OOPR
OLD OAK & PARK ROYAL
WALKING, CYCLING &
PUBLIC REALM

Cycle Network Assessment

APPENDIX TO MAIN REPORT
APRIL 2017

5th studio

Old Oak & Park Royal Walking, Cycling, Streets and Public Realm Strategy

Cycle Network Assessment

April 2017

5th studio

Alan Baxter

WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

London Cycle Design Standard - Five step analysis

1. Review existing (and reference case) conditions
2. Mesh density analysis
3. Accessibility classification
4. Area porosity analysis
5. Cycling Level of Service assessment

WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 1 Review existing conditions

The starting point for the review of existing conditions is the cycle route classification contained in the TfL Cycle Guides.

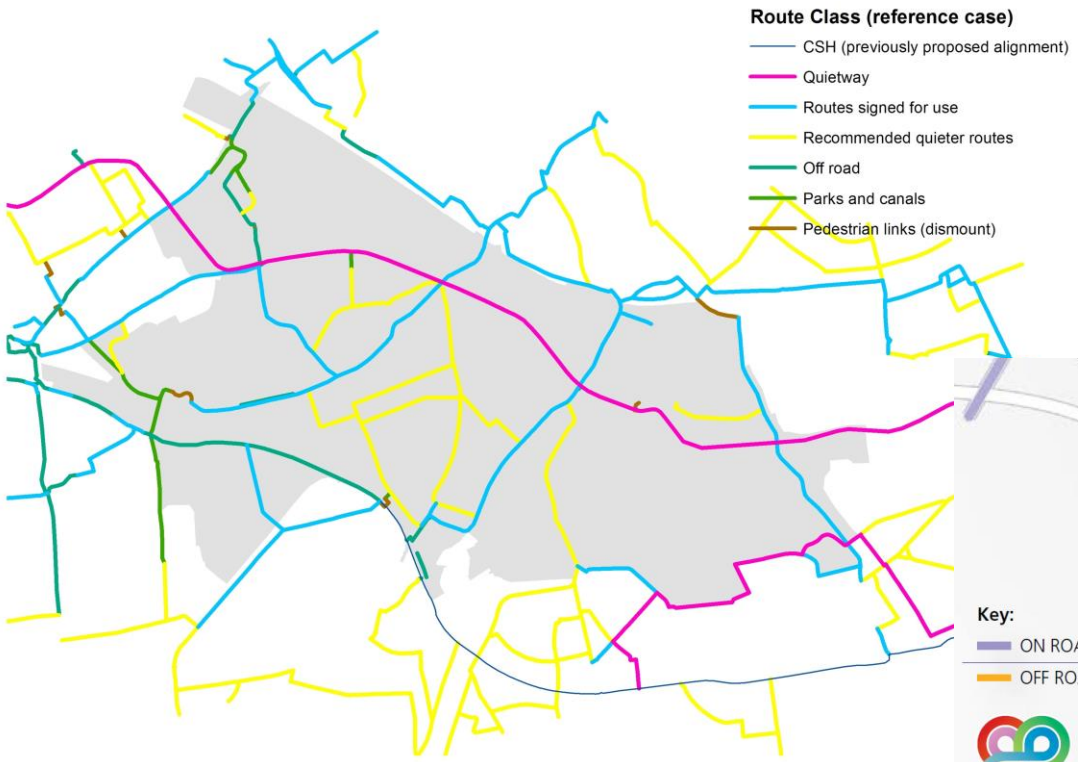
Looking to the future, the reference case network is expected to include projects from the Mayor's Vision:

- CSH10 following A40 alignment (following the spring 2016 consultation this alignment has since been rejected, but details of an alternative proposal are not available at this time)
- Designation of the canal towpath as a Quietway
- Additional Quietway from East Acton towards central London

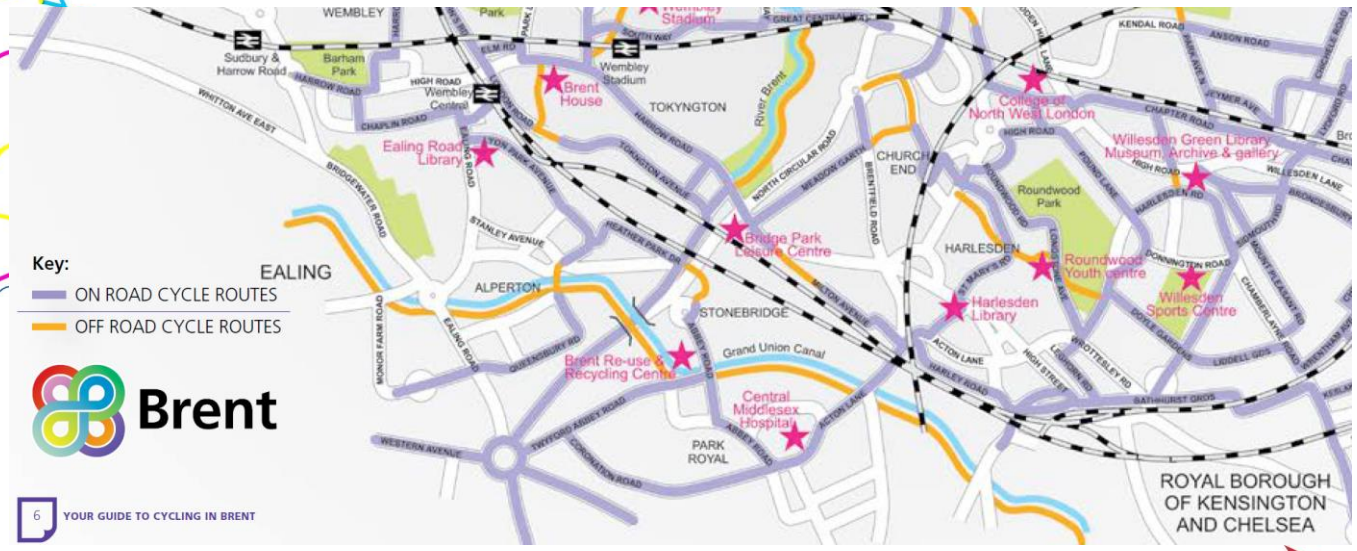


WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 1 Review existing conditions



Further sources include borough route classifications. For example, the Brent Cycle Map contains the same signed routes through Park Royal and across the north of the study area as the TfL Cycle Guides network.



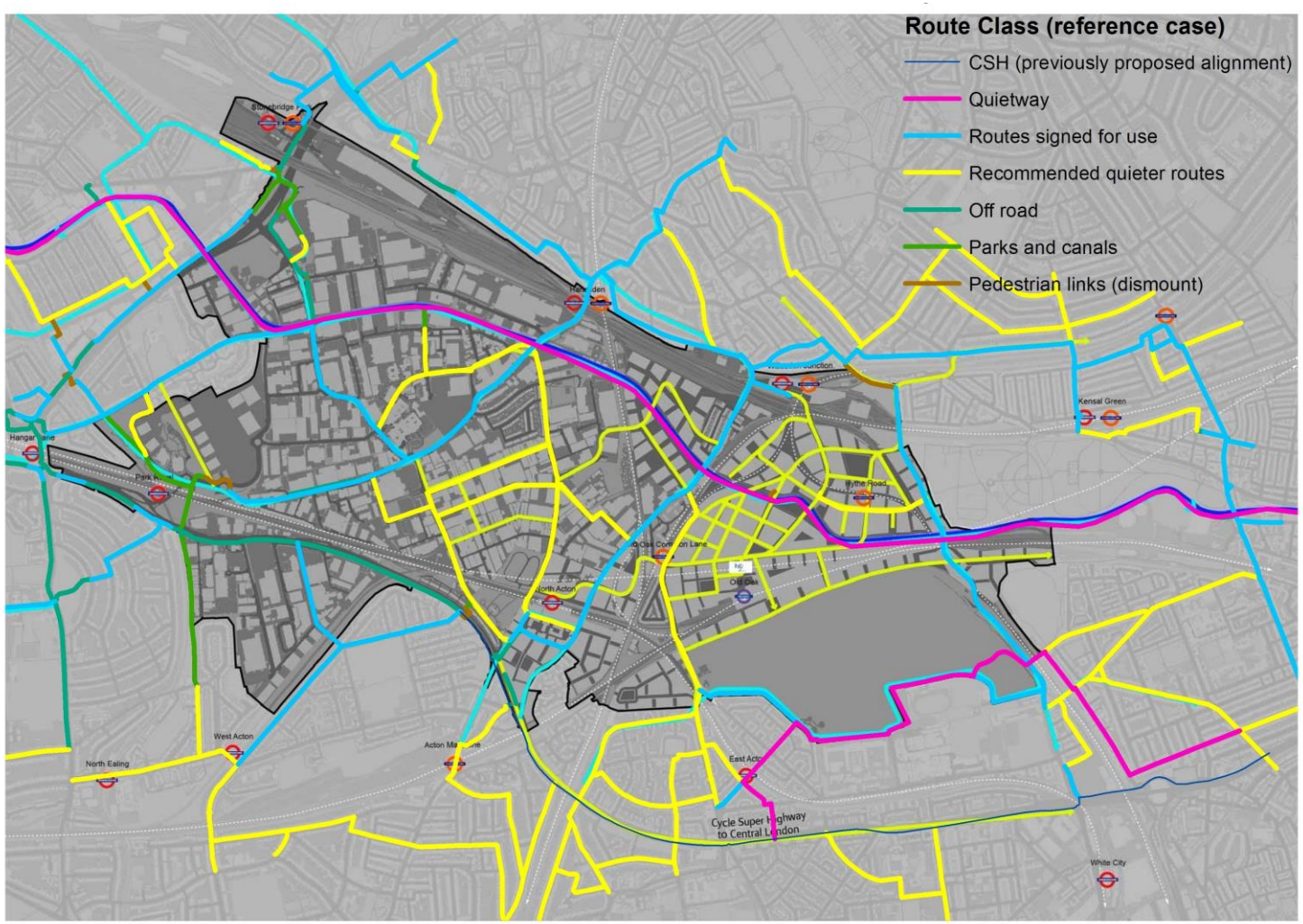
WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 1 Review existing conditions

When the OPDC Local Plan cycle route classification is overlaid on the reference case network, the addition of the internal layout of routes in Old Oak can be observed.

Several other sections are additional to the reference case network

- Links from North Acton to the A40 CSH on the Victoria Road gyratory
- A new cycle link running south of the GWML to land east of Scrubs Lane
- Incorporation of the Scrubs Lane / Harrow Road junction into the cycle network (currently a harsh environment for cyclists)



WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 1 Review existing conditions Conclusions

The study area has a comprehensive network of signed and recommended cycle routes. Future projects are expected to improve east-west routes into and through the study area, including a potential Cycle Superhighway between Acton and central London, the designation of the canal towpath as a Quietway and a new Quietway to East Acton.

The area is bounded by major roads (A40 and North Circular) where segregated off-street cycle infrastructure is essential. Some fragmented provision of cycle tracks is available.

There are several signed north-south routes through the study area (Scrubs Lane, Victoria Road, Acton Lane-Coronation Road). All of these roads are mainly strategic single carriageway routes carrying high volumes of traffic and a high proportion of freight. The nature of these routes means that they are only suitable for very confident cyclists.

The OPDC plans for Old Oak include high density employment and residential development and a completely new street network with a clear hierarchy of links for cyclists.

The western side of Park Royal is characterised by new industrial estates and large distribution centres accessed from several major roads. There is a partial and fragmented off-street cycle network providing access to these employment locations.

The eastern side of Park Royal is characterised by older industrial development consisting of smaller units in a more traditional street grid. This part of Park Royal is characterised by a higher density and more mixed employment profile, street-fronting industrial units, and high levels of on-street parking. The internal routes within this part of Park Royal are designated as part of the cycle network in the OPDC Local Plan, but the character of the streets is challenging for cyclists.

Step 2 Mesh Density Analysis Reference case

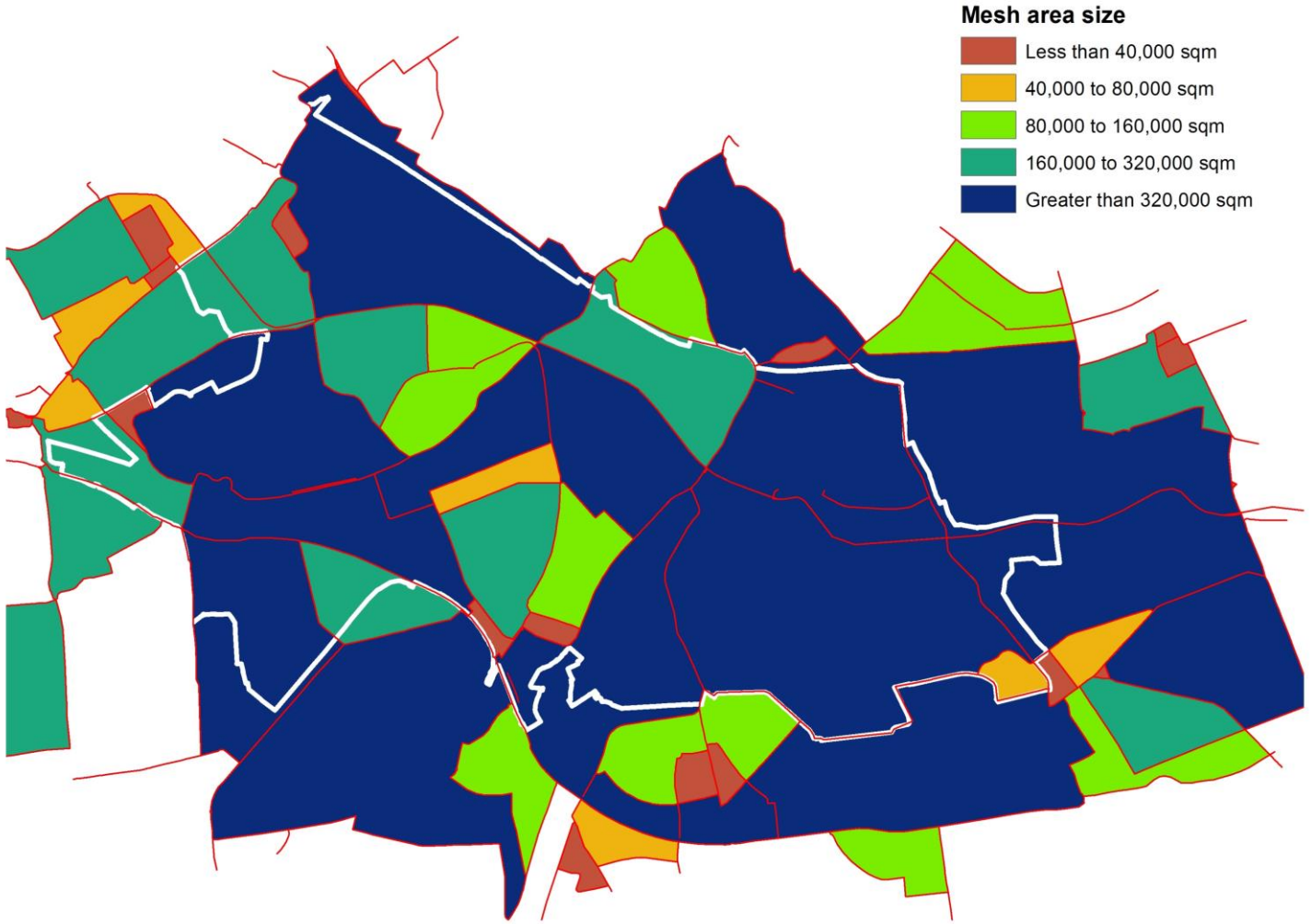
The principles of mesh density analysis are set out in the LCDS guidance (ch2 p15):

In a properly joined-up cycle network, cyclists should not have to travel more than 400 metres to get to a parallel route of similar quality

<u>Area bound method:</u>

An area of 160,000 square metres would be present inside a 400-metre by 400-metre mesh and so this can be used as the standard to measure against.

The vast majority of the reference case cycle network is coarser than the 160,000 sqm benchmark.

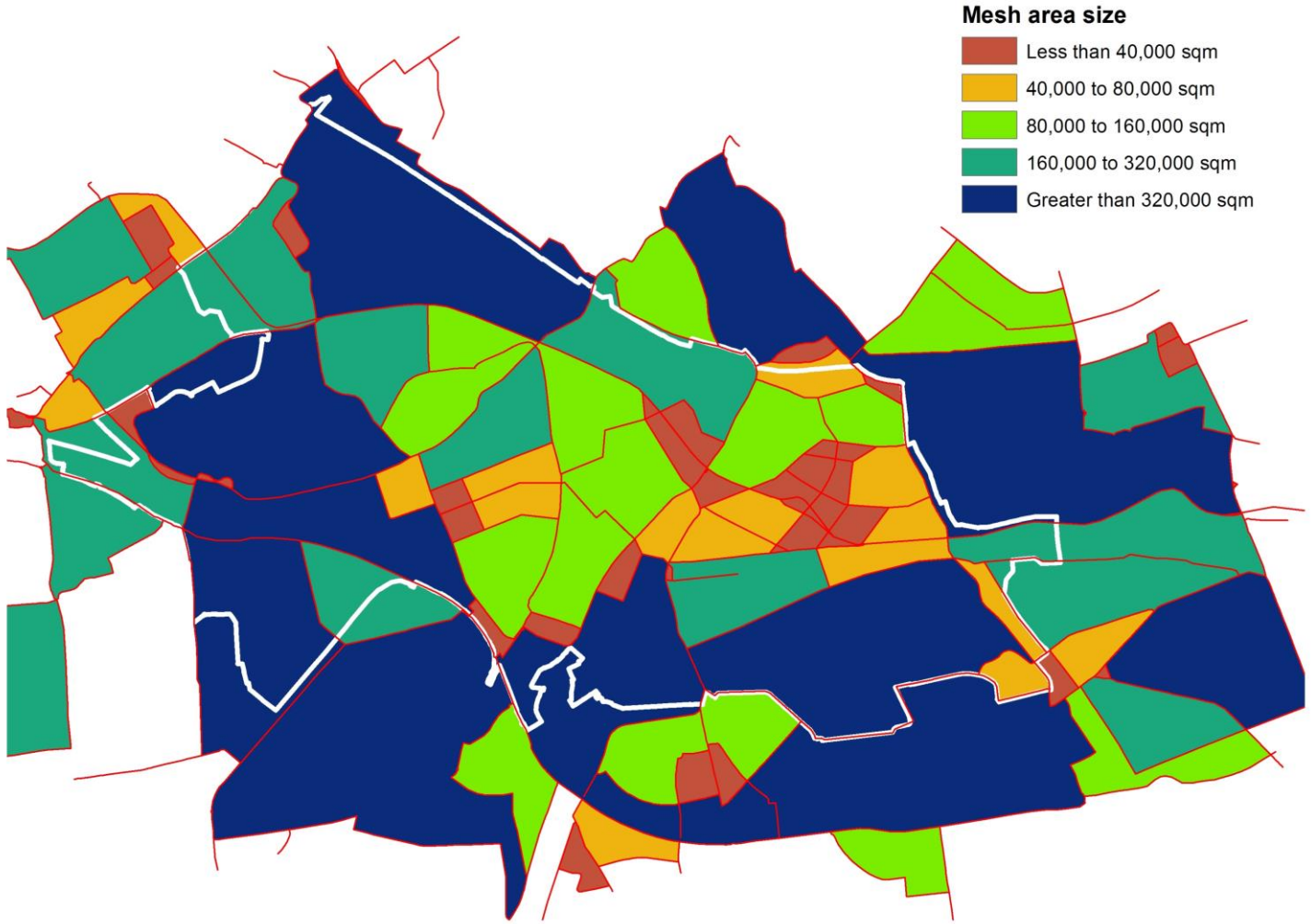


WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 2 Mesh Density Analysis OPDC network

With the introduction of the OPDC network, there is very high network coverage in the densest part of the Old Oak development. As the plans develop further, the most strategic alignments within this cycle route hierarchy need to be identified.

The creation of new cycle routes to the west of Victoria Road, linking through to Volt Avenue creates a suitable density of routes to connect the new Old Oak development with the eastern part of Park Royal.



WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 2 Mesh density analysis Conclusions



The internal cycle route network density is transformed in the core of the OPDC study area but not on its edges.

Key conclusions are:

- Additional connections from Willesden are precluded by rail infrastructure. Therefore the available cycle routes at Stonebridge Park and Harlesden are critical links.
- Network density to the north-east of the study area is poor. There are no links eastbound as a result of the cemeteries and cycle access into Old Oak is severed by Harrow Road / Scrubs Lane.
- New cycle links at Scrubs Lane and Victoria Road can provide strategic cycle access to the south and a (yet to be defined) new CSH10 alignment. Yet Wormwood Scrubs still represents a gap in the local cycle network between Hammersmith Hospital and Old Oak.
- There are limited options to improve cycle access from Acton due to parallel road and rail infrastructure. Therefore improved cycle routes at Park Royal station and North Acton are critical.

WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

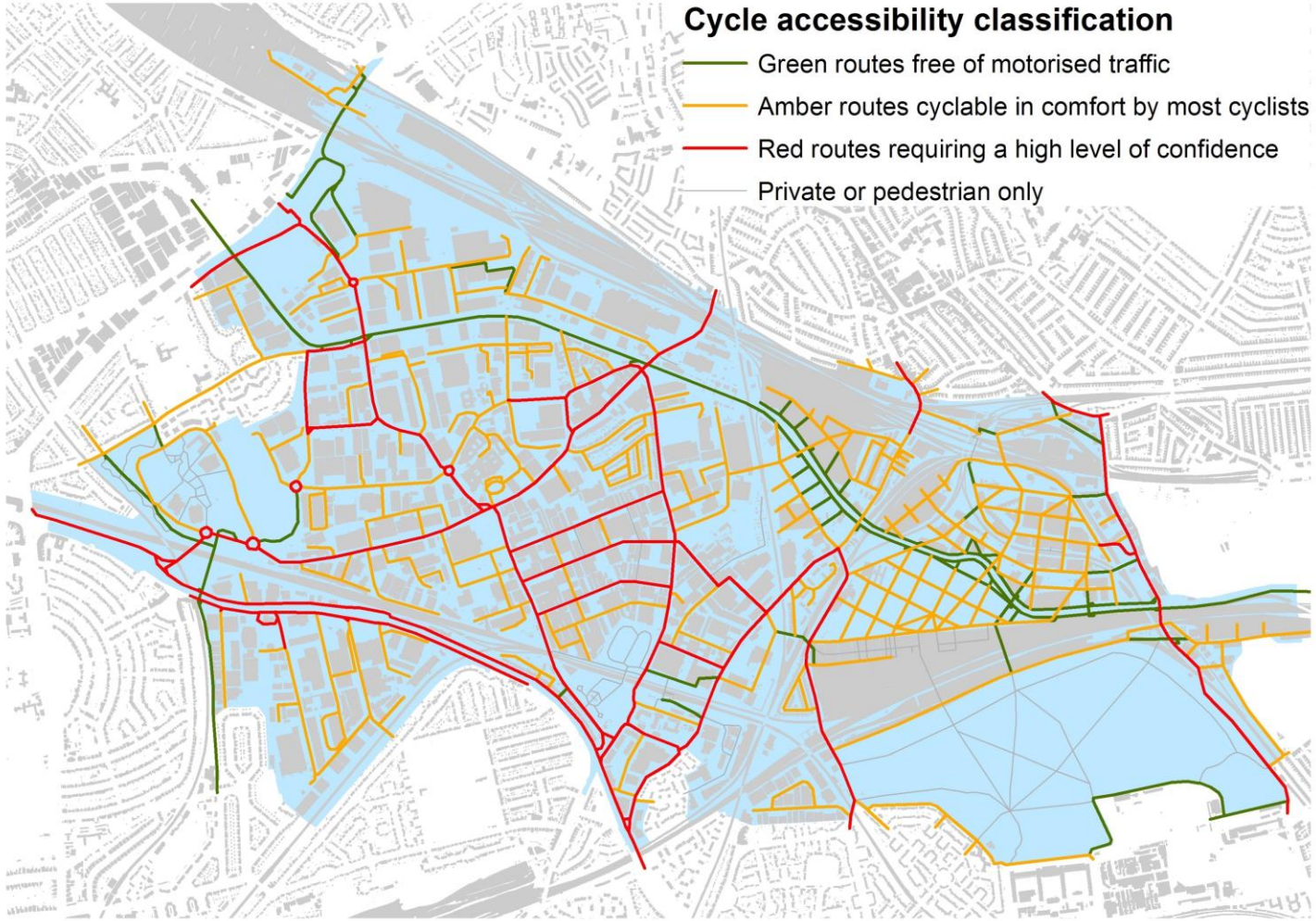
Step 3 Accessibility classification

All links in the expected OPDC cycle network have been classified as green, amber or red based on the experience needed to ride them comfortably.

Traffic-free routes that are suitable for cyclists of any age and experience are shown in green.

The majority of routes in the study are classed as amber since most cyclists should be comfortable on lightly-trafficked streets. The internal street layout of new development at Old Oak is expected to meet this standard throughout.

The key north-south routes through the study area are all classed as red since cyclists need to be confident to cycle on such heavily trafficked routes. Many of the internal streets in Park Royal are also red due to the conditions observed (high vehicle speeds, heavy and sometimes inconsiderate parking).



WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 3 Accessibility classification Conclusions

The OPDC network introduces a number of new links through the Old Oak area, opening up new routes for less confident cyclists. For example, the potential new link from Volt Avenue to the Old Oak development and the canal towpath provides improved access into the eastern edge of Park Royal, as does the North Acton link at Old Oak Common Lane. Similarly the link across Scrubs Lane from Wormwood Scrubs to the land east of Scrubs Lane will open up access to Old Oak for residents of Kensal Green.

However, there are still a number routes into and out of the study area for which no alternative to the red routes exists:

- The access routes to the south and a yet to be defined new CSH10 alignment are all red routes (Scrubs Lane, Old Oak Common Lane and Victoria Road), and there are no alternative north-south links.
- None of the access routes to the north-east allow cyclists to cross Scrubs Lane or Harrow Road with ease.

The Park Royal area is dominated by red routes, and some intervention is required before less confident cyclists can be persuaded to commute by bicycle.

In the western part of the Park Royal estate, this can be addressed by improving and maintaining the existing off-street cycle infrastructure, and providing safe access across the junctions, in particular the large roundabouts.

Interventions to enable cycling in the eastern part of the Park Royal estate are more difficult. It would be possible to open new cycle links into the employment areas if several of the east-west links could be converted to amber routes, notably Chandos Road, Bashley Road, Standard Road and Minerva Road. Yet the scale of the change required in these streets is significant, and would involve considerable parking control, traffic calming for speed reduction and improved management of servicing and loading activities.

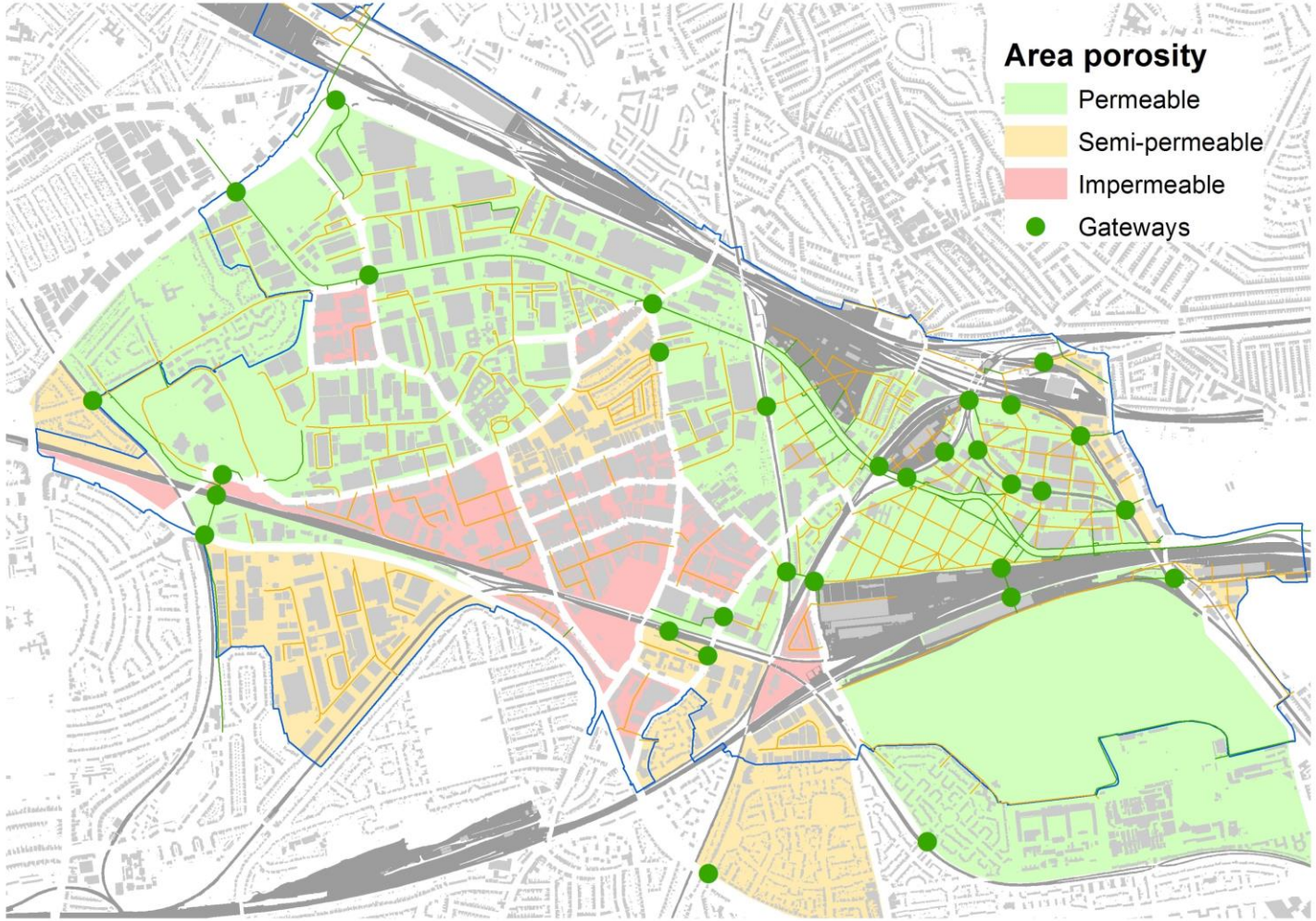
Step 4 Area porosity analysis

The principles of area porosity analysis are set out in the LCDS guidance (ch2 p18):

Area porosity is a measure of how many places there are for cyclists to enter, pass through and leave an area comfortably. A location that is 'porous' is a space that cyclists can pass through with ease and comfort – usually a junction.

In addition to the red routes, the study area is severed by the large number of railway lines running through it. Therefore the area porosity analysis considers both red routes and railway alignments.

Impermeable areas (in red) do not have any gateways (access points) classified as green or amber. The semi-permeable areas (in yellow) or permeable areas (in green) have one or multiple gateways into the area. Gateways can typically be a junction from one area to another across a red route, a link under/over a railway line, or in many cases the canal towpath that provides permeability across the study area.



WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 4 Area porosity analysis Conclusions

The greatest lack of permeability is encountered in the eastern part of the Park Royal estate, which is an area that could see a further intensification of employment in the future. The employment units are laid out in grid form and generally have a direct frontage onto busy red roads, which means that cycle access to these jobs is entirely reliant on routes classified as red roads.

There are several opportunities to provide greater permeability into this area:

- Town centre improvements around Central Middlesex Hospital, potentially including an alternative route from Coronation Road to Park Royal Road;
- Improved cycling provision through traffic management and calming measures on Chandos Road, Bashley Road, Standard Road and Minerva Road; and/or
- An alternative east-west route linking to Old Oak Common Lane through the North Acton link.

There are several other areas characterised as impermeable, including:

- The island surrounded by Barrett Green Road and Acton Lane, although there is some access to from the canal towpath and Central Way.
- The existing residential area at Wells House Road currently only has road access to Old Oak Common Lane. It may be possible to provide a secondary cycle route through the OOC station development, although this depends on the level changes.
- The island surrounded by Twyford Abbey Road, Abbey Road, Whitby Avenue and Rainsford Road.

Step 5 Cycling Level of Service audit

The Cycling Level of Service (CLOS) methodology is a structured way of assessing comfort and safety for cyclists at individual junctions. Each turning movement at the junction is assessed separately and scored using a red-amber-green classification.

CLOS assessments are prepared for two areas selected to represent the different character areas described in the conclusions of the previous steps:

- The Abbey Road example is typical of the western part of Park Royal. This example assesses the junctions linking the existing sections of off-street cycle tracks connecting the Stonebridge Park link to the canal towpath and Twyford Road.
- The Chase Road example is typical of the eastern part of Park Royal and also includes the junctions that are crucial to linking Park Royal with Old Oak Common.

LCDS Indicative criteria for scoring junction assessments

Factors needing removal or mitigation	Possible improvements	Further improvements
RED	**AMBER**	**GREEN**
Heavy left turn movement with high HGV mix	Entry treatment at side road junction	Left turn ban for general traffic
Opposed right turns with general traffic accelerating quickly into opportunistic gaps	Continuation of lane across junction	Opposing right turn banned for general traffic
Left slip lane	Right-turn protected island	Physically protected turn
Guard-railing	Tight corner radii; pinch points removed (avoiding nearside lane of 3.2-4.0m)	Left bypass of signals
Large junction radii	Bus lane of 3.0-3.2m or of 4.5m or more	Segregation of cycle movements using dedicated cycle signals
High speed motor traffic through junction	2m wide central feeder lane	Raised tables
Uphill gradients	ASLs (preferably 5m+ deep)	Area-wide speed limit/ reduction
Wide junction crossings	Signal adjustments to cycle movements	
No clear nearside access		
Multiple lanes		

Step 5 CLOS – Abbey Road

This section of Abbey Road is characterised by large surface warehouses and industrial estates with single access points. Two-way segregated cycle tracks are provided on one side of this section of Abbey Road. Basic maintenance measures to improve the existing cycle tracks would include cutting back vegetation, removing damaged street furniture and re-positioning street furniture blocking the cycle track or its visibility.

Continuity of the off-street paths over the major junctions is poor. Toucan crossings are not provided at the signalised junctions. The large roundabout at Premier Park Road has wide junction arms that encourage fast vehicle speeds through the junction. The arms have islands to facilitate uncontrolled crossing but visibility between some of the vehicle turning movements (notably HGVs turning left into Premier Park Road) and cyclists is poor.

Cycle access between the off-street tracks on Abbey Road and the towpath is constrained in terms of space but safe.









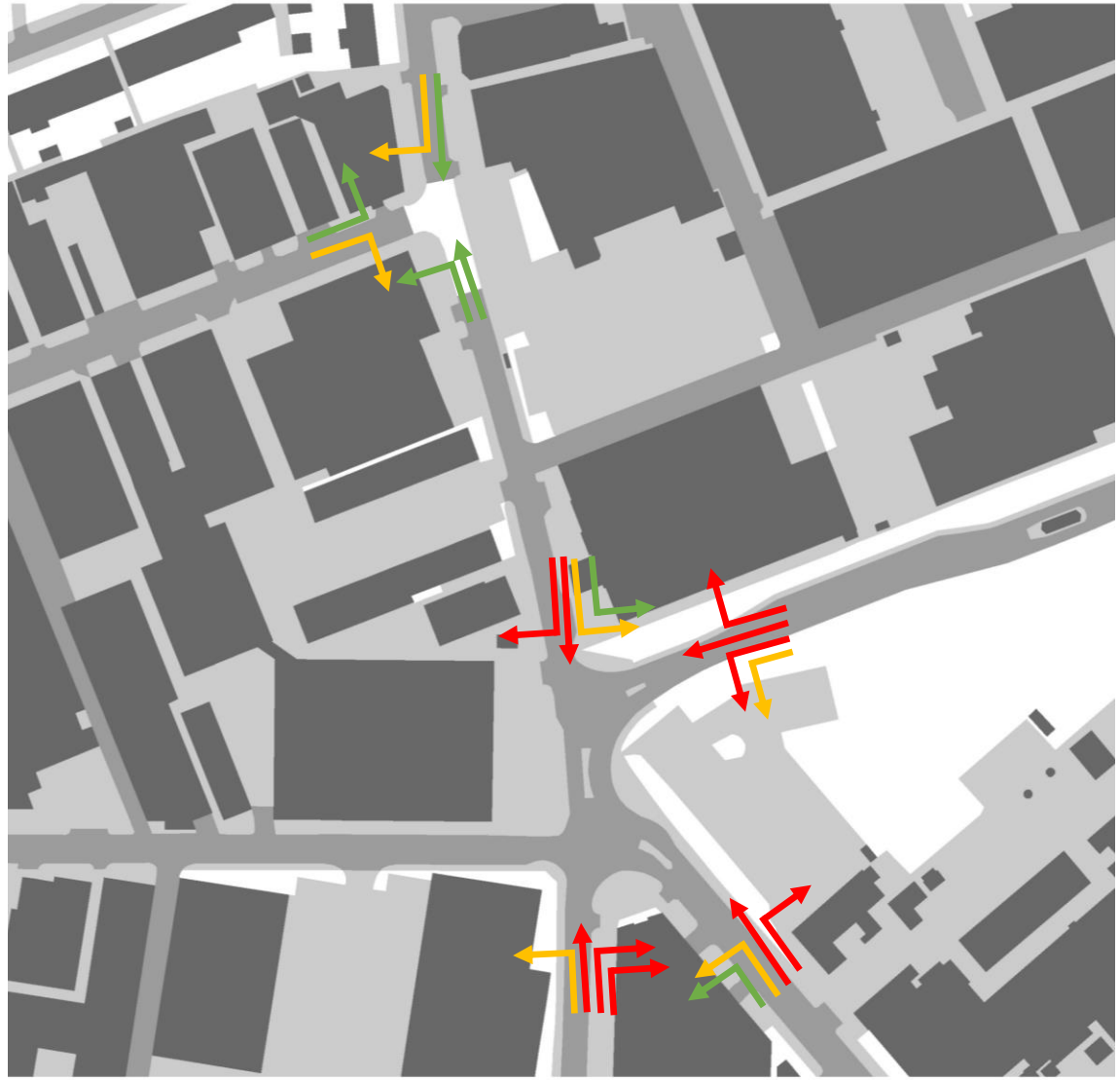
WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Step 5 CLOS – Chase Road

The streets in this example are characterised by narrower carriageways with mixed frontages and frequent forecourt activity and parking. No off-street cycling infrastructure is provided.

Standard Road and Minerva Road provide one-way links to /from Park Royal Road. A double mini-roundabout arrangement manages access to Volt Avenue and Standard Road. Strong flows of goods vehicles are observed travelling along Chase Road in both directions and westbound from Bashley Road to Standard Road. Aggressive driving behaviour is frequently observed, with some drivers willing to accept particularly short gaps to enter the roundabouts. Vehicle speeds and junction geometry make cycle movements, in particular right-turning movements, different for all but the most confident cyclists.

The T-junction with Minerva Road is traffic calmed with a raised table and zebra crossing facility. It can be observed that vehicles adapt their speed and behaviour accordingly at this junction, making conditions easier for cyclists.









WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Recommendations – Establish cycle route hierarchy in Old Oak Common

North-south corridors:

- Cycle improvements on Scrubs Lane are currently under investigation in a separate study and are likely to include segregated tracks.
- Cycle improvements on Victoria Road are currently under investigation in a separate study and are likely to include a secondary quieter route through the Shield site with a new pedestrian/cycle link to the Perfume Factory site. This will form part of the preferred HGV access route for construction of the HS2 station, which means the provision of a secondary route is an important link in the short-term.
- Old Oak Common Lane is unlikely to be attractive for cycling due to the gradient, potentially blank walls and servicing access to Old Oak Common Station
- An alternative signed cycle route from East Acton skirting around Wormwood Scrubs and crossing into Grand Union Street to the east of Old Oak Common Station should therefore be provided.

Cycle infrastructure on the High Street and Grand Union Street needs to be appropriate to their character. Segregated cycling facilities should be provided in a way that minimises conflict with high retail footfall (e.g. stepped tracks) and busy bus stops (e.g. one-way tracks to the rear of floating bus stops).

The remaining links around Old Oak Common HS2 Station and in the Car Giant site are expected to use a combination of traffic calming, filtered permeability and off-street cycle tracks on busier access roads to complete the cycle network.

Many links in the street network will have gradients of up to 1:20 as a result of the need to connect bridges and viaducts over and under railway lines and the canal. At 5% gradients over long distances, care should be taken to provide wider uphill cycle lanes due to the increased lateral movement of cyclists and to consider measures to calm the speed of downhill cyclists.

Cycle access to the towpath should be provided from the High Street. As long as lifts can also be provided as an alternative, it would be acceptable to provide ramps steeper than 1:20 to overcome what may be a considerable height difference between the towpath and the High Street.

Recommendations – Improve existing off-street cycle network in Park Royal

This package of measures can provide access to the existing fragmented off-street network in Park Royal, and convert it into a continuous route:

T22.1 Upgraded cycle tracks and junction improvements on Abbey Road

T42 Improved cycle lanes across Harlesden bridge

T23 Improved link from Park Royal station

T41.1, T41.2 and T41.3 Cycle facilities at roundabouts to link cycle tracks

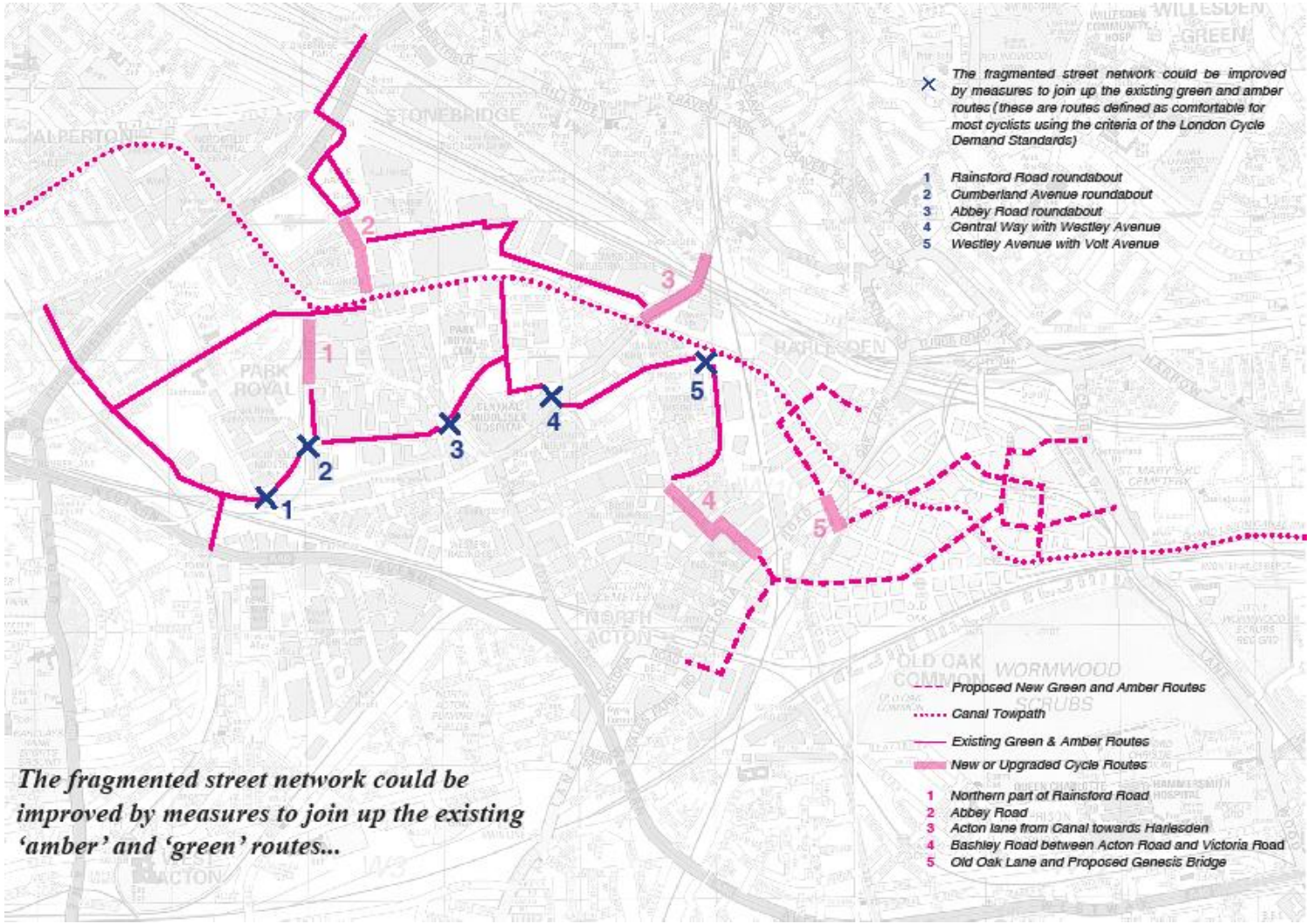
T41.4 Enable new link through the rear of Central Middlesex Hospital, across Abbey Lane and into the Wesley Avenue filtered route

T41.5 New link to canal towpath and Volt Avenue at the rear of North Acton Road park (if feasible)

T41.6 Improved link to canal towpath at Steele Road (incl. parking restrictions on approach)

T41.7 Completion of cycle track along Rainsford Road to Twyford Abbey Road, and connection to towpath

T43 Traffic calming measures in Bashley Road and Chandos Road



WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Recommendations – Improve existing off-street cycle network in Park Royal

Relevant design considerations for off-street network improvements:

- Cycle tracks (see LCDS section 4.2)
- Signalised junctions (see LCDS section 5.4)
- Roundabouts (see LCDS section 5.5)





WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Recommendations – Improve remaining cycle routes in Park Royal

The permeability analysis highlighted that the eastern part of Park Royal is a dense and growing area of employment but that it is the least permeable by bicycle. More major route improvements will be required to change the character of these roads to bring them to a level where they are comfortable for most cyclists.

Improvements to other main routes in order of priority:

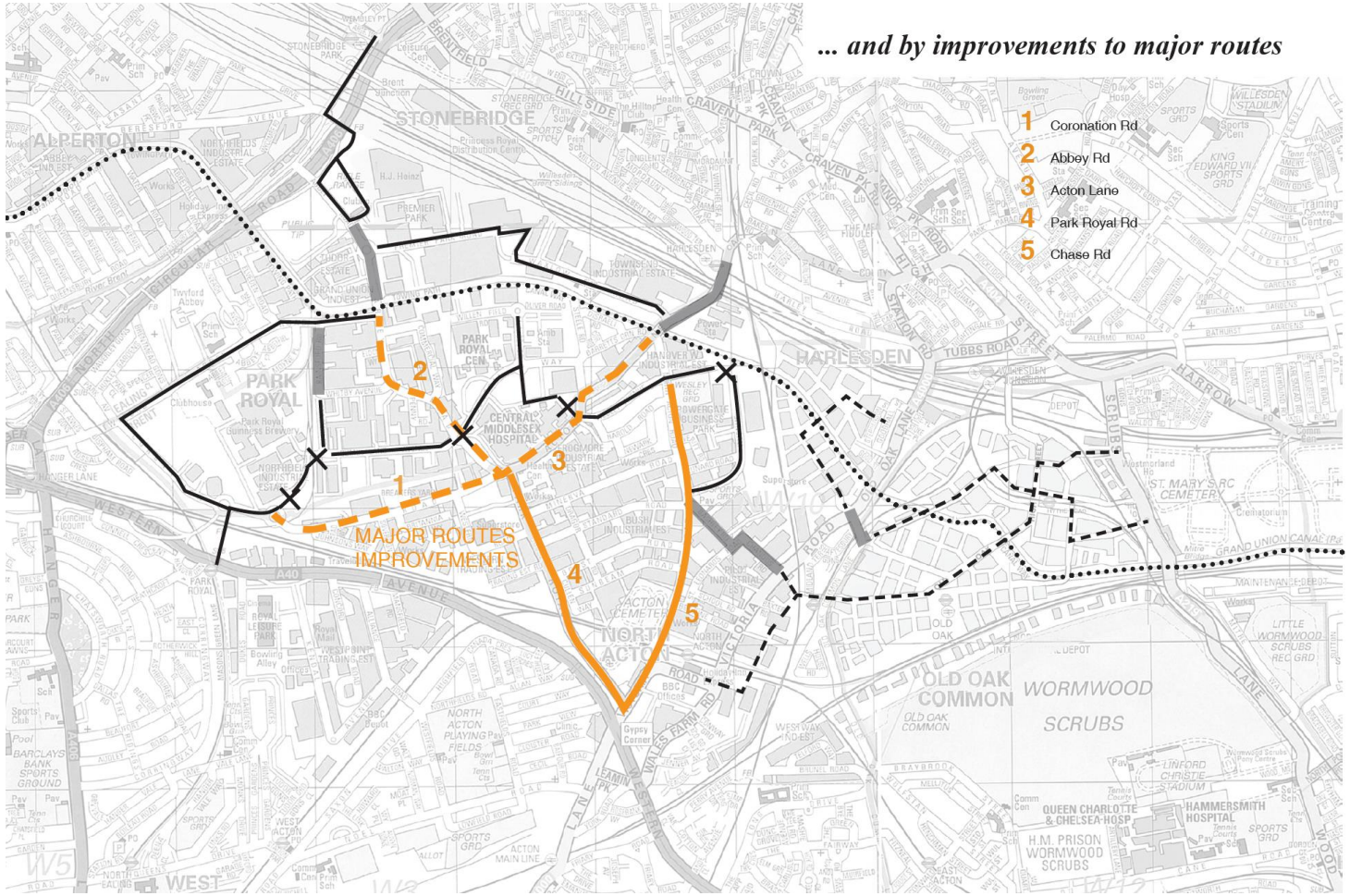
T44 Park Royal Road on- and off-street cycle lane improvements (potentially including link to the rear of the current Asda)

T45 Chase Road on-street cycle lanes and traffic calming at mini-roundabouts

T22.2 Cycle route improvements along Abbey Road

T46 Cycle route improvements and parking enforcement along Coronation Road

T47 Cycle route improvements along Abbey Lane



WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

Recommendations – Improve remaining cycle routes in Park Royal

Relevant design considerations for remaining routes network improvements:

- Cycle lanes (see LCDS section 4.3)
    - See section 4.3.4 on light segregation for a discussion of lightly protected cycle lanes, and design considerations where the segregating line is broken to allow access to side streets and frontages.
- Signalised junctions (see LCDS section 5.4)
- Roundabouts (see LCDS section 5.5)





WEDDERBURN.
TRANSPORT PLANNING AT A HUMAN SCALE

5th studio