AECOM

Broxbourne Transport Strategy Phase 2

Existing Conditions, Issues and Opportunities

May 2016

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Broxbourne Transport Strategy Phase 2

BOROUGH OF BROXBOURNE
www.broxbourne.gov.uk

Hertfordshire
Local Enterprise Partnership

Quality information

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000a	05/05/2016	AECOM Check 01 AECOM Approve 01	George Lunt Nik Bowyer	Associate Director Principal Consultant / Project Manager
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001b	06/06/2016	Client Check AECOM Approve 03	Kim Harding Nik Bowyer	Principal Policy Planner, Broxbourne Principal Consultant / Project Manager

Contents

1. Introduction

1.1. Background

1.1.1. Broxbourne Borough Council ("BBC") has recently completed a transport study analysing the impacts of likely traffic growth across the district, a result of projected increases in background traffic growth and of development sites proposed in the Broxbourne Local Plan (hereafter "the Local Plan"). The Local Plan covers the period 2016 to 2031. The outcome of this study was that the most significant impacts on the road network were predicted to occur in the south of the borough and on the A10, which forms a key north-south route through Broxbourne, Hertfordshire and the East of England.

1.1.2. BBC has commissioned AECOM to complete a study to take forward the work described above (Phase 1) into Phase 2 and will provide a robust evidence base to support BBC's transport strategy document during examination of the Local Plan. It will provide a means by which potential mitigation measures for the borough's road network may be progressed through a sifting exercise. It is imperative that suitable and robust transport measures are identified to promote the economic prosperity of Broxbourne through enabling of both residential and employment developments.

1.1.3. There are many workstreams involved in the production the Local Plan and corresponding supporting evidence bases. The 'Transport Strategy' needs to be produced at two key points in time:

- An 'interim' document supporting the Regulation 18 consultation exercise (June / July 2016)
- A 'final' document to support the Regulation 19 consultation (December 2016).

1.1.4. At each point in time a supporting Evidence Document is required which underpins the objectives and aims of the strategy. This evidence base will also be required to justify the level of development that can be accommodated by the transport network within the Local Plan period.

1.1.5. It is essential to understand the existing infrastructure provision within the borough and the existing issues that put pressure on the borough's assets. This evidence can help indicate likely issues that may occur in the future. It can also help to identify potential opportunities for future development and management of said infrastructure. This document brings together and summarises the existing conditions, issues and opportunities in the form of an Existing Conditions, Issues and Opportunities Report (ECIOR).

1.1.6. The ECIOR provides a summary of the data held by BBC and Hertfordshire County Council (HCC) and that which is openly available. It breaks the local transport provision down to individual streams and then draws these strands together to identify themes across the different modes.

1.1.7. This document also provides details of the workshop completed at BBC offices on 20th April 2016, where figures showing the existing conditions (included here as Appendices) were used to stimulate discussion and the issues and opportunities identified with each mode of transport was discussed. It will provide the background to the modelling exercise and the outputs will be used to sift potential transport strategies and feed into the Local Plan.

1.1.8. The key modelling outputs of the overall project will be updated forecasts of the Broxbourne Local Plan SATURN model comprising update forecast years aligned with the plan period, refined trip generation assumptions and the incorporation of the latest Local Plan sites.

1.2. Document Structure

1.2.1. The remainder of this document is structured as follows:

- Section 2: Existing Conditions Summary;
- Section 3: Issues identified at the workshop;
- Section 4: Opportunities identified at the workshop; and
- Section 5: Summary.

2. Existing Conditions Summary

This section gives an overview of existing transport infrastructure and associated information within the Borough of Broxbourne. Data are provided by Broxbourne Borough Council, Hertfordshire County Council, OpenStreetMap and publicly available bus information.

The information below is a summary of that contained in the Appendix, the information was presented at a workshop on 20th April 2016 with council officers and other stakeholders to stimulate the discussion surrounding transport issues in the borough.

2.1. Walking

Appendix 1 – Controlled Pedestrian Crossings

2.1.1. There are pedestrian and shared use bridges over the A10 at Lord Street and Cock Lane in Hoddesdon, Bass Hill and Church Lane in Broxbourne, Brookfield Lane and College Road in Cheshunt and by Theobalds Lane in Waltham Cross.

2.1.2. There are 63 controlled crossing points in the borough; 17 Puffin crossings 32 Pelican crossings, 11 Zebra crossings and 3 Toucan crossings. There are informal walking routes along the river bank, which consist of mainly worn grass/mud paths.

2.2. Cycling

Appendix 2 – Cycle Paths & Routes. Cycle Parking & Crossing Points

2.2.1. There is one National Cycle Network (NCN) cycle route from east of Cheshunt Station to the A10, the route is signed through residential estates and follows the road, which has on street parking. The NCN typically comprises traffic-free paths and quiet on-road cycling and walking routes, providing safer journeys for cyclists.

2.2.2. There are six official off-road cycle routes all on shared surfaces and shared use bridleways. These short sections include the Great Cambridge Road in Turnford, Goffs Lane to Churchgate Road to the west of the A10 in Cheshunt, Hammondstreet Road in Goff Oak, Sections of the A121 in Waltham Cross and Waltham Abbey and a very short section of A1170 in Hoddesdon.

2.2.3. There is provision of cycle parking at some key destinations; however the coverage of these seems to be sporadic and many more key destinations such as schools and shops are without them.

2.2.4. There are 8 routes over the A10, identified in 2.1.1, providing segregated transit across the A10. There are also under passes, for example near Waltham Cross rail station, these provide additional segregated ways to cross the A10. The majority of grade separated crossing locations are toward the northern end of the A10, as this section is a dual carriageway, with grade separated junctions.

2.2.5. There are three toucan crossings, all in the south of the borough, two of them are on the A121 and the third is by Theobald's Grove rail station. Toucan crossings are typically wider than pelican or puffin crossings, allowing cyclists and pedestrians to cross simultaneously.

2.3. Bus

Appendix 3 – Access to Bus Routes

2.3.1. Bus services are summarised in Table 2.3.1 below. High frequency routes (i.e. more than 5 services an hour) are all operated by Arriva with the exception of the 217 (Metroline).

2.3.2. Appendix 3 shows the coverage provided by bus stops. It uses the benchmark distance for walking to a bus stop of 400m (suggested walking distance as per government advice on inclusive mobility) and a maximum acceptable distance of 800m, these areas are highlighted using the bus stops as a centrepoint. This shows only a few areas which are unserved by bus, mostly on the outskirts of already developed land.

Table - 2.3.1 – Bus Services, Operators and Frequencies

Route	Operator	Origin	Destination	Frequency	Return Frequency
211	Regal Busways	Waltham Cross	Breach Barns	0.5	0.5
212	Regal Busways	Waltham Cross	Breach Barns	0.5	0.5
213	Regal Busways	Waltham Cross	Epping	1.25	1
217	Metroline	Waltham Cross	Turnpike Lane	5	4.75
240*	Regal Busways	Waltham Cross	Debden	0.5	0.5
242	Metroline	Waltham Cross	Cheshunt/ Potters Bar	1.75	1.75
250^	Regal Busways	Waltham Cross	Debden	1	1
251	Arriva	Hammond Street	Waltham Abbey	3	3.25
279	Arriva London	Waltham Cross	Manor House	10.25	10.25
310	Arriva	Hertford	Waltham Cross	6	6.25
317	Arriva London	Waltham Cross	Enfield	3	3
327	Go - Ahead London	Waltham Cross	Elsinge Estate	2 – Circular Route	
410/410a	TrustyBus	Holdbrook Estate	Harlow	2	2
411*	TrustyBus	Holdbrook Estate	Hertford	1	1
n279^	Arriva London	Waltham Cross	London, Trafalgar Square	3	3

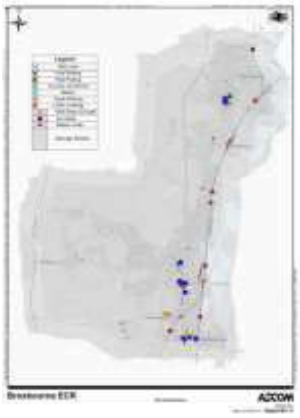
(*Sunday Only ^Night Bus Only)

2.3.3. There are a number of stops in the north east corner of the borough that exist on street, but appear not to be served by a bus service.

2.3.4. There are only three very short sections of bus lane identified within the study area and no coherent strategy between them. They are the northbound and southbound approaches to the junction of Turners Hill and Windmill Lane (the access road to Cheshunt Station) and the east to west Brewery Road in Hoddesdon.

2.4. Rail

Appendix 4 – Rail Infrastructure
Appendix 5 - Passenger Numbers through the key local stations



2.4.1. The rail infrastructure shows five stations in the borough, varying in physical size with the largest one being Broxbourne station, which is currently undergoing a programme of renovations. However, Cheshunt Station carries a greater number of passengers per year and indeed has more services.

2.4.2. There are eight level crossings including an uncontrolled gated pedestrian crossing by Park Lane.

2.4.3. There are cycle parking facilities provided at both Cheshunt Station and Broxbourne Station.

2.4.4. Cheshunt and Broxbourne Station have significant private parking facilities on site, with additional parking at the LIDO car park in close proximity to Broxbourne Station.

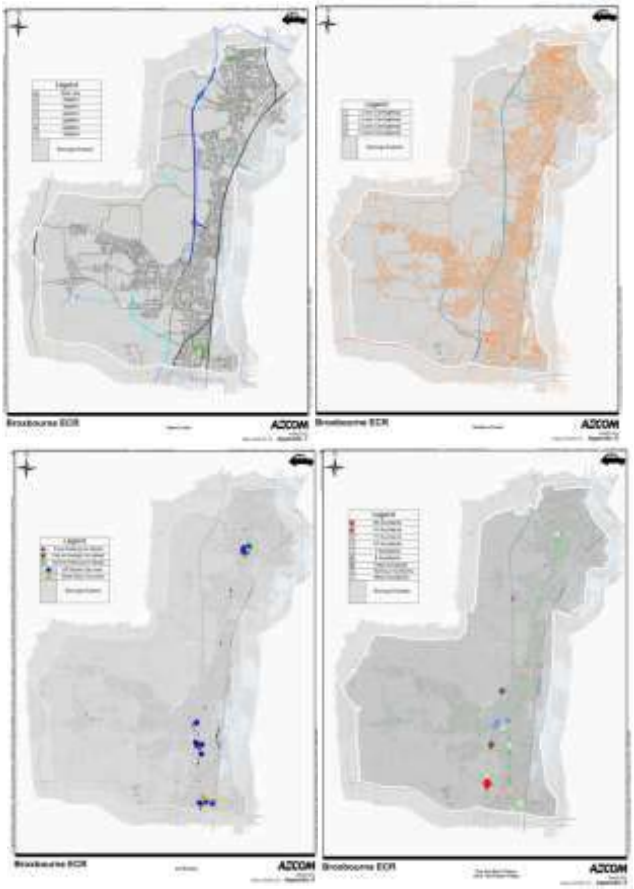
2.4.5. The table below details the number of entry and exit movements through each station for the last complete years. The data is latest in the series of Estimates of Station Usage for 2014-15, for all stations in Great Britain, published by Office of Rail and Road (ORR) on 15th December 2015.

Table 2.4.1 – Passenger Numbers through the key local stations (Appendix 5)

Station Name	2014-2015 Entries & Exits	Operator	Final destinations served	Service departures per hour (weekday 1pm-2pm)
Cheshunt	2,140,962	Abellio Greater Anglia	NB - Cambridge, Bishops Stortford, Hertford East	14
			SB - Stratford, London Liverpool Street	
Broxbourne	1,707,972	Abellio Greater Anglia	NB - Cambridge, Bishops Stortford, Hertford East	12
			SB - Stratford, London Liverpool Street	
Waltham Cross	881,504	Abellio Greater Anglia	NB - Cambridge, Bishops Stortford, Hertford East	6
			SB - Stratford, London Liverpool Street	
Rye House	432,202	Abellio Greater Anglia	NB - Hertford East	4
Theobalds Grove	297,524	London Overground	NB - Cheshunt	4
			SB - London Liverpool Street	

2.5. Roads

Appendix 6 – Number of Lanes
Appendix 7 – Speed Limits
Appendix 8 – Car Parking
Appendix 9 – Key Accident Clusters
Appendix 10.1 – SATURN Traffic Flows, AM
Appendix 10.2 – SATURN Traffic Flows, PM
Appendix 10.3 – SATURN Traffic Flows, AM - HGV
Appendix 10.4 – SATURN Traffic Flows, PM - HGV



2.5.1. Consistent and reliable traffic volume data are difficult to obtain or do not exist. Highways England maintains a detailed set of traffic flow data across the Strategic Road Network (SRN) although this accounts for a very low proportion of the road network in the vicinity of Broxbourne borough, with the M25 to the south being the only SRN around the borough. Likewise, the local highway authority – Hertfordshire County Council – maintains a set of annual monitoring sites and ad-hoc data, although these are sporadic within the borough and do not provide a continuous or consistent picture of the local road network.

2.5.2. As a proxy for observed traffic, data from the Broxbourne SATURN model have been used. The Broxbourne SATURN model has been validated to a Base Year of 2013 in accordance with the methods set out in the Department for Transport's (DfT) WebTAG. The SATURN model covers all of the A-roads, B-roads and main unclassified routes in the borough, with traffic loaded on at the edge of this network to represent traffic to/from neighbouring areas. The models have appropriate link/flow relationships modelled, with junction detail simulated to the method of operation and standard of junction. The validation of the model to 2013 traffic count data means that the model is suitable to act as a proxy to identify key existing traffic volumes and congestion.

2.5.3. The road network in Broxbourne consists of mainly single lane roads, however running north-south is the A10 and east-west at the southern extent of the borough is the M25.

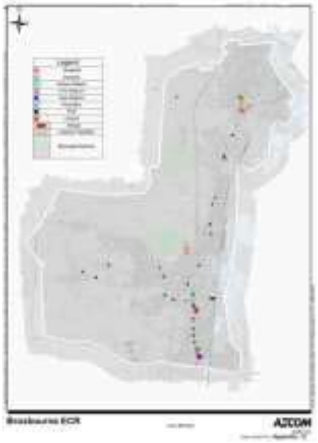
2.5.4. Speed limits across the local roads in the borough are mainly 30mph, with selected pockets of 20mph, 40mph and 50mph. The A10 speed limit varies in a northbound direction from 50mph, through 40mph and up to 60mph at the north of the borough.

2.5.5. The key accident hotspots are focused at the key junctions on the A10, Lieutenant Ellis Way, Church Lane and College Road. Other key locations are junctions at the southern end of the A1170 and A121.

2.5.6. There are 11 recognised car parks, mostly at grade but with a multi-storey car park at the Pavilions Shopping Centre. There are many on-street disabled parking locations, many of which are located around local housing. There are further pay and display locations, such as in front of shops and several free parking locations. There are other larger car parks but these are part of shops such as Sainsbury's at Hoddesdon and the Brookfield Centre.

2.6. Local Demographics and Geography

Appendix 11 – School Locations
Appendix 12 – Local Services
Appendix 13 – Travel to School Locations



2.6.1. The local places of interest in the borough include three doctors' surgeries, two in Hoddesdon and one in Cheshunt.

2.6.2. The hospital, fire station and police station are located close to each other in Cheshunt.

2.6.3. There are a total of 39 state-run education facilities in the borough, comprising:

- Three nurseries;
- 28 primary schools;
- Six secondary schools; and
- Two 'other' educational facilities, including education support centres.

2.6.4. The summary of the travel to work data taken from 2011 Census, shows that a greater number of residents of Broxbourne travel out of the borough to other locations to work, compared with the number of residents from other areas who commute into the Borough. The two key destinations for outflows being Enfield and East Herefordshire are also the two top origins for inflows.

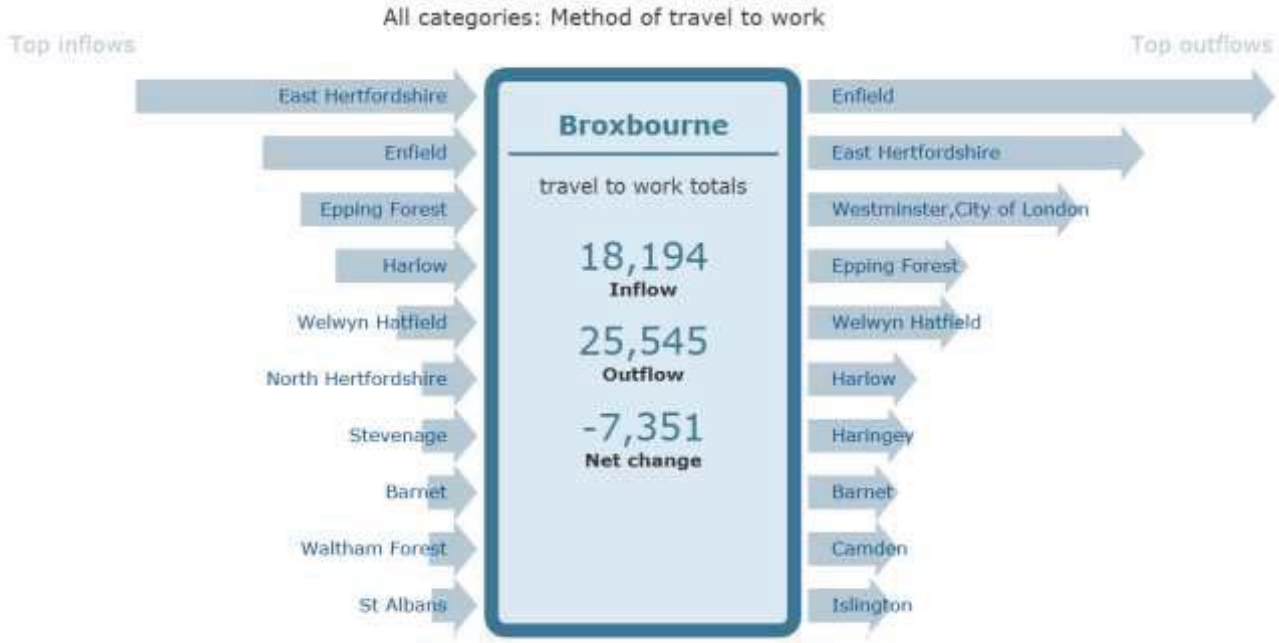


Figure 2.6.1 – Journey to Work Origins and Destinations for Broxbourne

2.6.5. The same data also show that cycling and walking both accounts for a lower proportion of travel than the national, regional and countywide averages. However train travel accounts for a higher proportion of trips than the national and regional average, reflecting the proximity of the borough to London.

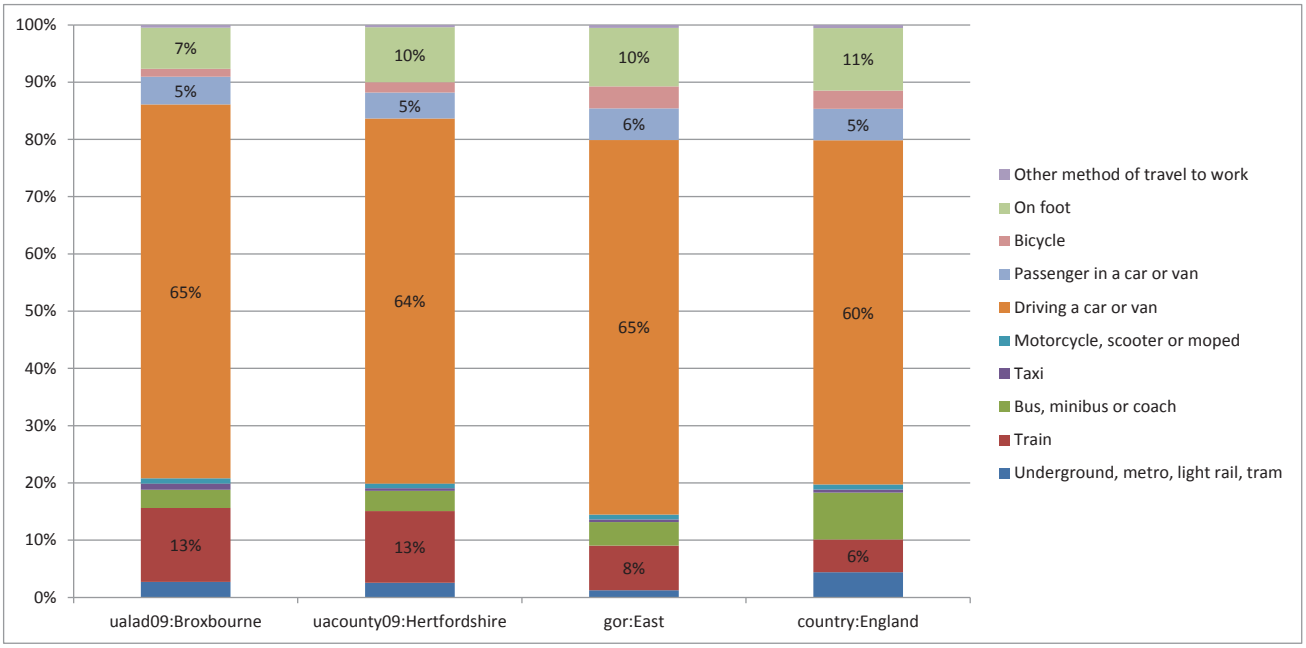


Figure 2.6.2 – Journey to Work Model Choice for Broxbourne; Compared to the County, Regional and National Average

2.6.6. The data also show that there are fewer short distance trips travelled for work, whilst between 5 and 30km the proportion of trips are higher than those for the rest of the county, region and country.

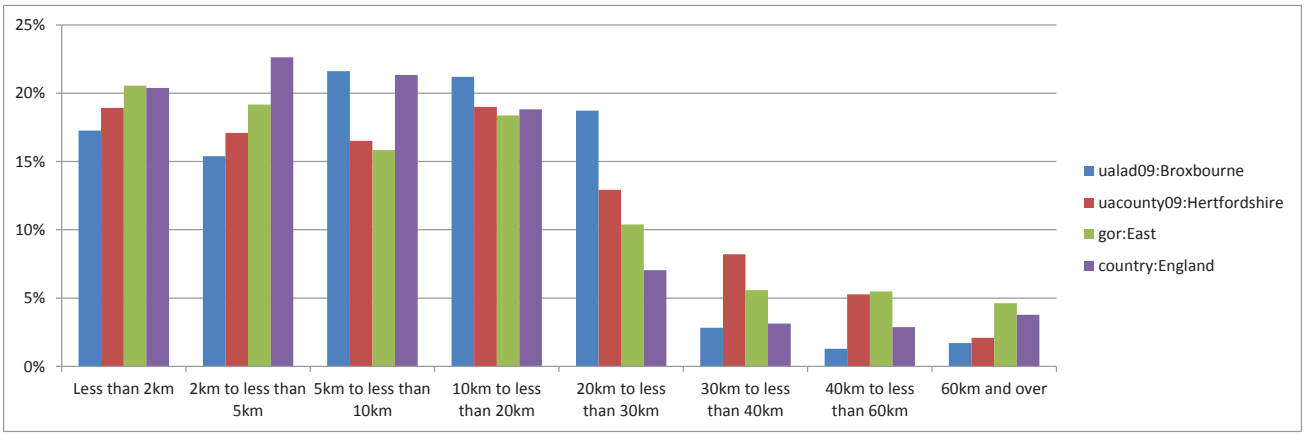


Figure 2.6.3 – Journey to Work distances for Broxbourne; Compared to the County, Regional and National Average

3. Issues

On 20th April 2016 a workshop was held in Broxbourne Borough Council offices to discuss the existing conditions and identify the transport issues and opportunities in the borough.

3.1. Workshop

3.1.1. Representatives for Broxbourne Borough Council, East Hertfordshire District Council, London Borough of Enfield, Epping Forest District Council, Harlow District Council, Welwyn-Hatfield Borough Council, Essex County Council, Hertfordshire County Council, Highways England; Transport for London; Hertfordshire Local Enterprise Partnership (LEP), Lee Valley Regional Park Authority and Thames Water were invited to attend. These neighbouring authorities and key strategic organisations were considered to be the key local stakeholders.

3.1.2. Representatives listed below were able to attend the workshop.

- Broxbourne Borough Council – Kim Harding, Douglas Cooper, Martin Paine, Alf Cuffaro;
- Hertfordshire County Council – Sue Jackson, Roger Flowerday, David Burt, Chris Allen-Smith;
- East Hertfordshire District Council – Kay Mead;
- Welwyn-Hatfield Borough Council – Paul Everard; and
- AECOM – Nik Bowyer, Stephen Hathaway, George Lunt.

3.1.3. The output of the workshop was the discussion of issues and opportunities, captured by AECOM, in both note and diagrammatical form.

3.1.4. AECOM collated the views of the attendees and are appended to the Appendices of the existing conditions section of this document. The full versions of these are included in Appendix 14.

3.2. Development Overview

3.2.1. To set the scene for the discussion Douglas Cooper described a revised set of development proposals for which BBC are looking to provide for as part of the Local Plan. Those larger development sites include:

- 1,500 houses and Retail Hub at Brookfield;
- 1 million square foot of Business Park at Park Plaza;
- 700 houses at Rosedale Park;
- 1,000 houses at Delamare Road; and
- 400 houses at High Leigh (Hoddesdon) – up to 523.

3.3. Notes of Discussion

3.3.1. The discussion was wide ranging and the local issues raised by attendees have been collated and split up by mode.

Issues – Walking

3.3.2. **Desire**: There is a low level of walking in the borough as there is 'less need to walk here than elsewhere'. So walking becomes a leisure activity rather than necessity.

3.3.3. **Health**: The district has a higher level of obesity than the national average.

3.3.4. **Public realm**: The public realm is in a poor state, there are narrow footways and a generally unappealing environment. This includes the pedestrian centres, shops, destinations, which are all perceived to be of poor quality.

3.3.5. **River path**: The 'New River Path' is currently just worn grass, this provides good access in summer, when it is dry but gets muddy in winter. It also does not cater for vulnerable users, such as the elderly or disabled.

3.3.6. **Connections**: Where there are connections provided between walking and other modes, the quality is low.

3.3.7. **Distance**: There is a significant distance between Cheshunt Station and the shops/facilities/key destinations that it would serve, as it is located to the extreme east of the borough. For example it is a 25 minute walk from Cheshunt Station to Council Offices, which dissuades most people from using the train to access the offices.

3.3.8. **A10 severance**: The perception is there are many main and busy roads to cross, to move from the east to the west of the borough, there are also long crossing times at these major junctions: for example, waiting five minutes in an unpleasant location to cross the A10 at Church Lane is not uncommon. This causes major severance between east and west.

3.3.9. **Footbridges**: The coloured footbridge over the A10 is underused and the Park Plaza crossings are currently underused, despite being able to carry a high capacity of pedestrians.

3.3.10. **Railway severance**: The at-grade crossings over the railway, mainly level crossings, cause severance/delay. The bridges also cause severance however and are unsuitable for some users such as the disabled, cyclists, buggies and elderly.

3.3.11. **Pedestrian safety:** There is also a simple gated at-grade pedestrian crossing over railway by Park Lane, there is no safety measures here, apart from a sign advising to look both way prior to crossing.

3.3.12. **Railway severance:** Access to the leisure facilities at Lee Valley Regional Park are restricted by the railway and the crossings provided.

3.3.13. **Severance:** There are poor access arrangements to Tesco/M&S at Brookfield; this is due to entrances to the building being on the wrong side for pedestrian access from Halfhide Lane.

3.3.14. **Health**: There are five declared Air Quality Management Areas (AQMAs) in the borough and several more that will be shortly announced – for example Waltham Cross and Monarchs Way is due to be declared.

Issues – Cycling

3.3.15. **Ownership:** There are shared use paths (SUPs) signed across the borough but no other facilities in place to support their designation. As a result there is a high level of conflict with pedestrians.

3.3.16. **Cyclist safety:** The cycle lanes on the on the B3176 consist of inconsistently provided and worn green lanes. They provide a false sense of security, are regularly blocked with parked cars and there is has a high level of conflict with traffic. Furthermore the highway condition on the 1m nearest the kerb is at its worst and so provides a very poor level of provision for cyclists.

3.3.17. **Public awareness:** The A10 north to south cycle route is barely used and not very well known. This perceived lack of a north to south route and severance east to west due to A10/River/Railway, leads to a disconnected network for cyclists.

3.3.18. **Severance:** The London Borough (LB) of Enfield is currently implementing 'mini-Holland' schemes (up to £30m funding). The schemes are to be in-place by 2018 and current cycle provision does not provide a coordinated strategy to connect to LB Enfield, apart from via the Lea Valley Park, meaning a high level of severance exists and generally poor cross boundary provision.

3.3.19. **Cyclist safety:** The circular cycle routes in the west of the borough are leisure routes, unsuitable for commuting.

3.3.20. **Cyclist safety:** There is a general lack of secure cycle parking at work places/schools/interchanges. Facilities at Cheshunt Station were full of motorbikes.

Issues – Bus

3.3.21. **Public perception:** The general consensus from workshop attendees was that there was a lack of any consistent bus priority measures across the borough.

3.3.22. **Public perception:** The quality of the bus infrastructure is poor across the borough and the bus quality is low.

3.3.23. **Service provision:** The routes serving the borough are predominantly north to south, there is minimal provision east to west and they don't appropriately serve the key destinations such as retail centres, rail stations and other local services.

3.3.24. **Accessibility:** Intermodal accessibility at bus and train interchange is not of a high quality, the distance between the two stations is too great, for a high quality provision.

3.3.25. **Service provision:** The Waltham Cross bus station also provides an interchange point into London, however the station is constrained and congested due to number of services already passing through it.

3.3.26. **Service provision:** Existing bus routes stop at every stop and as such have long journey times compared to cars/trains.

3.3.27. **Service provision:** It is expected that latest advice from Hertfordshire County Council is that 'Buses are soon to have to pay for themselves'.

Issues – Rail

3.3.28. **Accessibility:** Intermodal accessibility at bus and train interchange is not of a high quality, the distance between the two stations is too great, for a high quality provision.

3.3.29. **Railway Severance:** At-grade crossings over the railway, mainly level crossings, cause severance/delay when accessing the stations. It is understood that Crossrail 2 will require the closure of 'surplus' level crossings and other changes to the local network.

3.3.30. **Accessibility:** Theobald's Grove station is not at grade, but accessed by steps so does not provide easy access for the disabled, cyclists, buggies or the elderly.

3.3.31. **Service Provision:** There is a low frequency of trains on the branch line; track capacity is also limited on the mainline. There is also a lack of existing train access facilities at the major development sites of Park Plaza and Turnford (for Brookfield Centre).

Issues – Road

3.3.32. **Congestion:** The main issues are focussed on the A10, and were centred on congestion at the major junctions on the network, particularly around Church Lane/College Road and Lieutenant Ellis Way Roundabout. College Lane and Church Lane junctions particularly stressed for east to west movements due to weight of traffic on the north to south A10.

3.3.33. **Congestion:** There were delays identified in the AM Peak in the south of the borough, towards the M25 and accessing the A10 with suppressed demand also identified, due to existing congestion.

3.3.34. **Congestion:** There is a regional level, strategic element to the congestion on the network, brought about by through trips.

3.3.35. **Congestion:** The network is already under pressure and changes to junctions are only able to be as effective as the next weakest link on the network. This is contributed to by the fact that certain junctions act as a throttle to the remaining network, releasing them could make the overall capacity issues greater.

3.3.36. **Public Perception:** Solutions have previously been presented and were deemed to be unpalatable by local residents; concerns were also raised that a suitable major scheme may not be deliverable or fundable within the LTP period.

3.3.37. **Capacity Limitation:** Specific concerns were raised on the southbound A10 right turn to Church Lane, where queues regularly exceed the capacity of slip road and spill back to main line. The same issue was identified on the left turn to Church Lane from the A10.

3.3.38. **Congestion:** It was identified that generally the A121 has congestion issues, with junctions blocking back through the upstream junction in most peaks.

3.3.39. **Highway Type:** To the west of Goff's Oak the network connections are not very good, the roads here are an evolution of existing local road network, rather than roads built to serve a growing population and so lack the capacity to handle the demands upon them.

4. Workshop Opportunities

4.1.1. An open discussion was held with no options considered as being 'off the table'. There is an element of 'blue-sky thinking' in some of the options generated: sifting was not part of the workshop exercise. The resulting options are detailed below with a short description of their purposes and impacts on key modes.

A10 Underpass at the At-Grade Junctions (Lieutenant Ellis Way, College Road, Church Lane)

4.1.2. To tunnel the A10 under the existing junctions to facilitate direct and un-interrupted movement of the A10 traffic and so remove the mainline conflicting movements from the remaining local traffic junction.

Key Impacts:

4.1.3. *Pedestrian*: This would provide an advantage to the pedestrians, by removing the major conflicting movement from the junctions which cause a barrier to movement. Only local traffic would be left to conflict with them.

4.1.4. *Cyclists*: This would provide an advantage to the cyclists, by removing the major conflicting movement from the junctions which cause a barrier to movement. Only local traffic would be left to conflict with them.

4.1.5. *Road*: Free movement of traffic through the junctions, without the need to stop. There would be a need for local trips to feed on to the A10 either by grade separated slip roads or at other junctions.

4.1.6. *Sustainable Modes*: This option could assist sustainable transport access east to west, by reducing conflicts at the junctions, but does not aid in localising trips the LDP is tasked with.

A10 Flyovers at the At-Grade Junctions (Lieutenant Ellis Way, College Road, Church Lane)

4.1.7. Provide a flyover over the existing junctions to facilitate direct and un-interrupted movement of the A10 traffic and so remove the mainline conflicting movements from the remaining local traffic junction.

Key Impacts:

4.1.8. *Pedestrian*: This would provide an advantage to the pedestrians, by removing the major conflicting movement from the junctions which cause a barrier to movement. Only local traffic would be left to conflict with them, however the public realm would be affected due to the structures at pedestrian level required to support the flyover.

4.1.9. *Cyclists*: This would provide an advantage to the cyclists, by removing the major conflicting movement from the junctions which cause a barrier to movement. Only local traffic would be left to conflict with them.

4.1.10. *Road*: Free movement of traffic through the junctions, without the need to stop. There would be a need for local trips to feed on to the A10 either by grade separated slip roads or at other junctions.

4.1.11. *Sustainable Modes*: This option could assist sustainable transport access east to west, by reducing conflicts at the junctions, but does not aid in localising trips the LDP is tasked with.

M25 Junction 25 Double Grade Separation (i.e. A10 continuous flow north-south)

4.1.12. Provide an additional tier to the grade separation of J25 to enable access to Enfield (through movement on the A10) without interaction with traffic accessing / leaving the M25.

Key Impacts:

4.1.13. *Road*: Improved movement of traffic into and out of the south of the borough, giving improved access to both the M25 and LB Enfield.

4.1.14. *Sustainable Modes*: This option does not address the sustainable transport agenda, nor the localising of trips the LDP is to be tasked with.

Close Vehicle Access to A10 from Church Lane and College Road.

4.1.15. Re-connect local trips away from Church Lane and College Road to new or improved junctions north and south, to facilitate better east to west access for public transport/cycling/pedestrians. This would effectively close Church Lane and College Road junctions to general traffic, allowing for bus and walking/cycling priority measures to potentially be implemented.

Key Impacts:

4.1.16. *Pedestrian*: This would provide an advantage to the pedestrians by removing the conflicting traffic movements from the junctions more time can be allocated to sustainable modes, such as pedestrians/cyclists/buses.

4.1.17. *Cyclists*: This would provide an advantage to the cyclists by removing the conflicting traffic movements from the junctions more time can be allocated to sustainable modes, such as pedestrians/cyclists/buses.

4.1.18. *Bus*: This would provide an advantage to the bus passengers by removing the conflicting traffic movements from the junctions more time can be allocated to sustainable modes, such as pedestrians/cyclists/buses.

4.1.19. *Road*: Reduced access to the junctions will allow more time to be released to the A10 traffic as only conflicted with sustainable trips for the side road. There would be a need for local trips to feed on to the A10 either by grade separated slip roads or at other junctions.

4.1.20. *Sustainable Modes*: This option focusses the attention on the sustainable transport agenda and contributes to the desire to localise trips, as defined in the LDP.

New Link Road Through Lea Valley from A121

4.1.21. Provision of a new link road connecting from the A121 and routed through Lea Valley Park.

Key Impacts:

4.1.22. *Road*: New network capacity to move vehicles from the north to the south of the borough. This would alleviate some of the strategic pressure on the A10. It would also release supressed demand on the highway network.

4.1.23. *Local Place*: this would be an extremely difficult ‘sell’ on an environmental platform, given the wildlife, cultural and ecological importance of the park.

4.1.24. *Cycling*: It would reduce the appeal of the leisure provision in the area.

4.1.25. *Walking*: It would reduce the appeal of the leisure provision in the area.

4.1.26. *Sustainable Modes*: This option does not address the sustainable transport agenda, nor the localising of trips the LDP is to be tasked with.

Express Bus Service along A10 Stopping at Strategic Locations

4.1.27. A new bus service, targeting key destinations and using the A10 to access them. The service would target high frequency and high quality service, with on board facilities such as Wi-Fi.

Key Impacts:

4.1.28. *Bus*: This would reduce the appeal of the existing north south bus routes, and make these more local services, allowing them to be more targeted at local services and at the same time provide a concerted provision for commuters to access the new developments with a quick high quality, high frequency service.

4.1.29. *Road*: Successful provision and uptake should alleviate the generated pressure from the developments on the existing road network.

Link Road to M25 via New M25 Junction

4.1.30. A new road providing a new access point to the M25 via a completely new junction.

Key Impacts:

4.1.31. *Road*: New network capacity to move vehicles from the north to the south of the borough. This would also alleviate some of the strategic pressure on the A10. It would also release supressed demand on the highway network.

4.1.32. *Local Place*: this would be an extremely difficult 'sell' on an environmental platform, given the wildlife, cultural and ecological importance of the local area.

4.1.33. *Sustainable Modes*: This option does not address the sustainable transport agenda, nor the localising of trips the LDP is to be tasked with.

Access from Turnford/Park Plaza to Junction 22 of M25

4.1.34. Re-purposing the existing local highway to facilitate a route to M25 Junction 22 (London Colney). The route is already used by local traffic, but the capacity is low and the route unsigned.

Key Impacts:

4.1.35. *Road*: New network capacity to move vehicles from the north to the south of the borough. This would also alleviate some of the strategic pressure on the A10. It would also release supressed demand on the highway network.

4.1.36. *Local Place*: this could be a difficult 'sell' on an environmental platform, given the wildlife, cultural and ecological importance of the local area.

4.1.37. *Sustainable Modes*: This option does not address the sustainable transport agenda, nor the localising of trips the LDP is to be tasked with.

Rail Halt on Seven Sisters Line for Park Plaza

4.1.38. Provide a new local service via a new 'halt' (a small station, generally unstaffed and with no goods facilities) on the established line, thus providing access to the Park Plaza development.

Key Impacts:

4.1.39. *Rail*: Provision of new services should alleviate pressure on the existing stations abstracting trips from the network.

New Brompton Cycle Hire Hub at Stations

4.1.40. This would involve working with Brompton to bring one of their cycle hire facilities to the stations, to enable commuters to select Brompton Hire to be a valid mode choice to get to meetings and back to the station.

Key Impacts:

4.1.41. *Cycling*: Encouraging cycling uptake for trips arriving at the stations. The presence of the facility also raises the profile of cycling as a choice to access the station. This increase will aid towards a critical mass of cyclists, which, in turn, will encourage further switching.

New Signed/marked Cycle Routes to Connect the East-West Desire Lines to Rail/Key Destinations

4.1.42. Provide clearly signed and/or segregated offline cycle routes from stations to key development locations to facilitate the east to west desire lines.

Key Impacts:

4.1.43. *Cycling*: To encourage cycling uptake for trips to/from the key destinations. Their existence also raises the profile of cycling as a mode choice, which in turn aids towards achieving the critical mass of cyclists, which, in turn, will encourage further switching.

4.2. Previously Considered Options

4.2.1. JMP Consultants completed a study to assess the highway impacts of different spatial planning scenarios associated with the development of the Broxbourne Local Plan. Testing was undertaken using a SATURN based model, which was an 'extended and enhanced' cordon of the East London Highways Assignment Model (ELHAM), incorporating the highway network within Broxbourne'. The forecasting report compares the performance of the 'Do Minimum' highway conditions against three Local Plan scenarios known as the 'Preferred', 'Alternative' and the 'Combined'.

4.2.2. Mouchel also previously completed a study to determine the impact of the Broxbourne Local Development Framework (LDF) proposals on key junctions on the A10 in the Cheshunt and Waltham Cross area.

4.2.3. These options whilst not considered further are listed here to complete the list of options that could be taken forward for this submission of the LDP.

A10 M25 J25

4.2.4. Proposed improvements to the eastbound M25 Exit to A10 northbound.

A10 Junction with Lieutenant Ellis Way

4.2.5. Various junction designs proposed including hamburger roundabout, by pass lanes and lane widening.

A10 Junction with College Road

4.2.6. Various junction designs proposed including hamburger roundabout, by pass lanes and lane widening.

A10 Junction with Church Lane

4.2.7. Various junction designs were proposed including a hamburger roundabout, by pass lanes and lane widening.

Turnford Interchange from Brookfield Riverside Preliminary TA
Riverside Arm Roundabout from Brookfield Riverside Preliminary TA

4.3. Other Opportunities

4.3.1. It is noted that the focus of the discussion at the workshop and the previously considered options has concentrated on the issues of traffic volumes, congestion and safety on the A10 corridor. However, there are clearly many other and significant overarching issues that were identified through the course of the workshop: in particular concerning active modes (walking and cycling) and buses.

4.3.2. In the development of its transport strategy Broxbourne Borough Council will need to consider the opportunities and options that will further develop the active mode and bus network. The National Planning Policy Framework (NPPF) states that a presumption in favour of sustainable development should be the basis for every plan and every decision. In respect to transport, proposed plans should aim to "*actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and to focus significant development in locations which are or can be made sustainable*". A full framework that sets out how sustainable travel modes will be promoted should be a focus of the transport strategy, with the aim of reducing travel by private vehicle (car).

5. Summary

5.1. Work Completed

5.1.1. This report has provided a record of the existing conditions identified in the borough of Broxbourne, a summary of the existing conditions was used in a workshop with key stakeholders on 20th April 2016.

5.1.2. At the workshop the local transport issues were identified and a record of this discussion is included in this report. The three key themes of the workshop, those which were repeated in reference to multiple modes, were:

- Severance caused by A10
- Congestion on the A10
- Access to Train Stations

5.1.3. The workshop then identified a series of options to mitigate these issues, these will be taken forward to the initial sifting stage of the options.

5.2. Next Steps

5.2.1. Following the identification of existing conditions, issues and opportunities there is a need to assess the viability and deliverability of schemes within the Local Plan period to 2031. A high-level sifting exercise will be undertaken that considers the schemes and provides a qualitative (and quantitative, where data are available) assessment of the viability of the identified issues.

5.2.2. In order to undertake the sifting exercise it is necessary that a robust set of strategic aims and objectives is identified for the planning period by Broxbourne Borough Council. As the issues in particular highlight, there are a number of competing issues in the borough – particularly the relative dominance of the A10 and the need to ensure traffic keeps flowing, compared to the large severance issues that the A10 causes and which A10 prioritisation schemes may exacerbate. The current opportunities / options identification does not address non-highway issues in any significant detail.

5.2.3. AECOM will produce a short document that will set out the framework that development of a transport strategy could follow. This will not be the decision making process or formalisation of the transport strategy in itself, but will provide a guide for Broxbourne Borough Council to work through in order to identify its key aims and objectives. Identification of these objectives will provide a more robust basis for the sifting exercise.

5.2.4. Once the sifting exercise has been undertaken, an assessment of the effectiveness of the highway scheme options will need to be made. This will be undertaken by grouping the highway outputs from the sifting exercise into packages of schemes and assessing the relative outcome of these in the Broxbourne SATURN model. The current modelling platform does not allow for the testing of non-highway schemes, although travel demand management measures may be able to be represented through the reduction of trip rate. The framework produced by AECOM will identify further opportunities for more detailed assessment of alternative options.

AECOM

Broxbourne Transport Strategy Phase 2

Existing Conditions, Issues and Opportunities
APPENDICES

May 2016

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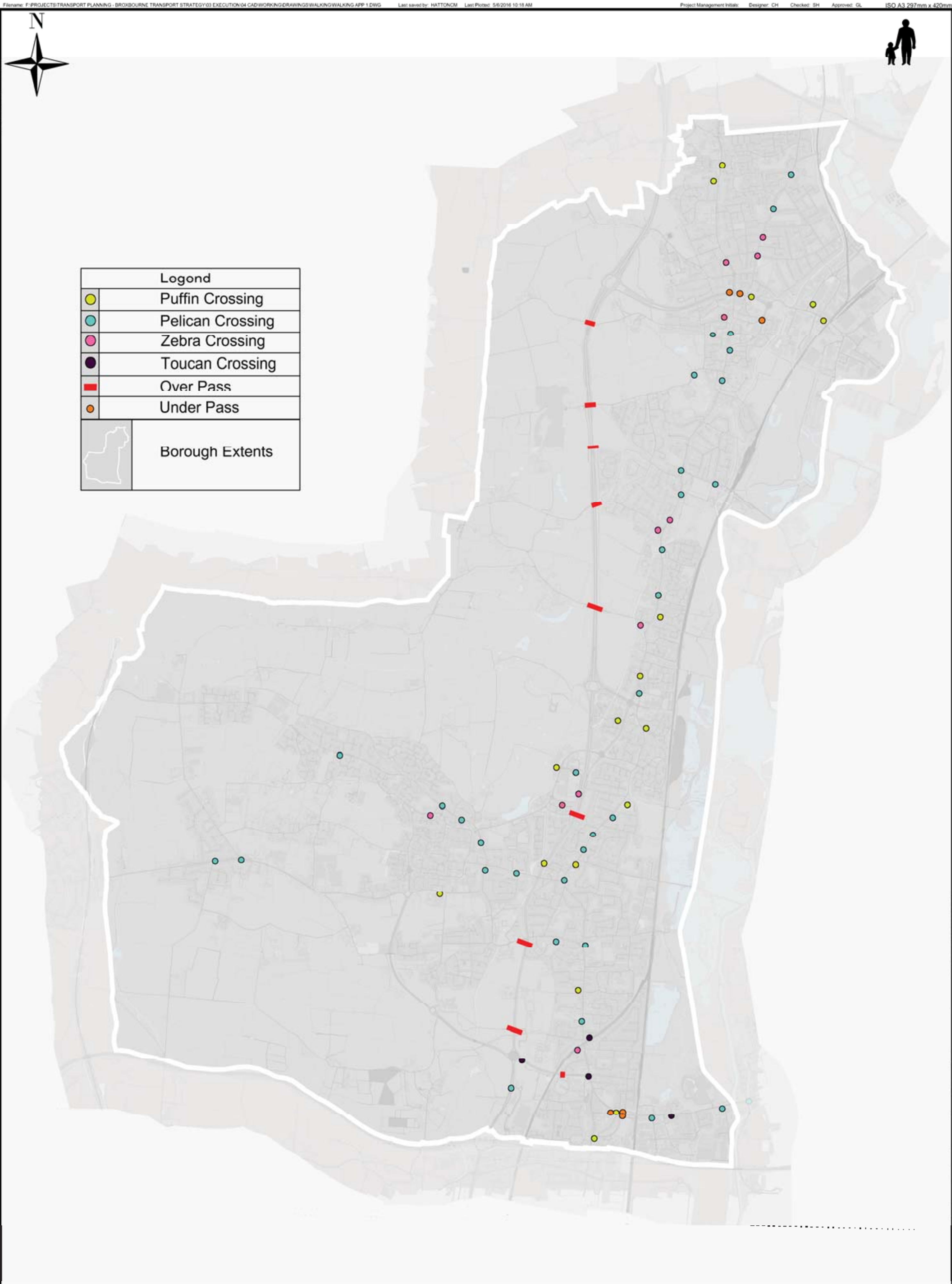

Broxbourne ECR

Controlled Pedestrian Crossings

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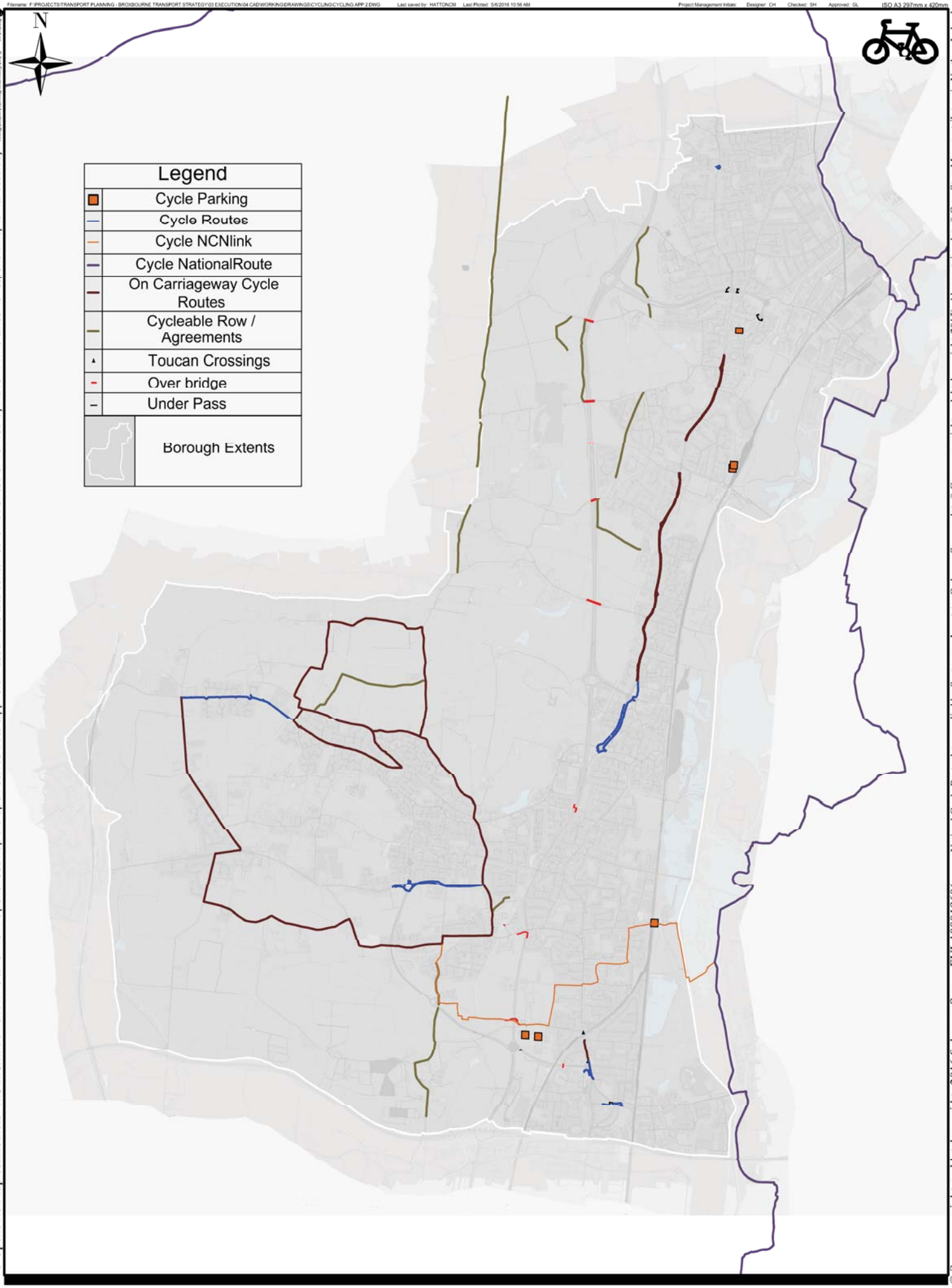
Date: 2016-04-15 **Appendix: 1**



Broxbourne ECR

Cycle Paths & Routes
Cycle Parking & Crossing Points

AECOM

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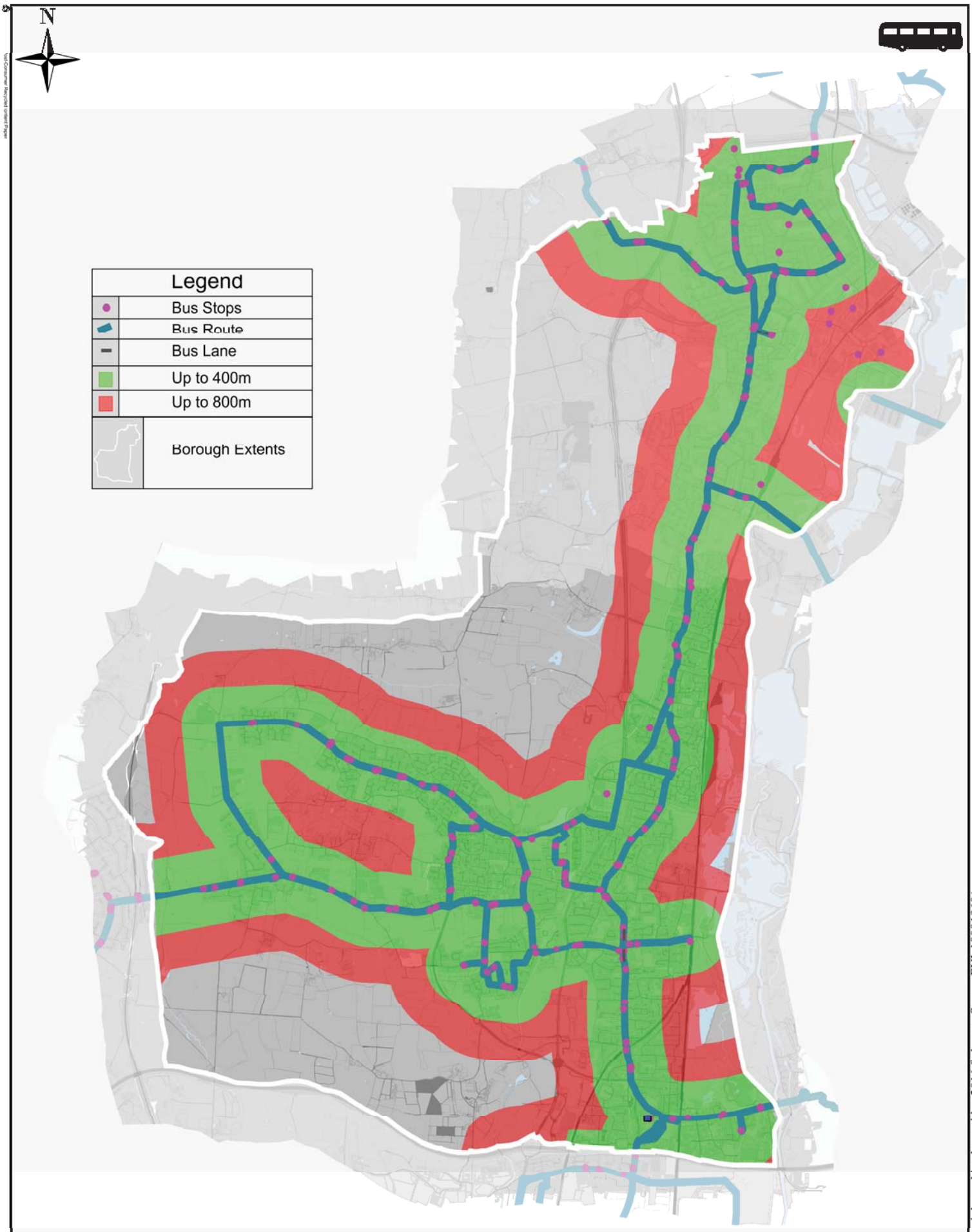

Broxbourne ECR

Access to Bus Routes

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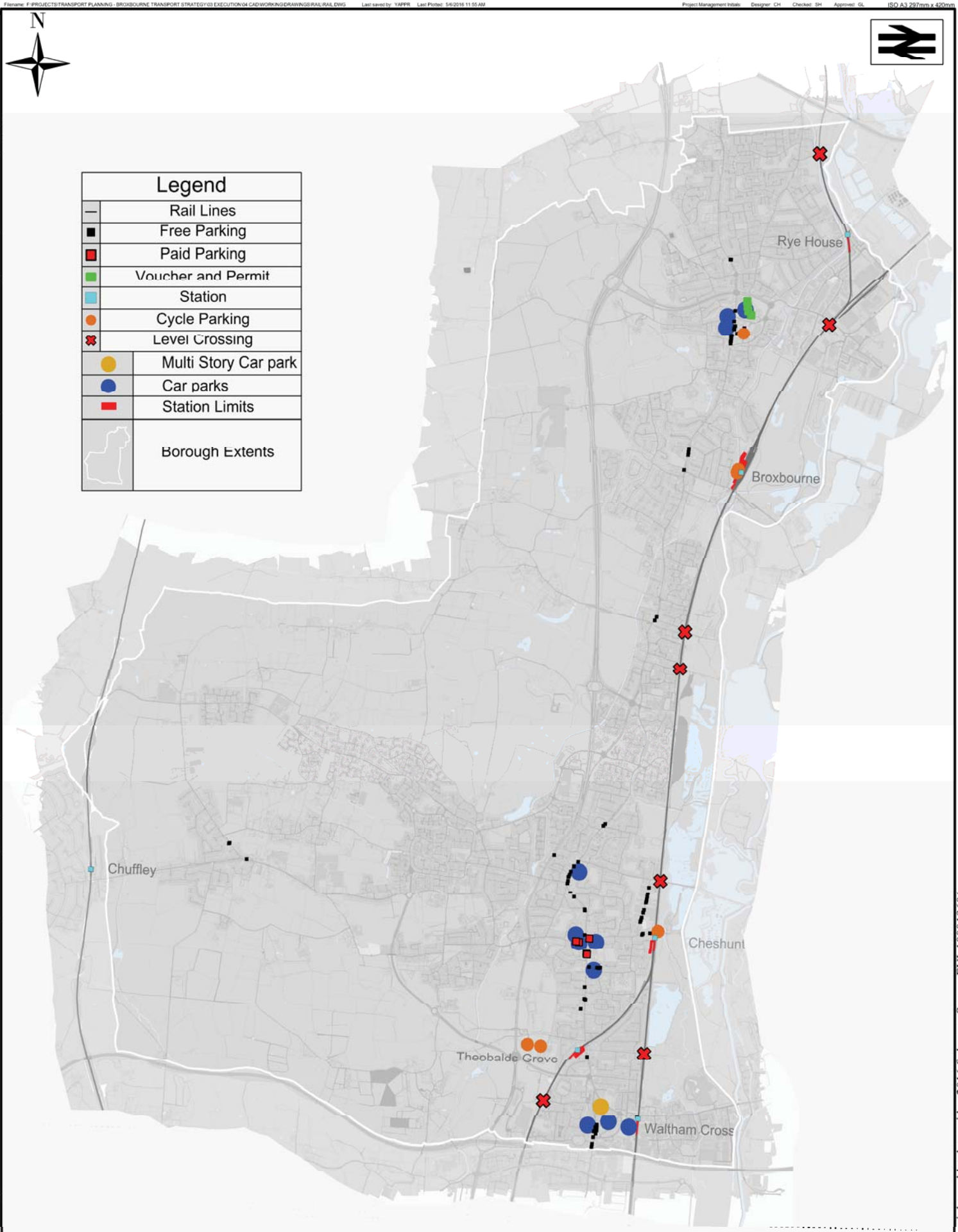
Date: 2016-04-15

Appendix: 3



Broxbourne ECR

Rail Infrastructure

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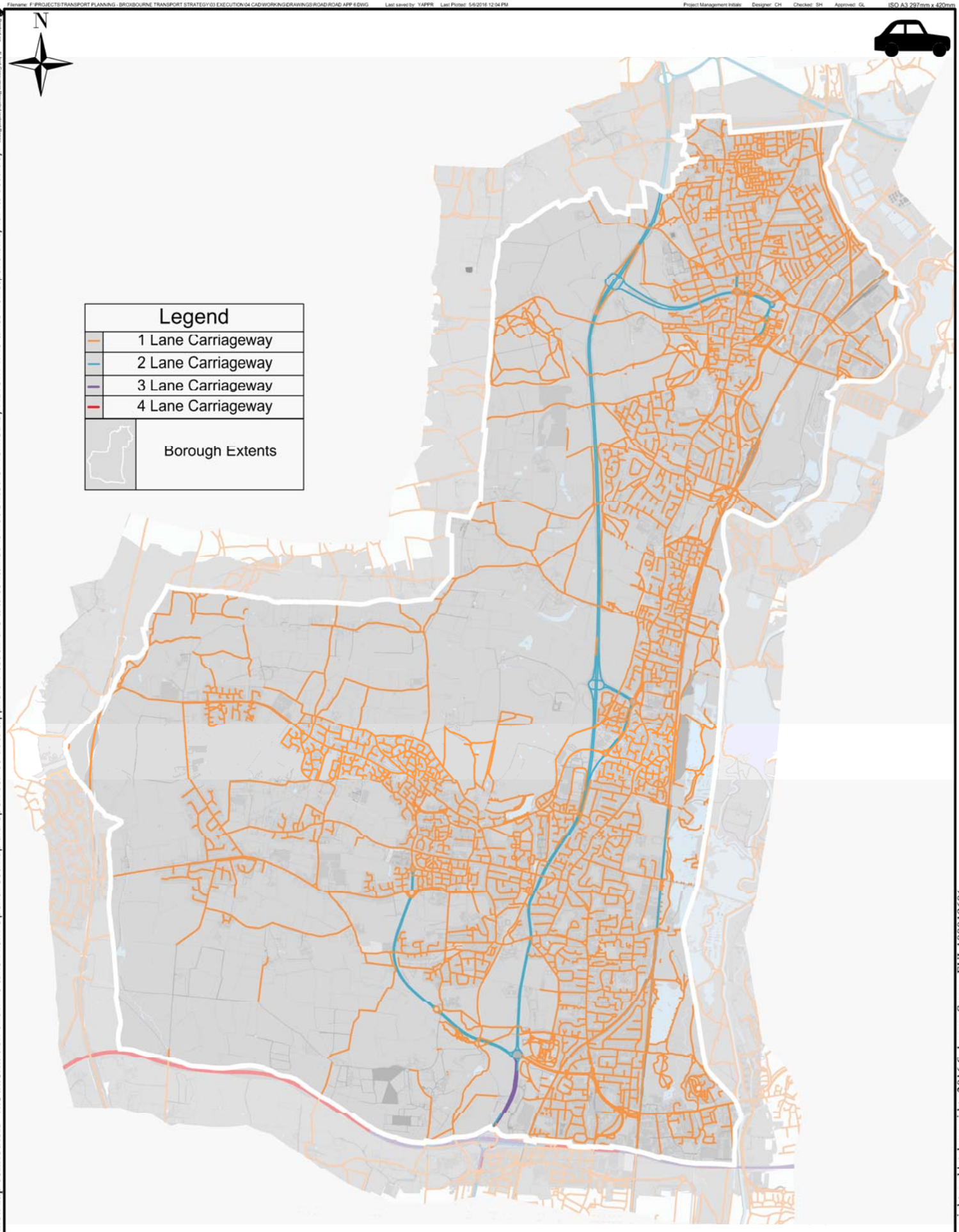
Date: 2016-04-15 **Appendix: 4**

Station Name	2014-2015 Entries & Exits	Operator	Final destinations served	Service departures per hour (weekday 1pm-2pm)
Cheshunt	2,140,962	Abellio Greater Anglia	NB - Cambridge, Bishops Stortford, Hertford East SB - Stratford, London Liverpool Street	14
Broxbourne	1,707,972	Abellio Greater Anglia	NB - Cambridge, Bishops Stortford, Hertford East SB - Stratford, London Liverpool Street	12
Waltham Cross	881,504	Abellio Greater Anglia	NB - Cambridge, Bishops Stortford, Hertford East SB - Stratford, London Liverpool Street	6
Theobalds Grove	297,524	London Overground	NB - Cheshunt London Liverpool Street	4
Rye House	432,202	Abellio Greater Anglia	NB - Hertford East SB - London Liverpool Street	4

Appendix 5 - Passenger Numbers Through the Key Local Stations



Broxbourne ECR

Number of lanes

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Date: 2016-04-15

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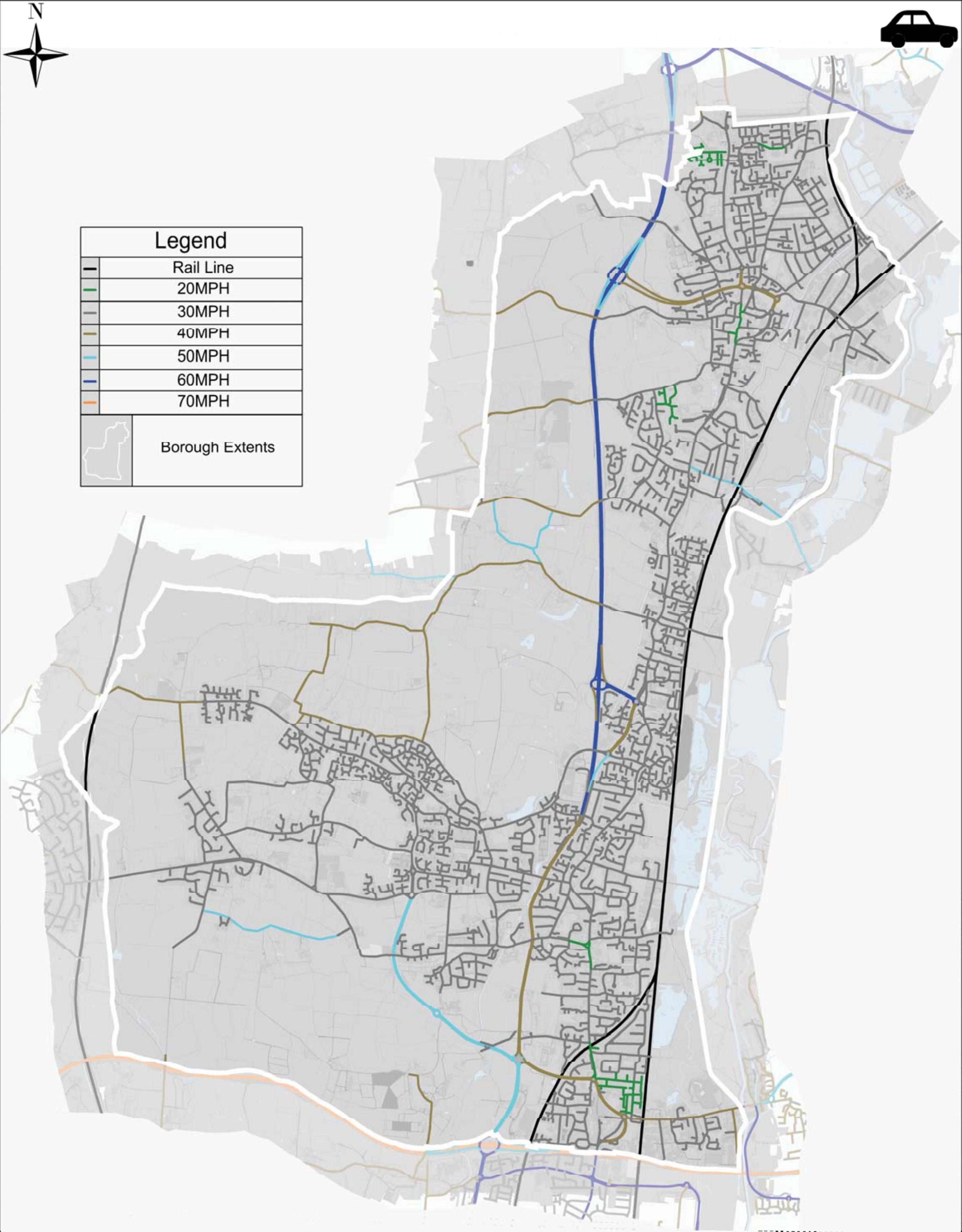

Broxbourne ECR

Speed Limits

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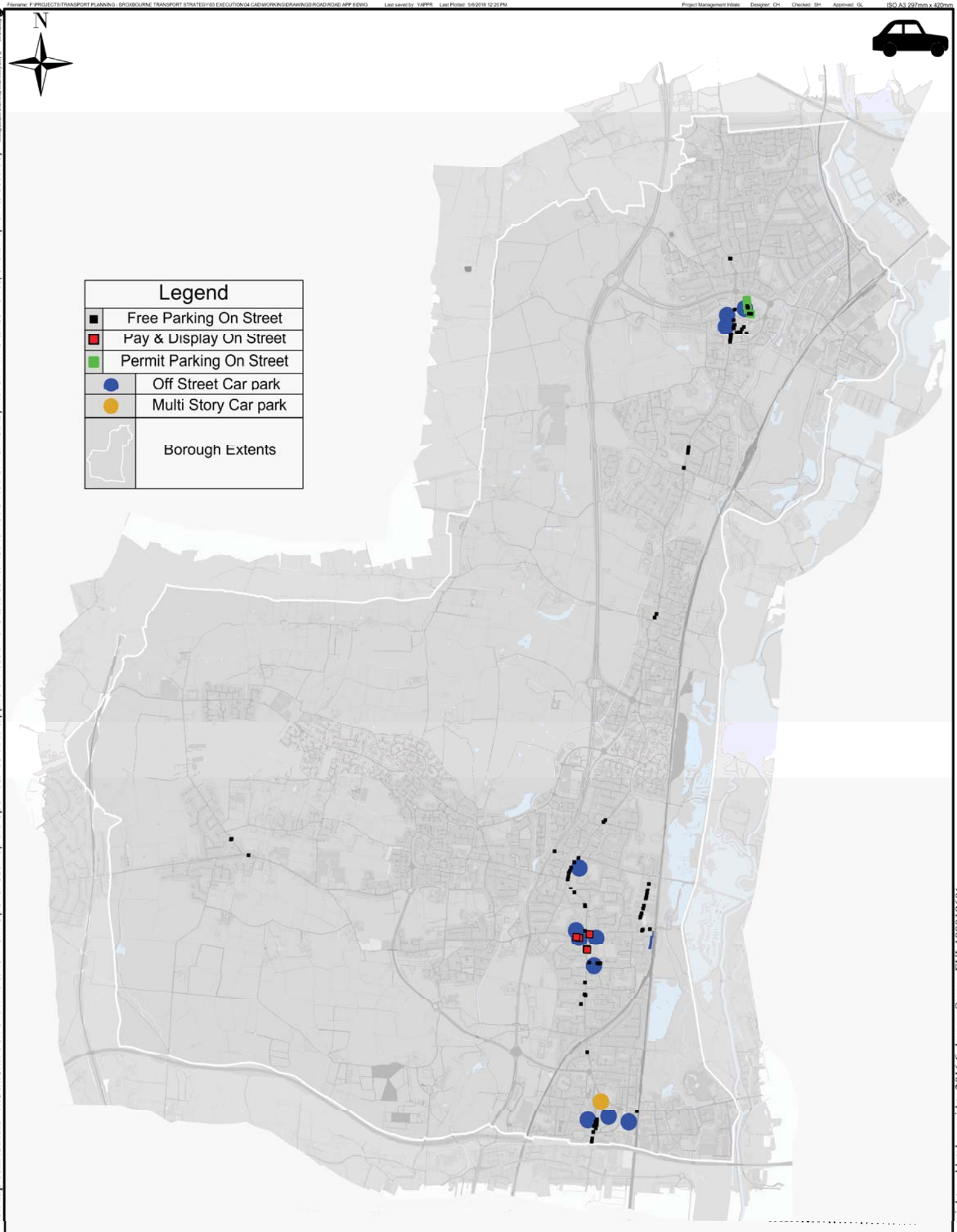

Broxbourne ECR

Car Parking

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Date: 2016-04-15 **Appendix: 8**

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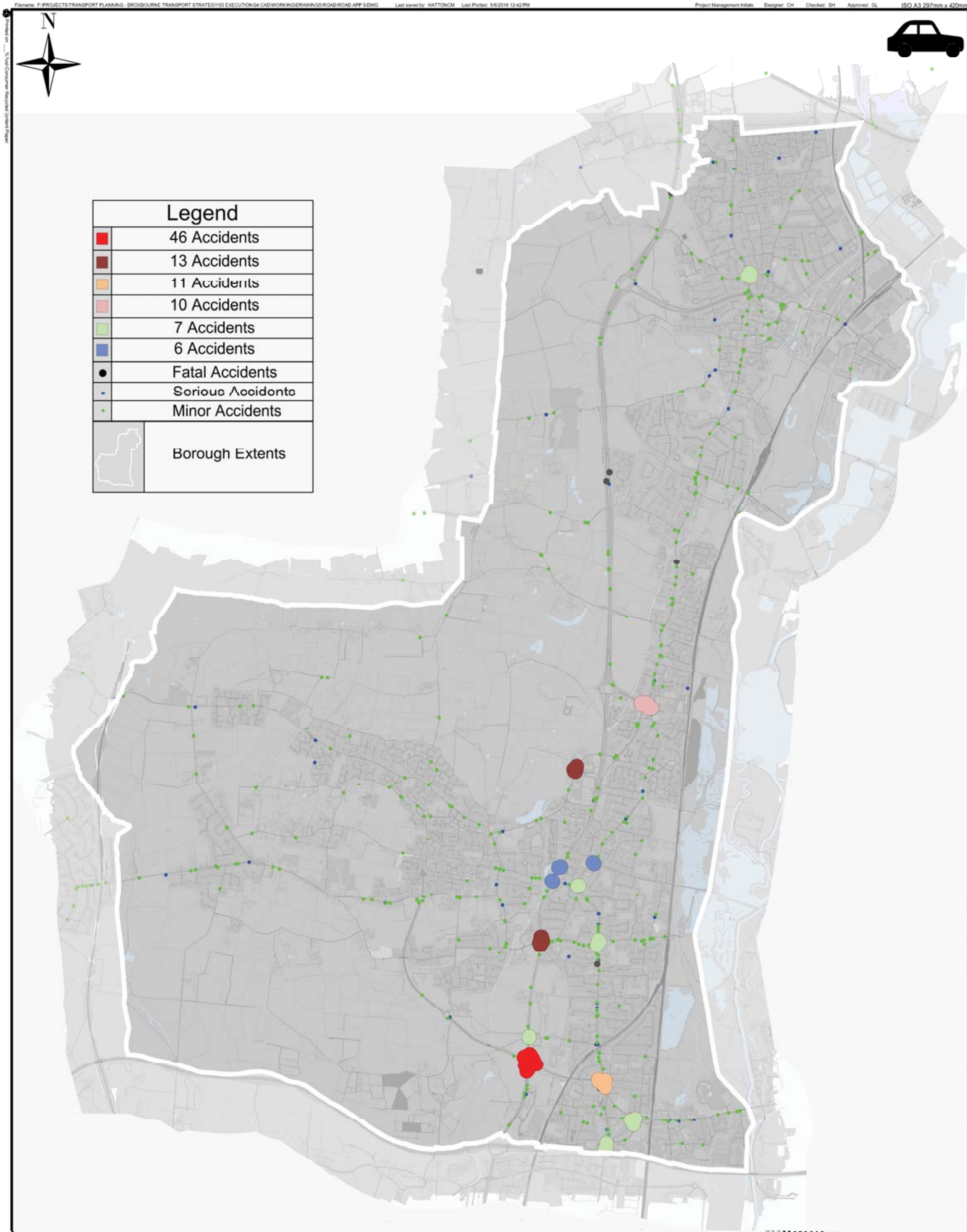

Broxbourne ECR

Key Accident Clusters
2012 - 2014 Stats 19 Data

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Date: 2016-04-15 **Appendix: 9**


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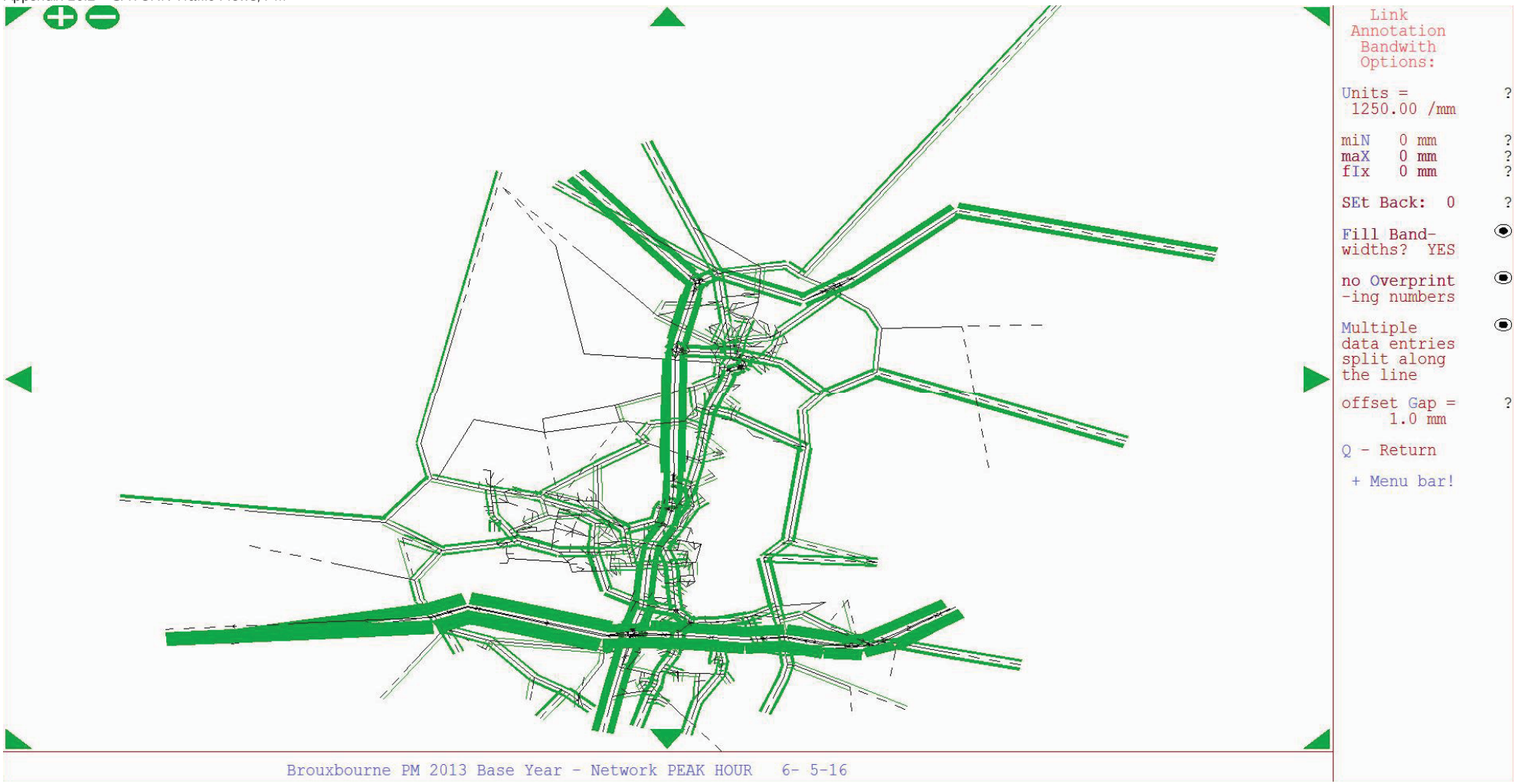
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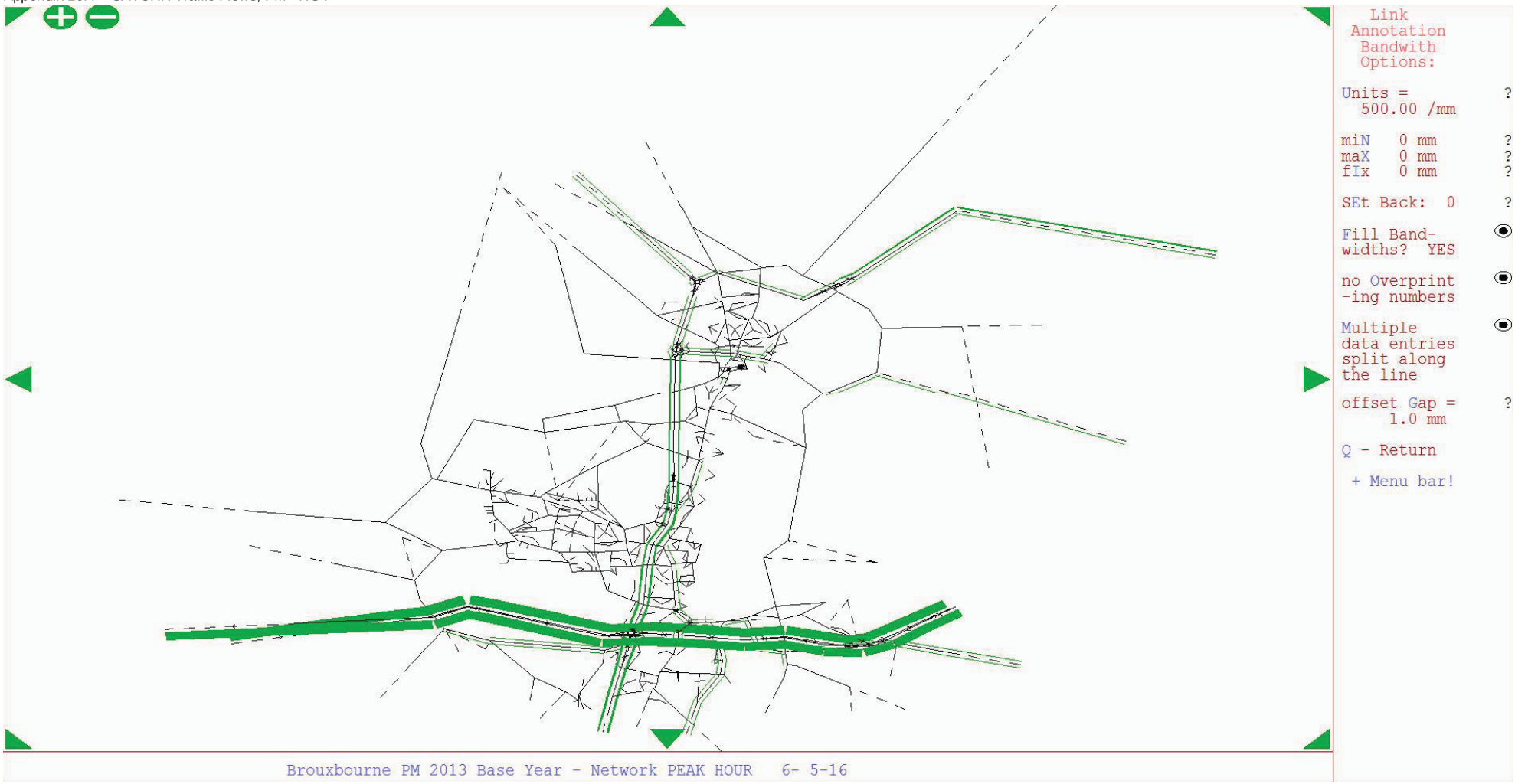
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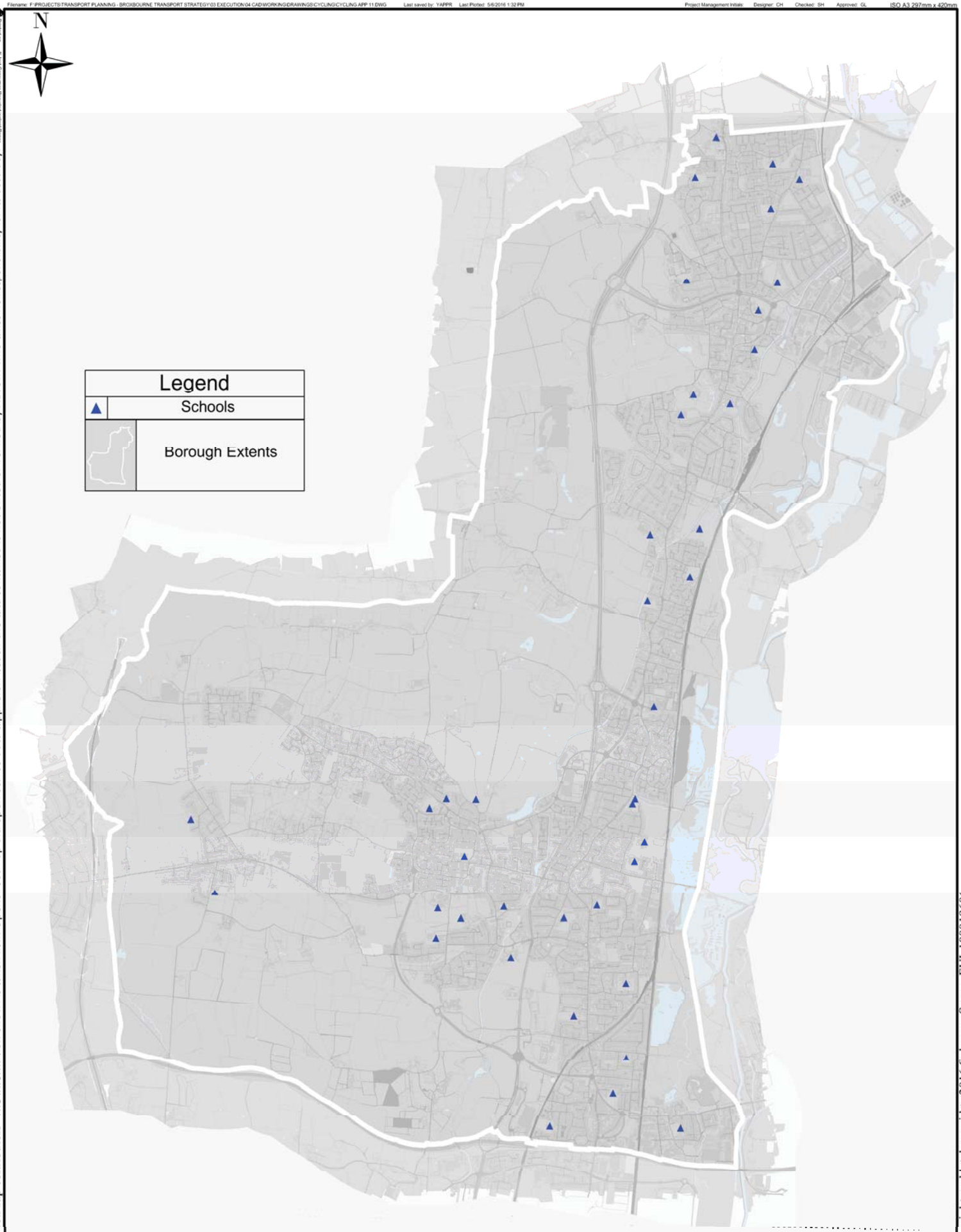

Broxbourne ECR

School Locations

AECOM

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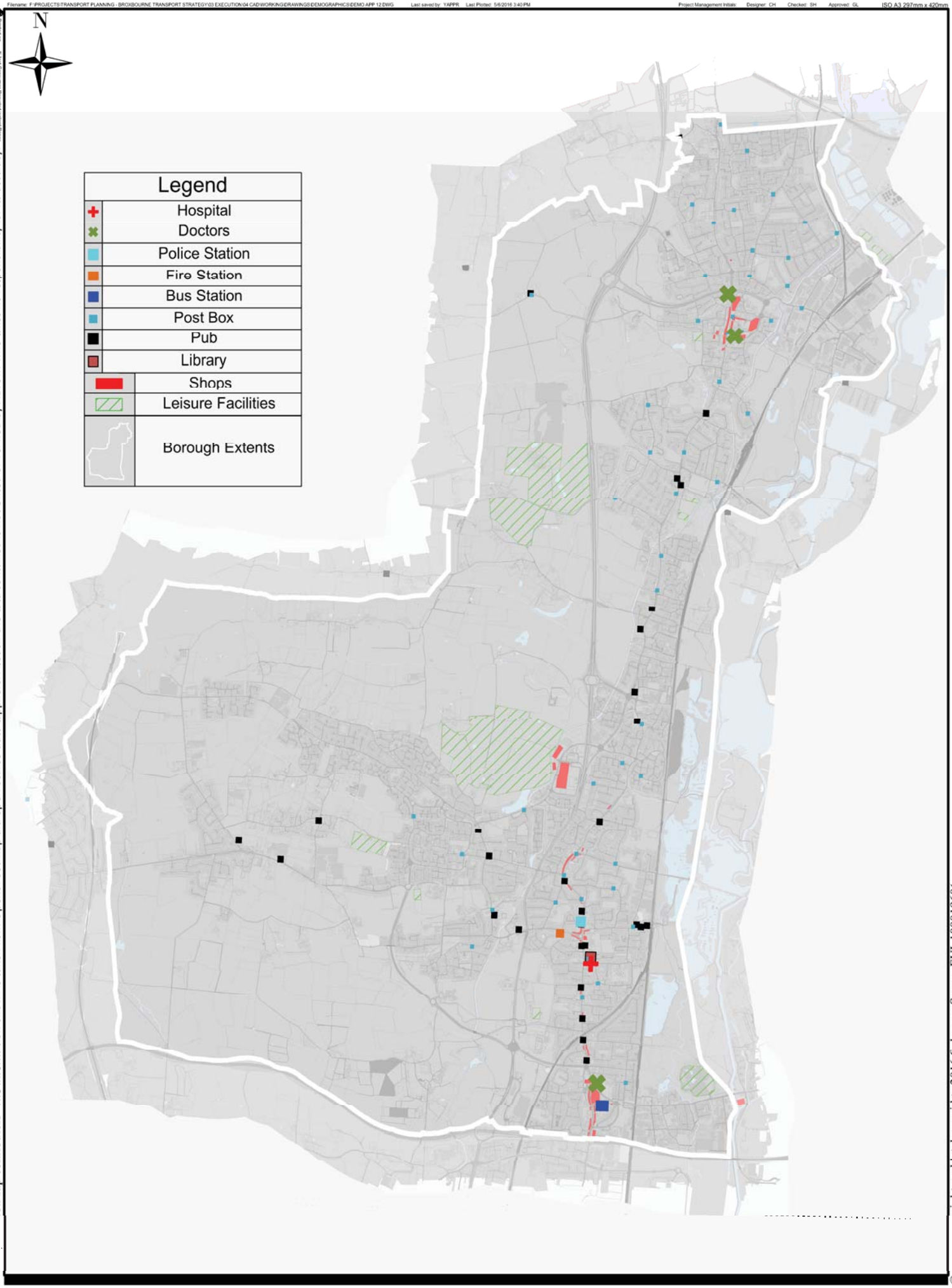
Date: 2016-04-15 **Appendix: 11**



Broxbourne ECR

Local Services

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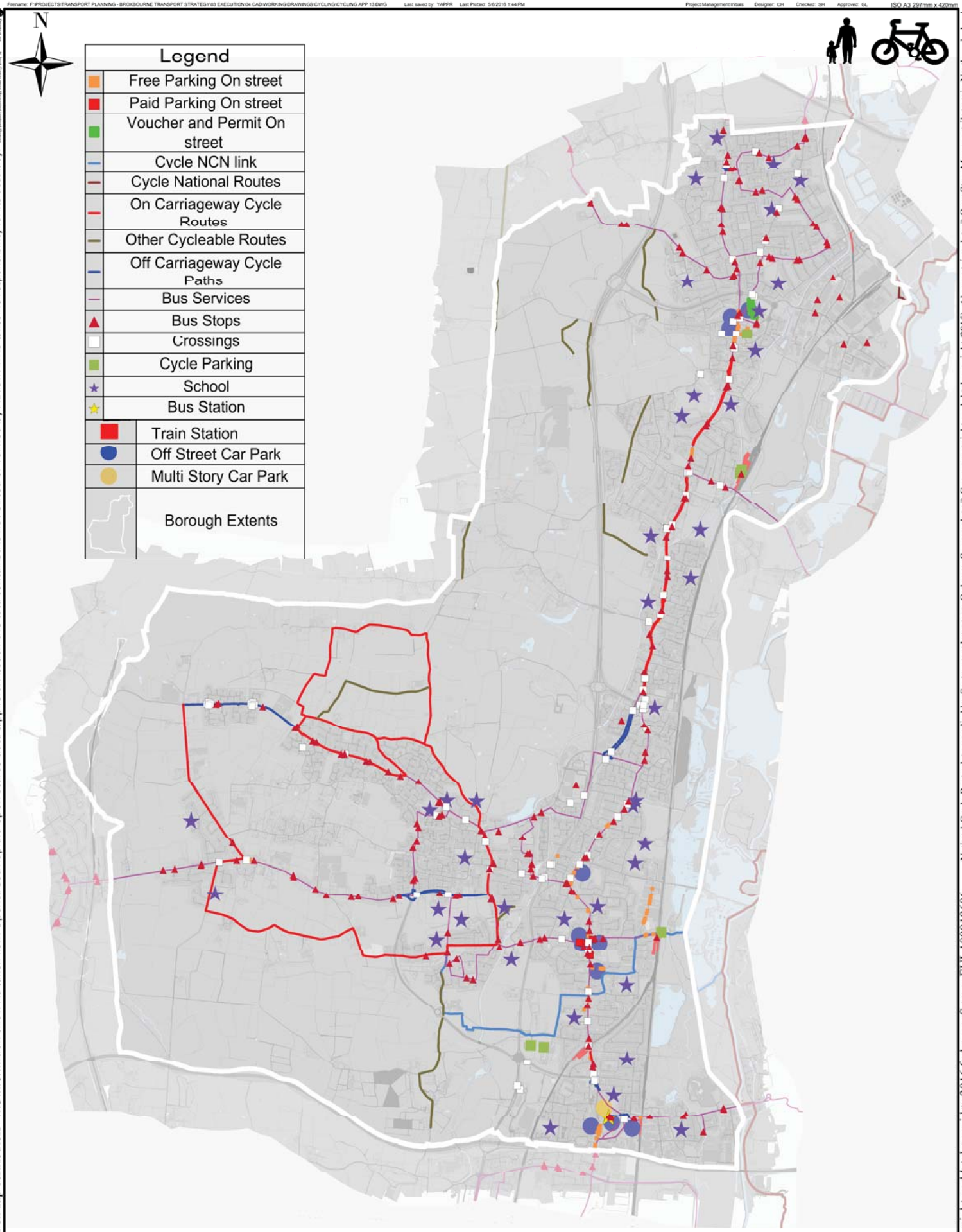

Broxbourne ECR

Travel to School Locations

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Date: 2016-04-15 **Appendix: 13**

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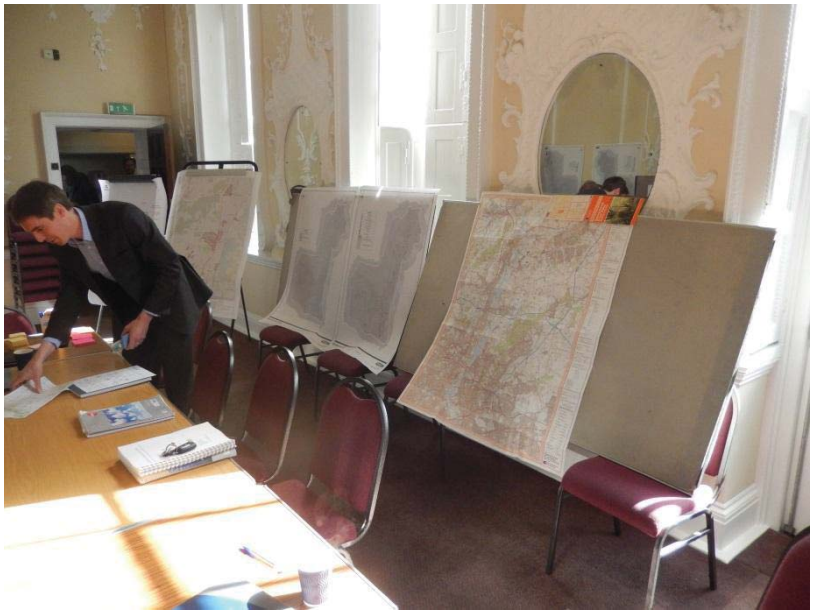

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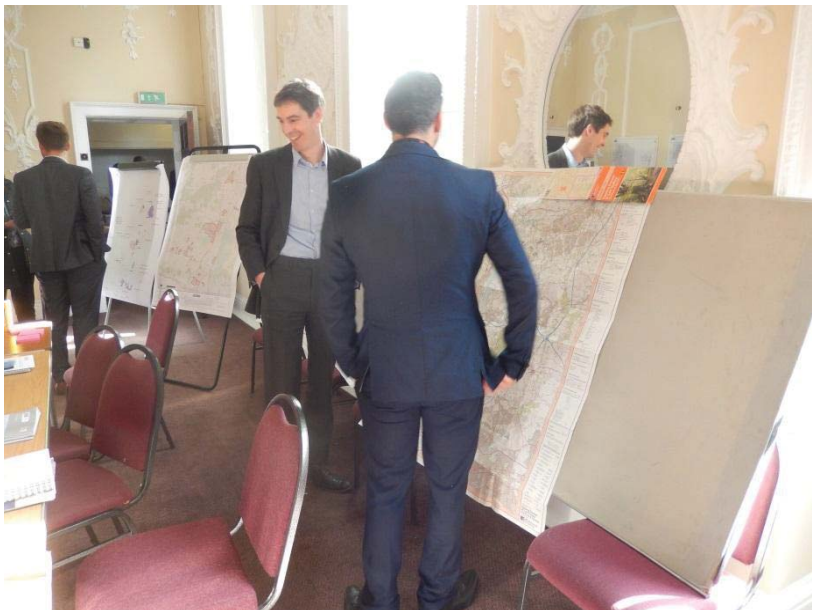

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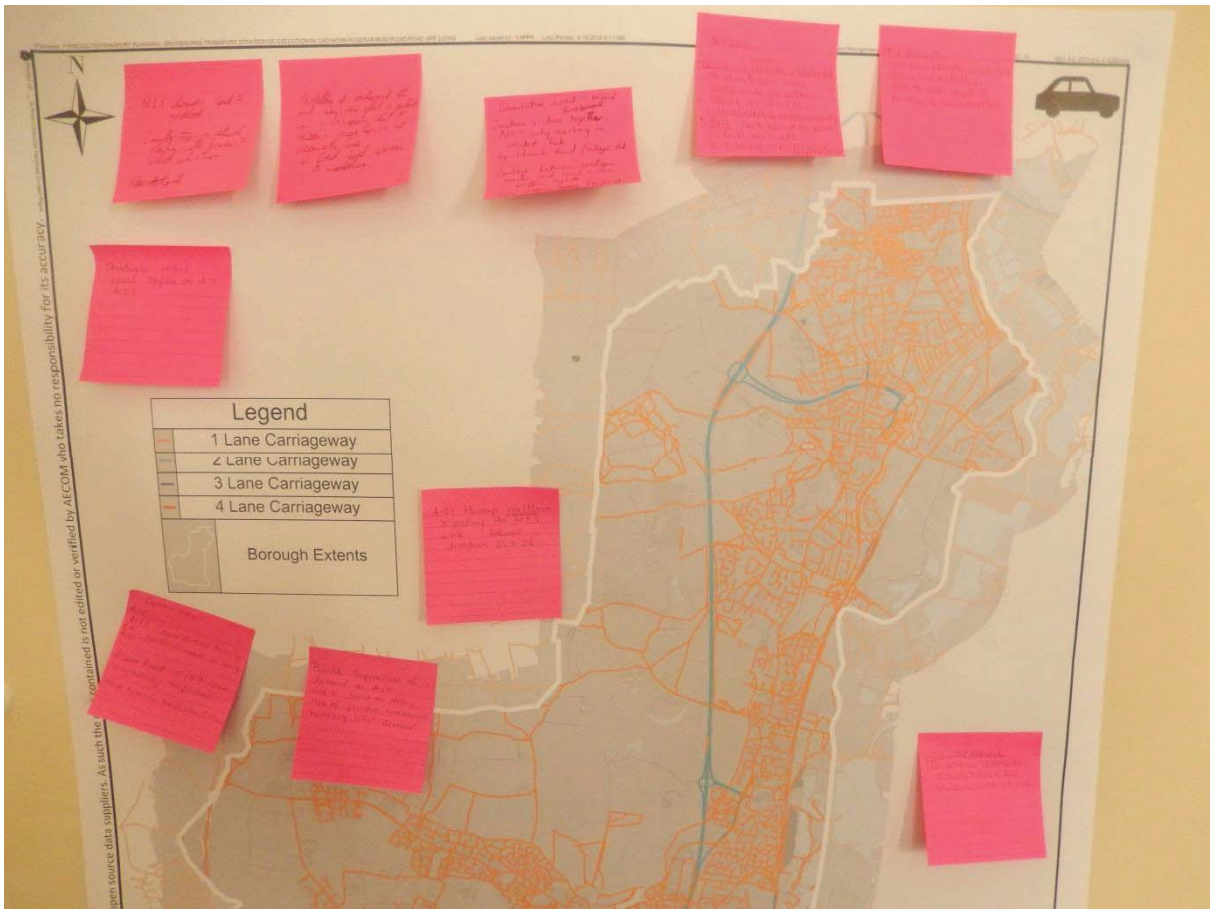

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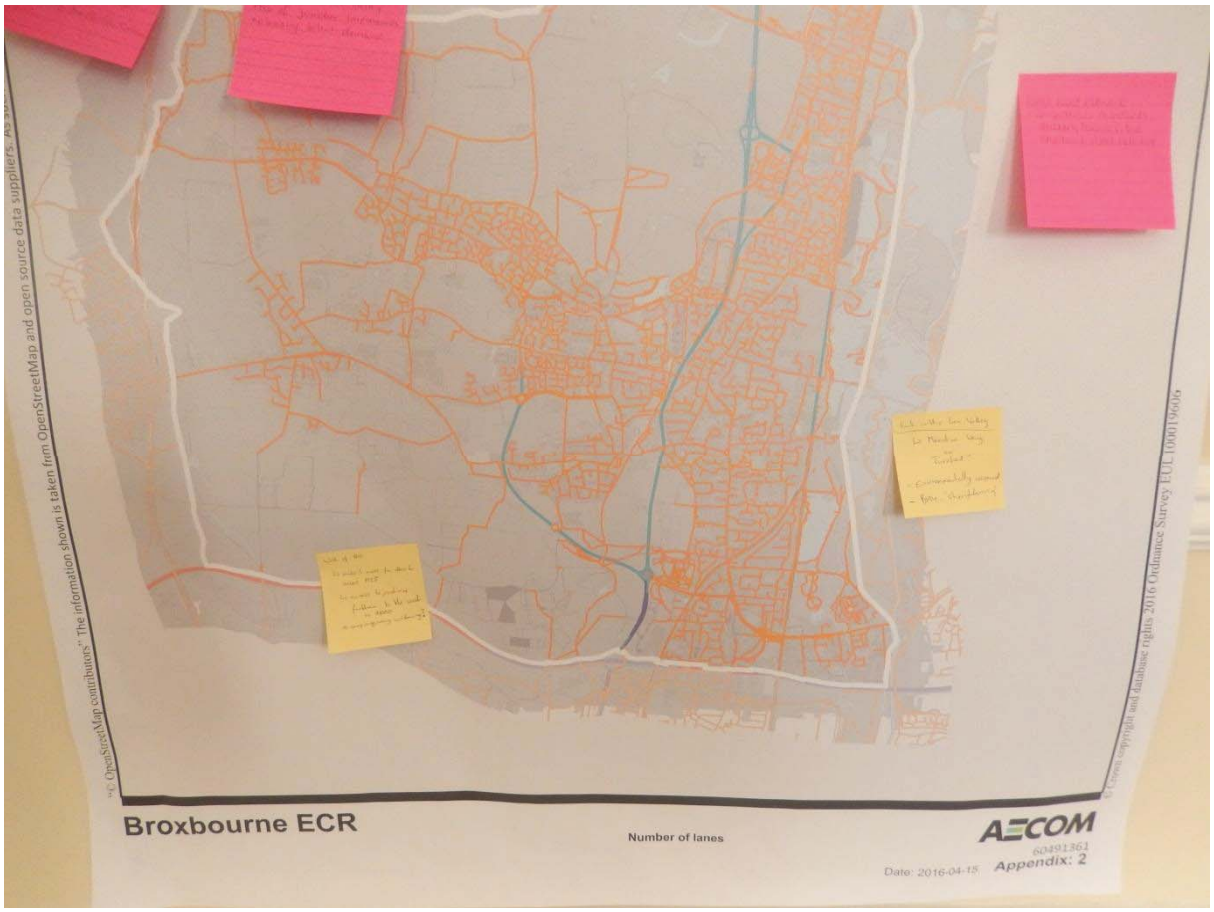

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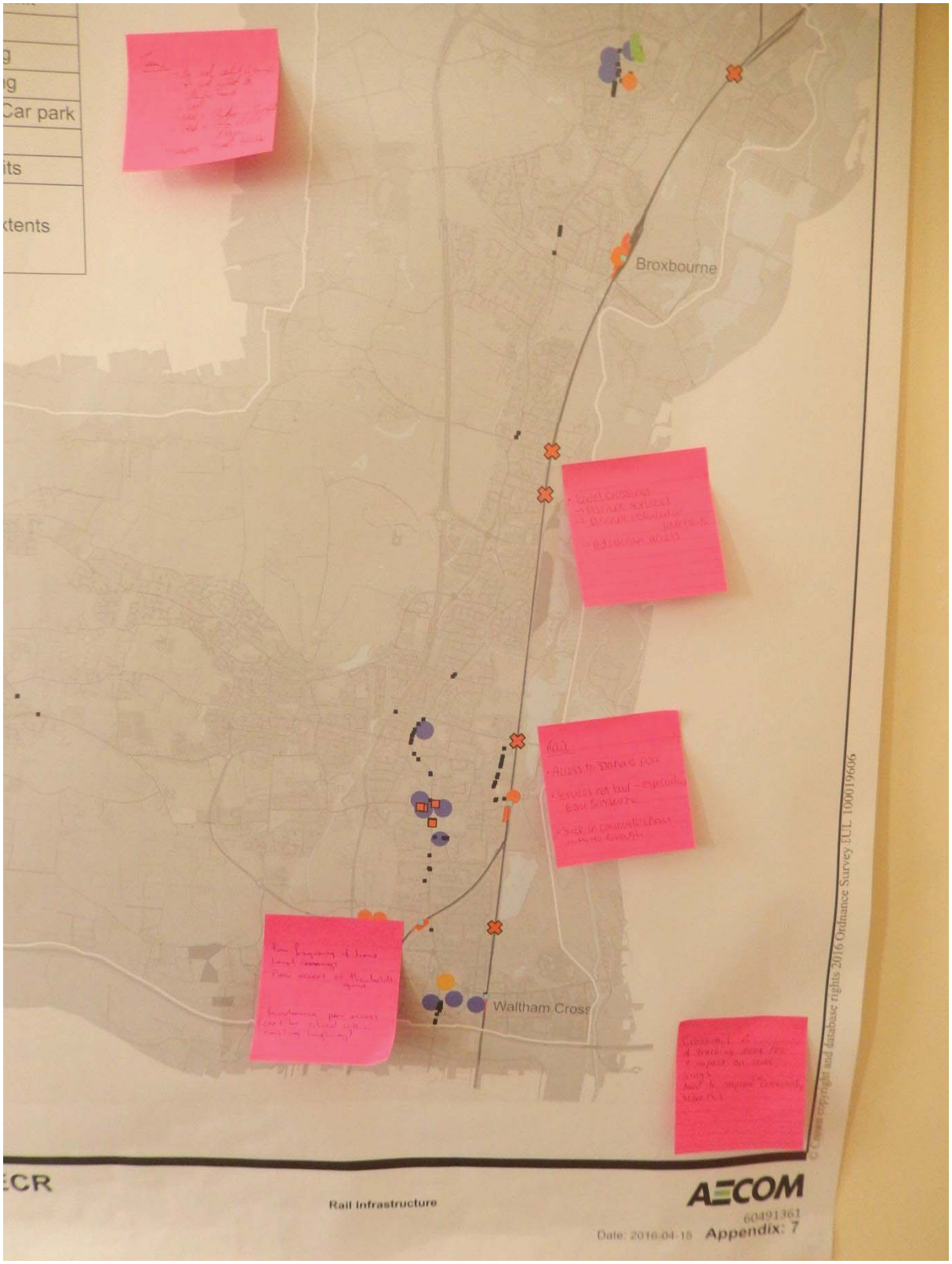

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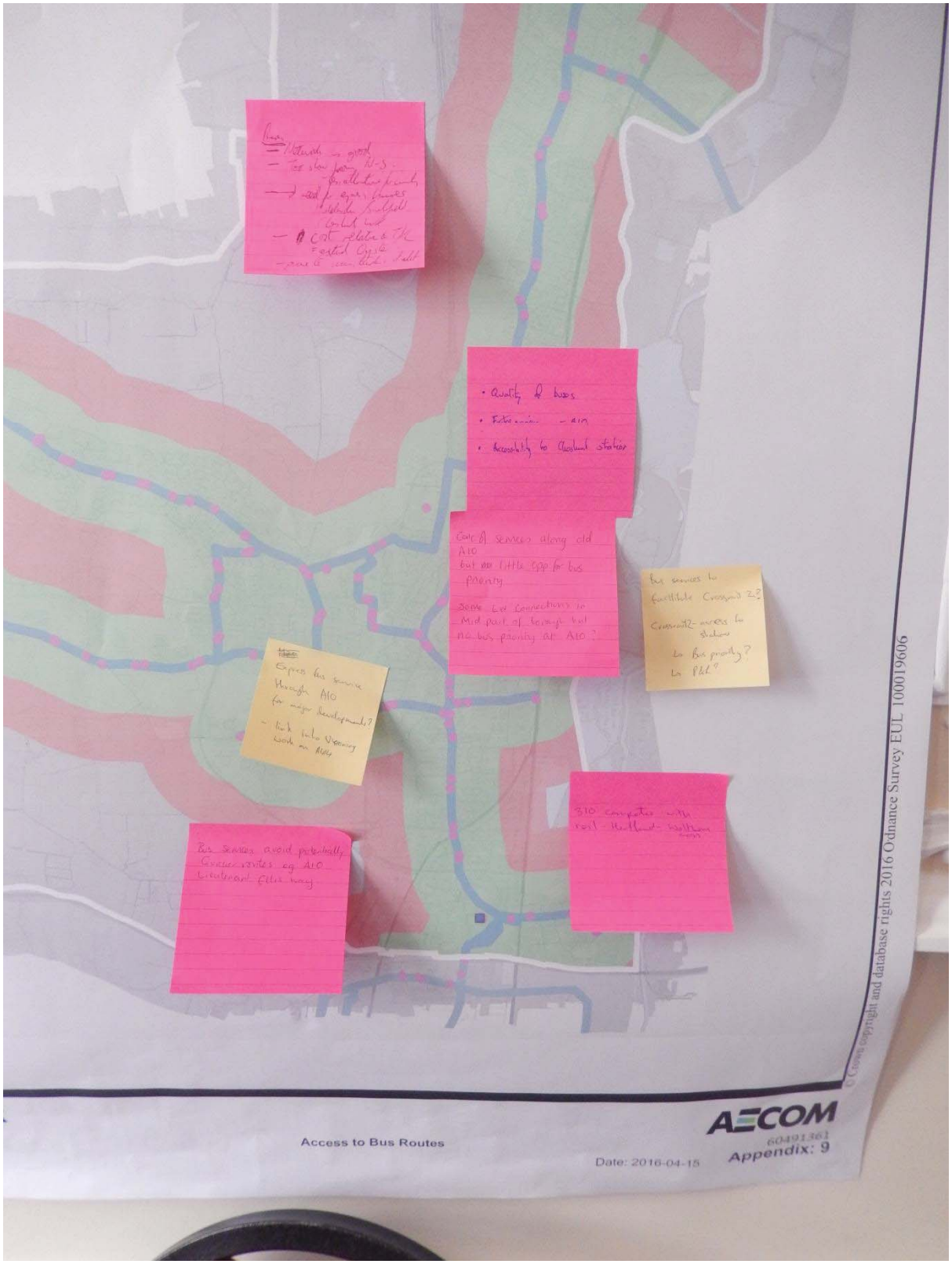

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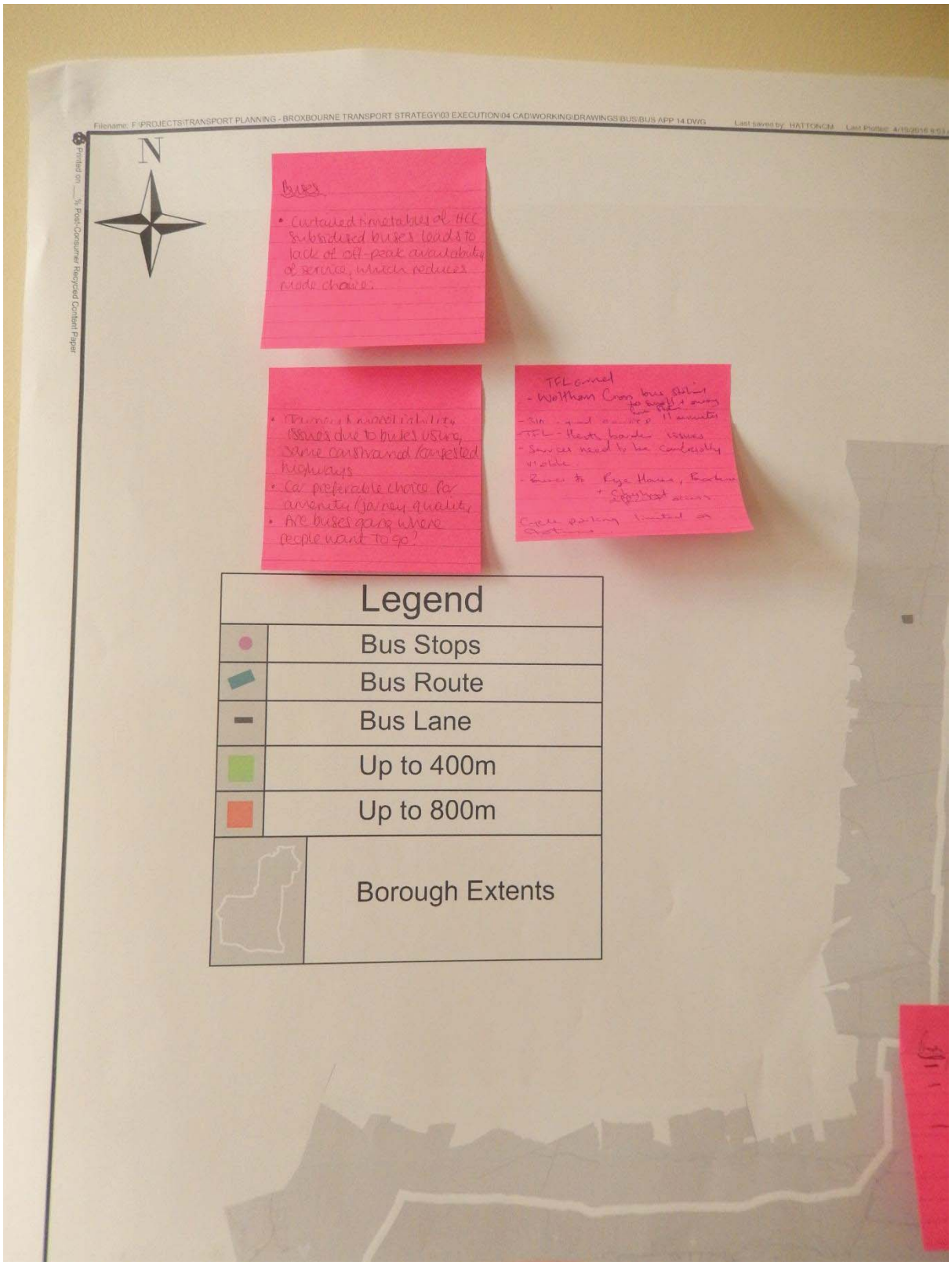

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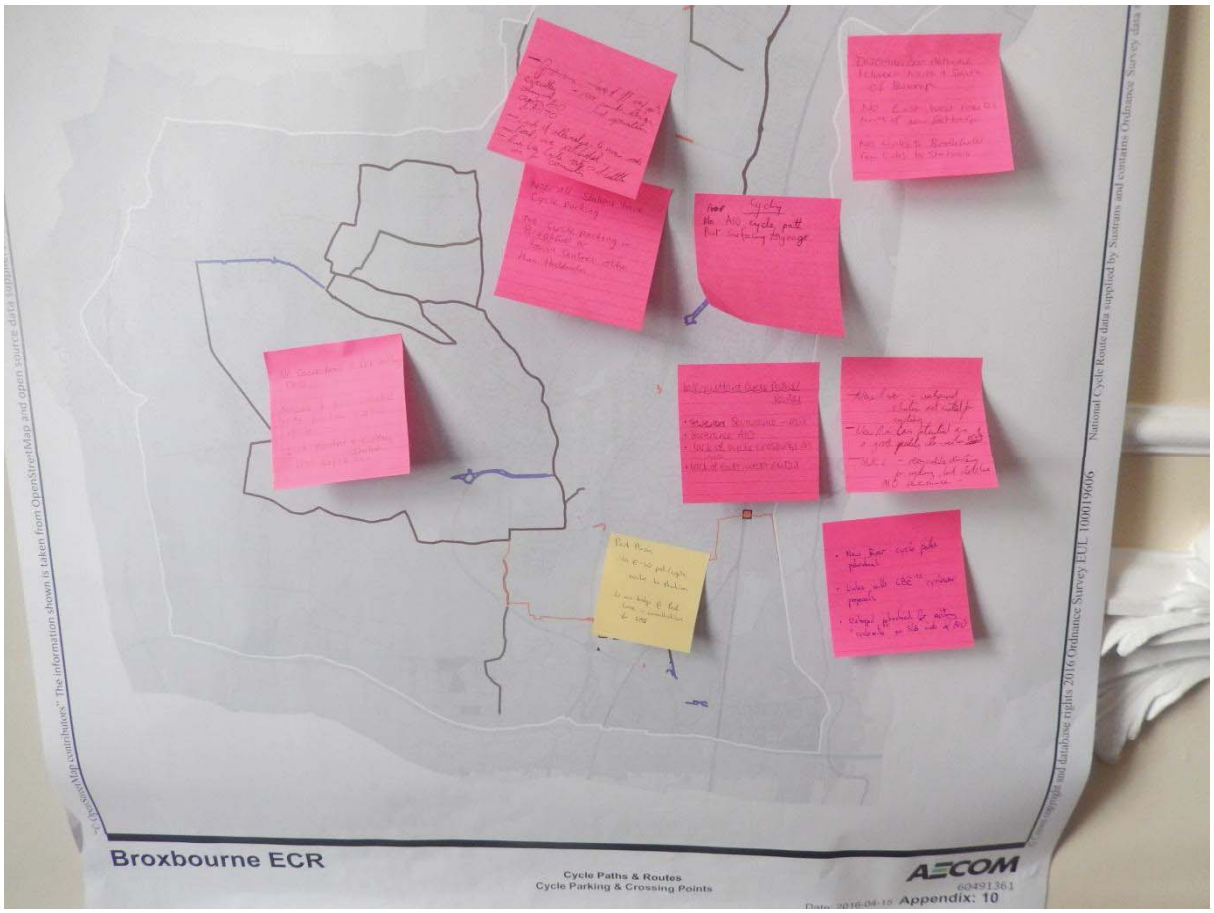

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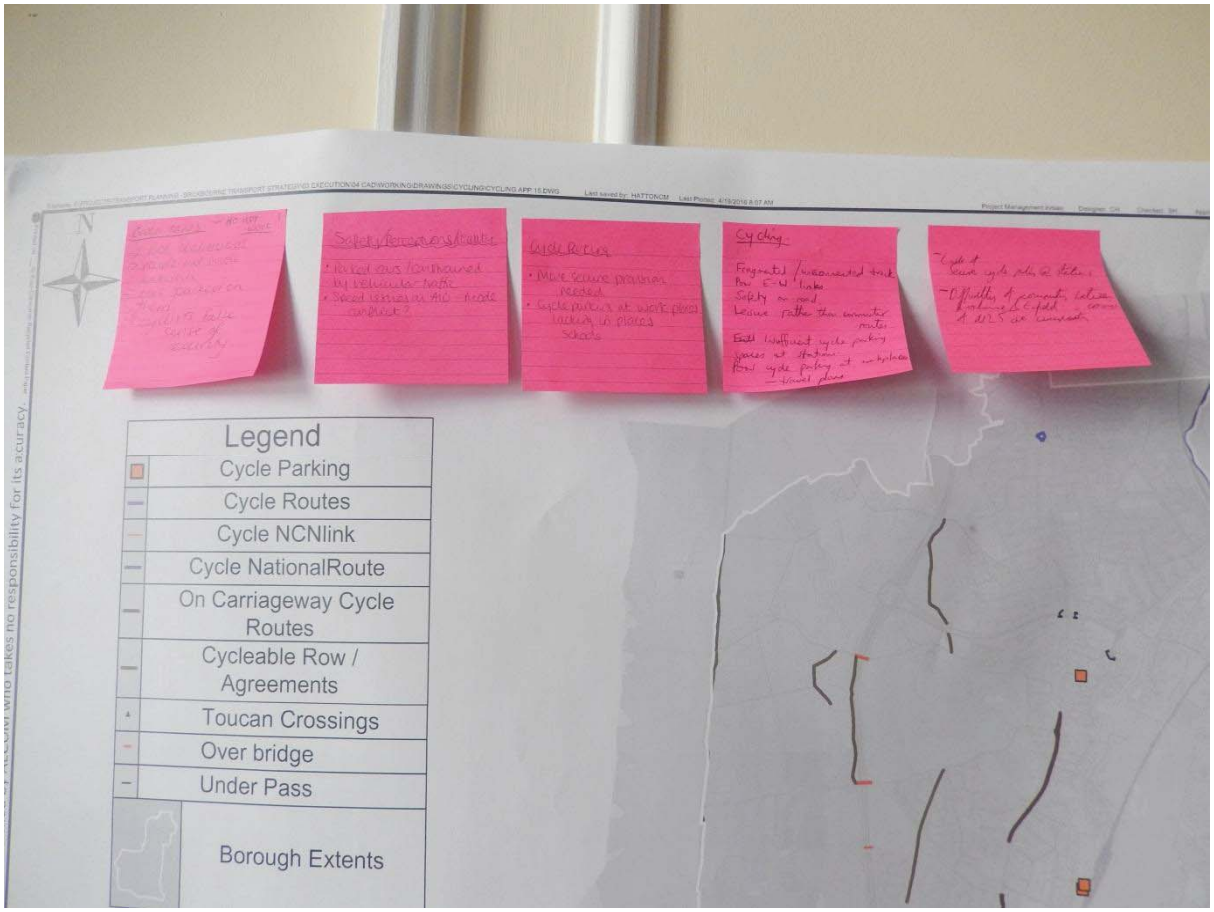

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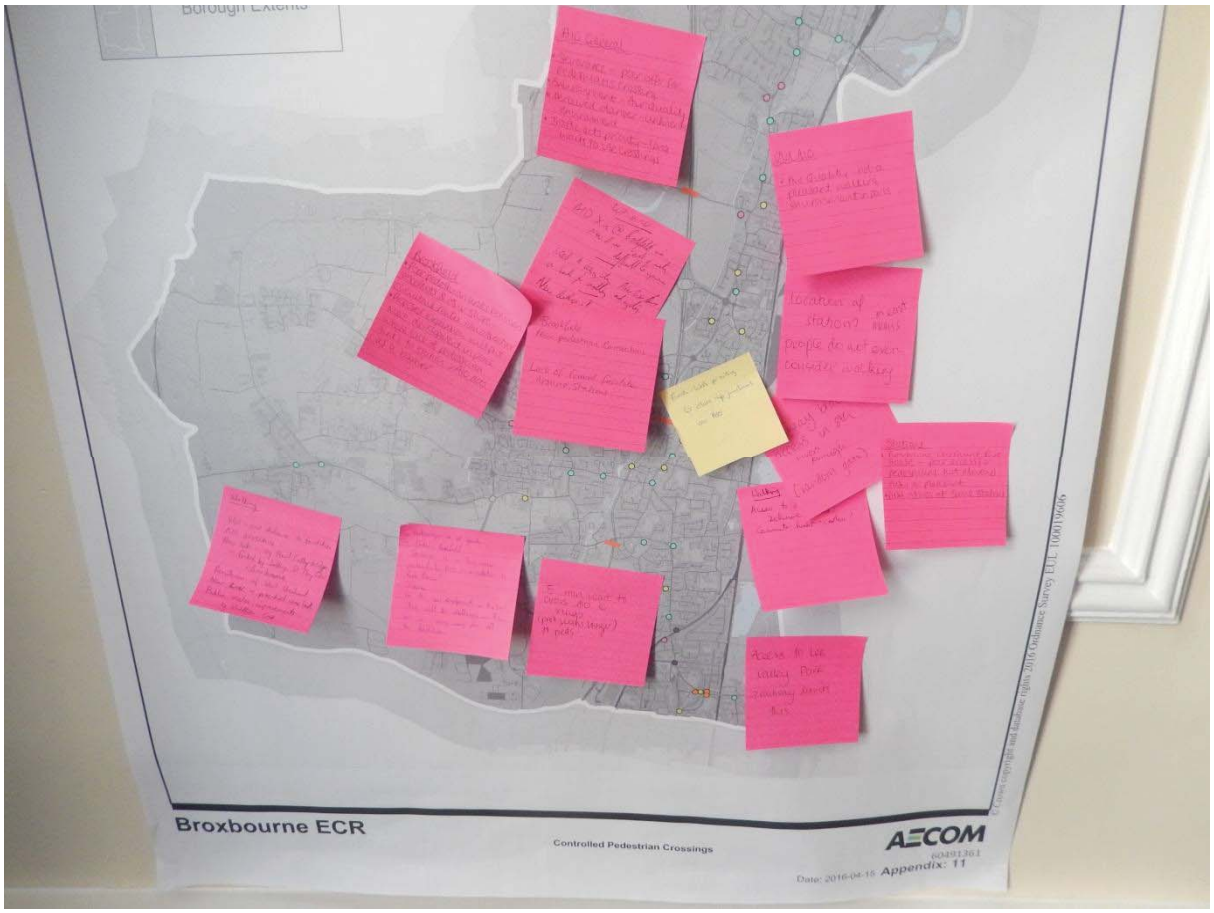

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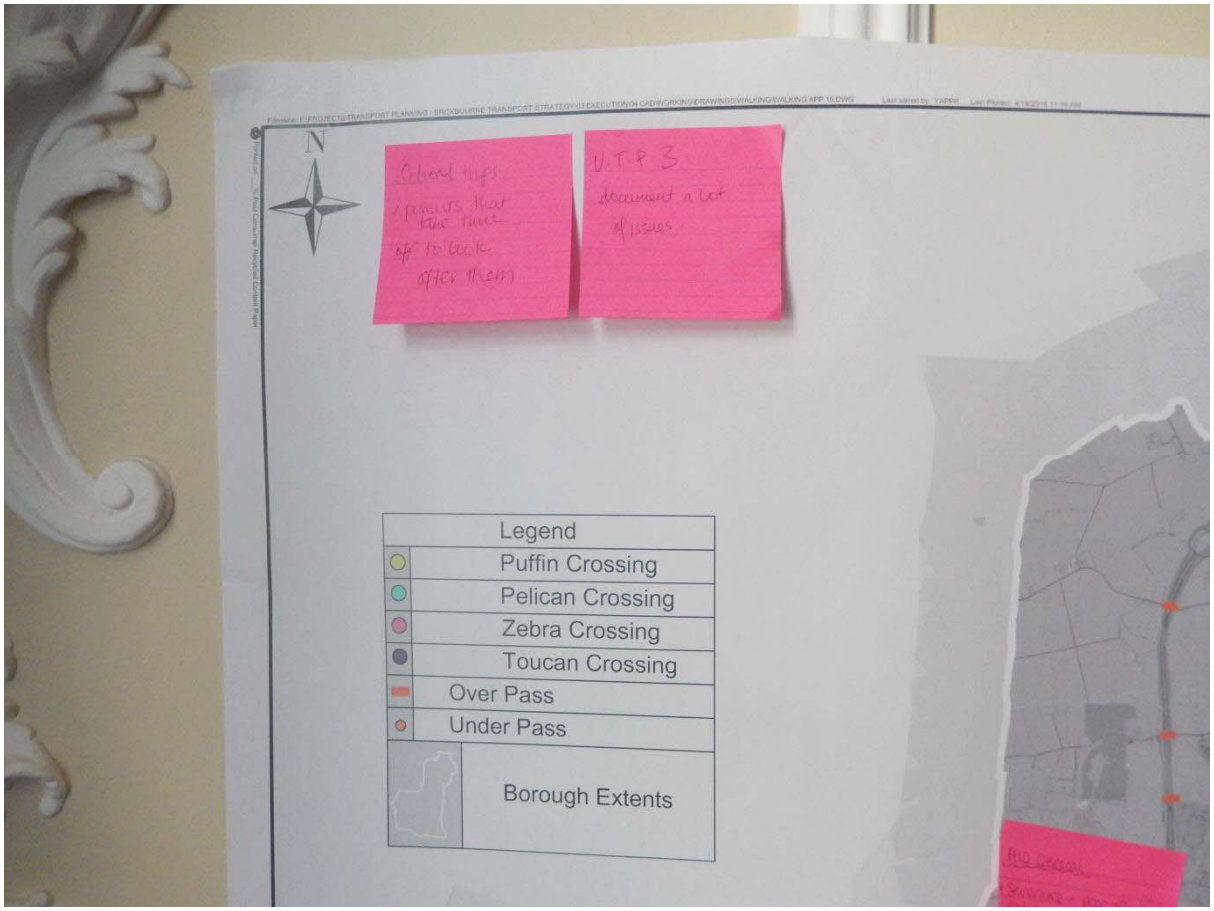

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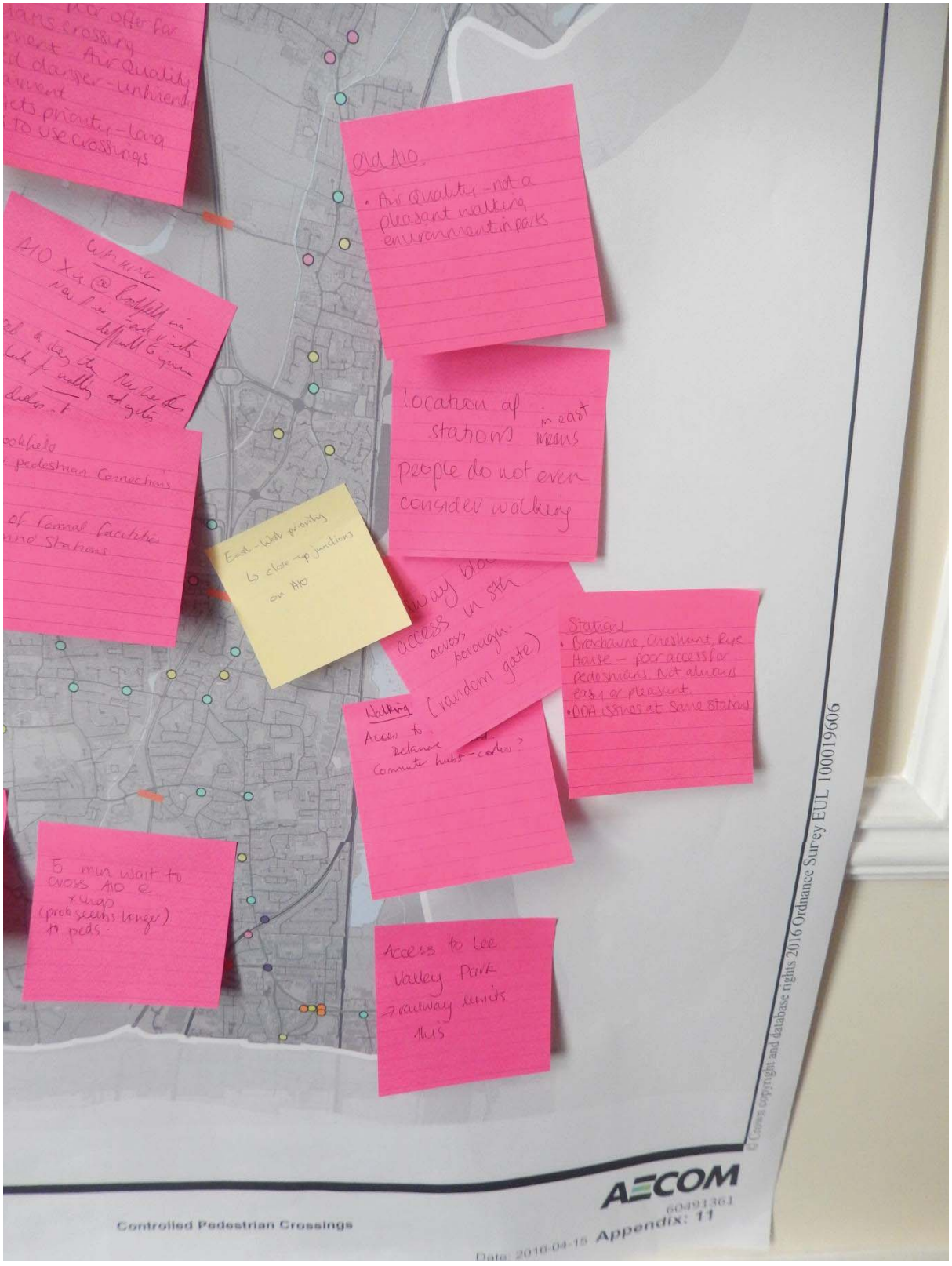

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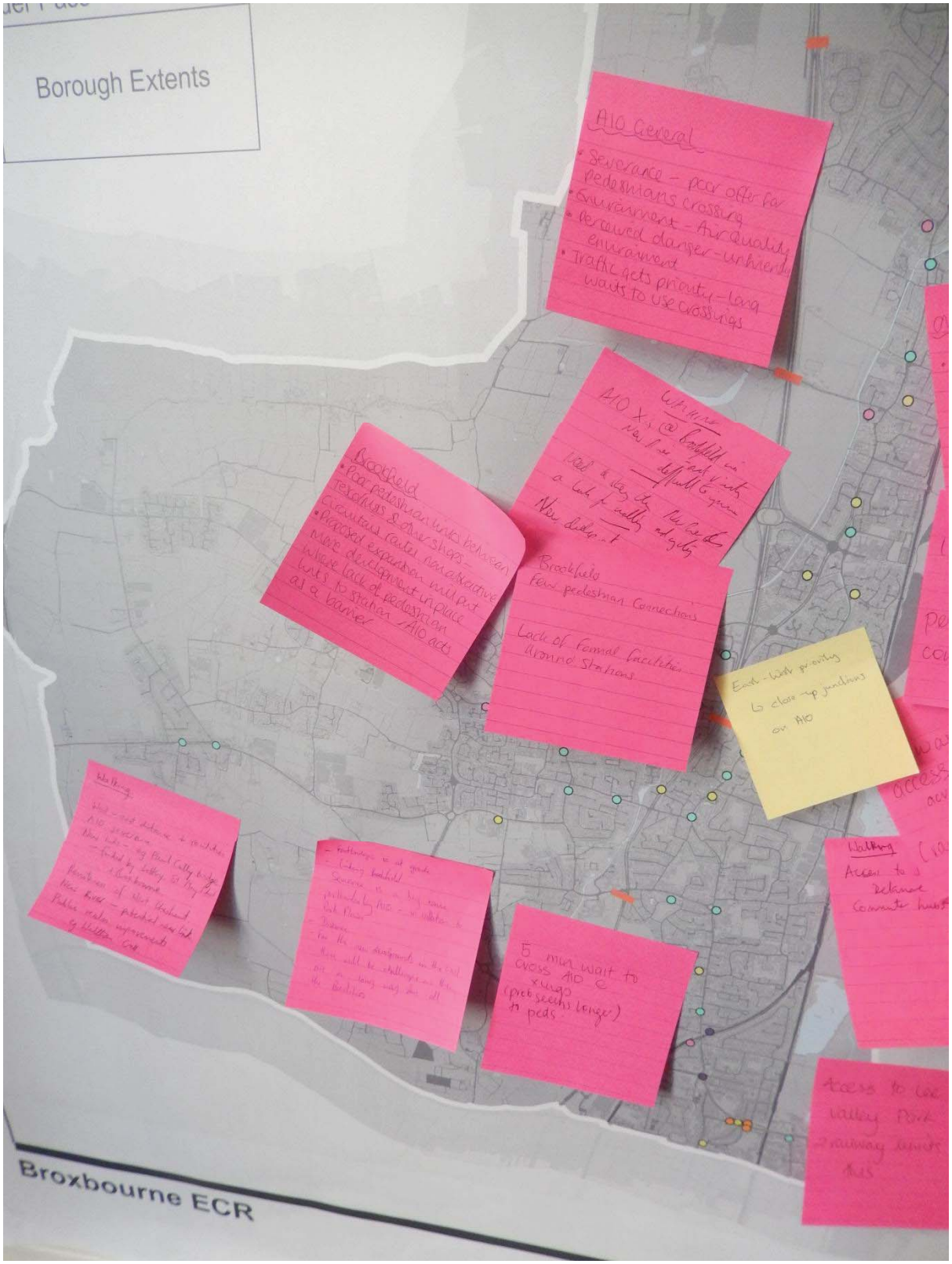

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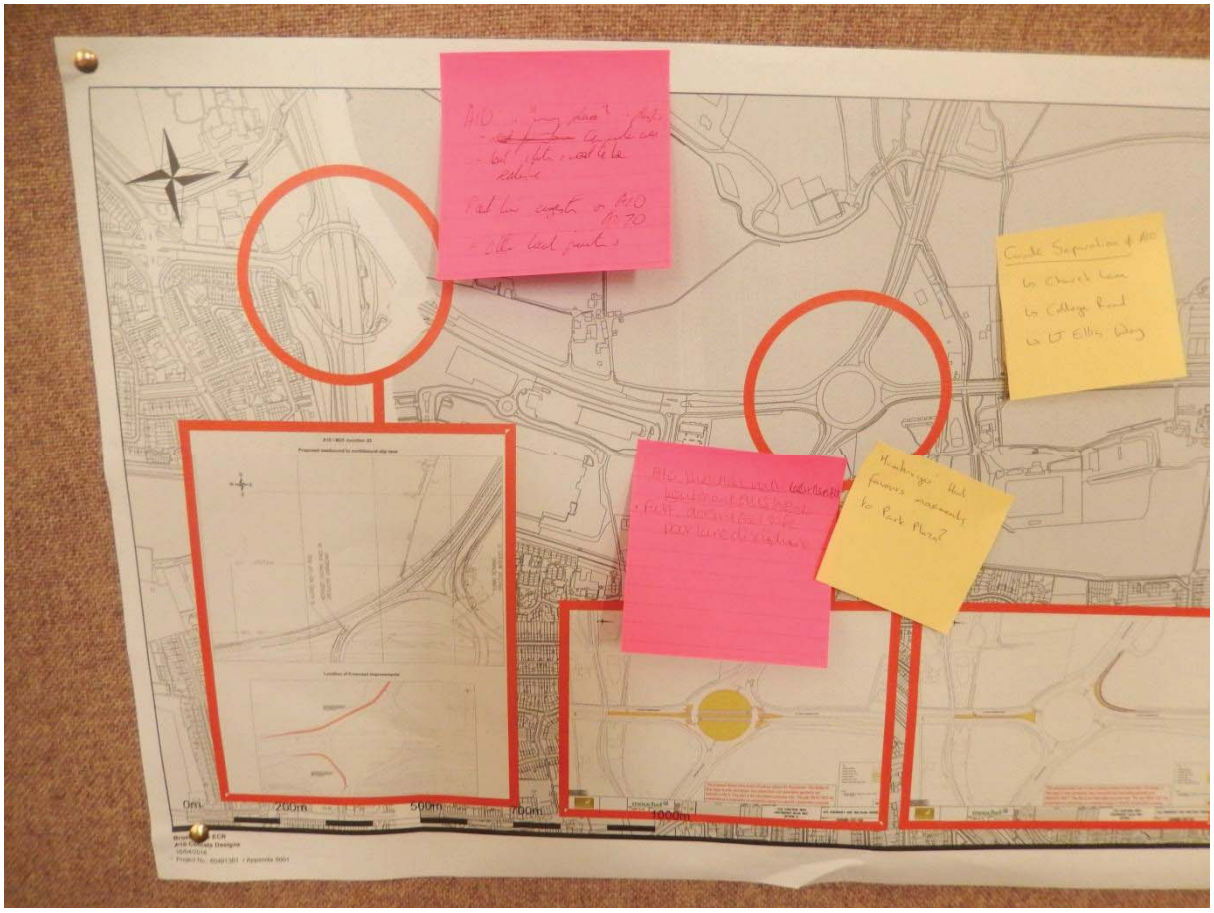

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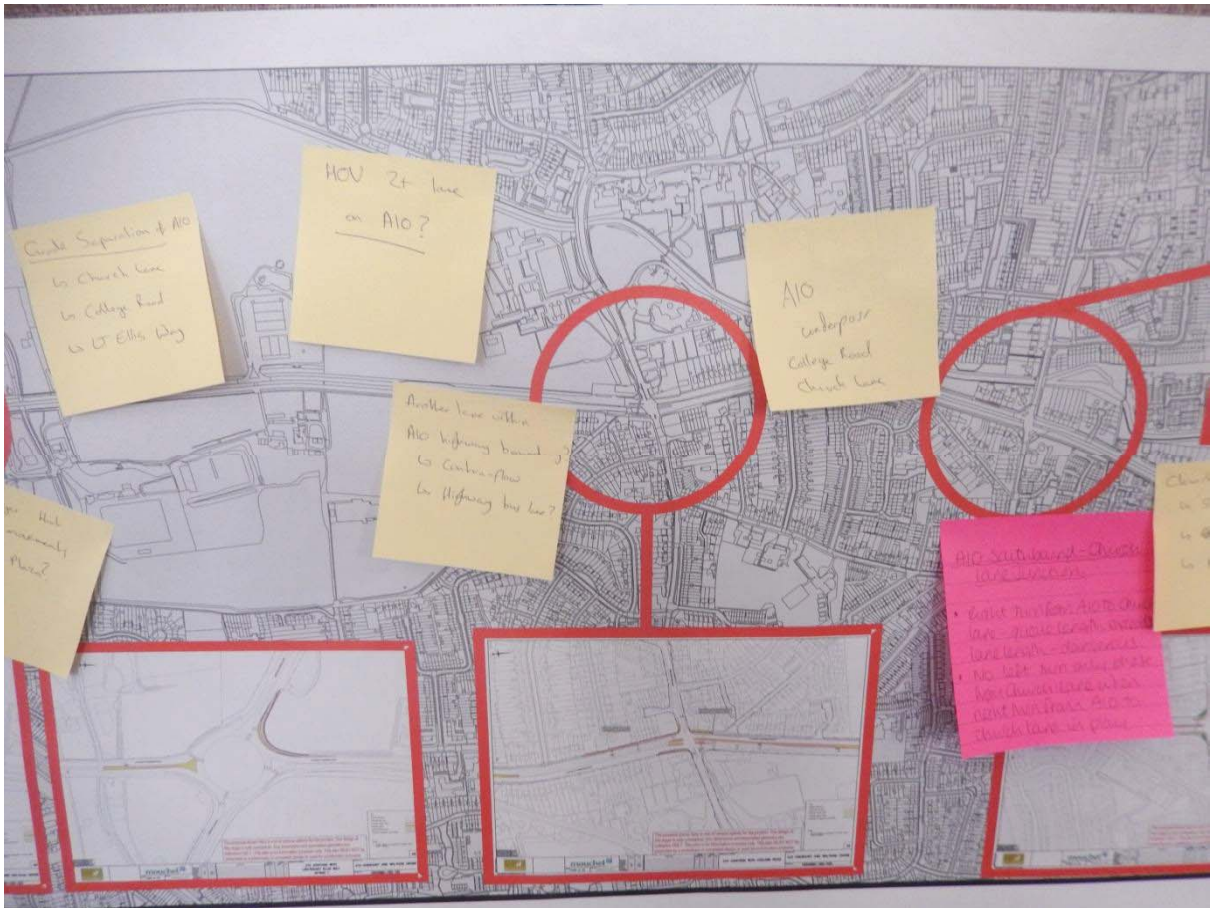

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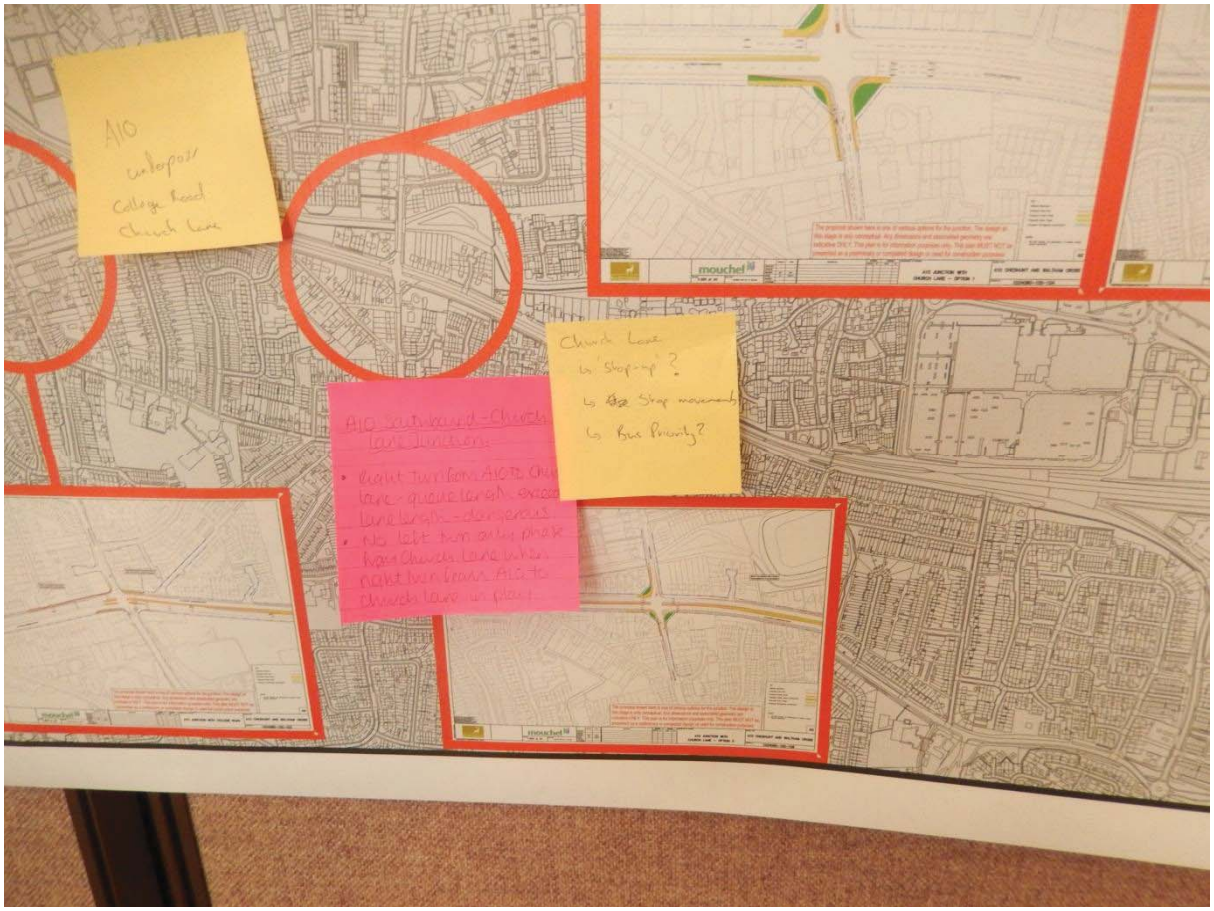

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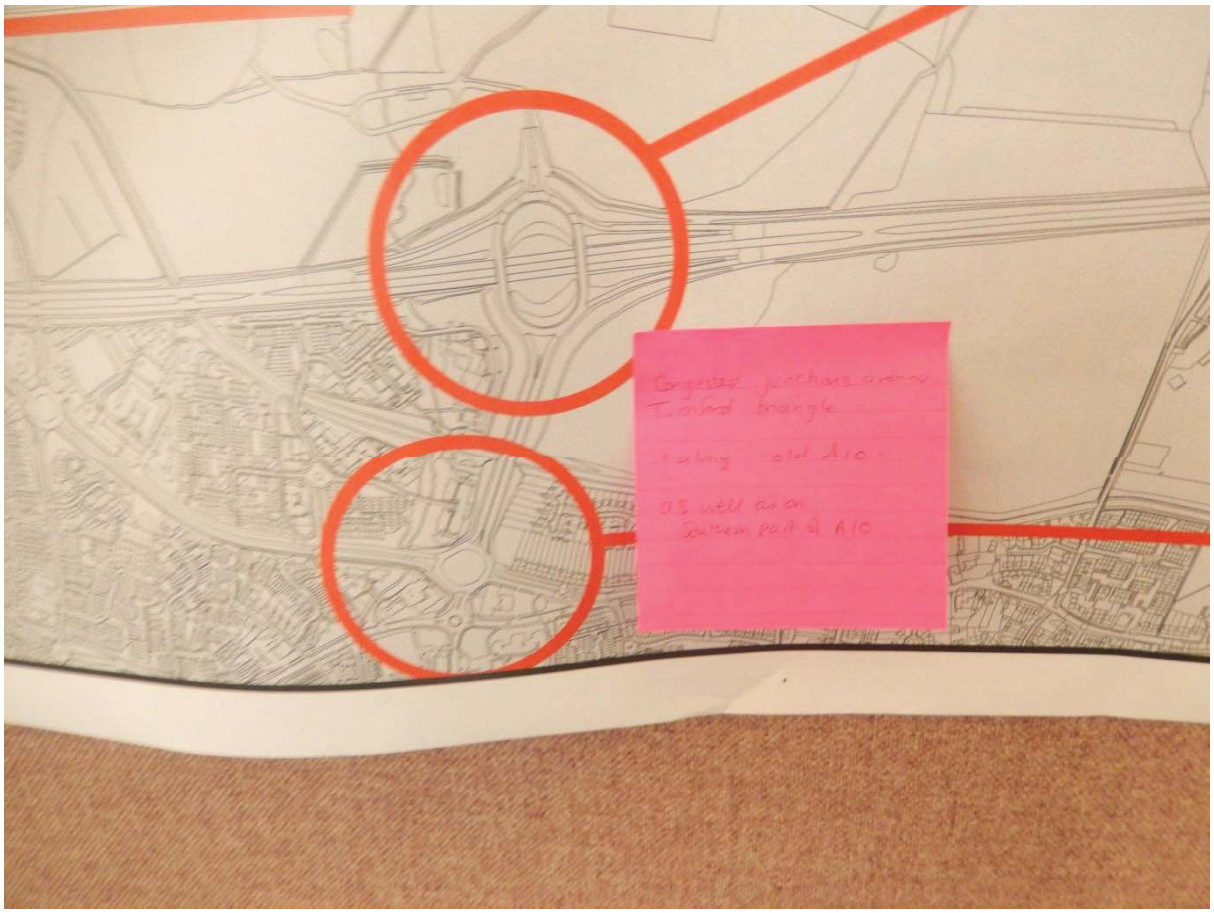

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AECOM (NYSE: ACM) is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries.

As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges.

From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, AECOM companies had revenue of approximately US$19 billion during the 12 months ended June 30, 2015.

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