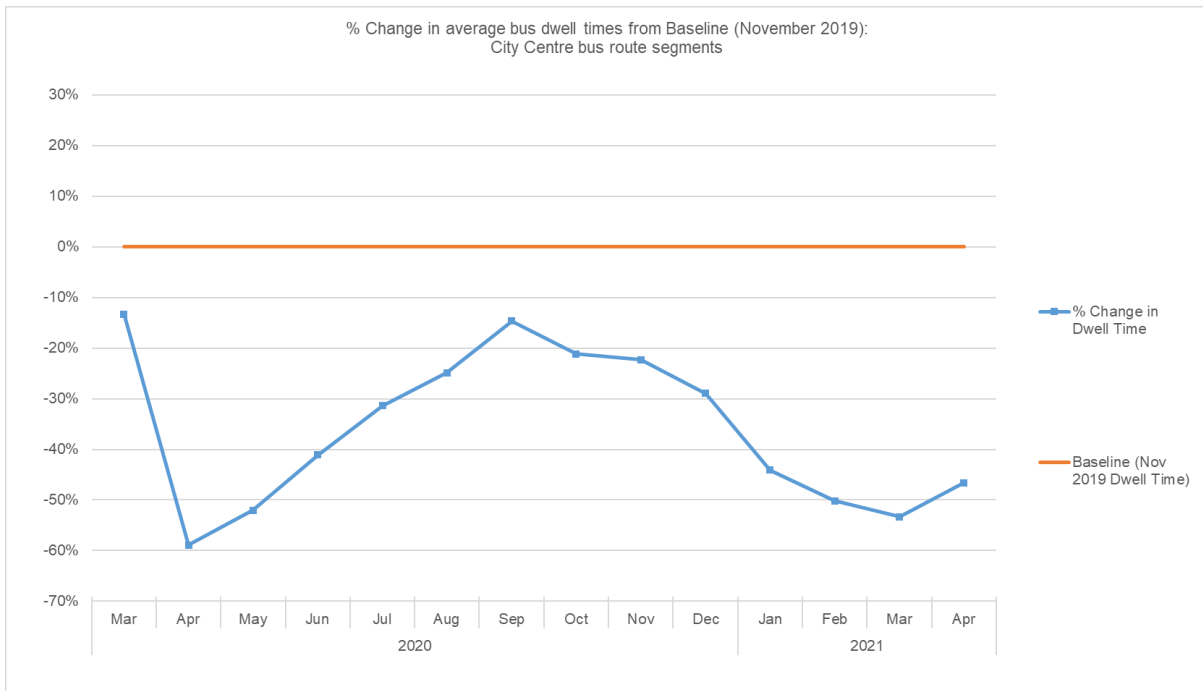


Fig 13. Bus Dwell Times

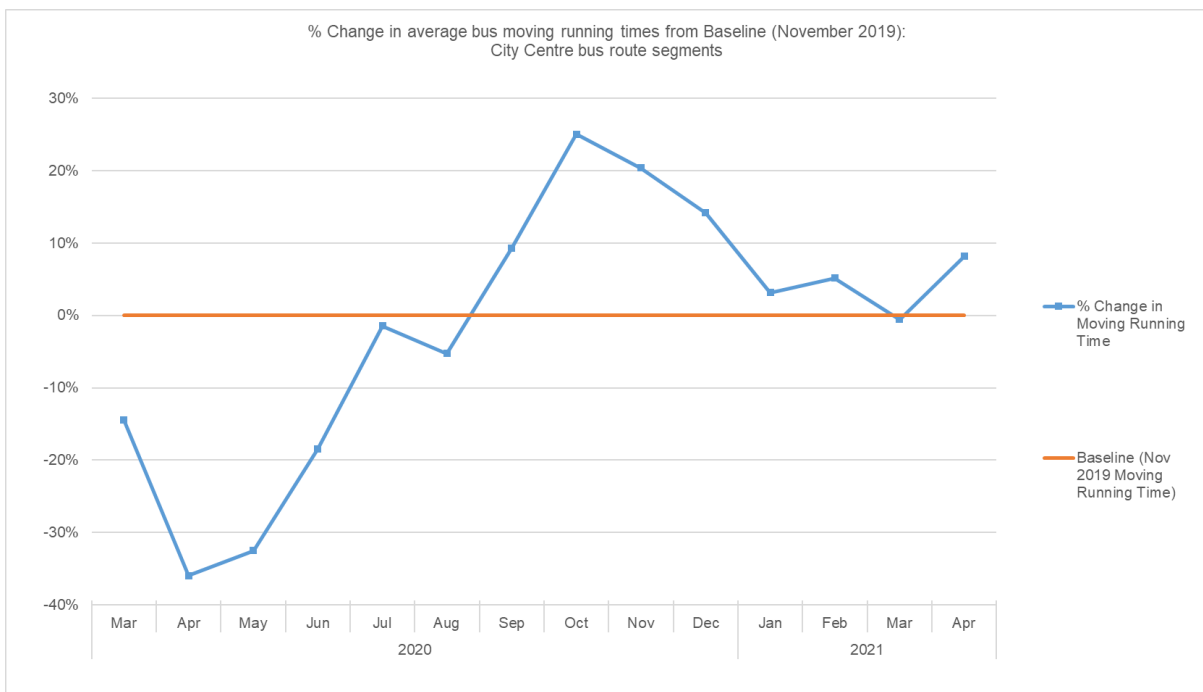


Fig 14. Running Times City Centre

3.21 The greatest impact on journey times was felt at the end of September last year as shops reopened however this appears to have reduced as we got closer to Christmas as people became accustomed to the interventions. From Christmas as we moved into lockdown the patterns settled but as shown in the general traffic figures road use did not reduce significantly as it had done in the first lockdown.

## Intervention areas

- 3.22 Survey work has been undertaken across all the intervention areas. This survey work included:-
- Camera surveys – Counting pedestrian and cycle movements.
  - Clipboard Surveys – A second round of Interviews (the first round was 956 interviews) Due to the weather the most recent survey, undertaken on the 21/22 of May, saw 704 people across the intervention sites.
  - Visual surveys – To assess behaviour.
  - Ongoing traffic counts.

As an overview a summary of the Clipboard Surveys is included below.

**Appendix 1 to this report has summaries of the travel data across all of the sites.**

### Clipboard Survey.

- 3.23 The results of the clipboard surveys which were commissioned on behalf of the Council to assess the impact of the interventions are summarised below, and the full data is included in the Appendix 3. This is a second survey undertaken with the first survey seeing 956 people surveyed over the 18<sup>th</sup> and 19<sup>th</sup> of December. The second survey was undertaken on the 21<sup>st</sup> and 22<sup>nd</sup> of May and this saw 704 people surveyed. Unfortunately due to the weather these numbers were done on the first survey and survey company also reporting that members of the public appeared more nervous of engaging than during the first survey. People were surveyed at all locations and were given the opportunity to comment on their experience of any interventions across the city. Overall, the response was very positive towards the interventions and the following are a selection of the questions asked and the responses received.
- 3.24 **What was their opinion on the temporary measure brought in to help enable physical distancing?**  
People were asked to score their view of the interventions from “**Very Positive**” to “**Very Negative**” across 5 options. Across all sites an average of 79% of people said their experience was “**Very Positive**” or “**Positive**”, almost identical to the last survey which was 80%.
- 3.25 **How did people visit these locations?**  
In all cases the top three modes of transport to get to the locations remained by foot, by car as a driver or by car as a passenger. For two of the locations cycling continued to remain in top three options, those were the recreational sites of the beach and the parks.
- 3.26 **Why have they visited certain locations less?**  
People were given a number of options to choose from for this question and could choose more than one option. “**Fear of being unable to social distance**” had the most responses followed by question with “**Fear of Contracting COVID**” and then “**Working from home**”

3.27 **Why had they visited certain locations more?**  
The overwhelming response here was “**I want to support physical shops**”.

3.28 **Have people been visiting the intervention locations more since restrictions began to ease.**  
People were given three options for this question, that they visited more, the same or less frequently. Across all the locations the highest scored response was the “**more frequently**” ranging from 61% for the City Centre to 71% for the Parks.

3.29 **Other points**  
**Similar responses to these questions as in the earlier survey.**  
**Walking and Cycling** – Almost 90% of people agreed or totally agreed that they felt safer walking and cycling. 94% found it easier to walk or cycle.  
**Access Bus Services** – 44% of people found accessing bus services the same with 32% saying it was easier and 17% saying it was harder. These figures are all very similar to the last results.  
**Parking** – 52% of people disagreed or totally disagreed that access to car parking was easier, while 35% were neutral and 13% felt it was easier.

#### **Other Consultations**

3.30 Early in the process there were a number of consultations undertaken on corridors that were not taken forward due to the budget constraints a summary of the responses is below. Appendix 4 also includes some of the early responses to our citizens space survey.

#### **Beach Esplanade**

The consultation undertaken for the Beach Esplanade resulted in 124 responses with 72% in agreement with the proposed scheme and 26% disagreeing.

#### **Hazlehead to City Centre**

The consultation undertaken for this proposed corridor resulted in 342 responses with 56% in favour of the scheme and 43% disagreeing.

### **NEXT STEPS**

#### **Committee Instructions**

3.31 Given the complexity of the current situation and the balance that needs to be struck between protecting the hard-won gains of the last 18 months and trying to return to a level of normality, there are a number of factors that must be considered.

The Director of Public Health has been clear that the need for physical distancing has been important as we have moved out of lockdown. It is also inevitable that as we do some people will drop their guard and that complacency may become a factor. For other people who have become accustomed to quieter streets and having more space there will no doubt be a period of acclimatisation to a busier city. Many businesses have also come to rely on the additional spaces provided particularly while numbers remain limited within

shops and cafes. Experience from Glasgow and the north of England has shown how quickly infection rates can change. Indeed, Aberdeen's own experience of the localised lockdown last year is an example of that.

- 3.32 That said Scotland and indeed the entire UK is in a much better position than it was last year. The vaccination program is running at pace with people under the age of thirty now able to book a vaccination appointment. As of the 25<sup>th</sup> of May, 3.1million people had received their first vaccination in Scotland and 1.9 million had received both. It is clear that in the coming months as we move to Level 0, a lot more will be known about the lifting of restrictions and the longer-term need for physical distancing.
- 3.33 The interventions currently in place are funded by Sustans and as per the original committee instruction when applying to the fund, we must work within that envelope. This means that we are unable to reinstate any of the interventions once they have been removed within the funds available. If this was required it would mean the Council funding this work which given the financial pressure on the Council would be extremely challenging.
- 3.34 Finally, in relation to the instructions from City Growth and Resources, it is clear that there are a number of studies currently underway that will have an overlap with the Spaces for People interventions. The majority of these will report back in August, and as yet, the outcomes of these are not known. The outcome of the Low Emission Zone study, which is being reported to this committee is now known, and that report shows that general traffic restrictions will be required on Union Street to deliver a Low Emission Zone in line with the national legislation.
- 3.35 However significant gains have now been made in both fighting the virus, and in the roll out of vaccinations. In that context the Director of Public Health has confirmed that they would support the lifting of measures in the neighbourhood centres once the city moves to Level 0. A more cautious approach is recommended for the City Centre due to the high levels of pedestrian traffic. The future of these interventions should be influenced by the outcomes of the other studies being reported back to the City Growth and Resources committee in August, and the public health situation at that time.

#### **Timetable for Physical Removal of the Interventions.**

- 3.36 In terms of physically removing the interventions the following sets out an estimated program for those works. It should be noted that there are a number of externalities which will impact on these works similar to any program. The Council has embarked on an ambitious road's improvements and resurfacing program across the city. Due to the loss of much of last years the Councils roads teams are working to complete a two-year program across this financial year. These challenges are compounded by other Councils across Scotland attempting to do the same, and therefore reducing the availability of external contractors to undertake these works. This will have a significant impact on the timing and resource available to undertake these works and would therefore have to be programmed in at the time of any instruction to proceed with removal.

- 3.37 The works involved in removing the temporary measures will include:-
- The lifting of any temporary structures such as footway extensions, parklets, ramps, planters etc.
  - Lifting of bollards and removal of bollard basis.
  - Burning off temporary road markings.
  - Removal of temporary signage, fixed and portable.
  - Patching for road surfaces, as necessary.
  - Reinstatement of road markings, parking bays etc.
  - Replacement of road signage.
  - Updating of any road orders as necessary.

- 3.38 The table below sets out the amount of time estimated to remove each of current interventions, however there are a number of factors to be considered.
- There will be a lead in time of lead in time of 3 weeks required to prepare any required Temporary Traffic Regulation Orders and provide advance notice through media briefs.
  - All works would run **consecutively** from when instructed.
  - Outwith any direct instruction, the sequencing will be determined by other ongoing work at the time of instruction. This is to limit disruption to residents, businesses and public transport, as well as to limit impact on the roads program.
  - The works will also have to be aligned with other service capacity including Building Maintenance and Grounds Maintenance.

Location	Individual time to Remove Interventions.			
	Week 1	Week 2	Week 3	Week 4
City Centre Union Street				
School Hill / Surrounding				
Rosemount				
Torry				
George Street				
Beach				

#### 4. FINANCIAL IMPLICATIONS

- 4.1 The table below shows the financial position to the end of the financial year 2020/21.

Gross Budget	Spend to Date
£1.760m	Claim 1 – £511,115.00 (Paid)
£0.352m (Additional grant award)	Claim 2 – £882,510.00 (Paid)
<b>Total – £2,112,000</b>	Claim 3 – £ 87,628.00 (Outstanding)

- 4.2 An additional £352k was secured from Sustrans to support maintenance of the scheme including additional monitoring. To date two claims have been paid totalling £1,393,625.

## 5. LEGAL IMPLICATIONS

- 5.1 While there are no direct legal implications arising from the recommendations of this report, the funding will be required to be spent in accordance with the legal agreement for the grant award. To date Sustrans have confirmed their satisfaction with the projects that the grant has been spent on and have paid the first two invoices. Sustrans are being kept up to date with all progress and expenditure.

## 6. MANAGEMENT OF RISK

Category	Risk	Low (L) Medium (M) High (H)	Mitigation
<b>Strategic Risk</b>	Public harm, allowing the COVID-19 virus to spread with the associated high risk of death through contacting the virus.	M	All interventions are now in place working within the funding envelope. A task force group has been set up to manage the programme with meetings to monitor progress and address any issues – drawn from senior staff across the Council.
	Failure to deliver the Socio-Economic Rescue Plan 2020/21	M	Close collaboration across other Clusters.
<b>Compliance</b>	Officers breach grant conditions.	L	All interventions have now been completed within the scope of the original grant award. Funds for maintenance and removal have been held back.
	Failure to comply with national Covid-19 legislation and guidance	L	Comply with legislation and guidance.
<b>Operational</b>	Insufficient staff to undertake the full programme.	L	All interventions are in place the risk is now limited to maintenance and removal.
<b>Financial</b>	Maintenance and removal cost exceed remaining budget.	L	Costs will be monitored on a regular basis.
<b>Reputational</b>	Programme not delivered.	L	Working within the budget envelope the maximum

			number of interventions have been delivered.
<b>Environment / Climate</b>	Air quality deteriorates and carbon emissions increase as more people start to travel, using the car more often due to advice to minimise use of public transport which will have reduced capacity for some time.	M	Performance of the road network will be closely monitored, including reviewing air quality data that is collected locally.

## 7. OUTCOMES

<u><b>COUNCIL DELIVERY PLAN</b></u>	
	<b>Impact of Report</b>
<b>Aberdeen City Council Policy Statement</b>	In addition to responding to the current public health emergency and imminent easing of lockdown requirements, this programme of temporary Covid-19 public health measures supports the delivery of the Economy Policy Statement 4. Increase city centre footfall through delivery of the City Centre Masterplan. The temporary Covid-19 public health measures actively support and encourage active and sustainable travel, in and across the City Centre and support maintenance and safe operation of the strategic road network enabling people to comply with physical distancing requirements.
<b>Aberdeen City Local Outcome Improvement Plan</b>	
Prosperous Economy Stretch Outcomes	The programme of temporary Covid-19 public health measures supports the delivery of Stretch Outcome 1 – 10% increase in employment across priority and volume growth sectors by 2026, and Stretch Outcome 2 – 90% of working people in living wage employment by 2026 by supporting the lockdown easing measures which will enable the economy to recover and people to get back to work where they cannot work from home. The temporary Covid-19 public health measures will enable people to move around by walking and cycling where possible, while protecting access to public transport and enabling compliance with physical distancing requirements. The temporary Covid-19 public health measures will also support businesses re-opening by providing additional space for customers and create space,

	where possible, for outdoor seating and leisure activities.
Prosperous People Stretch Outcomes	The programme of temporary Covid-19 public health measures within this report support the delivery of Stretch Outcome 11 – Healthy life expectancy is five years longer by 2026. The temporary Covid-19 public health measures actively support and encourage active and sustainable travel and help reduce environmental pollutants which are harmful to human health. The temporary Covid-19 public health measures are also designed to enable physical distancing while moving around, thereby minimising the risk of Covid-19 transmission and the likelihood of a second wave of the disease.
Prosperous Place Stretch Outcomes	The temporary Covid-19 public health measures support the delivery of Stretch Outcome 14 – Addressing climate change by reducing Aberdeen's carbon emissions by 42.5% by 2026 and adapting to the impacts of our changing climate, and Stretch Outcome 15 - 38% of people walking and 5% of people cycling as main mode of travel by 2026. The temporary Covid-19 public health measures improve and/ or create active and sustainable travel infrastructure.
<b>Regional and City Strategies</b>	The temporary Covid-19 public health measures support the delivery of the Regional and Local Transport Strategies, Strategic and Local Development Plans, Regional Economic Strategy and Action Plan, Health and Transport Action Plan, Local Outcome Improvement Plan, Air Quality Action Plan and Powering Aberdeen by encouraging more people to walk and cycle to work, health care and other services and destinations and as a result of the public health emergency, to be able to do this whilst also complying with physical distancing requirements. This is particularly important due to the imminent lockdown easing which will see more people travelling to work and other destinations as businesses start to re-open. Although bus travel will remain significantly reduced for some time, the temporary Covid-19 public health measures also help to ensure that this mode can still be used safely too.
<b>UK and Scottish Legislative and Policy Programmes</b>	The measures directly contribute to Public Health and Scottish Government requirements and legislation relating to the Covid-19 Pandemic, and in particular support physical distancing in public spaces. They will also support businesses as they start to re-open in accordance with the lockdown easing phases. The temporary Covid-19 public health measures will also



	contribute towards the delivery of the Scottish National Transport Strategy (NTS 2), the UK and Scottish legislation on Air Quality Standards and Objectives, and Climate Change Acts.
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## 8. IMPACT ASSESSMENTS

Assessment	Outcome
Impact Assessment	
Data Protection Impact Assessment	

## 9. BACKGROUND PAPERS

None

## 10. APPENDICES

Appendix 1: Summary of Survey Data

Appendix 2: NHS Data

Appendix 3: Survey Data Clip Board Surveys

Appendix 4: Summary of the Citizen Space and Common Place Surveys

## 11. REPORT AUTHOR CONTACT DETAILS

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# Appendix 1

## City Centre active travel levels

To better understand the effects of COVID-19 on the transport network, cameras have been monitoring active travel levels in 41 areas across the city. The filming has taken place on 4 days of the week (Tuesday, Wednesday, Saturday and Sunday) between 7am and 7pm. These are listed below

Upper Kirkgate	Schoolhill	Union Street (Adelphi)	Union Street (Bridge St to Mkt St)	Union Street (Music Hall)	Union Street (Chapel St/ Rose St)
King Street (St Machar)	King Street (Arts Centre)	King Street (Morrison s)	George Street (St Andrews St)	George Street (Spring Garden)	Rosemount Place (Craigie Loanings)
Rosemount Place (Eden Place)	Victoria Road (Victoria Bridge)	Victoria Road (Menzies Road to Walker Road)	St Nicholas Street	Market Street	Beach Boulevard (North side)
Beach Boulevard (South Side)	Beach Esplanade (Ballroom)	Beach Esplanade (Cafes)	Beach Esplanade (Accommodation Road)	Back Wynd	Belmont Street
Guild Street	Gallowgate	Holburn Street	North Deeside Road, Mannofield	Queens Road	Chapel Street
Rose Street	Justice Mill Lane	Westburn Road	Westburn Drive	Great Western Road	Bedford Road
Powis Terrace	Ashgrove Road	Cults (North Deeside Road)	Peterculter (North Deeside Road)	Wellington Road	

Monitoring at these sites has taken place over a series of 4-week periods with the most recent period (Period 9) reduced to 3 weeks to fit with the timescales for this report. The dates of these monitoring periods are shown below.

- Period 1 - 28th September to 25th October,
- Period 2 - 27th October to Sunday 22nd November
- Period 3 - 24th November to Sunday 20th December
- Period 4 - 22nd December to 17th January
- Period 5 - 19th January to 14th February
- Period 6 - 16th February to 14th March
- Period 7 - 16th March to 11th April
- Period 8 - 13th April to 9th May
- Period 9 - 11th May to 30th May

The table below shows the percentage changes in active travel levels for each period over the previous one. Increases are highlighted in green with reductions in red. As well as giving a figure for total active travel levels in each period, breakdowns for adult walking, child walking and road cycling are also given.

Comparison Period	Adult walking % change	Child Walking % change	Road Cycling % change	Total Active Travel % change
Period 2 over Period 1	2.91	17.03	10.83	3.4
Period 3 over Period 2	5.28	3.9	4.66	5.64
Period 4 over Period 3	-39.2	-62.64	10.54	-38.82
Period 5 over Period 4	-17.3	-55.9	-6.3	-17.5
Period 6 over Period 5	11.92	38.77	27.43	13.10
Period 7 over Period 6	5.08	-26.88	2.52	4.56
Period 8 over Period 7	14.48	31.50	9.18	14.33
Period 9 over Period 8	7.33	10.23	8.94	7.44

The results indicate a fall in total active travel levels citywide in Periods 4 and 5. Period 4 corresponds with the second Scottish lockdown, which came into force on Boxing Day 2020 while Period 5 saw wintry conditions hit Aberdeen. Both of these factors are likely to have affected active travel levels. However, since Period 5, levels have started to increase again and, although they are still down on the Period 4 total, they continue to grow with each subsequent period. Despite this, the road cycling levels continue to increase and, apart from period 5, have grown in every period since monitoring began. They are now at their highest level since monitoring began.

## Intervention Areas

### 1.1 Union Street

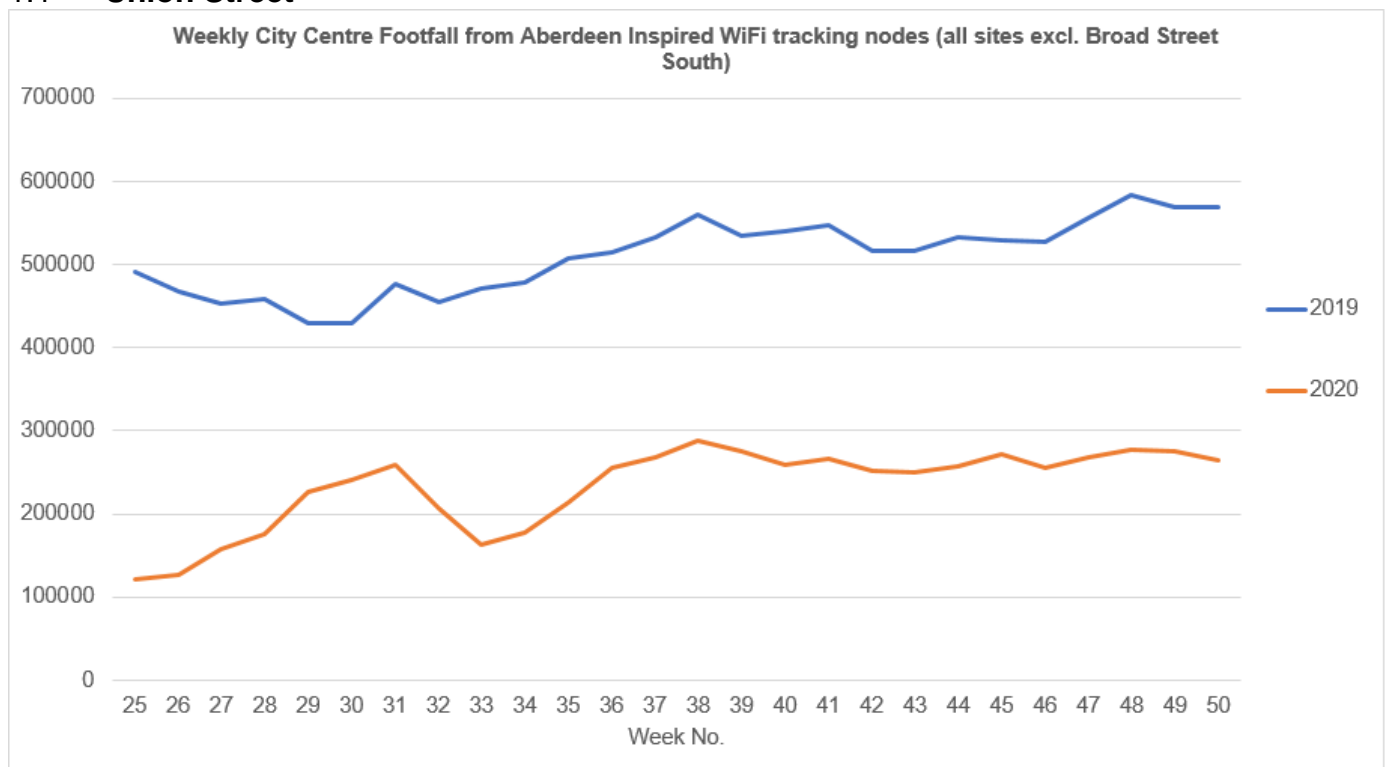


Fig 11. City Centre Footfall

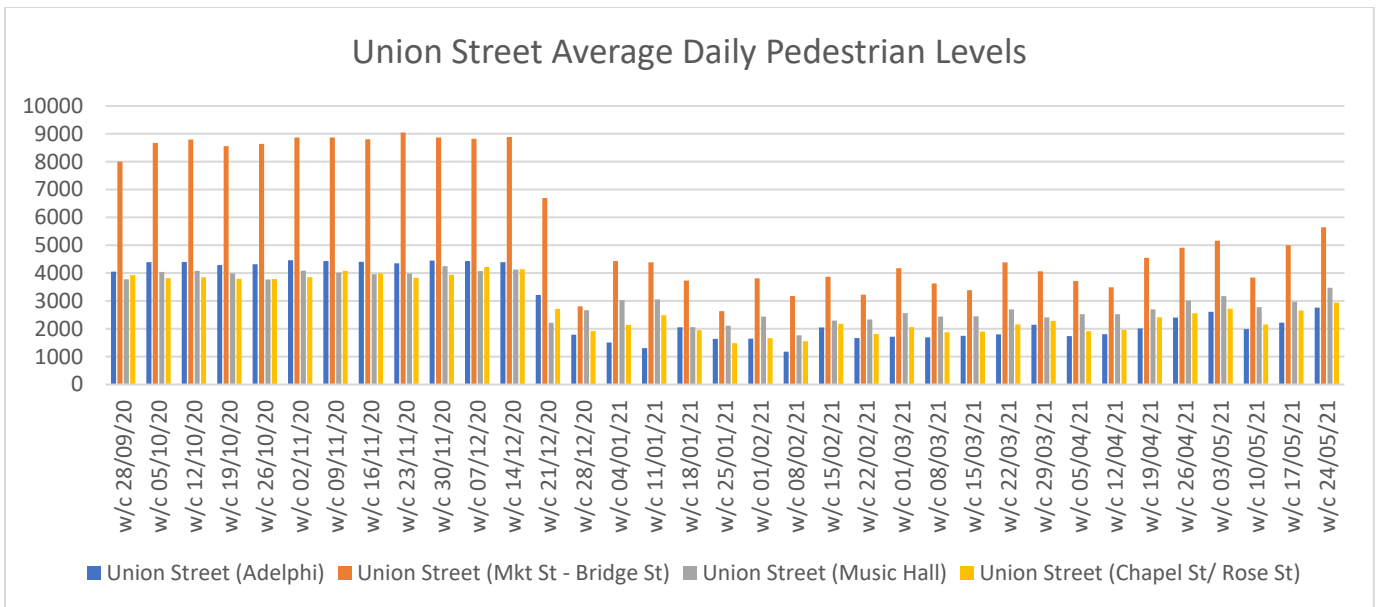


Fig 16. Union Street Pedestrian Levels

Looking more closely along Union Street, the rationale for closing the section between Bridge Street and Market Street is borne out by the significant levels of footfall in that section. Across the survey period this section often saw more than twice the pedestrian levels of any other section of Union Street.

The figures mirror the citywide findings of the 41 active travel monitoring sites. After the 14<sup>th</sup> December the figures show a real dip. This coincides with the festive period and then Scotland going into a second lockdown. However, growth in footfall is evident, especially from 19<sup>th</sup> April and continues, coinciding with the lifting of travel restrictions and the opening of non-essential shops and services.

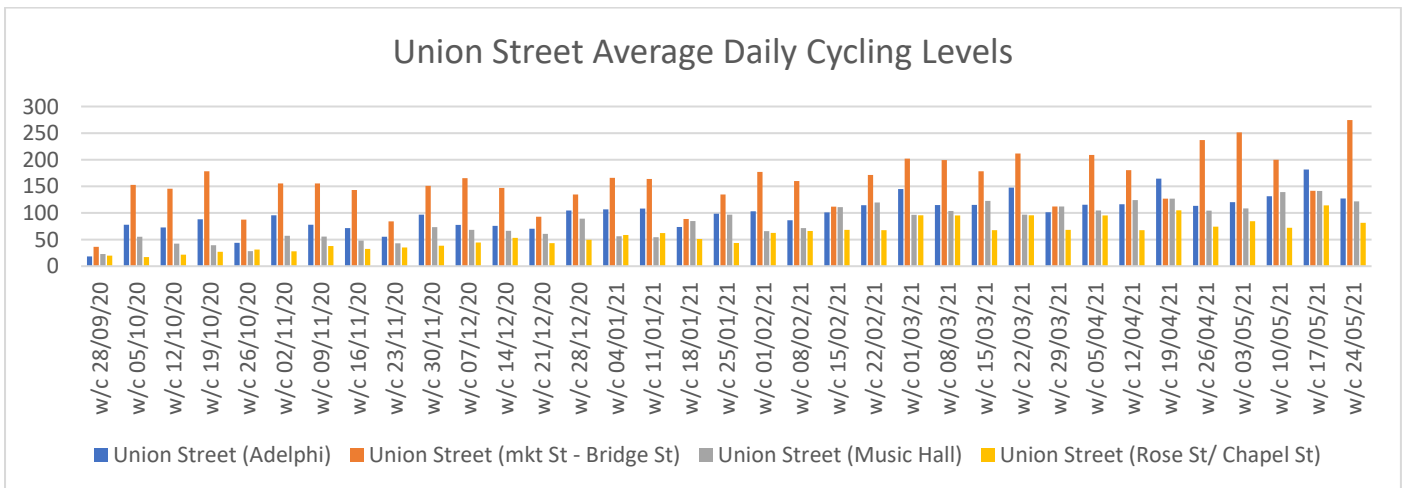


Fig 17. Union Street Cycling Levels

Similar to the pedestrian levels, the levels of cycling on the traffic-free section of Union Street between Bridge Street and Market Street is significantly higher. Again, across the survey period this section often saw more than twice the cyclists of any other section of Union Street. Cycling levels have not shown the same dip that footfall levels have and, although there is some fluctuation, it is evident that levels are growing more on the traffic-free section of Union Street.

The observational data for Union Street (Market Street to Bridge Street) showed:-

- Based on the 41 sites surveyed, over the 9 monitoring periods, this section of Union Street is the second most popular site in the city (behind Market Street which has come top in more periods) for total active travel levels.

- However, based on the total number of people who have passed through each site over the 9 monitoring periods, this section of Union Street still has the highest overall active travel count in the city.
- It is busier on weekdays than weekend days with Tuesday the busiest day.
- Pedestrians and cyclists continue to make good use of additional width created by closure of road.
- Pedestrians were generally observed to adhere to physical distancing.
- No pedestrian or cycle conflicts observed.
- No illegal entry by vehicles observed recently.
- Some queueing observed at shops following reduced lockdown measures. On occasion some shoppers don't always adhere to physical distancing.
- Increased footfall since re-opening of some shops.

The observational data for Union Street (Adelphi) showed:-

- Busiest day was Tuesday and this section continues to be busier on weekdays than weekend days.
- Has made the top 10 for 8 out of the 9 monitoring periods for child pedestrian levels and the top 10 for 6 out of the 9 monitoring periods for road cycling.
- Pedestrians and cyclists continue to make good use of physical distancing measures and the reallocated carriage way space.
- Very few cars observed entering site illegally, but when on site survey staff have observed vehicles turning right from Market Street, realise that they should not be entering Union Street, and make a U-turn to change direction. This has occurred even when ANPR cameras have not been present.

The observational data for Union Street (Music Hall) showed:-

- This section has made the top 10 for total active travel levels in the last 6 of the 9 monitoring periods
- Based on the total number of people who have passed through each site over the 9 monitoring periods, this section of Union Street makes the top 10 for overall active travel count in the city on Wednesday, Saturday and Sunday.
- Pedestrians continue to adhere to physical distancing and again use the additional space provided.
- Off camera, people are making use of pubs with outdoor seating areas. These are well managed to ensure physical distancing and minimal queueing.
- No vehicle / cycle conflicts observed.

The observational data for Union Street (Rose St Chapel St) showed:-

- This section has made the top 10 for child pedestrian levels in the last 6 of the 9 monitoring periods
- Busier on weekdays
- Off camera, people are making use of pubs with outdoor seating areas. These are well managed to ensure social distancing and minimal queueing.
- Pedestrians continue to adhere to physical distancing and again use the additional space provided.

## 1.2 Upper Kirkgate

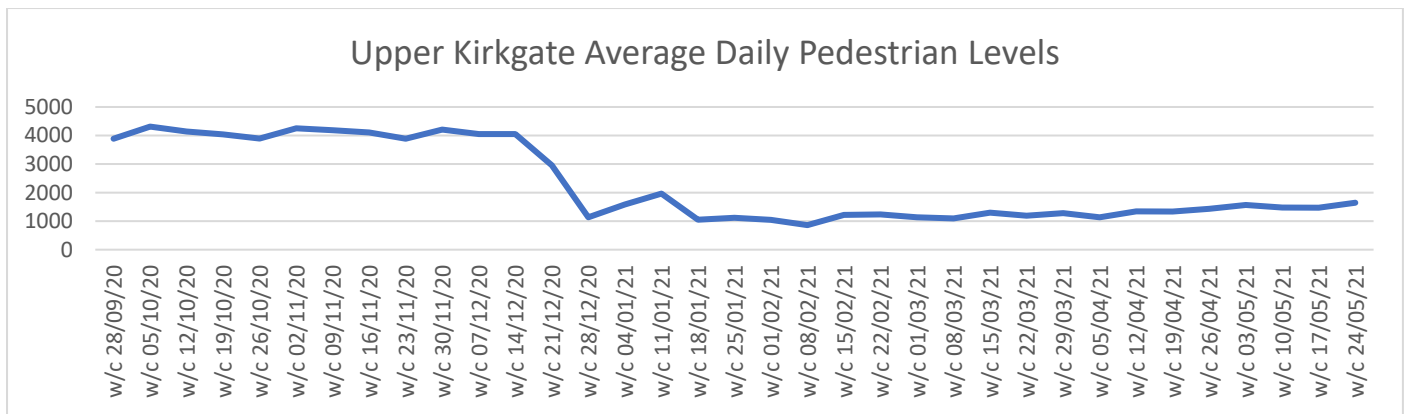


Fig 18 Upper Kirkgate Pedestrian Levels/

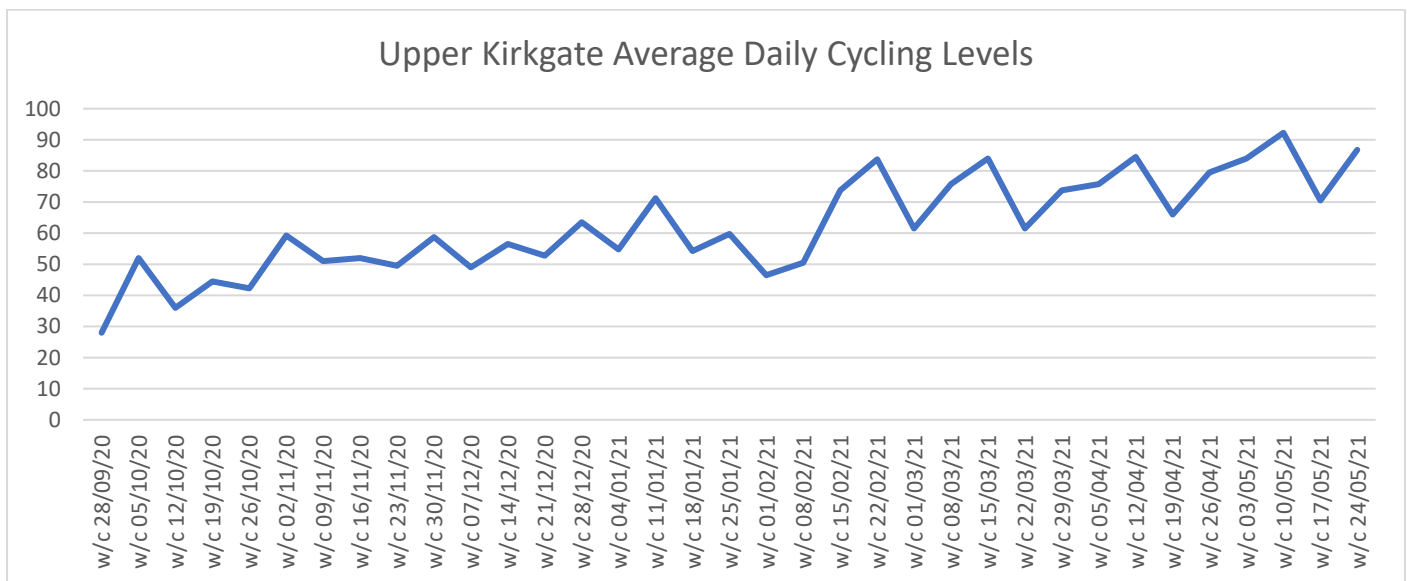


Fig 19 Upper Kirkgate Cycling Levels

The pedestrian levels on Upper Kirkgate, in line with figures across the city, dipped towards the end of December and, since February, have started to climb gradually again. However, the levels of cycling have continued to climb.

The observational data for Upper Kirkgate showed:-

- This site is busier on weekdays than weekends
- Physical distancing adhered to, with pedestrians making good use of extra width created by road closures.
- Cyclists making good use of route but remaining on road and steering clear of pedestrians.
- HGVs on weekday mornings seem to load / unload here for a brief period. This has not caused any issues for pedestrians.

### 1.3 George Street

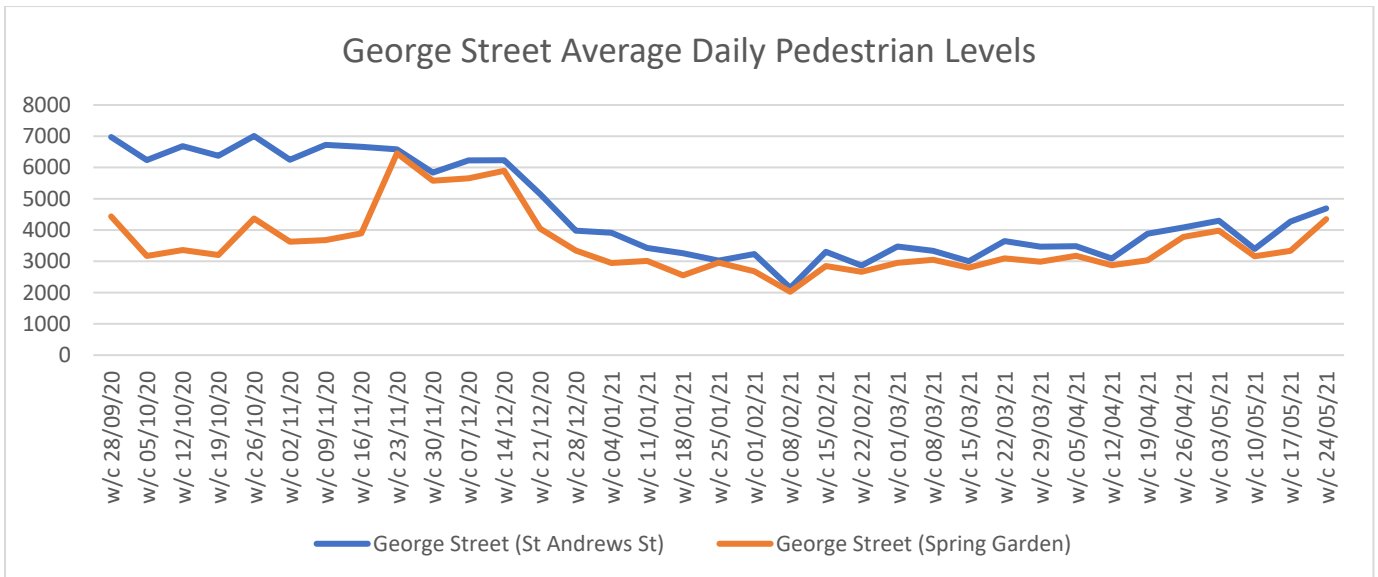


Fig 20 George Street Pedestrian Levels

The pedestrian levels on George Street reflect the pattern observed citywide with a decrease in late December and a gradual rise from February onwards. Where once there was quite a difference between active travel movements passing the cameras at St Andrews Street and Spring Gardens, levels now seem to be broadly similar. It is difficult to determine the cause, but the level of student accommodation and the proximity to the North East College may be a factor. Regardless, the increased pedestrian levels are welcomed.

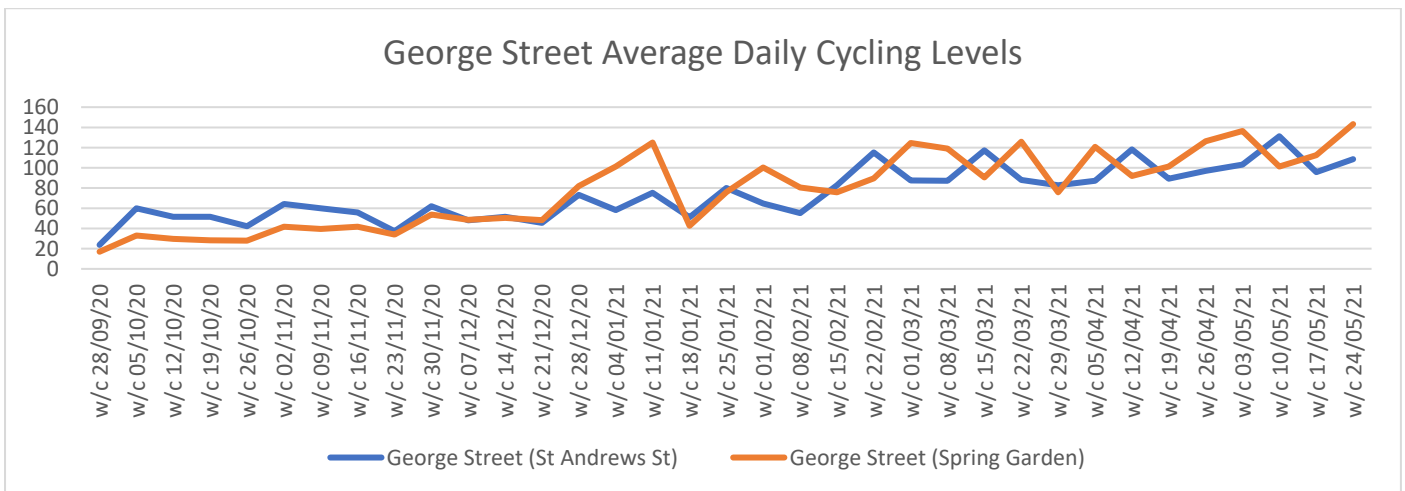


Fig 21 George Street Cycling Levels

Despite some fluctuations, the cycling levels on George Street have increased over time, especially through the Spring Garden monitoring site, which now posts a higher number than at St Andrews Street. Again this may be reflective of the strong student population in the area but is likely also reflective of the safer cycling environment.

The observational data for George Street (St Andrews Street) showed:-

- This section has made the Top 10 for total active travel levels in all 9 monitoring periods and the top 6 in 8 of them
- Based on the total number of people who have passed through each monitoring site over the 9 monitoring periods, this section of George Street has the 5th highest overall active travel count in the city.



- Slightly busier on the weekdays than the weekends with Wednesday the busiest day.
- Pedestrians make good use of street width to allow physical distancing.
- Minimal queuing observed on site at nearby shops. These are well managed, with social distancing adhered to. At no point has queue gone past view of camera

The observational data for George Street (Spring Gardens) showed:-

- This section has made the Top 10 for total active travel levels in the last 7 of the 9 monitoring periods.
- Busiest on weekdays with Tuesday the busiest day
- Physical distancing continues to be adhered to.
- No illegal vehicle manoeuvres observed.
- Cyclists make good use of cycle lane, preventing vehicle or pedestrian conflicts.
- Drivers observed to park considerably for traffic and pedestrians. There does seem to be more on street parking latterly as people make use of nearby takeaways.

### 1.4 Torry (Victoria Road)

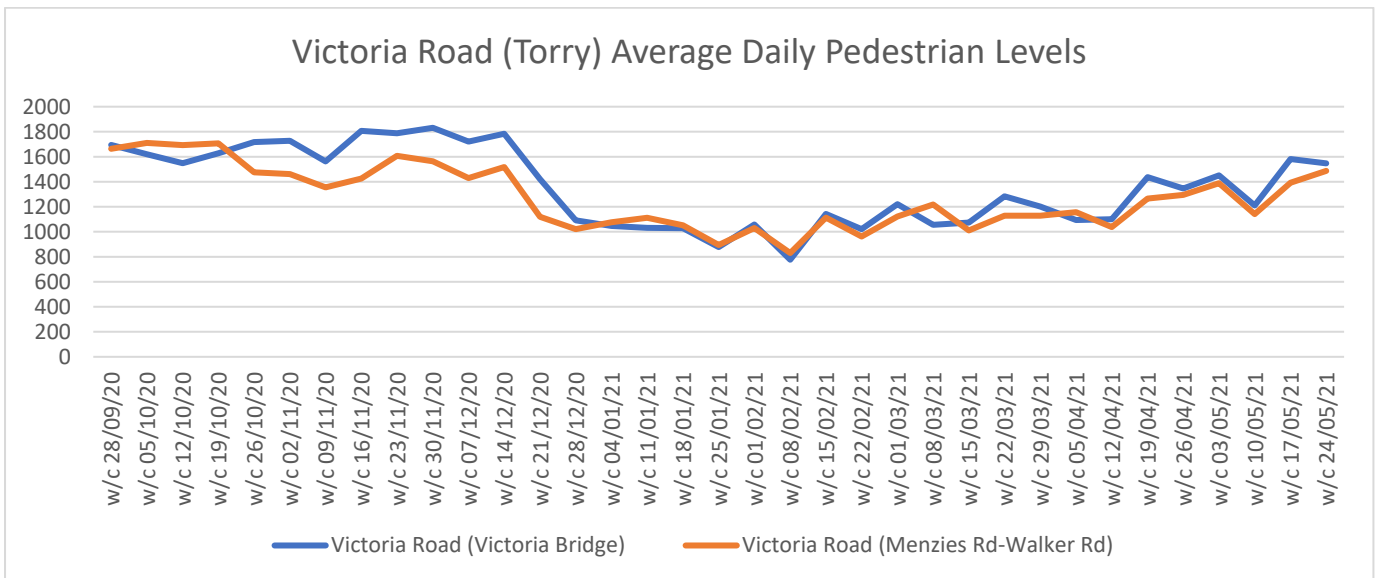


Fig 22 Torry (Victoria Road) Pedestrians Levels

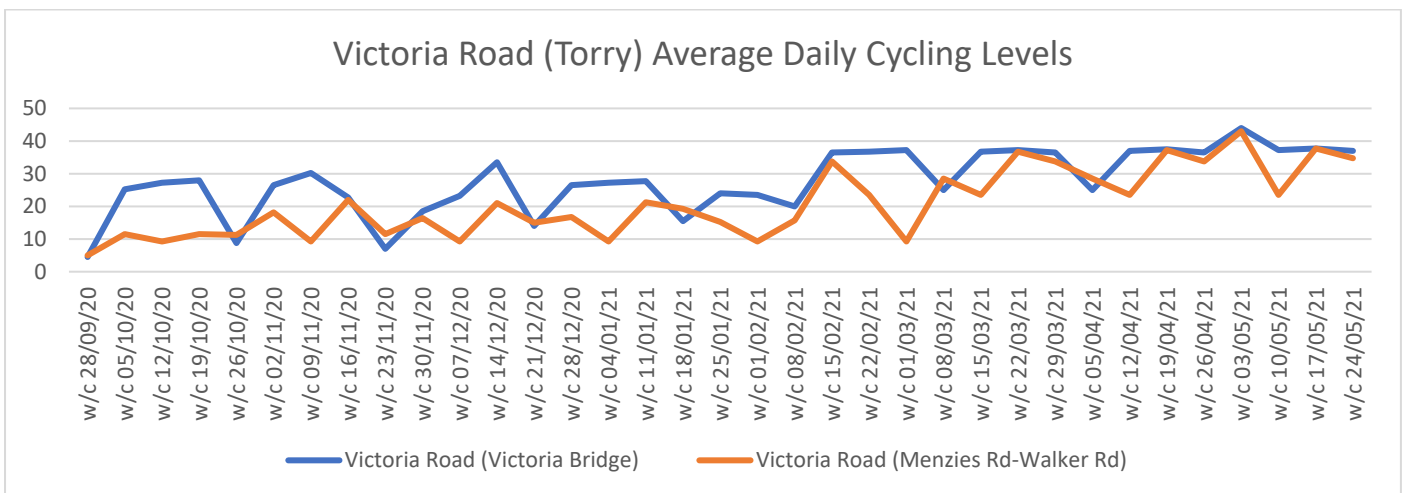


Fig 23 Torry (Victoria Road) Cycling Levels

The pedestrian levels in Torry reflect the pattern observed citywide with a decrease in late December and a gradual rise from February onwards. The cycling levels, despite some fluctuations, continue to rise.

The observational data for Torry (Victoria Road Bridge) showed:-

- This site is busier during the week with Wednesday the busiest day
- Pedestrians continue to adhere to physical distancing.
- On occasion, cyclists will ride on pavement instead of road. This may be due to the cobblestoned surface of the bridge.

The observational data for Torry (Victoria Road Shops) showed:-

- This site is busier on weekdays than weekends too with Wednesday also the busiest day.
- Not quite as busy as the Victoria Bridge site
- Pedestrians continue to adhere to physical distancing.
- Drivers observed to park considerately. Boundary markers remain undamaged at this location.
- Some on street parking increase latterly as people visit nearby chip shop. No queuing observed at chip shop or Spar store.

## 1.5 Rosemount

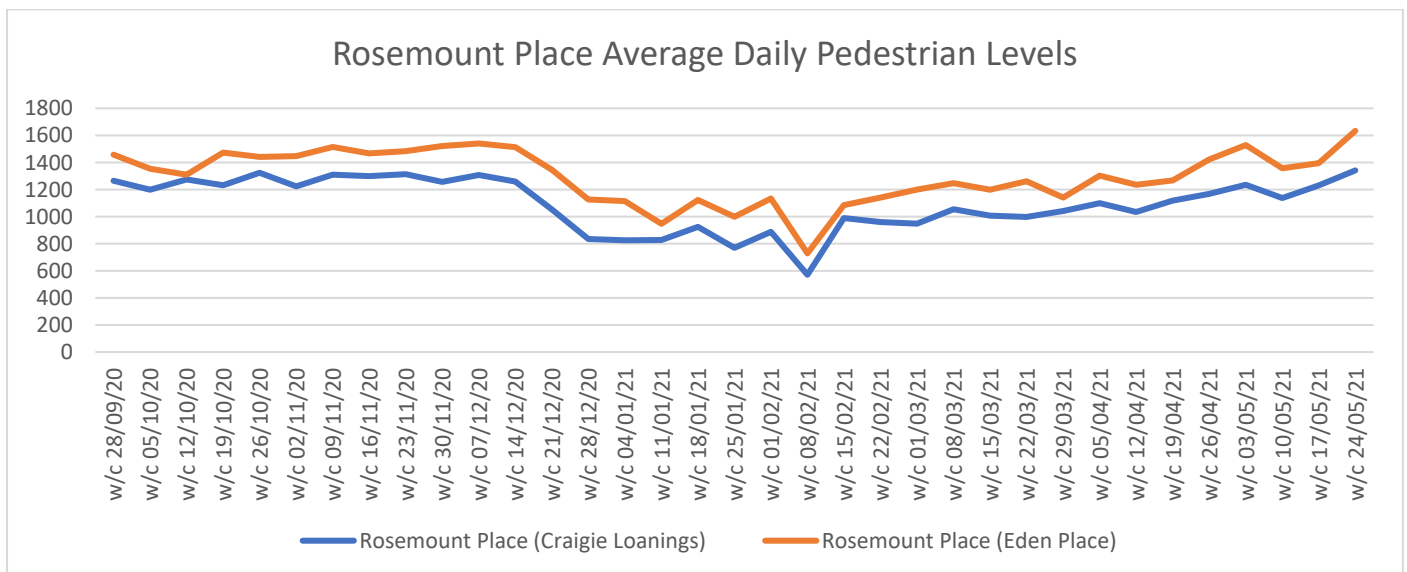


Fig 24 Rosemount Place Pedestrian Levels

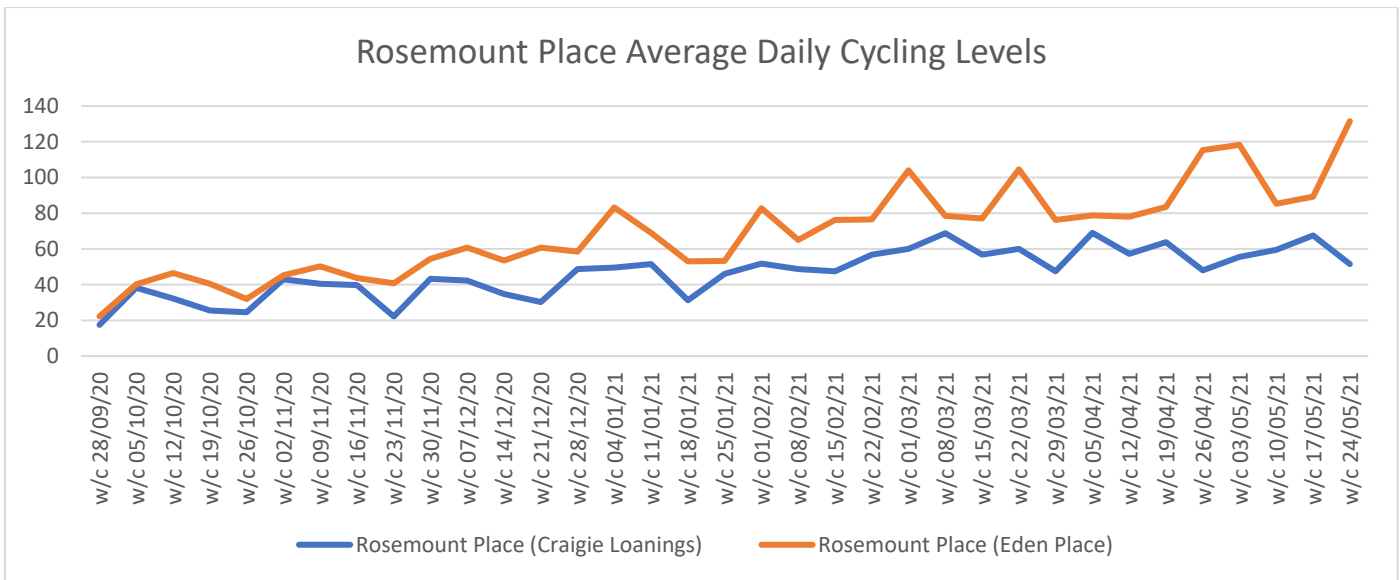


Fig 25 Rosemount Place Cycling Levels

The pedestrian levels in Rosemount reflect the pattern observed citywide with a decrease in late December and a gradual rise from February onwards. However, unlike other sites, the pedestrian levels at both Rosemount sites have now risen back to the original higher levels seen before December 2020.

The cycling levels, despite some fluctuations, continue to rise too. The Rosemount Place site at Craigie Loanings has seen a small overall rise while the site as Eden Place has risen more considerably.

The observational data for Rosemount (Craigie Loanings end) showed:-

- This site is busier during the week than weekends with Wednesday the busiest day.
- Pedestrians observed to maintain physical distancing and to use the reallocated carriage way space.
- No illegal vehicle movements observed despite changes in road layout.
- Cars observed to park considerately to prevent conflicts with pedestrians, vehicles, and cyclists.
- No illegal vehicle movements observed despite changes in road layout
- There does seem to be more on street parking latterly as people make use of nearby takeaways and shops.

The observational data for Rosemount (Eden Place) showed:-

- This site is busier than Craigie Loanings
- This site is busier during the week than weekends with Wednesday the busiest day.
- Pedestrians observed to maintain physical distancing.
- No illegal vehicle movements observed despite changes in road layout.
- Cars observed to park considerately to prevent conflicts with pedestrians, vehicles, and cyclists.
- There does seem to be more on street parking latterly as people make use of nearby takeaways and shops.

## 1.6 The Beach Esplanade

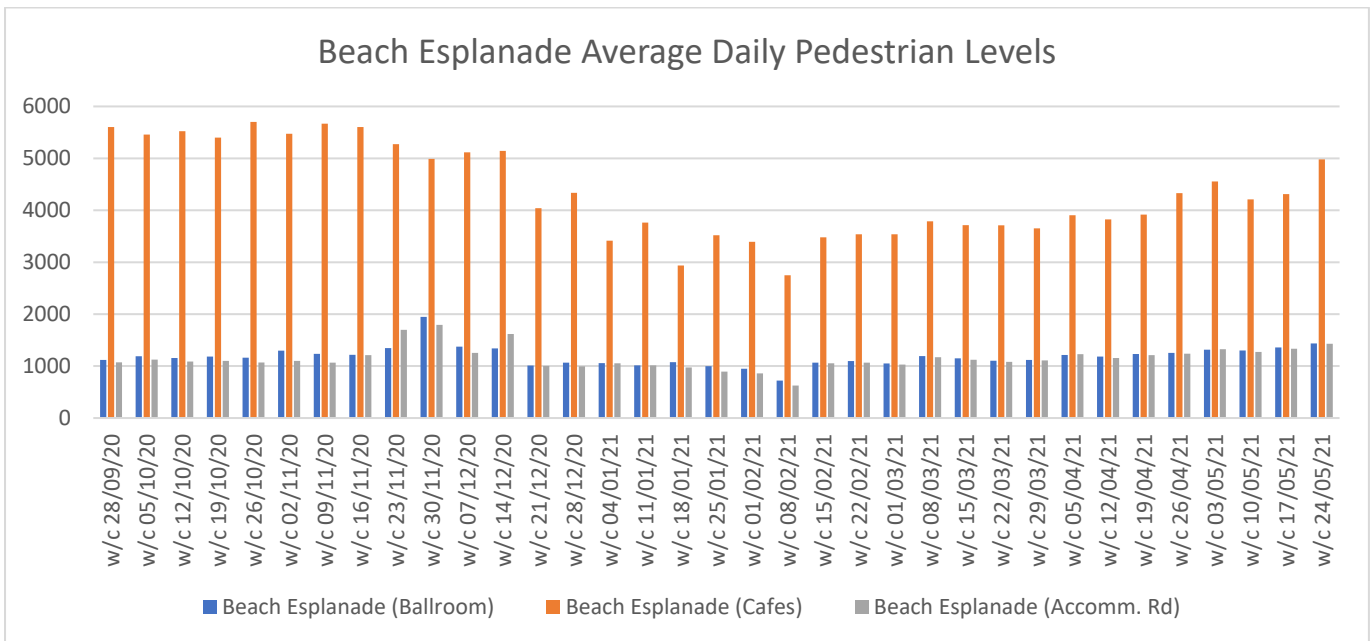


Fig 26 Beach Esplanade Pedestrian Levels

The pedestrian levels at the three Beach Esplanade sites reflect the pattern observed citywide with a decrease in late December and a gradual rise from February onwards. What is evident here is that the section beside the cafes, restaurants and retail offering at the beach is far busier with people then the sections further north at the Beach Ballroom and Accommodation Road.

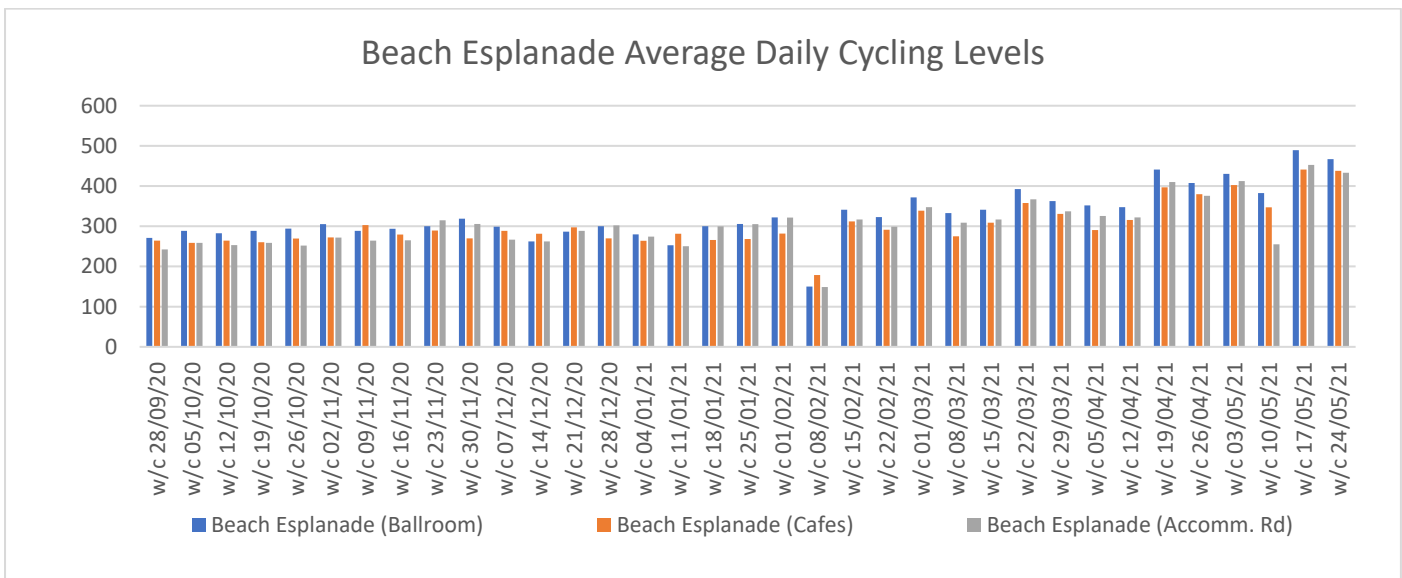


Fig 27 Beach Esplanade Cycling Levels

1. Sections of the Esplanade were closed from 23rd of November 2020 for Sfp Active Travel Corridor removal works.

The three Beach Esplanade sites have consistently posted the highest levels of cycling in the city in every monitoring period and on every day of the week. Despite some fluctuations, the overall levels of cycling at each of the three sites, continues to rise.

The observational data for Beach Esplanade (Ballroom) showed:-

- This has been the busiest monitoring site in the city for cycling in all of the monitoring periods
- This site has featured in the top 10 for the last 5 monitoring periods for child pedestrians
- It is busiest at the weekends with Saturday the busiest day
- All days showed an increase in total active travel levels over the period.
- Physical distancing generally adhered to.
- Cyclists made good use of cycle lanes while they were in place and did not use footways or road.
- The majority of pedestrians use pavement closest to seafront (Lower Promenade).

The observational data for Beach Esplanade (Cafés) showed:-

- This has been the busiest of the monitoring sites in the city with child pedestrians for the last 5 monitoring periods
- It has been the second busiest site for cycling in 3 monitoring periods and third in the other 6.
- It has been in the Top 5 busiest active travel sites, from those monitored, in 8 of the 9 monitoring periods.
- Based on the total number of people who have passed through each site over the 9 monitoring periods, this section of Beach Esplanade has the fifth highest active travel total for weekdays and the third highest for weekends.
- It is busier at weekends with Saturday the busiest day
- Physical distancing continues to be adhered to.
- Cyclists make good use of marked cycle lanes, and do not use footways or road.
- No issues observed with drivers misusing new one-way system.

The observational data for Beach Esplanade (Accommodation Road) showed:-

- This is the 2<sup>nd</sup> busiest site in the city for cycling
- Busier on weekend days than weekdays with Saturday the busiest day
- All pedestrians observed to be on seafront side of road.
- Pedestrians generally adhered to physical distancing.
- Cyclists made good use of cycle lane markings when they were in place and did not cycle on road or pavement.
- Despite proximity of parking bays to cycle lane (when it was in place), drivers parked considerately, causing no conflicts with drivers or cyclists, and causing no damage to red and white boundary markers.

## 1.7 Clipboard Survey Summary (Taken from the Committee Report).

The results of the clipboard surveys which were undertaken to assess the impact of the interventions are summarised below, and the full data is included in the Appendix 3. In the first survey, 956 people were surveyed over the 18<sup>th</sup> and 19<sup>th</sup> of December 2020 while, for the second, 704 people were surveyed on the 22<sup>nd</sup> and 23<sup>rd</sup> of May. These are very encouraging numbers, particularly in the context of the pandemic.

People were surveyed at the locations listed below and were given the opportunity to comment on their experience of any interventions across the city.

- Union Street (Market Street to Bridge Street section)
- Union Street (around Bon Accord Street)
- Beach
- Chapel St

- George St
- Rose St
- Rosemount
- Thistle St

Overall, the response was very positive towards the interventions and the following are a selection of the questions asked and the responses received.

### 1.8 **What was their opinion on the temporary measure brought in to help enable physical distancing?**

People were asked to score their view of the Spaces for People interventions in the City Centre, Beach, Rosemount and George Street, as well as Union Square and in the city's parks from "**Very Positive**" to "**Very Negative**" across 5 options.

When the "Very positive" and "Generally positive" answers were added together, the total was greater than 50% in all areas, suggesting that more people were positive about the temporary infrastructure than were negative. In 2020, the Beach was the most popular (97%), parks second (87%) Union Street third (82%), Union Square fourth (79%), George St fifth (72%) and Rosemount 6th (60%). In 2021, the order was the same and all of the sites saw a small percentage increase apart from Rosemount which reduced slightly.

### 1.9 **How did people visit these locations?**

People were asked how they travelled to visit the City Centre, Beach, Rosemount, George Street, Union Square and the city's parks. They were able to tick more than one option.

For both surveys, in all locations, visiting locations on foot was the most popular form of transport. Cycling was the second most popular for visiting the beach and the parks with car/van driver the second most popular city centre, Union Square and George Street with car/ van passenger the second most popular for Rosemount.

For mode split, based on the average figure for trips to the 6 destinations, foot was the most popular choice by some margin (76%), followed by car/ van driver (48%), then car/ van passenger (45%) then cycling (33%) which interestingly beat bus (6%). In both surveys no trips were recorded for taxi, motorbike or "other".

Given how high the active travel use is, this would suggest that walking and cycling-friendly infrastructure has both enabled and helped to support these journeys.

### 1.10 **Why have they visited certain locations less?**

For the same locations listed in 1.9 above, people were given a number of options to choose from for this question and could choose more than one option.

For not travelling to the City Centre more, the most popular answer, in both surveys, was that homeworking meant less need to travel there. This was closely followed by the fear of contracting COVID-19. For all other destinations, the fear of being unable to socially distance was the most popular.

It would seem therefore that continuing to provide infrastructure, which helps physical distancing, could help to mitigate two of the largest fears of "being unable to socially distance" and the "fear of contracting COVID-19"

To see if the changes to the transport network may have caused people to visit certain areas less a "difficulty accessing" option was added to this question for 2021. However, this

was not selected by any of the participants, suggesting the Spaces for People restrictions have not been seen as a barrier.

### 1.11 **Why had they visited certain locations more?**

For the same locations listed in 1.9 above, people were given a number of options to choose from for this question and could choose more than one option.

In 2020, the most popular reason to visit the City Centre more often was exercise, for Union Square it was "work" and "the feeling of safety compared with other places" that tied, for Beach and Rosemount it was the feeling of safety and for Rosemount and the parks, it was "to be around other people".

For the 2021 questionnaire, new options were added around wanting to visit places more often because people had "missed physical shops/ services", "wanted to support the physical shops/ services", "places had become easier to access and move around" and "places have become more attractive to be in". In 2021, two of these proved the most popular answers with 82-89% of respondents ticking that they wanted to support physical businesses in the identified areas and 78-82% of respondents ticking that they had missed these. Interestingly, although the options that made the Top 3 in 2020 - "exercise", "work", "feeling safer there than other places" and "being around other people" dropped out of the top 3 in 2021, the percentages of people who picked them remained the same.

People have a desire to return to physical businesses - bars, shops services - to support them so enabling them to do this is important.

### 1.12 **Have people been visiting the intervention locations to the same degree as pre COVID?**

For the same locations listed in 1.9 above, people were given three options for this question, that they visited more, the same or less frequently.

For both surveys, the most popular answer was that people have visited the areas with the same frequency since March 2020 when COVID-19 restrictions first began. For both surveys, the beach area and the parks were the areas which posted the highest numbers of "more frequent" visitors and, in both cases, the percentage had increased in the 2021 survey compared with the 2020 survey

In 2021, people were also asked if, since 26th April 2021, when lockdown restrictions began to ease, have they visited the following areas of the city more frequently, less frequently or the same amount?

Nobody that answered had not been to any of the areas at all since lockdown restrictions lifted and, for all of the sites, the most popular answer reported was that people visited more frequently now that restrictions had been lifted. The second most popular answer was "less frequently" at all sites, although most places, with the exception of Union Square, recorded a much lower "less frequently" figure than "more frequently".

In the case of Union Square, the "more frequently" figure was more than double the "less frequently" one and, for the parks, it was more than 4 times higher than the "less frequently" one.

This suggests that the main reason that people did not go to the named destinations more was related to the restrictions imposed during COVID-19.

### 1.13 **What works well**

In both 2020 and 2021, people did not identify any areas where the temporary measures did not work well.

In both years - 2020 and 2021 - over 99% of respondents did not identify anything they'd like to see done differently with the temporary measures

Where respondents identified areas where temporary measures should continue, those who did identified Union Street

In neither 2020 or 2021, did respondents identify any changes that should be removed

#### 1.14 Other points

**Parking** – 39% of people disagreed that access to car parking was easier, while 35% were neutral and 13% felt it was easier.

**Walking and Cycling** - Based on the scores for "totally agree" and "Neither agree nor disagree" added together 89% of people felt safer walking and cycling in the city and 94% found it easier walking and cycling, as a result of the new measures. This continued in 2021 with 90% and 94% respectively.

**Ease of getting around** - The most popular score for "I find it easier to get to places due to the new measures" was "Generally Agree" (41%) in 2020, followed by "Neither agree nor disagree" (38%). This was similar in 2021 with 39% and 38% respectively.

**Access to Bus Services** - The most popular score for "I find it easier to access bus services due to new measures" was "Neither agree nor disagree" in both 2020 (41%) and 2021 (44%)

**Parking** - The most popular score for "I find it easier to access parking in the city centre due to the new measures was "generally disagree" in both 2020 and 2021 (39%)

The temporary measures have made active travel appear safer and easier and they continue to do so. Given that this is the most sustainable mode, complies with physical distancing, encourages healthy lives and is available to the greatest number of people, it makes sense to continue to champion these modes.

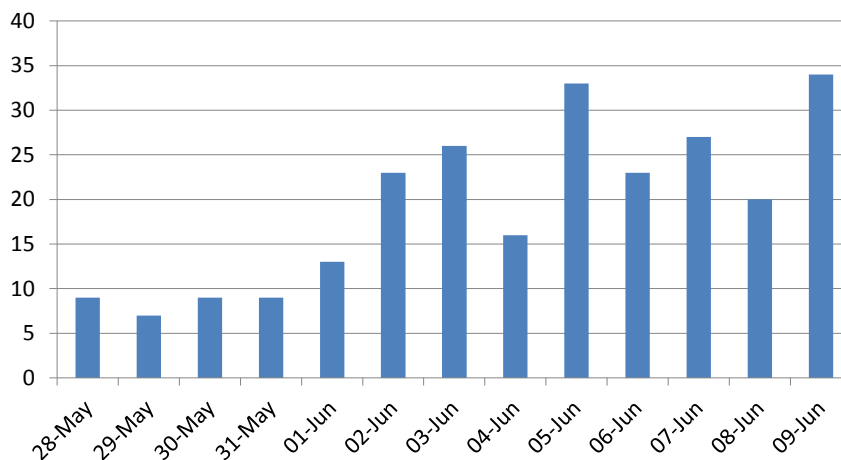
Given that some parking has had to be removed and some car park access made more difficult to enable safe physical distancing, it is not unexpected that people will find it harder to access parking.



## **Briefing note for Elected Members, MSPs MPs and Community Councils**

**Perceptions of COVID-19 across Grampian:** At the end of May the numbers of cases identified each day were around 8 or 9 each day, leading to a perception that COVID-19 had ceased to be a particular problem in Grampian. However, since then the number of cases has been steadily rising, with 34 cases reported for 9th June. Cases are now doubling approximately every 6-7 days

Daily Grampian Covid-19 cases

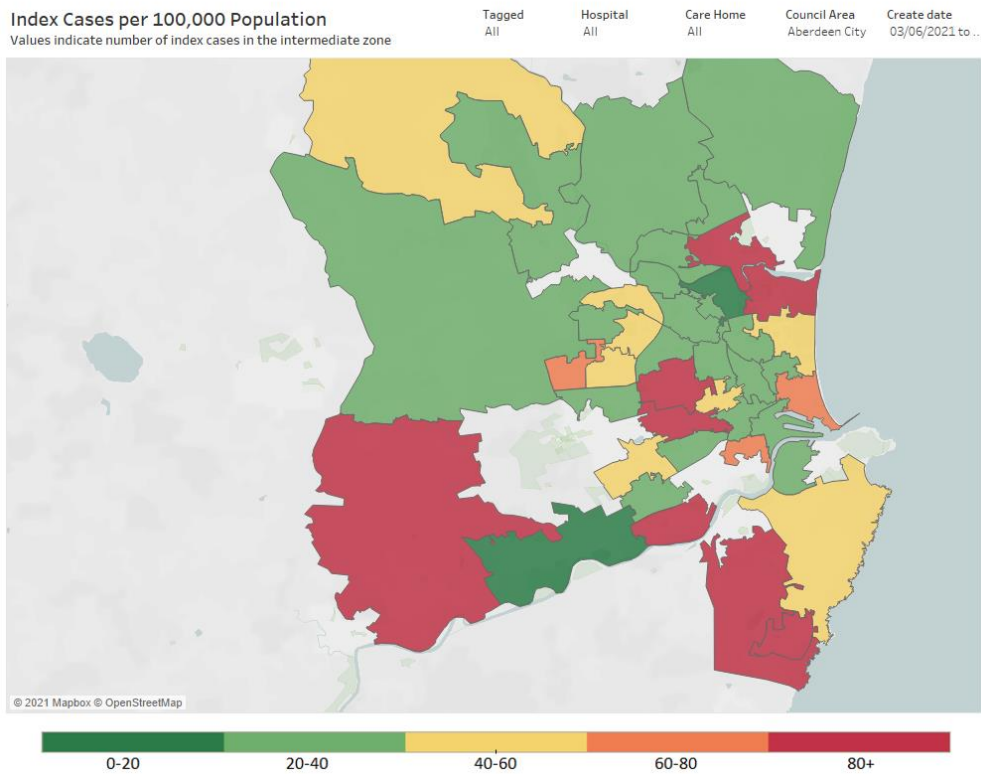


**Context:** These figures need to be set in the following context.

- Cases across Scotland are now exceeding 1000 per day. If cases were spread evenly across Scotland, Grampian would be seeing over 100 per day. With the easing of restrictions on both mixing and, in particular, travelling it seems only a matter of time before Grampian 'catches up' with board areas in the central belt and Tayside
- Over a very short period of time the dominant strain of the virus in Grampian has changed from the Alpha (Kent) variant to the Delta (Indian) variant, which now accounts for more than 80% of the cases in Grampian.
- The Delta variant is more than 60% more infectious than the Alpha variant.
- Vaccines do protect, but the second dose is very important against the Delta variant.
- Emerging evidence suggests that the Delta variant may be associated with higher rates of hospitalisation (perhaps up to double) than the Alpha variant, even taking account of vaccination.
- Long COVID affects at the very least a tenth of people who get the infection, and this includes young people, who are now the most likely people to catch it.

**Local 'hot spots':** There are particular increases in case numbers in Aberdeenshire West and South and in Aberdeen City West and South. The maps below also show the current situation in Aberdeen City, Aberdeenshire, and Grampian as a whole.

	26 <sup>th</sup> May to 2 <sup>nd</sup> June	3 <sup>rd</sup> June to 9 <sup>th</sup> June
Aberdeenshire West and South	10	40
Aberdeen City West and South	39	46



### Index Cases per 100,000 Population

Values indicate number of index cases in the intermediate zone

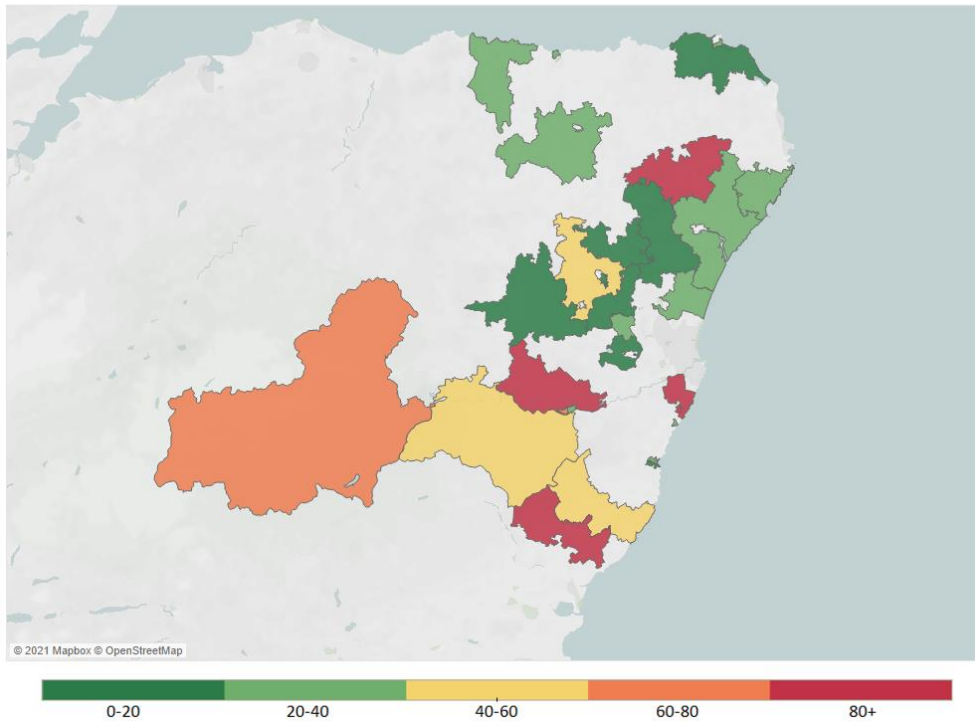
Tagged  
All

Hospital  
All

Care Home  
All

Council Area  
Aberdeenshire

Create date  
03/06/2021 to ...



### Index Cases per 100,000 Population

Values indicate number of index cases in the intermediate zone

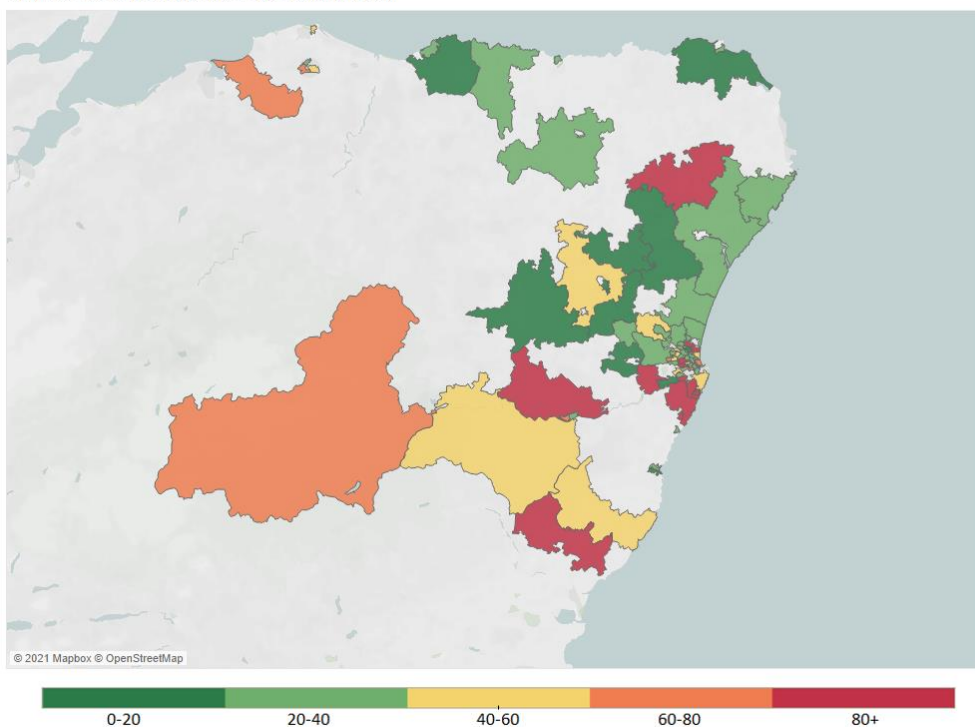
Tagged  
All

Hospital  
All

Care Home  
All

Council Area  
All

Create date  
03/06/2021 to ...



**Conclusion:** Notwithstanding public perception, it is clear that the situation in Grampian is serious and worsening. The objective now must be to delay the speed of the rise of this third wave for as long as possible and to use this period of delay to get as many people as possible vaccinated, ideally with two doses of the vaccine.

**What can be done?** Our partnership response means we are able to take enhanced measures to help to contain the infection.

- Make testing as available as possible. Testing, particularly asymptomatic testing is key to interrupting the spread. In addition to the currently available testing centres a mobile testing centre is opening in Banchory and Stonehaven from 12<sup>th</sup> to 16<sup>th</sup> June, and a testing service is opening in Aboyne Area Office from 11<sup>th</sup> to 18<sup>th</sup> June. Details of how to arrange a test are at [Community Testing with no COVID-19 symptoms \(nhsgrampian.org\)](https://www.nhs.uk/healthcare/healthcare-services/community-testing-with-no-covid-19-symptoms)

Anyone who has symptoms should arrange a PCR test at a government testing centre or by ordering a test through the post. However, all members of the public who have no symptoms are strongly urged to get a supply of LFD tests and to do the test twice weekly. Advice about how to go about getting a test is available at NHS Inform or from the Grampian Testing web page above.

<https://www.nhsinform.scot/illnesses-and-conditions/infections-and-poisoning/coronavirus-covid-19/test-and-protect/coronavirus-covid-19-get-a-test-if-you-do-not-have-symptoms>

LFD tests can also be picked up from participating community pharmacies. People can find their nearest pharmacy at

<https://maps.test-and-trace.nhs.uk/findatestcenter.html>

- Carry out enhanced contact tracing to try to identify sources of infection
- Make more use of customer lists from hospitality settings to encourage testing if people may have been exposed
- Accelerate the vaccination programme. This is unfortunately constrained by the available doses of vaccine being supplied to Grampian

No one wants to go back into restrictions or even lockdown. We need to encourage individuals, workplaces, hospitality establishments and communities to do their utmost to keep the third wave at bay. So what can people do to help?

- When invited people should go for the vaccination. Now that we are vaccinating younger age groups there is a significant proportion of appointments that are not being taken up. Younger people are still at risk of hospitalisation and of developing Long COVID and should not assume that they don't need to get vaccinated.
- Just because people are allowed to do some things does not mean that they should do these things. So people should:
  - Avoid unnecessary travel outwith their own area, and especially to the Central Belt of Scotland and to England. If you do need to travel for

your work or indeed for a family celebration participate in regular testing in addition to usual precautions

- Avoid crowded indoor places. If it looks too crowded, it is too crowded
- Limit the numbers of people mixing at home
- Continue with the usual precautions of social distancing and use of face coverings. Apart from mixing in households these precautions still apply in shops, public transport, circulation areas in public buildings and workplaces.
- Hospitality venues should continue to comply with the COVID requirements. Good ventilation and physical distancing are still required even in phase 2
- Businesses should consider whether or not they wish to close voluntarily, particularly in 'hot spot' areas.

You may also find the graphic (below), from the World Health Organisation, useful:

# Avoid the Three Cs

Be aware of different levels of risk in different settings.



There are certain places where COVID-19 spreads more easily:



## 1 Crowded places

with many people nearby



## 2 Close-contact settings

Especially where people have close-range conversations



## 3 Confined and enclosed spaces

with poor ventilation



The risk is higher in places where these factors overlap.

Even as restrictions are lifted, consider where you are going and #StaySafe by avoiding the Three Cs.

## WHAT SHOULD YOU DO?



Avoid crowded places and limit time in enclosed spaces



Maintain at least 1m distance from others



When possible, open windows and doors for ventilation



Keep hands clean and cover coughs and sneezes



Wear a mask if requested or if physical distancing is not possible

**If you are unwell, stay home unless to seek urgent medical care.**

Results of on-street clipboard surveys carried out to establish people's travel habits during COVID-19 pandemic and their reactions to the Spaces for People measures

Key

Most popular answer	
2nd most popular answer	
3rd most popular answer	

Site of questionnaire response	Dec-20		May-21	
	Number	Percentage	Number	Percentage
Union Street pedestrianised area	409	42.78	313.00	44.46
Union Street near Bon Accord	299	31.28	236.00	33.52
Beach	40	4.18	26.00	3.69
Chapel St	71	7.43	46.00	6.53
George St	27	2.82	13.00	1.85
Rose St	20	2.09	17.00	2.41
Rosemount	14	1.46	8.00	1.14
Thistle St	76	8.88	45.00	6.39
Surveyed in total	956	100.93	704.00	100.00

Site Observation - The number of respondents was less for the second round of surveys compared with the first (956 vs 704). Union Street remained the most popular location for attracting respondents

Q1. Postcode of respondents	AB10	AB11	AB12	AB13	AB14	AB15	AB16	AB18	AB21	AB22	AB23	AB24	AB25	AB31	AB32	AB35	AB37	AB38	AB39	AB41	AB42	AB45	AB51	REFUSE	Total
Percentage December 2020	20.92050209	10.77405858	7.845188285	0.209205021	0.627615063	10.66945607	9.937238494	0.523012552	5.439331	5.543933	7.217573	4.288703	7.322176	1.25523	2.09205	0.104603	0.523013	0.209205	0.104603	0.941423	0.732218	0.523013	0.209205	1.987448	100
Number December 2020	200	103.00	75	2	6	102	95	5	52	53	69	41	70	12	20	1	5	2	1	9	7	5	2	19	956
Percentage May 2021	18.75	6.25	8.522727273	0.284090909	0.852272727	10.9375	18.03977273	0	4.545455	6.25	9.232955	5.397727	6.25	1.136364	0.142045	0	0	0	0	0	0.142045	0.710227	0.284091	2.272727	100
Number May 2021	132	44.00	60	2	6	77	127	0	32	44	65	38	44	8	1	0	0	0	0	0	1	5	2	16	704

Q1. Observation - AB10 was still the most popular postcode for respondents. AB16 was the second most popular in the second survey, doubling its percentage share of the number of respondents since the first survey with AB15 third in both

Q2. Are you currently employed or in education?	Yes	No	Total
Percentage December 2020	59.41422594	40.59	100
Number December 2020	568	388.00	956
Percentage May 2021	57.10227273	42.90	100
Number May 2021	402	302.00	704

Q2. Observation - For both surveys, more than half of the respondents were employed or in education

Q3- If yes, what best describes your working status? (Tick all that apply)...	Percentage Dec 2020	Number Dec 2020	Percentage Dec May 2021	Number May 2021
Working / studying at home all the time	21.76	208.00	23.57954545	166
Working / studying at home some days	30.13	288.00	34.23295455	241
Commuting to work / place of study	18.10	173.00	16.61931818	117
Traveling to various locations for work / study	20.92	200.00	17.75568182	125
Furloughed	9.00	86.00	7.8125	55
Other (Please state)	0.10	1.00	0	0
Total	100.00	956.00	100.00	704.00

Q3. Observation - For both surveys, the most popular working status was "working/ studying at home some days", followed by "working/ studying at home all the time"

Q4. Since the middle of March 2020, when COVID-19 restrictions first began, have you visited the following areas of the city more frequently, less frequently or the same amount?	Dec-20				May-21					
	More frequently	Same frequency	Less frequently	Not at all	Total	More frequently	Same frequency	Less frequently	Not at all	Total
Q4a- Visited the City Centre? (percentage)	12.97	44.46	42.57		100	12.64204545	44.03409091	43.32386364		100
Q4a- Visited the City Centre? (number)	124.00	425.00	407.00		956	89	310	305		704
Q4b- Visited Union Square? (percentage)	11.19	46.23	42.57		100	10.79545455	44.60227273	44.60227273		100
Q4b- Visited Union Square? (number)	107.00	442.00	407.00		956	76	314	314		704
Q4c- Visited the Beach? (percentage)	35.98	58.05	5.96		100	37.5	57.38636364	5.113636364		100
Q4c- Visited the Beach? (number)	344.00	555.00	57.00		956	264	404	36		704
Q4d- Visited George Street? (percentage)	14.12	72.18	13.70		100	12.92613636	71.59090909	15.48295455		100
Q4d- Visited George Street? (number)	135.00	690.00	131.00		956	91	504	109		704
Q4e- Visited Rosemount? (percentage)	8.47	71.76	19.77		100	8.096590909	70.73863636	21.16477273		100
Q4e- Visited Rosemount? (number)	81.00	686.00	189.00		956	57	498	149		704
Q4f- Visited the parks? (percentage)	38.64	55.50	5.86		100	41.25177809	53.76955903	4.978662873		100
Q4f- Visited the parks? (number)	369.00	530.00	56.00		955	290	378	35		703

Q4. Observation - For both surveys, the most popular answer was that people have visited the areas with the same frequency since March 2020 when COVID-19 restrictions first began. For both surveys, the beach area and the parks were the areas which posted the highest numbers of "more frequent" visitors and, in both cases, the percentage had increased in the 2021 survey compared with the 2020 survey

Q5. Since 26th April 2021, when lockdown restrictions began to ease, have you visited the following areas of the city more frequently, less frequently or the same amount?	May-21				
	More frequently	Same	Less frequently	I have not gone there at all	Total
City Centre (percentage)	31.31	11.51	26.99		100.00
City Centre (number)	433.00	81.00	190.00		704.00
Union Square (percentage)	33.49	22.16	38.35		100.00
Union Square (number)	278.00	156.00	270.00		704.00
Aberdeen Beach (percentage)	66.04	0.00	33.95		100.00
Aberdeen Beach (number)	465.00	0.00	239.00		704.00
George Street (percentage)	32.43	12.64	36.93		100.00
George Street (number)	355.00	89.00	260.00		704.00
Rosemount (percentage)	39.49	3.41	37.36		100.00
Rosemount (number)	417.00	24.00	263.00		704.00
Parks (Duthie, Westburn, Victoria, Hazlehead, Seaton)(percentage)	31.74	13.64	15.63		100.00
Parks (Duthie, Westburn, Victoria, Hazlehead, Seaton)(number)	498.00	96.00	110.00		704.00

Q5. Observations - Nobody that answered had not been to any of the areas at all since lockdown restrictions lifted and, for all of the sites, the most popular answer reported was that people visited more frequently now that restrictions had been lifted. The second most popular answer was "less frequently" at all sites, although most places, with the exception of Union Square, recorded a much lower "less frequently" figure than "more frequently". In the case of Union Square, the "more frequently" figure was more than double the "less frequently" one and, for the parks, it was more than 4 times higher than the "less frequently" one.

956 956 956 956 956 956 956 956 704

Q5. Observations - This suggests that the main reason that people did not go to the named destinations more was related to the restrictions imposed during COVID-19

Q6. How have you visited these places? (please tick all that apply)	Dec-20									May-21								
	Foot	Cycle	Bus	Taxi	Car/ van passenger	Car/ van driver	Motorbike	Other	Foot	Cycle	Bus	Taxi	van passenger/ van driver	Motorbike	Other			
Q6a- How have you visited the City Centre? (percentage)	70.71	16.00	7.74	0.00	63.70	67.57	0.00	0.00	71.02	15.48	8.10	0.00	62.78409	65.76705	0.00			
Q6a- How have you visited the City Centre? (number)	676.00	153.00	74.00	0.00	609.00	646.00	0.00	0.00	500.00	109.00	57.00	0.00	442.00	463.00	0.00			
Q6b- How have you visited Union Square? (percentage)	77.09	19.25	11.61	0.00	50.73	61.19	0.00	0.00	78.41	18.75	11.51	0.00	51.84659	59.80114	0.00			
Q6b- How have you visited Union Square? (number)	737.00	184.00	111.00	0.00	485.00	585.00	0.00	0.00	552.00	132.00	81.00	0.00	365.00	421.00	0.00			
Q6c- How have you visited the Beach? (percentage)	75.31	53.56	0.00	0.00	36.40	33.37	0.00	0.00	74.14773	51.98864	0.00	0.00	35.36932	30.82386	0.00			
Q6c- How have you visited the Beach? (number)	720.00	512.00	0.00	0.00	348.00	319.00	0.00	0.00	522.00	366.00	0.00	0.00	249.00	217.00	0.00			
Q6d- How have you visited George Street? (percentage)	77.20	29.08	8.37	0.00	39.85	50.10	0.00	0.00	76.14	27.98	8.24	0.00	40.19886	52.27273	0.00			
Q6d- How have you visited George Street? (number)	738.00	278.00	80.00	0.00	381.00	479.00	0.00	0.00	536.00	197.00	58.00	0.00	283.00	368.00	0.00			
Q6e- How have you visited Rosemount? (percentage)	79.29	31.17	8.37	0.00	44.04	43.83	0.00	0.00	79.12	30.26	8.38	0.00	45.73864	45.17045	0.00			
Q6e- How have you visited Rosemount? (number)	758.00	298.00	80.00	0.00	421.00	419.00	0.00	0.00	557.00	213.00	59.00	0.00	322.00	318.00	0.00			
Q6f- How have you visited the parks? (percentage)	75.21	51.15	0.00	0.00	35.25	32.43	0.00	0.00	76.99	54.97	0.00	0.00	35.36932	31.25	0.00			
Q6f- How have you visited the parks? (number)	719.00	489.00	0.00	0.00	337.00	310.00	0.00	0.00	542.00	387.00	0.00	0.00	249.00	220.00	0.00			
Total Percentage	454.81	200.21	36.09	0.00	269.98	288.49	0.00	0.00	455.82	199.43	36.22	0.00	271.31	285.09	0.00			
Total Number	4348.00	1914.00	345.00	0.00	2581.00	2758.00	0.00	0.00	3209.00	1404.00	255.00	0.00	1910.00	2007.00	0.00			
Average percentage	75.80	33.37	6.01	0.00	45.00	48.08	0.00	0.00	75.97	33.24	6.04	0.00	45.22	47.51	0.00			

- 1=foot
- 2=cycle
- 3 = Bus
- 4 = Taxi
- 5 = Car / Van Passenger
- 6 = Car / Van Driver
- 7 = Motorbike
- 8 = Other

Q6. Observations - For both surveys, in all locations, visiting locations on foot was the most popular form of transport. Cycling was the second most popular for visiting the beach and the parks with car/van driver the second most popular city centre, Union Square and George Street with car/ van passenger the second most popular for Rosemount

Q6. Observations - For mode split, based on the average figure for trips to the 6 destinations, foot was the most popular choice by some margin (76%), followed by car/ van driver (48%), then car/ van passenger (45%) then cycling (33%) which interestingly beat bus (6%). In both surveys no trips were recorded for taxi, motorbike or "other"

Q6. Observations - Given how high the active travel use is, this would suggest that walking and cycling-friendly infrastructure has both enabled and helped to support these journeys...

Q7. If you have visited these places less, has anything prevented you from visiting these places more? (Please tick all that apply)	Dec-20									May-21								
	Home working means less need	I am able to shop online	Fear of being unable to socially distance	Fear of others behaving irresponsibly	I don't feel safe travelling by usual means	Fear of contracting COVID	Need to self isolate	Other (Please state)	Home working means less need	I am able to shop online	Fear of being unable to socially distance	Fear of others behaving irresponsibly	I don't feel safe travelling by usual means	Fear of contracting COVID	Need to self isolate	Other (Please state)	Difficulty accessing	
Q7a- What has reduced your travel to the City Centre? (percentage)	69.67	61.19	66.74	55.33	66.63	69.67	0.00	0.00	68.75	61.22	66.19	57.52841	66.90341	67.89773	0.00	0.00		
Q7a- What has reduced your travel to the City Centre? (number)	666.00	585.00	638.00	529.00	637.00	666.00	0.00	0.00	484.00	431.00	466.00	405.00	471.00	478.00	0.00	0.00		
Q7b- What has reduced your travel to Union Square? (percentage)	67.78	64.44	71.34	50.10	60.67	64.44	0.00	0.00	66.90	62.93	70.45	51.13636	61.93182	64.0625	0.00	0.00		
Q7b- What has reduced your travel to Union Square? (number)	648.00	616.00	682.00	479.00	580.00	616.00	0.00	0.00	471.00	443.00	496.00	360.00	436.00	451.00	0.00	0.00		
Q7c- What has reduced your travel to the Beach? (percentage)	0.00	0.00	71.55	62.13	62.66	71.23	0.00	0.00	0.00	0.00	71.59091	62.5	62.92614	68.46591	0.00	0.00		
Q7c- What has reduced your travel to the Beach? (number)	0.00	0.00	684.00	594.00	599.00	681.00	0.00	0.00	0.00	0.00	504	440	443	482	0.00	0.00		
Q7d- What has reduced your travel to George Street? (percentage)	66.84	64.54	71.55	50.94	61.09	64.54	0.00	0.00	32.81	36.79	72.87	52.69886	60.22727	63.92045	0.00	0.00		
Q7d- What has reduced your travel to George Street? (number)	639.00	617.00	684.00	487.00	584.00	617.00	0.00	0.00	231.00	259.00	513.00	371.00	424.00	450.00	0.00	0.00		
Q7e- What has reduced your travel to Rosemount? (percentage)	68.51	63.08	72.80	51.05	60.04	62.55	0.00	0.00	69.74	62.07	74.15	50.85227	60.08523	61.50568	0.00	0.00		
Q7e- What has reduced your travel to Rosemount? (number)	655.00	603.00	696.00	488.00	574.00	598.00	0.00	0.00	491.00	437.00	522.00	358.00	423.00	433.00	0.00	0.00		
Q7f- What has reduced your travel to the parks? (percentage)	0.00	0.00	71.23	63.28	63.08	70.50	0.00	0.00	0.00	0.00	71.73295	62.07386	61.78977	71.73295	0.00	0.00		
Q7f- What has reduced your travel to the parks? (number)	0.00	0.00	681.00	605.00	603.00	674.00	0.00	0.00	0.00	0.00	505.00	437.00	435.00	505.00	0.00	0.00		

Q7. Observations - For not travelling to the City Centre more, the most popular answer, in both surveys, was that homeworking meant less need to travel there. This was closely followed by the fear of contracting COVID-19. For all other destinations, the fear of being unable to socially distance was the most popular.

Q7. Observations - It would seem therefore that continuing to provide infrastructure, which helps physical distancing, could help to mitigate two of the largest fears of "being unable to socially distance" and the "fear of contracting COVID-19"

Q7. Observations - To see if the changes to the transport network may have caused people to visit certain areas less a "difficulty accessing" option was added to this question for 2021. However, this was not selected by any of the participants, suggesting the Spaces for People restrictions have not been seen as a barrier...

Q8. If you have visited these places more, what are the reasons for this (tick all that apply)	Dec-20									May-21										
	To meet people outside of home	Exercise	Work	I feel safer there than other places	To be around other people	To get a change of scenery	Mental health benefits	Other (please state)	To meet people outside of home	Exercise	Work	I feel safer there than other places	To be around other people	To get a change of scenery	Mental health benefits	Other (please state)	missed physical shops/ bars/ restaurants/ cafes/ services	support the physical shops/ bars/ restaurants/ cafes/ services	They have become easier to access and move around	They have become more attractive to be in
Q8a- What has increased your travel to the City Centre? (percentage)	64.23	72.49	37.55	17.26	55.13	52.72	55.02	0.00	64.91	71.73	38.07	15.19886	54.97159	52.98295	55.53977	0.00	81.25	84.00000	9.659091	5.539773
Q8a- What has increased your travel to the City Centre? (number)	614.00	693.00	359.00	165.00	527.00	504.00	526.00	0.00	457.00	505.00	268.00	107.00	387.00	373.00	391.00	0.00	572.00	627.00	68.00	39.00
Q8b- What has increased your travel to Union Square? (percentage)	55.65	59.31	63.18	63.18	55.96	48.64	43.93	0.00	55.11	60.09	63.21	62.78409	55.68182	48.29545	45.17045	0.00	81.95455	82.38636	8.380682	10.9375
Q8b- What has increased your travel to Union Square? (number)	532.00	567.00	604.00	604.00	535.00	465.00	420.00	0.00	388.00	423.00	445.00	442.00	392.00	340.00	318.00	0.00	584.00	580.00	59.00	77.00
Q8c- What has increased your travel to the Beach? (percentage)	54.92	59.83	0.00	64.44	58.05	50.63	46.97	0.00	54.12	59.23	0.00	66.61932	58.52273	51.5625	45.02841	0.00	80.82386	84.51700	8.522727	4.403409
Q8c- What has increased your travel to the Beach? (number)	525.00	572.00	0.00	616.00	555.00	484.00	449.00	0.00	381.00	417.00	0.00	469.00	412.00	363.00	317.00	0.00	569.00	595.00	60.00	31.00
Q8d- What has increased your travel to George Street? (percentage)	54.60	59.00	0.00	65.06	63.60	54.60	45.40	0.00	55.11	58.38	0.00	65.34091	63.35227	55.11364	44.74432	0.00	79.26136	85.51773	8.096591	3.977273
Q8d- What has increased your travel to George Street? (number)	522.00	564.00	0.00	622.00	608.00	522.00	434.00	0.00	388.00	411.00	0.00	460.00	446.00	388.00	315.00	0.00	558.00	610.00	57.00	28.00
Q8e- What has increased your travel to Rosemount? (percentage)	53.77	56.38	0.00	63.81	63.91	53.77	44.98	0.00	53.27	56.96	0.00	64.63068	63.63636	53.55114	45.73864	0.00	79.97159	85.79545	8.096591	3.977273
Q8e- What has increased your travel to Rosemount? (number)	514.00	539.00	0.00	610.00	611.00	514.00	448.00	0.00	375.00	401.00	0.00	455.00	448.00	377.00	322.00	0.00	563.00	604.00	57.00	28.00
Q8f- What has increased your travel to the parks? (percentage)	56.69	59.52	0.00	64.85	83.68	48.64	63.49	0.10	56.67614	59.09091	0.00	65.625	83.52273	48.15341	63.06818	0.00	78.40909	85.75750	7.8125	4.6875
Q8f- What has increased your travel to the parks? (number)	542.00	569.00	0.00	620.00	800.00	465.00	607.00	1.00	399.00	416.00	0.00	462.00	588.00	339.00	444.00	0.00	552.00	608.00	55.00	33.00

Q8. Observations - In 2020, the most popular reason to visit the City Centre more often was exercise, for Union Square it was "work" and "the feeling of safety compared with other places" that tied, for Beach and Rosemount it was the feeling of safety and for Rosemount and the parks, it was "to be around other people". For the 2021 questionnaire, new options were added around wanting to visit places more often because people had "missed physical shops/ services", "wanted to support the physical shops/ services", "places had become easier to access and move around" and "places have become more attractive to be in". In 2021, two of these proved the most popular answers with 82-89% of respondents ticking that they wanted to support physical businesses in the identified areas and 78-82% of respondents ticking that they had missed these. Interestingly, although the options that made the Top 3 in 2020 - "exercise", "work", "feeling safer there than other places" and "being around other people" dropped out of the top 3 in 2021, the percentages of people who picked them remained the same

Q8. Observations - People have a desire to return to physical businesses - bars, shops services - to support them so enabling them to do this is important. Couple this with the responses in Question 5 and this suggests people are travelling into and around the city in larger numbers to do so

Q9. What is your opinion of the temporary measures brought in to help enable physical distancing in the city?	Dec-20								May-21							
	Very positive	Generally positive	Very positive and generally positive combined	Neither positive nor negative	Generally negative	Very negative	No opinion	Total	Very positive	Generally positive	Very positive and generally positive combined	Neither positive nor negative	Generally negative	Very negative	No opinion	Total
Q9a- Opinion of physical distancing measure in the City Centre? (percentage)	46.03	36.19	82.22	6.69	6.38	3.14	1.57	182.2175732	48.01136	35.36932	83.38068	5.539773	6.392045	2.840909	1.846591	100
Q9a- Opinion of physical distancing measure in the City Centre? (number)	440.00	346.00	786.00	64.00	61.00	30.00	15.00	1742	338	249	587	39	45	20	13	704
Q9b- Opinion of physical distancing measure in Union Square? (percentage)	27.30	52.09	79.39	6.38	11.09	3.14	0.00	179.3933054	28.55114	51.70455	80.25568	6.25	10.79545	2.698864	0	100
Q9b- Opinion of physical distancing measure in Union Square? (number)	261.00	498.00	759.00	61.00	106.00	30.00	0.00	1715	201	364	565	44	76	19	0	704
Q9c- Opinion of physical distancing measure at the beach? (percentage)	62.66	34.21	96.86	3.14	0.00	0.00	0.00	196.8619247	65.05682	32.52841	97.58523	2.414773	0	0	0	100
Q9c- Opinion of physical distancing measure at the beach? (number)	599.00	327.00	926.00	30.00	0.00	0.00	0.00	1882	458	229	687	17	0	0	0	704
Q9d- Opinion of physical distancing measure in George Street? (percentage)	14.54	57.53	72.07	16.74	4.81	6.38	0.00	172.0711297	12.92614	59.94318	72.86932	16.76136	4.6875	5.681818	0	100
Q9d- Opinion of physical distancing measure in George Street? (number)	139.00	550.00	689.00	160.00	46.00	61.00	0.00	1645	91	422	513	118	33	40	0	704
Q9e- Opinion of physical distancing measure in Rosemount? (percentage)																



George St fifth (72%) and Rosemount 6th (60%). In 2021, the order was the same and all of the sites saw a small percentage increase apart from Rosemount which reduced slightly.  
 Q9. Observations - In both 2020 and 2021, the response to the temporary measures has continued to be positive overall with some overwhelmingly so.

Q10. Please tell us how much you agree with the following statements?	Dec-20									May-21								
	Totally agree	Generally agree	Totally agree and Generally agree combined	Neither agree nor disagree	Generally disagree	Totally disagree	Generally disagree and totally disagree combined	No opinion	Total	Totally agree	Generally agree	Totally agree and generally agree combined	Neither agree nor disagree	Generally disagree	Totally disagree	Generally disagree and totally disagree combined	No opinion	Total
Q10a- I feel safer walking and cycling in city due to new measures (percentage)	39.23	50.00	89.23	7.85	2.93	0.00	2.93	0.00	100.00	40.76705	48.86364	89.63068	7.528409	2.840909	0	2.840909	0	100
Q10a- I feel safer walking and cycling in city due to new measures (number)	375.00	478.00	853.00	75.00	28.00	0.00	28.00	0.00	956.00	287	344	631	53	20	0	20	0	704
Q10b- I find walking / cycling easier due to new measures (percentage)	40.17	53.77	93.93	3.97	1.05	1.05	2.09	0.00	100.00	41.90	52.13068	94.03409	4.119318	0.994318	0.852273	1.846591	0	100
Q10b- I find walking / cycling easier due to new measures (number)	384.00	514.00	898.00	38.00	10.00	10.00	20.00	0.00	956.00	295	367	662	29	7	6	13	0	704
Q10c- I find it easier to get to places due to new measures (percentage)	2.09	41.00	43.10	37.55	18.31	1.05	19.35	0.00	100.00	1.846591	38.92045	40.76705	37.78409	20.45455	0.994318	21.44886	0	100
Q10c- I find it easier to get to places due to new measures (number)	20.00	392.00	412.00	359.00	175.00	10.00	185.00	0.00	956.00	13	274	287	266	144	7	151	0	704
Q10d- I find it easier to access bus services due to new measures (percentage)	0.94	33.58	34.52	40.69	19.04	4.81	23.85	0.94	100.00	1.136364	31.96023	33.09659	43.89205	17.75568	4.261364	22.01705	0.994318	100
Q10d- I find it easier to access bus services due to new measures (number)	9.00	321.00	330.00	389.00	182.00	46.00	228.00	9.00	956.00	8	225	233	309	125	30	155	7	704
Q10e- I find it easier to access parking in the city due to new measures (percentage)	0.00	13.39	13.39	34.73	39.02	11.82	50.84	1.05	100.00	0	12.78409	12.78409	33.09659	39.20455	13.49432	52.69886	1.420455	100
Q10e- I find it easier to access parking in the city due to new measures (number)	0.00	128.00	128.00	332.00	373.00	113.00	486.00	10.00	1570	0	90	90	233	276	95	371	10	704

956 956 956 956 956 956 956 956 956

Q10. Observations - Based on the scores for "totally agree" and "Neither agree nor disagree" added together 89% of people felt safer walking and cycling in the city and 94% found it easier walking and cycling, as a result of the new measures. This continued in 2021 with 90% and 94% respectively.

Q10. Observations - The most popular option for "I find it easier to get to places due to the new measures" was "Generally Agree" (41%) in 2020, followed by "Neither agree nor disagree" (38%). This was similar in 2021 with 39% and 38% respectively.

Q10. Observations - The most popular option for "I find it easier to access bus services due to new measures" was "Neither agree nor disagree" in both 2020 (41%) and 2021 (44%)

Q10. Observations - The most popular option for "I find it easier to access parking in the city centre due to the new measures" was "generally disagree" in both 2020 and 2021 (39%)

Q10. Observations - The temporary measures have made active travel appear safer and easier and they continue to do so. Given that this is the most sustainable mode, complies with physical distancing, encourages healthy lives and is available to the greatest number of people, it makes sense to continue to champion these modes.

Given that some parking has had to be removed and some car park access made more difficult to enable safe physical distancing, it is not unexpected that people will find it harder to access parking

Q11. Are there any particular areas of the city where you think the temporary measures have worked well? If so, please tell us where and why.	Beach	Union St	Station	Shops	N/a	Total
Percentage (Dec 2020)	15.37656904	19.9790795	0.10460251	0.10460251	64.43514644	100
Number (Dec 2020)	147	191	1	1	616	956
Percentage (May 2021)	12.64204545	22.86931818			64.48863636	100
Number (May 2021)	89	161			454	704

Q11. Observations - The percentage of people who identified Union St as a successful area for temporary measures has increased in 2021 over 2020. Although the beach was also identified, it has fallen slightly in 2021 compared with 2020

Q11. Observations - This fall at the beach could be as a result of the removal of some of the temporary infrastructure. Likewise, the rise at Union St could be down to the increase in outdoor seating and, potentially, more people coming back into the city and experiencing the change:

Q12. Are there any areas of the city where you think the temporary measures have not worked well? If so, please tell us where and why.	N/A
Percentage (Dec 2020)	100
Number (Dec 2020)	956
Percentage (May 2021)	100
Number (May 2021)	704

Q12. Observations - In both 2020 and 2021, people did not identify any areas where the temporary measures did not work well.

Q13. Is there anything you would have liked to have seen done differently with the temporary measures and, if so, anywhere in particular?	Improve bus stops	Improve signage	Advertise changes better	N/A	Total
Percentage (Dec 2020)	0.313807531	0.313807531	0.10460251	99.26778243	100
Number (Dec 2020)	3	3	1	949	956
Percentage (May 2021)	0.284090909	0.142045455	0.142045455	99.43181818	100
Number (May 2021)	2	1	1	700	704

Q13. Observations - In both years - 2020 and 2021 - over 99% of respondents did not identify anything they'd like to see done differently with the temporary measures

Q14. Do you think consideration should be given to whether any of the temporary measures could be beneficial longer-term? If so, which, and what are your reasons?	N/A	Keep Union St Pedestrianised	Total
Percentage (Dec 2020)	96.9665272	3.033472803	100
Number (Dec 2020)	927	29	956
Percentage (May 2021)	97.15909091	2.840909091	100
Number (May 2021)	684	20	704

Q14. Observations - Although, in both 2020 and 2021, very few respondents identified areas where temporary measures should continue, those who did identified Union Street

Q15. Would you like to see any of the changes removed? If so, which ones?	N/A
Percentage (Dec 2020)	100
Number (Dec 2020)	956
Percentage (May 2021)	100
Number (May 2021)	956

Q15. Observations. In neither 2020 or 2021, did respondents identify any changes that should be removed

Q16- Any further comments?	N/A
Percentage (Dec 2020)	100
Number (Dec 2020)	956
Percentage (May 2021)	100
Number (May 2021)	956

Q16 Observations. No further comments were made in either questionnaire. This may have been as respondents were keen to move on

Q17 - Age bracket	Dec-20		May-21	
	Number	Percentage	Number	Percentage
Under 16	78	8.16	53	7.528409091
16 - 25	172	17.99	133	18.89204545
26 - 35	230	24.06	176	25
36 - 45	258	26.99	183	25.99431818

46 - 55	125	13.08	95	13.49431818
56 - 65	13	1.36	6	0.852272727
Over 65	80	8.37	58	8.238636364
<b>Total</b>	<b>956</b>	<b>100</b>	<b>704</b>	<b>100</b>

Q17. Observations. On both occasions the greatest numbers of respondents came from the 36-45 year age group, followed by 26-35, followed by 16-25.

Q18- Gender	Dec-20	Dec-20	May-21	May-21
	Number	Percentage	Number	Percentage
Male	465	48.64016736	353	50.14204545
Female	491	51.35983264	351	49.85795455
Non-binary	0			
Prefer not to say	0			
Prefer to self describe (add description)	0			
<b>Total</b>	<b>956</b>	<b>100</b>	<b>704</b>	<b>100</b>

Q18. observations. On both occasions, the split of male and female respondents was fairly even

## Appendix 4

### Summary of the Citizen Space and Common Place Surveys.

#### Citizens Space Physical Distancing Survey

The Citizens Space survey, asking people to identify locations where physical distancing is proving difficult and to give information on the specific problems and what could be done to alleviate them, now has a total of 188 responses.

#### Commonplace

The Commonplace site has attracted 248 respondents making (comments, agreements or disagreements), and 64 people have subscribed to news alerts of the site.

The majority of comments relate to cycling, followed closely by walking, and then private vehicles as shown in Figure 1 below.

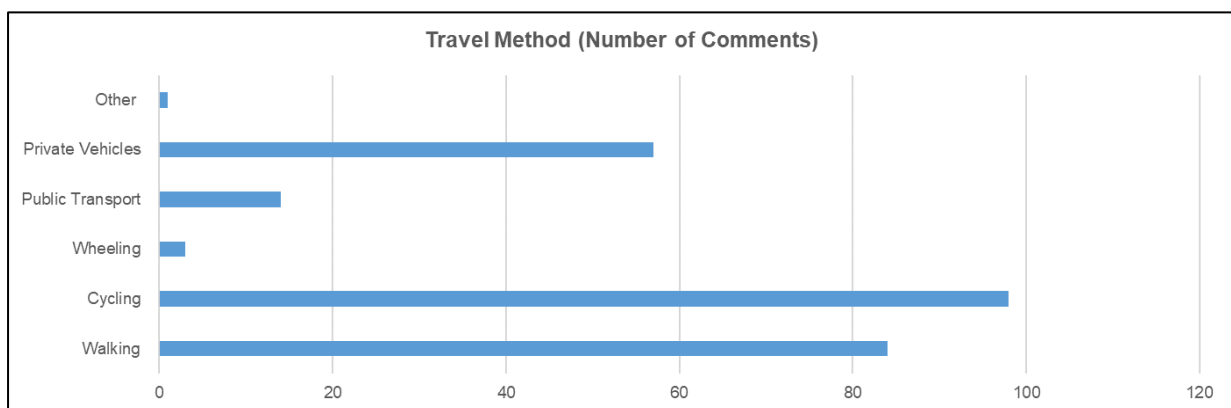


Figure 1: Number of comments per mode of transport

The main issues raised by respondents in terms of their ability to physically distance are: footways/paths are too narrow, speed of traffic and volume of traffic (Figure 2).

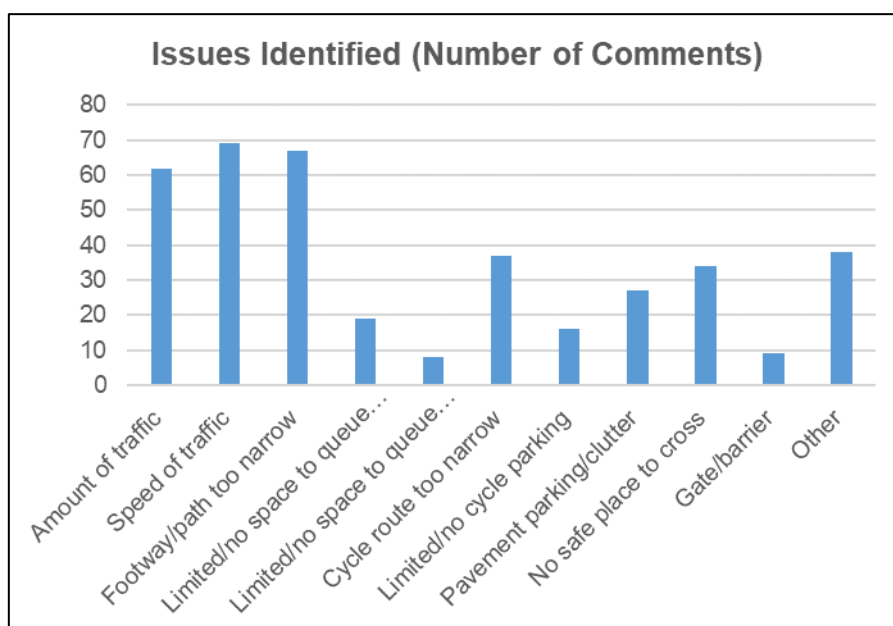


Figure 2: Issues identified

The main locations identified with narrow footpaths are: Market Street, Rosemount Place, Great Western Road and Anderson Drive (Figure 3).

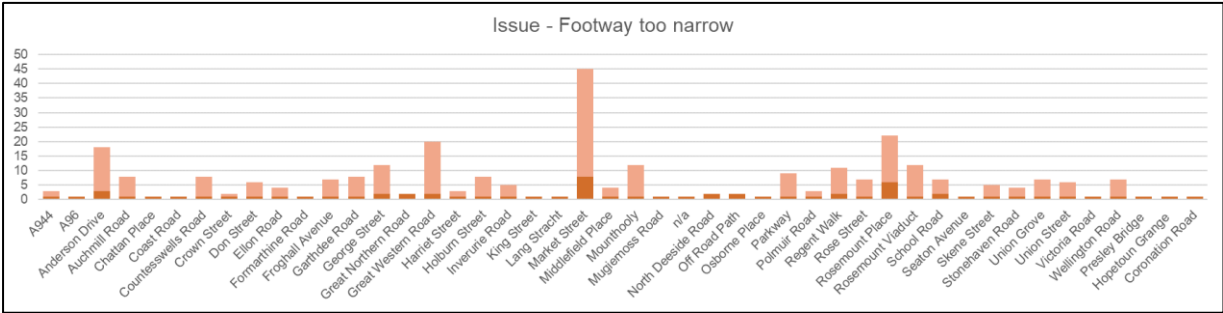


Figure 3: Locations where footways considered too narrow for physical distancing (Dark orange – number of comments, pale orange – number of agreements)

The main locations where the volume of traffic is seen as an issue are, Union Street, Rosemount Place, Great Western Road, Don Street, Market Street, North Deeside Road and Westburn Road (Figure 4).

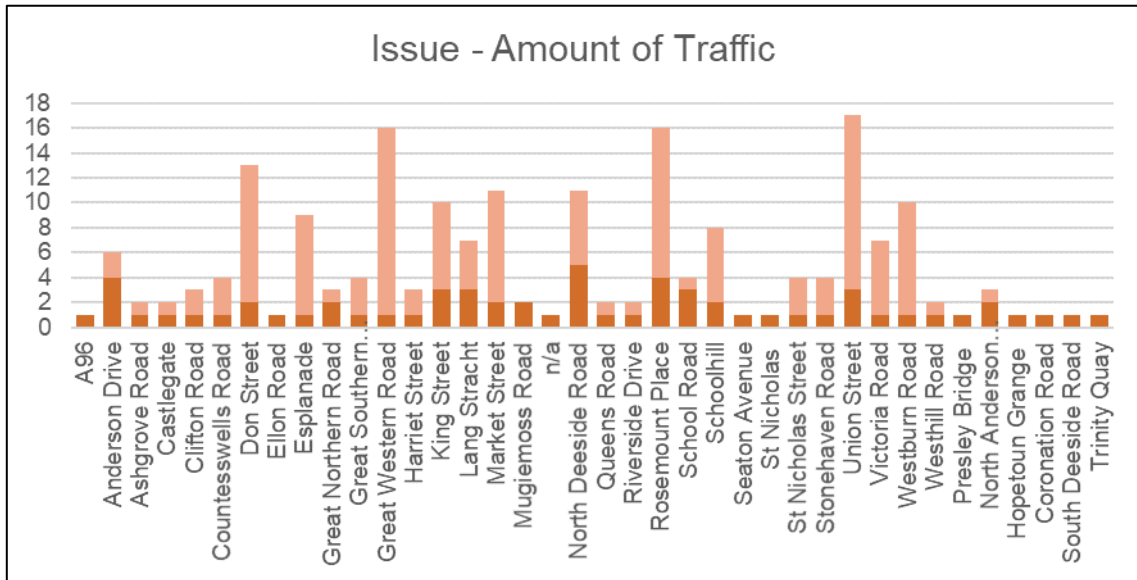


Figure 4: Locations where volume of traffic identified as a concern in terms of physical distancing (Dark orange – number of comments, pale orange – number of agreements)

The main locations where the speed of traffic is seen as an issue are Market Street, Anderson Drive, Rosemount Place, Don Street, School Road, North Deeside Road and Wellington Road (Figure 5).

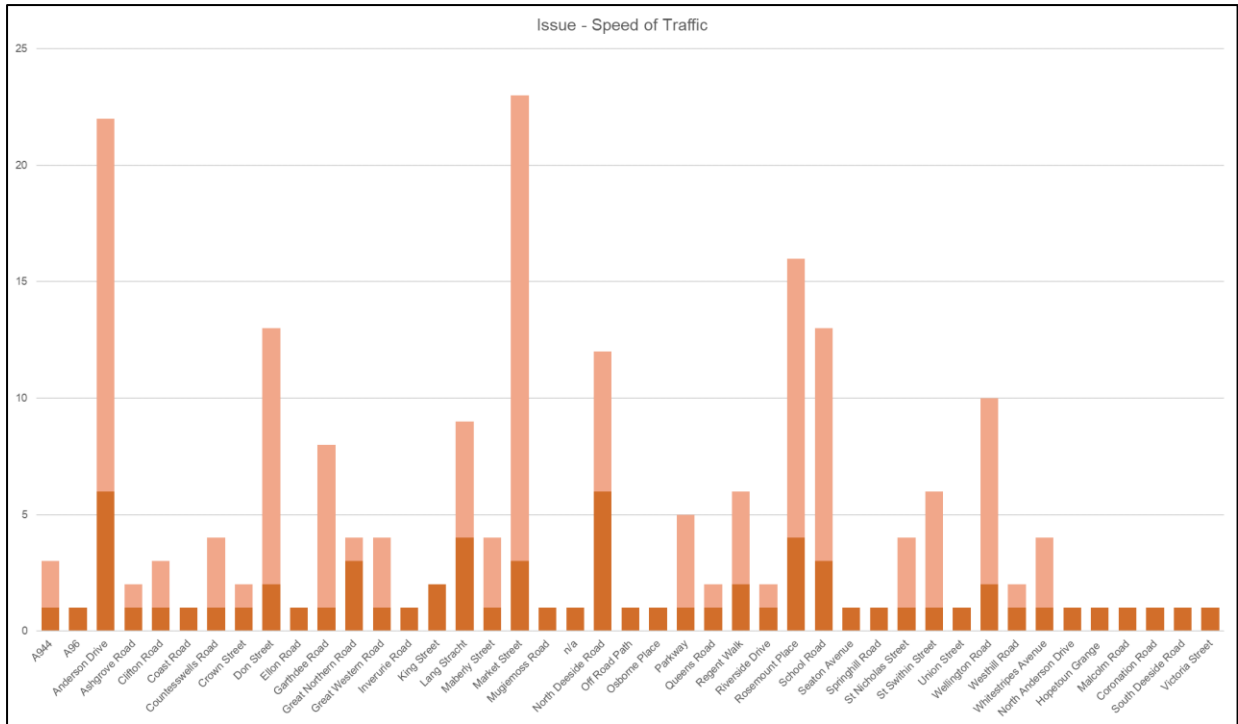


Figure 5: Locations where speed of traffic identified as a concern in terms of physical distancing (Dark orange – number of comments, pale orange – number of agreements)

Queuing space at shops is seen as an issue particularly in the City Centre, Rosemount and George Street (Figure 6).

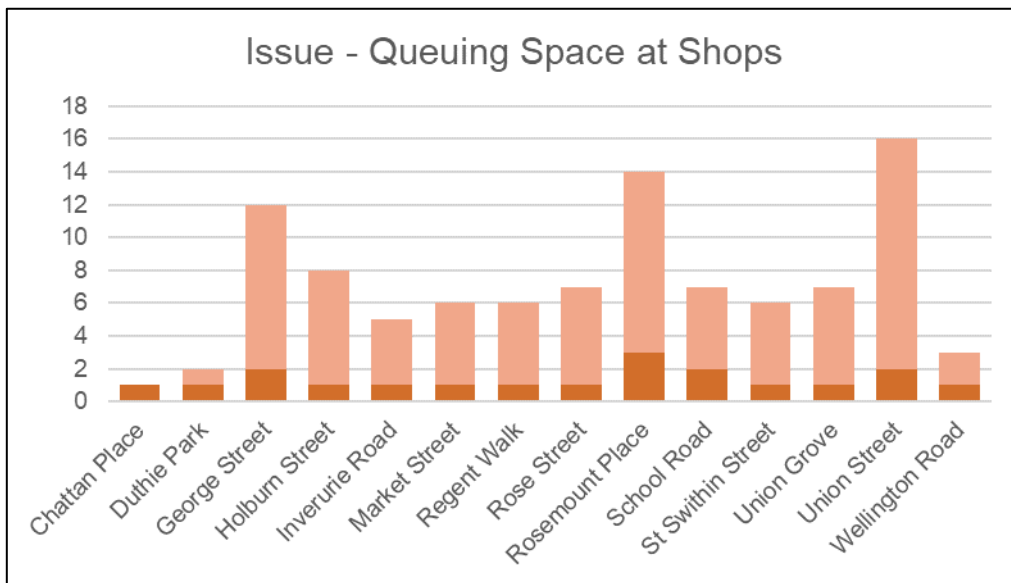


Figure 6: Locations where queuing space at shops is identified as a concern in terms of physical distancing (Dark orange – number of comments, pale orange – number of agreements)

Queuing space at bus stops is likewise seen as an issue in the City Centre, particularly Market Street, Rosemount and George Street (Figure 7).

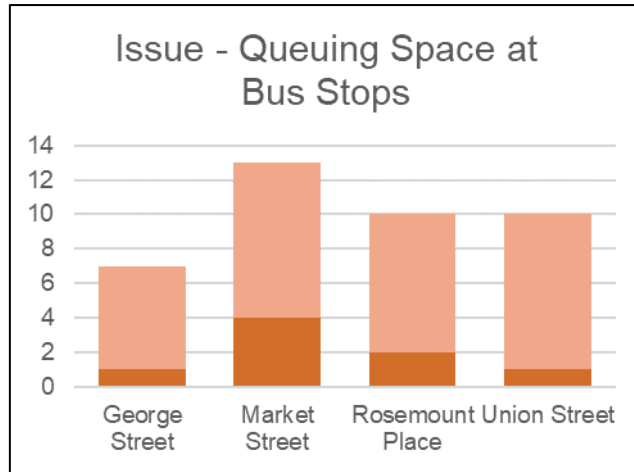


Figure 7: Locations where queuing space at bus stops is identified as a concern in terms of physical distancing (Dark orange – number of comments, pale orange – number of agreements)

Issues of narrow cycle routes were noted at a number of locations, particularly Great Western Road, Market Street, Victoria Road, Mounthooly and North Deeside Road (Figure 8).

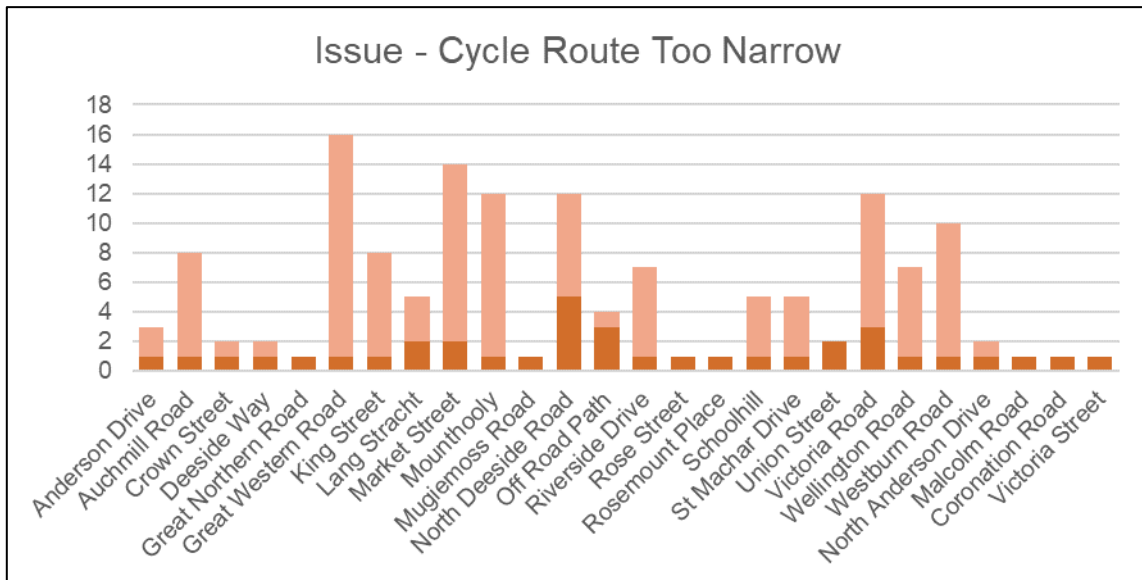


Figure 8: Locations where a narrow cycle route is identified as a concern in terms of physical distancing (Dark orange – number of comments, pale orange – number of agreements)

Respondents also identified areas where additional cycle parking would be beneficial particularly Market Street, Holburn Street, Victoria Road, North Deeside Road and Rosemount Place (Figure 9).

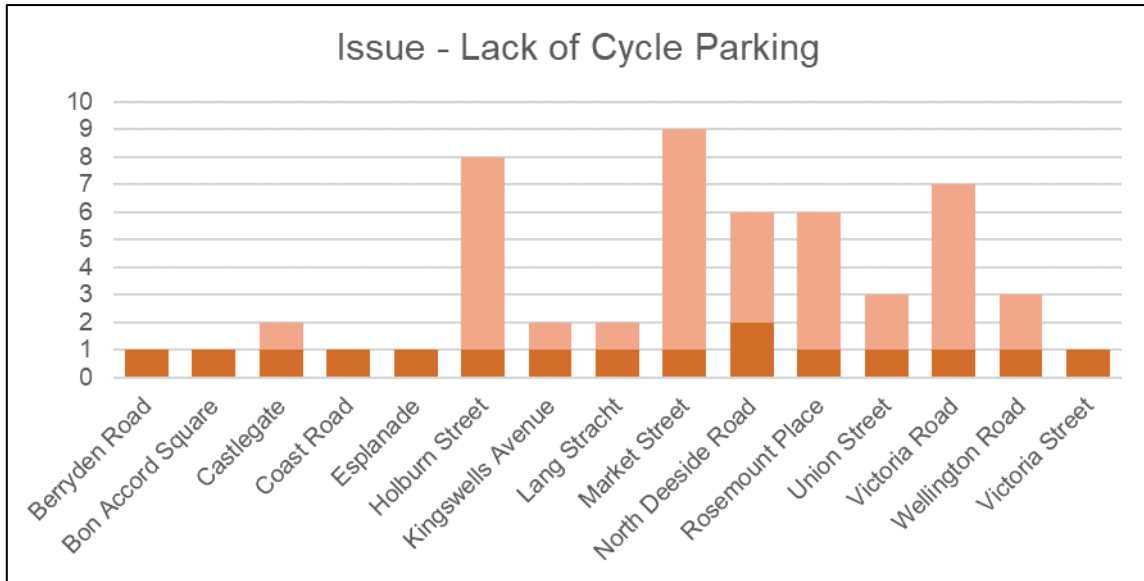


Figure 9: Locations where a lack of cycle parking is identified as a concern (Dark orange – number of comments, pale orange – number of agreements)

Concerns around pavement parking and/or street clutter were noted at a number of locations, particularly Market Street, Rosemount Place, Rosemount Viaduct and Victoria Road (Figure 10).

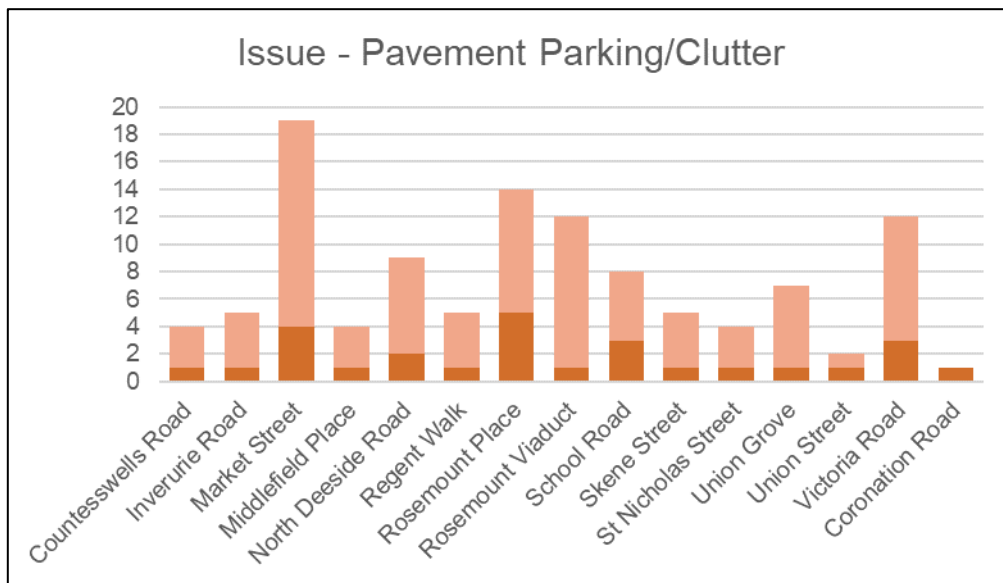


Figure 10: Locations where pavement parking/clutter is identified as a concern (Dark orange – number of comments, pale orange – number of agreements)

The main solutions identified by respondents are to: add a protected cycle lane, slow vehicles down, extend pavement space, and improve crossing points (Figure 11).

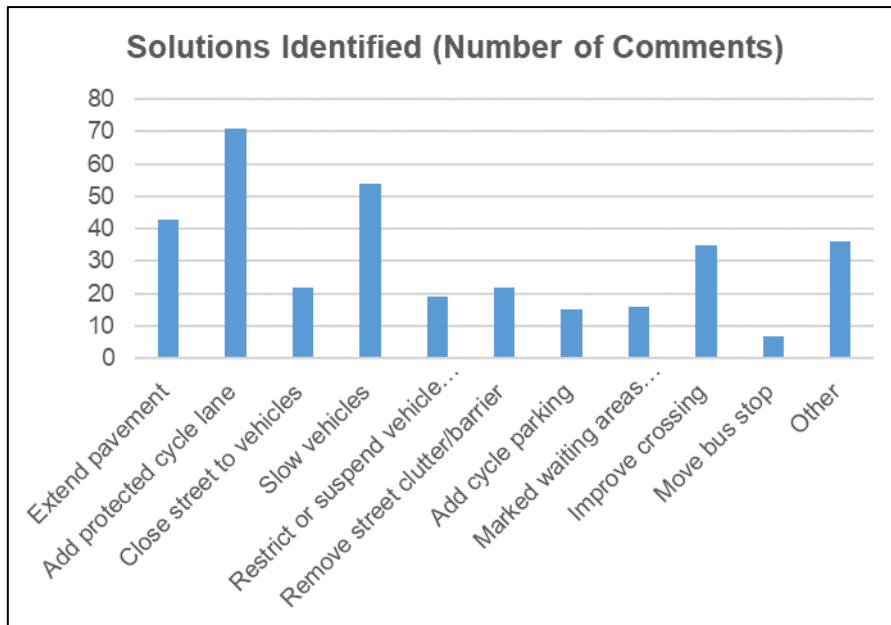


Figure 11: Solutions Identified

The Commonplace survey has now been extended to 13<sup>th</sup> August and a more detailed analysis of responses will be provided following the survey close.



## ABERDEEN CITY COUNCIL

<b>COMMITTEE</b>	City Growth and Resources
<b>DATE</b>	24 June 2021
<b>EXEMPT</b>	No
<b>CONFIDENTIAL</b>	No
<b>REPORT TITLE</b>	Investor Ready Propositions - Approach
<b>REPORT NUMBER</b>	COM/21/155
<b>DIRECTOR</b>	N/A
<b>CHIEF OFFICER</b>	Richard Sweetnam
<b>REPORT AUTHOR</b>	Lynn Mutch
<b>TERMS OF REFERENCE</b>	3.3

### 1. PURPOSE OF REPORT

- 1.1 To provide the Committee with the approach and methodology required to bring investor ready propositions to market, including resource implications and timescales for key projects within the various economic and infrastructure strategies.

### 2. RECOMMENDATION(S)

That the Committee:

- 2.1 Notes the key projects outlined in this report that are likely to be developed as investment proposals for the city;
- 2.2 Notes the four-phase approach that is employed to develop and bring investor ready propositions to market; and
- 2.3 Instructs the Chief Officer - City Growth to work with the Director of Resources to develop propositions for promotion by the Council and, Invest Aberdeen, to the Department for International Trade (DIT), Scottish Development International (SDI) and private sector investor events.

### 3. BACKGROUND

- 3.1 At the February 2021 City Growth & Resources Committee meeting, the Chief Officer – City Growth was asked to report back to the Committee on the methodology and approach to bring investor ready propositions to the market, including any resource implications and timescales for developing such opportunities.
- 3.2 In March 2017, the Council and Aberdeenshire Council approved the setting up of a dedicated inward investment team for the region with the aim of attracting inward investment in the form of company location, institutional investment and/

or expertise of development partners. Invest Aberdeen was set up and since then, it has supported the development of a number of investment opportunities in the city region that are continuously included in investment promotion activity by the UK Government, the Scottish Government and their agencies. These have included City Centre Masterplan (CCMP) projects, commercial developments for example TECA, and housing opportunities.

- 3.3 More recently there has been a focus on widening the portfolio in response to net zero and energy transition policy priorities of both governments, and the Council. In addition, industry has been responding to challenges from Covid-19 and the fall in oil barrel prices in April 2020 by seeking to diversify their activities with a focus on wider energy transition investments. The energy transition sector, and the role Aberdeen city region plays, has been attracting significant interest from UK and global investors with capital to invest.
- 3.4 The Council too reacted immediately to these new challenges and emerging opportunities. Having delivered the transformational projects in the 2012-2017 Strategic Infrastructure Plan (SIP), Net Zero Vision and a new Strategic Infrastructure Plan – Energy Transition was approved by the Council in May 2020. It proposed a number of new ‘green infrastructure investments’ that provides a framework for the development of capital infrastructure projects going forward.
- 3.5 Table 1 below provides a summary of the key projects for the city that identifies where potential investment propositions could come from. With clarity on the source of these potential projects, it will highlight resources needed for those that will be seeking investment in the immediate future. They are drawn from the SIP – Energy Transition, the CCMP and the current review work, the Council’s own Climate Change Plan, and the Regional Economic Strategy (RES).

**Table 1: Key Projects for the City**

<b>Project</b>	<b>Investment Sought</b>	<b>Date</b>	<b>Comment</b>
<b><i>ACC Projects</i></b>			
Aberdeen Hydrogen Hub Programme	Development partner  Commercial funding	2023	Key strand of the Net Zero Vision to become climate positive; and  Focus on application of h2 power in heat networks for housing (under feasibility)
Solar Farm – Energy Transition Zone	Development funding  Development expertise and	Tbc	Some investor interest and potential application in h2 work

<b>Project</b>	<b>Investment Sought</b>	<b>Date</b>	<b>Comment</b>
	Commercial Operation.		
Retrofit of existing Council housing stock to meet net zero ambitions.	Commercial funding  Development partner  Energy billing and management solutions.	2022	c22,000 housing units plus Council buildings to be 'decarbonised'.  Works may include fabric upgrades installation of heat pumps, electric heating solar pv, battery technology etc.
Queen Street Redevelopment	Commercial Funding  Development Partner  Operated of completed projects	2023	CCMP priority, and significant enabling work underway.  Potential mixed use - residential led scheme.
Former BHS and indoor market sites (Union street/ Hadden street/ Market street)	Delivery partner/ scheme operator and end users/ occupiers.	2021/22	Site being acquired by ACC and clearance works being progressed. Scheme to develop international market concept linking key areas within city centre.
Beach Masterplan	Development Finance  Development Partner(s)	2021/22	Masterplan currently being progressed which is likely to generate a range of development and operational opportunities
<b><i>Other Projects</i></b>			
Energy Transition Zone (ETZ)	Company location	2022	Focus on attracting new companies to locate to the city;  Financial investment could be required as activity develops –

Project	Investment Sought	Date	Comment
			e.g. link to H2 programme above
BioHub – Life Sciences	Operating partner Company location	2022	Aberdeen City Region Deal project
SeedPod – Food, Drink and Agriculture	Company location	2022	Aberdeen City Region Deal project
Aberdeen Harbour Expansion – Green Port	Commercial funding	2022/ 2023	Could support port electrification

#### 4. Approach and Methodology

- 4.1 The previous section identified key projects from the SIP – Energy Transition, CCMP, RES and the Climate Change Plan that could be of more interest to the investor market. The next stage involves assessing the maturity of the propositions and identifying any information gaps. The proposed approach below will ensure that all the constituent elements of a particular project are in place, from which officers/ project leads can progress to developing a financial model. This section looks at a four-phase approach to develop investor ready propositions for these projects. 0
- 4.2 For Council-led projects, officers will ensure that development work will provide information for these propositions, identifying any gaps and additional resources that may be needed. The first three phases highlight the work and resources to develop projects in the form of business cases that in turn provide the basis for the investor proposition.
- 4.3 The **first phase** involves preparatory work around research and development of the project. This will likely include a strategic assessment to establish the case for change and initial sequencing of activity and milestones in the form of a programme for the project. A *strategic outline case* will determine how project options have been arrived at and an assessment of how they meet the objectives and policy priorities of government and the Council (for its projects). This stage will also set out the key assumptions and data requirements that would be required for a final investor pitch, as well as any public sector funding requirements.
- 4.4 The **second phase** involves the market testing of a project with external third parties. During this phase information gaps are highlighted, assumptions developed and tested. At this stage, market insight will be gathered that potential investors in future will require. For example, investment in green infrastructure is higher risk as sometimes concepts and the rate of return is not proven. In developing the proposition for the Aberdeen Hydrogen Hub for example, officers undertook an industry engagement exercise that established the key information that would be needed around pricing and offtake (demand) for hydrogen in future. This allows officers to address and investigate issues

before progressing to market for a development partner, in the form of an *outline business case*.

- 4.5 The output from this phase is a more detailed appraisal of options and the preferred project to undergo further due diligence and testing. At this point an overall delivery strategy for the investor is also drafted.
- 4.6 The **third phase** will see the development of a *full business case*. This will continuously evolve in this phase and will incorporate feedback from the ongoing consultation or testing of a project. The full business case will determine the investment decision to proceed or not.
- 4.7 Each of these stages will form the basis of the **fourth and final phase** which is development of the investor proposition and to support the final investment decision (FID). In general, an investor proposition will at a minimum provide information on:
- Project – e.g. land ownership, control, costs, project dependencies, expected asset classes in completed development;
  - Type – retail, commercial, residential, industrial, leisure, education, health
  - Investor readiness – e.g. planning consents in place, contracts in place, delivery dates, connectivity (transport, digital);
  - Investment sought – e.g. finance; debt/ equity
  - Financial criteria – cashflow, expected timing of positive cashflow; rate of return; business case; income generation, all subject to sensitivity testing in response to changes in any of the key financial or economic assumptions;
  - Economic – demand (offtake demand re energy projects), on- off-site job creation, with input of property agent experts;
  - Delivery/ management model – e.g. joint venture, equity stake etc
  - Sustainability/ Net Zero – has the project assessed its ability to meet net zero carbon targets;
  - Political/ Government Support – e.g. has the project secured any central Government Funding;
  - Incentives – e.g. subsidy, grants, tax, R&D
- 4.8 The above information must be supported by robust and tested assumptions around costs, income (rate of return); risk and demand/ end market from the HM Treasury compliant business case development phases. During this phase there is also an opportunity to test the model through independent 'Gateway'/ peer review to provide additional assurance of the business cases prior to seeking final approval for the projects listed. This could involve relevant sector teams within DIT and SDI.
- 4.9 This information will be provided to investors in the form of a detailed template, from which any marketing or promotional collateral will summarise the propositions. For example, the projects promoted via Invest Aberdeen channels are summaries of more detailed analysis by relevant promoters, essentially a 'shop-window' to the project. Currently officers are working up investor propositions for the Aberdeen Hydrogen Hub and the information required is being developed in response to commercial investor interest (see Appendix 1 as an example of a general prospectus).

- 4.10 In the current economic climate and the context of Covid-19, more ‘traditional’ investment projects may not be as attractive to investors and there has been significant interest in the ‘energy transition’ sector, hydrogen deployment and Aberdeen city region. This also reflects the foundation of the offshore engineering supply chain in the city region, Aberdeen Harbour South Expansion and the Scotwind sea bed licensing rounds that will stimulate significant investment in the city.
- 4.11 Officers will work with inward investment agencies to develop propositions that will in turn be supported by Invest Aberdeen team. Opportunities in the city region have been promoted by the team in partnership with DIT, SDI and the Investment Promotion Working Group at SCA. An immediate challenge in the current investment climate is that green investment projects may need more appraisal in relation to their ability to contribute to the UK Government and Scottish Government climate change targets.
- 4.12 It is recommended that officers continue to employ this approach to development of investor ready proposals with a current focus on energy transition benefits. The table below highlights where resource is needed. Opportunity sourcing from developers and promoters across the city region will be ongoing supported by the regional Invest Aberdeen team. This is a two way process that relies on concepts coming forward from industry/ developer community.

**Table 2 – Summary of Status of Key Projects using the Four Phases**

<b>Project</b>	<b>Status</b>	<b>Priority</b>
Aberdeen Hydrogen Hub Programme	Phase 1-2 complete Phase 3 ongoing Phase 4 underway	High – in response to market interest and funding
Solar Farm – Energy Transition Zone	Phase 1-2	High – being reassessed in response to market interest
Retrofit of existing Council housing stock to meet net zero ambitions. -	Phases 1-2 – pilot projects underway	High – number of options currently being considered and being developed.
Queen Street Redevelopment	Phase 1-2	Medium
Former BHS and indoor market sites (Union street/ Hadden street/ Market street)	Phase 1	High
Beach Masterplan	Phase 1	Medium
Energy Transition Zone (ETZ)	Phases 1-3	High
BioHub – Life Sciences	Phases 1-3	High
SeedPod – Food, Drink and Agriculture	Phases 1-3	Medium

<b>Project</b>	<b>Status</b>	<b>Priority</b>
Aberdeen Harbour Expansion – Green Port	Phases 1-4	High

## **5. FINANCIAL IMPLICATIONS**

- 5.1 The resource requirements for the above is anticipated to include a blend of Council officers/ project leads, the Invest Aberdeen team, DIT, SDI and SE. However other specialist resource (typically including technical/ commercial and external specialist legal advice) may also be needed at different phases, and around phases one and three in particular.
- 5.2 For Council-led projects, market testing and engagement with interested parties in the second phase would be undertaken within the existing resources of clusters and/ or project budgets. Typically this would involve Resources, Commercial Procurement, Corporate Landlord and City Growth.
- 5.3 While feasibility work or business cases are being prepared for the work on key projects themselves, and this is within the scope of these budgets, some additional work could be required to develop investor propositions. This could result in additional cost that would come from within the existing project budgets, City Growth budget or Invest Aberdeen budget where appropriate. Officers are also continuing to work with the Scottish Cities Alliance (SCA) investment promotion teams as it embeds a consistent approach to financial modelling across cities' projects.
- 5.4 As well as institutional investment, it is likely that the key projects could be supported by other external funding. Officers will continue to develop the key projects for potential application to funds such as:
- UK Shared Prosperity Fund (UK Government launch in January 2022 as successor to EU Structural Funds – could see £1.5bn funding annually with spend profiles confirmed at next Spending Review);
  - Levelling Up Fund (UK Government, including building/ site development, with £800m earmarked for Scotland);
  - UK Infrastructure Bank (£12bn of debt/ equity finance and issue of guarantees);
  - Scottish National Investment Bank (debt/ equity finance on commercial terms – businesses or projects seeking more than £1m debt/ equity support);
  - Emerging Technologies Fund (Scottish Government, £180m for H2 and carbon capture and storage)
  - Energy Transition Fund (Scottish Government, North East of Scotland use, £62m);
  - Green Growth Accelerator (Scottish Government, relying on local government to deliver but potential to unlock £200m over the next five years. Call for Pathfinder projects to be submitted in September 2021)
- 5.5 As well as these government schemes, officers meet regularly with institutional investors. There has also been a shift in their investment policy towards 'green investment' for market ready projects seeking private capital to support energy transition.

5.6 Any bids for government funding will be supported from within existing resources.

## 6. LEGAL IMPLICATIONS

6.1 There are no legal implications arising directly from this report given this it is seeking approval for propositions for promotion to be developed. Depending on the final outcome of securing investment, each proposition will need to be developed in a legally compliant manner with support from legal services and appropriate external specialist legal advice being sought if necessary.

## 7. MANAGEMENT OF RISK

Category	Risk	Low (L) Medium (M) High (H)	Mitigation
<b>Strategic Risk</b>	Failure to secure inward investment for key regional projects that will promote recovery from the Covid-19 Pandemic or achieve the Council's Net Zero and energy transition ambitions	M	Development of robust investor ready propositions using the three phased approach described in section 3.10 that can be promoted in partnership with the Investment Promotion Team at Scottish Cities Alliance and by investment teams in both the UK and Scottish Governments as well as by dissemination at national and international events promoting regional strengths.
<b>Compliance</b>	None		
<b>Operational</b>	Working from home, attendance at Marischal College and potential travel to events and in-person investor meetings may pose additional risks due to the physical and mental health issues associated with Covid-19	L	Overseas travel risks are covered by the pre-travel risk assessment process. Health and wellbeing will be managed by lead officer.
<b>Financial</b>	Costs associated with the development of investor ready propositions and travel to meetings	L	Any additional costs associated with the development of investor ready propositions will be closely monitored by officers and managed under the



Category	Risk	Low (L) Medium (M) High (H)	Mitigation
	and events are found to be beyond available resource envelope.		Invest Aberdeen budget. Many events in the near to medium future are likely to become virtual events therefore attendance costs will be lower. In each case Officers will participate in planning groups for events including oversight and monitoring of budgets.
<b>Reputational</b>	Other major cities becoming the forerunners in the Hydrogen and Energy Transition sectors due to a failure to capitalise on the Cities first mover advantage and existing local expertise by developing robust project plans and propositions	M	Ensure our investment promotion collateral and activities are robust enough to engage potential investors and are widely promoted both locally and internationally by continuing to engage with local and international stakeholders and potential investors.
<b>Environment / Climate</b>	Failure to adequately secure investment in pursuit of the Council's Net Zero and energy transition ambitions	M	The development of strong business cases for energy projects and robust Investment propositions for use in stakeholder initiatives promoting the regional strengths. Attendance at events promoting the investment opportunities and actively promoting sectors via Investment leads and enquiries.

## 8. OUTCOMES

<b><u>COUNCIL DELIVERY PLAN</u></b>	
	<b>Impact of Report</b>
<b>Aberdeen City Council Policy Statement</b>	The proposals within this report support the delivery of the following Policy Statement objectives:  Economy:

	<p>7: Continue to maximise community benefit from major developments</p> <p>14. Work with both governments to unleash the non-oil and gas economic potential of the city</p> <p>Place:</p> <p>1. Build up existing strength in hydrogen technology</p> <p>2. Support efforts to develop the inward investment opportunities including the Energetica corridor</p>
<b>Aberdeen City Local Outcome Improvement Plan</b>	
Prosperous Economy Stretch Outcomes	The proposals within this report support the delivery of LOIP Stretch Outcome 1 – 10% increase in employment across priority and volume growth sectors by 2026.
Prosperous People Stretch Outcomes	The proposals in this report support the delivery of stretch outcome 11 - Healthy life expectancy (time lived in good health) is five years longer by 2026 by seeking investment in to Hydrogen and Net Zero initiatives that will support zero carbon emissions.
Prosperous Place Stretch Outcomes	The proposals in this report support the delivery of stretch outcome 14 – Addressing climate change by reducing Aberdeen’s carbon emissions by 42.5% by 2026 and adapting to the impacts of our changing climate by promoting and seeking investment for the Aberdeen Hydrogen Hub and the Energy Transition Zone.
<b>Regional and City Strategies</b>	
	The proposals within this report support the Regional Economic Strategy & Action Plan, Energy Transition Vision, Net Zero City Vision and Strategic Infrastructure Plan by working towards developing investor ready propositions that will attract potential investors to priority projects, supporting innovation and infrastructure development while creating jobs and supporting inclusive growth.
<b>UK and Scottish Legislative and Policy Programmes</b>	
	The recommendations in this report support the City’s response to the Intergovernmental Panel on Climate Change set under the Paris Agreement and the UK Governments ambition to have Net Zero emission by 2045. The report also set out the City’s plans to meet the Scottish Government’s Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.

## 9. IMPACT ASSESSMENTS

<b>Assessment</b>	<b>Outcome</b>
<b>Impact Assessment</b>	not required
<b>Data Protection Impact Assessment</b>	not required

## **10. BACKGROUND PAPERS**

- 10.1 RES/21/049 – Strategic Infrastructure Partnership with North East Scotland Pension Fund, City Growth and Resources, May 2021.
- 10.2 PLA/20/088 – Net Zero Vision and Infrastructure Plan, Urgent Business Committee, May 2020.

## **11. APPENDICES**

- 11.1 Appendix 1 - Hydrogen Opportunities in the Aberdeen City Region

## **12. REPORT AUTHOR CONTACT DETAILS**

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INVEST **ABERDEEN**

**LEADING THE  
GLOBAL ENERGY TRANSITION:  
HYDROGEN OPPORTUNITIES  
IN THE ABERDEEN CITY REGION**





World's first dual fuel diesel roadsweeper

For decades the Aberdeen City Region has led the global energy sector from the front and is now playing a pivotal role in the global energy transition. The region has a unique position in the global energy supply chain, an extraordinary portfolio of low and zero-carbon assets and capabilities, and various large-scale infrastructure projects in the pipeline supporting the drive to net zero.

Aberdeen is one of Europe's pioneering hydrogen cities with over five years of experience in delivering hydrogen infrastructure and transport projects and an existing fleet of hydrogen-fuelled vehicles that is currently expanding. The relative maturity of transport applications in the region creates an unrivalled opportunity to attract investment in transport and infrastructure to deliver commercial scale renewable hydrogen production and supply, including export potential.

The applications of hydrogen for decarbonisation of energy are wide-ranging, with opportunities for use in heat, industrial energy demand, and energy storage, as well as transport.

Aberdeen is uniquely placed to capitalise on this opportunity and now seeks long-term investment and development partners for a £1 billion hydrogen infrastructure development programme across housing, heating and transport sectors. Aberdeen City Council is open to a variety of investor involvement to include debt and equity partners, co-investment, and development funding.

The potential economic benefits of being at the forefront of this transition are significant. There is potential to unlock new economic opportunities worth upwards of £1 billion capital investment for Scotland's economy by 2030, as well as thousands of high-value jobs in the Aberdeen City Region.

## WHY ABERDEEN FOR HYDROGEN INVESTMENT

- Aberdeen Hydrogen Hub - A coordinated package of public and private funds will deliver Scotland's first commercially scalable, investable, hydrogen production site, making use of the region's renewable resources to provide a truly 'green' fuel supply and kick start the growth of the hydrogen sector initially for transport, with opportunities in heat, industry and beyond in the future. Each phase of the Aberdeen Hydrogen Hub's journey to scale production of green hydrogen is a key component of the city's Net Zero Vision policy.
- The Aberdeen City Region – The region is home to a globally competitive energy supply chain with a proven track record in energy technology development and deployment and a rich pool of talent. Leading the global energy transition and oil and gas decarbonisation, Aberdeen is the market leader in hydrogen development and hosts 6GW of offshore wind.
- The Energy Transition Zone (ETZ) represents a regional ambition to create a world leading zone for energy transition. A physical place for research and development, test and demonstration and manufacturing activities in an exemplar net zero environment. It will become the focal point for the development of the new energy transition industry cluster in the region.

The European Offshore Wind Deployment Centre (EOWDC)



# ABERDEEN: A SOUND INVESTMENT

- Leading the global energy transition
- Market leader in the development of hydrogen
- £10billion + investment pipeline for the city region
- Home to an extensive talent pool across various sectors
- In the UK attractiveness survey by EY, Aberdeen scores 7th in terms of foreign direct investment performance



## INVEST **ABERDEEN**

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## ABERDEEN CITY COUNCIL

<b>COMMITTEE</b>	City Growth & Resources
<b>DATE</b>	24 June 2021
<b>EXEMPT</b>	No
<b>CONFIDENTIAL</b>	No
<b>REPORT TITLE</b>	Feasibility of a Food & Crafts Market – Rubislaw Terrace Gardens
<b>REPORT NUMBER</b>	COM/21/159
<b>CHIEF OFFICER</b>	Richard Sweetnam
<b>REPORT AUTHOR</b>	Andrew Stephen
<b>TERMS OF REFERENCE</b>	3.3

### 1. PURPOSE OF REPORT

- 1.1 The purpose of the report is to report to the Committee on the feasibility of a local food and crafts market in the vicinity of Rubislaw Terrace Gardens, in Summer 2021.

### 2. RECOMMENDATION(S)

That Committee:-

- 2.1 Notes the findings of the work to date on the feasibility of a local food and crafts market in the vicinity of Rubislaw Terrace Gardens in Summer 2021;
- 2.2 Agrees that a market in Summer 2021 may not be feasible for the reasons noted in Section 4 of this report; and
- 2.3 Instructs Chief Officer City Growth to continue to work with local partners to explore the possibility of Rubislaw Terrace Gardens as a potential location for markets in the near future and provide any information, advice or guidance to in response to any confirmed demand from businesses/ producers.

### 3. BACKGROUND

- 3.1 The City Growth & Resources Committee on 11 May 2021 instructed the Chief Officer – City Growth to engage with businesses and other interested parties seeking to establish the feasibility for a local food and crafts market in the vicinity of Rubislaw Terrace Gardens and to report back to the next meeting of this Committee detailing options for potential implementation in Summer 2021 in consultation with the Depute Provost.
- 3.2 There has previously been a market in the west end of the city. The Thistle Street Food Market launched in September 2016 and operated monthly until December 2019. Its objective was to increase footfall in the West End, thereby

increasing visitor numbers to the independent businesses in the area. Initially the market was limited to food suppliers only that were not competing with local cafes.

- 3.3 It was organised by two local business people, and under the model. local food businesses were invited to host a stall themselves to promote their businesses. Feedback on the market suggests that it was a challenge for businesses as the pitch and staffing costs were not justified in terms of turnover and any other promotional benefit.
- 3.4 The market could cater for 20 food producers, but the pitches were never all sold. By December 2019, only 7 pitches were taken up and the decision was made to close.
- 3.5 An independent operator has delivered a 'one off' market in the west end, before, in 2013. Called Playpark, it incorporated a market of designers, with garden games produced by local artists to enhance public engagement. The Gardens is also used to host the Eid Festival a celebration of Eid-al-Fitr, signalling the end Ramadan in the Islamic calendar.
- 3.6 Following on from changes within the oil and gas sector since 2015, and changes in shopping patterns, the city's retail offer has faced unprecedented challenges since March 2020 and the Covis-19 pandemic. The city centre is seeing the permanent closure of a number of 'bricks and mortar' retailers such as Debenhams, John Lewis and, as footfall declines, smaller retail.
- 3.7 Overall all types of office vacancy rates have risen from a low of 2.7% in 2013 to 13.5% in May 2021 for the Aberdeen Office region. While specific retail sector vacancy rate evidence is not available, city centre footfall data until end March 2021 suggests footfall was down 75% when compared to 2019.
- 3.8 Since then UK national data (week ending 02/05/2021) indicates some modest recovery however as footfall across all UK benchmark retail destinations was down 25% compared with the same period in 2019 prior to the pandemic. Data recorded from 'average daily pedestrian counts' per month report an increase in pedestrian counts. Finally, Google mobility trends for places such as restaurants, cafés, shopping centres, theme parks, museums, libraries and cinemas is also used to assess the impact. For Aberdeen, compared to the pre-pandemic baseline, mobility had fallen by 25% in April to June 2021 period. This compares to falls of over 75% during lockdown periods of the pandemic.
- 3.9 The City Growth & Resources Committee on 11 May 2021 approved the City Centre Masterplan Review. In the short term action plan, the priority is to attract existing and new footfall to the city centre across retail, leisure, culture and recreation uses, maximising the opportunities from investments made by the Council in Aberdeen Art Gallery refurbishment, Provost Skene's House and Union Terrace Gardens.

## 4. ANALYSIS

- 4.1 Since the May Committee, officers have undertaken an assessment of supply of and potential demand for a local market at Rubislaw Gardens:

### Supply

- 4.2 Currently, and notwithstanding the challenges presented by Covid-19 and lockdowns, there are seven local markets in the Aberdeen City Council area:

- Curated Aberdeen, Bon Accord Centre – being implemented;
- Haan (Christmas), including Haan@theGallery – implemented (annual)
- Aberdeen Art Gallery Shop at the Top – implemented
- Belmont Street – implemented
- Thistle Street – implemented
- George Street - implemented
- Food Story, George Street - under development
- Gourmet Food Festival – pilot under development by Opportunity North East (ONE), an ‘open doors’ event for regional food and drink producers in September 2021

- 4.3 Curated Aberdeen opened on 4 June 2021, and aims to work with 30-50 traders. For the Bon Accord Centre, initiatives such as this could provide some mitigation against major and structural changes in the retail sector, including the John Lewis closure. Those changes could present opportunities for new businesses, including independent businesses, to take advantage of some gaps in the market. Shopping centres in city centres will need to evolve and this new initiative enables the Bon Accord Centre to adapt.

- 4.4 Councillor Stewart has been collaborating with Queens Cross Church to set up a farmers/ craft market on 26 June 2021 to support the local community in its recovery and deliver a new event. It is understood that there is interest from 17 stall holders.

- 4.5 In addition, there are local markets in the following locations within the city region. These are highlighted as often the same producers and businesses are participating in these markets.

- Aboyne – second Saturday, Monthly
- Ballater – fourth Saturday, Monthly
- Banchory – third Saturday, Monthly
- Ellon – fourth Saturday, Monthly
- Huntly - first Saturday, Monthly
- Inverurie – second Saturday, Monthly
- Peterhead – first Saturday, Monthly
- Stonehaven – first Saturday, Monthly
- Westhill – first Saturday, Monthly

- 4.6 In supply terms, there is a limited pool of local producers that can accommodate existing provision, constrained by costs and risk. For example, a food producer

has to consider overheads around costs of production, transport costs and where weather is poor, patronage suffers and producers are left with unsold stock. Similarly, other producers of non-perishable unsold stocks may not have the outlet to sell on.

- 4.7 This leads to another growing area of supply – online ‘pop up’ activity. Local markets have changed significantly during the pandemic with many niche retailers turning to the internet as an outlet, as ‘bricks and mortar’ retailers have also had to do. For independent traders, the online market is accounting for the majority of sales, and niche products are available online at any time and the regular market model may be in less demand as traders sell across the UK.
- 4.8 In response to this channel shift, in May 2020, the Council approved a short term response to the immediate impacts of Covid-19 in the form of a Socio-Economic Rescue Plan and has funded a ‘pop up shop’ pilot at Aberdeen Art Gallery for retail of local crafts produce. The ‘Shop At The Top’ model promotes and supports the work of local artists, designers and makers living and working in AB postcode areas. Under the model, the shop features 3-4 makers at a time, on a three-month rotation, who will each then nominate a maker for the next slot. The Gallery does not charge the makers to exhibit, but there is a charge of 25% commission on sales.
- 4.9 If a local market was to operate from Rubislaw Terrace Gardens, a number of items would need to be incorporated into plans of the organising business.
- In terms of the Covid-19 pandemic, timescales for relaxed controls around temporary outdoor hospitality during the pandemic are fluid. However the Council’s position is that these are reviewed at the end of September 2021, when Scottish Government guidance on Buildings Standards currently runs to;
  - A pop-up local market would however likely require other accreditation such as Market Traders licenses, or Environmental Health certification if relevant;
  - The Rubislaw Terrace Gardens would be able to accommodate a market of some description, but this would need to be carefully controlled; and
  - Consideration of any planning implications - size, use, space estimate.

### **Demand**

- 4.10 In order to establish information around cost and demand, the following consultations have been undertaken with private sector operators, Aberdeen Inspired and Aberdeenshire Council. There are two areas of demand – from businesses wishing to rent pitches at a market; and ultimately their customers.
- 4.11 In general, when deciding on participating in markets, footfall is key to the stallholders’ decision making. When footfall is high and predictable, it generates both repeat bookings and new enquiries as word spread amongst producers. But when footfall drops, for example during periods of bad weather or holiday season, stallholders are unlikely to commit. For the ultimate customers of a market, while there may be good intentions to support local or independent retail, markets are not as convenient as fast food outlets and this behaviour is a challenge.

- 4.12 Views were sought on the potential for a local market at Rubislaw. There may be some interest in organising and delivering content for an event that could incorporate for example independent traders operating under the HAAN and FINE brands. But there was recognition that in response to impact of Covid-19, a number of such 'local market events' are popping up such as Inspired Nights, Thistle Street Market, Affa Fine Car Boot and Backyard Collective at the beach. It is recommended that any new market would seek to expand on these and look to programme multiple markets encompassing quality offer of food, drink, art and music.
- 4.13 Quality and distinctiveness is key to a successful market. Feedback from repeat customers to existing markets is that there is very little variety from market to market. But the cycle is that at the same time businesses need repeat visitors to build a customer base and brand loyalty. A constraint in the Aberdeen city region is that there may not be a large enough pool of local producers to satisfy customers, and not enough customers to satisfy the objectives of stall holders.
- 4.14 This may suggest looking at a 'local market event' as opposed to a frequent market, particularly in the context of the existing supply in the city region, and online channels. Markets alone are not seen as a sufficient draw and tend to be successful over time, and benefit from being part of a wider event or activity in the city. To deliver the footfall thresholds needed, 'piggy backing' on another event that generates footfall provides customers with more than one reason to be in the city and attend a market, thereby spending more time in the city. The Events 365 programme, through the CCMP, provides a calendar of events and exhibitions that could facilitate planning. In the short term, Aberdeen Art Gallery will be delivering the British Artshow and other national exhibitions. The Tour of Britain Grand Depart is scheduled for September, while in due course major business conferences will be returning to P&J Live.
- 4.15 Consultees were also asked about location and timing. Given the existing uncertainty in terms of covid-19, existing commitments to other markets, a market in Summer 2021 may be premature. The Rubislaw Terrace Gardens location was also perceived as detracting from the push to attract and keep people in the city centre.
- 4.16 Start up costs are estimated at up to £6,000 for stalls, canopies, rent, promotion and advertising. Income depends on rent and occupancy. This would need to be assessed by the event organiser. An organiser will typically spend three days a week running a market. Operational activity includes:
- Compliance – eg road management, licensing, environmental health regulations;
  - Administration eg bookings, invoicing, collection;
  - Promotion eg images and product news, proofing and approval; and
  - Funding eg market licensing, public liability insurance and road management costs. Pitch rents do not cover these so some additional resource may be needed.

## **Recommended Next Steps**

- 4.17 The consultation suggests that if there is to be a new local food and art market, it has a better chance of success if it is underpinned by or aligned to an existing substantial event to maximise the opportunity from the footfall that is attracted to the location anyway. Depending on location this would still need to be managed as the existing retail/ trade is not supportive of any activity that is in direct competition with their offer.
- 4.18 A city centre location is the preferred approach and an event outwith the centre, even at Rubislaw, is perceived as drawing footfall away from city centre businesses.
- 4.19 There is a significant amount of preparatory work in advance of holding a market. This lead-in time and resource to set up should not be underestimated.
- 4.20 This report has relied on the input of existing or previous providers of markets in the Aberdeen city region. At the time of writing there has been no contact with local businesses or parties wishing to organise a market at Rubislaw Terrace Gardens, and provide the resources to do so. Using evidence from the Queens Cross event on 26 June, it is suggested that more work is needed before any decision can be made by organisers on whether or not to pilot a one off market event in the vicinity of or at Rubislaw in Summer 2021.
- 4.21 If there is interest from an operator in holding a market, now or in the future as a 'test market', officers will provide any information, advice or guidance on the event itself to the organisers.

## **5. FINANCIAL IMPLICATIONS**

- 5.1 The analysis above indicates the likely costs and other resources needed to deliver a successful event. For some existing events, organisers have benefitted from the support of the Council funded City Centre Manager within Aberdeen Inspired. As it has been focused on the new ballot, and depending on the outcome of that, it is not clear what non-financial support could be available.
- 5.2 There is no resource currently allocated in the Council budget for grant support for an organiser to deliver a local market.

## **6. LEGAL IMPLICATIONS**

- 6.1 There are no direct legal implications arising from the recommendations of this report.

## 7. MANAGEMENT OF RISK

Category	Risk	Low (L) Medium (M) High (H)	Mitigation
<b>Strategic Risk</b>	In not proceeding, does not contribute to Council priorities around city centre	L	The Council provides support to businesses, including independent retail through existing interventions
<b>Compliance</b>	A new market does not comply with relevant regulations	L	Information would be provided to market owners/organisers
<b>Operational</b>	A market at Rubislaw could affect existing activity in response to Covid-19	L	Information would be provided to market owners/organisers
<b>Financial</b>	N/A	N/A	N/A
<b>Reputational</b>	N/A – this is not a Council activity. But If the Council were to support a market, it could be perceived as having a negative impact on existing markets and city centre footfall	M	Any new intervention would need to add to existing provision elsewhere in the city
<b>Environment / Climate</b>	N/A	N/A	N/A

## 7. OUTCOMES

<b><u>COUNCIL DELIVERY PLAN</u></b>	
	<b>Impact of Report</b>
<b>Aberdeen City Council Policy Statement</b>	Independent market activity could, if successful, generate footfall in the city, depending on location
<b>Aberdeen City Local Outcome Improvement Plan</b>	
Prosperous Economy Stretch Outcomes	The proposals are unlikely to have a significant impact in the short term on supporting stretch outcome targets around tourism, leisure and hospitality jobs (Stretch 1).
Prosperous People Stretch Outcomes	N/A
Prosperous Place Stretch Outcomes	Destination markets can support place outcomes around a vibrant and attractive tourist and retail centre. This relies on scale, distinctiveness and

	quality of product, and a reputation. It is challenging for a new market to establish these credentials in the short term.
<b>Regional and City Strategies</b>	N/A
<b>UK and Scottish Legislative and Policy Programmes</b>	N/A

## 8. IMPACT ASSESSMENTS

Assessment	Outcome
Impact Assessment	Not Required
Data Protection Impact Assessment	Not Required

## 9. BACKGROUND PAPERS

- 9.1 Socio-Economic Rescue Plan Final Update - COM/21/099, City Growth and Resources Committee, 11 May, 2021.
- 9.2 City Centre Masterplan Review - RES/21/115, City Growth and Resources Committee, 11 May, 2021.

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