Appendix B

Ashgrove Connects Scheme Assessment

ATKINS
Member of the SNC-Lavalin Group

Ashgrove Connects

Ashgrove Connects Scheme Assessment

Aberdeen City Council

September 2022

Final Report

Based on TD 37/93 DMRB Stage 2 report layout

Notice

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Client signoff

Client	Aberdeen City Council
Project	Ashgrove Connects (BCI+ Ashgrove Road/ Ashgrove Road West)
Job number	5212138
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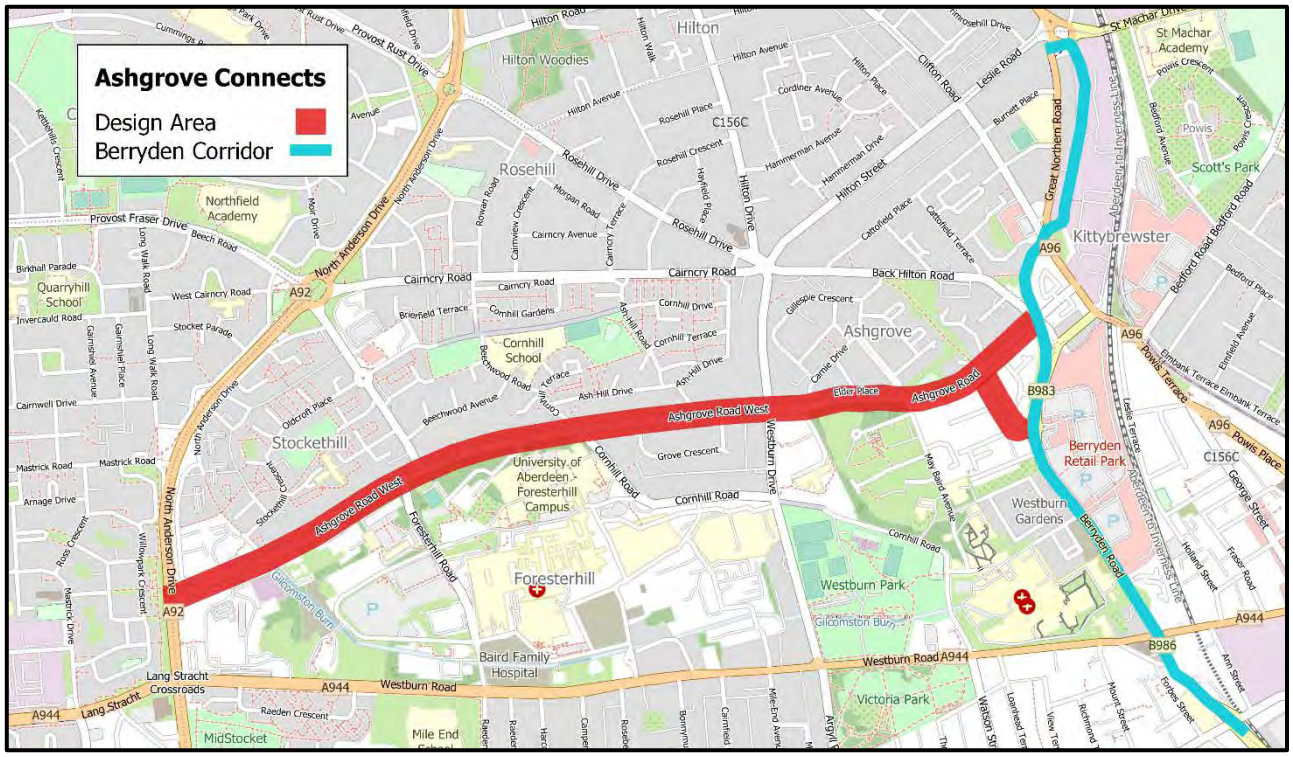
Contents

Main Report

Executive Summary

Scheme background

Atkins has been commissioned by Aberdeen City Council (ACC) to assess options for improvements to the transport network on Ashgrove Road and Ashgrove Road West and if required Laurelwood Avenue/ Elm Place, to connect the Berryden Corridor Improvement (BCI) proposals with Mastrick at North Anderson Drive.



ACC recognises that to enable all people (regardless of age or ability) to travel by active and sustainable modes and to engage in community activities, a holistic solution for the built environment is required. That is why this project has been developed in partnership with the communities who live and work in the area.

This Report summarises the assessment of options towards a technically feasible Concept Design (to RIBA Stage 2), that can demonstrate alignment with ACC policy, network need and public demand.

The scheme development stages as explained to the public are:

Alignment with policy and strategy, network need and public demand

The scheme assessment draws on robust consideration of the current and future needs of the city, the community and the streets relevant to the study area.

Aberdeen City Council Policy and Strategy

The adopted policy framework in Aberdeen, through approved ACC commitments including the Local Outcome Improvement Plan, Local Transport Strategy, Active Travel Action Plan, Climate Change Plan, the NE Scotland Roads Hierarchy, Aberdeen City Central Locality Plan and the Regional Transport Strategy, set a clear direction towards:

- More active travel, public transportation, and improved multi-modal accessibility;
- Locking in the benefits of strategic network changes by reducing traffic volumes and providing improved networks for walking, cycling and public transport;
- Greater prioritisation of space for people and community activities rather than traffic; and
- The need to take net zero and climate mitigation opportunities in all new schemes.

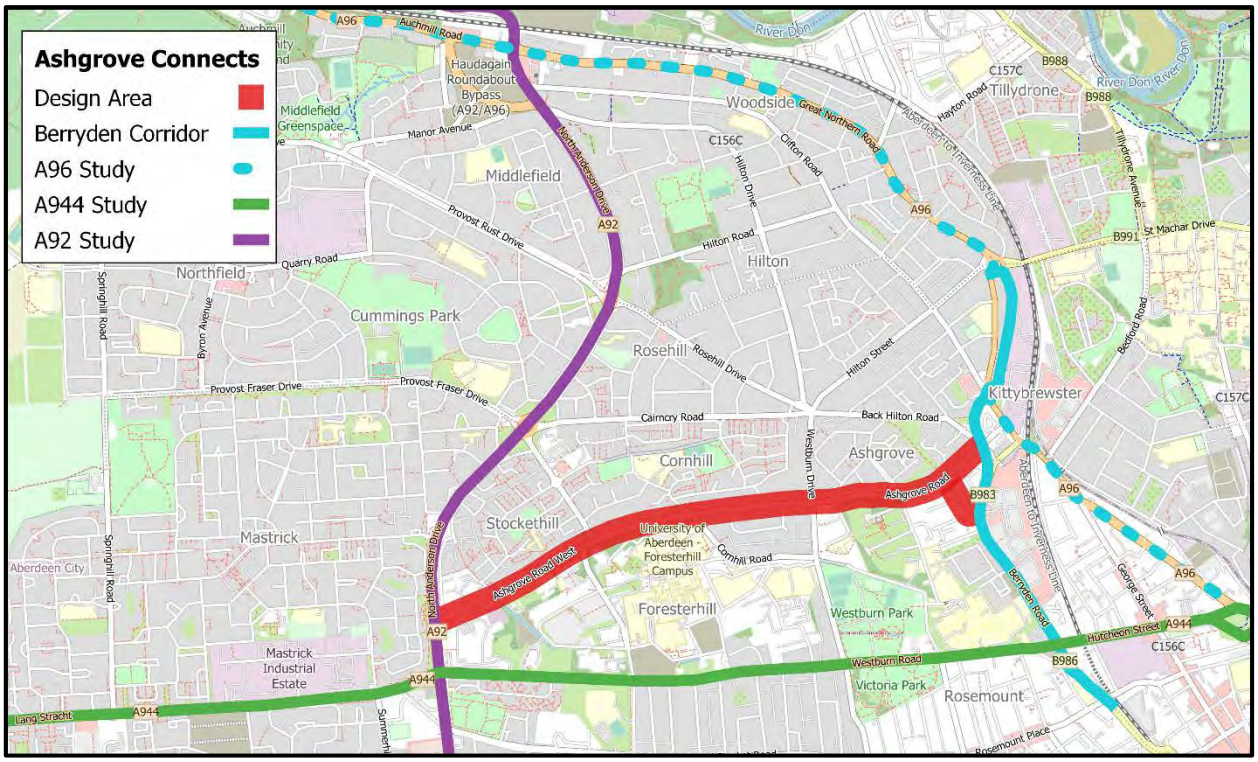
Two relevant commitments in the adopted Active Travel Action Plan 2017-2021 are to:

- Work towards a road network where all users are safe from the risk of being killed or seriously injured, and the injury rate is much reduced; and
- Ensure that all young people have the opportunity to travel to school by active and/or sustainable modes of transport and are equipped with the necessary knowledge, skills and infrastructure to allow them to undertake local journeys safely and independently.

Transport network

The transport network priorities in Aberdeen are changing. Key elements of this are:

- The NE Scotland Roads Hierarchy sets the context for transport planning, aims to lock in the traffic reduction benefits of the Aberdeen Western Peripheral Route (AWPR) and to ensure the successful delivery of the Local Development Plan, the Sustainable Energy Action Plan, the City Centre Masterplan (CCMP) and the emerging Local Transport Strategy;
- Particular to the study area, key complementary schemes all aim to improve bus operations and conditions for people walking, wheeling and cycling as well as keeping strategic traffic on the routes intended for it:
    - A96 Berryden Corridor Improvement (BCI),
    - A96 Inverurie to Aberdeen Multi-Modal Corridor Study;
    - A944 / A9119 Westhill to Aberdeen Multi-modal Corridor Study
    - A92 Bridge of Don to Bridge of Dee Multi-modal Corridor Study
- The A96 BCI scheme identified the need to develop strategically important cycle links along and across the road to maximise the mode shift benefits of the BCI investment as part of developing a network of connections. Delivery of these is outside the scope of the BCI project and are being developed separately by ACC. This scheme proposal is for one of these branches, and in full they are:
    - St Machar Drive (Berryden Corridor to Tillydrone Avenue)
    - **Ashgrove Road & Ashgrove Road West (Berryden Corridor - Mastrick)**
    - Skene Square & Gilcomston Steps, (Berryden Corridor - City Centre)
    - A96 Great Northern Road Berryden to Haudagain



Specifically in relation to the study area, the adopted Roads Hierarchy downgrades Ashgrove West to a tertiary or local route, that "No *longer functions as a priority route. Does not provide connection with the strategic road network. Much of its place function is residential*". A tertiary route is further defined as one where traffic speed should generally be 20mph and formal bus or cycle priority infrastructure is only necessary should the volume and composition of traffic require it.

The technical assessment within this study identified three primary transport mode requirements for the study area that are currently unmet:

- For cycling to become a realistic option for most people's everyday trips this study should provide safe and comfortable connections as part of a wider network to onward destinations;
- For the safety and comfort for people of all ages and abilities to walk and wheel to local destinations, there is a need to lower traffic speed, dissuade through traffic and enhance footways and crossings; and
- Improvements to links to and facilities at bus stops will improve the attractiveness of this mode.

Community and stakeholder demand

In order to ensure that the project responds to public need, Atkins developed an intensive engagement process that worked in parallel with the design process to ensure that proposals are understood and have the broad support of the community. The level of community engagement activity in the project so far is summarised below.

3,076	18	205	769	182
Online visitors	**Activities**	**Respondents**	**Contributions**	**News subscribers**

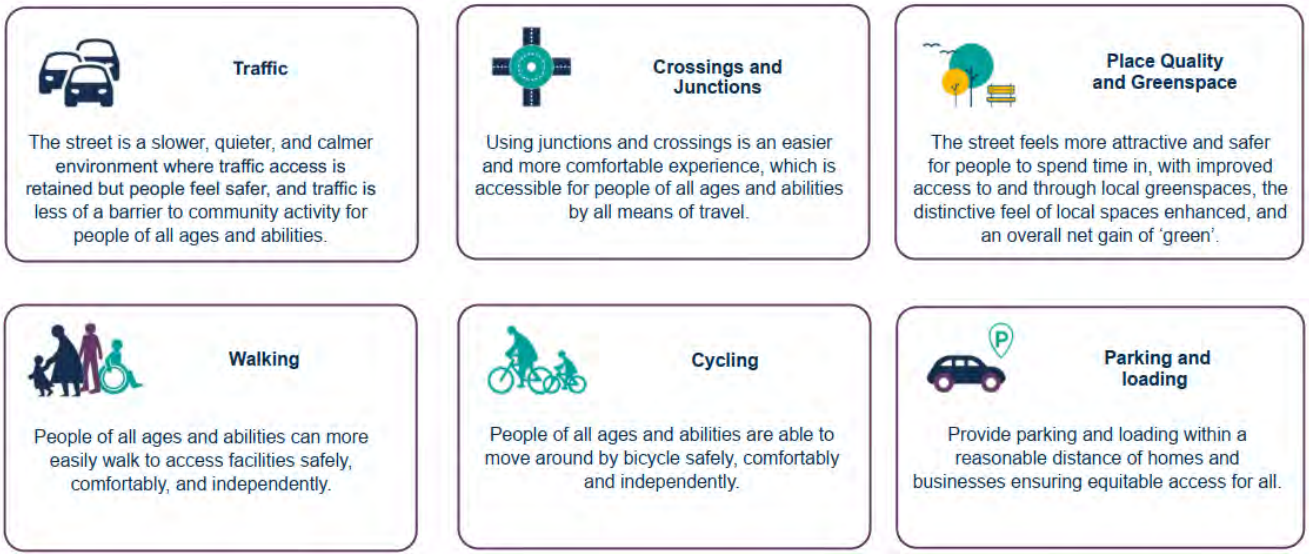
The public and stakeholders (through a Stakeholder Working Group of Council officers, local businesses, community groups, and statutory bodies) were asked to identify the key themes that needed improvement and to respond to Initial Design Ideas. The public priorities that emerged were:

- Slower and less traffic
- More crossings to reduce the severance effect of wide and heavily trafficked streets
- A network of safe infrastructure to make cycling accessible for most people
- Greater priority for pedestrians, particularly those with disabilities
- Improved place quality and access to greenspace
- A reduction in the negative impacts of parking and encourage use of off-street parking

Design Objectives

In summary of the policy, strategy and community priorities relating to this scheme, reducing the impact of through traffic, network improvements for sustainable modes, and enhancement of the residential place function is important factors for success.

Design Objectives were developed to ensure that the scheme proposals remain in line with these priorities. These were validated with the Stakeholder Working Group and have been tested through public engagement.



Concept Design Proposals

Concept Designs were developed within RIBA Stages 1 and 2:

- Stage 1 - Initial Design Ideas were presented to the public and stakeholders following options assessment against the Design Objectives; and
- Stage 2 - Concept Design proposals were prepared following community feedback and further detailed options assessment including statutory consultations and with Council officer feedback.

The key features of the proposals are:

- 20mph speed limit on Ashgrove Road and Ashgrove Road West;
- Reduced carriageway width and crossing distances;
- Continuous footways at side roads to provide design priority for pedestrians;
- One new controlled crossing of Ashgrove Road West;

- A significant net increase in the number of street trees and green infrastructure;
- Two new opportunities for public realm features as gateways into the community;
- Segregated cycle tracks on
  - Ashgrove Road West;
  - Ashgrove Road between Westburn Drive and Laurelwood Avenue; and
  - Laurelwood Avenue and Elm Place.
- Enhanced bus stop facilities and cycle bypasses of bus stops; and
- Reduction in available on street parking commensurate, prioritising residential need where required.

It is not the intention at RIBA Stage 2 of these Concept Design proposals to have resolved all operational and design challenges. The intention is to present technically feasible solutions and to highlight the deliverability opportunities and constraints that should be dealt with in detail at subsequent stages. These are presented within the Designer's handover documents.

Benefits

The Outline Business Case developed alongside this report identifies a number of key scheme benefits.

Community impacts	• Enables walkable and cyclable neighbourhoods • Greater accessibility of amenities and services • Differential equality impacts for people on low incomes • Reduced car dependence	Amenity value and public realm	• Improved accessibility for non-motorised users • Transport cost savings • Open space preservation • Improved quality of life
Modal shift from the private car	• Reduced carbon emissions • Reduced traffic congestion • Lower road maintenance costs • Fewer road accidents • Improved local air quality	Health impacts	• Higher levels of physical activity • Improved health • Safer roads for all users • Fewer sick days – economic growth • Reduced costs to the NHS
Journey quality benefits	• Improved user convenience, comfort, and safety • Enjoyment and wellbeing impacts		

Further to this, the Business case anticipates that while there are short term adaptations to be made, when considered over the medium to long term the re-allocation of road space to sustainable modes is likely to result in a neutral or reduced maintenance burden on the Council.

The total capital cost of the scheme is estimated to be in the region of £16 million (including all fees, complementary measures and optimism bias at 44%. Cost estimating at present is unpredictable due to the inflationary and supply chain pressures).

Package Appraisal and Phasing

A number of package options were appraised for alignment with policy, objectives and deliverability. The options considered ranged from do nothing (behaviour change and engagement only) to full implementation of the proposed scheme.

Full implementation offers the greatest maximisation of benefits and alignment with policy and objectives, particularly if delivered prior to or alongside the BCI.

The scheme is well aligned with Transport Scotland/ Sustrans' Places for Everyone funding which makes delivery affordable. This fund offers full design development costs and 70% of construction funding. The match funding element can be secured if the project is delivered prior to or alongside BCI implementation.

It is therefore recommended that ACC applies for funding for RIBA Stages 3-4 in October 2022 (for 2023-24) for the full scheme and to target construction commencement within the BCI construction period:

- 2023-24 Continuation of design and commencement of behaviour change interventions
- 2024-25 Commence construction in advance of or alongside the BCI.

Next steps

It is recommended that this proposal is further developed to remain in step with the BCI development and with other network improvements in the area, including the A944/A9119 and A92 multi-modal studies.

The immediate next steps are therefore to:

- Seek Council City Growth and Resources Committee approval to proceed;
- Update the community on progress; and
- Seek funding for further scheme development through RIBA Stages 3-4 (developed design and technical/ detailed design).

During RIBA Stage 3 it will be important early in the design process to:

- Invest further in community relations by continuing the depth of engagement to date;
- Address the identified gaps in response from businesses and local disability representatives;
- Work with stakeholders to plan implementation of the Behaviour Change Activation Plan;
- Plan for all monitoring and evaluation baseline data collection to be complete prior to implementation;
- At an early stage in the design process address the remaining design challenges prior to detailed design, in particular to:
    - Determine whether the final preferred options at Foresterhill/ Foresterhill Road and at Westburn Drive should be signal-controlled or roundabout junctions;
    - Finalise the balance of parking layouts and streetscape enhancements at Laurelwood Avenue and the east end of Ashgrove Road by continuing to engage in detailed discussions with residents and ACC officers;
    - Develop detailed solutions for maintenance, materials, sustainable urban drainage (including the potential for rain gardens) and for public realm and landscaping enhancements through further detailed engagement with relevant ACC officers.

1. Introduction

1.1. Background to this scheme assessment

1.1.1. The existing Berryden corridor facilitates journeys between the city centre, the north of Aberdeen and beyond. The Berryden Corridor Improvement (BCI) project will provide two lanes in both directions throughout the length of the corridor, widening the existing road between Skene Square and Ashgrove Road and creating a new road between Ashgrove Road and St Machar Drive. Alongside the new carriageway there will be segregated infrastructure for pedestrians and cyclists along the majority of its length. The BCI project will provide improved, continuous, and dedicated infrastructure for active travel modes along its length. This active travel infrastructure will provide a step change in provision, encouraging modal shift and improving perceptions of active travel safety. It will also provide a significant opportunity to further expand the provision of high-quality infrastructure on the surrounding network connecting neighbourhoods to the city centre.

1.1.2. During the consultation process for the Berryden Corridor Improvement project it was highlighted that for the full benefits of the new infrastructure for cycle traffic to be achieved, the proposed off-carriageway cycle infrastructure should extend further, providing continuity of provision for likely journeys, with a suggested link between the NHS Foresterhill Campus and the city centre cited as a specific example. Cycle infrastructure provided by the BCI project is being developed to address these demands on roads covered by the project, however, much of what was identified is outwith the BCI project's scope.

1.1.3. The connection routes identified as important to onward travel from the Berryden Corridor were:

- Kittybrewster Roundabout to Haudagain Roundabout (A96 Great Northern Road);
- Kittybrewster Roundabout to Tillydrone Avenue/ Diamond Bridge (St Machar Drive);
- Skene Square to City Centre; and
- Berryden Corridor to Cornhill/ Foresterhill/ Mastrick (Ashgrove Road & Ashgrove Road West).

1.1.4. The Kittybrewster Roundabout to Haudagain Roundabout (A96 Great Northern Road) and Kittybrewster Roundabout to Tillydrone Avenue/ Diamond Bridge (St Machar Drive) routes will be considered as part of the Inverurie to Aberdeen Multi-Modal corridor transport study forming a part of the programme of work funded by the Transport Scotland Bus Partnership Fund.

1.1.5. The Skene Square to City Centre and Berryden Corridor to Cornhill/ Foresterhill/ Mastrick (Ashgrove Road & Ashgrove Road West) routes are included Berryden Corridor Active Travel Connections Programme. The Berryden Corridor Active Travel Connections Programme has, in parallel with the BCI and with funding from Nestrans, considered options for the development of connections from the BCI cycle infrastructure which would maximise active travel opportunities on the corridor, leveraging the maximum active travel benefits of the BCI project.

1.1.6. Berryden Corridor to Cornhill/ Foresterhill/ Mastrick (Ashgrove Road & Ashgrove Road West) route is also known as Ashgrove Connects for consultation and project purposes.

1.1.7. In progressing this scheme, Aberdeen City Council (ACC) recognises that to improve the opportunities for all people (regardless of age or ability) to travel by active and sustainable modes and to engage in community activities, a holistic solution for the built environment may be required for those living and working adjacent to Ashgrove Road/ Ashgrove Road West.

1.1.8. Atkins has been commissioned by Aberdeen City Council (ACC) to assess options for improvements to the transport network on the alignment of Ashgrove Road and Ashgrove Road West and if required Laurelwood Avenue/ Elm Place, to connect the BCI proposals with Mastrick at North Anderson Drive.

1.1.9. This Report summarises the assessment of options towards a technically feasible Concept Design (to RIBA Stage 2), that can demonstrate alignment with ACC policy, network need and public demand with a view to applying for RIBA Stage 3-4 design funding in late 2022.

1.1.10. ACC recognises the importance of ensuring that the needs of stakeholders, businesses, residents, and other users of the spaces are at the heart of scheme assessment and that any proposals are both broadly understood and supported by all through public and stakeholder consultations.

1.1.11. The timeline for the public and stakeholder consultations are identified in Figure 1.1.

Figure 1.1 - Consultation Timeline

1.2. Overview of Report

1.2.1. The Atkins reporting was delivered into two main reports:

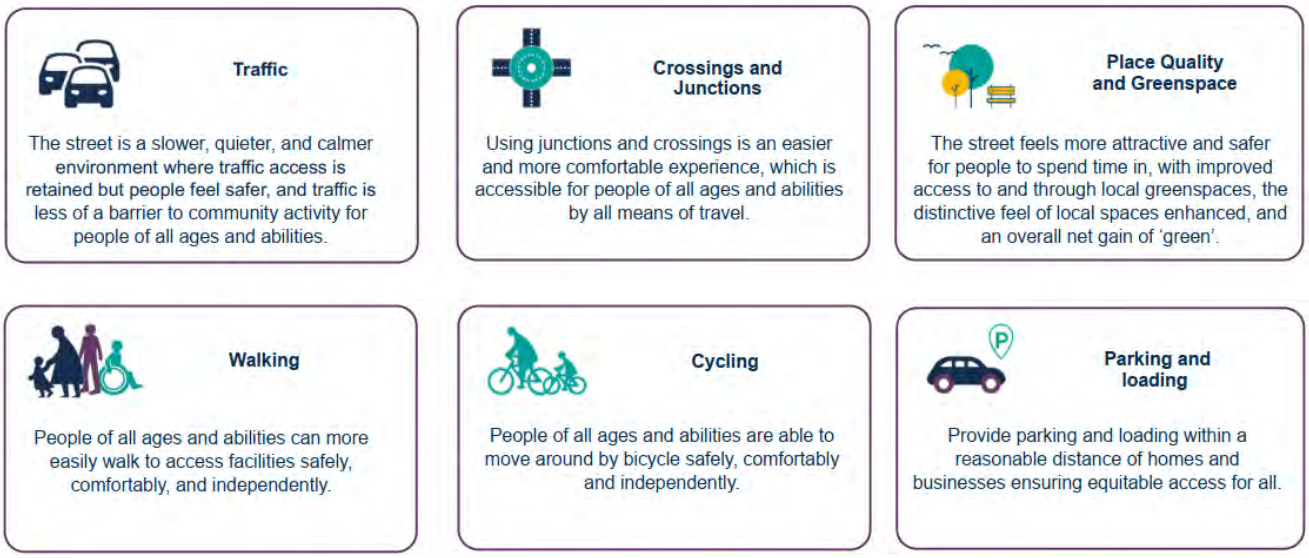
1. Baseline Assessment (CR-K) of community and technical data collection to develop Design Objectives; and
2. Concept design to RIBA Stage 2 and scheme assessment reporting to TD37/93 Stage 2

Baseline Assessment

1.2.2. The Baseline Assessment (CR-K) developed Scheme Design Objectives from community and background technical data collection. It provides the context for design development via data-gathering and fact-finding exercises to identify the potential constraints and opportunities for the scheme.

1.2.3. The Scheme Design Objectives identified are illustrated in Figure 1.2.

Figure 1.2 – Scheme Design Objectives



1.3. Scheme Assessment (this report)

1.3.1. The purpose of this report is to present the assessment of design options to identify a preferred Concept Design. Assessment was undertaken on the basis of alignment with Design Objectives and deliverability in relation to identified engineering, environmental and transport network opportunities and constraints.

1.3.2. This report details the process of identifying a preferred Concept Design Option and the potential impact of the scheme.

1.3.3. It has been structured in line with the layout of DMRB TD 37/93 Stage 2 Scheme Assessment reporting to remain consistent with standard ACC committee reporting. It is recognised that there is the need to develop content to satisfy the requirements of Sustrans' Places for Everyone funding applications. Therefore, the standard TD37/93 template has been adapted to ensure that the project is reported transparently.

1.3.4. The report is structured as follows:

- Introduction
- Existing Conditions
- Engagement Summary
- Concept Design Options Assessment and Proposals
- Proposed Concept Design
- Engineering Assessment
- Environmental Assessment

- Traffic Assessment
- Behavioural Change Activation
- Delivery Options Appraisal
- Economic Impact
- Summary & Recommendations

1.4. Related documents

1.4.1. Further details that complement this report are provided in the following:

- Constituent reports:
  - CR-A – Behaviour Change Activation Plan
  - CR-B – Traffic Data & Models
  - CR-C – Monitoring & Evaluation Plan
  - CR-D1 – Engagement Report (Stage 1)
  - CR-D2 – Engagement Report (Stage 2)
  - CR-E – Preliminary Ecological Appraisal
  - CR-J – Walking & Cycling Network Assessment
  - CR-K – Baseline Assessment
  - CR-L – Policy Review
- The full drawing package:
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00001: Location Plan
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00002: Anderson Road Junction to Castleton Drive
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00003: Castleton Drive to Forresterhill Road Junction
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00004: Foresterhill Road Junction (Signalised Option)
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00005: Foresterhill Road Junction (Compact Roundabout)
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00006: Cornhill Terrace/Cornhill Road Junction
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00007: Grove Crescent to Westburn Drive Junction
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00008: Westburn Drive Junction (Signalised Option)
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00009: Westburn Drive Junction (Roundabout Option)
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00010: Ashgrove East Transition to Laurelwood
  - ASH-ATK-HGN-ZZZZZ-DR-CH-00011: Ashgrove Road and Laurelwood

2. Existing Conditions

2.1. Introduction

2.1.1. This Chapter provides a summary of the existing engineering, environmental, and traffic conditions applicable to the Design Area. Further detail is provided in the Baseline Assessment (CR-K) to identify the opportunities and constraints within the Design Area.

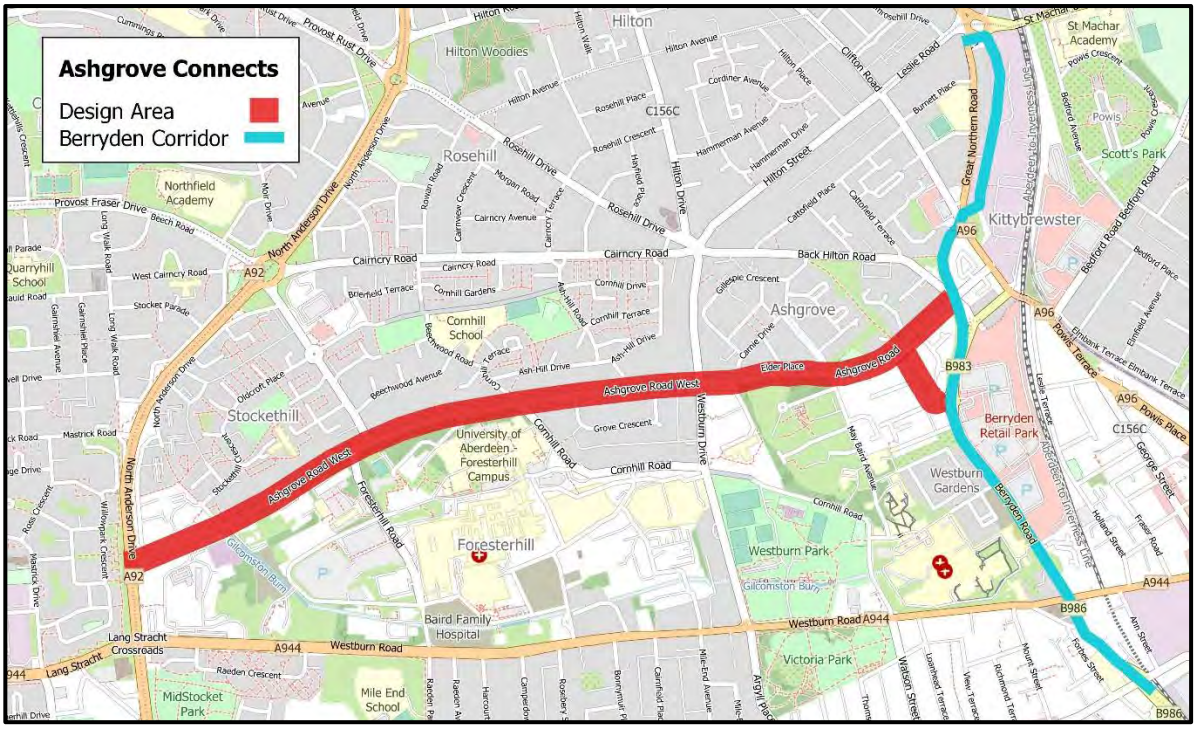
2.1.2. Note that items not covered in this Chapter have not been identified at this stage as being significant to the scheme or have not been included in the scope of the current commission.

2.2. Design Area

2.2.1. The Design Area for Ashgrove Connects is presented in Figure 2.1. It covers the full length of Ashgrove Road West and Ashgrove Road (jointly referred to in this report as 'Ashgrove Connects), between North Anderson Drive to the west and Berryden Road to the east, and also includes Laurelwood Avenue and Elm Place.

2.2.2. The Berryden Corridor Improvement Project involves widening the existing road and junction improvements between Skene Square and Ashgrove Road, and constructing a new section of road between Ashgrove Road and Kittybrewster roundabout. It is a committed project and will be integrated with the design options.

Figure 2.1 – Ashgrove Connects Design Area



2.3. Road geometry and standards

Ashgrove Road West

2.3.1. Ashgrove Road West is a single carriageway road that varies in width between 11m-13m and runs west-east between North Anderson Drive and Westburn Drive. It is subject to a 30mph speed limit and is situated within a Controlled Parking Zone (CPZ).

2.3.2. The built environment along Ashgrove Road West between North Anderson Drive and Westburn Drive is a mix of residential and employment uses. The land to the north is primarily residential and features residential properties with direct driveway access onto Ashgrove Road West. The land to the south, west of Cornhill Terrace, is generally for employment use and largely comprises various healthcare and educational sites such as the Ambulance Service, NHS Foresterhill Health Campus, and University of Aberdeen Foresterhill Campus.

2.3.3. While the route is not intended to serve an arterial / distribution function, its proximity to key routes does make it susceptible to through-traffic. Ashgrove Road West generally presents a wide, traffic-focused boulevard, with limited appeal and accessibility for people, place, and amenity.

2.3.4. The corridor is recently re-classified as a C-class tertiary route (from A class) in the NE Scotland Roads Hierarchy. While it to continues to serve an important role in the road network as an access to destinations such as the hospital and university it is intended to no longer serve as a major through-route for traffic.

Walking Provision

2.3.5. Footways are provided on both sides of the carriageway along the full route. The exception is the section northern footway between North Anderson Drive and Castleton Drive, where the footway instead follows the parallel road to the north. The footway widths on both sides of the carriageway are approximately 3m and are constrained by trees and lighting columns.

2.3.6. The majority of the formalised crossings are uncontrolled, except for those at the signal-controlled junctions (North Anderson Drive, Foresterhill Road, and Westburn Drive). Provision of dropped kerbs over side roads is inconsistent. Provision for vulnerable or impaired pedestrians is limited; tactile paving is provided at the Foresterhill Road and Westburn Drive junctions only.

2.3.7. The crossings over Cornhill Terrace and Cornhill Road are approximately 21m and 17m long respectively, which is wider than desirable and could cause issues for some users.

Cycling Provision

2.3.8. Cycle provision is limited to advisory 1.5m wide on-road cycle lanes on both sides of the carriageway. The cycle lanes are not continuous and are frequently interrupted by the provision of on-road parking bays.

2.3.9. The Foresterhill Road junction is provided with advanced stop-lines for cyclists on all four external approaches, although not for the 'internal' link between the two Foresterhill approaches. There are no cycle lanes leading into the advanced stop-line boxes.

Public Transport

2.3.10. There are three sets of bus stops (north and south) along Ashgrove Road West. These are served by a range of services to the north, west, and south of city, all of which also run through the city centre. The majority of these operate once or twice an hour, although the most frequent, the First 23 Sunshine service, operates five times per hour.

Parking

2.3.11. There is no cycle parking provision on Ashgrove Road West. Cycle parking is provided within the University of Aberdeen campus, the hospital, and Aberdeenshire Council's Woodhill House.

2.3.12. Ashgrove Road West is within a CPZ, and therefore all lengths of road must be covered by some form of restriction or control. Marked lengths are provided at the following locations:

- North side of carriageway:
- 25m west of Castleton Drive, westwards for approximately 90m
- South side of carriageway:
- East of Ambulance Service access (40m length)
- West of Foresterhill Road (south) (260m length)
- East of Foresterhill Road (south) (165m length)
- West of Cornhill Road (45m length)

2.3.13. Parking within these lengths is restricted to those with either a valid resident's permit, vouchers, or using the PayByPhone smartphone app.

Ashgrove Road

2.3.14. Ashgrove Road is a single-carriageway road that runs west-east between Westburn Drive and Berryden Road, and effectively acts as a continuation of Ashgrove Road West. The section between Westburn Drive and May Baird Avenue is approximately 9m wide, and it narrows to approximately 7.5m to the east of May Bard Avenue.

2.3.15. Ashgrove Road is more residential focused in its environment compared to Ashgrove Road West, with residential developments on both the north and south side of the carriageway. While there are commercial premises located here, e.g. the Royal Mail Depot and a convenience store, these are all located at the eastern end and are generate far less traffic relative to the area when compared to the hospital and university on Ashgrove Road West.

2.3.16. Ashgrove Road will link with the new Berryden Corridor Improvement dual-carriageway via a left-in / left-out priority junction, in place of its existing junction with Berryden Road.

Walking Provision

2.3.17. Continuous footways are provided on both sides of the carriageway, measuring approximately 3m between Westburn Drive and Laurelwood Avenue, and narrowing to 1.8-2m between Laurelwood Avenue and Berryden Road. The only signal-controlled junction in this section is at the junction of Westburn Drive with Ashgrove Road and Ashgrove Road West. Tactile paving is incorporated at all arms of the junction. All the formalised uncontrolled crossings do not currently comprise tactile paving.

Cycling Provision

2.3.18. Ashgrove Road does not feature any dedicated cycling facilities.

Public Transport

2.3.19. Ashgrove Road does not feature any public transport provision.

Parking

2.3.20. There is no provision for cycle parking on Ashgrove Road.

2.3.21. Car parking on Ashgrove Road is restricted between the junctions with Westburn Drive and May Baird Avenue, and there are a number of uncontrolled sections on the south side of the carriageway between May Baird Avenue and Berryden Road. Parking demand is largely dominated by residents, with overnight occupation observed 24 of 28 available space during parking surveys; it is however noted that two of those parking overnight did so on double yellow lines. Daytime occupation was observed to reduce to between 50-60%.

Laurelwood Avenue/ Elm Place

2.3.22. Laurelwood Avenue is a residential road that runs north-south between Ashgrove Road and Elm Place. It features direct drive-way access as well as on-street parking on both sides of the carriageway. Vertical traffic calming in the form of speed cushions is in place and it is subject to a 20mph speed limit. Whilst its primary function is as a residential road it is frequently used as by through traffic between Ashgrove Road and Berryden Road.

2.3.23. A 30m length of Elm Place between Berryden Road and Laurelwood Avenue is also part of the study area. The road carriageway width is approximately 10m, widening at the junctions. The 20mph speed limit signs are located approximately 15m from the Berryden Road junction.

Walking Provision

2.3.24. Footways are provided on both sides of the Laurelwood Avenue and Elm Place carriageways, measuring 2.5-3m in width, with the footway on the west side of Laurelwood Avenue constrained by trees. The north side Elm Place carriageway is over 5m in width.

2.3.25. All of the crossings are uncontrolled and are not consistently provided with tactile paving, although dropped kerbs are present across all junctions, including those to the north and south with

Ashgrove Road and Elm Place respectively. Whilst parked vehicles can obstruct visibility for crossing, the slow vehicle speeds, traffic calming, and frequent siting of dropped kerbs to serve driveways allows for crossing opportunities.

Cycling Provision

2.3.26. Laurelwood Avenue and Elm Place do not feature any dedicated cycling facilities.

Public Transport

2.3.27. Laurelwood Avenue and Elm Place are not on defined bus routes.

Parking

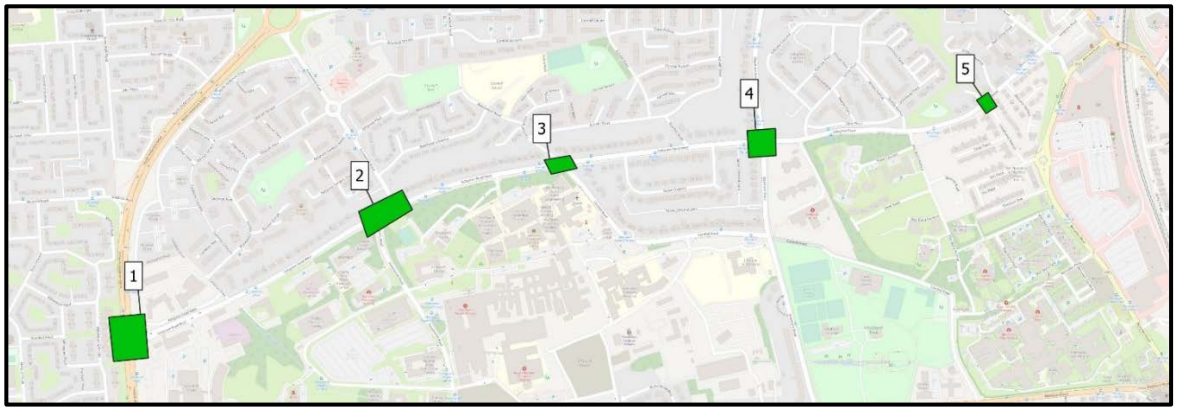
2.3.28. There is no provision for cycle parking on Laurelwood Avenue or Elm Place.

2.3.29. Parking is uncontrolled along Laurelwood Avenue, with no marked bays and no restrictions beyond 'no waiting at any time' restrictions at junctions. Elm Place features uncontrolled parking to the west of the Laurelwood Avenue junction, and has 'no waiting at any time' restrictions to the east.

Key Junctions

2.3.30. A significant number of junctions are situated along the street. These junctions are highlighted in Figure 2.2 and are identified as the more complex junctions that are subject to detailed assessment in this report.

Figure 2.2 – Key Junctions



1. North Anderson Drive –signal-controlled three-arm T-junction
2. Foresterhill Road – signal-controlled staggered crossroads
3. Cornhill Terrace – staggered priority crossroads
4. Westburn Drive – signal-controlled crossroads
5. Laurelwood Avenue – simple priority T-junction

2.3.31. In addition to the key junctions identified above, Ashgrove Road West forms priority junctions with nine side roads, plus multiple commercial / third party / unadopted / driveway accesses. Ashgrove

Road is similar, although right-turn ghost-islands are provided to serve Roxburghe House and May Baird Avenue.

2.4. Topography

2.4.1. Topographical surveys have not been undertaken at this stage and should be undertaken at RIBA Stage 3. All design and assessment work has been progressed using Ordnance Survey mapping.

2.5. Location of existing services

2.5.1. An initial utility search has been undertaken and the following utility services have been identified within the scheme:

- City Fibre**;**
- Street Lighting;
- Neos Network;
- Openreach (BT);
- Scottish Water;
- Vodafone;
- Scottish and Southern Electricity Network;
- Scotland Gas Network; and
- SSE Transmissions.

2.5.2. The utility search provides a list of known apparatus within the scheme extents and is summarised below:

- Between North Anderson Drive and Foresterhill an extra high voltage cable of 132kV is present in both the footway and carriageway.
- Fibre optic cables with active chambers are present throughout the scheme within the carriageway and footway. Openreach have live boxes and cables along the route, with live cabinets present at Foresterhill Road junction and Westburn Drive. A live pole is located at Grove Crescent Lane and a planned cable cross is noted at Westburn Drive junction.
- Street lighting within the scheme between North Anderson Drive and Westburn Drive consists of ‘Not Live Feed’ lighting columns and looped ACC – 3 core SWA cable. However, ‘Live Service – Concentric’ cables are present at two locations: Foresterhill Road and Westburn Drive. ‘Live Feed’ lighting columns are present between Westburn Drive and Berryden Road and ‘Live Looped’ lighting columns are at Westburn Drive and May Baird Avenue. At May Baird Avenue and Belmont Gardens, illuminated ‘Warning’ signs are present and an illuminated ‘Regulatory’ road sign is located at Berryden Road Junction.
- Scottish Water have both water distribution and wastewater pipes within the scheme. Water distribution pipes are in the carriageway and footway, and there are several hydrants also present in the footway. Wastewater pipes are in the carriageway and footway with trade

effluent chambers present between North Anderson Drive and Foresterhill, along May Baird Avenue to Berryden Road. CSO (Combined Sewer Overflow) chambers are present between Foresterhill and Cornhill, at Grove Crescent and May Baird Avenue and between May Baird Avenue and Berryden Road. At Foresterhill/Cornhill and Grove Crescent, there are several Buchan Traps.

- There are both low voltage electric and fibre optic cables running in the footway and carriageway throughout the scheme. Between May Baird Avenue and Berryden Road, a 22kV cable is present in the carriageway.
- There are both medium and low-pressure gas mains in the carriageway and the footway. The medium pressure pipe transitions into a 355 PE M/P (Polyethylene Medium Pressure) until Cornhill junction, then changes to a 315 PE with a 15in diameter thereafter. After Beattie Drive junction, a valve is located in the middle of the carriageway which the medium pressure main feeds into.

2.6. Heritage and Conservation

Character

2.6.1. There are clear differences in the character and identify of the western part of the study area (Ashgrove Road West) and the eastern part (Ashgrove Road to the east of Westburn Drive; Laurelwood Avenue and Elm Place).

2.6.2. Ashgrove Road West is a wide road designed to accommodate relatively high traffic volumes with a high priority given to through movement. By contrast Ashgrove Road is considerably narrower and has a design more suited to lower traffic volumes with a high proportion of local access movements.

2.6.3. Ashgrove Road, between Westburn Drive and May Baird Drive, is framed by long stretches of high stone walls, with few gaps and no frontages onto the street. There is minimal diversity of space and has little passive surveillance from adjacent properties or entrances.

Heritage and conservation

2.6.4. The only recorded heritage interest within the Design Area is the Rosemount and Westburn Conservation Area, which borders on a small stretch of Ashgrove Road on the south side, east of Westburn Drive.

2.6.5. The buildings with notable historic significance within this conservation area are situated in Rosemount to the south. Westburn has been included within the conservation area to retain the parklands of Westburn and Victoria Park.

2.7. Active Travel

2.7.1. An Active Travel Network Assessment (document CR-J) was undertaken to review existing conditions for walking and cycling in the area around Ashgrove Connects and identify

complementary network improvements to allow walking and cycling to be accessible as an everyday choice for all ages and abilities.

2.7.2. The key findings were:

- There is strong potential demand in areas close to the city centre due to both high sustainable transport mode share, low car ownership and a high population density. This supports the common principle of network design to focus on unlocking safe access to the city centre then building outwards
- Existing road conditions in the study area are not well suited to safe all ability access with an existing layout that includes many wide, straight roads that create a motor traffic dominated environment allowing high speeds through residential areas
- Barriers to walking and cycling in and around the scheme significantly limit the ability to get from one neighbourhood to the next or to local destinations;

2.8. Vehicular Traffic

2.8.1. Traffic flows are busiest between Foresterhill and Westburn, exceeding 10,000 vehicles per weekday, and quietest along Ashgrove Road at the east of the Design Area, at around 6,000 vehicles per weekday. Saturday flows were typically around 50-60% of the weekday flows throughout the study area.

2.8.2. HGV traffic as a percentage is higher towards the west, reaching over 8% towards North Anderson Drive as service and deliveries arrive via this major route. They are lower to the east, just over 5%, a reflection of the area as largely residential, with goods vehicles accessing the shops and Royal Mail depot but not generating much through-traffic.

2.8.3. Traffic movements at the west end of the Design Area are broadly tidal in nature as traffic is drawn from and to North Anderson Drive in the AM and PM peak hours respectively, whereas flows are generally balanced by direction in the centre and east of the area. While the daily flow profiles reflect typical weekday working patterns (i.e. observable AM / PM peak hours), there was minimal drop-off between the morning and evening peaks with traffic levels relatively steady throughout the day.

2.8.4. Average (mean) traffic speeds were observed to exceed the speed limit closer to North Anderson Drive and Westburn Drive and were lower in the centre of the Design Area in the vicinity of Foresterhill Road. It was however noted that the 85th percentile speeds observed during surveys were in excess of the 30mph limit at each of the surveyed locations.

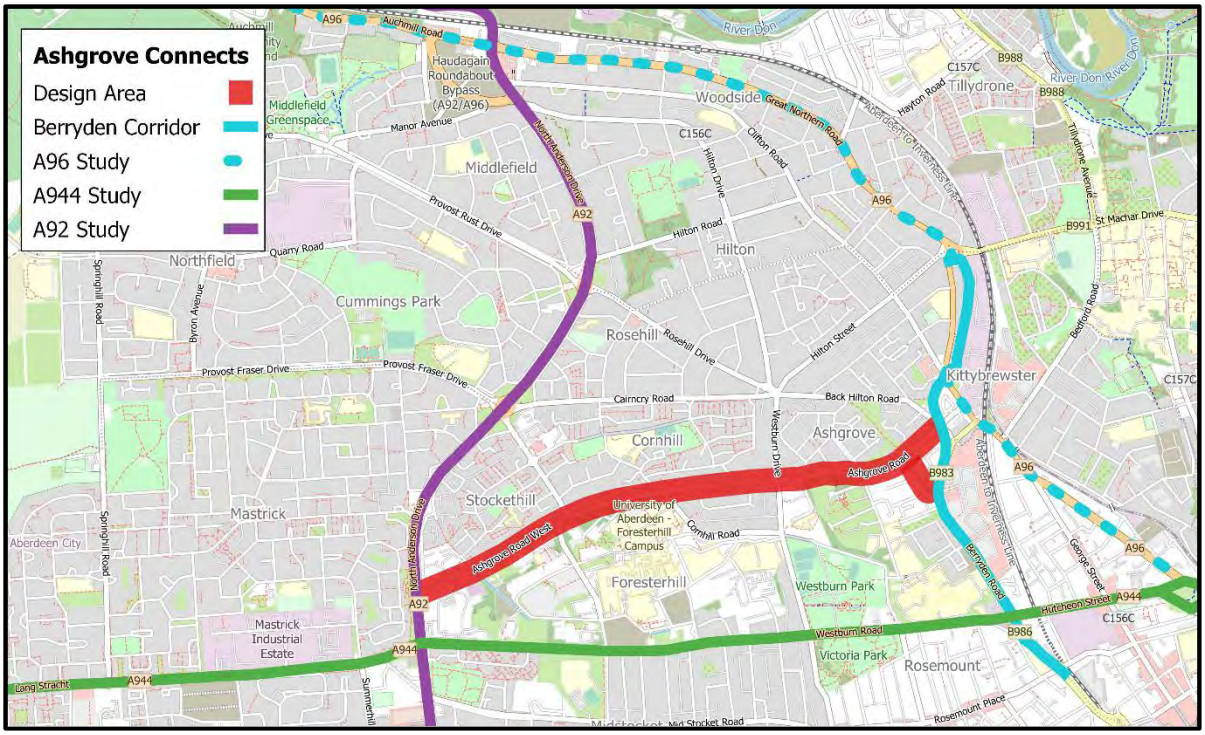
2.8.5. The adopted North East Scotland Roads Hierarchy identifies speed limits of 30-40mph as suitable for priority and secondary routes (i.e. A-class and B-class) and that 20mph is suitable for a tertiary (C-class) route. Ashgrove Road West, Ashgrove Road, Laurelwood Avenue and Elm Place are

classified as C-class roads in the Roads Hierarchy and therefore a change in speed limit to 20mph would be consistent with adopted ACC policy.

2.8.6. A review of collision data within the Design Area was undertaken using records supplied by ACC, covering the five-year period between 2016-2020. The review identified two clusters of collisions: one at the west end of the Design Area at the North Anderson Drive junction, and one at the east end at the Berryden Road and Powis Terrace junctions. One other collision was identified within the Design Area, which occurred to the east of the Foresterhill Road junction. None of the collisions was recorded as fatal, four were recorded as serious (two at each cluster), ten as slight, while the Foresterhill Road collision was recorded as damage-only (i.e. no injuries).

2.9. Proposed Multi-Modal Studies impacting the study area

Figure 2.3 – Proposed Improvement Projects



Berryden Corridor Improvement Project

2.9.1. The Berryden Corridor Improvement Project involves widening the existing corridor between Skene Square and Ashgrove Road, along with a series of junction upgrades along the corridor. A new section of road will be constructed immediately east of Ashgrove Road to connect with Kittybrewster Roundabout.

2.9.2. The traffic data supplied for the Traffic Impact Assessment was extracted from the Aberdeen City Centre Paramics Model 2019, which was adapted for the traffic modelling appraisal of the Berryden Corridor. As this is considered to be a committed scheme these turning movements are considered

more reflective of the traffic context within which Ashgrove Connects will operate, as opposed to using new traffic survey data.

2.9.3. Where a traffic redistribution impact is anticipated in any of the Ashgrove Connects proposals, for example with a turning or movement restriction, traffic has been reassigned using first principles without any forecast change in overall traffic. Further details of any redistributive impacts are covered in Section 8.6.

A92 Multi-Modal Study

2.9.4. Jacobs has been commissioned by ACC to develop a Scottish Transport Appraisal Guidance (STAG)-based appraisal of options for improvements to the A92 corridor between Bridge of Don and Bridge of Dee. The study places a focus on improving bus connections and conditions for people walking, wheeling, and cycling. Its main aim is to 'lock in' the local benefits arising from the opening of the Aberdeen Western Peripheral Route by seeking to encourage more people to travel sustainably. The study is funded by Transport Scotland's Bus Partnership Fund.

2.9.5. The project sets out the following objectives:

- TPO 1: Reduce the severance effects caused by the A92 for journeys across the corridor, particularly for journeys by bus;
- TPO 2: Enable the A92 corridor to be a more effective connector between communities/key trip attractors for users of active modes;
- TPO 3: Reduce the environmental impact of traffic on the A92 corridor;
- TPO 4: Reduce real and perceived road safety risks for users of all modes considering travelling along or across the A92 corridor;
- TPO 5: Support the roads hierarchy by encouraging use of the most appropriate routes for local and through traffic;
- TPO 6: Improve journey times and journey time reliability for buses and emergency vehicles.

2.9.6. The A92 Study identifies the following options that may impact on the Ashgrove Connects Design Area:

- introduce early-release signals to provide a green signal for cyclists to allow them to move off before other traffic at A92 North Anderson Drive / Ashgrove Road West junction
- introduce bus priority measures, such as bus lanes, signal controls, and bus stop improvements at the following locations:
    - A92 North Anderson Drive between Ashgrove Road West and Haudagain Roundabout
    - Ashgrove Road West, on approach to A92 North Anderson Drive
    - Foresterhill Road between Ashgrove Road West and A92 roundabout

A944 Multi-Modal Study

2.9.7. Stantec have been commissioned by ACC to undertake a STAG-based appraisal of the A944 (and A9119) corridors between Westhill and Aberdeen city centre. The study builds on previous work

and aims to further develop identified options to improve transport connections along the corridor, with a focus on active travel and public transport.

2.9.8. The project sets out the following objectives:

- TPO1: Improve the quality of the pedestrian experience for all, and address the barriers which affect some groups moving around as a pedestrian
- TPO2: Improve cycle routes to ensure they are sufficiently direct and connected, while improving journey quality, times, and safety for cyclists in the corridor
- TPO3: Rebalance the city centre environment in favour of more sustainable modes
- TPO4: Reduce journey times by bus and improve service punctuality
- TPO5: Improve the quality of bus services and bus stop infrastructure in the corridor, enhancing the experience for current bus users and attracting new passengers
- TPO6: Address the cost of public transport and reduce gaps in bus connectivity along the corridor
- TPO7: Provide improved integration between sustainable travel modes
- TPO8: Increase the mode share for sustainable travel modes along the A944 and A9119 transport corridors

2.9.9. The A944 Study is located away from the Ashgrove Connects Design Area, therefore there is no direct integration or conflict with Ashgrove Connects. It does however form part of a wider opportunity along with the other ongoing infrastructure improvement projects throughout Aberdeen to contribute to a well-connected quality network for non-motorised users of all ages and abilities

A96 Multi-Modal Study

2.9.10. Stantec have been commissioned by ACC to undertake a STAG-based appraisal of the A96 corridor between Aberdeen City Centre and Inverurie. It shares a similar aim to the A944 Study; to improve transport connections along the corridor, particularly active travel and public transport connections.

2.9.11. The project sets out the following objectives

- TPO 1 - Improve the quality of the pedestrian experience, and address the barriers which affect some groups moving around as a pedestrian
- TPO 2 - Improve the quality of the cycling experience, and address the barriers which prevent many people cycling
- TPO 3 - Improve the quality of bus travel in the corridor for all users, enhancing the network and the travel experience both for current bus users and to attract new users
- TPO 4 - Reduce bus journey times and improve punctuality in the corridor, and narrow the gap between bus and car-based journey times
- TPO 5 - Improve integration with, and access to rail services in the corridor

- TPO 6 - Manage journey time for general traffic to prevent traffic re-routing in the corridor

2.9.12. It builds upon the committed Berryden Corridor and includes options to provide further improvements beyond those already committed as part of the Berryden project. Four options are identified within the vicinity of the Ashgrove Connects Design Area, covering the A96 section between Printfield Walk to the City Centre. Each of the options would provide a segregated cycle track and bus priority measures (either a bus lane or busway) on the A96 to the north of its junction with Clifton Terrace, with each option varying to the south as follows:

- Option 1 - Segregated one or two-way cycle track following the alignment of the existing A96 (i.e not following the new Berryden Corridor). Would also include bus lane provision or a busway on the A96.
- Option 2 - Segregated one or two-way cycle track following the alignment of the existing A96 (i.e not following the new Berryden Corridor). Would also include bus lane provision on the A96, supported by widening the existing A96 at Belmont Road Railway Bridge.
- Option 3 - Segregated one or two-way cycle tracks following both the existing A96 and new Berryden Corridor alignments. The full length of the Berryden Corridor would be used to provide either a bus lane or busway between Craibstone and the rail / bus station.
- Option 4 - Segregated one or two-way cycle track following the existing A96 alignment. Bus gates would be provided between Clifton Road and Kittybrewster Roundabout.

A92 / A96 Haudagain Bypass

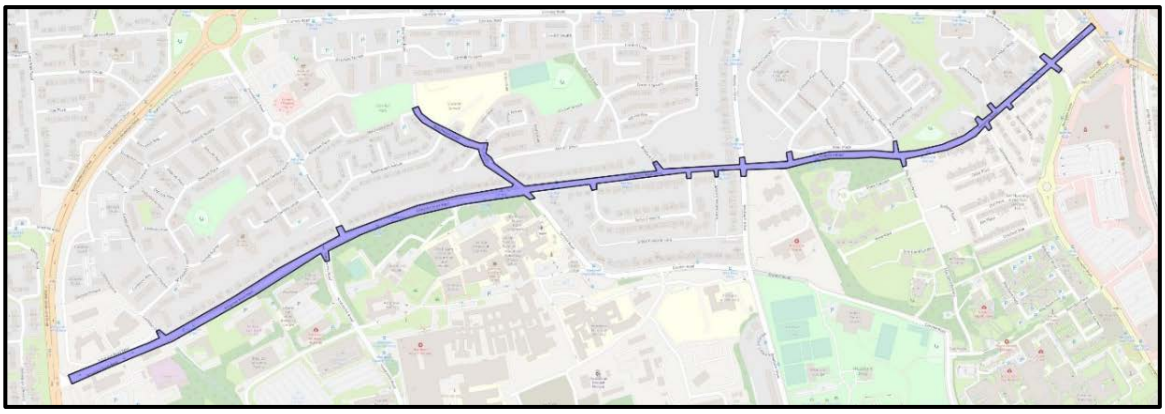
2.9.13. Also relevant to the study area is the established infrastructure improvement at the Haudagain roundabout. Farrans were commissioned by Transport Scotland to reconfigure the Haudagain Roundabout, formed by the A92 and A96, located to the north of the Ashgrove Connects Design Area. The project involved the provision of a new section of dual carriageway linking the western and southern approaches to Haudagain Roundabout to form a new 500m long bypass, with the aim of reducing traffic congestion and improving journey time reliability.

2.9.14. Although the project is relatively remote from Ashgrove Connects, it does contribute to wider active travel improvements. The Bypass links with the A92 and A96 via signal-controlled junctions, both of which provide toucan crossings over each approach, which connect with either shared or segregated cycle / footways.

2.10. Parking

2.10.1. Car parking surveys were undertaken on Tuesday 26th April and Saturday 30th April 2022. The surveys covered the full length of Ashgrove Road West and Ashgrove Road, along with the first 20m of each side road, as illustrated in Figure 2.4. As requested by ACC, the survey area also extended north on Cornhill Terrance and Beechwood Road to observe pick-ups / drop-offs at Cornhill Primary School.

Figure 2.4 – Parking Survey Area



2.10.2. Parking occupancy on Ashgrove Road West was minimal overnight, indicating a negligible level of use by residents. It reached a peak occupancy of approximately 30 vehicles on the surveyed weekday (of an overall estimated capacity of 112 spaces) and did not exceed ten parked vehicles on the Saturday survey.

2.10.3. Parking occupancy on Ashgrove Road was near full capacity (approximately 28 spaces) overnight and dropped to around 50% during the day on both the weekday and Saturday surveys, indicating that the majority of spaces are used by residents.

2.10.4. Given that the Design Area extends south on Laurelwood Avenue to the Elm Place junction further surveys should be undertaken during Stage 3 to cover both Laurelwood Avenue and Elm Place to establish baseline parking demand levels within the full Design Area.

2.11. Policy Context

2.11.1. A review of all established policy documentation relevant to Ashgrove Connects was undertaken as part of the Baseline Assessment. A summary of these documents and their alignment with Ashgrove Connects is presented in Table 2.1.

Table 2.1 - Policy Review Summary

Document	Overall Aims & Synergy with Ashgrove Connects
Local Outcome Improvement Plan 2016 to 2026	Links reduced car usage with various issues such as net zero, connectivity, and employment Sets percentage targets for increasing walking and cycling as main mode of travel by 2026
Climate Change Plan 2021 to 2025	Sets out scope of ACC's net zero ambitions, with interim targets Note that Council General Fund Revenue Budget and Capital Programme has funding commitment for initiatives that will support development of net zero
Regional Transport Strategy 2040	Aims include enhancing travel opportunities, reducing number and severity and casualties, increasing use of active travel, reducing proportion of journeys by car
Local Transport Strategy 2016 to 2021	Increase no. people walking / cycling / using public transport Improve public realm by prioritising pedestrians, cyclists, public transport
NE Scotland Roads Hierarchy 2019	Proposes to reclassify Ashgrove Road West as a C-class road / tertiary route
Active Travel Action Plan 2017 to 2021	The aim is to create an environment and culture in which walking and cycling are convenient, safe, comfortable, healthy and attractive choices of travel for everyday journeys. The associated network plan does not directly reference Ashgrove due to age of document, but its aims align with Ashgrove Connects.
Aberdeen City Central Locality Plan 2021 to 2026	Identifies Ashgrove and Stockethill as priority neighbourhoods Aims include creating employment opportunities, improving access to services, create opportunities for people to connect and increase physical activity
Partnership Development Plan 2021	Produced to support Local Outcome Improvement Plan
Sustainable Urban Mobility Plan 2020	Key principle is to lock in benefits of AWPR to prioritise movement of active and sustainable travel through the reallocation of carriageway space and other prioritisation and traffic management measures

3. Engagement Summary

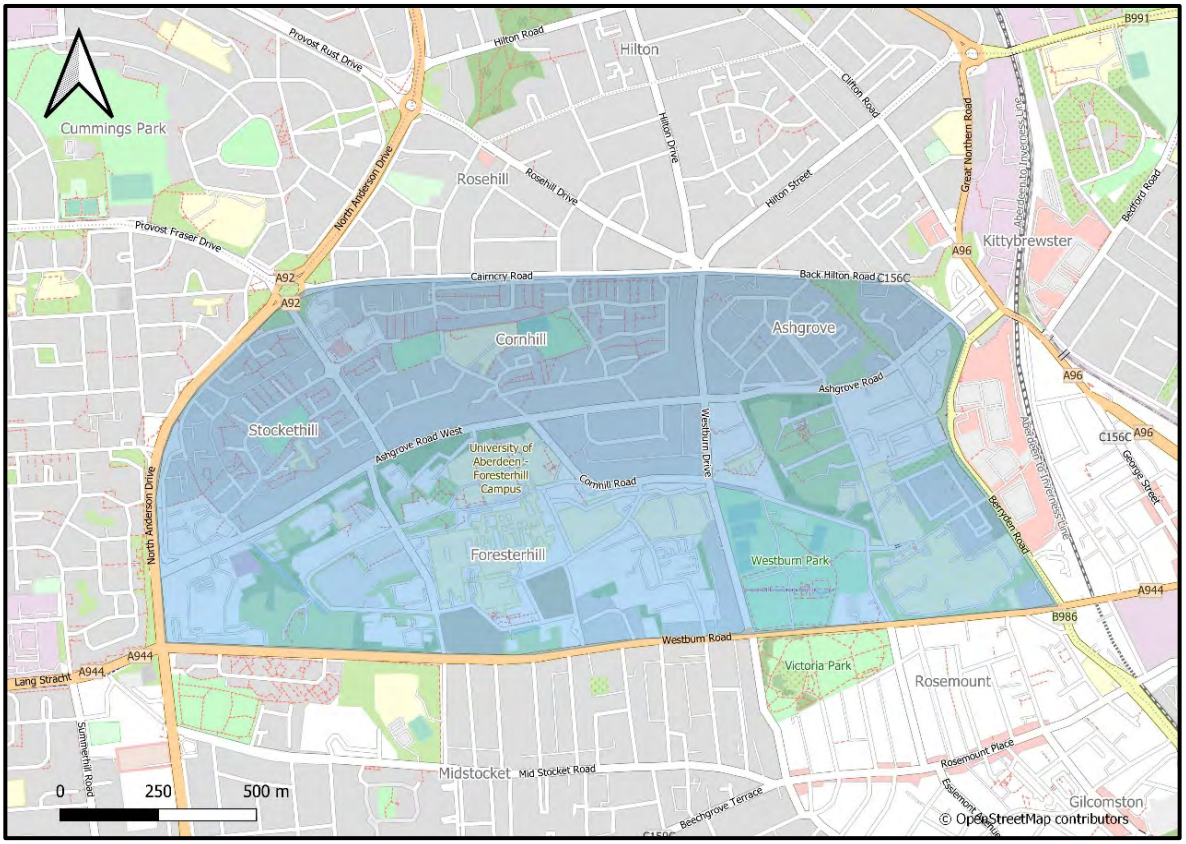
3.1. Introduction

3.1.1. This Chapter summarises the engagement undertaken which has actively involved the public and stakeholders to ensure their needs and aspirations are identified, understood, and considered, and to provide a level of influence over decisions. This is summarised in full in the Stage 1 Engagement Report (document CR-D1), Stage 2 Engagement Report (document CR-D2) and the Baseline Assessment (CR-K).

3.1.2. Engagement to date has comprised of raising awareness and understanding of the project, identifying local priorities, and developing these into Design Objectives with the support of the Stakeholder Working Group and generating feedback on Initial Design Ideas.

3.1.3. The area of engagement is presented in Figure 3.1.

Figure 3.1 – Engagement Area



3.1.4. A Stakeholder Engagement and Communications Plan has been developed which sets out the aims and objectives of the engagement process alongside a Stakeholder Matrix to identify levels of stakeholder influence against anticipated levels of interest in the project. This has been regularly

reviewed and updated throughout, taking into consideration any gaps in engagement with key demographics and lessons being learned.

3.1.5. An activities tracker has been kept up to date to record the level of engagement throughout the project, summarised in Figure 3.2.

Figure 3.2 – Level of engagement

3.2. Stage 1 (Define Stage)

3.2.1. Engagement on the project commenced in March with the launch of the project website, online webinar, walking audits as shown in Figure 3.3 and meetings with residents and stakeholders.

3.2.2. The purpose of this engagement period was to raise awareness and understanding of the project locally and gather information from the community on their experiences of using the streets. The information gathered helped to define local priorities and steer the development of Design Objectives.

3.2.3. Due to Covid-19 guidelines at the time, the project delivered a hybrid approach to engagement with a mixture of online and offline methods. Contact details were made available for members of the public to contact the project team directly by phone and email.

Figure 3.3 – Walking Audit with Cornhill Primary School

Participant at the walking audit:

"It was interesting to think critically about a street I've always used but never actively thought about."

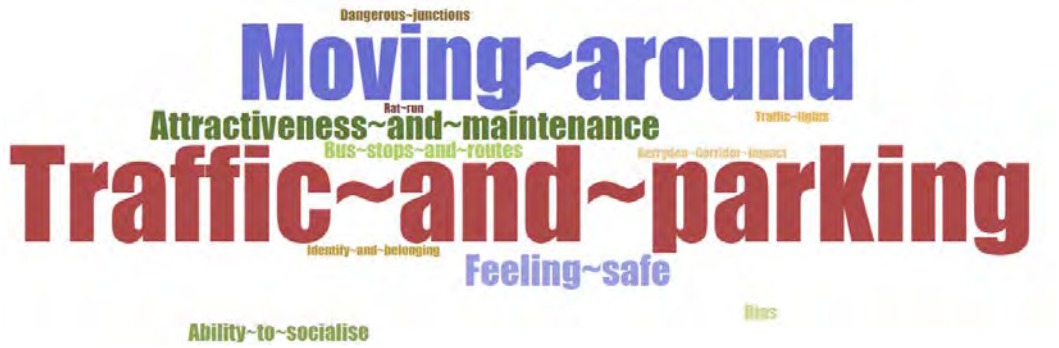
3.2.4. Between Tuesday 8th March and Sunday 3rd April, the project website received 958 visitors with 677 contributions either submitted directly on the website or surveyed by the project team.

3.2.5. This was promoted locally through local member briefings, a press release to local media, leaflet drops to residents and businesses, social media and notifications to identified stakeholders.

3.2.6. Most people who responded either live and work in the area and normally travel by active modes when combining on foot and by bike. There were slightly more female respondents and most fell within the 35-44 age category.

3.2.7. The top three topics respondents commented on overall were *traffic and parking*, *moving around on foot, by bike or wheelchair* and *feeling safe*. Figure 3.4 presents the themes respondents commented on, with the most popular appearing the largest.

Figure 3.4 – Word Cloud of Respondents' Comments



Survey respondent:

"The Ashgrove Road West/Foresterhill Road staggered junction is confusing and overly complicated. Multiple times as a car driver and cyclist I have experienced near misses due to traffic in the wrong lane. The sequencing of the lights is suboptimal, with traffic getting stopped on the junction, blocking it for cross-traffic, and significant spells in the cycle where no traffic gets to use the crossing."

3.2.8. More detail on the engagement undertaken and findings from Stage 1 is presented in the Baseline Assessment (CR-K).

3.2.9. Known gaps in the engagement response during Stage 1 include:

- Invitations to join a walking audit and attend a meeting of Disability Equity Partnership (DEP) were extended to Aberdeen City Council Officers however a lack of response has meant engagement has not yet taken place with disability forums. If there continues to be no

response or availability from disability forums, engagement should take place with a local care home and other sources to understand and assess accessibility requirements.

- Responses from businesses has been low. Further business drop-ins should take place during Stage 2 to establish key contacts and raise further awareness of the project.

3.3. Stakeholder Working Group

3.3.1. During Stage 1, a Stakeholder Working Group was established providing stakeholder and community representation to help the project align with local priorities. A Terms of Reference was developed outlining the groups purpose, responsibilities and membership.

3.3.2. The Stakeholder Working Group has invited representatives from different street users such as local residents, institutions, community groups, emergency services and disability groups. All groups invited to join the Stakeholder Working Group receive meetings invites and papers. Table 3-1 outlines the groups who have attended the meetings so far.

3.3.3. To date, four meetings of the Stakeholder Working Group have taken place as summarised in Table 3.1. Each meeting has been held with a clear purpose and to seek stakeholder validation on key outputs including the emerging themes from Stage 1, Design Objectives and findings from Stage 2.

Table 3.1 – Stakeholder Working Group meeting schedule

Date	Validation	Attendees
Wednesday 27th April	Emerging themes from Stage 1	ACC – Roads Projects ACC – Transport Strategy Atkins University of Aberdeen NHS Grampian Resident of Ashgrove Road West Resident of Ashgrove Road Rosemount & Mile End Community Council Grampian Cycle Partnership Aberdeen Health and Social Care Partnership
Wednesday 18th May	Design Objectives (5 out of 6)	ACC – Roads Projects ACC – Transport Strategy Atkins University of Aberdeen NHS Grampian Resident of Ashgrove Road West Resident of Ashgrove Road Cairncry / Cornhill Community Association Grampian Cycle Partnership
Wednesday 15th June	Design Objectives (6 out of 6)	ACC – Roads Projects ACC – Transport Strategy Atkins NHS Grampian Resident of Ashgrove Road West

		Resident of Ashgrove Road Rosemount & Mile End Community Council
Wednesday 24th June	Findings from Stage 2	ACC – Roads Projects Atkins University of Aberdeen NHS Grampian Resident of Ashgrove Road West Resident of Ashgrove Road Rosemount & Mile End Community Council Grampian Cycle Partnership Aberdeen Health and Social Care Partnership

3.3.4. The Stakeholder Working Group has provided strong support to the project delivery team and should continue to help to drive the project forward.

3.4. Stage 2 (Develop Stage)

3.4.1. The second consultation period commenced on Tuesday 21st June and closed on Sunday 17th July. The purpose of this was to collect feedback on the Initial Design Ideas to inform the development of a Concept Design.

3.4.2. The consultation was promoted through local member briefings, a press release to local media, leaflet drops to residents and businesses, social media, notifications to identified stakeholders and blogs through the project website. A copy of all the communication material can be found in Appendix 1 of the Stage 2 Engagement Report (CR-D2).

3.4.3. The consultation material was displayed on the project website and at Cornhill Library for people to view and respond to.

Participant at Cornhill Library:

"Thanks for the opportunity to view the designs. We did so at Cornhill Library this morning. We found these well-presented and so please accept our thanks to you and your team.

3.4.4. Alongside public events such as the webinar and drop-ins, workshops were also held with Cornhill Primary School, Crosby House Care Home and residents of Ashgrove Road and Laurelwood Avenue, as shown in Figure 3.5. These workshops allowed for more in-depth discussion on specific elements of the Initial Design Ideas such as parking and traffic flow for residents living on Ashgrove Road and Laurelwood Avenue and accessibility considerations for residents of Crosby House Care Home.

Figure 3.5 – Workshop with residents

3.4.5. The activities held during this period are summarised in Table 3.2 and more detail is provided in the Stage 2 Engagement Report (CR-D2).

Table 3.2 – Summary of Activities Held

Date	Activity	Audience	Attendees
Wednesday 22nd June	Workshop	Cornhill Primary School	6
Monday 27th June	Briefing	Local members	1
Tuesday 28th June	Webinar	Public	5
Tuesday 5th July	Drop-in	Public	44
Wednesday 6th July	Workshop	Crosby House Care Home	15
Tuesday 12th July	Workshop	Ashgrove Road and Laurelwood Avenue residents	9
		Overall Attendees	80

3.5. Summary of Responses

3.5.1. A more detailed analysis of respondents and responses is provided in the Stage 2 Engagement Report (CR-D2).

3.5.2. Between Tuesday 21st June and Sunday 17th July, the project website received 872 visitors with 92 contributions either submitted directly on the website or surveyed by the project team.

3.5.3. It was noted that the majority of respondents live or work in the area and normally travel by active modes, either on foot or by bike, similar to Stage 1. There were slightly more female respondents and most fell within the 35-44 age category.

3.5.4. The initial designs were split into two areas for people to respond to:

- Ashgrove Road West; and
- Ashgrove Road and Laurelwood Avenue.

Ashgrove Road West

3.5.5. Respondents were asked to feedback on the overall design ideas for this area against the Design Objectives:

- **80% of respondents agreed or mostly agreed** about the designs "*creating a slower, quieter street environment."*
- **84% of respondents agreed or mostly agreed** about the designs "making crossing the road and using junctions easier and a more comfortable experience."
- **89% of respondents agreed or mostly agreed** about the designs "making the street feel more attractive and safer for people to spend time in."
- **84% of respondents agreed or mostly agreed** about the designs "*making it easier to walk."*
- **80% of respondents agreed or mostly agreed** about the designs "enabling people of ages and abilities to move around by bicycle."
- **49% of respondents agreed or mostly agreed** and **37% neutral** about the designs "providing parking and loading within a reasonable distance of homes and businesses ensuring equitable access for all."

3.5.6. Respondents made the following general feedback on the overall designs for Ashgrove Road West:

- Support for:
    - The level of ambition shown.
    - A 20mph speed limit but concern people will not adhere to this without enforcement such as speed cameras.
    - Dissuading through traffic but scepticism about whether the design will be able to reduce traffic levels to prevent congestion, particularly at key junctions.

Respondent:

"Very impressed with the plans, especially the separate pedestrian, cycle, road ways."

- Concern about:
    - Emergency service access and impact on response times if the road is narrowed.
    - Future maintenance of areas of greenspace, trees, and cycle lanes.
    - Impact on access to and visibility from driveways from trees and cycle lanes.

Respondent:

"Not sure how drive accesses can be maintained and have safe cycle ways. All this planting is good but current maintenance of green in the city is rubbish."

- Suggestion to:
  - Improve signage for parking at the Foresterhill Health Campus.
  - Improve bike storage for those in flats.
  - Demonstrate how the designs will integrate with wider infrastructure changes.

Respondent:

"20mph speed limit now! We can't wait for later Stages. The changes clearly need to be integrated into an overall design in relation to Berryden Corridor and Anderson Drive potential revisions."

Ashgrove Road and Laurelwood Avenue

3.5.7. Respondents were asked to feedback on the overall design ideas for this area against the Design Objectives:

- **77% of respondents agreed and or mostly agreed** about the designs "*creating a slower, quieter street environment."*
- **69% of respondents agreed and or mostly agreed** about the designs "making crossing the road and using junctions easier and a more comfortable experience."
- **67% of respondents agreed and or mostly agreed** about the designs "making the street feel more attractive and safer for people to spend time in."
- **69% of respondents agreed and or mostly agreed** about the designs "*making it easier to walk."*
- **69% of respondents agreed and or mostly agreed** about the designs "enabling people of ages and abilities to move around by bicycle."
- **50% of respondents agreed and or mostly agreed** about the designs "providing parking and loading within a reasonable distance of homes and businesses ensuring equitable access for all."

3.5.8. Respondents made the following general feedback on the overall designs for Ashgrove Road and Laurelwood Avenue:

- Support for:
  - A 20mph speed limit.
  - Improved visibility and crossings.
  - Aesthetics improvements.

Respondent:

"Really hope that some combination of these ideas actually comes to fruition!"

- Concern about:
  - Location of parking bays.

- Emergency service access and impact on response times if the road is narrowed.
- Moving traffic volume and parking problems onto other residential streets.

Respondent:

"Reducing parking spaces will shift the cars to other streets - not necessarily solving any issues in the larger sense."

- Suggestion to:
  - Focus on reducing traffic volume further.
  - Extend 20mph zone to Elm Place.
  - Encourage businesses to promote their off-street customer car parks.

Respondent:

"More greenery should be planted, not just trees, and Ashgrove Road is wide enough to accommodate this along with a cycle path."

3.6. Workshop Responses

3.6.1. The purpose of the workshop with pupils of Cornhill Primary School was to present, discuss and develop the Initial Design Ideas through a 3D model. This highlighted:

- Positive feedback to many of the key design features, particularly more crossings, gateway features, secure cycle parking, modal filters, pocket parks and informal play areas.
- The need for secure cycle parking to enable more people to cycle, particularly for those living in high rise flats.
- The opportunity to trial some of the designs to gain more feedback from the community before making changes permanent.

3.6.2. The purpose of the workshop with residents and staff of Crosby House Care Home was to understand their travel behaviour, identify barriers to moving around and highlight improvements This highlighted:

- Many residents and their families travel by foot, wheelchair, and car/taxi to access the care home. Residents tend to travel along Ashgrove Road West, Ashgrove Road, and Laurelwood Avenue to visit the hospital/GP, shop, meet family/friends, and visit the park.
- Identified issues included high traffic speed and volume, high kerbs, no resting places, poor pavement conditions, and restricted visibility at junctions, particularly at the Ashgrove Road entrance to May Baird Avenue.
- Positive feedback to many of the key design features, particularly more crossings, 20mph speed limit, gateway features, continuous footways, and enhanced greenspace.

3.6.3. The purpose of the workshop with residents of Ashgrove Road and Laurelwood Avenue was to discuss the issues they face as residents of the streets and to understand their priorities for change

including opportunities to change traffic flow, parking arrangements and greenspace. This highlighted:

- Identified issues included high traffic speed and volume, traffic congestion, restricted visibility from parked vehicles, and maintenance of greenspace.
- Support for a one-way system but concerns about increasing traffic volume on Laurelwood Avenue as a result.
- Support for quiet streets but unsure whether this is achievable.
- Support for improved greenspace but need to consider smaller trees/pockets rather than tall trees which create visibility and maintenance issues.
- Concern at displacing parking to other streets and locating spaces near high walls, increasing risk of vandalism.
- Priorities for change highlighted reducing traffic speed and volume, improving crossings, enhancing place quality, meeting parking demand where possible, and improving cycling connections.

3.7. Statutory Stakeholder Responses

3.7.1. The Scottish Ambulance Service highlighted the need to consider a two-lane approach to North Anderson Drive from Ashgrove Road West to minimise the risk of ambulances being delayed. They also requested details of the Construction Stage Plan once the project reaches implementation stage. It is recommended that they continue to be consulted at each stage of the design process.

3.7.2. First Bus highlighted the need to consider traffic flow where public transport operates through the signal-controlled junctions to assist with overall operation. First Bus raised no issues with the proposed active travel elements.

3.7.3. To date, no response has been received from the following key stakeholders:

- Police Scotland
- Scottish Fire and Rescue

3.7.4. Stagecoach, Internal Council transport strategy and roads and planning authority stakeholders have been engaged at this early stage. This has identified the following items for consideration in the design process:

- Design and maintenance of landscaping, public realm;
- The nature of sustainable urban drainage proposals and tie ins to existing drainage;
- Maintenance of gullies;
- Agreement on a materials palette in line with emerging policy;
- Appropriate replacement of mature trees; and
- Junction and network modelling alongside parallel schemes.

3.7.5. It is recommended that for each of these items, engagement continues to agree details during Stages 3 and 4.

3.8. Summary and Next Steps

3.8.1. The engagement response during RIBA Stages 1 and 2 was overwhelmingly positive, both in terms of the volume of responses and the constructive nature of the contributions.

3.8.2. This has demonstrated strong support for change however the number of respondents to the second consultation was lower than the first. There could be several reasons for this including the overlap with the school holiday period, high level of response to the planning application for the former Rosehill House building, and Covid-19 continuing to be a barrier to people attending events and community facilities. These factors should be taken into consideration as the project moves into Stage 3.

3.8.3. The Stakeholder Working Group continues to provide great support to the project, both validating outputs at key stages and updating the wider community. The group should continue to communicate as the project moves between RIBA Stage 2 and 3 and drive the project forward.

3.8.4. Known gaps in the engagement response during Stage 2 include:

- Despite attempts to engage disability representatives, engagement with disability forums has not yet taken place. To ensure the project has identified and taken account of accessibility considerations, engagement has taken place with residents, staff and families of Crosby House Care Home through meetings, a survey and workshop. Engagement should continue with Crosby House while attempts to engage disability forums continue.
- Despite regular contact with businesses through drop-ins, there has been very limited response to the project so far from business owners. Engagement should continue with regular drop-ins to raise awareness and recorded delivery of information to premises.

3.8.5. Atkins has taken the key messages into the finalisation of concept design proposals as part of RIBA Stage 2.

3.8.6. Further recommendations for the next Stage of engagement have been outlined in the Stage 2 Engagement Report (CR-D2).

4. Concept Design Options Assessment and Proposals

4.1.1. This section summarises the Concept Design Proposals and the options assessment undertaken to identify the preferred options.

4.1.2. The Concept Design assessment process was undertaken in three stages:

- Design Objectives were identified in Stage 1 (Section 4.3);
- A High-Level Assessment of whole-scheme elements was undertaken to identify the general arrangement options for the length of street (Section 4.4); and
- A Detailed Assessment of specific locations was undertaken to identify a preferred option(s) (Section 4.5).

4.1.3. Further detailed optioneering was undertaken with Council stakeholders to produce the proposed Concept Designs described in Section 4.6.

4.2. Engineering Standards

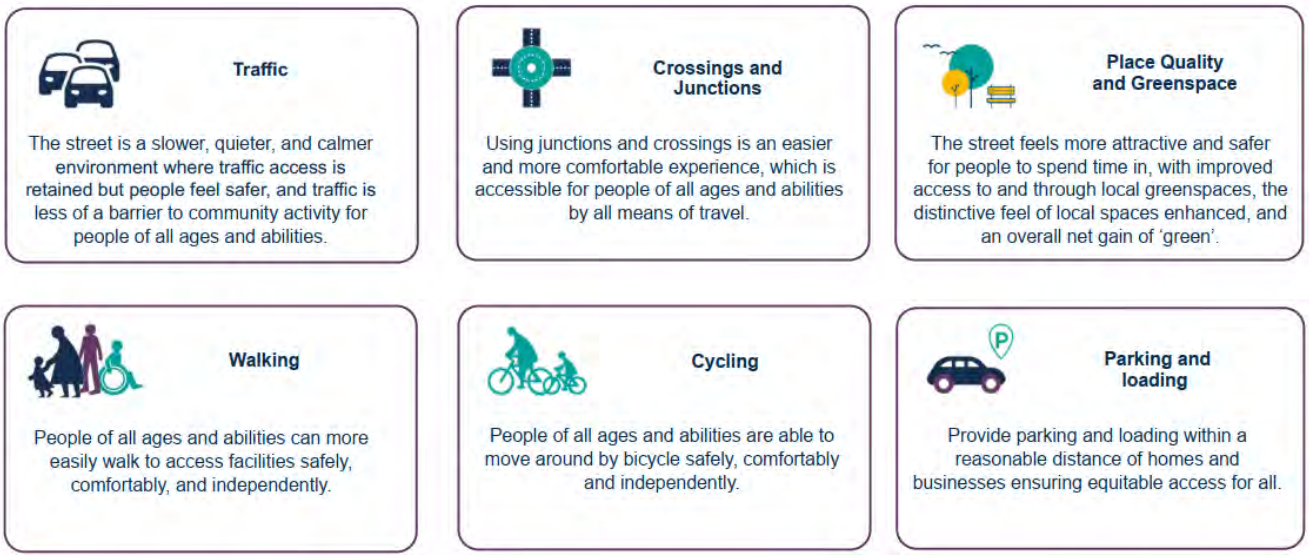
4.2.1. The design options identified for Ashgrove Connects have been designed taking account of the following documents:

- **Designing Streets:** The reclassification of the street to a C-class route provides an opportunity to design street elements in accordance with Designing Streets. It places emphasis on the importance of providing well-designed streets at the heart of sustainable communities and demonstrates the benefits that can be realised by assigning a higher priority to non-motorised users.
- **National Roads Development Guide (NRDG):** The NRDG was adopted by ACC in 2014, with some area-specific alterations. This document supports Designing Streets while bridging the gap to more traditional road design guides. It identifies geometric provision, design / construction details, and parking provision guidance.
- **Cycling By Design (CBD):** CBD provides guidance for cycling infrastructure design on all roads, streets, and paths in Scotland. It provides a variety of technical design considerations that should be met to ensure that active travel facilities are comfortable, safe, attractive, and suitable for walking and cycling users.
- **Design Manual for Roads and Bridges (DMRB):** The DMRB sets out all current standards for the design, assessment, and operation of trunk roads in the UK.
- **ACC Guidelines and Specification for Roads in Residential and Industrial Developments**

4.3. Design Objectives

4.3.1. Design Objectives were developed from community engagement, through policy and technical analysis of opportunities and constraints and were validated by the Stakeholder Working Group. The Design Objectives define how the scheme options are assessed and should continue to steer the development of the proposals through subsequent design stages. The process of Design Objectives development is detailed further in the Baseline Assessment. The Scheme Design Objectives are illustrated in Figure 4.1.

Figure 4.1 – Design Objectives



4.4. High Level Assessment

4.4.1. The high-level assessment focussed primarily on the overall approach taken for the scheme links.

4.4.2. A RAG (red-amber-green) scoring system was developed to assess options against each Design Objective. The RAG rating definitions are:.

- Green – Achieves Design Objective
- Amber – Partially achieves Design Objective
- Red – Does not achieve Design Objective

4.4.3. From this assessment, some high-level options were taken forward for detailed assessment and lower performing options were discarded. A red rating against any single objective was likely to result in an option being discarded.

4.4.4. This section summarises the scheme elements taken forward for detailed assessment. The full list of options considered within the High-Level Assessment is provided in Appendix A.

Traffic speed limits

4.4.5. Feedback from the community came out strongly in favour of reducing traffic speed, particularly on Ashgrove Road and Ashgrove Road West, with concerns around safety, suppression of community activity and active travel comfort and attractiveness.

4.4.6. The adopted NE Scotland Roads Hierarchy identifies speed limits of 30-40mph as suitable for priority and secondary routes (i.e. A-class and B-class) and that 20mph is suitable for a tertiary (C-class) route. Ashgrove Road West, Ashgrove Road, Laurelwood Avenue and Elm Place are classified as C-class roads in the Roads Hierarchy and therefore a change in speed limit to 20mph throughout the study area would be consistent with adopted ACC policy.

4.4.7. Surveyed traffic speeds on Ashgrove Road and Ashgrove Road West indicate that, under current guidance, a speed limit change would require complementary speed control measures such as carriageway width reductions or traffic calming.

Traffic calming

4.4.8. Ashgrove Road West is a bus route and a key emergency access route. Therefore, only horizontal deflections on the main corridor are considered appropriate.

4.4.9. On all minor access streets (other than those acting as bus routes or emergency vehicle property accesses), both vertical and horizontal deflections are options taken forward.

4.4.10. Further to this, the removal of centrelines and introduction of alternative surface treatments are recognised to reduce traffic speed by reducing the feeling of priority certainty amongst drivers. These are taken forward as considerations for detailed assessment.

Carriageway lane widths

4.4.11. Carriageway running lane width reduction options were considered in the context of supporting speed reduction measures, to reallocate space to other uses within the Design Objectives and to reduce the maintenance burden of wide trafficked carriageways. The approach taken is that the vehicle carriageway space should be the minimum required to facilitate essential movement safely at slow speed within a 20mph speed limit, with traffic capacity a secondary consideration. The following options were taken forward:

- Lanes of 3m + sufficient vehicle clearance distances on Ashgrove Road West; on Ashgrove Road between Westburn Drive and Laurelwood Avenue; on Laurelwood Avenue and on Elm Place (clearance distances vary dependent on vehicle type);
- Lanes no narrower than the existing traffic movement space on Ashgrove Road between Laurelwood Avenue and Berryden Road (measured as two-way running space of 5.6-5.8m).

4.4.12. It is further recommended that clearance distances are applied proportionately when calculating total carriageway width. The National Roads Development Guide (NRDG) recommends an absolute

minimum of 3m wide lanes on a bus route at 20mph (based on a 2.5m wheelbase width) + the relevant clearance distances depending on overall traffic and HGV (including bus) frequency. A 6m two-way carriageway width is the minimum that allows two buses to pass each other at low speed without mirrors overhanging footways. Assuming a 20mph speed limit, a 6.3m carriageway (3m lane + 3m lane + 0.3m clearance between vehicles) allows for additional clearance between vehicles to permit free flow at low speed. While additional clearance of 0.2m to each kerb generally allows buses and HGVs to avoid over-running gullies and therefore may be required where heavy vehicle frequency is especially high. However, to over-provide carriageway width will encourage higher free flow speed by general traffic. Further, for streets where some people will continue to cycle on the carriageway, Cycling by Design advises that "Where streets are designed for cycle users to mix with motor traffic, traffic lane widths should be designed to be between 2.8m and 3.2m to allow cycle users to safely adopt the primary riding position."

4.4.13. The analysis summarised in Figure 4.2 and Table 4.1 indicates that the frequency of heavy vehicle to heavy vehicle interactions is currently approximately one interaction every two minutes at peak period at the busiest locations (1 and 2). Therefore, it is not likely to be the case that the over-running of gullies is a frequent occurrence in the study area and the full clearance distances are not likely to be necessary. For this reason, a full two-way carriageway width of 6.5m is considered to be appropriate for Ashgrove Road West, and 6-6.5m for Ashgrove Road. Consideration should be given to the clearance distances to pedestrians and cyclists on adjacent footways and cycle tracks to ensure that vehicles are able to pass without mirrors overhanging the running space of these facilities. Cycle tracks should therefore be designed with a buffer from the kerb.

Figure 4.2 – ATC Survey Locations

Table 4.1 – Traffic volume and heavy vehicle frequency

Site	Average Weekday Flow (vehicles per day (vpd))			Average Weekday HGV flow* (% of vpd)			Average Peak HGV Frequency (per hour)		
	East-bound	West-bound	Total	East-bound	West-bound	Total	East-bound	West-bound	Total
1	2,798	4,121	6,919	9.3%	8.4%	8.7%	23	29	52
2	4,388	6,248	10,636	7.8%	8.6%	8.3%	26	47	73

3	2,870	3,327	6,196	6.2%	5.5%	5.8%	17	17	35

* Including buses

Cycling space

4.4.14. Cycling by Design provides guidance on the suitability of different cycle link types and the level of service they provide. The objective of this scheme is to provide a high level of service suitable for all ages and abilities.

4.4.15. Table 4.2 illustrates the maximum daily and peak hour flows on each link for which data is available. Figure 4.3 indicates how this relates to the guidance on the appropriate infrastructure required to achieve a high cycling level of service.

Table 4.2 – Maximum daily and peak period two-way flows

Site	Maximum daily two-way (pcu per day)	Maximum peak two-way (pcu per hour)	% HGVs
Ashgrove Road West (1)	7,223	649	8.7%
Ashgrove Road West (2)	11,114	920	8.4%
Ashgrove Road (3)	6,353	601	5.8%
Laurelwood Avenue	4,674	329	n/a
Elm Place	n/a	n/a	

4.4.16. The Ashgrove Road West and Ashgrove Road data has been identified from the ATC surveys undertaken in March 2022. The Laurelwood Avenue data has been identified from turning count data supplied by ACC; note that an expansion factor, assuming a neutral month of March, has been used to factor the supplied 12-hour flows to 24-hour flows using the method outlined in the COBA Manual. The Laurelwood Avenue data was supplied in PCUs (passenger car units), with no HGV data available. No data has been provided for Elm Place.

Figure 4.3 – Cycling level of service by traffic speed and volume

Motor Traffic Speed (85th percentile)	Two-way traffic flow (pcu per day)	Two-way traffic flow (pcu per hour)	Mixed Traffic Street	Detached or Remote Cycle Track	Cycle Track at Carriageway Level	Stepped or Footway Level Cycle Track	Light Segregation	Cycle Lane
0 to 30 kph	0 to 2000	0 to 200	●●●	●●●	●●●	●●●	●●●	●●●
	2000 to 4000	200 to 400	●●	●●●	●●●	●●●	●●●	●●●
	4000+	400+	●	●●●	●●●	●●●	●●●	●●
30 kph to 50 kph	0 to 1000	0 to 100	●●●	●●●	●●●	●●●	●●●	●●●
	1000 to 2000	100 to 200	●●	●●●	●●●	●●●	●●●	●●
	2000 to 4000	200 to 400	●	●●●	●●●	●●●	●●●	●●
	4000+	400+	●	●●●	●●●	●●	●●	●
50 kph to 65 kph	0 to 1000	0 to 100	●●	●●●	●●	●●	●●	●●
	1000 to 2000	100 to 200	●	●●●	●●	●●	●●	●
	2000+	200+	x	●●●	●●	●●	●	●
65 kph to 80 kph	0 to 1000	0 to 100	●	●●●	●●	●●	●●	●
	1000+	100+	x	●●●	●	●	●	●
80 kph to 95 kph	0 to 1000	0 to 100	●	●●●	●	●	●	●
	1000+	100+	x	●●●	●	●	x	x
95 kph to 110 kph	All	All	x	●●●	●	●	x	x

In relation to Design Principle – Safety

●●● **High Level of Service:** Suitable for most users.

●● **Medium Level of Service:** May not be suitable for some users, particularly novice users. Designer should consider the lack of attractiveness of the facility to these users and how this can be overcome or mitigated.

● **Low Level of Service:** Not suitable for a range of users, including novice and intermediate users. Should be avoided unless the risk to these users is conveyed to the Overseeing Organisation by the designer and accepted by the Overseeing Organisation. See Section 2.4.

x **Should not be used**

4.4.17. For the volume and composition of traffic in the study area, segregated cycle tracks should be considered.

4.4.18. For Laurelwood Avenue, Elm Place and Ashgrove Road (east of Laurelwood Avenue), options to provide a mixed traffic or cycle lane environment may be feasible depending on the nature of traffic movements. While these options are taken forward for consideration, it is observed that much of the traffic on these streets is through traffic and that without further traffic reductions cycling on carriageway is unlikely to suit the most vulnerable users such as children.

4.4.19. The highest level of coherence in an urban setting is offered by uni-directional cycle tracks on each side of the road carriageway. However it is recognised that where space is limited, bi-directional cycle tracks on one side of the road are an option.

4.4.20. Cycling by Design further recommends that “Within built up areas where a cycling facility is to be located adjacent to a road, there should be a strong presumption in favour of separating pedestrian and cycle movements.” Therefore shared use facilities have not been taken forward for further consideration.

4.4.21. Where cycle tracks are provided, the recommended widths in Cycling by Design are:

- 2m for uni-directional tracks
- 3m for bi-directional tracks
- 0.5m buffer to the carriageway (up to 30mph speed limit)

- Additional clearance distance to fixed objects

Footways

4.4.22. The condition of footways in the study area is currently impacted by tree roots and other surface issues. As a starting point, the option taken forward is for full footway resurfacing as part of this scheme. However, this may be revisited at a future stage.

4.4.23. The following actions are also taken forward in relation to footways:

- Footway width should be retained or increased wherever possible, recognising that there are some situations where footway width reductions may be acceptable where footway use is low;
- All footways should have appropriate flush access and tactile paving at crossings; and
- Pedestrian priority over vehicular traffic at most side streets is appropriate, in line with changes to the Highway Code.

Ashgrove Road/ Laurelwood Avenue/ Elm Place traffic circulation

4.4.24. Consideration was given to the traffic circulation patterns in the east end of the study area.

4.4.25. Public engagement responses were that residents here were concerned about the current volume of through traffic being unsuitable for the street environment. In discussion with ACC, the following parameters in relation to traffic were identified:

- The BCI scheme requires that the right turn and straight-ahead movement out of Elm Place onto Berryden Road must be retained;
- The left turn from Berryden Road into Ashgrove Road must be retained; and that
- Turning movements from Ashgrove Road into Laurelwood Avenue must be retained.

4.4.26. The High Level assessment considered a number of one-way circulation and turning restriction options within these parameters, and the resulting impact on traffic flows (as derived from modelled turning counts). The options taken forward for detailed analysis are:

- Anti-clockwise one-way circulation on either or both Laurelwood Avenue or Ashgrove Road;
- A false one-way street on Laurelwood Avenue; and
- A left turn ban from Ashgrove Road into Berryden Road.

Overall options taken forward for detailed assessment

4.4.27. The key features taken forward for consideration in detailed assessment are as follows:

- Narrowing of carriageway widths
- Segregated cycle tracks
- Resurfaced footways with widening where possible
- Side street entry treatments such as raised or continuous priority crossings and junction entry narrowing
- Shorter and more crossings for people walking and cycling

- Sustainable tree retention, re-instatement and replacement
- Low level planting and or use of rain gardens to reduce run-off
- Community placemaking features such as artwork, seating and greenspace access

4.4.28. Further to this, consideration of alternative traffic circulation patterns at the east end of the study area are taken forward for more detailed analysis.

4.5. Detailed Options Assessment

4.5.1. The detailed options assessment incorporates:

- Overall scoring of the options against each design objective using the RAG rating;
- Consideration of the technical deliverability of each option; and
- In some cases, to inform the RAG rating, more detailed engineering assessments of operational safety and traffic performance.

4.5.2. The detailed options assessment focusses on specific locations in the study area. These are:

- North Anderson Drive/ Ashgrove Road West junction;
- Foresterhill Road/ Foresterhill/ Ashgrove Road West double junction;
- Cornhill Terrace/ Cornhill Road/ Ashgrove Road West junction
- Westburn Drive/ Ashgrove Road West junction
- Ashgrove Road/ Laurelwood Avenue/ Elm Place

4.5.3. This section summarises the options considered for each location and how these were assessed. The full list of options considered at each location is provided in Appendix B.

North Anderson Drive/ Ashgrove Road West Junction

4.5.4. A summary of the assessment of North Anderson Drive junction options is provided in Table 4.3.

Table 4.3 – Summary of North Anderson Drive Assessment

Ref	Option	Assessment outcome
NA1	Do Nothing	No improvement for walking, cycling or speed control
NA2	Tighten entries, remove left turn filter into Ashgrove Road West & adjust signal timings	Limited improvement for walking and cycling
NA3	Signal-controlled with parallel crossings 2 arms	Limited improvement for walking and cycling. Land take may be required
NA4	**Signal-controlled with parallel crossings on 3 arms**	**Meets all objectives. Land take required west of North Anderson Drive**
NA5	Roundabout with parallel crossings on all arms	Should be considered within the full corridor study. Land take will be required

***** Proposed option(s) in bold

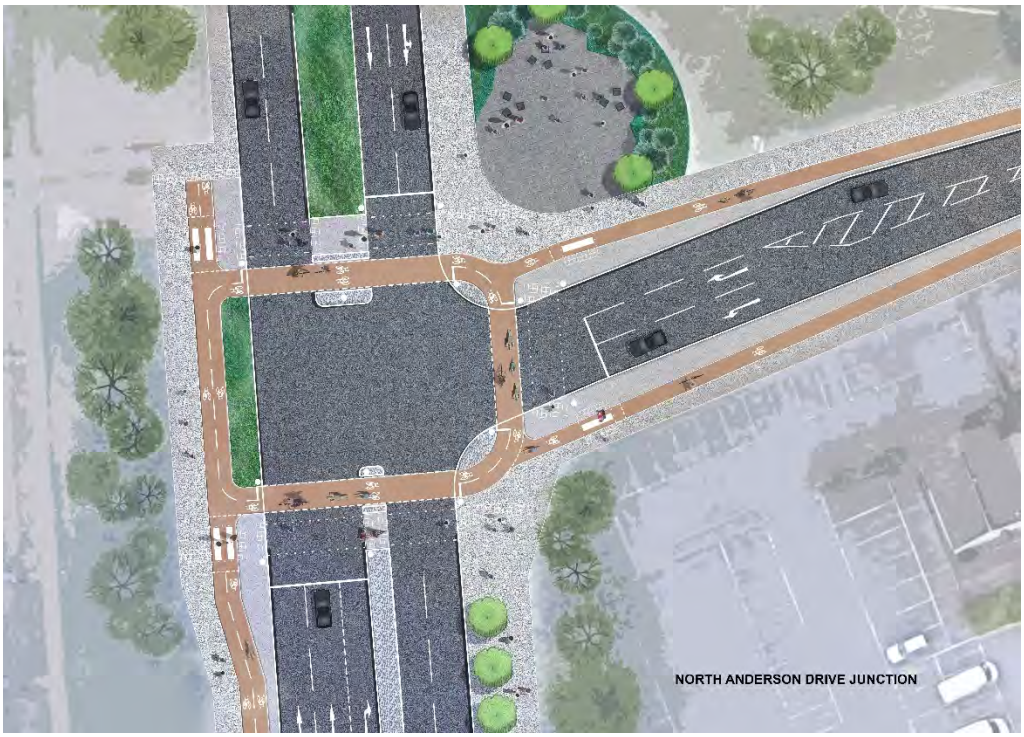
4.5.5. The assessment against objectives demonstrated that the signal-controlled junction with segregated cycle tracks and parallel crossings on all arms performs most favourably against the Design Objectives. The proposed layout is illustrated in Figure 4.4.

4.5.6. The preferred concept design is to retain signal-control, with the addition of cycle track crossings and upgraded pedestrian crossings to comply with guidance and standards:

- Parallel cyclist and pedestrian crossings;
- Uni-directional cycle tracks on the Ashgrove Road arm;
- A bi-directional cycle track on the west side of North Anderson Drive (pending tie-ins with the A96 multi-modal study);
- Removal of the left turn filter lane to discourage high speed through traffic onto Ashgrove Road;
- Retention of the two lane exit of Ashgrove Road in response to Emergency Service consultation;
- A community ‘gateway’ public realm area to the north-east side of the junction;
- All traffic movements are retained.

4.5.7. This option may require some increase in overall carriageway footprint.

Figure 4.4 – Proposed layout at North Anderson Drive



Deliverability

4.5.9. The junction performance of the preferred option was modelled. This is forecast to operate within capacity.

4.5.10. The design looks to create gateway features with the green spaces around the junction while improving the quality of these spaces. The quality of these spaces however does have a limit due to the proximity to North Anderson Drive and the associated noise and safety issues. Design of this space should be developed with the community and ACC Environmental Services.

4.5.11. The cycle facilities around the junction are bi-directional and with a north-south running cycle track on the west side. It is anticipated that the A92 multi-modal corridor study will consider improvements to the North Anderson Drive corridor in greater detail, including linked junction modelling and full corridor cycle track proposals. For this reason, therefore the preferred option retains the existing form of control (traffic signals) and approximate footprint of the existing junction. This allows future connections to tie into these tracks and have the option of transitioning to uni-directional tracks.

4.5.12. It is recommended that at RIBA Stage 3 further early engagement with the team developing the A92 multi-modal corridor proposals will be required to detail the design further. A number of mature trees will require replacement to include the cycle track on North Anderson Drive (west side). While the onward cycle track connection is shown on the west side of the junction, the most appropriate onward connection will be considered as part of the A92 study.

4.5.13. The junction has been tracked to ensure all existing turning movements can be accommodated.

4.5.14. The public realm proposal will require further development at Stage 3 to consider the form of the design as well as the ongoing ownership and maintenance of it.

4.5.15. The existing pedestrian crossing on the North Anderson Drive south arm is not currently compliant due to the lack of central refuge space. In order to provide adequate refuge islands to comply with guidance (the carriageway width of 18m is greater than the threshold for one stage crossings), the following changes are proposed:

- south arm central reservation widened to 2.2m (existing 1m)
- North central reservation widened to 5.3m (existing 2.8m)
- Southbound traffic approach lanes reduced to 3.25m each (total width 6.5m from existing approx. 7.75m)
- Northbound traffic approach lanes reduced to 3.25m (total width 6.5m from existing approx. 7.4m)

Lane widths can be tapered back to the existing widths over a distance of approximately 50m

4.5.16. This will create a safer environment for pedestrians with slower traffic and better crossing facilities.

Engagement response

4.5.17. The community and Stakeholder Working Group responses indicate that a significant majority of people are positive about the proposal including:

- Change of environment to encourage lower traffic speeds;
- New gateway and public space; and
- Improved crossings.

4.5.18. The key remaining issues at this location that the community raised are:

- Improve sequencing of traffic lights to reduce congestion;
- Enforcement of traffic speeds; and
- Impact of future developments on the former Rosehill Day Centre site.

Respondent:

"I like that the crossings will be improved. I am not sure people will listen to the 20mph speed limit here especially as many use it to access hospital car parks."

Foresterhill Road/ Foresterhill/ Ashgrove Road West Junction

4.5.19. A summary of the primary options assessed for the Foresterhill Road/ Foresterhill junction is provided in Table 4.4.

Table 4.4 – Summary of Foresterhill Road / Foresterhill Assessment

Ref	Option	Assessment
FH1	Do Nothing	No improvement for walking, cycling or speed control
FH2	Tighten entries & adjust signal timings	Limited improvement for walking and cycling
FH3	**Staggered Signal-controlled with parallel crossings**	**Fully achieves most objectives. Some cycling and walking movements experience delay**
FH4	Staggered signal-controlled with two-stage right-turn cycling	Lower level of service than FH3. May be more deliverable if FH3 approach lane widths cannot be narrowed
FH5	**Staggered Double Compact Roundabout with parallel crossings**	**Partially or fully meets all objectives**
FH6	Staggered Double Mini Roundabout with parallel crossings	Significant technical and safety issues not overcome at RIBA Stage 2
N.B A number of options to re-align the Foresterhill Road carriageway (refer to Appendix A options FH7-10). This would require approximately 10,000 square metres of third party land take. Works would require removal / relocation of underground hospital water reservoir, car park, tennis courts and encroachment on existing hospital building. These options were discounted for that reason.		

4.5.20. The two options performing most favourably against objectives and for deliverability are:

- FH3 Staggered signal-controlled with parallel crossings (Figure 4.5); and
- FH5 Staggered double compact roundabout with parallel crossings (Figure 4.5)

Staggered Signal-controlled junction option

4.5.21. This proposal is to retain signal-control with the following changes:

- Parallel cyclist and pedestrian crossings;
- Uni-directional cycle tracks on the Ashgrove Road arms;
- Removal of the filter lanes to simplify and improve junction operation;
- Reduction of pedestrian crossing distances;
- All traffic movements are retained; and
- This option can be delivered within the existing carriageway footprint.

Double Compact Roundabout option

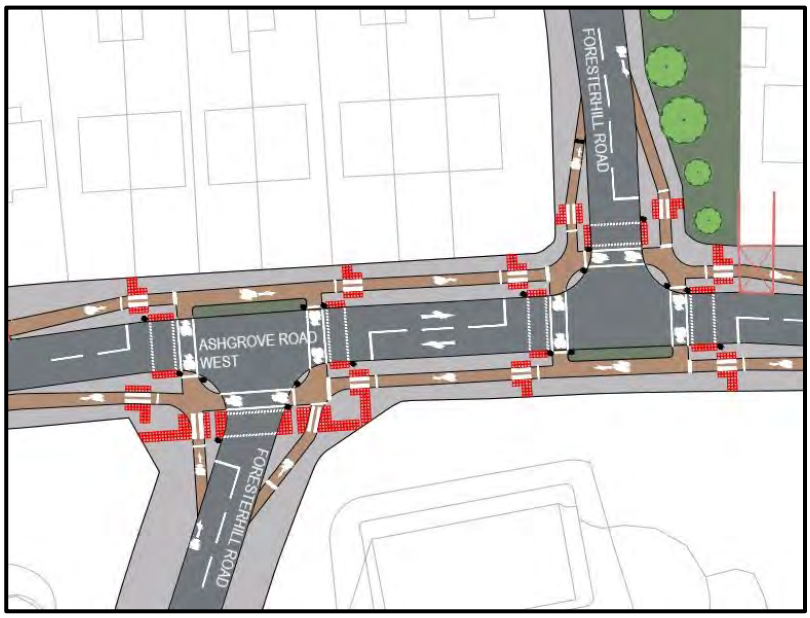
4.5.22. This option proposes to convert this junction into a double compact roundabout with the following features:

- Conversion of the Foresterhill Road and Foresterhill junctions into two roundabouts;
- Parallel cyclist and pedestrian zebra crossings on all arms;

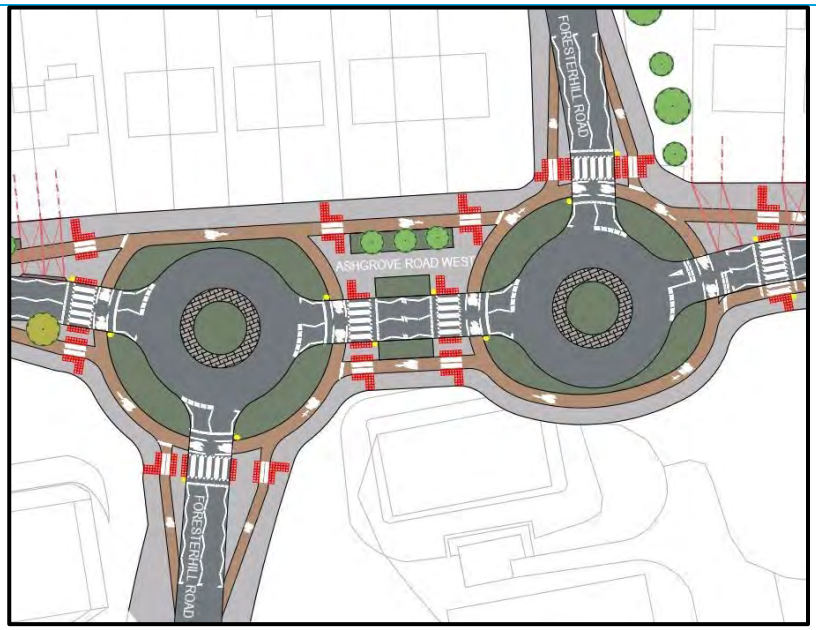
- Uni-directional cycle tracks on the Ashgrove Road arms;
- All traffic movements are retained; and
- This option will require some land purchase to the south of Ashgrove Road.

Figure 4.5 – Foresterhill Road junction layout proposed options

FH3 Staggered Signal-controlled with parallel crossings



FH5 Staggered Double Compact Roundabout with parallel crossings



Deliverability

4.5.23. This signal-controlled option can be delivered almost wholly within the existing carriageway footprint.

4.5.24. The zebra crossings of the cycle track are in most cases offset from the signal-controlled carriageway crossing. The optimal solution is to provide in-line crossings. If following further detailing it is not possible to deliver in-line zebra crossings within the existing footprint, one of two alternatives is recommended:

- Land-take to provide the necessary separation distance between tactile crossing points without constraining footway space; or
- A continuous footway is provided for pedestrians over the cycle track, negating the need for tactiles.

4.5.25. The compact roundabout option will change the feel of this junction as active travel users will have priority using the zebra and parallel crossing points. In order to achieve sufficient deflection, the footprint of the junction will require some land purchase to the south of the junction. This will encroach on the underground reservoir within the Foresterhill Health Campus.

Engagement response

4.5.26. The community and Stakeholder Working Group responses indicate that a significant majority of people are positive about the proposal including:

- Simplified junction
- Improved crossings with emphasis on people walking and cycling
- Removal of parking spaces on approach to junction

4.5.27. The key remaining issues at this location that the community raised are:

- Traffic congestion blocking driveway access
- Transition from cycle lanes onto Foresterhill Road
- Impact of narrowing the road on ambulance response times

Respondent:

"Less lanes will simplify this for unfamiliar drivers, but the operation of lights also needs fixing…Further measures should be considered to prevent non-essential traffic using Ashgrove Road West, given the importance of hospital access by ambulances and the good bus service."

Cornhill Terrace/ Cornhill Road / Ashgrove Road West Junction

4.5.28. A summary of the assessment of the Cornhill Terrace/ Cornhill Road options is provided in Table 4.5.

Table 4.5 – Summary of Cornhill Terrace / Cornhill Road Assessment

Ref	Option	Assessment
CH1	Do nothing	No improvement for walking, cycling or speed control
CH2	Tighten side road radii	Limited improvement for walking and cycling
Cornhill Terrace crossing		
CH3	Close Cornhill Terrace to traffic	All design objectives met fully. Removes junction conflicts and enhances school route. Possible operational issues with refuse vehicles and through traffic re-routing.
CH4	**Cornhill Terrace continuous footway**	**All design objectives met fully. Removes junction conflicts and enhances school route. No impact on operations**
Cornhill Road crossing		
CH5	Close Cornhill Road to traffic	Not possible on bus and emergency route
CH6	Continous footway and cycle track over Cornhill Road	Vertical deflection not possible on bus and emergency route
CH7	Parallel crossing of Cornhill Road	High level of service for people walking and cycling. Feedback from ACC that ongoing maintenance of markings is an issue that may create additional cost burden across city if replicated
CH8	**Cycle lane continued over Cornhill Road, dropped kerbs with no marked priority for pedestrians**	**Lower level of service for pedestrians and cyclists but reduced cost burden means this is most deliverable option**

4.5.29. Although the parallel crossing of Cornhill Road and the traffic closure on Cornhill Terrace are the highest performing options against objectives, they perform less favourably on deliverability. The proposed option here is illustrated in Figure 4.6:

- CH4 Cornhill Terrace continuous footway;
- CH8 Cycle lane continued over Cornhill Road, dropped kerbs with no continuous priority for pedestrians; and
- Parallel crossing of Ashgrove Road.

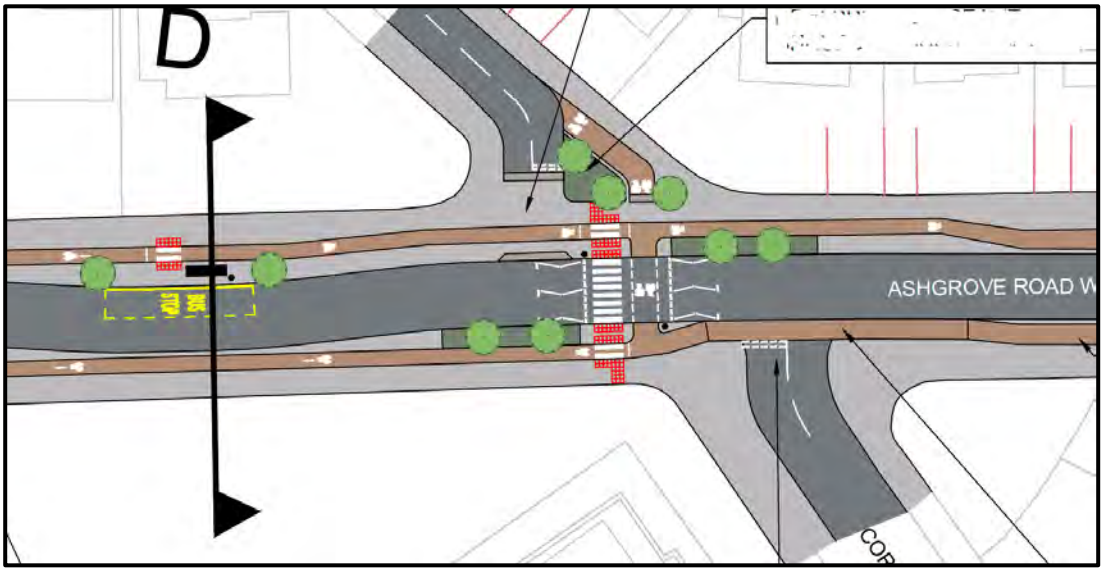
Deliverability

4.5.30. The proposed crossing of Ashgrove Road West is intended to address the missing desire line provision between bus stops, the hospital and Cornhill Primary school. There is an over 800m distance between formal crossings at this location and there is therefore good grounds to assume that, particularly with the addition of the cycle tracks to induce demand, the parallel crossing would be well used.

4.5.31. The design team is aware that ACC still applies the PV^2 assessment that is withdrawn from UK guidance. While a useful test to set budgetary priorities for upgrades there are significant shortcomings in applying this method of assessment to determine whether a crossing at this location is required. It is recommended that ACC commission a fuller assessment of potential induced demand at this location to determine whether this pedestrian and cyclist desire line should be met.

4.5.32. The interaction between bus stops, the proposed pedestrian crossings and vehicle turning movements has been carefully designed and tracked for feasibility. Further detailing of the interactions is recommended early in Stage 3 design.

Figure 4.6 – Cornhill Terrace/ Cornhill Road junction layout proposed option



Engagement response

4.5.33. The community and Stakeholder Working Group responses indicate that a significant majority of people are positive about the proposal including:

- New crossings;
- Improving the perception of junction safety; and
- Improved public space / greenspace.

4.5.34. The key remaining issues at this location that the community raised are:

- Noise impact of signalising crossings on closest residents;
- Reduced visibility from greenspace improvements; and
- Potential for vehicles to block the continuous footway / cycle lane when turning onto Ashgrove Road West from Cornhill Terrace.

Respondent:

"Move the bus stop to the west to allow the parallel crossing to be east of it, so nearer the junction?

Westburn Drive/ Ashgrove Road West/ Ashgrove Road Junction

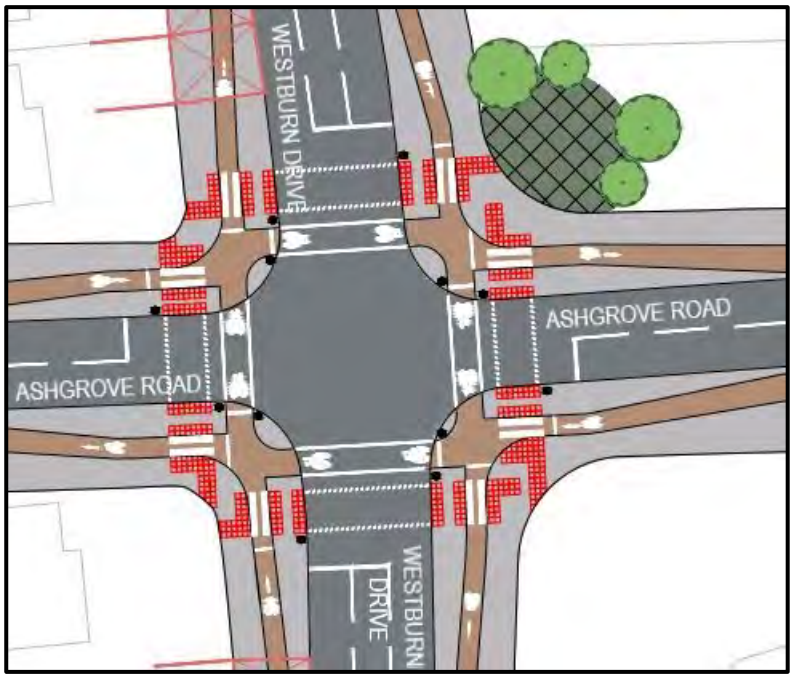
4.5.35. A summary of the assessment of the Cornhill Terrace/ Cornhill Road options is provided in Table 4.6 – Summary of Westburn Drive Assessment.

Table 4.6 – Summary of Westburn Drive Assessment

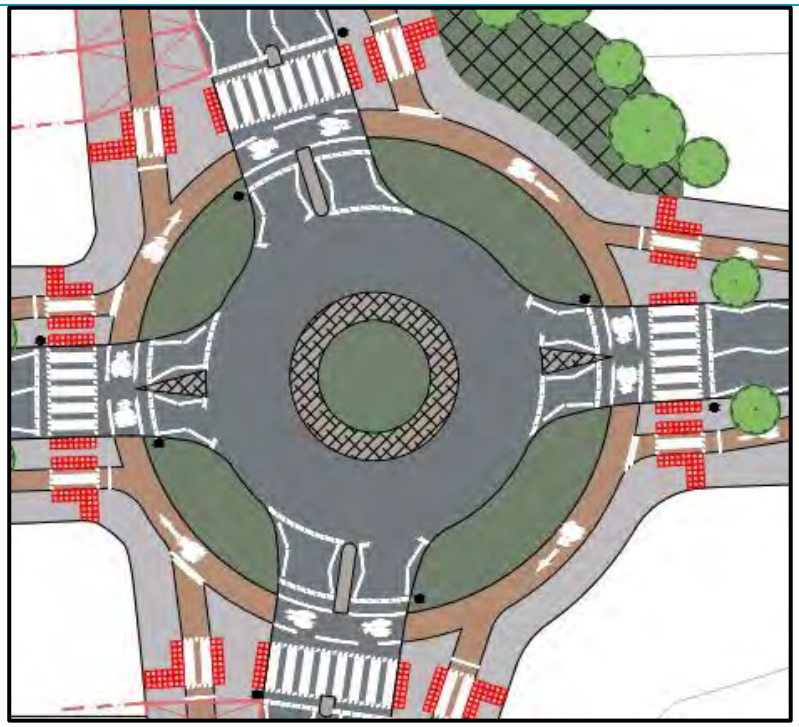
Ref	Option	Assessment
WB1	Do Nothing	No improvement for walking, cycling or speed control
WB2	Tighten entries & adjust signal timings	Limited improvement for walking and cycling
WB3	Signal-controlled (pedestrian crossing of cycle track partially signal-controlled)	Greater delay to cycling and walking than WB4. Possible safety issues with two forms of pedestrian / cycling control
WB4	**Signal-controlled (zebra pedestrian crossing of cycle track)**	**High level of service for cycling and walking. Junction model operates within capacity**
WB5	Signal-controlled Two-Stage Right-Turn	Low level of service for some cycle users. Junction model operates within capacity
WB6	Closure of Ashgrove Road West arm	Severs a bus route and emergency vehicle route. Unlikely to receive public and stakeholder support
WB7	Closure of Ashgrove Road arm	Severs an emergency vehicle route. Unlikely to receive public and stakeholder support
WB8	Closure of both Ashgrove Road arms	Severs a bus route and emergency vehicle route. Unlikely to receive public and stakeholder support
WB9	**Segregated cycling Compact Roundabout**	**High level of service for cycling and walking. Requires land take and detailing of private driveway accesses. Junction model operates over capacity**
WB10	Segregated cycling Mini Roundabout	Significant technical and safety issues not overcome at RIBA Stage 2

Figure 4.6 – Westburn Drive junction preferred options

WB4 Signal-controlled (zebra pedestrian crossing of cycle track)



WB9 Segregated cycling Compact Roundabout



4.5.36. A number of junction control options were explored to identify the most favourable layouts. The two options to be taken forward for further development at RIBA Stage 3 are:

- WB4 Signal-controlled Segregated Cycling (pedestrian crossing of cycle track); and

- WB9 Segregated cycling Compact Roundabout.

4.5.37. This proposal is to retain signal-control with the following changes:

- Parallel cyclist and pedestrian crossings;
- Uni-directional cycle tracks on the Ashgrove Road arms;
- Reduction of pedestrian crossing distances; and
- All traffic movements are retained.

4.5.38. This option can be delivered within the existing carriageway footprint.

Compact Roundabout option

- Conversion of the junction into a compact roundabout;
- Parallel cyclist and pedestrian zebra crossings on all arms;
- Uni-directional cycle tracks on the Ashgrove Road arms; and
- All traffic movements are retained.

4.5.39. This option will require some land purchase to the south-east and north-east of Ashgrove Road.

Deliverability

4.5.40. The signal-controlled option offers an overall higher level of service for all users, in terms of all abilities walking and cycling and minimising junction delay. While the roundabout option performs best on delay for most pedestrians and cyclists. The land-take requirements and the design of access to nearby private driveways require further investigation in the roundabout option.

4.5.41. A mini roundabout option with segregated cycle tracks (WB10) was explored. Atkins can find no precedent for this layout and Atkins' assessment is that the layout possible at this location fails to meet some of the key geometric guidance principles that ensure it is safe by design. However, should ACC decide to explore this option at a later stage, it is recommended that a more detailed safety study and possibly off-street or on-street trials are commissioned prior to implementation.

4.5.42. There is an opportunity to open up the high stone wall to permit access or a public realm opportunity towards Gillespie Crescent which may create a more welcoming environment and the opportunity for community engagement.

Engagement response

4.5.43. The community and Stakeholder Working Group responses indicate that a significant majority of people are positive about the proposal including:

- Priority crossings;
- Encouraging slowing traffic speeds approaching the junction; and
- Enhanced greenspace.

4.5.44. The key remaining issues at this location that the community raised are:

- Driver understanding of the roundabout layout;

- Reduced visibility from any improved greenspace; and
- Impact of opening the high wall on noise and safety for residents living behind this.

Respondent:

"I like the roundabout but worry how safe crossings would be. Concerned with the lights that turning right (south) onto Westburn Drive would be harder."

Ashgrove Road/ Laurelwood Avenue/ Elm Place

Key constraints

4.5.45. A number of key constraints had to be taken into account at this location:

- Current traffic volumes are incompatible with all ages and abilities cycling on street and therefore a segregated cycle track is required between Ashgrove Road and Berryden Road;
- The designs required to tie in with the concept proposals for the Berryden Corridor Improvement;
- The right turn vehicular exit from Elm Place onto Berryden Road (and the access for vehicles through Laurelwood Avenue) had to remain open. So a full closure of Laurelwood Avenue was ruled out in early option sifting;
- The vehicular left turn into Ashgrove Road from Berryden Road had to be retained;
- The businesses on Ashgrove Road require vehicular access to loading and off-street parking; and
- Although the majority of residents have off-street options, a number of residents live in terraced homes or flats. Therefore overnight parking demand should be provided for within a reasonable distance unless those residents have an off-street option.

4.5.46. The shortlisted options taken through assessment at this location are presented in Table 4.7 – Shortlist of Ashgrove Road/ Laurelwood Avenue/ Elm Place assessments.

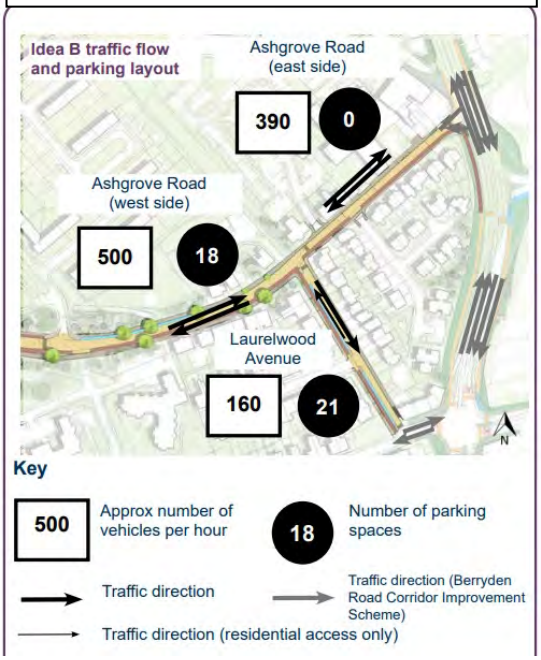
Table 4.7 – Shortlist of Ashgrove Road/ Laurelwood Avenue/ Elm Place assessments

Ref	Option	Assessment summary
ALP 1	Do Nothing	No improvement for walking, cycling or speed control
ALP 2	Tighten entries & adjust signal timings	Limited improvement for walking and cycling
ALP 3	One way circulation anti-clockwise, space reallocated to walking and cycling	More opportunities for car parking retention Analysis indicated that this would divert traffic onto Laurelwood Avenue
ALP 4	**Two-way traffic on Ashgrove Road, one way southbound on Laurelwood**	**Laurelwood - This would allow a two-way cycle track to be provided along with parking on one side** **Ashgrove – traffic calming to respond to community concerns, retention of parking, no cycle track**
ALP 5	One-way westbound on Ashgrove Road, no exit from Laurelwood to Ashgrove (false one-way)	Laurelwood - This would allow a two-way cycle track to be provided along with parking on one side Ashgrove – traffic calming to respond to community concerns Concerns with traffic management compliance. Considered to divert too much traffic onto Laurelwood Avenue
ALP 6	Retain two-way traffic movements on Ashgrove Road and Laurelwood	Insufficient space for cycling and walking unless all parking removed. This was not deemed publicly acceptable

Engagement response to options presented

4.5.47. A key element of the options development and assessment was public acceptability of the options. The public was presented with three primary options that transparently presented the impacts alternately on combinations of cycling, parking, tree loss and traffic volume impact. The full engagement materials are provided in Appendix C.

Example impacts presentation to public



4.5.48. The community and the Stakeholder Working Group responses indicate that a majority of people are positive about the options presented at consultation, including:

- 20mph speed limit;
- New crossings;
- Enhanced greenspace; and
- Safer cycling and walking.

4.5.49. The issues raised by some members of the community were:

- Location of parking bays, particularly between May Baird Avenue and Laurelwood Avenue; People expressed concern at the perception of safety of parking further along Ashgrove Road
- Ensuring customers park within off-street car parks; and
- The impact of the Berryden Corridor Improvement Scheme on traffic levels.

Respondent:

"The junction must not direct traffic travelling east on Ashgrove Road on to Laurelwood Avenue. It has to be borne in mind that Laurelwood Avenue, Cedar Place and Elm Place are residential streets, they should not be seen as a short cut between Ashgrove Road and Berryden Road."

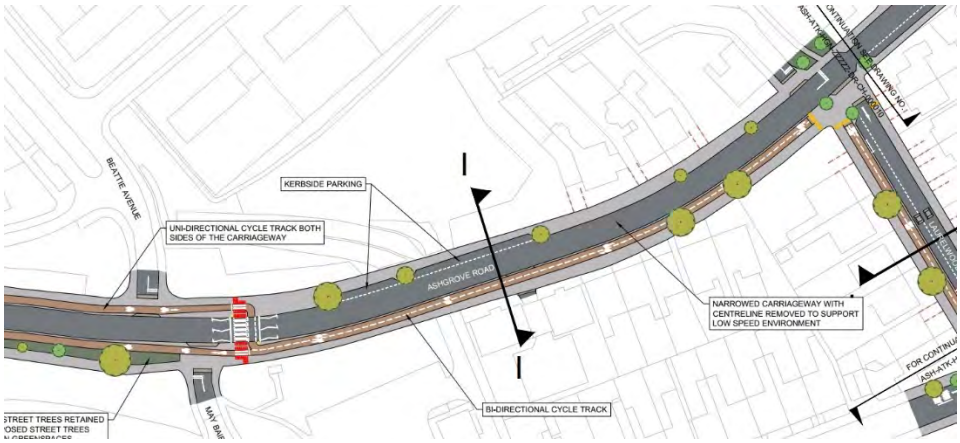
Proposed Option

4.5.50. All options at this location involved making trade-offs between cycling and walking amenity, tree felling, parking capacity and traffic volumes.

4.5.51. The proposed option to take forward is ALP4 which features:

- Two-way traffic on Ashgrove Road with traffic calming;
- One way southbound traffic on Laurelwood Avenue;
- A two-way cycle track on Laurelwood Avenue and Elm Place;
- Retention of existing trees and the potential to provide additional trees on Ashgrove Road and Laurelwood Avenue; and
- Retention of 40 parking bays and the removal of unlawful parking opportunities.

Table 4.8 – Proposed option for Ashgrove Road, Laurelwood Avenue and Elm Place

Ashgrove Road (May Baird to Laurelwood Ave)	
Ashgrove Road (Laurelwood to Berryden)	
Laurelwood Avenue/ Elm PLace	

4.5.52. This option is not the highest performing for cycling as it forces people travelling northbound into a more circuitous route with a gradient on Laurelwood Avenue and Berryden Road. However it does seek to create more favourable on-carriageway conditions for those who value directness while providing a longer all-abilities route.

4.5.53. This option has the advantage of reducing traffic volume on Laurelwood Avenue and retaining full width footways and existing trees, with the potential for more trees throughout the area.

4.6. Summary

4.6.1. This Options assessment was undertaken firstly at a high level and then for more involved details at certain locations, alongside public engagement.

4.6.2. The selected options were developed into the proposed Concept Design. Some of the key features are illustrated in the next chapter.

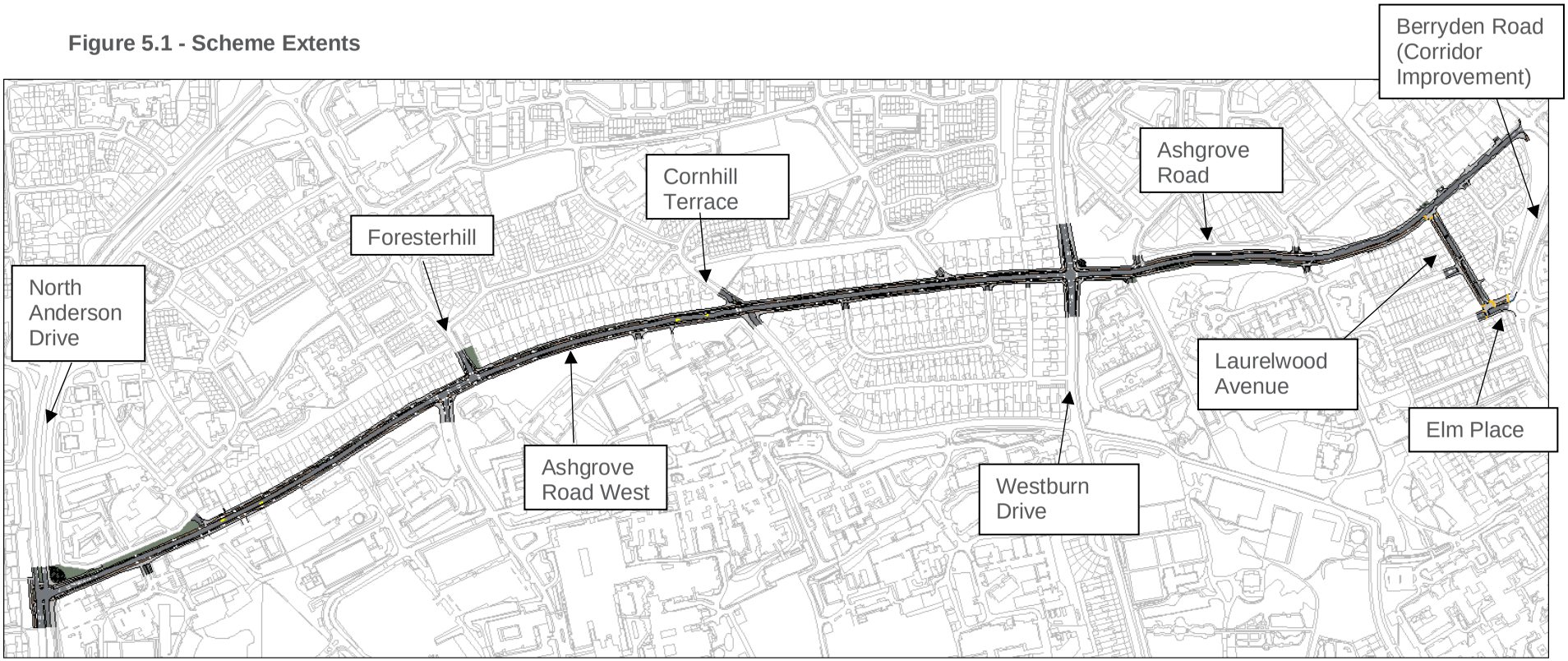
5. Proposed Concept Design

5.1.1. This chapter highlights some of the key features of the proposed design. Reference should be made to the design drawings (series ASH-ATK-HGN-ZZZZZ-DR-CH-000001 to 000011) and visualisations (series ASH-ATK-HGN-ZZZZZ-VS-UD-00001 to 00008).

5.2. Scope of works

5.2.1. The proposed scheme incorporates Ashgrove Road West, Ashgrove Road, Laurelwood Avenue and Elm Place between North Anderson Drive and Berryden Road. The full extent of the scheme is illustrated in Figure 5.1.

Figure 5.1 - Scheme Extents



5.3. General profiles

Figure 5.2 - Ashgrove Road West Existing and Proposed Cross-Sections (facing east)

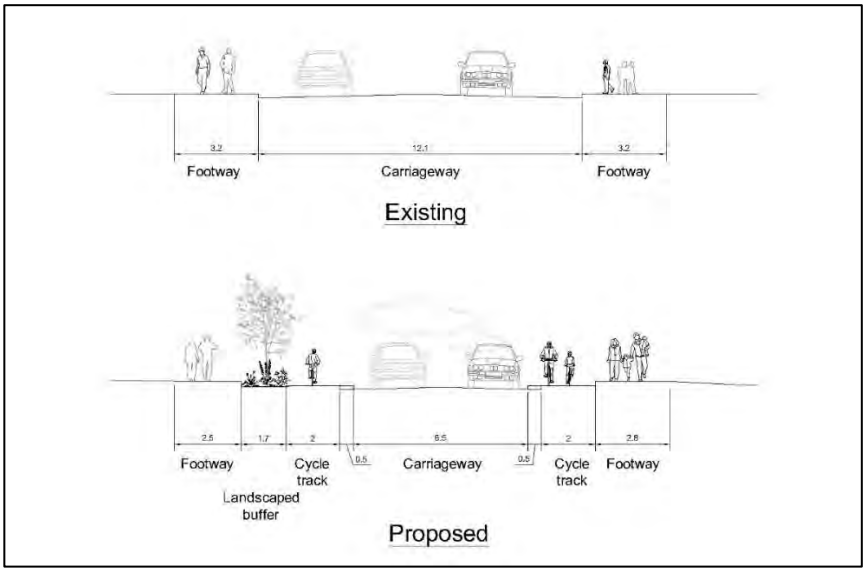


Figure 5.3 – Ashgrove Road West illustrative street view (before and after facing west)

Before

After

Figure 5.4 – Cornhill Road junction (before and after)

Before

After

Figure 5.5 – Ashgrove Road (between Westburn Drive and May Baird Avenue) Existing and Proposed Cross-Sections (facing east)

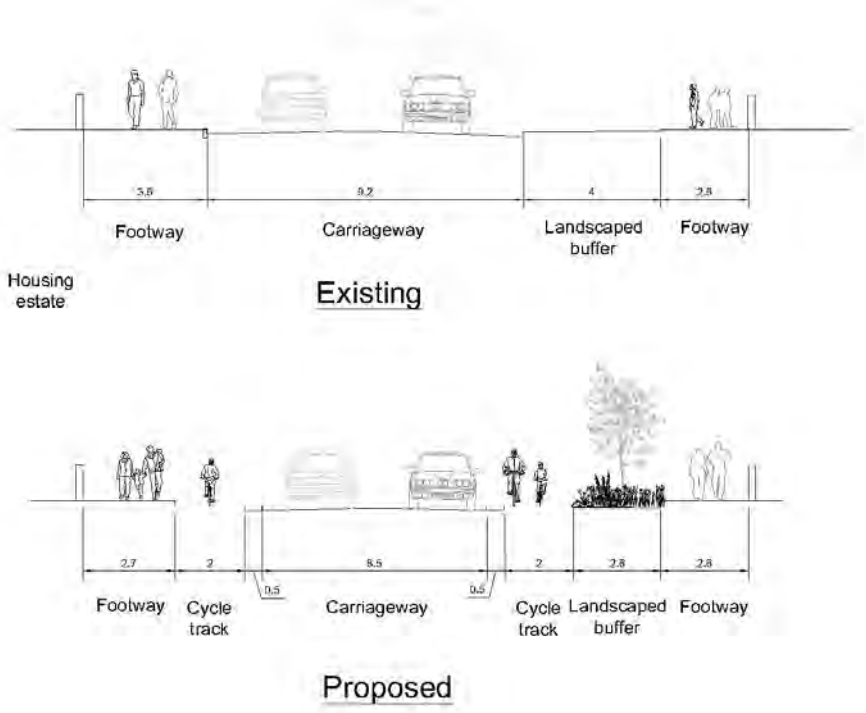
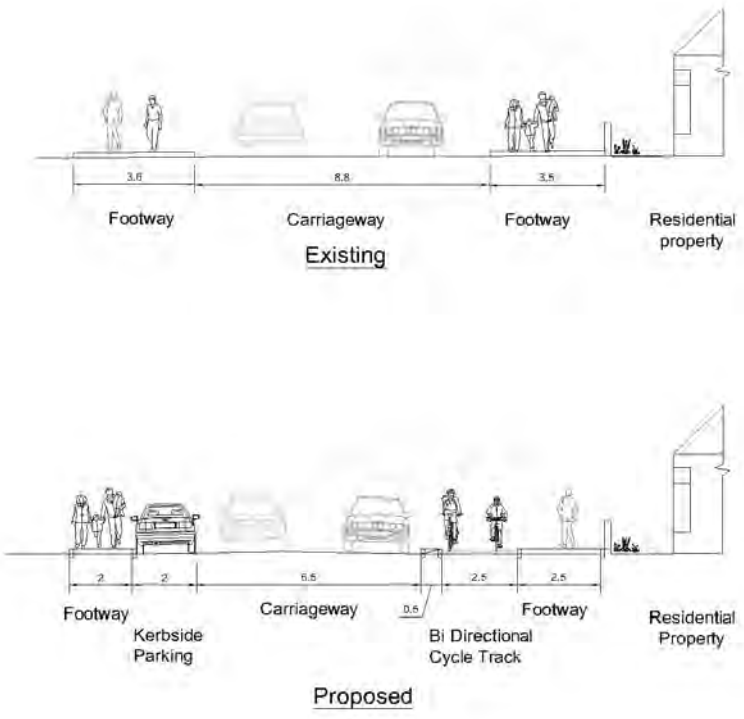


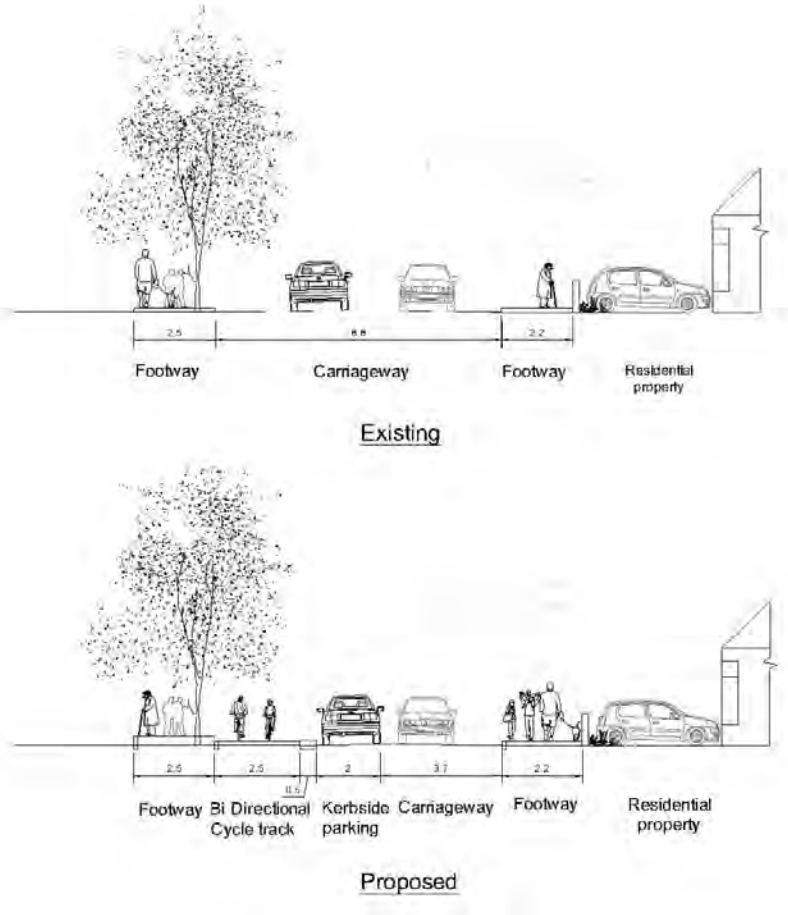
Figure 5.6 – Ashgrove Road (between May Baird Avenue and Laurelwood Avenue) Existing and Proposed Cross Sections (facing east)



5.3.1.

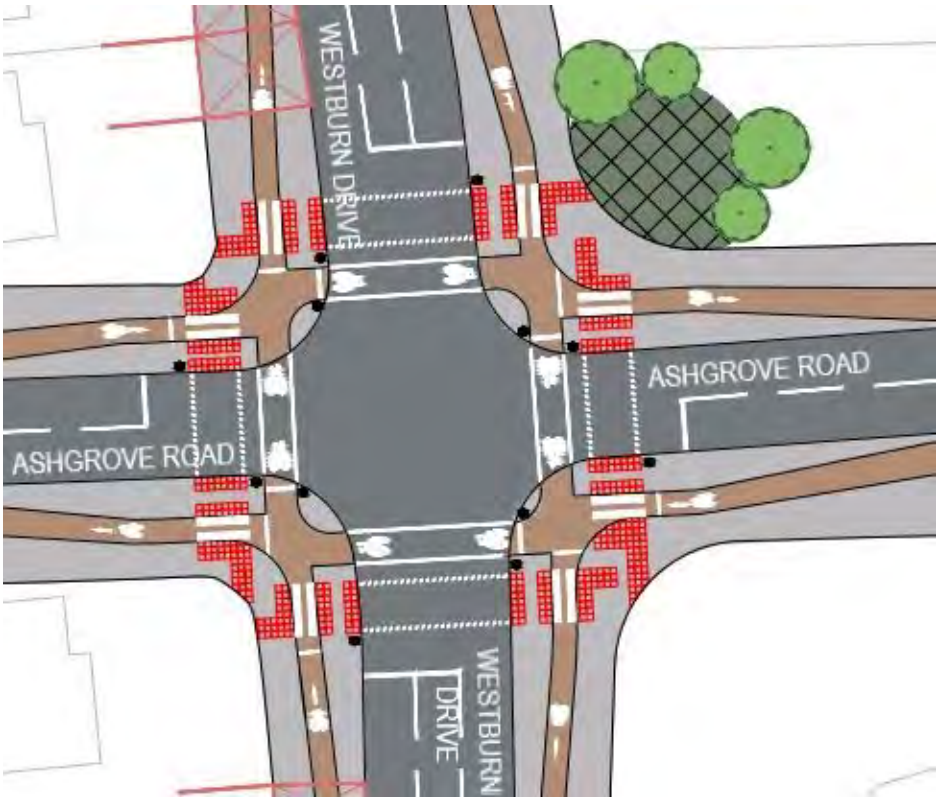
Before	
After	

Figure 5.7 – Laurelwood Avenue Existing and Proposed Cross-Sections (facing north)

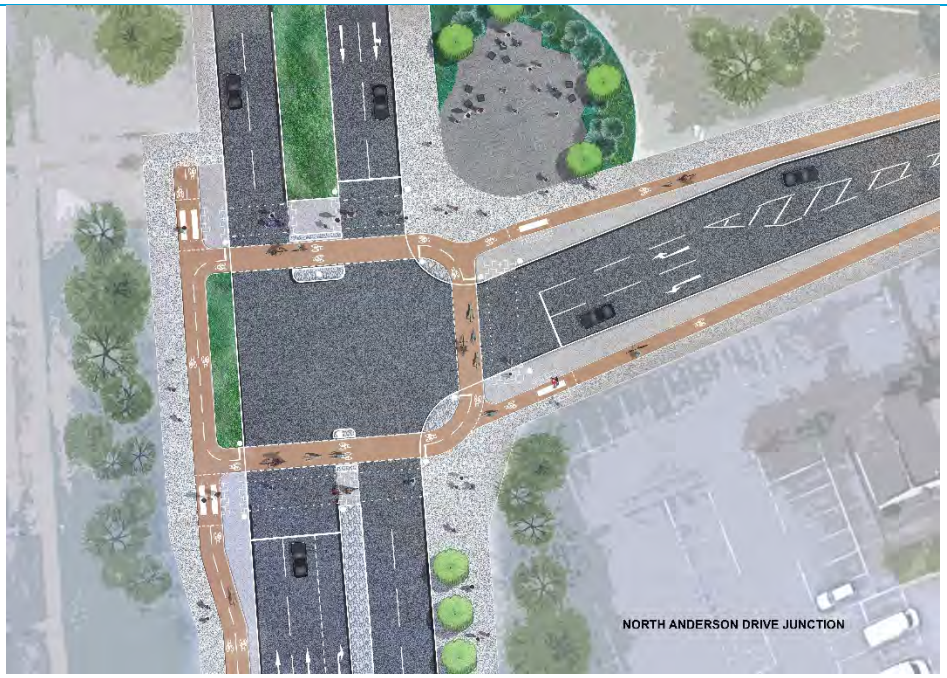


5.4. Signal-controlled junctions

Westburn Drive/ Ashgrove Road



N Anderson Drive/ Ashgrove Road



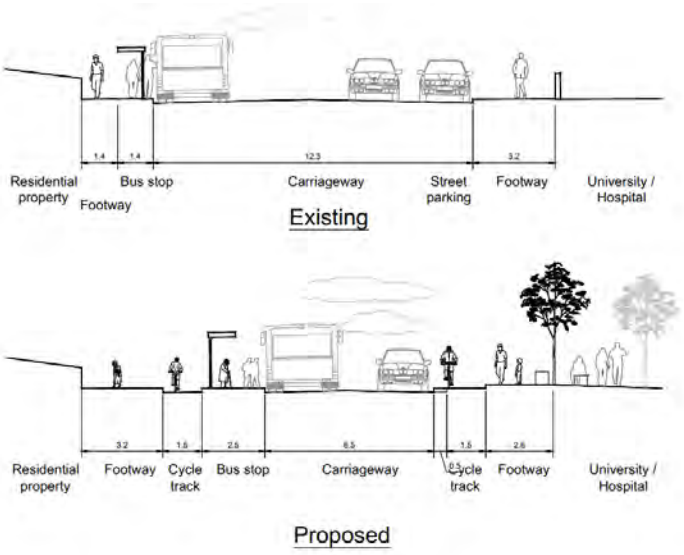
5.5. Compact roundabout design

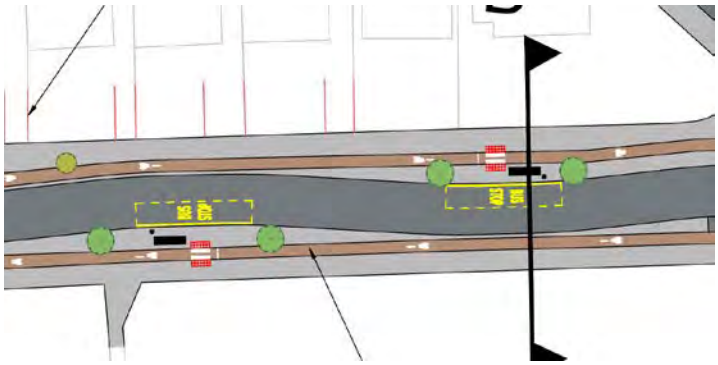
Foresterhill/ Foresterhill Road/ Ashgrove Road	
Westburn Drive	

5.6. Bus stop and cycle track interactions

5.6.1. Cycle track bypasses of bus stops are generally provided with full width available. This arrangement is known to deliver the highest level of risk reduction for street users as a whole by separating all modes.

Bus stop layout (Ashgrove Road West, west of Cornhill Terrace)

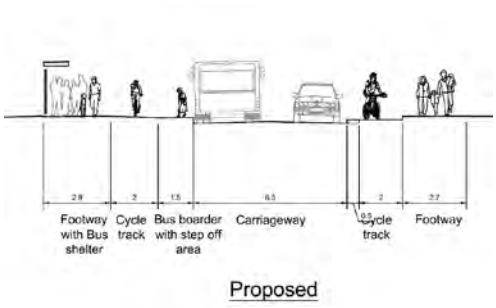


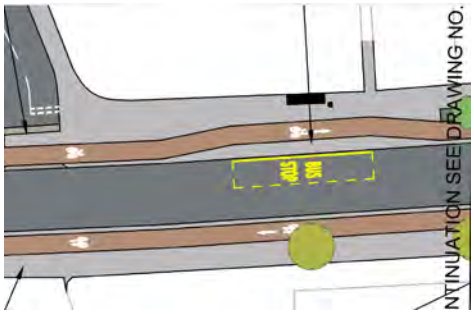


5.6.2. At the two bus stops immediately east of Castleton Drive, an alternative layout is demonstrated for constrained locations. This results in the bus shelter being located at the back of the footway. It is recommended that the options here are investigated in further detail at Stage 3 – it may be possible to achieve a full bus boarder island by reallocating cycle track and landscaping widths.

5.6.3. At this stage the design team has been unable to get a response from the Disability Equity Partnership.

Bus stops layout (Ashgrove Road West (east of Castleton Drive)



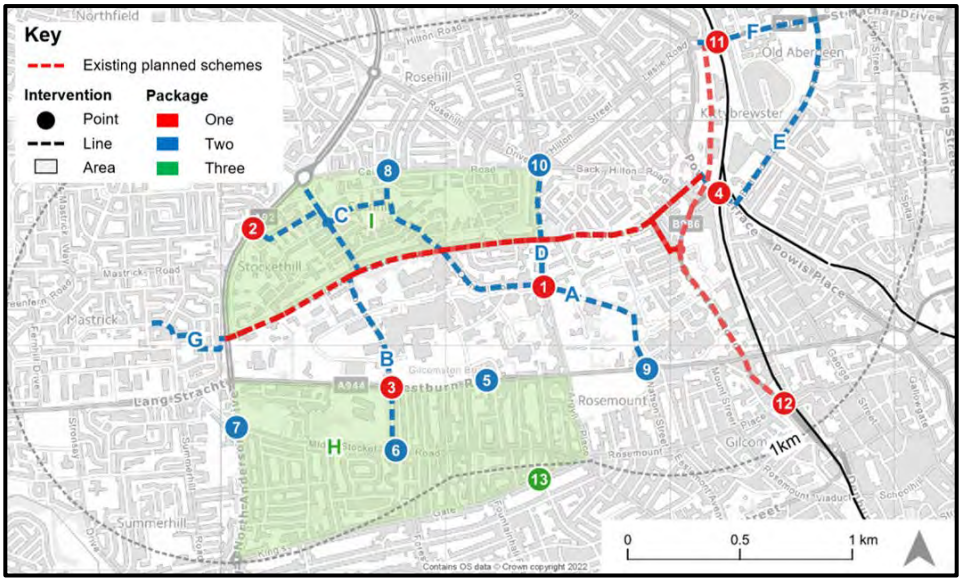


5.7. Active Travel Network Assessment proposals

5.7.1. The Active Travel Network Assessment (CR-J) identifies additional improvements that could be developed as part of or following scheme implementation. Those changes are therefore not considered within the scope of the proposals in the preceding sections of this Chapter.

5.7.2. A relatively small number of additional crossings and links delivered in tandem with Ashgrove Connects would significantly improve safe access, reduce severance, and support a wider range of journeys as shown in Figure 5.3:

Figure 5.3 - Recommended phased Improvements local to the study area

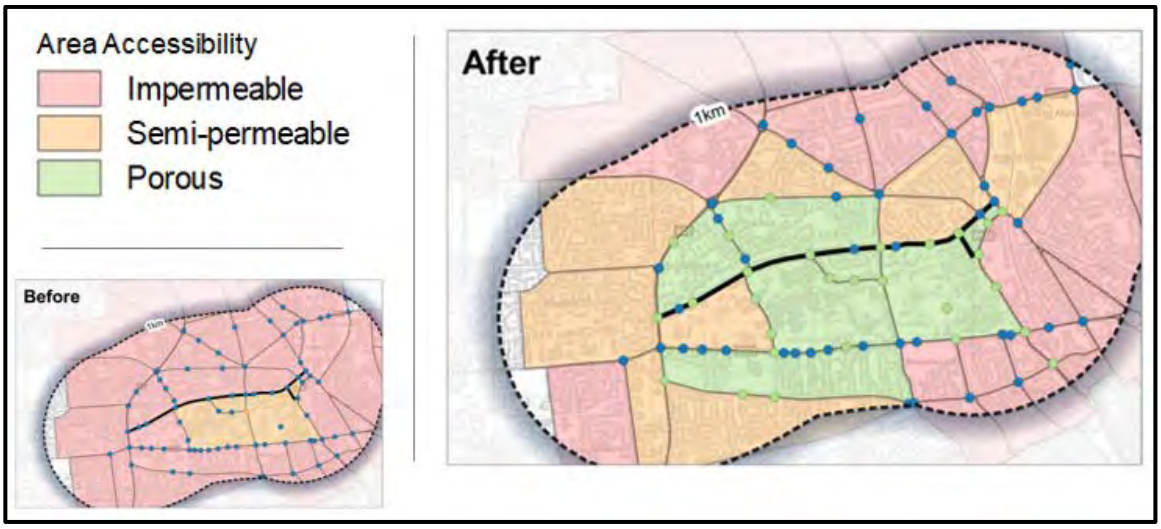


5.7.3. The impact of delivering Ashgrove connects as well as the additional minor interventions is illustrated in Figure 2.4 (before and after). This demonstrates the change in the network area that would be accessible by all ages and abilities walking and cycling were these interventions to be delivered.

5.7.4. It is recommended that:

- An independent level of service assessment is recommended at each development stage of the scheme, to ensure quality is maintained through to delivery; and that
- Progress is made towards a comprehensive strategic network study to provide a city-wide plan prioritising active travel routes for future development. This process would benefit from targeted engagement that would greatly enhance and enrich the network planning process along with further data collection and auditing.

Figure 5.4 - Permeability of the network for walking and cycling before and after interventions*



*Note that the 'after' scenario does not yet incorporate impact of the package links D, F or G or crossing 10. These are likely to illustrate further improvements in permeability.

6. Engineering Assessment

6.1. Introduction

6.1.1. This chapter summarises the impact of the preferred options for the scheme on existing infrastructure, summarising the key technical and deliverability opportunities and constraints.

6.2. Summary of proposals

6.2.1. The key features of the proposals impacting on existing infrastructure are summarised in Table 5.1.

- 20mph speed limit on Ashgrove Road and Ashgrove Road West;
- Reduced carriageway width and pedestrian crossing distances;
- Continuous footways at side roads to provide design priority for pedestrians;
- One new controlled crossing of Ashgrove Road West;
- A net increase in the number of street trees and green infrastructure (detailed in Chapter 6);
- Two new opportunities for public realm features as gateways into the community;
- Segregated cycle tracks on
    - Ashgrove Road West;
    - Ashgrove Road between Westburn Drive and Laurelwood Avenue; and
    - Laurelwood Avenue and Elm Place.
- Enhanced bus stop facilities and cycle bypasses of bus stops; and
- Reduction in available on street parking commensurate, prioritising residential need where required.

6.2.2. It is not the intention at RIBA Stage 2 of these Concept Design proposals to have resolved all operational and design challenges. The intention is to present technically feasible solutions and to highlight the deliverability constraints that should be dealt with in detail at subsequent stages. These are presented in full within the Designer's handover documents and summarised here.

6.3. Impacts

Carriageway

6.3.1. Full carriageway and footway reinstatement is assumed to be required for the full length of the route between property boundaries.

6.3.2. Following topographical surveys and further detailing, cost savings may be identified by rationalising the extents of reinstatement.

Vehicle tracking

6.3.3. Vehicle tracking has been undertaken for all existing and forecast HGV and bus movements. The designs are navigable for all intended traffic movements. The following elements in particular require further tracking conducted as the designs progress:

- The interaction of bus movements and bus stops between Cornhill Road and Ashgrove Road;

- The carriageway width and forward visibility at the horizontal deflection west of Cornhill Road/ Cornhill Terrace; and
- Loading access for the businesses at the east end of Ashgrove Road should be retained around the traffic calming features.

6.3.4. Engagement with emergency services and ACC operational teams has informed the concept designs, notably:

- Two approach lanes from Ashgrove Road to North Anderson Drive are retained;
- Level access to emergency service facilities is retained (no vertical deflection); and
- Cornhill Drive remains open for traffic, including refuge access.

On-street car parking

6.3.5. To align with the design objectives developed with the community, the aim of the parking proposals is to provide appropriately within a reasonable distance of homes and businesses. Observational surveys indicate that the vast majority of daytime turnover can be accommodated in off-street car parks and driveways. For residents, parking demand has been measured and largely accommodated near homes.

6.3.6. This is summarised in Table 6.1 provides a summary of the existing and proposed parking provision, along with surveyed parking demands within the designated parking bays and unrestricted parking areas within the Design Area. It does not include parking outwith legal parking spaces.

Table 6.1 - Summary of Existing & Proposed Parking Provision

Section	Existing	Proposed	Peak Demand (daytime)	Peak Demand (overnight)
ARW (N Anderson to Westburn)	112	0	30	3
AR (Westburn to May Baird)	0	0	0	0
AR (May Baird to Laurelwood)	13	9	10	10
AR (Laurelwood to Berryden)	15	11	10	11
Laurelwood	27	20	no data*	no data*
Elm Place	0	0	no parking permitted	no parking permitted
Total	167	40	50**	24*

* Further surveys required on Laurelwood Avenue and other minor streets at Stage 3
** The higher peak in daytime demand is assumed to be associated with business parking that can be accommodated in off-street car parks

6.3.7. The proposals are to provide no formal on-street parking bays on Ashgrove Road West.

6.3.8. On Ashgrove Road, while there is little difference between the peak daytime and overnight demands on, these peak demands do not provide an accurate reflection of the full daily parking demand profiles when turnover is higher. The overnight values are a reflection of residential

demands throughout the Design Area, while the daytime demanfpolds are largely driven by non-residential users.

6.3.9. As noted in Section 2.10 additional surveys will be required on Laurelwood Avenue and Elm Place to establish existing levels of demand.

6.3.10. It is noted that while there is a shortfall of daytime parking on Ashgrove Road West it is anticipated that any residual demand will be met by off-street parking. The daytime Ashgrove Road West parking is largely assumed to be linked to commuter, works, and delivery traffic, demand for which can be served off-street.

6.3.11. Any shortfall for overnight parking on Ashgrove Road is assumed to be minor, given existing demands and the proposed level of provision, and any residual demand can be met on nearby streets.

6.3.12. The proposals will include the implementation of Traffic Regulation Orders (TROs) to prohibit parking and loading outwith the parking bays provided throughout the Design Area, in line with the proposed parking provision summarised in Table 6.1.

6.3.13. Further work will be undertaken during Stages 3 and 4 to progress the TRO proposals. This will include continuous engagement with stakeholders and residents, as well as behaviour change activation with those affected by the proposals.

6.3.14. The feedback received from the public on parking proposals along Ashgrove Road West was mostly positive, particularly the improvements this could bring to the overall visibility and layout of junctions. Where people felt more neutral towards this, feedback suggested improvements would need to be made to sign post people to available car parks within the Foresterhill Health Campus to reduce the risk of parking displacement onto residential side streets.

6.3.15. The feedback received from the public on parking proposals along Ashgrove Road and Laurelwood Avenue was slightly more mixed. Where people felt positive towards this, the feedback highlighted improvements this could bring to the overall visibility of junctions, crossings and access to properties and businesses. Where people felt more negative towards this, feedback highlighted two primary concerns:

- The location of parking bays between May Baird Avenue and Laurelwood Avenue being situated further away from properties, increasing the distance to travel and risk of vandalism from reduced visibility.
- The number of parking bays being provided, particularly for those in properties without driveways and the increasing number of multiple occupancy licences within the area.

6.3.16. The Concept Design for Ashgrove Road and Laurelwood Avenue has been adapted on the back of this feedback to consider how to provide more space for parking whilst ensuring this does not compromise the other Design Objectives.

6.3.17. Those who attended the workshops for residents of Ashgrove Road and Laurelwood Avenue engaged constructively over the parking proposals and this should continue as the proposals

develop. The residents also highlighted the need to work with businesses in the area to encourage more use of their available off-street customer car parks. This has been included within the Behaviour Change Activation Plan (CR-A) as an opportunity to encourage a shift in parking behaviour.

Driveways

6.3.18. As there are many residential buildings along the corridor, there will also be many driveways crossing the footway and cycle track. The detailing of the ramp at the carriageway kerb will require further consideration, however it is assumed that a “Dutch entrance kerb” is most appropriate.

6.3.19. The Highway Code recommends but does not require drivers to reverse into driveways and emerge forwards. This allows the optimal visibility to cross footway, cycle track and enter the carriageway safely.

6.4. Summary of Constraints

6.4.1. An initial review of potential engineering constraints has been undertaken using site visits, responses from utility providers and online Google Maps. This review is not exhaustive but was designed to identify significant potential challenges early in the design process so that the project is cognisant of these as the design is developed. The constraints identified will need further investigation in the next design stage and their impact should be verified before changes are made to the design proposals.

6.4.2. These will impact each of the options to broadly the same degree, so have not been included as part of the options assessment.

6.4.3. Table 6.2 summarises the engineering constraints that were identified as part of this exercise.

Table 6.2 – Summary of engineering constraints

Location	Constraint	Notes
Sitewide	Lighting columns and utility cabinets.	Many of the lighting columns are located at the front of the footway. Where the footway kerbs are moved there is a risk that most of these will require to be moved.
Sitewide	Topographical	There is a risk that there will not be enough level difference for efficient drainage and the proposed kerb differential cannot be realised.
Sitewide	Street trees	There is a need to remove or replace several mature trees to accommodate the design proposals. It is also noted that the roots of large trees are likely to have spread to under the road.
Sitewide	As this is an urban area there will be limited space to lay down material and equipment and it is important to consider that there will be members of the public in close proximity.	Liaison with contractor is important to ensure that designs have construction methods suitable for the area.

Location	Constraint	Notes
Sitewide	There are a number of metal manhole covers in the existing carriageway.	If possible, these should not be located in the proposed cycle track or on crossings
Ashgrove Road West (North Anderson Drive– Ashgrove Road West Corner)	The proposed footway may encroach on an existing wooden fence. It is also noted that in this location the proposed cycle track may clash with 4 no. utility boxes and a large pole.	Additional land purchase and permission to change the alignment of the fence may be required.
Ashgrove Road West (Ashgrove Road West – North Anderson Drive Corner)	The ground appears to slope away at this location, meaning that the embankment may need to be built up to allow for the proposed footway. There may also be the need for some vegetation clearance (inc. some trees).	A stability check on the embankment will likely be required. It should also be considered that it is likely that access may be needed from the car park below during construction so permission from the landowner would need to be sought
Foresterhill junction (signal-controlled option)	In order to provide pedestrians with in-line crossings of cycle track to the signal-controlled junction, around a 1-2m strip of land purchase may be required from the Foresterhill Health Campus.	land purchase may be required. Land ownership searches are being conducted by ACC
Foresterhill Junction (compact roundabout option) (Western roundabout)	The proposed highway boundary appears to be within 1.5m of an underground reservoir that is part of the Foresterhill Health Campus site. The owners have been contacted and confirmed that it is in use. This option would require land take	Further investigation would be required with the asset owner to advise on the possibility of land purchase and on construction options in the vicinity.
Foresterhill Junction (compact roundabout option)	The proposed option appears to encroach upon part of the Foresterhill Health Campus site.	Additional land purchase may be required. Land ownership searches are being conducted by ACC
Westburn Drive (east side)	The proposed option will encroach third party land that appears to be part of Elmwood Hospital to the south west and greenspace to the north west of unknown ownership.	Additional land purchase may be required. Land ownership searches are being conducted by ACC
Laurelwood Avenue (Approx. 20m north of the junction with Elm Place)	There is a substation in this location.	Incorporate further detailed information in contractor's tender documents
Sitewide	LV electric cables have only 0.45m cover under the footway. Initial information from providers indicate that these are present across the site.	Incorporate further detailed information in contractor's tender documents
Sitewide	Medium pressure gas main is present under the main carriageway on Ashgrove Road (approx. 3m from the south footway)	If any excavation needs to take place within the exclusion zone, then hand digging would need to be used.
Ashgrove Road (between North Anderson Drive and the Ambulance centre)	Extra high voltage (132kV) nominally at a depth of 0.8m under the carriageway and 0.9m under the footway	Incorporate further detailed information in contractor's tender documents

7. Environmental Assessment

7.1. Introduction

7.1.1. This section of the report summarises the environmental assessment of the Design Area. It was agreed with the client that full Environmental Impact Assessment was not required at this stage of the Scheme. This section therefore reports on the:

- Preliminary Ecological Appraisal;
- Trees;
- Greenspace and SUDS; and
- Heritage and Conservation.

7.1.2. This section of the report should be read alongside the detailed assessment of existing conditions in the Baseline Assessment.

7.2. Preliminary Ecological Appraisal

7.2.1. The aim of the Preliminary Ecological Assessment (CR-E) was to identify the following:

- The key ecological constraints to the scheme
- If additional ecological surveys are required to inform an ecological impact assessment
- Avoidance, mitigation, compensation, and enhancement measures

7.2.2. The preparation of the report involved two main components: a desk study and a site walkover survey.

7.2.3. The desk study included a data request from the North East Scotland Biological Records Centre for information on any protected and notable species, and sites of local importance. An online search was also undertaken to investigate nearby statutory and non-statutory designated sites of nature conversation importance, ancient woodland inventory, waterbodies, and priority habitats.

7.2.4. The walkover survey followed the UK Habitat Classification System methodology and was undertaken between 21/07/2022 and 22/07/2022. It recorded the habitats and evidence of, or the suitability for, protected and priority species. The Survey Area comprised the Design Area and extended 50m in all directions, where accessible, from the Design Area boundary.

Baseline Conditions

7.2.5. No statutory designated sites for nature conservation were recorded within 2km of the Survey Area.

7.2.6. Two non-statutory designated sites for nature conservation were recorded within 1km of the site:

- Inverness – Aberdeen Railway Line Local Nature Conservation Site
- Hilton Wood Local Nature Conservation Site

7.2.7. The Survey Area mostly comprises hardstanding (roads and footways) and houses with associated gardens. Areas of species-poor grassland, ornamental scrub planting, and broadleaved woodland

were scattered throughout the Design Area, typically located around community amenity areas and commercial businesses.

7.2.8. Habitats within the Survey Area have suitability so support bats, badger, nesting birds, common species of reptile, red squirrel, hedgehog, and priority invertebrates. Possible veteran trees were also recorded.

Mitigation

7.2.9. Avoidance and mitigation measures include the following:

- Retention of habitat within the Survey Area as far as possible, including trees
- Avoidance of night-time working (defined as 30-minutes prior to sunset and 30-minutes after sunrise)
- Implementation of pollution prevention measures
- Methods to prevent accidental harm to wildlife during the works

Opportunities

7.2.10. Opportunities for biodiversity enhancement include the following:

- The installation of woodcrete bat and bird boxes within woodland areas
- The creation of habitats through habitat piles in grassland areas
- An increase in the floristic diversity through local-sourced green hay and woodland floristic communities

Recommendations

7.2.11. A preliminary bat roost assessment (PBRA) of structures and ground level tree assessment (GLTA) may be required, depending on the nature of the proposed works associated with the Scheme.

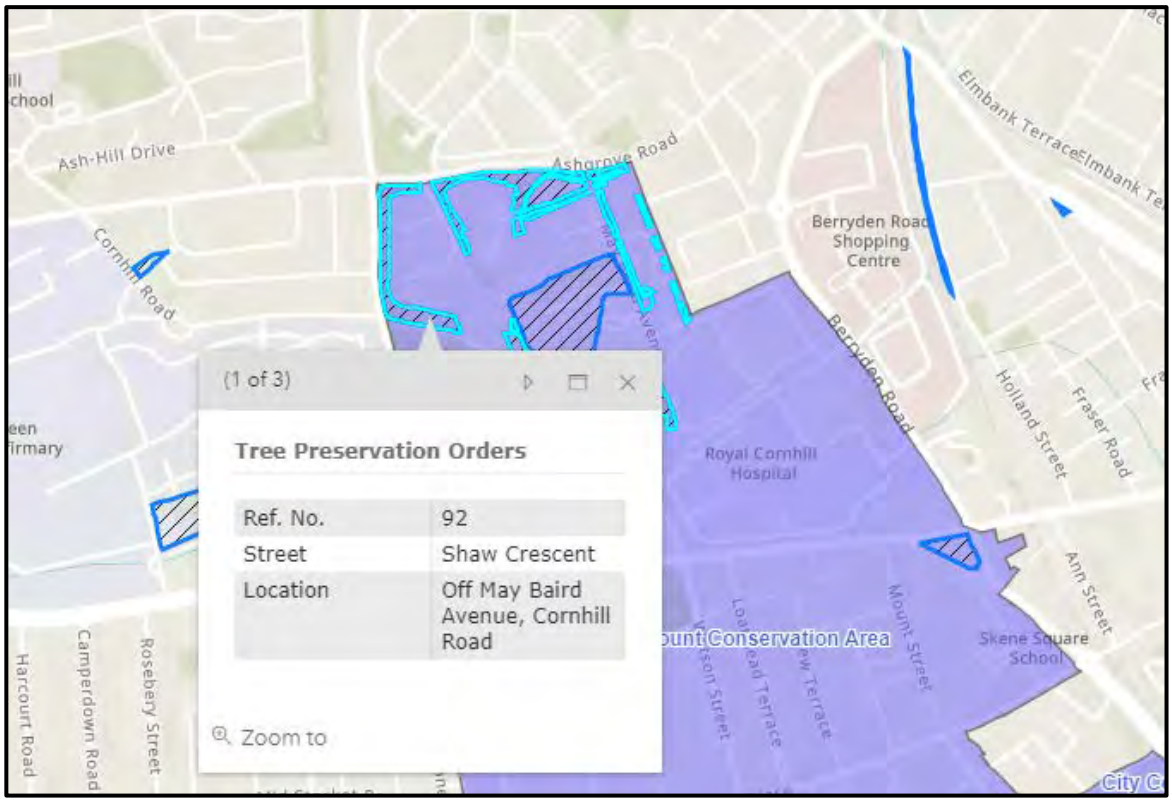
7.2.12. If works are likely to impact suitable habitat for red squirrel a survey for the presence or likely absence of squirrel dreys.

7.3. Trees

7.3.1. During RIBA Stages 1 and 2, an analysis of tree numbers and protection orders was undertaken and consultation was conducted with ACC's Tree Protection Officer. There are around 100 trees in the carriageway area within the project boundary. Additionally, there are a number of wooded areas, greenspaces and parkland adjacent to the project boundary with a high number of mature trees.

7.3.2. While all trees set within a Conservation area are automatically protected, an explicit tree preservation order is placed on the edge planting surrounding Elmwood and Roxburghe House, two NHS hospital facilities, running along Westburn Drive and Ashgrove Road. An extract of this area is illustrated in Figure 7.1

Figure 7.1 - Tree Preservation Orders



7.3.3. A quantification of the impact of the proposed scheme on tree numbers is provided in Table 7.1.

7.3.4. Stakeholder consultation indicated that many trees between North Anderson Drive and Foresterhill junctions are approaching the end of their lifespan and are already showing damage to the roots. The road section between Foresterhill and Cornhill junctions is planted with young trees, while the stretch from Cornhill to Westburn Drive has large mature lime trees of high quality. The eastern section of the project area on Ashgrove Road and Laurelwood Avenue has some scattered trees, with several trees already removed due to disease.

Table 7.1 - Quantification of impact on trees

Route section (within carriageway boundary unless stated)	Retain	remove	new	Total existing	Total proposed	Net change
North Anderson Drive (including gateway and west side outside of carriageway boundary)	7 *	8	7	15	14	-1
Ashgrove Road West between North Anderson Drive and Foresterhill	40	1	13	41	53	12
Foresterhill signal-controlled junction	0	1	6	0	6	6 **
Ashgrove Road West between Foresterhill and Cornhill	11	2 ***	17	13	28	11
Ashgrove Road West between Cornhill and Westburn Drive	25	2 ***	32	27	57	33
Westburn Drive signal-controlled junction	0	0	6	0	6	6 **
Ashgrove Road between Westburn Drive and Laurelwood Avenue	9	1 ***	16	10	25	15
Ashgrove Road between Laurelwood Avenue and Berryden Road	0	0	10	0	10	10
Laurelwood Avenue and Elm Place	6	2 ***	10	8	16	8
Total	98	17	117	110	213	103

* within the immediate vicinity of the junction
** assumes a signal-controlled junction. In the Compact roundabout scenarios, approximately 30-40 mature trees located outside of the carriageway at each of Foresterhill and Westburn Drive will require removal that may not be able to be reinstated
*** Carriageway, footway and cycle track construction in this location may irreparably damage the root base of mature trees. Replanting of trees in the adjacent greenspace is a replacement strategy if required.

Proposed next steps/ Mitigations

7.3.5. The scope of retaining existing trees will depend on the type of cycle infrastructure delivered and which construction method is chosen. There are several options for low-impact construction of cycle track but in the event of construction risking damage to the root zones of existing trees the safe choice is to replant the tree. For mature trees the replacement ratio could be 2-to-1 and as the table shows there is a large number of new trees proposed which would cover any loss of existing trees.

Opportunities

7.3.6. The project proposal proposes a large number of greenspaces on Ashgrove Road West where additional trees can be planted. The greenspace on Ashgrove Road immediately east of Westburn Drive also present an opportunity for replanting trees that were felled due to lime disease.

Recommendations

7.3.7. A replacement strategy should be developed alongside ACC's Tree Protection Officer and low-impact construction methods should be researches further.

7.4. Greenspaces and SUDS

7.4.1. There are currently no SUDS features on the corridor and there are no significant greenspaces in the carriageway space.

Opportunities

7.4.2. This concept design identifies opportunities to improve the streetscape and to create a consistent look and feel along the Ashgrove Road West and Ashgrove Road Corridor with landscaping and placemaking approaches that could follow alongside emerging Council policies on materials. Equally, there may be opportunities for some of those landscaped areas to be delivered as rain gardens to reduce run-off and alleviate capacity challenges in the sewer system. These should be explored in future project stages.

Impact/ Quantification of changes (positives & negative)

7.4.3. The proposed design allows for approximately 1,500 sqm of new greenspace to be delivered on Ashgrove Road West (0sqm at present) . The signal-controlled options at Foresterhill and Westburn Drive junctions add approximately 60 sqm each. The roundabout options for these junctions add approximately 370 and 780 sqm of greenspace however this makes up for the greenspace lost in land take. In total Ashgrove Road West has a net gain of 1,400 sqm with 120 sqm addition if the signal-controlled option is preferred. Due to Ashgrove Road and Laurelwood Avenue's existing narrow geometry, the only existing greenspace is located on the south side of Ashgrove Road between Westburn Drive and May Baird Avenue. This is approximately 750 sqm. Our design does require land take from this existing greenspace to provide high quality footways and cycle tracks, meaning that the new proposed area is approximately 580 sqm, a net loss of 270 sqm. In total along the entire corridor, the design has a net gain of between 1,130 and 1,250 sqm.

Section *	Approx Existing (m2)	Approx Proposed (m2)	Approx Net gain/ loss (m2)
Ashgrove Road West (N Anderson to Westburn Dr)	0	1,500*	+ 1,500
AR	750	480	-270
Laurelwood/ Elm Pl	0	0	0

* within the building to building carriageway and assuming the signal-control options at Foresterhill and Westburn
**With the roundabout options there are further opportunities for greenspace within the carriageway, however this comes at the cost of greenspace land take off the carriageway The overall impact will be relatively neutral.

Recommendations

7.4.4. The proposed streetscape improvements have received strong support from the community. It is recommended that an early step of Stage 3 should be to agree in more detail with Council officers the approach to the placemaking and landscaping features of these elements.

7.5. Heritage and Conservation

Impact of changes

7.5.1. The Westburn Drive / Ashgrove Road / Ashgrove Road West junction is adjacent to the north-west corner of the Rosemount and Westburn Conservation area. If after further investigation, the project promoter choses to go forward with a compact roundabout solution there will be an additional impact on the conservation area and in particular a requirement to remove approximately 30-40 mature trees that are part of the Tree Protection Order applied to all trees in conservation areas and partly with the removal of part of the boundary wall on Ashgrove Road and Westburn Drive. This is quantified in section 7.3. It is worth noting that the boundary wall is not mentioned specifically in the Conservation Area Character Appraisal and the proposed works are far from any listed buildings. However, removing the trees, which are mature trees of relatively high quality, may be a reason for objections.

7.5.2. Similarly at the Foresterhill junction around 30-40 additional mature trees would require removal (over and above the impact for the signal-controlled junction option).

Opportunities & constraints

7.5.3. The tree preservation orders in place within the conservation area presents a challenge to the project as it may restrict the delivery of a compact roundabout which would require parts of the wall and several trees to be removed. If approval was given to remove the walls on both sides of the street there is an opportunity to improve the streetscape further – the engagement responses noted that it currently feels enclosed and unsafe due to the long stretch of unbroken wall.

Next steps and mitigations

7.5.4. Due to the alignment of Ashgrove Road West and Ashgrove Road it is not feasible to deliver the compact roundabout solution at Westburn Drive without extending into greenspace land within the conservation area.

7.5.5. The boundary wall could be rebuilt to align with the new site boundary and thus re-establish the character of the space with the wall. There is scope within the wider project area to replant trees, even on a 2-to-1 ratio, to replace the mature trees that would need to be removed.

Recommendations

7.5.6. It is recommended that the opportunity to develop some of the placemaking and artwork opportunities alongside the community in order to secure buy-in and creativity from the people who know the area well.

7.5.7. Consultation with ACC Environmental Services and the Tree Preservation Officer should continue during Stage 3.

8. Traffic Assessment

8.1. Introduction

8.1.1. This Chapter summarises the junction modelling exercise undertaken for the existing layouts and the preferred design options, using the supplied traffic data from the Berryden Corridor project. The traffic network diagrams and modelling outputs are presented in CR-B.

8.1.2. Modelling was undertaken at four junctions:

- North Anderson Drive/ Ashgrove Road West
- Foresterhill/ Foresterhill Road/ Ashgrove Road West double junction
- Westburn Drive/ Ashgrove Road West/ Ashgrove Road
- Ashgrove Road/ Laurelwood Avenue

8.1.3. The primary purpose of the junction modelling exercise was to identify the impact of the preferred junction options, not to dictate the objectives-led options assessment. So while preliminary modelling was also undertaken on some alternative options during sifting, this is not reported on here.

8.2. Methodology

8.2.1. The junction modelling has been undertaken using the following industry-standard software packages –

- Traffic signals – Linsig 3
- Roundabouts – Junctions 10 (ARCADY module)
- Priority junctions – Junctions 10 (PICADY module)

8.2.2. Traffic signal timing data for the existing junctions was supplied by Aberdeen City Council. Geometric parameters for the existing junctions and the identified options were measured using Ordnance Survey mapping in AutoCAD. The saturation flows that the modelling software derived from the identified geometric parameters were not calibrated as no queue data was available with which to base any calibration on.

8.3. Traffic Data

8.3.1. Aberdeen City Council provided weekday junction turning count data extracted from the Aberdeen City Centre Paramics Model 2019. The model used 2019 baseline traffic flows, and the Paramics network included the following development considerations:

- City Centre Low Emissions Zone (LEZ)
- City Centre Masterplan
- South College Street Junction Improvements
- Haudagain Junction Improvements
- Berryden Corridor Improvements

8.3.2. The supplied turning count data was provided in PCUs (passenger car units), and no data was provided for HGVs. As agreed with Aberdeen City Council no allowance was made for further background traffic growth or any committed developments.

8.3.3. Weekday AM and PM peak hour data was identified for each junction from the supplied data. The modelled scenarios were therefore as undernoted:

- Supplied weekday AM peak hour (08:00 – 09:00)
- Supplied weekday PM peak hour (17:00 – 18:00)

8.3.4. The traffic network diagrams for the supplied data are presented in CR-B.

8.4. Assessment Criteria

8.4.1. There are two general indicators for each software package used to identify whether a junction is operating within or over capacity. One indicator is linked to individual approaches, and the other is for the full junction.

- Linsig:
  - Degree of Saturation: approaches experiencing a Degree of Saturation (DoS) over 90% are operating above capacity.
  - Percentage Residual Capacity: this indicates how much additional traffic can be accommodated across the entire junction before a DoS of 90% is reached on a single approach. A positive value indicates that the junction retains spare capacity, and a negative value indicates that the junction is over capacity.
- Junctions 10 (both ARCADY and PICADY modules):
  - Ratio of Flow to Capacity: approaches experiencing a Ratio of Flow to Capacity (RFC) values of greater than 0.85 are operating at capacity, and approaches operating above an RFC of 1.0 are above capacity
  - Network Residual Capacity: similar to the PRC in Linsig, this indicates how much additional traffic can be accommodated across the junction before an RFC of 0.85 is reached on a single approach. A positive value indicates that the junction retains spare capacity, and a negative value indicates that the junction is over capacity.

8.5. Modelling Results Summary

8.5.1. This Section presents the summary results of the modelling for each of the identified options. The full modelling outputs are presented in CR-B, and summary results comparing the modelled Percentage Residual Capacities and Network Residual Capacities for the existing and identified options are presented in Table 8.1.

Table 8.1 – Percentage and Network Residual Capacity Summary

Junction	Existing		Option 1		Option 2	
	AM	PM	AM	PM	AM	PM
North Anderson Drive	19%	10%	25%	9%	n/a	n/a
Foresterhill Road	135%	139%	49%	43%	74%	71%
Westburn Drive	51%	33%	24%	-10%	21%	6%
Laurelwood Avenue	214%	115%	172%	93%	n/a	n/a

8.5.2. The summary results indicate that, with the exception of Westburn Drive Option 1 (the compact roundabout), each of the identified junction options would remain within operating capacity. The following sections provide more detailed results summarising the predicted queues and DoS / RFC on each approach to the junctions for each option.

8.5.3. It should be noted that some queues are denoted as "(flare)" because Linsig combines the queue lengths for 'long' and 'short' lanes into a single queue length. The long and short lanes have been identified in the results tables.

8.5.4. It is recommended that further junction modelling is conducted during RIBA Stages 3-4 when the junctions will be designed in further detail.

North Anderson Drive / Ashgrove Road West

8.5.5. The modelling results for the existing and future layouts for North Anderson Drive are presented in Table 8.2 and Table 8.3 respectively.

Table 8.2 – North Anderson Drive Modelling Results – Existing Layout (Linsig)

Approach	Lane / Direction	AM		PM	
		Queue (pcu)	DoS	Queue (pcu)	DoS
N Anderson Drive (north)	Left (short)	(flare)	75%	(flare)	72%
	Ahead 1 (long)	14.9	75%	13.6	72%
	Ahead 2	14.7	74%	13.3	71%
Ashgrove Road West (east)	Left	1.9	21%	2.2	22%
	Right	0.2	5%	7.1	80%
N Anderson Drive (south)	Ahead 1	10.6	57%	16.6	77%
	Ahead 2 (long)	9.9	65%	18.2	82%
	Right (short)	(flare)	76%	(flare)	82%
Residual Capacity			19.0%		10.3%

Table 8.3 – North Anderson Drive Modelling Results – Future Layout (Linsig)

Approach	Lane / Direction	AM		PM	
		Queue (pcu)	DoS	Queue (pcu)	DoS
N Anderson Drive (north)	Left / Ahead	16	72%	16	80%
	Ahead	16	72%	17	80%
Ashgrove Road West (east)	Left	4	70%	9	82%
	Right	(flare)	70%	(flare)	82%
N Anderson Drive (south)	Ahead 1	10	53%	19	78%
	Ahead 2 (long)	11	69%	20	83%
	Right (short)	(flare)	72%	(flare)	83%
Residual Capacity			24.6%		9.1%

8.5.6. The modelling of the preferred option for North Anderson Drive indicates that the junction would remain within capacity, as the residual capacity in both the AM and PM peaks are positive The highest DoS was reported as 82% on the east approach in the PM peak hour, below the 90% threshold.

8.5.7. A comparison of the modelled queues for the existing and preferred option for North Anderson Drive is presented in Table 8.4. It demonstrates that while queues are predicted to increase, these increases would be relatively limited, and would not extend beyond the available storage.

Table 8.4 – North Anderson Drive Queue Comparison

Approach	Lane / Direction	Approx Capacity (pcu)	Existing		Option 1	
			AM	PM	AM	PM
N Anderson Drive (north)	Left (short)	2	(flare)	(flare)	n/a	n/a
	Ahead 1 (long)	50	15	14	16	16
	Ahead 2	50	15	13	16	17
Ashgrove Road West (east)	Left	20	2	2	4	9
	Right	20	0	7	(flare)	(flare)
N Anderson Drive (south)	Ahead 1	26	11	17	10	19
	Ahead 2 (long)	26	10	18	11	20
	Right (short)	9	(flare)	(flare)	(flare)	(flare)

Foresterhill Road / Ashgrove Road West

8.5.8. The modelling results for the existing, Option 1, and Option 2 layouts for Foresterhill Road are presented in Table 8.5, Table 8.6, and Table 8.7 respectively.

Table 8.5 – Foresterhill Road Modelling Results – Existing Layout (Linsig)

Junction	Approach	Lane / Direction	AM		PM	
			Queue (pcu)	DoS	Queue (pcu)	DoS
West	Ashgrove Road West (internal)	Left	0	17%	0	6%
		Ahead	0	5%	2	16%
	Foresterhill (south)	Left (short)	(flare)	31%	(flare)	32%
		Right (long)	2	31%	2	32%
	Ashgrove Road West (west)	Ahead (long)	2	17%	3.2	25%
		Right (short)	(flare)	17%	(flare)	25%
East	Ashgrove Road West (internal)	Left	0	6%	1	6%
		Ahead	2	20%	3	28%
	Foresterhill (south)	All	4	38%	4	37%
	Ashgrove Road West (east)	Ahead (short)	(flare)	38%	(flare)	38%
		Right (long)	4	38%	3	38%
Residual Capacity				135%		139%

Table 8.6 – Foresterhill Road Modelling Results – Option 1 (ARCADY)

Junction	Approach	AM		PM	
		Queue (pcu)	RFC	Queue (pcu)	RFC
West	Ashgrove Road West Internal (east)	1	0.47	1	0.32
	Foresterhill (south)	0	0.15	1	0.38
	Ashgrove Road West (west)	0	0.29	0	0.30
East	Ashgrove Road West Internal (west)	1	0.38	1	0.47
	Foresterhill (north)	1	0.35	1	0.37
	Ashgrove Road West (east)	1	0.43	1	0.41
Residual Capacity			34%		32%

Table 8.7 – Foresterhill Road Modelling Results – Option 2 (Linsig)

Junction	Approach	AM		PM	
		Queue (pcu)	DoS	Queue (pcu)	DoS
West	Ashgrove Internal (east)	1	34%	3	32%
	Foresterhill (south)	2	31%	5	39%
	Ashgrove (west)	3	21%	4	31%
East	Ashgrove Internal (west)	3	29%	3	35%
	Foresterhill (north)	5	52%	5	53%
	Ashgrove (east)	5	44%	6	52%
Residual Capacity		74%		71%	

8.5.9. A comparison of the modelled queues for the existing and preferred option for North Anderson Drive is presented in Table 8.8. It demonstrates that Option 1 would reduce the queues across both the west and east junctions, while Option 2 would result in queues only marginally longer than the existing levels.

Table 8.8 – Foresterhill Road Queue Comparison

Junction	Approach	Lane / Direction	Approx Capacity (pcu)	Existing		Option 1		Option 2	
				AM	PM	AM	PM	AM	PM
West	Ashgrove (internal)	Left	3	0	0	1	1	1	3
		Ahead	3	0	2				
	Foresterhill (south)	Left (short)	2	(flare)	(flare)	0	1	2	5
		Right (long)	15	2	2				
	Ashgrove (west)	Ahead (long)	50	2	3	0	0	3	4
		Right (short)	8	(flare)	(flare)				
East	Ashgrove (internal)	Left	3	0	1	1	1	3	3
		Ahead	3	2	3				
	Foresterhill (north)	All	10	4	4	1	1	5	5
	Ashgrove (east)	Ahead (short)	4	(flare)	(flare)	1	1	5	6
		Right (long)	35	4	3				

Westburn Drive / Ashgrove Road / Ashgrove Road West

8.5.10. The modelling results for the existing, Option 1, and Option 2 layouts for Westburn Drive presented in Table 8.9, Table 8.10, and Table 8.11 respectively.

Table 8.9 – Westburn Drive Modelling Results – Existing Layout (Linsig)

Approach	Lane / Direction	AM		PM	
		Queue (pcu)	DoS	Queue (pcu)	DoS
Westburn (north)	Left / Ahead (long)	13	60%	16	67%
	Right (short)	(flare)	60%	(flare)	67%
Ashgrove Road (east)	Left / Ahead (long)	4	56%	3	43%
	Right (short)	(flare)	56%	(flare)	43%
Westburn (south)	Left / Ahead (long)	9	44%	16	67%
	Right (short)	(flare)	44%	(flare)	67%
Ashgrove Road West (west)	Left / Ahead (long)	5	56%	10	68%
	Right (short)	(flare)	56%	(flare)	68%
Residual Capacity		51.2%		32.8%	

Table 8.10 – Westburn Drive Modelling Results – Option 1 (ARCADY)

Approach	AM		PM	
	Queue (pcu)	RFC	Queue (pcu)	RFC
Westburn (north)	3	0.68	3	0.72
Ashgrove Road (east)	1	0.39	2	0.43
Westburn (south)	1	0.51	2	0.69
Ashgrove Road West (west)	1	0.52	8	0.91
Residual Capacity		24%		-10%

Table 8.11 – Westburn Drive Modelling Results – Option 2 (Linsig)

Approach	Lane / Direction	AM		PM	
		Queue (pcu)	DoS	Queue (pcu)	DoS
Westburn (north)	Left / Ahead (long)	18	74%	20	80%
	Right (short)	(flare)	74%	(flare)	82%
Ashgrove (east)	All	6	67%	6	70%
Westburn (south)	Left / Ahead (long)	11	53%	21	83%
	Right (short)	(flare)	53%	(flare)	83%
Ashgrove (west)	All	9	75%	14	85%
Residual Capacity			20.8%		6.3%

8.5.11. A comparison of the modelled queues for the existing and preferred option for North Anderson Drive is presented in Table 8.12. It demonstrates that Option 1 would result in significantly reduced queueing across the junction, with only the west approach predicted to experience any notable queueing (in the PM peak). Queues are predicted to increase for Option 2 but are likely to remain within the available storage. The predicted queue of 21pcu on the south approach in the PM peak would be spread across the ahead and right-turn lanes, which have a combined capacity of 25pcu.

Table 8.12 – Westburn Drive Queueing Comparison

Approach	Lane / Direction	Approx Capacity (pcu)	Existing		Option 1		Option 2	
			AM	PM	AM	PM	AM	PM
Westburn (north)	Left / Ahead (long)	50	13	16	2	3	18	16
	Right (short)	5	(flare)	(flare)			(flare)	(flare)
Ashgrove (east)	Left / Ahead (long)	10	4	3	1	1	6	6
	Right (short)	5	(flare)	(flare)				
Westburn (south)	Left / Ahead (long)	20	9	16	1	2	11	21
	Right (short)	5	(flare)	(flare)			(flare)	(flare)
Ashgrove (west)	Left / Ahead (long)	28	5	10	1	8	9	14
	Right (short)	5	(flare)	(flare)				

Laurelwood Avenue

8.5.12. The modelling results for the existing, Option 1, and Option 2 layouts for Laurelwood Avenue are presented in Table 8.13, Table 8.14, and Table 8.15 respectively.

Table 8.13 – Laurelwood Avenue Modelling Results – Existing (PICADY)

Approach	AM		PM	
	Queue (pcu)	RFC	Queue (pcu)	RFC
Laurelwood Avenue	0	0.18	16	0.30
Ashgroad Road (west)	0	0.23	3	0.34
Residual Capacity		214.0%		115.0%

Table 8.14 – Laurelwood Avenue Modelling Results – Future Layout (PICADY)

Approach	AM		PM	
	Queue (pcu)	RFC	Queue (pcu)	RFC
Laurelwood Avenue	0	0.00	16	0.00
Ashgroad Road (west)	0	0.24	3	0.37
Residual Capacity		172.0%		93.0%

Table 8.15 – Laurelwood Avenue Queueing Comparison

Approach	Approx Capacity (pcu)	Existing		Option 1	
		AM	PM	AM	PM
Laurelwood Avenue	n/a	0	0	0	0
Ashgroad Road (west)	16	0	0	0	0

8.5.13. The results indicate that the junction is operating under minimal pressure at present, and this will continue with the provision of the design option for Laurelwood Avenue.

8.6. Vehicular traffic circulation

8.6.1. The proposals for the east end of the Design Area include changing Laurelwood Avenue to a one-way operation, restricting traffic to southbound movements only. This will require traffic that would previously have travelled northbound on Laurelwood Avenue to seek an alternative route. The following assumptions have therefore been made with regards to traffic circulation in this location:

- All northbound Laurelwood Avenue traffic would instead travel northbound via the Berryden Corridor and then turn west onto Ashgrove Road at the new left-in / left-out junction provided as part of the Berryden Corridor.
- Traffic that would have previously turned left (west) from Laurelwood Avenue onto Ashgrove Road would instead be assumed to run east-west on Ashgrove Road from the Berryden left-in / left-out junction.
- Traffic that would have previously turned right (east) from Laurelwood Avenue onto Ashgrove Road would make the same movements as traffic turning left (west). However, instead of continuing west past Laurelwood Avenue it would stop at a destination between Laurelwood Avenue and the Berryden junction.

- Any traffic to the west of Laurelwood Avenue would be unaffected.

8.6.2. The supplied and proposed two-way traffic movements to the east of Westburn Drive, along with the identified change in flows, is summarised in Table 8.16

Table 8.16 - Ashgrove Road Traffic Circulation

Location	Observed		Proposed option		Change	
	AM	PM	AM	AM	AM	PM
Ashgrove Road (East of Westburn)	418	529	418	529	±0	±0
Ashgrove Road (West of Laurelwood Road)	338	499	338	499	±0	±0
Laurelwood Road	237	329	127	159	-111	-170
Ashgrove Road (East of Laurelwood Road)	131	227	239	344	+108	+117
Ashgrove Road (West of Berryden Road	52	222	162	391	+111	+170
Berryden North	1146	1286	1146	1286	±0	±0
Berryden South	1129	1108	1239	1278	+111	+170

9. Behaviour Change Activation

9.1.1. This section presents a summary of the Behavioural Change Activation Report; the full version of is presented in CR-A.

9.1.2. Aberdeen's significant investment in new transport infrastructure is essential in achieving the City's Active Travel Action Plan objective of increasing the number of people cycling and walking each day. As well as building high quality infrastructure, there is the need for targeted "activation" to maximise the mode shift potential. Activation refers to the physical interventions that will encourage people to travel more sustainably by providing them with the knowledge, resources and skills to do so.

9.1.3. Activation plans seek to engage communities, schools, businesses and other local stakeholders through a combination of activities to deliver behaviour change. Programme activities can include measures such as bike libraries, community cycle hubs, walking groups and led rides; in combination with campaigns, cycle training, partnerships, knowledge and awareness raising and promotion of active travel.

9.1.4. The bespoke Activation Plan proposed by Atkins will enable ACC to maximise the potential usage of the Ashgrove Connects project and to extend understanding of the benefits of improved infrastructure. Without developing an activation plan alongside an infrastructure scheme, the return on investment will be slower to realise or not be realised in full.

9.1.5. Community engagement has taken place throughout the project, helping to bring local people together and provide a platform for them to share ideas, and in doing so identify active travel and placemaking opportunities. Engagement within educational settings, community resident groups and public facing organisations has ensured that this Activation Plan is co-designed, has key stakeholder buy-in and incorporates inclusive initiatives that meet the needs of the local communities.

9.1.6. Table 9.1 summarises the activities required to deliver the activation plan over the first three years, with the aim of reducing revenue funding as the physical interventions are implemented. Note that 'M&E' refers to the Monitoring and Evaluation Plan.

Table 9.1 – Behaviour Change Activation Plan Estimated cost

Year	Activity	Consultant / Third party suppler cost (£)	Assumptions	Total
Year 1	Development and approval of the Ashgrove Connects Behaviour Change Activation Plan	£20,000	The work to develop the finalised Activation Plan will be carried out by a chosen consultant via the approved commissioning process	£20,000
	Delivery of School Activation	£10,000	Third party suppliers to delivery chosen interventions	£10,000
	Overall coordination of the Activation Programme (including M&E)	£5,000	ACC to appoint a qualified programme coordinator to oversee the Activation Programme	£5,000
Total Year 1				**£35,000**
Year 2	Delivery of School Activation	£30,000	As above	£30,000
	Delivery of Community Activation	£30,000		£30,000
	Delivery of Business Activation	£5,000		£5,000
	Overall coordination of the Activation Programme (including M&E)	£15,000		£15,000
Total Year 2				**£80,000**
Year 3	Delivery of School Activation	£20,000	There is an assumption that year three costings will reduce as activities become self-sustained after the year 2 delivery period.	£20,000
	Delivery of Community Activation	£20,000		£20,000
	Delivery of Business Activation	£5,000		£5,000
	Overall coordination of the Activation Programme (including M&E)	£15,000		£15,000
Total Year 3				**£60,000**
Combined Activation Total				**£175,000**

9.1.7. It is recommended that these projected revenue costs are included in a future funding bid.

10. Delivery Options Appraisal

10.1.1. Further to the detailed assessment of scheme options, consideration has been given to the packaging of interventions for phased or partial delivery. These are scored against design objectives, deliverability and high-level cost assumptions. This section appraises packaging options against broad achievement of objectives.

10.2. Description of Options packages

10.2.1. The package options are described briefly below. It is assumed in all options that engagement, behaviour change and monitoring and evaluation would take place.

Do nothing

10.2.2. No change to the infrastructure in the area beyond the Berryden Corridor Improvement (BCI) scheme. While the lowest risk to deliver, this option may be impacted by public acceptance of no change.

Do Minimum 1 – Minor pedestrian improvements

10.2.3. This option is to implement side road, crossing and junction treatments to benefit pedestrians. This would include providing continuous footways, tightened corner radii and build outs to prevent parking in locations that impede other users.

10.2.4. The benefit of this option is that it would provide quick win benefits and is low deliverability risk. However, this option may not attract third party funding due to the limited impact of the interventions and may be less supported by the community than other options.

Do Minimum 2 – Soft segregated cycle tracks

10.2.5. This option is a lower cost way to provide cycle tracks within the confines of the existing carriageway, for example by providing bolt-down rubber kerbs. For the purpose of this option, it is proposed that at junctions these tracks transition into existing stop lines.

10.2.6. This option has the same impact on parking as full implementation, other than at Ashgrove Road east of Laurelwood Avenue where the existing layout can be retained. The primary benefit of this option is the relatively fast implementation time and lower cost. However, the benefit would primarily be for people cycling and not for other users. For this reason, it may be less supported by the community than other options unless clearly conducted as a temporary measure.

Do Minimum 3 – Ashgrove Road, Laurelwood Avenue and Elm Place traffic circulation only

10.2.7. This option would be to implement only the revised traffic circulation plans to complement the Berryden Corridor Improvement (BCI). This would reduce traffic on Laurelwood Avenue and Elm Place but would have limited impact on the other objectives. On its own it may be less publicly acceptable for residents in Ashgrove Road West.

Do Something 1 – Full implementation

10.2.8. This option would propose to implement the full scheme outlined in Chapter 4 of this report. The benefits of the scheme are to provide lower traffic impact on communities, the highest potential mode shift to sustainable modes, lower cost access to employment and improved community cohesion and satisfaction.

Do Something 2 – Ashgrove Road, Laurelwood Avenue and Elm Place only

10.2.9. This option is to implement the full proposed improvements at the east end of the study area between Westburn Drive and Berryden Road. The significant benefit to this option is to complement the BCI scheme and to respond to community priorities alongside BCI implementation.

Do Something 3 – Junctions and crossings + Do Something 2

10.2.10. This option is to implement the proposed junction improvements on Ashgrove Road West alongside the full redesign of the east end of the study area as described in Do Something 3. Junctions are the most hazardous locations for people walking and cycling and this would offer improvement for people walking, cycling and wheeling in the area at lower implementation cost than the full scheme.

Do Something 4 – Ashgrove Road West only

10.2.11. This option is to implement the full proposed improvements at the east end of the study area between Westburn Drive and Berryden Road. The benefit of this is that implementation on Ashgrove Road presents less delivery challenges than the east end of this site and would address the most significant traffic issues identified as well as provide more community spaces for residents. However this option (without also implementing the east end of the study area) would leave a gap in the cycle network connection between the communities and the city.

Assumed cost

10.2.12. An order of cost estimate has been prepared for the delivery of the full scheme (Do Something 1), at between £15-16m including all design development and construction fees. In order to develop order of scale cost to compare alternative options, the categorisation in Table 10.1 is applied:

Table 10.1 – Categorisation of order of scale cost

Category	Order of scale cost
High	£10m to £16m
Medium	£5m to £10m
Low	£0m to £5m

Qualitative Appraisal of packages

10.2.13. A 7 point qualitative scoring scale has been applied to each option, as shown in Table 10.2.

Table 10.2 – Qualitative appraisal scale

Score	Benefit	these are benefits or positive impacts which, depending on the scale of benefit or severity of impact, the practitioner feels should be a principal consideration when assessing an option's eligibility for funding;
+3	Major benefit	these are benefits or positive impacts which, depending on the scale of benefit or severity of impact, the practitioner feels should be a principal consideration when assessing an option's eligibility for funding;
+2	Moderate benefit	the option is anticipated to have only a moderate benefit or positive impact. Moderate benefits and impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together do so;
+1	Minor benefit	the option is anticipated to have only a small benefit or positive impact. Small benefits or impacts are those which are worth noting, but the practitioner believes are not likely to contribute materially to determining whether an option is funded or otherwise.
0	No benefit or impact	the option is anticipated to have no or negligible benefit or negative impact.
-1	Small minor cost or negative impact	the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding but taken together could do so.
-2	Moderate cost or negative impact	the option is anticipated to have only a moderate cost or negative impact. Moderate costs/negative impacts are those which taken in isolation may not determine an option's eligibility for funding, but taken together could do so;
-3	Major cost or negative impacts	these are costs or negative impacts which, depending on the scale of cost or severity of impact, the practitioner should take into consideration when assessing an option's eligibility for funding.

Table 10.3 – Qualitative scoring against objectives

Package	City & Region Policy	Transport Scotland/ Sustrans	Design objectives	Total
Do nothing	0	0	0	**0**
Do minimum 1 – Minor pedestrian improvements	+1	+1	+1	**+3**
Do Minimum 2 – Soft segregation cycle tracks	+1	+1	+1	**+3**
Do Minimum 3 – Ashgrove Road, Laurelwood Avenue and Elm Place traffic circulation only	+1	0	+1	**+2**
Do Something 1 – Full implementation	+3	+3	+3	**+9**
Do Something 2 – Ashgrove Road, Laurelwood Avenue and Elm Place only	+1	+1	+2	**+4**
Do Something 3 – Junctions and crossings + Do Something 2	+2	+2	+2	**+6**
Do Something 4 – Ashgrove Road West only	+1	+1	+2	**+4**

Table 10.4 – Qualitative scoring against deliverability

Package	Public acceptance	Technical Feasibility	cost	Affordability	Total
Do nothing	-2	+3	Low *	-1	**0**
Do minimum 1 – Minor pedestrian improvements	-1	+3	Low *	-1	**+1**
Do Minimum 2 – Soft segregation cycle tracks	-2	+2	Low	+3	**+1**
Do Minimum 3 – Ashgrove Road, Laurelwood Avenue and Elm Place traffic circulation only	-1	+2	Low*	-1	**-1**
Do Something 1 – Full implementation	+2	+1	High	+2	**+5**
Do Something 2 – Ashgrove Road, Laurelwood Avenue and Elm Place only	0	+2	Med	+2	**+4**
Do Something 3 – Junctions and crossings + Do Something 2	+2	+1	High	+2	**+5**
Do Something 4 – Ashgrove Road West only	+1	+2	Med	+1	**+3**

* May be unlikely to receive third party funding

10.3. Summary of Delivery Options Appraisal

10.3.1. The Do Nothing and Do Minimum options offer minor benefits and are unlikely to meet with significant public acceptance. Most of these options may not receive third-party funding and therefore may compare unfavourably with some higher cost options. They are not considered further as viable at this stage.

10.3.2. All the Do Something Options demonstrate moderate or major benefits against City policy outcomes, Design Objectives and to a varying degree public acceptance.

10.3.3. Full implementation of the scheme offers the most significant benefits to the City and is therefore likely to attract the greatest public acceptance as well as clear alignment with the objectives of the main third-party funder. It is recommended that this is progressed as a single project in order to maximise the impact.

10.4. Funding and Construction phasing

10.4.1. Three important factors have been considered in relation to the recommended phasing of project delivery:

- The source of third party funding that this project is primarily aligned with is Transport Scotland/ Sustrans‘ Places for Everyone Fund. This offers 100% design funding and 70% construction funding. The next window for applications closes on 18th October 2022 for funding announcements in December 2022 (Places for Everyone - Sustrans);

- Aberdeen City Council can use the Berryden Corridor Improvement as match funding to cover the remaining 30% construction funding provided the projects are delivered at least partly in the same construction year. BCI construction begins in 2023-24; and
- Full implementation of Ashgrove Connects will maximise the benefits of the BCI and maximise the potential for public acceptance.

Primary delivery phasing recommendation

10.4.2. This appraisal therefore recommends that Ashgrove Connects is progressed to Stage 3-4 as a single project and that it is delivered in parallel with the BCI Improvement.

Alternative delivery phasing option

10.4.3. There may be a reason in the future to deliver the project in phases. There are many ways to phase delivery, some of which are considered in 'Do Something' options in the appraisal. However the most beneficial alternative phasing to maximise benefits to the community and to the BCI is to:

- Deliver the east end of the study area (Ashgrove Road, Laurelwood Avenue and Elm Place) are implemented prior to or alongside BCI delivery;
- Deliver Ashgrove Road West proposals in a second phase subsequently; and
- Ensure that the North Anderson Drive junction design and the A92 multi-modal corridor proposals are complementary to each other, although they do not necessarily have to be aligned to the same timescale.

10.4.4. The detail of this is considered further in the Business Case.

11. Economic Impact

11.1. Overview of Benefits

11.1.1. By improving the quality of this area, and by delivering new places to rest and dwell, Ashgrove Connects will deliver amenity and recreational benefits along the corridor. Public realm improvements have been shown to increase local levels of economic activity, boost property values, and make an area more attractive to potential investors.[1]

11.1.2. ACC is seeking to deliver on local and national commitments to accessible neighbourhoods.[2] Compact communities improve the accessibility of key amenities and services for non-motorised users. This would also allow people to travel actively in support of their health and well-being, without access being limited by the cost of transport.[3]

11.1.3. Walking, wheeling, and cycling provide affordable and reliable transport.[4] Investment in areas of multiple deprivation can promote differential equity impacts by improving access to services and employment opportunities for those on a low income. Further, projects which reduce car dependency may free up additional disposable income for impacted households.[5]

11.1.4. There are also wider benefits of the scheme which need to be considered. Such impacts are increasingly given greater weight in transport policy. The Scottish Government's new *National Transport Strategy* places walking and wheeling and the top of the sustainable transport hierarchy, followed directly by cycling.[6]

11.1.5. Active travel projects encourage modal shift from the private car. By reducing the need to travel unsustainably, active travel projects can help meet transport planning objectives to reduce traffic congestion, energy consumption, and carbon emissions.[7] The *Council Climate Change Plan 2021 – 2025* states that ACC will promote active travel for these reasons to help tackle the climate emergency.[8] Encouraging people to walk and cycle also means lower roads maintenance costs to the Council,[9] fewer accidents and collisions, and improved air quality.

11.1.6. The health benefits of active travel are well-established. Increasing walking and cycling trips is a cost effective and practical way to improve public health as it gets more people out exercising more often.[10] GPs in some parts of the UK are now even prescribing walking and cycling to patients as a way to improve public health and reduce costs to the NHS.[11] There is a clear link between

[1] Living Streets (2018). *The Pedestrian Pound: the business case for better streets and places*.
[2] The Scottish Government committed to the 20-minute neighbourhood concept in the *2020-21 Programme for Government*. ACC included the concept as one of the key assessment themes in the *Place Based Investment Programme Fund*.
[3] ClimateXChange (2021). *20-minute neighbourhoods in a Scottish context*.
[4] World Health Organisation (2022). *Walking and cycling: latest evidence to support policy-making and practice*.
[5] Scottish Government (2022). *Reducing car use for a healthier, fairer, and greener Scotland*.
[6] Scottish Government (2020). *National Transport Strategy*.
[7] Christian Brand, et al. (2022). *The Climate Change Mitigation Effects of Daily Active Travel in Cities*
[8] Aberdeen City Council (2021) *Council Climate Change Plan 2021 – 2025*.
[9] Relative to the equivalent journey by car. See: Todd Litman (2016), *Transportation Cost and Benefit Analysis Guidebook*, Section 5.6.
[10] Scottish Government (2019). *National Walking Strategy: Action Plan 2016-2026*.
[11] Davies, N. (2022). *GPs to prescribe walking and cycling in bid to ease burden on NHS*. The Guardian.

increased physical exercise and reduced risk of chronic conditions like type 2 diabetes, heart disease, many types of cancer, depression and anxiety, and dementia.

11.1.7. Health benefits will even accrue to people who do not travel using the new active travel infrastructure. An increased mode share to walking and cycling will improve air quality across the project area. This will complement the Council's LEZ (Low Emission Zone) strategy, which was developed in response to dangerous levels of air pollution (mainly nitrogen dioxide – NO2) mostly caused by road traffic.

11.1.8. Finally, projects like Ashgrove Connects make active travel more safe, reliable, and, crucially, fun. Walking, wheeling, and cycling is already less stressful than driving[12] but improved infrastructure will enhance the quality of any journey and deliver enjoyment and wellbeing benefits to those who use it.[13]

11.1.9. The wide range of benefits anticipated through the Ashgrove Connects scheme is summarised in Table 11.1 overleaf.

Table 11.1 – Anticipated Benefits of Ashgrove Connects

Community impacts	Enables walkable and cyclable neighbourhoods Greater accessibility of amenities and services Differential equality impacts for people on low incomes Reduces car dependence	Amenity value and public realm	Improves accessibility for non-motorised users Transport cost savings Open space preservation Improves quality of life
Modal shift from the private car	Reduces carbon emissions Reduces traffic congestion Lower road maintenance costs Fewer road accidents Improves local air quality	Health impacts	Higher levels of physical activity Improves health Fewer sick days – economic growth Reduces costs to the NHS
Journey quality benefits	Improves user convenience, comfort, and safety Enjoyment and wellbeing impacts		

Monetising Active Travel Benefits

11.1.10. Active travel, accessible neighbourhoods, and the sustainable transport hierarchy have been established as policy priorities by the Scottish Government. A wealth of academic and grey literature supports this view, demonstrating the net positive impact of related projects at a macro level. ACC has accordingly focused on how best to deliver on these priorities by consulting our communities and businesses and designing schemes to a high quality, rather than directing resource to indicative monetary estimates.

11.1.11. Transport appraisal guidance in Scotland and the UK focuses largely on vehicular traffic. The primary benefits of transport investments, in the view of transport economists, are journey time

[12] Alexander Legrain, Naveen Eluru, and Ahmed M. El-Geneidy (2015). *Am Stressed, Must Travel: The Relationship between Mode Choice and Commuting Stress*
[13] Leonhard K. Lades, Andrew Kelly, and Luke Kellehera (2020). *Why is active travel more satisfying than motorized travel? Evidence from Dublin*.

savings. Such savings are valued because they allow more productive work to be carried out or more leisure to be enjoyed, at least in the short-run.[14] Consequently, there has been little space, historically, for the 'slow modes' – as walking, wheeling, and cycling were once described.

11.1.12. The UK Department for Transport (DfT) has now developed an approach for active travel schemes.[15] This allows the health benefits of walking and cycling to be considered, and benefit–cost ratios for such schemes can be much higher than for conventional road improvements.[16] Yet such appraisals rely on resource-intensive demand forecasts which are inherently uncertain. The DfT notes that due to relatively low scheme costs, cost-benefit analysis is highly sensitive to the findings of these forecasts.[17]

11.1.13. This points to the paradox in active travel appraisal. The extensive evidence base – government policy, academic literature, and climate and health data – all point to the benefits of sustained investment in active travel schemes. At the same time, evidencing the benefits of a specific scheme is resource intensive and fraught with uncertainties. Decision makers across Europe have often therefore relied on the larger evidence base alone to make the case for local cycling schemes. The focus is often instead on the outcomes which will contribute to wider mode shift at regional or national levels.

11.1.14. For example, the Parisian municipal government published its *Plan Vélo 2021-2026* in December 2021.[18] This new plan aims to make the city '100% cyclable' by constructing over 112 miles of segregated cycle lanes. The city committed to this €250 million investment in cycling infrastructure and did not need to justify this through formal cost-benefit analysis. Instead, the positive impact of cycling was established at a national level by the French government.[19]

11.1.15. Similarly, Copenhagen has excellent cycling infrastructure with segregated cycle lanes on every main road. Over a quarter (28%) of all trips and almost half (49%) of commutes to work or education were taken by bike in 2018.[20] At the publication of its first bicycle account in 1996 and later when the city launched its ambitions to become the "best cycling city of the world" in 2006, no cost-benefit analysis underpinned the business case for cycling infrastructure.[21] Instead, the city has focused on directly measurable indicators, such as trip numbers, the length of the cycle network, and budget allocations, as well as regular surveys of cyclists.[22]

11.1.16. Oslo undertook extensive consultation before the publication of its city cycling strategy in 2015.[23] Once again, instead of focusing on notional benefits derived from models, the city is targeting measures around travel behaviour, journey quality, and user safety. Regular surveys of the

[14] David Metz (2016). *Travel Fast or Smart?: A Manifesto for an Intelligent Transport Policy*. London Publishing Partnership.
[15] Department for Transport (2020). *TAG UNIT A5.1 Active Mode Appraisal*.
[16] Department for Transport (2014). *Value for Money Assessment for Cycling Grants*
[17] Department for Transport (2020). *TAG UNIT A5.1 Active Mode Appraisal*. para. 2.1.4.
[18] Ville de Paris (2021). *Plan Vélo 2021-2026*.
[19] République française (2021). *Impact économique et potentiel de développement des usages du vélo en France en 2020*.
[20] City of Copenhagen (2019). *The Bicycle Account 2018*.
[21] COWI (2009). *Economic evaluation of cycle projects - methodology and unit prices*.
[22] City of Copenhagen (2011). *Good, Better, Best The City of Copenhagen's Bicycle Strategy 2011-2025*.
[23] Oslo kommune (2015). *Oslos sykkelstrategi 2015-2025*

communities affected forms an integral part of monitoring and evaluation, rather than ex post measurements of economic impact.[24]

11.1.17. This approach can even be found in the UK. The Mayor of London introduced the Mini-Hollands scheme in 2013. Here, outer London Boroughs were invited to bid for funding to build Dutch-style cycling infrastructure.[25] Waltham Forest constructed 14 miles of segregated cycling paths and introduced extensive traffic calming and mixed mode crossing. The Borough's bid to the Greater London Assembly makes no mention of monetised benefits, instead outlining the likely qualitative benefits of the scheme and committing to monitoring trip and accident data.[26] The other successful bids did include monetised assessments, however, here again, community impacts/ improved quality of life benefits were considered prominently in both cases.[27]

11.1.18. The outcomes set out in the Monitoring and Evaluation framework (see Section 11.2) confirm the wide range of benefits associated with the scheme. While these have not been monetised it is clear that the scheme would deliver high Value for Money should formal cost-benefit analysis be undertaken.

11.2. Monitoring & Evaluation

Introduction

11.2.1. This Chapter sets out a brief outline of the Monitoring & Evaluation (M&E) Plan, and the current Stage 1-2 plan is presented in CR-C.

Purpose

11.2.2. In line with Sustrans' Places for Everyone funding application requirements and Transport Scotland policy guidance, the Ashgrove Connects Stage 1-2 M&E Plan develops a framework which would be used to capture, analyse and present data required to evaluate the likely impacts of the project pre and post construction. This also serves as a reference tool to guide future monitoring activities throughout the remaining lifecycle of the project.

Monitoring & Evaluation Framework

11.2.3. The proposed framework outlines a series of quantitative and qualitative outcomes and performance indicators based on overarching project objectives (Walking/Wheeling, Cycling, Crossings and Junctions etc.) which would be used to measure the project's impact. A sample of these include:

- Quantitative:
    - Peak and daily through traffic movements in the area;
    - Percentage of LGV/HGV movements;
    - Mean, max and 85%ile traffic speeds;

[24] Oslo kommune (2021). *Holdningsundersøkelse om å sykle Oslo 2020*
[25] Mayor of London (2016). *Transforming cycling in outer boroughs: Mini-Hollands programme*
[26] Waltham Forest Council (2013). *Mini-Holland bid*.
[27] Enfield Council (2013). *Mini-Holland bid report;* Royal Borough of Kingston upon Thames (2014). *Kingston mini-Holland Programme outline business case*

- Road collisions and casualties.

- Qualitative:
  - Perceptions of safety in the design area;
  - Perceived attractiveness of the design area;
  - Perceived friendliness of walking/wheeling, and cycling journeys in the design area;
  - Walking Audit scores.

11.2.4. Monitoring activities proposed within the plan are oriented towards tackling identified (actual and perceived) issues within the design area and achieving the Design Objectives. Evaluation of the project, similarly, are oriented to assess the extent to which these issues have been mitigated and objectives have been achieved post-construction.

Future Reporting Requirements

11.2.5. There are noted to be three main outputs of the Monitoring and Evaluation Plan, these are.:

- Baseline (Pre-construction) Monitoring reports, which evidence the baseline performance and potential impacts of a proposed route/project and its surrounding study area from inception to project handover to / adoption.
- 1-Year After (1YA, Interim) Monitoring Studies, which serves as an interim output of the M&E Plan, presenting the findings from data gathered and surveys undertaken one full year after a project's construction and certification. The 1YA study represents a benchmark for short-term objectives.
- 3-5 Years After (3-5YA, Final) Monitoring Studies, this serves as the final output of the Monitoring & Evaluation Plan. Presenting the findings from data gathered and surveys undertaken after the scheme has been operation for 3 or 5 years. 3YA or 5YA studies are used to evaluate longer-term objectives.

11.2.6. It is recommended that funding allowance is made during Stage 3-4 to ensure that all necessary baseline data is captured and future funding applications allow for post-implementation monitoring.

12. Summary and Recommendations

12.1.1. This report has been prepared to the DMRB TD37/93 Stage 2 Scheme Assessment report structure in accordance with the client's requirements. It summarises the baseline context and Design Objectives. as reported in full in the Baseline Assessment (document CR-K), and summarises the assessments undertaken to refine and develop the identified Concept Design options to be taken to RIBA Stage 3 design.

12.2. Design Objectives

12.2.1. Design Objectives were developed from a combination of community engagement, established policy, and technical analysis of opportunities and constraints. The Design Objectives were then validated by the Stakeholder Working Group. The Design Objectives define how the scheme options are assessed and should continue to steer the development of the proposals through subsequent design stages.

12.3. Scheme Options Assessment

12.3.1. A three stage Options Assessment was undertaken to identify a concept design proposal. This was complemented by extensive community engagement to inform the designs.

12.3.2. The resulting concept design has therefore robustly considered a broad range of options and enjoys broad public and stakeholder support.

12.4. Proposed option

12.4.1. The proposed changes are:

- 20mph speed limit on Ashgrove Road and Ashgrove Road West;
- Reduced carriageway width and crossing distances;
- Continuous footways at side roads to provide design priority for pedestrians;
- One new controlled crossing of Ashgrove Road West;
- A significant net increase in the number of street trees and green infrastructure;
- Two new opportunities for public realm features as gateways into the community;
- Segregated cycle tracks on
    - Ashgrove Road West;
    - Ashgrove Road between Westburn Drive and Laurelwood Avenue; and
    - Laurelwood Avenue and Elm Place.
- Enhanced bus stop facilities and cycle bypasses of bus stops; and
- Reduction in available on street parking commensurate, prioritising residential need where required.

12.5. Benefits

12.5.1. The benefits of the project are:

Community impacts	• Enables walkable and cyclable neighbourhoods • Greater accessibility of amenities and services • Differential equality impacts for people on low incomes • Reduced car dependence	Amenity value and public realm	• Improved accessibility for non-motorised users • Transport cost savings • Open space preservation • Improved quality of life
Modal shift from the private car	• Reduced carbon emissions • Reduced traffic congestion • Lower road maintenance costs • Fewer road accidents • Improved local air quality	Health impacts	• Higher levels of physical activity • Improved health • Safer roads for all users • Fewer sick days – economic growth • Reduced costs to the NHS
Journey quality benefits	• Improved user convenience, comfort, and safety • Enjoyment and wellbeing impacts		

12.6. Costs

12.6.1. Cost estimates have been provided, at an estimated £16million to full construction (subject to assumptions and exclusions, including inflationary uncertainty).

12.6.2. The Business Case estimates that while there are short-term adaptations to be made the reallocation of road-space from vehicular traffic to sustainable modes is likely to result in either a neutral or reduced maintenance burden for ACC.

12.7. Deliverability

12.7.1. The scheme is largely designed within the existing public boundary, with standard engineering constraints to mitigate.

12.8. Packages and phasing

12.8.1. A number of package options were appraised. Full implementation offers the greatest maximisation of benefits and alignment with policy and objectives, particularly if delivered prior to or alongside the BCI.

12.8.2. The scheme is well aligned with Transport Scotland/ Sustrans' Places for Everyone funding which makes delivery affordable. This fund offers full design development costs and 70% of construction funding. The match funding element can be secured if the project is delivered prior to or alongside BCI implementation.

12.9. Next Steps

12.9.1. It is therefore recommended that ACC applies for funding for RIBA Stages 3-4 in October 2022 (for 2023-24) for the full scheme and to target construction commencement within the BCI construction period.

12.9.2. The immediate next steps are therefore to:

- Seek Council City Growth and Resources Committee approval to proceed;
- Update the community on progress;
- During RIBA Stage 3 it will be important early in the design process to:
- Invest further in community relations by continuing the depth of engagement to date;
- Address the identified gaps in response from businesses and local disability representatives;
- Work with stakeholders to plan implementation of the Behaviour Change Activation Plan;
- Plan for all monitoring and evaluation baseline data collection to be complete prior to implementation;

12.9.3. At an early stage in the design process address the remaining design challenges prior to detailed design, in particular to:

- Determine whether the final preferred options at Foresterhill/ Foresterhill Road and at Westburn Drive should be signal-controlled or roundabout junctions;
- Finalise the balance of parking layouts and streetscape enhancements at Laurelwood Avenue and the east end of Ashgrove Road by continuing to engage in detailed discussions with residents and ACC officers;
- Develop detailed solutions for maintenance, materials, sustainable urban drainage (including the potential for rain gardens) and for public realm and landscaping enhancements through further detailed engagement with relevant ACC officers.

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Appendix A

High Level Options Assessment

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Member of the SNC-Lavalin Group

Design Objectives		
1	Traffic	The street is a slower, quieter, and calmer environment where traffic access is retained but people feel safer, and traffic is less of a barrier to community activity for people of all ages and abilities.
2	Crossings and Junctions	Using junctions and crossing is an easier and more comfortable experience, which is accessible for people of all ages and abilities by all means of travel.
3	Place Quality and Greenspace	The street feels more attractive and safer for people to spend time in, with improved access to and through local greenspaces, the distinctive feel of local spaces enhanced and an overall net gain of 'green'.
4	Walking	People of all ages and abilities can more easily walk to access facilities safely, comfortably, and independently.
5	Cycling	People of all ages and abilities are able to move around by bicycle safely, comfortably, and independently.
6	Parking and Loading	Provide parking and loading within a reasonable distance of homes and businesses ensuring equitable access for all.

Ratings

These ratings are to describe, in a basic form, how the design options align with Design Objectives.

Achieves Design Objective
Partially achieves Design Objective
Doesn't Achieve Design Objective

	Location		Option		Objectives appraisal						Take forward to detailed assessment	
Location ref	Location description	Option Ref	Definition	Description	Traffic	Crossings & junctions	Place & greenspace	Walking	Cycling	Parking & loading		Comments on filtering decision
All	All	1	Traffic speed limit	30mph speed limit						n/a	N	Extensive research demonstrates that 30mph speed limit settings are less compatible with community environments than 20mph settings, for reasons of safety, perceptions of safety.
All	All	2	Traffic speed limit	20mph speed limit						n/a	Y	Extensive research demonstrates that 20mph is the appropriate speed limit for most urban streets, is the default speed limit for tertiary/ local streets in the Aberdeen Roads Hierarchy and is gradually being implemented as the default urban speed limit across the UK. The concept design works towards a lower design speed compatible with a 20mph limit
All	All	3	Traffic speed limit	Neighbourhood speed limit (10mph or lower)						n/a	N	A 5-10mph speed limit is compatible with neighbourhood streets with a high place value, relatively high housing density and lots of community and play activity. The volume of traffic (circa 6,000-10,000 vpd) and environment is not considered conducive to a self-enforcing 10mph speed limit.
All	Main corridor	1	Traffic calming	Vertical deflection			n/a			n/a	N	The whole Ashgrove Road West/ Ashgrove Road corridor is a bus route as well as an emergency vehicle route. Aberdeen City's approach is to not implement vertical traffic calming on such routes.
All	Main corridor	2	Traffic calming	Horizontal deflection			n/a			n/a	Y	The use of carriageway narrowing, horizontal deflections, tightening of corner radii and the removal of right turn ghost islands or filters, as well as bringing but stop boxes into the mainline flow, are all permitted techniques for slowing traffic.
All	Side streets	3	Traffic calming	Vertical deflection			n/a			n/a	Y	In most cases, side streets do not carry bus or emergency vehicle traffic and traffic volumes are low. Therefore vertical traffic calming to control speed and provide pedestrian and cycle priority is permitted. There are some exceptions and this should be considered on a case by case basis.
All	Side streets	4	Traffic calming	Horizontal deflection			n/a			n/a	Y	The use of carriageway narrowing, horizontal deflections, tightening of corner radii and the removal of right turn ghost islands or filters, as well as bringing but stop boxes into the mainline flow, are all permitted techniques for slowing traffic.
All	All	1	Footways	Do nothing - retain existing surface	n/a	n/a			n/a	n/a	N	Existing footway surface is uneven and the roots of mature street trees disrupt the surface. It is likely that trees may fail over time
All	All	2	Footways	Do minimum - limited patching and resurfacing in the worst locations	n/a				n/a	n/a	N	While this should not be taken forward as the priority - the reality of funding priorities may mean that this option is kept on the table at further stages of design
All	All	3	Footways	Replacement and reinstatement of trees only where necessary for the scheme	n/a				n/a	n/a	N	While this should not be taken forward as the priority - the reality of funding priorities may mean that this option is kept on the table at further stages of design
All	All	4	Footways	Replacement and reinstatement of trees + resurface damaged surface throughout	n/a				n/a	n/a	Y	The Stage 2 design should aim to price for full reinstatement, however the requirement should be revisited at stage 3 to prioritise investment.

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Location ref	Location description	Option Ref	Definition	Description	Traffic	Crossings & junctions	Place & greenspace	Walking	Cycling	Parking & loading		Comments on filtering decision
ARW	Ashgrove West	1	traffic lane widths	Retain existing carriageway space allocations							N	Existing carriageway lane widths encourage high speed and overtaking and limits the opportunity to achieve other objectives. There is considerable under-utilised carriageway space at present.
ARW	Ashgrove West	2	traffic lane widths	Traffic movement lanes 3m each + clearance distances							Y	Through traffic, HGV and bus movement can be accommodated and will allow space to be reallocated to achieve the other objectives. Narrow carriageways encourage low traffic speed. Full free-flow clearances on a through route (rather than access) recommended by the NRDG would result in a total two-lane carriageway width of 6.7m, however this assumes no mirror overhang of the kerb, full clearance from kerb and 0.3m between opposing vehicle mirrors. The heavy vehicle flows on this tertiary/ local route that is primarily for access justify a narrower assumption of 6.5m, particularly where there is clearance distance to footway infrastructure and pedestrians that would be the case with protected cycle tracks.
ARW	Ashgrove West	3	traffic lane widths	Traffic movement lanes less than 3m each							N	Through traffic, HGV and bus movement cannot be accommodated. Lanes narrower than 3m creates safety risk for these movements at the identified volume.
ARW	Ashgrove West	1	cycling space	Shared carriageway with traffic		n/a	n/a				N	This may help maximise space for placemaking and green infrastructure. However where two-way traffic volume exceeds 200 PCUs per hour or speeds are over 30kph it will not achieve a high level of service for all ages and abilities and is likely to encourage cycling on footways.
ARW	Ashgrove West	2	cycling space	Shared footway		n/a	n/a				N	In combination with a narrow carriageway, this may help maximise space for placemaking and green infrastructure. However cycling on footways in the urban setting is not appropriate to allow all ages and abilities of pedestrian to feel comfortable. Equally it will not provide cycle users with sufficient directness and comfort and confident cyclists will not use it
ARW	Ashgrove West	3	cycling space	Uni-directional painted lanes		n/a	n/a				N	Where two-way traffic volume exceeds 200PCUs per hour or speeds are over 30kph this will not achieve a high level of service for all ages and abilities , and is likely to encourage cycling on footways.
ARW	Ashgrove West	4	cycling space	Uni-directional protected tracks		n/a	n/a				Y	The highest level of service for all ages and abilities on heavily trafficked streets. This is also the most space hungry and will require the carriageway to be narrowed to 6-6.5m to be accommodated. Impact on measured parking demand is minimal
ARW	Ashgrove West	5	cycling space	Bi-directional protected tracks		n/a	n/a				Y	Bi-directional tracks are suitable for all ages and abilities and perform far better than non-protected options. In comparison with uni-directional tracks they have slight space-saving advantages, however they are typically less coherent and can create additional conflicts at junctions. It is recommended that they are only used where space or functionality prevents the use of uni-directional tracks. Impact on measured parking demand is minimal
ARW	Ashgrove West	1	On-street parking	Retain existing capacity	n/a	n/a					N	Surveys indicate that there is very little on street parking and the vast majority of existing capacity is unused. Retention of on-street parking will limit the opportunity to use the space for movement and place
ARW	Ashgrove West	2	On-street parking	Meet isolated residential demand	n/a	n/a					N	Surveys indicate a very low level of overnight (assumed to be residential) on-street parking (3 vehicles). This can be accommodated in off-street locations or on side streets
ARW	Ashgrove West	3	On-street parking	Remove all parking	n/a	n/a					Y	Surveys indicate a very low level of overnight (assumed to be residential) on-street parking (3 vehicles). This can be accommodated in off-street locations or on side streets

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Location ref	Location description	Option Ref	Definition	Description	Traffic	Crossings & junctions	Place & greenspace	Walking	Cycling	Parking & loading		
AWMB	Ashgrove Road (Westburn to May Baird)	1	traffic lane widths	Retain existing carriageway space allocations						n/a	N	Existing carriageway lane widths encourage high speed and overtaking and limits the opportunity to achieve other objectives. There is considerable under-utilised carriageway space at present.
AWMB	Ashgrove Road (Westburn to May Baird)	2	traffic lane widths	Traffic movement lanes 3m each + clearance distances						n/a	Y	Through traffic and the low levels of HGV movement can be accommodated and will allow space to be reallocated to achieve the other objectives. Narrow carriageways encourage low traffic speed. Full free-flow clearances on a through route (rather than access) recommended by the NRDG would result in a total two-lane carriageway width of 6.7m, however this assumes no mirror overhang of the kerb, full clearance from kerb and 0.3m between opposing vehicle mirrors. The heavy vehicle flows on this tertiary/ local route that is primarily for access justify a narrower assumption of 6-6.5m, particularly where there is clearance distance to footway infrastructure and pedestrians that would be the case with protected cycle tracks.
AWMB	Ashgrove Road (Westburn to May Baird)	3	traffic lane widths	Traffic movement lanes less than 3m each						n/a	N	Low levels of HGV movement can be accommodated. Lanes narrower than 3m creates are feasible at this location at the identified volume.
AWMB	Ashgrove Road (Westburn to May Baird)	1	cycling space	Shared carriageway with traffic		n/a	n/a			n/a	N	This may help maximise space for placemaking and green infrastructure. However where two-way traffic volume exceeds 200 PCUs per hour or speeds are over 30kph it will not achieve a high level of service for all ages and abilities and is likely to encourage cycling on footways.
AWMB	Ashgrove Road (Westburn to May Baird)	2	cycling space	Shared footway		n/a	n/a			n/a	N	In combination with a narrow carriageway, this may help maximise space for placemaking and green infrastructure. However cycling on footways in the urban setting is not appropriate to allow all ages and abilities of pedestrian to feel comfortable. Equally it will not provide cycle users with sufficient directness and comfort and confident cyclists will not use it
AWMB	Ashgrove Road (Westburn to May Baird)	3	cycling space	Uni-directional painted lanes		n/a	n/a			n/a	N	Where two-way traffic volume exceeds 200PCUs per hour or speeds are over 30kph this will not achieve a high level of service for all ages and abilities , and is likely to encourage cycling on footways.
AWMB	Ashgrove Road (Westburn to May Baird)	4	cycling space	Uni-directional protected tracks		n/a	n/a			n/a	Y	The highest level of service for all ages and abilities on heavily trafficked streets. This is also the most space hungry and will require the carriageway to be narrowed to 6-6.5m to be accommodated. Some reduction in verge will likely be required. Likely reduction in parking capacity, with a slight impact on demand
AWMB	Ashgrove Road (Westburn to May Baird)	5	cycling space	Bi-directional protected tracks		n/a	n/a			n/a	Y	Bi-directional tracks are suitable for all ages and abilities and perform far better than non-protected options. In comparison with uni-directional tracks they have slight space-saving advantages, however they are typically less coherent and can create additional conflicts at junctions. It is recommended that they are only used where space or functionality prevents the use of uni-directional tracks. Likely reduction in parking capacity similar to uni-directional tracks, with a slight impact on demand
AWMB	Ashgrove Road (Westburn to May Baird)	1	On-street parking	Retain existing capacity	n/a	n/a					N	Surveys indicate that there is no on street parking provision. Providing on-street parking will limit the opportunity to use the space for movement and place
AWMB	Ashgrove Road (Westburn to May Baird)	2	On-street parking	Meet measured residential demand	n/a	n/a					N	Meeting all residential demand on the corridor itself will limit the opportunity to provide uni-directional protected cycle tracks and wider footways
AWMB	Ashgrove Road (Westburn to May Baird)	3	On-street parking	Remove all parking on the corridor	n/a	n/a					Y	There is limited if any demand for residential parking at this location. Occasional parking can take place on side streets

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AMBL	Ashgrove Road (May Baird to Laurelwood Ave)	1	traffic lane widths	Retain existing carriageway space allocations							N	Existing carriageway lane widths encourage high speed and overtaking and limits the opportunity to achieve other objectives. There is considerable under-utilised carriageway space at present.
AMBL	Ashgrove Road (May Baird to Laurelwood Ave)	2	traffic lane widths	Traffic movement lanes 3m each + clearance distances							Y	Through traffic and the low levels of HGV movement can be accommodated and will allow space to be reallocated to achieve the other objectives. Narrow carriageways encourage low traffic speed. Full free-flow clearances on a through route (rather than access) recommended by the NRDG would result in a total two-lane carriageway width of 6.7m, however this assumes no mirror overhang of the kerb, full clearance from kerb and 0.3m between opposing vehicle mirrors. The heavy vehicle flows on this tertiary/ local route that is primarily for access justify a narrower assumption of 6-6.5m, particularly where there is clearance distance to footway infrastructure and pedestrians that would be the case with protected cycle tracks.
AMBL	Ashgrove Road (May Baird to Laurelwood Ave)	3	traffic lane widths	Traffic movement lanes less than 3m each + clearance distance							Y	Low levels of HGV movement can be accommodated. Lanes narrower than 3m creates are feasible at this location at the identified volume.
AMBL	Ashgrove Road (May Baird to Laurelwood Ave)	1	cycling space	Shared carriageway with traffic		n/a	n/a				N	This may help maximise space for placemaking and green infrastructure. However where two-way traffic volume exceeds 200 PCUs per hour or speeds are over 30kph it will not achieve a high level of service for all ages and abilities and is likely to encourage cycling on footways.
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AMBL	Ashgrove Road (May Baird to Laurelwood Ave)	1	On-street parking	Retain existing capacity	n/a	n/a					Y	Residential demand at flats and terraced homes indicates a preference to retain existing parking where possible
AMBL	Ashgrove Road (May Baird to Laurelwood Ave)	2	On-street parking	Meet isolated residential demand	n/a	n/a					Y	Residential demand at flats and terraced homes indicates the need to retain existing parking where possible.
AMBL	Ashgrove Road (May Baird to Laurelwood Ave)	3	On-street parking	Remove all parking	n/a	n/a					N	Residential demand at flats and terraced homes indicates the need to retain parking where possible.

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ALB	Ashgrove Road (Laurelwood to Berryden)	1	traffic lane widths	Retain existing carriageway space allocations (5.6-5.8m two-way traffic) or equivalent for one-way street							Y	Maximises the opportunity to achieve other objectives. However by rationalising parking and introducing traffic calming measures, opportunities may be identified
ALB	Ashgrove Road (Laurelwood to Berryden)	2	traffic lane widths	Traffic movement lanes 3m each + clearance distances							N	Limits the opportunity to achieve other objectives. Through traffic and the low levels of HGV movement can be accommodated within existing movement space. Increasing the traffic movement space would remove all parking and speed up traffic
ALB	Ashgrove Road (Laurelwood to Berryden)	1	traffic circulation	Retain all existing movements							Y	Limits the opportunity to achieve other objectives. However should be considered in combination with options on surrounding streets.
ALB	Ashgrove Road (Laurelwood to Berryden)	2	traffic circulation	Westbound traffic only							Y	This may help maximise space for placemaking and green infrastructure however through traffic, HGV and access to businesses can only be accommodated westbound. May increase through traffic on Laurelwood Avenue.
ALB	Ashgrove Road (Laurelwood to Berryden)	3	traffic circulation	Eastbound traffic only							N	This may help maximise space for placemaking and green infrastructure however through traffic, HGV and access to businesses can only be accommodated eatbound. Increase in through traffic likely to have a negative impact on Laurelwood Avenue. Instruction from ACC is that the left turn from Berryden orridor into Ashgrove Road must be retained.
ALB	Ashgrove Road (Laurelwood to Berryden)	4	traffic curculation	Close Ashgrove Road to through traffic							N	Through traffic, HGV, access to businesses and bus movement cannot be accommodated in either direction. Increase in through traffic likely to have a negative impact on other residential streets. Instruction from ACC is that the left turn from Berryden orridor into Ashgrove Road must be retained.
ALB	Ashgrove Road (Laurelwood to Berryden)	5	traffic circulation	False one-way street: Ban left turn from Ashgrove Road to Berryden Road							Y	Provides opportunities to reallocate space to priority users. However may have a knock-on effect on Laurelwood Avenue
ALB	Ashgrove Road (Laurelwood to Berryden)	1	cycling space	Shared carriageway with traffic		n/a	n/a				N	This may help maximise space for placemaking and green infrastructure. However it will not achieve comfortable cycling conditions for all ages and abilities and is likely to encourage cycling on footways
ALB	Ashgrove Road (Laurelwood to Berryden)	2	cycling space	Shared footway		n/a	n/a				N	In combination with a narrow carriageway, this may help maximise space for placemaking and green infrastructure. However cycling on footways in the urban setting is not appropriate to allow all ages and abilities of pedestrian to feel comfortable. Equally it will not provide cycle users with sufficient directness and comfort and most confident cyclists will not use it
ALB	Ashgrove Road (Laurelwood to Berryden)	3	cycling space	Uni-directional painted lanes		n/a	n/a				N	This will not achieve comfortable cycling conditions for all ages and abilities and is likely to encourage cycling on footways
ALB	Ashgrove Road (Laurelwood to Berryden)	4	cycling space	Uni-directional protected tracks		n/a	n/a				Y	The highest level of overall cycling amenity for all ages and abilities on heavily trafficked streets. This is also the most space hungry and will require the carriageway to be narrowed to 6-6.5m to be accommodated.
ALB	Ashgrove Road (Laurelwood to Berryden)	5	cycling space	Bi-directional protected tracks		n/a	n/a				Y	Bi-directional tracks are suitable for all ages and abilities and perform far better than non-protected options. In comparison with uni-directional tracks they have slight space-saving advantages, however they are typically less coherent and can create additional conflicts at junctions. It is recommended that they are only used where space or functionality prevents the use of uni-directional tracks
ALB	Ashgrove Road (Laurelwood to Berryden)	1	On-street parking	Retain existing capacity		n/a					N	Retaining existing capacity will impact on other objectives. Feedback from the public indicated parking impedes visibility at junctions, narrows pavements and blocks driveway access to properties.
ALB	Ashgrove Road (Laurelwood to Berryden)	2	On-street parking	Meet isolated residential demand		n/a					Y	Residential demand at flats and terraced homes indicates the need to retain some existing parking where possible. This can be used to narrow the road and create a chicance effect to slow down traffic.
ALB	Ashgrove Road (Laurelwood to Berryden)	3	On-street parking	Remove all parking		n/a					N	Residential demand at flats and terraced homes indicates the need to retain some existing parking where possible. This can also be used to narrow the road and create a chicance effect to slow down traffic.

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Design Objectives		
1	Traffic	The street is a slower, quieter, and calmer environment where traffic access is retained but people feel safer, and traffic is less of a barrier to community activity for people of all ages and abilities.
2	Crossings and Junctions	Using junctions and crossing is an easier and more comfortable experience, which is accessible for people of all ages and abilities by all means of travel.
3	Place Quality and Greenspace	The street feels more attractive and safer for people to spend time in, with improved access to and through local greenspaces, the distinctive feel of local spaces enhanced and an overall net gain of 'green'.
4	Walking	People of all ages and abilities can more easily walk to access facilities safely, comfortably, and independently.
5	Cycling	People of all ages and abilities are able to move around by bicycle safely, comfortably, and independently.
6	Parking and Loading	Provide parking and loading within a reasonable distance of homes and businesses ensuring equitable access for all.

Ratings

These ratings are to describe, in a basic form, how the design options align with Design Objectives.

- Achieves Design Objective
- Partially achieves Design Objective
- Doesn't Achieve Design Objective

	Location		Option		Objectives appraisal						Take forward to detailed assessment	
Location ref	Location description	Option Ref	Definition	Description	Traffic	Crossings & junctions	Place & greenspace	Walking	Cycling	Parking & loading		Comments on filtering decision
LAEP	Laurelwood Avenue/ Elm Place	1	Traffic lane widths	Retain existing carriageway space allocations							N	Existing carriageway lane widths encourage high speed and flow and limits the opportunity to achieve other objectives.
LAEP	Laurelwood Avenue/ Elm Place	2	Traffic lane widths	Traffic movement lanes 3m each + clearance distances							Y	Through traffic and the low levels of HGV movement can be accommodated and will allow space to be reallocated to achieve the other objectives. Narrow carriageways encourage low traffic speed. Full free-flow clearances on a through route (rather than access) recommended by the NRDG would result in a total two-lane carriageway width of 6.7m, however this assumes no mirror overhang of the kerb, full clearance from kerb and 0.3m between opposing vehicle mirrors. The heavy vehicle flows on this tertiary/ local route that is primarily for access justify a narrower assumption of 6-6.5m, particularly where there is clearance distance to footway infrastructure and pedestrians that would be the case with protected cycle tracks.
LAEP	Laurelwood Avenue/ Elm Place	3	Traffic lane widths	Traffic movement lanes less than 3m each + clearance distance							Y	Lanes narrower than 3m creates safety risk for these movements at the identified volume.
LAEP	Laurelwood Avenue/ Elm Place	1	traffic circulation	Retain all existing movements							Y	Limits the opportunity to achieve other objectives. However should be considered in combination with options on surrounding streets.
LAEP	Laurelwood Avenue/ Elm Place	2	traffic circulation	Southbound traffic only							Y	This may help increase space for placemaking, green infrastructure and cycling. Increase in through traffic likely to have a negative impact on other streets.
LAEP	Laurelwood Avenue/ Elm Place	3	traffic circulation	Northbound traffic only							N	This may help increase space for placemaking, green infrastructure and cycling. Increase in through traffic likely to have a negative impact on other streets. Instruction from ACC is that the right turn from Laurelwood into Berryden Road must be retained.
LAEP	Laurelwood Avenue/ Elm Place	4	traffic circulation	Close Laurelwood Avenue to through traffic							N	This may help increase space for placemaking, green infrastructure and cycling. Increase in through traffic likely to have a negative impact on other streets. Instruction from ACC is that the right turn from Laurelwood into Berryden Road must be retained.
LAEP	Laurelwood Avenue/ Elm Place	5	traffic circulation	False one-way street: Ban left turn from Laurelwood Avenue to Ashgrove Road							Y	Provides opportunities to reallocate space to priority users. However may have a knock-on effect on Laurelwood Avenue
LAEP	Laurelwood Avenue/ Elm Place	1	cycling space	Shared carriageway with traffic		n/a	n/a				Y	This may help maximise space for placemaking and green infrastructure. However it will only achieve comfortable cycling conditions for all ages and abilities with traffic reduction and is likely to encourage cycling on footways. May be possible if traffic management can reduce traffic to accommodate
LAEP	Laurelwood Avenue/ Elm Place	2	cycling space	Shared footway		n/a	n/a				N	In combination with a narrow carriageway, this may help maximise space for placemaking and green infrastructure. However cycling on footways in the urban setting is not appropriate to allow all ages and abilities of pedestrian to feel comfortable. Equally it will not provide cycle users with sufficient directness and comfort and most confident cyclists will not use it
LAEP	Laurelwood Avenue/ Elm Place	3	cycling space	Uni-directional painted lanes		n/a	n/a				N	This will not achieve comfortable cycling conditions for all ages and abilities and is likely to encourage cycling on footways
LAEP	Laurelwood Avenue/ Elm Place	4	cycling space	Uni-directional protected tracks		n/a	n/a				Y	The highest level of overall cycling amenity for all ages and abilities on heavily trafficked streets. This is also the most space hungry and there is not enough space to accommodate this on Laurelwood Avenue without impacting on the other objectives. However a contra-flow track may be feasible if traffic can be reduced in the opposing direction
LAEP	Laurelwood Avenue/ Elm Place	5	cycling space	Bi-directional protected tracks		n/a	n/a				Y	Bi-directional tracks are suitable for all ages and abilities and perform far better than non-protected options. In comparison with uni-directional tracks they have slight space-saving advantages, however they are typically less coherent and can create additional conflicts at junctions. It is recommended that they are only used where space or functionality prevents the use of uni-directional tracks
LAEP	Laurelwood Avenue/ Elm Place	1	On-street parking	Retain existing capacity	n/a						N	Retaining existing capacity will impact on other objectives. Feedback from the public indicated illegal parking impedes visibility at junctions, narrows pavements and makes it difficult to cross the road.
LAEP	Laurelwood Avenue/ Elm Place	2	On-street parking	Meet residential demand	n/a						Y	Residential demand at flats and terraced homes indicates the need to retain some existing parking where possible. This can be used to narrow the road and slow down traffic.
LAEP	Laurelwood Avenue/ Elm Place	3	On-street parking	Remove all parking	n/a	n/a					N	Residential demand at flats and terraced homes indicates the need to retain some existing parking where possible. This can also be used to narrow the road and slow down traffic.

Appendix B

Detailed Options Assessment

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Design Objectives		
1	Traffic	The street is a slower, quieter, and calmer environment where traffic access is retained but people feel safer, and traffic is less of a barrier to community activity for people of all ages and abilities.
2	Crossings and Junctions	Using junctions and crossing is an easier and more comfortable experience, which is accessible for people of all ages and abilities by all means of travel.
3	Place Quality and Greenspace	The street feels more attractive and safer for people to spend time in, with improved access to and through local greenspaces, the distinctive feel of local spaces enhanced and an overall net gain of 'green'.
4	Walking	People of all ages and abilities can more easily walk to access facilities safely, comfortably, and independently.
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Ratings

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- Achieves Design Objective
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Location	Code	Options	Traffic	Crossings & Junctions	Place & Greenspace	Walking	Cycling	Parking & Loading	Deliverability
N. Anderson Drive junction	NA1	Do Nothing	Traffic remains unaffected and remains a significant barrier to the community.	Signal timings mean limited crossing opportunities. Inadequate refuge island over south approach.	Verges on each approach to junction; notable green space with trees on west side. Third party greenspace on northeast corner protected by fence line.	Filter island used for making 3 of the 4 crossing movements. No guardrails / barriers. Crossing points provided with dropped kerbs, but no tactile paving.	No cycling provision	No parking or loading requirement in vicinity of junction.	No impact on existing situation
	NA2	Tighten entries, remove left turn filter into Ashgrove Road West & adjust signal timings	Updated signal timings unlikely to have impact on traffic speeds. Speeds may be reduced by tightened geometry. Traffic volume unaffected.	Revised signal timings could provide more frequent crossing opportunities. Tightened geometry would reduce crossing distances. Interventions may result in increased queuing.	Tightened geometry may allow for larger verges.	Physical alterations present opportunity to provide additional features such as guard rails and tactile paving. Tightened carriageway geometry allows for wider footways / refuges.	No cycling provision	No parking or loading requirement in vicinity of junction.	Minimal impact on existing situation
	NA3	Signal-controlled with parallel crossings 2 arms	Updated signal timings unlikely to have impact on traffic speeds. Speeds may be reduced by tightened geometry. Traffic volume unaffected.	Removal of filter island, reduced crossing distances and provision of suitable refuge island over North Anderson Drive will improve quality of crossings. Removing one of the North Anderson Drive crossings is contrary to objectives.	Opportunity to develop public realm spaces and gateway features to create a higher quality space. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	Retains direct walking routes around junction to match desire lines. Can provide wider footways and additional pedestrian features e.g. tactile paving. Only one crossing over North Anderson Drive would require some pedestrians to cross twice depending on destination.	Provision of dedicated cycle track would provide a safe route for cyclists.	No parking or loading requirement in vicinity of junction.	Can be accommodated within existing available land. Junction modelling indicates this would remain within capacity.
	NA4	Signal-controlled with parallel crossings on 3 arms	Updated signal timings unlikely to have impact on traffic speeds. Speeds may be reduced by tightened geometry. Traffic volume unaffected.	Removal of filter island, reduced crossing distances and provision of suitable refuge island over North Anderson Drive will improve quality of crossings.	Opportunity to develop public realm spaces and gateway features to create a higher quality space. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	Retains direct walking routes around junction to match desire lines. Can provide wider footways and additional pedestrian features e.g. tactile paving.	Provision of dedicated cycle track would provide a safe route for cyclists.	No parking or loading requirement in vicinity of junction.	Some additional land required on the west side of the junction. Junction modelling indicates this would remain within capacity.
	NA5	Roundabout with parallel crossings on all arms	Represents significant change to current layout with high potential for adverse knock-on traffic impacts along corridor. Would limit options available for ongoing wider corridor study.	Carriageway zebra crossings likely to be unsuitable for some users. Crossings experience for vulnerable users would be considerably more uncomfortable. May require provision of controlled crossings away from junction on each approach.	Opportunity to provide green space on centre island, but this would not be accessible. Large footprint may result in loss of existing surrounding green space.	Increased junction size and less direct routing for pedestrians. Delay may reduce with priority crossings	Provision of dedicated cycle track would provide a safe route for cyclists.	No parking or loading requirement in vicinity of junction.	Signficant additional land take presents major barrier to provision. Very high north-south (and vice versa) traffic flows compared to turning movements make this form of junction unsuitable from a capacity standpoint.

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Location	Code	Options	Traffic	Crossings & Junctions	Place & Greenspace	Walking	Cycling	Parking & Loading	Deliverability
Foresterhill junction	FH1	Do Nothing	Traffic remains unaffected and remains a significant barrier to the community.	Junction layout is considered confusing by users. Modelling has found signal timings to be inefficient. Lack of refuge provision and long crossing distances present diffficulties for vulnerable users.	No public greenspace. Greenspace and trees located in third party land to south	Crossing points provided with tactiles and dropped kerbs. Crossing distances over Ashgrove Road West are relatively long (over 12m, cross four lanes of traffic). Crossings are provided over every approach.	No cycling provision	Cars parked in close proximity to junction on south side of Ashgrove Road West carriageway (to east and west). Parking to east reduces queueing space. Parking on Foresterhill Road south approach reduces capacity.	No impact on existing situation
	FH2	Tighten entries & adjust signal timings	Junction performance can be improved by adjusting signal timings.	Minimal changes	Minimal changes	Minimal changes	Minimal changes	Minimal changes	Minimal impact on existing situation
	FH3	Staggered signal-controlled with parallel crossings	Junction performance can be improved by adjusting signal timings. Simplified layout reduces confusion for drivers. Narrower carriageway may reduce vehicle speeds.	Simplified junction layout easier to navigate for users. Shorter crossing distances. Revised signal timings provide more green time for active travel. Addition of parallel cycle crossings ensures all users are catered for.	No impact on existing greenspace. Addition of verges presents opportunity to provide greenspace.	Crossing movements revised to better cater for desire lines. Crossing distances reduced. Crossing delay to wait for signals. Can provide wider footways and additional pedestrian features e.g. tactile paving.	High level of service (LoS) in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the juntion and on Ashgrove Road West. Medium LoS for delays due to signal controls.	Parking on approaches removed to significantly improve visibility and operation of junction. Private access retained.	Modelling indicates limited impact on performance; will remain within capacity. Deliverable within existing highway boundary.
	FH4	Staggered signal-controlled with two-stage right-turn cycling	Simplified layout reduces confusion for drivers. Narrower carriageway may reduce vehicle speeds.	Simplified junction layout easier to navigate for vehicles. Shorter crossing distances. Revised signal timings provide more green time for active travel. Addition of parallel cycle crossings and two-stage right-turns ensures all users are catered for. Significant impact on junction performance due to additional cycle stages.	No impact on existing greenspace. Addition of verges presents opportunity to provide greenspace.	Crossing movements revised to better cater for desire lines. Crossing distances reduced. Crossing delay to wait for signals. Can provide wider footways.	Low LoS in terms of all-ability movements. High LoS in terms of delay for left/ahead movements, but low LoS for right-turners. Low LoS for delays due to signal controls and delay from separate cycle staging. Updated in agreement with ACC comments	Parking on approaches removed to significantly improve visibility and operation of junction. Private access retained.	Modelling indicates signficiant impact on performance; will exceed capacity. Deliverable within existing highway boundary.
	FH5	Staggered Double Compact Roundabout with parallel crossings	Deflection provided by roundabouts will reduce vehicle speeds. Narrower carriageway may reduce vehicle speeds. Updated in agreement with ACC comments	Shorter crossing distances. Crossings further away from desire lines. Minimal crossing delay as zebra crossings have priority over traffic; no need to wait for signals. Updated in agreement with ACC comments	Impact on third party greenspace due to land take. Opportunity to provide significant greenspace elsewhere due to size of verges created.	All existing movements retained. Crossing distances reduced. Minimal crossing delay. Carriageway zebras are not preferred by visually-impaired users. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for High LoS for delays due to zebras.	Parking on approaches removed to significantly improve visibility and operation of junction. Private accesses retained by offseting zebra crossing. Updated in agreement with ACC comments	Requires third party land take and removal/relocation of adjacent undereground hospital water reservoir. Modelling indicates junction will be within capacity. Realignment of private accesses
	FH6	Staggered Double Mini Roundabout with parallel crossings	No / low deflection for east-west movements may lead to high vehicle speeds, particularly during off-peak.	Shorter crossing distances. Crossings further away from desire lines. Minimal crossing delay as zebra crossings have priority over traffic; no need to wait for signals. Lack of speed reduction may reduce crossing opportunities and perception of safety.	Impact on third party greenspace due to land take. Opportunity to provide significant greenspace elsewhere due to size of verges created.	All existing movements retained. Crossing distances reduced. Minimal crossing delay. Carriageway zebras are not preferred by visually-impaired users. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for High LoS for delays due to zebras.	Parking on approaches removed to significantly improve visibility and operation of junction. Private accesses retained by offseting zebra crossing. Updated in agreement with ACC comments	Significant safety issues with untested UK layout Requires third party land take. Works in proximity to underground structure. Modelling indicates junction will be within capacity. Relignment of private accesses
	FH7	Realigned four arm crossroad signal-controlled with parallel crossings	Simplified layout reduces confusion for drivers. Narrower carriageway may reduce vehicle speeds.	Simplified junction layout easier to navigate for users. Shorter crossing distances. Revised signal timings provide more green time for active travel. Addition of parallel cycle crossings ensures all users are catered for.	Impact on third party greenspace due to land take. Opportunity to provide significant greenspace elsewhere due to size of verges created.	Crossing movements revised to better cater for desire lines. Crossing distances reduced. Crossing delay to wait for signals. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. Medium LoS for delays due to signal controls.	Parking on approaches removed to significantly improve visibility and operation of junction. Private access retained. Opportunity to replace removed parking elsewhere due to drastically changed junction form.	Requires approximately 10,000 square metres of third party land take. Works would require removal / relocation of undereground hospital water reservoir, car park, tennis courts and encroachment on existing hospital building.
	FH8	Realigned four arm crossroad signal-controlled with two-stage right turn cycling	Simplified layout reduces confusion for drivers. Narrower carriageway may reduce vehicle speeds.	Simplified junction layout easier to navigate for vehicles. Shorter crossing distances. Revised signal timings provide more green time for active travel. Addition of parallel cycle crossings and two-stage right-turns ensures all users are catered for. Significant impact on junction performance due to additional cycle stages.	Impact on third party greenspace due to land take. Opportunity to provide significant greenspace elsewhere due to size of verges created.	Crossing movements revised to better cater for desire lines. Crossing distances reduced. Crossing delay to wait for signals. Can provide wider footways.	Low LoS in terms of all-ability movements. High LoS in terms of delay for left/ahead movements, but low LoS for right-turners.	Parking on approaches removed to significantly improve visibility and operation of junction. Private access retained. Opportunity to replace removed parking elsewhere due to drastically changed junction form.	Requires approximately 10,000 square metres of third party land take. Works would require removal / relocation of undereground hospital water reservoir, car park, tennis courts and encroachment on existing hospital building. Significant impact on junction performance due to two-stage right-turn.
	FH9	Realigned four arm Roundabout with parallel crossings	Simplified layout reduces confusion for drivers. Narrower carriageway may reduce vehicle speeds. Deflection provided by roundabouts will reduce vehicle speeds	Shorter crossing distances. Crossings further away from desire lines. Minimal crossing delay as zebra crossings have priority over traffic; no need to wait for signals.	Impact on third party greenspace due to land take. Opportunity to provide significant greenspace elsewhere due to size of verges created.	Crossings away from desire lines. Crossing distances reduced. Minimal crossing delay. Zebras are not preferred by visually-impaired users. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for High LoS for delays due to zebras.	Parking on approaches removed to significantly improve visibility and operation of junction. Private access retained by offseting zebra crossing	Requires approximately 10,000 square metres of third party land take. Works would require removal / relocation of undereground hospital water reservoir, car park, tennis courts and encroachment on existing hospital building.
	FH10	Realigned four arm Compact Roundabout with parallel crossings	Simplified layout reduces confusion for drivers. Narrower carriageway may reduce vehicle speeds. Deflection provided by roundabouts will reduce vehicle speeds	Shorter crossing distances. Crossings further away from desire lines. Minimal crossing delay as zebra crossings have priority over traffic; no need to wait for signals.	Impact on third party greenspace due to land take. Opportunity to provide significant greenspace elsewhere due to size of verges created.	Crossings away from desire lines. Crossing distances reduced. Minimal crossing delay. Zebras are not preferred by visually-impaired users. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for High LoS for delays due to zebras.	Parking on approaches removed to significantly improve visibility and operation of junction. Private access retained by offseting zebra crossing	Requires approximately 10,000 square metres of third party land take. Works would require removal / relocation of undereground hospital water reservoir, car park, tennis courts and encroachment on existing hospital building.
	FH11	Realigned four arm Mini Roundabout with parallel crossings	Simplified layout reduces confusion for drivers. Narrower carriageway may reduce vehicle speeds. No / low deflection for east-west movements may lead to high vehicle speeds, particularly during off-peak.	Shorter crossing distances. Crossings further away from desire lines. Minimal crossing delay as zebra crossings have priority over traffic; no need to wait for signals. Lack of speed reduction may reduce crossing opportunities and perception of safety.	Impact on third party greenspace due to land take. Opportunity to provide significant greenspace elsewhere due to size of verges created.	Crossings away from desire lines. Crossing distances reduced. Minimal crossing delay. Zebras are not preferred by visually-impaired users. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for High LoS for delays due to zebras.	Parking on approaches removed to significantly improve visibility and operation of junction.	Requires approximately 10,000 square metres of third party land take. Works would require removal / relocation of undereground hospital water reservoir, car park, tennis courts and encroachment on existing hospital building.

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3	Place Quality and Greenspace	The street feels more attractive and safer for people to spend time in, with improved access to and through local greenspaces, the distinctive feel of local spaces enhanced and an overall net gain of 'green'.
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Location	Code	Options	Traffic	Crossings & Junctions	Place & Greenspace	Walking	Cycling	Parking & Loading	Deliverability
Cornhill Terrace/ Cornhill Road junction	CH1	Do nothing	No physical features to reduce traffic speeds on Ashgrove Road West. Poor visibility for vehicles emerging from side arms.	Long crossing distances on every approach. North and south approaches approximately 20m long.	No public greenspace.	Long crossing distances. Dropped kerbs are provided, but no tactile paving or other facilities.	No cycling provision	Parking bays on south side of west approach. Driveways along north side on east and west approaches.	No impact on existing situation
	CH2	Tighten side road radii	Reduce traffic turning speeds	Slightly shorter crossing distances. Lack of crossing opportunities likely to remain an issue. Opportunity to provide pedestrian facilities, e.g. tactile paving.	Minor opportunity to provide greenspace, seating or artwork	No improvement to existing route choice. Opportunity to provide pedestrian facilities, e.g. tactile paving.	No cycling provision	Parking bays on south side of west approach. Driveways along north side on east and west approaches.	Minimal impact on existing situation
	Cornhill Terrace junction								
	CH3	Close Cornhill Terrace to traffic	Reduced vehicle turning speeds. Simplified junction layout.	Shorter crossing distances over all approaches. New controlled crossing over Ashgrove Road West. New priority crossing over Cornhill Road.	Opportunity to provide linear rain gardens or other amenities. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	All existing movements retained and improved. Wider footways.	High LoS in terms of all-ability movements. High LoS in terms of directness (all movements). High LoS in terms of delay for east-west movements.	Parking removed - limited demand. Private access retained.	Severance of traffic routes, particularly for residents, would lead to longer journey times. Deliverable within existing highway boundary. Possible refuse access issues - requires further investigation Possible resident acceptability issues
	CH4	Continuous footway across Cornhill Terrace	Reduced vehicle turning speeds. Simplified junction layout.	Shorter crossing distances over all approaches. New controlled crossing over Ashgrove Road West. New priority crossing over Cornhill Road.	Minor opportunity to provide linear rain gardens or other amenities. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	All existing movements retained and improved. Wider footways. Bus passengers required to cross cycle track to acces bus stop. Key link for access to school	High LoS in terms of all-ability movements. High LoS in terms of directness (all movements). High LoS in terms of delay for east-west movements.	Parking removed - limited demand. Private access retained.	Deliverable within existing highway boundary.
	Cornhill Road junction								
	CH5	Close Cornhill Road to traffic	Reduced vehicle turning speeds. Simplified junction layout. Significant detour for residents driving Would divert hospital traffic through residential streets Bus route so would require a bus gate	Shorter crossing distances over all approaches. New parallel crossing over Ashgrove Road West.	Opportunity to provide linear rain gardens or other amenities. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	All existing movements retained and improved. Wider footways. The bus stop facilities will have their own dedicated pedestrian-only surface Bus passengers required to cross cycle track to acces bus stop.	High LoS in terms of all-ability movements. High LoS in terms of directness (all movements). High LoS in terms of delay for east-west movements.	Parking removed - limited demand. Private access retained.	Public and stakeholder acceptability is unlikely Deliverable within existing highway boundary.
	CH6	Continous footway across Cornhill Road	Bus route and hospital access so verical deflection ruled out	No opportunity for vertical deflection so effectiveness limited. Would not comply with good practice	Does not present additional opportunities	More direct pedestrian routing, but not suitable for all users without vertical deflection	High LoS in terms of all-ability movements. High LoS in terms of directness (all movements). High LoS in terms of delay for east-west movements.	Parking removed - limited demand. Private access retained.	Severance of traffic routes, particularly for residents, would lead to longer journey times. Deliverable within existing highway boundary.
	CH7	Parallel crossing of Cornhill Road	Reduced vehicle turning speeds. Simplified junction layout.	Shorter crossing distances over all approaches. New parallel crossing over Ashgrove Road West. Legal priority over turning traffic	Does not present additional opportunities	Wider footways.	High LoS in terms of all-ability movements. High LoS in terms of directness (all movements). High LoS in terms of delay for east-west movements.	Parking removed - limited demand. Private access retained.	Deliverable within existing highway boundary. ACC advises this layout is not supported - challenges getting agreement to implement and maintain at this location
	CH8	Cycle lane continued over Cornhill Road, dropped kerbs with no marked priority for pedestrians	Tightened corner radii to reduce vehicle turning speeds. Simplified junction layout. Compliance with pedestrian and cycling priorty can be an issue with this layout	Shorter crossing distances over all approaches. No marked or legal priority for pedestrians crossing	Does not present additional opportunities	Wider footways.	Med LoS in terms of all-ability movements. High LoS in terms of directness (all movements). High LoS in terms of delay for east-west movements.	Parking removed - limited demand. Private access retained.	Deliverable within existing highway boundary.

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Design Objectives		
1	Traffic	The street is a slower, quieter, and calmer environment where traffic access is retained but people feel safer, and traffic is less of a barrier to community activity for people of all ages and abilities.
2	Crossings and Junctions	Using junctions and crossing is an easier and more comfortable experience, which is accessible for people of all ages and abilities by all means of travel.
3	Place Quality and Greenspace	The street feels more attractive and safer for people to spend time in, with improved access to and through local greenspaces, the distinctive feel of local spaces enhanced and an overall net gain of 'green'.
4	Walking	People of all ages and abilities can more easily walk to access facilities safely, comfortably, and independently.
5	Cycling	People of all ages and abilities are able to move around by bicycle safely, comfortably, and independently.
6	Parking and Loading	Provide parking and loading within a reasonable distance of homes and businesses ensuring equitable access for all.

Ratings

These ratings are to describe, in a basic form, how the design options align with Design Objectives.

- Achieves Design Objective
- Partially achieves Design Objective
- Doesn't Achieve Design Objective

Location	Code	Options	Traffic	Crossings & Junctions	Place & Greenspace	Walking	Cycling	Parking & Loading	Deliverability
Westburn Drive junction	WB1	Do Nothing	Traffic remains unaffected and remains a significant barrier to the community.	Limited crossing opportunities. Long (12m+) crossing distances.	Small areas of greenspace on eastern corners of junction.	All movements catered for. Footways more than 2m wide, but space restricted at corners.	No cycling provision	No parking or loading requirement in vicinity of junction.	No impact on existing situation
	WB2	Tighten entries & adjust signal timings	Minimal benefit from alterations to signal timings.	Unchanged.	Unchanged.	More space at corners, but otherwise unchagnged.	Minimal changes	No parking or loading requirement in vicinity of junction.	Minimal impact on existing situation
	WB3	Signal-controlled (ped xing of cycle track partially signalised)	Junction performance largely unaffected. Narrower carriageway for east-west movements may reduce vehicle speeds.	Shorter crossing distances. Increased green time for crossings.	Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls. Opportunity to provide linear rain gardens or other amenities.	All existing movements retained. Crossing distances reduced on east & west approaches. Crossing delay to wait for signals.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. Low LoS for delays due to signal controls at ped xings.	No parking or loading requirement in vicinity of junction.	Modelling indicates longer queues on each approach, but junction remains within capacity. Deliverable within existing highway boundary. Possible safety isues fue to two forms of crosing
	WB4	Signal-controlled (ped xing of cycle track unsignalised)	Junction performance largely unaffected. Narrower carriageway for east-west movements may reduce vehicle speeds.	Shorter crossing distances. Increased green time for crossings.	Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls. Opportunity to provide linear rain gardens or other amenities.	All existing movements retained. Crossing distances reduced on east & west approaches. Crossing delay to wait for signals.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. Medium LoS for delays due to signal controls.	No parking or loading requirement in vicinity of junction.	Modelling indicates longer queues on each approach, but junction remains within capacity. Deliverable within existing highway boundary.
	WB5	Signal-controlled with two-stage cycling right-turn	Junction performance largely unaffected. Narrower carriageway for east-west movements may reduce vehicle speeds.	Crossing distances on north & south approaches increased. Crossing distances on east & west approaches similar to existing. No segregated cycle crossings.	Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls. Opportunity to provide linear rain gardens or other amenities.	All existing movements retained. Crossing distances either the same or longer. Crossing delay to wait for signals.	Low LoS in terms of all-ability movements. High LoS in terms of delay for left/ahead movements, but low LoS for right-turners.	No parking or loading requirement in vicinity of junction.	Modelling indicates longer queues on each approach, but junction remains within capacity. Deliverable within existing highway boundary.
	WB6	Closure of ARW arm	Severance of vehicular access from Ashgrove Road West. Increased journey times for rerouted residential traffic. Improved junction performance from simplified junction.	Shorter crossing distances. Increased green time for crossings. Removed conflict with traffic on west approach.	Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls. Opportunity to provide linear rain gardens or other amenities. Opportunity to provide greenspace on closed section.	All existing movements retained. Crossing distances reduced on retained traffic arms. Crossing delay to wait for signals. No traffic conflict over west approach.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. No traffic conflict over west approach. Low LoS for delays due to signal controls.	No parking or loading requirement in vicinity of junction.	Junction would remain with capacity. Deliverable within existing highway boundary. Severance of traffic routes, particularly for residents, would lead to longer journey times. Low likelihood of public acceptance
	WB7	Closure of AR arm	Severance of vehicular access from Ashgrove Road. Increased journey times for rerouted residential traffic. Improved junction performance from simplified junction.	Shorter crossing distances. Increased green time for crossings. Removed conflict with traffic on east approach.	Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls. Opportunity to provide linear rain gardens or other amenities. Opportunity to provide greenspace on closed section.	All existing movements retained. Crossing distances reduced on retained traffic arms. Crossing delay to wait for signals. No traffic conflict over east approach.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. No traffic conflict over east approach. Low LoS for delays due to signal controls.	No parking or loading requirement in vicinity of junction.	Junction would remain with capacity. Deliverable within existing highway boundary. Severance of traffic routes, particularly for residents, would lead to longer journey times. Low likelihood of public acceptance
	WB8	Closure of both ARW and AR arms	Severance of vehicular access from Ashgrove Road West & Ashgrove Road. Increased journey times for rerouted residential traffic. Improved junction performance from simplified junction.	Shorter crossing distances. Increased green time for crossings. Removed conflict with traffic on east & west approaches.	Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls. Opportunity to provide linear rain gardens or other amenities. Opportunity to provide greenspace on closed section.	All existing movements retained. Crossing distances reduced on retained traffic arms. Crossing delay to wait for signals. No traffic conflict over east & west approaches.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. No traffic conflict over east & west approaches. Low LoS for delays due to signal controls.	No parking or loading requirement in vicinity of junction.	Junction would remain with capacity. Deliverable within existing highway boundary. Severance of traffic routes, particularly for residents, would lead to longer journey times. Low likelihood of public acceptance
	WB9	Compact Roundabout with segregated cycling	Narrower carriageway may reduce vehicle speeds. Deflection provided by roundabouts will reduce vehicle speeds	Shorter crossing distances. Crossings further away from desire lines. Minimal crossing delay as zebra crossings have priority over traffic; no need to wait for signals.	Impact on existing vegetation both within and beyond existing boundaries. Loss on east side of junction. Opportunity to mitigate with planting elsewhere. Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls.	All existing movements retained. Crossing distances reduced. Crossings away from desire lines. Minimal crossing delay. Zebras are not preferred by visually-impaired users. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. High LoS in terms of delay as no signal controls.	No parking or loading requirement in vicinity of junction.	Modelling indicates junction would be over capacity. Requires land take. May require turning restrictions for one or two private driveways
	WB10	Mini Roundabout with segregated cycling	Minimal carriageway may reduce vehicle speeds. No / low deflection may lead to high vehicle speeds, particularly during off-peak.	Shorter crossing distances. Crossings further away from desire lines. Minimal crossing delay as zebra crossings have priority over traffic; no need to wait for signals.	Impact on existing vegetation both within and beyond existing boundaries. Loss on east side of junction. Opportunity to mitigate with planting elsewhere. Opportunity to expand on existing limited greenspace within existing boundaries by opening eastern walls.	All existing movements retained. Crossing distances reduced. Crossings away from desire lines. Minimal crossing delay. Zebras are not preferred by visually-impaired users. Can provide wider footways.	High LoS in terms of all-ability movements. All cycle movements catered for, and all fully-segregated through the junction. High LoS in terms of delay as no signal controls.	No parking or loading requirement in vicinity of junction.	Safety issues with untested UK layout Junction would be over capacity. Requires land take, but to a lesser extent compared to compact & normal roundabout options.

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Design Objectives		
1	Traffic	The street is a slower, quieter, and calmer environment where traffic access is retained but people feel safer, and traffic is less of a barrier to community activity for people of all ages and abilities.
2	Crossings and Junctions	Using junctions and crossing is an easier and more comfortable experience, which is accessible for people of all ages and abilities by all means of travel.
3	Place Quality and Greenspace	The street feels more attractive and safer for people to spend time in, with improved access to and through local greenspaces, the distinctive feel of local spaces enhanced and an overall net gain of 'green'.
4	Walking	People of all ages and abilities can more easily walk to access facilities safely, comfortably, and independently.
5	Cycling	People of all ages and abilities are able to move around by bicycle safely, comfortably, and independently.
6	Parking and Loading	Provide parking and loading within a reasonable distance of homes and businesses ensuring equitable access for all.

Ratings

These ratings are to describe, in a basic form, how the design options align with Design Objectives.

- Achieves Design Objective
- Partially achieves Design Objective
- Doesn't Achieve Design Objective

Ashgrove Road/ Laurelwood/ Elm Place Triangle Options	Traffic	Crossings & Junctions	Place & Greenspace	Walking	Cycling	Parking & Loading	Deliverability
Ashgrove Road							
Do nothing	Cars parked on carriageway act as natural traffic calming to reduce vehicle speeds.	No controlled or priority crossing provision. Dropped kerb crossings without tactile paving over side roads.	No public greenspace.	Footway width varies but generally minimum of 2m.	Low LoS as no cycling provisions are provided.	Unrestricted parking on south side of carriageway at multiple locations. Private accesses on both sides.	Does not respond to public expectations. Deliverable within existing highway boundary.
Two-way carriageway with greenspace	Narrower carriageway (with no on-road parking) may maintain reduced vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	Opportunity to provide linear rain gardens or other amenities. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	Footway width varies but generally minimum of 2m.	Low LoS as no cycling provisions are provided.	Parking removed. Private access retained.	Deliverable within existing highway boundary.
Two-way carriageway with improved footways	Narrower carriageway (with no on-road parking) may maintain reduced vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	No public greenspace.	Opportunity to widen footways. Opportunity to provide facilities, e.g. tactile paving.	Low LoS as no cycling provisions are provided.	Parking removed. Private access retained.	Deliverable within existing highway boundary.
Two-way carriageway with one-way cycling	Narrower carriageway (with no on-road parking) may maintain reduced vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	No public greenspace.	Footway width varies but generally minimum of 2m.	High LoS for direcetion of one-way segragated cycleway flow. Low LoS for opposite direction on carriageway with no formal provisions.	Parking removed. Private access retained.	Deliverable within existing highway boundary.
Two-way carriageway with formal parking	Narrower carriageway (with no on-road parking) may maintain reduced vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	No public greenspace.	Opportunity to widen footways. Opportunity to provide facilities, e.g. tactile paving.	Low LoS as no cycling provisions are provided.	Unrestricted parking replaced with formal bayslevel of provision reduced. Private access retained.	Deliverable within existing highway boundary.
One-way carriageway with greenspace	Narrower carriageway (with no on-road parking) may maintain reduced vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	Opportunity to provide linear rain gardens or other amenities. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	Opportunity to widen footways. Opportunity to provide facilities, e.g. tactile paving.	Low LoS as no cycling provisions are provided.	Parking removed. Private access retained.	Deliverable within existing highway boundary.
One-way carriageway with parking and two-way cycling	Narrower carriageway (with on-road parking) may maintain reduced vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	Opportunity to provide linear rain gardens or other amenities between parking bays. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	Opportunity to provide facilities, e.g. tactile paving.	High LoS for all-ability movements	Parking retained but likely reduced. Private access retained.	Deliverable within existing highway boundary.
One-way carriageway with two-way cycling	Narrower carriageway (with no on-road parking) may maintain reduced vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	Opportunity to provide linear rain gardens or other amenities in place of parking. Opportunity to involve the community in these spaces to create a level of "ownership" of the space.	Opportunity to provide facilities, e.g. tactile paving.	High LoS for all-ability movements	Parking removed. Private access retained.	Deliverable within existing highway boundary.

	Traffic	Crossings & Junctions	Place & Greenspace	Walking	Cycling	Parking & Loading	Deliverability
Laurelwood Avenue							
Do nothing	Cars parked on carriageway act as natural traffic calming to reduce vehicle speeds.	No controlled or priority crossing provision. Dropped kerb crossings without tactile paving over side roads.	No public greenspace, other than trees within footway.	Wide (3m+) footways on both sides, but usable width on west reduced by trees in footway.	Low LoS as no cycling provisions are provided.	Unrestricted parking on south side of carriageway at multiple locations. Private accesses on both sides.	Deliverable within existing highway boundary.
Two-way carriageway with improved footways and on street cycling	Cars parked on carriageway act as natural traffic calming to reduce vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	No public greenspace. Slight improvement in placemaking	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	Low LoS as no cycling provisions are provided.	Unrestricted parking on south side of carriageway at multiple locations. Private accesses on both sides.	Deliverable within existing highway boundary.
Two-way carriagway with cycle lanes and no centrline	Cars parked on carriageway act as natural traffic calming to reduce vehicle speeds.	No controlled or priority crossing provision. Opportunity to improve crossings.	No public greenspace, other than trees within footway.	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	Medium LoS with on-road cycle provision (advisory lanes)	Parking removed. Residential demand not met Private access retained.	Deliverable within existing highway boundary.
Two-way carriageway as a quiet street	Reduced vehicle speeds due to design.	Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace. Slight improvement in placemaking	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	Medium LoS with no formal provision but environment for cycling improved	Unrestricted parking on south side of carriageway at multiple locations. Private accesses on both sides.	Deliverable within existing highway boundary.
Narrowed two-way carriageway with two-way cycle	Reduced vehicle speeds due to design.	Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace, other than trees within footway.	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	High LoS for all-ability movements	Parking removed. Private access retained.	Deliverable within existing highway boundary.
Narrowed two-way carriageway with two-way cycle and parking	Reduced vehicle speeds due to design.	Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace, other than trees within footway.	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	High LoS for all-ability movements	Unrestricted parking replaced with formal bayslevel of provision reduced. Private accesses on both sides.	Deliverable within existing highway boundary.
Narrowed two-way carriageway with one-way cycle and parking	Reduced vehicle speeds due to design.	Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace, other than trees within footway.	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	High LoS for direcetion of one-way segragated cycleway flow. Low LoS for opposite direction on carriageway with no formal provisions.	Unrestricted parking replaced with formal bayslevel of provision reduced. Private accesses on both sides.	Deliverable within existing highway boundary.
Narrowed two-way carriageway (false one-way) with two-way cycle	Reduced vehicle speeds due to design. False one-way removes traffic emerging onto Ashgrove Road, reducing traffic volumes.	Priority crossing over Laurelwood approach to Ashgrove Road juntion. Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace, other than trees within footway.	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	High LoS for all-ability movements	Parking removed. Private access retained.	Deliverable within existing highway boundary.
Narrowed two-way carriageway (false one-way) with two-way cycle and parking	Reduced vehicle speeds due to design. False one-way removes traffic emerging onto Ashgrove Road, reducing traffic volumes.	Priority crossing over Laurelwood approach to Ashgrove Road juntion. Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace, other than trees within footway.	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	High LoS for all-ability movements	Unrestricted parking replaced with formal bayslevel of provision reduced. Private accesses on both sides.	Deliverable within existing highway boundary.
Narrowed two-way carriageway (false one-way) with one-way cycle and parking	Reduced vehicle speeds due to design. False one-way removes traffic emerging onto Ashgrove Road, reducing traffic volumes.	Priority crossing over Laurelwood approach to Ashgrove Road juntion. Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace, other than trees within footway.	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	High LoS for direcetion of one-way segragated cycleway flow. Low LoS for opposite direction on carriageway with no formal provisions.	Unrestricted parking replaced with formal bayslevel of provision reduced. Private accesses on both sides.	Deliverable within existing highway boundary.
One-way carriageway with two-way cycle and parking	Reduced vehicle speeds due to design. One-way flow reduces overall traffic volumes.	Priority crossing over Laurelwood approach to Ashgrove Road juntion. Opportunity to improve crossings (e.g. priority / raised tables)	No public greenspace. Slight improvement in placemaking	Widened and cleared footways. Opportunity to provide facilities, e.g. tactile paving.	High LoS for all-ability movements	Unrestricted parking replaced with formal bayslevel of provision reduced. Private accesses on both sides.	Deliverable within existing highway boundary.

Appendix C

Initial Design Ideas (consultation)

Tell us what you think of the initial designs for Ashgrove Connects

Welcome to the **Design Stage of Ashgrove Connects** where you can view and feedback on the initial designs which have been developed from what you told us is important to you.

Please have a look through this booklet to view the initial designs and feedback to us by **Sunday 17th July** either through the project website, at Cornhill Library or pop along to one of the upcoming activities detailed on page 41.

We are presenting initial design ideas and we need your feedback to help steer the development of a concept design during the next stage of the project.

If you or your neighbours need support to view or feedback on the initial designs, please contact us.

Contact Us

Tel: 0131 221 5770

Email: emily.davie@atkinsglobal.com

Website: ashgroveconnects.commonplace.is

ABERDEEN CITY COUNCIL

About the Project

Overview

Ashgrove Connects gets local people involved in making Ashgrove Road, Ashgrove Road West and Laurelwood Avenue work better for those who live, work, study and visit here.

This is part of a programme of improvements across the city that will help provide everyone with safer, healthier and more sustainable transport and lifestyle options.

The project considers opportunities that complement the proposed infrastructure changes along the Berryden Corridor to ensure the communities of Ashgrove Connects benefit. The initial designs assume the Berryden Corridor is in place by the time Ashgrove Connects is delivered.

Your feedback is vital to ensure we understand your priorities.

Who is involved?

Aberdeen City Council

Leading the delivery of the project.

Atkins

Working on behalf of Aberdeen City Council to deliver the initial stages of the project.

Nestrans

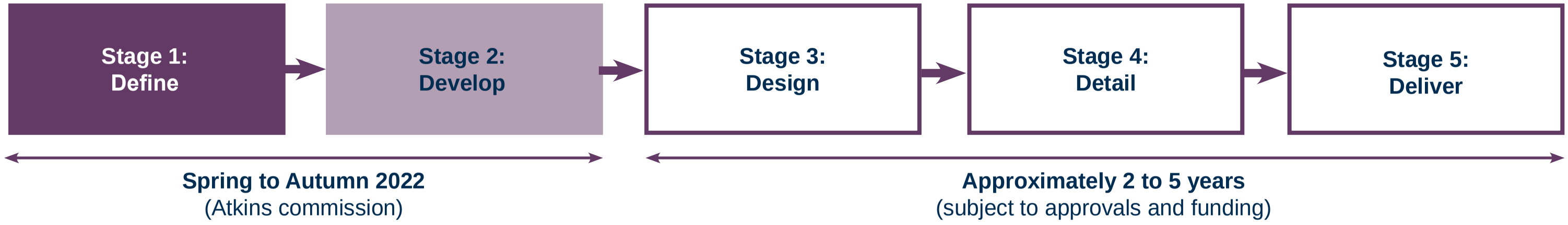
Funding Stages 1-2.

Stakeholder Working Group

Providing stakeholder and community representation to help the project remain in line with community priorities.

Timeline

An indicative timeline of the key project stages is outlined below. We are currently in Stage 2.



Emerging Themes

What have we done so far?

During the first stage of the project, we asked you to share your experiences of using the streets.

Through **surveys**, we collected information on traffic speed and flow, number of people walking and cycling, public life and parking demand.

These activities have helped to build up an understanding of how the streets and public spaces are perceived and used locally to inform the development of initial designs.

1,800 visitors to the project website

10 engagement activities

130 respondents to first survey

670 contributions to first survey

6 news blogs

3 meetings with the Stakeholder Working Group

Community Walking Audit

What have we found out?

There was a wide range of comments submitted during the first stage of the project, reflecting the number of opportunities to improve the streets and public spaces. The **topics** people commented on were:

A detailed summary of these findings is available in the **Stage 1 Report**.

From the information gathered, the following **themes** emerged:

- Create a slower, quieter street environment.
- More crossings and improved junctions that feel safer to use.
- Improved place quality and better access to greenspace.
- More enjoyable and accessible for people walking and wheeling.
- Improved conditions for people cycling.
- Improved parking layout to reduce the impact on people moving around.

Design Objectives

Overview

The emerging themes from Stage 1 were used to develop design objectives.

These set out what the project should achieve and will be used to ensure the designs remain in line with community priorities as they develop.

Design Objectives

Traffic

The street is a slower, quieter, and calmer environment where traffic access is retained but people feel safer, and traffic is less of a barrier to community activity for people of all ages and abilities.

Crossings and Junctions

Using junctions and crossings is an easier and more comfortable experience, which is accessible for people of all ages and abilities by all means of travel.

Place Quality and Greenspace

The street feels more attractive and safer for people to spend time in, with improved access to and through local greenspaces, the distinctive feel of local spaces enhanced, and an overall net gain of ‘green’.

Walking

People of all ages and abilities can more easily walk to access facilities safely, comfortably, and independently.

Cycling

People of all ages and abilities are able to move around by bicycle safely, comfortably and independently.

Parking and loading

Provide parking and loading within a reasonable distance of homes and businesses ensuring equitable access for all.

Study Area

Overview

We have used the design objectives to guide the development of **initial designs**.

To present this, we have split the study area into two: Ashgrove Road West, and Ashgrove Road and Laurelwood Avenue. We have done this to ensure we respond to the different characteristics of each area. Within each area we have focussed in on key sections of the design to provide more detail. In some sections we have developed two or three Ideas to show what could be possible. Elements of each design can be incorporated into different sections depending on the feedback from the community.

We are asking you to consider the different design ideas and feedback on what you like and what you would change, combine or improve. The feedback we receive will help to steer the development of a concept design for the study area.

Area 1: Ashgrove Road West
(see pages 7-23)

Area 2: Ashgrove Road and Laurelwood Avenue
(pages 24-41)

North Anderson Drive
(see pages 12-13)

Foresterhill
(see pages 14-15)

Cornhill
(see pages 16-20)

Westburn Drive
(see pages 21-23)

Ashgrove Road and Laurelwood Avenue
(see pages 24-41)

Key Design Features 1/2

Overview

Throughout the design, you will read about some key features that you may not be familiar with. We have highlighted these below to provide you with a better understanding of these features with examples from other parts of the country.

20mph Speed Limit
This is where the maximum speed limit is set at 20mph and the street is designed to encourage drivers to adhere to slower speeds.

Gateway
This indicates the transition to a slower speed street. This can include features such as signage, artwork, planting and seating.

Bus stop bypass
This is an arrangement that allows people to cycle behind a bus stop while keeping the footway separate for people walking. Tactile paving is used to guide people across the cycle lane to the bus stop.

Pocket park
This is an area of greenspace that could also introduce resting places, informal play, opportunities for the local community to come together to plant flowers, plants and trees and design artwork.

Protected cycle lanes
This is a type of cycle lane that separates people cycling from traffic and those walking on the footway by using kerbs and other features as protectors. It allows people to feel safer and can either be one-way, with people cycling in the same direction as traffic, or two-way, with people cycling in two directions on the same side of the road.

Rain garden
This is an area of attractive, low maintenance, wildlife friendly space which manages surface water runoff from hard surfaces such as footways.

Key Design Features 2/2

Parallel crossings
This is a type of crossing that provides priority to people crossing the road on foot and by bicycle. People cycling and walking have separate space and can be with traffic lights or with zebras where drivers give way.

Continuous footway
This is where the footway extends across a side road, giving priority to those walking and cycling. The continuous footway is set at the same level as the rest of the footway, further reducing vehicle speeds.

Quiet street
This is a type of street with low traffic speed and flow to allow cycling on the road to feel safer. Quiet streets are normally implemented with traffic calming features and with a low flow of through traffic movement.

False one-way street
This is a type of street that allows through traffic to flow one-way but residential access is permitted in both directions.

Modal filter
This is used to allow the passage of people walking and cycling but not motor vehicles. This can create safe and attractive routes for people walking and cycling between residential streets.

Secure bicycle storage
This provides secure cycle storage on street for those with limited space at home for bikes.

Informal play
This is a space which allows people to explore and enjoy their local area in a natural setting. This can incorporate plants, trees and informal play features which encourage fun on the move.

Cycle signals
At junctions with protected cycle lanes, people cycling can be provided with separate instruction to proceed. This can be run alongside people walking who are in a separate space. This helps to make all movements safer.

Ashgrove Road West Overview

Overview

The Ashgrove Road West area incorporates the space from North Anderson Drive to Westburn Drive and the junctions of Foresterhill and Cornhill. In developing design ideas, we have considered:

- Opportunities: what can be done to deliver community priorities; and
- Constraints: factors that place a limit on what can be done

The opportunities and constraints are presented over the next two pages followed by the design ideas for the individual sections.

Area 1: Ashgrove Road West
(see pages 7-23)

North Anderson Drive
(see pages 12-13)

Foresterhill
(see pages 14-15)

Cornhill
(see pages 16-20)

Westburn Drive
(see pages 21-23)

Ashgrove Road West Opportunities and Constraints 1/2

Traffic

Opportunities:

- Reduce speed limit to 20mph
- Provide junction ‘gateways’ to influence driver behaviour
- Narrow the road to control speed and reduce noise
- Make the route less attractive to through traffic

Constraints:

- Berryden Corridor Improvement Project is a committed project and is assumed to be in place
- Access is retained for heavy goods vehicles and buses
- Speed humps are not favoured as this is a bus and emergency route
- We will collaborate with the team delivering the A92 Multi-Modal Transport Study (North Anderson Drive)

Crossings and Junctions

Opportunities:

- More dedicated crossings
- Reduce the width of junctions
- Prioritise people over vehicles at side streets
- Improve the layout of signalised junctions and signal times
- Vehicle access changes at some side streets

Constraints:

- Current access for heavy goods vehicles and buses must be retained
- Landowners have not yet been consulted
- Private driveway access must be retained

Place Quality and Greenspace

Opportunities:

- Direct routes into pockets of adjacent greenspace
- More green space and resting places
- More trees which will last and won’t negatively impact on footways and properties
- Improve bus stop waiting environments
- Provide ‘gateways’ to create more of a community feel

Constraints:

- Retaining existing heavy goods access presents some limitations on space

Ashgrove Road West Opportunities and Constraints 2/2

Walking

Opportunities:

- Reduce speed limit to 20mph
- Narrow the road and add traffic calming measures
- More dedicated crossings
- Make the route less attractive to through traffic
- More green space and resting places
- Dissuade cycling on footways by providing a separate, safe space

Constraints:

- Raised crossings are not favoured as this is a bus and emergency route

Cycling

Opportunities:

- Reduce traffic on side streets to a safe level
- Provide a consistent and protected space for people to cycle on
- Separate people cycling from people walking and traffic at bus stops and through junctions
- Provide dedicated crossings
- Improve signage and cycle parking
- Consider onward travel connections to the city centre and further afield

Constraints:

- Traffic flow will remain too high for people, particularly children, to cycle on the road

Parking and loading

Opportunities:

- Only 2-3 vehicles park overnight, indicating low residential demand that could be accommodated elsewhere
- Prioritise community need over occasional parking
- Remove opportunities to park on footways and at junctions
- Ensure commuters use off-street parking
- Provide for loading access to businesses using off-street parking

Constraints:

- Resources to extend and manage Controlled Parking Zones are limited
- Providing space for community priorities means reducing the number of on street parking spaces available

Ashgrove Road West Existing Environment 1/2

Approach

The ideas for Ashgrove Road West aim to reduce traffic speed, dissuade unnecessary through traffic and provide better opportunities for people to travel sustainably and enjoy the area.

Reducing the speed limit to 20mph and re-allocating road space, as indicated in the street width diagrams (see page 11), will allow for safe space for walking and cycling by all ages, more crossings, more trees and greenspace, resting places and improved bus waiting areas. This is detailed further for each of the sections that follow.

Traffic

On average, there are over 10,000 vehicles travelling along stretches of Ashgrove Road West in a normal day (over 600 vehicles in the peak hour). 62% of vehicles travel above 30mph and almost all above 20mph.

We recommend a 20mph speed limit and a carriageway width of 6.5metres (currently between 10-12m) to better control speed and reduce noise. We have modelled the initial designs with current traffic flows to ensure this can be accommodated, although the designs aim to dissuade unnecessary through traffic.

Crossings, junctions and walking

There are currently 4 traffic signal junctions that provide opportunities to cross Ashgrove Road West.

Responding to need of the community, the initial designs propose adding an additional two parallel crossings at Castleton Drive and Cornhill Terrace.

Cycling changes

Overall traffic flow (7% of which is heavy goods vehicles) is way beyond the threshold considered appropriate for people to cycle, particularly children, on the road. This results in people cycling on the footways.

The initial designs propose a protected cycle lane on both sides of the street to enable people of all ages to cycle and keep the footway clear and safe for people walking.

Parking changes

Very few residents park on the street overnight (approximately 2-3 vehicles). A variety of other daytime users including deliveries and commuters occasionally park here but demand overall is low.

The initial designs propose no parking bays along Ashgrove Road West in order to improve junction safety and provide space for trees, greenspace, improved bus stops and protected cycle lanes. People would be required to park in off-street spaces or side streets where there is space available.

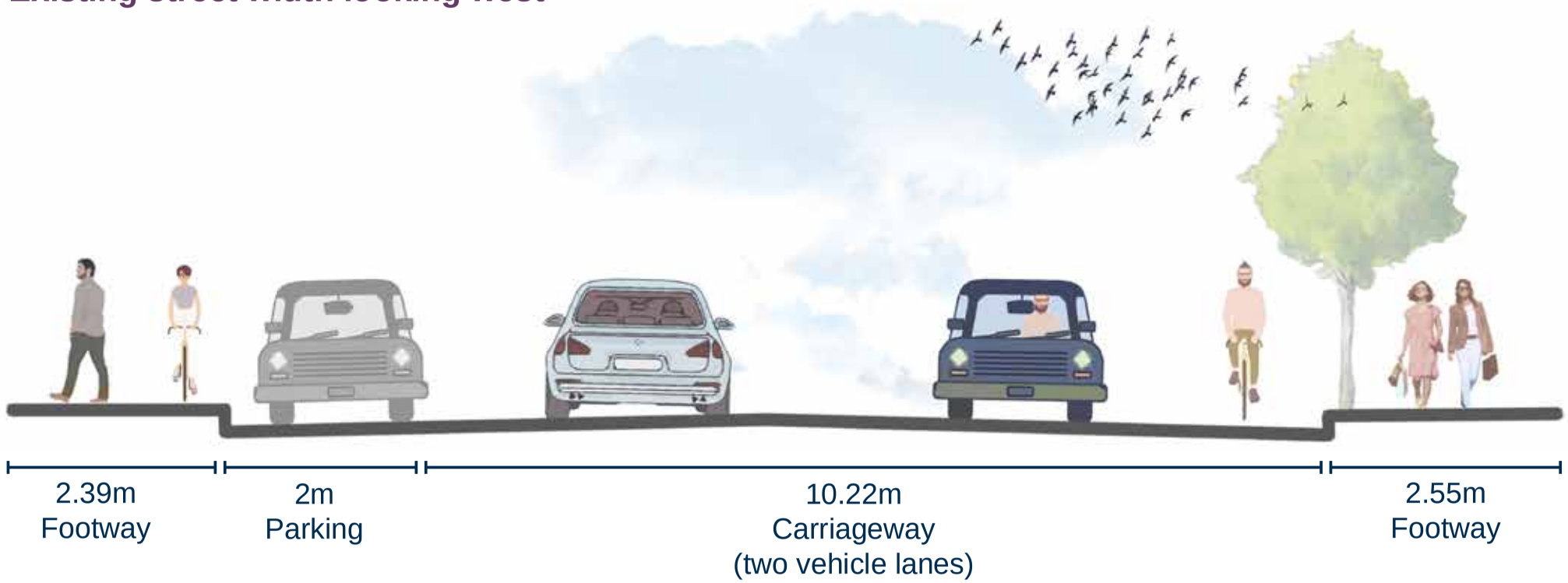
Ashgrove Road West Existing Environment 2/2

Place quality and greenspace changes

The initial designs retain space for the existing street trees while looking at opportunities for additional trees, greenspace, rain gardens, improved bus stops and resting places.

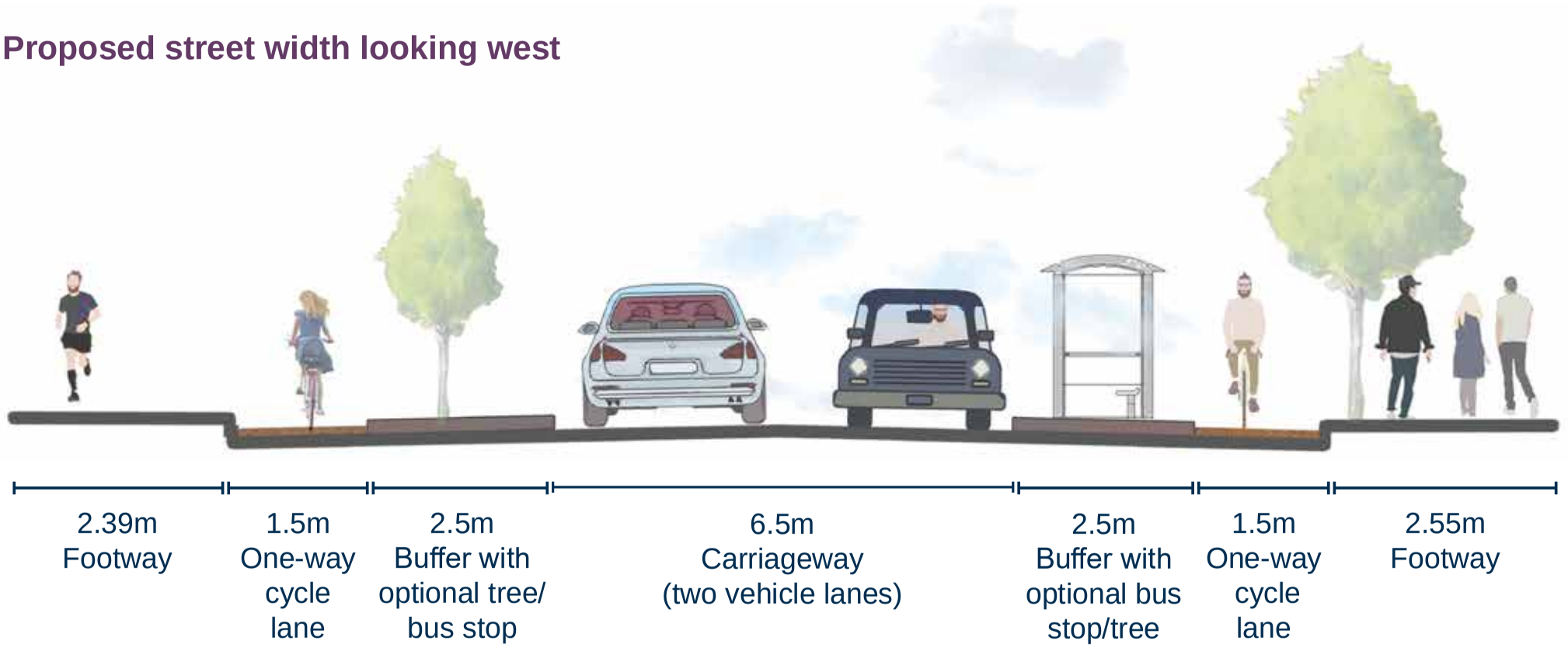
Where trees are found to be in poor health or damaging footways and properties, they would be replanted.

Existing street width looking west



Location of street width

Proposed street width looking west



North Anderson Drive Existing Environment

Overview

You told us that the layout of this junction prioritises traffic movement and does not adequately recognise this as a gateway into the community. While North Anderson Drive will remain a significant road corridor, there are opportunities to ensure that people can move across it more easily.

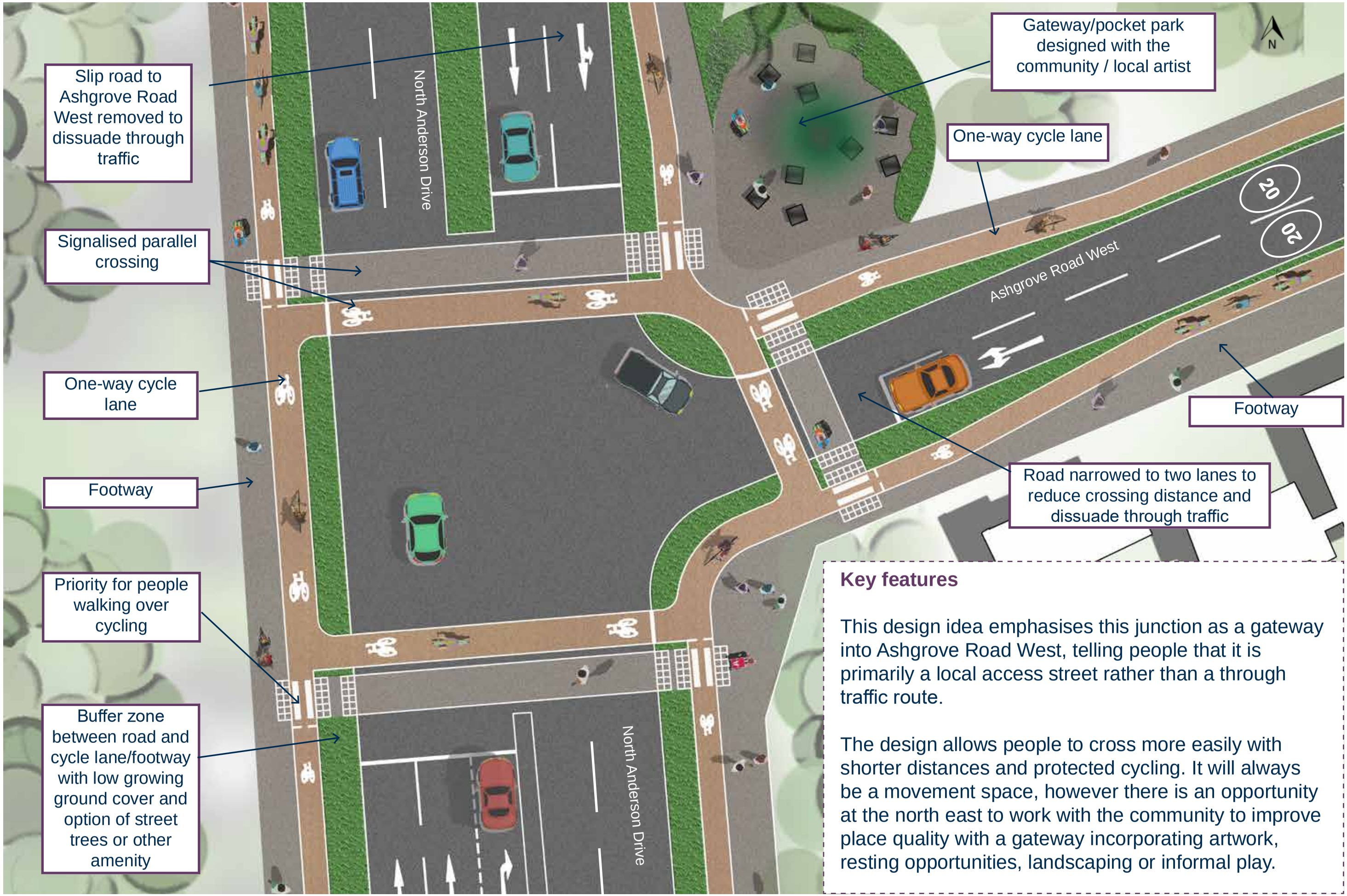
For this section, we have developed an idea for you to consider and feedback on.

You said:

- Wide entrance encourages high vehicles speeds and through traffic.
- Difficult to cross the junction in time.
- Appearance gives impression this is a through route for traffic.
- Difficult to cross the junction in time.
- Not pleasant to cross by bike.
- Parking provision is rarely used which creates the impression of a wide road.

Existing layout:

North Anderson Drive Design Idea



Key features

This design idea emphasises this junction as a gateway into Ashgrove Road West, telling people that it is primarily a local access street rather than a through traffic route.

The design allows people to cross more easily with shorter distances and protected cycling. It will always be a movement space, however there is an opportunity at the north east to work with the community to improve place quality with a gateway incorporating artwork, resting opportunities, landscaping or informal play.

Foresterhill Existing Environment

Overview

This is a key junction for people going to the Foresterhill Health Campus, Stockethill and Cornhill and for emergency access. There is an opportunity to simplify the signalised junction to make this feel safer to use by all modes of travel.

For this section, we have developed an idea for you to consider and feedback on.

You said:

- Congested environment with high traffic speeds.
- Confusing and complicated staggered traffic lights with poor signal times for all users.
- Trees are much loved but negatively impact the footway.
- Slow to cross the road in all directions.
- Difficult environment to cycle in.
- Parked vehicles cause confusion on western approach to traffic lights.

Existing layout:

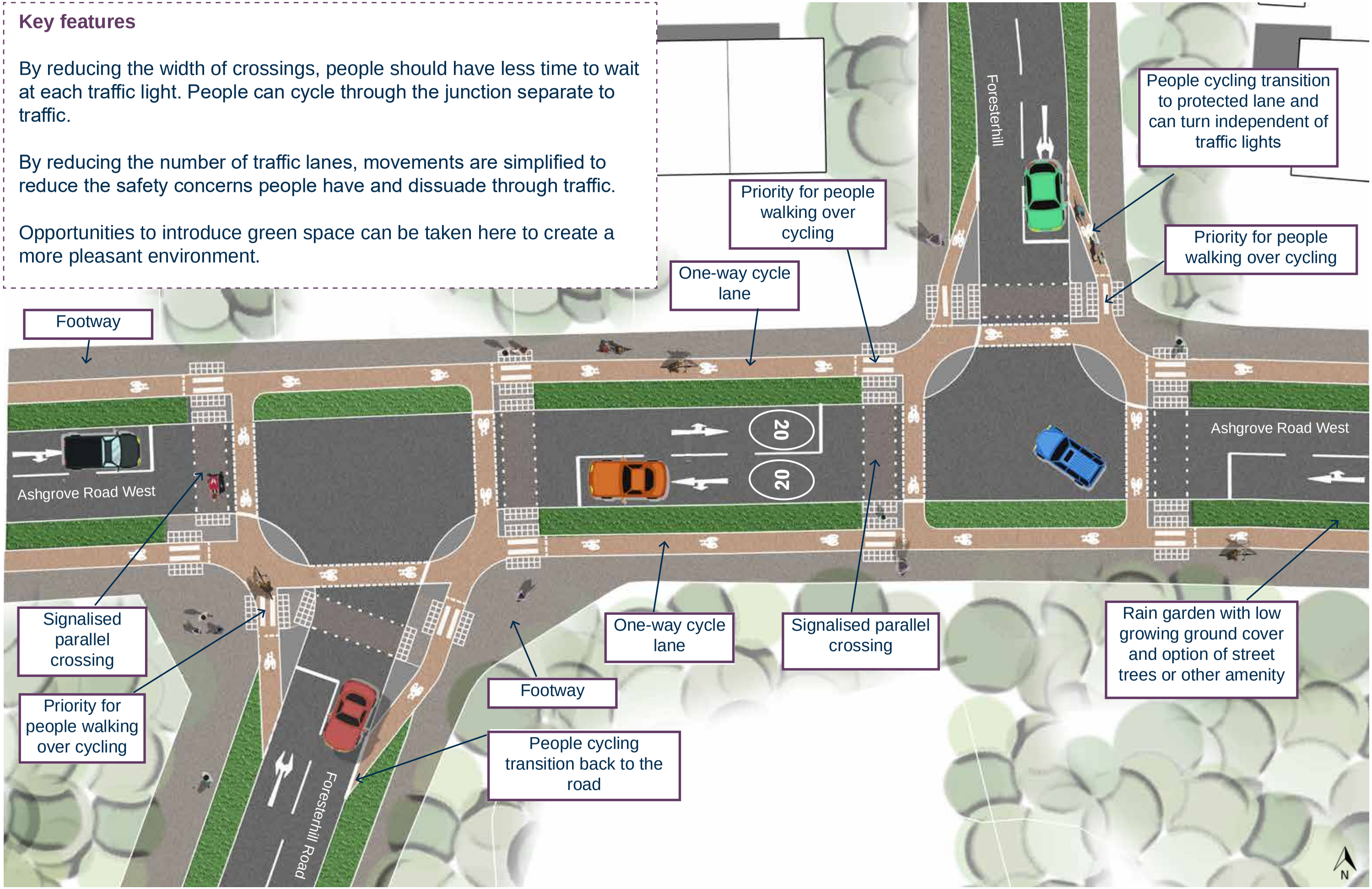
Foresterhill Design Idea

Key features

By reducing the width of crossings, people should have less time to wait at each traffic light. People can cycle through the junction separate to traffic.

By reducing the number of traffic lanes, movements are simplified to reduce the safety concerns people have and dissuade through traffic.

Opportunities to introduce green space can be taken here to create a more pleasant environment.



Cornhill Existing Environment

Overview

This is a key junction for children going to school and students to the university campus. There is an opportunity to change the layout to enable people to cross the road, make the junction feel safer and more attractive.

For this section, we have developed two ideas for you to consider and feedback on.

You said:

- Confusion over right of way from Cornhill Terrace onto Ashgrove Road West causes accidents.
- No crossing for the popular route between Cornhill Terrace and Cornhill Road.
- Poor street lighting and no resting places.
- Difficult to cross the road and poor footway conditions.
- Difficult environment to cycle in.
- Signage for Controlled Parking Zone causes confusion.

Existing layout:

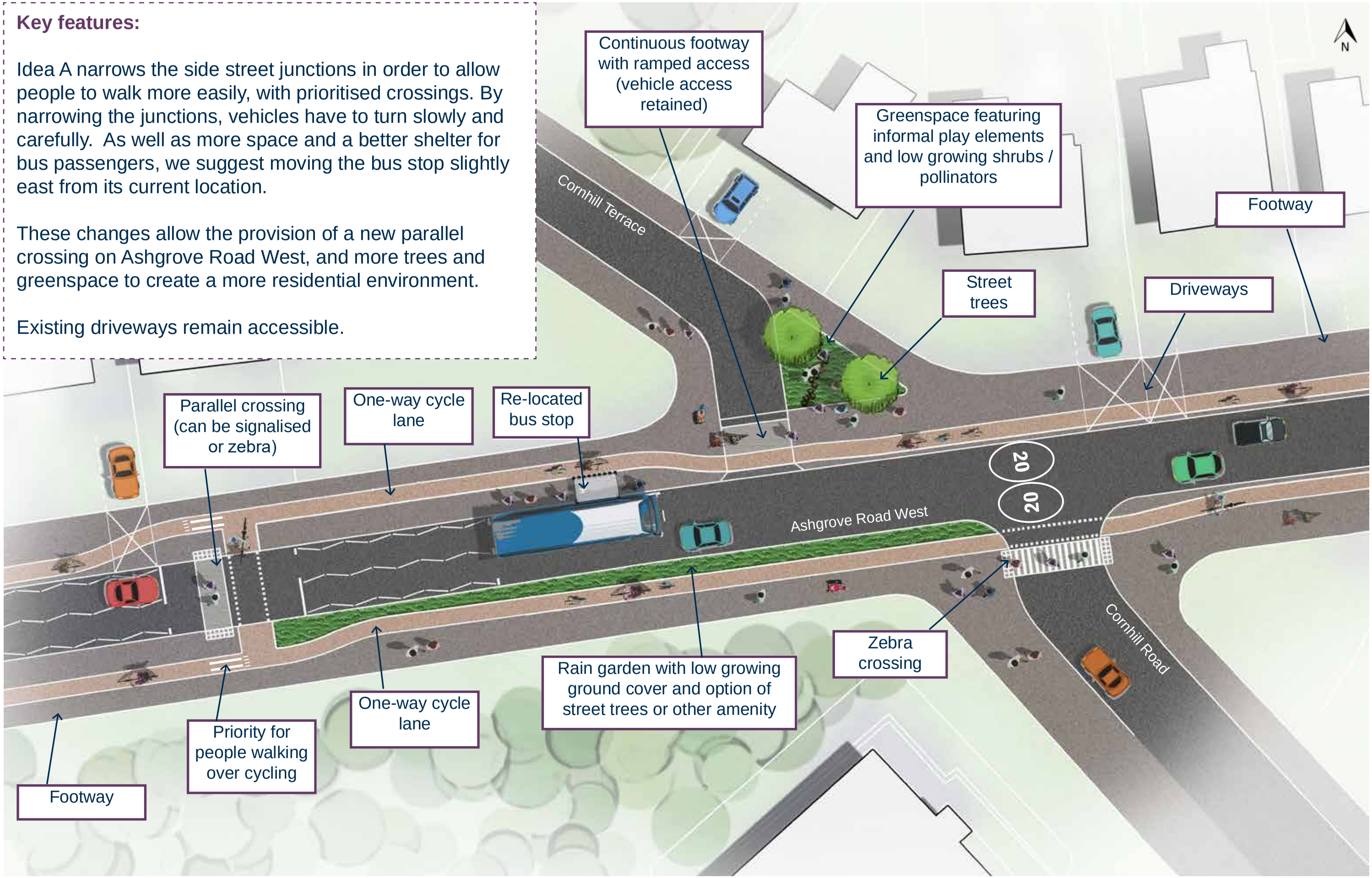
Cornhill Design Idea A (Small Greenspace)

Key features:

Idea A narrows the side street junctions in order to allow people to walk more easily, with prioritised crossings. By narrowing the junctions, vehicles have to turn slowly and carefully. As well as more space and a better shelter for bus passengers, we suggest moving the bus stop slightly east from its current location.

These changes allow the provision of a new parallel crossing on Ashgrove Road West, and more trees and greenspace to create a more residential environment.

Existing driveways remain accessible.



Cornhill Design Idea A (Small Greenspace)

Idea A street view

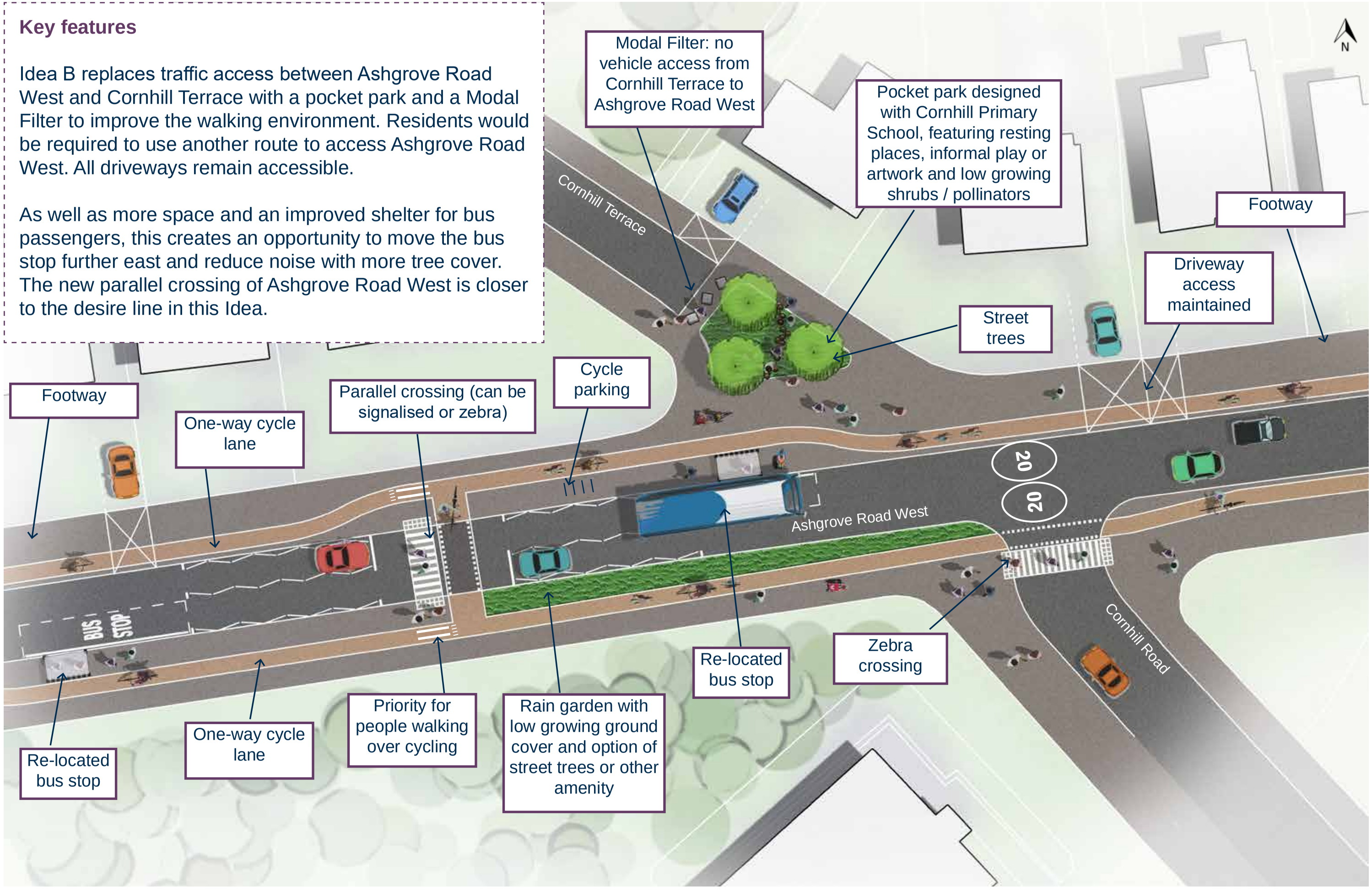
Existing street view

Cornhill Design Idea B (Pocket Park and Modal Filter)

Key features

Idea B replaces traffic access between Ashgrove Road West and Cornhill Terrace with a pocket park and a Modal Filter to improve the walking environment. Residents would be required to use another route to access Ashgrove Road West. All driveways remain accessible.

As well as more space and an improved shelter for bus passengers, this creates an opportunity to move the bus stop further east and reduce noise with more tree cover. The new parallel crossing of Ashgrove Road West is closer to the desire line in this Idea.



Cornhill Design Idea B (Pocket Park and Modal Filter)

Idea B street view

Existing street view

Westburn Drive Existing Environment

Overview

This is a key junction linking Ashgrove Road West and Ashgrove Road with Westburn Drive. There is an opportunity to change the layout of this signalised junction to provide more priority to people walking and cycling and make the junction feel safer for all travel modes.

For this section, we have developed two ideas for you to consider and feedback on.

You said:

- High vehicle speeds attempt to beat the traffic lights.
- Not enough time between traffic lights changing with drivers jumping red lights.
- Underutilised greenspace and high walls can feel intimidating to some.
- High vehicle speeds can make walking feel unsafe.
- Difficult environment to cycle in.
- Signage for Controlled Parking Zone causes confusion.

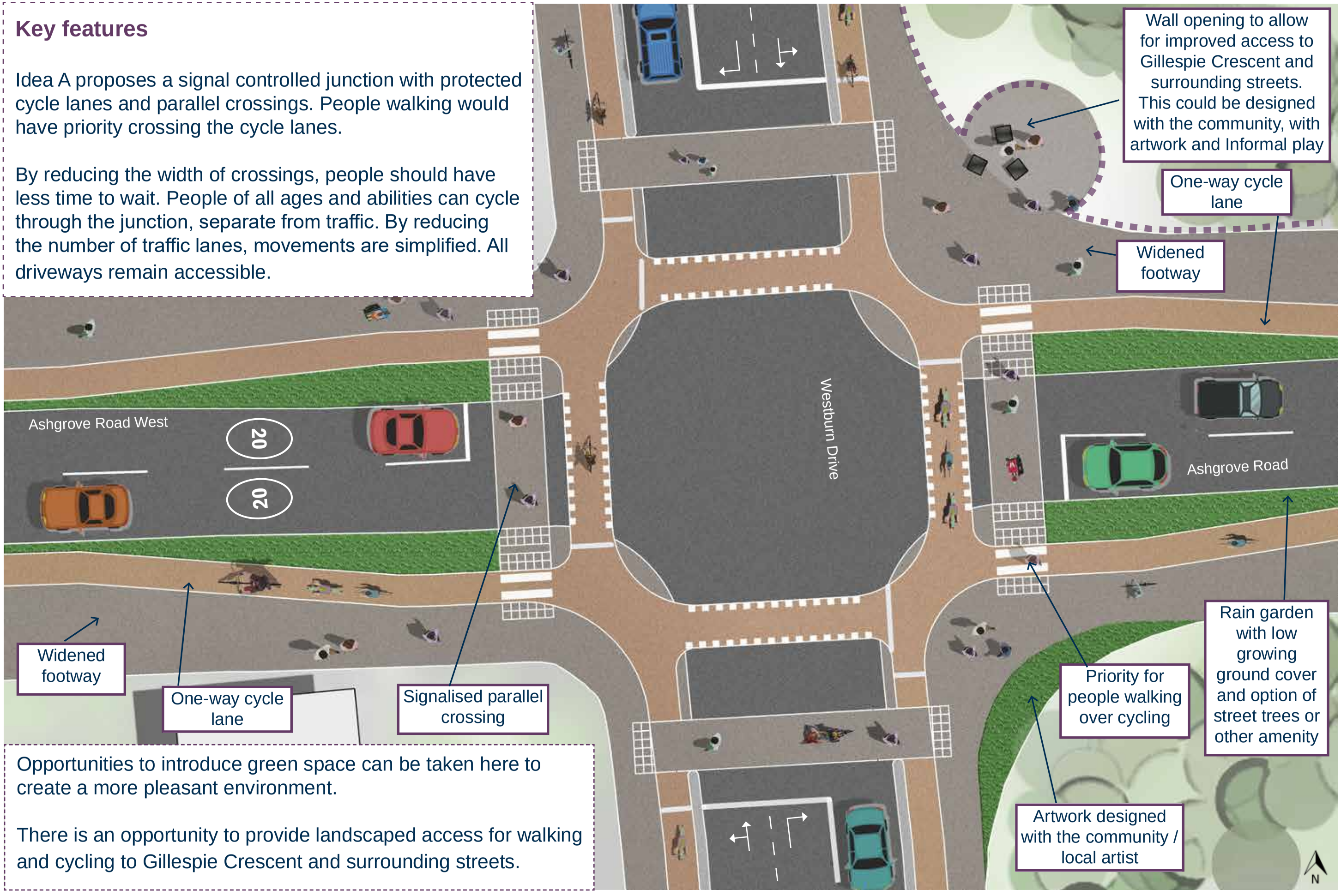
Existing layout:

Westburn Drive Design Idea A (Traffic signals)

Key features

Idea A proposes a signal controlled junction with protected cycle lanes and parallel crossings. People walking would have priority crossing the cycle lanes.

By reducing the width of crossings, people should have less time to wait. People of all ages and abilities can cycle through the junction, separate from traffic. By reducing the number of traffic lanes, movements are simplified. All driveways remain accessible.



Opportunities to introduce green space can be taken here to create a more pleasant environment.

There is an opportunity to provide landscaped access for walking and cycling to Gillespie Crescent and surrounding streets.

Westburn Drive Design Idea B (Roundabout)

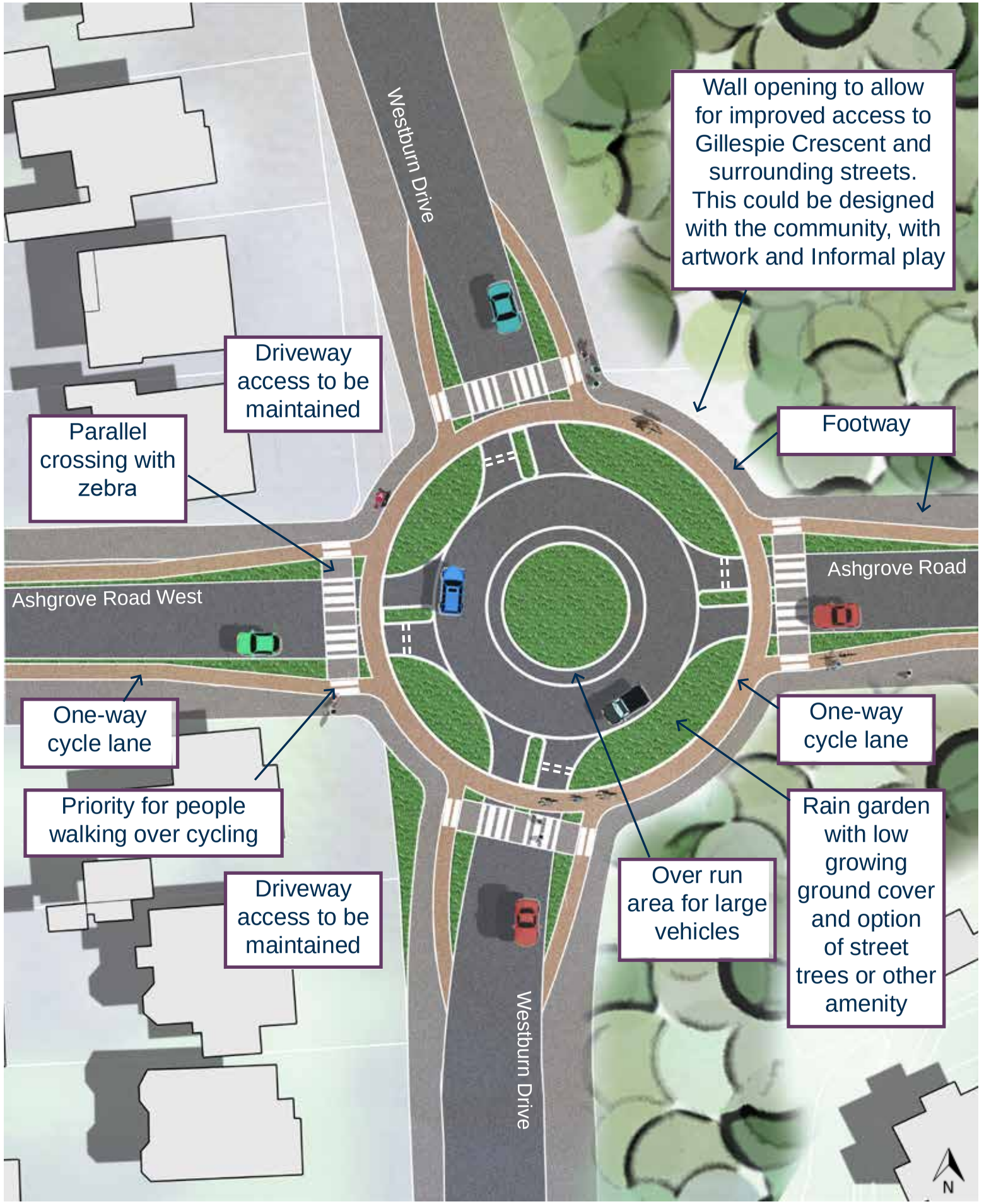
Key features

Idea B proposes a roundabout that provides priority over traffic for people walking and cycling through the junction using parallel crossings. This concept is common in other countries but relatively new to the UK.

Many people walking and cycling prefer the immediate priority over traffic so that they have less time to wait. People walking have priority over those cycling. Drivers are required to drive more slowly than at a traditional roundabout, but would experience less delay than at traffic signals.

This Idea requires more land than traffic signals and negotiations would be required with landowners to the north-east and south-east if this was something the community was interested in progressing at this location. We do not anticipate this would require land purchase to the north-west or south-west, however in these locations, arrangements to maintain driveway access would require consideration with those residents.

Example
Credit: PA Images / Alamy Stock Photo



Ashgrove Road and Laurelwood Avenue Overview

Overview

The Ashgrove Road and Laurelwood Avenue area incorporates the space from Berryden Road to Westburn Drive. We have particularly focussed in this section on the area to the east of May Baird Avenue. In developing design ideas we have considered:

- Opportunities: what can be done to deliver community priorities; and
- Constraints: factors that place a limit on what can be done

The opportunities and constraints are presented over the next two pages followed by three design Ideas for this area.

Area 2: Ashgrove Road and Laurelwood Avenue
(pages 24-40)

Ashgrove Road and Laurelwood Avenue Constraints and Opportunities 1/2

Traffic

Opportunities:

- Reduce speed limit to 20mph
- Traffic circulation patterns can be adapted to reduce traffic flow
- Provide junction ‘gateways’ to influence driver behaviour
- Narrow the road to control speed and reduce noise
- Traffic calming measures at junctions
- More greenspace to ‘absorb’ noise

Constraints:

- Berryden Corridor Improvement is a committed project and is assumed to be in place
- The right turn for traffic from Elm Place to Berryden Road (south) must be retained
- The left turn for traffic from Berryden Road into Ashgrove Road must be retained
- While unnecessary through traffic can be dissuaded, full removal of through traffic is not being considered

Crossings and Junctions

Opportunities:

- More dedicated crossings
- Reduce the width of junctions
- Prioritise people over vehicles at side streets
- Vehicle turning restrictions can be introduced to restrict through traffic within the constraints noted under ‘Traffic’

Constraints:

- Private driveway access to be retained

Place Quality and Greenspace

Opportunities:

- More green space and resting places
- More trees which will last and won’t negatively impact on footways and properties
- Provide ‘gateways’ to create more of a community feel

Constraints:

- Retaining existing heavy goods vehicle access presents some limitations on opportunities

Ashgrove Road and Laurelwood Avenue Constraints and Opportunities 2/2

Walking

Opportunities:

- Reduce speed limit to 20mph
- Narrow the road and add traffic calming measures
- More dedicated crossings
- Make the route less attractive to through traffic
- More green space and resting places
- Dissuade cycling on footways by providing a separate, safe space

Constraints:

- Vertical traffic calming is not favoured as this is an emergency route

Cycling

Opportunities:

- Reduce traffic below 200 per hours (two way) or provide a consistent and protected space for people of all ages to cycle on
- Separate people cycling from people walking and traffic
- Provide dedicated crossings
- Improve signage and cycle parking
- Consider onward travel connections to the city centre and further afield

Constraints:

- Current traffic flow

Parking

Opportunities:

- Define designated bays for parking
- Prioritise residential needs over occasional parking use
- Remove opportunities to park on footways and at junctions
- Ensure commuters use off-street parking
- On-street parking can be moved within a reasonable distance from those homes without off-street options

Constraints:

- Provide for loading access to businesses using off-street parking
- Resources to extend and manage
- Controlled Parking Zones may be limited
- Providing space for other community priorities means reducing the number of on street parking spaces available
- Discussion will be required with the community to determine the correct balance of priorities

Ashgrove Road and Laurelwood Avenue Existing Environment 1/3

Overview

The primary functions of Ashgrove Road and Laurelwood Avenue are residential streets, connections to and from other parts of the area, and in the case of Ashgrove Road access to businesses. In the future we have assumed that the committed Berryden Corridor Improvement project is in place.

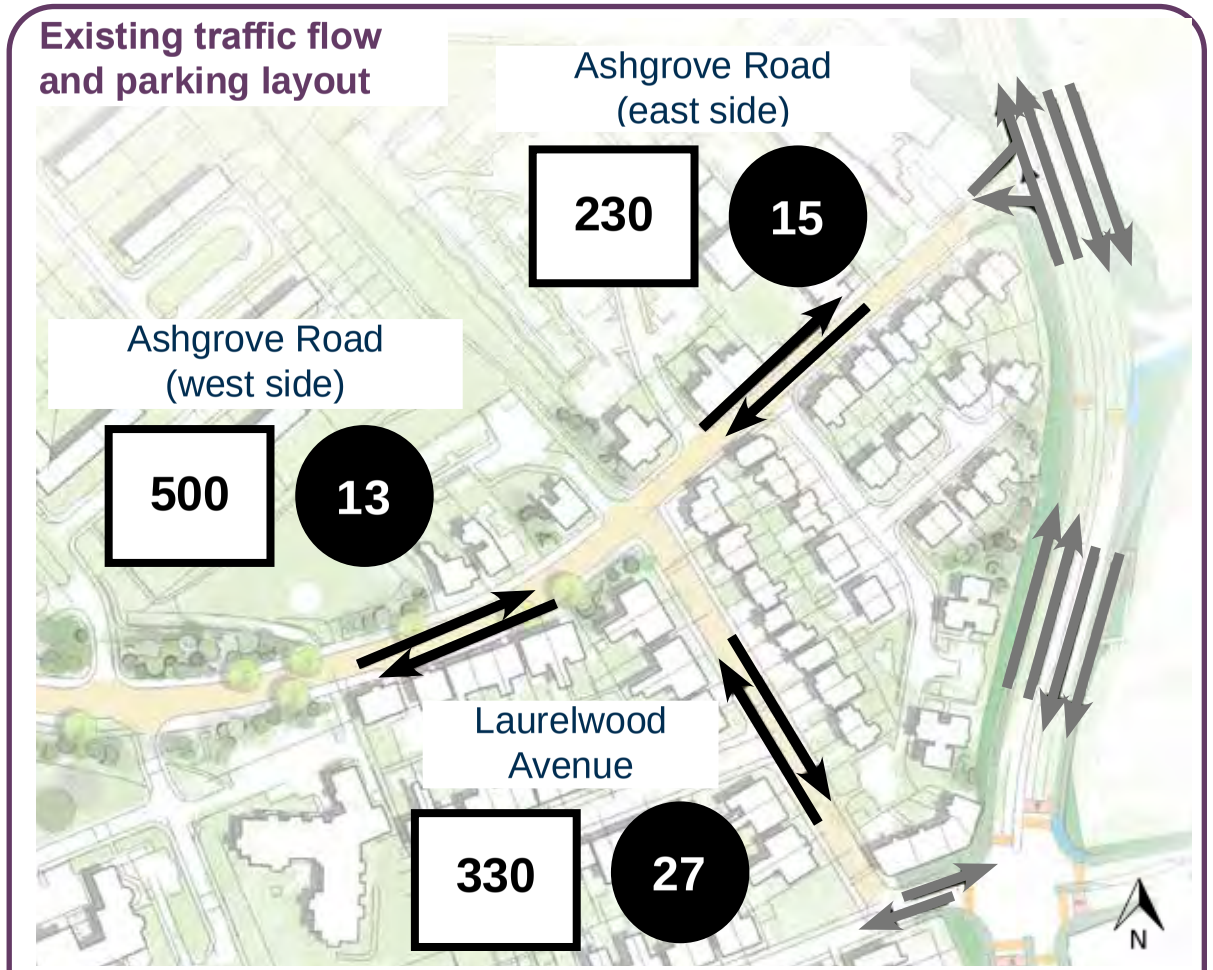
You told us that speed and flow of traffic is too high and walking and cycling in the area is difficult, particularly at junctions. There is an opportunity to consider changing traffic circulation and to adapt street layouts and junctions, within the context of the Berryden Corridor. By making such changes, there are different trade-offs to be made for the use of space, which we introduce here and develop within three design Ideas.

Traffic

On average, there are over 6,000 vehicles travelling along stretches of Ashgrove Road in a normal day. The diagram indicates (black arrows and boxes) the existing maximum hourly traffic flow (500 in the peak hour) in a normal day. This assumes the Berryden Corridor Improvement project has been implemented. The opportunities and constraints for changing traffic movements are listed on page 25.

A 20mph speed limit and traffic calming is already in place on Laurelwood Avenue.

Existing traffic flow and parking layout



Key

500 — Approx number of vehicles per hour

13 — Number of parking spaces

Traffic direction

Traffic direction (Berryden Road Corridor Improvement project)

Notes on traffic flows:

Existing traffic flows are based on counts from this project and models from the Berryden Corridor Improvement Project

Parking

On Ashgrove Road and Laurelwood Avenue, many properties have driveways and/or garages. Although there are no designated on-street bays, parking is permitted on multiple sections on both streets. On both streets, parking on the footway is also common, restricting the space for people walking and damaging footways. On Laurelwood Avenue, parking itself can have a traffic calming effect, however when cars are not parked, this effect is lost and through traffic speeds up. The number of vehicles that can legally park on these streets is indicated in the diagram (black circles). The majority of these spaces are occupied in the late evening, most likely by residents. Short stays are common in the daytime, indicating use by commuters and customers.

Ashgrove Road and Laurelwood Avenue Existing Environment 2/3

Cycling

When two-way traffic flow is over 200 vehicles per hour (100 vehicles in each direction), cycling with traffic is uncomfortable and perceived as unsafe for many people, including most children. People will therefore tend to cycle on the footway or not at all.

The presence of heavy goods vehicles also deters a lot of people and currently around 5% of traffic on Ashgrove Road is heavy goods vehicles. The diagram indicates (red arrows) that, on Ashgrove Road and Laurelwood Avenue, the traffic flow is beyond this comfort threshold for people.

Crossing, junctions and walking

People told us it was difficult to cross Ashgrove Road and Laurelwood Avenue, in particular for people with restricted mobility and buggies/prams.

The Berryden Corridor Improvement project will reduce traffic queuing and the initial designs identify additional crossing opportunities.

Place quality and greenspace

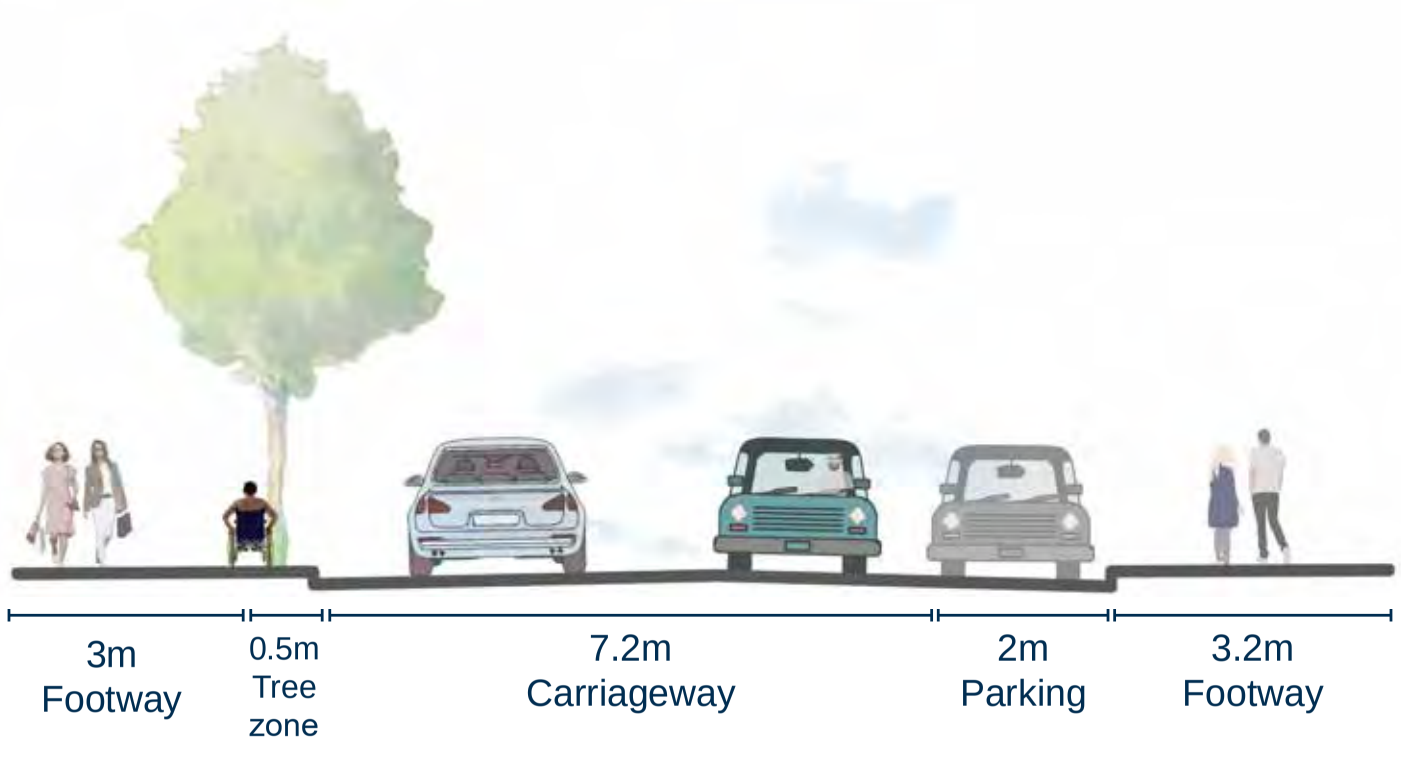
There are currently 12 trees on Ashgrove Road and Laurelwood Avenue between May Baird Avenue and Berryden Road. The initial designs aim to retain existing street trees and provide more trees where possible. We have indicated any change in numbers in the Design Ideas.

Where trees are found to be in poor health or damaging footways and properties, they would be replanted

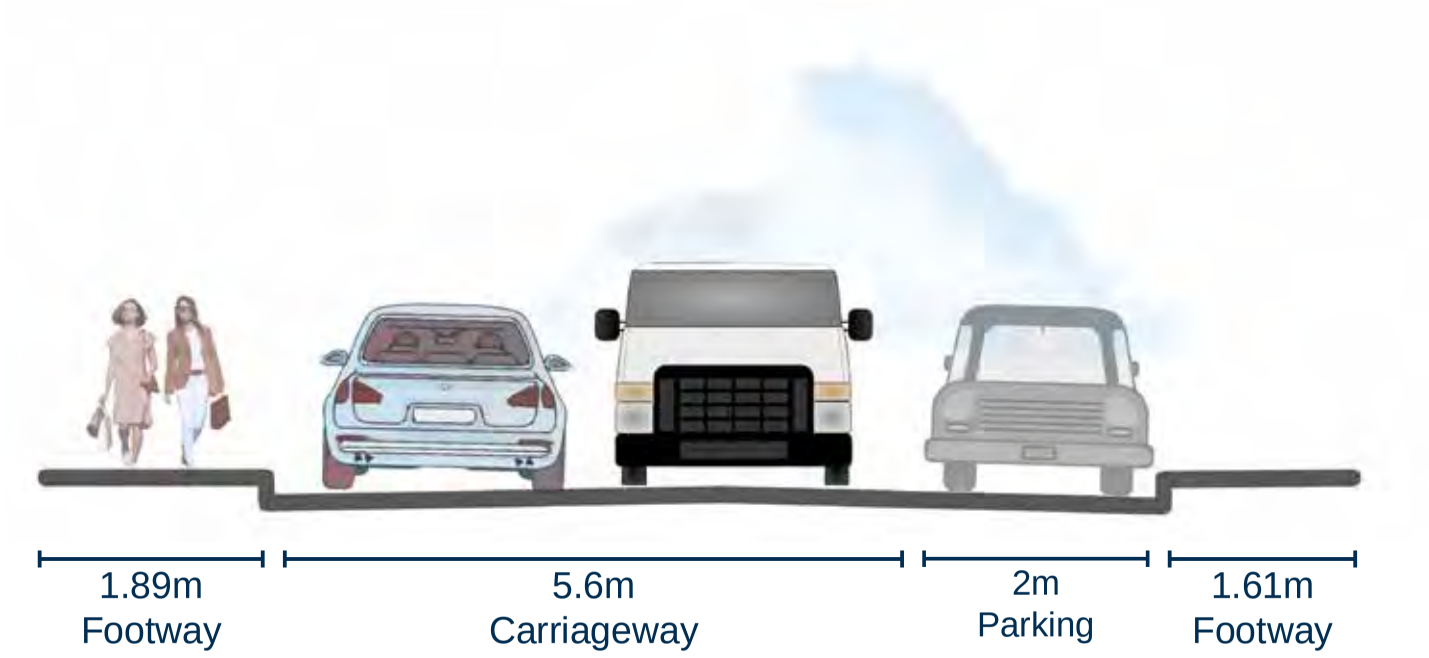
Ashgrove Road and Laurelwood Avenue Existing Environment 3/3

Location of existing street widths

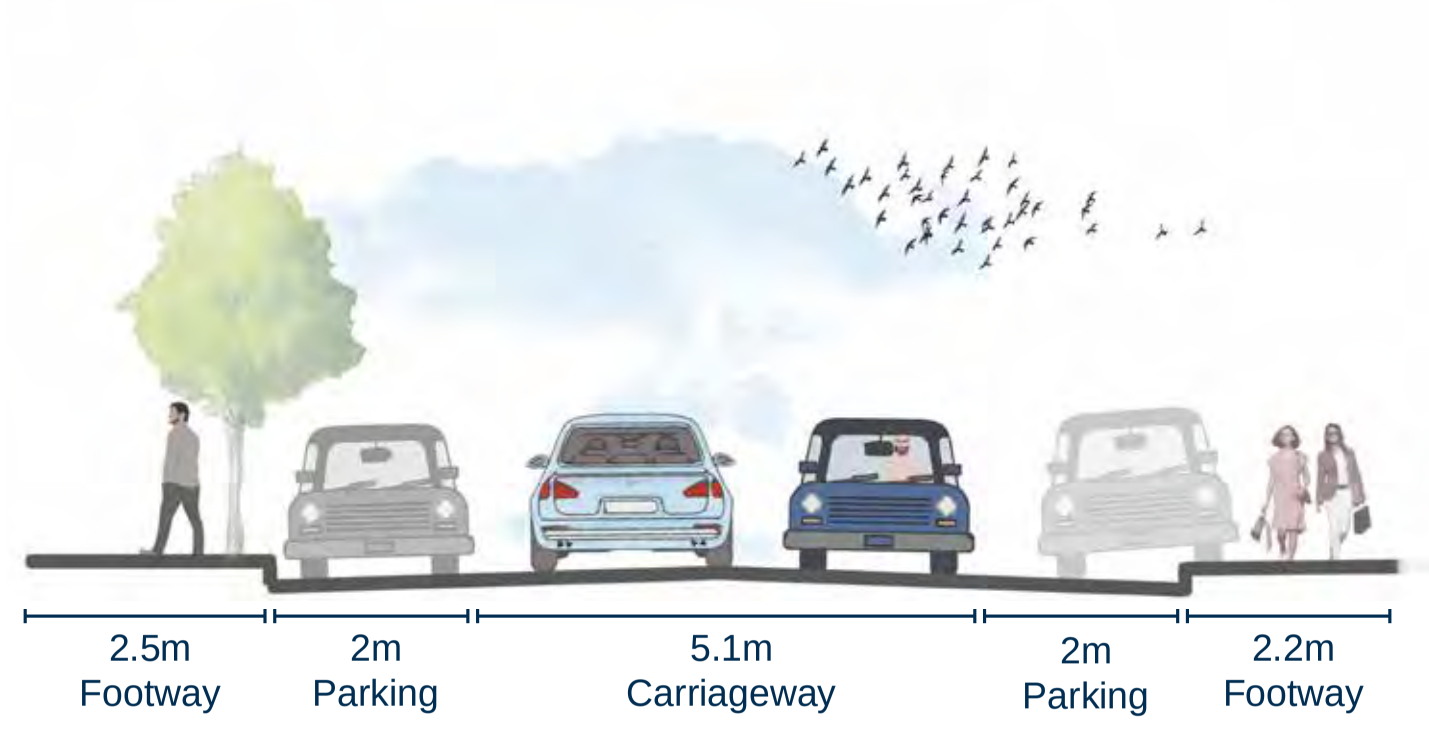
Width 1: Ashgrove Road looking east between May Baird Avenue and Laurelwood Avenue



Width 2: Ashgrove Road looking east between Laurelwood Avenue and Berryden Road



Width 3: Laurelwood Avenue looking north



Ashgrove Road and Laurelwood Avenue Idea A (One-way) 1/5

Key features

Idea A reduces the traffic carriageway space to 3.6metres for one-way traffic (on Ashgrove Road from Berryden Road to Laurelwood Avenue and on Laurelwood Avenue itself), and to 5.6m two-way on Ashgrove Road, west of Laurelwood Avenue.

The estimated traffic flow is detailed on the next page along with the parking bay locations.

This creates space for more trees and greenspace, a protected cycle lane, maintained footway widths and more crossings to allow all ages and abilities to get around. All driveways and businesses remain accessible.

Notes on design ideas:

Please note that elements of Ideas A, B and C are interchangeable. For example a one-way street or false-one way on Laurelwood Avenue is compatible with a two-way street on Ashgrove Road or a Quiet Street (if traffic conditions allow). The feedback you provide will help us understand your priorities to develop these ideas further.

Ashgrove Road and Laurelwood Avenue Idea A (One-way) 2/5

Traffic

This idea proposes the following arrangement for traffic circulation:

- Two-way traffic remains on Ashgrove Road between May Baird and Laurelwood Avenue;
- One-way traffic on Ashgrove Road from Berryden Road to Laurelwood Avenue (westbound);
- One-way traffic on Laurelwood Avenue to Elm Place (southbound).

The diagram on the right indicates our estimate of the likely worst case traffic flow on each street with these changes (see diagram notes). It indicates a reduction on Ashgrove Road (east side). A slight increase on Laurelwood Avenue overall is estimated, however because all the Laurelwood Avenue traffic would be travelling south, there would be less conflicts. The carriageway width and existing speed cushions will help to control speed.

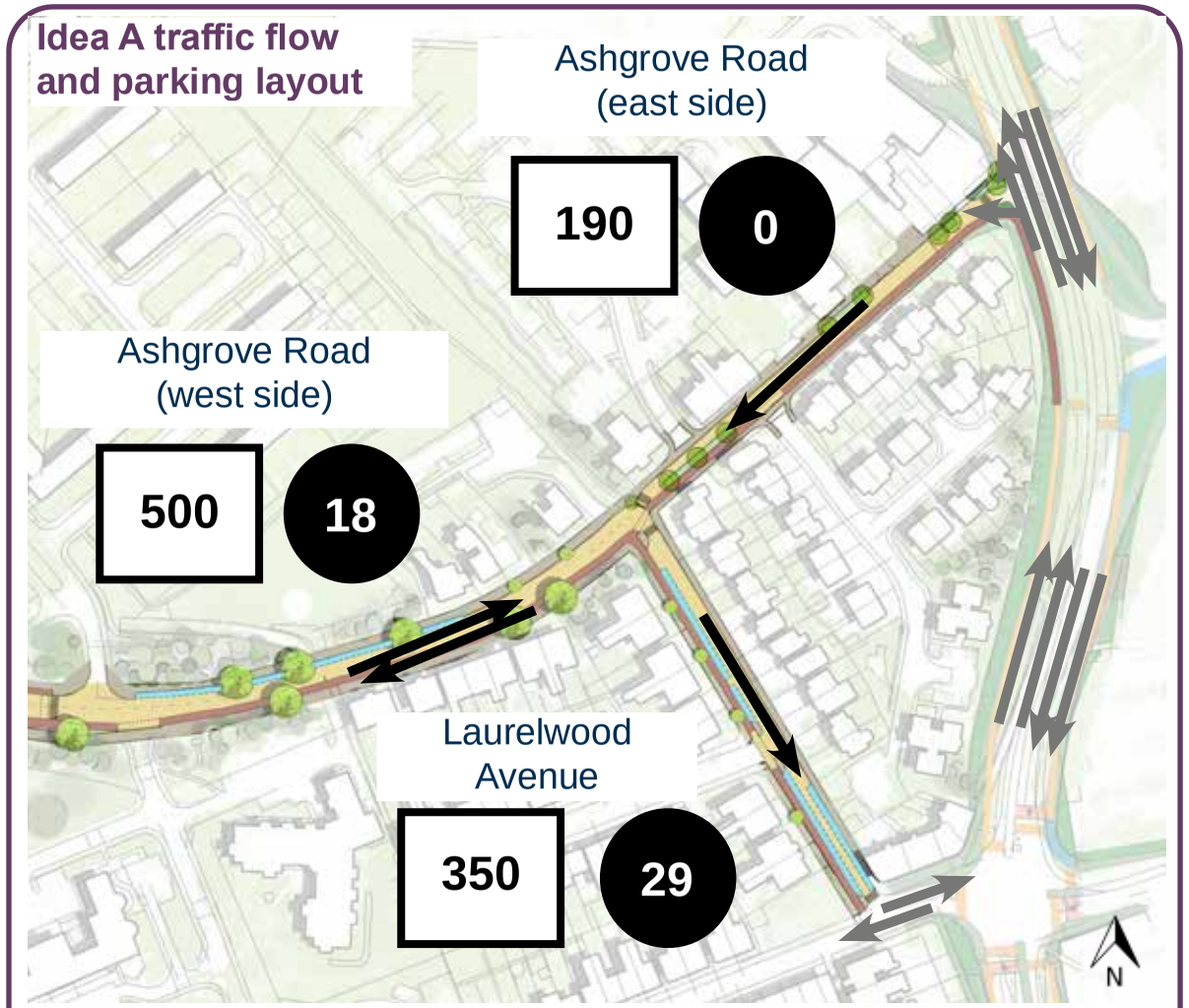
Parking

By providing a single two-way cycle lane instead of cycle lanes on both sides, we can maintain 47 of the existing 55 spaces and formalise these into bays.

The changes would be as follows:

- Ashgrove Road (May Baird to Laurelwood Avenue): From 13 to 18 spaces, located on the north side of the road;
- Ashgrove Road (Laurelwood Avenue to Berryden Road): From 15 to 0 spaces and with the opportunity for pavement parking removed, requiring residents to use driveways or park further along Ashgrove Road;
- Laurelwood Avenue: From 27 to 29 spaces, formalised in bays and with the opportunity for pavement parking removed.

Idea A traffic flow and parking layout



Key

500 — Approx number of vehicles per hour	18 — Number of parking spaces
Traffic direction	Traffic direction (Berryden Road Corridor Improvement Scheme)

Notes on traffic flows:

Existing traffic flows are based on counts from this project and models from the Berryden Corridor Improvement Project

We have used worst case traffic flow numbers. Our aim is to propose changes that will make Laurelwood Avenue and Ashgrove Road less attractive for through traffic. If this is successful, it is likely and that the overall flows will be lower than those shown because some of those vehicles will route elsewhere.

Ashgrove Road and Laurelwood Avenue Idea A (One-way) 3/5

Cycling

As traffic flows would still be uncomfortable for many people to cycle on Ashgrove Road and Laurelwood Avenue, Idea A includes a two-way protected cycle lane connecting with the cycling provision on Berryden Road.

However, should future analysis indicate that traffic can be reduced still further, the lessened need for a protected cycle lane on those streets could introduce the opportunity for a Quiet Street (Idea C, see page 40).

Crossings junctions and walking

With narrower road space and a 20mph speed limit, the environment will be more appropriate for a residential street. New crossings will help to slow traffic and make it easier to get around on foot:

- Ashgrove Road: three new crossings at May Baird Avenue, Laurelwood Avenue and Berryden Road; and
- Laurelwood Avenue: one new crossing at the junction with Ashgrove Road.

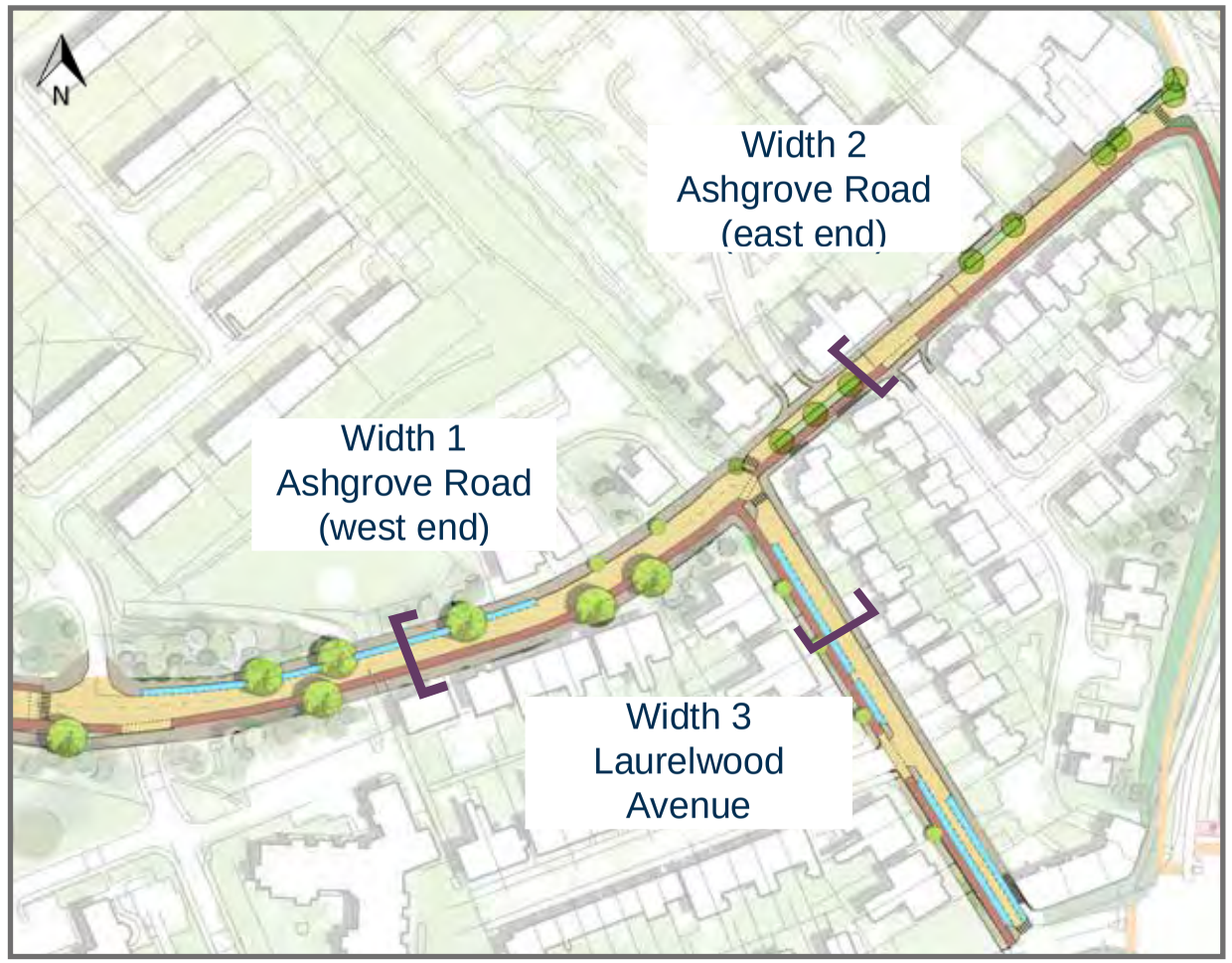
Place quality and greenspace changes

This idea could introduce up 10 new trees on Ashgrove Road, to increase the total number of trees from 12 to 20, with small opportunities for low growing greenspace or rain gardens.

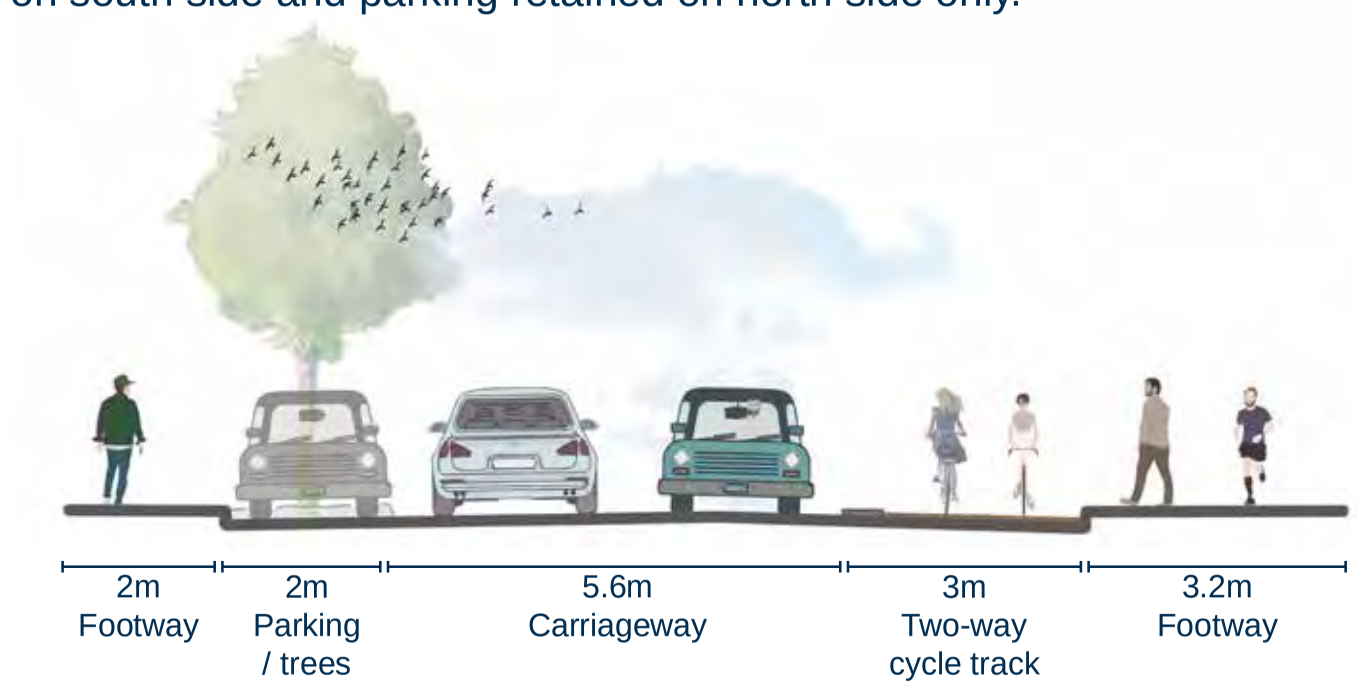
The location and mix of flora could be designed with the community.

Ashgrove Road and Laurelwood Avenue Idea A (One-way) 4/5

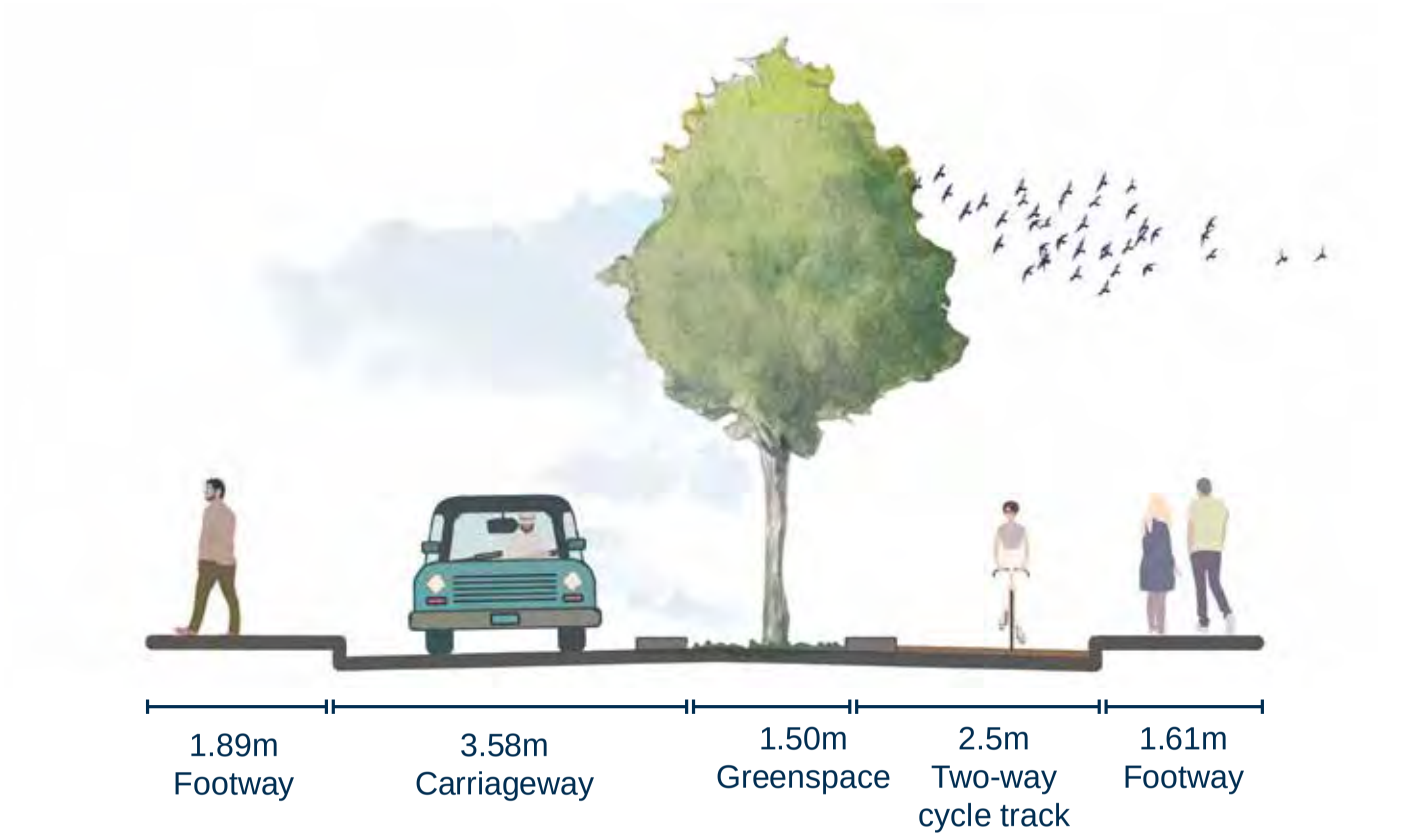
Location of street widths



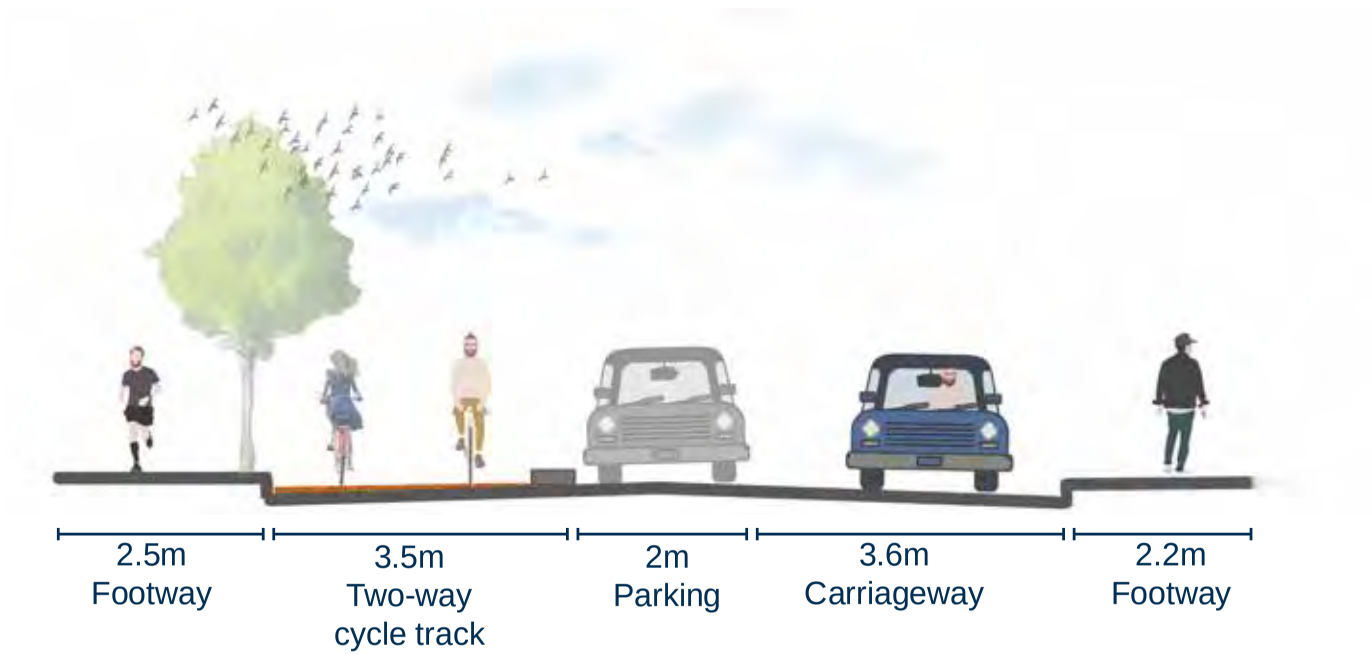
Width 1: Ashgrove Road looking east between May Baird and Laurelwood Avenue. Two-way traffic flow with a two-way cycle lane on south side and parking retained on north side only.



Width 2: Ashgrove Road looking east between Laurelwood Avenue and Berryden Road. One-way traffic flow with improved public realm and two-way cycle lanes on south side and no parking.



Width 3: Laurelwood Avenue looking north. One-way traffic flow with two-way cycle lane and parking retained.



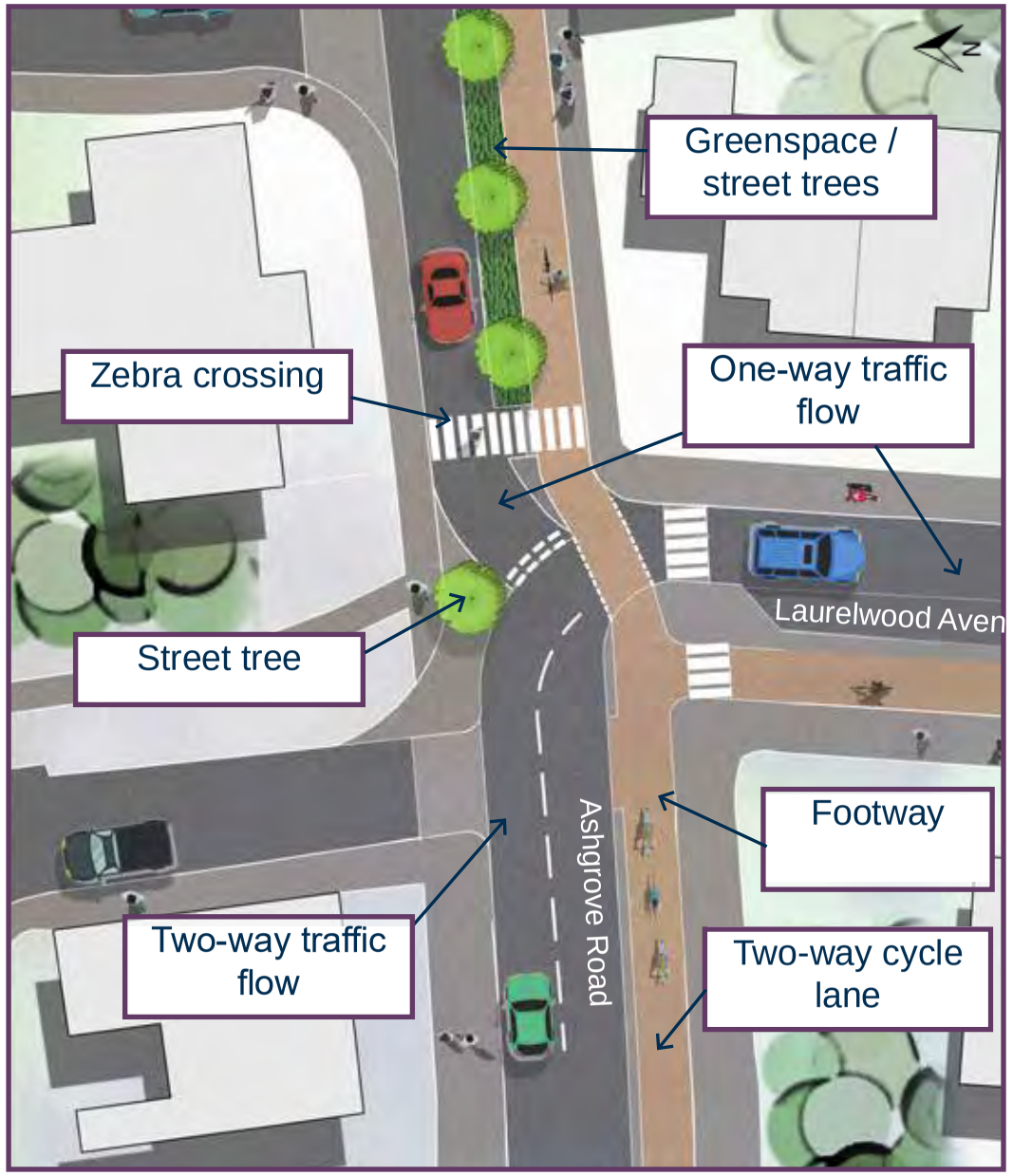
Ashgrove Road and Laurelwood Avenue Idea A (One-way) 5/5

Existing street view

Idea A street view

Existing layout

Idea A layout



Ashgrove Road and Laurelwood Avenue Idea B (False one-way) 1/5

Key features

Idea B allows two-way traffic to remain on all the streets. However on Laurelwood Avenue, traffic would be prevented from turning into Ashgrove Road. This is called a ‘false one-way street’ and means that only residential access is permitted northbound on Laurelwood Avenue.

In this scenario, the traffic movement space on all streets can be reduced to between 5-5.6metres. The estimated traffic flow is detailed on the next page along with the parking bay locations.

This creates space for a protected cycle lane, maintained footway widths and more crossings to allow all ages and abilities to get around. All driveways and businesses remain accessible.

Notes on design ideas:

Please note that elements of Ideas A, B and C are interchangeable. For example a one-way street or false-one way on Laurelwood Avenue is compatible with a two-way street on Ashgrove Road or a Quiet Street (if traffic conditions allow). The feedback you provide will help us understand your priorities to develop these ideas further.

Ashgrove Road and Laurelwood Avenue Idea B (False one-way) 2/5

Traffic

This idea proposes the following arrangement for traffic circulation:

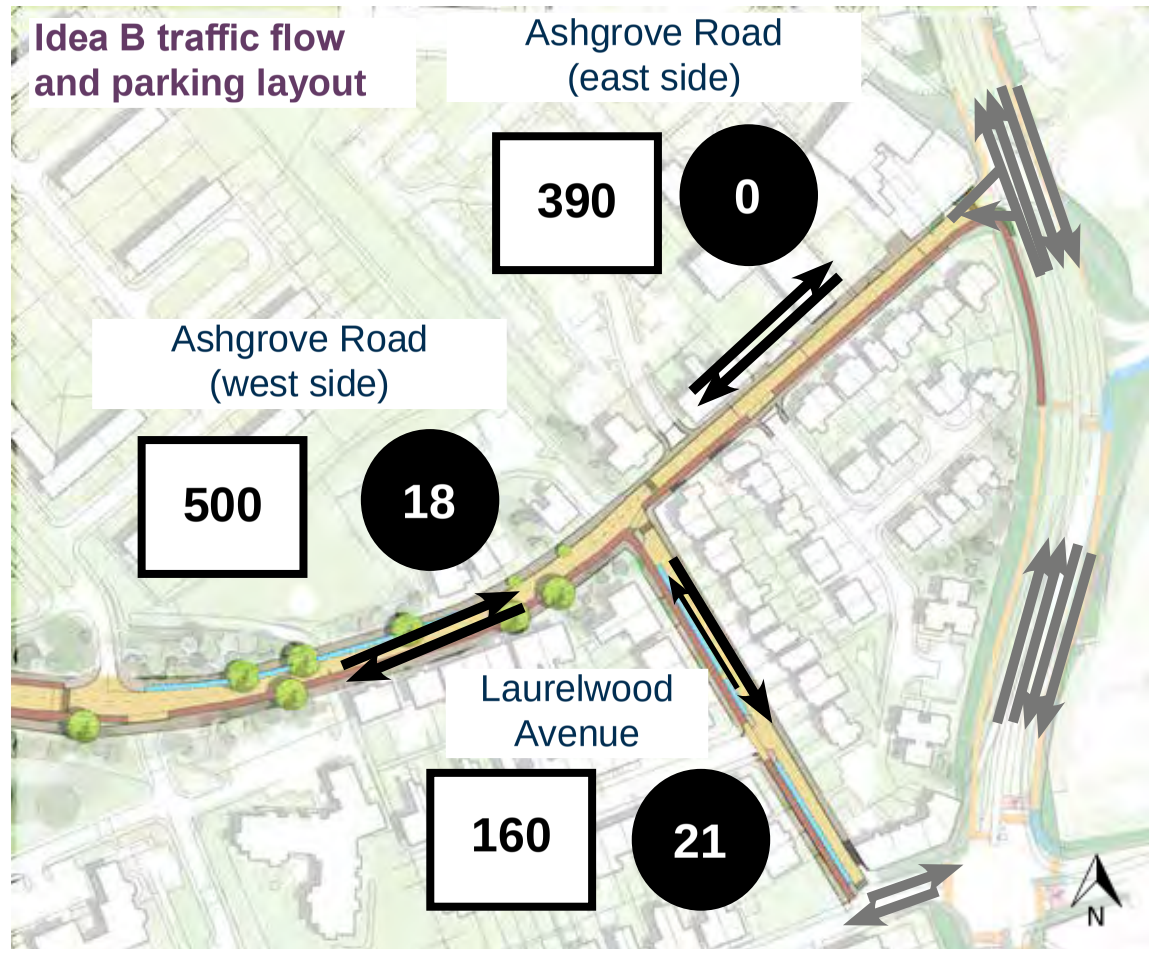
- Two-way traffic remains on Ashgrove Road;
- Traffic can still drive on Laurelwood Avenue to Elm Place (southbound)
- Only residents and visitors can drive from Elm Place to Laurelwood Avenue (northbound)

The diagram on the right indicates our estimate of the likely worst case traffic flow on each street with these changes (see diagram notes). It indicates a reduction on Laurelwood Avenue. A slight increase on Ashgrove Road overall is estimated. The carriageway width on both streets and speed cushions on Laurelwood Avenue will help to control speed.

Parking

By providing a single two-way cycle lane instead of cycle lanes on both sides, we can maintain 39 of the existing 55 spaces and formalise this into bays. The changes would be as follows:

- Ashgrove Road (May Baird to Laurelwood Avenue): From 13 to 18 spaces, located on the north side of the road;
- Ashgrove Road (Laurelwood Avenue to Berryden Road): From 15 to 0 spaces and with the opportunity for pavement parking removed, requiring residents to use driveways or park further along Ashgrove Road;
- Laurelwood Avenue: From 27 to 21 spaces, formalised in bays and with the opportunity for pavement parking removed.



Key

500 — Approx number of vehicles per hour

18 — Number of parking spaces

Traffic direction

Traffic direction (Berryden Road Corridor Improvement Scheme)

Traffic direction (residential access only)

Notes on traffic flows:

Existing traffic flows are based on counts from this project and models from the Berryden Corridor Improvement Project

We have used worst case traffic flow numbers. Our aim is to propose changes that will make Laurelwood Avenue and Ashgrove Road less attractive for through traffic. If this is successful, it is likely and that the overall flows will be lower than those shown because some of those vehicles will route elsewhere.

Ashgrove Road and Laurelwood Avenue Idea B (False one-way) 3/5

Cycling

Because traffic flows would still be uncomfortable for many people to cycle on Ashgrove Road and Laurelwood Avenue, Idea A includes a two-way protected cycle lane connecting with the cycling provision on Berryden Road.

However, should future analysis indicate that traffic can be reduced still further, the lessened need for a protected cycle lane on those streets could introduce the opportunity for a Quiet Street design (Idea C, see page 41).

Crossings junctions and walking

With narrower road space and a 20mph speed limit, the environment will be more appropriate for a residential street. New crossings will help to slow traffic and make it easier to get around on foot:

- Ashgrove Road: three new crossings at May Baird Avenue, Laurelwood Avenue and Berryden Road; and
- Laurelwood Avenue: one new crossing at the junction with Ashgrove Road.

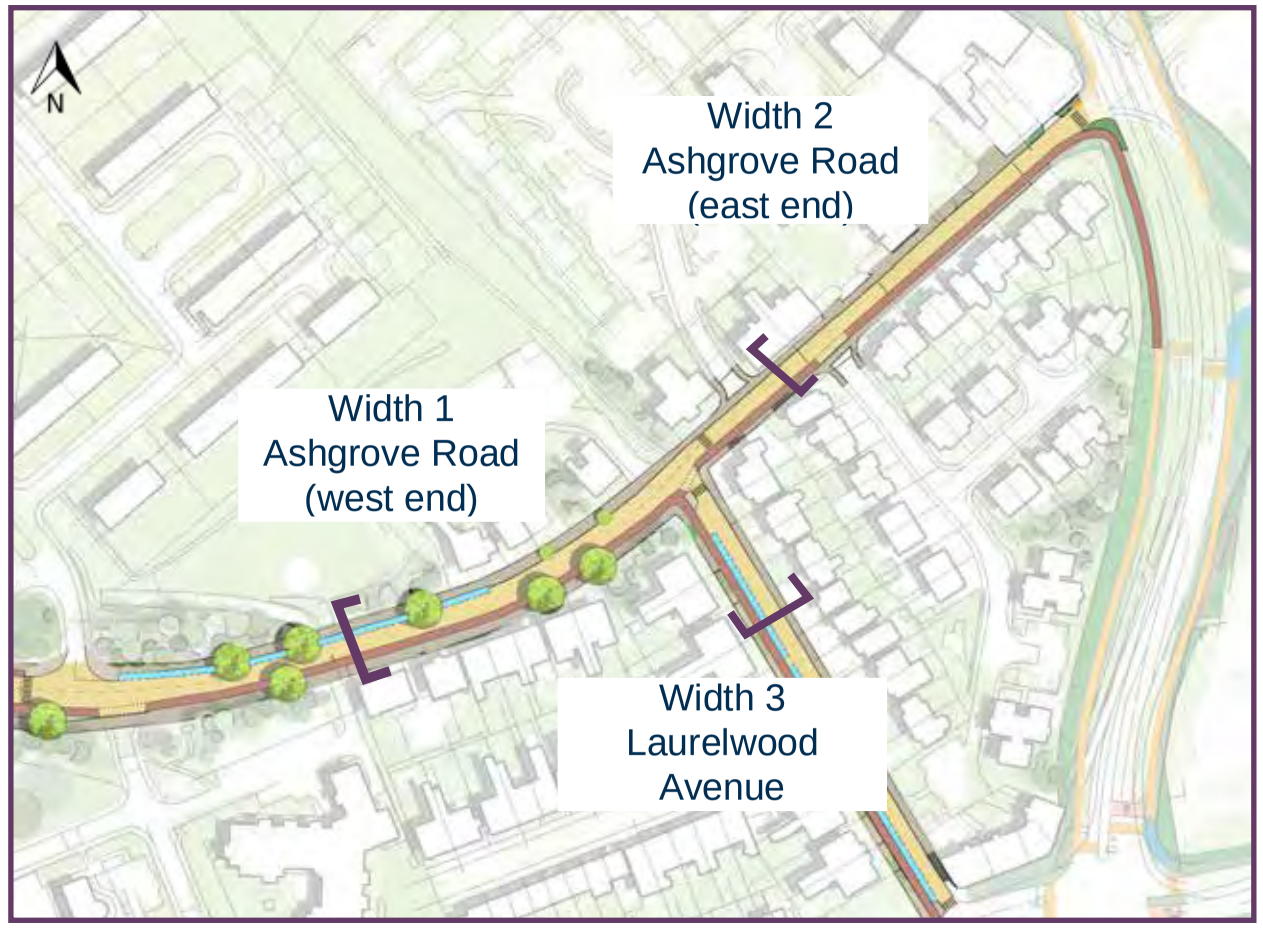
Place quality and greenspace changes

This Idea would maintain the same number of trees (8) on Ashgrove Road, however the trees on Laurelwood Avenue would likely require to be removed, with limited if any opportunities for low growing greenspace or rain gardens.

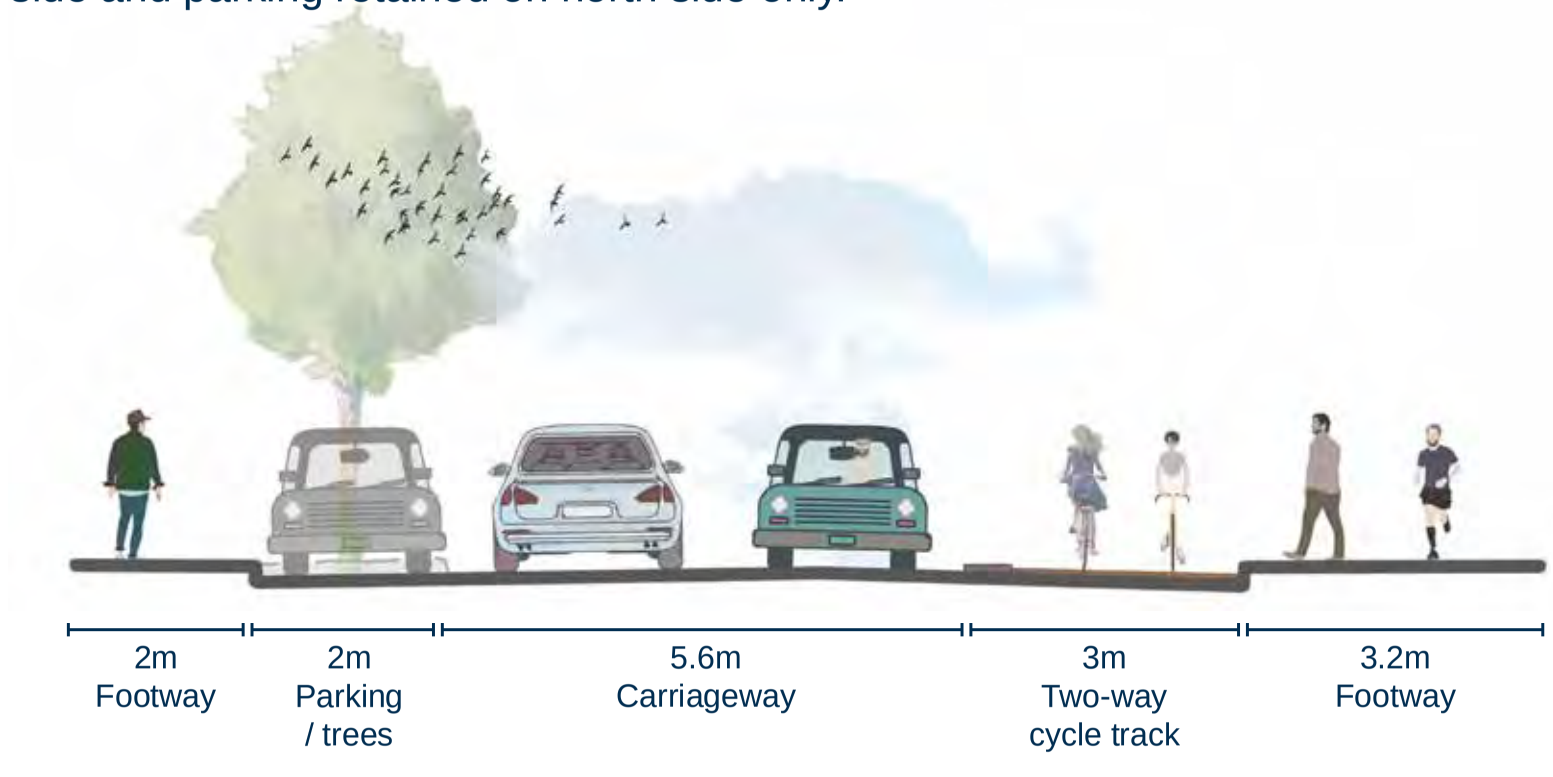
Overall, by reducing traffic the place quality on Laurelwood Avenue and Ashgrove Road is likely to improve.

Ashgrove Road and Laurelwood Avenue Idea B (False one-way) 4/5

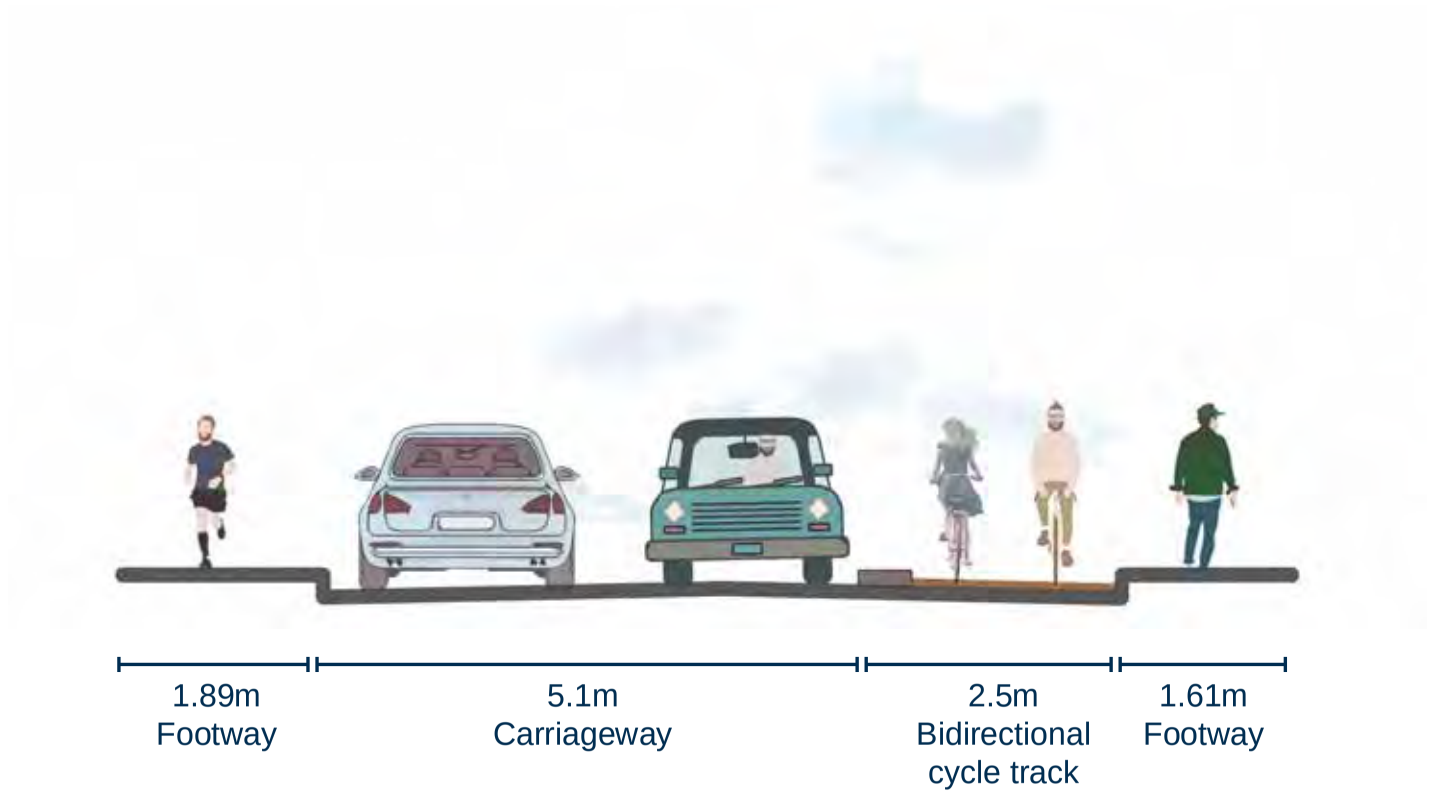
Location of street widths



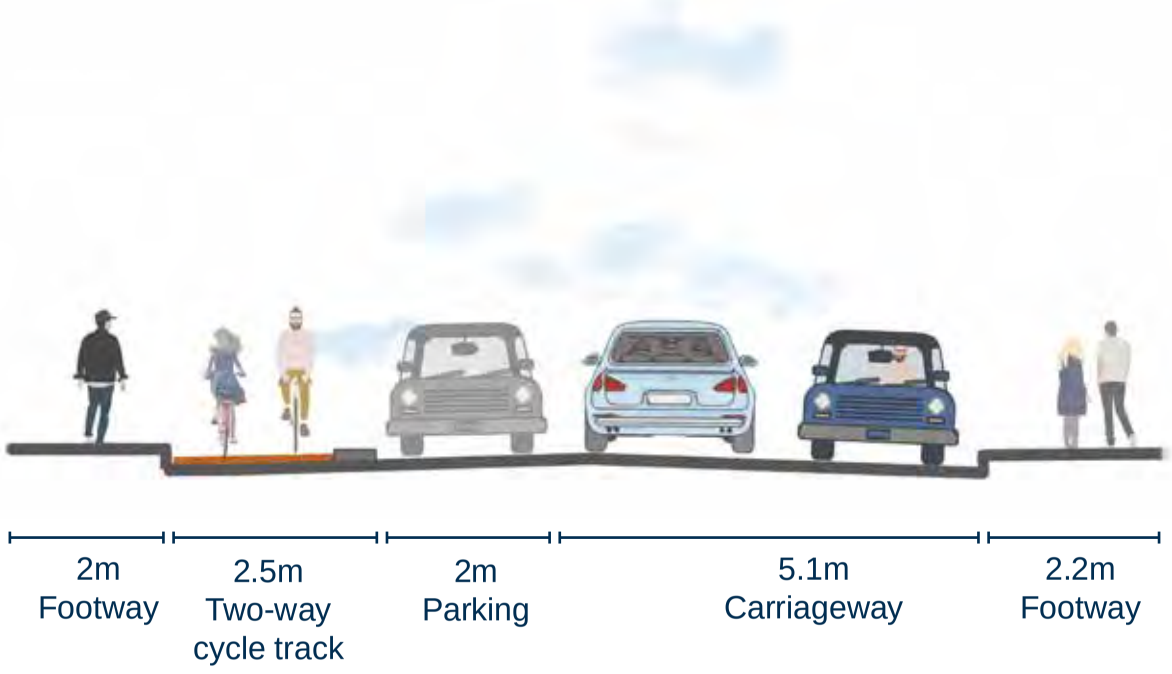
Width 1: Ashgrove Road looking east between May Baird Avenue and Laurelwood Avenue. Two-way traffic flow with a two-way cycle lane on south side and parking retained on north side only.



Width 2: Ashgrove Road looking east between Laurelwood Avenue Berryden Road. Two-way traffic with protected cycle track and no parking.



Width 3: Laurelwood Avenue looking north. Two-way street with protected cycle track and parking retained on west side.



Ashgrove Road and Laurelwood Avenue Idea B (False one-way) 5/5

Existing street view

Idea B street view

Ashgrove Road and Laurelwood Avenue Idea C (Quiet Street)

Key features

Idea C may be possible should future analysis indicate that traffic can be reduced still further to below 200 vehicles per hour (100 vehicles in each direction).

In this case, the lessened need for a protected cycle lane on those streets could introduce the opportunity for a Quiet Street design.

Quiet Streets use road narrowing, road surface and creative traffic calming features to give people of all ages confidence that they can cross the street and cycle on it without fear of traffic. We have shown some examples from other places and how the street widths could look on Laurelwood Avenue.

Typical features of this type of street include:

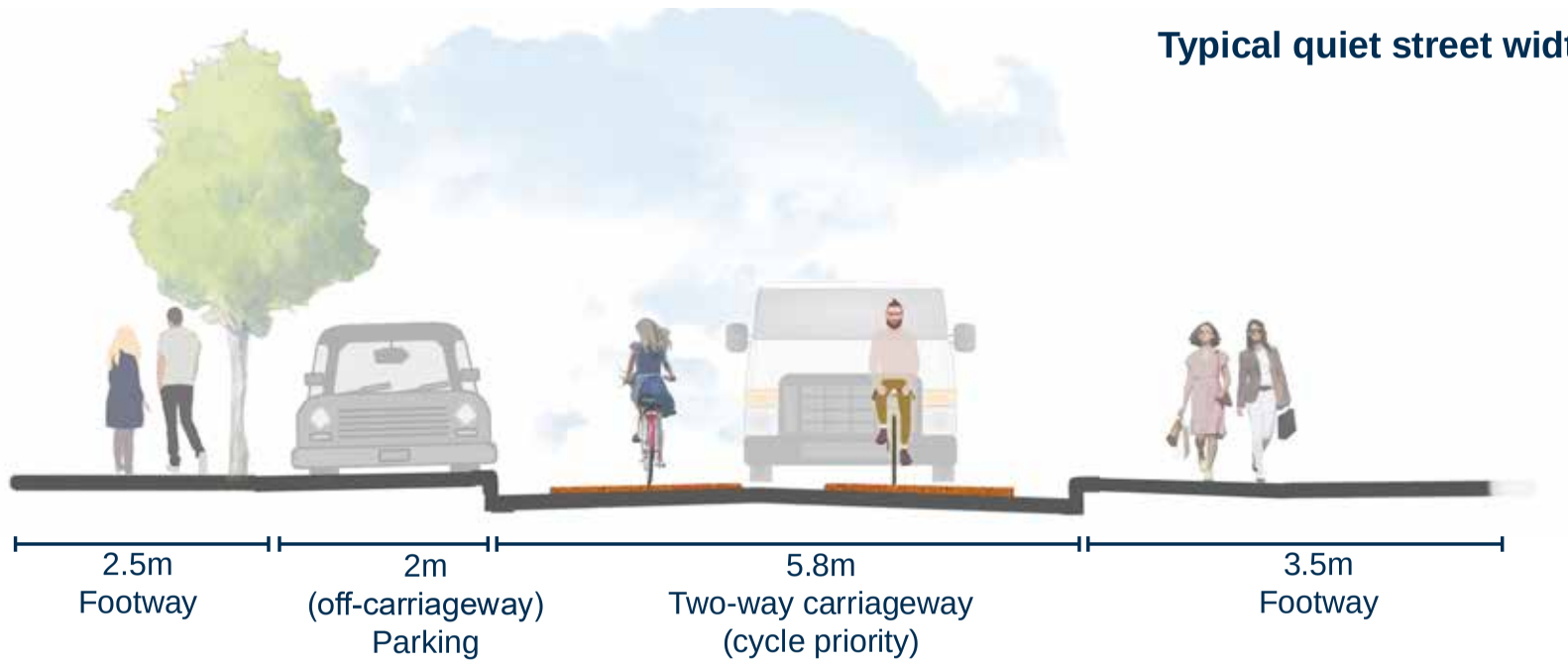
- Gateway features into the street, which can include artwork, trees and false one-way streets;
- Coloured carriageway surfaces to signal to drivers that they don't have priority;
- Speed cushions in the street to encourage people to cycle in the middle of the traffic lane;
- Central surface materials to discourage drivers from overtaking people cycling and control speed; and
- Defined parking bays.

This situation could allow for the existing number of parking bays to be formalised and the possibility that the existing number of street trees can be retained or increased, because a protected cycle lane would not be required.

Idea C may be dependent on broader restrictions on traffic access and it may not be possible. However we would welcome your feedback on this idea to understand if this is something we should explore further as a possibility on Laurelwood Avenue and/or Ashgrove Road (between Laurelwood Avenue and Berryden Road)

Examples of Quiet Streets

Typical quiet street width



Next Steps

Overview

Thank you for taking the time to view the initial design ideas for Ashgrove Connects. We now encourage you to feedback to us on what you like and what you would change, combine or improve.

How you can get involved

You can feedback on the initial designs through the following activities:

- **Visit** the project website or display in Cornhill Library*
- **Join** the live webinar on Tuesday 28th June between 7-8pm to find out more
- **Drop-in** to Cairncry Community Centre, anytime between 10-1pm, or Westburn Outdoor Centre, anytime between 4-7pm, on Tuesday 5th July to meet the team. Refreshments will be provided

*Opening hours: Tuesday/Wednesday/Thursday/Saturday: 10-1pm and Tuesday/Wednesday/Thursday: 2-5pm

Please feedback before Sunday 17th July. Your feedback will steer the development of a concept design during the next stage of the project.

Cornhill Primary School Walking Audit

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ABERDEEN CITY COUNCIL