

Wiltshire Council Risk Based Approach to Highway Defects



September 2018

Wiltshire Council

Risk Based Approach to Highway Defects

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Wiltshire Council

Risk Based Approach to Highway Defects

Introduction

1. The Council is responsible for the maintenance of the roads in Wiltshire, with the exception of motorways, trunk roads and those in private ownership. The highway network represents the Council's biggest asset, and is possibly its most significant potential liability. Maintaining a fit for purpose highway network is crucial to support economic development and to ease the movement of goods and people.
2. The highway network in Wiltshire comprises 4,500 kilometres of road, 3.9 million square metres of footway, 1,500 bridges and over 40,000 street lights with a replacement value of over £5 billion. It would cost over £330 million to resurface all of the roads, with additional costs to repair structural damage.
3. The condition of the county's roads is important to the public. This is demonstrated by the results of the Council's People's Voice and the National Highways and Transportation (NHT) surveys, which indicate low levels of public satisfaction with road conditions. In the Council's consultations on budget setting, expenditure on roads is the service area where the public have consistently wished to see more spent.
4. The safety of the highway network is a priority, and the Council reviews collision data to determine where further investigations are required, and where safety schemes are justified. Safety considerations are the priority with regard to defects on the carriageways and footways, and the way in which they are treated.
5. The Council has an adopted Skid Resistance Policy which reflects a risk based approach to identifying sites for treatment based on surface texture considerations. Skid resistance does not form part of this assessment as it is considered to be adequately covered by the current adopted policy.
6. This document has been prepared to set out the methodology used by the Council to manage the risks associated with carriageway defects, including those often referred to as potholes. It has been used to inform the new Wiltshire Highways Safety Inspection Manual (WHSIM).
7. Separate processes are used to inspect structures, street lighting, and rights of way, which are not included in this document.

Highways Asset Management

8. The then Wiltshire County Council developed a Transport Asset Management Plan (TAMP) in 2005 in order to improve the management of its transport infrastructure, including the county's roads, bridges, street lighting and transport related assets. It was prepared in accordance the then current Codes of Practice, particularly 'Well-Maintained Highways' published in July 2005.
9. In May 2013 the Highways Maintenance Efficiency Programme (HMEP) published new asset management guidance. The guidance provided advice on implementing asset management, and made a series of recommendations to achieve the benefits of asset management. The Department of Transport (DfT) is keen that authorities adopt an asset management approach and are encouraging adoption by including an incentive in the allocation of maintenance funding.
10. The Council prepared a highways asset management policy and strategy, which were adopted by the Council in May 2015, and reflected the new asset management guidance.
11. The Wiltshire Highways Asset Management Policy is:

Wiltshire Council is committed to adopting the principles of asset management, and will take a long term view when making maintenance and investment decisions. The asset management approach will deliver value for money and maximise the benefits for future prosperity by ensuring the right investment decisions are made. It will assist in targeting resources and managing risks associated with the statutory duties to maintain the highway infrastructure.
12. Wiltshire Council manages its highways assets in accordance with the policy. And develops programmes of work to maintain the highway and ensure that cost effective investment is made.
13. It is acknowledged that reactive repairs are no substitute for a planned maintenance programme on the network. However, with finite funds it is necessary to have measures in place to manage and reduce the risks posed by defects, which can arise for a number of reasons, including weather damage, drainage issues, ground conditions and the type and volume of traffic using the road.

The Code of Practice

14. The DfT commissioned a new Code of Practice 'Well-managed Highway Infrastructure' (the Code) which was published in October 2016. There was a two year period for highway' authorities to implement the recommendations before the old codes of practice cease to apply. This has implications for this Council because of the different approach adopted with the new Code of Practice.
15. The new Code of Practice replaces three previous documents: 'Well-maintained Highways', 'Management of Highway Structures' and 'Well-lit Highways'. It is designed to promote the adoption of an integrated asset management approach to highways infrastructure based on the establishment of local levels of service through risk-based assessment.
16. The intention of the Code is that Authorities will develop their own levels of service, and the Code therefore provides guidance for authorities to consider when developing their approach in accordance with local needs, priorities and affordability. The Code acknowledges that changing from reliance on specific guidance and recommendations in the previous Codes to a risk-based approach determined by each Highway Authority will involve appropriate analysis, development and gaining of approval through authorities' executive processes.
17. An initial review of the Code's recommendations indicated that most of the recommendations were already being complied with in Wiltshire, or were being implemented in connection with the asset management processes being introduced following the Peer Review and Incentive Funding assessments.

Risk Based Approach

18. The Code indicates that authorities should adopt a risk-based approach and a risk management regime for all aspects of highway maintenance policy. This includes investment, setting levels of service, operations, including safety and condition inspections, and determining repair priorities and replacement programmes. It should be undertaken against a clear and comprehensive understanding and assessment of the likelihood of asset failure and the consequences involved.
19. There are no prescriptive or minimum standards in the Code. Adoption of a risk based approach, taking into account of the advice in the Code, enables authorities to establish and implement levels of service appropriate to their circumstances.
20. A risk based approach has been adopted for many years in the management of some aspects of the county's highways. For example with regard to skid resistance where the Council's adopted policy has a process to identify those sites with greatest risk, and sets out a process for treating and managing them.
21. A risk based approach was adopted in developing the Wiltshire Highway Infrastructure Strategy and Plans. The asset inspection, renewal, improvement and investment strategies adopted by the Council have been developed to reflect the comparative risks in connection with the assets, and the need to be flexible to reflect changing situations and risks.
22. The processes around treatment of carriageway defects and potholes, especially with regard to the inspection regime and response to defects, need specific consideration following the introduction of the new Code. The Council's previous Highways Inspection Manual and arrangements reflected the old Code which will be superseded by the new Code.
23. The setting of response times for particular defects does not prevent a defect being dealt with in a shorter time should resources permit.

Highways Inspection Manual

24. The Highways Inspection Manual (HIM) was last reviewed in May 2013 when minor revisions were made to the previous version. The HIM set out the inspection frequencies of the network, with more frequent inspections of the higher classification of roads. It also set out the intervention levels which prompt a repair according to the circumstances.
25. The inspection manual is particularly important in keeping the county's roads safe, reducing claims and setting public expectations. There can be serious legal and financial implications of not following the standards set out in the HIM, which has been tested in court and has been found to be an effective process for managing risk.
26. The new Code suggests the HIM document and the approach to defect management should be reviewed in the light of the risk based approach. This requires consideration of the network, the inspection regime, and the defect response criteria. It is proposed that the HIM should be replaced by a new Wiltshire Highways Safety Inspection Manual (WHSIM) to reflect the new Code.

Network Hierarchy

27. The road network has been classified for many years, with A, B and C class roads representing the busier roads, and unclassified roads generally being the more minor rural roads and housing estate roads. These designations have evolved over the years and may not fully reflect the current relative importance of the roads, traffic volumes or the associated risks.
28. In order to adopt a risk based approach to carriageway defects it was necessary to review the county's road network, and identify a hierarchy of roads to reflect their relative importance, use and function. The hierarchy adopted is more detailed than the previous groupings included in the HIM, and has been agreed between the South West Highways Alliance (SWHA) members to help achieve a common hierarchy across the region.
29. The SWHA comprises all of the local highway authorities in the south west. It has a project board and a series of specialist sub-groups to reflect the different aspects of highway maintenance. The road hierarchy was developed by the South West Highways Asset Managers Group in response to the introduction of the new Code. The hierarchy is more detailed than that suggested by the old code and was considered to be a good representation of the road networks in the region.
30. The SWHA Road Hierarchy is summarised as:

Type	Carriageway Hierarchy
2	Strategic Route
3	Main Distributor
4	Secondary Distributor
5	Link Road
6	Local Link Road
7	Local Access Road
8	Minor Road
9	Lanes
10	Green Lanes and Tracks
11	Disused Tracks

31. The Type 1 road is used only for motorways which do not form part of the local road network managed by Wiltshire Council.
32. The Road Hierarchy descriptions are shown in more detail in **Appendix 1**.
33. The classification of roads in Wiltshire within the hierarchy was initially assessed as a desk top exercise, using GIS mapping and available photographic and video information. The local area highway teams then reviewed the initial assessments and used local knowledge to finalise the hierarchy designations and ensure consistency across different parts of the county. The adoption of the SWHA hierarchy will also help ensure consistency with adjoining authorities.

34. The hierarchy for the Wiltshire road network has been identified and shown on separate plans for each Area Board, which will be available on the Council's website. The hierarchy may need to be reviewed in the future if significant development or usage changes the nature of a particular road and its environment.
35. The use of footways is not necessarily reflected in the road type designation described above. In town centres usage would be expected to be higher even on comparatively minor roads. A separate hierarchy has been developed for footways and cycle-ways.

Footway Type	Description
F1	Main shopping areas
F2	Footways in other urban areas, rural areas, surfaced 'link' footpaths and shared pedestrian/vehicle areas.

Cycle-way Type	Description
C1	Part of Carriageway
C2	Remote from Carriageway

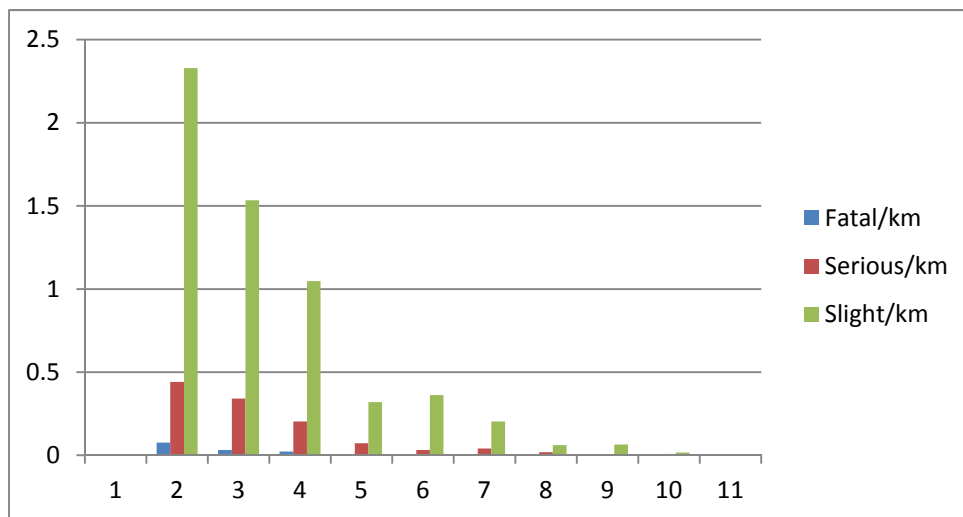
36. The footway and cycle-way hierarchies have been reviewed and the number of footway types have been reduced to two to reflect the levels of usage.

Identifying risks

37. A number of factors have been taken into account in identifying risks on the highway network. These include numbers killed and injured in vehicle collisions, frequency of defects arising, claims, and reports of defects.

Collision Data

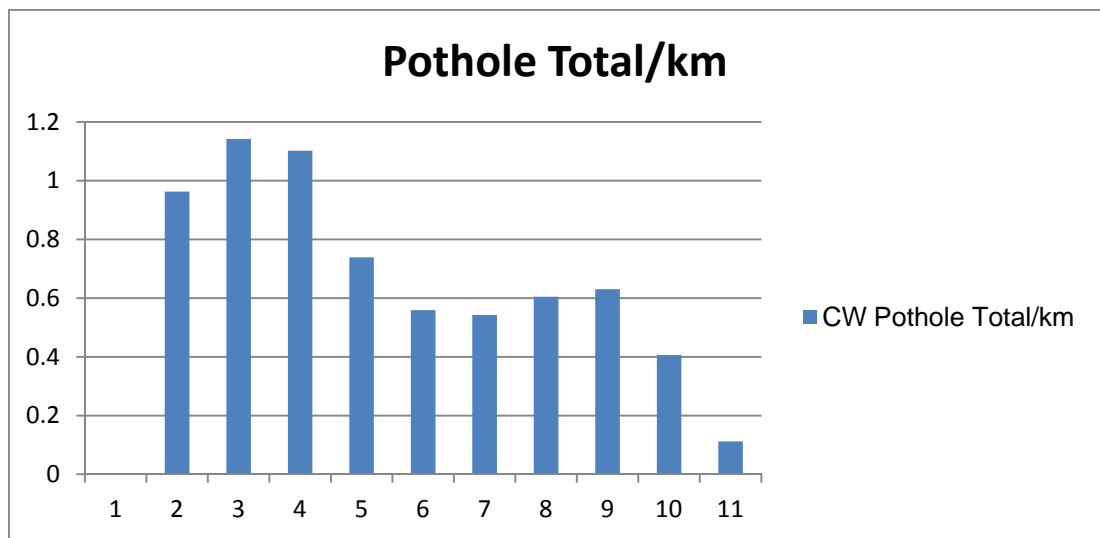
38. The police collect and collate injury collision statistics for the network. These include killed and seriously injured, and slight injuries. Information on damage only collisions is not collected, and has not been used in this assessment as any information would be incomplete and could be misleading. The collision data from April 2014 to May 2017 has been used to identify injury collision numbers and rates for different road categories.



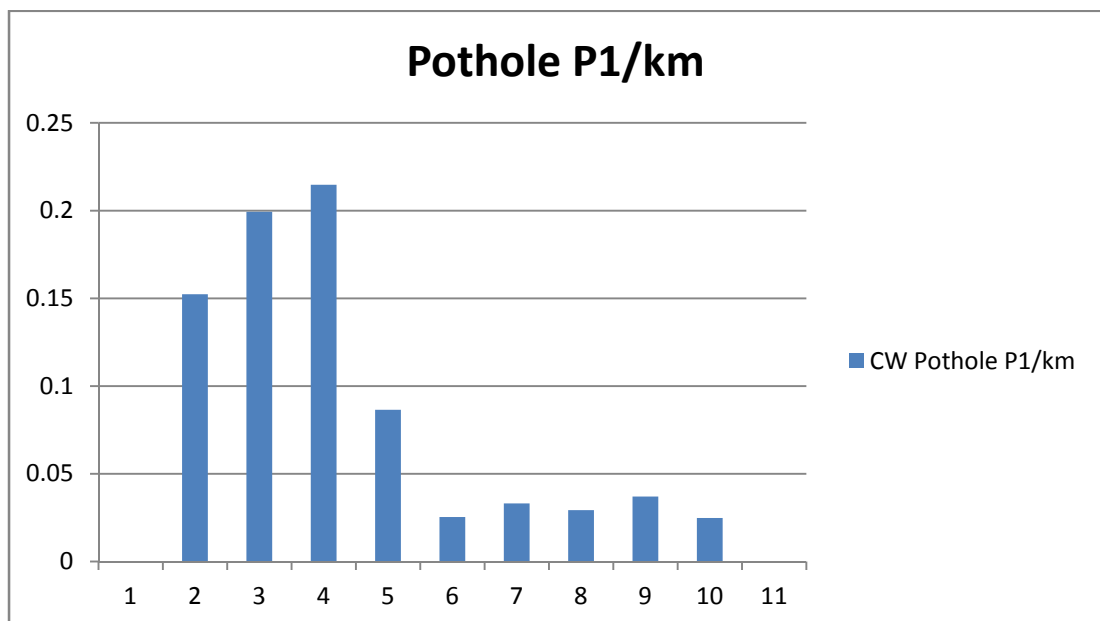
39. It is clear that the Type 2, 3 and 4 roads have significantly higher collision rates than the other road categories. They represent 24% of the road network by length, but together account for 80% of fatal accidents and 68% of serious and slight injury accidents. These roads groups have significantly more injury collisions than the other road categories.
40. In comparison the lower road types 5 to 10 have lower accident rates per km. Road types 6, 7, 8, 9 and 10 represent 44% of the network in length, but only 12.4% of collisions and 11% of Killed and Seriously Injured (KSI) collisions. Road type 5 represents 32% of the network, and has 19% of the collisions.
41. Although road conditions do not appear to be a major factor in the majority of recorded road incidents, the statistics do indicate the potential serious injury and damage risks associated with the busier parts of the network. On these roads collisions with other vehicles may not only be more likely but may also be more serious.

Potholes and carriageway defects

42. The number of potholes identified on the network from April 2016 to November 2017 have been analysed in terms of pothole numbers per km for each road type.

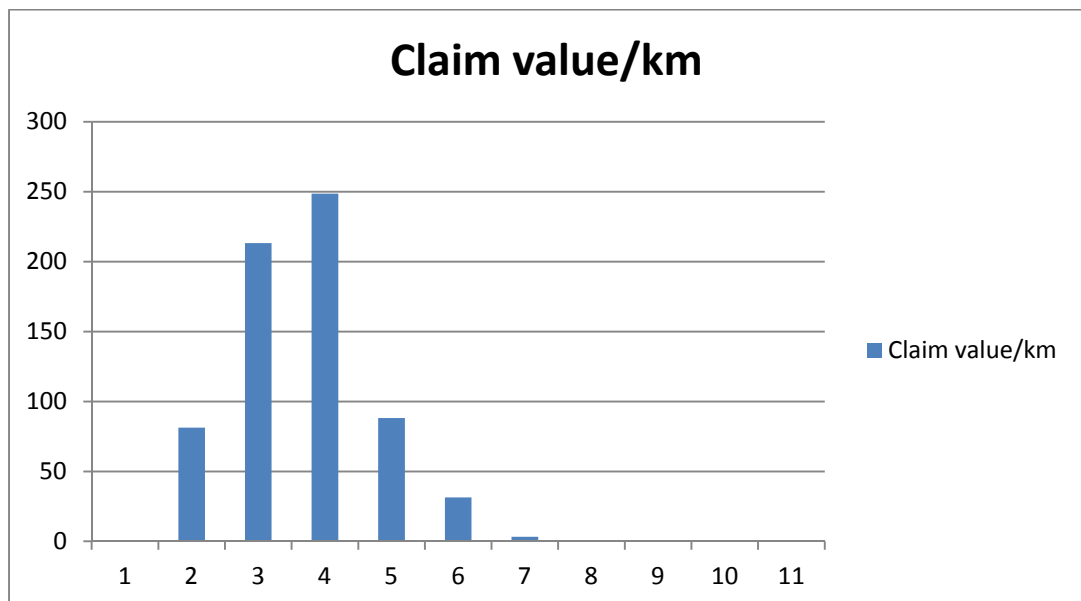


43. The Type 2, 3 and 4 roads have higher rates of potholes per kilometre compared to the other road categories. However, it is noticeable that the number of potholes per kilometre for the more serious safety defects (P1 potholes) is significantly higher on the Type 2, 3 and 4 roads than on the other road categories.

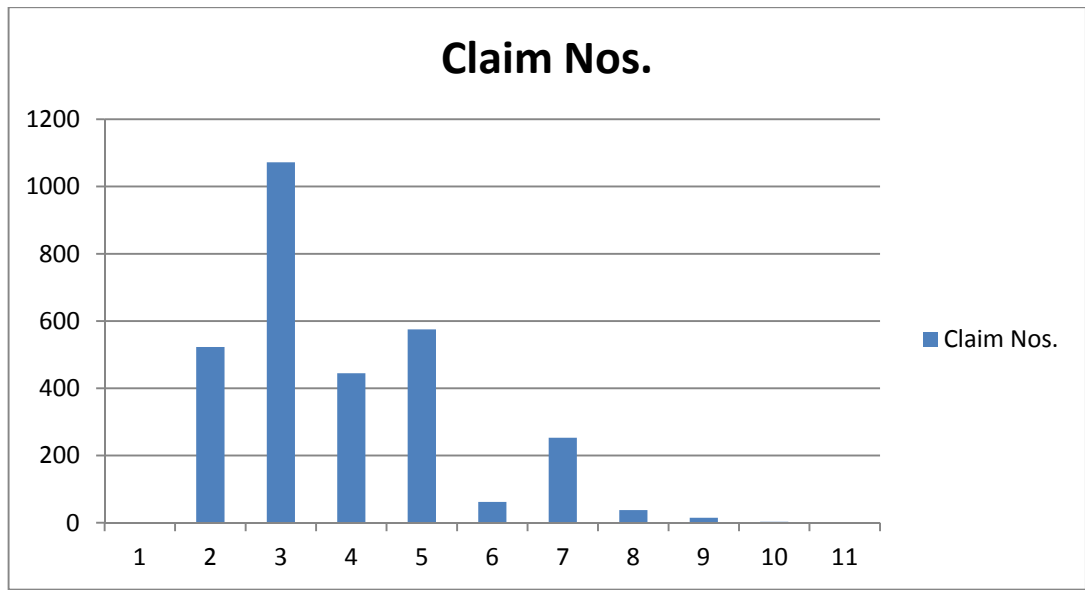


Claims

44. The Council has a good record of defending claims against it as highway authority. In some cases claims may be paid where justified and depending on the circumstances. The locations of claims between 2 January 2012 and 28 August 2015 have been taken into account as a factor in considering the risks in connection with the different road categories. Historic claim records have been used in the assessment because of the time it sometimes takes for claims to be resolved.

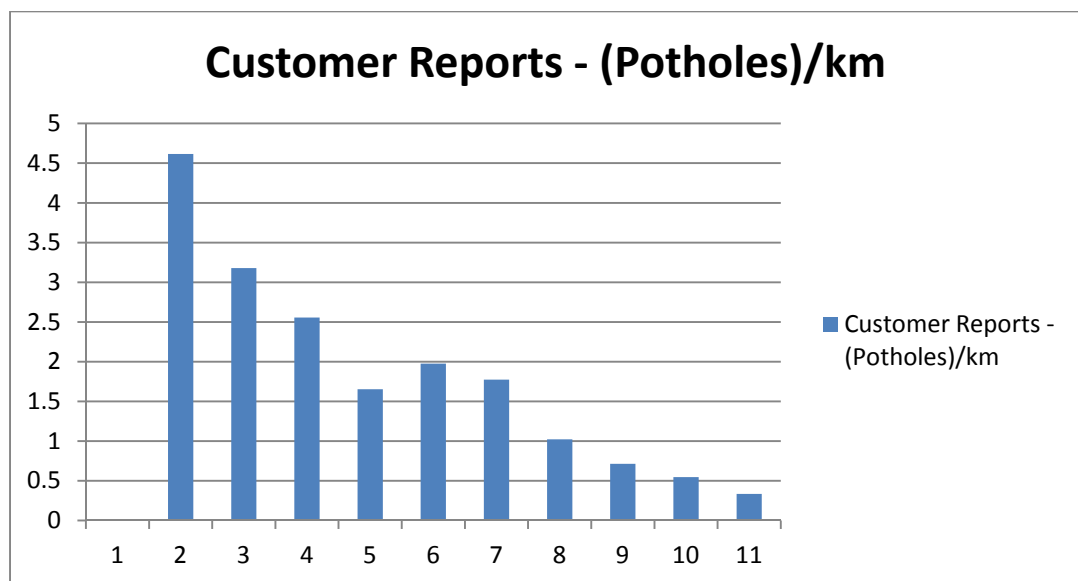


45. It is apparent that the highest values of claims are associated with the Type 3 and 4 roads, with most of the other claims associated with Type 2 and 5 roads. There are significantly fewer claims on the lower road categories.

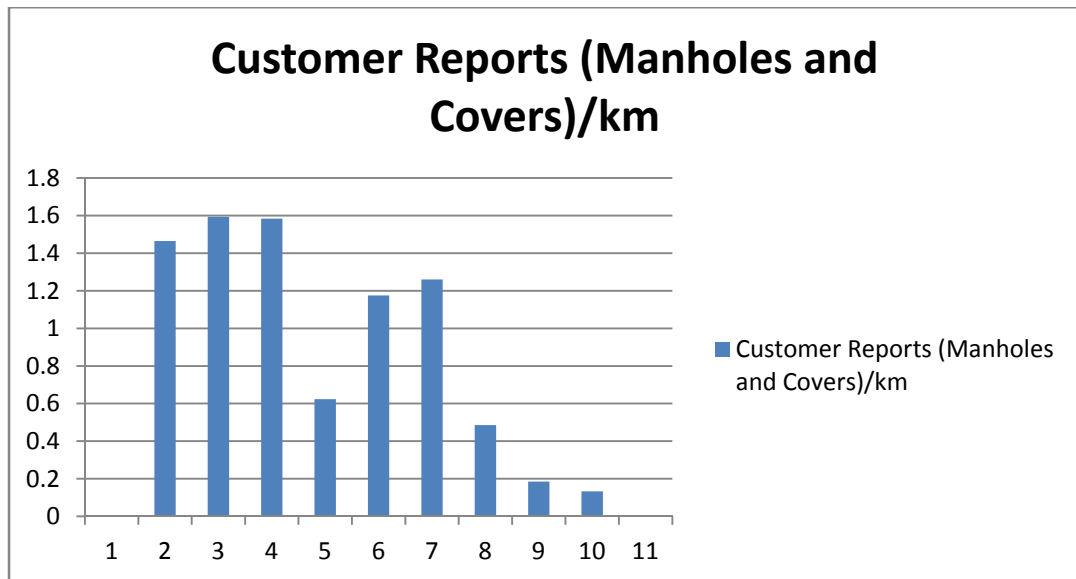


Customer Reports

46. The MyWiltshire system has proved to be very successful at encouraging the public to report defects on the highway. It is a single point of contact that combines website, app and telephone reports into one record. The reports often contain good information on the location of defects.



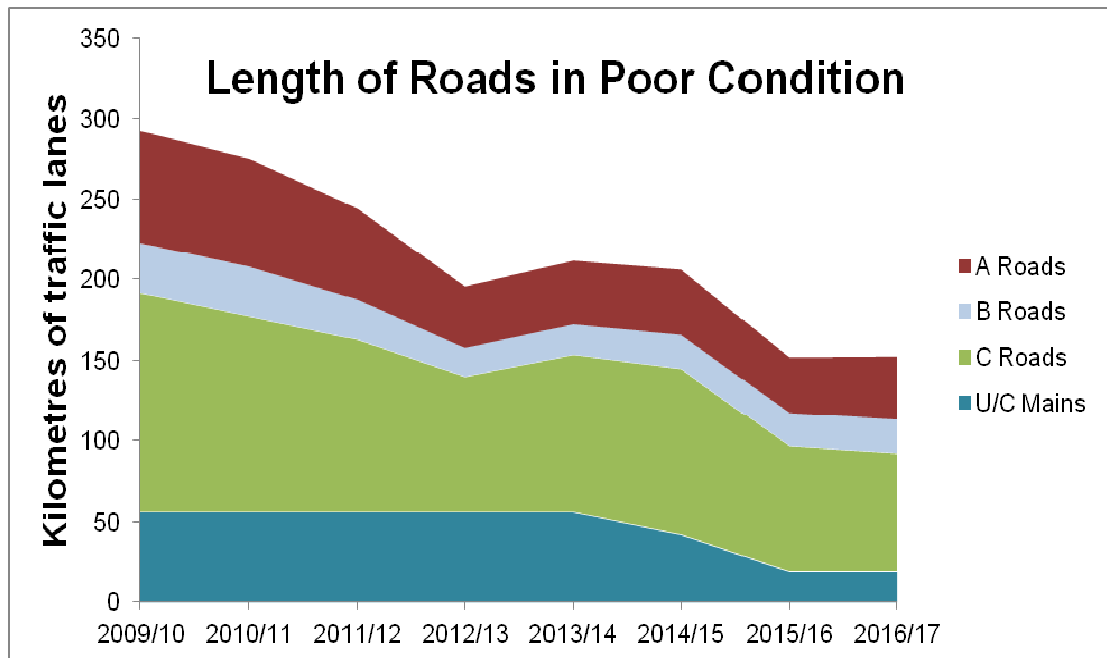
47. The customer reports information indicates that there are more pothole defect reports per kilometre for the higher type roads, with the highest rate being on the Type 2 roads.



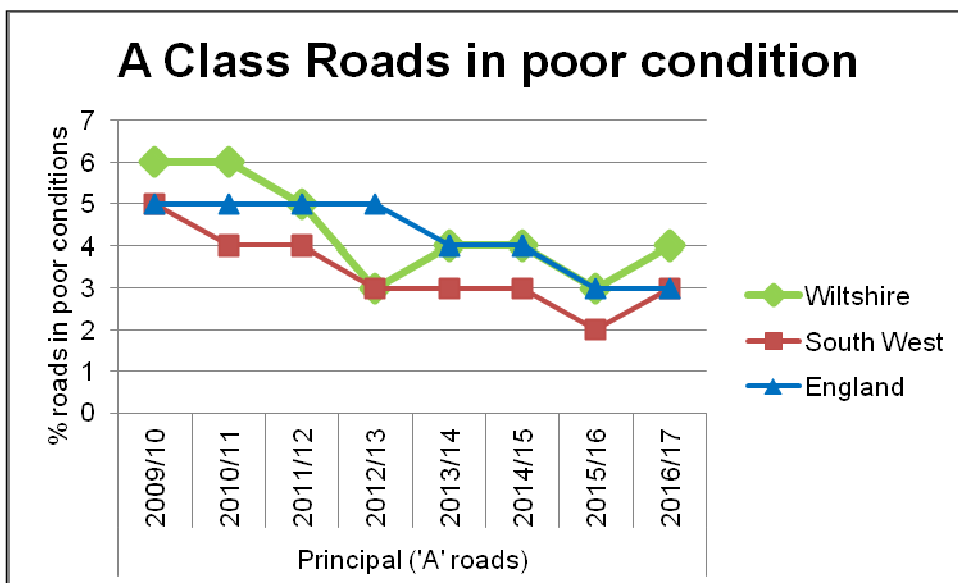
The customer reports about manhole and cover defects indicate a similar but less pronounced pattern, with the greatest number of reports on manhole and cover defects on the Type 2, 3 and roads.

Road Conditions

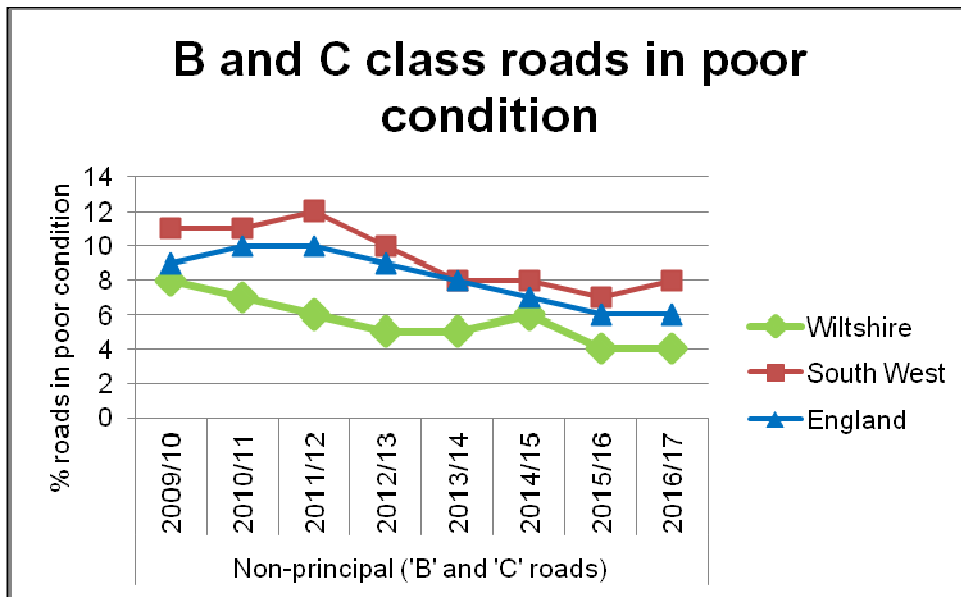
48. The condition of the county's roads has been improving in recent years. A total of 761 kilometres of road have been resurfaced since 2014, which is about 17% of the network. There have also been a significant number of smaller sites treated with hand patching and repairs to address localised areas in poor condition.
49. The detailed calculation of the backlog carried out by the Council's specialist consultants, WDM, indicates that there has been a significant reduction of 30% in the highway maintenance backlog since 2013, with the backlog reducing from an estimated £69.4 million to £48.2 million.
50. There has been a significant reduction in the length of road in Wiltshire in poor condition, which has almost halved since 2009. This has been largely due to the additional funding provided by the Council, especially in recent years through the Local Highways Investment Fund.



51. The condition of A roads has improved nationally since 2009 from 5% in poor condition to 3% in 2016/17 (Note - Low percentages are good). In Wiltshire the A class roads in poor condition have reduced by the same amount, but they have risen slightly above the national and south-west average at 4% in 2017.

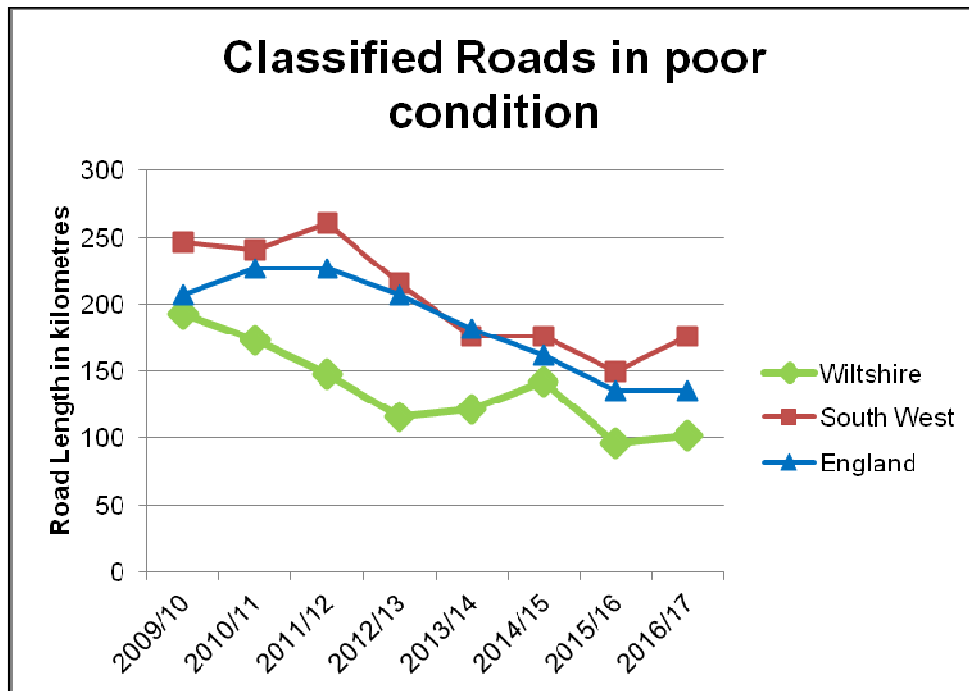


52. The B and C class roads represent 45% of the road network by length in Wiltshire. This is a large proportion of the network. Keeping these roads in good condition is important to the local communities, and requires substantial investment.



53. The B and C class road conditions in Wiltshire are much better than the national and south-west averages, with 4% in poor condition, which is half the south west average of 8%, and better than the national average of 6% for these types of roads.

54. If the condition of classified roads (A, B and C class roads) in Wiltshire had followed the national or south-west averages, the roads would be in appreciably worse condition than they are now. The graph below shows the actual lengths of road in poor condition in Wiltshire by year, and what the lengths would have been if Wiltshire's roads were in the same condition as the national or south-west average condition (i.e. there would be more in poor condition).



55. The condition of the unclassified roads is more difficult to compare as the assessment methods are not necessarily consistent across authorities. In general terms the condition of the more important unclassified roads in Wiltshire compares well with those of similar authorities in the south west, but further assessment would be required to get a better understanding of minor road conditions across the south west. Overall the condition of roads in Wiltshire has been improving in recent years.

Carriageway Risk Assessment

Risk Assessment Methodology

56. The Risk Assessment for carriageway defects has been undertaken using the Council's 4 x 4 risk matrix method using likelihood and potential impact to rank the potential risk.
57. The likelihood and impact have been scored from 1 to 4 for each road type, with 4 being highest likelihood or impact. The matrix indicates a Risk Score based on Likelihood x Impact of between 1 and 16, with a Risk Score of 16 representing the highest risk.

	Likelihood Rare (Score 1)	Likelihood Unlikely (Score 2)	Likelihood Possible (Score 3)	Likelihood Almost certain (Score 4)
Significant Impact (Score 4)	4	8	12	16
Moderate Impact (Score 3)	3	6	9	12
Minor Impact (Score 2)	2	4	6	8
Insignificant Impact (Score 1)	1	2	3	4

58. The calculated Risk Scores provides an indication of the level of likely risk:

Risk	Risk Score
High	12 to 16
Medium	6 to 9
Low	1 to 4

59. The likelihood and impact scores have been derived for each road type based on the best information currently available.

Likelihood Assessment - Carriageways

60. The likelihood associated with the risk from carriageway defects has been assessed based on the road hierarchy categorisation. It is considered that the likelihood of a carriageway defect resulting in damage, claim or collision is likely to be higher where traffic volumes are higher.

61. There is generally good traffic count information available for the main road network, particularly the A class roads, but there is less detailed information available for the minor roads. The cost of obtaining detailed traffic count information for every road on the highway network is considered to be prohibitive, and as an alternative the relative position in the hierarchy has been used to evaluate the likelihood in the risk assessment process.
62. The higher road types in the hierarchy are the strategic and distributor roads, which carry higher traffic volumes, and usually carry higher proportions of through traffic. The link roads would generally be expected to carry traffic predominantly with a local destination or origin. The local access roads, minor roads and lanes would have a high proportion of local traffic, often with drivers who may use the road several times a day and would be familiar with the local road conditions.
63. The road categories have been given a likelihood score based on their function within the network, which is described as High, Medium, Low and Very Low. They have been scored 4 to 1 accordingly.

Road Type	Typical traffic volume	Likelihood Score	Description
2	High	4	Strategic routes
3	High	4	Main Distributor roads
4	High	4	Secondary Distributor Roads
5	Medium	3	Link Roads
6	Medium	3	Local Link Roads
7	Low	2	Local Access Roads
8	Low	2	Minor Roads
9	Low	2	Lanes
10	Very Low	1	Green Lanes and Tracks
11	Very Low	1	Disused Tracks

64. The Likelihood scores determined above have been used to assess the overall risk.

Impact Assessment - Carriageways

65. The potential impact in the risk assessment has been evaluated taking into account a number of factors, including collisions, number of defects, claims received, and My Wiltshire reports for each road type.
66. There are considerably more killed and serious collision accidents on the higher road types 2, 3, and 4 when compared to other road types.
67. The higher type roads on the network generally have considerably more injury collisions than lower type roads. The rural unclassified roads have

fewer collisions than other parts of the network. This has been reflected in the impact score attributed to these road types.

68. There are more potholes per kilometre on the higher road types, and there are significantly more of the potentially serious P1 safety defects per km on the Type 2, 3 and 4 roads. These are therefore considered to have a greater potential impact in terms of damage resulting from defects.
69. The claims for damage or injury resulting from carriageway defects indicate that more claims per km are associated with Type 3 and 4 roads, with a low number of claims for the lower roads types. However, Type 5 roads have a high total value of claims. They represent a significant proportion of the network at 32% of the total, and the claim rate per km is less than for the Type 3 and 4 roads.
70. The customer reports for potholes, manhole and cover defects indicate a higher number of reports per kilometre on the higher type roads. The potential for damage on the higher type road would be expected to be higher, and could be considered to have a higher impact score.
71. The road categories have been given an impact score based on the injury collision data, pothole numbers, claims data and defect reports.

Road Type	Impact Score	Comments
2	4	High rate of collisions per km, especially fatalities. High number of P1 defects per km.
3	4	High rate of collisions per km, especially fatalities. High number of P1 defects per km.
4	4	Significant rate of collisions and fatalities. High number of P1 defects per km.
5	3	Appreciable rate of collisions, safety defects and claims. Significant number of P1 defects per km.
6	3	Appreciable number of collisions, lower safety defects and claims.
7	2	Lower collision rates and safety defects and claims per km.
8	2	Lower collision rates and safety defects and claims per km.
9	2	Lower collision rates and safety defects and claims.
10	1	Low collision rates and safety defects and claims per km.
11	1	Low collision rates and safety defects and claims per km.

72. The above Impact scores have been used in the risk assessment.

Risk Assessment - Carriageways

73. The risk assessment has been undertaken by using a matrix based on the derived from the Likelihood Score x Impact Score to produce a Risk Score of between 1 and 16. A Risk Score of 16 represents the highest risk.
74. The Risk scores for each road type are summarised below:

Road Type	Likelihood Score	Impact Score	Risk Score	Risk Rating
2	4	4	16	High
3	4	4	16	High
4	4	3	12	High
5	3	3	9	Medium
6	3	2	6	Medium
7	2	2	4	Low
8	2	2	4	Low
9	2	2	4	Low
10	1	1	1	Low
11	1	1	1	Low

75. The calculated risk score and rating have been used to determine the appropriate inspection frequency to manage the risks associated with carriageway defects.

Highways Inspections and Investigatory levels

Carriageway Inspection Frequencies

76. The inspection frequencies and intervention levels previously used by highway authorities have evolved over time, and generally reflected the suggested provisions in the old highways codes of practice. This included monthly inspections for the highest category roads with annual inspections for the less used roads.
77. The high risk rating associated with the Type 2, 3 and 4 roads reflects the higher risk associated with the strategic and distributor road network. It is proposed that in the WHSIM there should be monthly driven inspections undertaken on those roads. This is considered to be an accurate reflection of the risks associated with these roads which carry the most traffic and have the most injury collisions.
78. The medium risk rating of Type 5 and 6 roads reflects the lower risks associated with these roads, which have a lower risk rating than the strategic and distributor road network. However, these link roads still have appreciable safety issues and are important parts of the local road network. They will be subject to the next most frequent inspection regime, which will be 3 monthly inspections.
79. The Type 7, 8 and 9 roads have the lowest risk rating. This reflects the comparatively lower injury collision numbers, especially on the rural parts of the network and the generally lower traffic flows on these types of roads. These roads will be subject to less frequent inspections to reflect the lower risks when compared to the other road types. It is proposed that as suggested in the previous Code of Practice 'Well Maintained Highways', these would be subject to annual inspections.
80. Type 10 and 11 roads are green lanes, tracks and disused tracks, generally with negligible traffic flows compared to the main road network, and not having significant number of collision injuries or claims associated with them. It is not proposed to inspect these as part of the highway inspection regime. However, in many cases they are inspected as part of the management of rights of way, and reports of issues are investigated by the rights of way team or local highway office staff as required.

81. The carriageway inspection regime adopted for the WHSIM is:

Type	Carriageway Hierarchy	Inspection Frequency
2	Strategic Route	Monthly
3	Main Distributor	Monthly
4	Secondary Distributor	Monthly
5	Link Road	Three Monthly
6	Local Link Road	Three Monthly
7	Local Access Road	Annual
8	Minor Road	Annual
9	Lanes	Annual
10	Green Lanes and Tracks	Respond to reports
11	Disused Tracks	Respond to reports

82. The new inspection regime is broadly similar to that is used by many other authorities. The more frequent inspection of the higher type roads is considered to reflect the risks associated with those parts of the road network.

SWHA Road Type	Total Length (m)	Total Length by Group (m)	Number of inspections per year	Total length inspected per year (m)
Type 1				
Type 2	183,755.96	1,095,074.93	12	13,140,899.11
Type 3	562,003.26			
Type 4	349,315.71			
Type 5	1,444,838.98	1,602,261.94	4	6,409,047.78
Type 6	157,422.96			
Type 7	1,026,655.38	1,720,094.73	1	1,720,094.73
Type 8	477,637.20			
Type 9	215,802.15			
Type 10	120,517.82	138,391.53	0	
Type 11	17,873.71			
Total	4,555,823.12	4,555,823.12		21,270,041.61

Carriageway Investigatory levels

83. The WHSIM set out intervention levels for various types of defect, generally making reference to the type, size and depth of the defect. The road type indicates the appropriate investigatory level and time scale for the particular type and size of the defect.

84. The highest priority of pothole on Type 2, 3 and 4 roads (mainly A, B and some C class roads) would have a depth of more than 75mm and horizontal dimensions greater than 300mm x 300mm. This would be expected to have a

permanent or temporary repair, or be signed and guarded by midnight on the following day.

85. On Type 5, 6, 7, 8 and 9 roads the priority carriageway defect is a pothole with depth more than 100mm deep and horizontal dimensions greater than 300mm x 300mm. These are considered to be safety defects and should have had a permanent or temporary repair, or be signed and guarded by midnight on the following day.
86. Defects having horizontal dimensions greater than 300mm x 300mm and between 75mm deep and 40mm deep on Types 2, 3 and 4, and between 100mm deep and 40mm deep on road Types 5 to 9, are not considered to be urgent safety defects and would be repaired within 14 days and 28 days respectively.
87. The road network in Wiltshire is extensive and repair gangs may have to travel considerable distances to attend defects. The proposed investigatory levels should be achievable in all but the most adverse weather conditions, when other issues such as snow or flooding may have had to take priority for resources in the short term.
88. Defects of less than 40mm depth are fairly common on most highway networks across the country where existing carriageway surfaces are deteriorating, or where delamination of thin surfaces is occurring. These are not considered to be safety defects for the purposes of the WHSIM, and would be considered to have a considerably lower risk than the deeper defects, which need priority treatment.
89. The proposed carriageway investigatory levels are considered appropriate for the road network in its current condition. They should be achievable with existing resources, and would not require resources or funding to be diverted from planned maintenance to deal with reactive repairs that a higher standard would require.
90. Damaged covers, grating, frames and boxes have potential safety implications for road users. Investigatory levels are included in the WHSIM for these items, and for road edge damage such as over run and damaged kerbs.

Risk Assessment - Footways

91. The council has over 4 million sqm of footways and pedestrian areas, which range from busy town and city centre footways and pedestrian areas to less frequently used footways in villages and rural areas.
92. There is not a complete record of injuries resulting from incidents involving pedestrians on footways as there is with vehicle collisions on roads. However, an indication of the number of incidents can be derived from the number of claims received by the Council.
93. In the year from 1st April 2016 to 31st March 2017 there were 722 claims received in connection with roads and footways, with 689 being settled by 31st March 2018. The value of the claims paid was £173,934.73.
94. The number of claims paid in connection with footways during the period was 50 which represented 7.3% of the total number of highway claims, and at £24,850.00 was 14.3% of the total value. The claims in connection with footways represent a small proportion of the claims and injuries in comparison with those associated with carriageways.
95. The majority of the footway defects in 2017/18 were identified during inspections (58.9%), with a further 10.3% identified by technicians. There were 328 defects reported by the public which represented 30.8% of the total. Based on the footway defects identified in 21017/18:

Town or City	Defects Identified by Inspections	% Defects identified by inspection	Defects identified by technicians	% Defects identified by technicians	Defects Reported by Customer	% Defects Reported by Customer	Total Defects
Amesbury	8	40.0%	7	35.0%	5	25.0%	20
Calne	22	34.9%	13	20.6%	28	44.4%	63
Chippenham	63	51.2%	1	0.8%	59	48.0%	123
Corsham	66	65.3%	7	6.9%	28	27.7%	101
Devizes	31	55.4%	2	3.6%	23	41.1%	56
Malmesbury	33	67.3%	7	14.3%	9	18.4%	49
Melksham	58	70.7%	7	8.5%	17	20.7%	82
RWB	15	50.0%	1	3.3%	14	46.7%	30
Salisbury	149	59.4%	27	10.8%	75	29.9%	251
Trowbridge	160	70.2%	24	10.5%	44	19.3%	228
Warminster	9	29.0%	6	19.4%	16	51.6%	31
Westbury	13	41.9%	8	25.8%	10	32.3%	31
Total	627	58.9%	110	10.3%	328	30.8%	1065

Risk Assessment - Footways

96. The likelihood assessment for footways has been based on the likely level of usage expected for each footway type:

Footway Type	Typical pedestrian use	Likelihood Score	Description
F1	High	4	Main shopping areas
F2	Medium or Low	3	Other urban areas, rural footways and surfaced 'link' footpaths.

97. There is limited information about footway injuries and the claim numbers are comparatively small compared to carriageway rates. For the purposes of this assessment the impact score has been assessed as being medium, as they do not have the fatalities and more serious injuries associated with road collisions.

Footway Type	Impact Score	Comments
F1, and F2	3	Generally footway claims and injuries are not as serious as carriageway claims.

98. The impact score for each footway type has been derived from the likelihood and impact scores in accordance with the risk matrix process.

Footway Type	Likelihood Score	Impact Score	Risk Score	Risk Rating
F1	4	3	12	High
F2	3	3	9	Medium

Footway Investigatory levels

99. The accepted definition of a trip on a footway has been well established as being 20mm. This is based on previous versions of the code of practice and has been tested in court on a number of occasions. It is proposed to retain this definition in the WHSIM.

Footway Inspection Frequencies

100. The footway inspection frequencies and intervention levels used by highway authorities have evolved over time, and generally reflected the suggested

provisions in the old highways codes of practice. This included monthly inspections for the highest category roads footways and annual inspections for the less used routes.

101. It is proposed to continue the Council's current inspection regime of monthly walked inspections at the busiest pedestrian areas. This appears to have been effective for a number of years, conforms to the standards in previous codes of practice and is considered practical with current resources.
102. The less frequently used footways will be subject to inspections annually. The comparatively high number of reports now submitted by the public through the My Wiltshire system, and the ad-hoc inspections made by engineers and technicians, will mean that serious defects are generally identified promptly.

Risk Assessment – Other Assets

103. There are other highway assets which can have potentially serious safety implications, including bridges, street lighting, trees, traffic signals, road signs and drainage infrastructure.
104. Despite the potential risks associated with these assets, the number of incidents involving injury and claims in connection with them is very low when compared to those associated with the carriageways and footways. The routine highway inspections would be expected to identify the more serious issues which can be identified visually.
105. Obstructions in the highway, including fallen trees, flooding, and collapsed walls in certain circumstances may be safety defects in need of urgent action and these would be classified in the WHSIM as P1 defects.
106. Road signs, lighting columns, street furniture and trees identified as being at risk of collapse and likely to create a hazard will be reported by the inspectors to the Local Highways Manager/Highways Engineer for decision regarding the action to be taken. The priority will be to ensure the safety of the public, road users and the workforce.
107. Structural testing of lamp columns and illuminated signs will be undertaken on a risk based approach, taking into account the age of the equipment and type.
108. Programmes of tree inspections and works are regularly undertaken, subject to seasonal restrictions, to reduce the risk to the public. In some cases emergency work maybe required following severe storms or other weather events, or in response to particular safety concerns.
109. Damaged or faulty electrical equipment likely to be a hazard will also be treated as P1 defects and action would be taken by inspectors to safeguard the site and report to the appropriate organisation or department.
110. Lighting and other electrical equipment will be tested regularly as part of the maintenance regime for the asset.
111. Give way lines, stop lines, or zebra crossing markings which are missing or faded to such an extent that they are no longer adequate for their intended purpose would be classified as P3 defects. Other worn road markings and lining would not be considered a priority and would be potentially included in programmes of work or would be referred to the Local Highway Manager for decision.
112. Stop, give way, mandatory and prohibitory traffic signs badly damaged, dirty, obscured or missing would be classified as P4 defects to reflect the likely realistic replacement time. Other signs would be potentially included in

programmes of work or would be referred to the Local Highway Manager for decision.

113. Damaged safety barriers, guard rails, fences and street furniture would be P1 defects if likely to cause a hazard. Other defects with these assets would be potentially included in programmes of work or would be referred to the Local Highway Manager for decision.
114. Bridges and other structures are subject to regular condition surveys and inspections. Damage to parapets and other defects likely to cause a safety hazard would be expected to be identified during routine highway inspections, and are often reported by the public or police. The WHSIM identifies these as P1 defects.

Wiltshire Highways Safety Inspection Manual

115. The Highways Inspection Manual will be superseded by a new manual using the risk based approach described in this document. In previous years the inspection manuals have included condition and service inspections.
116. With the adoption of current asset management principles, and the availability of better technical information, it is proposed that the replacement document should be for safety inspections only using the risk based approach.
117. The Wiltshire Highways Safety Inspection Manual (WHSIM) sets out the inspection regime and investigatory levels to be applied when undertaking inspections on the Wiltshire Council highways network.

Inspection Processes

118. There are serious risks associated with the safety of staff when carrying out inspections, and consideration has been given to reducing these risks in developing the WHSIM. The equipment and safety procedures for both driven and walked inspections are set out in the WHSIM.
119. Driven inspection should be undertaken as a two-man operation, with one driving and one inspecting. This is for safety reasons, and also to ensure that there is effective inspection of the network.
120. It is recognised that there are potential limitations in carrying out footway inspections by a driven inspection, especially with regard to identifying the more minor defects. However, the use of this method is considered justified on the footways where there is lower usage and a history of fewer claims and defects.
121. The use of driven inspections of footways, particularly in rural areas allows resources to be concentrated on the walked inspections in the urban areas and busier footways.
122. Additional inspections are carried out by Council staff during their day to day work on the network, and reports from the public are also received, which significantly increases the monitoring undertaken on the network.

Adoption of WHSIM

123. The WHSIM will become operational at a date to be agreed.

APPENDIX 1 – SWHA Roads Hierarchy

Type	Carriageway Hierarchy	Carriageway Hierarchy Description
2	Strategic Route	Routes for traffic travelling long distances, often with little frontage access or pedestrian traffic. Speed limits are usually in excess of 40 mph and there are few junctions. Pedestrian crossings are either segregated or controlled and parked vehicles are often prohibited. Not always National Speed Limit
3	Main Distributor 3a	Routes between Strategic Routes and linking urban centres to the strategic network often with limited frontage access. In urban areas speed limits are usually 40 mph or less, parking is often restricted at peak times and there are positive measures for pedestrian safety
4	Secondary Distributor 3b	In rural areas these roads link the larger villages, industrial sites and commercial sites to the Strategic and Main Distributor Network.
5	Link Road 4a	In urban areas these roads usually have 30 mph speed limits and very high levels of pedestrian activity with some crossing facilities including zebra crossings.
6	Local Link Road	In rural areas these roads link the larger villages, industrial sites and commercial sites to the Strategic and Main Distributor Network.
7	Local Access Road 4b	In urban areas these roads usually have 30 mph speed limits and very high levels of pedestrian activity with some crossing facilities including zebra crossings.
8	Minor Road	These roads are residential interconnecting roads, usually with uncontrolled pedestrian movements. They provide well used vehicular links within the local access roads.
9	Lanes	These roads are residential interconnecting roads, usually with uncontrolled pedestrian movements. They provide well used vehicular links within the local access roads.
10	Green Lanes and Tracks	In rural areas these form minor access roads to houses and farms.
11	Disused Tracks	In urban areas these form minor side roads and vehicular alleyways

Appendix 2 – Revisions from HIM May 2013

The risk based assessment for the WSIM has resulted in number of changes from the HIM dated May 2013. The significant changes are summarised below:

Subject	Change	Comment
Road types	SWHA hierarchy adopted.	To align hierarchy with other authorities in the south west of England
Tolerance for Inspection frequencies	Tolerance for inspections added.	To make clear the tolerances allowed for carrying out inspections. These were not stated in the HIM.
Inspection Frequencies	Frequency for Road types 7, 8 and 9 to be annual rather than 6 monthly for previous equivalent Group 3 roads	Frequency for inspections of minor roads reduced to reflect lower risks associated with these roads.
P1 Response time	Changed from '24 hours' to 'repair by 23:59 on the next day'.	To align with other authorities and provide more realistic target taking into account risks.
Response times	Change from months to number of days.	To clarify response times and avoid potential confusion with months having different numbers of days.
Pothole defects	Size of P1 defect increased from 250mm to 300mm x 300mm	To return to definition used prior to May 2013, and to clarify definition taking into account risks.
Road markings and signs	Defect definitions and response times revised.	To reflect realistic response times in view of practical considerations and likely resource levels
Footway classifications	Previous three footway categorisations reduced to two.	Simplification of footway grouping to reflect levels of usage.
Footway Inspections	Frequency reduced from 6 monthly to annually on F2 footways.	To reflect low risk, increased public reports and frequency in previous code of practice.