

NEATH PORT-TALBOT COUNTY BOROUGH COUNCIL

Street Scene & Engineering Cabinet Board

19 October 2018

Report of the Head of Streetcare

M. Roberts

Matter for Decision

Wards Affected: All Wards

Management of potholes

Purpose of Report

1. To update Members on the ongoing internal review into the day to day management of highway defects, in particular potholes.

Background

2. The Council has a Highway Maintenance Plan in place which sets out the Council's process for planned and reactive highway maintenance. Separate to this report the plan is currently under review due to an impending revision to the national Code of Practice for Well Maintained Highways, and a revised plan will be brought forward for adoption in due course.
3. Reactive repairs include uneven footways, damaged or missing pavement flags, damaged gullies or other ironwork (including surrounding pavement), damaged kerbs, road/footway deformation and the main subject of this report, pot holes. Reactive repairs are revenue funded and generally undertaken by the Council's internal workforce. Where appropriate, legal notices are issued to statutory undertakers to make good defects.
4. Members will be familiar with potholes. They form when the road pavement becomes damaged in places and deteriorates, for example, due to:
 - wear and tear under vehicle loading, particularly on busy roads or where there are surface water drainage issues;

- water ingress into the road pavement followed by freezing and thawing processes;
 - poor quality repairs by utility companies; and,
 - long periods without pavement renewal or preservative measures.
5. Once initiated, the development of a pothole is progressive and the presence of water passing over or under the road surface can have a significant influence on the speed and level of degradation.
 6. Highway potholes are visible defects which impact on motorists and pedestrians using the road network. They can be a nuisance and often result in poor ride quality, and have the potential of becoming a hazard with possible consequences of vehicle damage and personal injury.
 7. Under the Highways Act, as Highway Authority for 'County Roads' the Council has a duty to maintain the highway for the safety and enjoyment of the travelling public (Welsh Government is the Highway Authority for Motorways and Trunk Roads). In reality however it is not feasibly practicable to keep all of the adopted highway completely free from defects all of the time. Consequently a Highway Authority has a general defence under Section 58 of the Highways Act in respect of any damage resulting from a failure to maintain a highway maintainable at the public expense so long as it can demonstrate it has taken such care as was reasonably required to secure that the highway was not dangerous for traffic. This is done by an authority establishing and working to policies and procedures, such as this Council's published Highway Maintenance and Winter Maintenance Plans. The former sets out highway network inspection frequencies and the intervention levels above which the Council will take action along with associated response times. The safety inspections for highways are designed to identify all significant defects not just pot holes.

How are potholes identified and managed?

8. Potholes are identified via two main channels as follows:-
 - Feedback from the public and Members via Customer Services, channelled through the Council's 'Service First' system; and,

- Defects, including potholes, identified by the Council's Highway Inspectors as part of the Council's Highway Network Inspection Regime associated with the Council's Highway Maintenance Plan.
9. In addition, a number of reports are also received by the Highway's Section and Neighbourhood Supervisors directly from officers, Members and others. Furthermore, supervisors also observe issues and put in hand actions as part of their daily duties.

Service First System

10. Service First is a database system used by Customer Services to log jobs using electronic forms with the street name being used as a common reference point.
11. Defect reports are received via telephone calls, an online reporting form, emails and letters. In 2017, 829 pothole defect reports were recorded by Service First (average 16 per week) along with a further 450 (average 8 to 9 a week) general highway defects. A detailed month by month analysis of pothole reports over the last three years is included in Appendix A.
12. All pothole service requests received via Service First are forwarded to the relevant Zone Supervisor and issued to their allocated multi-tasking gang who undertake a range of duties including environmental improvement and pot hole filling. There are six such 'Hit Squads' in the Neighbourhood Section of Streetcare Services, one gang per supervisor, each covering two neighbourhood management zones, as indicated in Appendix B. The six teams are shared as follows:
- Team 1: Zones 1 and 2
 - Team 2: Zones 3 & 4
 - Team 3: Zones 5 & 9
 - Team 4: Zones 6 & 10
 - Team 5: Zones 7 & 8
 - Team 6: Zones 11 & 12
13. The issuing of jobs is currently paper based and the Zone Supervisor subsequently 'closes down' the job on Service First following return of a completed task sheet from the gang, or alternatively transfers the task to others as appropriate. With

respect to pot holes, the Neighbourhood Services multi-tasking gangs undertake temporary/medium term repairs using cold applied materials provided in tubs which are carried as stock items on their vehicles.

Highway Network Inspection Regime (HNIR)

14. Defects identified under the Council’s HNIR are recorded on-site via hand held electronic devices which capture geographical location information. On return to the office, the records currently then have to be manually uploaded to the in-house Street Inspection Database. There are three dedicated Highway Inspectors who undertake walked and driven inspections.

15. In 2017, a total of 9,217 recordable defects were identified, including 3,959 potholes. 8,818 of the recorded defects, including the majority of pot holes, were issued to Highway Maintenance teams within Highways Section of Streetcare Services, with the other 399 being issued to others as detailed below:

Allocation of Defects	Number
Highway Maintenance Teams	
Carriageway (potholes)	3959
Footway (slips and trips)	1806
Kerbs	3053
Arboricultural Section	1
Highway Drainage officers	2
Highways Area Surveyor	81
Neighbourhood Zone Supervisor (all identified small/medium defects requiring 24hour repair)	103
Network Manager	7
Street Lighting	9
Streetworks	119
Miscellaneous/Other	77
TOTAL	9,217

A more detailed month by month analysis of defect inspections over the last three years is included in Appendix C.

16. When there is a full complement of staff, the highway maintenance teams consist of four gangs. There are two ‘Hotbox’ teams each with a specialist vehicle and support vehicle, and a third ‘towable

Hotbox' team which undertake permanent repairs to both potholes and footway hazards using hot-rolled materials. There is then a further 'slips and trips' gang that carries out repairs to footway pavements (using cold applied materials supplied in tubs and carried as stock items) including repairs to kerbs and paving slabs.

Issues with identification and management of pot holes

General

17. Further to the way defects are identified recorded and allocated it can be seen from above there are currently two distinct systems within Streetcare Services with respect to managing pot holes (and other defects) and the first issue is that, in the main, the two systems work independently and don't 'talk' to each other. Furthermore there are two databases rather than a single database of defects with actions pending etc. This can lead to duplication of work with defects being identified on both systems and jobs being raised separately for both the 'Hit Squads' and 'Hotbox Teams' to attend. It can also cause difficulties when defending 3rd party claims. At present there is no simple way to determine if a Service First call has already been identified by the Highway Inspectors without manually interrogating the system. Furthermore, any temporary short term repairs carried out by the neighbourhood teams are not either automatically 'knocked off' the system or referred for permanent repair by the hot box teams.
18. There is a small percentage of requests for service that are not identified or recorded on either system, for example, there are some phone calls direct to officers, albeit such requests could readily be 'injected' into the system by an officer e-mail to Service First. There will always be a few requests that enter the system via 'unorthodox' routes and these are being ignored with respect to any system redesign.

Service First System

19. The Service First system records customer details and the street name (including a basic description of the defect and its location). However, the current system as available to the public is unable to record exact pothole locations (and produce map based co-ordinates).

20. It is noted that some defects prove to be beyond the capabilities of the Neighbourhood teams, e.g. due to scale and others are beyond their remit, e.g. problems with statutory undertakers' infrastructure such as drain covers, and these need to be transferred to the appropriate officers as necessary. One issue is that when reports are referred to the highway teams, whether directly by Service First or referred onward from the neighbourhood teams, then due to inconsistencies in information an officer is required to visit each reported location to determine the appropriate action.
21. The Service First system has been created with a dashboard view which is fairly user friendly, but there are some operational issues. In particular, any cascaded reports which are subsequently reallocated to others e.g. from Neighbourhood to Streetworks are not easily identified and reallocated jobs are often forwarded without clear explanation (which is not facilitated by the system).
22. The system prints out paper job sheets and manual 'close down' of completed work is required. Another issue is that the current job sheets do not prompt for the size of the defect to be recorded, which is useful information when reviewing and planning service arrangements.
23. The system only records the date a job is closed down by the supervisor and will not accept any prior actual date that a job is completed by the repair teams. This may have been by design, perhaps with a well-intentioned concern for people giving incorrect completion dates in order to influence any performance data, but the reality is, particularly with manual data entry being potentially some considerable time after the work activity, the information from the system concerning measures of how long it actually takes for defects to be addressed is as a consequence very unreliable. To understand how you are performing, the most important thing is to have reliable measures.

Highway Inspection System

24. The current highways inspection system records the type of defect based on the street name, map co-ordinates and a brief description of the location together with any additional comments to help the repair teams. However it does not record any likely contributory factors to why the defect formed to help inform

appropriate action, for example, details of apparent drainage issues, substandard utility reinstatements or structural pavement issues, as may require further investigations before repairs are programmed.

25. The inspection system is heavily reliant on manual processes to upload inspections, print paper job sheets and close down completed work. Furthermore, there is no facility that enables further analysis of sites and repeat defects to aid decision making within the inspection database which would provide valuable information for planned maintenance.
26. Highway Inspectors take photographs for all carriageway and footway defects identified as part of the inspection regime, to assist recording and to provide information for repair crews. There is no facility for residents to upload defect pictures as part of reporting through Service First. Furthermore, Neighbourhood teams do not take photographic records when they attend a defect which would be helpful should a defect be subsequently referred to others or a subsequent claim be received.
27. Defects identified under the HNIR are prioritised for repair as Priority 1 or Priority 2 with target response times of 24 hrs and up to 35 working days respectively (inspectors are able to set intermediate timescales if they consider necessary). Priority 2 jobs are printed from the database in groups of up to 11 jobs per sheet which is not considered flexible and limits the ability to filter works dependent on risk to the public. Similarly, any defects referred from Neighbourhood Services, e.g. due to scale, have to be assessed and added separately to work schedules.
28. It is noted there is not a gang within the highway teams which is dedicated to undertaking permanent repairs relating to public / Member reports. Any defects referred from Neighbourhood Services to the Highway Teams take their priority alongside other work given that, as indicated above, demands received by the Highway Teams are added into the HNIR reports and prioritised accordingly.
29. HNIR generated paper job sheets currently require the initials of the lead attending employee and the date of completion for the supervisor to close down the job but there is no system in place to record the repair work using photographs. Some team members

will add their own footnotes to the sheets (e.g. when jobs have been completed before their visit, or when additional work is completed, or when they are unable to find the defect). Other information relating to their work is included on a separate (paper) dayworks sheet. This information includes the team start and finish times, weather conditions, plant and materials used and the number of defects repaired. Although the type of material is noted there is no measurement given for the size of repair which is unhelpful for service review and planning. Furthermore, the information which is available is only held in paper form and is not available to view in the HNIR.

How are pot holes currently repaired?

30. Reactive pothole repairs issued to the Neighbourhood 'Hit Squads' are repaired using a cold lay proprietary product from 25kg tubs, such as 'Viafix' or 'Instamac'. Provided these repairs follow the manufacturer's instructions they can be considered semi-permanent.
31. Carriageway defects issued to the Highway Maintenance Teams (Hotbox) should be disc cut and repaired using hot-rolled bituminous material with the joint around the repair being sealed. Hot-rolled patch repairs would be expected to have a similar life expectancy to the surrounding road surface. At times, when the tarmac plant is out of operation or when a Hotbox is out of service, or during periods of staff leave/sickness, if necessary the 'hot box' teams can also use cold lay proprietary products.

Issues associated with current fixing of pot holes

Size of repair

32. As identified above, under existing systems the approximate size of each defect is not recorded as a matter of course by either the Highway Inspectors or Neighbourhood Teams when they attend a defect as part of inspections and Service First responses. Furthermore, any defect size reported by the public is frequently inaccurate. This causes difficulty managing the most appropriate type of repair required. Furthermore, a lack of annual summary information is unhelpful in planning appropriate overall resource requirements in terms of the repair options available.

33. To inform this review the table below shows an analysis of carriageway defects identified as part of the HNIR between December 2017 and March 2018. The defect sizes relate to the minimum work required to repair the actual pothole and remove any immediate or potential hazard from the highway. From the analysis, as shows in the table, around 20% of defects would have benefited from additional work to prevent further deterioration directly adjacent to the recorded pothole.

Area Range (m2)	No. of Records	Number which would benefit from adjacent additional work
0.0 > 0.5	1044	213
0.5 > 1.0	202	48
1.0 > 2.5	122	23
2.5 > 5.0	44	8
Area > 5.0	31	4
TOTAL	1,443	296

This information suggests we do not currently have the right balance of arrangements in terms of resource deployment and repair techniques used. Furthermore, the benefits of carrying out additional desirable work adjacent to pot holes at the time of attending to deal with the pothole needs to be weighed against the impact on service responsive to defect reports.

Availability of tarmac

34. There can be issues with sourcing material (our tarmac is sourced from Express Tarmac Plant, Wharf Road, Neath Abbey) but problems are common to all tarmac plants. We use Express Tarmac because it is local, which means travel times are reduced and return journeys are possible within the working day if required.
35. Tarmac is provided on a first come first served basis which can, if there is a queue, result in delays. The plant suffers a breakdown on average ten times a year resulting in material having to be sourced elsewhere. Delays can also occur (on average once every two weeks) due to electrical / mechanical faults which can take anything from a few hours to a morning or afternoon to fix, depending on when a fitter/electrician can attend.

36. The tarmac plant is not always open when required. In particular, whilst it is open on most weekends it is only available for a limited number of hours in the morning on either Saturday or Sunday or both. An issue is that defects that are in traffic sensitive areas are usually programmed for Sunday to reduce the disruption caused to the public and improve safety for the workforce. Also, this restricts capacity to undertake additional weekend working if required in response to peaks in service demand.

Issues affecting hot box productivity / availability

37. Further to the above, the existing set up of two large hotboxes and a towable hotbox is not believed to reflect the right balance of arrangements. There are delays in collecting tarmac, time spent cutting and digging out repairs on minor unclassified roads which might be better from a risk management perspective being utilised elsewhere, and issues with targeting the correct type of repair to each defect. The existing paper set up which has multiple jobs on each sheet, results in regular occasions where not all the jobs are completed on each sheet (which can occur for various reasons such as time constraints, running out of material etc.) and there are then subsequently delays to the repairing of the remaining defects pending their re-issue.
38. Dealing with defects on a reactive basis is inherently less productive than planned work where activity can be grouped by location etc. Productivity on planned work is therefore affected when Hot Boxes are diverted to deal with reactive work such as Service First complaints where larger repairs are required.
39. Productivity is also affected by:
- In-house drainage teams calling on a hotbox to assist with revenue maintenance work which is estimated to occur once every two weeks;
 - Making multiple visits to areas with recurring defects associated with surface water problems (normally back lanes);
 - Adverse weather conditions;
 - The need for additional traffic management, particularly on fast roads;

- Drivers being on compensatory time off due to 'Drivers Hours' rules and taking part in the gritting rota during the winter;
- Breakdowns and servicing (the Hotboxes typically have around 90% availability); and,
- Staffing leave and sickness. There is no provision in the budget for backfilling staff when on leave or sickness. The three 'hotbox' crews have to work their leave between them and supervisors work to ensure at least one hotbox and a 'tub team' are always in operation as a minimum.

Current demand vs capability to respond

40. Information on defects identified and completed is given in Appendix D. It should be noted that the information is not broken down into Priority 1 (emergency 24hr repair required) and Priority 2 defects, and all Priority 1 defects are attended to promptly. Furthermore, it needs to be accepted that the data is not entirely reliable for reasons set out in this report, in particular that there is not a single database through which all the work is organised, and that not all Priority 2 defects identified within a given year should be expected to be completed within the same year, e.g. issues identified in December. However, it must be acknowledged that not all Priority 2 repairs are currently dealt with within the set response times. From the available data it is estimated that, on average over the last 7 years, the following have not been dealt with within the set response time:

- Up to 29% of Priority 2 carriageway defects
- Up to around 25% of Priority 2 footway and kerb defects

41. This level of responsiveness includes some use of overtime. It represents a risk and is one reason that from time to time there are successful third part claims against the Council. That is not to say that all risk cover ever be eliminated.

Estimated cost of reactive highway repair (including pot holes)

42. The estimated annual cost for dealing with pot-hole in Neath Port Talbot is set out in Appendix E. In summary, the total spend on pot holes by Streetcare Services is estimated to be up to circa £500,000 per annum.

Third Party Claims

43. According to “Car Parts 4 Less”, potholes collectively cost motorists a £684 million annually in car repairs and, on average, motorists make a claim every 17 minutes. Statistics for NPT are given in Appendix F.
44. In summary there were 90 carriageway and footway related claims received in 2017/18. Also in 2017/18, 22 claims in the system were settled by insurance and 104 were successfully repudiated.

Comparison of techniques for pothole repairs

45. A comparison of techniques for pothole repairs is given in Appendix G.
46. This Council has often taken the opportunity to try new techniques and approaches to highway maintenance, both for planned works and reactive repairs. One example is that in 2013 the Network Management Section employed a spray injection patching contractor to carry out a trial of pothole repairs as part of the annual planned maintenance programme. Following the successful trial a jet patching contractor was issued with a programme of work in 2014 which also proved successful. Since that time many other programmes of spray injection patching have been contracted out via two contractors (Velocity and Archway Roadmaster).

Action Plan

47. Further to this review the following actions given in Appendix H are proposed. It has been estimated the IT work will take 6 months to complete.

Financial Impact

48. None. As far as any ongoing expenditure is concerned, the cost implications of actions need to be contained within existing budgets given ongoing financial austerity.

Equality Impact Assessment

49. There are no equality impacts associated with this report.

Sustainable Development

50. The proposed actions will improve the efficiency and productivity of the service and should for example, stop duplicate visits to defects by the reactive and planned maintenance teams. The attendance of any nearby clusters of defects in one journey will also further reduce the number of trips. These improvements will reduce vehicle emissions and potentially material wastage, whilst a greater number of potential hazards to the travelling public will be dealt with sooner. The improved information provided by the updated IT system will also provide for further improved service planning in future.

Workforce Impact

51. There will be no workforce impacts from the proposed actions other than the introduction of some new technology for which training will be provided.

Legal Impact

52. The Authority has a statutory duty under section 41 of the Highway Act to maintain highways maintainable at public expense. A robust inspection and repair regime provides the basis of a sound defence against insurance claims further to section 58 of the Highways Act.

Risk Management

53. Failure to properly manage potholes and other highway defects could have a serious impact on road safety and expose the Authority to greater third party claims for personal injury or vehicle damage.

54. In determining its arrangements the Council needs to consider how best to deliver services and minimise risk exposure whilst managing within available resources. Risk management forms an important consideration as part of the most recently published Code of Practice for Highways Maintenance. To best minimise risk associated with potholes the following is required:-

Standards

55. Maintenance standards, which include inspection and repair priorities, need to be clearly identified and take account of local needs as well as national guidance. We are currently reviewing our plans in light of the new Code of Practice for Highway Maintenance.

Identification

56. A consistent approach to defect identification and repair response must be followed. Inspection manuals should be used to support the implementation of maintenance policies and we do this. Furthermore, formal training is also required to ensure Highway Inspectors have an appropriate understanding and level of competence in relevant legislation, local policy, highway engineering and material performance. Our Highway Inspectors have undertaken such training.

Training

57. Network managers, maintenance managers and inspectors can be called to attend court to provide evidence in civil liability claims. The provision of court room skills training should not only help those individuals prepare for such eventualities, but will also ensure that a robust defence to an action can be presented. Some training has been provided but we could do more here.

Recording

58. Accurate and detailed records need to be maintained for every highway inspection. These need to be consistent to provide evidence that a road/street was inspected and if any defects were observed, including when the inspection took place and who undertook the inspection. Where repairs are required the date of completion must be captured. Our Inspectors currently use hand held data capture devices which log all the appropriate details. Any defects are 'dotted' on the system which provides map co-ordinates and automatically brings up the location for it to be logged onto the database.
59. Local authorities should therefore work closely with their insurance partners to ensure that the best risk management measures have

been put in place for their communities. In 2017 this provided open access to its insurers to audit the council's processes. There were some minor improvement suggestions but otherwise the Council was essentially given 'a clean bill of health' which is reflected in the fact that this Council is on the upper quartile for the repudiation of third party insurance claims.

Consultation

60. There is no requirement for external consultation on this item

Recommendation(s)

61. That the detailed action plan contained in Appendix H to the report be endorsed.

Reason for Proposed Decision(s)

62. To ensure the Council's arrangements for dealing with pot holes remain suitable and sufficient.

Implementation of Decision

63. The decision is proposed for implementation after the three day call-in period.

Appendices

- Appendix A: Service First Statistics
- Appendix B: Neighbourhood Zone Map
- Appendix C: Highway Defect Inspection Statistics
- Appendix D: Demand vs performance in terms of set response time
- Appendix E: Estimated cost of reactive highway repairs (including potholes)
- Appendix F: Third Party Claims
- Appendix G: Comparison of techniques for pothole repairs
- Appendix H: Detailed Action Plan

List of Background Papers

64. None

Officer Contact

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Appendix A – Service First Data

TABLE 1 - CRM & SERVICE FIRST JOBS RECORDED UNDER 'POTHOLE' JAN 2015 to 31st MAR 18

YEAR	MONTH	CRM & SERVICE FIRST JOBS RECORDED UNDER POTHOLE	AVERAGE NO OF POTHOLE JOBS RECEIVED PER WEEK OVER SIX MONTHS	POTHOLE JOBS CLOSED DOWN IN EACH MONTH	AVERAGE NO OF POTHOLE JOBS CLOSED DOWN PER WEEK OVER SIX MONTHS	AVERAGE WORKING DAYS TAKEN TO CLOSE POTHOLE JOBS OVER SIX MONTHS
2015	JAN	66	11	57	11	9
	FEB	63		46		
	MAR	59		70		
	APR	45		48		
	MAY	23		19		
	JUN	32		44		
	JUL	29	7	23	6	10
	AUG	21		20		
	SEP	27		28		
	OCT	16		15		
	NOV	38		34		
	DEC	43		38		
2015	TOTAL	462		442		
2016	JAN	169	31	128	27	7
	FEB	224		194		
	MAR	126		118		
	APR	126		124		
	MAY	79		75		
	JUN	74		65		
	JUL	59	12	74	12	15
	AUG	66		56		
	SEP	68		81		
	OCT	54		66		
	NOV	21		17		
	DEC	33		25		
2016	TOTAL	1099		1023		
2017	JAN	85	22	64	21	13
	FEB	118		96		
	MAR	158		134		
	APR	71		97		
	MAY	72		77		
	JUN	62		65		
	JUL	39	10	45	10	14
	AUG	48		41		
	SEP	36		33		
	OCT	45		41		
	NOV	54		55		
	DEC	41		41		
2017	TOTAL	829		789		
2018	JAN	150	31	110	30	8
	FEB	128		134		
	MAR	129		143		

TABLE 2 - CRM & SERVICE FIRST JOBS RECORDED UNDER 'FOOTPATH/CARRIAGEWAY' (*EXCLUDING KERBS)

YEAR	MONTH	CRM & SERVICE FIRST JOBS RECORDED UNDER FOOTWAY / C'WAY	AVERAGE NO OF FOOTWAY / C'WAY JOBS RECEIVED PER WEEK OVER SIX MONTHS	FOOTPATH / C'WAY JOBS CLOSED DOWN IN EACH MONTH	AVERAGE NO OF FOOTPATH / C'WAY JOBS CLOSED PER WEEK OVER SIX MONTHS	AV. WORKING DAYS TO CLOSE 'FOOTPATH / CARRIAGEWAY' JOBS OVER SIX MONTHS
2015	JAN	31	7	23	6	25
	FEB	30		35		
	MAR	37		43		
	APR	28		21		
	MAY	22		16		
	JUN	24		30		
	JUL	35	8	20	8	19
	AUG	50		50		
	SEP	36		38		
	OCT	29		20		
	NOV	26		41		
	DEC	19		30		
2015	TOTAL	367		367		
2016	JAN	43	10	23	8	26
	FEB	54		18		
	MAR	27		43		
	APR	41		48		
	MAY	48		34		
	JUN	39		41		
	JUL	34	9	38	9	48
	AUG	43		41		
	SEP	45		40		
	OCT	39		46		
	NOV	34		46		
	DEC	28		23		
2016	TOTAL	475		441		
2017	JAN	36	9	22	9	39
	FEB	38		36		
	MAR	60		37		
	APR	29		54		
	MAY	31		35		
	JUN	32		38		
	JUL	38	9	37	8	21
	AUG	47		45		
	SEP	44		38		
	OCT	36		32		
	NOV	45		40		
	DEC	14		21		
2017	TOTAL	450		435		

Appendix B - Neighbourhood Management Zone Map



<h2>Neighbourhood Services Zones</h2>		<p>Network Management Neath Port Talbot County Borough Council Cyngor Bwrdeistref Sirol Castell-nedd Port Talbot Mr. Gareth Nutt Director of Environment The Quays, Brunel Way, Baglan Energy Park, Neath, SA112GG</p>
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APPENDIX C - HIGHWAY DEFECT INSPECTION STATISTICS

TABLE 3 - PRIORITY 2 DEFECTS IDENTIFIED AS PART OF THE HIGHWAY INSPECTION REGIME IN 2015 - 17

YEAR	MONTH	TOTAL PRIORITY 2 JOBS RECORDED ON INSPECTION DATABASE	JOBS ISSUED TO HOTBOX TEAMS		JOBS ISSUED TO HOTBOX TEAMS AND SLIPS & TRIPS GANG	
			CARRIAGEWAY DEFECTS	AVERAGE CARRIAGEWAY JOBS ISSUED/WK OVER 6 MONTHS	FOOTWAY DEFECTS	AVERAGE FOOTWAY JOBS ISSUED/WK OVER 6 MONTHS
2015	JAN	900	274	47	136	36
	FEB	1193	153		201	
	MAR	1516	308		217	
	APR	1194	245		156	
	MAY	744	122		135	
	JUN	723	114		83	
	JUL	640	132	44	79	40
	AUG	839	124		152	
	SEP	1377	162		292	
	OCT	1239	231		225	
	NOV	663	260		121	
	DEC	758	223		158	
2015	TOTAL	11786	2348		1955	
2016	JAN	1428	346	80	289	45
	FEB	1379	274		221	
	MAR	1571	391		231	
	APR	1543	412		214	
	MAY	1094	337		128	
	JUN	842	309		91	
	JUL	617	282	56	108	22
	AUG	783	164		121	
	SEP	473	227		59	
	OCT	661	229		104	
	NOV	695	370		126	
	DEC	337	172		60	
2016	TOTAL	11423	3513		1752	
2017	JAN	1189	502	85	224	36
	FEB	503	205		93	
	MAR	725	351		139	
	APR	749	365		186	
	MAY	766	385		132	
	JUN	797	390		171	
	JUL	559	226	68	100	33
	AUG	816	361		157	
	SEP	713	268		137	
	OCT	738	314		121	
	NOV	998	409		169	
	DEC	664	183		177	
2017	TOTAL	9217	3959		1806	

TABLE 3 (cont.) - PRIORITY 2 DEFECTS IDENTIFIED AS PART OF THE HIGHWAY INSPECTION REGIME

YEAR	MONTH	TOTAL PRIORITY 2 JOBS RECORDED ON STREET INSPECTION DATABASE	JOBS ISSUED TO SLIPS & TRIPS GANG		JOBS ISSUED TO OTHER DEPARTMENTS AND MISCELLANEOUS ISSUES IN EACH CALENDER YEAR	
			KERB DEFECTS	AVERAGE KERB JOBS ISSUED PER WEEK OVER SIX MONTHS	Department	JOBS PER YEAR
2015	JAN	900	467	143	ARBORICULTURE	39
	FEB	1192	757		HIGHWAY DRAINAGE	28
	MAR	1511	848		HIGHWAYS SURVEYOR	241
	APR	1194	698		N M ZONE SUPERVISOR	87
	MAY	744	444		NETWORK MANAGER	15
	JUN	723	516		OTHER	107
	JUL	640	389	118	STREET LIGHTING	18
	AUG	839	494		STREETWORKS	118
	SEP	1377	853		MISCELLENOUS	16
	OCT	1239	734			
	NOV	663	254			
	DEC	758	354			
2015	TOTAL	11780	6808		TOTAL	669
2016	JAN	1428	752	166	ARBORICULTURE	0
	FEB	1379	835		HIGHWAY DRAINAGE	0
	MAR	1571	884		HIGHWAYS SURVEYOR	112
	APR	1543	852		N M ZONE SUPERVISOR	141
	MAY	1087	586		NETWORK MANAGER	5
	JUN	842	416		OTHER	27
	JUL	617	195	48	STREET LIGHTING	24
	AUG	697	358		STREETWORKS	144
	SEP	473	149		MISCELLENOUS	28
	OCT	661	300			
	NOV	695	164			
	DEC	337	93			
2016	TOTAL	11330	5584			481
2017	JAN	1189	446	53	ARBORICULTURE	1
	FEB	503	172		HIGHWAY DRAINAGE	2
	MAR	725	185		HIGHWAYS SURVEYOR	81
	APR	749	167		N M ZONE SUPERVISOR	103
	MAY	766	212		NETWORK MANAGER	7
	JUN	797	205		OTHER	60
	JUL	559	197	64	STREET LIGHTING	9
	AUG	816	260		STREETWORKS	119
	SEP	713	279		MISCELLENOUS	17
	OCT	738	288			
	NOV	998	373			
	DEC	664	269			
2017	TOTAL	9217	3053		TOTAL	399

APPENDIX D – Demand Vs Performance against response set time

The table below indicates performance in terms of dealing with demand within allocated response time, noting that all Priority 1 (emergency) defects are attended to promptly.

Year	<u>Carriageway Defects</u>		<u>Footway Defects</u>	
	<u>No. identified</u>	<u>Defects Completed</u>	<u>Defects identified</u>	<u>Defects Completed</u>
2010	3023	2154 (71.25%)	2491	1689 (67.80%)
2011	3045	2514 (82.56%)	1935	1521 (78.60%)
2012	3161	2398 (75.86%)	1525	1030 (67.54%)
2013	3120	2457 (78.75%)	1252	1161 (92.73%)
2014	2787	1921 (68.93%)	1804	1147 (63.58%)
2015	2503	1779 (71.07%)	2141	1826 (85.28%)
2016	3696	2166 (58.60%)	1921	1371 (71.36%)
2017	3442	2357 (62.00%)	1572	1110 (70.61%)
	Average	71.12%	Average	74.68%

Year	<u>Kerb Defects</u>	
	<u>Defects identified</u>	<u>Defects Completed</u>
2010	4773	2962 (62.05%)
2011	7206	6407 (88.91%)
2012	6093	5119 (84.01%)
2013	7007	4114 (58.71%)
2014	7553	6546 (86.66%)
2015	6823	6220 (91.16%)
2016	5592	4354 (77.86%)
2017	2432	1324 (54.44%)
	Average	75.47%

Appendix E – Est. cost of reactive highway repairs (incl. potholes)

The cost of dealing with pot holes is not recorded separately from the cost of dealing with reactive repairs generally (i.e. the cost of dealing with pot holes and uneven footways, damaged or missing pavement flags, damaged gullies or other ironwork (including surrounding pavement), damaged kerbs, and localised road/footway deformation. Based on costs in 2017, expenditure on reactive repairs was as follows:-

Neighbourhood 'Hit Squads'

Based on information available these teams spend around a third of their time on dealing with highway defects, particularly pot-holes, kerb and gully grating defects. On this basis, and given the cost of a team is around £56,000 per year, then the annual spend on pot holes in Neighbourhood Services is up to:

$£56,000 \times 0.33(\%) \times 6 \text{ (teams)} = £111,000$. In addition, the number of tubs of repair material used by the 6 teams was 2,477 (circa 62 tonnes of material) amounting to a cost of £38,969.

The spend on reactive highway repairs by Neighbourhood Service is therefore estimated to be typically around £149,969

Highways 'Hot Box' Teams

Based on information available the hotbox teams spend around two thirds of their time on dealing with pot-holes whilst the 'tub team' works almost exclusively on dealing with kerb defects. On this basis the estimated annual spend on pot holes is up to:

Hotbox teams: $2 \times £105,000 \times 0.66$ £138,600

Towable Hotbox team: $1 \times £93,000 \times 0.6$ £61,380

In addition, the number of tubs of repair material used was 1,736 (circa 43 tonnes of material) along with 830 tonnes of tarmac amounting to a cost of circa £154,000. The spend on reactive highway repairs by Highways is therefore estimated to be typically around £353,980

The total spend on pot holes by Streetcare Services is therefore estimated to be up to £503,949 per annum.

Appendix F – Details of third party claims in NPT

Carriageways: Statistics for third party claims received, settled and repudiated in the last 5 financial years are as follows.

Financial Year	Type of claim	Total received	Total settled (*)	Total value of settled claims (*)	Total repudiated (*)	Repudiation Rate (#)
2017/18	Pothole	46	14	£114,442.61	63	82%
	Oil	1				
	Stone	1				
	Ironwork	0				
	Other	17				
2016/17	Pothole	57	16	£59,434.78	89	85%
	Oil	0				
	Stone	2				
	Ironwork	11				
	Other	12				
2015/16	Pothole	78	18	£101,043.01	93	84%
	Oil	0				
	Stone	3				
	Ironwork	3				
	Other	13				
2014/15	Pothole	37	14	£10,343.70	35	71%
	Oil	0				
	Stone	2				
	Ironwork	6				
	Other	15				
2013/14	Pothole	69	11	£91,331.11	70	86%
	Oil	0				
	Stone	4				
	Ironwork	9				
	Other	13				

(*) In reality these figures are likely to be a combination of third party claims relating to both the subject financial year and earlier years but should not include claims which were outstanding / in dispute at the end of the year.

(#) In reality this calculation will likely include a combination of third party claims relating to the financial year and earlier years but should not include claims which were outstanding / in dispute at the end of the year.

Appendix F – Details of third party claims in NPT (Cont.)

Footways: Statistics for third party claims received, settled and repudiated in the last 5 financial years.

Financial Year	Type of claim	Total received	Total settled (*)	Total value of settled claims(*)	Total repudiated (*)	Repudiation Rate (#)
2017/18	Pothole	3	8	£149,670.18	44	85%
	Oil	0				
	Stone	0				
	Ironwork	2				
	Other	20				
2016/17	Pothole	1	6	£97,367.64	37	86%
	Oil	0				
	Stone	0				
	Ironwork	2				
	Other	18				
2015/16	Pothole	2	2	£70,084.01	61	97%
	Oil	0				
	Stone	0				
	Ironwork	8				
	Other	26				
2014/15	Pothole	4	5	£55,781.07	36	88%
	Oil	0				
	Stone	0				
	Ironwork	6				
	Other	49				
2013/14	Pothole	4	8	£115,295.81	46	85%
	Oil	0				
	Stone	0				
	Ironwork	9				
	Other	26				

(*) In reality these figures are likely to be a combination of third party claims relating to both the subject financial year and earlier years but should not include claims which were outstanding / in dispute at the end of the year.

(#) In reality this calculation will likely include a combination of third party claims relating to the financial year and earlier years but should not include claims which were outstanding / in dispute at the end of the year.

Appendix G – Comparison of techniques for pot hole repairs

<u>CURRENT HOTBOX SYSTEM</u>			
Name	Purchase Cost	Advantages	Disadvantages
Hotbox	Vehicle cost circa £125k	<ul style="list-style-type: none"> • Long lasting repair • Large sections can be repaired • A JCB patch planer is available on larger jobs – less issue with HAVS 	<ul style="list-style-type: none"> • Excavation required (possible HAVS issues). • Waste material generated (cost of disposal and downtime). • More than 1 employees required. • Low productivity. • JCB & Driver need bringing in on larger jobs
<u>ALTERNATIVE SYSTEMS</u>			
Name	Purchase Cost	Advantages	Disadvantages
Nuphalt Thermal Road Repair System	Approx. £37k for panel van to be fitted out (plus cost of Panel van).	<ul style="list-style-type: none"> • No waste. • No excavation required (no HAVS issues). • 2 employee operation. • Increased productivity averaging 20 defects in a 10 hour day based on information from supplier. 	<ul style="list-style-type: none"> • Takes longer in cold weather. • Due to the design of the machine, it is not suitable during periods of wet weather as water can penetrate the electronics & a wet surface takes longer to heat and repair.
Jetpatcher rear boom system (under pressure)	£93k + Vat without Chassis.	<ul style="list-style-type: none"> • Can be added to existing gritter chassis. • No excavation required (No HAVS Issues). • 2 man operation. • Expected increased productivity awaiting confirmation of expected output as experienced by CCS. 	<ul style="list-style-type: none"> • Unsuitable for heavily trafficked areas (junctions). • Downtime if combined with gritter chassis. • Unsuitable for use in Winter

Name	Purchase Cost	Advantages	Disadvantages
Archway Cab controlled from front arm (sprayed & compacted)	£198k if vehicle chassis purchased through Archway. Possibly less if chassis purchased through Fleet.	<ul style="list-style-type: none"> • Potential 1 employee operation. • No excavation required (No HAVS issues). • Expected increased productivity averaging 20 defects a day in on a 10 hour day based on past experience. 	<ul style="list-style-type: none"> • Unsuitable for heavily trafficked areas (junctions). • Not suitable in poor weather conditions (Initial feedback from Powys is that the system is pulled off the road during the winter.)
BOBCAT and planer (to be used in conjunction with existing Hotbox) + 7.5 tonne support vehicle required	Approx £40k Approx £45k	<ul style="list-style-type: none"> • Long lasting repair • Large sections can be repaired • Patch planer would increase productivity compared to standard Hotbox repairs • less issue with HAVS 	<ul style="list-style-type: none"> • Waste material generated (cost of disposal and downtime). • Usually a 3-4 employee operation. • Low productivity compared with Archway & Jetpatcher
Over-banding and crack filling system	To be confirmed	<ul style="list-style-type: none"> • Quick & easy • High output • No cutting out, planing or routing required • Extends pavement life • Restricts water penetration • Ideal for pre-patching prior to surface dressing • Repairs are robust suited to roundabout and junction repairs • Cost-effective over time compared to other pavement maintenance techniques • Can be used all year including winter 	<ul style="list-style-type: none"> • Highly skilled process • Involves heat and manhandling material at high temperatures • Requires the use of specialist plant, such as heating plant and heat lances, which are particularly noisy

Spray injection patching as undertaken by companies such as 'Velocity' and 'Archway Roadmaster' is a nationally recognised and approved system of repair for both reactive and programmed maintenance. It provides a robust temporary repair that is particularly suited to roads that are in fair condition without structural defects and with only localised potholing. Further information on spray injection patching can be found on the RSTA site – <http://www.rsta-uk.org/spray-injection-patching/>

The City and County of Swansea have operated their own "jet patcher" for several years and Powys have recently purchased two machines from Archway Roadmaster Ltd.

The Network Management Section has also trialled the "Overbanding and Crack Filling" system, also known as a system known as "Crack Sealing & Joint Repair". The system basically involves the infilling of cracks and potholes with a hot applied thermoplastic resin and/or bituminous material. One of the Council's term service contractors, Nolan Roadmarking Ltd., carry out the work and repairs can be expected to last from between 3 and 6 years. The system is especially suited to areas of high stress such as on busy roundabouts where centreline joint failure is prevalent. It is a relatively quick process, compared to traditional bitumen macadam infill patching, and extensive areas of carriageway can be treated in a relatively short period of time. The system has been used in the following areas with great success:-

- Aberdulais roundabout over the A465;
- The roundabout outside Asda at Ystalyfera;
- Extensive patching work on the B4242 between Ynysygerwn and Aberpergwm;
- Pre-patching for surface dressing on the B4242 between Ynysygerwn and Aberpergwm;
- Extensive patching work on the A474 between Rhydyfro and Cwmgors; and,
- Pre-patching for surface dressing on the A48 in the vicinity of Margam Park.

Appendix H – Detailed Action Plan

No.	Action	By Whom
1	Effectively develop a single defect recording/mgt system which integrates Service First and Highway Inspector reports into one computer system by implementing a method to link the Service First calls to the Highway Inspection records	IT with Service employees
2	Introduce ICT device which provides easy use with map for each highway maintenance gang and 'hit squad' to allow for live issuing of jobs and instant closing down and updating of completed jobs (eliminating printed lists), along with recording of photographs of repairs (include item placed to give scale or otherwise include record approx. size of defect), amount and type of materials used, and length of time taken to complete. Repair by 'hit squads' to be marked as 'made good' (if expected to last at least one highway inspection cycle) or temporary repair, the latter to be automatically transferred for follow up planned permanent repair.	IT with Service employees
3	Modify Service First to be able to link any report to an existing defect in the system already identified by Inspectors as necessary/appropriate. Existing jobs will have a photograph attached which should facilitate identification of duplicate defects. The system also needs to be able flag defects on the database within a set distance of allocated report/repair location which might also be repaired whilst on site thereby reducing time lost to travelling between jobs.	IT with Service employees
4	Complete ongoing development of system to accommodate transfer of responsibility between teams after initial logging, to include prompt to input reason and photograph, and show audit trail of transfers	IT with Service employees
5	Modify system to allow jobs to be updated in the field (in any case current	IT with Service

	issues should essentially cease with introduction of ICT devices and on-site update)	employees
6	Highway Inspectors and 'hit squad' employees to measure defect size where possible, or otherwise make an estimate, and record.	Service employees
7	Maintain split of reactive and planned maintenance between Neighbourhood Services and Highways Services [i.e. all publically reported defects (carriageway & footway including kerbs), plus emergency repairs identified by Inspectors, to be initially attended by Neighbourhood teams] All jobs attended to be dealt where possible, even if not above the intervention limit. [The alternative would be to channel all reports through the highway inspectors which would solve some issues but bring together reactive and planned work and overall provide a less responsive system]	Service employees
8	Undertake detailed evaluation of the position with kerb defects and their repair, including repair/mitigation measure. As only around 5% of defects require kerb replacement, evaluation to include an assessment of the longevity of minor repairs and the extent of current 'tail chasing'. Evaluate value of recording and treating defects where replacement is not required in risk management terms, and the benefit of letting a one-off capital scheme to replace any significant 'repeat offenders' defects. Consider also the benefit of letting a once a year contract to replace 'Priority 2' kerbs which need replacing.	Network Mgt
9	Change configuration of internal highway teams to: 1x5 employee hotbox to improve cover and capacity for faster roads needing stop/go boards etc. (and develop routine programme of works for fast roads around the County Borough on a rota basis), 1x3 employee hotbox; and 2 x 2 employee highway repair gangs applying proprietary cold laid materials. Towable hotbox to be turned over for permanent use by in-house drainage and capital gangs as they	Service Manager

	require thereby reducing the number of occasions where defect maintenance resources are diverted away from normal duties. Repairs up to '2 tubs' on classified roads and '4 tubs' on unclassified roads will be allocated to 'tub teams'. Larger repairs and all repairs on fast roads to be allocated to hotboxes. Freeing the two Hotboxes from some of the smaller repairs will provide a better use of resources.	
10	Network Mgt to analyse database for clusters of defects 2/3 time per year and issue programmes of work to external spray injection repair contractors. Keep under review the benefit of purchasing and operating specialist repair vehicles/equipment.	Network Mgt
11	The existing £102,000 planned minor works budget to provide the funding, after saving from annual payments regarding the towable hotbox (£3,332.60), to a) increase staff complement in the highway teams from 11 to 12 (£26,750 year 1) and b) the balance to be utilised to pay for 'spray injection' repairs going forward.	Service Manager
12	Investigate the possibility of purchasing a Hotbox body that could be fitted onto the existing gritter/lorry swap bodies and evaluate benefit. In the interim extend use of the hotbox which is due for renewal if no major issues.	Service/Fleet Manager
13	Hotbox drivers to be allocated mobile phone to allow direct contact with tarmac plant. This will allow improved time management in respect of ordering and receiving tarmac, resulting in fewer delays waiting in the plant.	Service Mgr
14	Maintain use of tarmac plant at weekends when available (or spend more on getting it to open at weekends and make greater budget provision to increase O/T to increase capacity?). Storing tarmac in the Hotbox overnight from a Friday afternoon to a Saturday morning is possible, but results in a reduction of the tarmac quality so is not generally considered suitable.	Service Manager
15	Only undertake work for other sections out-of-hours unless resources allow.	Service Manager

16	Ensure enough LGV drivers are trained within the Highway Maintenance team to provide cover in the event of absence allowing the Hotbox to be maintained in operation as much as possible.	Service Manager
17	Reduce impact on Hotbox of inclement weather by preparing jobs in advance of tarmacking when weather restricts work activity.	Service Employees
18	Having implemented the above, review again the responsiveness of the service vs demand.	Service Manager