

Hearing Statement – Matter 34 (Site H2089)

Kirklees Local Plan

On behalf of Miller Homes

January 2018



I. Introduction

I.1. This is a Hearing Statement prepared by Spawforths on behalf of Miller Homes in respect of:

- Matter 34: Dewsbury and Mirfield housing and mixed use allocations: Green Belt releases and Site H2089 land south of Ravensthorpe Road / Lees Hall Road, Dewsbury

I.2. Miller Homes has significant land interests in the area and has made representations to earlier stages of the Local Plan process.

I.3. The Inspector's Issues and Questions are included in **bold** for ease of reference. The following responses should be read in conjunction with Miller Homes' comments upon the submission version of the Kirklees Local Plan, dated December 2016.

I.4. Miller Homes has also expressed a desire to attend and participate in Matter 34 of the Examination in Public.

2. Matter 34 – Dewsbury and Mirfield

**Site H2089 – land south of Ravensthorpe Road / Lees Hall Road
(2,310 dwellings within the Plan period, 1,690 dwellings beyond the
Plan period)**

a) The Access Statement Technical Note (SS14) identifies a need for four access points into the site. What is the estimated dwelling capacity that could be served from each of these points? How is this capacity reflected in the phasing plan and housing trajectory? Has necessary third party land been secured?

- 2.1. Extensive technical assessment has been undertaken by i-Transport, Aecom and Kirklees Council regarding the traffic capacity of the access proposals and their phasing and this is reported in the Transport Strategy (SS14).
- 2.2. The dwelling capacity that can be accommodated and served by each access point depends on a range of factors including: design standards including the number of units that can be served by a single access; the provision of secondary access points; the ability to connect access points such that the traffic is distributed between accesses; background traffic flows; and the traffic flows generated by development.
- 2.3. The housing trajectory and phasing plan have been used to consider the disposition of development across the site and for each year within the Plan period. The access provision for each year has been evaluated and is summarised in Table 2.3 of the Transport Strategy. From this, key trigger points have been established and the capacity of the accesses at these times evaluated. This has been reflected in the masterplan, Delivery Framework and Phasing Storybook (SS14).
- 2.4. The detailed capacity assessment results are presented in the Transport Strategy (Section 2.3) and these show that the phased access strategy can accommodate the traffic flows generated by the proposed allocation at each point in time. In practice, residents on the site will have a choice of which access to use once the roads through the site are constructed

but the following table summarises the levels of development tested off each access at trigger points:

Trigger Point	Total Units	No. of Units Served By				
		Lees Hall Road Access	Forge Lane Access	Ravens-thorpe Road Access	Choice of Accesses	Sands Lane Access
1. Maximum levels of development before connection between Lees Hall Road and Ravensthorpe Road	890	505 ¹	-	335	-	50
2. Maximum level of development before Forge Lane Access is delivered	1,475	460	-	350	615	50
3. Maximum level of development before DRSR delivered ²	1,890	345	300	325	870	50
4. End of Plan period	2,310	345	300	395	1,220	50

1. With secondary access via King Edward Street; 2. 1,890 dwellings tested at 2029. Anticipated DRSR delivered at c.2,000 dwellings.

- 2.5. The capacity of the accesses is therefore represented within the phasing plan as the analysis confirms that all accesses will operate satisfactorily throughout the build period of the development.
- 2.6. The access points are primarily under the control of Miller Homes or the Council, other than a small parcel along the preferred route at Forge Lane where all parties are in constructive advanced discussions. It is anticipated that although the Forge Lane access is not needed until circa 1,500 dwellings are occupied that due to these advanced discussions that the Local Centre and Forge Lane access can be delivered early.

b) The Technical Note and Delivery Framework identify the need for strategic highway intervention at about the 2000th dwelling, with one solution being the provision of a new bridge and strategic highway through the site.

i. How would the new strategic road link into the scheme, and has a potential route been incorporated into the masterplanning work?

ii. How would the strategic road link be funded, and what effect would it have on the viability of the development scheme?

iii. Are other potential options being investigated?

- 2.7. The Delivery Framework and accompanying masterplan allow for a new strategic road link into the scheme at around the 2,000th dwelling. The Dewsbury Riverside Strategic Route (DRSR) is a potential option to increase highway capacity in the area and along the A644 corridor.
- 2.8. The new strategic road link will run from A644 at Low Mill Lane (north of the River Calder), bridging the river and railway to land within the site at its north western end. A new road will then run to the east, broadly parallel with the railway, connecting into the site access roundabout at Ravensthorpe Road/Calder Road. An indicative route from Low Mill Lane to the site and the link into the access roundabout are shown on the masterplan. This route reflects the Arups feasibility appraisal which considered topography and technical matters and is summarised in the Delivery Framework (SS14).
- 2.9. Given the likely delivery rates for the development, the strategic intervention required at circa 2,000 units will be needed towards the end of the plan period. As this strategic intervention is not needed for a number of years, all options are being considered and assessed in terms of short, medium and long term procurement and delivery options, which includes private sector funding, a joint public/private sector funding or public sector funding. The current assumption is that the DRSR is funded wholly by the private sector and that model is currently contained in the viability appraisal.

c) At what stage would improvements to Ravensthorpe station be required? What would these improvements involve and how would they be delivered / funded?

2.10. Miller Homes supports potential improvements at Ravensthorpe Station, however these improvements are not required as part of the scheme. Dewsbury Riverside can act as a catalyst to regenerate the neighbourhoods to the south of the town, increase the population and local expenditure thereby enhancing the potential to improve the railway station.

d) Should the proposal clearly specify the number/location of access points required and highways/transport infrastructure requirements?

2.11. The masterplan within the Delivery Framework (SS14) clearly shows the number and location of access points and approach to highways/transport infrastructure requirements. Miller Homes considers, in accordance with Local Plan Policy PLP5 that the approach to delivering the scheme should be contained within a Masterplan Framework, which will be endorsed by the Council.

2.12. The Masterplan is informed by a Transport Strategy (SS14), which has evaluated the development proposals using the Kirklees Transport Model. This has identified potential locations where highways/transport mitigation may be needed. It is envisaged that off-site junctions will be assessed in detail as planning applications for additional development come forward and the details will be agreed with the Council. The Delivery Framework and Transport Strategy identify the locations that will need to be assessed at particular trigger points during the life of the development, with these subject to future review with the Council.

e) Does the Plan provide sufficient detail on other infrastructure requirements, including education, open space, allotments and provision of a Local Centre? Should the Plan specify the amount of land required for the provision of such facilities, along with details of timing/phasing? How and at what stage will provision be made for early years/childcare and secondary education facilities? What size/form of Local Centre was factored into the Viability Assessment?

- 2.13. Miller Homes considers that the Local Plan needs to provide sufficient detail whilst not being overly prescriptive in terms of site requirements. Therefore, broad guidance should be provided in the Local Plan as to considerations for the site, whilst the Masterplan Framework should balance and detail those matters.
- 2.14. Miller Homes therefore considers that the Masterplan Framework, which will be prepared in accordance with Local Plan Policy PLP5, which provides the opportunity for further community and stakeholder engagement, is the most appropriate document to provide detail on infrastructure requirements and potential timescales and phasing.
- 2.15. The Masterplan at present shows land for a primary school within this plan period. The current understanding is that this will be needed at or around 350 dwellings. Land is also shown within the masterplan for a primary school and secondary school beyond the plan period, which is shown in accordance with current projections. The current understanding is that the secondary school is not needed on the site, however given the long delivery timescales, land is shown in case that position changes. If the land is not needed for a school this plot can provide further housing development.
- 2.16. A local centre of circa 4 acres has been factored into the viability assessment, which includes a health centre, community centre and some retail units and apartments.
- 2.17. Nevertheless, Miller Homes does have **concerns** that the Local Centre which is being planned for and a pre-application has been submitted is not included as part of the allocation policy box and is therefore not part of the allocation. There is a mention of “new community hubs” within the supporting text for aspects of the scheme to consider, however Miller Homes considers that the allocation of a Local Centre needs emphasising and should

form part of the actual allocation. **Miller Homes therefore suggests that the housing allocation be amended to be a mixed-use scheme and the Local Centre be part of the actual allocation.**

f) Should the proposal provide clearer detail on mitigation required in association with biodiversity, including the retention of existing habitats? Has ecological and arboricultural survey work been completed?

- 2.18. The site has been fully surveyed in relation to ecological matters over a number of years by Aecom and Brooks Ecological. These surveys relate to both the wider site and the areas which benefit from outline planning permission. There are no signs of protected fauna species and no significant flora species. The site is a mixture of arable fields with introduced shrubs, improved and poor semi-improved grassland and woodlands, mature trees and hedgerows.
- 2.19. The Delivery Framework (SS14) and accompanying masterplan take into account the ecological survey finds and the opportunities that the scheme could create through the creation of habitat linkages in the masterplan providing wildlife corridors encompassing existing features, adjacent buffer habitats and land for additional ecological enhancement. This can be seen in the overall green infrastructure provision on the masterplan.
- 2.20. Miller Homes therefore considers that the Masterplan Framework, which will be prepared in accordance with Local Plan Policy PLP5 is the most appropriate location to provide detail on biodiversity matters. This will ensure flexibility in the plan whilst balancing the site requirements.
- 2.21. Ecological and arboricultural survey work is continuing to ensure that the relevant surveys are undertaken in the relevant ecological window in preparedness for forthcoming planning applications.

g) Why does the Masterplan show residential development in southern sections of the site which are identified in the Landscape Framework Plan as ‘areas of development stand-off’ which are important for visual reasons?

- 2.22. As part of the Baseline Assessment for Dewsbury Riverside a Landscape Assessment was undertaken by TPM Landscape in 2012 and Landscape Framework Plan prepared in 2016. The Landscape Framework Plan is guidance and has informed the Masterplan for the scheme.
- 2.23. The Landscape Framework Plan identifies a broad zone along the upper slopes of the southern boundary as “Areas of Development Standoff to steep slopes and highest ground to provide a positive interface with adjacent farmland and to reduce visual impacts upon the valley ridge line”. This zone is just a broad principle to recognise that this area is higher up the hillside, slightly more prominent and has a tendency to be more steeply-sided.
- 2.24. The area is indicated as a hatch without a border to signify that this is not a clearly defined boundary, but more a recognition that the upper slopes are slightly more prominent. Therefore, the term ‘stand-off’ could be misinterpreted in this regard.
- 2.25. The intention was not to suggest that there were particular areas where development should be discounted entirely, rather that development on the upper slopes will need to be designed to make allowance for the steep slopes and to allow for mitigation through design in order to provide the positive interface with adjacent farmland. The design mitigation could include (for example) the following measures:
- Incorporate green networks in the most prominent/ sensitive locations to reduce the built form.
 - Providing more trees than a ‘standard’ layout, including along roadsides and also in rear gardens, in order to soften the built form when viewed from across the valley.
 - Ensuring that the design layout does not locate buildings on the most prominent ridges.

- Providing 'non-standard' units where necessary to fit the steeper slopes.
- Minimise lighting effects through directional low-level street lighting,

2.26. The approach to the masterplan and green infrastructure shown in the Delivery Framework (SS14) shows that development is not located on the steeper or more prominent slopes, that strategic green networks dissect and runs through the entire scheme breaking up the development cells and that further green infrastructure will be incorporated within each phase.

h) Have constraints relating to air quality, noise, contamination and land stability been satisfactorily investigated and addressed? Are related mitigation measures and requirements clearly expressed in the Plan? How have these constraints and measures impacted on the viability of the scheme?

2.27. Miller Homes has prepared a Delivery Framework for Dewsbury Riverside, which has been submitted to the Examination Library (SS14) and explains the principles and evidence that underpins the scheme. This document summarises the extensive surveys that have been undertaken on the site.

2.28. The site has been fully assessed and there are no major constraints to development of the site. Furthermore, two portions of the site benefit from outline planning permission. As part of the outline planning applications air quality and noise matters were addressed and are not major constraints with mitigation measures being the provision of a Travel Plan and low emission vehicle charging points. These matters can therefore be considered through subsequent planning applications and the Masterplan Framework.

2.29. Geo-environmental assessments and intrusive surveys have been undertaken across the site and indicate that the site is suitable for residential development. Furthermore, Site Investigations were submitted and considered as part of the outline planning applications. The majority of the site is essentially greenfield and no significant contamination is anticipated. Nonetheless, due to previous activities, including mining on some parts of the site, remediation and restoration works are anticipated and planned for in certain areas.

- 2.30. Civic Engineers has taken the recent site investigation information along with historic mining records and geological maps to construct a three-dimensional model of the existing and proposed ground levels. This model has informed the approach towards restoring and delivering the site, for example in terms of incidental coal extraction or grouting potentially worked shallow coal seams. The model respects a number of site constraints including existing boundary levels, areas of retained woodland, the existing watercourse and existing utility services; gas, clean water and overhead electricity networks. This consideration has informed the phasing and masterplan approach to the scheme.
- 2.31. The masterplan has avoided, wherever practical, constraint areas and where incursion into these areas is unavoidable costs have been included within the viability. The surveys and investigations are on-going as planning applications and Reserved Matters submissions are being prepared.

i) Is the indicative site capacity justified, having regard to landscape, environmental and other constraints and the provision of necessary infrastructure? How many dwellings are likely to be accommodated on land that is currently not within the Green Belt, both within the Plan period and over the whole development period? How many hectares will be required for development up to 2031 (2,310 houses)?

- 2.32. The indicative masterplan has taken into account the environmental and infrastructure considerations for the site. The Delivery Framework (SS14) provides a potential dwelling capacity range depending on coverage options and average unit sizes. This indicates the potential for between 3,237 and 4,655 dwellings, with the median being in the order of 3,997 homes.
- 2.33. A proportion of the site benefits from being outside the Green Belt as an existing housing allocation, Provisional Open Land or within the Urban Area. A significant proportion of this area already benefits from Outline Planning Permission. Furthermore, Yorkshire Housing is submitting in February 2017 Reserved Matters for Phase 1 (Lees Hall Road), Miller Homes has submitted a Pre-Application for Reserved Matters for Phase 2 (Ravensthorpe Road) and Kirklees Council has submitted a pre-application for Phase 3 (the Local Centre, including

land for the primary school and further housing). The scheme is therefore progressing in a timely manner as anticipated.

- 2.34. The area of land outside the Green Belt can potentially achieve in the order of 420 dwellings, which includes:

Phase	Description	Dwellings
Phase 1	Lees Hall Road	120
Phase 2	Ravensthorpe Road	120
Phase 3_1	Ravensthorpe Road residual land	60
Phase 3_2	Local Centre Apartments	70
Phase 5_1	Lees Hall Road POL residual land	50
Total		420

- 2.35. There is also potential for an extra care facility as part of the local centre, which could provide additional housing opportunities.
- 2.36. The gross site area which is anticipated to come forward within the plan period is in the region of 137 hectares, which includes the housing, local centre, primary school and green infrastructure.

j) The housing trajectory indicates that 710 dwellings will come forward within five years, with the first units delivered in 2018/19. Are the estimated delivery timescales reasonable and justified?

- 2.37. Miller Homes has prepared a Phasing Storybook (SS14) for the proposed scheme, which builds on the information contained in the Delivery Framework. This explains the approach towards opening up and delivering the site.
- 2.38. The site is readily available for development being in two principal landownerships. The scale of the site and the multiple potential access points provide an opportunity to maximise the delivery rates within the site, with potential for the development to be delivered

simultaneously in different locations. The Phasing Plan shows the different phases and areas of the site, which in effect given the scale of the site are different outlets. The Plans show a logical and structured programme of phasing which is based on the coordinated implementation of the earthworks and delivery of infrastructure.

2.39. A significant proportion of the early year's delivery already benefits from outline planning permission (240 dwellings). Yorkshire Housing are progressing Phase 1 at Lees Hall Road and Miller Homes is bringing forward Phase 2 at Ravensthorpe Road. A developer is in advanced discussions for delivering the local centre. The scheme is therefore progressing as anticipated in a timely manner.

2.40. The Phasing Storybook shows that within five years, following adoption of the Local Plan, 710 dwellings will have been built and a further 290 plots will benefit from detailed permission and not yet started. The infrastructure will therefore be in place to accommodate 1,000 new homes. In conjunction with this the local centre and the primary school would have been built. In addition, a further 405 dwellings will have outline planning permission.

2.41. Two developers are already committed to the site and advanced discussions are occurring with a third. Furthermore, there is interest from other developers. Added to the project specific resources within the Council and our experience of the timely determination of the outline planning applications for Phases 1 and 2, Miller Homes considers that the proposed trajectory is both reasonable and justified.

k) What effect would the proposed boundary change and allocation have on the Green Belt and the purposes of including land within it? In particular, how would the existing gap between Dewsbury and Thornhill be affected? Are there exceptional circumstances that justify altering the Green Belt? Is there evidence to demonstrate that the section of the site likely to come forward beyond 2031 would be justified and needed to meet housing requirements in the longer term?

2.42. One of the key drivers for the Dewsbury Riverside project is its role as a catalyst and a major strategic intervention to help regenerate Dewsbury. Dewsbury Riverside builds on

previous regeneration initiatives and masterplans for the area. The delivery of 4,000 new homes will create significant economic benefits which will be the catalyst for transformational change.

2.43. Dewsbury Riverside is an important part of the strategic interventions within the North Kirklees Growth Zone. The potential of a new housing offer through Dewsbury Riverside will help to reshape the area, meet existing and new demand and provide the homes for the future to meet growing demand and aspirations. The site has major benefits sitting in a prime strategic location at the heart of the Leeds City Region. It is located equidistant from the M62 and M1 Motorways with an entrance corridor along the A644 and A638. Furthermore, the site is located directly on the Leeds to Manchester / Huddersfield railway line with Ravensthorpe Station on the site boundary. The site is therefore ideally located to appeal to all sectors of the housing market. It has a wide sales catchment for housing development and access to key employment markets for residents.

2.44. Dewsbury Riverside can generate significant new benefits through:

- Enabling the regeneration and urban renaissance of Dewsbury and Ravensthorpe.
- Assisting in the provision of new strategic highways infrastructure.
- Creating significant new job opportunities and inject in the region of £400m GVA into the local economy.
- Creating the critical mass to assist in enhancing Ravensthorpe Station and surrounding area.
- Creating a high quality housing environment.
- Accommodating a range of housing types and tenure, including custom build, increasing choice and mix in the area and improving affordability.
- Delivering a new local centre which will integrate with the existing communities.
- Delivering landscape and environmental enhancement, including a Green Infrastructure strategy.
- Creating a robust and defensible urban edge and new Green Belt boundary.

- 2.45. The scheme is therefore a long term project where delivery transcends plan periods and as can be seen in the Phasing Storybook (SS14), planning permission will have been granted for the entirety of the scheme in this plan period. The certainty for delivery of the entire scheme therefore needs to be confirmed in this Local Plan.
- 2.46. Kirklees Council have recognised that in order to deliver 31,140 new homes by 2031. Green Belt land will need to be released for development. Release of the Dewsbury Riverside site will not however result in the merging of any existing settlements or in any adverse impact on the setting and character of an historic town. It will however create a new, long term defensible Green Belt boundary to the south of the site and catalyse local regeneration.
- 2.47. Kirklees is enveloped by the West Yorkshire Green Belt which is placing a significant pressure and obstacle to housing delivery. To meet the housing need and economic growth aspirations Kirklees have recognised a need to review the Green Belt. Dewsbury Riverside is a unique opportunity to meet the housing need and economic growth aspirations whilst delivering significant regeneration benefits for the area.
- 2.48. Paragraph 83 of The Framework considers that Green Belt boundaries can change “in exceptional circumstances”. Such a circumstance exists through the significant need to provide housing in Kirklees, and the need for regeneration and renewal in Dewsbury and Ravensthorpe. The aspirations to revitalise the area, which stem from the Housing Market Renewal programme, North Kirklees Strategic Development Framework and the now revoked Regional Spatial Strategy provide the context for Green Belt change, inward investment and urban renaissance.
- 2.49. The development of this site will not have a significant impact on any of the reasons for the Green Belt designation in the area. The new Green Belt boundaries will be drawn to provide a long term robust boundary. The development will not result in the coalescence of neighbouring towns, and will not encroach on the countryside nor affect the setting and special character of an historic town.
- 2.50. Miller Homes consider the proposed new Green Belt boundary at Dewsbury Riverside is robust and has been designed to accord with the Framework which requires that boundaries should be clearly defined using readily recognisable features to ensure permanency. The proposed edge of the Green Belt that would be created by Dewsbury Riverside would

utilise distinctive features and have a positive role to play in distinguishing between the urban and Green Belt areas. The proposed new boundary would be amended to utilise existing woodland, field boundaries, tree belts, lanes and tracks to ensure the Green Belt is defined for the long term. The development of the site would lead to opportunities being created for green infrastructure and access to the green spaces beyond. The site would be within close proximity to both opportunities for outdoor sport and recreation and service and retail facilities and employment opportunities. The boundary therefore fully accords with the Framework and is well defined for the long term.

Proposed Change

2.51. To overcome the objection and address soundness matters, the following changes are proposed:

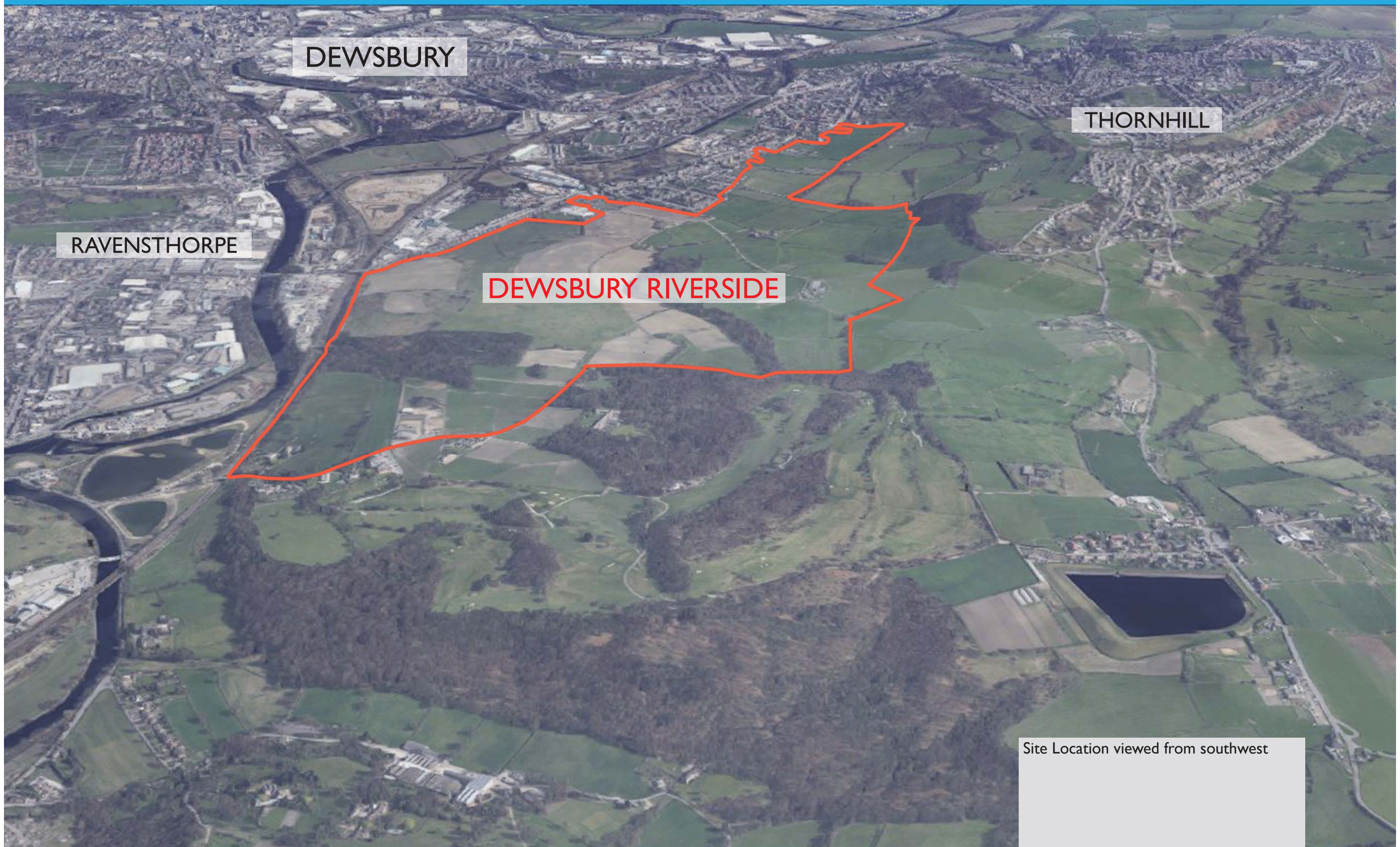
- Identify and allocate District and Local Centres on H2089 Dewsbury Riverside

DEWSBURY RIVERSIDE

PHASING STORYBOOK

Aerial Photograph

Dewsbury Riverside



Site Location viewed from southwest

Introduction

Miller Homes has experience of the project management and implementation of major developments throughout the UK. Inevitably these schemes require long term commitment from landowners and developers and the management of infrastructure costs in relation to both on-site and off-site (mitigation) requirements.

Miller Homes has accumulated expertise in the delivery of major schemes, most notably in West Yorkshire at Wakefield East/City Fields and associated delivery of the Wakefield Eastern Relief Road.

The Dewsbury Riverside site is readily available for development being in two principal landownerships. The scale of the site and the multiple potential access points provide an opportunity to maximise the delivery rates within the site, with potential for the development to be delivered simultaneously on different locations. The Phasing Plan shows the different phases and areas of the site, which in effect, given the scale of the site, are different sales outlets. The Plan shows a logical and structured programme of phasing which is based on the coordinated implementation of the earthworks, remediation and delivery of infrastructure and relocation of the gas main and pylons.

Furthermore, on the basis that part of the site is allocated in the current UDP for housing and another part as Provisional Open Land which benefit from a recently granted Outline Planning Permission it is considered reasonable for the development to commence in 2018 from two outlets, in advance of the Local Plan adoption, and for this to ramp up on adoption of the Local Plan.

Upon adoption of the Local Plan a small scheme of up to 50 dwellings will be able to come forward immediately at Sands Lane with its own access arrangements. Furthermore, in relation to highways the Forge Lane access is not needed until around 1,500 units, nevertheless it is anticipated that this access along with the Local Centre will be delivered much sooner in the short term around 2018/19. The delivery of the Forge Lane access will allow for later phases to be brought forward earlier as the infrastructure will be in place at the heart of the site. The Local Centre is a key gateway into the site and has the ability to 'market make'. Plans are already well advanced for the development of a GP surgery, local shops and community facility along with older person accommodation.

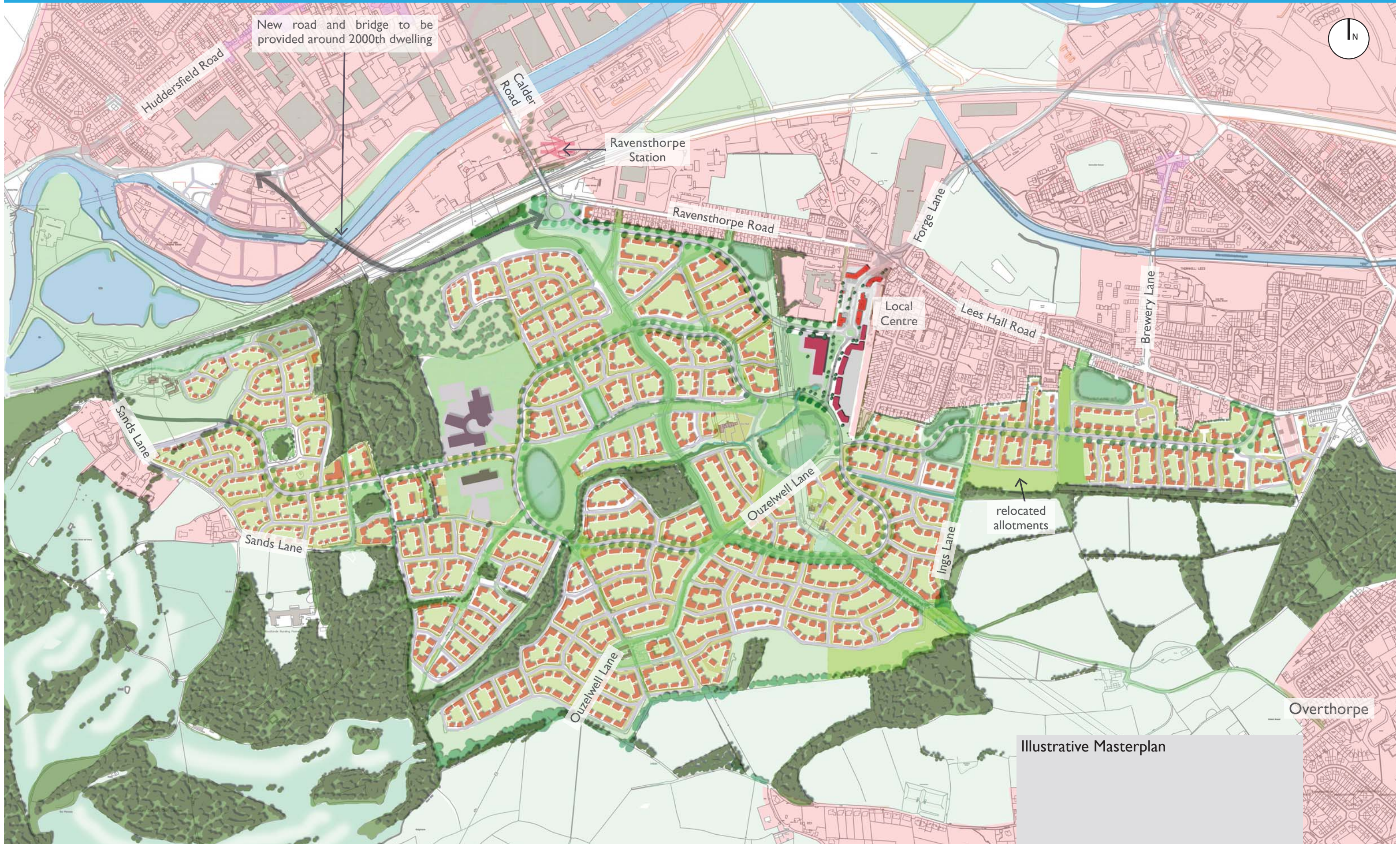
The delivery of the site is further amplified through key delivery partners with Yorkshire Housing progressing the first phase from Lees Hall Road and looking to take an interest in the wider site as a mix of market and affordable housing. There is also interest in the site from other housebuilders, the Private Rented Sector and in developing the Local Centre along with the older person accommodation. Further opportunities are also being developed within the scheme for custom build and self build properties.

Each phase therefore has the potential to address different markets and distinct value bands. Based on what is currently known about the site and the proposed scheme, and the assumptions above, we anticipate that the scheme could deliver 2,310 homes in the local plan period and in the region of 1,690 homes beyond the plan period.

This Phasing Storybook explains the broad strategy in delivering the major regeneration scheme.

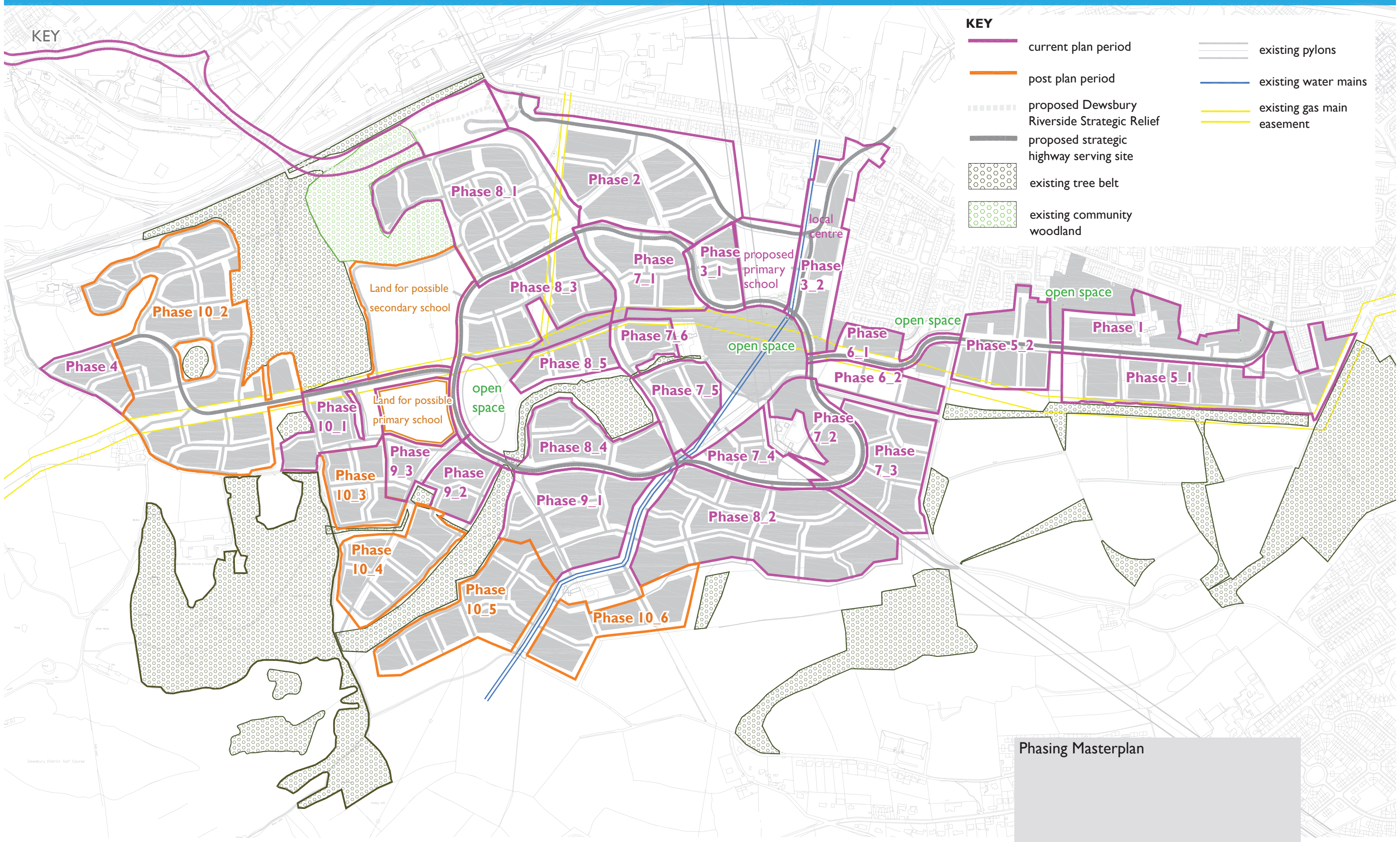
Illustrative Masterplan

Dewsbury Riverside



Development Phases 2017 to 2041 (4000 dwellings)

Dewsbury Riverside



KEY

KEY

- current plan period
- post plan period
- proposed Dewsby Riverside Strategic Relief
- proposed strategic highway serving site
- existing tree belt
- existing community woodland
- existing pylons
- existing water mains
- existing gas main easement

Phasing Masterplan

Phases I to 7.1 (The First 7 Years)

Dewsbury Riverside

Anticipated Time Line

2017

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027

2028

2029

2030

2031

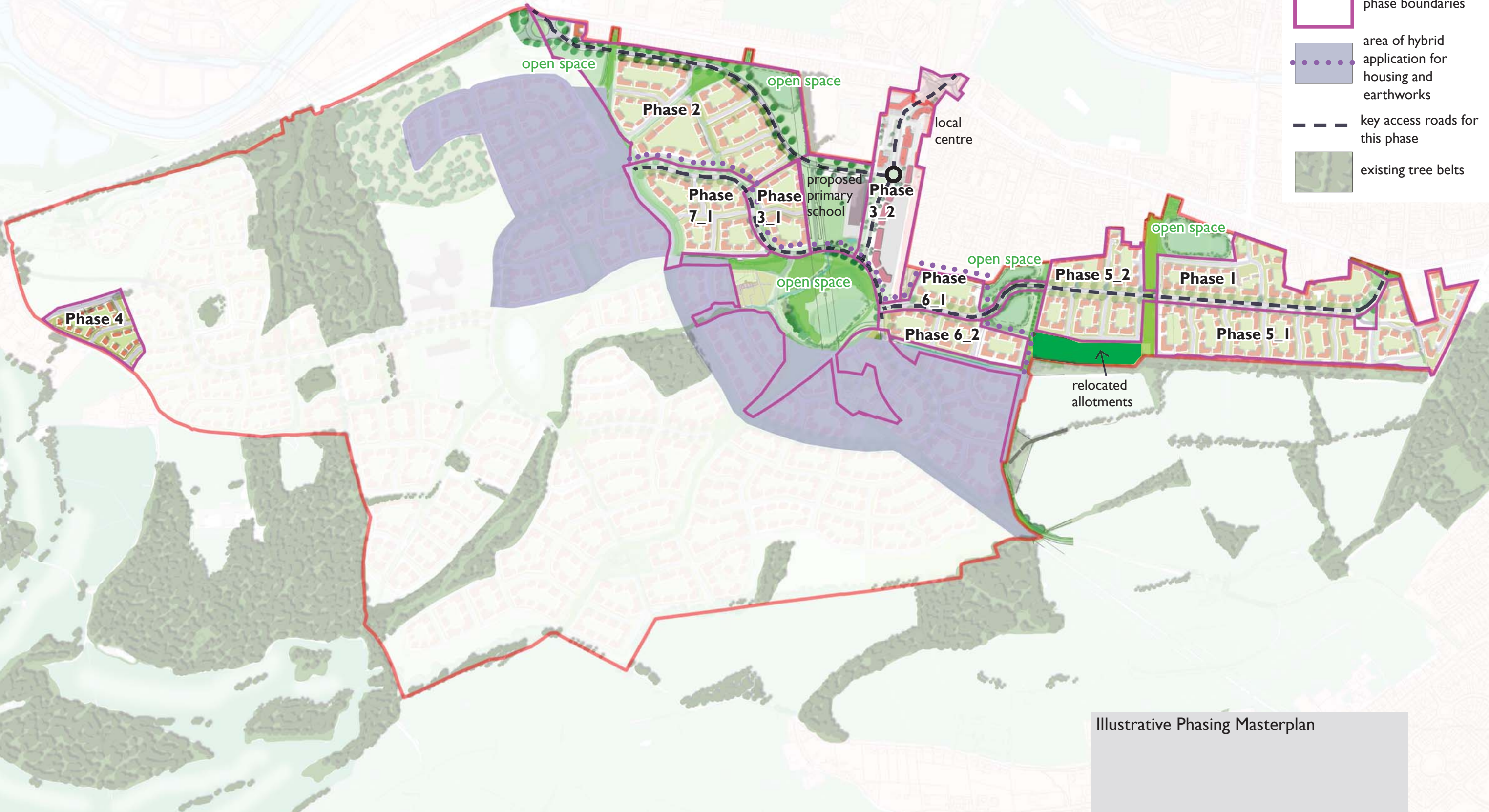
Post Plan Period

Development commences

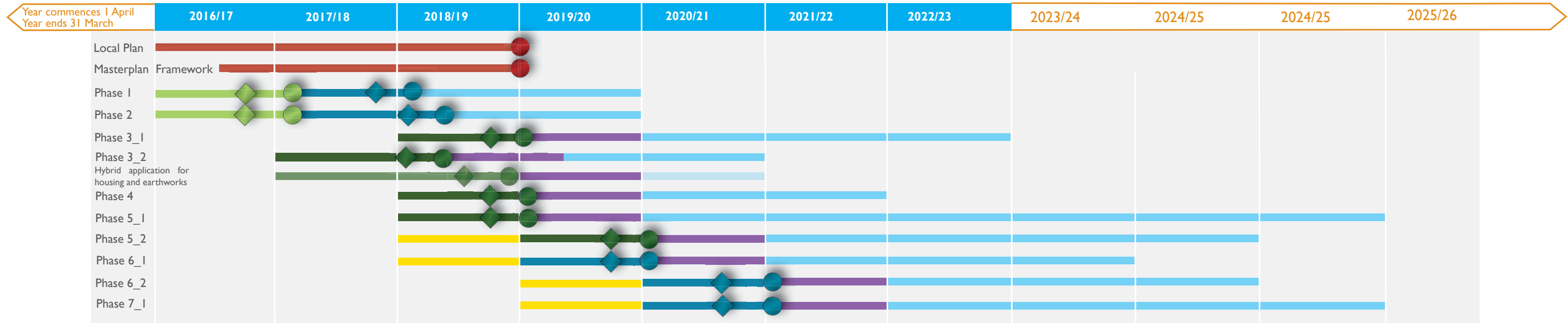
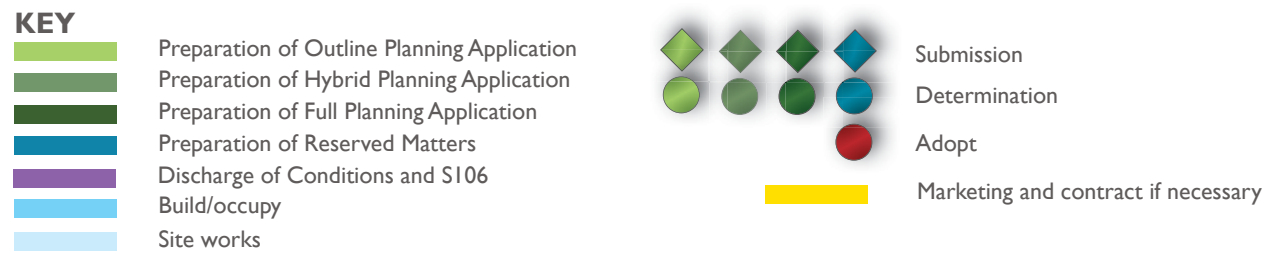
Completion first 710 dwellings

KEY

- phase boundaries
- area of hybrid application for housing and earthworks
- key access roads for this phase
- existing tree belts



Illustrative Phasing Masterplan



Miller Homes secured Outline Planning Permission for Phases 1 and 2 in 2017. Yorkshire Housing is taking Phase 1 forward and Reserved Matters will be submitted in February 2018. A pre-application for the Reserved Matters for Phase 1 and for a planning application for Phase 3 the Local Centre have been submitted.

A hybrid application for the wider early phases, which will include an earthworks scheme and Green Infrastructure will be submitted towards the end of 2018 and likely to include and Environmental Impact Assessment. This application will be determined when the Local Plan is adopted. This application is already being prepared and will allow the ground works to progress swiftly.

The delivery of the site is based on a number of access points and phased implementation. I-Transport’s Transport Strategy fully explains the approach. In the short term access will be gained from Lees Hall Road and Ravensthorpe Road via priority junctions, which will be later upgraded to roundabouts at the appropriate time. The two access points will link through the internal road network of the site. The Forge Lane access is

not needed in terms of highways capacity until circa 1,500 dwellings, but will come forward earlier which will allow for greater permeability of the scheme and the creation of the strategic route through the site.

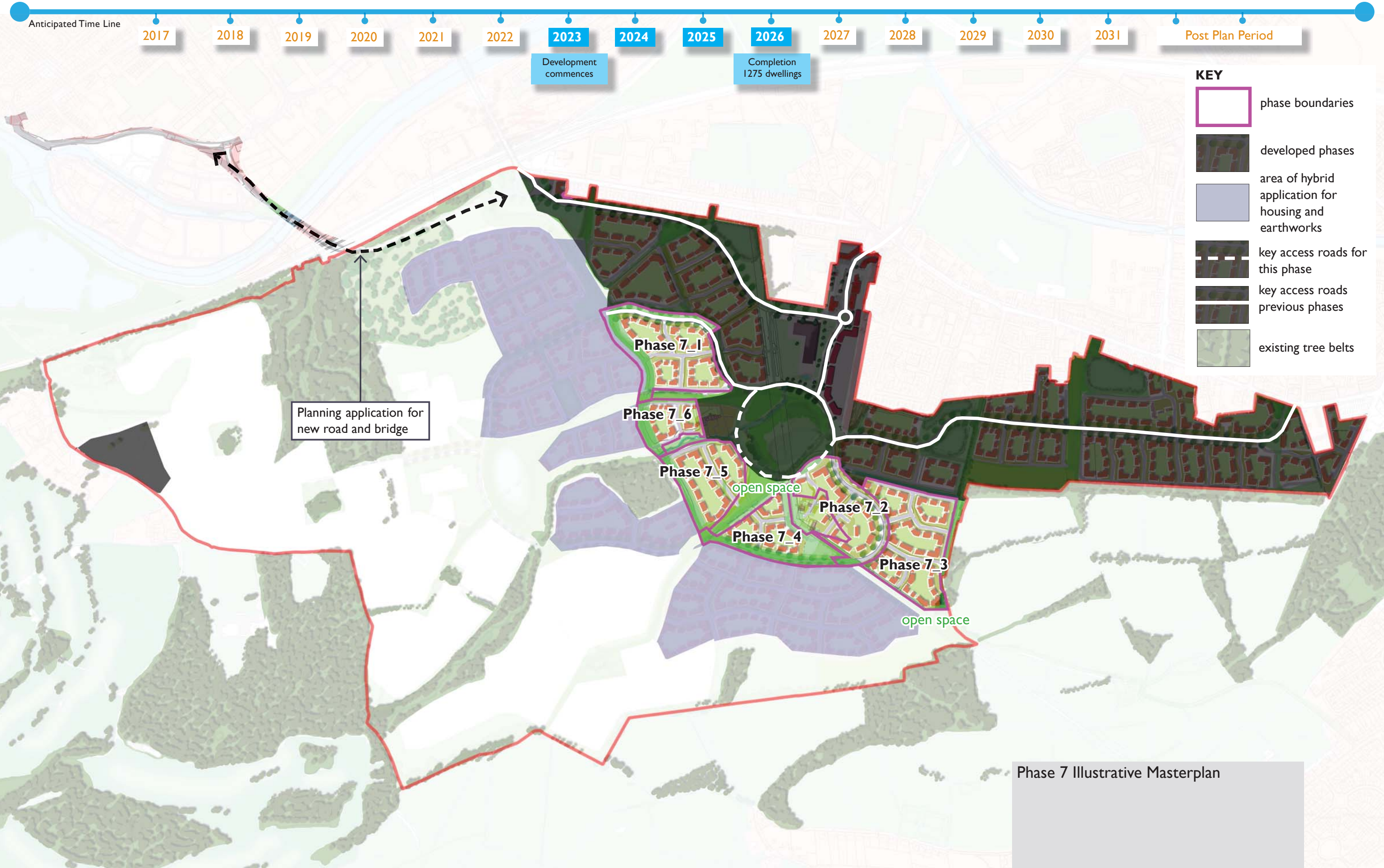
Development will commence in the short term on Phases 1, 2 and 3. Land will be made available for the new primary school in Phase 3 of the scheme. Following adoption of the Plan a modest scheme at Sands Lane will move forward along with further phases at Lees Hall Road starting with Phase 5_1 and then moving onto Phase 5_2, 6_1, 6_2 and 7_1. Phases 6_2 and 7_1 are anticipated to commence towards the end of the first five years. This approach will allow a phased approach to outlets and whilst some complete, others will commence.

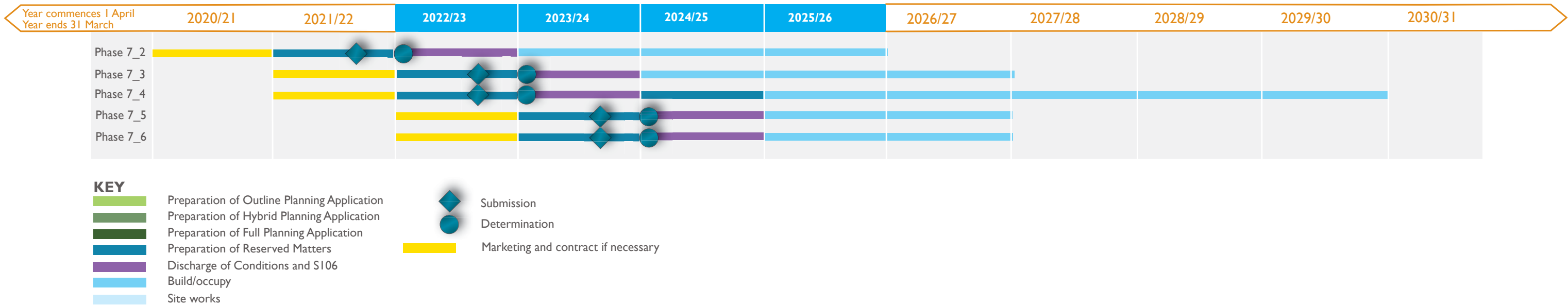
With phases of the site already benefitting from planning permission (240 dwellings) and with planning applications and Reserved Matters progressing and developers on-board for the early phases it is considered reasonable that in the first five years that the scheme will have secured planning permission for 1,000 plots and have delivered 710 dwellings with a further 405 dwellings with Outline Planning approval.

- 710 dwellings completed
- 290 dwellings with benefit of Reserved Matters/detailed planning permission but not started
- 405 dwellings with outline planning approval
- Local centre completed
- Primary school completed

Phases 7.1 to 7.5

Dewsbury Riverside





This phase of the scheme will complete the housing at the Lees Hall Road end of the scheme and continue the delivery of Phase 7 and the residual housing on the restored land. Phase 7_1 is already under construction whilst the other Phase 7 outlets will all start as the earlier phases start to complete. It will also create the central area of green infrastructure and drainage features. The drainage strategy for the scheme shows that each phase will cater for its own drainage.

During this period preparations for planning will commence for the Dewsbury Riverside Strategic Route, if it is required.

During this period 1,275 dwellings will have been completed on Dewsbury Riverside. This is a further 565 dwellings. However, planning permissions will be in place to bring forward a further 1,190 dwellings, which includes planning permission for Phase 8 as it is important that as one phase completes a seamless transition is maintained in commencing the next phase.

- 565 dwellings completed
- 1130 dwellings with benefit of Reserved Matters/detailed planning permission but not started
- 60 dwellings with outline planning approval

Phase 8.1 to 8.5

Dewsbury Riverside

Anticipated Time Line

2017

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027

2028

2029

2030

2031

Post Plan Period

Development commences

Completion 1680 dwellings

KEY

- phase boundaries
- developed phases
- area of hybrid application for housing and earthworks
- key access roads for this phase
- key access roads previous phases
- existing tree belts

Construction commences on new road and bridge

open space

Phase 8_1

Phase 8_3

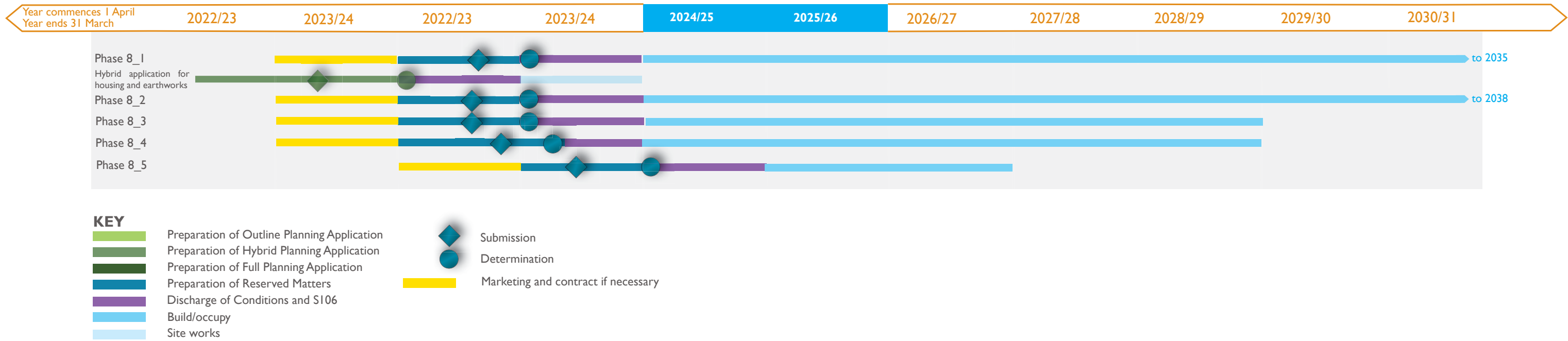
Phase 8_5

open space

Phase 8_4

Phase 8_2

Phase 8 Illustrative Masterplan



This phase is the central portion of the site. Phases 8_1 and 8_3 already benefit from outline planning permission having formed part of the earlier earthworks scheme. Ahead of progression on Phases 8_2, 8_4 and 8_5 a hybrid application for housing and enabling/earthworks will be submitted around 2023, which if necessary will be accompanied by an Environmental Impact Assessment. This will prepare and deliver the platform for each phase.

The main site circulatory road and bus route will be completed as part of Phase 8, which brings public transport provision into the heart of the site. Infrastructure delivery is a main aspect of this phase as delivery of the Dewsbury Riverside Strategic Route will commence towards the end of this phase, if it is required, ahead of completion of the 2000th unit. As part of the green infrastructure strategy further areas of public open space and drainage features will also be created.

During this period 1,680 dwellings will have been completed on Dewsbury Riverside. This is a further 405 dwellings. However, planning permissions will be in place to deliver a further 1,085 dwellings, which includes Phase 9.

- 405 dwellings completed
- 1045 dwellings with benefit of Reserved Matters/detailed planning permission but not started
- 40 dwellings with outline planning approval

Phases 9.1 to 9.3

Dewsbury Riverside

Anticipated Time Line

2017

2018

2019

2020

2021

2022

2023

2024

2025

2024

2025

2028

2029

2030

2031

Post Plan Period

Development commences

Completion 2100 dwellings

KEY

- phase boundaries
- developed phases
- area of hybrid application for housing and earthworks
- key access roads for this phase
- key access roads previous phases
- existing tree belts



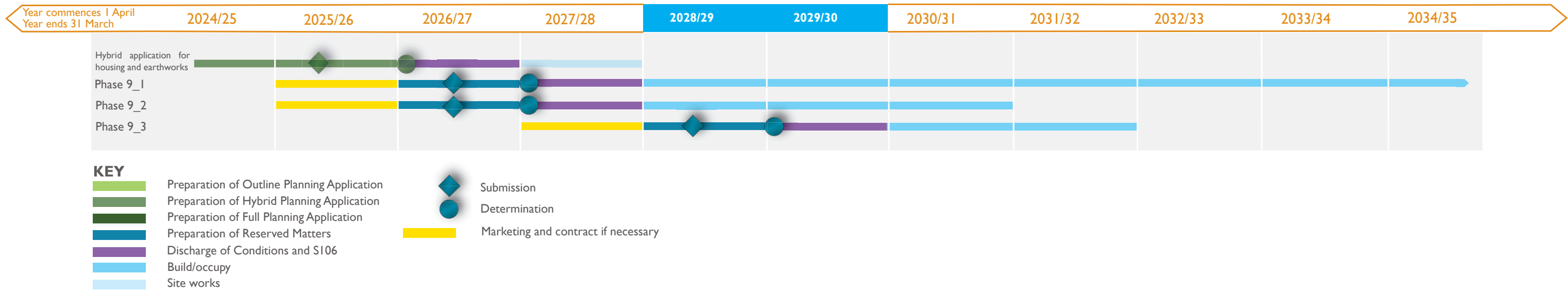
Phase 9_3

Phase 9_2

Phase 9_1

open space

Phase 9 Illustrative Masterplan



This phase will deliver Phase 9 of the scheme towards the latter years of the Plan. Ahead of progression on Phase 9 a hybrid application for housing and the enabling works and earthworks will be prepared around 2025, which will be accompanied by an Environmental Impact Assessment, if necessary. This will allow for subsequent Reserved Matters for each phase of housing.

Phase 9 is a relatively small phase on the main circulatory route in the heart of the site. As part of this scheme further green infrastructure and drainage features will be created.

During this period 2,100 dwellings will have been completed on Dewsbury Riverside. This is a further 420 dwellings. However, planning permissions will be in place for up to a further 1,900 dwellings, which includes planning permission for the final phase – Phase 10.

- 420 dwellings completed
- 785 dwellings with benefit of Reserved Matters/detailed planning permission but not started
- 1115 dwellings with outline planning approval

Phases 10.1 to 10.6

Dewsbury Riverside

Anticipated Time Line

2017

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027

2028

2029

2030

2031

Post Plan Period

2041

Development commences

Completion 2310 dwellings

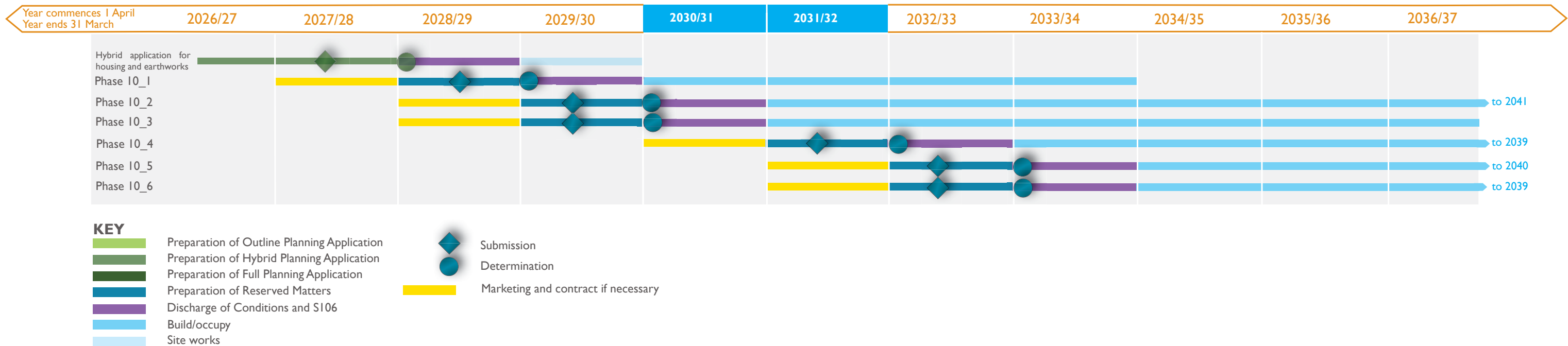
Completion of scheme

KEY

-  phase boundaries
-  developed phases
-  key access roads for this phase
-  key access roads previous phases
-  existing tree belts



Phase 10 Illustrative Masterplan



This is the final phase where planning will commence during the final years of the Local Plan. A hybrid application for housing and the enabling works and earthworks will be prepared around 2027, which will be accompanied by an Environmental Impact Assessment, if necessary. This will allow for subsequent Reserved Matters for each phase of housing.

It is anticipated that Phase 10 enabling works/earthworks will occur from 2029 onwards, whilst Phase 10_1 will deliver housing during the final year of the Plan. Details for Phases 10_2 and 10_3 should be approved during the final year of the plan.

Phase 10 will primarily deliver housing during the post plan period. Other phases that transcend into the next plan period are Phases 8_1, 8_2, 9_1, and 9_3.

During this period land will be made available for the new primary school and if required also a new secondary school. If the secondary school is not needed then this will provide a further area for new housing. Further green infrastructure and drainage features will also be created.

During this period 2,310 dwellings will have been completed on the

site, whilst the final phases of the scheme will start to commence, with around 1,690 dwellings coming forward post plan period. This Phase will complete the major regeneration scheme, which should occur around 2040/41.

- 1900 dwellings completed
- New Primary School completed
- Potential new Secondary School if required

Green Infrastructure

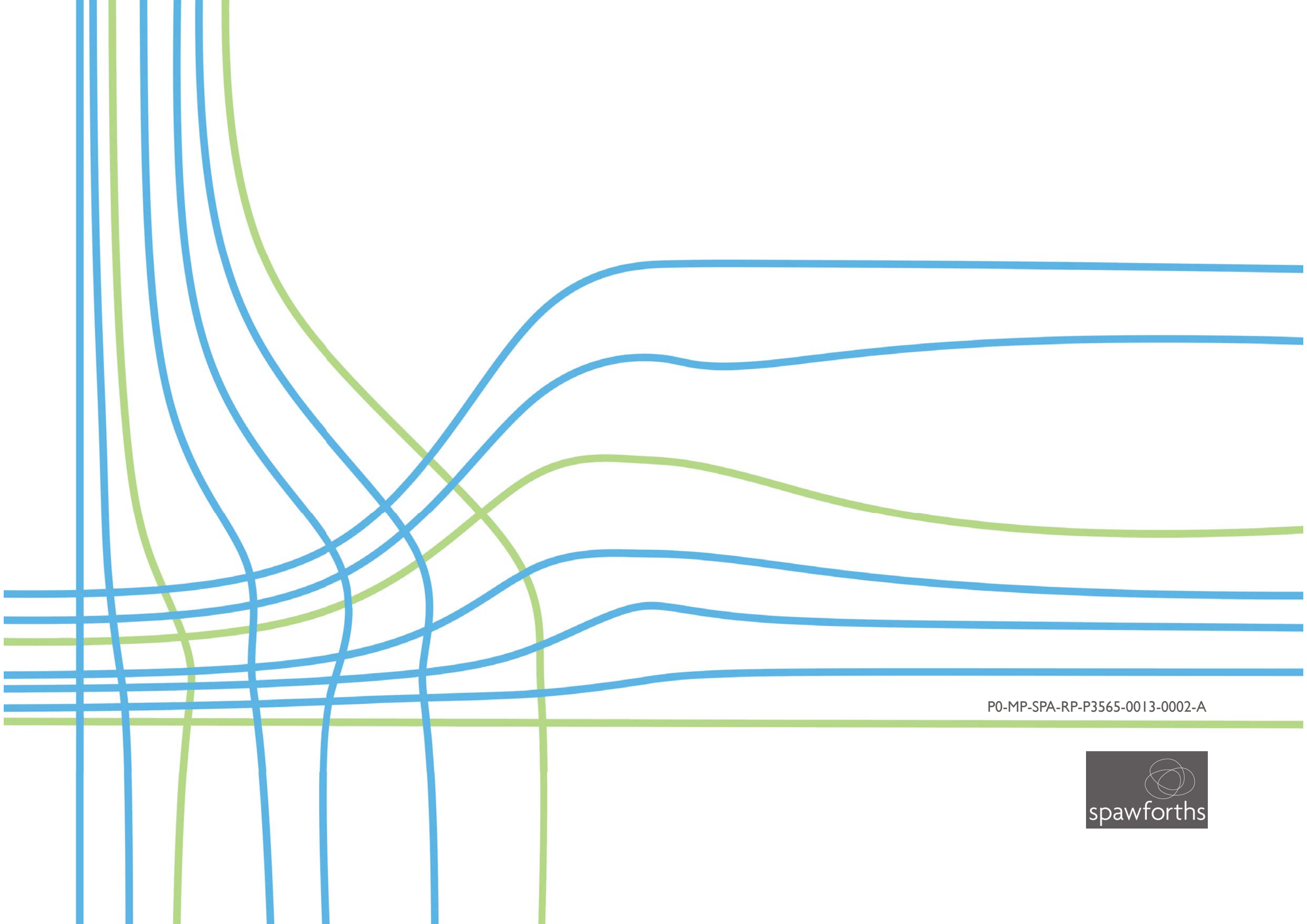
Dewsbury Riverside



Green Infrastructure Plan with masked background



Green Infrastructure Plan showing connections to wider area



P0-MP-SPA-RP-P3565-0013-0002-A





DEWSBURY RIVERSIDE
TRANSPORT STRATEGY
Client: Miller Homes



DEWSBURY RIVERSIDE

TRANSPORT STRATEGY

Client: Miller Homes

i-Transport LLP
Park House
Park Square West
Leeds
LS1 2PW
Tel: 0113 357 1360
Fax: 0113 357 1361
www.i-transport.co.uk

i-Transport Ref: SE/dc/ITM11043-010C R

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SECTION 1 INTRODUCTION

1.1 Overview

- 1.1.1 Kirklees Council (KC) is preparing a new Local Plan and is proposing to allocate land for strategic development, identified within the emerging plan as site H2089 'Land South of Ravensthorpe Road, Thornhill Lees, Dewsbury'. The site is known as Dewsbury Riverside and is being promoted for development by Miller Homes.
- 1.1.2 The site is located c.2.5km south of Dewsbury town centre, south of Ravensthorpe Road and Lees Hall Road and north-west of Thornhill. A plan showing the location of the site is included as Appendix 1.A.
- 1.1.3 The Publication Draft Local Plan identifies the site as having a capacity of 4,000 residential dwellings, with 2,310 delivered within the plan period to end 2031.
- 1.1.4 A Concept Masterplan of the site has been developed by Spawforths and is included within the Delivery Framework document. This shows the broad disposition of residential development across the site and potential locations of supporting and complementary uses such as schools (primary and potential secondary), retail and leisure facilities, primary health care uses, community facilities and areas of open space.
- 1.1.5 The size of the site and the mix of uses will assist in minimising off site travel, with residents able to access a range of facilities and services on the site, within easy walking or cycling distance. This combined with the sites location, adjacent to the existing urban area and in close proximity to additional services and public transport networks, means that the site presents an excellent opportunity to promote sustainable transport and reduce vehicular traffic generations.
- 1.1.6 Nevertheless, a development of the size proposed will continue to generate sizeable traffic flows and these will need to be managed and, where appropriate, their impacts mitigated.

- 1.1.7 An outline transport strategy to serve and facilitate the delivery of the site has therefore been developed, also including proposals to access the site. In the short-medium term, access will be via the existing road network in the area. In the longer-term, a 'strategic intervention' will provide an additional access as well as increased off-site highways capacity. One options for this is the Dewsbury Riverside Strategic Route.
- 1.1.8 The development of the transport strategy and access proposals has necessarily taken account of the stage in the planning process, with the development allocations not yet confirmed, and the size of the site and the timeframe over which it will be developed with many aspects likely to evolve over the development build-out period, with details assessed as individual planning applications are prepared. Thus the final detailed strategy will need to be flexible, responding to changes over time. The public transport measures, access proposals and highways mitigation measures to accommodate off-site traffic impacts will therefore be refined as the development progresses and planning applications are prepared.
- 1.1.9 The Council is, however, keen to demonstrate that the proposals will deliver residential development in the early years of the plan and this has therefore been addressed in this report.
- 1.1.10 The approach has been discussed and agreed with the Council and it has also used the Council's transport model to assess the impacts of development and strategic highways interventions in the longer term. More conventional traffic assessment work has also been conducted, at the request of KC, to assess the shorter-term implications of the development corresponding with five and seven year Local Plan timeframes i.e. to address the short-term delivery of dwellings on the site.

1.2 **Scope of this Report**

- 1.2.1 This report therefore provides an outline transport assessment of the development proposals and sets out the following:-
- In Section 2.0, a summary of the development proposals including access provision;
 - In Section 3.0, the sustainable travel strategy developed to serve the potential allocation;

- In Section 4.0, a summary of the techniques and modelling used to assess the traffic impacts of the proposals;
- In Section 5.0, the results of the short-term traffic assessments, designed to show development can be delivered in the early years of the plan; and
- In Section 6.0, the results of the assessments of the proposals in the longer-term using the Kirklees Transport Model.

1.2.2 The conclusions of the report and assessments are set out in Section 7.0.

1.3 Conclusions

1.3.1 The overall conclusions of this report are that:

- The size of the site and mix of uses proposed will encourage sustainable travel and minimise traffic impacts.
- The proposed allocation is sustainable and accessible by sustainable modes, with it being capable of supporting improvements in provision for pedestrians, cyclists and public transport users.
- The site will result in benefits for the local area, enhancing connectivity.
- The site can be accessed satisfactorily and assessments show that the proposed access provision will operate within capacity.
- The traffic impacts of development in the short-term are modest and assessments show that the site can contribute to the delivery of development in the early years of the plan.
- The longer-term impacts of the proposals as a whole will not be severe with a strategy identified to consider mitigation as development progresses.

1.3.2 It is concluded that the site is suitable for allocation for development as proposed by the Council.

SECTION 2 DEVELOPMENT PROPOSALS

2.1 Masterplan

Site Location

- 2.1.1 Dewsbury Riverside represents an opportunity to deliver much needed housing growth in a truly sustainable manner, underpinned by a comprehensive transport strategy that focuses on the promotion of sustainable travel modes and encompasses lifestyle choices, behavioural change and place making.
- 2.1.2 The site is located in a sustainable location and is well defined by existing housing, roads and tracks. The site is located on the edge of Dewsbury and Ravensthorpe, which provide shops and services, and also access to public transport facilities, with bus stops located on Lees Hall Road and Huddersfield Road and a train station at Ravensthorpe. The location of the site is shown in Appendix 1.A. The site is located c.800m south of the centre of Ravensthorpe, c.2.5km to the south of Dewsbury town centre and c.9.5km north east of Huddersfield.
- 2.1.3 The site comprises primarily farmland, but also includes areas which have had a history of mining. Part of the site is an existing UDP housing allocation and part of the site is Protected Open Land. Parts of the UDP housing allocation and Protected Open Land have each recently achieved a planning consent for a total of 240 residential dwellings.

Dewsbury Riverside Vision

- 2.1.4 Spawforths has set out the vision for Dewsbury Riverside. This is to create up to 4,000 new homes in an urban extension to the south of Dewsbury, which will be a driver for regeneration. The overall scheme will create sufficient economic impetus to deliver new infrastructure and regenerate Dewsbury town centre, Ravensthorpe and the riverside.
- 2.1.5 As identified by Spawforths, Dewsbury Riverside forms an essential element of the regeneration plans for Dewsbury. The project aims to:
- Deliver the regeneration and urban renaissance of Dewsbury and Ravensthorpe through housing delivery of sufficient quantity to generate transformational change.

- Rejuvenate Dewsbury town centre through creation of distinctive quarter, new linkages and reconnection with the Riverside.
- Address all sectors of the market demand for affordable housing need in south Dewsbury.
- Enhance the level of service provision and recreation and leisure opportunities.
- Open up the potential for the delivery of improved infrastructure and connections whilst extending and enhancing green corridors and linkages.

2.1.6 Spawforths note the aim is to regenerate Dewsbury to the benefit of residents, employers, investors and visitors. The aim is to position Dewsbury as a quality place to attract new investors, employment opportunities and housing. The scheme aims to reduce future forecast congestion in Ravensthorpe and deliver environmental improvements. It will reinstate Dewsbury as a place of economic and cultural activities in the Leeds City Region. In its wider context, the project will act as a catalyst for further investment and development across the Leeds City Region.

2.1.7 Spawforths conclude that the vision for Dewsbury Riverside is to deliver transformational change and investment in this area and create a high quality gateway. The key elements being to drive forward the economy in the region, enhance the residential offer, regenerate the town centre, improve the environment, create excellent transport connectivity and improve access to employment opportunities. The redevelopment of the area will accelerate the urban renaissance of Dewsbury and enhance the connectivity between the existing communities and the environment beyond, creating the potential for new active leisure opportunities within Dewsbury, promoting healthy living and an improved environment. The renewal of Dewsbury will help the town to achieve its economic growth aspirations over the coming decades. Consequently, it will enhance the effectiveness of previous and ongoing investment to revitalise Dewsbury town centre, as well as providing the opportunity to help support and enable housing growth.

2.1.8 In addition, the redevelopment of Dewsbury offers the opportunity to develop the town's road network, improving connectivity and access to neighbouring communities and the town centre. It will also allow the coordination of public transport services in the area, enabling better access to employment opportunities across the District and Leeds City Region as a whole. Through such sustainable redevelopment, Dewsbury Riverside will deliver economic, social and environmental benefits and improve the quality of life for its local population and beyond.

Overview of the Proposals

2.1.9 A draft concept masterplan of the site, prepared by Spawforths, is included in the Delivery Framework report. This shows an indicative disposition of the proposed uses across the site.

2.1.10 The proposed urban extension to the south of Dewsbury has the capacity for around 4,000 new homes, alongside community facilities, open space, new schools and a local centre to create a sustainable community. The new local centre has been located close to Forge Lane to tie into the heart of the existing Ravensthorpe settlement to promote cohesion between the new and existing communities.

2.1.11 Existing green links and corridors will be extended through the proposed residential site and these will connect the green space infrastructure. The green links could also accommodate pedestrian and cycle routes, with an emphasis on safe routes to school. Sustainable urban drainage features will create further amenity for the open space as well as creating new habitat to promote diversity of wildlife species.

2.1.12 The masterplan shows the potential to deliver both primary schools and a potential secondary school on the site, located to reduce off-site trip making and provide for education needs locally. There is a very good prospect of the majority of school trips being made locally within the site – these, along with work trips, are predominately made in the morning peak hour. The number of school places at the proposed primary and possible secondary schools can be 'balanced' with the number of expected school age children in the proposed 4,000 dwellings. Information from the National Travel Survey (NTS) demonstrates that trips to local schools are predominately made on foot:

Table 2.1: NTS Modal Split of Trips to School

Main Mode	Aged 5 – 10 Years		Aged 11 – 16 Years	
	Under 1 mile (1.6km)	All lengths	Under 1 mile (1.6km)	All lengths
Walk	78%	44%	87%	37%
Bicycle	2%	1%	3%	2%
Car/Van	20%	48%	8%	26%
Bus	-	6%	2%	29%
Other	-	1%	-	5%
Total	100%	100%	100%	100%

2.1.13 All of the residential dwellings will be within one mile (1.6km) of the proposed primary and possible secondary schools, the majority at distances much less than this. School aged children will therefore be able to walk to their local schools with very few car trips likely to be made.

2.1.14 Access is considered in further detail in Section 2.3 below but the masterplan shows four proposed accesses from the adjacent highway network: off Lees Hall Road; an extension of Forge Lane; off Ravensthorpe Road; and off Sands Lane. The masterplan also shows a potential new strategic connection from Low Mill Lane that will also provide access in the longer-term.

2.2 Housing Trajectory

2.2.1 A development of 4,000 dwellings will be phased over and beyond the plan period. The phasing will affect the transport strategy for the site including access provision, off-site traffic impacts and the sustainable transport proposals to serve the site.

2.2.2 An indicative housing trajectory has been developed by Spawforths with the total development of 4,000 dwellings disaggregated into several phases.

2.2.3 The number of dwellings delivered within the plan period in five year periods is summarised in the table below:-

Table 2.2: Summary of Development Phasing

Period	No. of Dwellings in Period	Cumulative No. of Dwellings
2017 to 2021	350	350
2022 to 2026	925	1,275
2027 to 2031	1,035	2,310
Total in plan period	2,310	2,310
Beyond plan period	1,690	4,000

2.3 Access to the Site

2.3.1 Traffic modelling and traffic capacity assessments of junctions has been undertaken to determine a phased access strategy for the site, also taking account of the development trajectory and phasing.

Dewsbury Riverside Strategic Route

2.3.2 The jointly commissioned traffic modelling indicates that c.2,000 dwellings can be occupied at Dewsbury Riverside before significant additional off-site highways capacity is needed. This is considered in further detail in Section 6.0 below. The additional off-site highways capacity in the A644 corridor is referenced as a new strategic intervention.

2.3.3 One option for this is a new road connection running from A644 at Low Mill Lane, crossing the river Calder and railway line, then connecting with and running through the site and onwards to Dewsbury town centre via Forge Lane and Savile Road. The scheme is known as the Dewsbury Riverside Strategic Route (DRSR).

2.3.4 Given the likely delivery rates for the development as set out at 2.2 above, the strategic intervention required at c.2,000 units will be needed towards the end of the plan period in 12 to 13 years.

2.3.5 Miller Homes commissioned Arup to carry out a feasibility review of a potential new bridge across the Calder and railway which would form a key, and most costly, part of the DRSR. This review concluded that the proposed structure is deliverable, subject to a full and detailed engineering assessment that would be conducted at the appropriate time. The potential alignment and general arrangement of the bridge are shown on the Arup drawing 245166-00 included in Appendix 2.A of this report.

2.3.6 A number of options are available to procure and deliver the strategic intervention which include:-

- i) By the public sector
- ii) By the private sector
- iii) A public/private sector joint venture.

As the strategic intervention is not needed for 12 – 13 years then all options will be considered and assessed, including any alternative schemes identified by the Council, in terms of procurement and delivery options.

- 2.3.7 The DRSR will provide access to the site but clearly additional access points will be needed given the timescales for the delivery of this scheme.

Phased Access Strategy

- 2.3.8 In advance of the DRSR (or an alternative), access to the proposed allocation will be provided at four locations with the delivery of these phased with development. These are, starting at the eastern end of the site:-

- i) Off Lees Hall Road
- ii) Via a continuation of Forge Lane into the site.
- iii) Off Ravensthorpe Road.
- iv) Off Sands Lane.

- 2.3.9 The phasing of the access points has included the consideration of the potential number of units that can be served by a single access (i.e. off a cul-de-sac) and the resultant need to provide roads through the site connecting the access points. If needed, additional secondary/emergency accesses are available to serve the initial phases of development in advance of the provision of a spine road through the site.

- 2.3.10 The locations of the access points are shown on the concept masterplan and also on the plan at Appendix 2.B.

- 2.3.11 An Indicative Access Phasing Plan is summarised in Table 2.3 below. Details will be reviewed as specific planning applications are brought forward for development. The access phasing has been determined through consideration of highways design and capacity issues. The spine road through the site and access via Forge Lane may be delivered earlier than shown in the table below.

Table 2.3: Indicative Access Phasing Plan

Year	No. Units at Year End	Access Provision
2019	45	Separate phases accessed via Lees Hall Road and Ravensthorpe Road.
2020	175	Separate phases accessed via Lees Hall Road and Ravensthorpe Road. 10 units accessed off Sands Lane.
2021	350	Separate phases accessed via Lees Hall Road and Ravensthorpe Road. 35 Units accessed of Sands Lane.
2022	530	Separate phases accessed via Lees Hall Road and Ravensthorpe Road. 50 units accessed off Sands Lane.
2023	710	Separate phases accessed via Lees Hall Road and Ravensthorpe Road. Provide secondary access to eastern end of site via King Edward Street. 50 units accessed off Sands Lane.
2024	890	Separate phases accessed via Lees Hall Road and Ravensthorpe Road. Provide secondary access to eastern end of site via King Edward Street. 50 Units accessed off Sands Lane.
2025	1,080	Site accessed off Lees Hall Road and Ravensthorpe Road with road link (spine road) connecting both access points. Potential to downgrade King Edward Street secondary access. 50 units accessed off Sands Lane.
2026	1,275	Site accessed off Lees Hall Road and Ravensthorpe Road with road link (spine road) connecting both access points. Potential to downgrade King Edward Street secondary access. 50 units accessed off Sands Lane.
2027	1,475	Site accessed off Lees Hall Road and Ravensthorpe Road with road link (spine road) connecting both access points. Potential to downgrade King Edward Street secondary access. 50 units accessed off Sands Lane.
2028	1,680	Introduce additional access via continuation of Forge Lane at c.1,500 dwellings. Therefore site accessed off Lees Hall Road, Ravensthorpe Road and Forge Lane with spine road connecting all three. 50 units accessed off Sands Lane.
2029	1,890	Site accessed off Lees Hall Road, Ravensthorpe Road and Forge Lane with spine road connecting all three. 50 units accessed off Sands Lane.
2030	2,100	Deliver DRSR (or alternative) at c.2,000 units. Thus additional access to site created. Lees Hall Road, Forge Lane and Ravensthorpe Road accesses all connect to DRSR via site spine road. 50 units accessed off Sands Lane.
2031 End of Plan Period	2310	Serve the site via all access points with the Lees Hall Road, Forge Lane and Ravensthorpe Road accesses connected to the DRSR. 50 units accessed off Sands Lane.
2041 Full Development	4,000	Serve the site via all access points with the Lees Hall Road, Forge Lane and Ravensthorpe Road accesses connected to the DRSR. 50 units accessed off Sands Lane.

2.3.12 Although the Forge Lane access is not needed until c.1,500 dwellings are delivered, it may be provided earlier as part of the early delivery of the local centre and to open up the site.

2.3.13 Considering the phasing in Table 2.3 above, the following scenarios have been considered for the traffic capacity assessment of the site accesses, with the dwelling numbers corresponding with end of year completions set out in the trajectory:-

1. Scenario 1: 2024 with 890 units – maximum level of development before connection between Lees Hall Road and Ravensthorpe Road site accesses.
2. Scenario 2: 2027 with 1,475 units – maximum level of development before Forge Lane access is delivered.
3. Scenario 3: 2029 with 1,890 units – approximate level of development before DRSR is delivered.
4. Scenario 4: 2031 with 2,310 units – corresponding to the end of the Plan period.
5. Scenario 5: 2041 with 4,000 units – corresponding with the completion of the full development.

Access provision

2.3.14 The details of the accesses at each of the access points off the existing road network is set out below.

Lees Hall Road

2.3.15 The access at Lees Hall Road is likely to take the form of a priority controlled junction with the potential to upgrade to a roundabout should this be needed to provide additional capacity. There are additional opportunities to serve the eastern end of the site at King Edward Street/Ings Lane which could be used as a secondary or emergency access.

2.3.16 The planning approval for 120 dwellings at Lees Hall Road (reference 2016/94117) includes a priority junction proposal which is shown on drawing ITY11389-GA-001B included in Appendix 2.C. Key elements of the arrangements are:-

- Minor arm carriageway width = 6.75m.
- 2 x 2.0m wide footways tying into existing footways on Lees Hall Road.
- 10m radii at the junction.

- Dropped kerbs and tactile paving incorporated on the minor arm to facilitate safe east/west pedestrian movement.
- Visibility splay requirements in the horizontal plane have been derived using the methodology set out in 'Manual for Streets' (MfS) and taking account of observed 85th percentile speeds from an Automatic Traffic Counter installed on Lees Hall Road.
- Visibility in the vertical plane achieves the requisite 0.6m x 2.0m envelope.
- Stagger distance to next junction to the east (Parker Road) is c.33m.
- Stagger distance to next junction to the west (Lees Holm) is c.85m.

2.3.17 It is proposed to relocate the existing speed table on Lees Hall Road adjacent to the site access junction circa 25m west of its current position. Doing so places the speed table equidistant between junctions and would not impede access to existing properties.

2.3.18 East of the proposed site access (and west of Parker Road) dropped kerbs and tactile paving is proposed to guide pedestrians across Lees Hall Road at an appropriate location. Suitable visibility is achieved with reference to the observed 85th percentile traffic speeds.

2.3.19 Sufficient land has been reserved around the junction in the above planning consent to allow future conversion to a higher capacity roundabout should this be necessary. No third party land is required to deliver this access proposal.

Forge Lane

2.3.20 The DRSR will leave the site and connect with the existing highway network at Forge Lane, with the aim being to give priority to the Forge Lane to site movements and with Lees Hall Road and Ravensthorpe Road giving way to the new route. An additional secondary/emergency access could be provided between the Ravensthorpe Road and Forge Lane access points, via Ravensthorpe Road past Ravenshall School.

2.3.21 Several options have been developed to provide such an access from Forge Lane as follows:-

- i) Via Blackers Court, as shown on drawing ITM11043-GA-059. Ravensthorpe Road and Lees Hall Road join the new through route with a limited stagger.
- ii) Via the community facility, as shown on drawing ITM11043-GA-046B. The two side roads join the through route with a 37m stagger distance. A right-turn lane is provided to Ravensthorpe Road.
- iii) Via the car park of the community facility, as shown on drawing ITM11043-GA-048A. The stagger distance between the two side roads is increased to 45m. No right turn lane is provided.

2.3.22 All of the above drawings are included in Appendix 2.C. Note that all of the options require third party land and liaison is underway with the relevant parties to secure this.

2.3.23 There is also the potential for a temporary access via the Ravenshall school access road.

Ravensthorpe Road

2.3.24 The recently approved planning application for 120 dwellings at Ravensthorpe Road (reference 2016/94118) includes a priority junction access as shown on drawing ITY11390-GA-002B included in Appendix 2.C. Traffic analysis confirms this can accommodate significant levels of traffic and will therefore serve the existing phases of development. No third party land is needed.

2.3.25 The key elements of this access proposal are:-

- Minor arm carriageway width = 7.3m.
- 2 x 2.0m wide footways tying into existing footways on Ravensthorpe Road.
- 6m radii at the junction.
- Dropped kerbs and tactile paving incorporated on the minor arm to facilitate safe east/west pedestrian movement.

- Visibility splay requirements in the horizontal plane have been derived using the methodology set out in 'Manual for Streets' (MfS) and taking account of observed 85th percentile speeds from an Automatic Traffic Counter installed on Ravensthorpe Road.
- Visibility in the vertical plane achieves the requisite 0.6m x 2.0m envelope.
- Initial access gradients no steeper than 1:40 for the first 12.0m and 1:20 thereafter with suitable transition curves.
- Maximum gradient of 1:40 for the first 12m.

2.3.26 It is proposed to relocate the existing speed cushions on Ravensthorpe Road adjacent to the site access junction circa 17m east of their current position. Doing so enables the introduction of dropped kerbs and tactile paving to provide an uncontrolled pedestrian crossing of Ravensthorpe Lane to serve the desire line to Ravensthorpe Station.

2.3.27 As development progresses, the priority junction access will be replaced with a roundabout that will provide greater capacity and also a connection to the DRSR. A preliminary layout is shown on drawing ITY11390-GA-001 included in Appendix 2.C. The arrangements may need to be modified slightly to account for minor changes to the site access road made subsequent to the production of the drawing.

Sands Lane

2.3.28 A small pocket of residential development (50 units) is proposed to be served off Sands Lane with the route to the main road network via Steanard Lane. There will be no vehicular connection through to the remainder of the Dewsbury Riverside site, ensuring Sands Lane only serves a limited number of dwellings.

2.3.29 Sands Lane serves a limited number of residential dwellings and Dewsbury District Golf Club. Access will be taken into the site via a simple priority junction and an indicative arrangement is shown on drawing ITM-11043-GA-60 included in Appendix 2.C. No third party land is needed for this.

Traffic Capacity Assessments of the Site Accesses

- 2.3.30 Traffic capacity assessments of each of the site access junctions has been undertaken for the phasing scenarios set out at 2.3.13 above. For Scenarios 1 – 4, these use background flows derived from traffic surveys with adjustments made (re-assignment) to take account of the effects of the site spine road and DRSR. Scenario 5 uses traffic flows output from the Kirklees Traffic Model. Development generated traffic is assigned to each access point taking account of the site spine road.
- 2.3.31 For Scenarios 1 – 4, two sets of development traffic generations have been assessed: first, using the trip generation rates derived for the site (and set out in Section 4.0 below); and secondly using TRICS derived trip generation rates and consistent with those used in the Phase 1 applications (i.e. the two existing consents). Only the results with the higher TRICS trip generation rates are presented below. Scenario 5 uses traffic flows from the Kirklees Transport Model which adopts site specific trip rates.
- 2.3.32 The assessments necessarily adopt a series of assumptions related to the phasing of the parcels of the development. These will be revisited as both the detail of the masterplan is progressed and planning applications are brought forward.

Scenario 1: Development Before the Lees Hall Road and Ravensthorpe Road Accesses are Connected

- 2.3.33 This scenario is at 2024 with a total of 890 dwellings completed. Fifty units will be served off Sands Lane and, as noted above, there will be no connection to the remainder of the Dewsbury Riverside site. The phasing indicates that 505 dwellings would be served via the Lees Hall Road access (with a potential secondary connection via King Edward Street) and 335 dwellings would be served off Ravensthorpe Road.
- 2.3.34 The summary results from the capacity assessments of the site accesses are set out in the table below.

Table 2.4: Scenario 1: Site Access Capacity Assessment Results

Junction	Movement	AM Peak Hour		PM Peak Hour	
		Max RFC	Max Queue	Max RFC	Max Queue
Lees Hall Road Site Access	Site Access Left Turn	0.23	0	0.12	0
	Site Access Right Turn	0.18	0	0.10	0
	Lees Hall Road	0.10	0	0.25	1
Ravensthorpe Road Site Access	Site Access	0.26	0	0.15	0
	Ravensthorpe Road Right Turn	0.04	0	0.10	0
Sands Lane Site Access	Site Access	0.04	0	0.02	0
	Sands Lane Right Turn	0.00	0	0.00	0

2.3.35 The assessments demonstrate clearly that the site accesses will accommodate the development traffic flows at 2024, before roads within the site connect the access points at Lees Hall Road and Ravensthorpe Road.

Scenario 2: Development Before Access Via Forge Lane is Delivered

2.3.36 At 2027, a total of 1,475 units will be delivered. It is envisaged that the Forge Lane access will be delivered no later than by the occupation of 1,500 units and therefore the traffic flows at end 2027 approximate for this. A connection is provided, by way of the site spine roads, between the Lees Hall Road and Ravensthorpe Road site accesses and the derivation of traffic flows takes account of this. Taking account of the phasing plan and for traffic assessment purposes, it has been assumed:

- 460 dwellings are accessed via the Lees Hall Road access.
- 350 dwellings are accessed via the Ravensthorpe Road access.
- 615 dwellings can use either access.
- 50 dwellings are accessed only off Sands Lane.

2.3.37 Summary results from the capacity assessments of the site accesses are set out below. Those for the Sands Lane site access are as set out in Table 2.4 and are not repeated.

Table 2.5: Scenario 2: Site Access Capacity Assessment Results

Junction	Movement	AM Peak Hour		PM Peak Hour	
		Max RFC	Max Queue	Max RFC	Max Queue
Lees Hall Road Site Access	Site Access Left Turn	0.34	1	0.17	0
	Site Access Right Turn	0.31	0	0.18	0
	Lees Hall Road	0.14	0	0.35	1
Ravensthorpe Road Site Access	Site Access	0.56	1	0.33	1
	Ravensthorpe Road Right Turn	0.11	0	0.28	1

2.3.38 The analysis shows that the proposed accesses at Lees Hall Road and Ravensthorpe Road can accommodate the traffic generated by c.1,500 units before an access via Forge Lane is delivered.

Scenario 3: Maximum Development Before DRSR is Delivered

2.3.39 It is anticipated that the DRSR (or an alternative) will be delivered at c.2,000 units occupied on the site. This assessment adopts the trajectory at 2019 with 1,890 units delivered. All the access connections from the existing road network are open at this stage and the following has been adopted for assessment purposes, taking account of the phasing plan for the site:

- 345 units accessed solely via Lees Hall Road.
- 300 units accessed solely via Forge Lane.
- 325 units accessed solely via Ravensthorpe Road.
- 870 units able to use any access.
- 50 units accessed solely via Sands Lane.

2.3.40 The results of the capacity assessments are set out in the table below.

Table 2.6: Scenario 3: Site Access Capacity Assessments

Junction	Movement	AM Peak Hour		PM Peak Hour	
		Max RFC	Max Queue	Max RFC	Max Queue
Lees Hall Road Site Access	Site Access Left Turn	0.19	0	0.10	0
	Site Access Right Turn	0.45	1	0.39	1
	Lees Hall Road	0.07	0	0.17	0
Ravensthorpe Road Site Access	Site Access	0.74	3	0.46	1
	Ravensthorpe Road Right Turn	0.46	1	0.70	3
Forge Lane Site Access	Lees Hall Road Ahead and Left Turn	0.34	1	0.35	1
	Lees Hall Road Right Turn	0.19	0	0.12	0
	Forge Lane	0.90	8	0.84	5
	Ravensthorpe Road Ahead and Left Turn	0.48	1	0.54	1
	Ravensthorpe Road Right Turn	0.05	0	0.12	0
	Site Access	0.28	1	0.34	1

2.3.41 All of the access junctions operate within capacity. The Forge Lane access is approaching capacity but drivers will have the opportunity to use different access points if necessary. It is concluded that the proposed accesses can accommodate the traffic flows generated by the development before the DRSR is delivered.

Scenario 4: End of Plan Period

2.3.42 It is anticipated that 2,310 dwellings will be occupied at 2031, the end of the plan period. All accesses will be in operation and the DRSR (or an alternative) will be in place, with this connecting into the Ravensthorpe Road access. For the purposes of traffic assessment it has been assumed:-

- 345 units accessed solely via Lees Hall Road access.
- 300 units accessed solely via Forge Lane access.
- 395 units accessed solely via Ravensthorpe Road access.
- 1,220 units could access the site via any of the above.
- 50 units accessed solely via Sands Lane.

2.3.43 The results of the capacity assessments of each site access are set out in the table below, noting that at this point the Lees Hall Road and Ravensthorpe accesses are converted to roundabouts.

Table 2.7: Scenario 4: Site Access Capacity Assessment Results

Junction	Movement	AM Peak Hour		PM Peak Hour	
		Max RFC	Max Queue	Max RFC	Max Queue
Lees Hall Road Site Access	Lees Hall Road East	0.41	1	0.42	1
	Site Access	0.33	0	0.24	0
	Lees Hall Road West	0.09	0	0.10	0
Ravensthorpe Road Site Access	Ravensthorpe Road East	0.20	0	0.16	0
	Site Access	0.49	1	0.40	1
	DRSR	0.34	1	0.39	1
	Calder Road	0.22	0	0.39	1
Forge Lane Site Access	Lees Hall Road Ahead and Left Turn	0.29	0	0.17	0
	Lees Hall Road Right Turn	0.22	0	0.14	0
	Forge Lane	0.58	2	0.43	1
	Ravensthorpe Road Ahead and Left Turn	0.30	0	0.39	1
	Ravensthorpe Road Right Turn	0.00	0	0.00	0
	Site Access	0.15	0	0.20	0

2.3.44 All of the access junction operate satisfactorily and can therefore accommodate all of the development proposed within the Plan period.

Scenario 5: Full Development

2.3.45 All accesses are open with the DRSR also in place. The Lees Hall Road and Ravensthorpe Road accesses are roundabouts. Traffic flows at each access have been derived from the Kirklees Traffic Model and the results of capacity assessments are set out in the table below.

Table 2.8 Scenario 5: Site Access Capacity Assessment Results

Junction	Movement	AM Peak Hour		PM Peak Hour	
		Max RFC	Max Queue	Max RFC	Max Queue
Lees Hall Road Site Access	Lees Hall Road East	0.33	1	0.70	2
	Site Access	0.41	1	0.22	0
	Lees Hall Road West	0.07	0	0.04	0
Ravensthorpe Road Site Access	Ravensthorpe Road East	0.14	0	0.31	0
	Site Access	0.54	1	0.35	1
	DRSR	0.38	1	0.41	1
	Calder Road	0.20	0	0.32	1
Forge Lane Site Access	Lees Hall Road Ahead and Left Turn	0.23	0	0.36	1
	Lees Hall Road Right Turn	0.07	0	0.13	0
	Forge Lane	0.27	0	0.50	1
	Ravensthorpe Road Ahead and Left Turn	0.28	0	0.37	1
	Ravensthorpe Road Right Turn	0.01	0	0.02	0
	Site Access	0.19	0	0.23	0

2.3.46 The analysis confirms that the access proposals can accommodate the traffic flows generated by the full development of 4,000 dwellings at Dewsbury Riverside.

Summary

2.3.47 The dwelling capacity that can be served from each access point depends on a range of factors: design standards including the number of units served from a single access; the provision of secondary accesses (e.g. at King Edward Street); background traffic flows; the traffic generated by development using the access; the traffic generated by development using other accesses, as some of this may pass an access; and the impacts of the roads through the site, distributing traffic between the accesses.

2.3.48 The phasing plan and trajectory has therefore been used as inputs to developing the detailed phasing of the access strategy with access provision matched to development coming on-stream, including the provision of roads through the site to connect the different access points.

2.3.49 The levels of development delivered each year have therefore been considered and the access provision needed to deliver this identified, as set out at Table 2.3. From this, various 'trigger points' have been established – such as the levels of development served off individual accesses before they are connected, the levels of development served off the Lees Hall Road and Ravensthorpe Road access before the Forge Lane access is delivered.

2.3.50 Capacity assessments have then been undertaken of these ‘trigger points’, referred to as scenarios above. These demonstrate that the phased access strategy can accommodate the traffic flows generated by the draft allocation. In summary, the levels of development tested off each access are as follows, noting that this is for assessment purposes and that when the connections between accesses are delivered then drivers will have a choice of which access to use.

Table 2.9: Summary of Access Provision and Dwellings Served

Scenario	Total Units	No. of Units Served By				
		Lees Hall Road Access	Forge Lane Access	Ravensthorpe Road Access	Choice of Accesses	Sands Lane Access
1. Maximum levels of development before connection between Lees Hall Road and Ravensthorpe Road	890	505 ¹	-	335	-	50
2. Maximum level of development before Forge Lane Access is delivered	1,475	460	-	350	615	50
3. Maximum level of development before DRSR delivered ²	1,890	345	300	325	870	50
4. End of Plan period	2,310	345	300	395	1,220	50

1. With secondary access via King Edward Street; 2. 1,890 dwellings tested at 2029. Anticipated DRSR delivered at c.2,000 dwellings

2.3.51 Satisfactory and safe access can therefore be provided to the site with the phased access strategy proposed. The details of access proposals/arrangements will be resolved as planning applications are brought forward for development, consistent with the approach adopted for the recent planning consents at Lees Hall Road and Ravensthorpe Road.

SECTION 3 SUSTAINABLE TRAVEL STRATEGY**3.1 Overview**

3.1.1 The transport strategy for the site will focus on promoting sustainable travel modes and reducing car use, particularly that for single occupancy travel. Within this context, the travel and transport strategy for the site is to:

- i) Take advantage of the site's existing locational characteristics;
- ii) Seek to minimise the number of vehicular trips generated by the proposal through the provision of mixed uses and high quality design, thus maximising trip internalisation;
- iii) Maximise opportunities for walking and cycling trips, particularly over shorter distances;
- iv) Encourage trips to/from Ravensthorpe and Dewsbury and their environs to be made by public transport or through shared transport (i.e. a Car Club);
- v) Encourage commuting trips to Dewsbury, Leeds, Huddersfield and other destinations to be made by bus and rail;
- vi) Reduce emissions associated with vehicular trips which are generated by both public transport and private vehicles; and
- vii) Mitigate the impacts of residual car borne trips by the design of the access strategy and introduction of highways mitigation improvements where absolutely necessary.

3.1.2 As well as achieving modal shift, the travel strategy for the site will assist in creating a coherent new community and will reduce the vehicular traffic flows generated by the site.

3.1.3 The locational characteristics of the site and existing sustainable travel networks are set out in Sections 3.2 and 3.3. The mixed-use nature of the site is set out in Section 2.0 above. Strategies for encouraging walking/cycling, public transport and the Travel Plan are included in Sections 3.4 – 3.6. The accessibility of the site is then considered in 3.7. The traffic impacts of the proposals are set out in subsequent sections of this report.

3.1.4 The site will provide a range of benefits as outlined in the submissions made by Spawforths. Specific transport benefits of the proposals will include:-

- Everyday facilities located in the development in walkable neighbourhoods, thus putting place first, enhancing inclusion, promoting sustainable lifestyle choices and behavioural change.
- New viable bus services and high quality bus infrastructure that will connect the site with key destinations and will also provide enhanced connectivity for existing residents and businesses in Ravensthorpe and the surrounding area.
- Specific and targeted travel plan measures again designed to promote sustainable travel modes.
- Provision of on-plot and on street electric vehicle charging points and an electric vehicle car club to encourage some vehicular journeys to be made by low emission vehicles.
- Existing access provision off several places on the local road network which can accommodate the traffic generated by the proposals and which will spread traffic around the local networks.
- The potential to enhance connections to the A644 through the delivery of the Dewsbury Riverside Strategic Route, resulting in benefits in terms of reduced congestion in Ravensthorpe.

3.2 Demographic and Travel Characteristics

3.2.1 The demographics and existing travel characteristics of the local area will influence the travel movements generated by the site and the transport strategy that will support it. These have therefore been assessed in detail. The 2011 Census dataset has been interrogated to formulate demographic, employment and workplace statistics which contribute towards the unique travel characteristics in the study area. The results are summarised below.

3.2.2 The study area adopted represents a collection of Major Super Output Areas (MSOA) from the 2011 Census. The following MSOAs have been used: 019 West Town and Dewsbury Moor; 023 Ravensthorpe; and 024 Savile Town and Thornhill Lees. These are also aggregated as ‘South Dewsbury’ and data for the whole of Kirklees District is also presented.

Population and Households

3.2.3 The population and number of households in each of the areas is shown in Table 3.1 below. Average household sizes have also been derived. The average figure for the South Dewsbury area (three MSOAs combined) is also shown as well as the average for Kirklees District.

Table 3.1: Population, Households and Household Size

Indicator	West Town	Ravensthorpe	Savile Town & Thornhill Lees	South Dewsbury	Kirklees
Household Size	3.1	3.0	3.4	3.2	2.4
Population	6,560	7,932	10,691	25,183	422,458
Households	2,126	2,624	3,102	7,856	173,525

3.2.4 The average household sizes within the three areas are all higher than Kirklees as a whole, with Savile Town/Thornhill Lees having the highest household size. Data from the 2001 Census (not now available at the same geographical level) indicates that Savile Town has an average household size of approximately double that of the Kirklees average.

3.2.5 Table 3.2 summarises the age breakdown for the three areas, South Dewsbury and Kirklees.

Table 3.2: Population Breakdown

Age	West Town	Ravensthorpe	Savile Town & Thornhill Lees	South Dewsbury	Kirklees
0 – 15	31%	33%	28%	30%	20%
16 – 17	3%	3%	3%	3%	3%
18 – 19	4%	3%	4%	3%	3%
20 – 24	8%	7%	9%	8%	7%
25 – 29	8%	10%	8%	9%	7%
30 – 44	23%	23%	21%	22%	21%
45 – 59	14%	12%	15%	14%	19%
60 – 64	3%	3%	4%	3%	6%
65 – 74	4%	4%	5%	4%	8%
75 – 84	2%	3%	3%	3%	5%
85 – 89	1%	1%	1%	1%	1%
90 +	0%	0%	0%	0%	1%
Total	100%	100%	100%	100%	100%

Source: 2011 Census

3.2.6 Table 3.2 shows that there are higher proportions of young people in the study area than in Kirklees as a whole, with the population under 30 comprising 53% in South Dewsbury compared to c.40% in Kirklees as a whole.

Employment Status

3.2.7 Table 3.3 illustrates the employment status of residents within South Dewsbury.

Table 3.3: Employment Status

Employment Status	West Town	Ravensthorpe	Savile Town & Thornhill Lees	South Dewsbury	Kirklees
16 – 74 All Part Time	16.1%	12.6%	15.9%	14.9%	13.0%
16 – 74 All Full Time	28.6%	25.8%	21.2%	24.5%	32.7%
16 – 74 All Self Employed	8.9%	8.9%	10.0%	9.4%	8.0%
16 – 74 All Unemployed	0.1%	7.7%	4.8%	4.5%	4.2%
16 – 74 Econ Active Student	3.1%	2.6%	3.1%	2.9%	3.1%
16 – 74 Retired	8.2%	7.3%	8.3%	8.0%	12.8%
16 – 74 Econ Inactive Student	8.2%	6.9%	10.8%	9.0%	5.1%
16 – 74 Econ Inactive	26.9%	28.1%	25.9%	26.8%	21.1%
Total	100%	100%	100%	100%	100%

Source: 2001 Census

3.2.8 Table 3.3 demonstrates that South Dewsbury has a higher proportion of economically inactive residents than Kirklees as a whole.

Car Ownership

3.2.9 Table 3.4 shows car ownership levels across the South Dewsbury area.

Table 3.4: Car Ownership Levels

Cars Owned	West Town	Ravensthorpe	Savile Town & Thornhill Lees	South Dewsbury	Kirklees
0 Cars	34.2%	29.6%	28.8%	33.9%	26.4%
1 Cars	44.8%	43.5%	46.6%	45.1%	42.8%
2 Cars	17.7%	13.8%	19.1%	16.9%	24.6%
3 Cars	2.6%	2.5%	4.2%	3.2%	4.7%
4+ Cars	0.7%	0.7%	1.4%	1.0%	1.5%
Total	100%	100%	100%	100%	100%
Cars Per HH	0.91	0.81	1.03	1.00	1.12

3.2.10 Table 3.4 demonstrates that there are lower levels of car ownership and higher proportions of households with no cars in South Dewsbury compared with the District as a whole. Approximately 34% of households have no car compared with c.26% in Kirklees as a whole. The average number of cars per household is 1.00 in South Dewsbury compared to 1.12 in Kirklees. Lower levels of household car ownership, coupled with larger and younger households, may lead to more trip making locally and by modes other than the car.

3.2.11 TEMPRO has been used to forecast future levels of car ownership within South Dewsbury. The analysis concludes that there is lower growth in cars in the 2016 – 2031 period in Dewsbury compared to Kirklees and higher existing and forecast levels of households without a car when comparing the two areas. The data shows that Dewsbury is likely to have lower car ownership levels than Kirklees as a whole in the future.

Indices of Deprivation

3.2.12 The Index of Multiple Deprivation 2015 (IMD) indicates deprivation related to income, employment, health and disability, education skills and training, barriers to housing services, living environment and crime.

3.2.13 The IMD ranked Kirklees as 101st out of 354 local authorities in England. Kirklees as a whole has an IMD of 23.96 whereas those for the areas in South Dewsbury exceed this (West Town 47.18, Ravensthorpe 44.59 and Savile Town/Thornhill Lees 30.68), indicating higher levels of deprivation in South Dewsbury. Providing local and improved facilities may assist with improving quality of life in the local area.

Modal Split

3.2.14 Table 3.5 illustrates the modal split of journeys to work derived from the 2011 Census.

Table 3.5: Modal Split of Journeys to Work

Mode	West Town	Ravensthorpe	Savile Town & Thornhill Lees	South Dewsbury Average	Kirklees Average
Work From Home	6.9%	6.8%	9.3%	7.9%	9.2%
Metro/Train	3.8%	2.8%	3.8%	3.5%	2.8%
Bus	7.1%	9.6%	6.0%	7.4%	7.7%
Taxi	2.3%	2.0%	2.0%	2.1%	0.9%
Car Driver	55.4%	54.6%	57.7%	56.1%	61.8%
Car Passenger	8.9%	8.8%	7.0%	8.0%	6.4%
Motorcycle	0.7%	0.4%	0.3%	0.4%	0.7%
Cycle	1.3%	0.7%	0.9%	1.0%	0.9%
Walk	13.0%	13.6%	12.2%	12.8%	9.3%
Other	0.7%	0.6%	0.8%	0.7%	0.4%

Source: SWS Census Analysis

3.2.15 The analysis shows that South Dewsbury has a slightly higher proportion of public transport users on average at 10.9% with Kirklees at 10.5%. The walk modal share is also higher at 12.8% compared to 9.3%. The data confirms that residents in South Dewsbury make more trips by sustainable modes and fewer trips by car.

Travel to Work

3.2.16 Table 3.6 gives the average distances travelled to work by residents in South Dewsbury, showing that the area has shorter average distances travelled to work than Kirklees as a whole. This indicates that people travel to work to nearby areas.

Table 3.6: Distance Travelled to Work (km)

West Town	Ravensthorpe	Savile Town & Thornhill Lees	South Dewsbury Average	Kirklees Average
9.3	8.3	9.1	8.9	12.7

3.2.17 Analysis of census data has also been undertaken to ascertain the likely travel destinations for journeys to work, which account for a significant proportion of peak hour travel. Table 3.7 summarises the distribution of work trips for the study area. This shows the proportions of trips made to Kirklees and the MSOAs in South Dewsbury as well as the proportion to the very local area.

Table 3.7: SWS Census Distribution

Origin	Destination		
	Local MSOA	Rest of South Dewsbury	Rest of Kirklees
West Town	6.0%	14.1%	50.3%
Ravensthorpe	20.0%	9.8%	39.5%
Savile Town & Thornhill Lees	20.0%	6.1%	39.2%
South Dewsbury	16.4%	9.5%	42.9%

Source: 2011 SWS Census

3.2.18 The table confirms that, as indicated by the average travel distances, many trips are made locally with c.20 – 30% of the work trips made from the South Dewsbury area made within the area itself, providing opportunities for these to be made on foot, by bike or by public transport.

Summary

3.2.19 In summary, the area has unique demographics which affect travel movement:

- Lower levels of car ownership and higher proportions of households with no cars: c.34% of households without a car compared to c.26% in Kirklees as a whole; 1.00 cars per household compared to 1.12 in Kirklees.
- Higher proportions of economically inactive residents.
- Younger population with c.53% aged under compared to c.40% in Kirklees. Potential for more local trips.
- Much shorter average travel to work distances: averaging 8.9km in South Dewsbury compared to 12.7km in Kirklees.
- High proportions of (work) trips made locally and high proportions made within the origin MSOA.
- Higher bus and walk modal shares (for journeys to work) with corresponding lower car modes shares.

3.2.20 All of the above confirms that there is the opportunity to develop a transport strategy that supports local trip making by sustainable modes of travel and thereby reduces reliance on the car.

3.3 Existing Travel Networks

Walking and Cycling

- 3.3.1 The site abuts the adjacent highway network at Lees Hall Road and Ravensthorpe Road and there are footpaths on the roads in the surrounding area. The footpaths continue towards Ravensthorpe and Dewsbury.
- 3.3.2 Part of the National Cycle network runs to the north of the site, the Calder Valley Greenway connecting Huddersfield and Dewsbury town centres. It is largely traffic-free with some on-road sections. A plan of the route is given in Appendix 3.A.
- 3.3.3 At Dewsbury town centre, the national cycle network runs northwards as route 66 Dewsbury to Oakenshaw. It runs along the Calder and Spen Valley Greenway and is again largely traffic-free. The award winning Spen Valley Greenway uses a disused railway line between Dewsbury, Heckmondwike, Cleckheaton, eventually connecting to Bradford. A plan of the route is included in Appendix 3.A.
- 3.3.4 The West Yorkshire Cycling Map identifies several cycle routes in the vicinity of the site. These include:
- Advisory routes along Ravensthorpe Road and Calder Road connecting with the national cycle network route 66;
 - An advisory route along Ouzewell Lane that connects with the site;
 - An advisory route along Ings Lane connecting to Overthorpe Road at Thornhill and therefore running through the site;
 - An advisory route along Lees Hall Road with connections, via Brewery Lane and Ingham Road / Slaithwaite Road, to a traffic free path along the Calder and Hebble navigation with connection to the Spen Valley Greenway;
 - Advisory cycle routes through Savile Town to Dewsbury town centre and connecting with the national cycle network;
 - Rough bridleway / cycle tracks across the western side of the site, connecting the site with Sands Lane, Ravensthorpe Road, Ouzelwell Lane and Foxroyd Lane / Jacksons Lane;

- An advisory route along Steanard Lane connecting the site with Lower Hopton and Mirfield.

3.3.5 Extracts from the West Yorkshire Interactive Map are included in Appendix 3.A.

3.3.6 Several Public Rights of Way (PRoW) cross the site as shown in Appendix 3.B. These comprise public footpaths and bridleways. They connect to the existing road network at various locations including Steanard Lane, Sands Lane, Ravensthorpe Road, Lees Hall Road, Overthorpe Road, Foxroyd Lane, Jacksons Lane and Whitley Road.

Bus Services

3.3.7 The North Kirklees Bus Map and Summary Table are included in Appendix 3.C showing the bus routes and services in the vicinity of the site. The bus services closest to the site are as follows:-

Table 3.8: Bus Services Closest to the Site

Route No.	Route	Closest Point to Site	Service Frequency	
			Mon to Sat Daytime	Evenings and Sundays
128/130	Dewsbury – Ouzelwell – Grange Moor – Overton -Horbury – Wakefield	Ouzelwell Lane (Ouzelwell Estate)	60	-
280	Dewsbury – Thornhill Lees – Dewsbury	Lees Hall Road / Brewery Lane	12 – 15	30
202/203	Huddersfield – Mirfield – Dewsbury – Tingley – White Rose – Leeds	Huddersfield Road	15	30
205	Dewsbury – Northorpe – Mirfield	Huddersfield Road	60	-
253	Dewsbury – Mirfield – Cleckheaton – Bradford	Huddersfield Road	60	60
262	Dewsbury – Mirfield – Hopton - Kirkheaton – Upper Heaton – Huddersfield	Huddersfield Road and Calder Road, Lower Hopton	60	60
278	Halifax – Elland – Brighouse – Mirfield – Dewsbury	Huddersfield Road	60	60

3.3.8 The closest bus service to the site is the 280 Dewsbury – Thornhill Lees service that runs along Lees Hall Road and Brewery Lane. It provides a 12 minute frequency services on weekdays during the daytime (15 minutes on a Saturday) and a 30 minute frequency service during the evenings and on Sundays. The 128/130 Dewsbury to Wakefield route serves the Ouzelwell estate adjacent to the site and provides an hourly daytime service on weekdays and Saturdays.

3.3.9 Other services are further afield and can be accessed at Huddersfield Road with the bus routes along the A644 providing a combined eight buses per hour in the daytime to Dewsbury and Mirfield (five per hour in the evening) and also serving several other destinations including: Huddersfield, the White Rose Centre and Leeds, all served by the frequent 202/203 services and Huddersfield also by the 262; Bradford by the hourly 253 and Halifax and Elland by the hourly 278.

Rail Services

3.3.10 Ravensthorpe station is located close to the site off Calder Road, see Appendix 1.A. The station is on the Huddersfield – Leeds line and although the Huddersfield – Wakefield line runs adjacent to the station, there are no platforms on this line and therefore trains do not stop at Ravensthorpe. There are ‘bus shelter’ type waiting facilities on the platforms with information provided on train services.

3.3.11 The station is, as noted above, on the Huddersfield to Leeds line with a route plan included in Appendix 3.D. To the east, services run to Dewsbury, Batley, Morley, Cottingley and Leeds whilst to the west they run to Mirfield, Deighton and Huddersfield.

3.3.12 There are hourly services running along the line, stopping at Ravensthorpe, throughout the day and evenings other than: a twice hourly morning peak weekday / Saturday service towards Dewsbury and Leeds; an additional evening peak service to Mirfield; and two-hourly services on Sundays.

3.3.13 The approximate journey time to stations served by Ravensthorpe are as follows:-

Table 3.9: Journey Times from Ravensthorpe Station

Station	Approximate Time
Dewsbury	3 minutes
Batley	7 minutes
Morley	13 minutes
Leeds	25 minutes
Mirfield	4 minutes
Huddersfield	17 minutes

3.4 Walking and Cycling Strategy

- 3.4.1 As far as the promotion of walking and cycling are concerned, the most important factors are distance and quality of routes. The mix of uses on the site and approach to high quality internal design will facilitate movements by pedestrians and cyclists. Many everyday destinations will be available within the site – schools, health facilities, shops, leisure and play areas – and will be within walking and/or cycling distance.
- 3.4.2 The layout of the streets and routes for pedestrians and cyclists within the site will be designed to encourage local travel by bike and on foot. ‘Safe Routes to School’ will be at the forefront of the place design with priority and crossing facilities where appropriate.
- 3.4.3 The site is well connected to existing walk and cycle routes as set out at 3.3 above, with many of the roads close to the site being advisory cycle routes and these providing connections to the national cycle network including the Spen Valley Greenway and Calder Valley Greenway. Appendix 3.E shows the site in relation to existing facilities.
- 3.4.4 As planning applications for major development on the site are progressed, a series of improvements to the pedestrian/cyclist environment will be investigated in detail and, where appropriate, implemented in line with development coming forward. At this stage it is envisaged these could include:
- i) Improvements to the PRow that run across the site and their connections to the external street network. These could include: widening and improvements to surfacing/drainage; lighting; and signage.
 - ii) Provision of high quality footways / cycleways leaving the site to connect to existing networks.
 - iii) Delivery of a pedestrian route through the site to Ravensthorpe railway station with the opportunity to introduce a controlled crossing at Ravensthorpe Road to be explored.
 - iv) Improved signage at Brewery Lane to include routes to the traffic-free cycle path along the Calder and Hebble navigation and onwards to the Spen Valley Greenway.

- v) Working with the Council to investigate the potential to create a cycle route to Dewsbury town centre with funding to be provided by development.
- vi) Investigation of cycle crossing facilities at busier roads and junctions.
- vii) Assessing the potential to provide improved access to the canalside route at Slaithwaite Road.

3.4.5 The above will be supported by measures introduced through Travel Plans (see 3.6 below) that will complement physical improvements and encourage cycle use.

3.4.6 Ravensthorpe centre is easily within walking distance of the site and whilst Dewsbury town centre is at the limit or beyond walking distance for most of the site, it is within an easy cycling distance. Many facilities will be available on the site but residents will also be able to walk and/or cycle to a range of destinations within the local area.

3.5 **Public Transport Strategy**

Bus Strategy

3.5.1 The development will be phased over the Local Plan period and beyond and, in the short-term, the number of residential occupations will be modest, as evidenced by the indicative trajectory and phasing plan for the site included in Appendix 2.A. The early phases of development will be towards the northern end of the site, close to Ravensthorpe Road and Lees Hall Road.

3.5.2 There are existing bus routes at Lees Hall Road/Brewery Lane and Ouzelwell Lane as well as more frequent services on Huddersfield Road. The 12 minute frequency 280 Dewsbury – Thornhill Lees service runs past the phase 1A/1B site and will provide a frequent and high quality connection to Dewsbury town centre. The phase 2A site is c.800m from this service but close to the hourly 128/130 service that runs between Dewsbury and Wakefield. At its closest point, phase 2A is c650m from Huddersfield Road where there are very frequent bus services including the 202/203 Huddersfield – Mirfield – Dewsbury – Leeds route running at a 15 minute frequency.

3.5.3 Thus the early phases of development will be served by existing bus routes, consistent with the approach adopted for the recently consented sites on the UDP allocated land and protected open land.

- 3.5.4 In the medium – longer term the development will be more remote from existing bus routes and walking distances to bus stops will exceed thresholds that are commonly applied. New or extended bus routes will therefore be needed to serve the site. In practice, such new/extended services will not be needed for a number of years given the housing trajectory, the location of the early phases of development and existing bus provision.
- 3.5.5 It is possible, probably likely, that bus routes and services in the area will change over the next 5 – 10 years, making it difficult to plan in detail the bus provision for the site which will not be needed for several years and which will continue to the end of the plan period and beyond.
- 3.5.6 However, an indicative bus strategy has been developed in outline to demonstrate that it will be feasible to serve the site and provide suitable and sustainable alternatives to car use. The details of specific routes and services can then be resolved as detailed planning applications are progressed for the residential proposals.
- 3.5.7 The basis of the strategy is as follows:-
- i) Assess potential new/extended bus route options and derive the costs of these.
 - ii) Estimate the potential patronage and resultant revenues on new/extended bus services.
 - iii) By comparing revenues with costs, assess the need for operating subsidy and confirm that services will be viable in the longer term.

Bus Services and Costs

- 3.5.8 Several options for new/extended bus provision are possible and the final set of proposals will be discussed with the Council, WYCA and local bus operators. At this stage, to indicate that bus services are likely to be deliverable, three options have been evaluated:-
- Option 1: Circular hopper bus running at a 30 minute day-time frequency.
 - Option 2: Circular hopper bus running at a 15 minute day-time frequency.
 - Option 3: Extension of the existing 280 bus service into the site.

- 3.5.9 A local circular hopper route could connect the site with key destinations in the local area including Ravensthorpe railway station, Ravensthorpe centre, Dewsbury town centre and railway station. The route could potentially be operated with a midi-bus. An indicative route is shown in Appendix 3.F. Depending upon demand, the route could be extended to additional destinations such as Mirfield railway station and Dewsbury and District Hospital.
- 3.5.10 As an alternative, the 280 bus service currently operates at a day-time frequency of 12 minutes and runs close to the site at Lees Hall Road / Brewery Lane roundabout. It could be diverted into the site at Lees Hall Road then run around a loop, exiting at the Ravensthorpe Road access and returning to its current route at Brewery Lane. An indicative route is shown in Appendix 3.F.
- 3.5.11 The costs of operating these services have been calculated by estimating the number of buses needed and then applying a typical cost per annum per bus of £150,000. Typically buses will operate throughout the day seven days a week and with a reduced service in the evenings and on Sundays. The number of buses needed is calculated based on existing timetabled bus times and speeds and the frequency (i.e. 15 or 30 minutes options are considered for new circular bus routes).
- 3.5.12 The estimated number of buses needed and the resultant costs per annum are as follows:

Table 3.10: Bus Route Options and Costs

Option	Service	Frequency	No. of Buses Needed	Cost Per Annum
1	Circular Hopper	30 mins	2	£300,000
2	Circular Hopper	15 mins	4	£600,000
3	Extended 280	12 mins	2 - 3	£375,000

- 3.5.13 Thus costs vary between £300,000 and £600,000 per annum, depending upon the frequency of operation. The extension of the 280 through the site offers a relatively low cost option albeit this will possibly impact upon existing patronage and revenues as a result of increases in journey time.

3.5.14 In practice, bus provision will be phased and be responsive to both development completions and actual bus usage, the latter estimated via the Travel Plan and by the bus operator. The actual package of bus improvements will likely be a combination of several of the above e.g. with frequency increasing as development levels increase. They are presented as distinct options at this stage to give an indication of potential bus routes and their viability.

Potential Revenues

3.5.15 Patronage generated by the development on new/extended bus services has been calculated based on the number of bus trips per person per annum derived from the National Travel Survey (NTS) with a 10% up-lift to account for increases in bus use resulting from the implementation of the Travel Plan. Background revenues along the routes resulting from improved service provision are also estimated. The number of dwellings occupied each year (mid-point) is multiplied by the average household size, derived from TEMPRO, to derive the number of residents at the development.

3.5.16 Some of the bus trips will be made for education purposes and as a worst case these have been deducted from the revenue calculations on the basis that school pupils will potentially use school buses and therefore any revenues may not be attributable to the developer funded scheduled bus services. This is a worst case as some pupils will potentially use the scheduled buses. It offsets those residents who will use other bus services whose revenues cannot be attributed to the new/extended services.

3.5.17 Revenues are then calculated based on a typical fare, taken as £1.40 per trip based on the cost of a monthly bus pass. This is then discounted to account for the use of concessionary travel. Thus at 2041 when the development is complete, the total revenues are predicted at c.£820,000.

3.5.18 Of course, revenues in practice vary depending upon the frequency of service provided and the destinations served. These are difficult to predict with accuracy at this stage. The total revenues for Option 1 have been discounted by 20% to reflect the lower frequency.

3.5.19 New/extended bus services will affect ‘background’ revenues as a result of changes to bus services within existing areas. Additional bus services will generally increase revenues whereas extensions to existing services will potentially result in a reduction in existing revenues as passengers respond to increased journey times as a result of diverted services (e.g. into the site). Other developments along the routes could also generate additional revenues and could contribute to the costs of the bus services.

3.5.20 Such revenues are again very difficult to predict and will vary depending upon the change in service. The following have been adopted as indicative revenues but will need to be refined at the appropriate time through detailed liaison with bus operators and WYCA. Such revenues are assumed to build-up/reduce over two years.

Table 3.11: Background Revenues

Option	Service	Frequency	Additional Revenue
1	Circular Hopper	30 mins	+£125,000
2	Circular Hopper	15 mins	+£200,000
3	Extended 280	12 mins	-£75,000 ¹

¹ Background revenues reduce as a result of increased journey times for existing passengers

3.5.21 Thus the total annual revenues at 2041 for each of the options is estimated as:-

Table 3.12: Total Revenues at 2041

Option	Service	Frequency	Total Revenue Per Annum
1	Circular Hopper	30 mins	£783,000
2	Circular Hopper	15 mins	£1,022,000
3	Extended 280	12 mins	£747,000

Revenue Support and Viability

3.5.22 Appendix 3.G sets out the bus costs and revenues for each of the three options over the plan period and beyond to the completion of the development. For illustrative purposes, all of the bus services are assumed to start at 2022/23. The tables identify the short-fall between revenues and costs and therefore the annual revenue support (subsidy) requirements, which are indicative. These are summed for the period over which costs exceed revenues to give the total indicative subsidy.

3.5.23 In summary, the total subsidy and the difference between costs and revenues at 2031 (end of plan period) and 2041 (completion of development) are set out in the table below for each option:-

Table 3.13: Total Subsidy and End Year Viability

Option	Service	Frequency	Total Subsidy	2031 Viability ¹	2041 Viability
1	Circular Hopper	30 mins	£201,360	+£189,610	+£482,700
2	Circular Hopper	15 mins	£1,217,940	+£55,760	+£422,100
5	Extended 280	12 mins	£1,405,930	+£5,760	+£372,100

3.5.24 Considering each of the options:-

- Option 1:
 - A modest subsidy is needed to support the service during the early years of operation.
 - The subsidy could be reduced significantly if background revenue builds up at a faster rate than assumed.
 - Delaying the introduction of the service by a year or two will reduce the subsidy.
 - Revenues exceed costs after a short period and the service should easily be viable in the longer term.
- Option 2:
 - A significant subsidy is needed to support the services over c.7 years.
 - As for Option 1, this will be reduced if background revenue builds up at a faster rate or the introduction of the service is delayed for a short period.
 - In practice, the service could start as a lower frequency service (as per Option 1) with the frequency increasing as development is built-out and occupied.
 - Revenues exceed costs in the longer term and the service should therefore be viable over the longer term.
- Option 3:
 - A significant subsidy is needed to support the service over c.8 years.

- As for Options 1 and 2, the subsidy will be reduced if the start of the service is delayed.
- Revenues cover costs towards the end of the plan period indicating there is a good prospect of such a service being viable in the long term.

3.5.25 Overall, the above confirms there is potential to introduce bus services which will serve a range of important destinations and which will be viable, thereby providing a lasting alternative to car travel. The precise services (including their routes) will depend upon detailed assessments and liaison with bus operators, the Council and WYCA and can be determined at the time detailed planning applications are progressed.

3.5.26 A range of 'hard' and 'soft' measures can also be implemented to encourage and promote bus use. These could include: high quality stops, shelters and timetable information; bus priority; taster tickets or bus passes; personalised travel planning; and general promotion of bus use via the Travel Plan.

3.5.27 Given the timescales over which development will be phased (and any uncertainties regarding this phasing) and when bus services will likely be needed (c. 2022/23), and also that the services could serve other developments, then the delivery of specific proposals cannot be sensibly identified at this stage. The analysis does, however, confirm that it will be possible to deliver viable bus services.

3.5.28 It is therefore proposed that, subject to the confirmation of the draft allocation in the Local Plan, further liaison is undertaken with the Council and WYCA with the aim of establishing a framework for the provision of bus services and a mechanism to fund such services.

3.5.29 The 'framework' (effectively a service specification) will include details of destinations to be served, operating times (first and last buses by day of the week), service frequencies/headways (again by day of the week and time of the day), size and quality (e.g. age) of the buses to be used along the routes.

- 3.5.30 The 'mechanism' will include details of the costs of such services, how fare revenues will be collected and allocated to the site, how background revenues will be identified and allocated to the services and how any revenues in excess of costs will be apportioned. The mechanism will need to determine (through liaison with the Council and WYCA) whether bus services are provided solely by the developer(s) or whether funds are paid by the developer to an appropriate collecting authority who will provide and deliver the bus services. The latter will allow better co-ordination and potentially economies of scale.
- 3.5.31 In conclusion, the size of the draft allocation is such that it will support new or enhanced existing bus services ensuring the site is accessible by bus and is sustainable.

Rail Strategy

- 3.5.32 A strategy will be developed that will encourage trips to Dewsbury, Huddersfield and Leeds by rail, particularly those for commuting journeys.
- 3.5.33 The site is close to Ravensthorpe station – c.150m from the site access on Ravensthorpe Road – and much of the site is within 800m of the station, an easy walking distance. Buses can also serve the site and station in the future as set out at 3.5.9 above.
- 3.5.34 The station currently provides hourly train services to Mirfield, Huddersfield, Dewsbury and Leeds, with the latter two destinations served by half hourly services in the morning peak hour. There are planned improvements on the line as a result of franchise commitments and the Trans Pennine Route upgrade that will result in a doubling of frequencies to two trains per hour and also the introduction of an hourly service to/from Manchester.
- 3.5.35 The Council commissioned Aecom to study the effects of potential improvements at the station. Aecom identify that the current usage at the station is very low – c.35,000 passenger journeys per annum which compares, for example, with c.455,000 journeys per annum at Mirfield.
- 3.5.36 Aecom considered the potential for improvements at the station with various measures assessed including improved waiting facilities, enhancing the approach to the station, better way-making, expansion of car parking, development of a bus interchange and the addition of Wakefield bound platforms.

3.5.37 Aecom's modelling of the options used standard railway industry techniques which adopt the existing patronage of the station as a starting point. Given this is low then the assessments indicate only modest increases in patronage and revenues and a poor economic case. However, it is considered this simply reflects the existing limited catchment of the station and the low current usage.

3.5.38 Aecom do, however, conclude that **“the proximity of Dewsbury Riverside to the railway station presents a considerable opportunity for mode shift and wider regeneration of Ravensthorpe which should be taken into account when considering Ravensthorpe railway station for future investment”**.

3.5.39 Miller Homes considers that there is potential to improve the station and attract additional patronage, particularly from the Dewsbury Riverside development, albeit this has not been taken into account in the traffic modelling work. Therefore as part of future planning application proposals, Miller Homes will work with key stakeholders (the Council, WYCA, Network Rail and the TOCs) to evaluate improvements to attract passengers to the station.

3.5.40 These could include:-

- Bus linkages between the site and the station (see 3.5.9 above);
- Improved access and environmental enhancements to the approach road;
- Improved waiting and information facilities;
- Provision of additional car parking, potentially using land at Dewsbury Riverside which is close by; and
- Measures in the Travel Plan to encourage rail use.

3.6 Promoting Sustainable Travel Choices

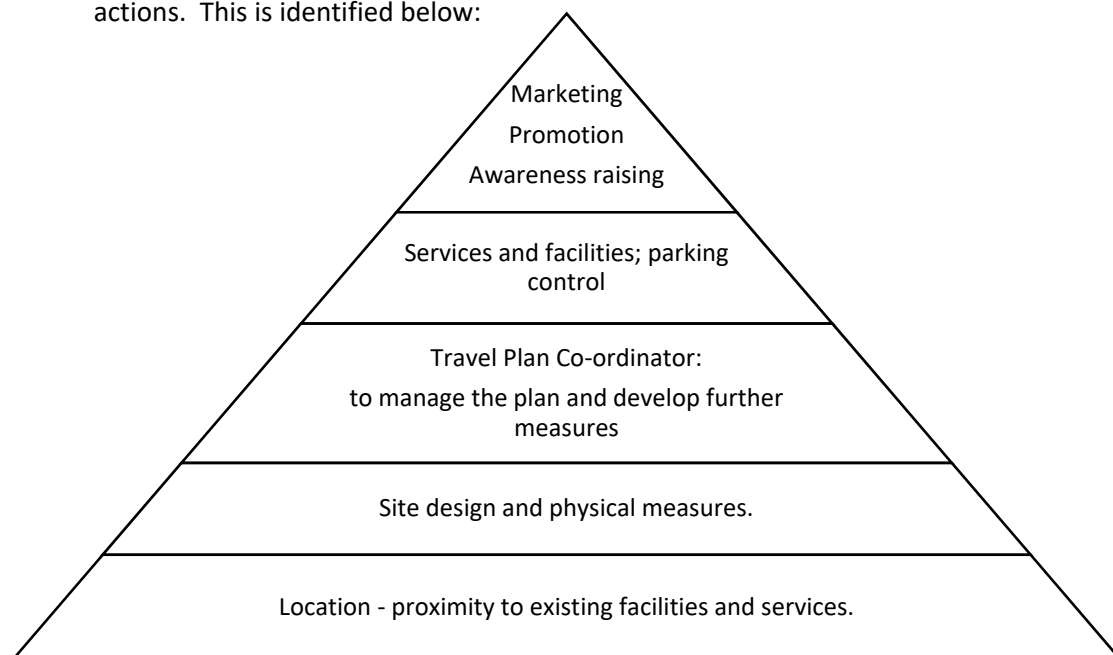
Overview

- 3.6.1 As well as the physical measures to promote walking, cycling and public transport set out above in Sections 3.4 and 3.5, the development of the site will include the production of comprehensive travel plans to support the proposals. These will primarily identify the delivery of ‘soft’ measures to encourage the use of sustainable modes, to complement the physical measures, mix of uses and high quality design approach.
- 3.6.2 In practice it is likely there will be several travel plans – for separate uses and for individual plots and/or reserved matters applications as they come forward. This section sets out the principles of the plans – objectives, targets and measures – which will be applied to more specific travel plans as the development proposals are progressed.
- 3.6.3 Inevitably there will be some residual car trips and the impacts of these are considered in Sections 5.0 and 6.0 below.

Travel Plan Philosophy

Travel Plan Pyramid

- 3.6.4 The DfT document ‘Making residential travel plans work: guidelines for new development’ notes that the travel plan can be viewed as a pyramid of measures and actions. This is identified below:



- 3.6.5 At the base of the pyramid is the location of the site. In this respect the proposals should be considered in the context of the site including a comprehensive range of facilities and services with dwellings close to these facilities and services i.e. destinations will be available within the site.
- 3.6.6 The DfT note that the next stage should include the fundamental characteristics that need to be incorporated into the design of the site to support the use of sustainable modes. The design approach focuses on creating a sense of place and promoting sustainable travel making, particularly slow travel within the site.
- 3.6.7 The next tier is the Travel Plan Co-ordinator(s) who will develop and manage the travel plan process, be responsible for the delivery of the plan(s) and liaison with the Council, organise monitoring and reviews of the plan and ensuring that the travel plan targets are achieved.
- 3.6.8 The next level is the services and facilities that will be obtained for the site such as bus services but also a range of other measures outlined below.
- 3.6.9 The final top tier is the promotion and marketing of the travel plan and services, raising awareness of the plan through various information initiatives and delivered by the travel plan co-ordinator.

Travel Plan Objectives and Targets

- 3.6.10 The detailed objectives and targets for the travel plan(s) will be discussed and agreed with the Council and other key stakeholders, such as WYCA and Highways England, at the appropriate time.
- 3.6.11 Broad objectives have been considered at this stage:
- i) Bring together the mix of uses, design of the site and travel plan measures such that the need to travel is reduced.
 - ii) Provide measures and initiatives that are inclusive, promote cohesion and provide alternatives for all residents and other users on the site.
 - iii) Promote hard and soft measures such that sustainable modes are the first mode(s) of choice, rather than the car.

- iv) Minimise the traffic generated by the development proposals such that targets are achieved.
- v) Assist in developing a sense of place within the site.
- vi) Promote healthy lifestyle choices through the use of non-car modes with emphasis on cycling and walking.
- vii) Minimise the environmental impacts of travel through a coherent design philosophy (mix of use; good design and linkages in the site; promotion of sustainable modes and measures) and reduce the emissions associated with residual car trips.

3.6.12 Specific SMART targets will be developed for the plan(s) but these will focus on two key aspects:

- First, meeting agreed modal share targets and a maximum proportion of car driver trips; and
- Secondly, ensuring that the actual traffic flows generated by the sites are consistent with those adopted in transport assessments, such that there is no harm from additional car trips.

3.6.13 Formal monitoring arrangements will be agreed to assess the achievement of objectives and targets on an on-going basis.

Travel Plan Measures

3.6.14 Detailed assessment and evaluation will be undertaken to establish the most appropriate measures for the site but it is recognised that the size of the proposals are such that a comprehensive package of initiatives will be needed to achieve objectives and targets. There will be general measures to be applied across the site and all modes, specific measures to promote walking and cycling and public transport, measures to reduce residual vehicular trips and information/awareness raising that can be rolled out across the whole site and range of uses.

3.6.15 The measures are summarised below.

Generic Measures

3.6.16 These will include:

- Travel Plan Co-ordinator(s): the TPC's will be responsible for the overall delivery of the plans including liaison with the Council. They will monitor the plan against objectives and targets and identify measures to promote sustainable travel. Given the size of the site and mix of uses then it is likely there will be several Co-ordinators who will receive training and support as necessary.
- Personalised travel planning: the TPC's will liaise with individual householders and employees etc. to plan specific journeys and show how these can be undertaken by sustainable modes.
- Welcome Packs: these will be provided to every new household and employee and will set out the benefits of travel plan measures, the initiatives available on the site and contact details for any further information.
- Broadband: all homes and businesses will be equipped with broadband, enabling working from home etc.

3.6.17 The mix of uses on the site, all in close proximity, and the high quality place design linking these together will be the single most important generic measure to encourage the use of sustainable travel modes.

Measures to Promote Walking and Cycling

3.6.18 Physical measures, including new footway/cycleway connections, are considered above. Additional measures will include:-

- Bicycle user group: the TPC will investigate the potential for a BUG to be established at the site to encourage residents to meet and exchange tips on cycle routes and maintenance. The TPC will forge links with cycle shops to arrange discounts on purchases and repairs, if possible.
- Travel voucher: Miller Homes will offer a voucher to each new household which can be used to purchase equipment or part purchase a bicycle.

- Cycle storage and stands: secure weather protected cycle storage and/or stands will be provided throughout the site.
- Safe routes to school and walking bus: the main pedestrian routes to the school will be designed and audited using 'Safe Routes to School' principles and Miller Homes will fund the advertising of walking bus schemes and the provision of fluorescent vests for children and walking bus 'drivers'.
- Cycling proficiency schemes at schools: Miller Homes will fund these for a period to be agreed with the Council.
- Cycle centre: Miller Homes will investigate the provision of a cycle centre within the local centre and this could be home to the BUG.
- Cycle training: this will be offered to residents and employees who are less confident regarding the use of a bike. The BUG can co-ordinate this.
- Bike buddy: volunteers will be sought to 'buddy-up' with less confident cyclists and the TPC will promote this and seek recruits.

Measures to Promote Public Transport

3.6.19 New bus services and supporting infrastructure will be delivered by Miller Homes using the framework as set out above. Further measures will promote the use of buses including:

- Travel vouchers/travel cards/bus tickets: Miller Homes will supply a monthly bus pass to each household on first occupation. The TPC will seek to obtain discounts from bus operators for these tickets or tickets for extended periods.
- 'Taster' tickets: Miller Homes will supply the TPC with tickets to supply to potential bus users identified through personalised travel planning.

- Bus buddies: this is used in other towns where trained volunteers provide one-to-one support to older people, learning disabled people, people with physical and sensory impairments etc. to aid their understanding of using public transport and to help them gain confidence.

Reducing Car Use

3.6.20 Residents will continue to seek to make some journeys by car and the following will be delivered on the site to reduce the impacts of travel:

- The proposed development is of a sufficient magnitude to warrant and sustain a viable Car Club. Car clubs provide their members with convenient access to newer, cleaner (low emission) vehicles without the expense of ownership. Car clubs also enable communities to share assets and can help tackle parking pressures, improve accessibility and support sustainable travel initiatives.
- Car sharing schemes: car sharing will be promoted from occupation of the dwellings by the TPC. A bespoke car sharing scheme could be developed or existing car sharing initiatives could be used such as wycarshare.

Information and Awareness

3.6.21 It is important to raise awareness of the measures and initiatives that will be available at the site and therefore information will be provided as follows:-

- Site specific travel guide: a foldable map, setting out the details of bus services and walk and cycle routes, will be developed by Miller Homes. It will be included in sales literature and updated regularly for distribution by the TPC.
- Website: a Travel Plan website will be developed for the site giving residents access to up-to-date travel information.
- Notice boards: these will be located within sales offices and at strategic points around the development, displaying up-to-date information on sustainable modes and setting out the benefits of these and other travel plan measures.
- Campaigns: the TPC will hold events and campaigns related to national and local initiatives such as 'Bike to Work' day and local organised cycle rides.

- Technology: a Travel Plan smartphone app will be created to provide residents and users of the site with travel information at their fingertips. This could include real-time bus information and digital payment options. A free phone service for travel queries could also be promoted.

3.6.22 The TPC and travel plan measures will be funded by Miller Homes.

3.7 **Accessibility of the Site**

Overview

3.7.1 The accessibility of the Dewsbury Riverside site to key facilities and services by a range of travel modes is summarised below. The site will include at least two primary schools, a possible secondary school and a local centre (including health, retail, leisure and community uses) with these helping to contain trips within the site.

Table 3.14: Distance to Key Facilities and Services

Facility Type	Name	Distance
Primary Schools	New schools on the site	On-Site
	Ravenshall School	200m
	Thornhill Lees C of E Infant and Nursery School	850m
	Headsfield C of E Junior School	1.0km
	Ravensthorpe C of E Junior School	1.1km
Secondary Schools	Potential new school on the site	On-Site
	Thornhill Community Academy	1.9km
	John Fisher Catholic Voluntary Academy	3.2km
	Westborough High School	3.3km
Health	GPs in local centre on the site	On-Site
	Thornhill Lees Medical Centre	500m
	Ravensthorpe Health Centre	550m
	Brewery Lane Surgery	800m
	Brewery Lane Pharmacy	500m
	Sykes Chemist	500m
	Thornhill Dental Practice	1.3km
	Dewsbury Dental Care	1.8km
Retail	Local centre on the site	On-Site
	Kang Brothers Off Licence	170m
	Mullaco Supermarket	550m
	Ravensthorpe Retail Park	700m
	Thornhill Lees Post Office	800m
	Nisa Local	1.6km
	ASDA Superstore	2.1km
Leisure	Play areas on the site	On-Site
	Thornhill Lees Village Hall	180m
	Honeysuckle Park	300m
	Centenary Square Football Pitch	950m
Employment	Facilities on the site (schools, local centre)	On-Site
	Industrial Units off Forge Lane	150m
	Industrial Units off Netherfield Road	550m
	Industrial Units off Huddersfield Road	900m
	Bretton Park Industrial Estate	1.3km
	Dewsbury town centre	2.5km

3.7.2 Local facilities and services within the vicinity of the site are shown in Appendix 3.H and the distances from the closest of the three main site accesses to the key destinations in the local area are set out in the table below.

Accessibility to Education

3.7.3 At least two primary schools and potentially one secondary school will be provided on the site; these facilities will be within a short and easy walking or cycling distance for all future residents of the site.

3.7.4 There are also several other primary schools within Thornhill Lees, Ravensthorpe and Savile Town which are within a 2km walking distance of the nearest site access. The nearest off-site high school is Thornhill Community Academy which is 1.9km from the nearest site access. Other high schools are further afield but the size of the site is such that there may be potential for additional school buses, depending upon the demand which can be monitored via the Travel Plan.

3.7.5 Overall, the accessibility to both primary and secondary education is concluded to be excellent.

Accessibility to Health Facilities

3.7.6 The local centre on the site will potentially include a GP surgery and pharmacy and these will be within an easy walk of all the dwellings on the site. There are other GP surgeries, dental practices and pharmacies in Thornhill, Thornhill Lees and Savile Town and all are within easy walking or cycling distance of the site.

3.7.7 Dewsbury and District Hospital is located c.3.5km from the site, this is within a reasonable cycle distance. There is the potential for new bus services to connect the site to the hospital via Dewsbury town centre.

3.7.8 It is concluded that the accessibility to health facilities is very good.

Accessibility to Retail and Leisure

3.7.9 The local centre provided on the site will include convenience stores and other community facilities. The site will include various areas of open space and play areas. All will be within an easy walk or cycle of all the dwellings on the site.

3.7.10 There are other retail and leisure facilities within Thornhill Lees, Ravensthorpe and Savile Town which are within walking distance of the site. Additional retail and leisure facilities are located within Dewsbury town centre which is within cycling distance from the site and can be accessed via new and existing bus services connecting the site to the town centre.

3.7.11 Retail and leisure facilities further afield in locations such as Huddersfield and Leeds can be accessed via rail services from Ravensthorpe station.

3.7.12 It is concluded that the accessibility to retail and leisure facilities is very good.

Accessibility to Employment

- 3.7.13 There are numerous industrial units within 2km walk of the site including those located off Forge Lane, Huddersfield Road, Calder Road and Netherfield Road.
- 3.7.14 For those residents working in Dewsbury town centre, the existing 280 bus service will either be diverted through the site or a new bus service will be developed to provide a service to the town centre. For those working further afield in locations such as Huddersfield and Leeds, these locations can be accessed via rail services from Ravensthorpe station.
- 3.7.15 The accessibility to employment is therefore considered to be good.

Summary

- 3.7.16 In conclusion, a range of facilities and services will be available locally within walking and/or cycling distance. These include: primary schools, a possible secondary school, local centre and play areas on site; other primary schools and secondary schools in Thornhill, Thornhill Lees and Savile Town; health facilities including doctors, dentists and pharmacies in Thornhill and Thornhill Lees; retail facilities are provided within the local areas of Thornhill Lees, Ravensthorpe and Savile Town as well as Dewsbury town centre.
- 3.7.17 The bus strategy will provide connections to Dewsbury town centre; this will provide sustainable access to the town centre itself and destinations further afield such as Leeds, Huddersfield and Manchester via rail services from Dewsbury station. Also, Ravensthorpe station is within a comfortable walking distance and provides connections to destinations such as Leeds and Huddersfield.
- 3.7.18 It is therefore concluded that the site is sustainable and accessible via a range of travel modes and will therefore be in accordance with the NPPF.

SECTION 4 TRAFFIC ASSESSMENT METHODOLOGY

4.1 Overview

4.1.1 The potential traffic impacts of the proposals at Dewsbury Riverside have been assessed including through liaison with the Council. Two approaches have been adopted:-

- i) Assessing the short-term impacts of the development proposals within five and seven year Local Plan horizons as requested by the Council; and
- ii) Assessing the longer-term impacts of the full Dewsbury Riverside development as well as its phasing.

4.1.2 The results of the short-term impact assessment are set out in Section 5.0 with those for the longer-term in Section 6.0. Both use difference technical approaches.

4.1.3 The short-term assessments use existing traffic flows as the starting point and development generated trips are then added. The derivation of the existing flows and the development generated trips are set out below in 4.2 and 4.3 respectively. The longer-term assessments use the Kirklees Transport Model and the overall approach including the development of the base model and the scenarios tested are set out at 4.4 with the development traffic forecasts (including development trip generations) set out at 4.5.

4.2 Existing Traffic flows

4.2.1 Existing traffic flows in the South Dewsbury area have been obtained from a series of traffic surveys at key junctions. The locations of the surveys and the dates they were conducted are set out in Table 4.1 below.

Table 4.1: Traffic Survey Locations and Dates

Junction Description	Date of Survey
A644 / Low Mill Lane / Fir Avenue	17/03/2016
Huddersfield Road / North Road/ Queen Street/ Calder Road	17/03/2016
Lees Hall Road/ Forge Lane	17/03/2016
A638 Ring Road/ Mill Street Lane	03/07/2012
A644/ Thornhill Road	03/07/2012
A644/ Cemetery Road/ Watergate Road	03/07/2012
A638/ A644/ Dewsbury Ring Road	03/07/2012
A638/ Ring Road/ Mill Street	03/07/2012
A638/ B6409/ Church Street	03/07/2012
A638/A644	03/07/2012
Forge Lane/ Station Road / Thornhill Road / Savile Road	17/03/2016
Lees Hall Road/ Brewery Lane	17/03/2016
Slaithwaite Road/ Station Road/ Brewery Lane	17/03/2016
Slaithwaite Road/ Lees Hall Road	03/07/2012
B6409/ Headfield Road	17/03/2016
B6409/ Mill Street East/ Mill Street West	17/03/2016
A644/ Steanard Lane	15/10/2015
A644/ Church Lane	17/03/2016
A644/ Queen Street/ Station Road	17/03/2016
Steanard Lane/ Sands Lane	15/10/2015
Slaithwaite Road/ Headfield Road	17/03/2016
Headfield Road/ Bretton Street	17/03/2016
A644/ Ravenhouse Road	17/03/2016

4.2.2 All of the survey data has been factored to a consistent year of 2016 using TEMPRO and the overall peak hours have been identified: AM peak 07:45 – 08:45; and PM peak 16:30 – 17:30. The resultant peak hour 2016 traffic flows are given in Appendix 4.A.

4.3 Development Trips: 5 and 7 Year Assessment

4.3.1 As noted above, the Council has requested an assessment of the short-term implications of the development identified in the Local Plan: at their request, assessments of the levels of development occupied at five and seven years have been conducted. The ‘seven year’ assessment represents the first five years of occupations on the site. The current trajectory shows 350 and 710 dwellings occupied at five and seven years respectively.

4.3.2 Two applications for development at Dewsbury Riverside have recently obtained consent, totalling 240 dwellings. Thus these dwellings are effectively committed and the 5 and 7 year assessments therefore test the impacts of additional development i.e. the 240 dwellings are included in the base traffic forecasts. The assessments therefore include the traffic generated by:

- 5 years – 165 dwellings
- 7 years – 470 dwellings

4.3.3 The traffic assessments adopt an approach consistent with the Transport Assessments of the consented sites: they use a TRICS trip rate and a commuting journey pattern for the trip distribution (both of these assumptions are revised for the assessments with the Kirklees Transport Model – see 4.5 below).

4.3.4 The trip rates adopted are those used in the consented planning applications and are derived from the 'Houses Privately Owned' category in TRICS. Seventy of the dwellings are sheltered housing/older person housing and separate trip rates have been derived for these. The resultant trip generations for 165 and 470 dwellings are shown in the table below.

Table 4.2: Short-Term Trip Generation

Time Period	Direction	No of Trips	
		5 years 165 units	7 years 470 units
AM Peak Hour	Arrival	17	54
	Departure	39	148
	Two-Way	56	202
PM Peak Hour	Arrival	37	131
	Departure	27	87
	Two-Way	64	218

4.3.5 The trips have been distributed to destinations using the pattern of journeys to work from the 2011 Census from the local area. This gives the following distribution pattern in terms of points entering/leaving the local area with trips then assigned to the fastest route based on google mapping:-

Table 4.3: Trip Distribution

Destination	Proportion of Trips
A638 Wakefield Road	7.9%
A638 Halifax Road & A652 Bradford Road	10.1%
A653 Leeds Road	13.8%
Heckmondwike Road	16.4%
North Road	5.4%
Thornhill Road (Destination)	1.1%
A644 Huddersfield Road	19.3%
Lees Hall Road (Destination)	2.1%
Savile Road (Destination)	2.1%
Headfield Road (Destination)	2.1%
B6117 The Common	8.4%
Slaithwaite Road (Destination)	2.1%
Edge Top Road (Destination)	0.8%
Whitely Road	2.9%
Briestfield Road	2.5%
Ravensthorpe Employment	2.9%
Total	100.0%

4.3.6 The development generated traffic flows used in the 5 and 7 year traffic assessments are included in Appendix 4.B.

4.3.7 The baseline flows for use in the assessments have been derived by adding committed development flows to the 2016 base flows. The committed developments comprise the dwellings on the consented sites at Dewsbury Riverside and 169 dwellings on a consented site at Forge Lane. The future year baseline flows are given in Appendix 4.C. The resultant future baseline + development flows are included in Appendix 4.D.

4.4 Traffic Modelling of the Local Plan

4.4.1 Traffic assessments of the full proposed allocation at Dewsbury Riverside have been assessed using a development of the Kirklees Transport Model with the modelling work being undertaken by Aecom, the Council's consultants.

4.4.2 The Kirklees Transport Model was developed by Aecom for the Council to support the development of the Local Plan. Full details are set out in the Council's Transport Model Technical Paper and Addendum (April 2017) which forms part of the evidence base for the Local Plan.

- 4.4.3 The model is a strategic model covering the whole of Kirklees District and beyond, with the spatial extent ensuring traffic enters and leaves the District at the correct point. The demand model covers a full 24 hour period but the traffic assignment models, which provide traffic flow estimates on links and at junctions, cover the morning (08:00 – 09:00) and evening (17:00 – 18:00) peak hours as well as an average inter-peak hour (10:00 – 16:00).
- 4.4.4 The model divides Kirklees and the surrounding area into a series of zones, with the purpose of the model being to understand how people move between these zones. New development is represented by new zones.
- 4.4.5 The highway assignment model contains a detailed representation of the highway network in Kirklees with key junctions coded in detail to reflect the capacity of individual traffic movements and with links coded with speed/flow relationships. A series of traffic counts and journey time surveys were used to calibrate and validate the model.
- 4.4.6 The model includes forecast scenarios which take account of planned/committed development and development identified as draft allocations in the Local Plan as well as planned transport infrastructure interventions. The forecast year adopted in the model is 2030. The model has then been used to assess changes in transport conditions as a result of the Local Plan development and infrastructure, largely by comparing changes in delays at junctions and overall journey speeds.
- 4.4.7 The Council’s Technical paper concludes:-

“The results of the journey speed analyses show that do something (i.e. with all the development and the proposed transport schemes in place) forecast year results have generally improved or remained fairly constant when compared to the do minimum results. The evidence backs up the conclusion that at a district-wide level the proposed transport mitigation strategy can accommodate the development proposed in the Kirklees Local Plan Period 2016 – 2031”

- 4.4.8 The Technical Paper goes on to note that:-

“The model is a strategic representation of a large proportion of the Kirklees transport network and care must be taken when interpreting the results at the relatively spatially coarse short corridor level. Nonetheless the results at a corridor level do give an indication of where further investigation and analysis must be carried out to understand the impact of the proposed land uses allocations and the subsequent impact of the mitigation proposed”

and

“Throughout the more detailed analysis and investigation of the traffic model the Local Authority will ensure that appropriate mitigation is developed.”

- 4.4.9 The approach adopted for the assessment of the full allocation at Dewsbury Riverside is consistent with the above approach. A more detailed model of the South Dewsbury area has been developed by Aecom and this has been used to test the proposed allocation and supporting major infrastructure. The results of the modelling are then used to identify the locations where mitigation will need to be considered in detail.
- 4.4.10 The starting point for the South Dewsbury traffic model was the Kirklees Transport Model described above, with this updated to reflect more detail. Zones were disaggregated and more detail was added to the network. The trip matrices were rebuilt to reflect the greater levels of spatial detail in the zones and additional traffic counts were used to assist with matrix estimation and model calibration.
- 4.4.11 Aecom developed the South Dewsbury Traffic Model and their technical note on the calibration and validation of the model is included in Appendix 4.E.
- 4.4.12 In terms of turning counts, Aecom note that both peak models show a good level of calibration against the GEH statistic and an excellent level of calibration when taking into account all criteria. They note that discrepancies in count information (expected when counts are undertaken on different days in different months and years) means achieving calibration against all counts would not be possible.
- 4.4.13 Aecom also note that the model validates against observed journey time data along the A644 corridor for both time periods and both directions but acknowledge that the model is faster than the observed times in the peak directions. Aecom go on to note there is considerable day-to-day variation in journey times and also variation within the peak hour.
- 4.4.14 Overall Aecom conclude that the model has an excellent level of calibration. The Council and Miller Homes have agreed that the model is suitable for forecasting the impacts of the draft allocation at Dewsbury Riverside.

4.4.15 Aecom has also produced traffic forecasts using the new base year model. The forecasts take account of many developments and transport interventions and the model has therefore been used to forecast the effects of these, consistent with the approach adopted for the Kirklees Transport Model but at a greater level of spatial detail. Forecasts for a 2030 'Do-Minimum' have been produced which take account of all the other allocations in the Local Plan excluding Dewsbury Riverside and all the transport interventions, other than a major highways scheme in South Dewsbury. This Do-Minimum has then been used as a base on which the effects of the Dewsbury Riverside development are assessed. The traffic forecasting adopted is consistent with that in the Kirklees Transport model.

4.4.16 A series of scenarios have been tested by Aecom as set out in Table 4.4 below with the objectives of the tests being to:

- Identify, in board terms for the Local Plan, traffic impacts resulting from development at Dewsbury Riverside.
- Identify the impacts of potential new road options.
- Assist in determining the phasing of development and infrastructure.

Table 4.4: Traffic Model Forecast Scenarios

Test Ref	Description
1	2030 Do-Minimum (DM)
2	2030 DM + 1,000 dwellings at Dewsbury Riverside
3	2030 DM + 2,000 dwellings at Dewsbury Riverside
4	Test 3 + Dewsbury Riverside Strategic Route (DRSR)
5	Test 3 + Ravensthorpe Local Bypass (RLBP)
7	2030 DM + 4,000 dwellings + DRSR
8	2030 DM + 4,000 dwellings + RLBP
10	2030 DM + DRSR
11	2030 DM + RLBP

4.4.17 The DRSR is described above (section 2.3). The RLBP is a local route that includes bridging the Calder and railway (as the DRSR) and with a new link between A644 and Calder Road to the east of Ravensthorpe gyratory. Tests 10 and 11 above are designed to identify the impacts of only the new roads.

4.4.18 The modelling of the Dewsbury Riverside development adopts trip rates and a trip distribution pattern as set out in the following section. The results of the modelling are set out in Section 6.0.

4.5 Development Traffic Forecasts

- 4.5.1 The anticipated patterns of the car trips generated by development at Dewsbury Riverside were supplied to Aecom for use in the modelling. The trip rates are c.20% lower than those adopted for the 5 and 7 year assessments and reflect the nature of the full allocation.

Trip Generation Rates

- 4.5.2 The Draft Local Plan's vision for Kirklees, which has influenced the proposed site allocations, notes:-

“People will have access to a range of local facilities including services, health-care and education provision, and adequate infrastructure. Places will be well-connected encouraging sustainable travel including increased opportunities for walking and cycling and improved links to other parts of the Leeds City Region and beyond”.

- 4.5.3 Furthermore, Draft Policy DLP20 notes the following regarding sustainable travel:-

“New development will be located in accordance with the spatial development strategy to ensure the need to travel is reduced and that essential travel needs can be met by forms of sustainable transport other than the private car. The council will support development proposals that can be served by alternative modes of transport such as public transport, cycling and walking and in the case of new residential development is located close to local facilities.

The council will support demand management measures which discourage single occupancy car travel within new development and encourage the use of low emission vehicles to improve areas with low levels of air quality. Proposals should include measures to encourage the use of sustainable travel options, including public transport, the promotion of personal journey planning, walking, cycling, car sharing and electronic communication and home working.

Travel plans will be required for all major planning applications in accordance with current guidance and should set targets and monitoring arrangements to ensure sustainable travel patterns are maintained. Travel plans should include agreed and defined outcomes related to a package of specified measures to be implemented”.

- 4.5.4 Thus the Council anticipates the use of sustainable travel modes for significant development allocations/proposals and the supporting text justifying the policy confirms this is expected to reduce traffic flows.

4.5.5 The starting point for the calculation of development generated trips is the total number of annual trips per person derived from the National Travel Survey (NTS). The overall methodology has involved a ‘first principles’ approach adopting the following steps:-

- a) Deriving the total trips per person using NTS data.
- b) Calculating the total annual number of trips per household using the average household size.
- c) Disaggregating by home based and non-home based trips.
- d) Deriving the peak hour travel movements.
- e) Splitting into journey purposes and then disaggregating by mode.

4.5.6 The National Travel Survey (NTS) gives the annual number of two-way trips by all modes per person as 921 in 2014. Two adjustments have been made to this related to the local area and age profile. Discussions with DfT have identified that they can provide ‘total trips per person’ data at regional level. For the Yorkshire and Humber region, the DfT has advised that the number of trips per person is 963 i.e. 4.6% greater than the national average. This higher figure has therefore been used as the starting point in the calculations. The NTS also gives annual trips per person by age band. The national average data is shown in the table below along with a proposed adjustment which may reflect a younger age profile in the proposed development, which have higher NTS trip making levels.

Table 4.5: NTS Age Distribution

Age Band	Proportion of Total	
	NTS Average	Proposed
0 – 16	19.9%	20.0%
17 – 20	3.4%	5.0%
21 – 29	8.9%	10.0%
30 – 39	14.2%	15.0%
40 – 49	15.9%	20.0%
50 – 59	13.9%	15.0%
60 – 69	12.9%	10.0%
70 +	10.9%	5.0%

4.5.7 This results in a 6.8% uplift to the NTS rate resulting in 1,028 trips per person per annum i.e. c.12% above the national average when also taking account of the regional variation.

4.5.8 The above trip rate has been applied to the average household size of 2.39ppd at 2030 derived from TEMPRO giving 2,457 trips per household per annum. Whilst the existing household size in South Dewsbury is larger than this, it is anticipated that the delivery of new homes will allow households to disaggregate. The total number of trips has then been disaggregated into home based (HB) and non-home based (NHB) using data from TEMPRO which identifies that 87.4% of trips are HB. Thus the number of HB and NHB trips is:-

- HB = 2,147 trips
- NHB = 310 trips

4.5.9 Although NHB trips are, by definition, not made to/from the residential dwellings on the site, they are used as a proxy for trips made by others to/from the dwellings.

4.5.10 The calculations to derive the number of peak hour trips are undertaken in three stages:-

- i) Calculate daily trips from the annual figures using TEMPRO data.
- ii) Calculate 12 hour trips from the daily total using TEMPRO.
- iii) Calculate peak hour trips from the 12 hour total using TRICS data.

4.5.11 TEMPRO identifies that 75.4% of all trips are made on weekdays. Thus the number of weekday trips is:-

- HB = 6.23 trips/day
- NHB = 0.90 trips/day

4.5.12 TEMPRO also identifies that 84.3% of daily (24 hour) trips are made in the 07:00 – 09:00 12 hour period, giving:

- HB = 5.25 trips/12 hours
- NHB = 0.76 trips/12 hours

4.5.13 Factors have been derived from TRICS to obtain peak hour trip rates per household (all modes). The average of factors from the TRICS ‘houses privately owned’, ‘affordable housing’ and mixed private/affordable housing’ categories have been used, identifying that 12.91% and 11.64% of 12 hour trips are made in the AM and PM peak hours respectively. This results in the following peak hour person trip rates:-

Table 4.6: Peak Hour Person Trip Rates

Peak Hour	Trip Type		
	HB	NHB	Total
AM Peak	0.678	0.098	0.776
PM Peak	0.611	0.088	0.699

4.5.14 Trips by journey purpose have been derived using data from TEMPRO. This gives data for the AM peak period 07:00 – 10:00 and PM peak period 16:00 – 19:00. Assessment of the impacts of the proposals is for the peak hours and therefore the peak period proportions have been adjusted to reflect this, with work trips increasing in proportion and noting that these have higher estimated car modal shares. The trip purpose proportions adopted are as follows:

Table 4.7: Journey Purpose Proportions

Journey Purpose	AM Peak Hour		PM Peak Hour	
	TEMPRO	Adjusted	TEMPRO	Adjusted
Education	36.7%	37.0%	8.8%	3.0%
Employer’s Business	2.6%	3.0%	3.1%	3.0%
Holiday	0.4%	0.0%	1.5%	1.0%
Personal Business	3.6%	3.0%	7.6%	7.0%
Recreation/social	8.0%	6.0%	14.5%	12.0%
Shopping	10.6%	8.0%	22.4%	20.0%
Visiting Friends etc	4.1%	3.0%	11.7%	10.0%
Work	34.0%	40.0%	30.4%	44.0%
Total	100.0%	100.0%	100.0%	100.0%

4.5.15 The trip rates by purpose are then calculated but, for presentational purposes, the trip rates are multiplied by the 4,000 dwellings proposed on the site. The number of peak hour trips by journey purpose by all modes are set out in the table below:-

Table 4.8: Peak Hour Trips by Journey Purpose (4,000 dwellings)

Journey Purpose	AM Peak Hour	PM Peak Hour
Education	1,003	73
Employer's Business	81	73
Holiday	0	24
Personal Business	81	171
Recreation/social	163	293
Shopping	217	489
Visiting Friends etc	81	244
Work	1,085	1,075
NHB (all purposes)	392	352
Total	3,103	2,794

4.5.16 The number of car driver trips has been calculated by factoring the trips in the above table by car driver modal share proportions. The car driver proportions and the source of the data are set out in the table below:-

Table 4.9: Car Driver Modal Share Proportions

Journey Purpose	Car Driver Proportion	Source of Data
Education	13.1% AM 20.1% PM	TEMPRO
Employer's Business	76.8% AM 71.3% PM	TEMPRO
Holiday/ Personal Business/ Recreation/ Social/ Visiting	35.7%	TEMPRO – weighted averaged used as these purposes are aggregated in the trip distribution assessment
Shopping	33.4% AM 35.4% PM	TEMPRO
Work	59.6%	2011 census journey to work data

4.5.17 Further adjustments have been made to the work and education trips reflecting that the peak weekdays for these are higher than the averages weekdays. Trips by both purposes are increased as follows:

- Work: 261 days – 25 days leave – 8 bank holidays – 5 sick days = 223. Therefore trips increase by $261/223 = +17\%$.
- Education: 261 days but only 195 school days therefore trips increase by $261/195 = 33.8\%$.

4.5.18 For NHB trips, TEMPRO gives a modal share of 51-55% by car driver. As a worst case, 75% car driver has been adopted to reflect the location of the site and the nature of NHB trips. Thus the number of car driver trips (two-way) generated by 4,000 residential dwellings are:-

Table 4.10: Peak Hour Car Driver Trips by Journey Purpose

Journey Purpose	AM Peak Hour	PM Peak Hour
Education	176	20
Employer's Business	62	52
Holiday/Personal Business/ Recreation/ Social/ Visiting	116	261
Shopping	72	174
Work	757	750
NHB (all purposes)	294	264
Total	1,477	1,521

4.5.19 The car driver trip rates are then calculated simply by dividing the above total trips by 4,000 dwellings. The directional split is calculated using TRICS data. The calculations of the trip rates are set out in full in Appendix 4.F. The trip rates developed in the modelling included a slightly higher trip rate resulting from an error in the calculation of the number of weekday trips. The following car driver trip generation rates were used in the modelling of the Dewsbury Riverside proposals:-

Table 4.11: Traffic Model Trip Generation Rates

Time Period	Arrival	Departure	Total
AM Peak Hour	0.116	0.279	0.395
PM Peak Hour	0.257	0.149	0.406

Comparison with TRICS Data

4.5.20 The AM and PM peak hour trip rates have been compared with those derived from the latest versions of TRICS. The two-way proposed and TRICS derived trip rates for various TRICS categories are set out in the table below, with the TRICS selection excluding sites in London, Ireland and Northern Ireland, in town centres and at the edge of town centres. The default TRICS data range has been used.

Table 4.12: Comparison with TRICS Trip Rates

Source	Two-Way Trip Rate (per vehicle)	
	AM Peak	PM Peak
Proposed	0.395	0.406
TRICS – Houses Privately Owned	0.439	0.466
TRICS – Affordable Houses	0.432	0.488
TRICS – Mixed Private Housing	0.474	0.531
TRICS – Mixed Affordable Housing	0.417	0.468
TRICS – Mixed Private/Affordable	0.417	0.386

4.5.21 Thus the proposed trip rates are c.10%-13% lower than the TRICS houses privately owned trip rates and c.9% - 13% lower than the average of the above TRICS rates.

4.5.22 The above indicates that the proposed rates are only slightly below the TRICS rates and the following should be noted:-

- i) The TRICS sites are historic but the proposed trip rate is for 2030, adopting a 2030 average household size. As households get smaller then the number of trips reduces.
- ii) Related to the above, trip rates are reducing over-time. Vehicular trip rates derived from TRICS have reduced (as can be evidenced by TRICS searches) and NTS data shows that total annual trips per person (by all modes) have also reduced over time, by c.12% between 2002-2014.
- iii) The average site size in the TRICS searches is very significantly below the proposed site, with these being 180, 94, 88, 56 and 230 units for the categories in Table 4.12. The site will have a significant level of complementary facilities (generally not available on smaller sites) allowing trip making to be internalised for some trips.
- iv) The majority of TRICS sites do not have Travel Plans in operation.

4.5.23 It is therefore considered the proposed trip rates are appropriate for the following reasons:-

- i) The characteristics of the local area and the potential to disaggregate existing households, resulting in the creation of new households but not a direct increase in trip making.
- ii) The demographics of the local area lend themselves to lower levels of trip making including local trips, lower levels of car ownership, high bus and walk modal shares etc.
- iii) Demand responses to growth including combined trips, redistribution and mode switching, changes in the timing of trips and peak spreading. All of these are likely to reduce peak hour car driver trip rates.
- iv) The mixed-use nature of the site with facilities provided on site to allow many trips to be internalised.

- v) The sustainable transport strategy that will support the site will provide opportunities for residents to use non-car modes of travel. There will be ample opportunities for local travel that can be made without a car.

4.5.24 Overall it is concluded that the trip rates derived and proposed are suitable for use in the assessments of the traffic impacts of the Council's proposed strategic development allocation. It is, however, recognised that the Council considers the proposed allocations may generate higher traffic flows. It is therefore envisaged that, as development on the site progresses, traffic monitoring is undertaken such that empirical trip rates can be established. These can be used subsequently to inform assessments of the need for and timing of mitigation and input into planning applications as these are brought forward.

Trip Distribution

4.5.25 The development generated trips have been distributed to the surrounding area by journey purpose. For work trips, the pattern of car driver trips from Census journey to work data was used. For other trips, assumptions have been made regarding the destinations of trips e.g. primary school trips to nearby schools; shopping trips to Ravensthorpe, Dewsbury, Huddersfield, Leeds etc.

4.5.26 The resultant overall trip distribution in terms of points in the South Dewsbury Traffic Model network is:-

Table 4.13: Overall Trip Distribution – Kirklees Traffic Model

Destination	Proportion of Trips
A644 Huddersfield Road	16.4%
Church Lane	1.0%
North Road	3.7%
Ravensthorpe	3.5%
Heckmondwike Road	12.2%
Dewsbury town centre and surrounds	24.3%
A638 Halifax Road and A652 Bradford Road	5.5%
A653 Leeds Road	9.8%
A638 Wakefield Road	8.0%
Lees Hall Road/ Ravensthorpe Road area	1.8%
Slaithwaite Road area	1.5%
Thornhill	1.0%
Whitley Road	2.0%
Briestfield Road	1.7%
Hostingley Lane	7.5%
Total	100.0%

4.5.27 The trip generations and distribution were supplied to Aecom who used the Kirklees Traffic Model to produce traffic assignments (flows on links and turning movements at junctions). These are described in Section 6.0.

SECTION 5 SHORT-TERM DELIVERY TRAFFIC ASSESSMENT

5.1 Overview

5.1.1 The Council has requested that the traffic impacts of potential development on the allocation site are assessed, taking account of the number of units delivered within the first five and seven years of the plan, the latter corresponding with the first five years of occupations on the site. It is understood this is to demonstrate that there is a reasonable prospect of development being delivered within the early years of the plan.

5.1.2 The indicative housing trajectory prepared by Spawforths indicates a total of 350 dwellings occupied at end 2021 (5 year plan period) and 710 dwellings at end 2023 (7 year plan period). Two planning applications, each for 120 dwellings, have recently been approved by the Council on 12 April 2017; at Lees Hall Road (reference 2016/94117) and Ravensthorpe Road (reference 2016/94118).

5.1.3 Thus a large proportion of the development envisaged in the first five years of the plan is already committed and a significant proportion of that in the plan's first seven years is committed. Therefore the impacts of 165 dwellings and 470 dwellings should be considered in the assessments with the committed developments included in the future year baseline.

5.2 Five Year Assessment

Access

5.2.1 Access to the development will be from the consented accesses off Lees Hall Road and Ravensthorpe Road and also off Sands Lane (subject to planning).

Traffic Flows

5.2.2 The traffic flows used in the assessments are set out in appendices 4C and 4D. The future year baseline flows, taking account of committed developments, are assessed and then the 'with development' flows are considered. Comparison of the two sets of results allows the impacts of the short-term development to be assessed and the need for any mitigation identified.

Proportional Impacts

5.2.3 The proportional impacts of the five year development at junctions surrounding the proposed allocation are set out in the table below.

Table 5.1: Proportional Impacts of Development in the First Five Years of the Plan

Junction	Base Traffic Flows ¹		Development Flows (5 Year – 165 Dwellings)		Proportional Impact	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
A644/Low Mill Lane/Fir Avenue	1972	1843	21	23	1.1%	1.3%
A644/Low Mill Lane	2052	1872	21	23	1.0%	1.3%
A644/Calder Road Gyratory	2772	2548	29	33	1.0%	1.3%
Lees Hall Road/Forge Lane	1116	1097	18	21	1.6%	2.0%
A644/Temple Road/Broad Street	2535	2466	14	15	0.6%	0.6%
A644/Thornhill Road	2609	2704	13	16	0.5%	0.6%
A644/Cemetery Road	2557	2627	10	15	0.4%	0.6%
A644/A638 Dewsbury Ring Road	2787	3058	11	12	0.4%	0.4%
A644/Old Westgate/Mill Street	2310	2671	8	10	0.4%	0.4%
A644/Savile Road/Bus Station	2509	2630	12	14	0.5%	0.5%
A638 Wakefield Road/A644	3517	3812	11	12	0.3%	0.3%
Forge Lane/Station Road/ Thornhill Road/ Savile Road	2132	2156	12	14	0.6%	0.7%
	2284	2148	12	14	0.5%	0.7%
Lees Hall Road/Brewery Lane	694	636	23	25	3.3%	3.9%
Slaithwaite Road/Brewery Lane	1567	1736	8	9	0.5%	0.5%
Slaithwaite Road/Lees Hall Road	1914	1666	8	9	0.4%	0.6%
Savile Road/Headfield Road	1408	1599	11	13	0.8%	0.8%
Savile Road/Mill Street	2270	2625	10	11	0.4%	0.4%
A644/Steuard Lane	2038	1881	24	26	1.2%	1.4%
A644/Church Lane	1864	1658	11	12	0.6%	0.7%
A644/Station Road/Queen Street	1648	1746	11	12	0.6%	0.7%
Steuard Lane/Sands Lane	393	437	17	18	4.3%	4.1%

¹ Includes Committed Development

5.2.4 As can be seen from the above table, the absolute and proportional impacts of development generated traffic are very low, with only the junctions near the site accesses (Lees Hall Road/ Forge Lane, Lees Hall Road/ Brewery Lane and Steuard Lane/ Sands lane) seeing increase in traffic of 2% and above. Such increases will be within daily variations in traffic flows.

Traffic Capacity Assessments

5.2.5 Considering the above, the detailed impacts of the proposals in the first five years of the plan have been assessed at the following junctions:-

- Lees Hall Road / Forge Lane
- Lees Hall Road / Brewery Lane

- Steanard Lane / Sands Lane
- Lees Hall Road site access
- Ravensthorpe Road site access
- Sands Lane site access.

Lees Hall Road / Forge Lane

5.2.6 The mini-roundabout junction has been assessed with ARCADY. The results of the assessment are set out in Table 5.2 below, showing that the junction will operate satisfactorily and easily within capacity. The proposed allocation has no material impact on the operation of the junction.

Table 5.2: Five Year Assessment of Lees Hall Road / Forge Lane Junction

Arm / Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Forge Lane	0.41	0.7	0.45	0.8	0.41	0.7	0.46	0.9
Lees Hall Rd (E)	0.58	1.4	0.39	0.7	0.59	1.4	0.40	0.7
Lees Hall Rd (W)	0.40	0.7	0.47	0.9	0.41	0.7	0.48	1.0

Lees Hall Road / Brewery Lane

5.2.7 This mini-roundabout junction has also been modelled with ARCADY with the results presented in Table 5.3 below. The junction is predicted to operate within capacity and the traffic generated by the proposed allocation has no material impact on its operation.

Table 5.3: Five Year Assessment of Lees Hall Road / Brewery Lane Junction

Arm / Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Lees Hall Rd (E)	0.41	0.7	0.31	0.5	0.43	0.8	0.32	0.5
Lees Hall Rd (W)	0.28	0.4	0.29	0.4	0.29	0.4	0.30	0.4
Brewery Lane	0.13	0.2	0.15	0.2	0.13	0.2	0.16	0.2

Steanard Lane / Sands Lane

5.2.8 The priority junction has been modelled with PICADY and the results are summarised in Table 5.4, demonstrating that the junction operates well below capacity and the proposed allocation has no material impact.

Table 5.4: Five Year Assessment of Steanard Lane / Sands Lane Junction

Arm / Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Sands Lane to Steanards Lane (N and S)	0.07	0.1	0.13	0.1	0.10	0.1	0.15	0.2
Steanards Lane RT to Sands Lane	0.03	0.0	0.01	0.0	0.03	0.0	0.01	0.0

Site Accesses

5.2.9 The site accesses at Lees Hall Road, Ravensthorpe Road and Sands Lane have all been assessed with PICADY and the results are summarised in Tables 5.5 to 5.7 below. All are shown to operate well within capacity.

Table 5.5: Five Year Assessment of Lees Hall Road Site Access

Arm/Movement	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Site Access LT to Lees Hall Rd (W)	0.07	0.1	0.04	0.0
Site Access RT to Lees Hall Rd (E)	0.05	0.1	0.03	0.0
Lees Hall Rd (W) to Site Access/Lees Hall Rd (E)	0.03	0.0	0.07	0.1

Table 5.6: Five Year Assessment of Ravensthorpe Road Site Access

Arm/Movement	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Site Access to Ravensthorpe Rd (E and W)	0.09	0.1	0.06	0.1
Ravensthorpe Rd (W) to Site Access	0.02	0.0	0.04	0.0

Table 5.7: Five Year Assessment of Sands Lane Site Access

Arm/Movement	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Site Access	0.03	0.0	0.02	0.0
Sands Lane (S) to Sands Lane (N)/ Site Access	0.00	0.0	0.00	0.0

Summary

5.2.10 The traffic assessment of the development proposed in the first five years of the plan period shows that proportional increases in traffic will be low and the traffic generated by the proposals will not have a material impact on the surrounding highway network. There is therefore no highways related impediment to the delivery of development in the first five years of the Local Plan period.

5.3 Seven Year Assessment

Access

5.3.1 A total of c710 dwellings will likely be delivered in the first seven years of the plan; a net total of 470 dwellings accounting for those that are already committed. Access to the development parcels will be from three priority junctions, the two consented accesses at Lees Hall Road and Ravensthorpe Road and also at Sands Lane.

Traffic Flows

5.3.2 The traffic assessments use future baseline flows, which include committed development traffic including that from the recently consented sites at Dewsbury Riverside, and future year baseline flows with the traffic generated by the proposed allocation. As for the five-year assessment, comparison of the assessment results allows the impacts of the allocation in the first seven years to be established along with the need for any mitigation. The traffic flows used in the assessments are set out in Appendices 4C and 4D.

Proportional Impacts

5.3.3 The proportional impacts of the traffic generated by the net development envisaged in the first seven years of the plan at junctions surrounding the draft allocation are set out in the table below.

Table 5.8: Proportional Impacts of Development in the First Seven Years of the Plan

Junction	Base Traffic Flows ¹		Development Flows (7 Year – 470 Dwellings)		Proportional Impact	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
A644/Low Mill Lane/Fir Avenue	1977	1848	54	58	2.7%	3.0%
A644/Low Mill Lane	2057	1877	54	58	2.6%	3.1%
A644/Calder Road Gyratory	2784	2561	88	95	3.1%	3.7%
Lees Hall Road/Forge Lane	1127	1108	70	76	6.2%	6.9%
A644/Temple Road/Broad Street	2540	2472	39	38	1.5%	1.5%
A644/Thornhill Road	2614	2710	37	46	1.4%	1.7%
A644/Cemetery Road	2561	2633	24	39	1.0%	1.5%
A644/A638 Dewsbury Ring Road	2792	3063	31	34	1.1%	1.1%
A644/Old Westgate/Mill Street	2314	2675	26	28	1.1%	1.1%
A644/Savile Road/Bus Station	2514	2636	44	47	1.7%	1.8%
A638 Wakefield Road/A644	3512	3817	41	44	1.2%	1.1%
Forge Lane/Station Road/ Thornhill Road/ Savile Road	2140	2164	57	62	2.7%	2.8%
	2292	2156	57	62	2.5%	2.9%
Lees Hall Road/Brewery Lane	704	647	101	108	14.3%	16.7%
Slaithwaite Road/Brewery Lane	1570	1740	44	47	2.8%	2.7%
Slaithwaite Road/Lees Hall Road	1918	1670	29	32	1.5%	1.9%
Savile Road/Headfield Road	1415	1605	53	57	3.7%	3.5%
Savile Road/Mill Street	2276	2631	48	52	2.1%	2.0%
A644/Steuard Lane	2043	1886	58	63	2.8%	3.3%
A644/Church Lane	1869	1663	39	42	2.1%	2.5%
A644/Station Road/Queen Street	1653	1751	39	42	2.4%	2.4%
Steuard Lane/Sands Lane	393	437	24	25	6.1%	5.8%

¹ Includes Committed Development

5.3.4 The table shows that the allocation has generally modest impacts, in terms of proportional increases, at most junctions other than those close to the site accesses. Taking account of the absolute and proportional increases in traffic and the turning movements made by development traffic, the impacts of the development generated traffic are assessed at the following junctions:

- A644 / Calder Road Gyratory
- Lees Hall Road / Forge Lane
- Forge Lane / Station Road / Thornhill Road / Savile Road
- Lees Hall Road / Brewery Lane
- Savile Road / Headfield Road
- A644 / Steuard Lane
- A644 / Church Lane

- A644 / Station Road / Queen Street
- Steanard Lane / Sands Lane
- Lees Hall Road site access
- Ravensthorpe Road site access
- Sands Lane site access

Traffic Capacity Assessments

A644 / Calder Road Gyrotory

5.3.5 The A644 Calder Road gyrotory has been modelled with LINSIG and the results are summarised in the table below.

Table 5.9: Seven Year Assessment of A644 / Calder Road Gyrotory

Link	Arm/Movement	Base + Committed Development + Phase 1				Base + Committed Development + Proposed Allocation			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		DoS (%)	MMQ (PCUs)	DoS (%)	MMQ (PCUs)	DoS (%)	MMQ (PCUs)	DoS (%)	MMQ (PCUs)
J1 1/1	North Road	73.2	9.6	64.4	5.8	71.3	9.2	64.8	5.8
J1 1/2									
J1 2/1	Internal Give-Way Westbound	14.4	0.2	34.9	1.8	17.1	0.3	38.0	1.9
J1 3/1	Huddersfield Road from Dewsbury	65.2	6.3	62.6	6.6	68.1	7.4	64.3	7.3
J1 3/2				64.2					
J1 6/1	Huddersfield Road from Mirfield	79.5	15.8	66.9	12.3	83.1	17.0	70.0	13.4
J1 7/1	Internal Give-Way Eastbound	30.6	0.1	31.4	1.7	34.9	0.2	34.5	2.0
J1 9/1	Retail Park	19.7	0.2	40.1	0.3	19.9	0.2	40.9	0.3
Overall- J1		PRC= 13.3% Total Delay= 12.9 PCU/Hr		PRC= 34.5% Total Delay= 10.1 PCU/Hr		PRC= 8.3% Total Delay= 13.6 PCU/Hr		PRC= 28.6% Total Delay= 10.8 PCU/Hr	
J2 2/1	Huddersfield Road from Dewsbury	79.9	17.9	71.2	14.3	82.7	19.4	74.1	15.2
J2 2/2									
J2 3/1	Huddersfield Road from Mirfield – Ahead	69.3	5.0	58.9	6.8	70.4	4.5	60.0	7.2
J2 3/2	Huddersfield Road from Mirfield – Right Turn	57.1	3.6	57.4	4.5	57.4	3.6	62.0	5.1
J2 4/1	Calder Road	77.4	9.4	69.5	7.9	84.4	11.7	72.9	8.9
Overall- J2		PRC=12.6% Total Delay= 11.5 PCU/hr		PRC=26.4% Total Delay= 9.9 PCU/hr		PRC=6.6% Total Delay= 13.5 PCU/hr		PRC=21.4% Total Delay=11.0 PCU/hr	

5.3.6 The results show that the junctions operate within capacity and the traffic generated by the proposed allocation has little impact on its operation. This is not unexpected as the allocation, after seven years of delivering development, increases the total traffic flows by 3 – 4% which is well within daily variations in traffic.

5.3.7 The mean maximum queues predicted by the model are relatively low. The modelled queues at 2016 have been compared with those observed during surveys. The table below shows: surveyed mean maximum queues; the modelled mean maximum queue; and the actual maximum queue observed during the peak hour (i.e. the single highest observation). The modelled mean maximum queue is compared with the surveyed mean maximum queue to check the validity of the traffic model.

Table 5.10: Ravensthorpe Gyratory: Comparison of Surveyed and Modelled Queues

Entry	AM Peak Hour			PM Peak Hour		
	Surveyed MMQ	Modelled MMQ	Surveyed Max Q	Surveyed MMQ	Modelled MMQ	Surveyed Max Q
A644 West	20	15	36	11	13	35
North Road	15	10	40	5	5	13
Retail Park	1	0	3	1	0	3
A644 East	15	16	29	15	13	33
Calder Road	7	8	19	16	7	26

5.3.8 Thus the table shows that the model generally validates well against observed mean maximum queues; it is recognised that the longest queues observed during the peak hours are much higher (generally c. double) that of the mean.

5.3.9 On the basis of the assessment results presented in Table 5.9 it is concluded that mitigation is not needed to accommodate the traffic generated by the allocation during the first seven years of the plan. Of course, this will be assessed again as planning applications for development are submitted.

Lees Hall Road / Forge Lane

5.3.10 The results of the traffic capacity assessment of the mini-roundabout are set out in Table 5.11 below. These show the junction will operate within capacity with the traffic generated by the proposed allocation having only a limited impact on the performance of the junction. Mitigation is not needed to accommodate the development generated traffic.

Table 5.11: Seven Year Assessment of Lees Hall Road / Forge lane Junction

Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Forge Lane	0.41	0.7	0.45	0.9	0.42	0.8	0.48	0.9
Lees Hall Rd (E)	0.58	1.4	0.40	0.7	0.63	1.7	0.44	0.8
Lees Hall Rd (W)	0.41	0.7	0.48	0.9	0.44	0.8	0.52	1.1

Forge Lane / Station Road / Thornhill Road / Savile Road

5.3.11 These double mini-roundabouts are located along the main route between the site and Dewsbury town centre and around 60 vehicles per hour generated by the proposed allocation in the first seven years of the plan are predicted to use the junctions, c.1 vehicle per minute in the peak hours. The roundabouts have been modelled with ARCADY and the results are set out in Table 5.12 below.

Table 5.12 Seven Year Assessment of the Forge Lane / Station Road / Thornhill Road / Savile Road Junction

Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Junction 11b- Arm 1- Link Road	0.80	0.0	0.63	0.0	0.80	0.0	0.65	0.0
Junction 11b- Arm 2- Thornhill Road	1.17	44.2	1.56	164.2	1.20	49.2	1.69	186.2
Junction 11b- Arm 3- Savile Road	0.66	2.0	0.79	3.7	0.67	2.1	0.82	4.3
Junction 11a- Arm 1- Station Road	1.14	72.2	0.82	4.3	1.18	91.7	0.89	7.0
Junction 11a- Arm 2- Forge Lane	1.49	98.3	0.85	5.1	1.53	115.9	0.89	5.8
Junction 11a- Arm 3- Link Road	0.57	0.0	0.74	0.0	0.58	0.0	0.76	0.0

5.3.12 The results of the modelling indicate that the junctions are predicted to operate significantly over-capacity. In the morning peak, there are long predicted queues on Thornhill Road, Station Road and Forge Lane. In the PM peak, a long queue is predicted on Thornhill Road. The traffic generated by the proposed allocation increases queue lengths.

5.3.13 It is, however, considered that the results presented in the table, whilst predicted by the ARCADY model, are not realistic taking account of observations on the ground. ARCADY has difficulty in modelling mini-roundabouts and a comparison of surveyed queues with modelled base 2016 queues show the following:-

Table 5.13: Forge Lane / Station Road / Thornhill Road / Savile Road: Comparison of Observed and Modelled Queues

Arm	AM Peak Hour				PM Peak Hour			
	Surveyed Mean Spot Q	Surveyed Mean Max Q	Surveyed Max Q	Modelled Mean Q	Surveyed Mean Spot Q	Surveyed Mean Max Q	Surveyed Max Q	Modelled Mean Q
Thornhill Road	3	7	18	22	6	15	40	75
Savile Road	2	5	17	2	17	31	41	3
Forge Lane	2	4	14	27	1	2	9	3
Station Road	1	8	34	39	1	4	22	3

5.3.14 The surveys identify some long queues as shown by the maximum observed queues (i.e. the maximum single observation) but these are of limited duration, evidenced by comparing the one-off maximum with the average maximum (the average of maximum queues within each minute of the hour) and the average spot queue (the average of queues observed on the minute within each hour). These are consistent with on-site observations where limited queuing has been observed.

5.3.15 TRL recommend that the modelled queues over the peak hour are compared with the surveyed average spot queues. This comparison shows that on all the arms where the model predicts long queues, these are significant over-estimates compared to the surveys. The queue on Savile Road in the PM peak hour is under-estimated by the model. This confirms that the ARCADY model does not replicate traffic conditions at the junctions.

5.3.16 Given the above, the operation of this junction will need to be assessed in detail as further planning applications are progressed and the need for any mitigation to accommodate development generated traffic will be identified.

Lees Hall Road / Brewery Lane

5.3.17 The results of the capacity assessment of this mini-roundabout are set out in Table 5.14 below. These show that the junction will operate satisfactorily and well within capacity and that the development generated traffic has no material impact.

Table 5.14: Seven Year Assessment of the Lees Hall Road / Brewery Lane Junction

Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Lees Hall Rd (E)	0.42	0.7	0.32	0.5	0.49	1.0	0.37	0.6
Lees Hall Rd (W)	0.28	0.4	0.29	0.4	0.31	0.5	0.34	0.5
Brewery Lane	0.13	0.2	0.15	0.2	0.15	0.2	0.20	0.2

Savile Road / Headfield Road

5.3.18 Headfield Road joins Savile Road at a priority controlled 'T' junction with a ghost-island to accommodate right-turn manoeuvres into the minor road. The junction has been modelled with PICADY and the results are summarised in Table 5.15 below. These show that the junction will operate satisfactorily and the development generated traffic will have no material impact.

Table 5.15: Seven Year Assessment of the Savile Road / Headfield Road Junction

Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Headfield Rd to Savile Rd (S)	0.31	0.4	0.36	0.5	0.32	0.5	0.38	0.6
Headfield Rd to Savile Rd (N)	0.27	0.4	0.37	0.6	0.32	0.5	0.41	0.7
Savile Rd (S) to Savile Rd (N)	0.48	1.5	0.45	1.3	0.50	1.7	0.46	1.4
Savile Rd (S) to Headfield Rd	0.53	0.4	0.53	0.5	0.54	0.4	0.54	0.5

A644 / Steanard Lane

5.3.19 A small pocket of development (50 dwellings) is proposed to be accessed off Sands Lane. Sands Lane joins with Steanard Lane and the latter connects with A644 Huddersfield Road at a priority controlled 'T' junction with a ghost-island right-turn lane. The capacity of the junction has been modelled with PICADY and a summary of the results of the assessment are included in Table 5.16 below.

Table 5.16: Seven Year Assessment of the A644 / Steanard Lane Junction

Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Steanard Lane to A644 (E and W)	1.10	13.2	0.66	1.8	1.30	25.4	0.76	2.8
A644 West RT to Steanard Lane	0.19	0.2	0.18	0.2	0.20	0.3	0.20	0.2

5.3.20 The junction is predicted to operate satisfactorily and within capacity in the PM peak hour but over-capacity in the AM peak hour. The modelled RFC on Steanard Lane increases from 1.10 to 1.30 and the modelled maximum queue increases from 13 pcu to 25 pcu as a result of the development.

5.3.21 The maximum queue given by PICADY is for a 15 minute period within the peak hour with the program increasing the average flow by 12.5% in this 15 minute period. Overtime, it is expected that the traffic profile in the peak hour will 'flatten' such that there is less variation and this has been assessed using PICADY. In the morning peak hour, the results show that the Steanard Lane arm has a RFC of 0.80 increasing to 0.93 when the development traffic is added with the queue length increasing from 3 to 8 pcu. Thus if the traffic profile flattens it is expected that the junction will operate within capacity.

5.3.22 Furthermore, the volume of development traffic joining the main road from Steanard Lane is low – only 18 vehicles per hour i.e. one vehicle every three minutes. This level of traffic is not expected to have a significant impact at the junction. The existing traffic flows exiting Steanard Lane to join A644 in the AM peak hour are 152 vehicles per hour with the majority of this traffic travelling from Lower Hopton or beyond. Alternative routes to A644 are available. Thus, if delays do increase at the junction then only a small proportion of existing traffic would need to re-assign to avoid these delays such that overall flows (and therefore delays) are not increased significantly.

5.3.23 Overall, it is concluded that mitigation is not required to accommodate the traffic flows generated by the proposed allocation.

A644 / Church Lane

5.3.24 Church Lane runs around the eastern edge of Mirfield, joining A644 Huddersfield Road at a priority controlled junction, again with a ghost-island right-turn lane. The capacity of the junction has been assessed using PICADY and the results are summarised in Table 5.17 below. These show that the junction will operate within capacity and that the traffic generated by the development has no material impact.

Table 5.17: Seven Year Assessment of A644 / Church Lane Junction

Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Church Lane LT to A644 (E)	0.58	1.3	0.30	0.4	0.58	1.4	0.30	0.4
Church Lane RT to A644 (W)	0.14	0.2	0.16	0.2	0.15	0.2	0.17	0.2
A644 (E) to Church Lane/A644 (W)	0.50	1.9	0.65	3.6	0.51	1.9	0.66	3.8

A644 / Station Road / Queen Street

5.3.25 This traffic signal controlled cross-roads lies in the centre of Mirfield. Station Road runs to the south from A644 Huddersfield Road and provides access to various uses / car parks as well as Mirfield station and onward to Lower Hopton and beyond. Queen Street provides access to a limited number of properties and is relatively lightly trafficked. The capacity of the junction has been assessed with LINSIG and the results are summarised in the table below.

Table 5.18: Seven Year Assessment of A644 / Station Road / Queen Street

Link	Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		DoS (%)	MMQ (PCUs)	DoS (%)	MMQ (PCUs)	DoS (%)	MMQ (PCUs)	DoS (%)	MMQ (PCUs)
1/1	A644 (East)	93.5	26.8	90.5	23.7	94.8	28.8	92.7	25.6
2/1	Station Road	89.7	11.5	89.8	13.9	93.9	13.2	89.8	13.9
2/2									
3/1	A644 (West)	52.5	8.8	62.9	11.7	52.7	8.8	65.8	12.9
3/2									
6/1	Queen Street	7.0	0.5	7.5	0.7	7.4	0.5	7.5	0.7
Overall		PRC= -3.9% Total Delay= 23.8 PCU/Hr		PRC= -0.6% Total Delay= 24.6 PCU/Hr		PRC= -5.3% Total Delay= 26.6 PCU/Hr		PRC= -3.0% Total Delay= 26.2 PCU/Hr	

5.3.26 The junction is predicted to operate towards capacity with degrees of saturation on A644 East exceeding 90% and on Station Road being around 90%. The traffic generated by the development has little impact with the total queues increasing by 4 and 3 pcus in the morning and evening peak hours respectively, increases of c.6 – 7%. Total delays at the junction increase by 12% and 6% in the AM and PM peak hours respectively. It is concluded that mitigation is not required to accommodate the traffic flows generated by the development.

Steanard Lane / Sands Lane

5.3.27 The results of the assessment of this priority junction are set out in Table 5.19 below, demonstrating that it will easily operate within capacity.

Table 5.19: Seven Year Assessment of the Steanard Lane / Sands Lane Priority Junction

Arm/Movement	Base + Committed Development				Base + Committed Development + Proposed Allocation			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Sands Lane to Steanards Lane (N and S)	0.07	0.1	0.13	0.1	0.11	0.1	0.16	0.2
Steanards Lane RT to Sands Lane	0.03	0.0	0.01	0.0	0.03	0.0	0.01	0.0

Site Accesses

5.3.28 At seven years into the Local Plan, it is envisaged that the site will continue to be served by the three priority junction accesses at Lees Hall Road, Ravensthorpe Road and Sands Lane. The capacity of the access junctions has been assessed and the results are set out in Tables 5.20 – 5.22 below.

Table 5.20: Seven Year Assessment of the Lees Hall Road Site Access

Arm/Movement	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Site Access LT to Lees Hall Rd (W)	0.18	0.2	0.09	0.1
Site Access RT to Lees Hall Rd (E)	0.13	0.1	0.07	0.1
Lees Hall Rd (W) to Site Access/Lees Hall Rd (E)	0.08	0.1	0.19	0.3

Table 5.21: Seven Year Assessment of the Ravensthorpe Road Site Access

Arm/Movement	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Site Access to Ravensthorpe Rd (E and W)	0.19	0.2	0.12	0.1
Ravensthorpe Rd (W) to Site Access	0.03	0.0	0.08	0.1

Table 5.22: Seven Year Assessment of the Sands Lane Site Access

Arm/Movement	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Q (PCU)	Max RFC	Max Q (PCU)
Site Access	0.04	0.0	0.02	0.0
Sands Lane (S) to Sands Lane (N)/ Site Access	0.00	0.0	0.00	0.0

5.3.29 The results demonstrate that all of the site access junctions will comfortably operate within capacity and are therefore suitable for serving the development levels envisaged on the proposed allocation in the early years of the plan.

Summary

5.3.30 The housing trajectory identifies that 710 dwellings will be delivered in the first seven years of the plan of which 240 are already committed with planning permission, leaving a residual of 470 units. The traffic flows generated by these dwellings have been assessed.

5.3.31 The proportional impacts of this traffic will be relatively low, most junctions seeing an increase in traffic flows of less than 10% which will be within the daily variation in traffic. The highest proportional and absolute increases in traffic are at junctions closest to the site accesses and along the main road network.

5.3.32 Traffic assessments show that the increases in traffic will generally have no significant impact on the operation of the surrounding road network. The double mini-roundabouts along Forge Lane are predicted to operate over-capacity but the modelling results under-estimate the capacity of the junction as a whole as shown by the comparison with queue length surveys. The operation of this junction will be assessed in detail as planning applications are progressed and the need, or otherwise, for any mitigation to accommodate development generated traffic will be identified.

- 5.3.33 Capacity assessments of the site access junctions, at Lees Hall Road, Ravensthorpe Road and Sands Lane, demonstrate these will operate satisfactorily and can accommodate the traffic flows generated by the proposed allocation in the first seven years of the plan.
- 5.3.34 Overall it is concluded that there are no significant highways impediments that will preclude the delivery of development in the first seven years of the Local Plan period.

SECTION 6 LOCAL PLAN TRAFFIC ASSESSMENT**6.1 Overview**

6.1.1 The Publication Draft Local Plan identifies the site as having a capacity of 4,000 residential dwellings, with 2,310 delivered within the plan period to 2031. This section of the report considers the broad traffic implications of this level of development, using outputs from the South Dewsbury Traffic Model to indicate the scale of impacts of the proposals and identifying the locations that will need to be subject to further assessment as planning applications are brought forward for development.

6.1.2 The assessment uses the approach set out at Section 4.4 with the development traffic forecasts described at Section 4.5. The overall approach is consistent with the modelling and assessment work the Council has conducted albeit the trip generation rates applied to the Dewsbury Riverside development are lower. This is considered further in Section 6.5.

6.1.3 Section 6.2 sets out the outputs from the various model runs/tests. Section 6.3 considers the impacts of new strategic road provision, specifically the Dewsbury Riverside Strategic Route. The impacts of phased development in advance of the delivery of the DRSR (or an alternative) are considered in Section 6.4 whilst the impacts of the full development of 4,000 dwellings are outlined in Section 6.5.

6.2 Traffic Model Outputs

6.2.1 Aecom has used the South Dewsbury Traffic Model to run a series of option tests as set out at Table 4.4 above. These include different levels of development and alternative infrastructure provision.

6.2.2 Test 1 is the 2030 Do-Minimum which, for the purposes of the assessments presented in this report, represents the Publication Draft Local Plan development excluding Dewsbury Riverside i.e. includes significant levels of other development across the district. The road networks tested include all the transport schemes planned in the Borough (see Table 1 in the Council's April 2017 Transport Model Technical Paper) but excluding the Ravensthorpe Relief Road; these highway schemes will provide significant additional capacity.

6.2.3 The inclusion in the model of both significant additional demand (represented by the Local Plan allocations) and supply (represented by the transport schemes) will potentially significantly affect traffic movements. The SATURN model takes these effects into account, re-assigning traffic across the network.

6.2.4 Aecom has supplied outputs from the traffic model for each option test. These give for the AM and PM peak hours:-

- Turning flows at junctions within the South Dewsbury area.
- Delays for each turning movement at these junctions.
- Ratios of flow/capacity (V/C) for each turning movement at the junctions.

6.3 Impacts of the DRSR

6.3.1 Traffic model tests 10 and 11 assess the impacts of building new roads without the Dewsbury Riverside development i.e. to assess solely the impacts of potential new highways infrastructure and the potential benefits this could bring. Test 10 assesses the impacts of the DRSR whilst test 11 assesses the effects of a local bypass of Ravensthorpe. As the latter would connect with the on-site road network and hence, via the site roads, to Forge Lane then the impacts of the two schemes are similar. Therefore the impacts of the DRSR only are considered.

6.3.2 It has been agreed with the Council that the impacts of the allocation/infrastructure on traffic flows can be assessed by comparing the flows on the road links in the South Dewsbury area. The location of the links for this traffic flow analysis are shown in Appendix 6.A. Table 6.1 below presents the modelled traffic flows from test 1 (2030 Do-Minimum) and test 10 (2030 Do-Minimum + DRSR) for the AM and PM peak hours. The differences between the tests are also shown in the table and give the impacts of the DRSR, noting that these are presented for information purposes as the new road is only likely to be delivered if development at Dewsbury Riverside is also delivered.

Table 6.1: Comparison of Two-Way Traffic Flows: 2030 Do-Minimum vs 2030 Do-Minimum + DRSR

Location Number	Road Name	AM Peak Hour			PM Peak Hour		
		Do-Min	Do-Min + DRSR	Difference	Do-Min	Do-Min + DRSR	Difference
1	A644 Mirfield	1055	1341	286	1114	1230	+116
2	A644 Ravensthorpe Gyrotory	1596	1081	-515	1576	976	-600
3	A644 Huddersfield Road (near Ravenhouse Road)	1840	1822	-18	1763	1678	-85
4	A644 approaching Dewsbury Ring Road	1948	1847	-101	2213	2117	-96
5	Calder Road	706	245	-461	632	192	-440
6	Low Mill Lane	77	1033	956	92	1095	1003
7	New Link Road Bridge Crossings	0	979	979	0	1005	1005
8	Ravensthorpe Road	842	1297	455	820	1354	534
9	Forge Lane	532	790	258	701	915	214
10	Slaithwaite Road	1544	1399	-145	1310	1185	-125
11	Savile Road	1285	1392	107	1045	1121	76
12	Thornhill Road	1009	991	-18	1241	1102	-139
13	Headfield Road (N-S)	686	744	58	750	828	78
14	Headfield Road (E-W)	403	451	48	254	249	-5
15	Mill Street East	785	808	23	862	919	57
16	Lees Hall Road	327	367	40	228	313	85
17	Mill Street West	951	919	-32	1105	994	-111
18	Savile Road North	1413	1518	105	1181	1239	58

6.3.3 The summary impacts of the DRSR as predicted by the traffic model are:-

- The new road (where it crosses the river/railway) carries c.1,000 vehicles per hour (vph). (Location 7 in the table)
- Traffic flows through Ravensthorpe gyrotory (location 2) are reduced by c.500 – 600 vph whilst those on Calder Road (location 5) reduce by c.450 vph. Delays along the A644 at Ravensthorpe are reduced.
- Traffic flows on Low Mill Lane (location 6) increase as this will form part of the DRSR.
- Traffic flows on Ravensthorpe Road (location 8) increase by c.450 – 530 vph but, in practice, the DRSR will not be delivered without the Dewsbury Riverside development and, in these circumstances, the traffic would transfer to the DRSR through the site.

- The impacts elsewhere are generally modest with: increases in traffic on the A644 (location 1) of c.120 - 290 vph; increases on Forge Lane (location 9) of 215 – 260 vph; increases on Savile Road (location 11) of 80 – 110 vph; and with reductions on Thornhill Road (location 12) of 20 – 140 vph.

6.3.4 Thus it is concluded that the DRSR has benefits in terms of flow reductions in Ravensthorpe with limited adverse effects. The need to mitigate for any adverse impacts will be subject to more detailed assessment as planning applications for development are progressed.

6.4 Impacts of Development Pre DRSR

6.4.1 The South Dewsbury traffic model has been used to assess the effects of development on the proposed allocation in advance of the delivery of major off-site highways capacity and an additional access i.e. in advance of the delivery of the DRSR. Two model runs have been undertaken with 1,000 dwellings (test 2) and 2,000 dwellings (test 3) delivered on the proposed allocation.

6.4.2 The results of the modelling of 2,000 dwellings pre DRSR (i.e. test 3) are summarised below.

Overall Impacts

6.4.3 The traffic model outputs statistics on total travel times and travel distances which have been used to assess the network-wide effects of 2,000 dwellings at the draft allocation. So that the impacts of the development are not 'diluted' across the whole traffic model, Aecom 'cordoned' the analysis to the likely area of influence of the proposals which was agreed with the Council.

6.4.4 Not unexpectedly, the model shows increase in both total travel times and distances, with the total travel time increasing by 15 – 16% and distance travelled by 10 – 11%. The average speeds reduce by 0.7 – 1.0 kph (0.4 – 0.6 mph). It is concluded that the impacts of the development across the whole South Dewsbury network are therefore modest and not severe.

Development Traffic Assignments

- 6.4.5 The nature of the model is such that when development traffic is added to routes then some background traffic may re-assign. The model also takes account of traffic generated by many development sites (including all the other draft local plan allocations) and infrastructure improvements planned to be implemented across Kirklees. All of these impacts are taken into account in the modelling.
- 6.4.6 To understand the patterns of actual development traffic, Aecom has conducted select link analysis of traffic flows entering and leaving the site and the results for the AM and PM peak hour are given in Appendix 6.B. Modelled development generated traffic flows on highway links are set out in the table below, with this showing two-way flows in the AM and PM peak hours.

Table 6.2: Traffic Flows on Road Links – 2,000 Dwellings at Dewsbury Riverside

Location	AM Peak Hour	PM Peak Hour
A644 Mirfield	58	60
A644 Ravensthorpe	113	108
A644 near Ravenshouse Road	26	28
A644 approaching Dewsbury Ring Road	12	100
Calder Road	199	162
Ravensthorpe Road	12	7
Forge Lane	341	333
Station Road	77	42
Savile Road	355	202
Thornhill Road	50	138
Headfield Road (N – S)	28	140
Headfield Road (E – W)	22	19
Mill Street East	0	105
Lees Hall Road (east of site access)	122	230
Mill Street West	105	67
Savile Road North	210	218
A638 Wakefield Road	95	94
A653 Leeds Road	53	33

- 6.4.7 The development traffic flows are highest along the route between the site and Dewsbury town centre via Forge Lane and Savile Road. Calder Road carries two-way development traffic flows of c.160 – 200 vph, carrying traffic to the main A644 where it distributes to the east and west and also along North Road. Traffic flows along Lees Hall Road East of the site access are c.120 – 230 vph, with the highest flows in the PM peak hour corresponding also with higher flows on Headfield Road and Mill Street East.

Impacts of Development on Traffic Flows

6.4.8 The above traffic flows are solely those generated by the development on the road network. As noted at 6.4.5, the model takes account of re-assignment effects when additional traffic demand is added to a network. The net impacts of the development (2,000 dwellings) on the South Dewsbury road network has been assessed by comparing the 2030 Do-Minimum traffic assignments (test 1) with those for 2030 Do-Minimum + 2,000 dwellings (test 3). The results are summarised in the table below.

Table 6.3: Comparison of Two-Way Traffic Flows: Do-Minimum vs Do-Minimum + 2,000 Units at Dewsbury Riverside

Location Number	Road Name	AM Peak Hour			PM Peak Hour		
		Do-Min	Do-Min + 2,000 Units	Difference	Do-Min	Do-Min + 2,000 Units	Difference
1	A644 Mirfield	1055	1030	-25	1114	1139	25
2	A644 Ravensthorpe Gyratory	1596	1624	28	1576	1601	25
3	A644 Huddersfield Road (near Ravenhouse Road)	1840	1888	48	1763	1765	2
4	A644 approaching Dewsbury Ring Road	1948	2015	67	2213	2245	32
5	Calder Road	706	727	21	632	731	99
6	Low Mill Lane	77	81	4	92	92	0
7	New Link Road Bridge Crossings	-	-	-	-	-	-
8	Ravensthorpe Road	842	675	-167	820	824	4
9	Forge Lane	532	768	236	701	979	278
10	Slaithwaite Road	1544	1444	-100	1310	1254	-56
11	Savile Road	1285	1394	109	1045	1098	53
12	Thornhill Road	1009	1048	39	1241	1374	133
13	Headfield Road (N-S)	686	896	210	750	962	212
14	Headfield Road (E-W)	403	427	24	254	287	33
15	Mill Street East	785	857	72	862	1019	157
16	Lees Hall Road	327	321	-6	228	281	53
17	Mill Street West	951	1142	191	1105	1121	16
18	Savile Road North	1413	1579	166	1181	1292	111

6.4.9 The changes in traffic flows are generally modest. In the AM peak hour the highest increases are along routes towards Dewsbury town centre – Forge Lane, Savile Road and Mill Street West as well as Headfield Road and Mill Street East. There is a similar picture in the PM peak with increases in traffic also on Thornhill Road and Calder Road exceeding 100 vph.

Impacts of Development on Highway Capacity

- 6.4.10 The impacts of the traffic flow changes described above on the capacity of the South Dewsbury road network have been assessed by comparing the traffic model outputs which provide ratios of flow to capacity (v/c) and, where relevant, the changes in delays at junctions.
- 6.4.11 The v/c ratios at key junctions have been compared for the 2030 Do-Minimum (test 1) and the 2030 Do-Minimum + 2,000 dwellings (test 3). The highest v/c ratio at each junction has been considered and these are summarised on the plans at Appendix 6.C. A 'traffic light' annotation has been used with: red indicating v/c exceeds 110% (i.e. the junction is predicted to operate above capacity); amber indicating a v/c ratio between 90 – 110% (i.e. the junction is predicted to operate at capacity); and green where v/c is less than 90% (i.e. the junction is predicted to operate within capacity).
- 6.4.12 The analysis shows that in both peak hours, the majority of the junctions are predicted to operate within capacity. Several junctions are predicted to operate around capacity albeit the majority of these are the same status in the without and with development assessments. The majority of these have similar v/c ratios in both cases.
- 6.4.13 The analysis does identify the following potential impacts:-
- AM peak hour
 - Turn from the south to Savile Road at the Forge Lane double mini-roundabouts: v/c increases from 82% to 94% with a corresponding increase in delay from 18 to 37 seconds.
 - Westbound movement on A644 at its junction with Thornhill Road: v/c increases from 108% to 117%; whilst the delays on this movement do not increase significantly (29 to 32 seconds), the delays on Thornhill Road increase by c.1 minute (156 seconds to 217 seconds).
 - Right-turn from Dewsbury ring road to A652 Bradford Road: the v/c increases from 91% to 106%; with the delays increasing from 255 seconds to 266 seconds.
 - PM peak hour

- Right-turn from Steanard lane to A644 Huddersfield Road: v/c increases from 89% to 92% with the delay increasing from 110 seconds to 114 seconds.
- Left and ahead movements from Mill Lane West at its junction with Savile Road: the v/c ratios increase from 77% to 94%; the delays increase from 38 seconds to 42 seconds.
- Right turn from A653 Leeds Road at its junction with Dewsbury ring road: v/c increases from 89% to 92% with the delay increasing from 74 seconds to 84 seconds.
- The ahead movement from A644 Huddersfield Road where it joins Dewsbury ring road: the v/c increases from 92% to 96%; the delay increases from 67 seconds to 82 seconds.

6.4.14 Overall, the model indicates that the impacts of the development are not severe and therefore that 2,000 dwellings on the Dewsbury Riverside site can be developed in advance of a strategic highways intervention such as the DRSR. The trigger point for mitigation, including a major scheme, will be refined as planning applications are progressed and more detailed work is undertaken. All phasing triggers will be agreed with the Council.

6.4.15 Whilst the modelling is considered appropriate at this stage in the planning process, as planning applications come forward then more detailed traffic assessments will be needed as noted. This is considered further in the next Section after the assessment of the full 4,000 dwelling development at Dewsbury Riverside.

6.5 Impacts of 4,000 Dwellings at Dewsbury Riverside

6.5.1 The South Dewsbury traffic model has been used to assess the effects of the full 4,000 dwelling development at Dewsbury Riverside, also taking into account the delivery of the strategic intervention, the DRSR or an alternative, as development progresses. Test 7 includes this scenario and the results are compared with the 2030 Do-Minimum (test 1).

6.5.2 The results of the modelling of 4,000 dwellings and the DRSR are summarised below.

Overall Impacts

- 6.5.3 The overall network-wide impacts of the full proposed development at Dewsbury Riverside have been assessed by comparing the total time and distance travelled in the South Dewsbury area with that from the Do-Minimum.
- 6.5.4 The model predicts increases in overall travel times and distances which are expected given there are additional trips in the model generated by 4,000 dwellings at Dewsbury Riverside. The average speeds, however, show little change: in the AM peak the speed increases by 0.7 kph (0.4mph), likely as a result of the inclusion of additional highways capacity by the DRSR; and in the PM peak the average speed reduces by 0.4kph (0.25 mph).
- 6.5.5 It is therefore concluded that the impacts of the full development and supporting infrastructure across the South Dewsbury network as a whole are modest and not severe.

Development Traffic Assignments

- 6.5.6 Select link analysis of traffic flows entering and leaving the site is given in Appendix 6.D. The two-way development only traffic flows on highway links are shown in the table below for the AM and PM peak hours.

Table 6.4: Traffic Flows on Road Links – 4,000 dwellings at Dewsbury Riverside + DRSR

Location	AM Peak Hour	PM Peak Hour
A644 Mirfield	133	128
A644 Ravensthorpe	19	16
A644 near Ravenshouse Road	51	87
A644 approaching Dewsbury Ring Road	9	166
Calder Road	100	141
Ravensthorpe Road	14	17
Forge Lane	688	584
Station Road	142	50
Savile Road	703	333
Thornhill Road	101	274
Headfield Road (N – S)	56	368
Headfield Road (E – W)	45	49
Mill Street East	0	251
Lees Hall Road (east of site access)	204	511
Mill Street West	223	154
Savile Road North	431	436
A638 Wakefield Road	192	191
A653 Leeds Road	110	98
DRSR at bridge crossing	383	288

6.5.7 The overall pattern of development traffic is similar to that for the scenario with 2,000 dwellings albeit the development flows are higher, broadly approximately double in many locations. The highest flows are again along the route between the site and Dewsbury town centre via Forge Lane and Savile Road. Traffic flows on Calder Road are lower than with 2,000 dwellings, reflecting the inclusion of the DRSR in the network which carries c.290 – c.380 vph of the development traffic generations. Flows on A644 through Ravensthorpe are much lower for the same reason. Headfield Road and Mill Street East carry reasonable volumes of development traffic.

Impacts of Development on Traffic Flows

6.5.8 The impacts of the development on total traffic flows, taking account of re-assignment effects, has been assessed by comparing the modelled outputs for the test with 4,000 dwellings and the DRSR (test 7) with those for the 2030 Do-Minimum. The results are summarised in the table below.

Table 6.5: Comparison of Two-Way Traffic Flows: Do-Minimum vs Do-Minimum + 4,000 Units at Dewsbury Riverside + DRSR

Location Number	Road Name	AM Peak Hour			PM Peak Hour		
		Do-Min	Do-Min + 4,000 + DRSR	Difference	Do-Min	Do-Min + 4,000 + DRSR	Difference
1	A644 Mirfield	1055	1284	229	1114	1309	195
2	A644 Ravensthorpe Gyratory	1596	1021	-575	1576	918	-658
3	A644 Huddersfield Road (near Ravenhouse Road)	1840	1847	7	1763	1709	-54
4	A644 approaching Dewsbury Ring Road	1948	1937	-11	2213	2139	-74
5	Calder Road	706	326	-380	632	337	-295
6	Low Mill Lane	77	1299	1222	92	1259	1167
7	New Link Road Bridge Crossings	0	1247	1247	0	1169	1169
8	Ravensthorpe Road	842	1168	326	820	1236	416
9	Forge Lane	532	1292	760	701	1311	610
10	Slaithwaite Road	1544	1102	-442	1310	1210	-100
11	Savile Road	1285	1489	204	1045	1235	190
12	Thornhill Road	1009	1042	33	1241	1352	111
13	Headfield Road (N-S)	686	1222	536	750	1266	516
14	Headfield Road (E-W)	403	518	115	254	350	96
15	Mill Street East	785	947	162	862	1109	247
16	Lees Hall Road	327	422	95	228	433	205
17	Mill Street West	951	1149	198	1105	1249	144
18	Savile Road North	1413	1742	329	1181	1527	346

6.5.9 The traffic demand generated by the 4,000 dwelling development and the additional capacity created by the inclusion of the DRSR results in some significant traffic flow changes.

6.5.10 The new link road carries c.1,200 vph at the bridge crossings with similar, slightly higher, traffic flows on Low Mill Lane which forms part of the DRSR. There are reductions in flows, as a result of the DRSR, along the A644 in Ravensthorpe of c.600 vph and along Calder Road of c.300 – 400 vph. Traffic flows are shown to increase along Ravensthorpe Road but, in practice, traffic is expected to use the DRSR through the development site, aided by the proposed junction configuration at Forge Lane.

6.5.11 Traffic flows increase along the routes towards Dewsbury town centre: at Forge Lane by c.600 – 750 vph and Savile Road by c.200 vph; and along the north-south Headfield Road by c.520 – 540 vph and Mill Street East by c.160 – 250 vph. It appears, the model re-assigns traffic from Slaithwaite Road to Forge Lane particularly in the AM peak hour and this possibly reflects the increased flows on Lees Hall Road.

Impacts of Development on Highway Capacity

6.5.12 The impacts of the above traffic flow changes on the capacity of the South Dewsbury road network have also been assessed using outputs from the traffic model. This compares v/c ratios and, where relevant, delays using the approach set out at 6.4.10 and 6.4.11 above. Plans summarising the v/c ratio at junctions are included in Appendix 6.E.

6.5.13 The analysis shows that, in both peak hours, the majority of junctions either operate within capacity or there is no significant change in the overall operation of the junctions. The analysis identifies the following potential impacts;-

- AM peak hour
 - Station Road approach to A644 in Mirfield: the v/c ratio increases from 97% to 99% with delays increasing by c.1 minute.
 - Steanard Lane approach to A644: the delays for the movements from Steanard Lane increase by c.2.5 minutes.
 - A644 at Calder Road traffic signals: the v/c reduces from 103% to 93% with a reduction in delay of c.1.7 minutes.
 - At the Forge Lane/Savile Road mini-roundabouts: the v/c increases on some movements to just below 100%; the highest delays increase by c.45 seconds.
 - Right-turn from Mill Street East to Savile Road: the v/c increases from 84% to 95% with the delay increasing by 36 seconds.
 - Right-turn from Dewsbury ring road to A652 Bradford Road: the v/c reduces from 91% to 87% with a corresponding reduction in the delay of 15 seconds.
- PM peak hour
 - Station Road approach to A644 in Mirfield: v/c ratios increase from 95% to 99% for the left-turn and from 99% to 109% for the right-turn; delays increase by 23 seconds.

- Steanard Lane approach to A644: the delays on Steanard Lane increase by c.50 – 60 seconds.
- Calder Road on the approach to A644: the v/c ratio reduces from 101% to 21% with a corresponding reduction in delay of c.2.5 minutes.
- At the Forge Lane / Savile Road mini-roundabouts, delays on some movements increase by c.10 – 20 seconds.
- Mill Street West approaching Savile Road: v/c increases from 77% to 99% with delays increasing by c.1 minute.
- Right-turn from Dewsbury ring road to Wakefield Road: the v/c ratio increases from 96% to 99% with an increase in the delay of 23 seconds.

6.5.14 The modelling indicates that the development as a whole is likely to have some adverse traffic impacts but also some benefits, particularly in Ravensthorpe. At this stage it is concluded that traffic impacts are not severe and, where necessary, off-site highways improvements will be implemented to accommodate adverse impacts resulting from traffic flows generated by the development.

6.5.15 Off-site junctions will be assessed as planning applications for additional development come forward and the details will be agreed with the Council. This will also take account of any variations in trip generation rates with these observed from surveys at the initial phases of development.

6.5.16 Mitigation will be assessed at the following junctions:

Table 6.6: Potential Phased Off-Site Mitigation

Plan Years	Approx No. Units	Off-Site Potential Mitigation
0 – 5 Years	350	<ul style="list-style-type: none"> - A644/Calder Road Ravensthorpe gyratory - A644/Steuard Lane - A644/Church Lane, Mirfield - A644/Station Road/Queen Street, Mirfield - Forge Lane/Saville Road/Thornhill Road mini roundabouts - Forge Lane/Ravensthorpe Road - Brewery Lane/Lees Hall Road
5 – 7 Years	710	As above
7 – 10 Years	1275	As above + <ul style="list-style-type: none"> - Savile Road/Mill Street East/Mill Street West - Savile Road/Headfield Road - Slaithwaite Road/Headfield Road - B6409 Savile Road/Dewsbury Ring Road - Slaithwaite Road/Lees Hall Road - A644/Temple Road/Thornhill Road
10 – 15 Years	2,310	As above + <ul style="list-style-type: none"> - A644/Low Mill Lane/Fir Avenue - A644/Cemetery Road - A644/A638 Dewsbury Ring Road/Mill Street West - A638 Dewsbury Ring Road/Wakefield Road - A638 Dewsbury Ring Road/Bradford Road

6.5.17 The above will be reviewed during the scoping of individual planning applications for the development on the site and the areas for assessment agreed with the Council at the appropriate time.

SECTION 7 SUMMARY AND CONCLUSIONS

7.1 Summary

Development Proposals

- 7.1.1 Kirklees Council (KC) is preparing a new Local Plan and is proposing to allocate land for strategic development, identified within the emerging plan as site H2089 'Land South of Ravensthorpe Road, Thornhill Lees, Dewsbury'. The site, known as Dewsbury Riverside, is being promoted for development by Miller Homes. The Publication Draft Local Plan identifies the site as having a capacity of 4,000 residential dwellings, with 2,310 delivered within the plan period to end 2031.
- 7.1.2 Dewsbury Riverside represents an opportunity to deliver much needed housing growth in a sustainable manner, underpinned by a comprehensive transport strategy that focuses on the promotion of sustainable travel modes and encompasses lifestyle choices, behavioural change and place making.
- 7.1.3 The site is located in a sustainable location and is well defined by existing housing, roads and tracks. The site is located on the edge of Dewsbury and Ravensthorpe, which provide shops and services, and also access to public transport facilities, with bus stops located on Lees Hall Road and Huddersfield Road and a train station at Ravensthorpe. The site is located c.800m south of the centre of Ravensthorpe, c.2.5km to the south of Dewsbury town centre and c.9.5km north east of Huddersfield.
- 7.1.4 The proposed urban extension to the south of Dewsbury has the capacity for around 4,000 new homes, alongside community facilities, open space, new schools and local centre to create a sustainable community. A development of 4,000 dwellings will be phased over and beyond the plan period. The phasing affects the transport strategy for the site including access provision, off-site traffic impacts and the sustainable transport proposals to serve the site. This has been taken into account in this report.

Access Provision

- 7.1.5 Traffic modelling and traffic capacity assessments of junctions has been undertaken to determine a phased access strategy for the site, taking account of the likely development trajectory.

7.1.6 Jointly commissioned traffic modelling indicates that 2,000 dwellings can be occupied at Dewsbury Riverside before significant additional off-site highways capacity is needed. The additional off-site highways capacity in the A644 corridor is referenced as a new strategic intervention. One option for this is a new road connection running from A644 at Low Mill Lane, crossing the river Calder and railway line, then connecting with and running through the site and onwards to Dewsbury town centre via Forge Lane and Savile Road. This scheme is known as the Dewsbury Riverside Strategic Route (DRSR).

7.1.7 Given the likely delivery rates for the development, the strategic intervention required at c.2,000 units will be needed towards the end of the plan period in 12 to 13 years.

7.1.8 In advance of the DRSR (or an alternative), access to the proposed allocation will be provided at four locations with the delivery of these phased with development. These are, starting at the eastern end of the site:-

- i) Off Lees Hall Road
- ii) Via a continuation of Forge Lane into the site.
- iii) Off Ravensthorpe Road.
- iv) Off Sands Lane.

7.1.9 The accesses have the capacity to accommodate all the traffic generated by the proposed allocation, both within and beyond the plan period.

Site Transport Strategy

7.1.10 The transport strategy for the site will focus on promoting sustainable travel modes and reducing car use, particularly that for single occupancy travel. Within this context, the travel and transport strategy for the site is to:

- Take advantage of the site's existing locational characteristics;
- Seek to minimise the number of vehicular trips generated by the proposal through the provision of mixed uses and high quality design, thus maximising trip internalisation;

- Maximise opportunities for walking and cycling trips, particularly over shorter distances;
- Encourage trips to/from Ravensthorpe and Dewsbury and their environs to be made by public transport or through shared transport;
- Encourage commuting trips to Dewsbury, Leeds, Huddersfield and other destinations to be made by bus and rail;
- Reduce emissions associated with vehicular trips which are generated by both public transport and private vehicles; and
- Mitigate the impacts of residual car borne trips by the design of the access strategy and introduction of highways mitigation improvements where absolutely necessary.

7.1.11 As well as achieving modal shift, it is anticipated that the travel strategy for the site will assist in creating a coherent new community and will reduce the vehicular traffic flows generated by the site.

7.1.12 Analysis of census data has been conducted and this shows that the area has unique demographics which affect travel movement:

- Lower levels of car ownership and higher proportions of households with no cars: c.34% of households without a car compared to c.26% in Kirklees as a whole; 1.00 cars per household compared to 1.12 in Kirklees.
- Higher proportions of economically inactive residents.
- Younger population with c.53% aged under compared to c.40% in Kirklees. Potential for more local trips.
- Much shorter average travel to work distances: averaging 8.9km in South Dewsbury compared to 12.7km in Kirklees.
- High proportions of (work) trips made locally and high proportions made within the origin area.
- Higher bus and walk modal shares (for journeys to work) with corresponding lower car modes shares.

7.1.13 These confirm that there is the opportunity to develop a transport strategy that supports local trip making by sustainable modes of travel and thereby reduces reliance on the car.

7.1.14 As far as the promotion of walking and cycling are concerned, the most important factors are distance and quality of routes. The mix of uses on the site and approach to high quality internal design will facilitate movements by pedestrians and cyclists. Many everyday destinations will be available within the site – schools, health facilities, shops, leisure and play areas – and will be within walking and/or cycling distance. The layout of the streets and routes for pedestrians and cyclists within the site will be designed to encourage local travel by bike and on foot. ‘Safe Routes to School’ will be at the forefront of the place design with priority and crossing facilities where appropriate.

7.1.15 This report notes that as planning applications for major development on the site are progressed, a series of improvements to the pedestrian/cyclist environment will be investigated in detail and, where appropriate, implemented in line with development coming forward. At this stage it is envisaged these could include:

- Improvements to the PRow that run across the site and their connections to the external street network.
- Provision of high quality footways / cycleways leaving the site to connect to existing networks.
- Delivery of a pedestrian route through the site to Ravensthorpe railway station.
- Improved signage at Brewery Lane to include routes to the traffic-free cycle path along the Calder and Hebble navigation and onwards to the Spen Valley Greenway.
- Working with the Council to investigate the potential to create a cycle route to Dewsbury town centre with funding to be provided by development.
- Investigation of cycle crossing facilities at busier roads and junctions.
- Assessing the potential to provide improved access to the canalside route at Slaithwaite Road.

- 7.1.16 Bus provision to the site will be phased. The development will be delivered over the Local Plan period and beyond and, in the immediate short-term, the number of residential occupations will be modest, as evidenced by the indicative trajectory and phasing plan for the site. The early phases of development will be towards the northern end of the site, close to Ravensthorpe Road and Lees Hall Road, where there are existing bus routes at Lees Hall Road/Brewery Lane and Ouzelwell Lane as well as more frequent services on Huddersfield Road. Thus the early phases of development will be served by existing bus routes, consistent with the approach adopted for the recently consented sites on the UDP allocated land and protected open land.
- 7.1.17 In the medium – longer term the development will be more remote from existing bus routes. New or extended bus routes will therefore be planned to serve the site. In practice, such new/extended services will not be needed for a number of years given the housing trajectory, the location of the early phases of development and existing bus provision. It is possible, probably likely, that bus routes and services in the area will change over the next 5 – 10 years, making it difficult to plan in detail the bus provision for the site at this stage.
- 7.1.18 However, this report sets out a bus strategy that has been developed in outline to demonstrate that it will be feasible to serve the site and provide suitable and sustainable alternatives to car use. The details of specific routes and services can then be resolved as detailed planning applications are progressed for the residential proposals and liaison is undertaken with bus operators, the council and WYCA. Overall, the report confirms there is potential to introduce bus services which will serve a range of important destinations and which will be viable, thereby providing a lasting alternative to car travel.
- 7.1.19 It is therefore proposed that, subject to the confirmation of the draft allocation in the Local Plan, further liaison is undertaken with the Council and WYCA with the aim of establishing a framework for the provision of bus services and a mechanism to fund such services.
- 7.1.20 As far as rail is concerned, the site is very close to Ravensthorpe station. A strategy will therefore be developed in detail that will encourage trips to Dewsbury, Huddersfield and Leeds by rail, particularly those for commuting journeys. This is likely to include:-

- Bus linkages between the site and the station;

- Improved access and environmental enhancements to the approach road;
- Improved waiting and information facilities;
- Provision of additional car parking, potentially using land at Dewsbury Riverside which is close by; and
- Measures in the Travel Plan to encourage rail use.

7.1.21 As well as physical measures to promote walking, cycling and public transport, the development of the site will include the production of comprehensive travel plans to support the proposals. These will primarily identify the delivery of ‘soft’ measures to encourage the use of sustainable modes, to complement the physical measures, mix of uses and high quality design approach.

Development Traffic Impacts

7.1.22 The approach to the assessment of the potential traffic impacts of the proposals at Dewsbury Riverside has been set out. Two key approaches have been adopted:-

- i) Assessing the short-term impacts of the development proposals within five and seven year Local Plan horizons as requested by the Council; and
- ii) Assessing the longer-term impacts of the full Dewsbury Riverside development as well as its phasing.

7.1.23 Both use difference technical approaches. The short-term assessments use existing traffic flows as the starting point and development generated trips are then added. The derivation of the existing flows and the development generated trips are set out in this report. The longer-term assessments use the Kirklees Transport Model and the overall approach including the development of the base model and the scenarios tested are also set out along with the development traffic forecasts.

7.1.24 The Council requested that the traffic impacts of potential development on the allocation site are assessed, taking account of the number of units delivered within the first five and seven years of the plan. It is understood this is to demonstrate that there is a reasonable prospect of development being delivered within the early years of the plan. These assessments are presented in this report, considering junctions across the South Dewsbury road network.

7.1.25 The report also includes an assessment of the full capacity of 4,000 residential dwellings with the broad traffic implications of this level of development set out. These use outputs from the South Dewsbury Traffic Model to indicate the scale of impacts of the proposals and identifying the locations that will need to be subject to further assessment as planning applications are brought forward for development. A schedule of junctions to be assessed in further detail is set out.

7.2 Conclusions

7.2.1 The size of the site and the mix of uses will assist in minimising off site travel, with residents able to access a range of facilities and services on the site, within easy walking or cycling distance. This combined with the sites location, adjacent to the existing urban area and in close proximity to additional services and public transport networks, means that the site presents an excellent opportunity to promote sustainable transport and reduce vehicular traffic generations.

7.2.2 The site will provide a range of benefits as outlined in the submissions made by Spawforths. Specific transport benefits of the proposals will include:-

- Everyday facilities located in the development in walkable neighbourhoods, thus putting place first, enhancing inclusion, promoting sustainable lifestyle choices and behavioural change.
- New viable bus services and high quality bus infrastructure that will connect the site with key destinations and will also provide enhanced connectivity for existing residents and businesses in Ravensthorpe and the surrounding area.
- Specific and targeted travel plan measures again designed to promote sustainable travel modes.

- Provision of on-plot and on street electric vehicle charging points and an electric vehicle car club to encourage some vehicular journeys to be made by low emission vehicles.
- Existing access provision off several places on the local road network which can accommodate the traffic generated by the proposals and which will spread traffic around the local networks.
- The potential to enhance connections to the A644 through the delivery of the Dewsbury Riverside Strategic Route, resulting in benefits in terms of reduced congestion in Ravensthorpe.

7.2.3 The site will include at least two primary schools, a possible secondary school and a local centre (including health, retail, leisure and community uses) with these helping to contain trips within the site. A range of facilities and services will therefore be available locally within walking and/or cycling distance with other facilities nearby in Thornhill Lees, Ravensthorpe and Savile Town as well as Dewsbury town centre.

7.2.4 The bus strategy will provide connections to Dewsbury town centre; this will provide suitable access to the town centre itself and destinations further afield such as Leeds, Huddersfield and Manchester via rail services from Dewsbury station. Also, Ravensthorpe station is within a comfortable walking distance and provides connections to destinations such as Leeds and Huddersfield.

7.2.5 It is therefore concluded that the site is sustainable and accessible via a range of travel modes and will therefore be in accordance with the NPPF.

7.2.6 Capacity assessments of the site access junctions, at Lees Hall Road, Ravensthorpe Road, Forge Lane and Sands Lane, demonstrate these will operate satisfactorily and can accommodate the traffic flows generated by the proposed allocation. Sustainable access to the site can therefore be provided.

7.2.7 The traffic assessment of the development proposed in the first five years of the plan period shows that proportional increases in traffic will be low and the traffic generated by the proposals will not have a material impact on the surrounding highway network. There is therefore no highways related impediment to the delivery of development in the first five years of the Local Plan period.

- 7.2.8 The housing trajectory identifies that 710 dwellings will be delivered in the first seven years of the plan of which 240 are already committed with planning permission, leaving a residual of 470 units. The proportional impacts of this traffic will be relatively low, most junctions seeing an increase in traffic flows of less than 10% which will be within the daily variation in traffic. Traffic assessments show that the above increases in traffic will generally have no significant impact on the operation of the surrounding road network and it is concluded that there are no significant highways impediments that will preclude the delivery of development in the first seven years of the Local Plan period.
- 7.2.9 Traffic modelling shows that the DRSR has benefits in terms of flow reductions in Ravensthorpe with limited adverse effects. The need to mitigate for any adverse effects will be subject to more detailed assessment as planning applications for development are progressed.
- 7.2.10 The South Dewsbury traffic model has been used to assess the effects of development on the proposed allocation in the advance of the delivery of major off-site highways capacity and an additional access i.e. in advance of the delivery of the DRSR. Overall, the model indicates that the impacts of the development are not severe and therefore that 2,000 dwellings on the Dewsbury Riverside site can be developed in advance of a strategic highways intervention such as the DRSR. The trigger point for mitigation, including a major scheme, will be refined as planning applications are progressed and more detailed work is undertaken.
- 7.2.11 The traffic model has also been used to assess the effects of the full 4,000 dwelling development at Dewsbury Riverside, also taking into account the delivery of the strategic intervention, the DRSR or an alternative, as development progresses. The modelling indicates that the development as a whole is likely to have some adverse traffic impacts but also some benefits, particularly in Ravensthorpe. At this stage it is concluded that traffic impacts are not severe and off-site highways improvements will be implemented to accommodate adverse impacts resulting from traffic flows generated by the development.

7.2.12 It is envisaged that off-site junctions will be assessed as planning applications for additional development come forward and the details will be agreed with the Council. This will also take account of varying trip generation rates with those observed from surveys at the initial phases of development. The above will be reviewed during the scoping of individual planning applications for the development on the site and the areas for assessment agreed with the Council at the appropriate time.

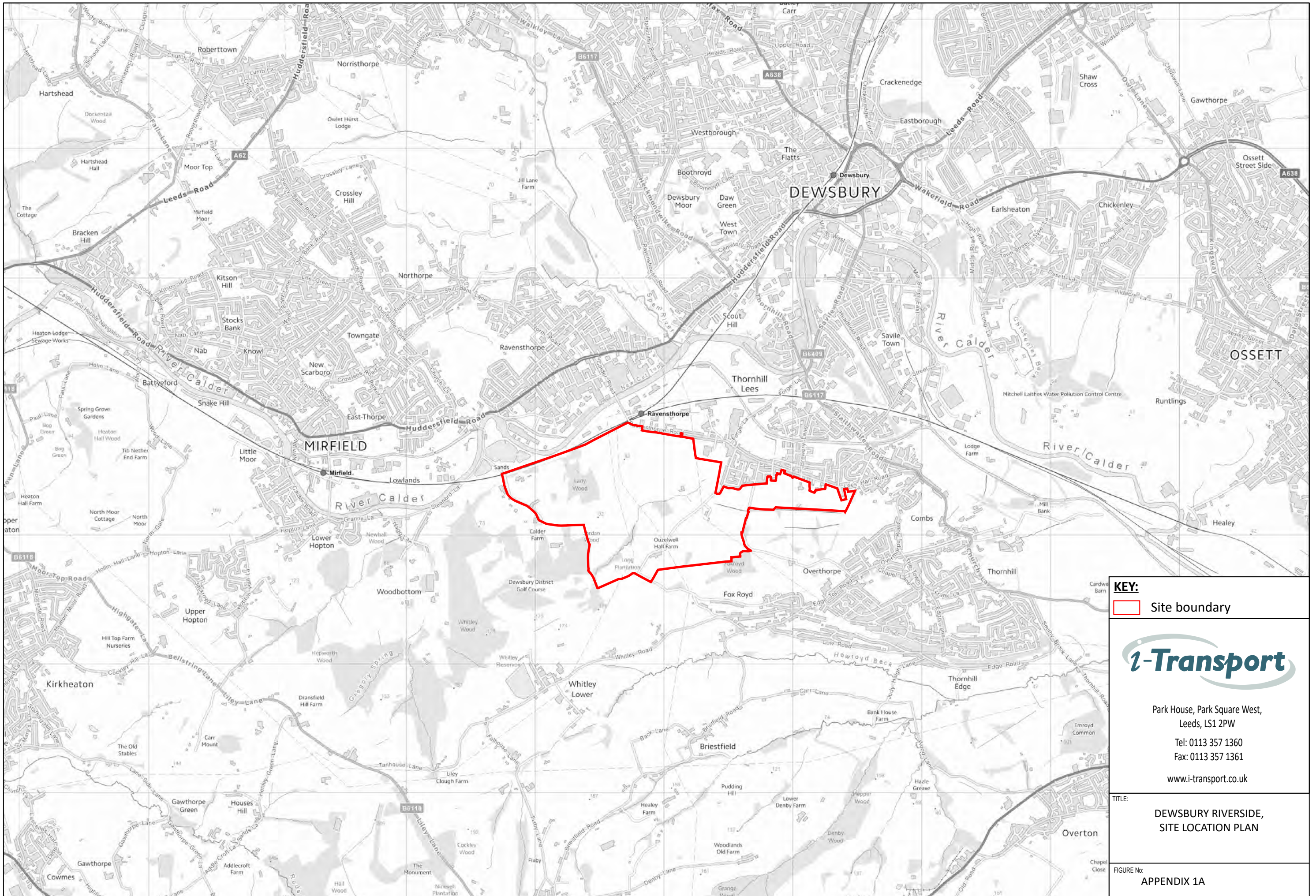
7.2.13 The overall conclusions of this report are therefore that:

- The size of the site and mix of uses proposed will encourage sustainable travel and minimise traffic impacts.
- The proposed allocation is sustainable and accessible by sustainable modes, with it being capable of supporting improvements in provision for pedestrians, cyclists and public transport users.
- The site will result in benefits for the local area, enhancing connectivity.
- The site can be accessed satisfactorily and assessments show that the proposed access provision will operate within capacity.
- The traffic impacts of development in the short-term are modest and assessments show that the site can contribute to the delivery of development in the early years of the plan.
- The longer-term impacts of the proposals as a whole will not be severe with a strategy identified to consider mitigation as development progresses.

7.2.14 It is therefore concluded that the site is suitable for allocation for development as proposed by the Council.

APPENDIX 1.A

Site Location Plan



KEY:
 Site boundary

i-Transport

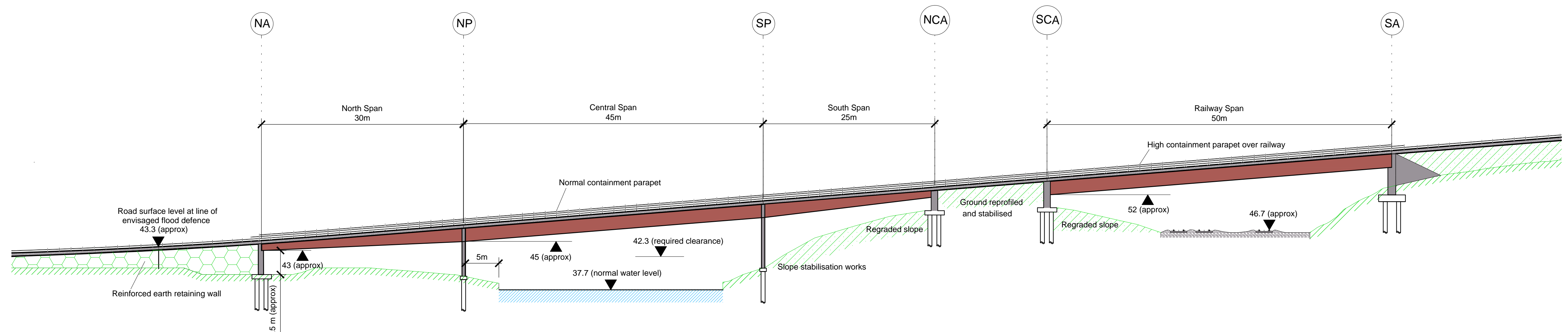
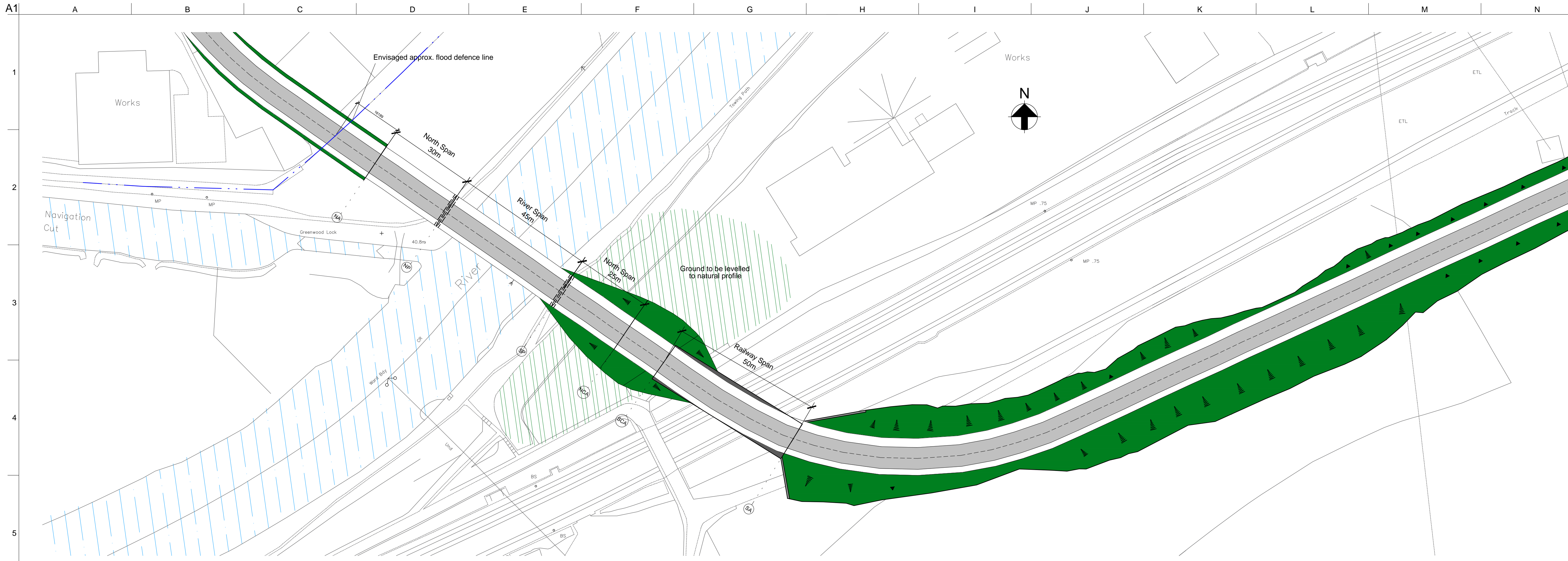
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TITLE:
**DEWSBURY RIVERSIDE,
 SITE LOCATION PLAN**

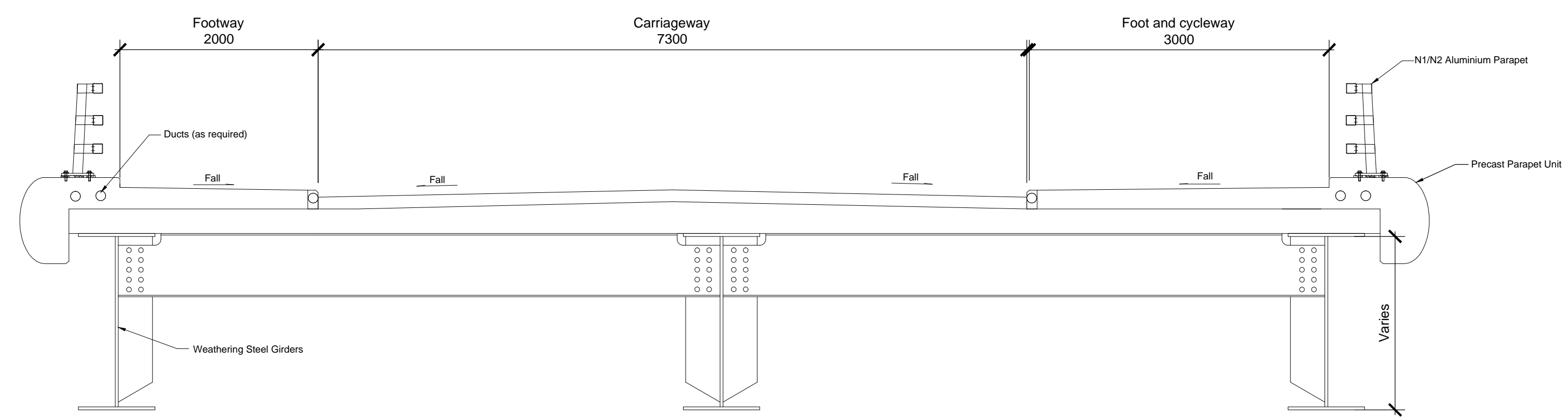
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APPENDIX 1A

APPENDIX 2.A

**Arup Drawing 247166-00-
1 Issue 1**



Bridge Elevation
Scale 1:350



Deck Cross Section
Scale 1:40

01	06/11/15	NT	SN	GT
Draft Issue				
Issue	Date	By	Chkd	Appd

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Tel +44(0)113 242 8498 Fax +44(0)113 242 8573
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Job Title
Ravensthorpe Relief Road

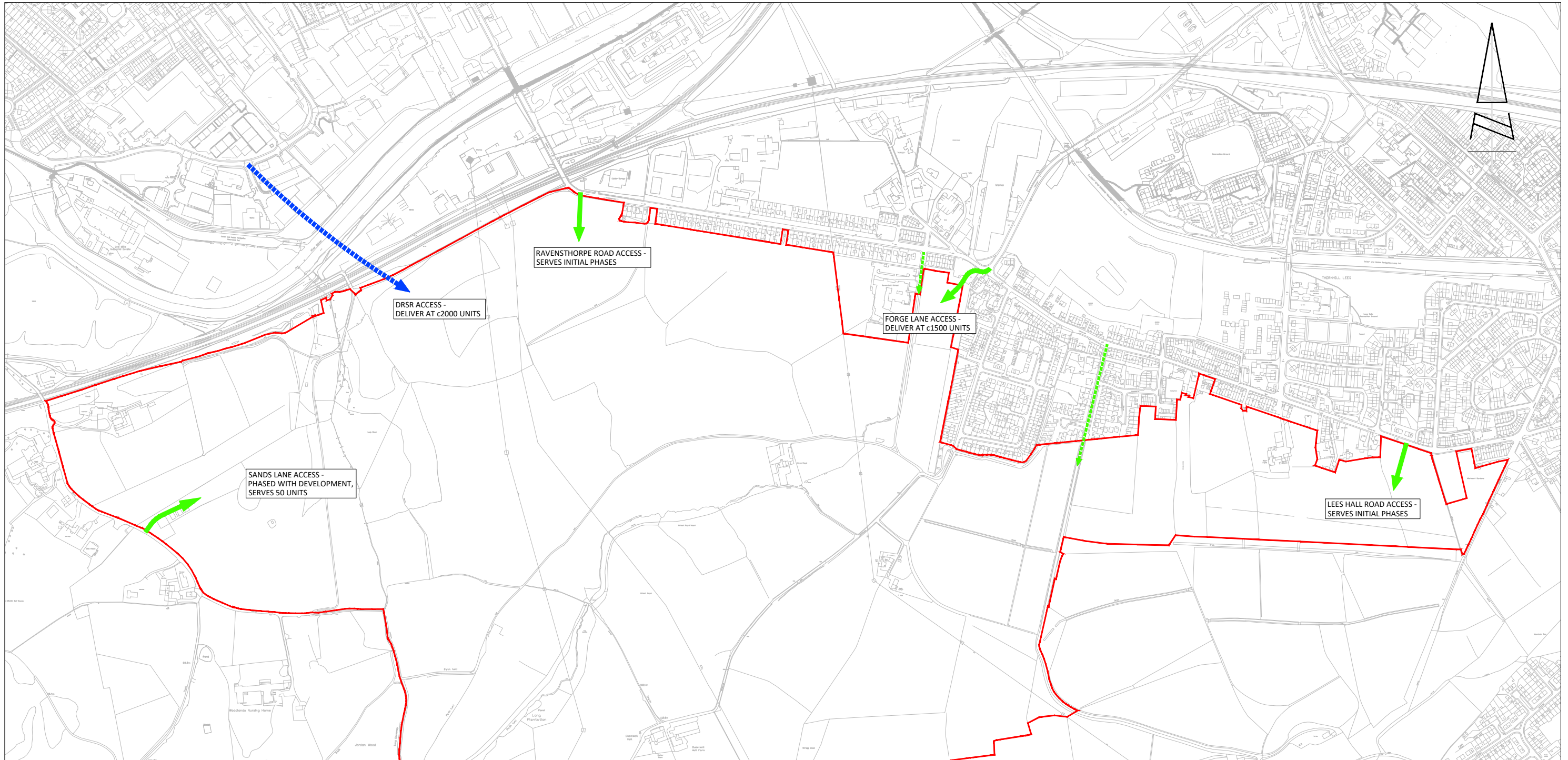
Drawing Title
**Outline Feasibility Study
Alignment
General Arrangement**

Scale at A1 Varies
Discipline **Bridges and Civil Structures**

Drawing Status		
Feasibility		
Job No	Drawing No	Issue
245166-00	1	1

APPENDIX 2.B

Access Strategy



KEY:

- Main Access
- - - → Potential Secondary or Emergency Vehicle Access
- - - → DRSR

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Tel: 0161 830 2172
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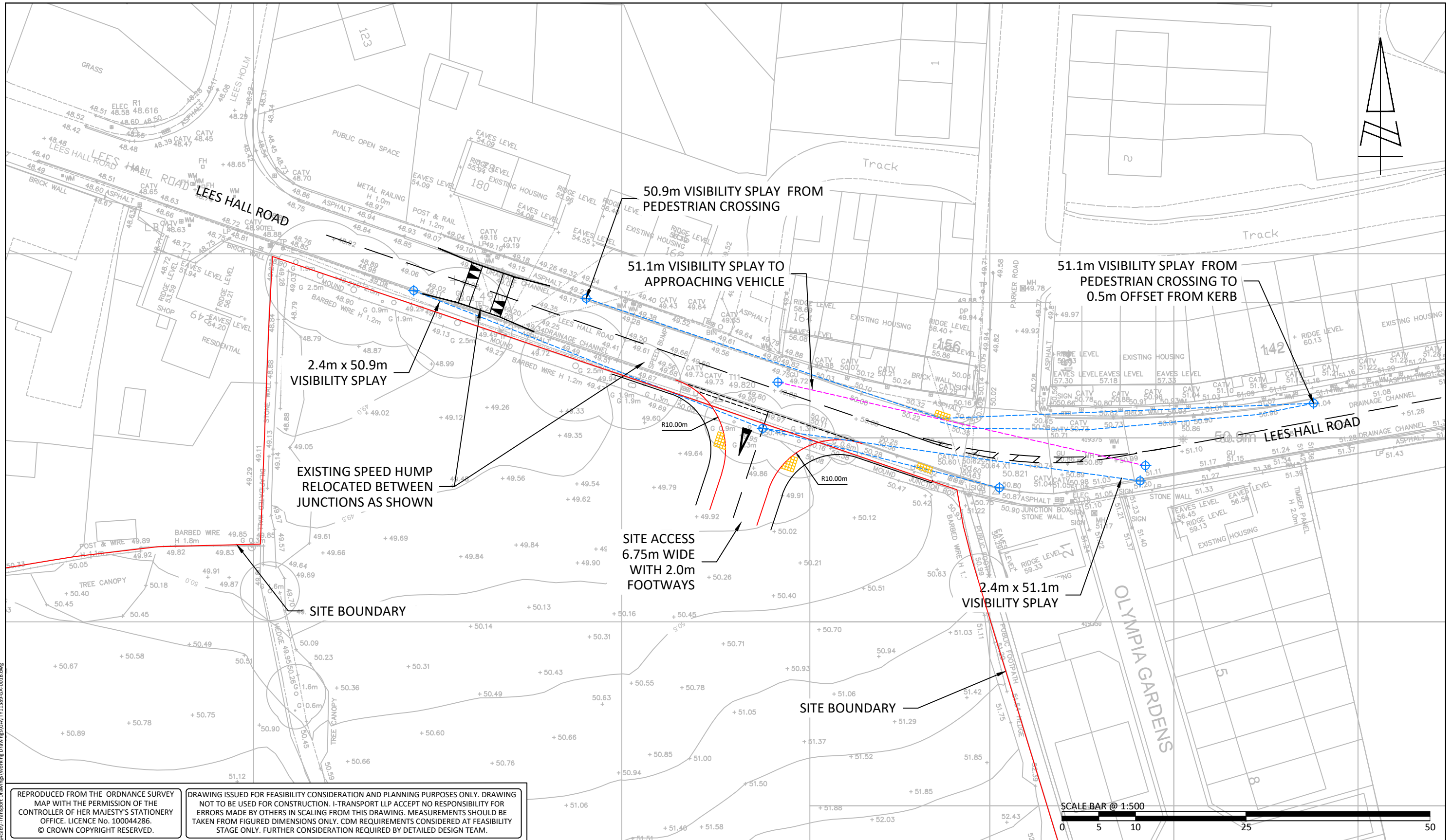
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STATUS: DRAFT					

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PROJECT:	DEWSBURY RIVERSIDE	CLIENT: MILLER HOMES

SCALE @ A3:	NTS	CHECKED:	SEE	APPROVED:	SEE
FILE REF:	ITM11043	DRAWN:	JB	DATE:	20.07.17
DRAWING No:	ITM11043-GA-061				
PROJECT No:	ITM11043	REV:	-		

APPENDIX 2.C

Site Access Plans



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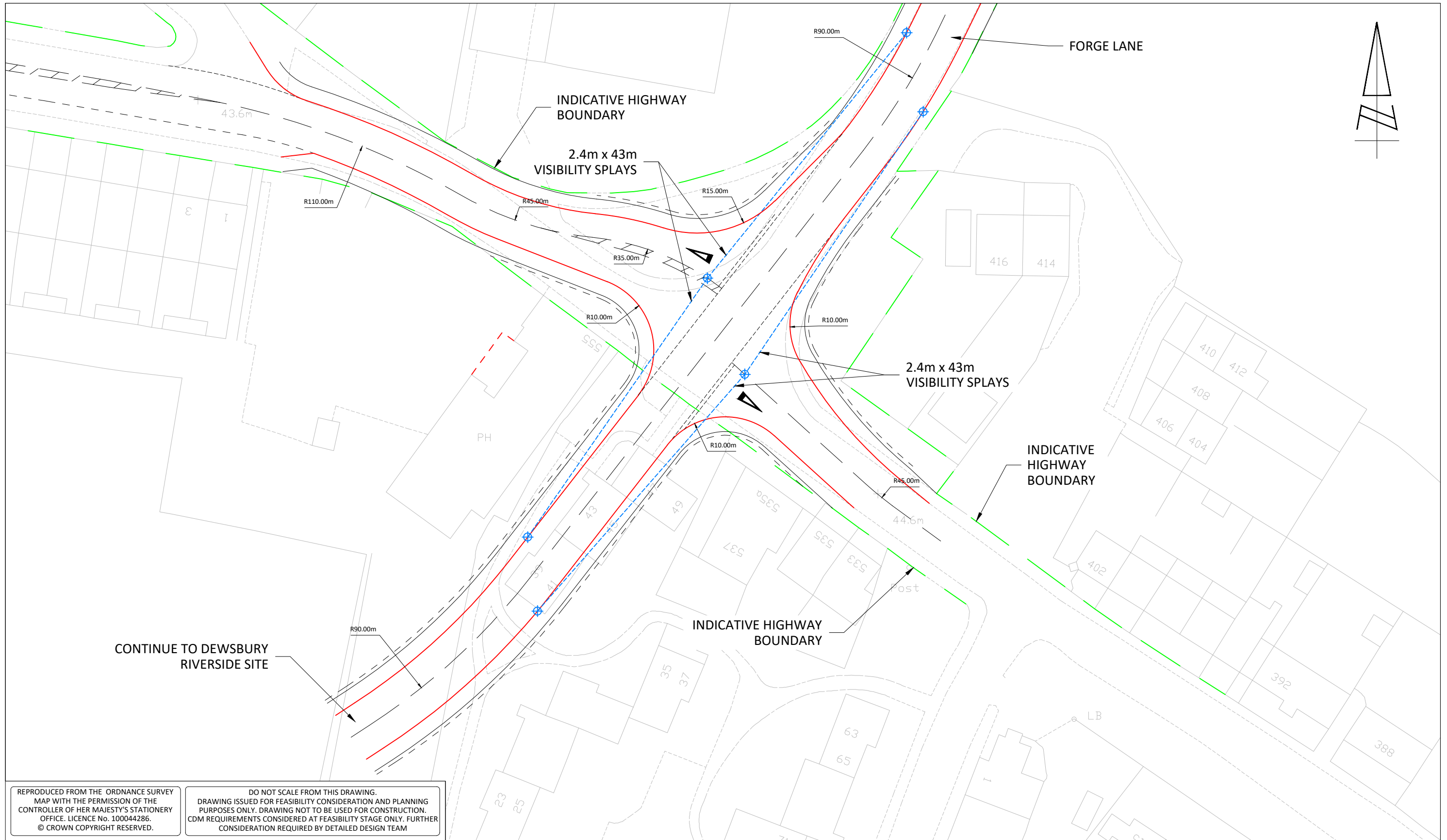
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REV	DATE	BY	DESCRIPTION	CHK	APD
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A	15.11.16	PH	SITE BOUNDARY AMENDED	GJ	SE
STATUS: PLANNING					

TITLE:	SITE ACCESS TO APPLICATION SITE FROM LEES HALL ROAD	
PROJECT:	LAND OFF LEES HALL ROAD, DEWSBURY	MILLER HOMES
CURT:		

SCALE @ A3:	1:500	CHECKED:	GJ	APPROVED:	SE
FILE REF:	ITY11389-GA-001	DRAWN:	PH	DATE:	11.11.2016
DRAWING No:	ITY11389 - GA - 001				
PROJECT No:	ITY11389	REV:	B		

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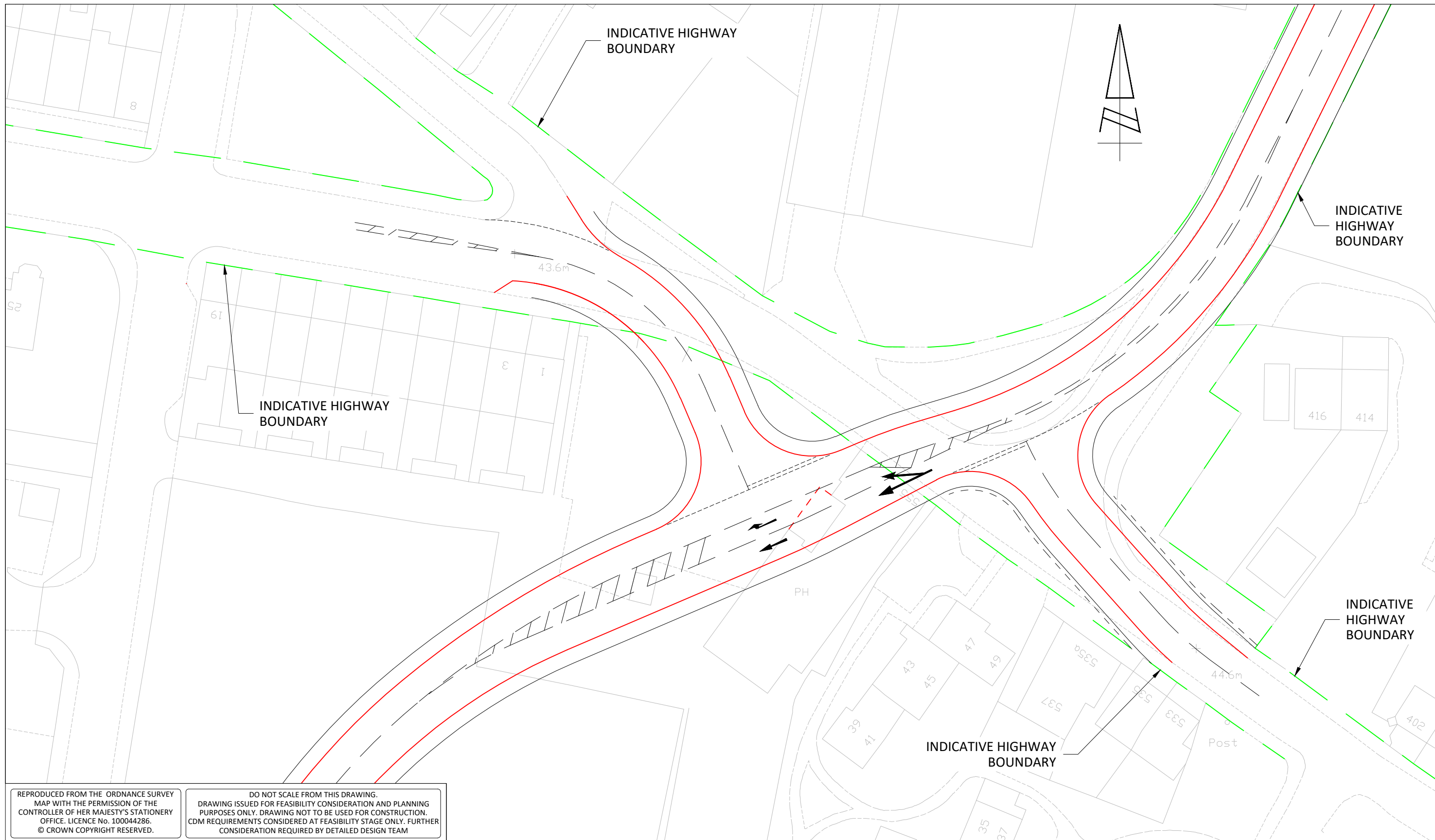


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Fax: 0161 830 2173
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REV	DATE	BY	DESCRIPTION	CHK	APD
STATUS: DRAFT					

TITLE:	FORGE LANE ACCESS VIA BLACKERS COURT	
PROJECT:	DEWSBURY RIVERSIDE	CLIENT: MILLER HOMES

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DRAWING No:	ITM11043-GA-059				
PROJECT No:	ITM11043	REV:	-		



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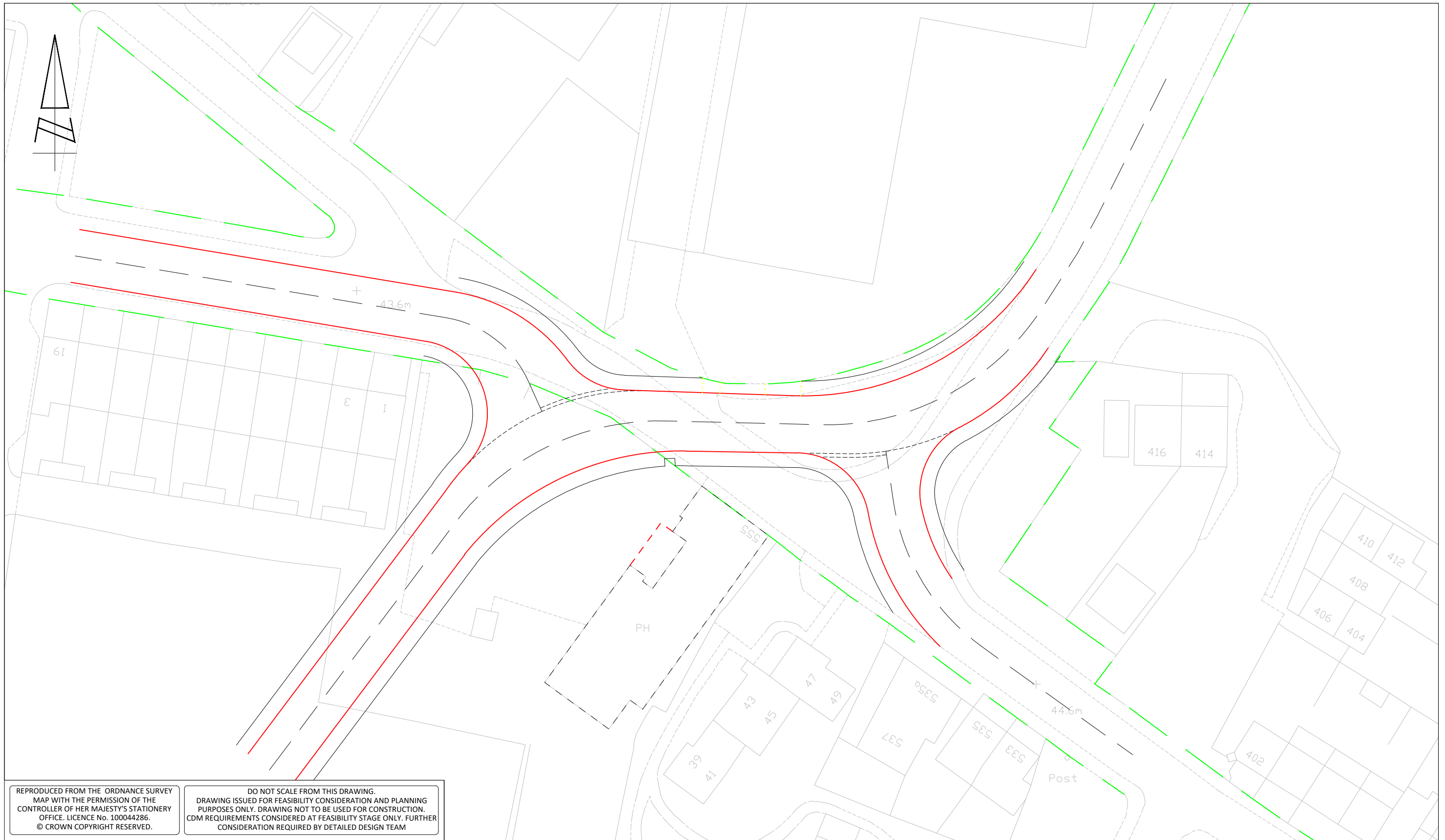


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A	20.03.17	JB	MINOR MODIFICATIONS	SE	SE
STATUS: DRAFT					

TITLE:	FORGE LANE - POTENTIAL ACCESS ARRANGEMENTS	
PROJECT:	DEWSBURY RIVERSIDE	MILLER HOMES
CLIENT:		

SCALE @ A3:	1:500	CHECKED:	RE	APPROVED:	SEE
FILE REF:	ITM11043-GA-046	DRAWN:	PH	DATE:	10.03.2017
DRAWING No:	ITM11043-GA-046				
PROJECT No:	ITM11043	REV:	B		



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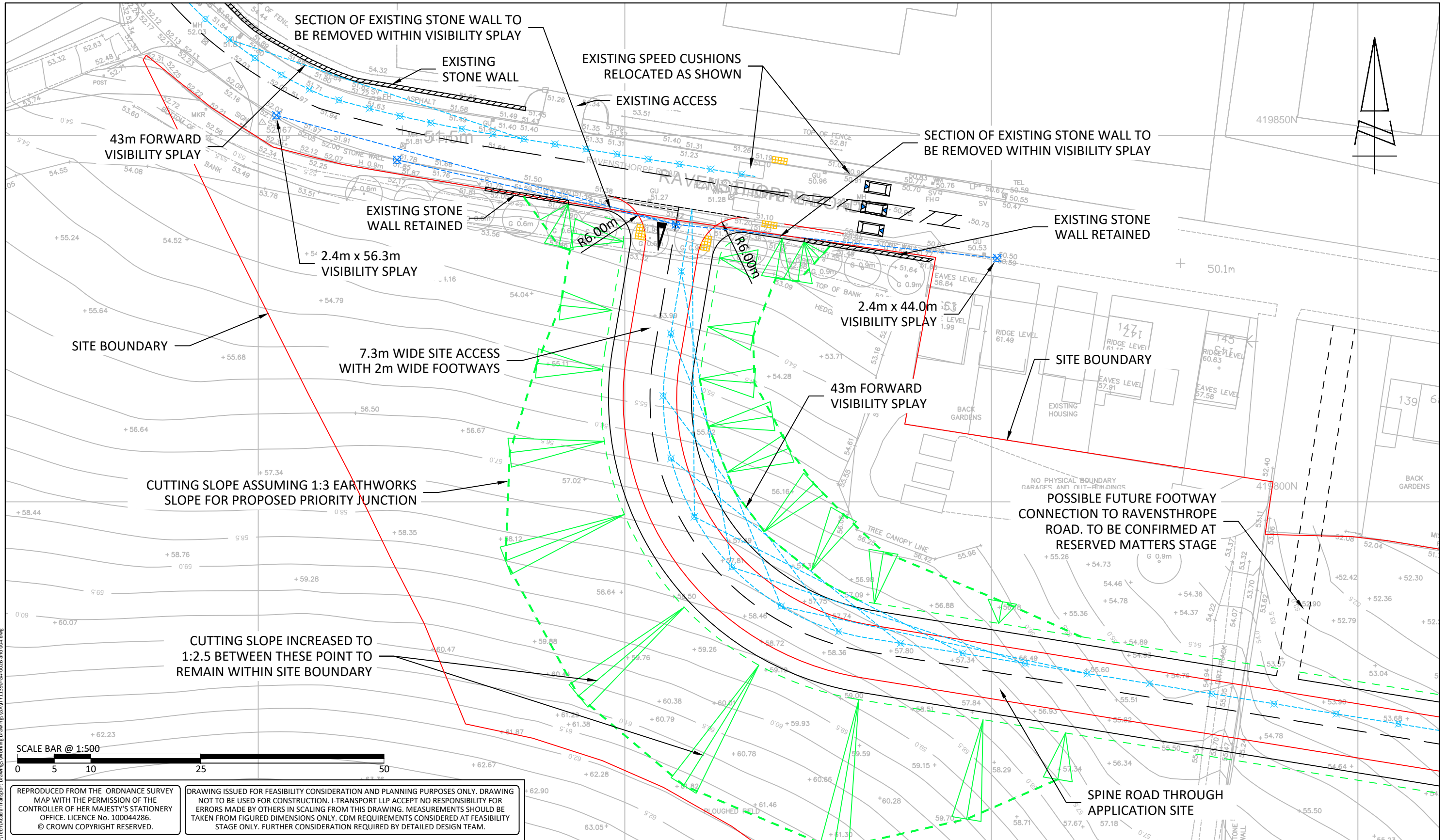


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Manchester, M3 3WR
Tel: 0161 830 2172
Fax: 0161 830 2173
www.i-transport.co.uk

REV	DATE	BY	DESCRIPTION	CHK	APD
A	20.07.17	JB	MINOR MODIFICATIONS	SE	SE
STATUS: DRAFT					

TITLE: FORGE LANE - ALTERNATIVE ACCESS ARRANGEMENTS	
PROJECT: DEWSBURY RIVERSIDE	CLIENT: MILLER HOMES

SCALE @ A3: 1:500	CHECKED: RE	APPROVED: SE
FILE REF: ITM11043-GA-048	DRAWN: PH	DATE: 17.03.17
DRAWING No: ITM11043-GA-048		
PROJECT No: ITM11043		REV: A



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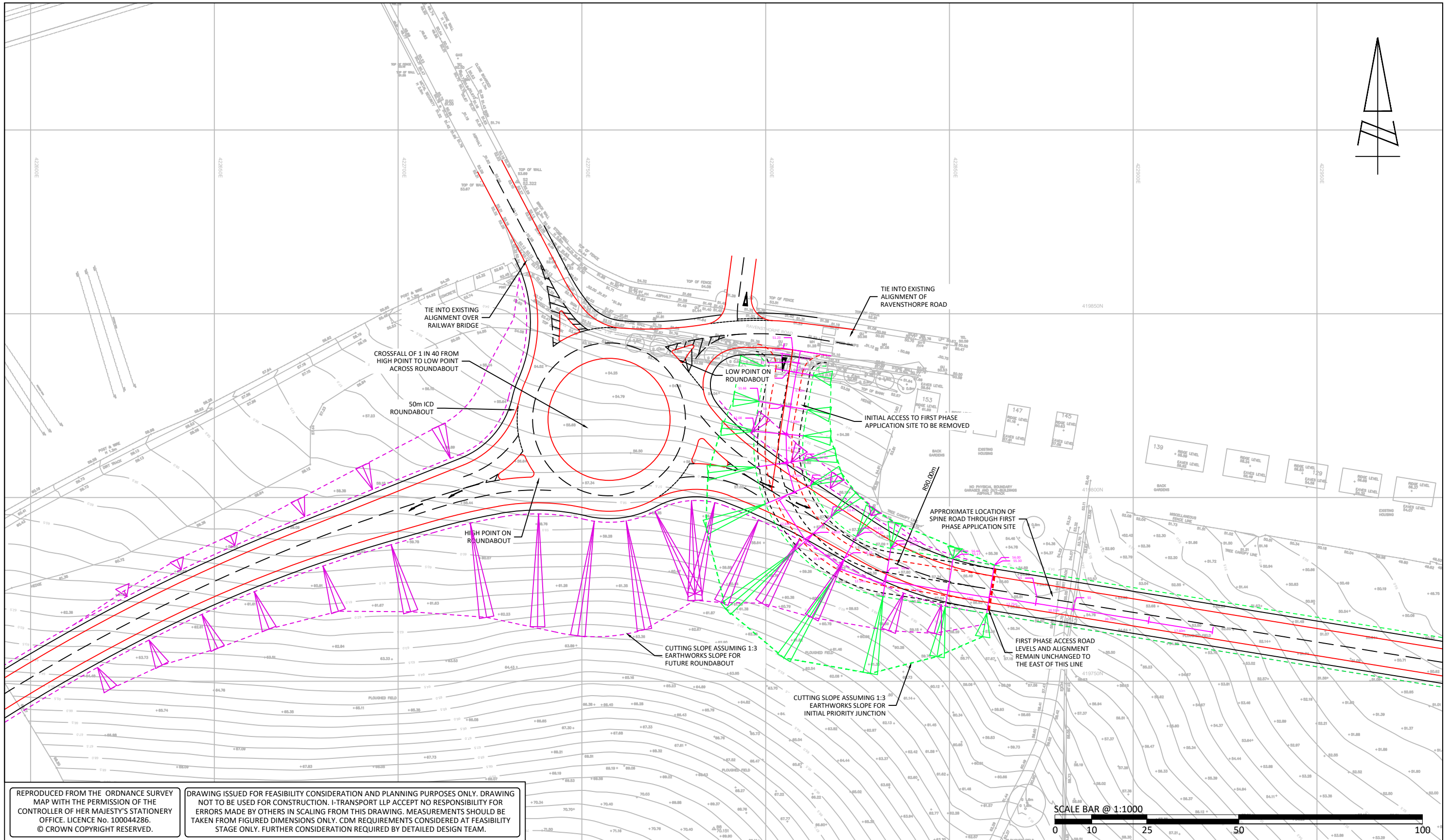
Tel: 0113 357 1360
Fax: 0113 357 1361

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B	07.03.17	PH	FORWARD VISIBILITY SPLAY SHOWN AND EARTHWORKS ADJUSTED	GJ	SE
A	15.11.16	PH	EARTHWORKS AMENDED	GJ	SE
REV	DATE	BY	DESCRIPTION	CHK	APD
STATUS:			PLANNING		

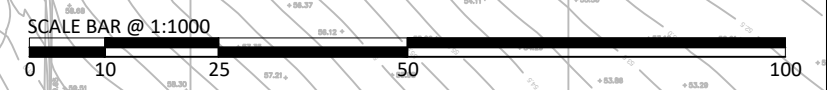
TITLE:	SITE ACCESS TO APPLICATION SITE FROM RAVENSTHORPE ROAD	
PROJECT:	LAND OFF RAVENSTHORPE ROAD, DEWSBURY	CLIENT: MILLER HOMES

SCALE @ A3:	1:500	CHECKED:	GJ	APPROVED:	SE
FILE REF:	ITY11390-GA-002	DRAWN:	PH	DATE:	11.11.2016
DRAWING No:	ITY11390 - GA - 002				
PROJECT No:	ITY11390	REV:	B		



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Fax: 0113 357 1361

REV	DATE	BY	DESCRIPTION	CHK	APD
STATUS: PLANNING					

TITLE:	SITE ACCESS TO APPLICATION SITE FROM RAVENSTHORPE ROAD	
PROJECT:	LAND OFF RAVENSTHORPE ROAD, DEWSBURY	MILLER HOMES

SCALE @ A3:	1:1000	CHECKED:	GJ	APPROVED:	SE
FILE REF:	ITY11390-GA-001	DRAWN:	PH	DATE:	10.11.2016
DRAWING No:	ITY11390 - GA - 001				
PROJECT No:	ITY11390				
REV:	-				

C:\Users\peterhill\Desktop\ITY11390-GA-001.dwg



REV	DATE	BY	DESCRIPTION	CHK	APD

STATUS: **FRAFT**

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TITLE:	INDICATIVE SANDS LANE ACCESS		SCALE @ A4:	1:500	CHECKED:	SEE	APPROVED:	SEE	
PROJECT:	DEWSBURY RIVERSIDE		FILE REF:	ITM11043	DRAWN:	JB	DATE:	20.07.17	
CLIENT:	MILLER HOMES		DRAWING No: ITM11043-GA-060						
			PROJECT No:	ITM11043				REV:	



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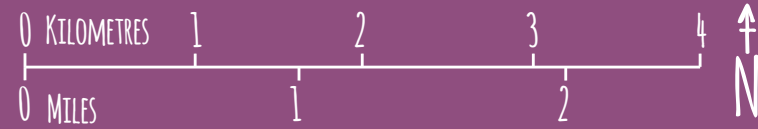
Tel: 0161 830 2172
Fax: 0161 830 2173

www.i-transport.co.uk

APPENDIX 3.A

Cycle Route Plans

STAGE 13: HUDDERSFIELD TO DEWSBURY



THINGS TO SEE AND DO

John Smith Stadium, Huddersfield

Home of Huddersfield Town Football Club and Huddersfield Giants Rugby League Club.

Dewsbury Museum

Located in Crow Nest Park, the museum is a great place to discover Dewsbury's proud history and heritage.

Holroyd Park

A great local amenity with multi-activity games area, playgrounds and bowling.

Country Park and Nature Reserve

The River Spen runs through Dewsbury Country Park and the Lower Spen Local Nature Reserve where you might glimpse a kingfisher darting along the river.

To find more attractions visit www.visithuddersfield.com



ENJOY THE SLOW TOUR ON THE NATIONAL CYCLE NETWORK!



The Slow Tour is a guide to 21 of the best cycle routes in Yorkshire.

It's been inspired by the Tour de France Grand Départ in Yorkshire in 2014 and funded by Public Health Teams in the region. All routes form part of the National Cycle Network - more than 14,000 miles of traffic-free paths, quiet lanes and on-road walking and cycling routes across the UK.

This route is part of National Route 66 and 69, so just follow the signs.

TAKE CARE!

- ⚠ Share the path. Give way to pedestrians and wheelchair users.
- ⚠ There are some on-road sections at Mirfield, Ravensthorpe and Huddersfield.
- ⚠ Busy crossing at Bog Green Lane (B6118).



TAKE A BREAK!

Whether you want tea and cake, a pint of real ale, or a hearty meal, the town centres in Huddersfield, Mirfield and Dewsbury are full of places to eat and drink. Alternatively, grab some delicious local produce and stop off for a picnic along the route.

KEY

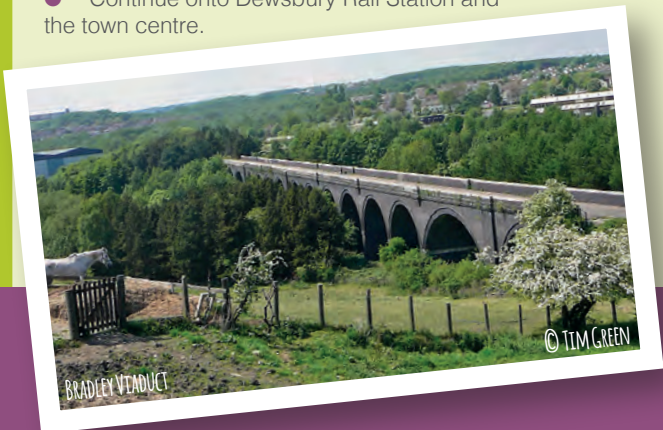
- Slow Tour route
- On-road / Traffic-free
- National Cycle Network
- On-road / Traffic-free
- National Cycle Network route number
- Café
- Pub
- Restaurant
- Railway with station
- Take care here
- Attraction
- Picnic spot
- Access point
- Bike shop

Huddersfield to Dewsbury

Huddersfield to Dewsbury 19 miles return journey (9.5 miles each way). This is approximately 3 hours.

This route takes you from Huddersfield, with its beautiful mix of Georgian, Victorian and neo-classical architecture, and birthplace of Rugby League, to the minster town of Dewsbury. The majority of the route follows peaceful traffic free greenways and a riverside path through a wooded agricultural landscape and urban greenspace.

- Exit Huddersfield Railway Station, passing the statue of Harold Wilson, and follow signs to National Route 69 on a short on-road section to join the Birkby Bradley Greenway. As the path emerges from woodland it provides a good view of the John Smith Stadium and Dalton Bank Nature Reserve.
- After crossing Leeds Road, you join the Calder Valley Greenway on National Route 66 and travel over Bradley Viaduct which has 15 high arches of blue brick above the River Colne and Huddersfield Broad Canal.
- Once over the viaduct, you can take a short detour by public bridleway and footpath to Dalton Bank Local Nature Reserve which has a mix of conifer and native woodland.
- Then it is peaceful traffic-free pedalling as the route continues to Colne Bridge.
- You continue on to Mirfield, where there are some on road sections as you travel through the town centre. You rejoin the former rail corridor through an arched gateway.
- In Ravensthorpe the route passes through Holroyd Park. You take quiet residential streets to join the Spen Valley Greenway passing the Lower Spen Nature Reserve and Dewsbury Country Park.
- The route follows the River Calder for a very pleasant stretch. A bridge takes you across the Dewsbury flood alleviation channel and gives you an excellent view of the river and weir.
- Continue onto Dewsbury Rail Station and the town centre.



OVERVIEW MAP



STAGE 13

Huddersfield to Dewsbury

SLOW TOUR



OF YORKSHIRE

ON THE NATIONAL CYCLE NETWORK



The Slow Tour is a guide to 21 of the best cycle routes across Yorkshire on the National Cycle Network.

The routes have something for everyone, whether you are a family, new to cycling or a regular cyclist. You can take public transport to the start of most routes and hire bikes there too.

**Tourist attractions ● heritage sites
cafés and pubs ● picnic spots ● canals
museums ● playgrounds ● artwork**

If you like this route, try out the other 20.

**Download your free maps at
WWW.SUSTRANS.ORG.UK/SLOWTOUROFYORKSHIRE**



Huddersfield to Dewsbury is part of Routes 66 and 69 of the National Cycle Network

ENJOY A GREAT CYCLING DAY OUT... AT YOUR OWN PACE!



STAGE 12: OSSETT TO OAKENSHAW



THINGS TO SEE AND DO

Dewsbury
Dewsbury is the largest town in the Heavy Woolen district and has an impressive Minster, many notable Victorian buildings, a lively market and Dewsbury Museum set in Crow Nest Park.

Dewsbury Country Park
The route skirts the park, which was once a Landfill Site, but is now a much loved green space.

Local Nature Reserves
Toad Holes Beck and Railway Terrace are home to a wide variety of butterflies and birds, as well as wildflower meadows.
To find more attractions visit www.visithuddersfield.com

TAKE A BREAK!

- Savile Town Wharf and Canal Basin is a working boatyard on the Dewsbury Cut. Visit the Leggers Inn or cafe, the ideal refreshment stop for cyclists and walkers.
- Milepost Café, Liversedge is right on the Spen Valley greenway and a great place to pop in for some coffee and cake.
- Many pubs, cafés and independent shops in Cleckheaton.

BIKE HIRE
Yorkshire has 'Bike Libraries' where you can borrow bikes, find out more at bikelibraries.yorkshire.com

TAKE CARE!
 Share the path. Give way to pedestrians, horseriders and wheelchair users.
 The route through Dewsbury town centre is busy, watch out for cars, buses and pedestrians.



ENJOY THE SLOW TOUR ON THE NATIONAL CYCLE NETWORK!

The Slow Tour is a guide to 21 of the best cycle routes in Yorkshire. It's been inspired by the Tour de France Grand Départ in Yorkshire in 2014 and funded by Public Health Teams in the region. All routes form part of the National Cycle Network - more than 14,000 miles of traffic-free paths, quiet lanes and on-road walking and cycling routes across the UK.
This route is part of National Routes 66 and 699, so just follow the signs.

KEY

- Slow Tour route On-road / Traffic-free
- National Cycle Network On-road / Traffic-free
- National Cycle Network route number
- Café
- Pub
- Restaurant
- Shop
- Railway with station
- Access point
- Take care here
- Attraction
- Picnic spot / Gardens
- Bike shop / Cycle hire



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OSSETT TO OAKENSHAW

Ossett to Oakenshaw 23 mile round trip (11.5 miles each way). This is approximately 3-4 hours.

This great ride begins at Ossett Town Hall and travels to Dewsbury, before heading north through the Spen Valley to the southern edge of Bradford using the traffic-free Spen Valley Greenway.

- From Ossett Town Hall, head south onto the West Wells Road where the route quickly becomes a traffic free path, following a former railway line. The route takes you through the Earlsheaton tunnel, complete with its bat friendly lighting.
- After the Portrait bench, with its sculptures of local people (including Brian Robinson – the first Brit to finish the Tour de France), you can head north into Dewsbury Town Centre passing the Sports Centre.
- To continue to Oakenshaw take a left to cross the River Calder on a viaduct. When the route joins the towpath turn right for the canal basin in Savile Town with pub/café, or left to join the Calder and Hebble Navigation.
- The canal loops around Dewsbury to join another former railway line, the Spen Valley Greenway. From here there are 7 miles of wonderful traffic free pedalling, passing a selection of sculptures including metal sheep, giant hoops, digger seats and Tour de France themed mileposts.
- The path is gently uphill, and passes close to the town centres of Heckmondwike and Cleckheaton, which both have refreshment stops.
- After bridging over the M62, the route crosses the golf course to arrive in Oakenshaw, where you'll find Victoria Park, which has a play area and skate park, and the local nature reserves of Toad Holes Beck and Railway Terrace.
- This is the turning point to retrace the route back to the start. You can continue on National Route 66 to the centre of Bradford following a signed route on roads and through Bowling Park.



Ossett to Oakenshaw

SLOW TOUR 
OF YORKSHIRE
 ON THE NATIONAL CYCLE NETWORK



The Slow Tour is a guide to 21 of the best cycle routes across Yorkshire on the National Cycle Network.

The routes have something for everyone, whether you are a family, new to cycling or a regular cyclist. You can take public transport to the start of most routes and hire bikes there too.

**Tourist attractions ● heritage sites
 cafés and pubs ● picnic spots ● canals
 museums ● playgrounds ● artwork**

If you like this route, try out the other 20.

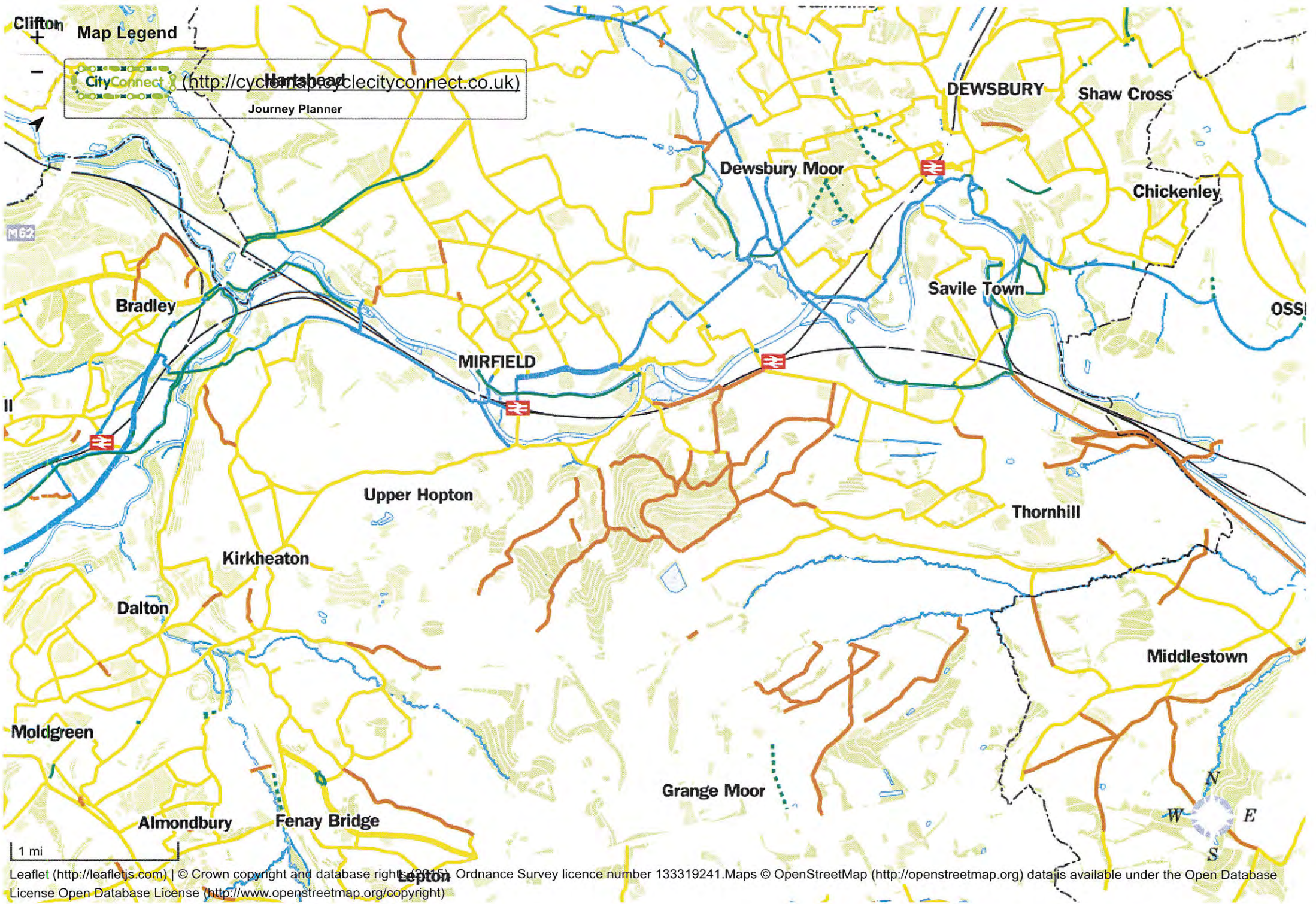
Download your free maps at
WWW.SUSTRANS.ORG.UK/SLOWTOUROFYORKSHIRE



Ossett to Oakenshaw is part of Routes 66 and 699 of the National Cycle Network

**ENJOY A GREAT CYCLING DAY OUT...
 AT YOUR OWN PACE!**





Clifton +

Map Legend

CityConnect (<http://cyclemap.cyclecityconnect.co.uk>)
Journey Planner

M62

A64

Moldgreen




1 mi

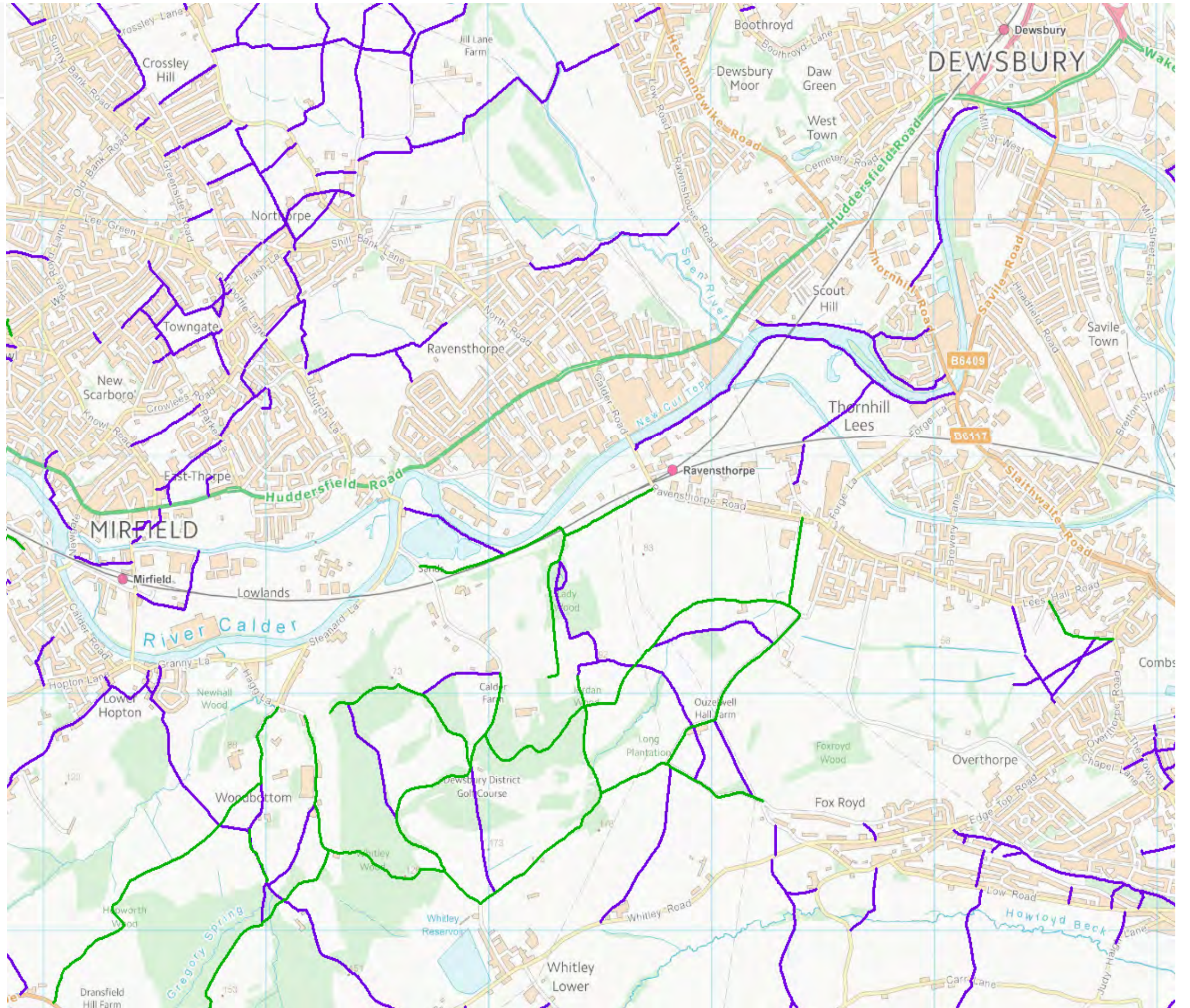
APPENDIX 3.B

PRoW Plans

Public rights of way near Dewsbury

Map key Search Disclaimer

-  **Footpath**
Public footpaths are public rights of way on foot.
-  **Bridleway**
Public bridleways are public rights of way on foot, or leading or riding a beast of burden (e.g. a horse). Cyclists may also use bridleways, but must give way to riders and pedestrians.
-  **Byway**
Public byways open to all traffic are public rights of way for all types of traffic but are mainly used by pedestrians, horse riders and cyclists and may not be suitable for all types of motorised vehicle.



APPENDIX 3.C

Bus Route Information

North Kirklees Bus & Train Map

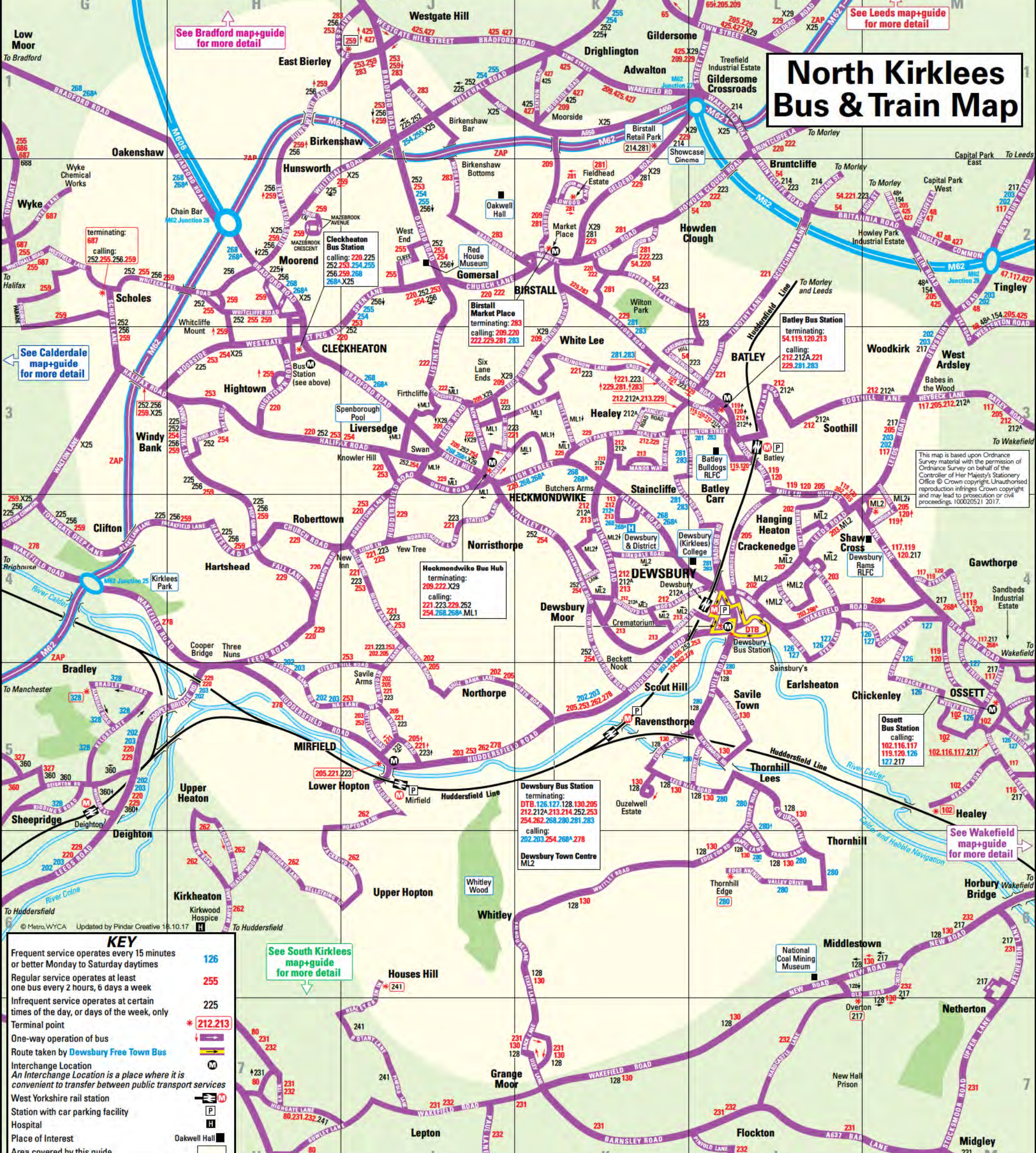
See Bradford map+guide for more detail

See Leeds map+guide for more detail

See Calderdale map+guide for more detail

See South Kirklees map+guide for more detail





See Wakefield map+guide for more detail









KEY

- Frequent service operates every 15 minutes or better Monday to Saturday daytime **126**
- Regular service operates at least one bus every 2 hours, 6 days a week **255**
- Infrequent service operates at certain times of the day, or days of the week, only **225**
- Terminal point *** 212.213**
- One-way operation of bus **↔**
- Route taken by **Dewsbury Free Town Bus** **↔**
- Interchange Location **M**
- An Interchange Location is a place where it is convenient to transfer between public transport services
- West Yorkshire rail station **M**
- Station with car parking facility **P**
- Hospital **H**
- Place of Interest **■**
- Area covered by this guide **□**



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Service	Route	Service Frequency Mon to Sat Daytime (mins)	Evenings and Sundays (mins)	Operator
DTB	Dewsbury Free Town Bus <i>Circular Bus via Bus Station, Railway Station and Sainsbury's</i>	20	–	YTG ^(M)
54	Batley - Morley - Cottingley - Holbeck - Leeds	60	–	FB ^(M)
117	Wakefield - Ossett - Shaw Cross - Westerton - Tingley - White Rose - Leeds	60	60	AY ^(M)
119 120	Wakefield - Horbury Junction - Horbury - Ossett - Shaw Cross - Batley	60	–	AY ^(M)
126 127	Dewsbury - Earlsheaton - Ossett - Horbury - Wakefield	10	30 (eves) 20 (Suns)	AY
128 130	Dewsbury - Ouzelwell - Grange Moor - Overton - Horbury - Wakefield	60	–	AY ^(M)
202 203	Huddersfield - Mirfield - Dewsbury - Shaw Cross - Tingley - White Rose - Leeds <i>* Sunday eve Shaw Cross - Leeds section is hourly</i>	15	30*	AY
205	Dewsbury - Shaw Cross - Morley - Gildersome - Pudsey	60	–	AY ^(M)
205	Dewsbury - Northorpe - Mirfield	60	60 (not Suns)	LN
209	Leeds - Whitehall Rd - Gildersome - Birstall - Heckmondwike	60	–	AY ^(M)
212 212A	Dewsbury - Staincliffe - Dewsbury & District Hospital - Batley - Kirkhamgate - Wakefield <i>212A serves Arncliffe Road/Hayburn Road</i>	60	60	AY ^(M)
213	Dewsbury - Dewsbury & District Hospital - Batley	60	–	AY ^(M)
214	Birstall Retail Park - Morley - White Rose Centre	60	–	AY
217	Overton - Netherton - Horbury - Ossett - Shaw Cross - Leeds <i>Peaks only</i>	 (not Sats)	–	AY
220	Leeds - White Rose Centre - Morley - Birstall - Gomersal - Cleckheaton - Hightown - Roberttown - Huddersfield	60		AY ^(M)
221	Leeds - White Rose Centre - Morley - Batley - Heckmondwike - Mirfield <i>* Monday to Saturday daytime every 30 minutes between Leeds and Heckmondwike</i>	60*	–	AY ^(M)
222	Leeds - White Rose Centre - Morley - Birstall - Gomersal - Heckmondwike <i>* No evening service</i>	60	60*	AY ^(M)
223	Leeds - White Rose Centre - Morley - Batley - Heckmondwike - Mirfield		60	AY ^(M)
225	Leeds - Cleckheaton - Clifton - Brighouse	 (not Sats)	–	AY ^(M)

Service	Route	Service Frequency Mon to Sat Daytime (mins)	Evenings and Sundays (mins)	Operator
229	Leeds - Gildersome - Birstall - Batley - Heckmondwike - Hartshead - Huddersfield	30	60	AY/FH ^(M)
231	Huddersfield - Lepton - Grange Moor - Flockton - Netherton - Horbury - Lupset - Wakefield <i>One return journey to Scissett Middle School via Emley</i>	60	60 (eves) Every 2 hrs (Suns)	AY/FH YTG ^(M)
232	Huddersfield - Lepton - Emley - Flockton - Middlestown - Horbury - Lupset - Wakefield	60	60 (eves) Every 2 hrs (Suns)	AY/FH YTG ^(M)
241	Huddersfield - Waterloo - Lepton - Houses Hill	60	–	YTG ^(M)
252	Dewsbury - Heckmondwike - Scholes - Cleckheaton - Gomersal - Birkenshaw - Drighlington - Leeds		60 (daily eves)	AY ^(M)
253	Dewsbury - Mirfield - Cleckheaton - East Bierley - Bradford	60	60	AY ^(M)
254 255	Cleckheaton - Gomersal - Birkenshaw - Drighlington - Leeds (Combined Service)	15	30 (Suns daytime)	AY ^(M)
254	Dewsbury - Ravenshouse Road - Heckmondwike - Windy Bank - Cleckheaton - Gomersal - Drighlington - Leeds	30	60 (Suns daytime)	AY ^(M)
255	Halifax - Wyke - Scholes - Cleckheaton - Gomersal - Birkenshaw - Drighlington - Leeds <i>* Hourly service from Halifax to Scholes. Sunday daytime services extend to Leeds</i>	30*	60 (not eves)	AY ^(M)
256	Brighouse - Clifton - Hartshead - Scholes - Cleckheaton - Hunsworth - East Bierley - Bradford		–	AY/FB ^(M)
259	Brighouse - Clifton - Hartshead - Scholes - Cleckheaton - Hunsworth - East Bierley	60	–	TL ^(M)
262	Dewsbury - Mirfield - Hopton - Kirkheaton - Upper Heaton - Huddersfield <i>* Sunday buses run between Mirfield and Huddersfield only</i>	60	60*	FH/YTG ^(M)
268 268A	Wakefield (268A) - Dewsbury - Dewsbury & District Hospital - Heckmondwike - Cleckheaton - Oakenshaw - Bradford <i>† Wakefield - Dewsbury 20 minutes * Sunday daytime Dewsbury - Cleckheaton section runs every 30 minutes</i>	10(M-F)† 15(Sats)	60*	AY
278	Halifax - Elland - Brighouse - Mirfield - Dewsbury	60	60	AY ^(M)
280	Dewsbury - Thornhill Lees - Thornhill	12-15	30	AY
281	Fieldhead Estate* - Birstall - Howden Clough - Batley - Batley Carr - Dewsbury <i>*Evenings and Sundays starts from/extends to Birstall Business Park</i>	30	60	AY
283	Bradford - East Bierley - Birkenshaw Bar - Birstall - Batley - Batley Carr - Dewsbury	30	60	AY ^(M)
687	Scholes - Wyke - Odsal - Bradford - Fagley	20	–	FB ^(M)

Service	Route	Service Frequency Mon to Sat Daytime (mins)	Evenings and Sundays (mins)	Operator
884 ^(*)	Dewsbury – Batley – Bradford – Shipley – Guiseley – Burley – Ilkley ⇄ <i>Connects to Dales bus 884 service to Malham via Skipton</i> NOT SHOWN ON MAP	 (Public Hols)		AY
X25	Brighouse - Cleckheaton - Birkenshaw M621 - Leeds <i>Peak journeys only</i> ^(†)	 (not Sats)	–	AY
X29	Leeds - Gildersome - Birstall - Heckmondwike		–	AY ^(M)
METRO LOCAL SERVICES				
ML1	Firthcliffe and White Lee Road - Heckmondwike Morrisons <i>circular</i>	30	–	TL ^(M)
ML2	Shaw Cross - Dewsbury - Dewsbury Moor	60	–	TL ^(M)

Notes:

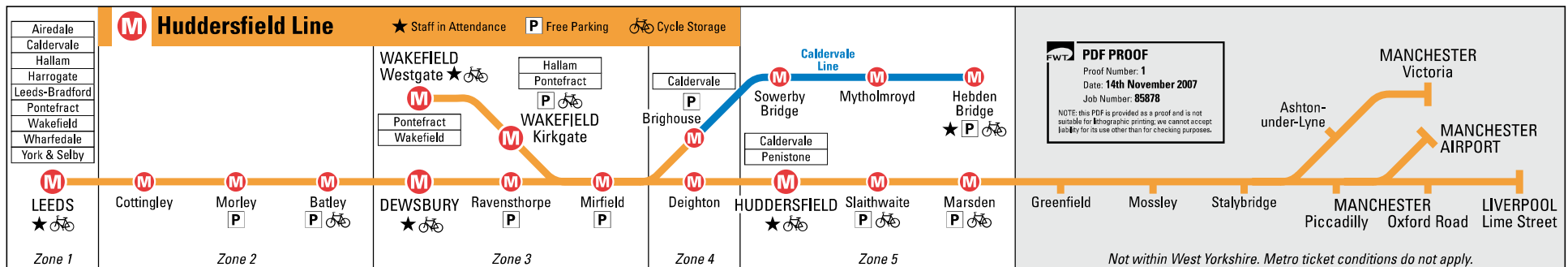
- 126** - Frequent service operates every 15 minutes or better Monday to Saturday daytimes
- 117** - Regular service operates at least one bus every 2 hours, 6 days a week
- 214** - Infrequent service operates at certain times of the day, or days of the week, only
-  - Infrequent service at these times. For details please visit www.wymetro.com or ring MetroLine 0113 245 7676
- ^(M) - Subsidised by Metro
- ^(†) - Limited stop service for all or part of route.
- ^(*) - Summer service
-  - Connection guaranteed, through fares available and passengers can stay on bus

Bus operators in North Kirkles

Code	Operator	Telephone No.	Code	Operator	Telephone No.
AY	Arriva Yorkshire	0344 800 4411	LN	Longstaff's	01924 463122
FB	First (Bradford)	0113 381 5000	SC	Station Coaches	01924 477230
FH	First Calderdale and Huddersfield	0113 381 5000	TL	TLC Travel Ltd	01274 727811
			YTG	Yorkshire Tiger	0344 800 4411

APPENDIX 3.D

Railway Network Plan



Work on the line. Engineering works often affects weekend travel. Passengers are requested to check before travel.

MetroTrain is operated in accordance with the requirements of Metro by Northern Rail.

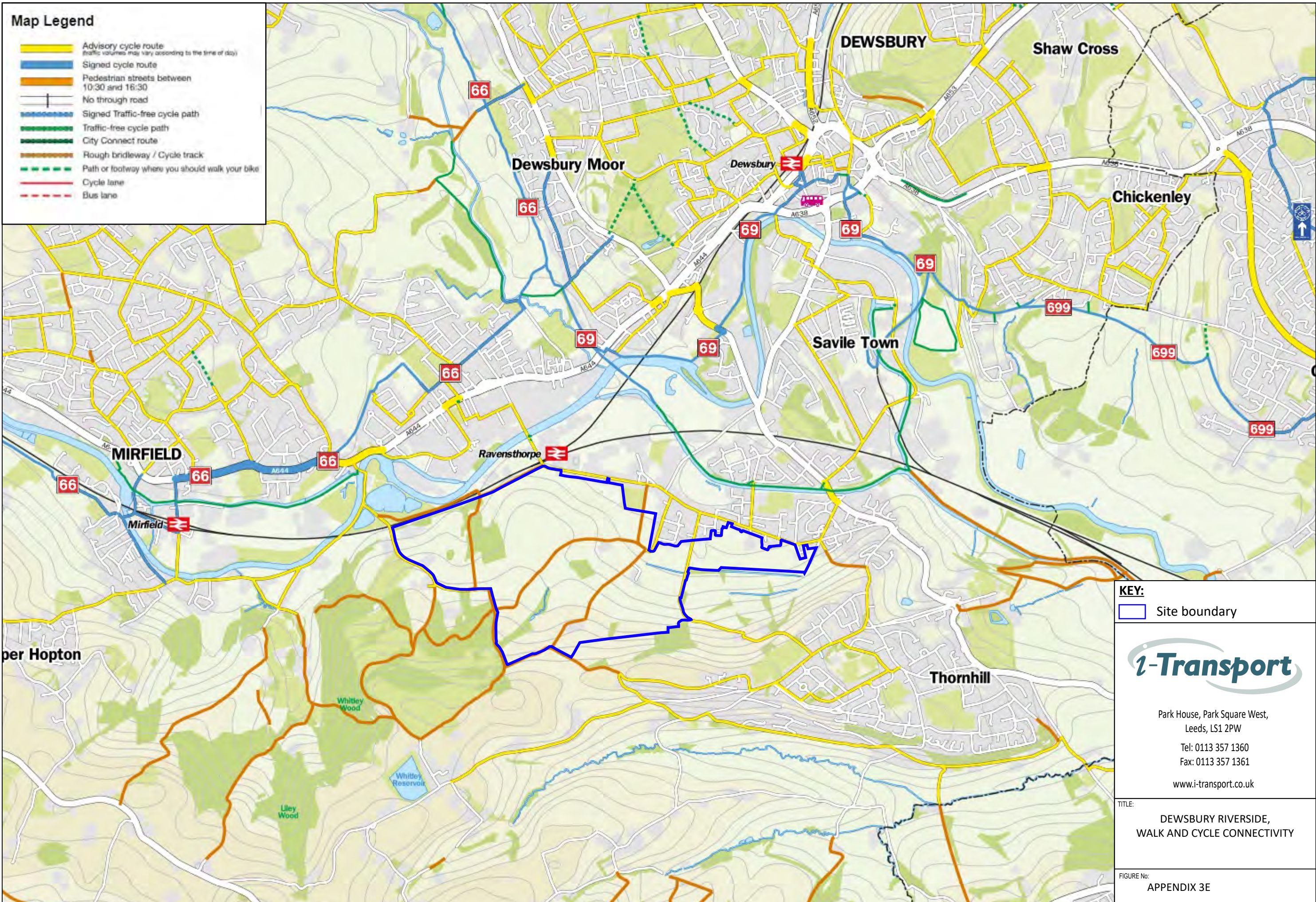
Traintaxi. At all main stations there is a taxi rank outside the station from which taxis are normally available. At many other stations there is a taxi rank or cab office nearby. To find out more information to assist your journey you can check the Traintaxi guide on the internet at www.traintaxi.co.uk. This gives information for all stations on the national rail network including names of cab firms and contact details to facilitate pre-booking.

Metro Travel Information: 0113 245 7676
National Rail Enquiry Service: 08457 48 49 50 (24 hours)
Northern Rail Helpline: 0845 000 0125

Before you board a train at a staffed station, you must have a valid ticket or pass for your journey. If you do not purchase your ticket from the ticket office when it is open, you will not be able to take advantage of any discounted or concessionary fares. When boarding at an unstaffed station or when the ticket office is closed, you must purchase a ticket from the conductor on the train.

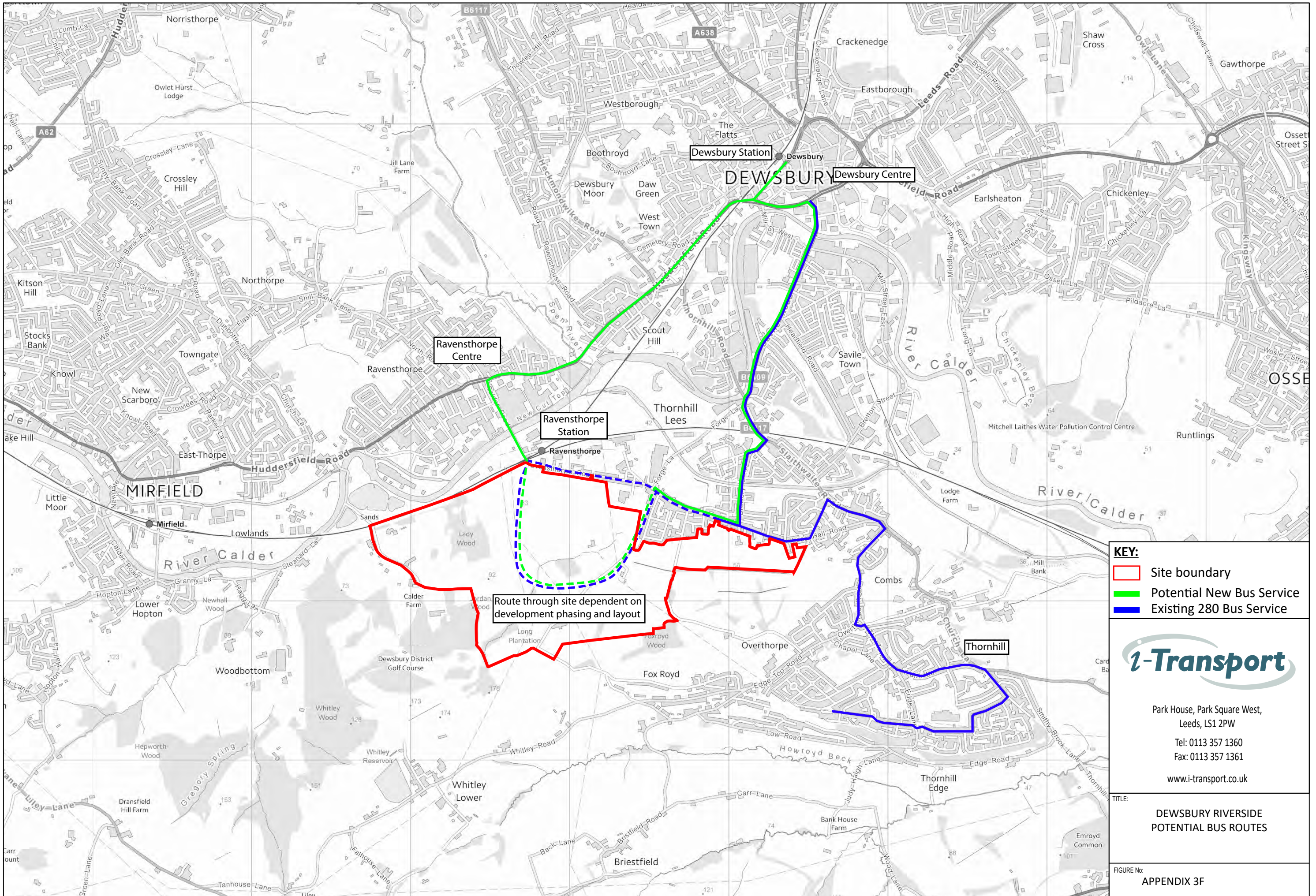
APPENDIX 3.E

**Walk and Cycle
Connections**



APPENDIX 3.F

Potential Bus Routes



- KEY:**
- Site boundary
 - Potential New Bus Service
 - Existing 280 Bus Service



Park House, Park Square West,
Leeds, LS1 2PW
Tel: 0113 357 1360
Fax: 0113 357 1361
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TITLE:
**DEWSBURY RIVERSIDE
POTENTIAL BUS ROUTES**

FIGURE No:
APPENDIX 3F

APPENDIX 3.G

Bus Costs and Revenues

Dewsbury Riverside - Bus Patronage & Revenue Calculations
Indicative Bus Revenue and Costs

	Estimated Yield	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	2035/36	2036/37	2037/38	2038/39	2039/40	2040/341
Housing Per Year	2310	0	0	45	130	175	180	180	180	190	195	200	205	210	210	210	210	210	210	210	210	210	180	120	85	45
Cumulative Start of the Year		0	0	0	45	175	350	530	710	890	1080	1275	1475	1680	1890	2100	2310	2520	2730	2940	3150	3360	3570	3750	3870	3955
Cumulative End of the Year		0	0	45	175	350	530	710	890	1080	1275	1475	1680	1890	2100	2310	2520	2730	2940	3150	3360	3570	3750	3870	3955	4000
Total Delivered (midpoint)				23	110	263	440	620	800	985	1178	1375	1578	1785	1995	2205	2415	2625	2835	3045	3255	3465	3660	3810	3913	3978
Bus Revenue Per Annum				£4,651	£22,736	£54,258	£90,946	£128,151	£165,356	£203,595	£243,384	£284,206	£326,062	£368,951	£412,357	£455,763	£499,169	£542,575	£585,981	£629,387	£672,793	£716,199	£756,505	£787,509	£808,695	£822,131

OPTION 1 NEW CIRCULAR 30 MINUTE FREQUENCY

Revenue - Development								£102,521	£132,285	£162,876	£194,707	£227,365	£260,849	£295,161	£329,886	£364,611	£399,335	£434,060	£468,785	£503,510	£538,235	£572,959	£605,204	£630,007	£646,956	£657,704
Revenue - Background								£62,500	£93,750	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000	£125,000
Total Revenue								£165,021	£226,035	£287,876	£319,707	£352,365	£385,849	£420,161	£454,886	£489,611	£524,335	£559,060	£593,785	£628,510	£663,235	£697,959	£730,204	£755,008	£771,958	£782,707
Cost Per Annum								£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000	£300,000
Subsidy								-£134,979	-£73,965	-£12,124	£19,707	£52,365	£85,849	£120,161	£154,886	£189,611	£224,335	£259,060	£293,785	£328,510	£363,235	£397,959	£430,204	£455,007	£471,956	£482,704
Total Subsidy												-£201,361														

OPTION 2 NEW CIRCULAR 15 MINUTE FREQUENCY

Revenue - Development								£128,151	£165,356	£203,595	£243,384	£284,206	£326,062	£368,951	£412,357	£455,763	£499,169	£542,575	£585,981	£629,387	£672,793	£716,199	£756,505	£787,509	£808,695	£822,131
Revenue - Background								£100,000	£150,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000	£200,000
Total Revenue								£228,151	£315,356	£403,595	£443,384	£484,206	£526,062	£568,951	£612,357	£655,763	£699,169	£742,575	£785,981	£829,387	£872,793	£916,199	£956,505	£987,510	£1,008,697	£1,022,134
Cost Per Annum								£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000	£600,000
Subsidy								-£371,849	-£284,644	-£196,405	-£156,616	-£115,794	-£73,938	-£31,049	£12,357	£55,763	£99,169	£142,575	£185,981	£229,387	£272,793	£316,199	£356,505	£387,509	£408,695	£422,131
Total Subsidy																-£1,217,938										

OPTION 3 EXTEND EXISTING 280 BUS SERVICE 12 MINUTE FREQUENCY

Revenue - Development								£128,151	£165,356	£203,595	£243,384	£284,206	£326,062	£368,951	£412,357	£455,763	£499,169	£542,575	£585,981	£629,387	£672,793	£716,199	£756,505	£787,509	£808,695	£822,131
Revenue - Background								-£37,500	-£56,250	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£75,000	-£74,999	-£74,998	-£74,997
Total Revenue								£90,651	£109,106	£128,595	£168,384	£209,206	£251,062	£293,951	£337,357	£380,763	£424,169	£467,575	£510,981	£554,387	£597,793	£641,199	£681,505	£712,510	£733,697	£747,134
Cost Per Annum								£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000	£375,000
Subsidy								-£284,349	-£265,894	-£246,405	-£206,616	-£165,794	-£123,938	-£81,049	-£37,643	£5,763	£49,169	£92,575	£135,981	£179,387	£222,793	£266,199	£306,505	£337,509	£358,695	£372,131
Total Subsidy																										-£1,405,925

APPENDIX 3.H

Key Facilities and Services

KEY:

Education

- 1 Ravenshall School
- 2 Headfield C of E Junior School
- 3 Ravensthorpe C of E Junior School
- 4 Diamond Wood Community Academy
- 5 St Paulinus Catholic School
- 6 Boothroyd Primary Academy
- 7 Paradise Primary School
- 8 Thornhill Infant and Junior School
- 9 Overthorpe C of E School
- 10 Westmoor Junior School
- 11 Bywell Junior School
- 12 Thornhill Lees C of E Infant & Nursery School
- 13 Savile Town C of E Infant & Nursery School
- 14 Pentland Infant & Nursery School

- 1 Thornhill Community Academy
- 2 Westborough High School
- 3 St John Fisher Academy
- 4 Manor Croft Academy
- 5 Castle Hall Academy
- 6 The Mirfield Free Grammar & Sixth Form

Health - GP

- 1 Brewery Lane Surgery
- 2 Thornhill Lees Medical Centre
- 3 Ravensthorpe Health Centre
- 4 Paddock Surgery
- 5 Mountain Road Surgery
- 6 Savile Road Surgery
- 7 Savile Town Medical Centre
- 8 Windsor Medical Centre
- 9 Mount Pleasant Medical Centre
- 10 Mirfield Health Centre
- 11 Dewsbury Primary Care Centre
- 12 Victoria Medical Centre

Health - Pharmacy

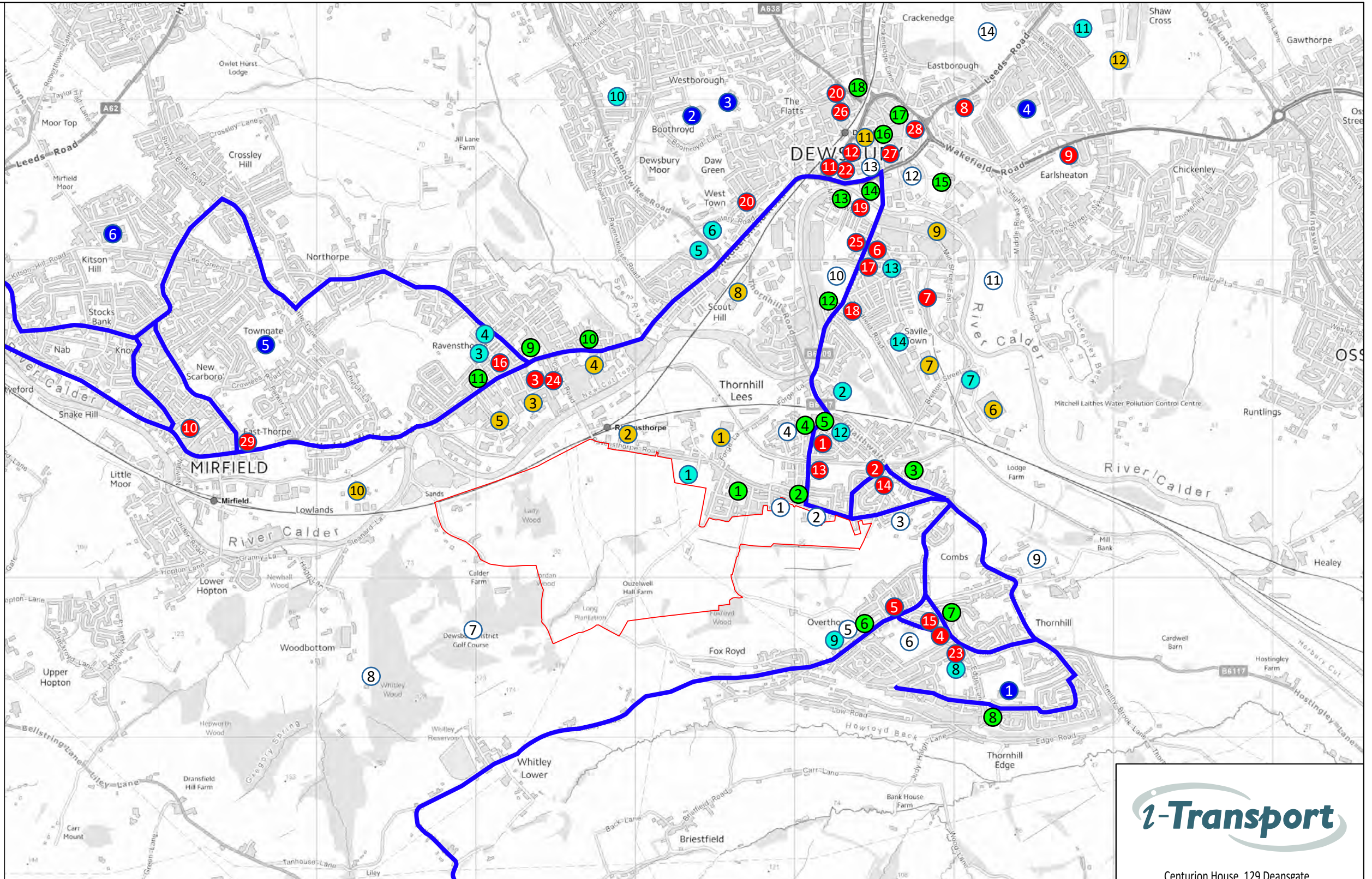
- 13 Brewery Lane Pharmacy
- 14 Sykes Chemist
- 15 Rowlands Pharmacy
- 16 Well Ravensthorpe
- 17 Nobles Chemist
- 18 Savile Town Pharmacy
- 19 Asda Pharmacy
- 20 Pharmacy D
- 21 Lloyds Pharmacy
- 22 Pharmacy D

Health - Dentist

- 23 Thornhill Dental Surgery
- 24 Ravensthorpe Health Centre
- 25 Dewsbury Dental Care
- 26 Dewsbury Dental Centre
- 27 Baker & Rigby Dental Surgery
- 28 The Empire House Dental Surgery
- 29 Wood Dental

Leisure

- 1 Morton House Club & Institute
- 2 Thornhill Lees Village Hall



- 3 Honeysuckle Park
- 4 Centenary Football Pitch
- 5 Overthorpe Sports Club
- 6 Overthorpe Park
- 7 Dewsbury District Golf Club
- 8 Hopton Mills Cricket Club
- 9 Thornhill Cricket & Bowling Club
- 10 Savile Road Sports Pitches
- 11 Dewsbury United Cricket Club
- 12 Dewsbury Sports Centre
- 13 New Picture House
- 14 Hanging Heaton Golf Club

Retail

- 1 Kang Brothers Off-License
- 2 The Bakery
- 3 Mullaco Supermarket
- 4 Shops on Brewery Lane
- 5 Thornhill Lees Post Office
- 6 Edge Top Post Office
- 7 The Co-operative Food
- 8 Thornhill Edge Post Office
- 9 Ravensthorpe Retail Park
- 10 Local Shops on A644
- 11 Ravensthorpe Post Office

- 12 NISA Local
- 13 Asda Superstore
- 14 B&Q and Farmfoods
- 15 Rishworth Shopping Centre
- 16 Dewsbury Town Centre
- 17 Dewsbury Market
- 18 Lidl

Employment

- 1 Industrial Units off Forge Lane
- 2 Industrial Units off Ravensthorpe Road
- 3 Industrial Units off Netherfield Road
- 4 Industrial Units off Huddersfield Road
- 5 Industrial Units off Low Mill Lane
- 6 Bretton Park Industrial Park
- 7 Bretfield Court Industrial Estate
- 8 Industrial Units off Thornhill Road
- 9 Industrial Units off Mill Street East
- 10 Industrial Units off Lowlands Road
- 11 Dewsbury Town Centre
- 12 Shaw Cross Business Park

— Existing Bus Routes



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TITLE:
**DEWSBURY RIVERSIDE,
KEY FACILITIES AND SERVICES**

FIGURE No:
APPENDIX 3H

APPENDIX 4.A

**Existing Peak Hour Traffic
Flows**

2012-2016
 AM Growth Factor = 1.016
 PM Growth Factor = 1.018

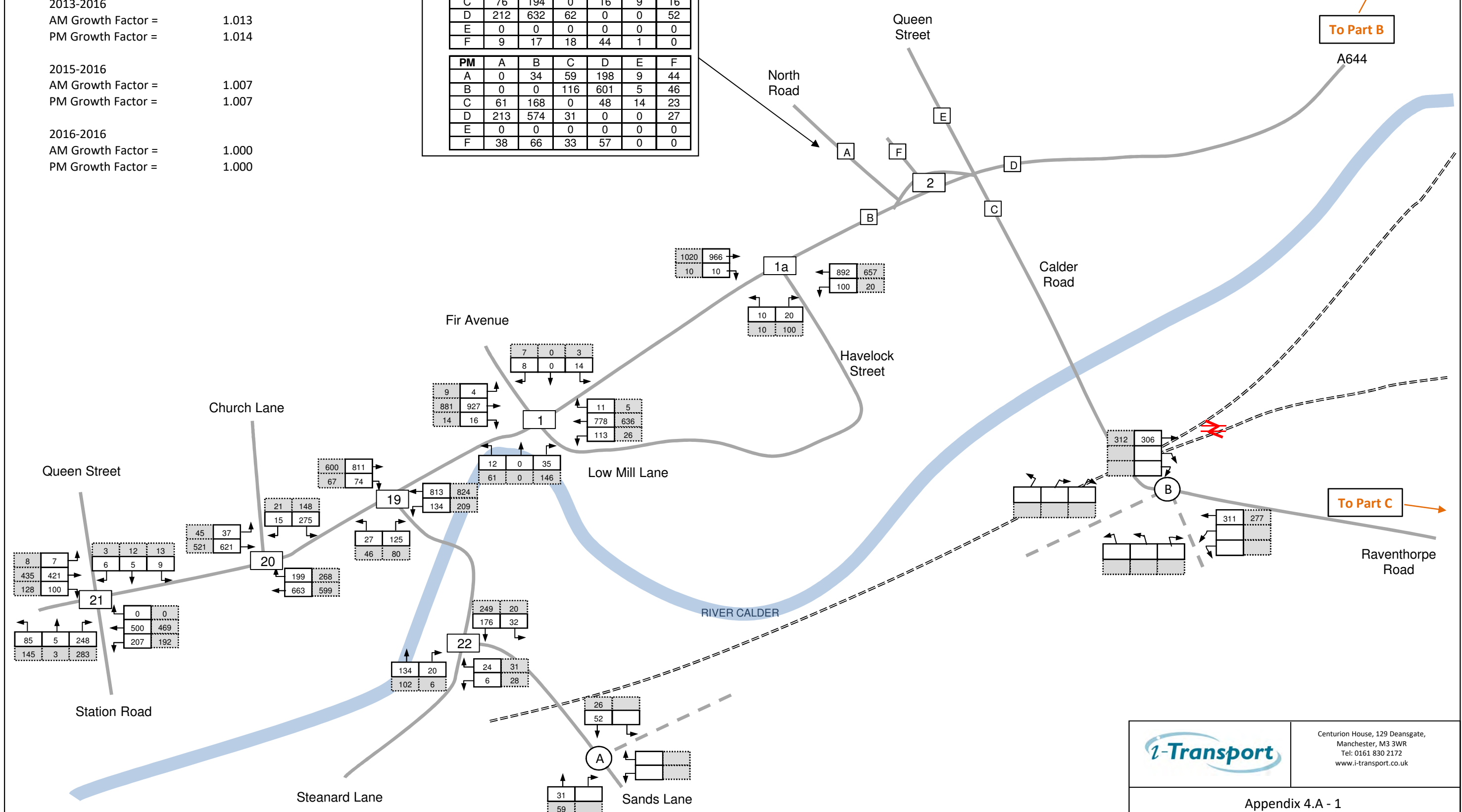
2013-2016
 AM Growth Factor = 1.013
 PM Growth Factor = 1.014

2015-2016
 AM Growth Factor = 1.007
 PM Growth Factor = 1.007


2016-2016
 AM Growth Factor = 1.000
 PM Growth Factor = 1.000


AM	A	B	C	D	E	F
A	0	18	156	379	9	28
B	0	0	70	620	5	48
C	76	194	0	16	9	16
D	212	632	62	0	0	52
E	0	0	0	0	0	0
F	9	17	18	44	1	0

PM	A	B	C	D	E	F
A	0	34	59	198	9	44
B	0	0	116	601	5	46
C	61	168	0	48	14	23
D	213	574	31	0	0	27
E	0	0	0	0	0	0
F	38	66	33	57	0	0



Key

 AM Peak (07:45 - 08:45)

 PM Peak (16:30 - 17:30)

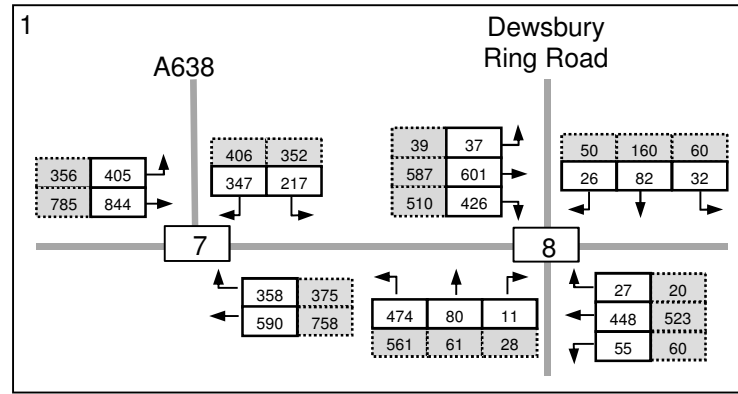


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Appendix 4.A - 1

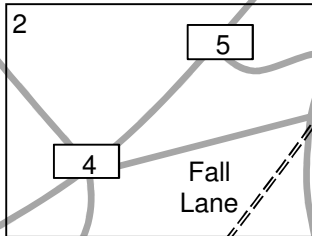
Riverside Dewsbury
 2016 Base Flows

Note: Traffic flows shown in PCUs



Cemetery Road

Heckmondwike Road



Broad Street

To Part A

A644

Thornhill Road

To Part C

Saville Road

To Part C

Saville Road

Mill Street

Bus Station

Old Westgate

9

34 14 59
35 15 45

0 0
541 538
116 81

44 0 675
109 0 707

0 0
446 458
600 559

125 59
166 195
402 273

276 410 9
294 378 14

87 384 258
49 303 254

221 255
178 206
10 23

17

608 90
413 51

550 126
495 132

70 80
159 152

16

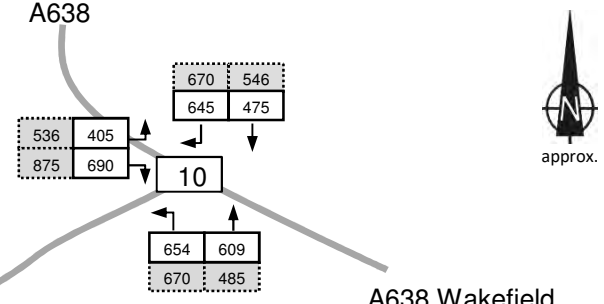
15

Mill Street East

Orchard Street

Headfield Road

Caledonian Road



A638 Dewsbury Ring Road

536 405
875 690

670 546
645 475

10

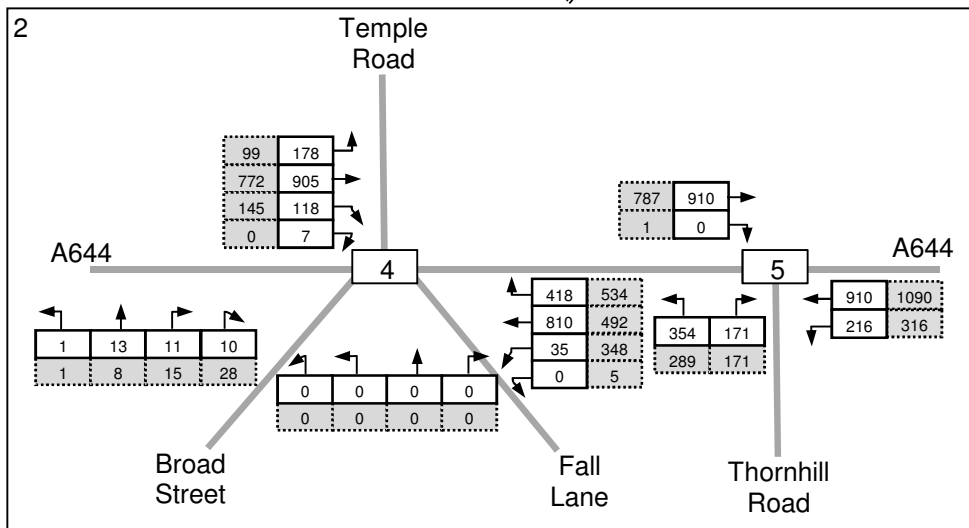
654 609
670 485

A638 Wakefield Road

2012-2016	AM Growth Factor =	1.016
	PM Growth Factor =	1.018
2013-2016	AM Growth Factor =	1.013
	PM Growth Factor =	1.014
2015-2016	AM Growth Factor =	1.007
	PM Growth Factor =	1.007
2016-2016	AM Growth Factor =	1.000

Key

- AM Peak (07:45 -08:45)
- PM Peak (16:30 - 17:30)



Temple Road

A644

A644

1 13 11 10
1 8 15 28

99 178
772 905
145 118
0 7

418 534
810 492
35 348
0 5

0 0 0 0
0 0 0 0

787 910
1 0

354 171
289 171

910 1090
216 316

Broad Street

Fall Lane

Thornhill Road

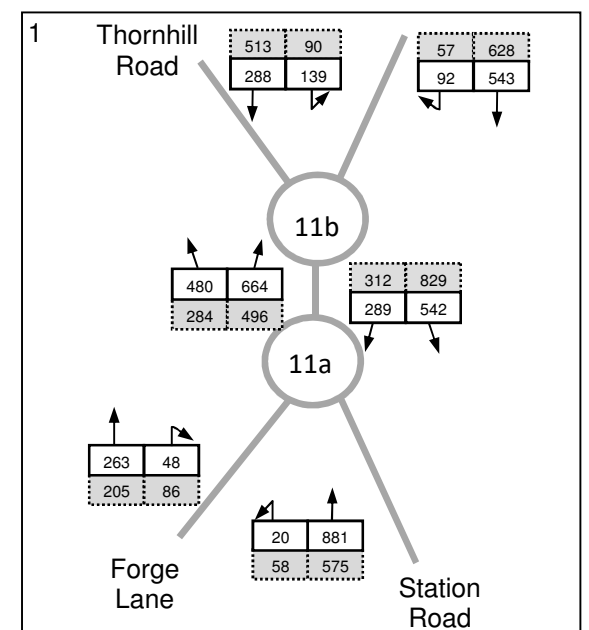


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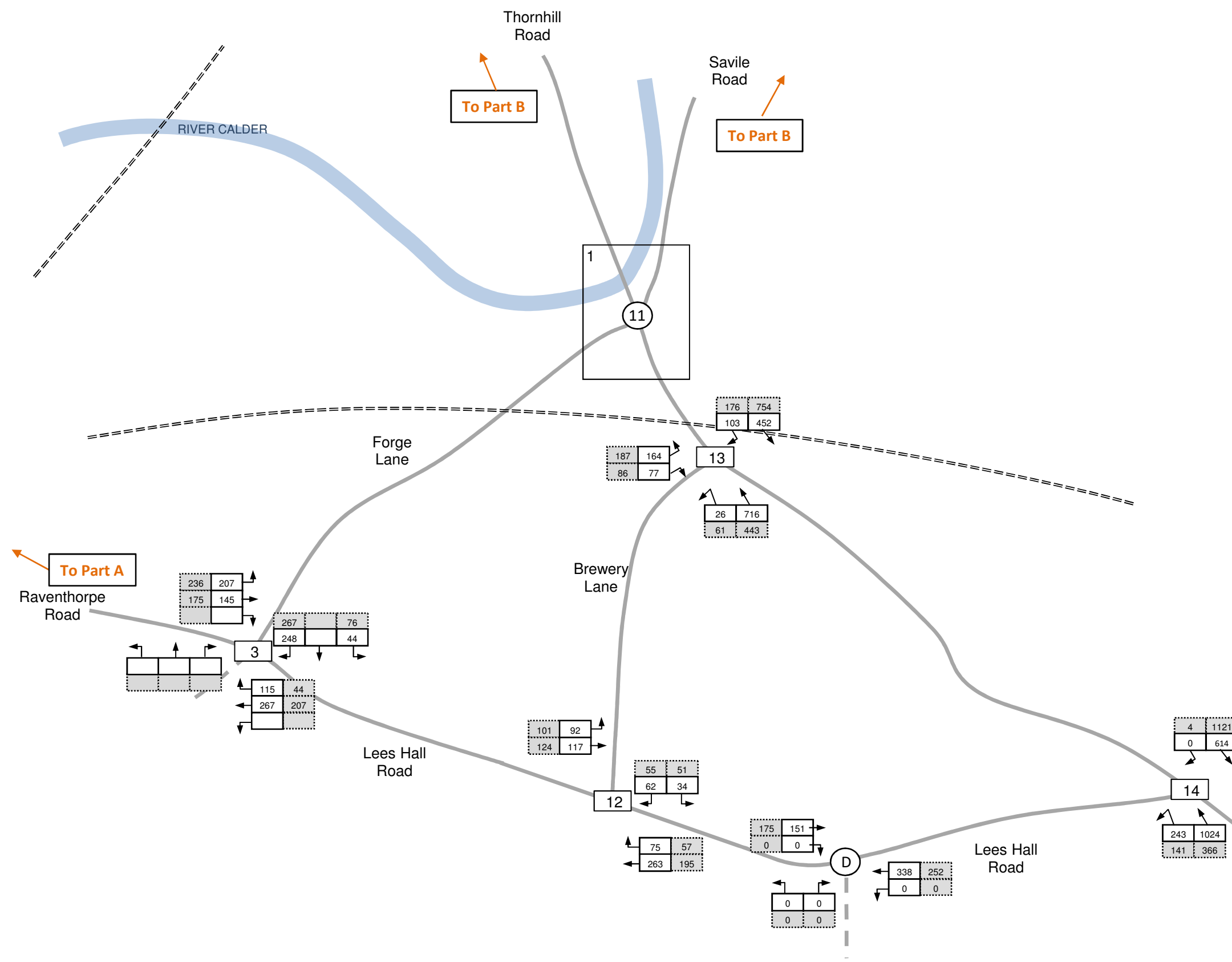
Appendix 4.A - 2

Riverside Dewsbury
2016 Base Flows

Note: Traffic flows shown in PCUs



Flows taken from 2013 survey



2012-2016	
AM Growth Factor =	1.016
PM Growth Factor =	1.018
2013-2016	
AM Growth Factor =	1.013
PM Growth Factor =	1.014
2015-2016	
AM Growth Factor =	1.007
PM Growth Factor =	1.007
2016-2016	
AM Growth Factor =	1.000
PM Growth Factor =	1.000

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	Appendix 4.A - 3

Key	
	AM Peak (07:45 - 08:45)
	PM Peak (16:30 - 17:30)

Riverside Dewsbury
2016 Base Flows

Note: Traffic flows shown in PCUs

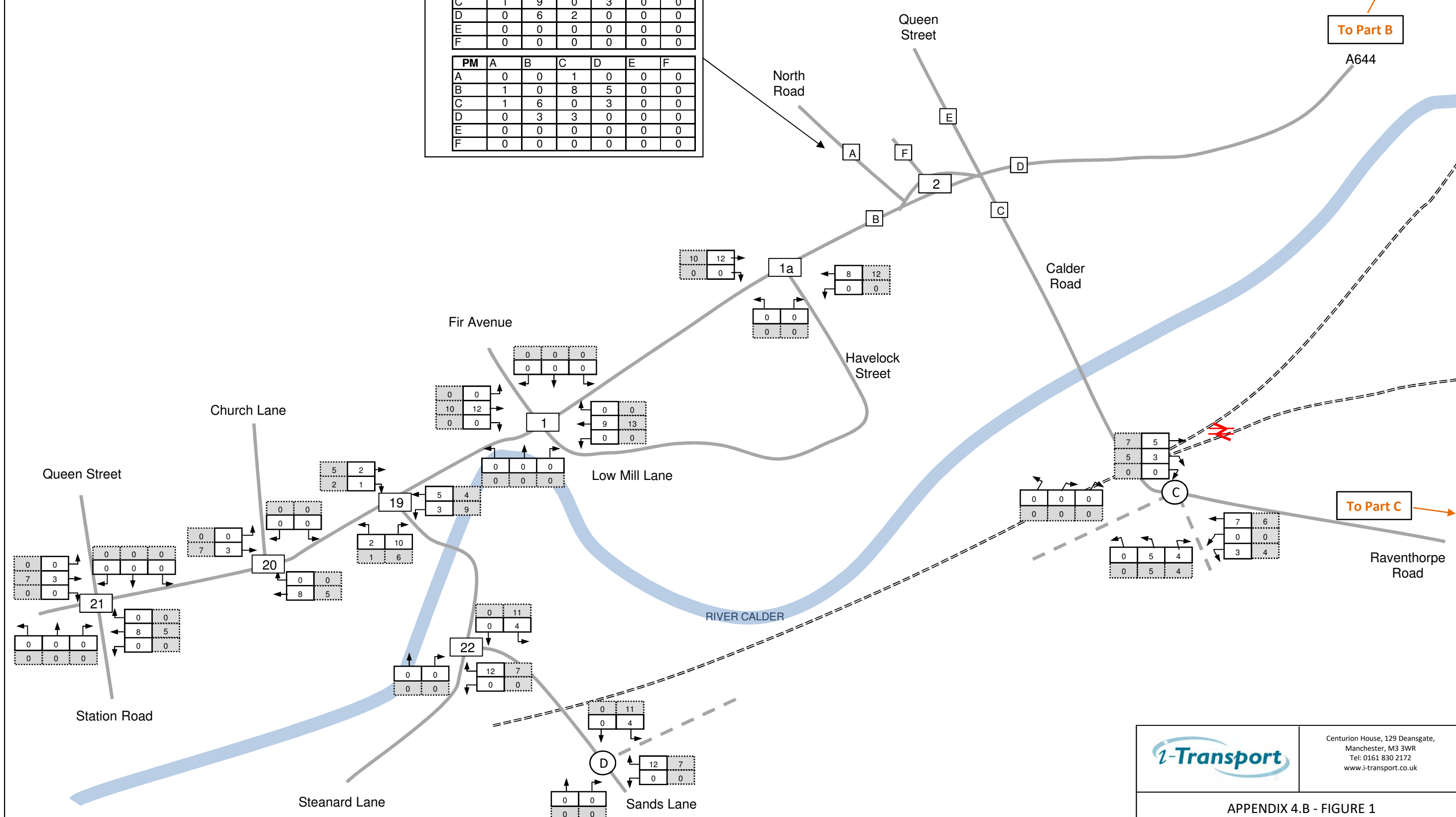
APPENDIX 4.B

**Development Traffic
Flows – 5 and 7 Year
Assessments**



1						
AM	A	B	C	D	E	F
A	0	1	1	0	0	0
B	0	0	4	2	0	0
C	1	9	0	3	0	0
D	0	6	2	0	0	0
E	0	0	0	0	0	0
F	0	0	0	0	0	0

PM	A	B	C	D	E	F
A	0	0	1	0	0	0
B	1	0	8	5	0	0
C	1	6	0	3	0	0
D	0	3	3	0	0	0
E	0	0	0	0	0	0
F	0	0	0	0	0	0



To Part B

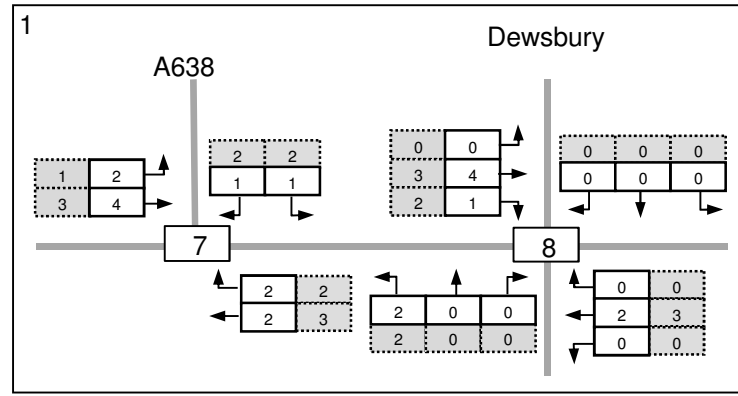
To Part C

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	APPENDIX 4.B - FIGURE 1

Riverside Dewsbury
Total Proposed Residential Development
5 Year Assessment - Part A

Key	
	AM Peak (07:45 - 08:45)
	PM Peak (16:30 - 17:30)

Note: Traffic flows shown in PCUs



Heckmondwike

Cemetery

Watergate

Mill Street

Saville Road

RIVER CALDER

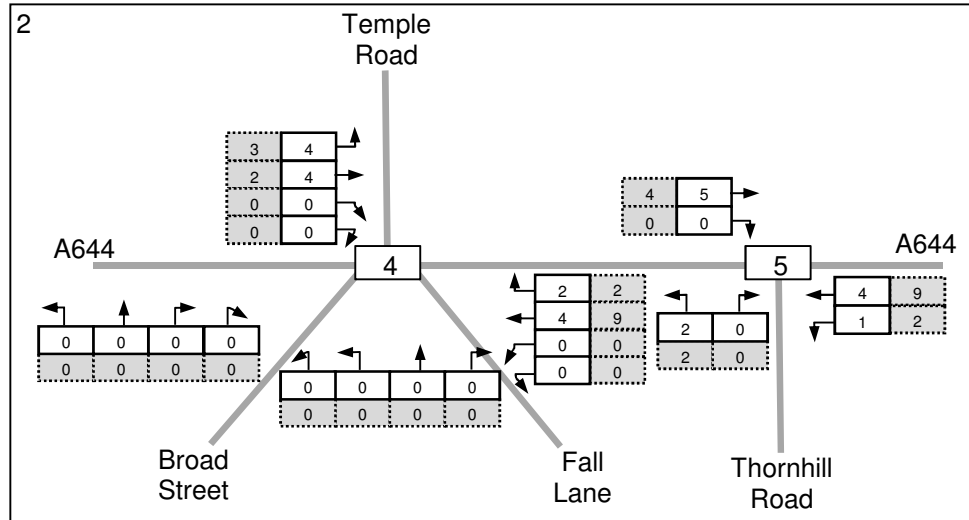
Mill Street

Orchard

Thornhill

Headfield

Caledonian Road



To Part A

To Part C

To Part C

Key

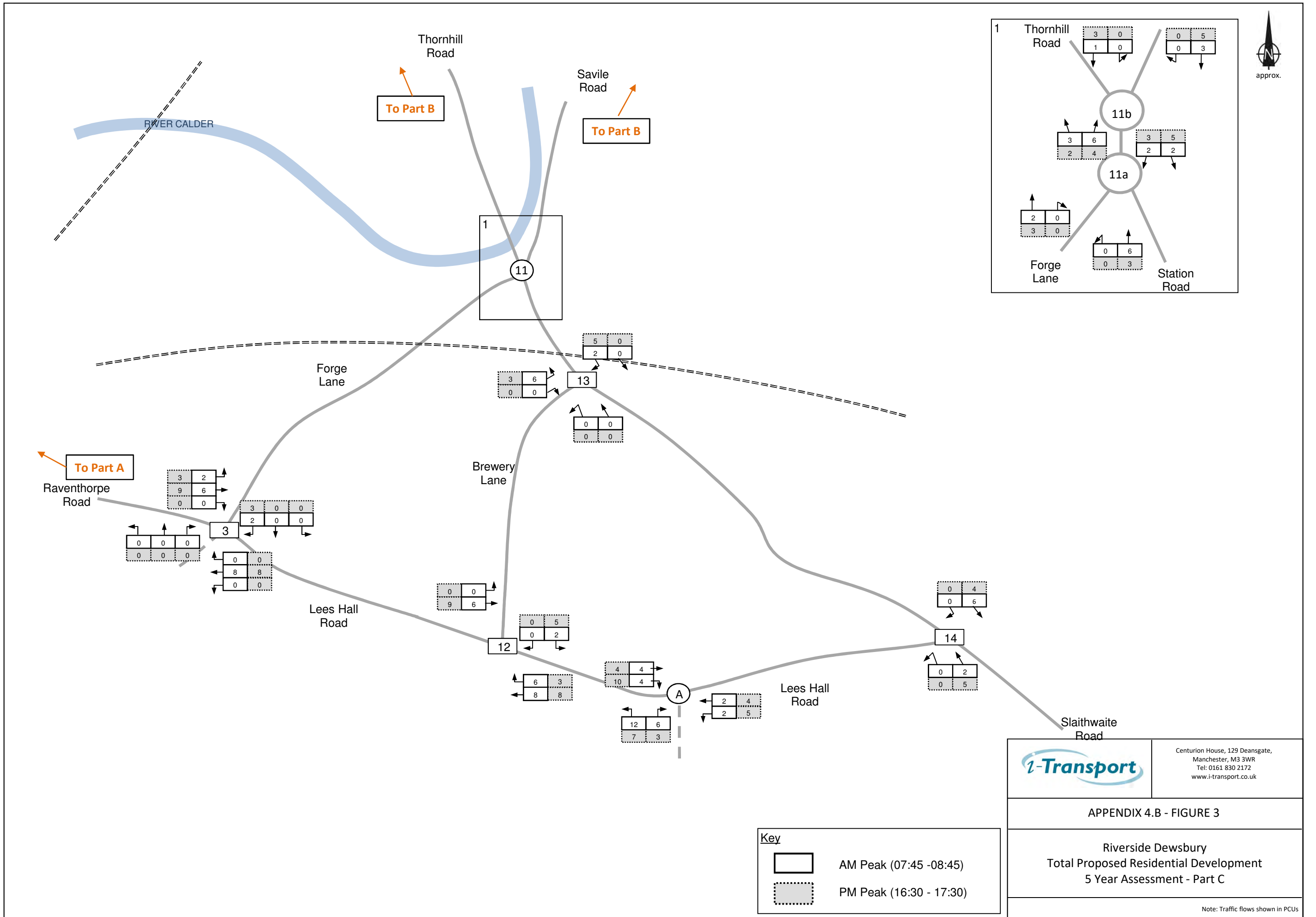
- AM Peak (07:45 - 08:45)
- PM Peak (16:30 - 17:30)

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APPENDIX 4.B - FIGURE 2

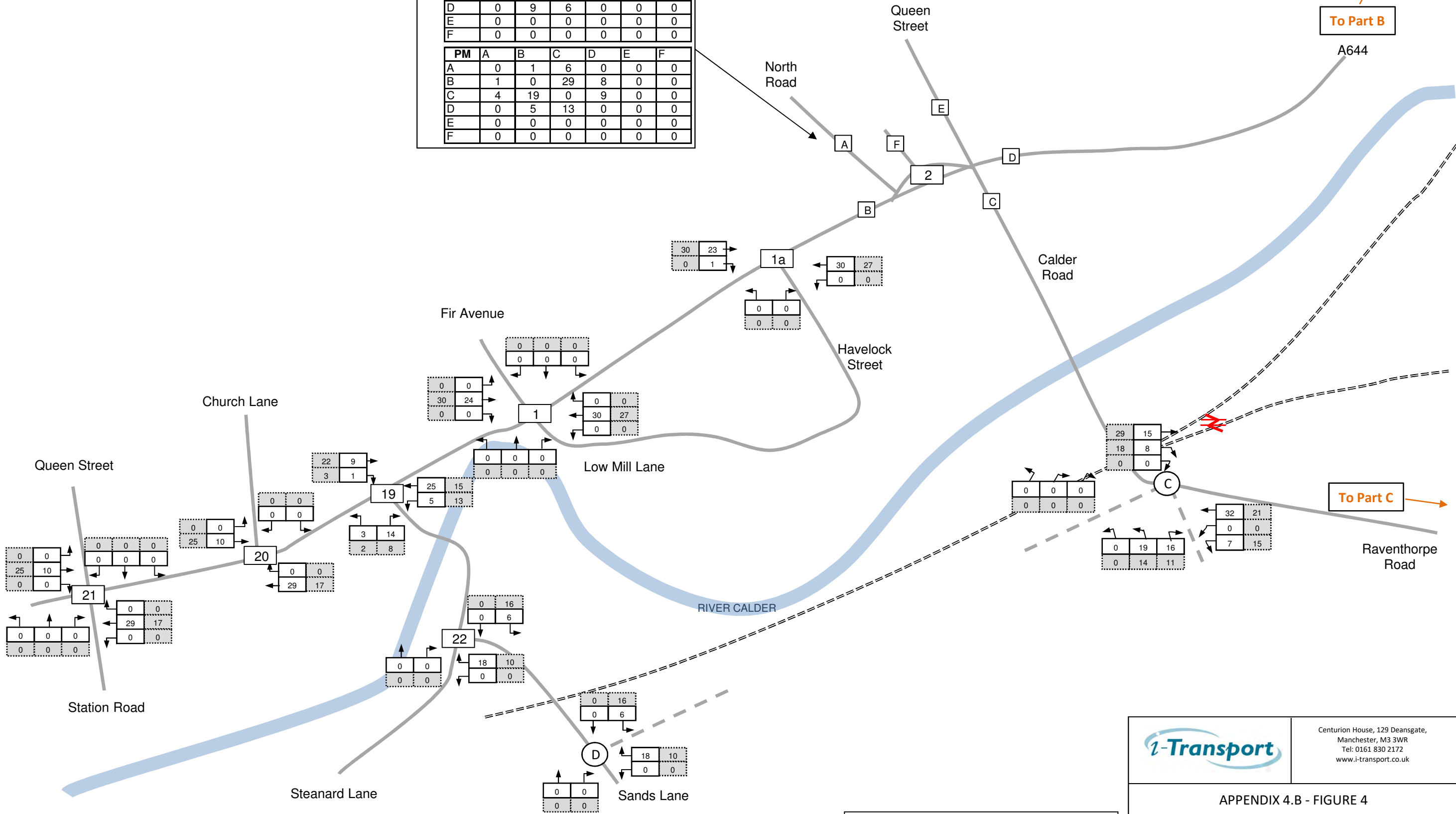
Riverside Dewsbury
Total Proposed Residential Development
5 Year Assessment - Part B

Note: Traffic flows shown in PCUs





1						
AM	A	B	C	D	E	F
A	0	1	3	0	0	0
B	0	0	12	3	0	0
C	7	33	0	14	0	0
D	0	9	6	0	0	0
E	0	0	0	0	0	0
F	0	0	0	0	0	0
PM	A	B	C	D	E	F
A	0	1	6	0	0	0
B	1	0	29	8	0	0
C	4	19	0	9	0	0
D	0	5	13	0	0	0
E	0	0	0	0	0	0
F	0	0	0	0	0	0

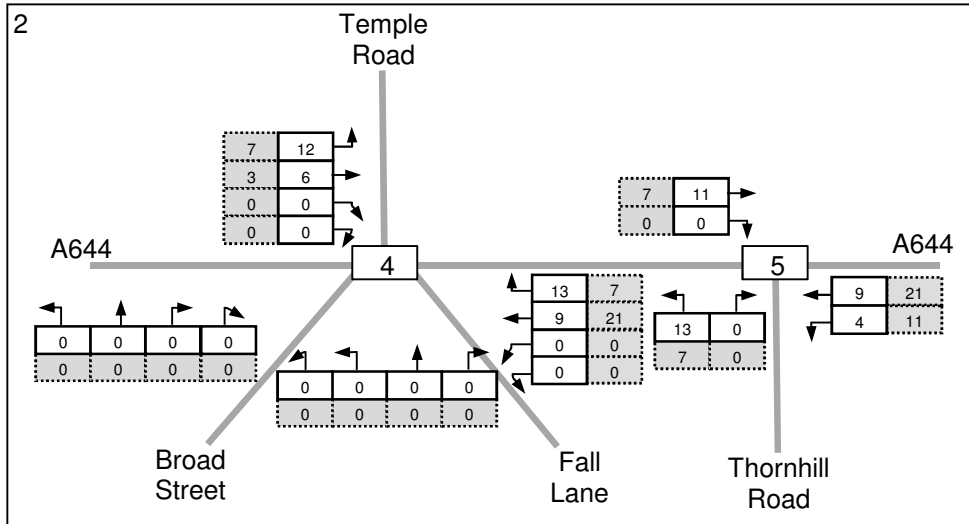
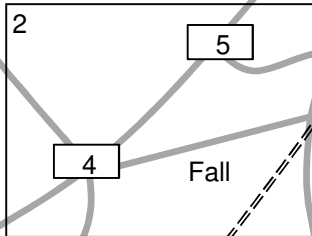
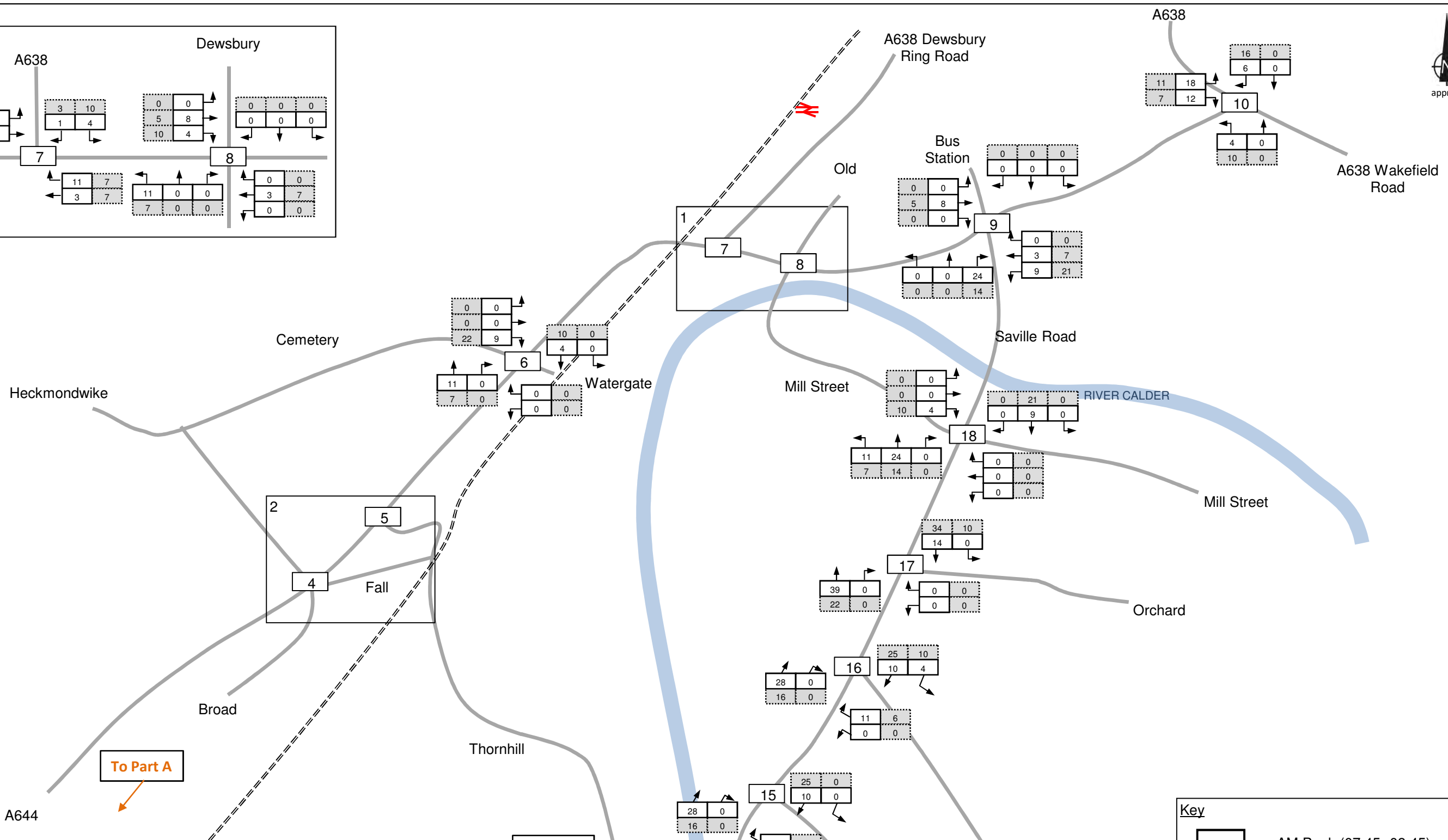
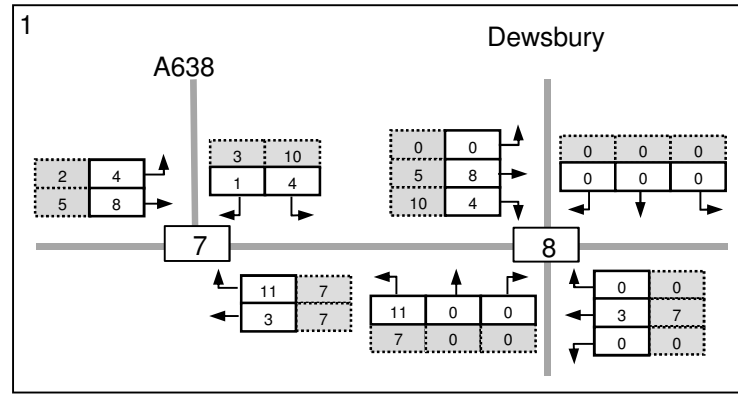


Key	
	AM Peak (07:45 - 08:45)
	PM Peak (16:30 - 17:30)

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	APPENDIX 4.B - FIGURE 4

Riverside Dewsbury
Total Proposed Residential Development
7 Year Assessment - Part A

Note: Traffic flows shown in PCUs



Key

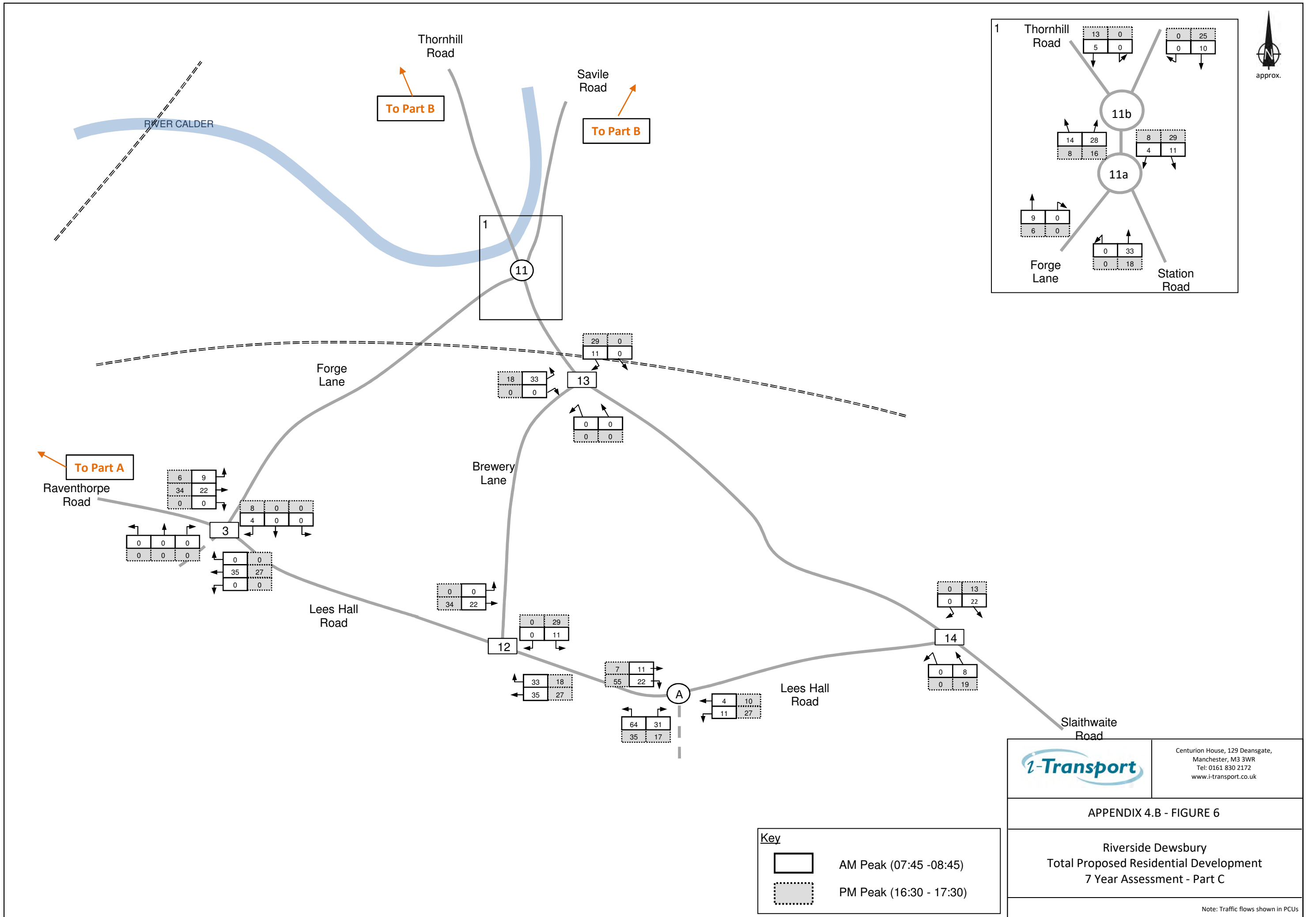
- AM Peak (07:45 - 08:45)
- PM Peak (16:30 - 17:30)

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APPENDIX 4.B - FIGURE 5

Riverside Dewsbury
Total Proposed Residential Development
7 Year Assessment - Part B

Note: Traffic flows shown in PCUs



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APPENDIX 4.B - FIGURE 6

Riverside Dewsbury
Total Proposed Residential Development
7 Year Assessment - Part C

Note: Traffic flows shown in PCUs

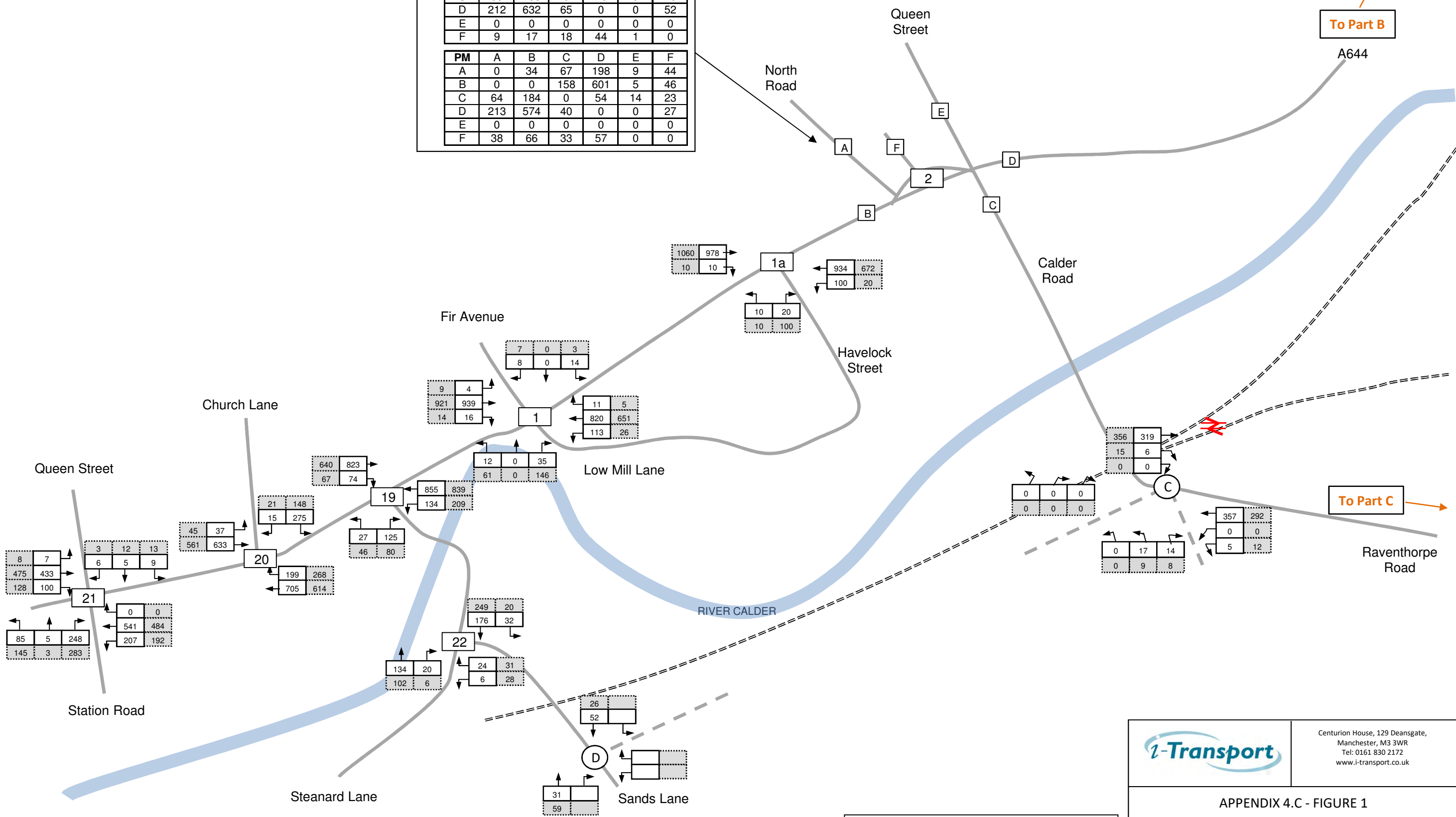
APPENDIX 4.C

**Future Year Baseline
Traffic Flows**



1						
AM	A	B	C	D	E	F
A	0	18	158	379	9	28
B	0	0	83	620	5	48
C	85	238	0	26	9	16
D	212	632	65	0	0	52
E	0	0	0	0	0	0
F	9	17	18	44	1	0

PM	A	B	C	D	E	F
A	0	34	67	198	9	44
B	0	0	158	601	5	46
C	64	184	0	54	14	23
D	213	574	40	0	0	27
E	0	0	0	0	0	0
F	38	66	33	57	0	0



To Part B

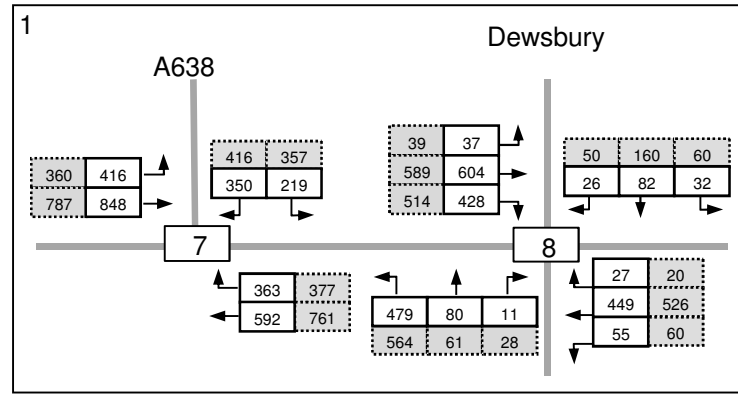
To Part C

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	APPENDIX 4.C - FIGURE 1

Dewsbury Riverside
 Base + Committed Development Flows
 (P1 - 185 Dwellings) - Part A

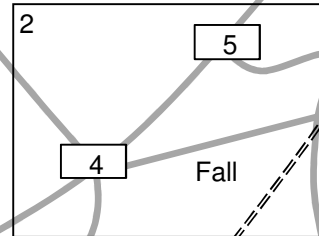
Key	
	AM Peak (07:45 - 08:45)
	PM Peak (16:30 - 17:30)

Note: Traffic flows shown in PCUs



Heckmondwike

Cemetery



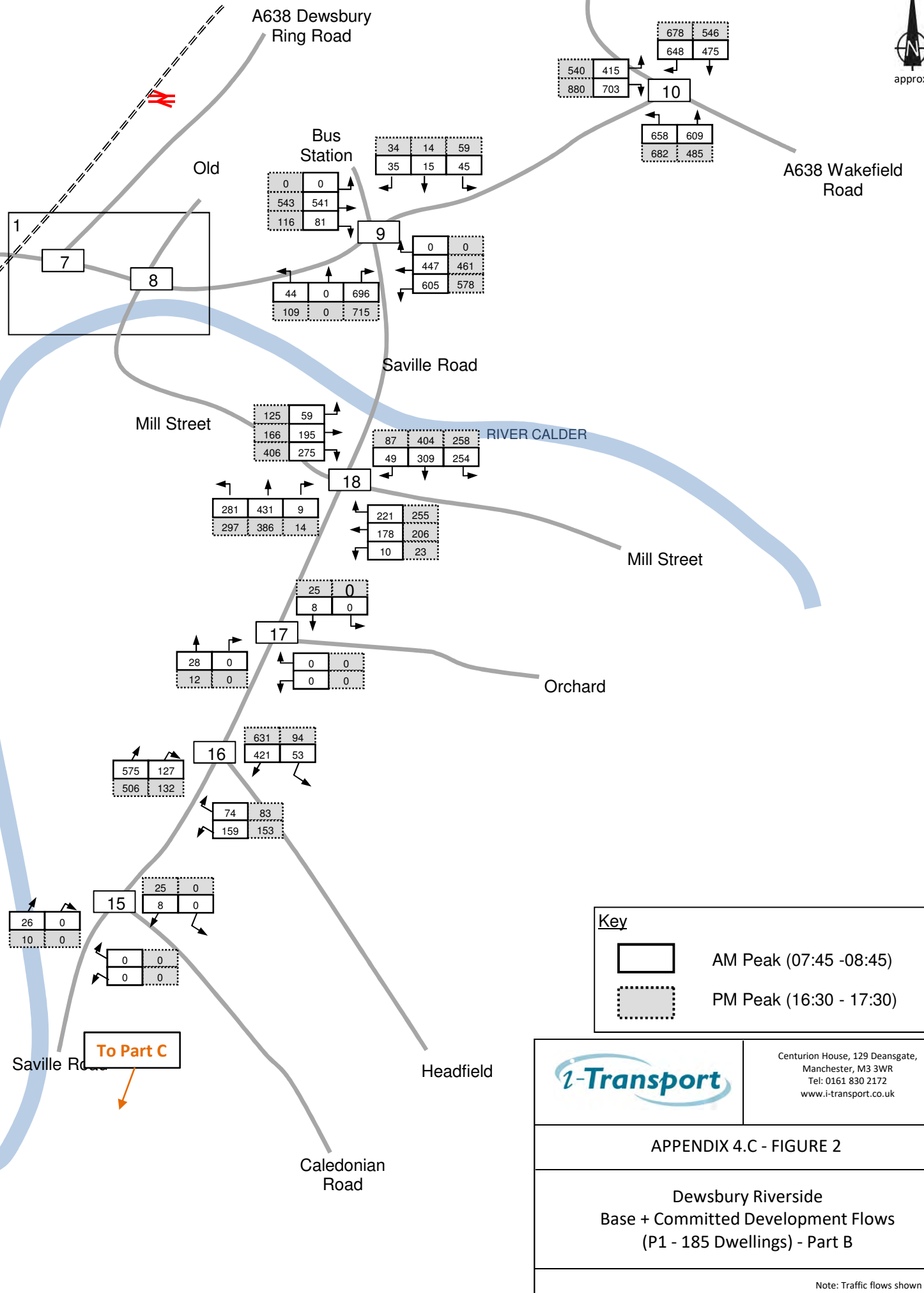
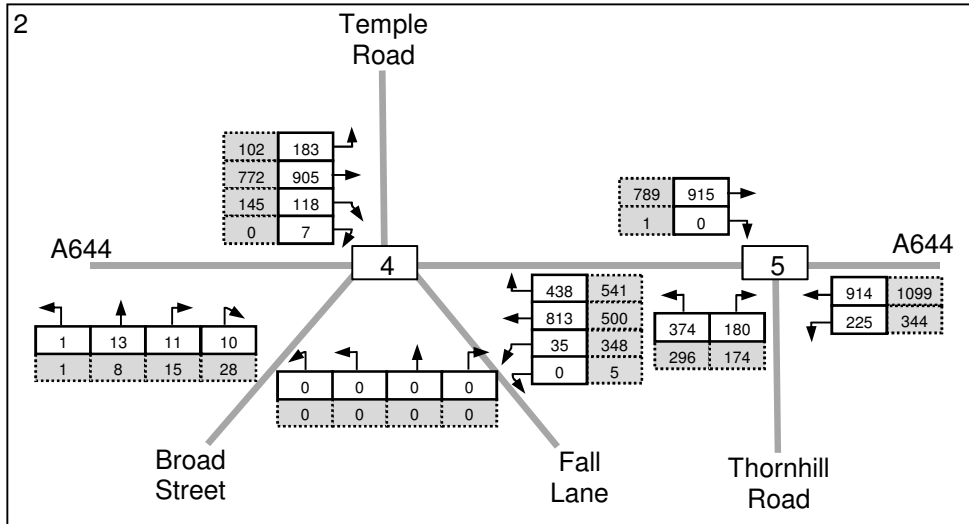
Broad

Thornhill

To Part A

To Part C

To Part C



Key

- AM Peak (07:45 - 08:45)
- PM Peak (16:30 - 17:30)

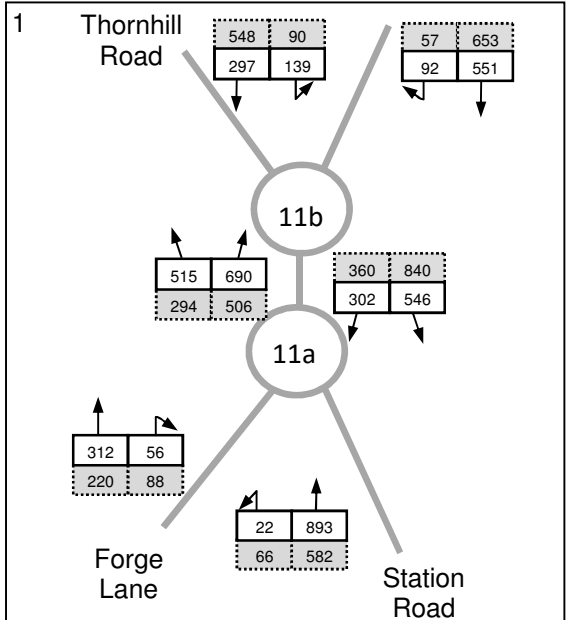
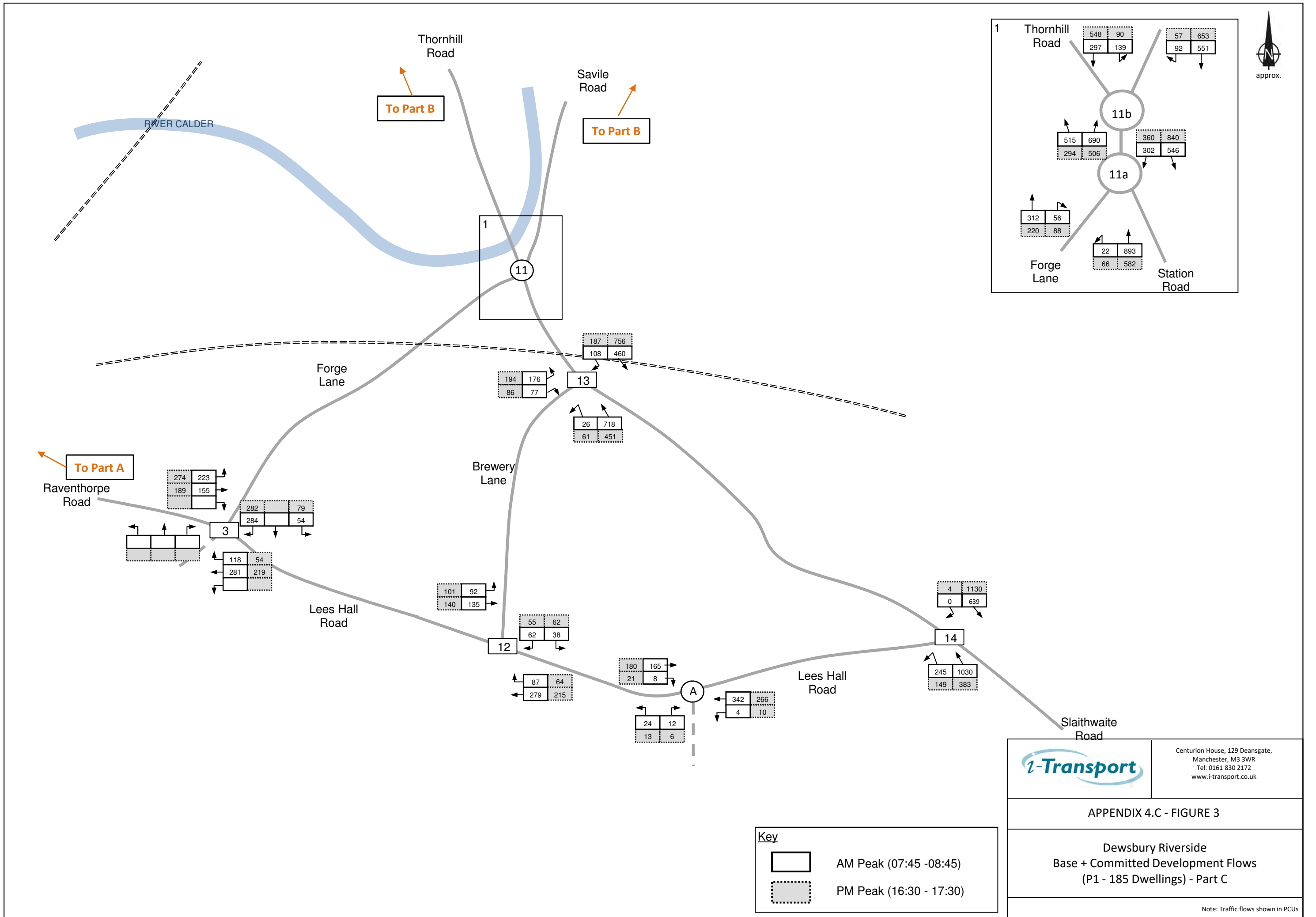
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APPENDIX 4.C - FIGURE 2

Dewsbury Riverside
Base + Committed Development Flows
(P1 - 185 Dwellings) - Part B

Note: Traffic flows shown in PCUs



To Part B

To Part B

To Part A

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APPENDIX 4.C - FIGURE 3

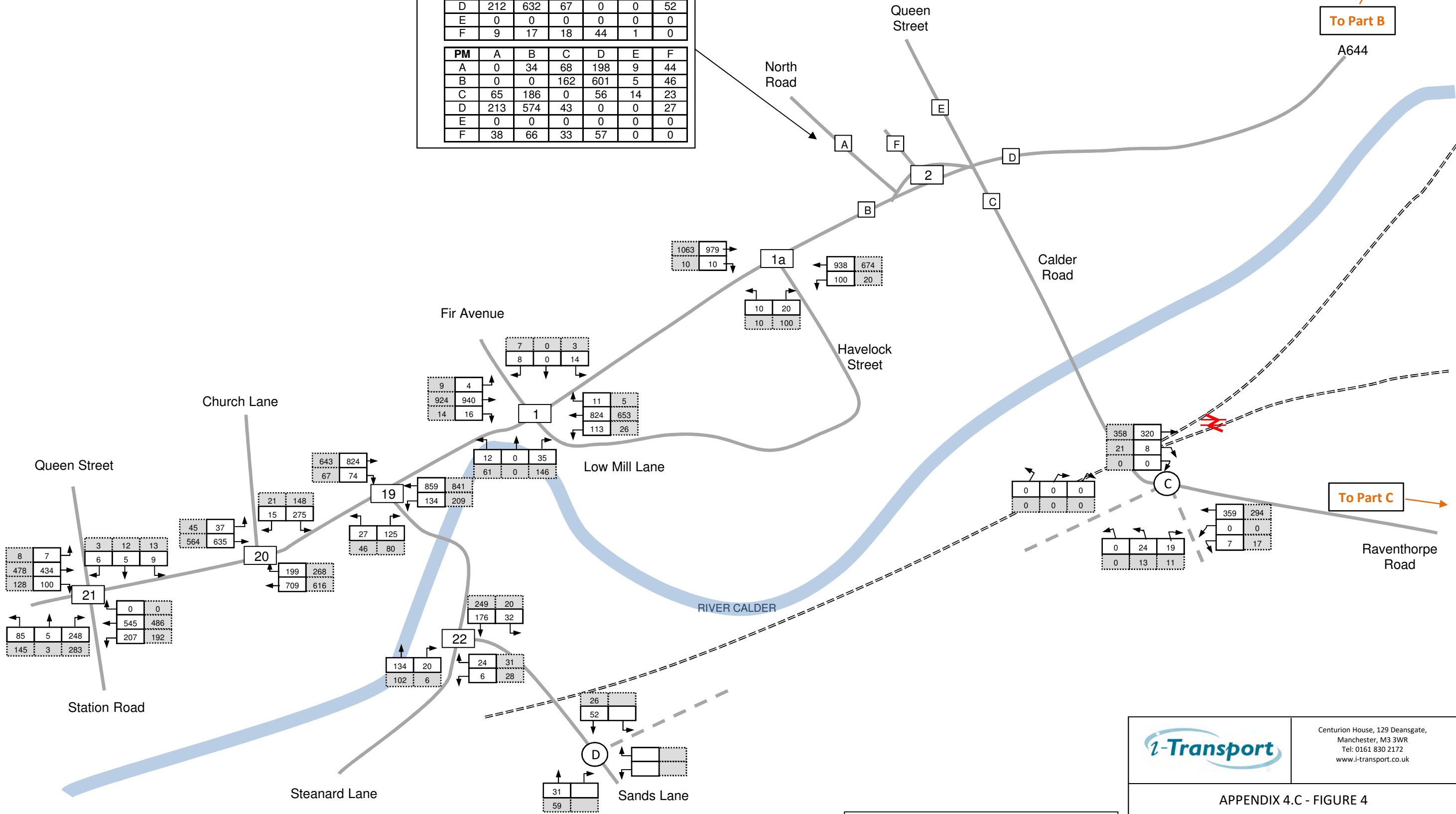
Dewsbury Riverside
Base + Committed Development Flows
(P1 - 185 Dwellings) - Part C

Note: Traffic flows shown in PCUs



1						
AM	A	B	C	D	E	F
A	0	18	159	379	9	28
B	0	0	85	620	5	48
C	86	242	0	30	9	16
D	212	632	67	0	0	52
E	0	0	0	0	0	0
F	9	17	18	44	1	0

PM	A	B	C	D	E	F
A	0	34	68	198	9	44
B	0	0	162	601	5	46
C	65	186	0	56	14	23
D	213	574	43	0	0	27
E	0	0	0	0	0	0
F	38	66	33	57	0	0

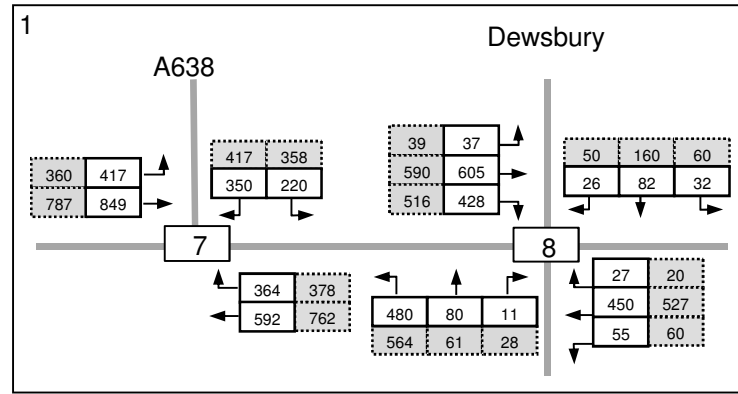


Key	
	AM Peak (07:45 - 08:45)
	PM Peak (16:30 - 17:30)

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	APPENDIX 4.C - FIGURE 4

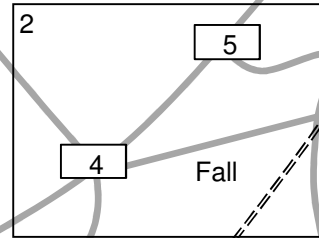
Dewsbury Riverside
 Base + Committed Development Flows
 (P1 - 240 Dwellings) - Part A

Note: Traffic flows shown in PCUs



Heckmondwike

Cemetery



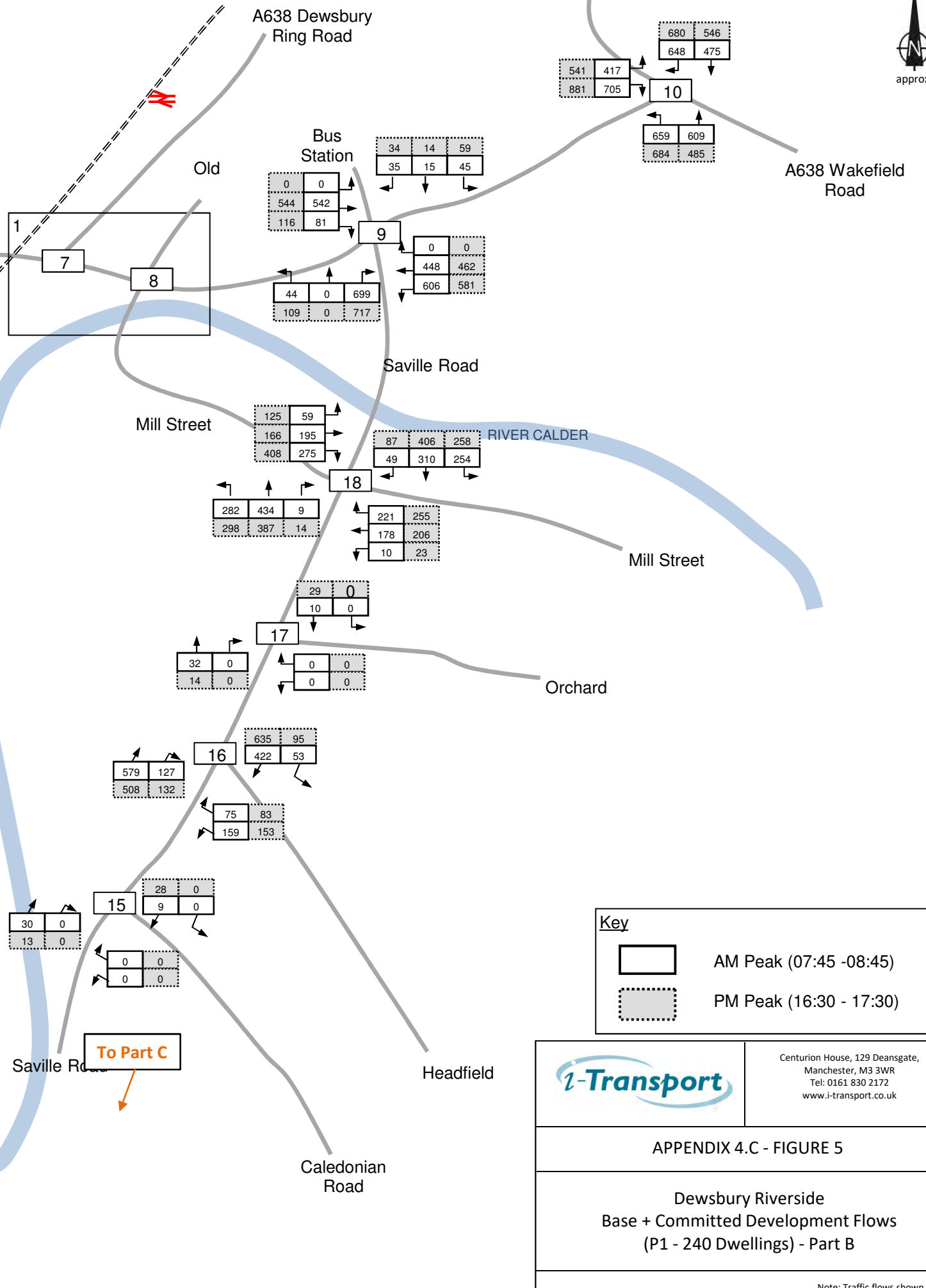
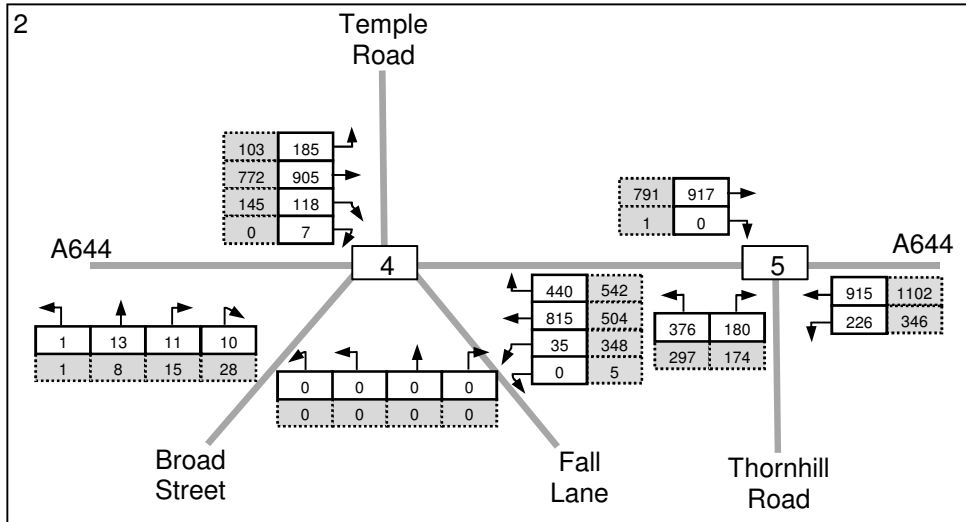
Broad

Thornhill

To Part A

To Part C

To Part C



Key

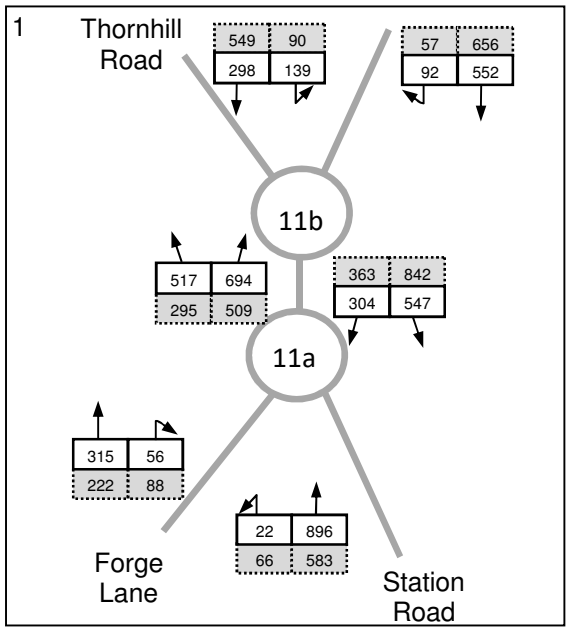
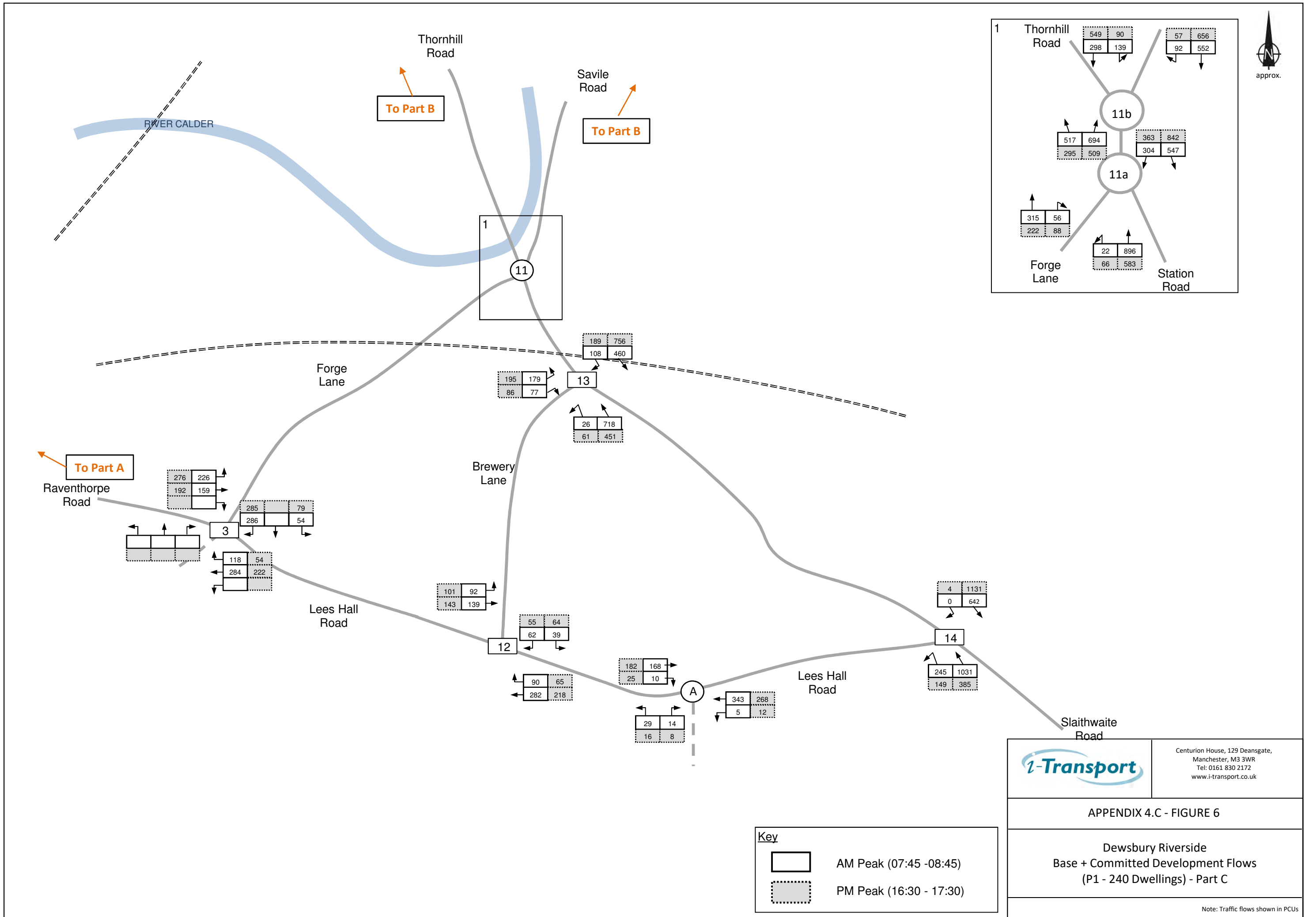
- AM Peak (07:45 - 08:45)
- PM Peak (16:30 - 17:30)

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APPENDIX 4.C - FIGURE 5

Dewsbury Riverside
Base + Committed Development Flows
(P1 - 240 Dwellings) - Part B

Note: Traffic flows shown in PCUs



Thornhill Road

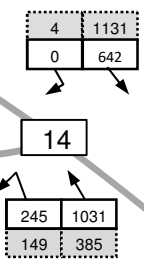
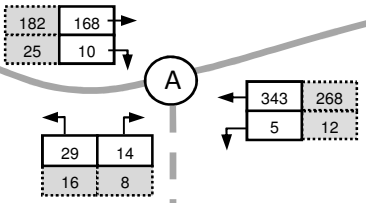
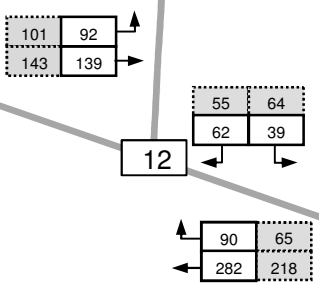
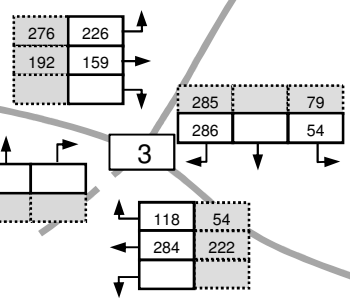
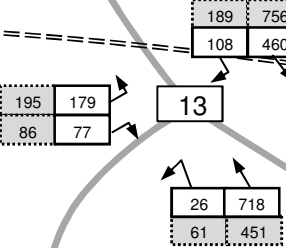
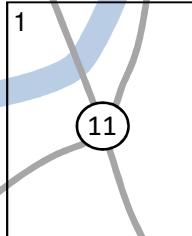
To Part B

Savile Road

To Part B

To Part A

RIVER CALDER



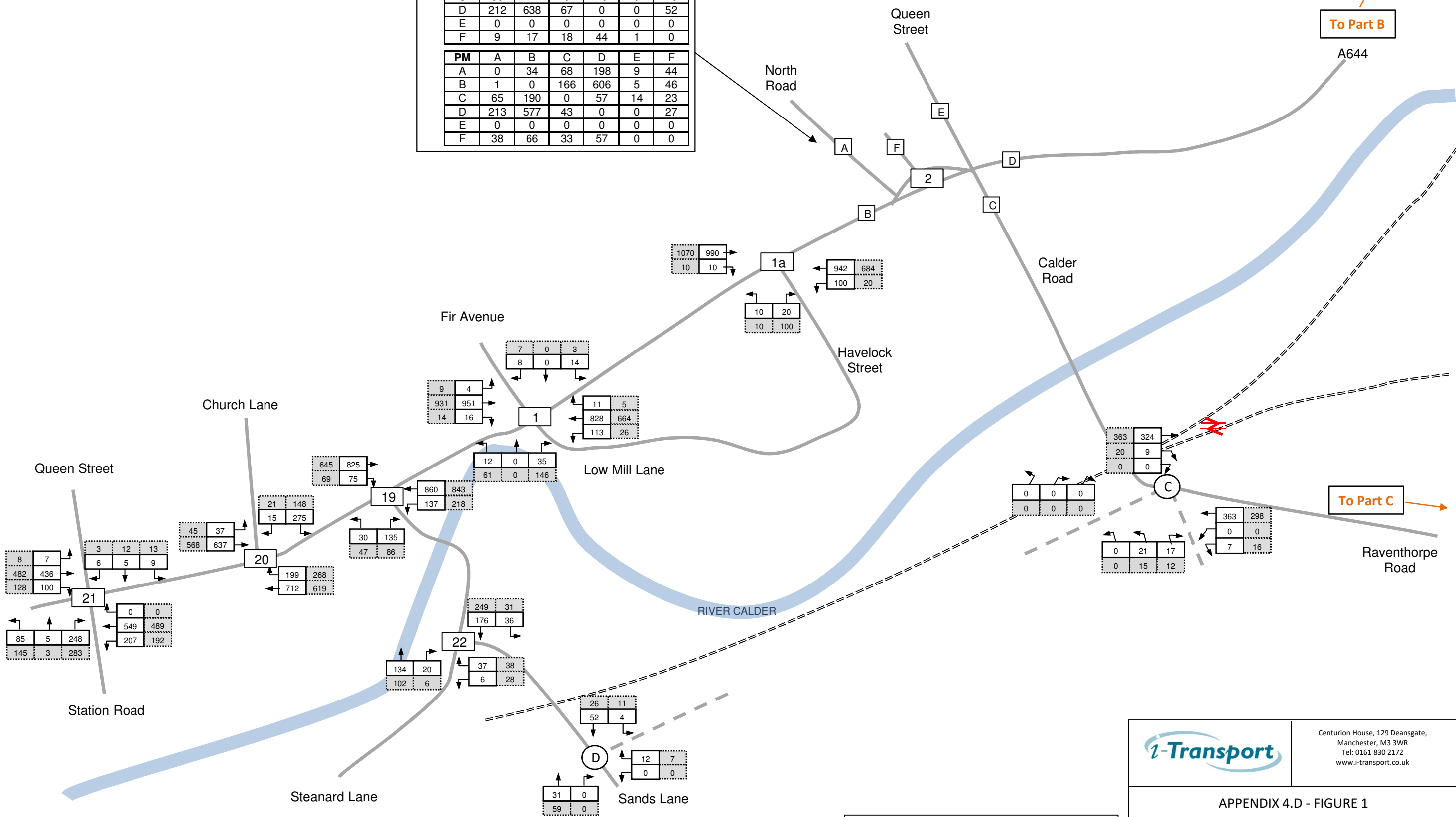
APPENDIX 4.D

**Future Year Baseline +
Development Traffic
Flows**



1						
AM	A	B	C	D	E	F
A	0	19	159	379	9	28
B	0	0	87	622	5	48
C	86	247	0	29	9	16
D	212	638	67	0	0	52
E	0	0	0	0	0	0
F	9	17	18	44	1	0

PM	A	B	C	D	E	F
A	0	34	68	198	9	44
B	1	0	166	606	5	46
C	65	190	0	57	14	23
D	213	577	43	0	0	27
E	0	0	0	0	0	0
F	38	66	33	57	0	0



To Part B

To Part C




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APPENDIX 4.D - FIGURE 1

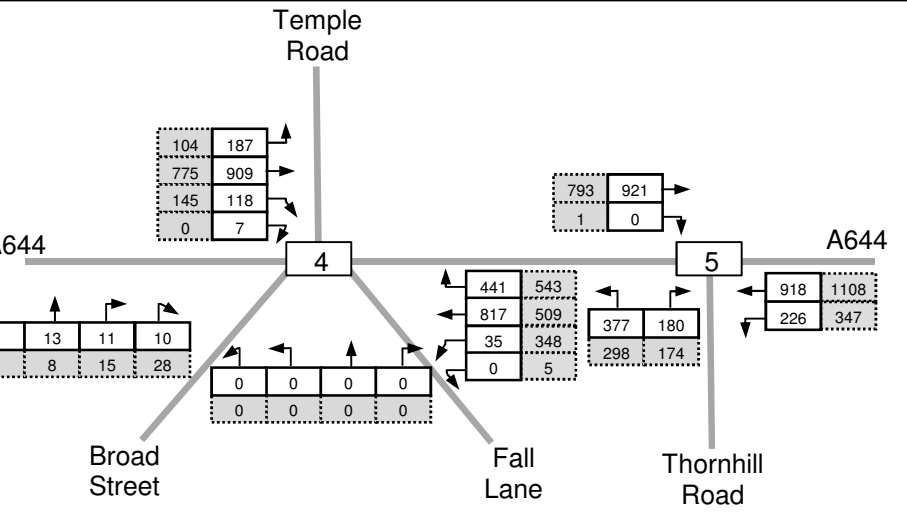
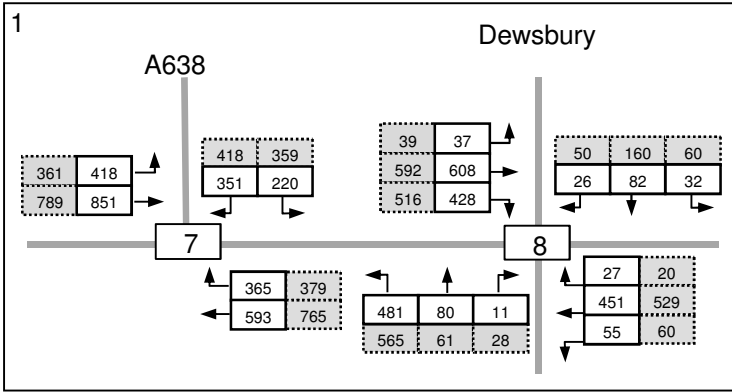
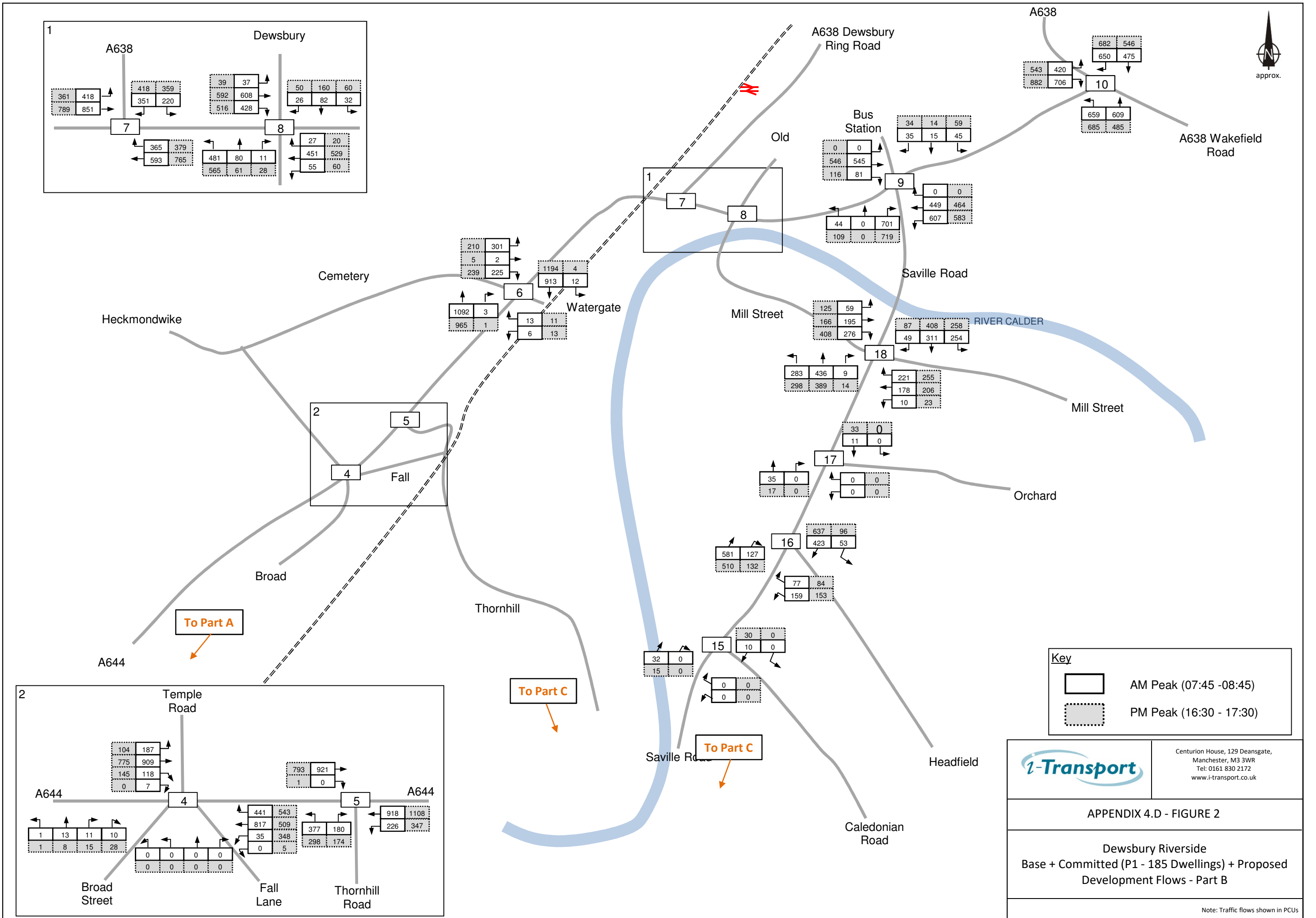
Dewsbury Riverside
Base + Committed (P1 - 185 Dwellings) + Proposed
Development Flows - Part A

Note: Traffic flows shown in PCUs

Key

 AM Peak (07:45 - 08:45)

 PM Peak (16:30 - 17:30)



Key

- AM Peak (07:45 - 08:45)
- PM Peak (16:30 - 17:30)

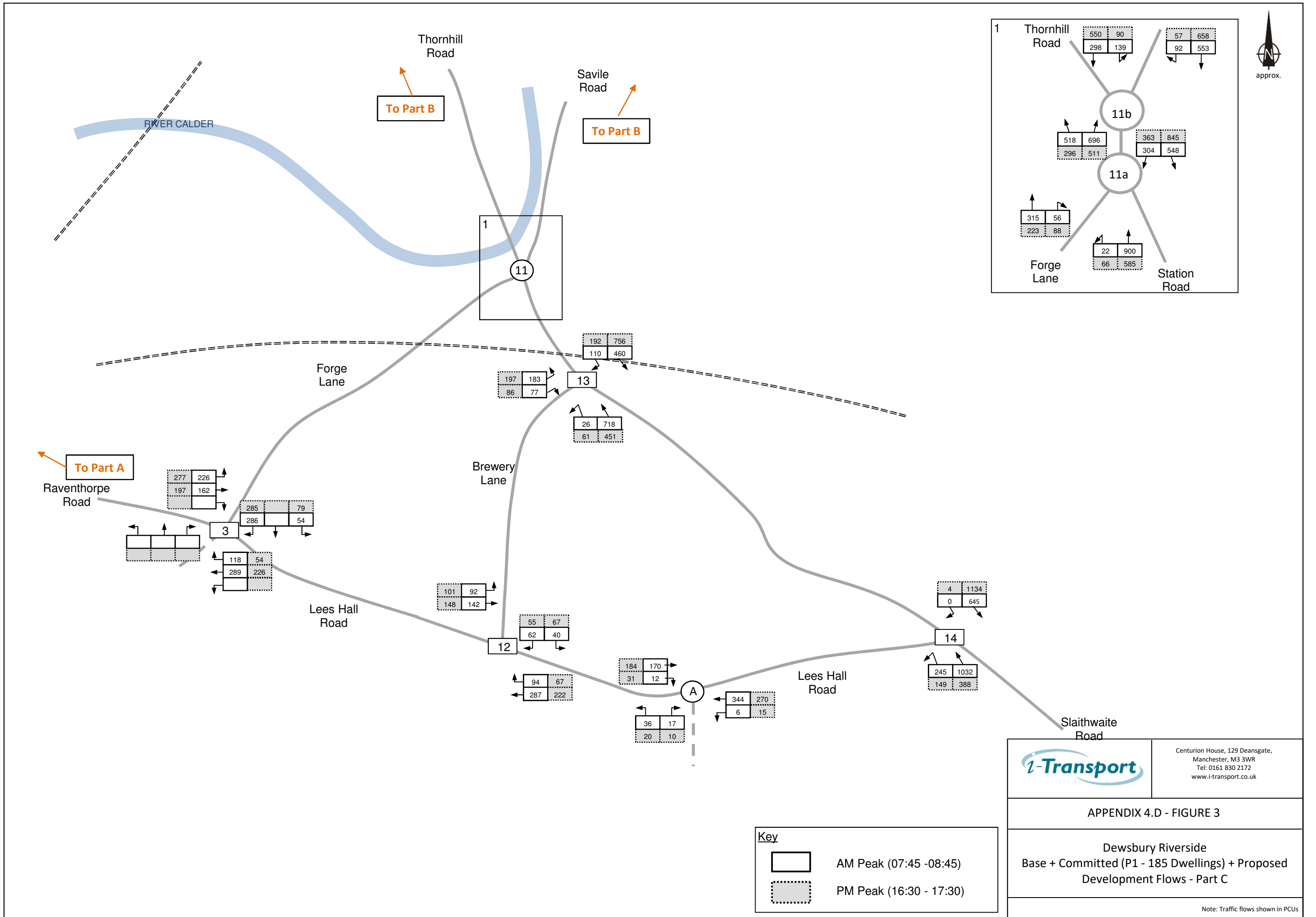
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APPENDIX 4.D - FIGURE 2

Dewsbury Riverside
 Base + Committed (P1 - 185 Dwellings) + Proposed
 Development Flows - Part B

Note: Traffic flows shown in PCUs



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APPENDIX 4.D - FIGURE 3

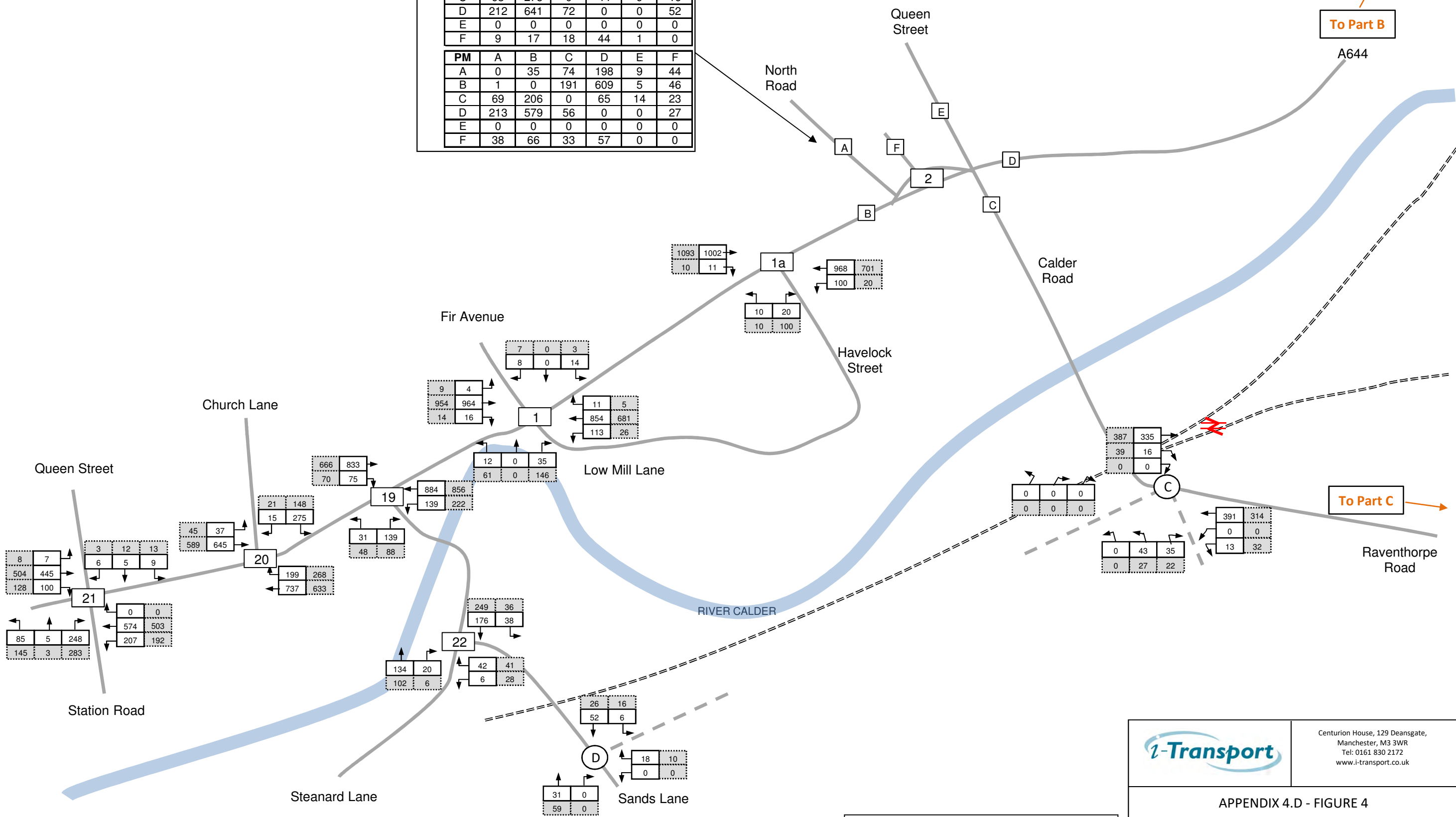
**Dewsbury Riverside
 Base + Committed (P1 - 185 Dwellings) + Proposed
 Development Flows - Part C**

Note: Traffic flows shown in PCUs



1						
AM	A	B	C	D	E	F
A	0	19	161	379	9	28
B	0	0	97	623	5	48
C	93	275	0	44	9	16
D	212	641	72	0	0	52
E	0	0	0	0	0	0
F	9	17	18	44	1	0

PM	A	B	C	D	E	F
A	0	35	74	198	9	44
B	1	0	191	609	5	46
C	69	206	0	65	14	23
D	213	579	56	0	0	27
E	0	0	0	0	0	0
F	38	66	33	57	0	0



To Part B

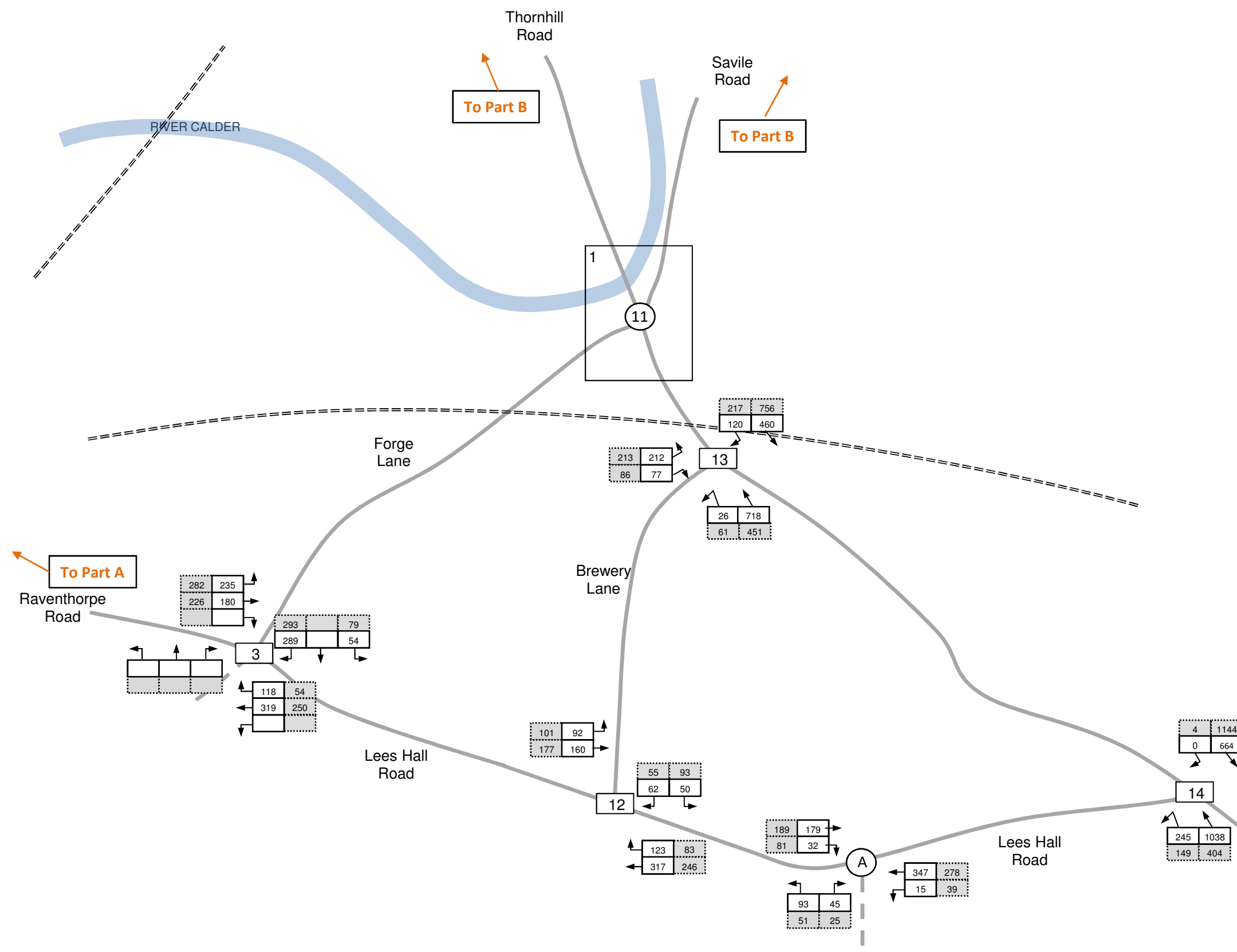
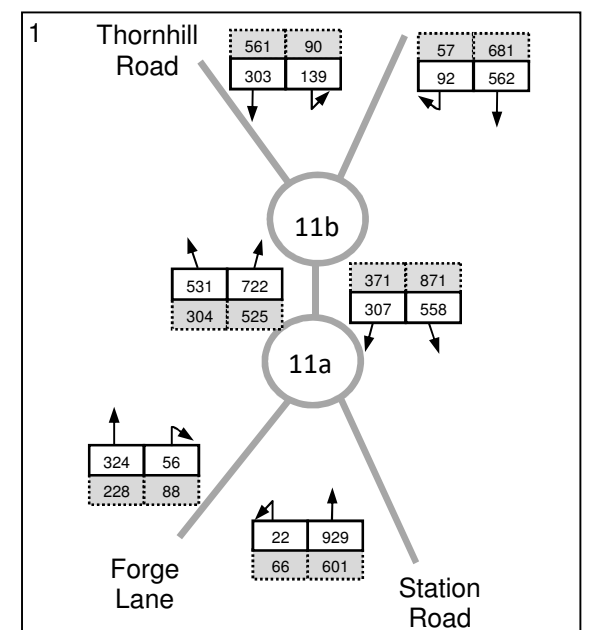
To Part C

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	APPENDIX 4.D - FIGURE 4

Dewsbury Riverside
 Base + Committed (P1 - 240 Dwellings) + Proposed
 Development Flows - Part A

Key	
	AM Peak (07:45 - 08:45)
	PM Peak (16:30 - 17:30)

Note: Traffic flows shown in PCUs



Key

	AM Peak (07:45 - 08:45)
	PM Peak (16:30 - 17:30)

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APPENDIX 4.D - FIGURE 6

Dewsbury Riverside
Base + Committed (P1 - 240 Dwellings) + Proposed
Development Flows - Part C

Note: Traffic flows shown in PCUs

APPENDIX 4.E

**Aecom Technical Note on
the South Dewsbury
Traffic Model**

Technical Note

Project:	Dewsbury Riverside Development Impact Test	Job No:	60340084
Subject:	Model Calibration and Validation Note		
Prepared by:	T Grabowski	Date:	18/11/2016
Checked by:	G Paget	Date:	18/11/2016
Approved by:	S Dalgleish	Date:	21/11/2016

1. Introduction

AECOM has been commissioned by iTransport and Kirklees Council to test the impact on the highway network of a proposed major housing development in the south of Dewsbury. It has been agreed that the Kirklees SATURN traffic model, developed by AECOM in 2015, will be used as a starting point for undertaking the assessment. However, before the impact of the housing development can be assessed, the SATURN model needs to be updated to include additional detail in the area of interest, as well as ensuring that the model is calibrated and validated to a good standard in the study area. Figure 1 shows the study area as coded in the SATURN model.

Figure 1: Study Area as coded in the SATURN network



The remaining sections of this technical note outline the changes which have been made to the Kirklees SATURN model, as well as presenting the updated calibration and validation results for the revised SATURN model in the area of interest

Direct Tel: +44 (0)191 224 6651
 T +44 (0)191 224 6500
 F +44 (0)191 224 6599
 E Tanja.Grabowski@aecom.com
www.aecom.com

First Floor,
 One Trinity Gardens
 Quayside
 Newcastle Upon Tyne
 NE1 2HF
 United Kingdom

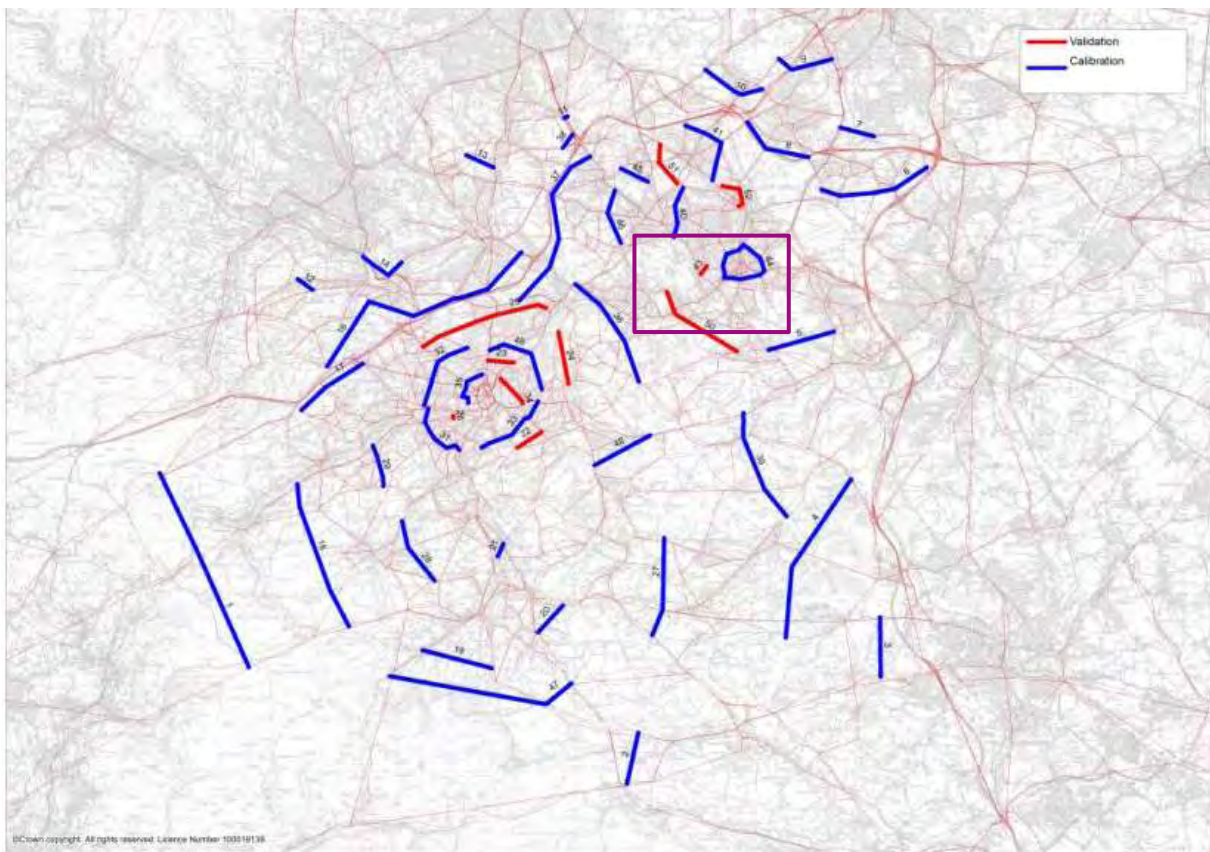
2. Background

The following section provides a summary of the development of the 2015 Kirklees SATURN model and provides the overall calibration and validation results.

In 2015, AECOM constructed a strategic traffic model for the Metropolitan Borough of Kirklees using SATURN, version 11.3.12F software. Three one hour time periods were modelled; the AM peak hour, an average inter-peak hour and the PM peak hour. One of the key reasons for constructing the model was to use it as a basis for understanding the impact of future development on the operation of the highway network.

The Kirklees SATURN model was calibrated and validated by using screenlines as shown in Figure 2 below. The purple box highlights the area of the current study.

Figure 2: Kirklees Highway Model Calibration and Validation Screenlines



The screenlines were calibrated and validated according to the criteria shown in Table 1 and discussed further below:

- Percentage of screenlines with a modelled flow within 5% of the observed flow; and
- “Graduated criterion” this is a relaxed criteria, which reflects the number of count sites in the screenline. Where a screenline consisted of less than 5 count sites it was considered reasonable to apply a relaxed set of criteria. The assumption was taken that if the screenline consisted of only one count then an individual count criterion would apply i.e. within 15%. Between 1 and 5 counts it was assumed that the value of the criteria is pro rata as set out in Table 1 below. This was considered to give an accurate view of the state of the model.

Table 1: Acceptability Criteria for Short Screenlines

Number of counts in screenline	Acceptability Criteria
5	5% (as in WebTAG M3.1)
4	7.5%
3	10%
2	12.5%
1	15%

After two rounds of matrix estimation the following screenline results, shown in

Table 2, were achieved:

Table 2: Base Model Screenline Performance, All Vehicles (Re-Estimation, Calibration and Validation Results)

Calibration	0800	IP	1700
% Screenlines <5%	83%	88%	82%
Graduated Criterion	92%	91%	88%
Validation	0800	IP	1700
% Screenlines <5%	85%	85%	85%
Graduated Criterion	100%	100%	95%

Validation of the SATURN model was also carried out against observed journey time information for 44 different routes. In accordance with WebTAG guidance, a journey time is considered validated if the modelled journey time is within 15% of the observed journey time for 85% of cases. The results of the validation are shown in Table 3 below.

Table 3: Journey Time Validation Results

	0800	IP	1700
Total Journey Time Routes	44	44	44
Routes Meeting WebTAG Criteria	39	41	37
% Meeting Criteria	89%	93%	84%

The results show that in the AM and interpeak models, the validation exceeds WebTAG guidance. In the PM peak model, the validation is only 1% below WebTAG guidance. Taking this into consideration alongside the screenline validation discussed previously, the model was considered to show a good level of validation in accordance with WebTAG guidance.

3. Updated Model

A number of changes were required to the Kirklees SATURN model to make it suitable for assessment of the Dewsbury Riverside development proposal. This largely required the addition of new links as summarised below:

- Railway Street and Longcauseway, which provide access to a retail park south of the Dewsbury ring road
- Link Road, which connects Longcauseway with B6409 Savile Road
- Fall Lane, which runs between the A644 Huddersfield Road and Thornhill Road
- Park Road, which provides access from residential estates to the A644 Huddersfield Road
- Queen Street, which is a one-way street leading from the A644 Huddersfield Road at the junction with Calder Road towards a residential estate
- Low Mill Lane and Havelock Street
- Sands Lane, which connects the proposed development site with Steanard Lane

Figure 3 below highlights the links which have been added to the model.

Figure 3: SATURN Network Additional Links



A review of the Kirklees SATURN zoning system was also required as the zones were considered too large to replicate detailed turning movements in the study area of interest. The process undertaken to disaggregate the zoning system is discussed in further detail in 'Dewsbury Riverside Tech Note – Revised Zones.docx'.

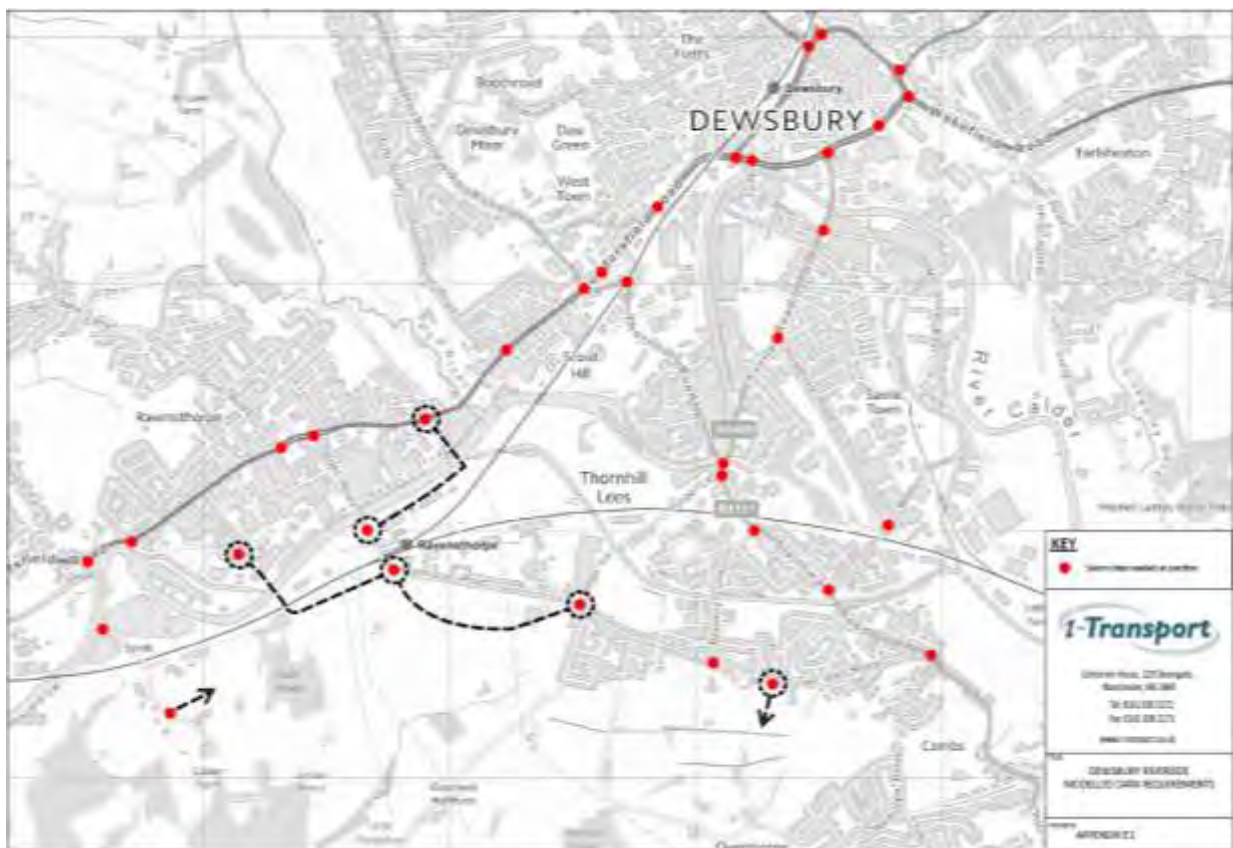
Following the updates to the SATURN model, a number of network checks were carried out to ensure the model replicated the existing highway network in the study area of interest. These network checks were carried out by both AECOM and iTransport staff and led to a number of further changes. The full list of changes is documented in a separate technical note 'I Transport Queries 05052016_v3. This will be updated as any subsequent changes are made.

4. Data Requirements

Miller Homes is promoting significant residential led mixed-use development through the Kirklees Local Plan. A transport strategy is being developed, including new highways infrastructure, to support the proposals. Significant work has already been undertaken but further work is required to refine the transport strategy. It has been agreed that the Kirklees SATURN model will be used to provide inputs into the further development of the strategy. Data will only be required in the AM and PM peak models as this is when the cumulative impact of background traffic levels and traffic generated by the development is expected to be at its maximum.

iTransport, acting on behalf of Miller Homes, has defined key junctions for which model outputs are required. An overview of these junctions is provided in Figure 4 below.

Figure 4: SATURN model data output requirements



It is important that there is confidence in the base year modelled flows at these junctions to ensure a realistic assessment of the change in flows as a result of the development. To have confidence in the base year modelled flows, it is necessary to compare the modelled traffic flows to observed traffic flow data. Some data was available from the construction of the wider Kirklees SATURN model and iTransport commissioned additional traffic surveys where data was not available. The available data spans several years and therefore factors have been applied to survey data from previous years to ensure a 2016 base year is considered at all junctions. .

5. Model Calibration and Validation Process

Calibration is an iterative process of refining input data and parameters so the model represents observed traffic conditions. The key indicator for calibration of a traffic model is the comparison of modelled flows

and observed flows at the same network locations. Validation of the traffic model ensures that the calibrated traffic model is representative of another set of observed data, which has not been used in the calibration exercise. As part of this assessment, validation of the traffic model has been carried out against observed journey time data. The calibration and validation criteria, calibration process and calibration and validation results are discussed in greater detail below.

5.1. Calibration and Validation Criteria

The criteria for model calibration and validation are defined in Chapter 12, Section 4.4 of the Design Manual for Roads and Bridges (DMRB). A summary of this is shown in Table 4 below.

Table 4: DMRB Minimum Guideline Acceptability for Model Calibration and Validation

Type	Criteria	Acceptability Guideline
Absolute	Individual flows within 15% for flows 700-2,700 vph	85% of cases
	Individual flows within 100 vph for flows < 700 vph	85% of cases
	Individual flows within 400 vph for flows > 2,700 vph	85% of cases
	Total screenline flows (normally > 5 links) to be within 5%	All (or nearly all) screenlines
GEH	GEH statistic: i.) individual flows : GEH < 5 ii.) Screenline (+) totals : GEH < 4	85% of cases All (or nearly all) screenlines
	Journey Time	Journey Times within 15% (or 1 minute if higher)

For the calibration to be acceptable, either the individual flows/screenline flows criteria or the GEH criteria must be achieved. GEH is a calculated statistic which is based on the following formula:

$$GEHStat = \sqrt{\frac{\{O - M\}^2}{\frac{1}{2}\{O + M\}}}$$

With: O = Observed traffic flow

M = Modelled traffic flow

Due to the high level of detail which is required in the study area, it was considered important to achieve the flow or GEH criteria for individual turning flows in as many key locations as possible. It must be remembered that this is a strategic transport model and the level of effort involved in network coding and zone disaggregation to calibrate all turning count movements to the Flow / GEH statistic would not deliver value for money or offer significant benefits to the outcome of the study.

5.2. Network Calibration

As part of the iterative process to calibrate the traffic model, a number of adjustments were made to network coding as follows:

- Speed-flow curves: New speed-flow curves were defined to better replicate the condition of local side roads in the study area.
- Signal times: Some signal timings were adjusted based on updated information. A signal which was not part of the prior model was added on Steanard Lane.
- Gap acceptance: The default gap acceptance of the model is set to 4 seconds. This has been adjusted at number of locations where it was considered to be unrealistic based on site observations.
- Saturation flows: Saturation flows have been adjusted for some turning movements to reflect observed local conditions. The guidelines which were developed as part of the initial network creation for the Kirklees model were used for this to ensure consistency with the base model.

- Distance: A number of link distances were adjusted as small discrepancies in the modelled to actual distance were causing some unusual route choice.

After the model calibration with the prior matrix was at a satisfactory level based on a comparison with surveyed counts in the study area, matrix estimation was undertaken to improve the fit between modelled and observed data in some locations. The process was undertaken for car, light goods vehicles and heavy goods vehicles, with counts included in the control file which had not met the calibration criteria. .

The estimated matrix was assigned to the SATURN network and a number of iterations run until convergence was met. The convergence criteria was set at %GAP of less than 0.02% on 4 successive iterations, which is comparable to how the original Kirklees SATURN model was assigned. This level of convergence is considerable better than that required by WebTAG (0.1% over four iterations) Convergence was achieved within 13 assignment iterations in the AM peak model and within 23 assignment iterations in the PM peak model

6. Calibration and Validation Results

Modelled turning flows and modelled journey time information has been extracted from the SATURN model and compared to observed data. The results are summarised below.

6.1. Turning Count Calibration

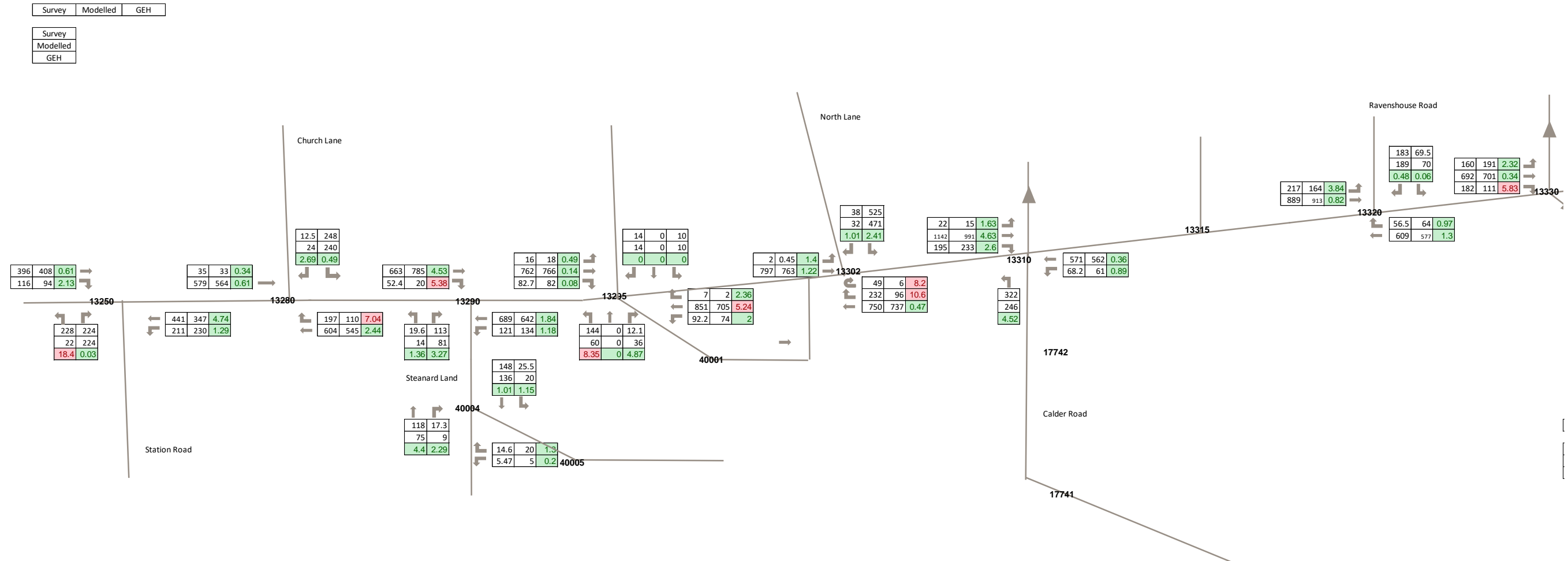
The overall level of calibration for both peak models is shown in Table 5 below. The minimum guideline acceptability according to the DMRB is shown in Table 4 above.

Table 5: Level of Model Calibration for All Vehicle Types

	Total Turning Counts	Absolute within guideline	GEH <5	Combined
AM	164	156	150	157
		95%	91%	96%
PM	164	151	136	153
		92%	83%	93%

The results show that both peak models show a good level of calibration against the GEH statistic, and an excellent level of calibration when taking into account all criteria. There are a number of discrepancies in count information between adjacent junctions, and therefore achieving calibration against all counts in the study area would not be possible. A comparison of modelled to observed traffic flow is shown in Figures 5 to 10 below.

Figure 5: Network Calibration Overview AM 1/3



Direct Tel: +44 (0)191 224 6651
 T +44 (0)191 224 6500
 F +44 (0)191 224 6599
 E Tanja.Grabowski@aecom.com
 www.aecom.com

First Floor,
 One Trinity Gardens
 Quayside
 Newcastle Upon Tyne
 NE1 2HF
 United Kingdom

Figure 6: Network Calibration Overview AM 2/3

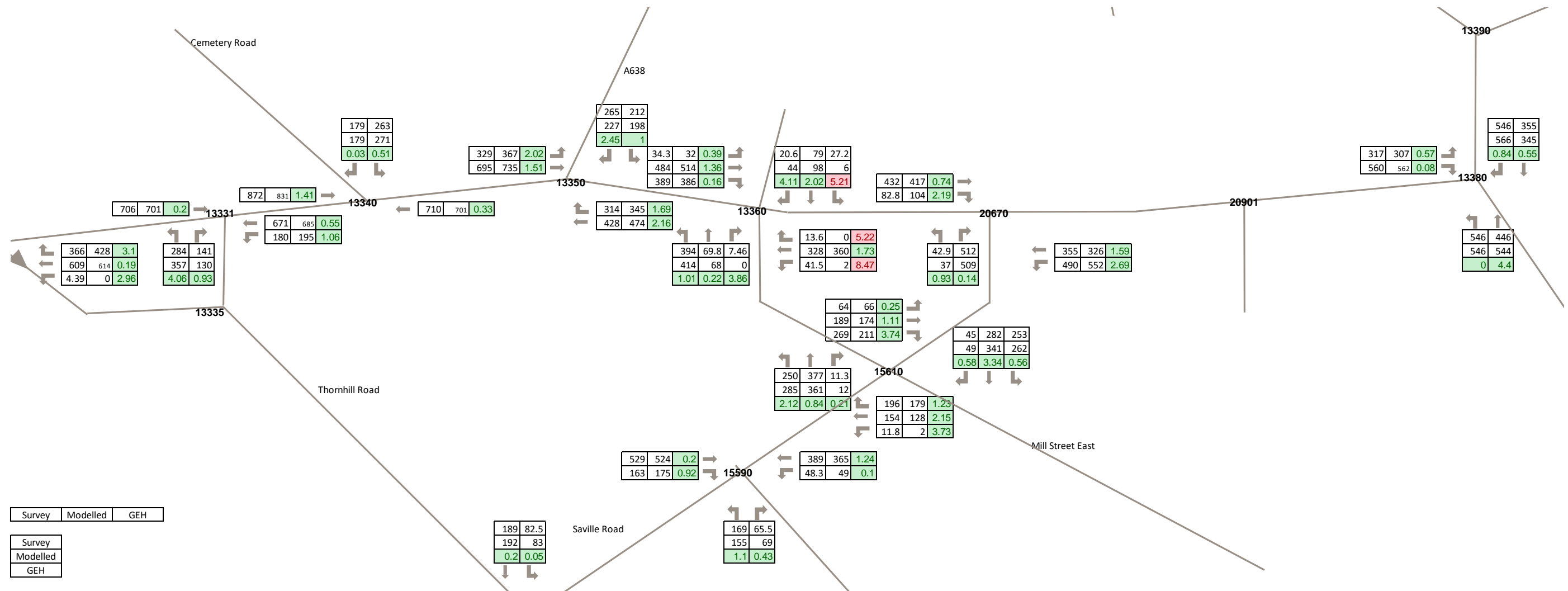


Figure 7: Network Calibration Overview AM 3/3

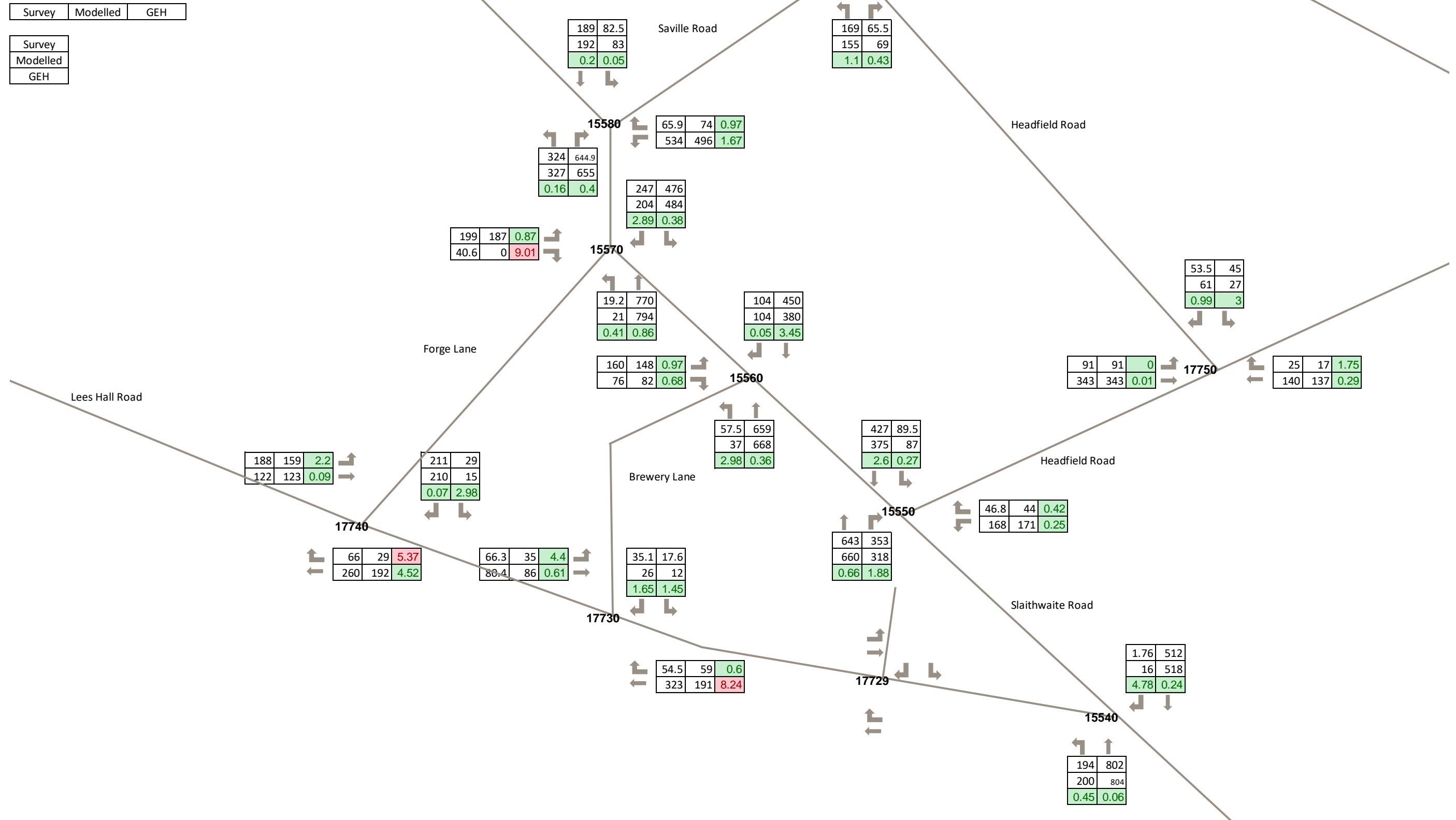


Figure 8: Network Calibration Overview PM 1/3

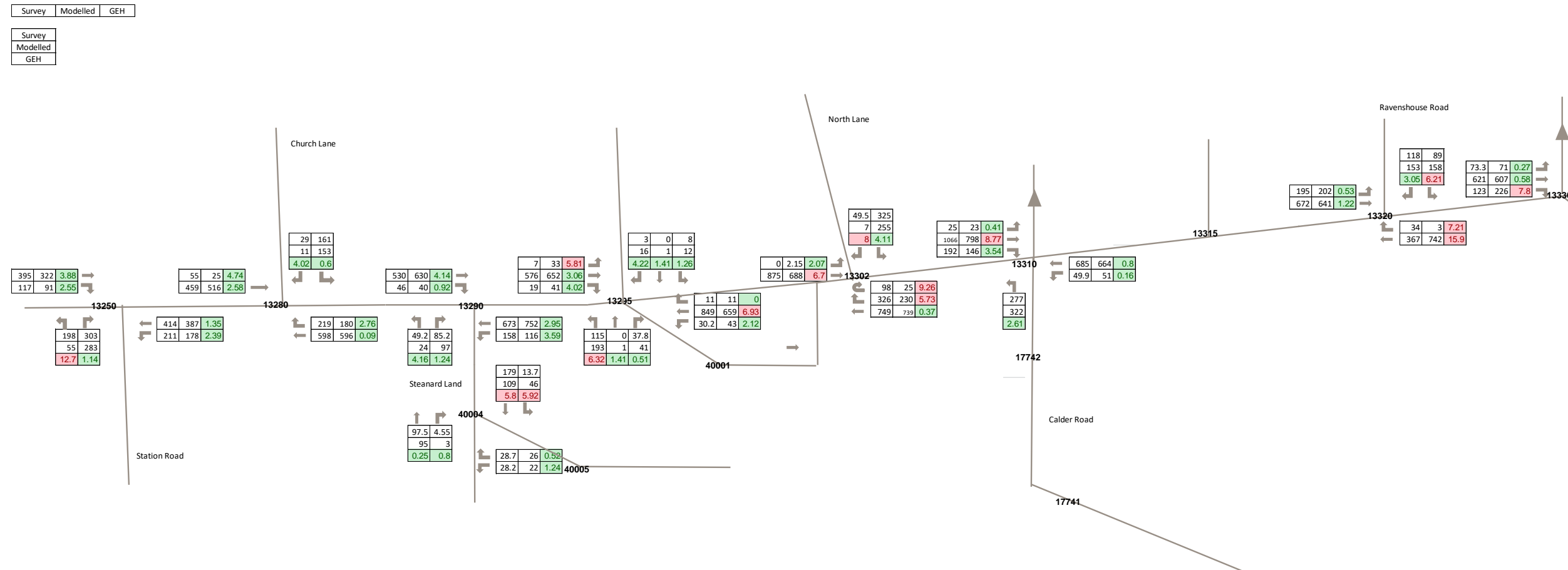


Figure 9: Network Calibration Overview PM 2/3

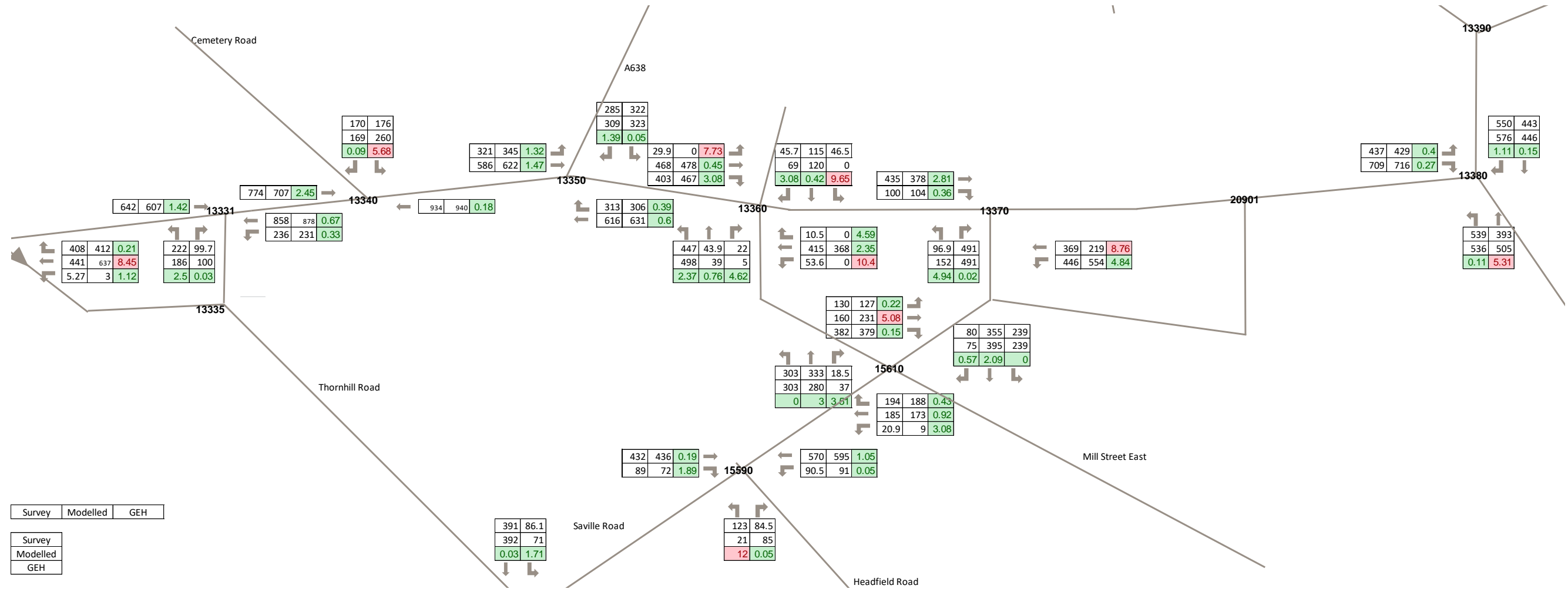
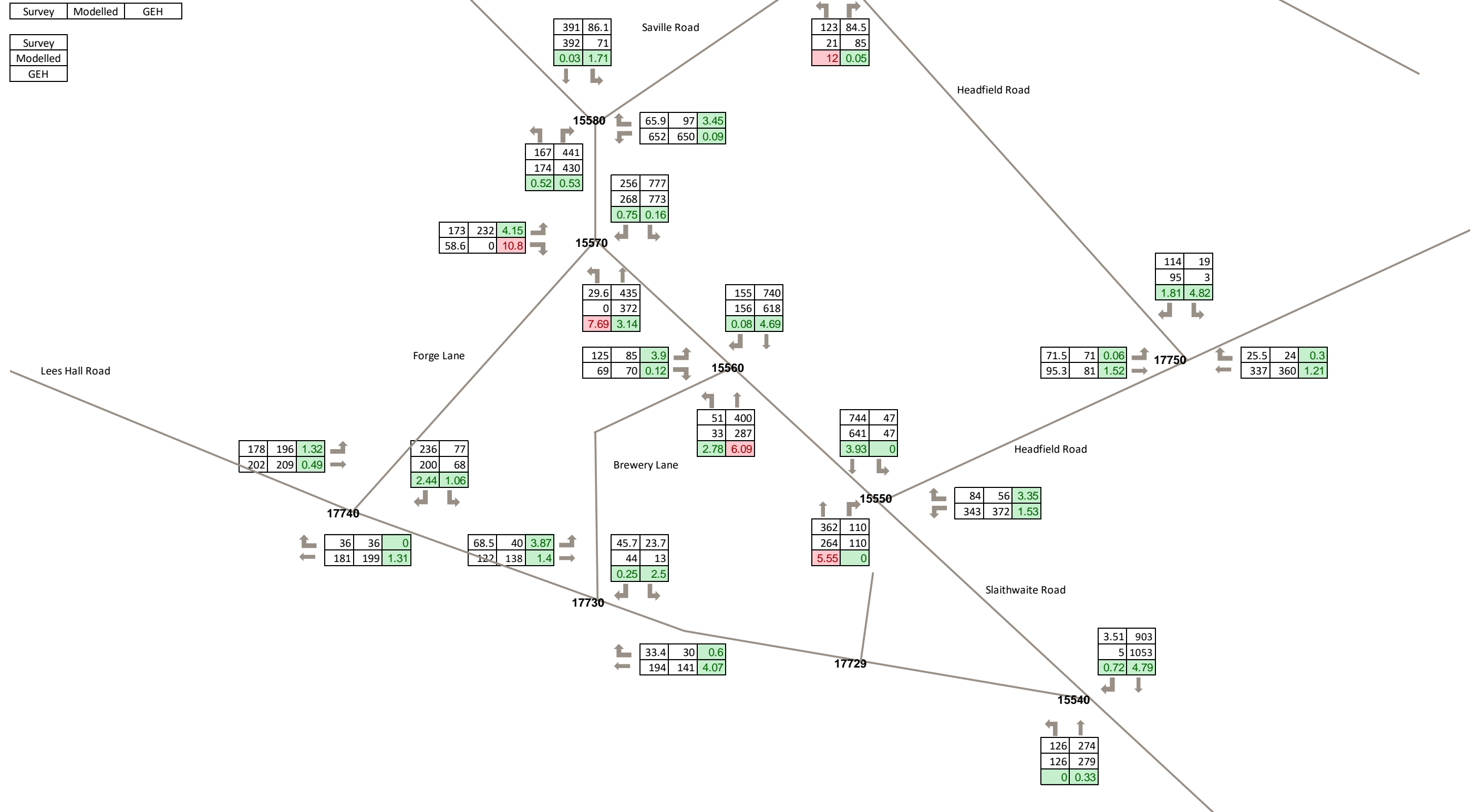


Figure 10: Network Calibration Overview PM 3/3



Technical Note

6.2. Journey Time Validation

Journey time data for Huddersfield Road was obtained from TrafficMaster and these data were used to validate the model. Figure 11 shows the eastbound journey time route and Figure 12 shows the westbound journey time route within the area of interest.

Figure 11: Journey Time Route, Huddersfield Road EB



Figure 12: Journey Time Route, Huddersfield Road WB



Direct Tel: +44 (0)191 224 6651
T +44 (0)191 224 6500
F +44 (0)191 224 6599
E Tanja.Grabowski@aecom.com
www.aecom.com

First Floor,
One Trinity Gardens
Quayside
Newcastle Upon Tyne
NE1 2HF
United Kingdom

A comparison of modelled to observed journey time information for the Huddersfield Road route is shown in Table 6 below.

Table 6: Journey Time Validation Overview

	Surveyed Journey Time (s)	Revalidated Base Model (s)	Difference
AM EB	803	690	-14.0%
AM WB	770	756	-1.8%
PM EB	564	588	4.2%
PM WB	1122	956	-14.8%

The model validates against observed journey time data along the corridor of interest for both directions and both time periods although it is acknowledged that the model is faster than the observed times in the peak directions. Site visits as well as the observed data indicate that there is considerable day to day variation in the peak direction journey times. There is also considerable variation within the peak hour. The SATURN model represents average conditions across the hour and therefore is not able to model some of these variations. Nevertheless it is considered that the journey times in the model are a reasonable reflection of the observed conditions.

Summary

It has been agreed that the 2015 Kirklees SATURN model will be used to test the impact of a proposed major housing development to the south of Dewsbury. However, before this model can be used, a number of updates were required to add additional detail not included in the original model, and undertake a more detailed calibration and validation exercise in the area of interest. The results of this update have shown an excellent level of calibration in the study area. The validation results in the AM peak are good, but the westbound journey time in the PM peak has not been met. This will be taken into consideration when reviewing the results of the development testing.

APPENDIX 4.F

**Trip Generation
Calculations**

TRIP GENERATION - DEWSBURY

1) Trips Per Person

Average number of trips by purpose: England, 2014

921	All Purposes, All Modes
-----	-------------------------

Average number of trips by purpose: Yorkshire & Humber region, 2014

963	All Purposes, All Modes
-----	-------------------------

Uplift to account for modified age profile

1.028	Adjusted local trips per person
-------	---------------------------------

2) Trips Per Household

Future Year Planning Data (2030)

TEMPRO Area Description	Name	< 16	16 to 64	65+	Total	HHs	Jobs	Workers
00CZ2	Dewsbury	13457.2	31458.8	8937.8	53853.8	22574.6	26585	17768

Household Size 2.39

Annual trips per household 2457

3) HBNHB Split

TEMPRO data for Dewsbury

Home Based (HB)	87.4%
Non Home Based (NHB)	12.6%

OD Data average day for combined modes

Annual Trips Per HH on Site	2457
HB	2147
NHB	310

4) Peak Hour Trips

	Origin	Destination	Total
Average Weekday HB&NHB	188273	188433	376706
Average Saturday HB&NHB	175504	175252	350756
Average Sunday HB&NHB	131591	131373	262964

Weekday x 5	1883530
Saturday	350756
Sunday	262964
Full Week	2497250
% Weekday Trips	75.4%

Weekday Trips Per HH on Site	
HB	6.23
NHB	0.90
2-Way Person Trips Per Household	7.13

	Origin	Destination	Total
Average Weekday HB&NHB	188273	188433	376706
Average Weekday OffPeak HB&NHB	30012	29287	59299

% Daily Trips Outside 07:00 - 19:00	15.74%
-------------------------------------	--------

12hr Weekday Trips Per Household	
HB	5.25
NHB	0.76
2-Way Person Trips Per Household	6.01

Peak Hour Trip Proportion	
AM TRICS Proportion	12.9%
PM TRICS Proportion	11.6%

Taken from TRICS

	Peak Hour Person Trips Per HH	
	HB	NHB
AM	0.678	0.098
PM	0.611	0.088

5) Trips By Journey Purpose

	Origin & Destination (HB)	
	AM	PM
Work	24505	22191
Employers Business	1868	2293
Education	26420	6468
Shopping	7659	16354
Personal Business	2614	5538
Recreation/Social	5742	10625
Visiting Friends/Relatives	2972	8538
Holiday/Day Trip	291	1102

Data (trip ends) from TEMPRO

	HB Journey Purpose Proportions			
	AM	Adjusted AM	PM	Adjusted PM
Work	34.0%	40.0%	30.4%	44.0%
Employers Business	2.6%	3.0%	3.1%	3.0%
Education	36.7%	37.0%	8.8%	3.0%
Shopping	10.6%	8.0%	22.4%	20.0%
Personal Business	3.6%	3.0%	7.6%	7.0%
Recreation/Social	8.0%	6.0%	14.5%	12.0%
Visiting Friends/Relatives	4.1%	3.0%	11.7%	10.0%
Holiday	0.4%	0.0%	1.5%	1.0%
	100.0%	100.0%	100.0%	100.0%

HB Person Trips (Two-Way) by Purpose for the development

4000 Units

	No. Of Trips	
	AM	PM
Work	1085	1075
Employers Business	81	73
Education	1003	73
Shopping	217	489
Personal Business	81	171
Recreation/Social	163	293
Visiting Friends/Relatives	81	244
Holiday	0	24
NHB	392	352
	3103	2794

6) Trips By Mode

Mode	Total
Work From Home	3.9%
Metro	0.1%
Train	4.0%
Bus	7.8%
Taxi	1.9%
Motorcycle	0.5%
Car driver	59.6%
Car Passenger	7.9%
Cycle	0.9%
Walk	12.6%
Other	0.7%
TOTAL	100.0%

SWSCensus Modal Split - MSOA Kirklees 017, 019, 023, 024 and 028

Trip Purpose - AM Peak	Car Driver			All Modes			%Car Driver
	Origin	Destination	Total	Origin	Destination	Total	
Employers Business	592	842	1434	786	1082	1868	76.8%
Education	1524	1946	3470	12366	14054	26420	13.1%
Shopping	1191	1370	2561	3650	4009	7659	33.4%
Personal Business	421	509	930	1218	1396	2614	35.6%
Recreation/Social	1007	1098	2105	2784	2958	5742	36.7%
Visiting Friends/Relatives	499	505	1004	1530	1442	2972	33.8%
Holiday	63	61	124	150	141	291	42.6%
Total for Personal Business, Recreation/Social, Visiting Friends/Relatives & Holiday	1990	2173	4163	5682	5937	11619	35.7%
NHB	1694	1797	3491	3206	3307	6513	53.6%

Temporo Mode Splits - Car Driver

Trip Purpose - PM Peak	Car Driver			All Modes			%Car Driver
	Origin	Destination	Total	Origin	Destination	Total	
Employers Business	929	705	1634	1287	1006	2293	71.3%
Education	712	587	1299	3483	2985	6468	20.1%
Shopping	3000	2788	5788	8375	7979	16354	35.4%
Personal Business	1005	974	1979	2800	2738	5538	35.7%
Recreation/Social	1997	1966	3963	5339	5286	10625	37.3%
Visiting Friends/Relatives	1428	1437	2865	4218	4320	8538	33.6%
Holiday	183	191	374	532	570	1102	33.9%
Total for Personal Business, Recreation/Social, Visiting Friends/Relatives & Holiday	4613	4568	9181	12889	12914	25803	35.7%
NHB	1994	2030	4024	3930	3941	7871	51.1%

Temporo Mode Splits - Car Driver

	Modal Split - Car Trips		
	AM Peak	PM Peak	
Work Trips	59.6%	59.6%	From SWSCensus
Education	13.1%	20.1%	Temporo O+D
Employers Business	76.8%	71.3%	Temporo O+D
Holiday			
Personal Business	35.7%	35.7%	
Recreation/Social			
Visiting Friends/Relatives			Temporo O+D Weighted Average (AM and PM)
Shopping Food	33.4%	35.4%	Temporo O+D 50%
Shopping Non-Food	33.4%	35.4%	Temporo O+D 50%
NHB	75.0%	75.0%	Adjusted to 75%

Annual School Days	195	Estimated Based on Kirklees School Calendar
Annual No. Of Weekdays	261	
School Days Factor	1.34	

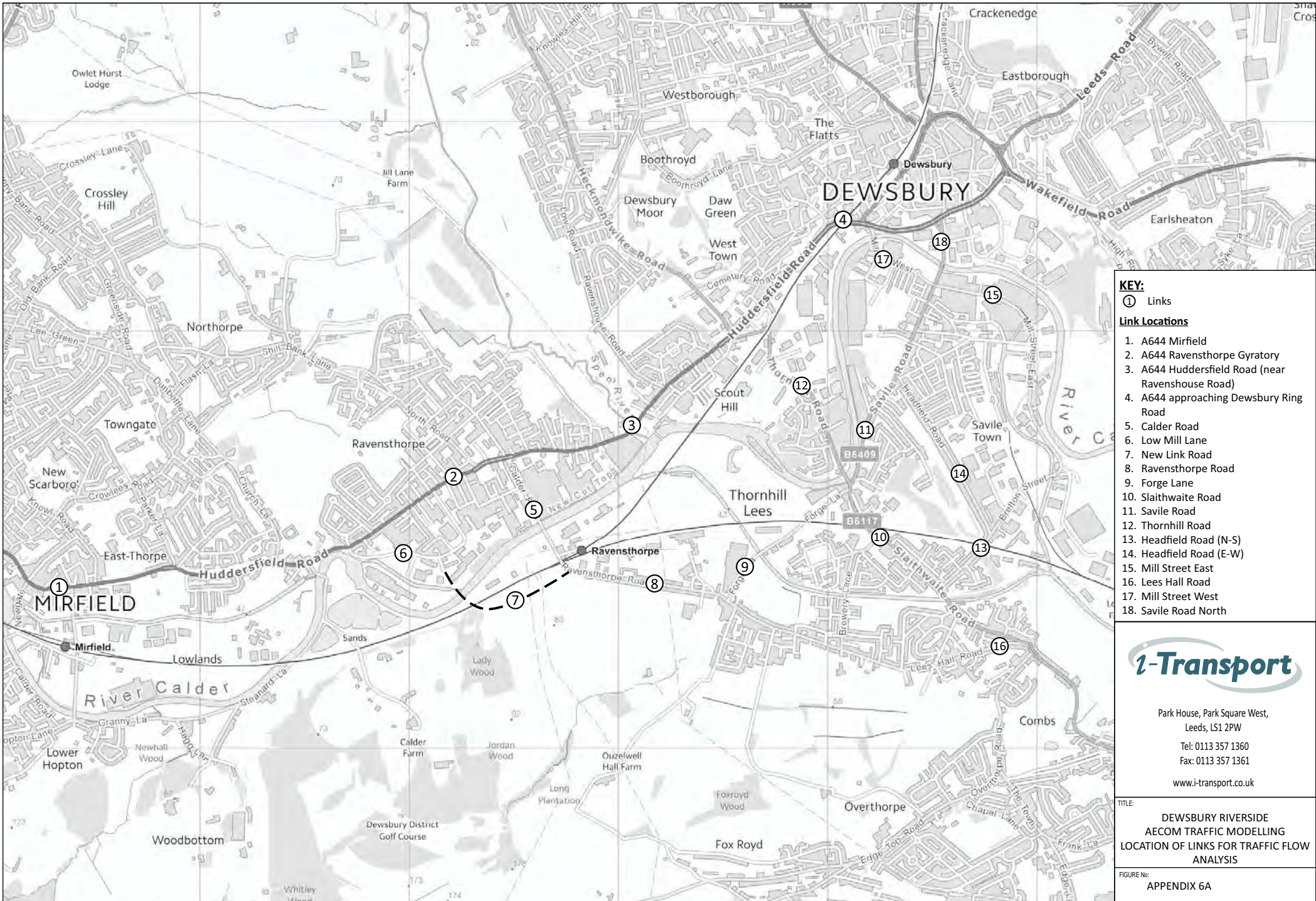
Annual Work Days	223	(261 days - 25 holiday - 8 bank holiday - 5 sick days)
Annual No. Of Weekdays	261	
Work Days Factor	1.17	

7) Peak Hour Car Driver Trips By Purpose

	Car Driver	
	AM Peak	PM Peak
Work Trips	757	750
Education	176	20
Employers Business	62	52
Holiday	116	261
Personal Business		
Recreation/Social		
Visiting Friends/Relatives		
Shopping Food	36	87
Shopping Non-Food	36	87
NHB	294	264
Total	1477	1521

APPENDIX 6.A

Links Used for Traffic Flow Analysis



- KEY:**
- ① Links
- Link Locations**
1. A644 Mirfield
 2. A644 Ravensthorpe Gyratory
 3. A644 Huddersfield Road (near Ravenshouse Road)
 4. A644 approaching Dewsbury Ring Road
 5. Calder Road
 6. Low Mill Lane
 7. New Link Road
 8. Ravensthorpe Road
 9. Forge Lane
 10. Slaithwaite Road
 11. Savile Road
 12. Thornhill Road
 13. Headfield Road (N-S)
 14. Headfield Road (E-W)
 15. Mill Street East
 16. Lees Hall Road
 17. Mill Street West
 18. Savile Road North



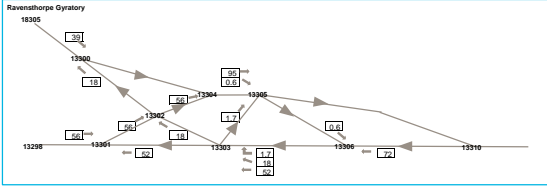
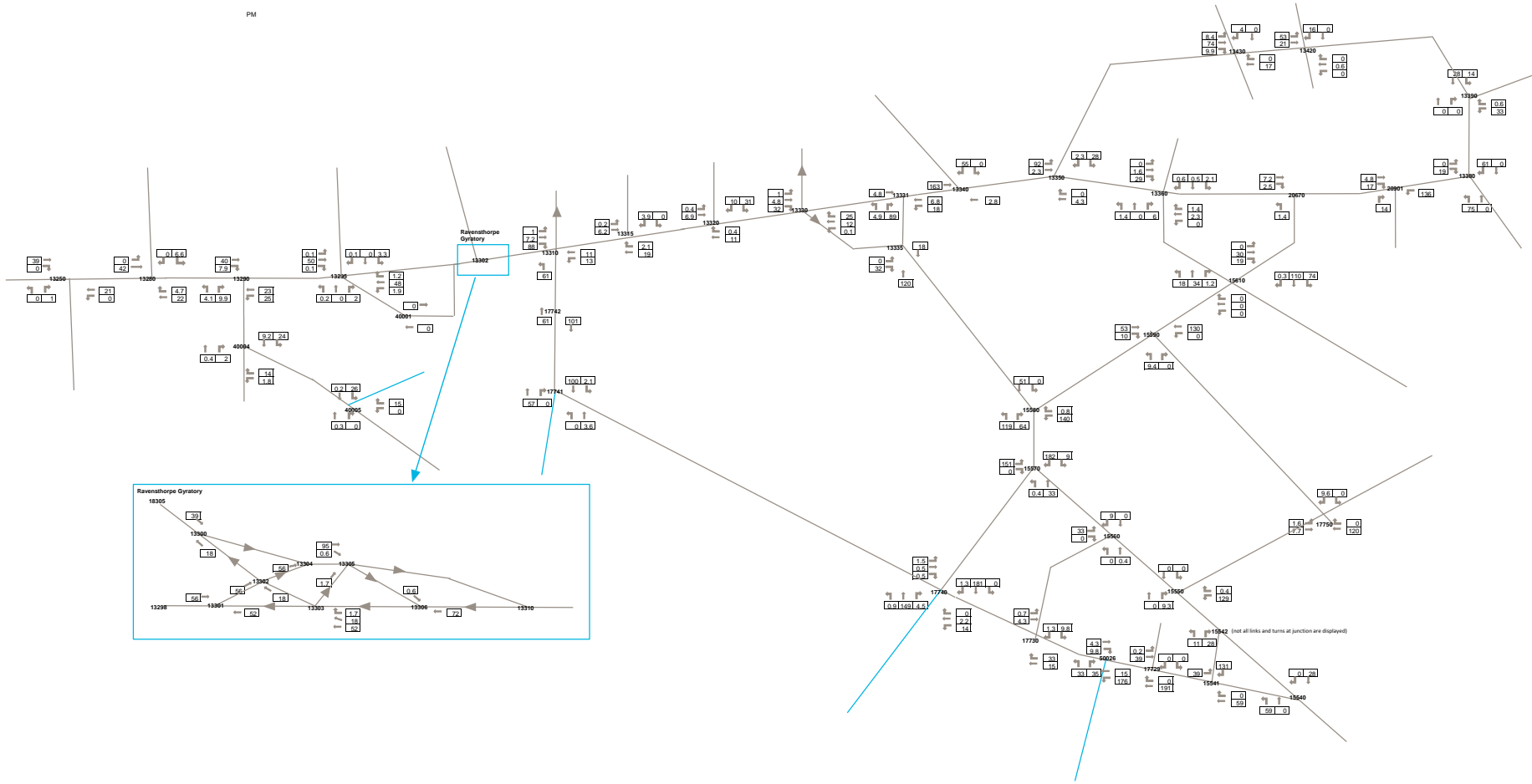
Park House, Park Square West,
Leeds, LS1 2PW
Tel: 0113 357 1360
Fax: 0113 357 1361
www.i-transport.co.uk

TITLE:
DEWSBURY RIVERSIDE
AECOM TRAFFIC MODELLING
LOCATION OF LINKS FOR TRAFFIC FLOW
ANALYSIS

FIGURE No:
APPENDIX 6A

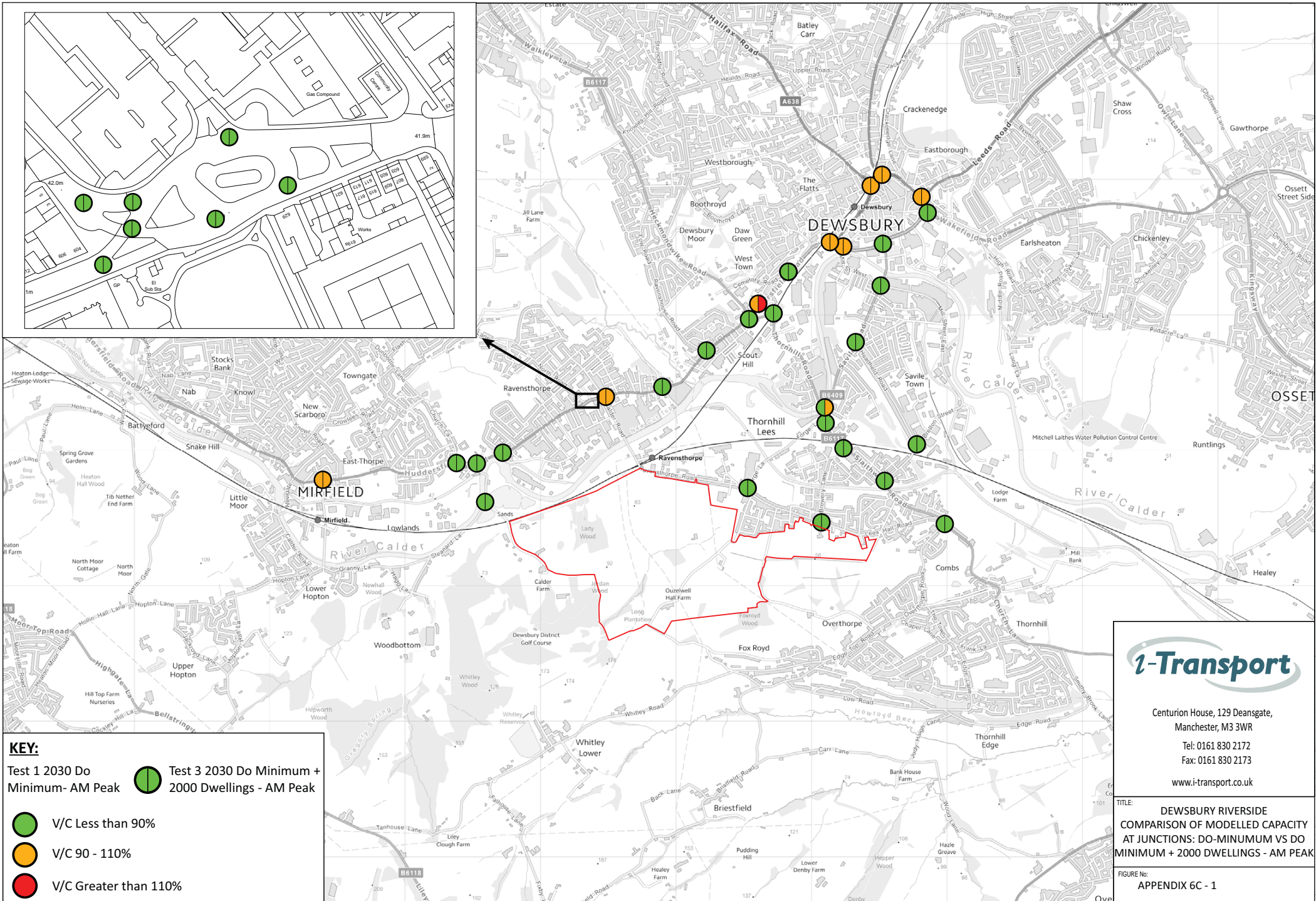
APPENDIX 6.B

**Select Link Analysis –
2,000 Dwellings**

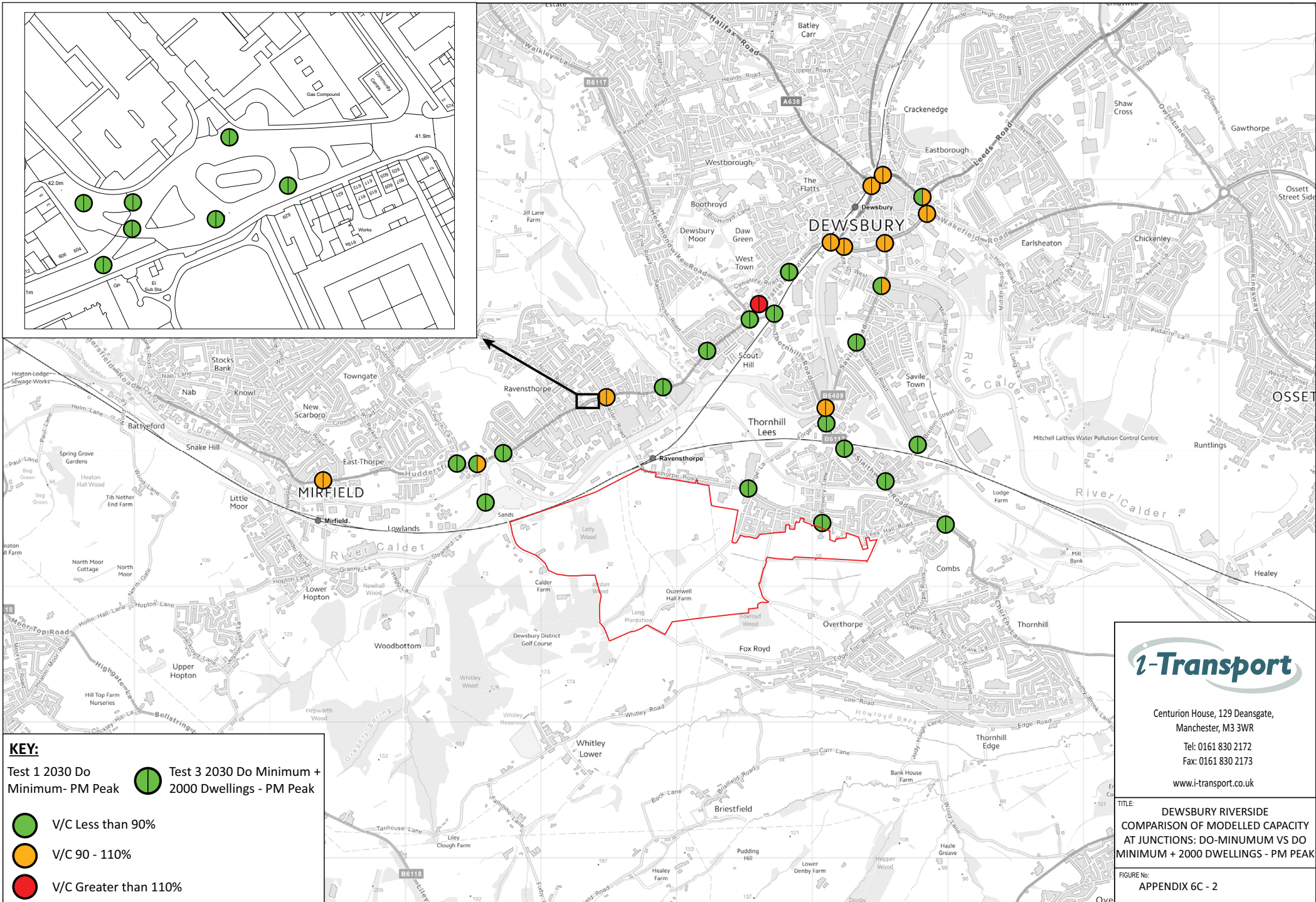


APPENDIX 6.C

Comparison of Modelled Capacity at Junctions: Do- Minimum vs Do-Minimum + 2,000 Dwellings



Note:- Image taken from Google Earth



Centurion House, 129 Deansgate,
 Manchester, M3 3WR
 Tel: 0161 830 2172
 Fax: 0161 830 2173
 www.i-transport.co.uk

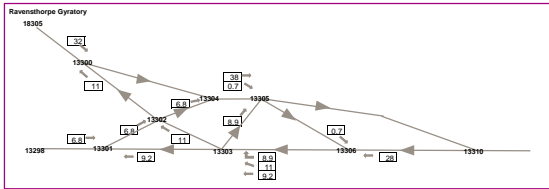
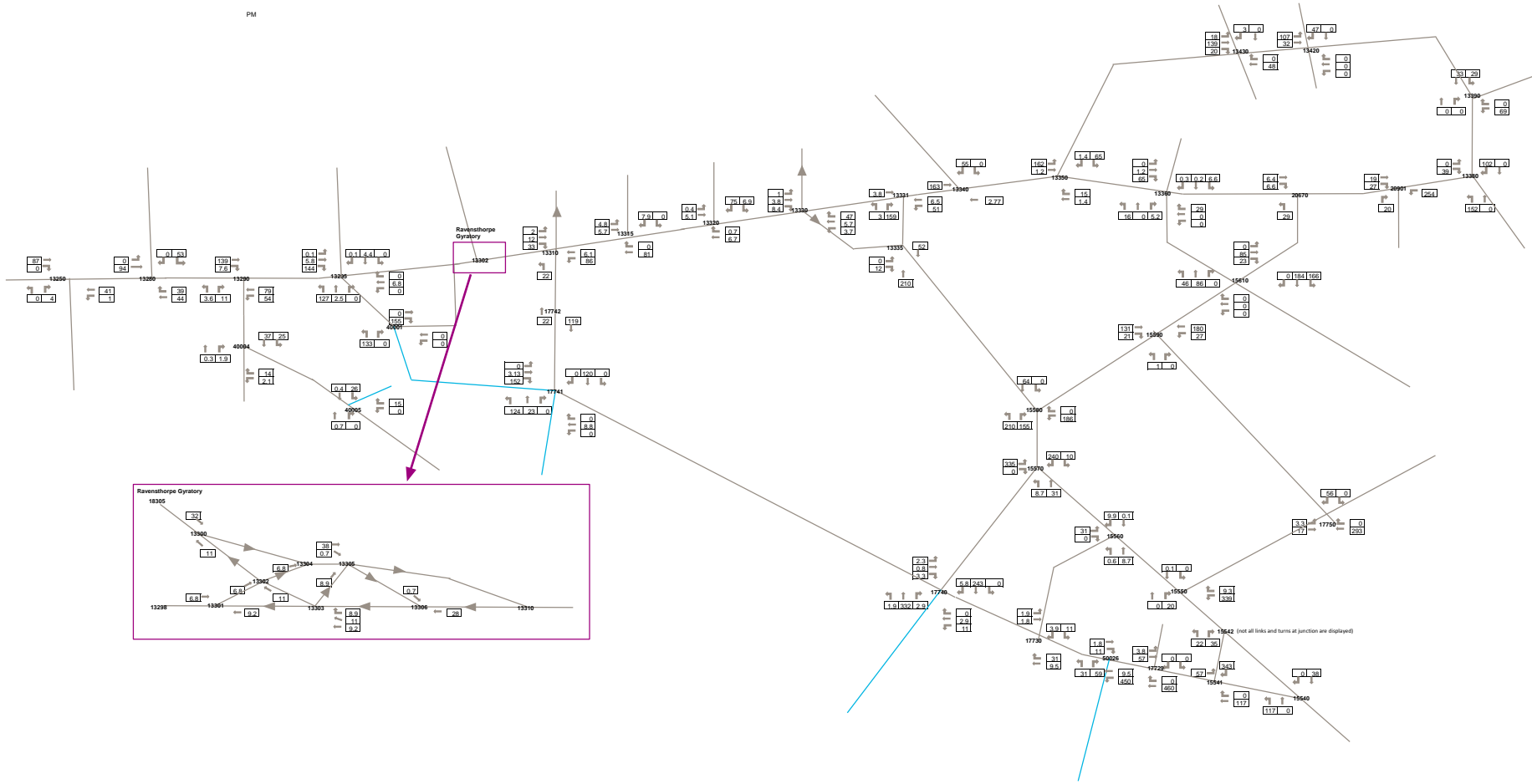
TITLE: DEWSBURY RIVERSIDE
 COMPARISON OF MODELLED CAPACITY
 AT JUNCTIONS: DO-MINIMUM VS DO
 MINIMUM + 2000 DWELLINGS - PM PEAK

FIGURE No: APPENDIX 6C - 2

Note:- Image taken from Google Earth

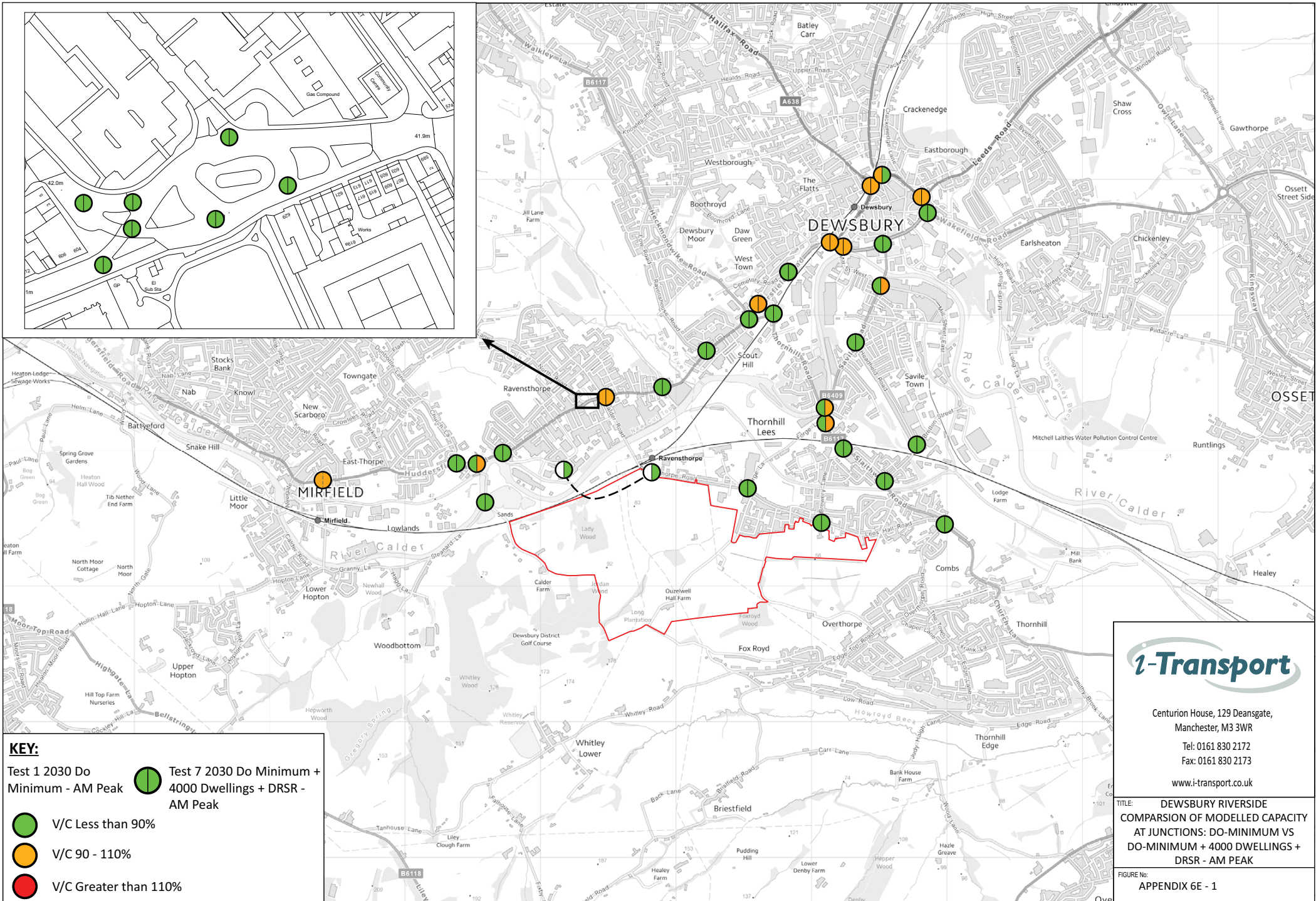
APPENDIX 6.D

**Select Analysis – 4,000
Dwellings + DRSR**

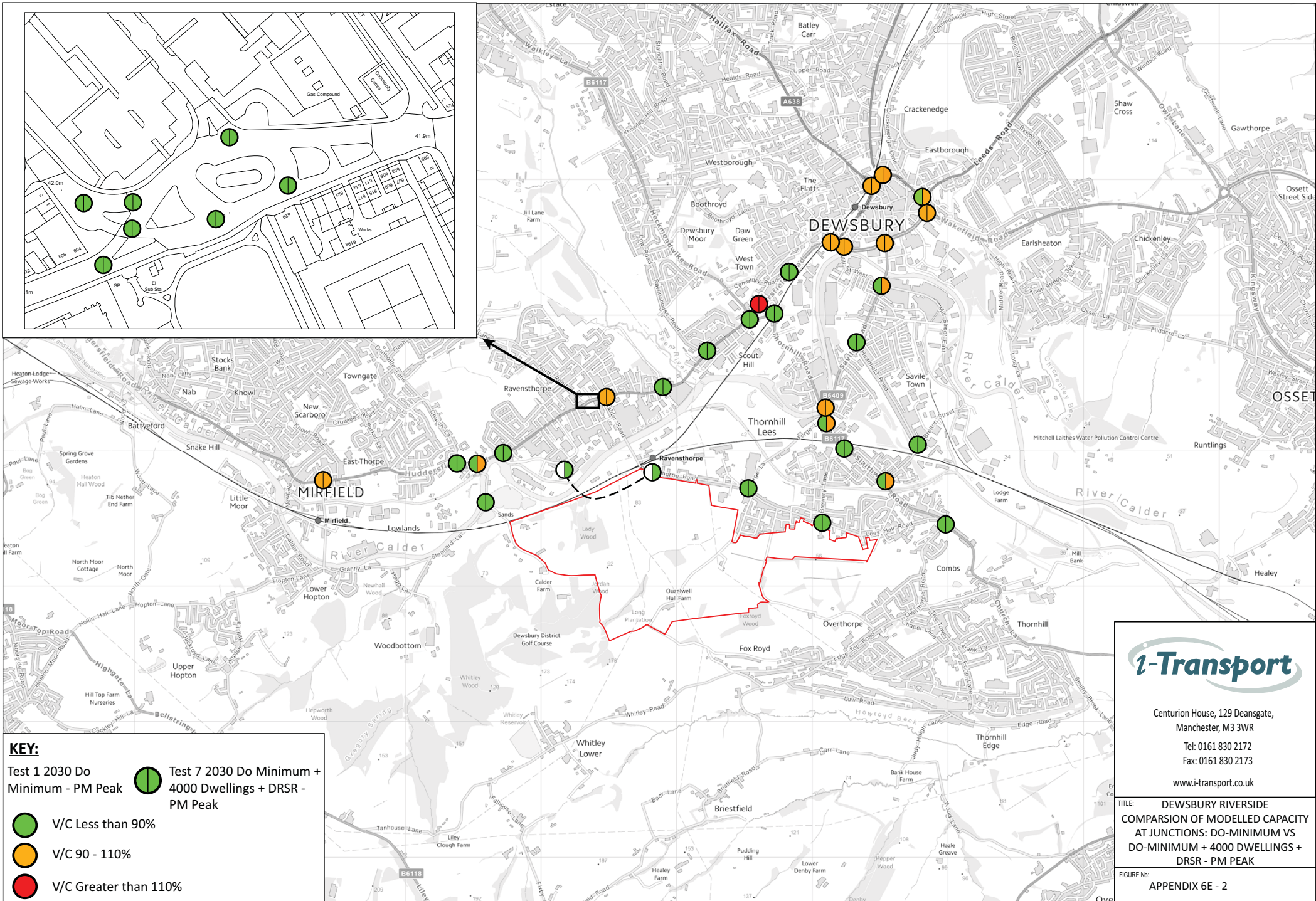


APPENDIX 6.E

**Comparison of Modelled
Capacity at Junctions: Do-
Minimum vs Do-Minimum
+ 4,000 Dwellings + DRSR**



Note:- Image taken from Google Earth



Note:- Image taken from Google Earth



E enquiries@i-transport.co.uk

W www.i-transport.co.uk

Grove House, Lutyens Close
Chineham Court, Basingstoke
Hampshire RG24 8AG

T 01256 338 640

F 01256 338 644

Centurion House
129 Deansgate
Manchester M3 3WR

T 0161 830 2172

F 0161 830 2173

4 Lombard Street
London
EC3V 9HD

T 020 7190 2820

F 020 7190 2821

Park House
Park Square West
Leeds LS1 2PW

T 0113 357 1360

F 0113 357 1361