



P e l l F r i s c h m a n n

## **York Outer Ring Road**

Existing and Proposed Cycle Facilities

Date: January 2021

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**Prepared for:**

City of York Council  
West Offices  
Station Rise  
York  
YO1 6GA

**Prepared by:**

Pell Frischmann  
George House  
George Street  
Wakefield  
WF1 1LY



Pell Frischmann

## Contents

### Executive Summary

<b>1</b>	<b>Brief.....</b>	<b>1</b>
1.1	The Stated Brief: .....	1
1.2	How the brief will be delivered.....	1
<b>2</b>	<b>Policy and DfT Guidance overview .....</b>	<b>2</b>
2.1	Decarbonising Transport – setting the Challenges (March 2020) .....	2
2.2	Gear Change – a bold vision for cycling and walking (July 2020) .....	2
2.3	LTN 1/20 Cycle Design Guide (July 2020).....	2
2.4	Relevant policy and design references to the YORR scheme.....	2
<b>3</b>	<b>Baseline assessment .....</b>	<b>4</b>
3.1	Context.....	4
3.2	Cycling Level of Service .....	4
3.3	Cycling Level of Service audit summary .....	4
3.3.1	Links .....	4
3.3.2	Roundabout junctions.....	4
3.4	Detailed observations .....	4
3.4.1	Uncontrolled crossings: .....	4
3.5	Conclusion .....	5
<b>4.</b>	<b>Proposed Dualling scheme Assessment.....</b>	<b>6</b>
4.1	Scheme background .....	6
4.2	Cycling Level of Service summary – proposed dualling scheme.....	6
4.3	Detailed observations .....	6
4.4	Conclusion .....	7
<b>5.</b>	<b>Proposed scheme – Junction Assessment Tool (JAT) analysis.....</b>	<b>8</b>
5.1	Using JAT.....	8
5.2	JAT results .....	9
5.3	Detailed observations .....	9
5.4	Conclusion .....	9
<b>6.</b>	<b>Predicted potential for cycle trips .....</b>	<b>10</b>
<b>7.</b>	<b>Overall Conclusions.....</b>	<b>11</b>
<b>8.</b>	<b>Recommendations .....</b>	<b>12</b>

**Figures**

See Appendices C & D

**Tables**

Table 1 JAT Analysis .....9

**Appendices**

**Appendix A CLOS ASSESSMENT FOR EXISTING PROVISION**

**Appendix B CLOS FOR PROPOSED A1237 DUALLING SCHEME**

**Appendix C Figures 1-7 JAT Assessment**

**Appendix D Figure 8: Propensity to Cycle analysis for York**

# 1 Brief

## 1.1 The Stated Brief:

- Identify / summarise cycling standards and their hierarchy
- Review of the existing facilities and what the “new” enhancements / proposals are.
- How the proposals compare to the requirements of LTN 1/20 including Cycling Level of Service Assessment (CLOS) and application of the Junction Assessment Tool (JAT) to the proposed scheme
- Highlight further work that may be needed to be undertaken

## 1.2 How the brief will be delivered

- Policy & DfT guidance context
- Baseline assessment: CLOS audit including site visit
- Proposed scheme: CLOS audit to Appendix A LTN 1/20
- Proposed scheme: JAT audit to Appendix B LTN 1/20
- Summary report & recommendations with reference to LTN 1/20 & Gear Change policy document

## 2 Policy and DfT Guidance overview

### 2.1 Decarbonising Transport – setting the Challenges (March 2020)

This policy document gives the context for the proportional increase in carbon footprint that transport is making and the need to bring transport to net zero by 2035. This can only be achieved by a sea change in the way we travel. Electric vehicles are only part of the answer. *“There is no option – we have to change the way we travel”.*

### 2.2 Gear Change – a bold vision for cycling and walking (July 2020)

The policy document for setting out how the government will achieve reduced car travel by switching to more cycling and walking for local journeys. It builds on *Decarbonising Transport* and states all the reasons for change: increase active travel for better health (addressing a high obesity rate), reduce emissions to achieve better air quality (there’s increasing evidence of the harm caused by particulates and nitrogen dioxide), reducing congestion and demand for parking to help create more attractive high streets.

It identifies that journeys to work, school and for leisure have potential for modal switch because their average distance is less than 5 miles, many less than 2 miles – all cyclable. It makes clear that the required change will only happen via high standard protected infrastructure. There is a stated target for half of all urban journeys to be on foot or by bicycle by 2030.

### 2.3 LTN 1/20 Cycle Design Guide (July 2020)

This is the long-awaited design guidance which is a prerequisite to providing cycle infrastructure which is fit for purpose and to enable the change in travel behaviour set out in *Gear Change*. It follows best continental practice. It is a significant step forward from the superseded guidance (LTN 2/08) It sets out design options for providing segregated infrastructure, priority across side roads, options at traffic signal junctions and roundabouts to ensure cyclists can safely use busy junctions.

The emphasis is on coherence (continuity and ease of using), directness and achieving flow with the minimum need to stop.

### 2.4 Relevant policy and design references to the YORR scheme

[Gear Change policy document, Theme 2 Putting cycling and walking at the heart of transport ... states:](#)

*“We will ensure that new local and strategic A road schemes include appropriate provision for cycling. The new cycling budget is the largest sum ever committed to active travel in this country. But if we are serious about putting cycling at the heart of transport policy, we must further shift the balance between projects for motoring and projects for cycling. To receive Government funding for local highways investment where the main element is not cycling or walking improvements, there will be a presumption that all new schemes will deliver or improve cycling infrastructure to the new standards laid down, unless it can be shown that there is little or no need for cycling in the particular road scheme. Highways England will deliver even more cycling infrastructure as part of RIS2 published in March 2020 through the new Users and Communities Fund.”*

[And:](#)

*“We will ensure that the tools which assess transport schemes’ value for money give fair weight to the broader benefits of cycling schemes Significant improvements have been made to the assessment of benefits such as health and sustainability in transport schemes, including*

*through the Department for Transport's Active Mode Appraisal Toolkit<sup>33</sup>. However, aspects of cost-benefit analysis may still undervalue cycle schemes' longer-term benefits, such as journey quality benefits from segregated cycle lanes and health benefits. We will review and if necessary, rewrite guidance to ensure that it does not disadvantage cycling schemes."*

LTN 1/20 Design Guidance Section 1.6 *Summary Principles* includes the statement:

*"Consideration of the opportunities to improve provision for cycling will be an expectation of any future (please note emphasis – auditor) local highway schemes funded by Government. To receive Government funding for local highways investment where the main element is not cycling or walking, there will be a presumption that schemes must deliver or improve cycling infrastructure to the standards in this Local Transport Note, unless it can be shown that there is little or no need for cycling in the particular highway scheme. Any new cycling infrastructure must be in line with this national guidance. The approach of continuous improvement is recognised in both the National Planning Policy Framework and Local Cycling and Walking Infrastructure Plan Guidance. Cycle infrastructure requirements should be embedded in local authority planning, design and highways adoption policies and processes."*

Notwithstanding the above, both the Cycling and Walking Investment Strategy (a statutory document) and the Local Cycling and Walking Infrastructure Plan methodology put emphasis on using evidence gathering to identify the shorter, local journeys that are achievable by cycling and walking. Whilst this evidence may not yet be available for the local area served by the YORR scheme, it is a fair assumption that the A1237, being an orbital, tends not to serve the shortest of journeys. These are dominated by journeys that are radial in nature, with respect to the city centre.

## 3 Baseline assessment

### 3.1 Context

The outer ring road (A1237) was designed and built in the late 1980's when both policy and design guidance for provision for cycling and active travel was much less developed. Whilst this assessment is undertaken to the new LTN 1/20 guidance the date of construction of the ring road should be borne in mind.

### 3.2 Cycling Level of Service

Cycling Level of Service (CLOS) is the audit tool developed by Transport for London and adopted by the LTN 1/20 latest DfT design guidance. A CLOS has been undertaken for the existing infrastructure and road network and roundabouts in the scheme. It is contained in Table 1 of Appendix A. Some additional interpretive text is provided below.

### 3.3 Cycling Level of Service audit summary

#### 3.3.1 Links

Overall, the level of service provided for cycling along the existing ring road is inadequate by current standards. The A1237 is busy with almost continuous traffic and a prevailing national speed limit of 60mph. Only one link, between Wigginton Road and Haxby Road roundabouts, is provided with a fully segregated cycle track which provides high standards of safety, cohesion and directness. For all the other links, cyclists must use the main carriageway with other traffic. Provision does not meet the new standards for cohesion, safety, comfort and attractiveness. The result is a very intimidating environment for cycling.

#### 3.3.2 Roundabout junctions

Overall level of provision varies. Some roundabouts have shared-use facilities around the periphery with uncontrolled crossing points for each arm – which is consistent with expectations from earlier decades. Shipton Road and Haxby roundabouts are notable for providing one or more underpasses for cyclists and pedestrians travelling north – south. These go a long way to reducing community severance of the settlements just outside the ring road. Clifton Moor, Monks Cross and Little Hopgrove roundabouts have no specific cycling provision so cyclists have to take up a position in the appropriate traffic lane. These large and medium-size roundabouts have a poor cyclist casualty record, principally circulating cyclists in collision with overshooting entering traffic and with exiting traffic. Cyclists tend to take up a position on the extreme outer circumference of the carriageway which may feel to be the safest place but leaves cyclists vulnerable to being hit by entering and leaving vehicles.

### 3.4 Detailed observations

#### 3.4.1 Uncontrolled crossings:

Several of the roundabout arms have uncontrolled crossing points for cyclists (and pedestrians). Based on Table 10.2 of the current LTN 1/20, this provision is not sufficient for the prevailing traffic flow and speed. The current guidance would require grade separated crossings. When using the crossings, the auditor experienced difficulty in judging the intended direction of traffic leaving or circulating on the roundabout, being very reliant on driver's correct signalling and moderate exit speed. Splitter islands act as useful refuges but in some cases, it meant two requirements to stop before completing the crossing.

In a similar way, peripheral cycle tracks end abruptly, close to the roundabout exits. This makes it difficult to join the carriageway safely.

On the approaches to the roundabouts the edge line ceases as multiple, narrow traffic lanes commence. For the cyclist, the effect is to deny the space to move up the inside of queuing vehicles, instead having to be part of the queue.

On approaching several of the roundabouts with peripheral cycle tracks and crossings on a bicycle it would be useful to know the recommended routes to take for each destination. As a non-local cyclist, the auditor noted a cycle track taking off to the left but didn't know which destinations it served – for example, when cycling eastbound towards the Strensall Road roundabout and wishing to head to Huntington, it would be useful to know that the periphery cycle track and crossings provide for the entire roundabout negotiation or whether the rider should be using the right turn traffic lane. Cycle-specific white on blue direction signing would be helpful.

### 3.5 Conclusion

The CLOS assessment of the existing provision (Appendix A) scored 48 percent. Welsh Active Travel Act (2013) guidance advises that schemes scoring less than 70 percent require improvement. The dominant reasons for this low score assessment include the absence of segregated infrastructure on high flow/ high speed links, inadequate or absent safe infrastructure at some roundabouts and sub-standard crossing provision at the roundabout arms. These conditions all have negative impacts on cohesion and safety in the CLOS.

## 4. Proposed Dualling scheme Assessment

### 4.1 Scheme background

The dualling scheme of the A1237 from Shipton Road roundabout to Little Hopgrove roundabout has been several years in development with options analysis and cost estimates work being done from 2017 onwards. This, of course, pre-dates the recent policy and design guidance from DfT earlier this year. Nevertheless, public engagement on the current scheme proposals has recently been completed and some responses have been strongly informed by the new policy and design standards with heightened expectations of provision for cycling.

### 4.2 Cycling Level of Service summary – proposed dualling scheme

Notwithstanding the above (section 4.1), the assessment is based on the current Gear Change policy document and LTN 1/20 design guidance and is shown in Appendix B. The overall CLOS score for the entire scheme has been assessed as 70 percent – a significant improvement on the existing CLOS (48 percent). This has been principally achieved through the proposed provision of cycle tracks parallel to every link except for the easternmost Monks Cross to Little Hopgrove roundabouts. Additionally, two roundabouts (Clifton Moor and Strensall Road) are to include new cycle and pedestrian underpasses and the existing ones at Haxby Road are to be linked to provide more protected movements and turns. These measures go some way to addressing the low scores that the existing infrastructure has along links and at some roundabouts.

Substandard provision remains for some movements at certain roundabouts: Wigginton Road, Monks Cross and Little Hopgrove being notable for retaining some difficult and potentially high-risk crossings and turns.

### 4.3 Detailed observations

The proposed cycle tracks on *both* sides of the Clifton Moor roundabout to Wigginton Road roundabout link, when coupled with the existing cycle track between Wigginton Road and Haxby Road, will facilitate many cycling trips. The secondary school on Haxby Road and the out-of-town retail park between Rawcliffe and Clifton Moor are strong trip generators. Therefore, many cycle movements and turns can be expected at the Wigginton Road roundabout which, under current proposals, will only provide advisory (uncontrolled) at grade crossing of the roundabout arms.

Monks Cross roundabout, under current proposals, will also only provide advisory (uncontrolled) at grade crossings. Dedicated left turn traffic lanes are proposed and these will present a particular risk to cyclists sharing the carriageway. Whilst current cycle trips may be low here, new developments including a stadium at East Huntington are noted.

The use of the Fire Station access from Strensall Road through to the proposed farm access road should be secured to provide a bound surface cycle track between Strensall Road and Monks Cross roundabouts.

The proposed cycle tracks on the links will be shared (with pedestrians) and unsegregated with a width of 3m plus verges. Although unsegregated provision is no longer advocated for urban locations it remains acceptable in rural, low footfall locations such as this situation.

It is Assumed that bridge parapets are 1.4m high to meet required standards.

## 4.4 Conclusion

The CLOS assessment of the proposed scheme (Table 2 Appendix B) scored 70 percent. This corresponds to the minimum acceptable overall score (Welsh Active Travel Act (2013) guidance). Therefore, the proposed dualling scheme will provide a significant improvement on the cycling level of service over the level currently prevailing (score of 48 percent). That said, there are deficiencies (score of zero – red) that do need addressing – principally the uncontrolled, at grade crossing movements at Wigginton Road and Monks Cross roundabouts and the link of high volume, high speed traffic between Monks Cross and Little Hopgrove. The Junction Assessment Tool analysis, below, provides more detail on the roundabout issues and risks.

## 5. Proposed scheme – Junction Assessment Tool (JAT) analysis

### 5.1 Using JAT

The JAT adopted by LTN 1/20 (Appendix B in that document) is a specific technique to measure safety and risk for cyclists at existing and proposed junctions, using the cycling infrastructure available or proposed.

LTN 1/20 explains that “A junction assessment should consider ALL potential cycle movements through a junction. It is not enough to plan a cycle route as a linear corridor from A to B if joining or leaving it midway is problematic, dangerous or impossible. However, there may be some situations where not all movements at a junction need to be considered if some are not permitted for cyclists”. The auditor would also add that where dedicated infrastructure such as underpasses provide for certain movements and turns then the assessment is made on the basis that this provision is used.

LTN 1/20 further explains that “The junction assessment should be represented graphically (on a plan) by colour-coding each movement red, amber or green. Movements designated as red are the most uncomfortable or unsafe for cyclists, and so on:

**Red:** where conditions exist that are most likely to give rise to the most common collision types, then the movement should be represented on the plan as a red arrow

**Amber:** where the risk of those collision types has been reduced by design layout or traffic management interventions, then the movement should be coloured amber

**Green:** where the potential for collisions has been removed entirely, then the movement should be coloured green”.

Plans of each roundabout with the colour-coding assigned to each turn by the auditor are shown in Figures 1 – 7 in the appendix.

To obtain a score for each junction JAT assigns the following scores to each colour coding to align with the CLOS scoring:

- **Red** – zero
- **Amber** – 1
- **Green** – 2

## 5.2 JAT results

Table 1, below, shows the tabulated results of the JAT assessment. Figures 1 – 7 in Appendix C show how each potential movement or turn has been assessed using the colour coding described in section 5.1.

Table 1 JAT Analysis

Junction	Score	No. movements	Possible score	Percent score
<b>Shipton Road</b>	11	14	28	39
<b>Clifton Moor</b>	13	10	18	72
<b>Wigginton Road</b>	11	15	30	37
<b>Haxby Road</b>	12	6	12	100
<b>Strensall Road</b>	8	6	12	66
<b>Monks Cross</b>	14	15	30	47
<b>Little Hopgrove</b>	5	9	18	27
<b>TOTALS</b>	<b>70</b>	<b>75</b>	<b>148</b>	<b>47</b>

## 5.3 Detailed observations

With high standard physical segregation as provided by grade separated crossings it is possible to provide safe and attractive cycle infrastructure – as demonstrated by the proposals for Haxby roundabout (maximum score of 100 percent). All movements and turns will be undertaken by using the two underpasses and cyclists need never encounter any part of the roundabout and its approach and exit arms.

At some of the other roundabouts such as Clifton Moor and Strensall Rd, the proposed single underpass at each provide for some cyclist movements and turns but, critically, not all. So, assessment scores for these were less than at Haxby.

The assessment scores for Wigginton Road and Monks Cross are lower, explained by the absence of grade separated crossings.

Shipton Road scores poorly despite having one (existing) underpass. This is explained by the fact that there are four other roundabout arms which provide at grade, uncontrolled crossings.

## 5.4 Conclusion

Table 10.2 in Cycle Infrastructure LTN 1/20 states that for roads with a speed limit of 60mph or greater, the only crossing provision which would be acceptable, safe and attractive to most potential users is a grade separated type. The dualling scheme proposes a speed limit of 60mph so, unless lower speed limits are applied at and on the approaches and exits to the roundabouts, grade separation is the only option which meets the standards of LTN 1/20 and the policies for promotion of active travel in *Gear Change*.

## 6. Predicted potential for cycle trips

To inform justification and prioritization of the improvements to proposed cycle infrastructure to address deficiencies identified in the CLOS and JAT assessments the Propensity to Cycle Tool may be used as shown in Appendix D. This tool has been developed by Cambridge University for DfT, to estimate the potential for increased cycling trips on specific routes for given percentage increases in overall cycling. When the parameters are set to government target (equality) (from 0.8 billion stages in 2013 to 1.6 billion stages in 2025 – a doubling) it is the radial routes which show the greatest potential for increased cycle journeys with Haxby Road and Strensall Road being notable.

The orbital A1237 does not show potential for cycling except for the Haxby – Strensall link, Haxby – Wigginton Road link and, to a lesser extent, the Shipton Road – Clifton Moor link. Therefore, this is some justification for not providing more extensive cycling infrastructure east of Strensall Road. Figure 8 in Appendix C to this report refers.

Development of a Local Cycling and Walking Infrastructure Plan (LCWIP) for York will identify need, demand and the dominant local journey patterns that have the greatest potential for modal switch to these modes. Such a plan may further refine the justification and prioritized for targeted cycle infrastructure enhancements on the dualling scheme and its roundabouts.

## 7. Overall Conclusions

Overall, the dualling scheme will provide much better for people wishing to undertake local journeys to the trip attractors close to the route than existing provision does. The proposed cycle tracks together with the additional underpasses should provide a significant enhancement.

The weaknesses in the proposed cycling provision are the roundabouts where underpasses will not provide for some or all the potential movements and destinations needed by cyclists. This is particularly the case at Wigginton Road roundabout where the comprehensive provision of cycle tracks on each side from Clifton Road roundabout coupled with the existing cycle track to Haxby Road roundabout will promote higher usage and result in demand for a range of turning movements at Wigginton Road – trip generators will include the out-of-town retail park and the secondary school on Haxby Road. This conclusion is supported by the results of the Propensity to Cycle analysis for “government target” (Appendix D Figure 8: Propensity to Cycle analysis for York).

Monks Cross roundabout has limited proposed crossing provision and is to be served by a cycle track linking it to Strensall Road. Despite recent and planned nearby development the Propensity to Cycle analysis does not predict much potential increase in cycle trips at the eastern end of the dualling scheme so there is less justification for providing comprehensive crossing infrastructure here – and also at Little Hopgrove roundabout for the same reason.

## 8. Recommendations

To address deficiencies at Wigginton Road and some of the movements at Shipton Road roundabouts consideration should be given to enhancing the proposed provision for cycling (and pedestrian) movements and turns by providing either controlled crossings as part of a signalized roundabout and peripheral cycle tracks (Figures 10.39 and 10.41 of LTN 1/20 refer) or parallel crossings (enhanced zebra crossing which legally provide for cyclists – section 10.4 and Table 10.2 of LTN 1/20 refer).

To provide the signalised option the speed limit on the roundabout and its arms will need to be 50mph or less. The parallel crossing option is only appropriate on sections of road with a 30mph limit and less than 8000 AADT (LTN 1/20). Potential layouts are shown at Figures 10.37 and 10.41 in LTN 1/20.

## Appendix A

# CLOS ASSESSMENT FOR EXISTING PROVISION

Appendix A: Cycling Level of Service Tool								Score	Comment
Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)		
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	1. Ability to join/leave route safely and easily: consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	0	Uncontrolled at grade crossings inappropriate
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	0	Long links with no provision. No direction signing to navigate Rbts
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	3. Density of routes based on mesh width ie distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 – 1000m	Route contributes to a network density mesh width <250m	(2) N/A	Rural road so network density does not apply
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible.	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	

York Outer Rinf Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Directness	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	5. Stopping and give way frequency		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	1	Uncontrolled rdbt arm crossings require min 2 stops
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	6. Delay at junctions		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (eg bypass at signals)	0	Rt turns at rbtbs require multiple delays
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	1	
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	8. Gradient		Route includes sections steeper than the gradients recommended in Chapter 5	There are no sections of route steeper than the gradients recommended in Chapter 5	There are no sections of route which steeper than 2%	2	

York Outer Ring Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	Rdbts act to partially reduce speed
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	Critical 0	
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5%HGV	2500-5000 and <2% HGV	0-2500 AADT	AADT 0	
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Figure 4.1. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on-carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	Critical 0	

York Outer Ring Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Safety		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions.	13. Conflicting movements at junctions		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	0	Variable provision between rdbts
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout.	0	Lack of direction signing to show route for cyclists at rdbts
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (eg nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity – eg less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	2	
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	1	

York Outer Ring Road - Existing and Proposed Cycle Facilities

W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (eg from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	1	
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete pavements with frequent joints.	Machine laid smooth and non-slip surface – eg Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	1	
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	1	
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	20. Signing		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	1	

York Outer Ring Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	21. Lighting		Most or all of route is unlit	Short and infrequent unlit/ poorly lit sections	Route is lit to highway standards throughout	2	
			22. Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	1	
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	1	
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure nonoverlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	(2) N/A	Trip ends not served
<b>Audit Score Total</b>								<b>(24)</b>	<b>48%</b>

## Appendix B CLOS FOR PROPOSED A1237 DUALLING SCHEME

## Appendix A: Cycling Level of Service Tool

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Cohesion	Connections	Cyclists should be able to easily and safely join and navigate along different sections of the same route and between different routes in the network.	1. Ability to join/leave route safely and easily; consider left and right turns		Cyclists cannot connect to other routes without dismounting	Cyclists can connect to other routes with minimal disruption to their journey	Cyclists have dedicated connections to other routes provided, with no interruption to their journey	1	Some rdbts require protracted turn procedures
	Continuity and Wayfinding	Routes should be complete with no gaps in provision. 'End of route' signs should not be installed – cyclists should be shown how the route continues. Cyclists should not be 'abandoned', particularly at junctions where provision may be required to ensure safe crossing movements.	2. Provision for cyclists throughout the whole length of the route		Cyclists are 'abandoned' at points along the route with no clear indication of how to continue their journey.	The route is made up of discrete sections, but cyclists can clearly understand how to navigate between them, including through junctions.	Cyclists are provided with a continuous route, including through junctions	1	Inconsistent provision ranging good to poor
	Density of network	Cycle networks should provide a mesh (or grid) of routes across the town or city. The density of the network is the distance between the routes which make up the grid pattern. The ultimate aim should be a network with a mesh width of 250m.	3. Density of routes based on mesh width ie distances between primary and secondary routes within the network		Route contributes to a network density mesh width >1000	Route contributes to a network density mesh width 250 – 1000m	Route contributes to a network density mesh width <250m	N/A (2)	Mainly rural
Directness	Distance	Routes should follow the shortest option available and be as near to the 'as-the-crow-flies' distance as possible.	4. Deviation of route Deviation Factor is calculated by dividing the actual distance along the route by the straight line (crow-fly) distance, or shortest road alternative.		Deviation factor against straight line or shortest road alternative >1.4	Deviation factor against straight line or shortest road alternative 1.2 – 1.4	Deviation factor against straight line or shortest road alternative <1.2	2	

York Outer Ring Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Directness	Time: Frequency of required stops or give ways	The number of times a cyclist has to stop or loses right of way on a route should be minimised. This includes stopping and give ways at junctions or crossings, motorcycle barriers, pedestrian-only zones etc.	5. Stopping and give way frequency		The number of stops or give ways on the route is more than 4 per km	The number of stops or give ways on the route is between 2 and 4 per km	The number of stops or give ways on the route is less than 2 per km	1	
	Time: Delay at junctions	The length of delay caused by junctions should be minimised. This includes assessing impact of multiple or single stage crossings, signal timings, toucan crossings etc.	6. Delay at junctions		Delay for cyclists at junctions is greater than for motor vehicles	Delay for cyclists at junctions is similar to delay for motor vehicles	Delay is shorter than for motor vehicles or cyclists are not required to stop at junctions (eg bypass at signals)	1	Variable
	Time: Delay on links	The length of delay caused by not being able to bypass slow moving traffic.	7. Ability to maintain own speed on links		Cyclists travel at speed of slowest vehicle (including a cycle) ahead	Cyclists can usually pass slow traffic and other cyclists	Cyclists can always choose an appropriate speed.	2	
	Gradients	Routes should avoid steep gradients where possible. Uphill sections increase time, effort and discomfort. Where these are encountered, routes should be planned to minimise climbing gradient and allow users to retain momentum gained on the descent.	8. Gradient		Route includes sections steeper than the gradients recommended in Chapter 5	There are no sections of route steeper than the gradients recommended in Chapter 5	There are no sections of route which steeper than 2%	2	Gradients never an issue

York Outer Ring Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Safety	Reduce/remove speed differences where cyclists are sharing the carriageway	Where cyclists and motor vehicles are sharing the carriageway, the key to reducing severity of collisions is reducing the speeds of motor vehicles so that they more closely match that of cyclists. This is particularly important at points where risk of collision is greater, such as at junctions.	9. Motor traffic speed on approach and through junctions where cyclists are sharing the carriageway through the junction	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	1	On rdbt entry and exit arms
			10. Motor traffic speed on sections of shared carriageway	85th percentile > 37mph (60kph)	85th percentile >30mph	85th percentile 20mph-30mph	85th percentile <20mph	0	60 mph on east-most link
	Avoid high motor traffic volumes where cyclists are sharing the carriageway	Cyclists should not be required to share the carriageway with high volumes of motor vehicles. This is particularly important at points where risk of collision is greater, such as at junctions.	11. Motor traffic volume on sections of shared carriageway, expressed as vehicles per peak hour	>10000 AADT, or >5% HGV	5000-10000 AADT and 2-5% HGV	2500-5000 and <2% HGV	0-2500 AADT	0	AADT for east-most link?
	Risk of collision	Where speed differences and high motor vehicle flows cannot be reduced cyclists should be separated from traffic – see Figure 4.1. This separation can be achieved at varying degrees through on-road cycle lanes, hybrid tracks and off-road provision. Such segregation should reduce the risk of collision from beside or behind the cyclist.	12. Segregation to reduce risk of collision alongside or from behind	Cyclists sharing carriageway – nearside lane in critical range between 3.2m and 3.9m wide and traffic volumes prevent motor vehicles moving easily into opposite lane to pass cyclists.	Cyclists in unrestricted traffic lanes outside critical range (3.2m to 3.9m) or in cycle lanes less than 1.8m wide.	Cyclists in cycle lanes at least 1.8m wide on-carriageway; 85th percentile motor traffic speed max 30mph.	Cyclists on route away from motor traffic (off road provision) or in off-carriageway cycle track. Cyclists in hybrid/light segregated track; 85th percentile motor traffic speed max 30mph.	1	Off c/w except for east-most link

York Outer Ring Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Safety		A high proportion of collisions involving cyclists occur at junctions. Junctions therefore need particular attention to reduce the risk of collision. Junction treatments include: Minor/side roads – cyclist priority and/or speed reduction across side roads Major roads – separation of cyclists from motor traffic through junctions.	13. Conflicting movements at junctions		Side road junctions frequent and/or untreated. Major junctions, conflicting cycle/motor traffic movements not separated	Side road junctions infrequent and with effective entry treatments. Major junctions, principal conflicting cycle/motor traffic movements separated.	Side roads closed or treated to blend in with footway. Major junctions, all conflicting cycle/motor traffic streams separated.	0	Some rdbs to have uncontrolled crossings of entry & exit arms
	Avoid complex design	Avoid complex designs which require users to process large amounts of information. Good network design should be self-explanatory and self-evident to all road users. All users should understand where they and other road users should be and what movements they might make.	14. Legible road markings and road layout		Faded, old, unclear, complex road markings/ unclear or unfamiliar road layout	Generally legible road markings and road layout but some elements could be improved	Clear, understandable, simple road markings and road layout.	2	Assumes clear cycle route direction signing
	Consider and reduce risk from kerbside activity	Routes should be assessed in terms of all multi-functional uses of a street including car parking, bus stops, parking, including collision with opened door.	15. Conflict with kerbside activity	Narrow cycle lanes <1.5m or less (including any buffer) alongside parking/loading	Significant conflict with kerbside activity (eg nearside cycle lane < 2m (including buffer) wide alongside kerbside parking)	Some conflict with kerbside activity – eg less frequent activity on nearside of cyclists, min 2m cycle lanes including buffer.	No/very limited conflict with kerbside activity or width of cycle lane including buffer exceeds 3m.	2	
	Reduce severity of collisions where they do occur	Wherever possible routes should include "evasion room" (such as grass verges) and avoid any unnecessary physical hazards such as guardrail, build outs, etc. to reduce the severity of a collision should it occur.	16. Evasion room and unnecessary hazards		Cyclists at risk of being trapped by physical hazards along more than half of the route.	The number of physical hazards could be further reduced	The route includes evasion room and avoids any physical hazards.	2	

York Outer Rinf Road - Existing and Proposed Cycle Facilities

W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Comfort	Surface quality	Density of defects including non cycle friendly ironworks, raised/sunken covers/gullies, potholes, poor quality carriageway paint (eg from previous cycle lane)	17. Major and minor defects		Numerous minor defects or any number of major defects	Minor and occasional defects	Smooth high grip surface	2	
		Pavement or carriageway construction providing smooth and level surface	18. Surface type		Any bumpy, unbound, slippery, and potentially hazardous surface.	Hand-laid materials, concrete pavements with frequent joints.	Machine laid smooth and non-slip surface – eg Thin Surfacing, or firm and closely jointed blocks undisturbed by turning heavy vehicles.	2	
	Effective width without conflict	Cyclists should be able to comfortably cycle without risk of conflict with other users both on and off road.	19. Desirable minimum widths according to volume of cyclists and route type (where cyclists are separated from motor vehicles).		More than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum values.	No more than 25% of the route includes cycle provision with widths which are no more than 25% below desirable minimum	Recommended widths are maintained throughout whole route	1	Parts of existing cycle track <2.5m wide
	Wayfinding	Non-local cyclists should be able to navigate the routes without the need to refer to maps.	20. Signing		Route signing is poor with signs missing at key decision points.	Gaps identified in route signing which could be improved	Route is well signed with signs located at all decision points and junctions	2	Assumes clear cycle route direction signing

York Outer Ring Road - Existing and Proposed Cycle Facilities  
W50819-PEL-GEN-ZZ-RP-CH-005 P01 S3

Key requirement	Factor	Design principle	Indicators	Critical	0 (Red)	1 (Amber)	2 (Green)	Score	Comment
Attractiveness	Social safety and perceived vulnerability of user	Routes should be appealing and be perceived as safe and usable. Well used, well maintained, lit, overlooked routes are more attractive and therefore more likely to be used.	21. Lighting		Most or all of route is unlit	Short and infrequent unlit/ poorly lit sections	Route is lit to highway standards throughout	1	Assumes links not lit
			22. Isolation		Route is generally away from activity	Route is mainly overlooked and is not far from activity throughout its length	Route is overlooked throughout its length	1	Underpasses lit to reduce risk
	Impact on pedestrians, including people with disabilities	Introduction of dedicated on-road cycle provision can enable people to cycle on-road rather than using footways which are not suitable for shared use. Introducing cycling onto well used footpaths may reduce the quality of provision for both users, particularly if the shared use path does not meet recommended widths.	23. Impact on pedestrians, Pedestrian Comfort Level based on Pedestrian Comfort guide for London (Section 6.1)		Route impacts negatively on pedestrian provision, Pedestrian Comfort is at Level C or below.	No impact on pedestrian provision or Pedestrian Comfort Level remains at B or above.	Pedestrian provision enhanced by cycling provision, or Pedestrian Comfort Level remains at A	2	Shared unsegregated sections are on low pedestrian areas so acceptable
	Minimise street clutter	Signing required to support scheme layout	24. Signs informative and consistent but not overbearing or of inappropriate size		Large number of signs needed, difficult to follow and/ or leading to clutter	Moderate amount of signing particularly around junctions.	Signing for wayfinding purposes only and not causing additional obstruction.	2	
	Secure cycle parking	Ease of access to secure cycle parking within businesses and on-street	25. Evidence of bicycles parked to street furniture or cycle stands		No additional cycle parking provided or inadequate provision in insecure nonoverlooked areas	Some secure cycle parking provided but not enough to meet demand	Secure cycle parking provided, sufficient to meet demand	N/A (2)	Final destinations not part of scheme
<b>Audit Score Total</b>								<b>35</b>	<b>70%</b>

## Appendix C Figures 1-7 JAT Assessment




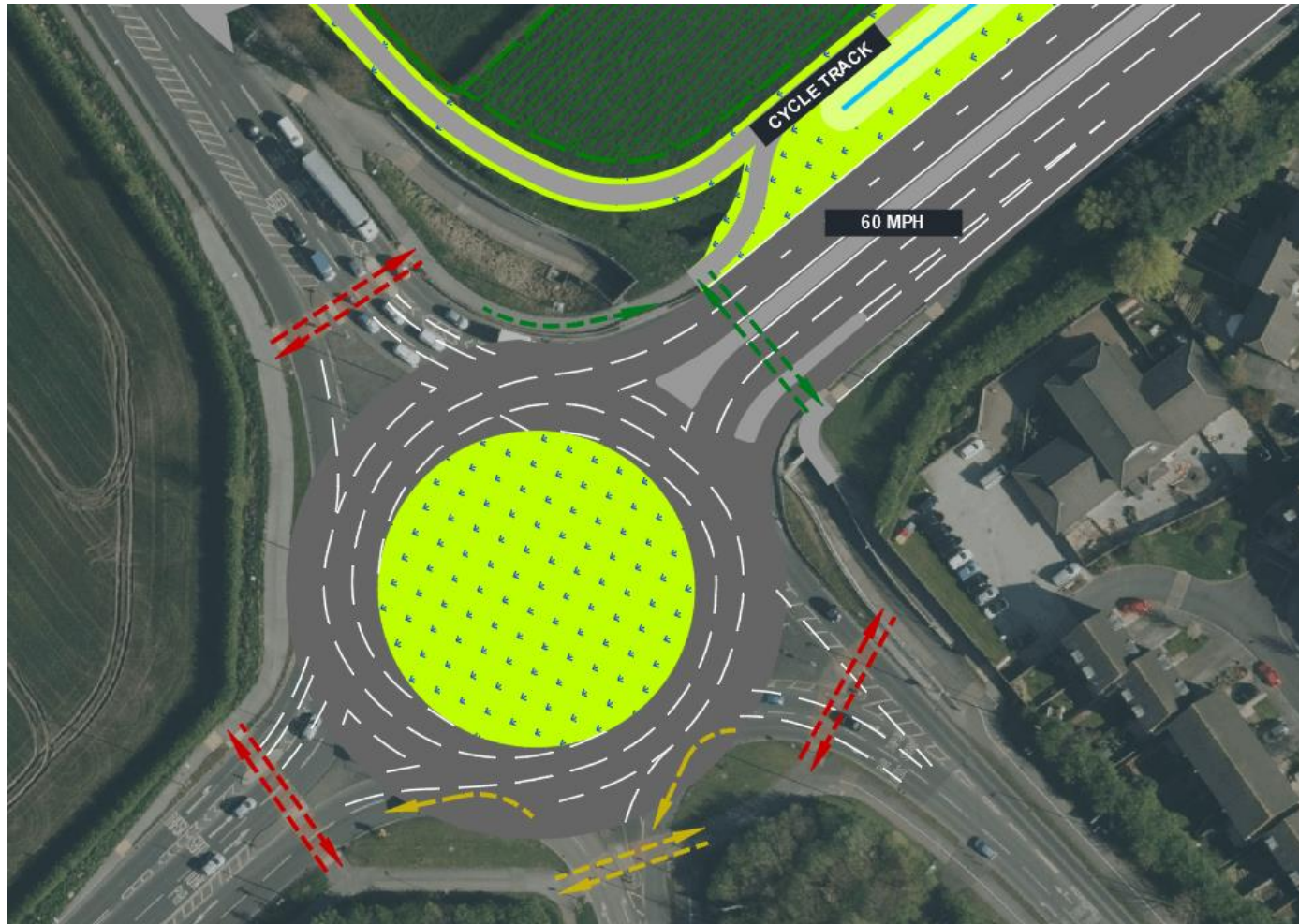
<u>Key</u>	
	Conditions exist for the most common collision types
	Measures are in place to reduce the chances of collisions
	Design or measures in place which remove the chances of the collision types completely

Figure 1 A19 / Shipton Road



- ← - - - → Conditions exist for the most common collision types
- ← - - - → Measures are in place to reduce the chances of collisions
- ← - - - → Design or measures in place which remove the chances of the collision types completely

Figure 2 Clifton Moor



Figure 3 Wigginton Road

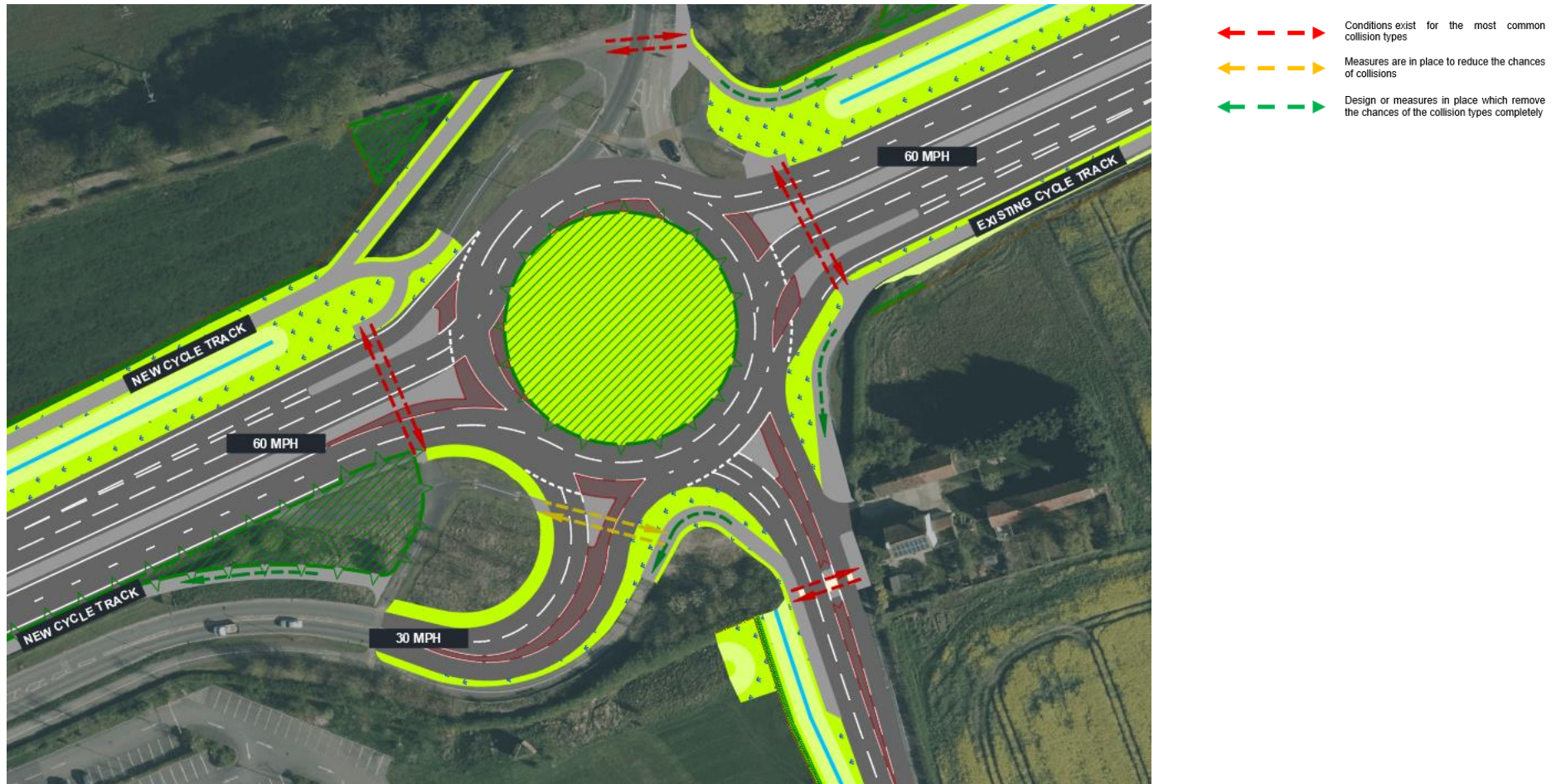


Figure 4 Haxby Road



Figure 5 Strensall Road

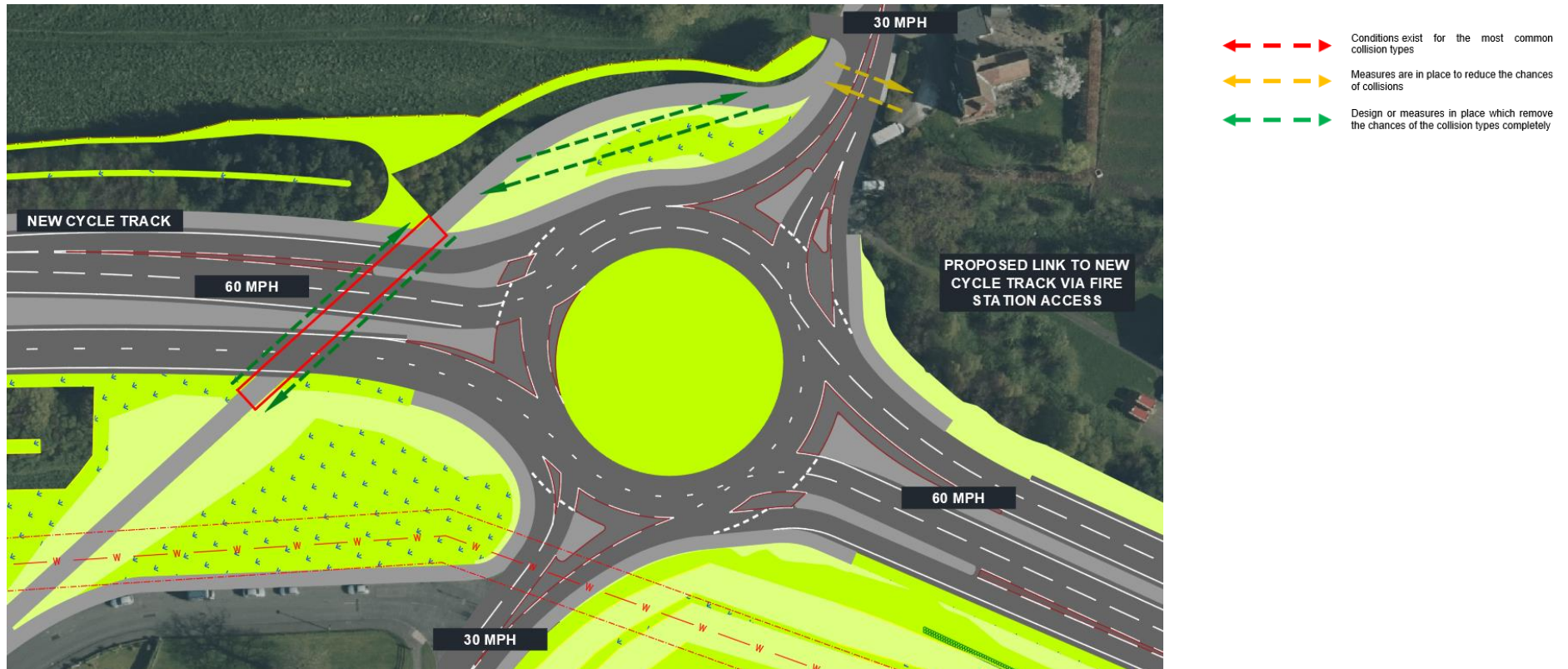
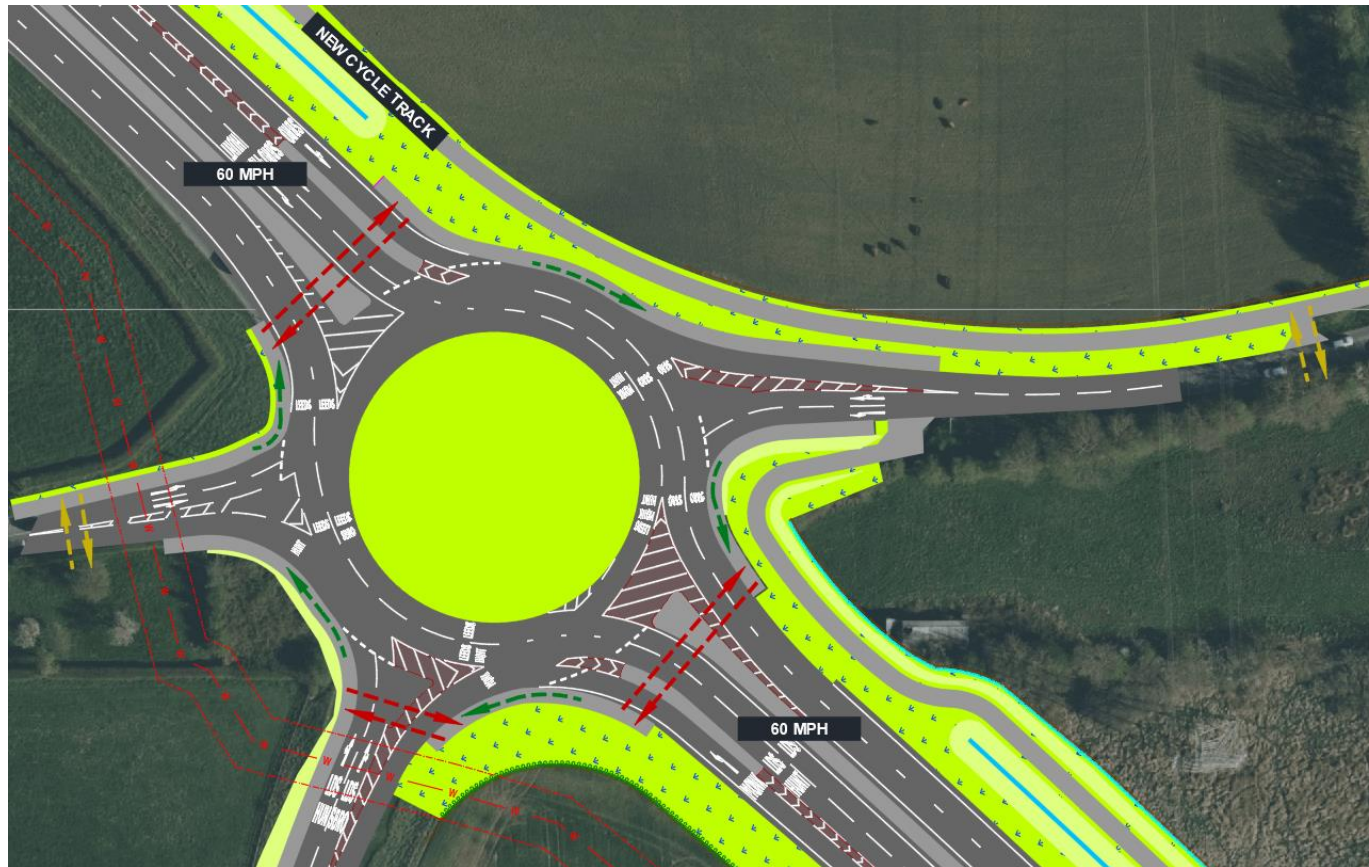
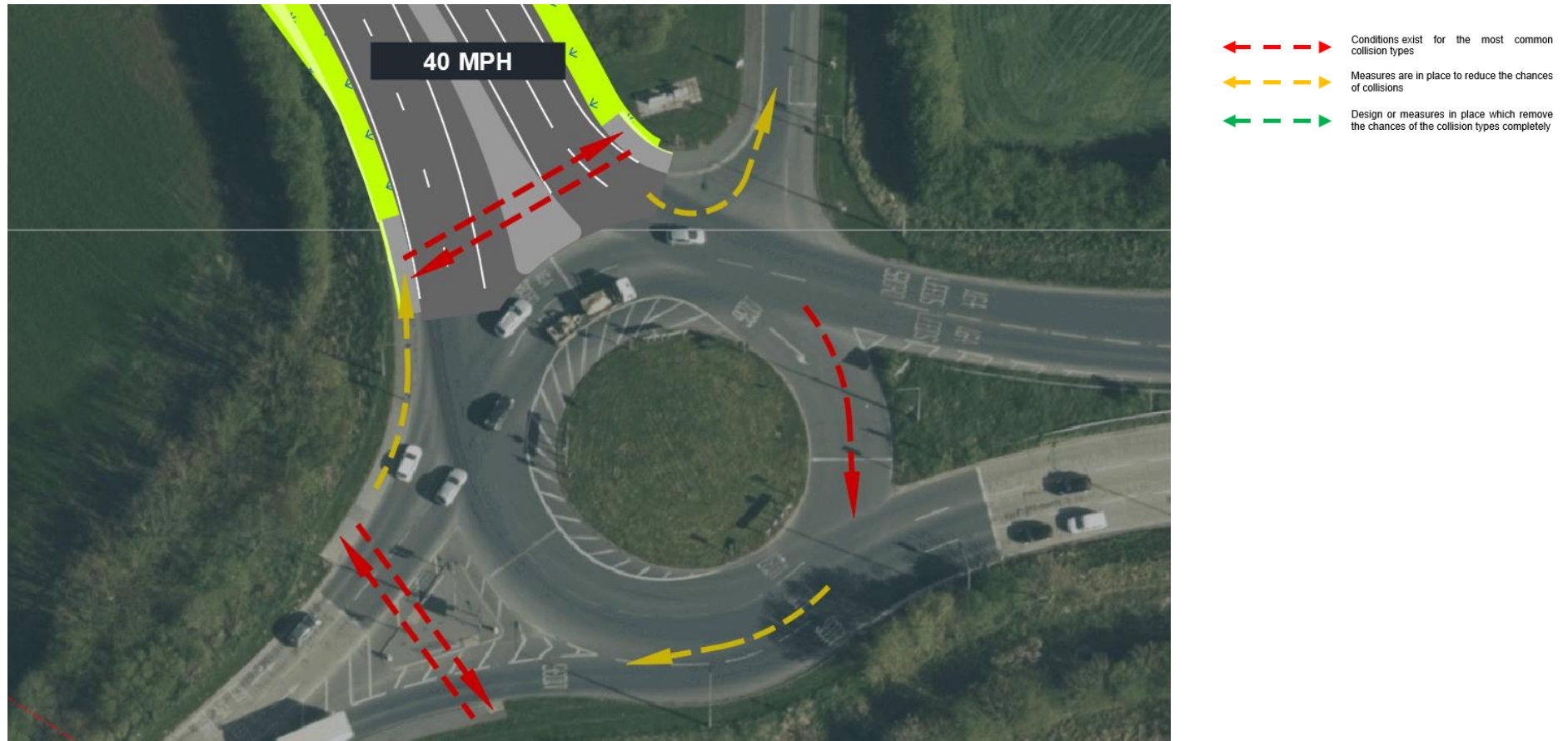


Figure 6 Monks Cross



- ← - - - → Conditions exist for the most common collision types
- ← - - - → Measures are in place to reduce the chances of collisions
- ← - - - → Design or measures in place which remove the chances of the collision types completely

Figure 7 Little Hopgrove



## Appendix D Figure 8: Propensity to Cycle analysis for York

Figure 8 Propensity to Cycle analysis for York: set at “government target – equity” (from 0.8 billion stages in 2013 to 1.6 billion stages in 2025)

