

COMMITTEE Enterprise, Planning and Infrastructure

DATE 26 November 2009

DIRECTOR Gordon McIntosh

TITLE OF REPORT Jetpatcher – Road Repair Machine

REPORT NUMBER:EPI/09/136

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## 1. PURPOSE OF REPORT

To review the operation and effectiveness of the Jetpatcher and consider future options for increasing the output and costs for the operation.

## 2. RECOMMENDATION(S)

It is recommended that

- a) members note the current Jetpatcher operations
- b) members note the options available to increase the number of repairs undertaken against a background of prudent financial management as part of the 2010/11 budget process.

## 3. FINANCIAL IMPLICATIONS

To carry out repairs using the Jetpatcher costs £225,000 per annum

This equates to 60% of the road patching budget

The capital outlay for the purchase of another Jetpatcher would be £140,000 and would require having a crew of staff in its own right. The revenue costs of the staffing and repayment of the running costs and capital repayment changes for the vehicle would be £145,000 per annum. The difference in costs being the material charges

An alternative solution would be to train additional staff and to operate the vehicle seven days a week for longer hours/day. This would minimise the revenue costs while still providing an extended service. It is estimated that this would cost £239,000 per annum.

## 4. SERVICE & COMMUNITY IMPACT

Currently the Roads Service is managing to meet targets set for the repair of "Safety Defects". There are however at present an increasing number of non safety defects which are deteriorating rapidly to a "Safety Defect". A short spell of adverse weather is likely to increase the number of Safety Defects that the current resource will not cope with giving the ongoing deterioration of the road network.

An extra resource would allow the Roads Service to better cope with the increase in Safety Defects through the year and especially the winter period when increasing numbers of defects

occur. It is not however anticipated that this extra resource would allow the service to fully cope with the number of potholes expected over the winter period as there is an increasing need to increase investment in planned maintenance programmes.

## 5. OTHER IMPLICATIONS

Staffing will be from the existing workforce working overtime or by double shifting the operation. Additional training will be required. There are no further implications.

## 6. REPORT

The Council purchased a Velocity Jetpatcher in March 2009 following approval of the Resources Management Committee of the 4<sup>th</sup> December 2007.

The Jetpatcher has been operating since this date and has proved to be very reliable considering the complexity of the machine.

“Jetpatcher” is an environmentally friendly repair process due to the use of cold emulsion, the eradication of disruptive and time consuming cutting out of the remaining materials. The elimination of waste material as well as its disposal, further damage to the surrounding area caused by the use of jackhammers, vibrating and mechanical rollers are other positive considerations.

This reduced operation of vibration equipment by employees encompasses two Council directives, the elimination of Hand Arm Vibration Syndrome and the purchase of low vibration equipment.

Jet patching is also a safer method of repair. Speedy installation reduces traffic control requirements, congestion and delays. Operatives are not exposed to traffic for extended periods, motorists and pedestrians are less frustrated by what appears to be unrelenting road works and continual traffic delays.

Jetpatcher repairs are 10% cheaper than deferred set patching (this is the cold patch material which does not lose its flexibility with time) and approximately 33% of the cost of structural permanent patching.

On average the “Jetpatcher” will lay approximately fifteen tonnes of material in a standard working week. (See Appendix 1)

This table shows the weekly output of the operation and the number of potholes that have been repaired; this is dependant on the size, the depth and the location of the pothole. For week commencing 4th October it is very noticeable that there was a high usage of materials with a low number of repairs, this is because the machine was being used to repair poor edges of carriageway by repairing the surface and strengthening the edges i.e. one pothole would have been equivalent to as much as 100 potholes

Appendix 2 shows a sample of the weekly work with number of potholes repaired, hours operated and quantity of materials used.

The “Jetpatcher” has proved effective at providing a lasting repair to both deep and shallow potholes, as well as sealing crazed areas of carriageways. The repairs are more effective than using deferred set. The patches are not as effective as structural patching using hot

bituminous materials but do produce a cheaper, quicker and environmentally friendly repair. On the down side they do not produce the same ride quality as conventional patching.

Whilst the “Jetpatcher” does offer a very cost effective solution, it does have limitations to where and when it can be used.

- 1 The vehicle is physically fairly large and this does preclude it from accessing some locations.
- 2 The unit is noisy when operating which means that it cannot be used close to residential property during late evening and early mornings. Often this is when roads are most accessible.
- 3 Operating the Jetpatcher produces a fine mist of bitumen in the air, which will during windy conditions be blown onto both property and people; we are currently looking at methods of reducing this by surrounding the area of the operation with barriers and plastic sheeting.
- 4 There is at times a light overspray of bitumen on the surface which can be picked up on shoes or tyres, in order to limit this the final part of the operation is to cover the repair with a thin layer of dry (6mm) chips.

### Operating Costs

The operating cost of the “Jetpatcher” is in the order of £3600 per week.

This can be broken down further –

- Labour £1500
- Plant £1275
- Material £ 800

This gives an operating cost of £98 per hour

When required there are additional cost for Traffic Safety and Control which can add about £300 to the weekly bill

In order to maintain the effectiveness of the operation and in order to keep pace with the ever increasing number of potholes the following options are being considered

1. Purchase a second “Jetpatcher”. This would have immediate “Capital Budget” implication of approximately £140,000. There would be a revenue cost of £3,600 per week to the revenue budget to cover operational costs.
2. Increase the operating hours of the existing “Jetpatcher”. It would be possible to do this by extending the working day and working at weekends. This increases the output of the operation with no further Capital Budget implications. The revenue costs would be as follows

- Labour 48 hr week £2000
- Plant (capital costs covered in 37 hour but increased running costs) £1300

- Material £ 900

This gives an operating cost of £88 per hour

3. Increase the operating hours of the existing “Jetpatcher” by double shifting the operation. This would effectively double the output of the operation with no further Capital Budget implications. The revenue costs would be as follows

- Labour 74 hr week £3000
- Plant (capital costs covered in 37 hour but increased running costs) £1600
- Material £1600

This gives an operating cost of £84 per hour

This double manning of the machine will require to train up additional operators

4. Increase the output of the Jetpatcher by reducing the lost time operations. This could be done by providing an additional squad to carry out the suit up for the repairs ahead of the machine

- (1) remove or protect vehicles in the locus
- (2) carry out preparatory works ahead of operation
- (3) tidy up behind the operation.

There would be a Revenue Budget cost of £1,600 for this resource operating normal hours. This would be increased to between £2,800 to work alongside the “Jetpatcher”, if it was working extended hours.

At present we cannot justify this additional cost to output

It should be remembered that due to the number, location and timescales the Jetpatcher is only one part of the operation to repair potholes, deferred set materials are used to tackle repairs that have to be carried out quickly or in difficult locations and asphalt patching is still required to high stress areas

## 7. REPORT AUTHOR DETAILS

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## 8. BACKGROUND PAPERS

Business Case Resources Management Committee of the 4<sup>th</sup> December 2007.

## Appendix 1

### WEEKLY VELOCITY VOLUMES

<u>WEEK NO.</u>	<u>WEEK ENDING</u>	<u>TOTAL REPAIRS</u>	<u>M3 OUTPUT</u>
10	08 March 2009	310	18.1
11	15 March 2009	425	11.3
12	22 March 2009	138	4.2
13	29 March 2009	221	5.9
14	05 April 2009	292	9.1
15	12 April 2009	131	3.1
16	19 April 2009	0	0
17	26 April 2009	252	7.8
18	03 May 2009	159	6.4
19	10 May 2009	252	10.5
20	17 May 2009	135	4.8
21	24 May 2009	200	7.1
22	31 May 2009	107	4.8
23	07 June 2009	129	4.7
24	14 June 2009	0	0
25	21 June 2009	298	9.3
26	28 June 2009	84	7.3
27	05 July 2009	206	6.5
28	12 July 2009	147	5.2
29	19 July 2009	0	0
30	26 July 2009	0	0
31	02 August 2009	435	11.2
32	09 August 2009	149	4.6
33	16 August 2009	0	0
34	23 August 2009	179	6.5
35	30 August 2009	105	2
36	06 September 2009	96	2.8
37	13 September 2009	155	5.8
38	20 September 2009	190	6
39	27 September 2009	0	0
40	04 October 2009	92	13.3
41	11 October 2009	209	8.5
42	18 October 2009	0	0
43	25 October 2009	130	3.4
44	01 November 2009	201	4.6
	Total Repairs	5427	
	Cost per repair	£18.57	
	Total Output (m3)		194.8
	Average Pothole(m3)		0.036

## Appendix 2

### Typical Jetpatcher Summary Report



#### Complete Week Summary for Machine

##### Aberdeen City Velocity Patching Machine

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
<b>Date</b>	-	5/5/2009	6/5/2009	7/5/2009	8/5/2009	-	10/5/2009	-
<b>Truck/Man Hours</b>	-	8	11	11	10	-	7	47 Hrs
<b>Velocity Hours</b>	-	1.7	1.9	2.4	2	-	2.9	11
<b>M3 Output</b>	-	0.3	1.9	2.2	2.8	-	3.2	10.5 m3

#### Material Laid per Street/Road (approx.)

Street/Road Name	M3 Output	Total Repairs	Special Defects Repaired	Site Survey Carried
<b>Monday, 4 May, 2009</b>				
<b>Tuesday, 5 May, 2009</b>				
School Rd, Peterculter	0.1	6	-	-
Thorn Grove Ave, Aberdeen	0.1	2	-	-
Towerview Walk, Peterculter	0.1	2	-	-
<b>Wednesday, 6 May, 2009</b>				
Great Southern Rd, Aberdeen	0.3	5	-	-
Hosefield Rd, Aberdeen	1.2	9	-	-
S Esplanade W, Aberdeen	0.4	4	-	-
<b>Thursday, 7 May, 2009</b>				
Great Western Rd, Aberdeen	0.4	5	-	-
Greenwell Rd, East Tullos Industrial Estate	0.8	7	-	-
Hammersmith Rd, Aberdeen	0.3	3	-	-
Links Rd, Aberdeen	0.7	74	-	-
<b>Friday, 8 May, 2009</b>				
Braehead Way, Bridge of Don	0.5	5	-	-
Craigshaw Dr, West Tullos Industrial Estate	0.1	3	-	-
Wellheads Place, Wellheads Industrial Estate	1.8	32	-	-
Wellheads Way, Wellheads Industrial Estate	0.4	16	-	-
<b>Saturday, 9 May, 2009</b>				
<b>Sunday, 10 May, 2009</b>				
Greenbank Crescent, East Tullos Industrial Estate	0.2	5	-	-
Greenbank Rd, East Tullos Industrial Estate	1.9	27	-	-
Greenwell Place, East Tullos Industrial Estate	0.2	4	-	-
Greenwell Rd, East Tullos Industrial Estate	0.9	35	-	-
		252		

Please Note: The material volumes recorded in this report are an approximation of actual daily output. E&OE.

# VELOCITY VOLUMES 2009

