

SAFETY / CRASH BARRIERS

1.0 EXECUTIVE SUMMARY

This report states how the Roads & Amenity Services intend to identify, assess and address bridges and sections of road requiring safety/crash barriers. The Council has in place a comprehensive asset management system for road surfaces and a number of other road assets. Producing an inventory and prioritising safety/crash barriers will further enhance the roads asset management process.

To ensure assessment of crash/safety barriers is carried out thoroughly and consistently, a risk assessment will be utilised to score safety/crash barriers and bridge parapets, see Appendices A and B.

An initial inventory will be gathered to assess the scale and condition of existing safety/crash barriers and bridge parapets, and also potential new sites. Thereafter a policy will be developed to ensure ongoing checking and maintenance of the inventory. The inventory collection will be in line with other asset management data collection and prioritisation works carried out in Roads and Amenity.

The inventory will be used to inform the Service Asset Management Plan of any works that may be required to support upgrades to existing barriers and to install new barriers at high risk sites. The size of any investment will become clear once the initial inventory assessment has been carried out.

Staff resource will be required to develop the initial inventory and to keep this up to date going forward. The initial inventory gathering will be funded from existing vacancies as a one-off exercise and is estimated as being a 6 month temporary post. The resource requirement ongoing will be assessed once the size and condition of the inventory is established.

1.1 Recommendations

It is recommended that Members:

- Endorse this report

SAFETY / CRASH BARRIERS

2.0 INTRODUCTION

2.1 This report states how the council will identify, assess and address bridges and sections of road requiring safety/crash barriers. The Council has in place a comprehensive asset management system for road surfaces and a number of other road assets. Producing an inventory and prioritising safety/crash barriers will further enhance the roads asset management process.

3.0 RECOMMENDATIONS

It is recommended that the committee:

- Endorse this report

4.0 DETAIL

4.1 The roads in Argyll and Bute are generally safe, however a proportion of collisions involve vehicles leaving the carriageway.

Road Restraint Systems (RRS) are intended to:

- Prevent vehicles leaving the road;
- Reduce the severity of impact with roadside hazards;
- Protect the roadside equipment (signs etc) from damage

4.2 RRS are often referred to as safety barriers or crash barriers. On bridges and retaining walls they are referred to as parapets.

Risk Assessment

4.3 To ensure assessment of RRS is carried out thoroughly and consistently, a risk assessment will be utilised to score existing safety/crash barriers and bridge parapets, and potential new RRS sites, see Appendices A and B.

- 4.4 The risk assessment identifies a site as a low, medium or high risk. This determines the prioritisation and how quickly the risk will be addressed. Sites assessed as low risk would not typically require any level of investment. Sites falling into the medium and high categories would be prioritised and actioned according to available budget.

Initial inventory and assessment

- 4.5 The process will only be effective if there is an accurate inventory and assessment of existing RRS. An inventory of parapets is currently being prepared over a 2 year period, however an updated list of safety barriers on roads is still required. An inventory will be gathered of all locations which currently have an RRS and an assessment of their suitability and condition carried out. The inventory will also look at sites which do not have RRS but may require them. These will be identified from existing collision sites.
- 4.6 Once an inventory has been gathered and risk assessed, costed options can be developed to reduce the highest risks, this is likely to include the installation and upgrade of RRS.
- 4.7 There is also a need for a sustainable maintenance regime to keep all existing RRS in serviceable condition.
- 4.8 There is currently no officer capacity in the service to gather the required inventory. A temporary post for 6 months will be created to gather this information, work up costed options and develop an upgrade programme. This officer resource will be funded from existing budgets available within roads.
- 4.9 It is proposed that a second report be brought to the EDI committee to present the results of the inventory gathering. This will include an assessment of the existing RRS, potential new RRS sites, and the cost to upgrade both to a satisfactory and safe condition. At this point an RRS policy will be developed to propose how the inventory can be checked and maintained in the future. The inventory collection and RRS policy is in line with other asset management data collection and prioritisation works carried out in Roads and Amenity. The inventory will be used to inform the Service Asset Management Plan of any works that may be required to support upgrades to existing barriers and to install new barriers at high risk sites. The size of any investment will become clear once the initial inventory assessment has been carried out.

5.0 CONCLUSION

- 5.1 It is vital that the Council maintains and upgrades its safety/crash barrier and bridge parapet stock to ensure the safety of road users.
- 5.2 An initial inventory gathering and assessment exercise will allow us to assess the scale of upgrades required and to develop a Road Restraints Systems Policy and a forward plan. Thereafter robust execution of this policy will help

reduce safety risks to the users of the Council's roads and bridges across Argyll and Bute.

6.0 IMPLICATIONS

- 6.1 Policy – the Road Restraints Policy is a new policy which will be developed once more information has been gathered.
- 6.2 Financial –The initial inventory gathering to be carried out utilising vacancy savings. Currently unknown financial investment required to install / upgrade RRS will be quantified at a future EDI committee.
- 6.3 Legal – see risk
- 6.4 HR – new temporary post to be created
- 6.5 Equalities - none
- 6.6 Risks
 - Health and Safety risk to road users if this policy is not implemented
 - Increased risk of legal challenge in the event of an collision if this policy is not implemented
- 6.7 Customer Service - Public pressure arises to install safety barriers at many accident sites. This policy will help explain the reasons for installation or otherwise of safety barriers and help manage customer expectations.

Executive Director of Development and Infrastructure: Pippa Milne

Head of Roads and Amenity Services: Jim Smith

Policy Lead: Councillor Roddy McCuish

August 2017

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Roads Network and Standards Manager
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Appendix A Risk assessment to score safety/crash barriers.


Appendix B Risk Assessment to score bridge parapets.

Appendix A – Safety / Crash Barrier Risk Assessment

Appendix A is an example of a crash barrier risk assessment with typical scores.

Factor	Priority Rank	Risk Factor Score
Location	1 - Rural U & B roads and urban C roads	1
Layout	0 - Straight alignment and/or complies with TD9	0
	2 - High likelihood of lane changing, overtaking, positioning manoeuvres or avoiding action.	3
Collision	2 - Longitudinal Hazard that is highly likely to be reached resulting in harm or a spot hazard downstream of a feature which may guide the vehicle towards the hazard.	2
	2 - Percentage of KSI for primary feature >30%	2
Consequential	0 - No secondary events likely.	0
	0 - No impact on network availability.	0
	0 - No major cost implications.	0
Total Priority Score		8 – Lower Priority Site

Appendix B – Parapet Risk Assessment

	<h2 style="margin: 0;">Ardteatle Cottage</h2>	Made By: <div style="background-color: #e0e0e0; padding: 2px; text-align: center;">AR</div>	On: <div style="background-color: #e0e0e0; padding: 2px; text-align: center;">07/07/2017</div>	Version: <div style="background-color: #e0e0e0; padding: 2px; text-align: center;">Rev d</div>																																					
Hazard <i>(Comments on Scoring)</i>																																									
PRIORITY RANKING OF PARAPET																																									
1. Asset Use																																									
All Purpose Road over 4,000 vehicles per day	5	1																																							
3000-4000	4																																								
2000-3000	3																																								
1000 to 2000	2																																								
Below 1000 vpd / Pedestrian Only	1																																								
2. Below Asset (select highest appropriate value)																																									
Railway - High speed, or busy, or carrying hazardous substances.	5	3																																							
Railway - other	4																																								
Effect of location or layout on risk to vehicle occupants (eg. height, deep water, electrified railway).	0-5																																								
Other areas occupied by people, valuable installations, environmentally sensitive areas such as conservation areas, storage of hazardous material etc.	1-5																																								
3. Type of Highway carried by the structure																																									
Single carriageway, single lane	5	5																																							
Single carriageway very narrow 2 lanes without centre line <i>(approx 1.5 lanes without laybys. More risk of collision than 2 lanes, less severity than single lane head on)</i>	4																																								
Single carriageway, 2 or more lanes	3																																								
Urban Dual	2																																								
Footbridge	1																																								
4. Road and Structure layout (select highest appropriate value)																																									
Poor accident record	2-5	4																																							
Close to junctions/interchanges	3																																								
Inferior horizontal/vertical alignment	1-4																																								
Reduced clearance carriageway to parapet	<0.3		5																																						
	0.3 - 0.5		4																																						
	0.5 - 1.0		3																																						
	1.0 - 1.5	2																																							
	>1.5	1																																							
Location or layout does not affect risk	0																																								
5. Containment features																																									
Parapet forms, in whole or part, main structural elements	5	3																																							
As above but would not lead to loss of structure (bridge or a span) <i>(if structure had to be closed temporarily, e.g. if part of a spandrel fails, is that a "loss"?)</i>	3																																								
Parapets not part of structural members	0																																								
Total score (Sum of 1, 2, 3, 4 & 5)			16																																						
6. Approach, Parapet & Departure Scoring (select highest appropriate value)																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">5</td> <td>No Element / Non-Functional Element <i>(for either Pedestrians or Vehicles)</i> <i>(eg Loose Posts / Timber Posts / No Connection To Parapet / No Anchorages)</i></td> </tr> <tr> <td style="text-align: center;">4</td> <td>Badly degraded vehicle barriers <i>(where vehicle containment is required)</i></td> </tr> <tr> <td style="text-align: center;">2-3</td> <td>Sub Standard Barriers</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Vehicle containment level N1, N2, H2 or H4a as appropriate, or equivalent. Pedestrian containment if Footbridge <i>(for example, masonry of correct height and thickness)</i></td> </tr> <tr> <td style="text-align: center;">0</td> <td>No containment required <i>(option for pedestrians on Approaches or Departures)</i></td> </tr> </table>	5	No Element / Non-Functional Element <i>(for either Pedestrians or Vehicles)</i> <i>(eg Loose Posts / Timber Posts / No Connection To Parapet / No Anchorages)</i>	4	Badly degraded vehicle barriers <i>(where vehicle containment is required)</i>	2-3	Sub Standard Barriers	1	Vehicle containment level N1, N2, H2 or H4a as appropriate, or equivalent. Pedestrian containment if Footbridge <i>(for example, masonry of correct height and thickness)</i>	0	No containment required <i>(option for pedestrians on Approaches or Departures)</i>	Approach Parapet Departure Other <i>(Headwall / Pedestrian / Fence / Signage)</i> Total Multiplier (Sum of)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">Left</td> <td colspan="2" style="text-align: center;">Right</td> </tr> <tr> <td style="text-align: center;">Ped</td> <td style="text-align: center;">Veh</td> <td style="text-align: center;">Ped</td> <td style="text-align: center;">Veh</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5</td> </tr> <tr> <td colspan="2"></td> <td colspan="2" style="text-align: center;">0</td> </tr> <tr> <td colspan="2"></td> <td colspan="2" style="text-align: center;">60</td> </tr> </table>	Left		Right		Ped	Veh	Ped	Veh	5	5	5	5	5	5	5	5	5	5	5	5			0				60		
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		60																																							
7. Vehicle Speed																																									
Estimated Speed of Vehicles	Less than 30mph	0.8	0.8																																						
	30mph - 50 mph	1																																							
	greater than 50mph	1.2																																							
Which category does the inspector feel this should be?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; color: red;">Red</td> </tr> <tr> <td style="text-align: center; color: orange;">Amber</td> </tr> <tr> <td style="text-align: center; color: green;">Green</td> </tr> </table>	Red	Amber	Green	Comments?	Priority Ranking																																			
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Amber																																									
Green																																									
<i>(Total Score * Total Multiplier * Speed Factor)</i>				39																																					