

# Vulnerable Road User Audit – Stage 1

<b>DATE:</b>	24 September 2019	<b>CONFIDENTIALITY:</b>	Public
<b>SUBJECT:</b>	Vulnerable Road User Audit Stage 1		
<b>PROJECT:</b>	Science Vale Cycle Network	<b>AUTHOR:</b>	Gareth Nurse BEng (Hons) CEng MCIHT

## 1. BACKGROUND

- 1.1. WSP was appointed by the Oxfordshire County Council (OCC) to undertake the Preliminary Design of Science Vale Cycle Network (SVCN) Route 1, a cycle route connecting Wantage to Harwell Campus.
- 1.2. This project aims to contribute to increase the proportion of journeys to work, made by cycling in Science Vale, by 50% by 2021. This will also support OCC aims to increase levels of cycling in Oxfordshire by 10% by 2031.
- 1.3. The Vulnerable Road User Audit follows the Vulnerable Road User Audit and Guidelines Standards and Guidelines issued by Oxfordshire County Council in August 2003.
- 1.4. This report is the stage 1 audit that aims to assess whether the scheme has considered the needs of Vulnerable Road Users (VRUs) at this stage.
- 1.5. Extract of the Vulnerable Road User Audit Checklist is attached in Appendix A.

## 2. GENERAL PLANNING FOR VULNERABLE ROAD USERS

- 2.1. The cycle route is proposed on a mix of existing rights of way, comprising existing bridleway, byway, footpath, carriageways (public highway) and farm tracks. Whilst cyclists have existing rights to use the bridleway (Section 1B), carriageways (public highways Section 1C) and byways (Sections 1F2 to 1K2), the remaining sections will need to have land agreements made with the landowners.
- 2.2. Although this is a cycle network scheme, the scheme aims to create a continuous route for pedestrians, cyclists and equestrians from Wantage to Harwell.
- 2.3. All sections in Route 1 are 2.5m to 3.6m wide except. Section 1G2 and the proposed Ginge Brook bridge is proposed to be 2.5m wide to suit the environment and to meet requests by local landowners. The proposed widths are suitable for un-segregated shared use footway / cycleway / equestrians in this location.
- 2.4. All sections except section 1F2 (and its approach in section 1G2) follow the existing ground gradient. Topographical survey has not been carried out for Route 1, except for sections 1F2 and some of 1G2 where bridge design and its approach design are required, but the existing route gradients on other route sections are suitable for cycling without modification.
- 2.5. The proposed Ginge Brook bridge in section 1F2 will have a gradient of 12.5% at its western end and eastern end approaches, and a gradient of 8% on the bridge itself. It is recognised by the scheme sponsor and the design team that the steep gradients will increase the difficulty for VRU to

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use the route. However, due to existing local restraints, the gradients are necessary and have been used on National Cycle Network Routes such as at Bristol and Derbyshire.

- 2.6. The scheme explored a wide range of surfacing materials. Type 1 sub-base is currently the most preferred option as it provides suitable surface for all legal users of the route. Concrete or asphalt will be installed at junctions with large farm vehicles to aid turning onto the highway and to minimise tracking mud or debris from tyres onto the carriageway.
- 2.7. The area is AONB, so street lighting is not to be provided.
- 2.8. Traffic signs will be installed in suitable locations to alert users, but it is recommended that any signing is sympathetic to the area's AONB status.
- 2.9. Crossfall for all sections are 1 in 40 to facilitate drainage. The crossfall is suitable for all vulnerable road users.

As part of this Vulnerable User Audit, the designers have been through the whole of the OCC standards and guidelines document and sections 3 and 4 below comment on the relevant points from this document.

## 3. DESIGNING - AT GRADE CROSSINGS

- 3.1. Any existing road markings are to be refreshed. New road markings will be added at the junctions where required. This will benefit all the vulnerable users.
- 3.2. Street lighting is not proposed, or required, at crossings or junctions. Users on existing byway travel without any existing lighting in the AONB. It is considered that users can safely use the proposed route without lighting. It is quite common in rural areas that pedestrians, cyclists and equestrians provide their own artificial lighting, e.g. with torches or cycle lights.

## 4. DESIGNING - OFF ROAD PATH

- 4.1. Visibility of Route 1 is generally good. Exact visibility to be confirmed in the Detailed Design stage.
- 4.2. As mentioned in 2.1, Route 1 is proposed on a mix of existing rights of way. OCC is currently liaising with the landowners and its internal legal team to finalise the legal user group of the finished path. It is the intention that all vulnerable users can be catered for by this scheme, e.g. pedestrians, cyclists and equestrians. So that vulnerable road users (pedestrians, cyclists and equestrians) can use the proposed route in safety and comfort it is recommended that all motor propelled vehicles (MPVs), motor cycles and large horse carriages are banned from the byway sections by TRO and physical barriers. Locked gates are recommended at highway junction points along the byway with a 1.5m gap alongside the gates to allow access for pedestrians, cyclists, equestrians and narrow horse

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carriages. The width of the proposed route is suitable for the AONB rural setting but it is not proposed at a width wide enough for two-way use by wide horse carriages and motor propelled vehicles passing vulnerable users; this would be inappropriate for the rural AONB setting and local environment. As well as impacts on the environment, to provide a wide route, the loss of agricultural land would require agreement with land owners and would require land in excess of that currently being used on the byway sections. It is noted that although the existing byway legally allows two-way traffic for MPVs, motor cycles and horse carriages, the existing route widths mean this is currently not practical. Given that the proposals include provision of a well compacted Type 1 sub-base or asphalt planings surface, traffic speeds and traffic usage could increase along the route as a consequence of the proposals and therefore it is important to consider managing and restrictions to the byway in order to protect vulnerable road users.

- 4.3. Type 1 sub-base or asphalt planings are the preferred option for surface materials. This material is suitable for walkers, cyclists and equestrians. Type 1 sub-base material is available locally. In addition they are suitable for agricultural use by heavy farm vehicles.

## 5. CONCLUSION

- 5.1. The scheme has considered the needs of VRUs at this stage.
- 5.2. Science Vale Cycle Network is a cycle network scheme that aims to provide a continuous route for pedestrians, cyclists and equestrians from Wantage to Harwell.
- 5.3. In order to provide safety and comfort for pedestrians, cyclists and equestrians it is recommended that motor propelled vehicles, including motor cycles and large horse carriages are banned from those sections of the byway where they currently have legal rights of use as the existing and proposed widths are not appropriate to accommodate two-way traffic flow mixed with vulnerable road users.
- 5.4. The width, crossfall and surface materials of the route are designed to accommodate the need of all legal users.
- 5.5. The gradients of this route follow existing ground profiles except section 1F2. It is recognised that the proposed bridge in Section 1F2 has steep gradients which may not be suitable for some vulnerable road users. However, it is unavoidable due to natural constraints and it is expected that warnings will be put on the route and on local cycling maps and information.



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## APPENDIX A. VULNERABLE ROAD USER AUDIT CHECKLIST (EXTRACT)

### STAGE B – DESIGN BRIEF

For guidance, please see **Standards and Guidelines sections 2.1 and 2.2**

- B.1. What are the key objectives outlined in the brief?  
Does the brief take into consideration the needs of pedestrians, cyclists, equestrians and disabled people?

The key objective of this scheme is to provide a cycle route, connecting Wantage to Harwell. The new proposed route will allow use by pedestrians, cyclists and equestrians. In addition, the route will have a reasonable level of provision for disabled users, e.g. appropriate for use by suitable wheelchairs and appropriate for other disability users group.

- B.2. Has data on vehicle flows and speeds, numbers of cyclists, pedestrians and equestrians, and VRU personal injury accidents been provided/reported? What are the key issues?

Classified counts have been carried out along the route, in March 2019.





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Is the scheme expected to be <b>regularly</b> used by any particular VRU group(s)?	✓	Access will be possible.	✓	✓
Is the scheme expected to be regularly used by high risk or inexperienced VRUs e.g. children?	Possible use by children to and from Wantage.	Possible.	Possible use by children to and from Wantage.	Local young persons likely to use route for leisure purposes.

B.6. In light of answers to B1-B5 above, does the project brief adequately consider the needs of all relevant Vulnerable Road User Groups? Will the scope of the project, as set out in the brief, enable any opportunities to improve conditions for VRU to be taken?

The project brief adequately considered the needs of pedestrians, cyclists and horse riders, subject to consideration at byway sections for TRO and physical barriers to prevent the use of motor propelled vehicles, motor cycles and horse carriages.  
It is recognised that the proposed bridge in Section 1F2 will have a gradient of 12.5% at its western and eastern ends, a gradient of 8% on the bridge itself. The gradients may increase the potential for users losing control, however, due to existing constraints, the gradient cannot be improved without substantial damage to the natural landscape.



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### STAGE 1 – FEASIBILITY/ PRELIMINARY DESIGN/ DRAFT PLANS

#### 1.1 General Issues

No.		S&G Ref.	Yes	No	N/A	Comments
1.1.1	<b>Brief Audit:</b> Does the feasibility / preliminary design fully reflect the outcome of the Stage B Audit?	3.1	✓			Yes – subject to conclusion of the TRO advertised for the byway sections, the preliminary design reflects the outcome of the Stage B audit (above).



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No.	S&G Ref.	Yes	No	N/A	Comments																																																					
						Yes	No	N/A	Included in scheme?																																																	
1.1.2	If the scheme specifically targets, or is expected to be regularly used by VRUs, are the measures provided for VRUs in accordance with the 'Hierarchy of Measures'? Are measures higher up in the hierarchy possible but not included in the scheme?	2.2	✓		<table border="1"> <thead> <tr> <th rowspan="2">Hierarchies of provision for pedestrians and cyclists.</th> <th colspan="3">Provision possible?</th> <th rowspan="2">Included in scheme?</th> </tr> <tr> <th>Yes</th> <th>No</th> <th>N/A</th> </tr> </thead> <tbody> <tr> <td>· Is there scope for reducing volumes of traffic?</td> <td>✓</td> <td></td> <td></td> <td>Yes</td> </tr> <tr> <td>· Can existing traffic speeds be reduced?</td> <td></td> <td>✓</td> <td></td> <td>No</td> </tr> <tr> <td>· Could junction treatments or traffic management measures be carried out to benefit cyclists?</td> <td></td> <td>✓</td> <td></td> <td>No</td> </tr> <tr> <td>· Could highway space be reallocated to benefit pedestrians or the use of available carriageway be changed to give more space to cyclists?</td> <td></td> <td>✓</td> <td></td> <td>No</td> </tr> <tr> <td>· Could additional at-grade crossings benefit pedestrians?</td> <td></td> <td>✓</td> <td></td> <td>No</td> </tr> <tr> <td>· Could the quality of existing pedestrian routes be improved?</td> <td>✓</td> <td></td> <td></td> <td>Yes</td> </tr> <tr> <td>· Could cycle lanes be provided or cycle tracks constructed from carriageway space</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>· If improving existing routes is not possible or beneficial could a new alignment for pedestrian routes be provided? If at grade crossings are not possible could grade separated crossings be provided?</td> <td></td> <td></td> <td>✓</td> <td>N/A</td> </tr> <tr> <td>· Can specific off road cycle tracks or shared use facilities be provided?</td> <td>✓</td> <td></td> <td></td> <td>Yes</td> </tr> </tbody> </table>	Hierarchies of provision for pedestrians and cyclists.	Provision possible?			Included in scheme?	Yes	No	N/A	· Is there scope for reducing volumes of traffic?	✓			Yes	· Can existing traffic speeds be reduced?		✓		No	· Could junction treatments or traffic management measures be carried out to benefit cyclists?		✓		No	· Could highway space be reallocated to benefit pedestrians or the use of available carriageway be changed to give more space to cyclists?		✓		No	· Could additional at-grade crossings benefit pedestrians?		✓		No	· Could the quality of existing pedestrian routes be improved?	✓			Yes	· Could cycle lanes be provided or cycle tracks constructed from carriageway space		✓			· If improving existing routes is not possible or beneficial could a new alignment for pedestrian routes be provided? If at grade crossings are not possible could grade separated crossings be provided?			✓	N/A	· Can specific off road cycle tracks or shared use facilities be provided?	✓			Yes
Hierarchies of provision for pedestrians and cyclists.	Provision possible?			Included in scheme?																																																						
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· Could highway space be reallocated to benefit pedestrians or the use of available carriageway be changed to give more space to cyclists?		✓		No																																																						
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No.		S&G Ref.	Yes	No	N/A	Comments
1.1.6	<b>Directness:</b> Are routes for all users sufficiently direct? Are barriers and waiting times minimised?	3.5	✓			Yes – the scheme provides a direct route for VRUs from Wantage to Harwell without barriers and waiting times from traffic.
1.1.7	<b>Attractiveness:</b> Viewed overall, is the scheme sufficiently attractive to encourage use by VRUs?	3.6	✓			Yes – the scheme keeps the proposed routes on the existing track. New surfacing and drainage will improve attractiveness of the route.
1.1.8	<b>Safety:</b> Does the design minimise actual and perceived safety and security risks for VRUs?	3.7	✓			Yes – the design improved road surface, crossfall and drainage of the route, alongside necessary restrictions to motor propelled vehicles, motor cycles and wide horse carriages.
1.1.9	<b>Comfort:</b> Are the facilities easy to use by VRUs? Are widths, surfaces and gradients adequate?	3.8	✓			Yes – all sections are 2.5m to 3.6m wide and will be resurfaced with type 1 sub-base material or asphalt planings. Gradients are steep on section 1F2 however the scheme proposes improved gradients compared with existing and are suitable for most VRUs.





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No.		S&G Ref.	Yes	No	N/A	Comments
1.1.13	<b>Carriageway:</b> Does the scheme include any carriageway or verge alterations or links, including cycle lanes?	-	✓			If yes complete section 1.2
1.1.14	<b>Footway/ Cycleway:</b> Does the scheme include any footway or cycle way alterations or links, or pedestrianised areas?	-	✓			If yes complete section 1.3
1.1.15	<b>Traffic calming:</b> Does the scheme include any traffic calming or “home zone” areas?	-		✓		If yes complete section 1.2
1.1.16	<b>At grade crossings:</b> Does the scheme include any controlled or uncontrolled at-grade crossings?	-		✓		If yes complete section 1.4
1.1.17	<b>Grade Separated crossings:</b> Does the scheme include any grade separated crossings?	-		✓		If yes complete section 1.5



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No.		S&G Ref.	Yes	No	N/A	Comments
1.1.18	<b>Off Road paths:</b> Does the scheme include any off-road paths?	-	✓			If yes complete section 1.6
1.1.19	<b>Modal Interchange:</b> Does the scheme include any modal interchanges (including bus stops, cycle parking, car parking, parking for disabled people)?	-		✓		If yes complete section 1.7



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## STAGE 1 – PRELIMINARY DESIGN/ DRAFT PLANS

### 1.2. Carriageway and Verge – including traffic calming and cycle lanes

No.		S&G Ref.	Yes	No	N/A	Comments
	<b>General Carriageway</b>					
1.2.1	Do traffic lane and parking bay widths consistently meet required standards?	4.1			✓	n/a
1.2.2	Will roadside verges in areas of equestrian usage enable safe passage?	4.2			✓	n/a
	<b>Traffic Calming</b>					
1.2.3	Will vertical traffic calming measures hinder, endanger or discomfort cyclists or other VRUs?	4.6			✓	n/a
1.2.4	Will horizontal traffic calming measures hinder, endanger or discomfort cyclists?	4.7			✓	n/a



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No.		S&G Ref.	Yes	No	N/A	Comments
1.2.5	Are suitable speed control measures provided in any shared areas (e.g. home zones, quiet lanes)?	4.8			✓	n/a
	<b>Junction Treatments and Traffic Management</b>					
1.2.6	Are advanced stop lines and approach cycle lanes provided at all traffic signals?	4.9			✓	n/a
1.2.7	Are cyclists exempt from any banned movements or restricted turns? Have opportunities to provide a cyclist bypass at traffic signals been taken?	4.10			✓	n/a
1.2.8	Could any roundabouts be modified to improve safety for VRUs? Could an alternative form of junction control replace any roundabouts?	4.11			✓	n/a







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### STAGE 1 – PRELIMINARY DESIGN/ DRAFT PLANS

#### 1.3. Footways, pedestrianised areas and shared- use facilities (adjacent to carriageway)

No.		S&G Ref.	Yes	No	N/A	Comments
	<b>General</b>					
1.3.1	Do widths of all footways meet recommended standards?	5.1		✓		Footway provision is provided on the byway and bridleway. The proposed width of the bridge, at 2.5m clear (Section 1F2), is narrower than the desirable minimum width for shared use footways / cycleways / equestrian routes on structures where 3.0m is the desirable minimum. However, the proposed 2.5m width will provide suitable width for the route and a width narrower than 3.0m was requested by local land owners so that the new structure was in keeping with the local rural environment in AONB. Departure is recommended at this locations (1F2).



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No.		S&G Ref.	Yes	No	N/A	Comments
1.3.2	Does level of provision of dropped kerbs meet recommended standards?	5.4			✓	n/a
1.3.3	Does provision of raised or priority footway/cycleway crossings meet recommended standards?	5.5 5.15			✓	n/a
1.3.4	Is the use of ramps and steps minimised, and ramps always provided as an alternative to steps?	5.7			✓	n/a
1.3.5	Are cyclists permitted to use pedestrianised areas where no alternative exists? Is demarcation adequate?	5.8			✓	n/a
1.3.6	Is appropriate landscaping provided?	5.12			✓	n/a



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No.		S&G Ref.	Yes	No	N/A	Comments
1.3.7	<b>Cycle Tracks/ Shared use Facilities</b>					
1.3.8	On shared use facilities is adequate segregation provided?	5.13	✓			2.5m to 3.6m width is provided.
1.3.9	Does the width of cycle track/shared-use facility meet recommended standards?	5.14		✓		See 1.3.1.
1.3.10	Does the treatment of the cycle track/shared -use facility at minor junctions meet recommended approaches?	5.15	✓			Appropriate VRU crossings will be provided.



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No.		S&G Ref.	Yes	No	N/A	Comments
1.3.11	Does the alignment of the cycle /shared-use facility meet recommended standards?	5.16		✓		Proposed alignment geometry generally meets DMRB standards. However, at turns along the route (e.g. junctions), alignment criteria has not been followed. Cyclists will be expected to slow down to 10kph. Furthermore at sections 1F2 and 1G2 approach gradients to the proposed bridge are 1 in 8, steeper than 1 in 12 standard. This cannot be avoided without significant environmental impact and 1 in 8 gradients have been used in other schemes, for example NCN routes in Bristol and Derbyshire.
1.3.12	Do the cycle track-carriageway entry/exit arrangements meet recommended standards?	5.17			✓	n/a



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## STAGE 1 – PRELIMINARY DESIGN/ DRAFT PLANS

### 1.4. At Grade Crossings - Controlled and Uncontrolled

No.		S&G Ref.	Yes	No	N/A	Comments
1.4.1	Is the type of crossing facility appropriate and are crossing facilities conveniently located?	6.1			✓	n/a
1.4.2	Are crossings of an adequate width for the volume of pedestrians (and cyclists if appropriate)?	6.2			✓	n/a
1.4.3	Are users able to cross without undue delay?	6.3			✓	n/a
1.4.4	Is the visibility at crossing points adequate?	6.4			✓	n/a
1.4.5	Are waiting areas of an adequate size and does the layout of any central refuge meet recommended standards?	6.8			✓	n/a



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No.		S&G Ref.	Yes	No	N/A	Comments
1.4.6	Does the level of provision of dropped kerbs meet recommended standards?	6.6			✓	n/a
1.4.7	Does provision of raised or priority footway/cycleway crossings meet recommended standards?	6.7			✓	n/a
1.4.8	Does the design of signalised crossing points accord with best practice?	6.10			✓	n/a



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### STAGE 1 – PRELIMINARY DESIGN/ DRAFT PLANS

#### 1.5. Grade Separated Crossings- Includes underpasses and bridges

No.		S&G Ref.	Yes	No	N/A	Comments
1.5.1	Could a more convenient and safe at grade crossing facility be provided?	7.1			✓	n/a
1.5.2	Could the forward visibility and level of surveillance be improved?	7.2			✓	n/a
1.5.3	Are ramps <i>and</i> stairs provided on both sides of the bridge/underpass?	7.3			✓	n/a
1.5.4	Do ramp specifications for the bridge/underpass meet recommended standards?	7.4			✓	n/a
1.5.5	Do stair specifications for the bridge/underpass meet recommended standards?	7.5			✓	n/a



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No.		S&G Ref.	Yes	No	N/A	Comments
1.5.6	If the facility is shared –use is adequate segregation provided?	7.6			✓	n/a
1.5.7	Do the dimensions of the bridge meet recommended standards?	7.7			✓	n/a
1.5.8	Do the dimensions of the underpass meet recommended standards?	7.8			✓	n/a





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## STAGE 1 – PRELIMINARY DESIGN/ DRAFT PLANS

### 1.6. Off-Road Paths - Including Canal Towing Paths

No.		S&G Ref.	Yes	No	N/A	Comments
1.6.1	Could the forward visibility of the path and level of surveillance be improved?	5.16 8.1		✓		Suitable forward visibility has been provided.
1.6.2	Could legal use be extended to other non-motorised users?	8.2		✓		The scheme currently allows all non-motorised users to use.
1.6.3	Where path is shared use is adequate segregation provided?	5.13			✓	This is a shared use path with no segregation.
1.6.4	Is the proposed surface suitable for all users?	8.3	✓			Type 1 sub-base is suitable for all users.
1.6.5	Do widths meet recommended standards?	5.14	✓			Yes – all sections are minimum 3m wide. The bridge is 2.5m wide which is suitable for the expected level of use.



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No.		S&G Ref.	Yes	No	N/A	Comments
1.6.6	Do road crossings and carriageway entry/exit arrangements meet recommended standards?	5.15	✓			Appropriate VRU crossings will be provided.
1.6.7	Is appropriate landscaping provided?	5.12			✓	n/a



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### STAGE 1 – PRELIMINARY DESIGN/ DRAFT PLANS

#### 1.7 Modal Interchanges –Including bus stops and stations, cycle parking and car parking for disabled people

No.		S&G Ref.	Yes	No	N/A	Comments
1.7.1	Is adequate shelter and seating provided at modal interchanges?	9.1			✓	n/a
1.7.2	Are raised kerbs provided at bus stops?	9.2			✓	n/a
1.7.3	Does the width of the footway at bus stops meet recommended standards?	9.3			✓	n/a
1.7.4	Are accessible facilities for timetable information provided?	9.4			✓	n/a
1.7.5	Does the location and amount of cycle parking meet recommended standards?	9.7			✓	n/a
1.7.6	Does the type of parking device meet recommended standards?	9.8			✓	n/a



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No.		S&G Ref.	Yes	No	N/A	Comments
1.7.7	Are there an adequate number of disabled parking spaces with access to local amenities?	9.9			✓	n/a