

TECHNICAL NOTE: Bus Strategy

DATE:	19 March 2024	CONFIDENTIALITY:	Public
SUBJECT:	Bus Strategy		
PROJECT:	Earl Shilton Sustainable Urban Extension	AUTHOR:	Sam Gardner
CHECKED:	Bev Coupe	APPROVED:	Bev Coupe

Purposed of Technical Note

The purpose of this technical note (TN) is to outline the short, medium and long-term proposals for the bus strategy for the Site. As there is no longer a bus service that routes in the vicinity of the Site, the strategy will require pump prime funding of a bus to serve the Site. This will require a phased approach as the Site is built out.

Proposed Development – Access and Interconnectivity

Both applications have been prepared to work in combination to deliver the majority of the overall allocation requirements, providing up to 1,500 new dwellings, up to 5.3 hectares of employment land, a new community hub that will comprise a two-form entry primary school and local retail facilities as well as improved sports provision, new play areas, public open space, landscaping, access and drainage. This is referred to herein as ‘the Proposed Development’. The illustrative masterplan for the Proposed Development is shown in **Figure 2**.

Figure 2 Illustrative Masterplan of Proposed Development



There are five proposed vehicular accesses as part of the Proposed Development:

- A47 Southern Roundabout – into Application B site;

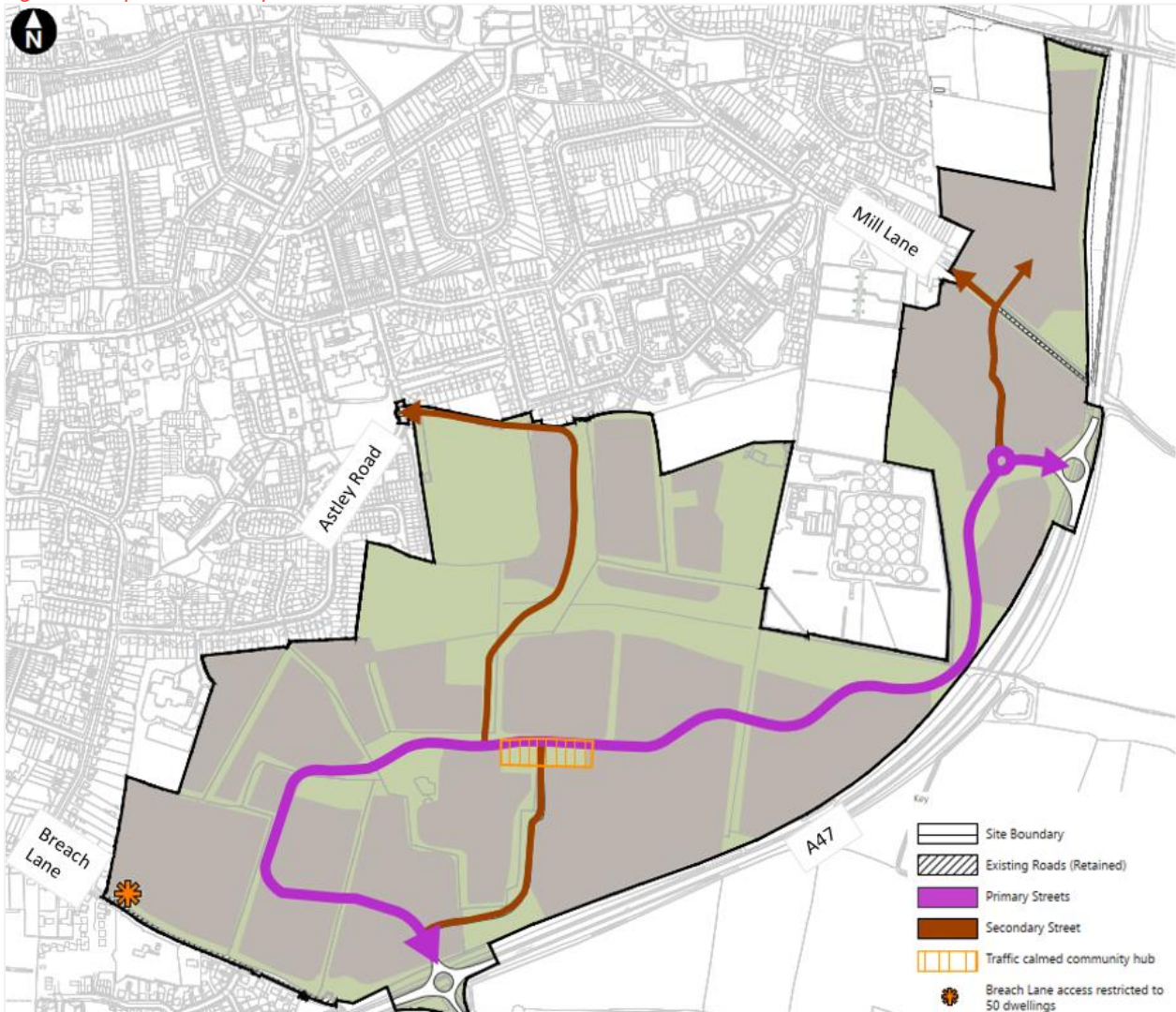
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- A47 Northern Roundabout – into Application B site;
- Mill Lane mini-roundabout – into Application A and B sites;
- Astley Road priority junction – into Application A site; and
- Breach Lane priority junction – into a discrete residential land parcel, part of Application B.

The vehicular accesses are illustrated in **Figure 3**.

Figure 3 Proposed Development Parameter Plan



The Proposed Development Parameter Plan (**Figure 3**) details a primary street and an internal loop/secondary street to enable alternative routes into the central part of the Site, the community hub and primary school.

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- The broad location of the primary street through the SUE is on a similar alignment to that set out in the AAP. It will run through the centre of the SUE and connect the Application A and B areas, joining the new southern and northern A47 roundabouts. The route has been designed to accommodate future bus services (6.75m wide carriageway) and pedestrian and cycle facilities with a 2m footway on one side and a 3m shared cycle facility on the other.
- An internal loop/secondary street is proposed running south from the local centre to the A47 southern access within Application B. Secondary streets will also connect to Astley Road and Mill Lane (and proposed employment area) and will be designed to allow access and bus use but discourage through traffic. Other routes will provide access to residential areas only and in the case of Breach Lane will be for no more than 50 homes.

This design provides flexibility in terms of overall phasing as early connectivity could be achieved either by linking Astley Road to either one of the A47 accesses or by creating a link between the two A47 accesses. The design, also, creates greater internal connectivity for buses and other road users, and allows optimisation of bus routing to maximise accessibility for occupants, subject to detailed design.

The primary and secondary road geometries comply with the *Leicestershire Highway Design Guide* (2022) which states that 'Major Residential' access roads should have a carriageway width of 6.75m and 'Residential' access roads should have a carriageway width of 6m minimum where it is part of a bus route.

Content of the Technical Note

The Technical Note is set out as follows:

- Section 2 – Baseline Situation;
- Section 3 – Earl Shilton SUE Bus Strategy;
- Section 4 – Application B Bus Strategy;
- Section 5 – Application A Bus Service Costings and Contribution and
- Section 6 – Summary and Conclusions.

2. BASELINE BUS ACCESSIBILITY

The existing bus services provide Earl Shilton with good connectivity to major local destinations such as Leicester, Barwell, Hinckley and Nuneaton.

Earl Shilton is currently served by two local bus services^{1,2}:

- 148 – Leicester to Coventry (operated by Stagecoach) runs through the town centre and has two services per hour per direction Monday to Saturday and one per hour per direction on Sunday.

¹ www.arrivabus.co.uk/find-a-service accessed 20/10/23

² <https://www.stagecoachbus.com/timetables> accessed 20/10/23

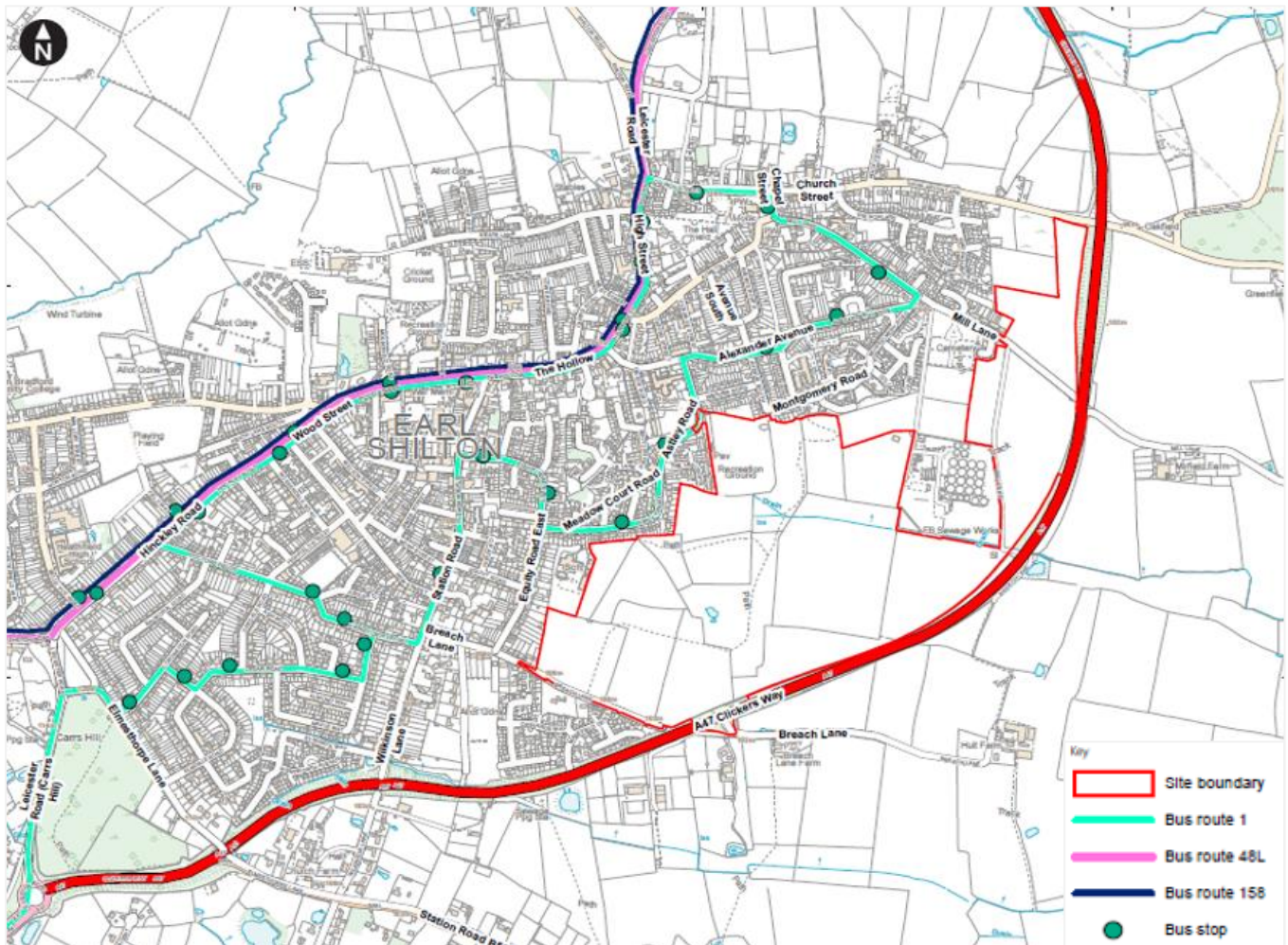
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- 158 – Nuneaton/Hinckley to Leicester (operated by Arriva) also runs through the town centre and has approximately two services per hour per direction Monday to Saturday and one per hour per direction on Sunday.

Both of the bus services run on strategic routes, linking Earl Shilton the major local destinations.. **Figure 4** illustrates these bus service routes within Earl Shilton and the bus stops served by the buses.

Figure 4 Existing and Recently Withdrawn Bus Services in the Earl Shilton Area



The nearest bus stops to the Site which are served by the existing bus services are located in the centre of Earl Shilton along High Street and Wood Street (Keates Lane and twin stops Almey's Lane on High Street and Library on Wood Street), and have bus shelters. **Table 1** summarises the walking distances and journey times from each of the accesses within Earl Shilton to the nearest bus stops and shows that the nearest is from Astley Road (440m/six minute walk) and the furthest from Mill Lane (1.1km/15 minute walk).



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Table 1 Distance from the Site to the nearest bus stop summary

Site Location	Nearest Bus Stop	Approximate Walking Distance	Approximate Walking Time
Mill Lane Access	High Street - Almey's Lane stop	1,100 m	15 mins
Astley Road Access	High Street - Almey's Lane stop	440 m	6 mins
Breach Lane Access	Wood Street - Library stop	1,000 m	14 mins

The LCC publication *Leicestershire Highway Design Guide* (2022)³ identifies that:

"...normally walking distances to bus stops in urban areas should be a maximum of 400m and desirably no more than 250m."

It is noted that the Stagecoach Group publication *Bus Services and New Residential Developments* (2017)⁴ and the Chartered Institute of Highways and Transportation (CIHT) publication *Buses in Urban Developments* (2018)⁵ advises that there will be circumstances where achieving a 400-metre walking catchment:

"...results in an inefficient and contrived layout, greatly undermining the potential effectiveness of the proposed bus route. Stagecoach will always prefer an efficient bus routing strategy, serving the great majority of dwellings well, than one that serves all homes poorly with a low-frequency or indirect service. Thus we support policy approaches offering some degree of flexibility on walking distances to bus stops where this is appropriate."

The walking distances from the Site to the nearest bus stops served by existing bus services, as shown in Table 1, are too far to be attractive as a mode of transport choice. Discussion with the bus operators, Arriva and Stagecoach, has established that a diversion of either of the services near to and/or within the Site is not a feasible option as these are direct, fast routes and it would lengthen journey times which would be to the detriment of existing passengers. Therefore, the bus strategy for the Site as a whole needs to incorporate a bespoke service.

Within the submitted TA it was proposed that the Arriva bus service 1, also shown in Figure 4, which routed between Hinckley Bus Station and Earl Shilton, would be enhanced in terms of service frequency and re-routed through the SUE on completion of the spine road through the Site. Since the submission of both OPAs, bus service 1 has been withdrawn, occurring at the end of August 2023. .

The service took 33 minutes from Earl Shilton Sandringham Avenue to Hinckley Bus Station and 17 minutes from Hinckley Bus Station and Sandringham Avenue, a total of 50 minutes. Therefore, one bus was sufficient for an hourly bus service. However, the service ran every two hours as it also looped to

³ Leicestershire Highways Design Guide – 2022 interim guide, online available at:

<https://resources.leicestershire.gov.uk/environment-and-planning/planning/leicestershire-highway-design-guide>

⁴ Stagecoach, *Bus Services and New Residential Developments*, 2017, available online at

<https://www.stagecoachgroup.com/~media/Files/S/Stagecoach-Group/Attachments/pdf/bus-services-and-new-residential-dev.pdf>

⁵ CIHT Buses in Urban Developments, January 2018, available online at [CIHT - BUSES BROCHURE 2018_cs4.indd](#)

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Barwell as bus service 2. Arriva announced that the withdrawal of the bus service was because customer demand had reduced. This could have been a result of the Covid-19 pandemic impact on bus patronage, and because of its low frequency. A service with a higher frequency than two hourly is likely to be a more attractive travel choice option. The timetable prior to withdrawal of the service is shown below.

Bus Service 1 Timetable (withdrawn August 2023)

Monday to Friday - Barwell East Green

	2 ¹	2 ²	1	2	1	2	1	2
Earl Shilton Sandringham Avenue	--	--	1027	--	1227	--	1657	--
Earl Shilton Coniston Close	--	--	1032	--	1232	--	1702	--
Earl Shilton Library	--	--	1044	--	1244	--	1714	--
Hinckley Ashby Road	--	--	1053	--	1253	--	1723	--
Hinckley The Crescent Bus Station	--	--	1103	--	1303	--	1733	--
Hinckley The Crescent Bus Station	0910	0910	--	1110	--	1310	--	1740
Hinckley Netherley Court	0918	0918	--	1118	--	1318	--	1748
Barwell Brockey Close	0933	0933	--	1133	--	1333	--	1803
Barwell East Green	--	--	--	--	--	--	--	1812

¹ Term Time Only ² Only During School Holidays

Monday to Friday - Earl Shilton Sandringham Avenue

	2	1	2	1	2	1
Barwell Brockey Close	0933	--	1133	--	1333	--
Barwell East Green	0942	--	1142	--	1342	--
Hinckley Ashby Road	0953	--	1153	--	1353	--
Hinckley The Crescent Bus Station	1003	--	1203	--	1403	--
Hinckley The Crescent Bus Station	--	1010	--	1210	--	1640
Hinckley Netherley Court	--	1018	--	1218	--	1648
Earl Shilton Sandringham Avenue	--	1027	--	1227	--	1657

Saturday - Hinckley The Crescent Bus Station

	1	2	1	2	1	2	1	2
Hinckley The Crescent Bus Station	--	1110	--	1310	--	1510	--	1710
Hinckley Netherley Court	--	1118	--	1318	--	1518	--	1718
Barwell Brockey Close	--	1133	--	1333	--	1533	--	1733
Barwell East Green	--	--	--	--	--	--	--	1742
Earl Shilton Sandringham Avenue	1027	--	1227	--	1427	--	1627	--
Earl Shilton Coniston Close	1032	--	1232	--	1432	--	1632	--
Earl Shilton Library	1044	--	1244	--	1444	--	1644	--
Hinckley Ashby Road	1053	--	1253	--	1453	--	1653	--
Hinckley The Crescent Bus Station	1103	--	1303	--	1503	--	1703	--

Saturday - Earl Shilton Sandringham Avenue

	2	1	2	1	2	1	2	1
Barwell Brockey Close	0933	--	1133	--	1333	--	1533	--
Barwell East Green	0942	--	1142	--	1342	--	1542	--
Hinckley Ashby Road	0953	--	1153	--	1353	--	1553	--
Hinckley The Crescent Bus Station	1003	--	1203	--	1403	--	1603	--
Hinckley The Crescent Bus Station	--	1010	--	1210	--	1410	--	1610
Hinckley Netherley Court	--	1018	--	1218	--	1418	--	1618
Earl Shilton Sandringham Avenue	--	1027	--	1227	--	1427	--	1627

As shown in Figure 4, service 1 was closest to the Application A Site with bus stops on Mill Lane, Alexander Avenue, Astley Road and Meadow Court Road which would have been accessible for new residents in northern parts of the Site.

Analysis of the walking distances to the bus stops served by the withdrawn Service 1 using Basemap TRACC 2.0.4 software was undertaken as part of the submitted TA and FTP. This was based on the illustrative masterplan and focuses on the key links from the Site rather than all possible pedestrian routes that will be constructed. TRACC uses a walking speed of 4.8 kmph which is based on the Department of Transport (DfT) publication *Journey Time Statistics: Notes and Definitions*⁶. For origins/destinations not on the road network the journey commences with a walk to the nearest point on the network, with a speed penalty applied, and then continues on the road network.

Figure 5 shows the walking distances to each bus stop and illustrates the extent of accessibility within the Site, demonstrating that locations near to Meadow Court Road, Astley Road and Montgomery Road are within 400m of the withdrawn Service 1 bus stops and the majority of the Site is within 800m.

⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/853603/notes-and-definitions.pdf

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Figure 5 Withdrawn Service 1 - Bus Stop Catchment Areas – Distance (m)

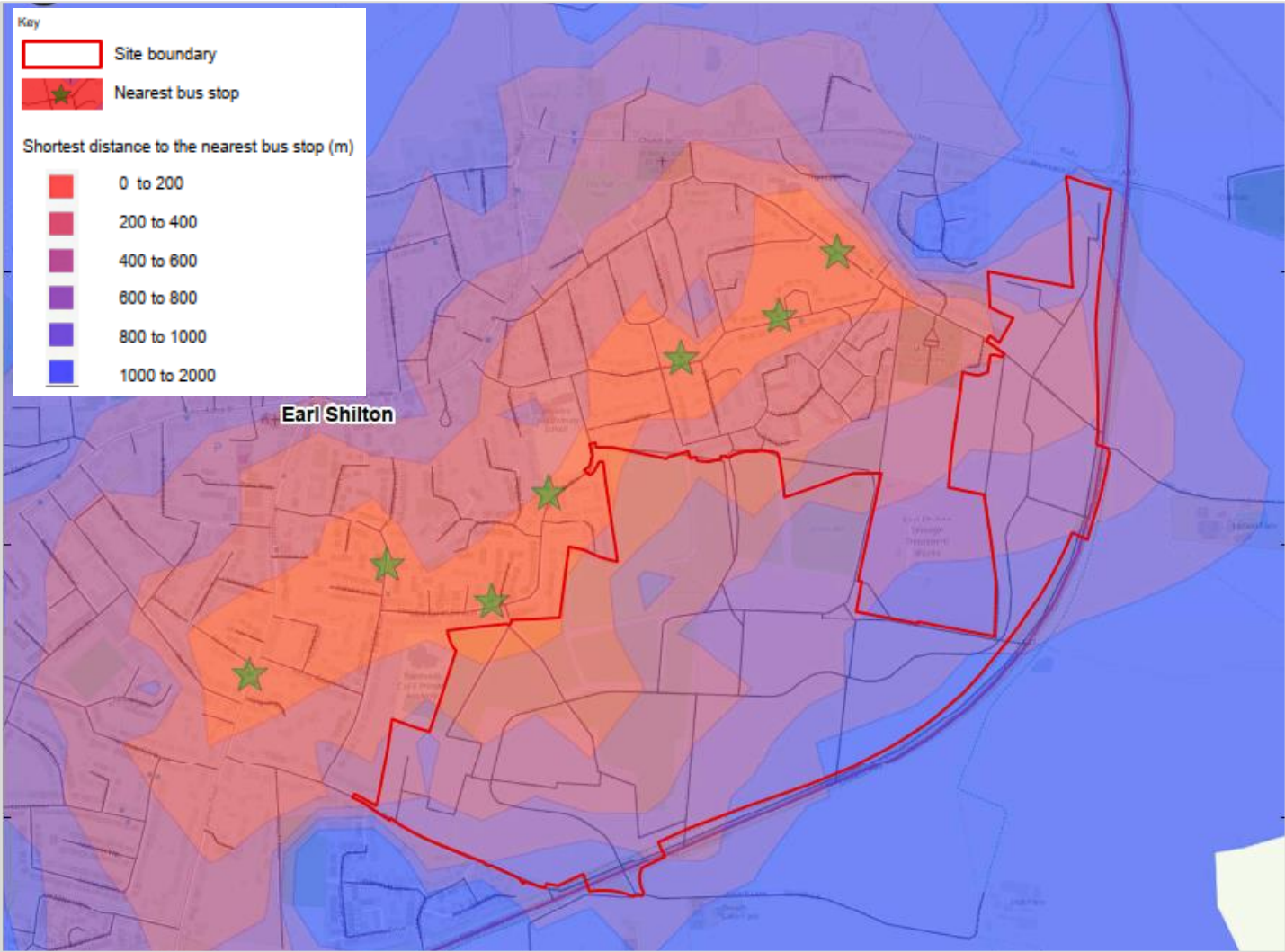


Table 2 provides a summary of this for the whole completed site and the separate Application A and Application B sites. This shows that the Application A site has better accessibility to the former bus service 1 bus stops than Application B, however, the average walking distance for Application B is only 743m and a 9-minute journey time, which is a reasonable walking distance.



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Table 2 Average walking distance and time from areas of the Site to the former Service 1 bus stops

Internal Road and Footway Scenario	Application and Land Parcel	Average Walking Distance to Nearest Bus Stop (m)	Average Walking Time to Nearest Bus Stop (mins)
Existing connections and all internal connections	Whole Site	595	8
Existing connections and Application A internal connections	Application A Land Main Parcel 1	367	5
Existing connections and Application A internal connections	Application A North Mill Lane Parcel 2	595	7
Existing connections and Application B internal connections	Application B	743	9

The bus strategy for the Site considers reinstatement of part of the route, as set out in the following section.

3. EARL SHILTON SUE BUS SERVICE STRATEGY

The bus strategy for the Site at full completion is based on connectivity to Earl Shilton town centre and to Hinckley Bus Station, from where Hinckley Train Station is an eight-minute walk away.

Bus Routeing

On full completion of the Proposed Development, the bus service would route through the Site, either via Mill Lane and Astley Road or via one or both of the A47 roundabouts. The routeing options are identified below.

1. A47 from Hinckley – Wilkinson Road – Station Road – Equity Road East – Meadow Court Road – Astley Road – Earl Shilton SUE Astley Road access – Earl Shilton SUE Spine Road – Earl Shilton SUE Mill Lane access - Mill Lane – Chapel Street - Church Street – Hill Top – High Street – Wood Street – Hinckley Road – Station Road – Wilkinson Road – A47 to Hinckley.
2. A47 from Hinckley - Station Road – Wilkinson Road - Hinckley Road - Wood Street - High Street - Hill Top - Church Street - Chapel Street - Mill Lane – Earl Shilton SUE Mill Lane access - Earl Shilton SUE Spine Road - Earl Shilton SUE Astley Road access - Astley Road - Meadow Court Road - Equity Road East - Station Road - Wilkinson Road - A47 to Hinckley
3. A47 from Hinckley A47 – Earl Shilton SUE A47 Southern Roundabout – Earl Shilton SUE Spine Road – Earl Shilton SUE Mill Lane access - Mill Lane – Chapel Street - Church Street – Hill Top – High Street – Wood Street – Hinckley Road – Station Road – Wilkinson Road – A47 to Hinckley.
4. A47 from Hinckley A47 – Earl Shilton SUE A47 Southern Roundabout – Earl Shilton SUE Spine Road – Earl Shilton SUE A47 Northern Roundabout – A47 to Hinckley.

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Bus Frequency

One bus would be sufficient to provide at least an hourly service for Route Options 1 - 3, which could potentially be one every 45 minutes.

Route Option 4 would be quicker, and one bus could potentially have a frequency of one every 30 – 45 minutes. However, this route would not provide a connection between the SUE and Earl Shilton town centre and wouldn't offer the benefit of patronage from existing residential areas within Earl Shilton to support the commercial viability of the service.

It is anticipated that the bus service will be commercially viable before the SUE is completed and the bus service frequency by this stage will be dependent on the bus operator.

4. PHASED BUS STRATEGY

As there is no existing bus service to appropriately serve the majority of the Site due to the distance to the bus stops on Earl Shilton High Street and Wood Street, there will be a need for the funding of a bus to serve the Site. A phased bus service strategy will be required that fits with the staged delivery of each of the application sites. In the short and medium term, this will entail reinstatement of bus service 1 which will be most accessible to the Application A Site, as well as the residential parcel of Breach Lane, Application B, and an extension into the Application B Site via the southern A47 roundabout to serve its early phasing delivery.

Short and Medium Term

Commencement of a bus service to serve a new development is a balance between providing travel choice in the early stages of occupation and optimum use of developer contribution funding. Whilst it would be ideal for a bus service to be in place from day 1 of occupation in order to influence travel choice at the outset, this would be poor use of funding as revenue earned from patronage from occupants from the site would be minimal. A pragmatic approach is to identify a threshold of development that would trigger the commencement of the service.

It is proposed that the contribution or commencement of bus provision is triggered once 150 dwellings have been constructed and occupied.

Initial construction delivery will be based off separate access points with no internal connections. On the basis that there will be no internal connectivity, the short-term bus strategy is the reinstatement of Service 1, potentially with a modified route through Earl Shilton to shorten the journey time, thereby enabling a slight increase in frequency compared to the withdrawn service – an approximate 40 - 45 minute journey time. The re-instated bus service would additionally route to Application B via the southern roundabout with a loop facilitated by a turning arrangement.

Figure 6 illustrates the short-term bus access route to the Application B Site, noting that would be a turning head or loop to enable the service to route into the Site along the secondary street and turn in the vicinity of the community hub and school.

Figure 6 Potential short-term bus route into Application B's site

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The potential route from Hinckley would be as follows (red text showing revised route from pervious service 1):

- A47 from Hinckley – Proposed Site southern roundabout, turning within the Site – A47 - Wilkinson Road – Station Road – Equity Road East – Meadow Court Road – Astley Road - Alexander Avenue – Mill Lane – Chapel Street - Church Street – Hill Top – High Street – Wood Street – Hinckley Road – Station Road – Wilkinson Road – A47 to Hinckley.

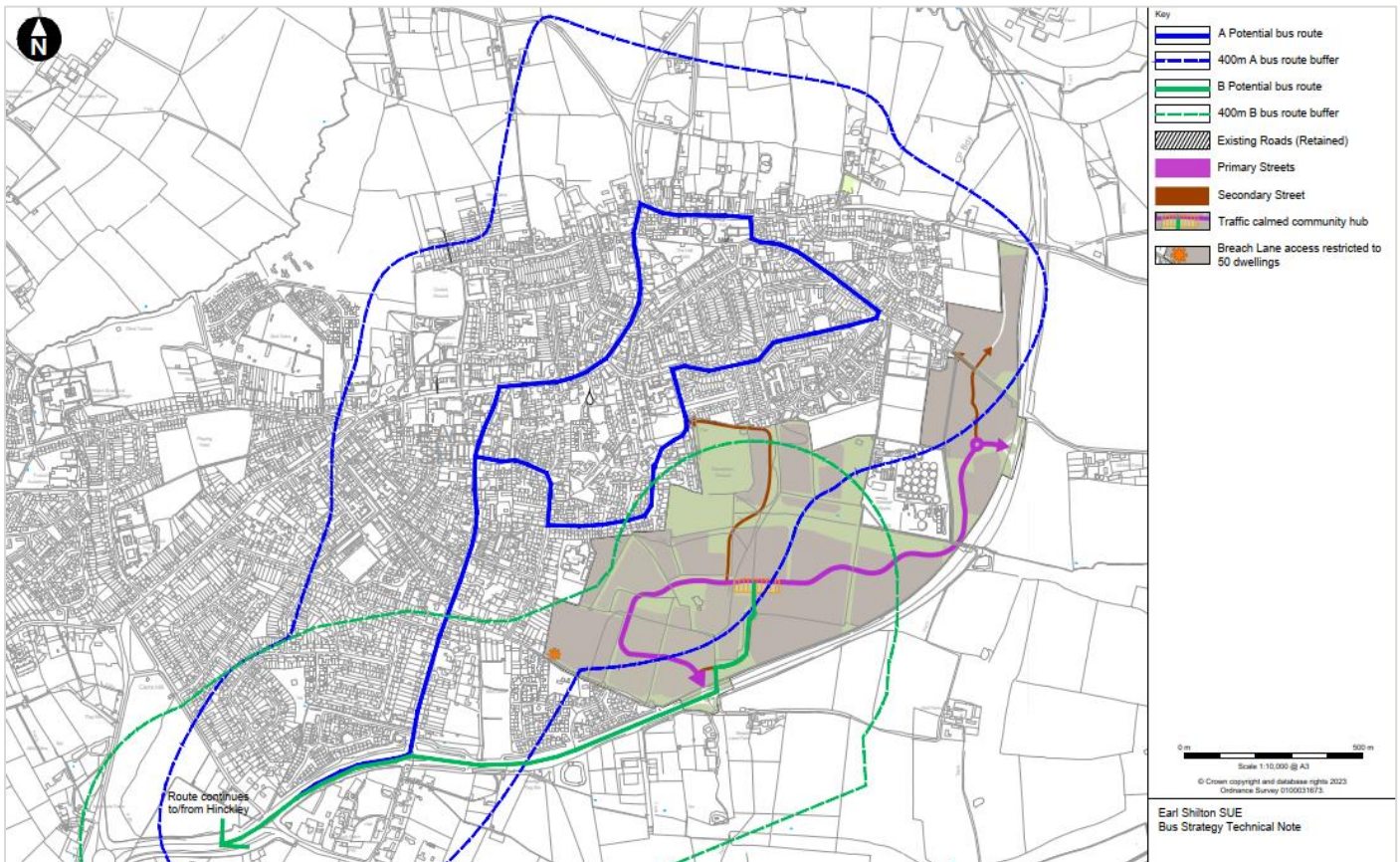
One bus would be sufficient to provide at least an hourly service.

Figure 7 shows an overlay of a 400m buffer around the bus route for both Application A and Application B in the short-term, showing good coverage of both sites, although acknowledging that this is a ‘crow flies’ distance rather than walking distance.

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Figure 7 400m buffer from overlaid on Primary and Secondary access parameter plan



Long term Year 6 to Year 10

On full completion of the Proposed Development, the bus service would route through the Site, either via Mill Lane (Application A) or both A47 roundabouts (Application B):

- A47 –Southern Roundabout – through Site – Mill Lane – Chapel Street - Church Street – Hill Top – High Street – Wood Street – Hinckley Road – Leicester Road (Carrs Hill) – A47 to Hinckley.
- A47 –Southern Roundabout – through Site – Northern Roundabout – A47 to Hinckley.

5. BUS STOP INFRASTRUCTURE

Bus stop locations will be site to enable the majority of residential properties to be within 400m of an existing or a new bus stop. New bus stops would be at suitable intervals, to be agreed with LCC, but anticipated to be no greater than 600 m apart. It is intended to provide high quality Disability Discrimination Act (DDA) compliant bus stops which would generally include the following:

- installation of high-quality bus shelters (with at minimum lighting, seats and passenger information panels);

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- raised access kerbs would be installed, providing level access for passengers boarding or alighting the buses;
- an associated maintenance and cleaning programme so the stops do not fall below the required standard;
- be safe, well lit and level pedestrian routes to the bus stops, including suitable points to cross the highway; and
- appropriate traffic management to prevent illegal parking at the bus stops i.e. Clearway Orders.

6. BUS SERVICE COSTINGS AND CONTRIBUTION

Consideration has been given to potential bus service costs and a contribution amount, taking into account potential patronage from the new occupants and existing households and revenue from this.

Assumptions

Table 4 sets out the assumptions on costs and revenue. It should be noted that this does not include assumptions on inflation.

Table 4 Potential Bus Service Scenario Assumptions

	Assumptions
Bus Operating Cost per annum *	£180,000
Patronage	The residential and employment land uses of the Proposed Development Application B and existing households within 400m of a bus stop on the potential bus route.

* based on advice from Arriva regarding an indicative standard annual bus cost for one bus operating a 12 hour per day Monday to Saturday service. Bus operating cost will vary depending on service level and operator, for example.

The following is assumed with regards to the Proposed Development.

- Mode share – consideration has been given to the implications of differing percentages, including the 2011 Census journey to work data which recorded a mode share for bus of 4.23% and the 2021 Census journey to work data which recorded a mode share for bus of 2.83%.
- The mode share has been applied to the person trips for the Proposed Development residential land use. For employment, the estimated number of jobs for the employment land uses has been based on Table 12.9 of the Environmental Statement (ES) and the mode share applied to this.
- A construction period of 10 years for the residential element has been assumed, comprising an average of 50 dwellings per annum for Application A and 100 residential units per annum for Application B. The employment uses are assumed to occur later in the construction programme, from Year 7 to Year 12.

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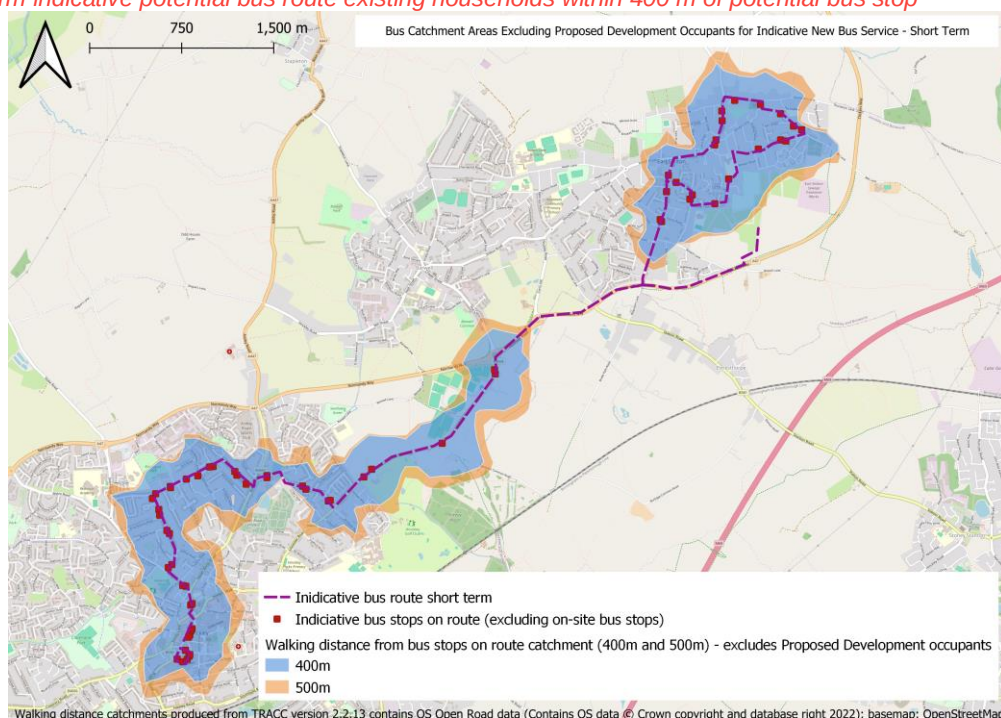
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- An average fare cost of £1.35 has been assumed based on the current fare structure in the locality and taking into account patronage by full fare paying adults (assumed to be 56.3% based Census 2021 data on age in Hinckley and Bosworth 006A-006F) and children (11.3%) and non-fare paying passengers – children under 4 years old (5.4%) and pensioners with a bus pass (20.6%).

The following is assumed with regards to existing household patronage.

- The mode share for the Proposed Development residential land use is applicable, however, consideration needs to be given to the catchment overlap with existing bus services (148 and 158). To allow for these established, 'competing' services, the potential mode share for the proposed new route from existing households has been reduced to an eighth.
- Existing households within 400m of a bus stop on the potential bus service route have been determined using TRACC (v. 2.2.13 using OS Open Road road network) and bus stops⁷ along the potential bus route taking consideration the locations of the bus stops for the withdrawn service (**Figure 8** and **Figure 9**). The number of households was derived from the 2011 Census 'KS401EW - Dwellings, household spaces and accommodation type'⁸ for 2011 Census Output Areas where the majority of residential areas within the Output Area reside within the 400m bus stop catchment boundary.

Figure 8 Short-term indicative potential bus route existing households within 400 m of potential bus stop



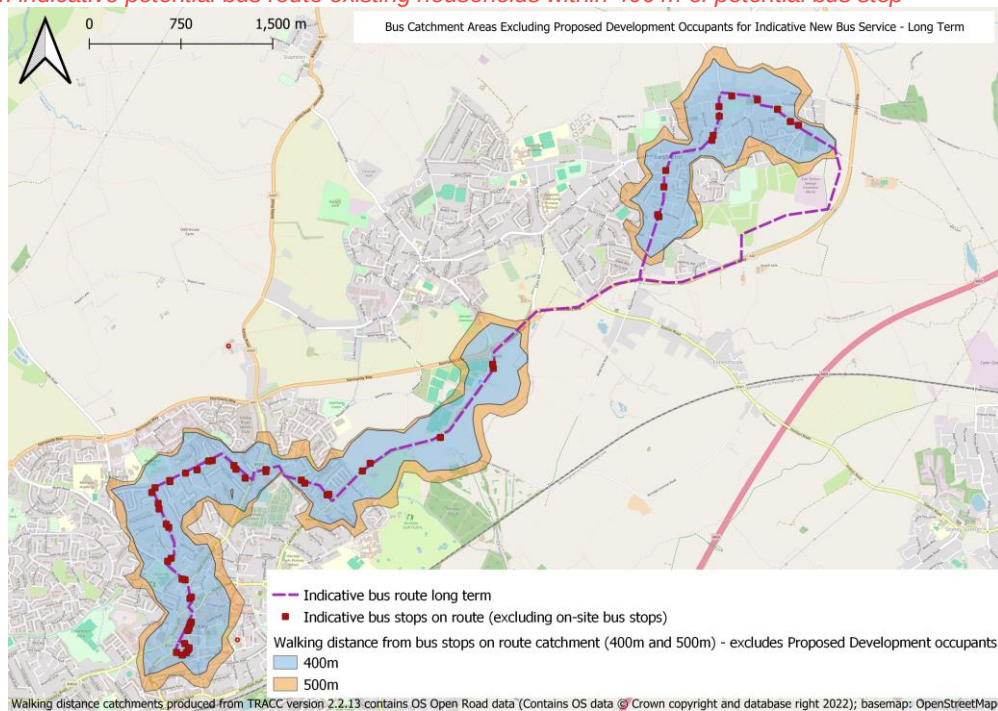
⁷ Department for Transport National Public Transport Access Notes (NaPTAN) dataset (online). Available at: <https://beta-naptan.dft.gov.uk/download/la> [Accessed 13/12/23]

⁸ Nomis 2011 Census Dataset 'KS401EW - Dwellings, household spaces and accommodation type' (online). Available at: https://www.nomisweb.co.uk/sources/census_2011 [Accessed 13/12/23]

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Figure 9 Long-term indicative potential bus route existing households within 400 m of potential bus stop



- Based on the calculation of existing households within 400m of the bus service routes, there are up to 5,777 households along the short term route and 5,631 households along the long term route.
- Based on the bus mode share and allowance for patronage on existing bus services, it is estimated that there would be 282 daily passengers from existing households along the short term route and 275 daily passengers along the long term route.

Results

A summary of the calculations, for commercially viable mode share scenarios, is provided in **Table 5**. This shows that with the inclusion of revenue from existing households within 400m of the proposed bus route, commercial viability will be as follows:

- One bus – by Year three and completion of 450 dwellings
- Two buses – by Year 10 and completion of all of the dwellings, school and community hub and 67% employment

Table 6 provides a summary of the results for the commercial viability showing that a contribution of £55,843 would be needed towards the operation of one bus service and £1,106,215 towards two bus services.

The calculations for each scenario are included in **Appendix A**.

Table 5 – Summary of Bus Cost Revenue by Year

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Estimated Annual Patronage												
Earl Shilton SUE	17815	35630	53445	71775	89590	107405	127256	145071	164923	184774	186810	188846
Existing Households	85,765	85,765	85,765	85,765	85,765	85,765	83,598	83,598	83,598	83,598	83,598	83,598
Total Annual Patronage	103,580	121,395	139,210	157,540	175,355	193,170	210,854	228,669	248,520	268,371	270,407	272,443
Estimated Revenue												
Earl Shilton SUE revenue	£24,085	£48,171	£72,256	£97,037	£121,122	£145,207	£172,045	£196,130	£222,968	£249,806	£172,274	£175,027
Existing household revenue	£115,951	£115,951	£115,951	£115,951	£115,951	£115,951	£113,020	£113,020	£113,020	£113,020	£113,020	£113,020
Total Revenue	£140,036	£164,121	£188,206	£212,987	£237,072	£261,158	£285,065	£309,150	£335,988	£362,826	£365,579	£368,331
Annual Bus cost/revenue – One bus												
Bus cost per annum*	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000
Bus subsidy (-) /bus viability	-£39,964	-£15,879	£8,206	£32,987	£57,072	£81,158	£105,065	£129,150	£155,988	£182,826	£185,579	£188,331
Annual Bus cost/revenue – Two buses												
Bus cost per annum*	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000
Bus subsidy (-) /bus viability	-£219,964	-£195,879	-£171,794	-£147,013	-£122,928	-£98,842	-£74,935	-£50,850	-£24,012	£2,826	£5,579	£8,331

* Based on operator cost provided

Table 6 Commercial Viability Results Summary

Proposed Development Mode Share Value	One Bus	Two Buses
Year of Commercial Viability	Year 3	Year 10
Proposed Development Status at Year of Commercial Viability	450 dwellings have been built and occupied	1,500 dwellings built and occupied School, retail and community hub completed 67% of employment built and occupied
Contribution Amount Overall to Year of Viability*	£55,843	£1,106,215

*Taking into account revenue from fare paying passengers



TECHNICAL NOTE: Bus Strategy

DATE:	19 March 2024	CONFIDENTIALITY:	Public
SUBJECT:	Bus Strategy		
PROJECT:	Earl Shilton Sustainable Urban Extension	AUTHOR:	Sam Gardner
CHECKED:	Bev Coupe	APPROVED:	Bev Coupe

It is proposed to provide a contribution of £1,106,215 to fund two buses in order to ensure that there is a good level of frequency. It is anticipated that the contribution will be split into three payment periods, to be confirmed with the public transport officer in LCC. As identified earlier in this TN, it is proposed that the development threshold to trigger the first contribution payment is construction and occupation of 150 dwellings.

7. ADDITIONAL BUS STRATEGY CONTRIBUTIONS

The Applicants will comply with LCC advice and requirements regarding Travel Plan contributions and monitoring. Relative to the bus strategy, this will include the following:

- Travel Information Packs will be produced as part of the Travel Plan implementation. This will include information on the SUE funded bus service and the other services in Earl Shilton, and connections to Hinckley Rail Station. The Applicant will either produce their own Travel Information Packs and will pay LCC £500 to review and approve the content or will pay LCC to produce these, understood to be £52.85 per pack.
- LCC currently asks for two adult passes (each pass being valid for six months) per residential plot. An Arriva bus pass costs £360.00.

8. SUMMARY

There are two existing bus services which provide Earl Shilton with good connectivity to major local destinations. A third service, bus service 1, routed closest to the Site, however, was withdrawn in August 2023.

The bus strategy for the Earl Shilton SUE will need to consider the reinstatement of the withdrawn route as the existing services and associated bus stops are more than 400m from the Site boundary.

The routing for the Earl Shilton SUE bus strategy is anticipated to be as follows:

- Short-term (no internal connectivity within the Site) – reinstate bus service 1 to route along road network in proximity to Site boundary and to Application B site via the proposed southern roundabout junction.
- Medium-term – as per the short-term route.
- Long term - route service through the whole Site.

Based on the provision of one bus, the contribution amounts towards the operation of the bus service would be £55,843 or £1,106,215 towards two bus services.

It is proposed to provide a contribution of £1,106,215 to fund two buses in order to ensure that there is a good level of frequency. It is anticipated that the contribution will be split into three payment periods and that the development threshold to trigger the first contribution payment is construction and occupation of 150 dwellings.



TECHNICAL NOTE: Bus Strategy

DATE:	19 March 2024	CONFIDENTIALITY:	Public
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PROJECT:	Earl Shilton Sustainable Urban Extension	AUTHOR:	Sam Gardner
CHECKED:	Bev Coupe	APPROVED:	Bev Coupe

Appendix A

BUS COST/REVENUE

Earl Shilton Bus Patronage Calculations

Mode share			
	2011 Census - Lower Layer Output Area 009c	Future Assumption ES SUE*	Future Assumption Existing HH*
Bus mode share	4.23%	4.23%	0.53%
* 2011 census level reduced to a 1/8 due to the existing services having overlapping catchment areas			

	Person trip rates based on TA		Bus Patronage based on number of jobs derived from Table 12.9 of Environmental Statement			
	Residential		Employment B1	Employment B2	Employment B8	Retail
AM Peak Hour	1.17	Number of Jobs	142	227	204	20
PM Peak Hour	1.078	Two-way trips	284	454	408	40
Daily	9.236	Bus mode share trips	12	19	17	2
Daily bus trip rate based on bus mode share of person trip rate	0.391	Total Employment two-way daily trips by bus	50			

Daily bus trip rate based on mode share of person trip rate - Exising Households	0.049
--	-------

	Potential patronage opportunities within 400m of bus route	Annual Growth based on Construction Phasing (year)											
		1	2	3	4	5	6	7	8	9	10	11	12
Residential - dwellings	1,000	150	300	450	600	750	900	1,050	1,200	1,350	1,500	1,500	1,500
Emp B1- m²	2,000							333	667	1,000	1,333	1,667	2,000
Emp B2- m²	11,400							1,900	3,800	5,700	7,600	9,500	11,400
Emp B8- m²	11,400							1,900	3,800	5,700	7,600	9,500	11,400
Existing HH - Short Term and Long Term Bus Routes		5,777	5,777	5,777	5,777	5,777	5,631	5,631	5,631	5,631	5,631	5,631	5,631

	Daily bus patronage based on bus trip rates											
	1	2	3	4	5	6	7	8	9	10	11	12
Residential	59	117	176	234	293	352	410	469	527	586	586	586
Emp B1-	0	0	0	0	0	0	2	4	6	8	10	12
Emp B2-	0	0	0	0	0	0	3	6	10	13	16	19
Emp B8-	0	0	0	0	0	0	3	6	9	12	14	17
Retail (Employment)				2	2	2	2	2	2	2	2	2
Existing HH - Short Term and Long Term Bus Routes	282	282	282	282	282	282	275	275	275	275	275	275

Annual bus patronage

Operating days:

304	Residential	304	Retail	252	Employment
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	Annual bus patronage based on daily trips and annual operating days											
	1	2	3	4	5	6	7	8	9	10	11	12
Residential	17815	35630	53445	71261	89076	106891	124706	142521	160336	178151	178151	178151
Emp B1	0	0	0	0	0	0	505	505	1009	1514	2018	2523
Emp B2	0	0	0	0	0	0	807	807	1613	2420	3226	4033
Emp B8	0	0	0	0	0	0	725	725	1450	2175	2899	3624
Retail (Employment)	0	0	0	514	514	514	514	514	514	514	514	514
Total SUE	17815	35630	53445	71775	89590	107405	127256	145071	164923	184774	186810	188846
Existing HH - Short Term and Long Term Bus Routes	85,765	85,765	85,765	85,765	85,765	85,765	83,598	83,598	83,598	83,598	83,598	83,598
Total	103,580	121,395	139,210	157,540	175,355	193,170	210,854	228,669	248,520	268,371	270,407	272,443

Bus Cost / Revenue Per Annum

Average single bus fare		£1.35	Annual bus cost	No of buses	Bus cost	Total cost
				1	£180,000.00	£180,000.00

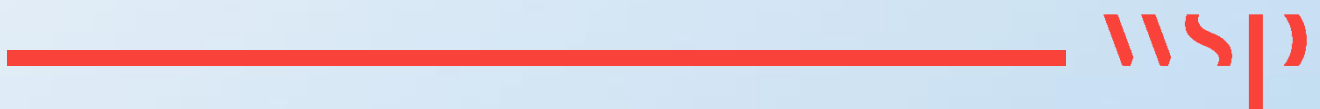
Years of Construction	1	2	3	4	5	6	7	8	9	10	11	12
Annual Bus cost	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000	£180,000
SUE Residential	£24,085	£48,171	£72,256	£96,341	£120,426	£144,512	£168,597	£192,682	£216,768	£240,853	£240,853	£240,853
SUE Emp B1	£0	£0	£0	£0	£0	£0	£682	£682	£1,364	£2,046	£2,729	£3,411
SUE Emp B2	£0	£0	£0	£0	£0	£0	£1,090	£1,090	£2,181	£3,271	£4,362	£5,452
SUEEmp B8	£0	£0	£0	£0	£0	£0	£980	£980	£1,960	£2,940	£3,920	£4,900
SUE Retail Employment	£0	£0	£0	£695	£695	£695	£695	£695	£695	£695	£695	£695
SUE Revenue	£24,085	£48,171	£72,256	£97,037	£121,122	£145,207	£172,045	£196,130	£222,968	£249,806	£252,559	£255,311
Existing HH	£115,951	£115,951	£115,951	£115,951	£115,951	£115,951	£113,020	£113,020	£113,020	£113,020	£113,020	£113,020
Total Revenue	£140,036	£164,121	£188,206	£212,987	£237,072	£261,158	£285,065	£309,150	£335,988	£362,826	£365,579	£368,331
Bus subsidy (-) /bus viability	-£39,964	-£15,879	£8,206	£32,987	£57,072	£81,158	£105,065	£129,150	£155,988	£182,826	£185,579	£188,331

Average single bus fare		£1.35	Annual bus cost	No of buses	Bus cost	Total cost
				2	£180,000.00	£360,000.00

Years of Construction	1	0	1.692	1.692	1.692	1.692	1.692	1.692	1.692	1.692	1.692	0
Annual Bus cost	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000	£360,000
SUE Residential	£24,085	£48,171	£72,256	£96,341	£120,426	£144,512	£168,597	£192,682	£216,768	£240,853	£240,853	£240,853
SUE Emp B1	£0	£0	£0	£0	£0	£0	£682	£682	£1,364	£2,046	£2,729	£3,411
SUE Emp B2	£0	£0	£0	£0	£0	£0	£1,090	£1,090	£2,181	£3,271	£4,362	£5,452
SUEEmp B8	£0	£0	£0	£0	£0	£0	£980	£980	£1,960	£2,940	£3,920	£4,900
SUE Retail Employment	£0	£0	£0	£695	£695	£695	£695	£695	£695	£695	£695	£695
SUE Revenue	£24,085	£48,171	£72,256	£97,037	£121,122	£145,207	£172,045	£196,130	£222,968	£249,806	£252,559	£255,311
Existing HH	£115,951	£115,951	£115,951	£115,951	£115,951	£115,951	£113,020	£113,020	£113,020	£113,020	£113,020	£113,020
Total Revenue	£140,036	£164,121	£188,206	£212,987	£237,072	£261,158	£285,065	£309,150	£335,988	£362,826	£365,579	£368,331
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Appendix I

**PROPOSED STUDY AREA FOR
JUNCTION ASSESSMENT
TECHNICAL NOTE (DOC REF: 42523-
WSPE-XX-XX-TN-OT-00001_S0_P03**





TECHNICAL NOTE 2

DATE:	14 November 2023	CONFIDENTIALITY:	Public
SUBJECT:	Proposed Study Area for Junction Assessment		
PROJECT:	Earl Shilton Sustainable Urban Extension	AUTHOR:	Bev Coupe
CHECKED:	Grace Smith	APPROVED:	Neil Hall

INTRODUCTION

Overview

WSP UK Limited (WSP), formerly Wood E&IS UK Limited, has been commissioned by Bloor Homes Ltd, Jelson Limited and Barwood Strategic Land II LLP (the 'Applicants') to submit two outline planning applications (OPA) for a comprehensive residential led mixed-use development known as the Earl Shilton Sustainable Urban Extension (SUE). The two separate, but aligned, OPAs are referred to as application A and B. Application B for Bloor Homes and Jelson was submitted in December 2021 and Application A for Barwood Strategic Land was submitted in March 2023.

Both applications have been prepared to work in combination to deliver the majority of the overall allocation requirements, providing up to 1,500 new dwellings, up to 5.3 hectares of employment land, a new community hub that will comprise a two-form entry primary school and local retail facilities as well as improved sports provision, new play areas, public open space, landscaping, access and drainage. This is referred to herein as 'the Proposed Development'.

One Transport Assessment (TA) and Framework Travel Plan (FTP) was produced to support both Applications and was submitted in December 2021. Comments from the Leicestershire County Council (LCC) Highways Development Management (HDM) team and National Highways identified the need for agreements on the traffic modelling and transport assessment approach and for further testing using the Pan Regional Traffic Model (PRTM).

Further PRTM modelling has been undertaken in consultation with LCC HDM, National Highways and Warwickshire County Council (WCC) Highways, collectively referred to herein as the 'highway authorities'. The Applicants have commissioned AECOM to carry out the PRTM modelling. The PRTM modelling is based on the full allocation of 1,600 dwellings.

Purpose of Technical Note

The purpose of this technical note (TN) is to identify the proposed Study Area for more detailed testing of the impact of the Proposed Development on the road network based on junction capacity assessments.

Content of Technical Note

The Technical Note is set out as follows.

- Section 2 – PRTM Overview – summary of PRTM methodology and results;
- Section 3 – Proposed Study Area – presents the methodology and results for identifying the Study Area; and
- Section 4 – Summary – presents a summary of the junctions for assessment.

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PRTM OVERVIEW

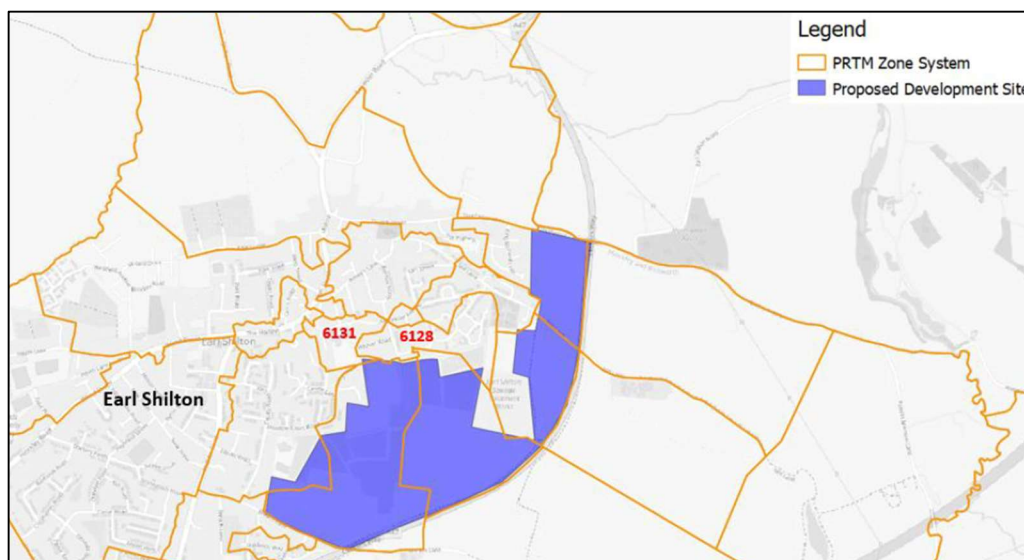
Overview

PRTM v2.3 has been used to assess the impact of the Proposed Development on the local and strategic road network. The ‘unconstrained’ version of the model has been used, as is required by the highway authorities.

The following have been agreed with the highway authorities.

- Highway-only run of PRTM using SATURN congested highway assignment software.
- Base year review which the PRTM validated well to TAG criteria as being suitable for forecasting purposes for the assessment. The Base Year Model Review report is included in **Appendix A**.
- Uncertainty Log for forecasting which takes account of planning growth and highway infrastructure assumptions in Leicestershire and neighbouring Warwickshire. The Uncertainty Log v1.2 is included in **Appendix B**.
- Trip rates and traffic generation which were agreed as part of the original PRTM modelling work and align with the nearby Barwell SUE. The full allocation of 1,600 dwellings has been assumed, and therefore allows for the Persimmon site which is south of Thurlaston Lane.
- Traffic distribution of the Proposed Development based on appropriate ‘Parent Zones’ near to the Site. Zone 6128 has been selected as the parent zone for housing as it contains a large proportion of residential trips, and zone 6131 was selected for education trips as it contains a significant proportion of primary school trips. **Figure 1** shows the location of the two parent zones selected for the development trip distribution.

Figure 1: Parent Zones Used for Traffic Distribution



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PRTM runs of without and with Proposed Development scenarios have been run for the following forecast years:

- 2026 Opening Year assessment of the Proposed Development at full occupation for National Highways – in accordance with DfT circular 01/2022; and
- 2036 Completion Year and also the end of HBBC's local plan period.

The modelling periods for the weekday peak periods in the TA were the same as in the PRTM v.2.3 – AM 0800-0900 and PM 1700-1800.

The Proposed Development has four access junctions:

- Access 1 – Southern A47 roundabout
- Access 2 - Northern A47 roundabout
- Access 3 – Mill Lane
- Access 4 – Astley Road.

The internal road network to and from Access 3 and Access 4 will include traffic management features to discourage through-traffic which has been included in the modelling.

Seven development zones have been used to represent the proposed Earl Shilton SUE development with four development zones representing housing and three development zones to represent employment, retail (the urban centre) and education.

A second PRTM run has been undertaken of a 'without Padge Hall Farm' scenario, referred to herein as 'without PHF'. Padge Hall Farm is a recently approved and therefore committed development south of the A5 at Hinckley and east of The Long Shoot in Nuneaton comprising 1.4 million sqft of B2/B8 floorspace. The proposals include a new access on the A5, a scheme of mitigation works to the A5/A47 Dodwells Roundabout, pedestrian and cycle measures along the A5, and enhancements to the local bus service. As the mitigation works at Dodwells Roundabout are within the Padge Hall Farm site, National Highways required a model run without the development to test the situation in the event that the development, and therefore the mitigation scheme, was not delivered, or delivery was delayed.

PRTM Results

The Forecasting Report is included in **Appendix C**. This provides the following summary on the routing of the Proposed Development trips, the majority of which route via the A47 (between 50-60%).

- A47 West - 30% of trips are forecast to route west via the A47 to / from Hinckley in both the AM and PM peak hours;
- A47 East - 20% of trips are forecast to route east via the A47 to / from Leicester in the AM peak hour; route east towards Leicester via the A47 (20-30% of development trips); 25-30% of trips are forecast to route east via the A47 to / from Leicester in the PM peak hour;
- 23-27% of trips are forecast to route via Astley Road in both the AM and PM peak hours, with the majority of trips to / from the proposed 'urban centre';

TECHNICAL NOTE 2

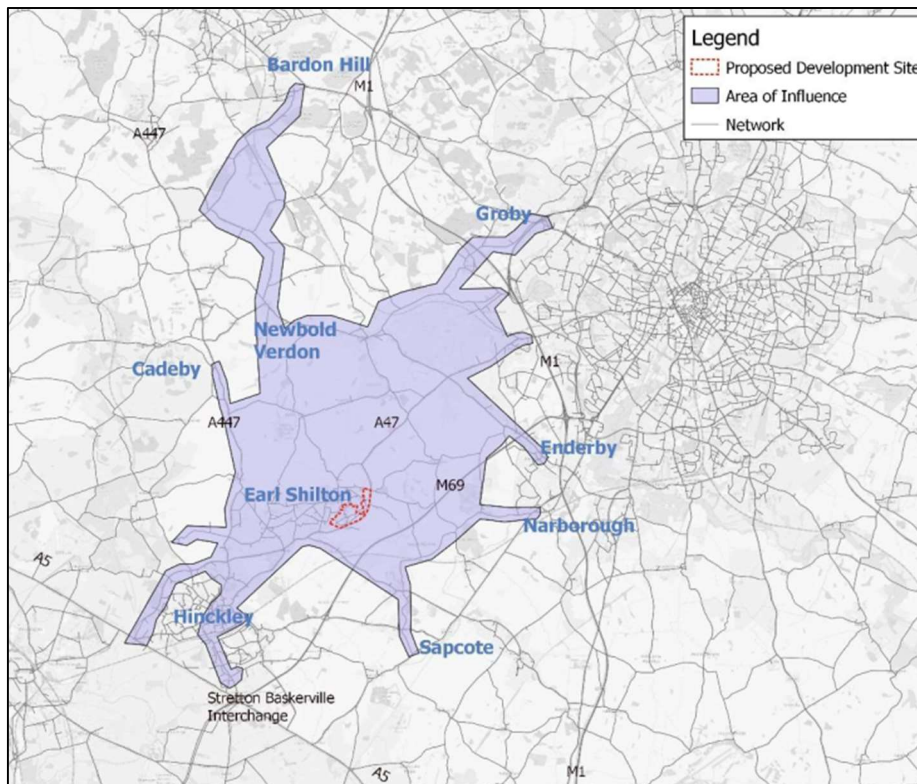
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- 10% of trips are forecast to route via Mill Lane in both the AM and PM peak hours;
- 12-24% are forecast to route via Shilton Road to / from Kirkby Mallory and Newbold Verdon to access the Barden Business Park and Coalville;
- 10% are forecast to route via Thurlaston Lane to access Narborough, Littlethorpe and Blaby, and also the A5 south, routeing through villages to the south such as Stoney Stanton, Sapcote, Enderby and Narborough.

Area of Influence

The Forecasting Report identifies an Area of Influence which has been defined by considering the links which are forecast to change by more than $\pm 5\%$ and ± 30 PCUs between the 2026 and 2036 'With Development' and 'Without Development' scenarios in either the AM Peak or PM Peak hours. The links which are forecast to meet these criteria are included in the Area of Influence are shown in **Figure 2**

Figure 2: Area of Influence from Forecasting Report



As shown in **Figure 2**, the Area of Influence contains the following areas/links:

- the urban centre of Earl Shilton;
- the A47 between the A5 and the M1;
- the A447 Ashby Road between Hinckley's urban centre and Cadeby;

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- the B585 between Bardon Hill and Newbold Verdon;
- local roads between Sapcote and Narborough: Sapcote Road, Long Street, Huncote Road; and
- local roads between Desford and Groby: Station Road, Desford Lane, Groby Road and Sacheverell Way.

Forecast Delay Change

Changes in delay can be generated from two sources:

- link delay based on the speed-flow curve applied to the link; and
- junction delay due to capacity constraints for individual turning movements

The largest increases in delay are forecast on the A47 within the immediate vicinity of the proposed development.

Forecast Node Volume-Capacity Ratio

Node/junction capacity estimates based on maximum volume-capacity ratios (VCR) for individual turning movements identify locations where the forecast flows are approaching or exceeding the forecast capacity. maximum VCR. Node VCR exceeding 85% indicate that the highway network is under stress, and there is likely to be a reduction in speed and an increase in delay.

The maximum node VCR plots in the Forecasting Report (Appendix C) show that, as expected, the junctions forecast to be most affected by the Proposed Development trips are on the A47 within the immediate vicinity of the Proposed Development with increases in the node VCRs at the following:

South of the development:

- A47 / Wilkinson Lane;
- A47 / Station Road;
- A47 / Leicester Road roundabout; and
- A47 / The Common / B4668, Leicester Road roundabout.

North of the development:

- A47 Leicester Road / Dan's Lane / Desford Road; and
- Desford Crossroads (A47 Hinckley Road / B582 Leicester Lane / B582 Desford Road).

There are also some increases (and decreases) in node VCRs forecast for junctions within central Hinckley, along the B590 for all modelled scenarios and some increases in Stoney Stanton on the B581 in the 2036 AM and PM peak hours. These changes in VCRs are directly related to the forecast flow changes as shown in Figure 3.1 and Figure 3.2 of the Forecasting Report (**Appendix C**).

It is noted that the A47 / Station Road, the A47 / Dan's Lane / Desford Road and the A47 / Beggars Lane junctions are already forecast to be operating above 100% in the PM peak hour and the Desford

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Crossroads (A47 Hinckley Road / B582 Leicester Lane / B582 Desford Road) is already forecast to be operating above 85% in both the AM and PM peak hours.

It is noted that junctions within Earl Shilton town have not been identified as having VCRs of above 85%.

PROPOSED STUDY AREA

Methodology

The proposed methodology for identifying the Study Area for further assessment is set out below.

1. Links which are forecast to change by at least 5%, or more than 30 vehicles between the without and with scenarios (as illustrated in Figure 2 – the Area of Influence from the PRTM testing). Junctions outside this Aol have not been included.
2. Junctions where the VCR is over 85% in any scenario, indicating that the junction is under stress resulting in an increase in delay – these are report on in the Forecasting Report.
3. The development causes a change in VCR % band width - the Forecasting Report does not provide the detail of VCR change, but reports on the % band width - 'no change' in VCR % band width will not reflect % changes in VCR.
4. Consideration of appropriate routeing and strategic corridors in a holistic manner - the modelling output indicates capacity constraints along the A47 corridor as a result of the addition of the Proposed Development trips, a consequence of which is re-routeing of background traffic onto less appropriate, non-strategic, routes. These roads can be considered as 'rat-run' routes, used by drivers to avoid heavy traffic and delays on strategic corridors. Mitigation on these routes is not desirable as it may result in higher traffic flows and environmental concerns for rural communities. Mitigation at key junctions on strategic corridors such as the A47 may lead to additional demand routeing through intermediary junctions along the A47 corridor and therefore a holistic assessment of junctions should be considered.

For the purpose of assessment, the 'with PHF' and 2036 AM and PM peak hour scenarios have been considered. A separate assessment of the without and with PHF scenarios at the A5 junctions, Dodwells Roundabout and A5/The Long Shoot signal junction will be undertaken using the National Highways VISSIM model which has been provided to WSP. The methodology for assessment will be based on the approach agreed with the transport consultants for the Barwell Sue development.

Appendix D presents tables which assess whether the junctions with a VCR of over 85% should be within the Study Area for further assessment. There is regard for the appropriateness of routeing and assessment of strategic corridor junctions rather than rat-run routes.

Strategic and Wider Network Study Area

The proposed Study Area junctions are listed in **Table 1** and illustrated in **Figures 3** and **4**. As already noted, the impact of the Proposed Development trips at Dodwells Roundabout is being assessed in the National Highways' A5 VISSIM model, which includes the A5/The Long Shoot signal junction.

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Desford Crossroads has not been included on the recommendation of LCC HDM during a meeting on 17th October 2023. This is because LCC will deliver an improvement scheme and developers will be required to provide a contribution towards the cost of this.

In addition, at the request of LCC HDM, the Spa Lane (B590)/ Leicester Road (B590)/Leicester Road (B4668) junction has been included as a study area junction.

Table 1 – Proposed Study Area Junctions

ID	Junction	Existing Junction Type	Time of Impact	
			AM	PM
SN1	A5/A47 - Dodwells Roundabout ¹	Roundabout		✓
SN2	A47/A447 Ashby Road	Signalised	✓	✓
SN3	A47/The Common/B4688	Roundabout		✓
SN4	A47/Leicester Road	Roundabout	✓	
SN5	A47/Station Road B581	Signalised	✓	✓
SN6	A47/Wilkinson Road	Signalised	✓	
SN7	A47/Dans Lane	Priority	✓	✓
SN8	A47/Beggars Lane	Signalised		✓
SN9	A47/Kirby Lane	Signalised	✓	✓
SN10	Spa Lane (B590)/ Leicester Road (B590)/Leicester Road (B4668)	Signalised	✓	✓

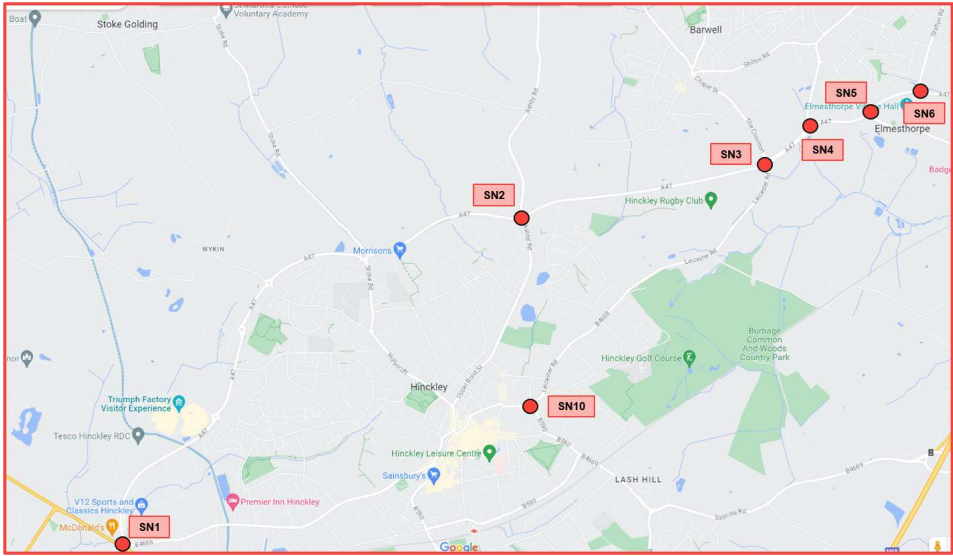
Note

1. Dodwells Roundabout and A5/The Long Shoot signal junction assessed by A5 VISSIM

TECHNICAL NOTE 2

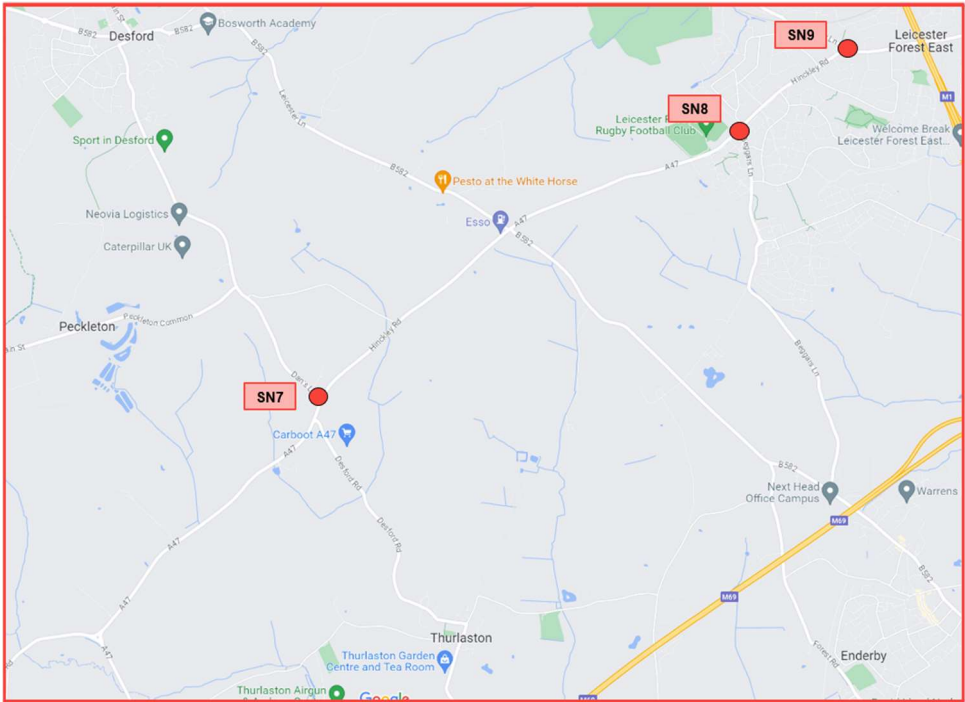
DATE:	14 November 2023	CONFIDENTIALITY:	Public
SUBJECT:	Proposed Study Area for Junction Assessment		
PROJECT:	Earl Shilton Sustainable Urban Extension	AUTHOR:	Bev Coupe
CHECKED:	Grace Smith	APPROVED:	Neil Hall

Figure 3 – Study Area Junctions South of Earl Shilton SUE



Background map source: www.google.co.uk

Figure 4 - Study Area Junctions North of Earl Shilton SUE



Background map source: www.google.co.uk

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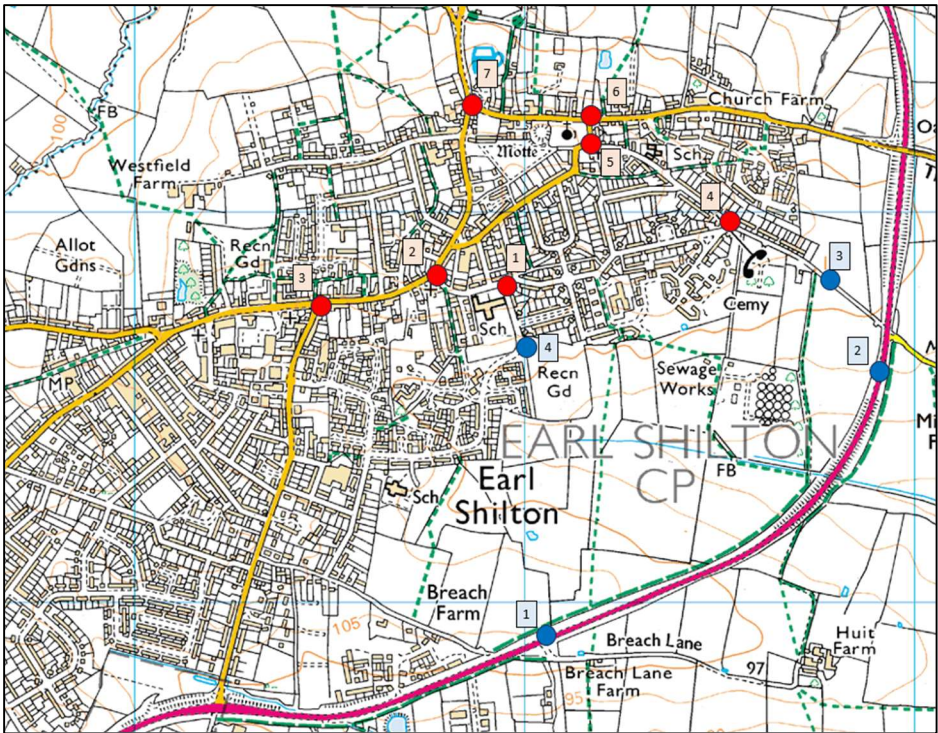
Local Junctions Study Area

It is recognised that the two access junctions onto the Earl Shilton local road network, at Astley Road and Mill Lane, will result in traffic impacts on local junctions from the Proposed Development trips. In order to assess this impact, seven junctions have been identified for junction capacity assessments, as set out in Table 2 and shown in Figure 5.

Table 2 – Proposed Local Junctions Study Area

ID	Junction	Junction Type
LN1	Astley Road/Alexander Avenue	Priority T-junction
LN2	Alexander Avenue/High Street	Mini Roundabout
LN3	Station Road/Wood Street/High Street	Signal T-junction
LN4	Mill Lane/Alexander Avenue	Priority T-junction
LN5	Mill Lane/Almey’s Lane/Chapel Street	Priority T-junction
LN6	Chapel Street/Church Street	Priority T-junction
LN7	Church Street/Leicester Road	Priority T-junction

Figure 5 – Local Junctions Study Area and Access Junctions



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Access Junctions

Finally, the four access junctions will also be assessed for junction capacity, as set out in **Table 3** and **Figure 5**.

Table 3 – Access Junctions

ID	Junction	Junction Type
A1	A47/Southern access road	Roundabout
A2	A47/Northern access road	Roundabout
A3	Mill Lane/Access road	Mini roundabout
A4	Astley Road/Access road	Priority T-junction

SUMMARY

The proposed Study Area comprises 21 junctions. **Table 4** provides a full list of the junctions for assessment, including identification of any junctions with a committed improvement scheme, and the capacity assessment software to be used.

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Table 4 – Summary of Study Area Junctions

ID	Junction	Junction Type	Layout	Software
SN1	A5/A47 - Dodwells Roundabout ¹	Roundabout	Existing	Junctions 10
SN2	A47/A447 Ashby Road	Signalised	Existing	LinSig
SN3	A47/The Common/B4688	Roundabout	Existing	Junctions 10
SN4	A47/Leicester Road	Roundabout	Existing	Junctions 10
SN5	A47/Station Road B581	Signalised	Existing	LinSig
SN6	A47/Wilkinson Road	Signalised	Existing	LinSig
SN7	A47/Dans Lane	Priority T-junction Signalised ²	Existing Committed scheme ²	Junctions 10 LinSig
SN8	A47/Beggars Lane	Signalised	Committed scheme ³	LinSig
SN9	A47/Kirby Lane	Signalised	Committed scheme ⁴	LinSig
SN10	Spa Lane (B590)/ Leicester Road (B590)/Leicester Road (B4668)	Signalised	Existing	LinSig
LN1	Astley Road/Alexander Avenue	Priority T-junction	Existing	Junctions 10
LN2	Alexander Avenue/High Street	Mini Roundabout	Existing	Junctions 10
LN3	Station Road/Wood Street/High Street	Signal T-junction	Existing	LinSig
LN4	Mill Lane/Alexander Avenue	Priority T-junction	Existing	Junctions 10
LN5	Mill Lane/Almey's Lane/Chapel Street	Priority T-junction	Existing	Junctions 10
LN6	Chapel Street/Church Street	Priority T-junction	Existing	Junctions 10
LN7	Church Street/Leicester Road	Priority T-junction	Existing	Junctions 10
A1	A47/Southern access road	Roundabout	Proposed scheme	Junctions 10
A2	A47/Northern access road	Roundabout	Proposed scheme	Junctions 10
A3	Mill Lane/Access road	Mini roundabout	Proposed scheme	Junctions 10
A4	Astley Road/Access road	Priority T-junction	Proposed scheme	Junctions 10

1. To be tested using the National Highways' A5 VISSIM which includes the adjacent A5/The Long Shoot signal junction.
2. Currently a priority T-junction, but improvement scheme included in PRTM modelling, identified in Uncertainty Log as 'near certain' – Nevovia Logistics site (HBBC planning ref: 21/00619/FUL) includes signalisation at the junction. Confirmation on need to test existing layout being sought from HBBC. Planning condition 35 identifies scheme drawings – either Drawing_403.10671.00001.H005.4 or Drawing_403.10671.00001.H005.4 – LCC HDM to advise on which improvement scheme to test.
3. The approved Hastings Fields residential development (885 dwellings) (Blaby District Council planning ref: 19/1610/OUT) includes an improvement scheme to the existing signal junction
4. The Hastings Fields development includes an improvement scheme to the existing signal junction (noted that that this was originally proposed as part of the Lubbethorpe development (Blaby planning ref: 11/0100/1/OX).



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Appendix A

BASE YEAR MODEL REVIEW REPORT

PRTM

Transport Modelling

Earl Shilton SUE

Base Year Model Review

Quality information

Prepared by	Checked by	Verified by	Approved by
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Principal Consultant	Associate Director	Regional Director	Regional Director

Revision History

Revision	Revision date	Details	Authorised	Name	Position
v1.0	09-11-2022	Draft			
v1.1	30-11-2022	For Issue	Yes	Mark Dazeley	Regional Director

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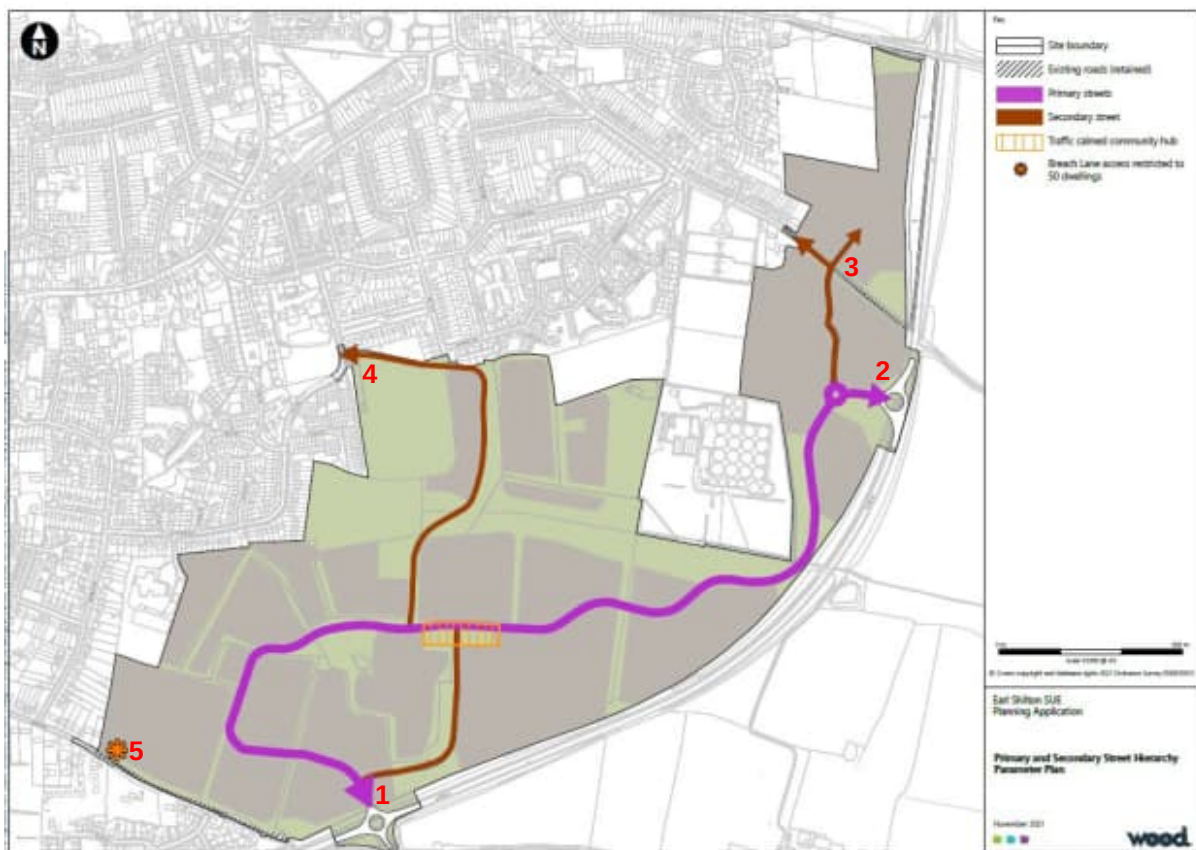
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Section 1 - Introduction

1.1 Background

- 1.1.1 The Earl Shilton Sustainable Urban Extension (SUE) is a mixed-use development of an allocated site to the south of Earl Shilton, Leicestershire for which Bloor Homes, Jelson Homes and Barwood Land are seeking planning permission. The proposed development includes 1,500 dwellings, employment and education.
- 1.1.2 The indicative site location and the five highway network access points to the proposed development are shown in Figure 1.1. The five access locations¹ are located at:
1. A47 / Breach Lane roundabout;
 2. A47 access roundabout south of Mill Lane;
 3. Mill Lane;
 4. Astley Road; and
 5. Breach Lane.
- 1.1.3 Proposed access arrangements are shown in Figure 1.2 to Figure 1.7.

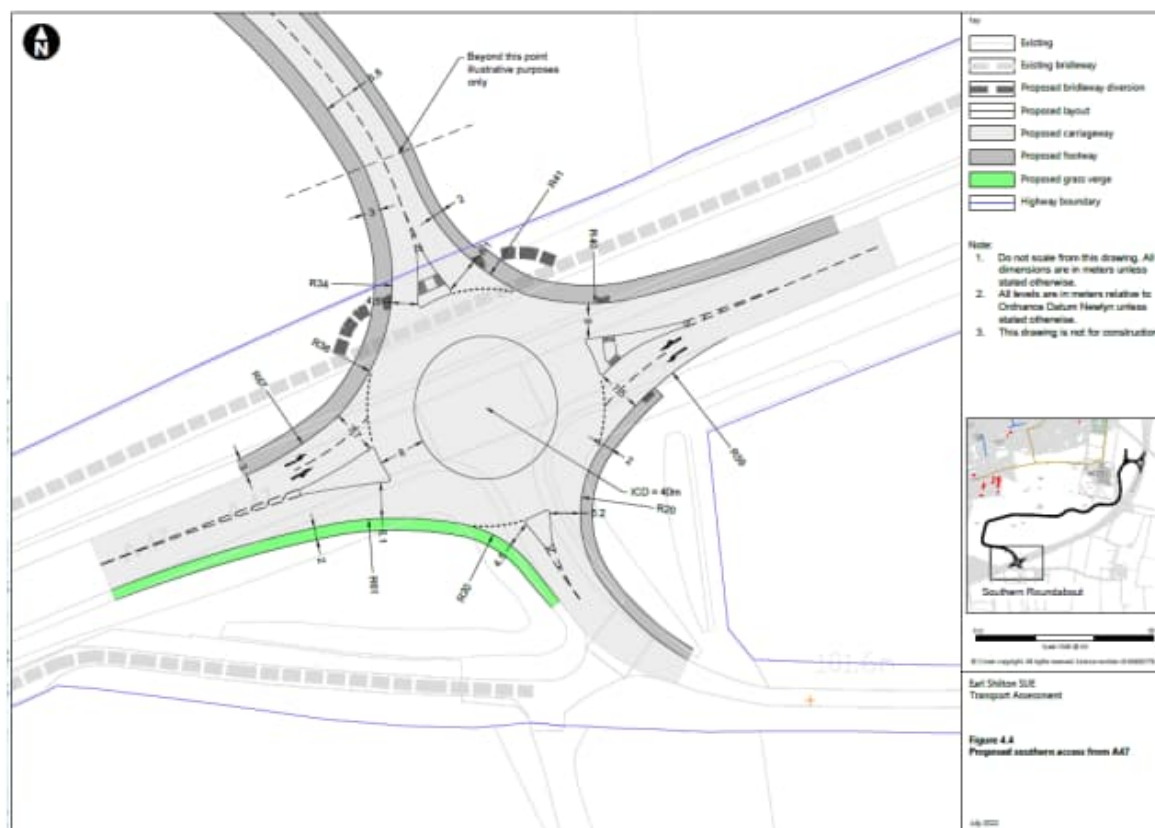
Figure 1.1: Indicative Location and Highway Access of the Earl Shilton SUE¹



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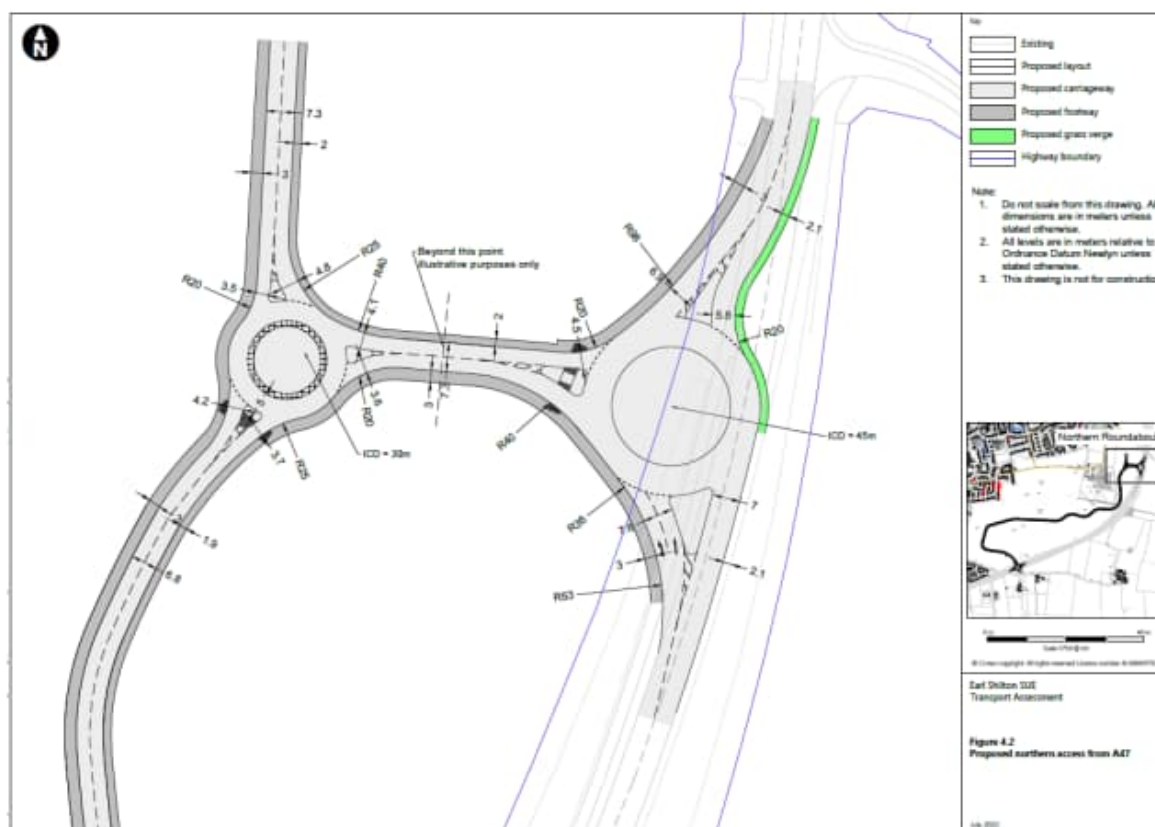
¹ 'Earl Shilton SUE Access Strategy Technical Note v2.pdf'

Figure 1.2: A47 / Breach Lane Roundabout Access (1)¹



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Figure 1.3: A47 South of Mill Lane Access (2)¹



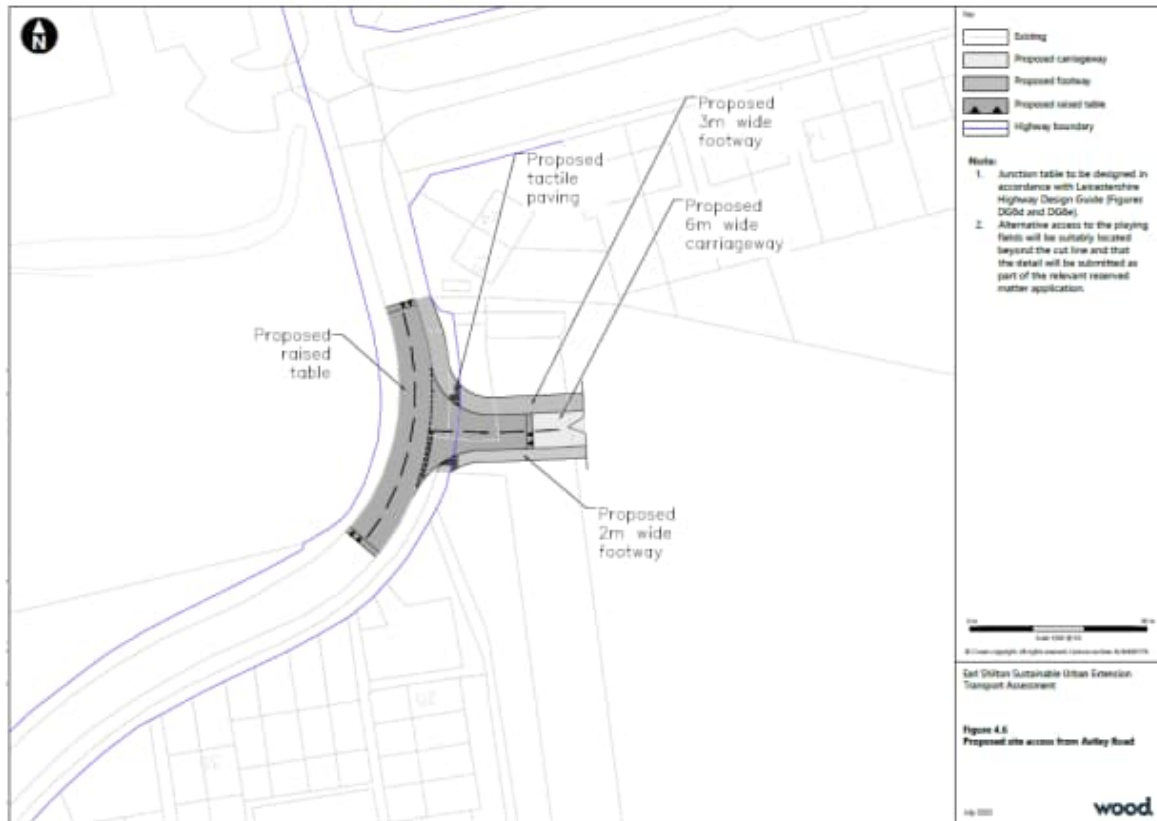
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Figure 1.4: Mill Lane Option 1 Access (3)¹

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Figure 1.5: Mill Lane Option 2 Access (3)¹

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Figure 1.6: Astley Road Access (4)¹

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Figure 1.7: Breach Lane Access (5)¹

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1.1.4 AECOM has been commissioned to undertake strategic modelling to assess the potential traffic impacts of the proposed development using the Pan-Regional Transport Model (PRTM). The first stage of this commission is to undertake a review of the latest production version (v2.3) of the PRTM base year model.

1.1.5 The base year of the PRTM is 2014. Whilst the base year of the PRTM is ageing, TAG Unit M2.2² states that

“Former guidance (withdrawn sections of the Design Manual for Roads and Bridges) indicated that models should not be used without justification where the source data are more than five years old when used for detailed scheme appraisal because there might be significant changes to the travel patterns and traffic level. This simple threshold should not be used, as there can be significant changes that would make the use of more recent data inappropriate or there may have been little change and older data may be acceptable. Changes such as the closure or opening of a major retail centre or major transport infrastructure such as a new bypass would be expected to result in the need to collect and use more recent data.

Model development and scheme appraisal can require considerable time, to the point that the data to which the model has been developed and calibrated has aged. TAG guidance on the Proportionate Update Process should be applied to judge the merits of updating transport models. In most circumstances where the model data were collected a few years before forecasts produced by the model are used to appraise the merits of a scheme, it would be reasonable to make efforts to demonstrate what potential changes have occurred in recent land-use and travel patterns that could affect the model in some way (as described above). Where changes are moderate in scale, it is proportionate to document this evidence in reporting of model development or forecasts used for scheme appraisal to explain associated model uncertainty.”

1.1.6 There have been no significant highway network changes in Earl Shilton or on the nearby Strategic Road Network (SRN) roads (i.e. the A5 and M69) since 2014. As such, in the context of strategic assessment for the proposed development at Earl Shilton SUE, it is considered that the base year of 2014 is a reasonable basis for forecasting.

1.1.7 For context, the update of the base year model of the PRTM was planned to take place in 2020 / 2021, which has been delayed by the COVID-19 pandemic. Due to the uncertainty of the timescale and impact of the COVID-19 pandemic, it has been difficult to plan data collection and model development tasks. There is ongoing work to develop an interim base year model to represent 2019 which is anticipated to be completed and ready for applications towards the end of 2022, and in parallel, to develop a 2023 base year model (assuming post-COVID-19 travel patterns are judged to have stabilised).

1.1.8 This document is the Base Year Model Review Report which summarises the key characteristics of the PRTM v2.3 in the vicinity of the proposed development site, including the zone structure, network coding and the base year calibration / validation performance.

1.2 TAG Databook Version

1.2.1 The latest production version (v2.3) of the PRTM uses the May 2020 TAG databook which was published in July 2020 – this was the latest TAG databook available at the time of the last model calibration, and the base year model results presented in this report are from this version of the PRTM.

1.2.2 A sensitivity test for the base year model with the November 2022 databook was undertaken. Appendix B shows the modelled flow difference plots between the base year models with the May 2020 and the November 2022 TAG databooks. Most links show an absolute modelled flow difference of fewer than 5 PCUs, and as such do not materially affect the overall base year model performance results. For forecast modelling, the November 2022 TAG databook will be used.

² §4.4.4 & 4.4.5, TAG Unit M2.2 (May 2020)

1.3 Structure of the Report

1.3.1 Following the introduction, this report contains the following sections:

- Section 2 reviews the base year zone system and network structure in the vicinity of the proposed Earl Shilton SUE development;
- Section 3 details the review of the PRTM v2.3 base year model performance compared with observed data in the vicinity of the proposed Earl Shilton SUE development;
- Section 4 summarises the findings of the base year model review;
- Appendix A provides the journey time validation graphs for the routes considered as part of this review; and
- Appendix B shows the modelled flow difference plots between the base year models with the May 2020 and the November 2022 TAG databooks.

Section 2 - Zone System and Network Structure

2.1 Introduction

2.1.1 This section details the review of the zone system and network structure of the base year (2014) PRTM highway model, which includes a review of the model zone system in the vicinity of the proposed Earl Shilton SUE development and a review of the base year highway network coding in the vicinity of the proposed Earl Shilton SUE, focusing on:

- site access locations;
- key local roads and junctions in and around Earl Shilton;
- the A47 from the A5 Longshoot Junction to the A563;
- the A5 from Longshoot to the M69;
- the M69 Junction 2; and
- the M69 / M1 junction.

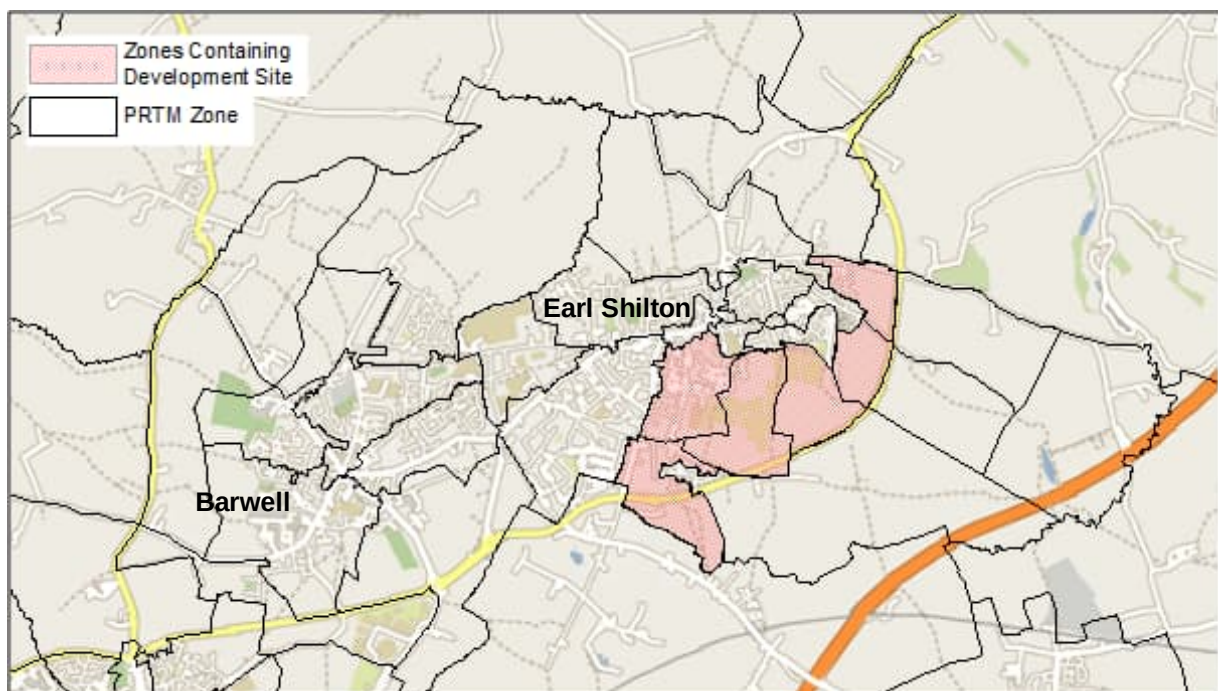
2.2 Zone System

2.2.1 The existing zoning for the PRTM v2.3 is largely defined by existing land-use and 2011 Census geography. Figure 2.1 shows the PRTM v2.3 highway model zone system around the proposed development. Five of the six existing zones contain existing housing in the base year planning data. It is proposed that five new development zones, linked to the proposed development accesses, be used to represent the Earl Shilton SUE and to keep the development-related demand separate from the existing demand.

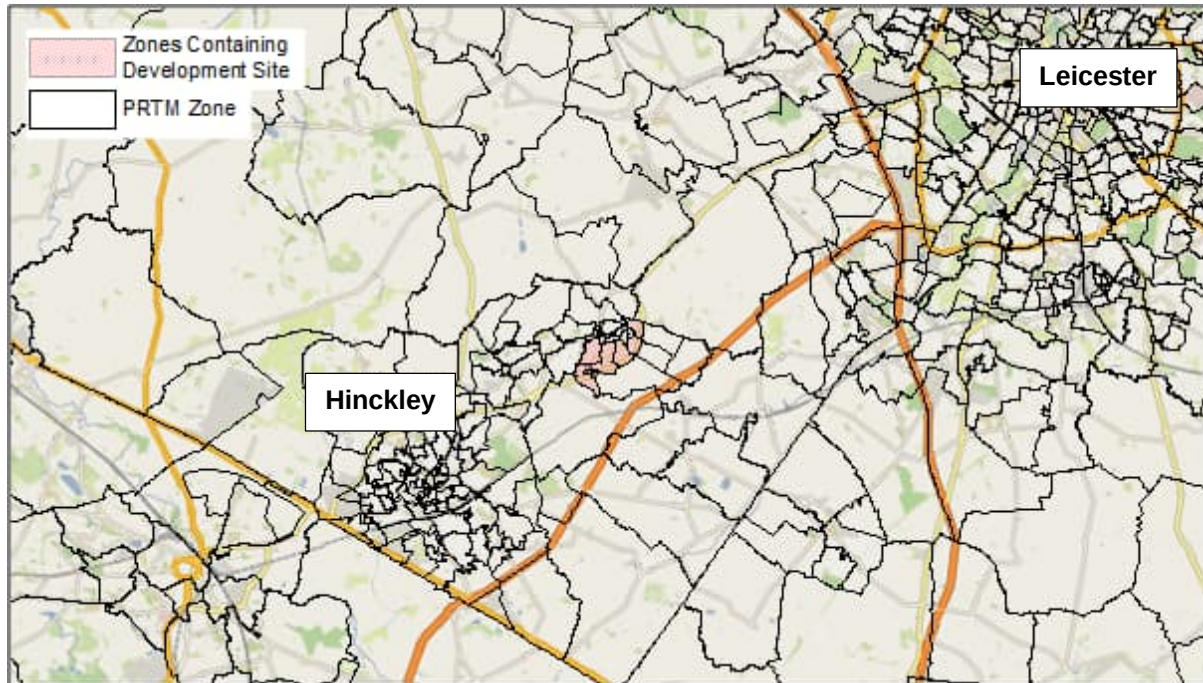
2.2.2 Local to the proposed development, the zone system has adequate detail, with smaller zones covering the denser populated areas in Barwell and Earl Shilton and slightly larger zones covering the rural, less densely populated areas.

2.2.3 For the wider area, Figure 2.2 shows the zone system between Hinckley and Leicester City. Denser zoning covers the urban areas and less dense zoning covers the rural areas. The zoning for the PRTM is judged to be adequate to represent the different land-use and population density in the likely area of impact of the proposed development.

Figure 2.1: Highway Model Zones near Earl Shilton



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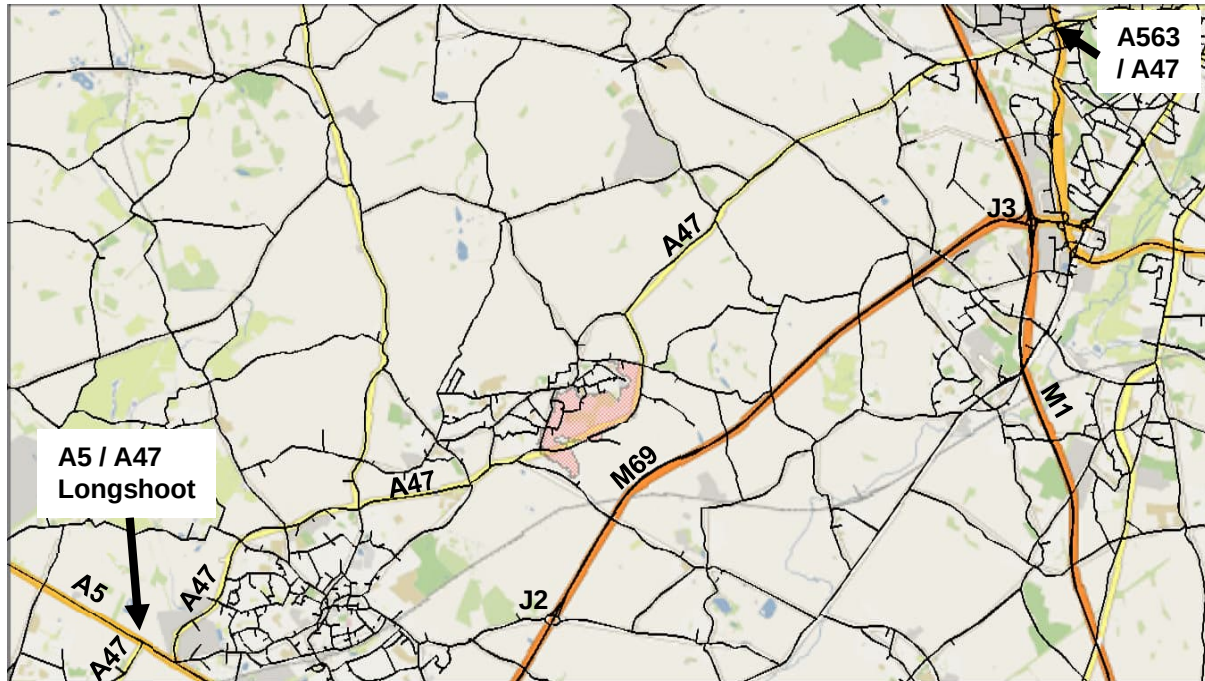
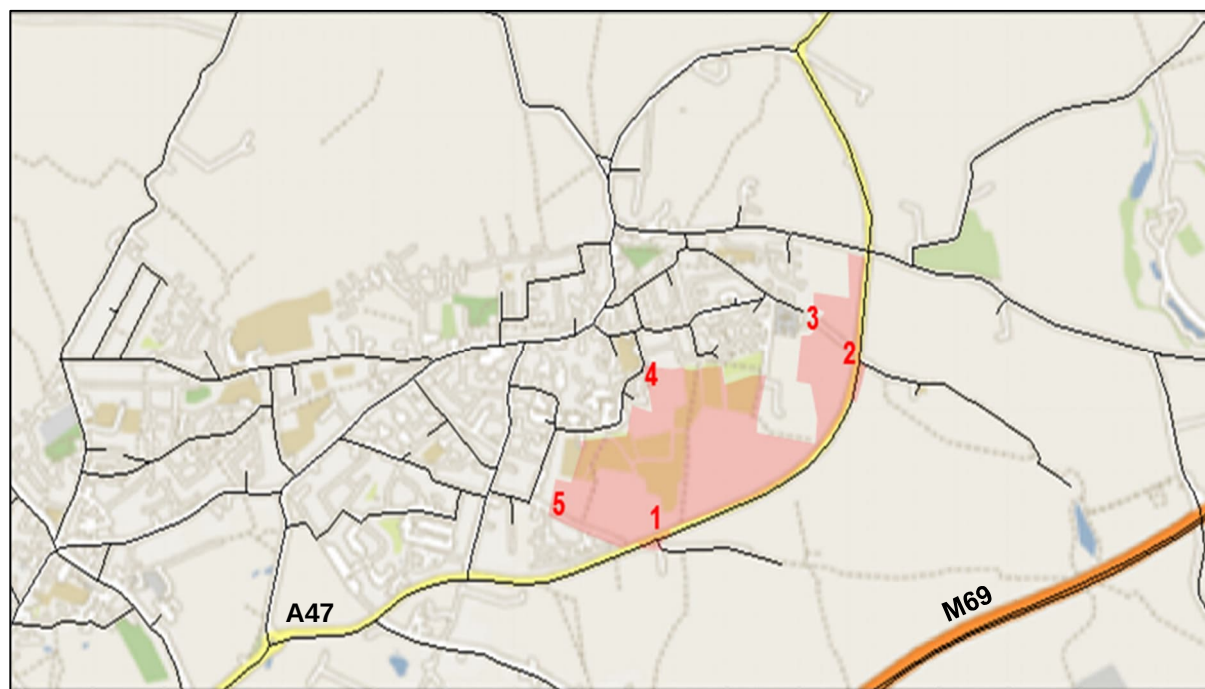
Figure 2.2: Highway Model Zones Between Hinckley and Leicester City

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2.3 Network Structure

- 2.3.1 The PRTM v2.3 highway network between Hinckley and Leicester City is shown in Figure 2.3. The highway network in Earl Shilton is shown in detail in Figure 2.4 with the proposed site accesses shown as per Figure 1.1. Highway network coding has been reviewed against the PRTM Coding Manual³ and Google Street View images to check the detailed junction coding in terms of number of lanes, lane allocation, flare lengths and junction standard.
- 2.3.2 Link coding has been reviewed in terms of coded versus measured distance, speed flow curves and link capacities.
- 2.3.3 It should be noted that as a strategic model, the PRTM v2.3 highway network does not, by design, include all the detailed residential and local road network in the vicinity of the proposed development (Figure 2.4). This should be considered when interpreting the data and results from the PRTM.

³ PRTM 2014 Base SATURN Coding Manual (December 2020)

Figure 2.3: Highway Model Network Structure Between Hinckley and Leicester City**Figure 2.4: Highway Model Network Structure in Earl Shilton**

Site Access Locations

- 2.3.4 The site access locations for the proposed Earl Shilton SUE have been reviewed.
- 2.3.5 The proposed southern site access to the A47 at Breach Lane (Figure 1.2) will include converting an existing priority junction to a roundabout. The network review shows that the existing A47 / Breach Lane priority junction is suitably coded in the base year model.
- 2.3.6 The proposed northern site access to the A47 at Mill Lane (Figure 1.3) will include converting an existing priority junction to a roundabout. The network review shows that the existing A47 / Mill Lane priority junction is suitably coded in the base year model.

- 2.3.7 The proposed access at Mill Lane (Figure 1.4 and Figure 1.5) is within an area of residential streets which are not coded in detail in the PRTM highway network. The stretch of Mill Lane between Chapel Street and Frank Booton Close is included and coded in accordance with the PRTM Coding Manual. The access proposals as shown in Figure 1.4 and Figure 1.5 (whichever option is used) will be connected to Mill Lane but will not be coded in detail as local residential streets are not, by design, included in the PRTM highway network.
- 2.3.8 Figure 1.6 shows the proposed access at Astley Road. Astley Road and Meadow Court Road are present in the PRTM highway network and the coding is adequate in the base year model. A short flare (1.5 PCUs) is coded on the Meadow Court Road approach at the junction with Equity Road East which is unlikely to have a material impact on the modelling results.
- 2.3.9 The proposed site access at Breach Lane (Figure 1.7) is not coded in the PRTM highway network, as Breach Lane to the east of Equity Road East is a no through route which provides access to a few houses only. The adjacent junction to the west is incorrectly coded with the wrong priorities. The coding has been corrected in the base year network as part of the TAG databook sensitivity test. The modelled flows with and without the corrected Breach Lane coding are identical. This is expected as the junction operates significantly below capacity in the base year model. The Breach Lane network correction will be included in the forecast modelling for this application.
- 2.3.10 It should be noted that turning movements will not be available for the base year model at the Breach Lane / Equity Road East junction as the stretch of Breach Lane to the east of Equity Road East is not coded. Also, Equity Road is not coded which should be considered when assessing the junctions on Station Road and Equity Road East.

Earl Shilton

- 2.3.11 Key junctions in Earl Shilton have been reviewed which include:
- Astley Road / Alexander Avenue;
 - Alexander Avenue / High Street;
 - Mill Lane / Chapel Street;
 - Chapel Street / Church Street;
 - Meadow Court Road / Equity Road East; and
 - Equity Road East / Breach Lane.
- 2.3.12 All the above junctions except for Equity Road East / Breach Lane, as discussed in Paragraph 2.3.9, have been reviewed and are suitably coded.
- 2.3.13 The main route through the centre of Earl Shilton (Leicester Road, Hinckley Road, Wood Street, The Hollow and High Street) was reviewed in detail. This was subject to the introduction of traffic calming measures between 2014 and 2016 as part of the Hinckley Area Project Phases 1-3 (PRTM Scheme 41), which will be included in the forecast networks.
- 2.3.14 There are slight discrepancies between the coded link distances and measured link distances on the approaches to the A47 / Leicester Road (South) roundabout, but the overall coded distance for the A47 between the B4668 Leicester Road and B581 Station Road is correct. Therefore, from a strategic modelling point of view, the discrepancies in coded link distances will not have a material impact on the modelling results.
- 2.3.15 The northbound approach to the Shilton Road / Leicester Road junction has narrowed in ~2018 due to additional cycle lanes and repositioned islands. The base year has a short flare (4 PCUs) coded which is correct. A short flare (4 PCUs) is also coded for the westbound Shilton Road arm. The slight change of junction geometry and flare lengths since the base year of 2014 for this junction is unlikely to have a material impact on the strategic modelling results as such it is not proposed to update the coding for forecast modelling.
- 2.3.16 Wood Street has been reviewed and the coding is suitable. The flares at the junction with Kings Walk are present in the 2014 base year, which is correct. It is noted that the flares have been removed around 2018 and the PRTM forecast highway networks do not reflect this. It is proposed that the coding for the Wood Street / Kings Walk is updated to reflect the current configuration for forecast modelling for this application. Signal timings have also been reviewed and are suitable with a long inter-green stage, representing the green stage for the missing southern arm serving the Co-op.

- 2.3.17 The eastbound approach to the Alexander Avenue / High Street junction was narrowed significantly around 2016. The base year coding is suitable. The forecast year coding uses a reduced speed which is an acceptable way of representing the narrower road at this location, as it is for the whole section from Heath Road to Keats Lane.

Wider Area

- 2.3.18 As the proposed Earl Shilton SUE development is located to the north of the A47 with proposed direct accesses to the A47, key junctions on the A47 to the south and north-east of Earl Shilton have been reviewed. Strategic junctions on the A5 and M69 Junction 2 have also been reviewed. Table 2.1 summarises the review for the wider network.

Table 2.1: Wider Area Network Review

Location Reviewed	Node	Issue(s)	Comment
A47 south of Earl Shilton			
A47 / Wilkinson Lane (Station Road, Earl Shilton)	49931	None	-
A47 / Station Road (B581)	49987	None	-
A47 / Leicester Road (southern roundabout)	40243	Distances either side of the roundabout are incorrect with the western arm being too short and the eastern arms both being too long by a similar distance.	<i>Negligible impact</i> - overall coded distances for the A47 between the B4668 Leicester Road and B581 Station Road is correct and journey times are reasonable.
A47 / Leicester Road (southern roundabout)	40243	None	-
A47 / Leicester Road / The Common	40346	None	-
A47: A47 / Leicester Road / The Common roundabout to A47 / Ashby Road		Base year model and forecast year model speeds are different.	From 2018, the Hinckley Area Project Phases 1-3 scheme coding changes this link to 40mph maximum from a representation of national speed limit. Early plans for this scheme may have included speed changes on the A47 that have not been implemented. Forecast models will retain the representation of national speed limit unless otherwise advised ⁴ .
A47 / Ashby Road	40168	Offside flare coded eastbound.	<i>Negligible impact</i> - offside flare coded eastbound as pseudo lane to represent stacking within junction. This is a method of SATURN coding to represent greater than average stacking capacity mid-junction.

⁴ LCC NDI have responded to an AECOM query (24/11/2022) regarding the speed limit reduction scheme and confirmed that it was intended to be the approach to Ashby Road only, which has been implemented.

Location Reviewed	Node	Issue(s)	Comment
Normandy Way: Ashby Road to Stoke Road	-	Three priority junctions are coded to serve spigots for zones in the north of Hinckley. These are inconsistently coded for the right turns which have 90m long offside flare lanes to mitigate queuing caused by the opposed right turn. The link is also coded with a suburban capacity index which has an allowance for junctions.	<i>Negligible impact</i> - Journey times are representative in the base year compared with observed and does not appear to affect forecast year models with higher levels of demand. The coding would only be an issue if right turning flows increase significantly.
A47 / Stoke Road	40111	Sword Drive arm is not modelled.	<i>Negligible impact</i> - The Sword Drive arm is not represented and the small amount of demand that the retail park and housing will generate loads onto Wykin Road to the south-west, closer to the centroid of the zone. From a strategic modelling point of view, this is acceptable.
A47 / Wykin Road	40112	None	-
A47: Wykin Road to Dodwells Roundabout		None	The Outlands Drive, Roston Drive and Brindley Road Junctions are coded appropriately. It should be noted that there is a new roundabout on this section and this will be incorporated in the forecast models.
A47 / A5 Dodwells Roundabout	40169	None	The Dodwells roundabout has been reviewed against the 2014 Google Street View images. It is suitably coded. The junction has been improved since 2014, and the current junction configuration will be represented in the forecast models.
A47 / A5 The Longshoot	40491	None	-
A47 north-east of Earl Shilton			
A47: Leicester Road (northern roundabout) to Beggar's Lane	-	None	LCC has noted that recently the speed limit on this section has been reduced from national speed limit to 50mph. For forecast models, as per other PRTM coding, any sections coded with a maximum speed >50mph will have the maximum speed reduced.

Location Reviewed	Node	Issue(s)	Comment
A47 / Leicester Road (northern roundabout)	49932	None	-
A47 / Desford Road	40443	None	-
A47 / Dan's Lane	30152	None	-
Peckleton Lane		None	No entry from A47 correctly coded.
A47 / B582 Desford Crossroads	30145	None	-.
A47 / Beggar's Lane	9228	None	-
A47: Beggars Lane to A47 / Kirby Lane	-	None	Intermediate junctions all correctly coded.
A47 / Kirby Lane	9291	None	-
A5 Dodwells to M69			
A5 / Hammonds Way	49037	None	-
A5 / Sketchley Lane	73647	None	-
M69			
A5 / M69 (M69 Junction 1)	-	None	Coded as an exploded junction. The fixed speeds on the gyratory and slip roads are correctly coded as per the PRTM coding manual. Signal stage times and gap acceptance values are default values. The geometry and distances are acceptable for strategic modelling.
M69 Junction 2		None	Coded as an exploded junction with acceptable coding for strategic modelling.

Location Reviewed	Node	Issue(s)	Comment
M69 Junction 3		None	-
Fosse Way			
B4114 North of A5		Coded at >50mph. Correct for base year. A recent change from national speed limit to 50mph.	For forecast modelling, any sections coded with a maximum speed >50mph will be reviewed and have the maximum speed reduced if necessary.
B581 adjacent to B4114		Coded at >50mph. Correct for base year. A recent change from national speed limit to 50mph.	For forecast modelling, any sections coded with a maximum speed >50mph will be reviewed and have the maximum speed reduced if necessary.

Section 3 - PRTM Base Year Model Performance

3.1 Introduction

- 3.1.1 This section presents a summary of the performance of the PRTM v2.3 base year model compared with the observed traffic counts and journey times in the vicinity of the proposed Earl Shilton SUE development.
- 3.1.2 As part of the development of the PRTM v2.3, an extensive collection of observed link count data was undertaken forming screenlines and cordons through the PRTM network that centres around Leicestershire. Count data were used to both calibrate and validate the model to observed data. In addition to the observed traffic count data, observed journey time data have been derived from Trafficmaster data for several routes across the county and are used to validate the model.

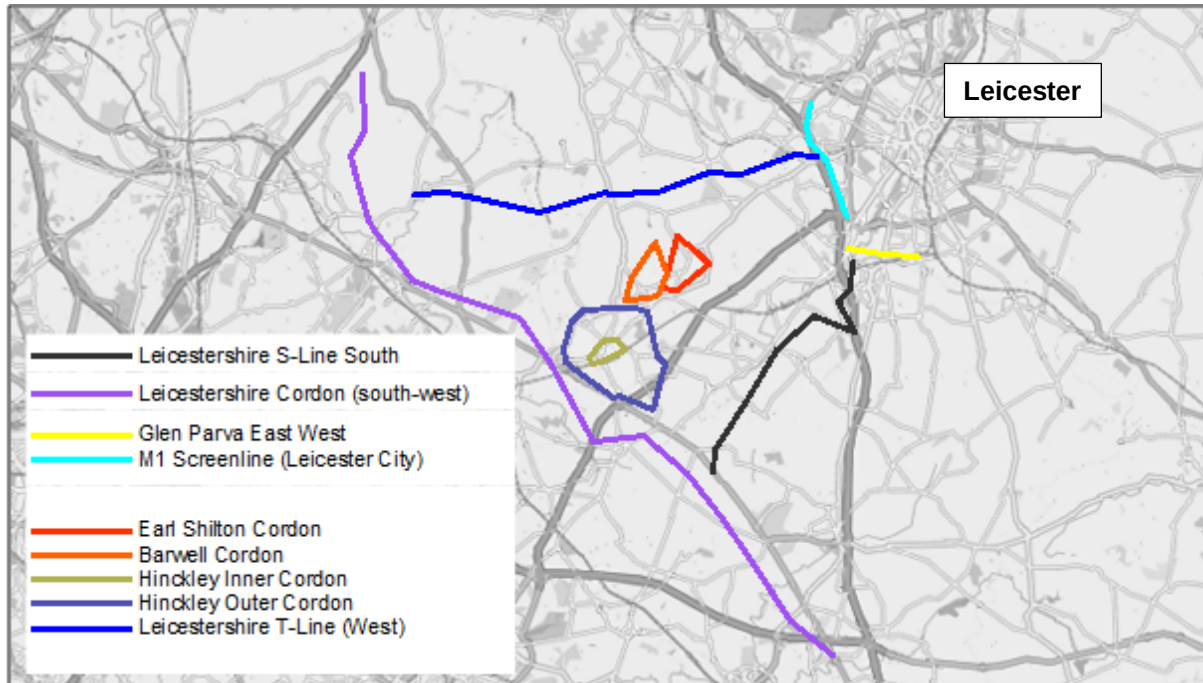
3.2 PRTM v2.3 Highway Base Year Model Screenline / Cordon Performance

- 3.2.1 Guidelines set out in Table 1 of TAG Unit M3.1 on highway assignment modelling state that a modelled screenline meets TAG criteria if the differences between modelled flows and observed counts are 'less than 5% of the counts' and that this should be true for 'all or nearly all screenlines'.
- 3.2.2 Screenlines are normally made up of five links or more. Within the PRTM v2.3 there are several screenlines / cordons with fewer than five count locations and/or with a relatively low observed flow for the screenline. It has been noted that such screenline/cordons have a tendency to fail the 5% TAG criterion for screenline/cordon flows even when all individual links are within the TAG criteria. For this reason, the flow criterion has been adjusted for screenlines/cordons with fewer than five counts and/or low observed flows.
- 3.2.3 This revised criteria are based on the individual link validation criteria and are given in Table 3.1. These use the individual link flow TAG criteria for screenlines with one count, and the standard screenline criterion for screenlines with five or more counts, interpolating between these two points for screenlines with between two and four counts. These revised criteria have been used in the assessment of the modelled screenline flows compared with observed data.

Table 3.1: Revised Screenline flow Validation Criteria

Number of Counts on Screenline	Acceptability Guideline
5 of more counts	Within $\pm 5\%$ or ± 100 vehicles of observed count
4 counts	Within $\pm 7.5\%$ or ± 100 vehicles of observed count
3 counts	Within $\pm 10\%$ or ± 100 vehicles of observed count
2 counts	Within $\pm 12.5\%$ or ± 100 vehicles of observed count
1 count	Within $\pm 15\%$ or ± 100 vehicles of observed count

- 3.2.4 The location of the screenlines and cordons which are relevant to the proposed Earl Shilton SUE development are shown in Figure 3.1 and detailed in Table 2.1. Four cordons covering Earl Shilton, Barwell, Hinckley and central Hinckley have been selected. Five screenlines have been selected bounding the likely area of interest.
- 3.2.5 All the screenlines and cordons pass the acceptability criteria except for the M1 screenline (Leicester City) westbound which is a marginal failure with higher than observed modelled flows. This overstates congestion, so the failure is on the conservative side for development control purposes. This level of performance shows that the model performs well in the area around the proposed Earl Shilton SUE at a screenline level.

Figure 3.1: Screenlines and Cordon

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Table 3.2: Screenline / Cordon Performance

Screenline / Cordon	No. Counts	AM Peak					PM Peak				
		Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	Pass?
Leicestershire T-Line (West) Northbound	11	7,722	7,779	57	1%	✓	9,240	9,200	-40	0%	✓
Leicestershire T-Line (West) Southbound	11	8,971	9,030	59	1%	✓	7,820	7,881	61	1%	✓
Hinckley Outer Cordon Inbound	14	5,342	5,354	12	0%	✓	6,384	6,394	10	0%	✓
Hinckley Outer Cordon Outbound	14	5,485	5,494	9	0%	✓	5,312	5,328	17	0%	✓
Hinckley Inner Cordon Inbound	9	4,591	4,602	11	0%	✓	3,892	3,949	57	1%	✓
Hinckley Inner Cordon Outbound	9	3,235	3,248	13	0%	✓	4,420	4,469	50	1%	✓
Barwell Cordon Inbound	8	1,477	1,403	-74	-5%	✓	2,176	2,152	-24	-1%	✓
Barwell Cordon Outbound	8	1,901	1,877	-24	-1%	✓	1,750	1,678	-73	-4%	✓
Earl Shilton Cordon Inbound	7	907	937	30	3%	✓	1,539	1,551	12	1%	✓
Earl Shilton Cordon Outbound	7	1,361	1,395	34	3%	✓	1,093	1,105	12	1%	✓
M1 Screenline (Leicester City) Eastbound	5	8,441	8,730	290	3%	✓	9,104	8,831	-274	-3%	✓
M1 Screenline (Leicester City) Westbound	11	8,625	8,390	-235	-3%	✓	8,690	9,217	527	6%	✗
Leicestershire Cordon (South-west) Inbound	19	7,034	7,177	143	2%	✓	9,155	9,147	-8	0%	✓
Leicestershire Cordon (South-west) Outbound	19	8,768	8,892	124	1%	✓	7,741	7,757	16	0%	✓
Leicestershire S-Line (South) Eastbound	9	6,584	6,745	161	2%	✓	6,502	6,470	-31	0%	✓
Leicestershire S-Line (South) Westbound	9	6,555	6,329	-226	-3%	✓	7,483	7,671	188	3%	✓
Glen Parva East-West Northbound	3	3,659	3,692	32	1%	✓	2,858	2,974	116	4%	✓
Glen Parva East-West Southbound	3	2,819	2,815	-4	0%	✓	3,393	3,372	-21	-1%	✓

3.3 PRTM v2.3 Highway Base Year Model Link Flow Performance

3.3.1 Guidelines set out in Table 2 of TAG Unit 3.1 on highway assignment modelling state that a modelled link flow meets TAG criteria if at least one of the two following conditions is met:

- Flow criteria:
 - modelled flow is within 100 vehicles for counts with an observed flow of less than 700 vehicles;
 - modelled flow is within 15% vehicles for counts with an observed flow between 700 and 2,700 vehicles; or
 - modelled flow is within 400 vehicles for counts with an observed flow greater than 2,700 vehicles.
- GEH criteria:
 - a GEH⁵ value of less than 5.

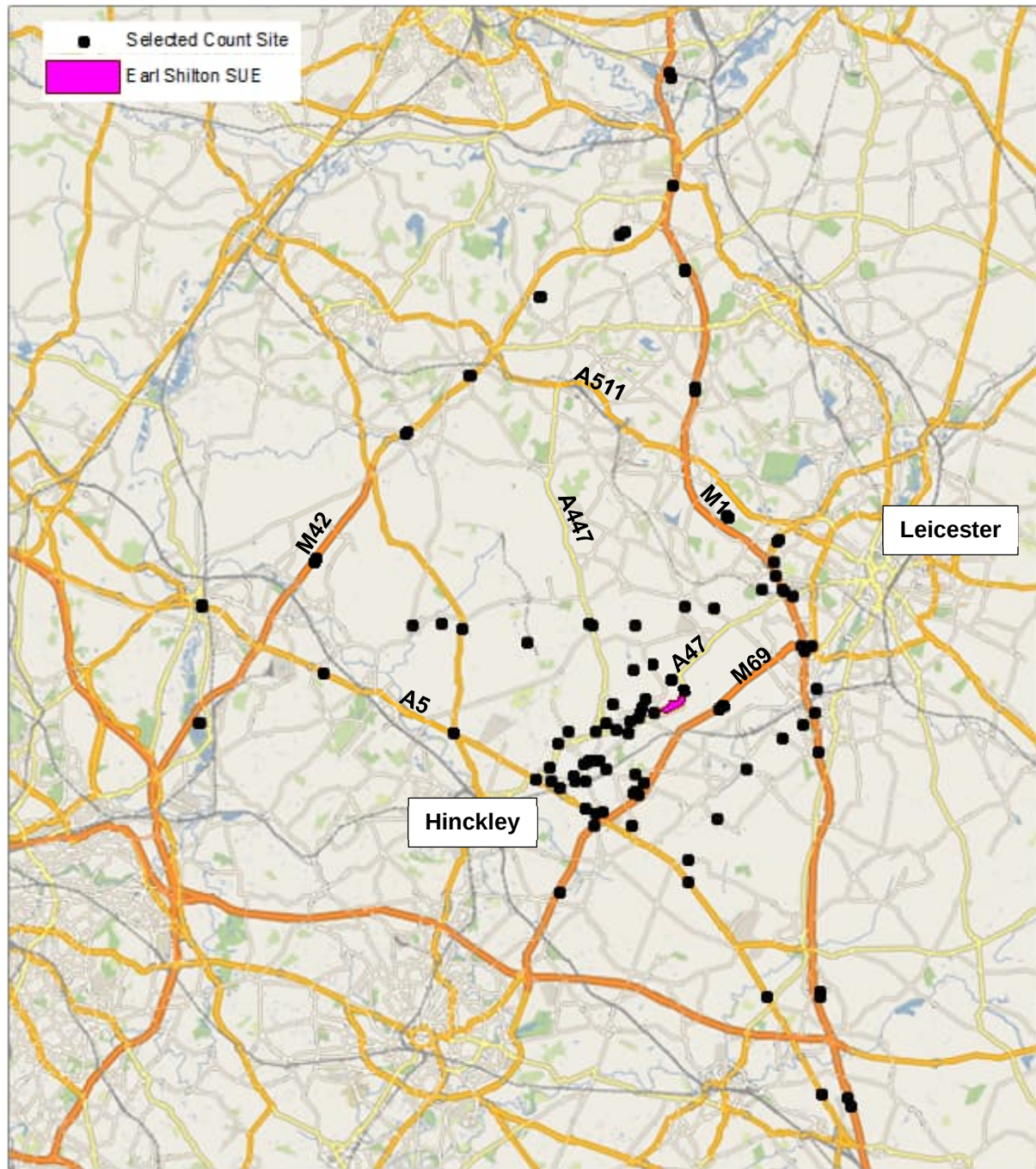
3.3.2 Figure 3.2 shows the locations of the observed traffic count data (168 counts by direction) in south-west Leicestershire and on the SRN which have been used for the calibration and validation of the PRTM v2.3 near the proposed Earl Shilton SUE development. The validation counts included are all on the SRN.

3.3.3 Modelled flows on links have been compared with observed counts by direction for the AM Peak and PM Peak hours. For calibration counts, 128 (88% pass rate) and 129 (88%) counts meet TAG criteria out of 146 directional counts for the AM Peak and PM Peak hours respectively (Table 3.3).

3.3.4 For validation counts, all 22 directional counts (i.e. 100%) meet TAG criteria for both AM Peak and PM Peak hours (Table 3.4). This indicates that the model performs well compared with observed counts in the areas near the proposed Earl Shilton SUE development and exceeds the 85% TAG criteria.

3.3.5 Figure 3.3 and Figure 3.4 illustrate the locations of the links passing TAG criteria in the AM Peak and PM Peak hours respectively. The count sites nearest to the proposed development in Earl Shilton and Barwell including the A47 perform well, meeting TAG criteria in both directions and in both AM Peak and PM Peak hours. The SRN performs very well except for M69 Junction 3 in the AM Peak hour, which is a known issue that has been investigated and retained due to the risk of overfitting. This should be considered when interpreting results at this junction.

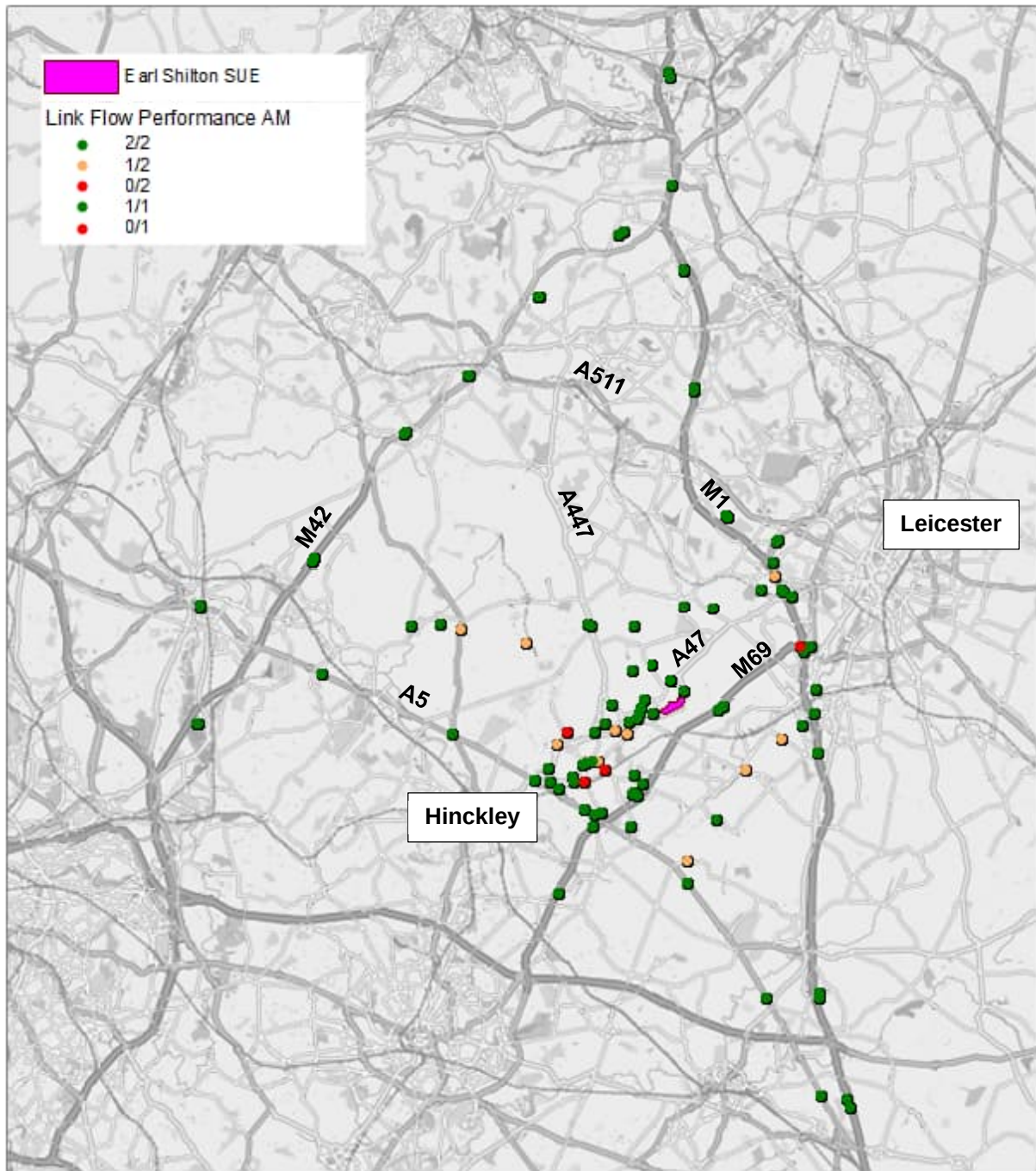
⁵ $GEH = \sqrt{\frac{(M-O)^2}{(M+O)/2}}$, where M is the modelled flow and O is the observed flow

Figure 3.2: Observed Count Locations

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Figure 3.3: Link Flow Performance AM

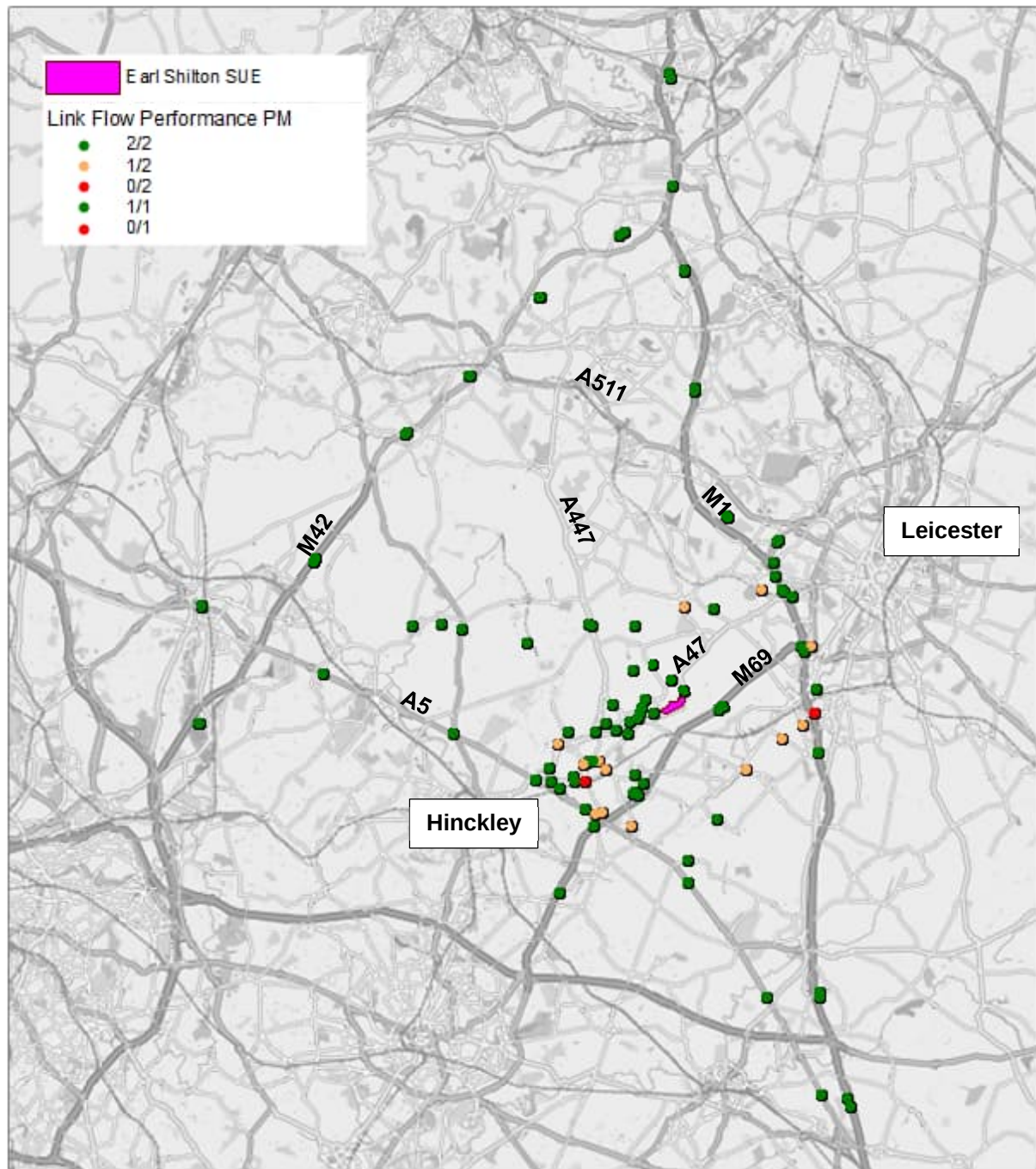
Green = passing in both directions (or one direction if a one-way count), orange = passes in one direction, red = fails in both directions.



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Figure 3.4: Link Flow Performance PM

Green = passing in both directions (or one direction if a one-way count), orange = passes in one direction, red = fails in both directions.



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Table 3.3: Link Flow Performance (Calibration Counts)

Location	AM Peak						PM Peak					
	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?
Aston Lane Inbound	68	67	-1	-2%	0.1	✓	65	45	-21	-31%	2.8	✓
Aston Lane Outbound	39	71	33	84%	4.4	✓	72	44	-28	-39%	3.7	✓
Lychgate Lane Inbound	36	23	-13	-36%	2.4	✓	56	29	-27	-48%	4.1	✓
Lychgate Lane Outbound	46	40	-6	-13%	0.9	✓	53	50	-3	-6%	0.4	✓
Wykin Road Inbound	135	276	141	104%	9.8	✗	143	247	103	72%	7.4	✗
Wykin Road Outbound	147	178	31	21%	2.4	✓	174	193	19	11%	1.4	✓
Hinckley Road Inbound	556	583	27	5%	1.1	✓	638	704	67	10%	2.6	✓
Hinckley Road Outbound	554	530	-24	-4%	1.0	✓	559	610	50	9%	2.1	✓
Dodwells Road Inbound	452	458	6	1%	0.3	✓	768	741	-28	-4%	1.0	✓
Dodwells Road Outbound	718	722	5	1%	0.2	✓	598	612	14	2%	0.6	✓
Coventry Road Inbound	422	474	51	12%	2.4	✓	578	615	37	6%	1.5	✓
Coventry Road Outbound	544	582	38	7%	1.6	✓	377	412	35	9%	1.8	✓
Coventry Road Inbound	776	851	76	10%	2.7	✓	711	737	26	4%	1.0	✓
Coventry Road Outbound	544	624	80	15%	3.3	✓	727	810	83	11%	3.0	✓
Leicester Road Inbound	674	836	163	24%	5.9	✗	419	531	112	27%	5.2	✗
Leicester Road Outbound	394	411	16	4%	0.8	✓	669	746	77	11%	2.9	✓
Upper Bond Street Inbound	563	447	-117	-21%	5.2	✗	455	403	-52	-11%	2.5	✓
Upper Bond Street Outbound	287	223	-64	-22%	4.0	✓	493	424	-69	-14%	3.2	✓
Westfield Road Inbound	153	69	-84	-55%	8.0	✓	100	56	-45	-45%	5.1	✓
Westfield Road Outbound	115	42	-72	-63%	8.2	✓	126	46	-79	-63%	8.5	✓
Derby Road Inbound	285	246	-39	-14%	2.4	✓	275	230	-45	-16%	2.8	✓
Derby Road Outbound	293	348	56	19%	3.1	✓	394	430	36	9%	1.8	✓
Hollycroft Inbound	503	485	-18	-4%	0.8	✓	431	439	8	2%	0.4	✓
Hollycroft Outbound	306	253	-53	-17%	3.1	✓	555	456	-99	-18%	4.4	✓
Shilton Road Inbound	94	103	9	9%	0.9	✓	110	108	-2	-2%	0.2	✓
Shilton Road Outbound	100	100	0	0%	0.0	✓	94	95	1	1%	0.1	✓
Hinckley Road Inbound	147	149	2	1%	0.1	✓	218	208	-10	-5%	0.7	✓
Hinckley Road Outbound	199	199	0	0%	0.0	✓	176	181	5	3%	0.4	✓
Thurlaston Lane Inbound	78	83	5	6%	0.6	✓	141	162	21	15%	1.7	✓
Thurlaston Lane Outbound	124	177	53	43%	4.3	✓	71	77	6	8%	0.7	✓
Leicester Road, Barwell Inbound	191	189	-1	-1%	0.1	✓	399	386	-13	-3%	0.7	✓
Leicester Road, Barwell Outbound	364	357	-7	-2%	0.4	✓	236	237	1	1%	0.1	✓

Location	AM Peak						PM Peak					
	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?
Hinckley Road Inbound	302	336	34	11%	1.9	✓	506	505	-2	0%	0.1	✓
Hinckley Road Outbound	410	440	30	7%	1.4	✓	380	351	-29	-8%	1.5	✓
Kirkby Road Inbound	53	53	0	0%	0.0	✓	72	74	2	2%	0.2	✓
Kirkby Road Outbound	63	67	4	7%	0.5	✓	44	44	0	-1%	0.0	✓
Elmesthorpe Lane Inbound	27	-	-27	-100%	7.3	✓	93	-	-93	-100%	13.6	✓
Elmesthorpe Lane Outbound	75	-	-75	-100%	12.3	✓	47	-	-47	-100%	9.7	✓
Heath Lane Inbound	122	104	-18	-15%	1.7	✓	87	96	10	11%	1.0	✓
Heath Lane Outbound	88	58	-30	-34%	3.5	✓	125	157	32	26%	2.7	✓
Stapleton Lane Inbound	134	132	-2	-2%	0.2	✓	257	271	14	6%	0.9	✓
Stapleton Lane Outbound	204	205	1	1%	0.1	✓	177	183	7	4%	0.5	✓
Shenton Lane Northbound	27	121	95	355%	11.0	✓	40	117	77	196%	8.8	✓
Shenton Lane Southbound	40	151	111	279%	11.4	✗	29	90	60	205%	7.8	✓
Sutton Lane Northbound	33	75	43	130%	5.8	✓	45	75	30	68%	3.9	✓
Sutton Lane Southbound	28	42	14	52%	2.4	✓	30	74	44	144%	6.1	✓
Newbold Road Northbound	68	81	13	19%	1.5	✓	86	64	-22	-26%	2.6	✓
Newbold Road Southbound	82	65	-17	-20%	1.9	✓	73	106	32	44%	3.4	✓
Peckleton Lane Northbound	254	296	42	16%	2.5	✓	303	423	119	39%	6.3	✗
Peckleton Lane Southbound	309	390	81	26%	4.3	✓	201	234	33	16%	2.2	✓
Station Road Northbound	264	325	61	23%	3.6	✓	305	251	-54	-18%	3.2	✓
Station Road Southbound	351	371	20	6%	1.1	✓	289	400	111	38%	6.0	✗
Frolesworth Road Eastbound	98	147	49	50%	4.4	✓	94	104	10	10%	1.0	✓
Frolesworth Road Westbound	74	41	-33	-44%	4.3	✓	105	203	99	94%	7.9	✓
Narborough Road Eastbound	79	139	60	75%	5.7	✓	135	123	-12	-9%	1.1	✓
Narborough Road Westbound	126	46	-80	-64%	8.7	✓	123	249	127	103%	9.3	✗
Croft Road Eastbound	347	187	-160	-46%	9.8	✗	248	216	-31	-13%	2.0	✓
Croft Road Westbound	263	340	76	29%	4.4	✓	438	283	-155	-35%	8.2	✗
Warwick Road Eastbound	204	263	59	29%	3.8	✓	309	409	100	32%	5.3	✗
Warwick Road Westbound	329	312	-17	-5%	0.9	✓	319	493	174	55%	8.6	✗
Twycross Road Northbound	127	117	-11	-9%	1.0	✓	199	184	-15	-7%	1.1	✓
Twycross Road Southbound	238	166	-73	-31%	5.1	✓	121	135	14	12%	1.3	✓
Wellsborough Road Northbound	87	130	43	50%	4.1	✓	118	133	15	13%	1.3	✓
Wellsborough Road Southbound	120	109	-11	-9%	1.1	✓	103	97	-6	-6%	0.6	✓
Leicester Lane Northbound	378	258	-120	-32%	6.7	✓	580	501	-79	-14%	3.4	✓
Leicester Lane Southbound	616	495	-121	-20%	5.1	✓	431	297	-134	-31%	7.0	✓

Location	AM Peak						PM Peak					
	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?
Coventry Road Eastbound	500	360	-140	-28%	6.8	✖	777	612	-165	-21%	6.3	✖
Coventry Road Westbound	774	662	-112	-14%	4.2	✓	646	650	4	1%	0.1	✓
Blaby Road Eastbound	979	915	-64	-7%	2.1	✓	952	1,009	57	6%	1.8	✓
Blaby Road Westbound	919	1,018	99	11%	3.2	✓	1,163	1,022	-141	-12%	4.3	✓
Twycross Road Northbound	378	258	-120	-32%	6.7	✖	397	327	-70	-18%	3.7	✓
Twycross Road Southbound	410	397	-13	-3%	0.7	✓	347	282	-65	-19%	3.7	✓
Hinckley Road Northbound	667	609	-58	-9%	2.3	✓	552	549	-3	-1%	0.1	✓
Hinckley Road Southbound	521	513	-8	-2%	0.4	✓	633	550	-83	-13%	3.4	✓
The Common Inbound	204	260	56	28%	3.7	✓	326	408	82	25%	4.3	✓
The Common Outbound	368	355	-13	-3%	0.7	✓	275	302	27	10%	1.6	✓
Canning Street Inbound	32	58	26	81%	3.9	✓	24	26	2	6%	0.3	✓
Canning Street Outbound	3	59	56	1640%	10.0	✓	10	114	105	1077%	13.3	✖
Carrs Hill Inbound	366	311	-55	-15%	3.0	✓	750	683	-68	-9%	2.5	✓
Carrs Hill Outbound	616	610	-6	-1%	0.2	✓	392	366	-26	-7%	1.4	✓
Station Road Inbound	94	122	29	30%	2.7	✓	202	294	91	45%	5.8	✓
Station Road Outbound	200	263	63	32%	4.2	✓	141	189	48	34%	3.7	✓
Leicester Inbound	875	933	58	7%	1.9	✓	572	583	11	2%	0.5	✓
Leicester Outbound	487	364	-123	-25%	6.0	✖	806	767	-38	-5%	1.4	✓
Rugby Road Inbound	541	494	-47	-9%	2.0	✓	1,240	995	-245	-20%	7.3	✖
Rugby Road Outbound	1,062	947	-115	-11%	3.6	✓	589	622	33	6%	1.3	✓
Lutterworth Inbound	102	118	16	16%	1.5	✓	287	387	101	35%	5.5	✖
Lutterworth Outbound	289	325	36	12%	2.0	✓	105	93	-13	-12%	1.3	✓
Stoke Road Inbound	376	262	-114	-30%	6.4	✖	189	100	-89	-47%	7.4	✓
Stoke Road Outbound	238	118	-119	-50%	8.9	✖	327	310	-17	-5%	0.9	✓
Ashby Road Inbound	728	698	-30	-4%	1.1	✓	542	541	0	0%	0.0	✓
Ashby Road Outbound	408	502	94	23%	4.4	✓	653	633	-20	-3%	0.8	✓
Normandy W Inbound	818	755	-63	-8%	2.2	✓	710	673	-37	-5%	1.4	✓
Normandy W Outbound	514	643	130	25%	5.4	✖	834	879	45	5%	1.5	✓
A5460 East Of Junction 21 Eastbound	2,777	3,137	360	13%	6.6	✓	3,436	3,192	-244	-7%	4.2	✓
A5460 East Of Junction 22 Westbound	3,446	3,176	-270	-8%	4.7	✓	2,984	3,578	594	20%	10.4	✖
Rugby Road Inbound	771	508	-263	-34%	10.4	✖	677	548	-129	-19%	5.2	✖
Rugby Road Outbound	706	477	-229	-32%	9.4	✖	738	605	-133	-18%	5.1	✖
London Road Inbound	835	1,102	267	32%	8.6	✖	799	980	181	23%	6.1	✖
London Road Outbound	588	811	224	38%	8.5	✖	708	838	129	18%	4.6	✓

Location	AM Peak						PM Peak					
	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?
A46 East Of Kirby Muxloe Interchange Eastbound	1,016	1,017	2	0%	0.0	✓	918	916	-2	0%	0.1	✓
A46 East Of Kirby Muxloe Interchange Westbound	737	743	6	1%	0.2	✓	953	941	-12	-1%	0.4	✓
Ratby Ln Eastbound	1,139	1,121	-18	-2%	0.5	✓	468	530	62	13%	2.8	✓
Ratby Ln Westbound	384	489	105	27%	5.0	✗	1,060	1,058	-2	0%	0.0	✓
Hinckley Rd Eastbound	1,047	1,049	1	0%	0.0	✓	1,020	985	-35	-3%	1.1	✓
Hinckley Rd Westbound	867	737	-130	-15%	4.6	✓	1,155	1,109	-46	-4%	1.4	✓
High Cross Road Eastbound	69	191	122	175%	10.7	✗	173	204	31	18%	2.3	✓
High Cross Road Westbound	176	134	-42	-24%	3.3	✓	83	181	97	117%	8.5	✓
Wolvey Road Inbound	83	116	33	40%	3.3	✓	286	470	184	65%	9.5	✗
Wolvey Road Outbound	114	187	73	64%	6.0	✓	65	35	-30	-46%	4.2	✓
Nutts Lane Inbound	151	97	-54	-36%	4.8	✓	311	264	-47	-15%	2.8	✓
Nutts Lane Outbound	327	284	-43	-13%	2.5	✓	99	69	-30	-30%	3.2	✓
M42 J10 - J11 (Inside Lane) Southbound	2,450	2,365	-85	-3%	1.7	✓	2,365	2,324	-41	-2%	0.8	✓
A46 Tmu Site 6539/1 On A46 Northbound Between A50 Eastbound	2,462	2,406	-55	-2%	1.1	✓	3,263	3,208	-55	-2%	1.0	✓
A46 Tmu Site 6540/1 On A46 Southbound Between 380 Westbound	3,191	3,245	54	2%	0.9	✓	2,540	2,531	-8	0%	0.2	✓
A5 Tmu Site 7572/1 On A5 Northbound Between A51 North-Westbound	2,282	2,280	-2	0%	0.0	✓	2,280	2,273	-7	0%	0.1	✓
A5 D.I.R.F.T North-Westbound	483	479	-4	-1%	0.2	✓	732	728	-4	-1%	0.1	✓
A5 Tmu Site 7571/1 On A5 Southbound Between A51 South-Eastbound	1,846	1,849	3	0%	0.1	✓	2,518	2,473	-45	-2%	0.9	✓
A5 D.I.R.F.T South-Eastbound	738	753	15	2%	0.6	✓	513	511	-1	0%	0.1	✓
M1 Jn 23 - Jn 23A Northbound	3,850	3,842	-8	0%	0.1	✓	4,208	4,265	57	1%	0.9	✓
M1 Jn 23 - Jn 23A Southbound	4,243	4,253	10	0%	0.2	✓	4,014	3,987	-27	-1%	0.4	✓
A42(T) North Of The A511 Northbound	2,104	2,027	-76	-4%	1.7	✓	2,000	2,003	4	0%	0.1	✓
A42(T) North Of The A511 Southbound	1,975	1,966	-9	0%	0.2	✓	2,110	2,098	-12	-1%	0.3	✓
A42(T) Northbound	2,304	2,291	-12	-1%	0.3	✓	2,308	2,308	0	0%	0.0	✓
A42(T) Southbound	2,082	2,075	-6	0%	0.1	✓	2,293	2,293	0	0%	0.0	✓
M1 Northbound	3,321	3,209	-112	-3%	2.0	✓	3,690	3,678	-12	0%	0.2	✓
M1 Southbound	3,367	3,593	226	7%	3.8	✓	3,231	3,210	-21	-1%	0.4	✓
M69 Northbound	2,414	2,309	-105	-4%	2.2	✓	2,639	2,815	176	7%	3.4	✓
M69 Southbound	2,700	2,768	68	3%	1.3	✓	2,700	2,707	7	0%	0.1	✓
M42 Northbound	2,332	2,322	-10	0%	0.2	✓	2,676	2,669	-7	0%	0.1	✓
M69 Northbound	1,845	1,915	70	4%	1.6	✓	3,301	3,294	-7	0%	0.1	✓
M69 Southbound	2,984	2,979	-5	0%	0.1	✓	2,195	2,192	-3	0%	0.1	✓

Location	AM Peak						PM Peak					
	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?
M1 North Of Junction 24 Northbound	4,565	4,509	-56	-1%	0.8	✓	5,308	5,270	-38	-1%	0.5	✓
M1 North Of Junction 24 Southbound	5,265	5,214	-51	-1%	0.7	✓	4,884	4,792	-92	-2%	1.3	✓
M1 North Of M6 Northbound	2,943	2,899	-44	-1%	0.8	✓	3,377	3,374	-3	0%	0.0	✓
M1 North Of M6 Southbound	3,107	3,136	29	1%	0.5	✓	3,026	3,023	-3	0%	0.0	✓
A5 North-Westbound	1,426	1,436	11	1%	0.3	✓	1,441	1,453	12	1%	0.3	✓
A5 South-Eastbound	1,379	1,372	-7	0%	0.2	✓	1,395	1,373	-22	-2%	0.6	✓
A5 North-Westbound	574	568	-6	-1%	0.3	✓	917	912	-4	0%	0.1	✓
A5 South-Eastbound	940	950	10	1%	0.3	✓	582	584	2	0%	0.1	✓
M1 Northbound	3,470	3,380	-90	-3%	1.5	✓	3,913	3,838	-75	-2%	1.2	✓
M1 Southbound	3,554	3,636	82	2%	1.4	✓	3,514	3,532	18	0%	0.3	✓
M1 J21 Northbound Off-Slip Northbound	690	666	-24	-3%	0.9	✓	568	564	-3	-1%	0.1	✓
M69 Eastbound Approach Northbound	1,165	854	-311	-27%	9.8	✗	1,018	1,002	-15	-2%	0.5	✓
A5 West Of Wolvey Road North-Westbound	992	996	4	0%	0.1	✓	799	790	-9	-1%	0.3	✓
A5 West Of Wolvey Road South-Eastbound	982	974	-8	-1%	0.2	✓	1,064	1,069	5	0%	0.2	✓

Table 3.4: Link Flow Performance (Validation Counts)

Location	AM Peak						PM Peak					
	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?
M1 Jn 22 - Jn 23 Northbound	3,736	3,688	-48	-1%	0.8	✓	4,005	4,136	132	3%	2.1	✓
M1 Jn 18 - Jn 19 Northbound	3,864	3,912	48	1%	0.8	✓	4,227	4,368	140	3%	2.1	✓
M1 Jn 22 - Jn 23 Southbound	3,931	4,016	85	2%	1.3	✓	3,933	3,884	-49	-1%	0.8	✓
M1 Jn 18 - Jn 19 Southbound	3,775	3,791	16	0%	0.3	✓	4,037	4,109	72	2%	1.1	✓
M42 J9 - J10 Northbound	2,783	2,555	-228	-8%	4.4	✓	3,602	3,214	-388	-11%	6.6	✓
M42 J9 - J10 Southbound	2,868	2,596	-272	-9%	5.2	✓	2,687	2,450	-237	-9%	4.7	✓
A5 Tmu Site 7592/2 On A5 Northbound Between M42 North-Westbound	1,005	877	-127	-13%	4.2	✓	1,000	981	-19	-2%	0.6	✓
A5 Tmu Site 7600/2 On A5 Northbound Between 4027 North-Westbound	617	588	-29	-5%	1.2	✓	702	672	-30	-4%	1.2	✓
A5 Tmu Site 7592/1 On A5 Southbound Between M42 South-Eastbound	846	806	-40	-5%	1.4	✓	1,092	960	-132	-12%	4.1	✓
A5 Tmu Site 7600/1 On A5 Southbound Between A426 South-Eastbound	801	702	-99	-12%	3.6	✓	625	621	-4	-1%	0.2	✓

Location	AM Peak						PM Peak					
	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?	Observed (veh)	Modelled (veh)	Abs Diff (veh)	% Diff	GEH	Pass?
A42 South Of M1 J23A Northbound	1,976	1,874	-102	-5%	2.3	✓	1,900	1,896	-4	0%	0.1	✓
A42 J12 - J13 (Ashby) Northbound	2,482	2,443	-39	-2%	0.8	✓	2,399	2,279	-119	-5%	2.5	✓
A42 South Of M1 J23A Southbound	1,827	1,783	-44	-2%	1.0	✓	1,936	1,716	-221	-11%	5.2	✓
A42 J12 - J13 (Ashby) Southbound	2,172	2,112	-59	-3%	1.3	✓	2,447	2,348	-99	-4%	2.0	✓
A5 Fenny Drayton North-Westbound	915	817	-98	-11%	3.3	✓	1,077	944	-133	-12%	4.2	✓
A5 Fenny Drayton South-Eastbound	1,032	956	-76	-7%	2.4	✓	907	833	-74	-8%	2.5	✓
M1 Northbound	5,440	5,510	70	1%	0.9	✓	6,615	6,576	-39	-1%	0.5	✓
M1 Southbound	6,256	6,331	76	1%	1.0	✓	5,563	5,617	54	1%	0.7	✓
M1 N Of Junction 23A Northbound	4,719	4,966	248	5%	3.6	✓	5,274	5,657	382	7%	5.2	✓
M1 N Of Junction 23A Southbound	5,538	5,782	244	4%	3.2	✓	5,346	5,438	92	2%	1.3	✓
M69 North Of Junction 1 Northbound	1,970	1,993	23	1%	0.5	✓	2,521	2,502	-18	-1%	0.4	✓
M69 North Of Junction 2 Southbound	2,495	2,429	-66	-3%	1.3	✓	2,127	2,155	28	1%	0.6	✓

3.4 PRTM v2.3 Highway Base Year Model Journey Time Performance

- 3.4.1 Figure 3.5 shows the 12 journey time routes considered for this base year model review. The journey time routes cover the strategic roads in the vicinity of the proposed Earl Shilton SUE development, including the A5, A47, A447, M1, and M69 as well as routes within Earl Shilton and Barwell.
- 3.4.2 The TAG acceptability criteria for journey time routes are for the modelled journey time to be within $\pm 15\%$ (or ± 1 minute) of the observed journey time. Table 3.5 shows the journey time performance of the base year model for the selected routes for the AM Peak and PM Peak hours, and Appendix A shows the comparison of modelled and observed journey times in distance-time graph format.
- 3.4.3 The Earl Shilton Bypass, Leicester Road and Station Road / Heath Lane / The Common journey time routes, which are the main roads closest to the proposed development, perform well, passing TAG criteria in all directions for both AM Peak and PM Peak hours.
- 3.4.4 The A47 (Leicester Forest East Inbound) journey time route fails TAG criteria in the AM Peak hour, with the journey time graph in Appendix A showing that the model overrepresents the delays for the approach to the A47 / Ratby Lane / Braunstone Lane junction; however, it is noted that this failure is marginal as the difference between the observed and modelled journey times is shown to be 15.5%.
- 3.4.5 The Rugby Road / Ashby Road journey time route fails TAG criteria in the PM Peak hour, with the journey time graph in Appendix A showing that the model underrepresents the delays at the signals at the Rugby Road / Hawley Road junction.
- 3.4.6 Overall, for the journey time routes considered, 27 (96%) out of 28 directional routes meet TAG criteria in both the AM Peak hour and PM Peak hour, which exceeds the TAG criterion of 85%.

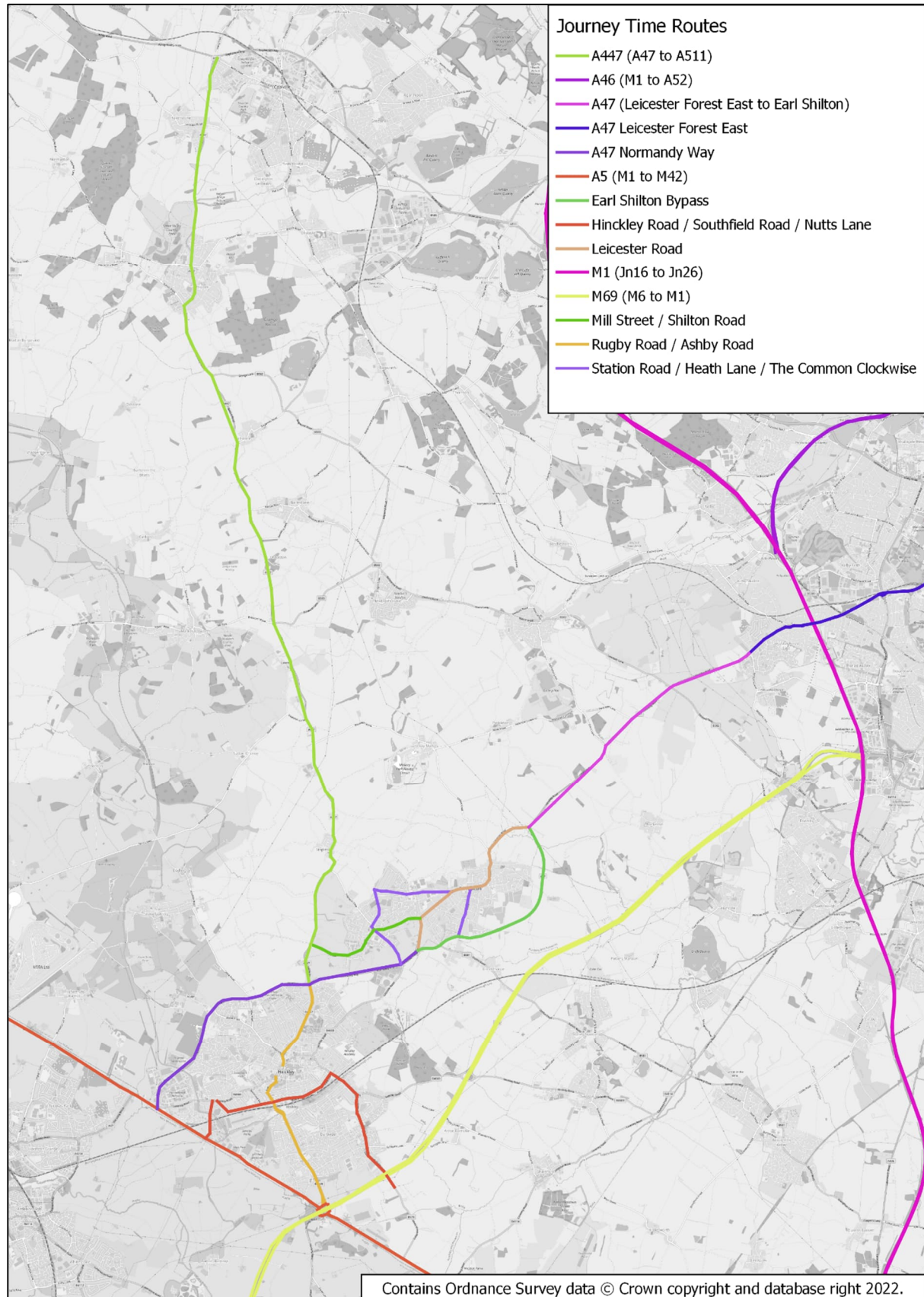
Figure 3.5: Journey Time Routes

Table 3.5: Journey Time Performance in the Vicinity of the Earl Shilton SUE Development

Route	AM Peak					PM Peak				
	Observed (mm:ss)	Modelled (mm:ss)	Abs Diff (mm:ss)	% Diff	Pass?	Observed (mm:ss)	Modelled (mm:ss)	Abs Diff (mm:ss)	% Diff	Pass?
A47 Leicester Forest East Inbound	16:13	18:44	02:31	15.5%	✗	13:01	13:43	00:43	5.5%	✓
A47 Leicester Forest East Outbound	12:16	13:39	01:22	11.2%	✓	14:53	17:01	02:08	14.3%	✓
A47 Normandy Way Eastbound	07:38	08:10	00:32	7.0%	✓	08:03	08:44	00:41	8.6%	✓
A47 Normandy Way Westbound	10:42	09:51	-00:51	-8.0%	✓	08:54	08:54	00:00	0.0%	✓
Earl Shilton Bypass Eastbound	04:06	04:31	00:24	9.9%	✓	03:53	04:40	00:47	20.1%	✓
Earl Shilton Bypass Westbound	04:11	04:47	00:36	14.5%	✓	04:02	04:39	00:37	15.2%	✓
Leicester Road Northbound	05:25	06:11	00:46	14.2%	✓	05:24	06:13	00:50	15.3%	✓
Leicester Road Southbound	05:52	06:22	00:30	8.4%	✓	05:38	06:26	00:48	14.2%	✓
Rugby Road / Ashby Road Northbound	13:46	12:07	-01:39	-11.9%	✓	15:52	11:44	-04:08	-26.1%	✗
Rugby Road / Ashby Road Southbound	10:04	11:02	00:58	9.7%	✓	09:50	10:47	00:58	9.8%	✓
Hinckley Road / Southfield Road / Nutts Lane Eastbound	14:36	13:39	-00:57	-6.5%	✓	15:04	14:10	-00:54	-5.9%	✓
Hinckley Road / Southfield Road / Nutts Lane Westbound	13:41	13:24	-00:17	-2.1%	✓	16:01	13:46	-02:16	-14.1%	✓
Station Road / Heath Lane / The Common Clockwise	08:37	09:15	00:37	7.2%	✓	08:22	09:14	00:51	10.2%	✓
Station Road / Heath Lane / The Common Anti-Clockwise	08:07	09:10	01:02	12.7%	✓	08:46	09:10	00:24	4.6%	✓
Mill Street / Shilton Road Eastbound	04:14	04:23	00:08	3.2%	✓	04:12	04:25	00:13	5.2%	✓
Mill Street / Shilton Road Westbound	04:15	04:23	00:07	2.8%	✓	04:05	04:22	00:17	6.8%	✓
A47 (Leicester Forest East to Earl Shilton) Eastbound	04:39	04:53	00:14	5.0%	✓	04:55	04:43	-00:12	-4.0%	✓
A47 (Leicester Forest East to Earl Shilton) Westbound	05:39	05:11	-00:28	-8.1%	✓	05:30	05:05	-00:24	-7.4%	✓
A447 (A47 to A511) Northbound	22:11	21:24	-00:48	-3.6%	✓	21:28	21:05	-00:23	-1.8%	✓
A447 (A47 to A511) Southbound	22:24	21:04	-01:20	-6.0%	✓	21:45	21:20	-00:25	-1.9%	✓
M1 (Jn16 to Jn26) Northbound	51:39	57:40	06:01	11.6%	✓	00:08	00:57	00:50	1.4%	✓
M1 (Jn16 to Jn26) Southbound	59:46	01:57	02:11	3.6%	✓	52:49	59:15	06:26	12.2%	✓
M69 (M6 to M1) Northbound	17:57	19:54	01:56	10.8%	✓	17:03	15:05	-01:58	-11.6%	✓
M69 (M6 to M1) Southbound	14:26	14:49	00:23	2.6%	✓	14:15	14:34	00:19	2.3%	✓
A46 (M1 to A52) Northbound	25:17	26:31	01:14	4.9%	✓	28:33	29:23	00:50	2.9%	✓
A46 (M1 to A52) Southbound	27:25	29:48	02:23	8.7%	✓	24:13	26:44	02:31	10.4%	✓
A5 (M1 to M42) Eastbound	42:40	41:46	-00:53	-2.1%	✓	40:32	40:56	00:24	1.0%	✓
A5 (M1 to M42) Westbound	41:23	42:32	01:10	2.8%	✓	46:43	41:29	-05:15	-11.2%	✓

Section 4 - Summary

- 4.1.1 The PRTM v2.3 highway model represents an average weekday in April / May / June in 2014 for AM Peak, average interpeak and PM Peak hours. This review is focused on the suitability of the model for the use in the strategic assessment of the proposed Earl Shilton SUE development in the AM Peak and PM Peak hours.
- 4.1.2 The review of the base year highway model has considered the zone system and network structure in the vicinity of the proposed development, and the network coding in Earl Shilton, along the A47, the A5 and the M69. It has also considered the performance of the base year model compared with the observed flows and journey time data collated as part of the model development.
- 4.1.3 In terms of the model zone system, the PRTM v2.3 is considered to contain sufficient detail for a strategic assessment of the proposed development. The proposed development covers several zones in Earl Shilton most of which contain existing housing. The development will be modelled with five new development zones to keep the development-related demand separate from existing demand.
- 4.1.4 A review of the coded highway network near the proposed development has shown the coding of the base year model is satisfactory in terms of consistency with the PRTM Coding Manual and suitably coded for the purpose of strategic modelling.
- 4.1.5 Near the scheme, one minor highway network change have been made to correct the priority coding at the existing Breach Lane junction (node 73623) (see Paragraph 2.3.9). Sensitivity test shows that this has no effect on the base year model calibration.
- 4.1.6 In Earl Shilton and the wider area, none of the coding anomalies are significant in the base year. Small updates will be made to forecast year networks to reflect the actual implementation of highway schemes (Hinckley Area Project Phases 1-3) that are not reflected in the forecast year networks.
- 4.1.7 A review of the performance of the base year highway model compared with observed counts and journey time data collated as part of the model development has been undertaken. An extensive data set of observed traffic counts and journey times has been collated as part of the development of the PRTM v2.3. Of this data set, nine screenlines and cordons (18 screenlines and cordons by direction) and 168 directional counts have been identified as part of this base year review. In terms of journey times, 12 routes (24 by direction) have been assessed in the vicinity of the proposed development.
- 4.1.8 The review shows that 17 of the 18 screenlines and cordons identified as part of this review meet TAG criteria in the PM Peak hour and all 18 passing in the AM Peak hour. In the PM Peak, the M1 screenline (Leicester City) is marginally below the acceptability criteria in the westbound direction.
- 4.1.9 Regarding link flow performance, most modelled flows are within the criteria set out within TAG. Of the 146 directional calibration counts, 128 pass in the AM Peak hour (88% pass rate) and 129 in the PM Peak hour (88% pass rate); and all 22 directional validation counts pass (i.e. 100% pass rate) in both AM Peak and PM Peak hours.
- 4.1.10 In terms of the journey time routes, 27 (96%) out of 28 directional routes meet TAG criteria in the AM Peak hour and PM Peak hour respectively, which exceeds the 85% TAG criteria guidelines. The journey time performance compared with observed data for the selected routes is generally very good with a single (marginal) failure in the AM Peak and an single failure in the PM Peak, that has been investigated and understood (section 3.4.5).
- 4.1.11 In summary, based on this base year model review, the PRTM v2.3 is considered suitable for the strategic assessment of the proposed Earl Shilton SUE development.

Appendix A - Journey Time Route Performance

Figure A 1: Leicester City Journey Time Routes

A47 Leicester Forest East

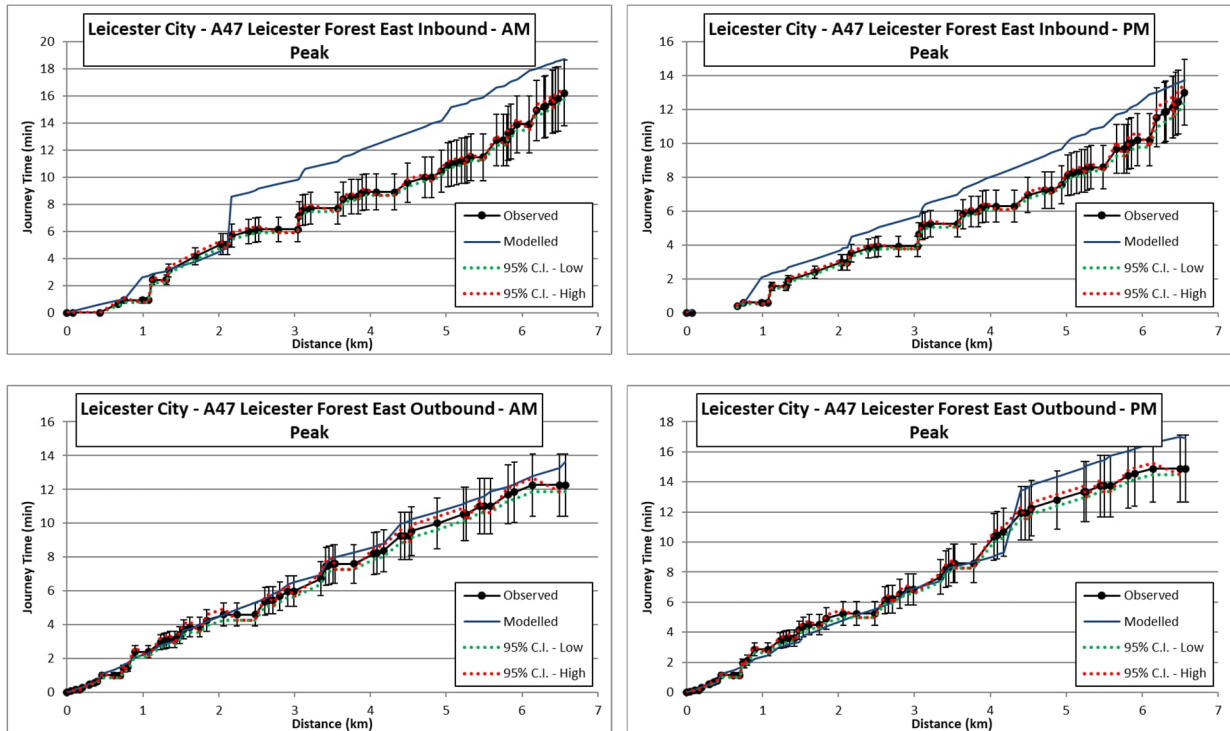
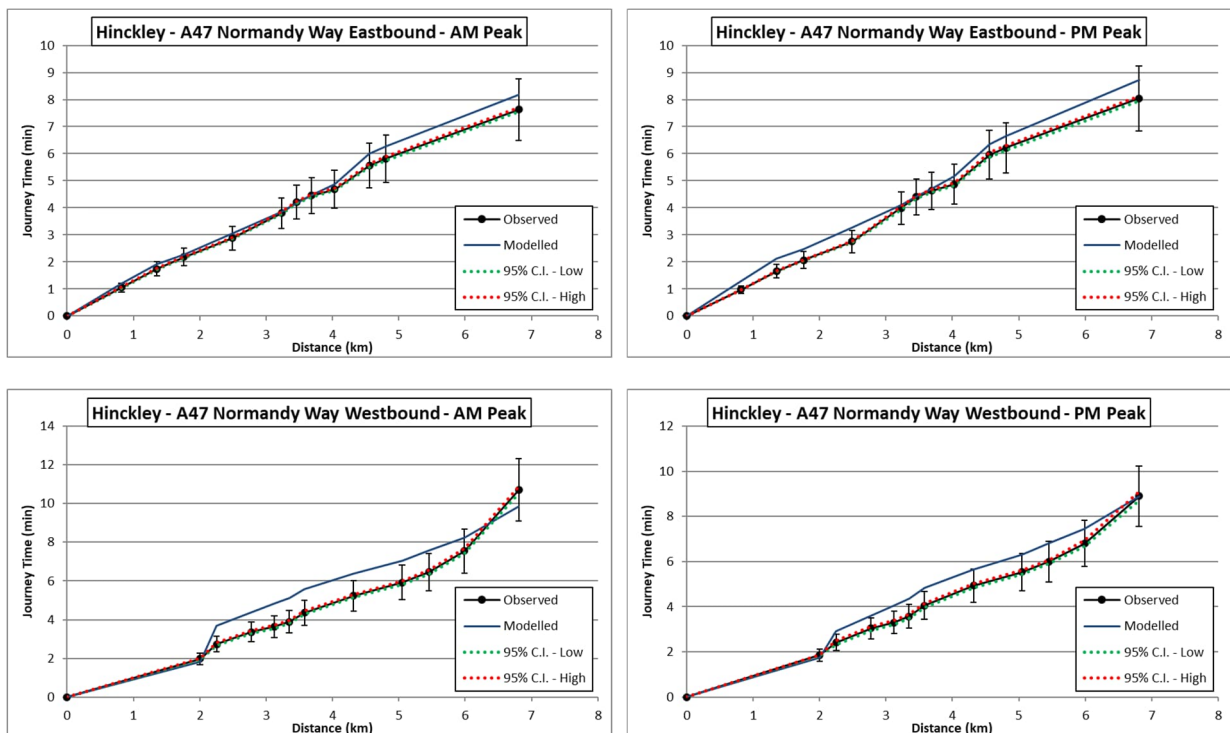
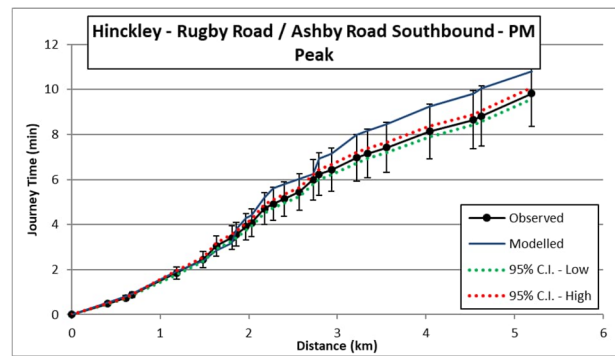
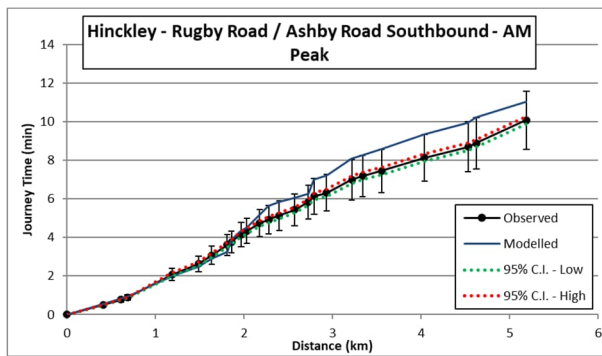
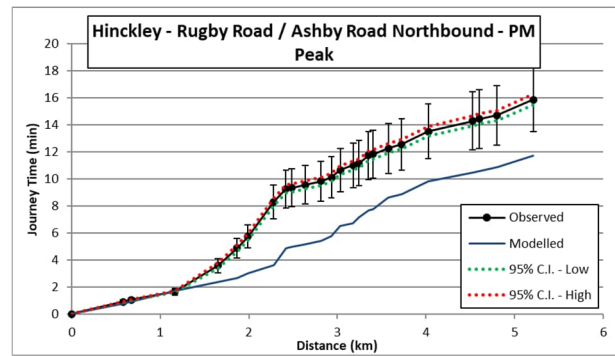
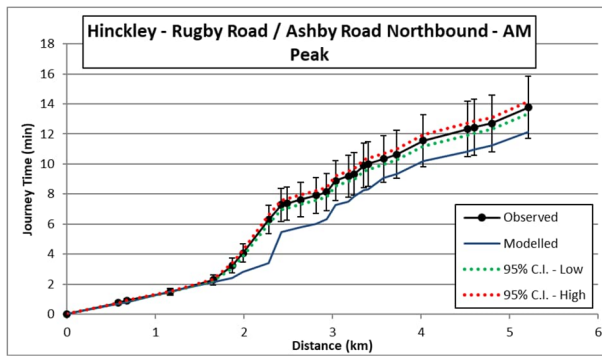


Figure A 2: Hinckley Journey Time Routes

A47 Normandy Way



Rugby Road / Ashby Road



Hinckley Road / Southfield Road / Nutts Lane

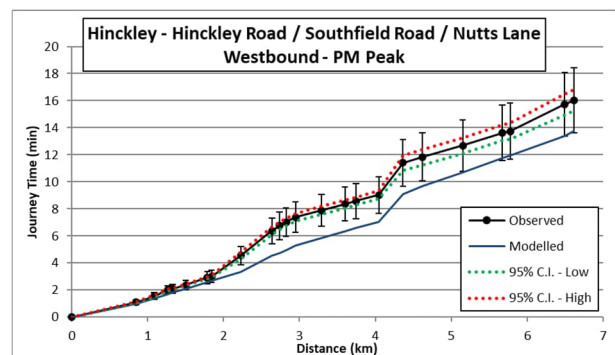
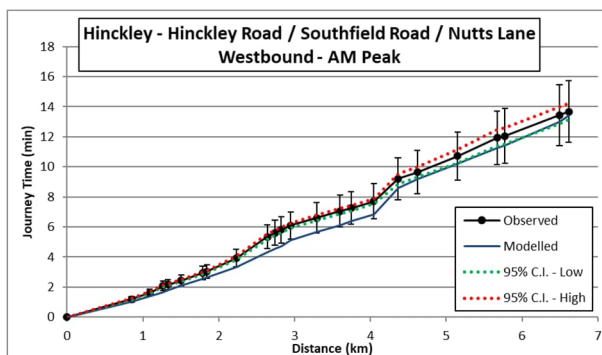
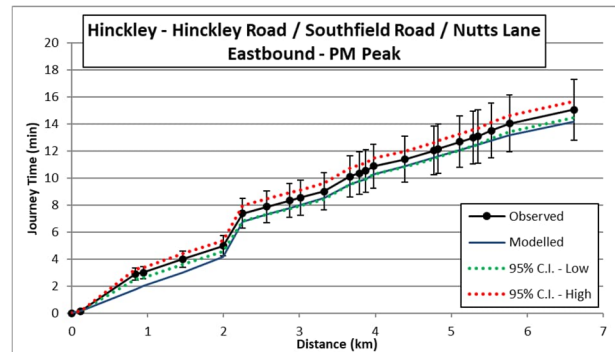
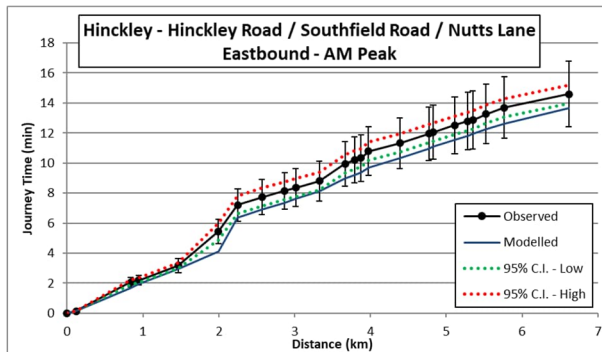
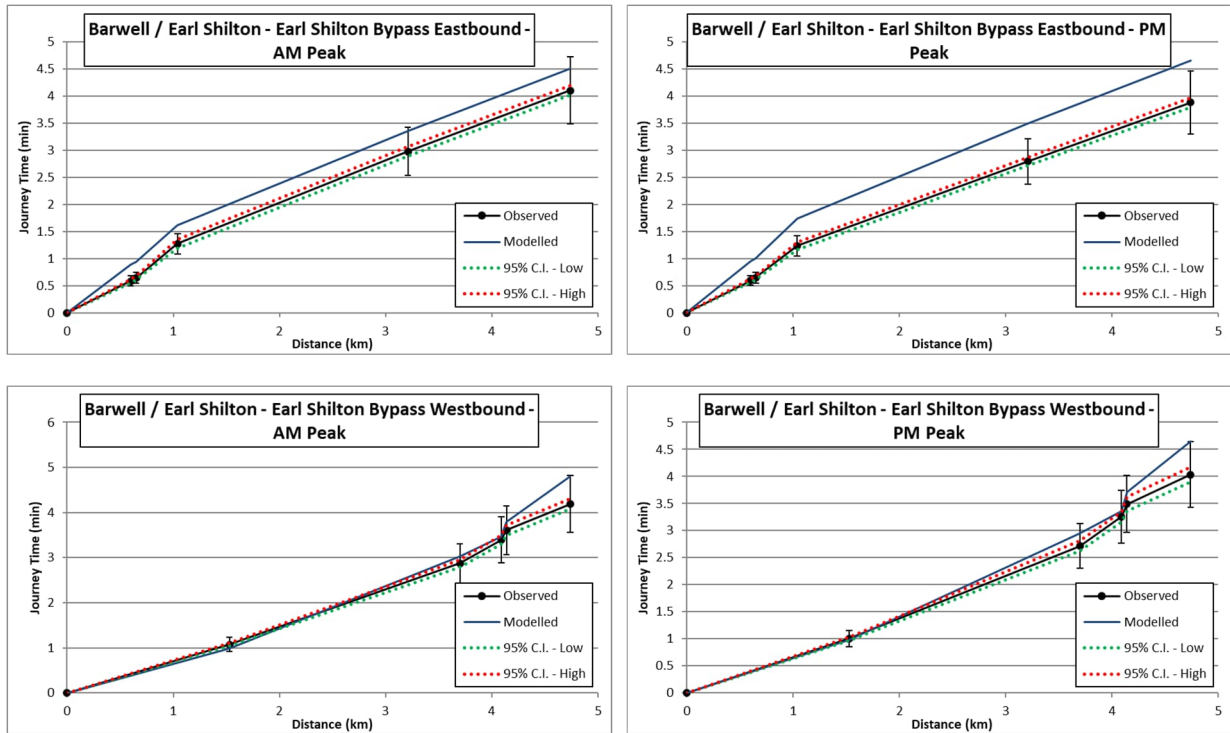
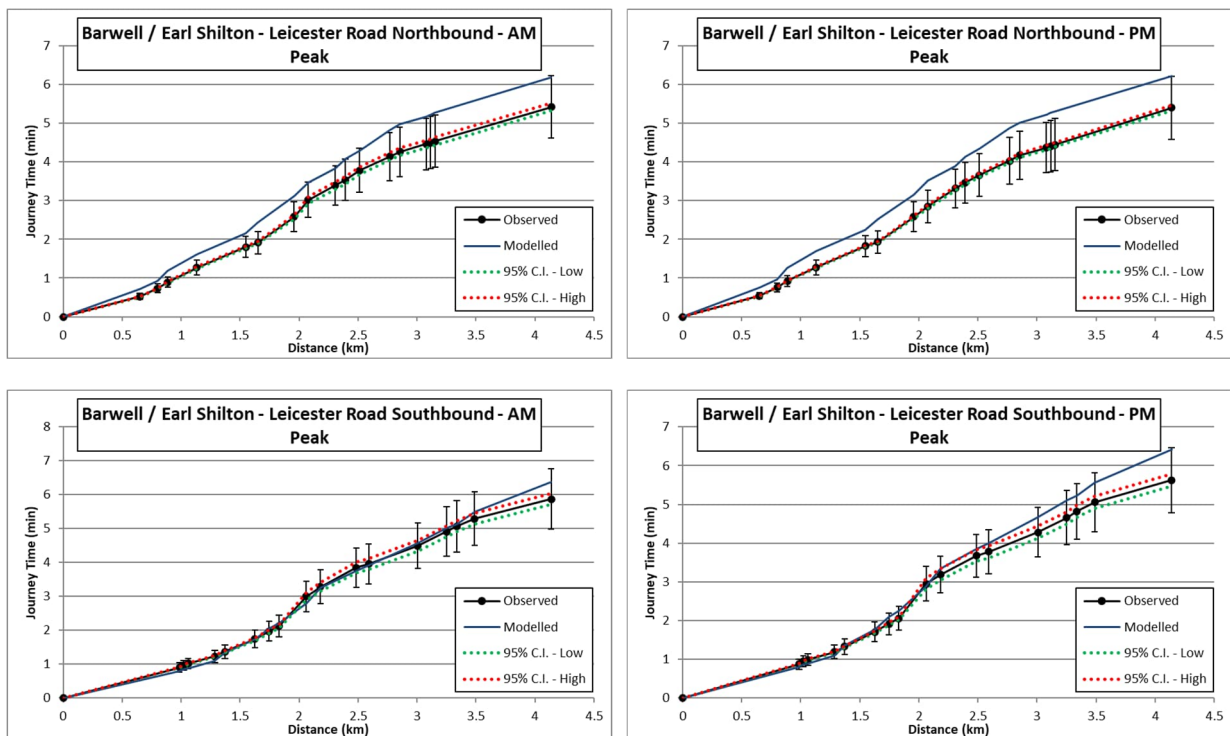


Figure A 3: Barwell / Earl Shilton Journey Time Routes

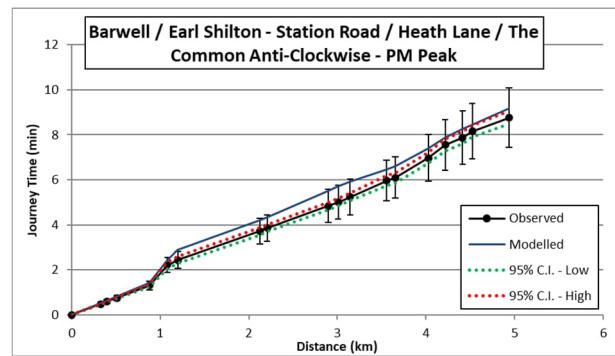
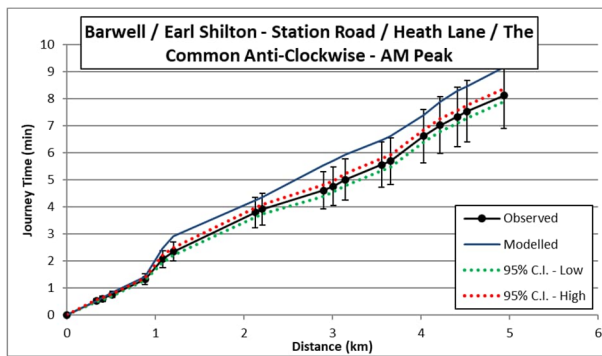
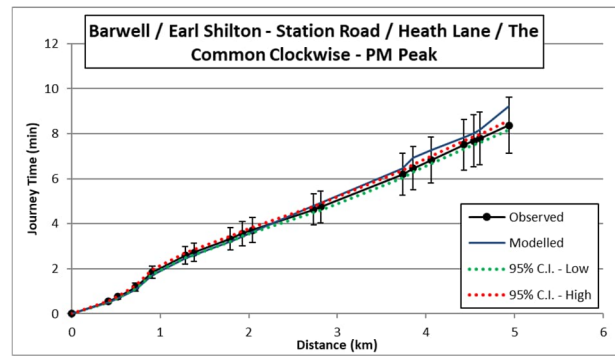
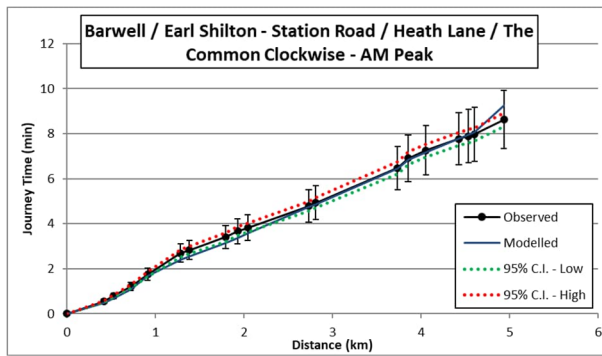
Earl Shilton Bypass



Leicester Road



Station Road / Heath Lane / The Common Clockwise



Mill Street / Shilton Road

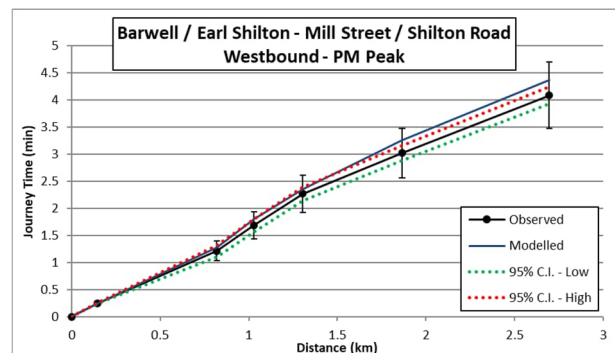
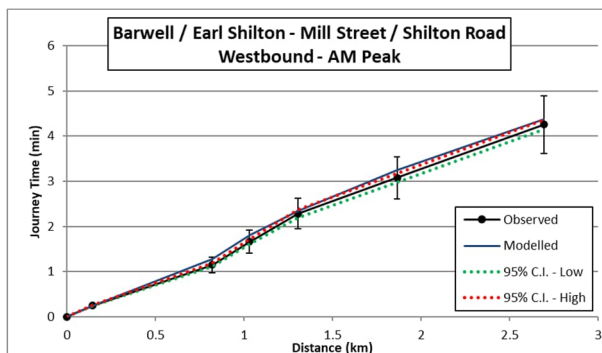
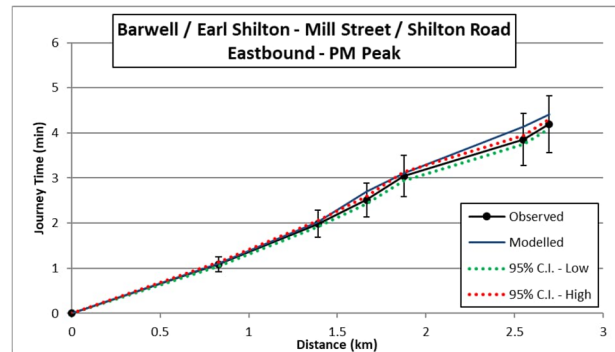
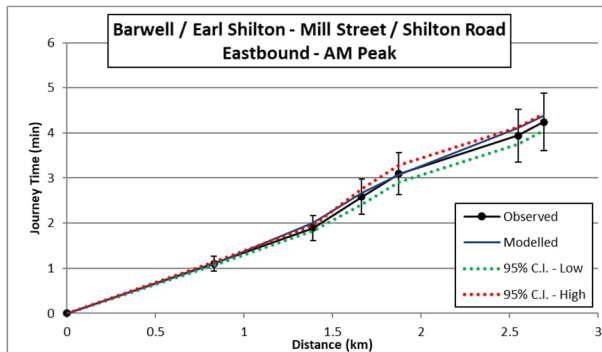
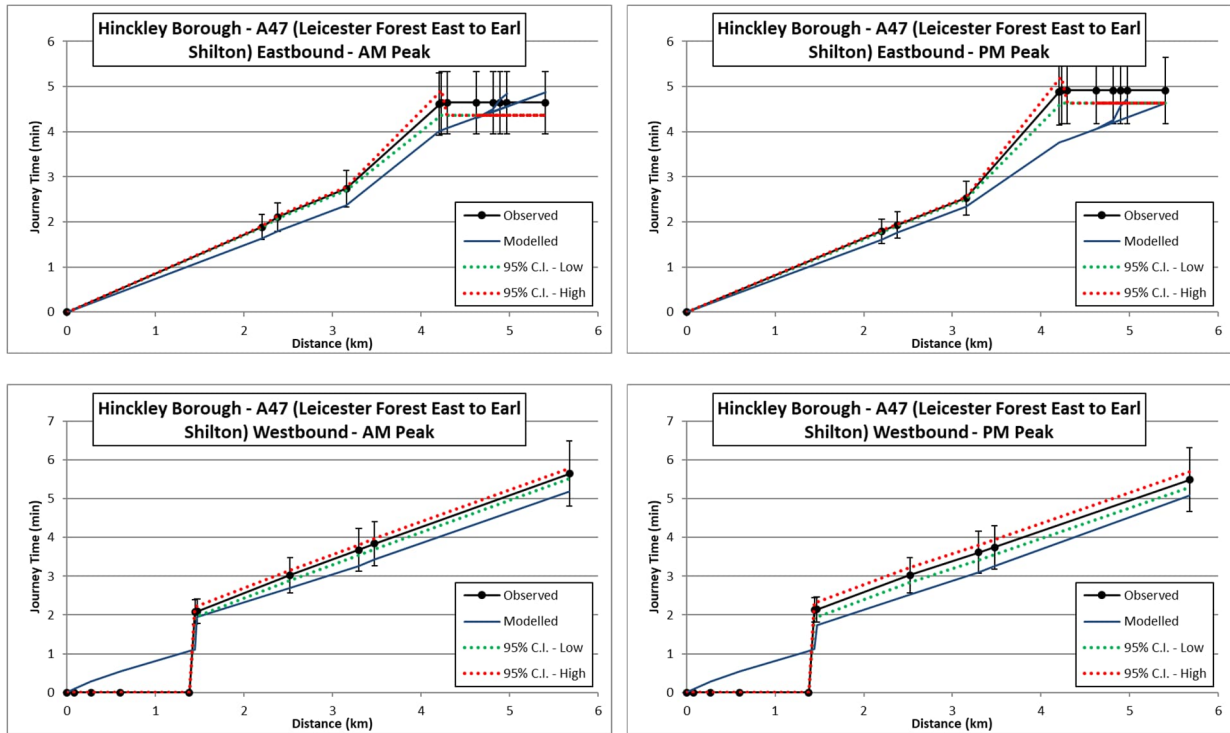


Figure A 4: Hinckley Borough Journey Time Routes

A4 (Leicester Forest East to Earl Shilton)



A447 (A47 to A511)

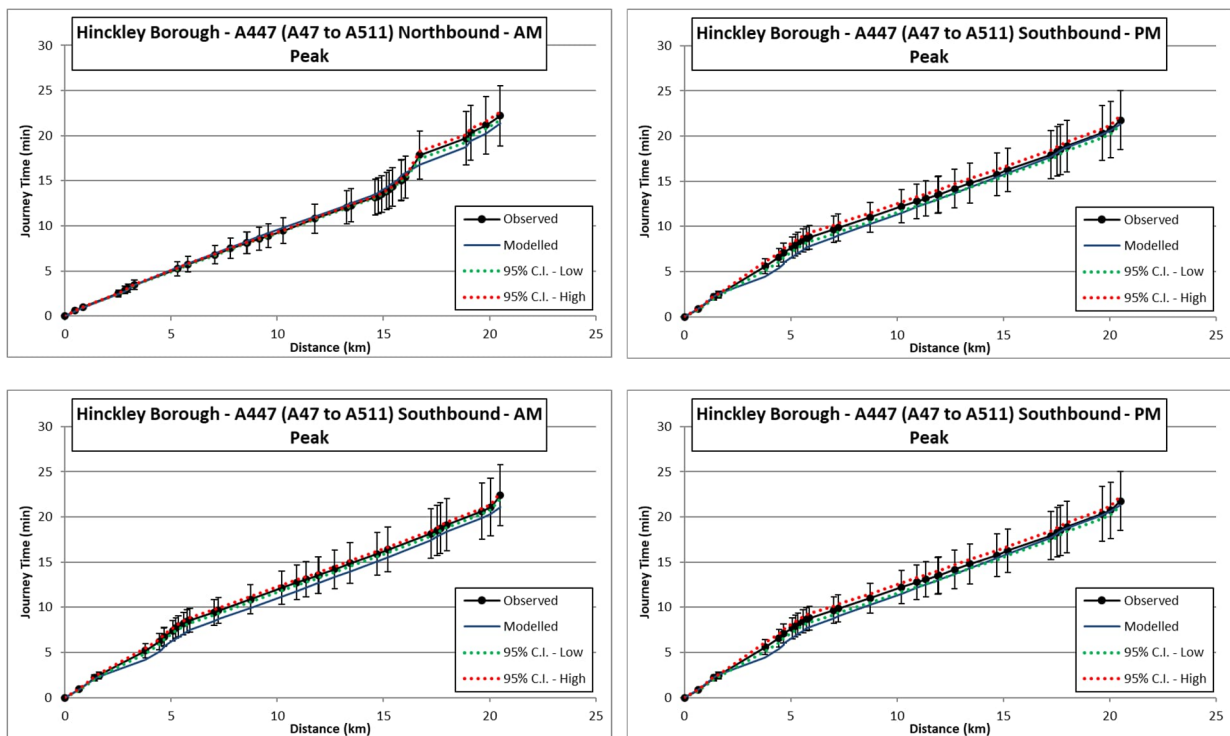
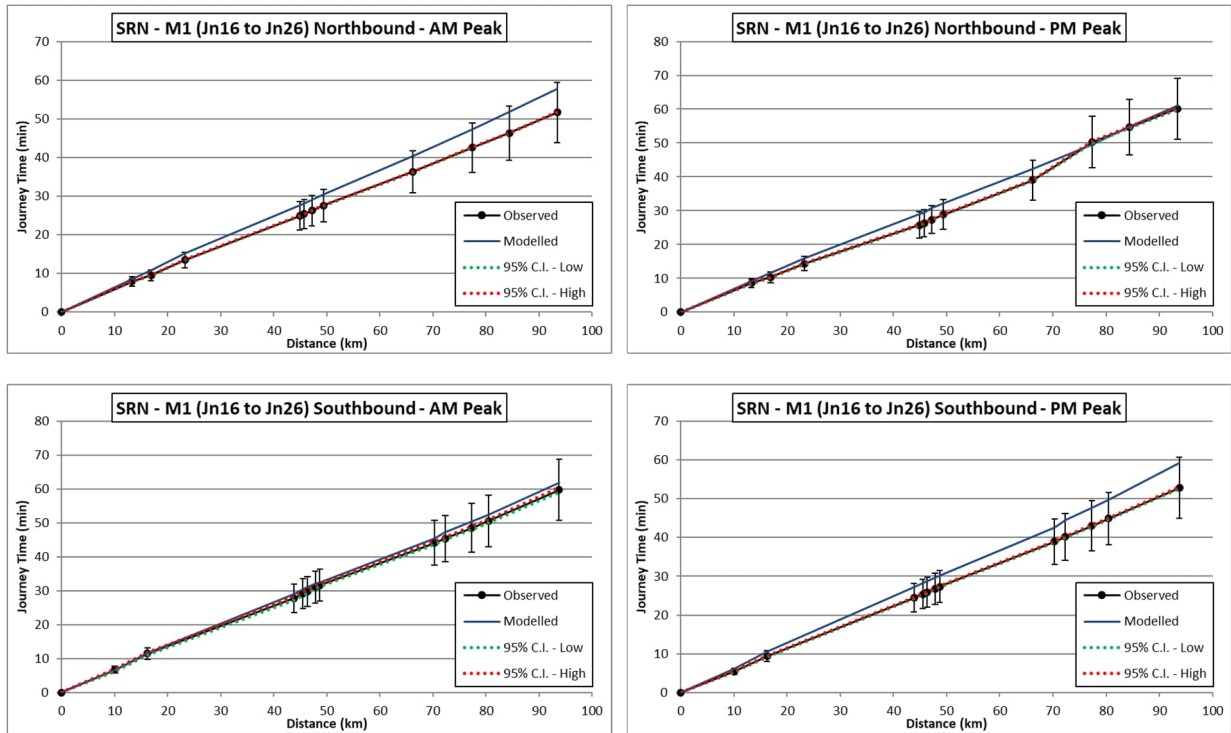
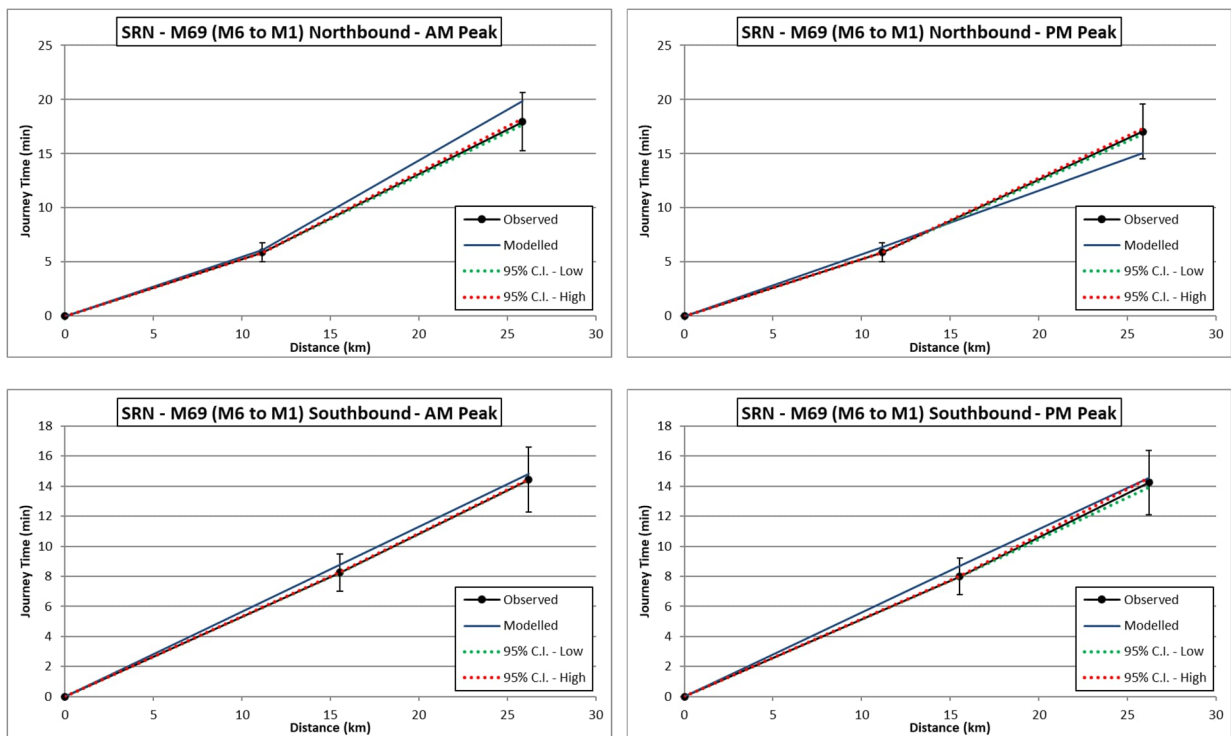


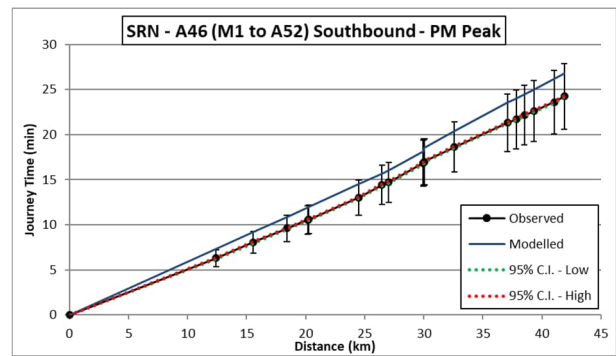
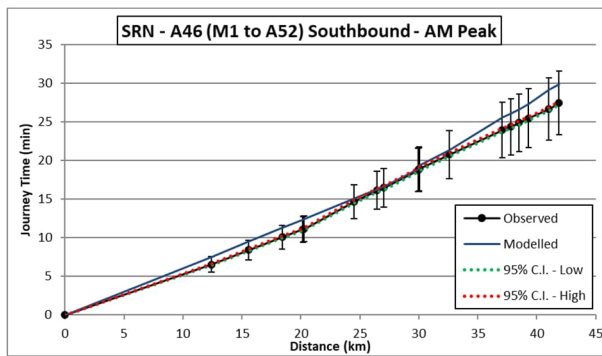
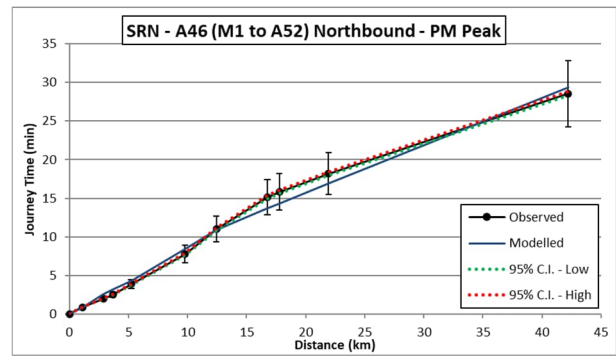
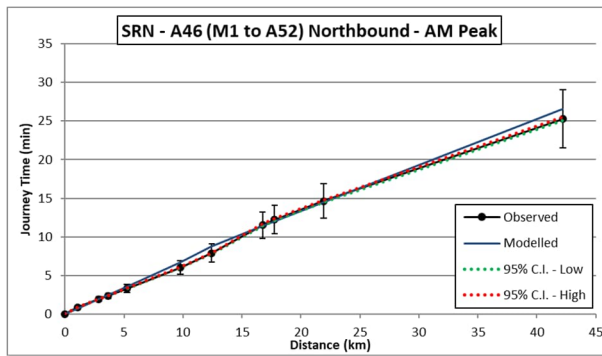
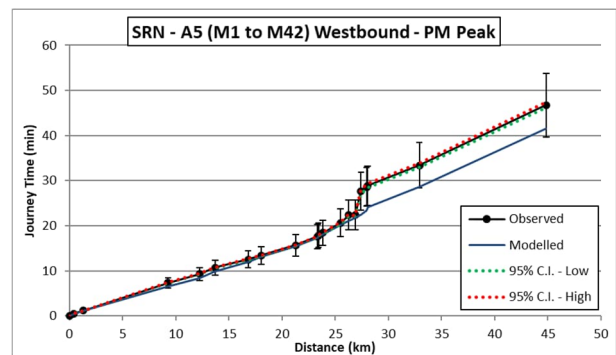
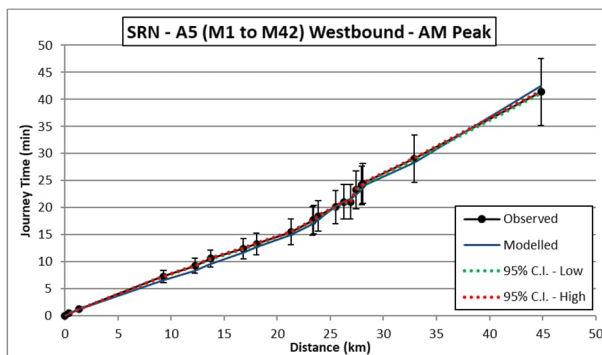
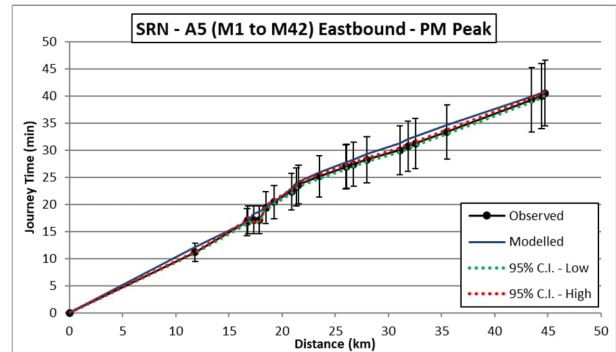
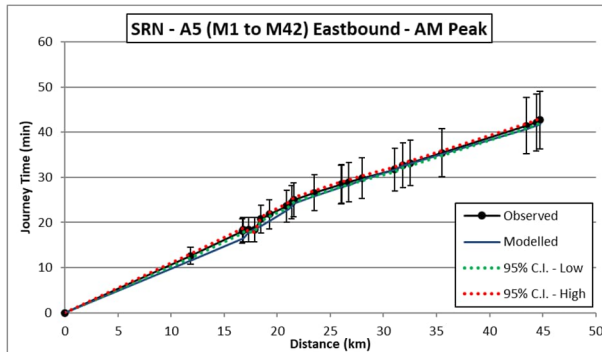
Figure A 5: SRN Journey Time Routes

M1 (Junction 16 to Junction 26)



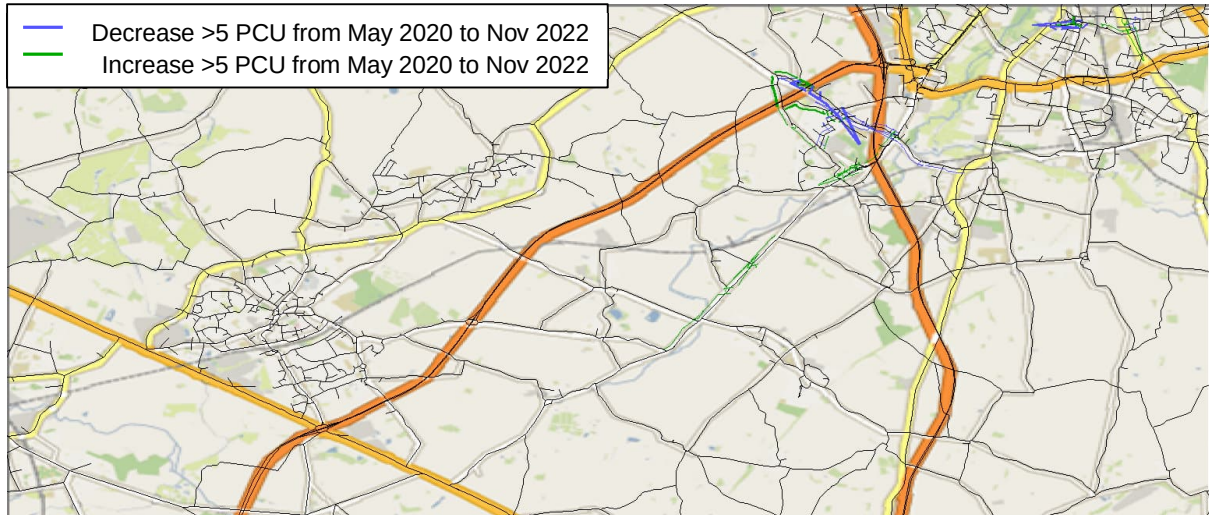
M69 (M6 to M1)



A46 (M1 to A52)**A5 (M1 to M42)**

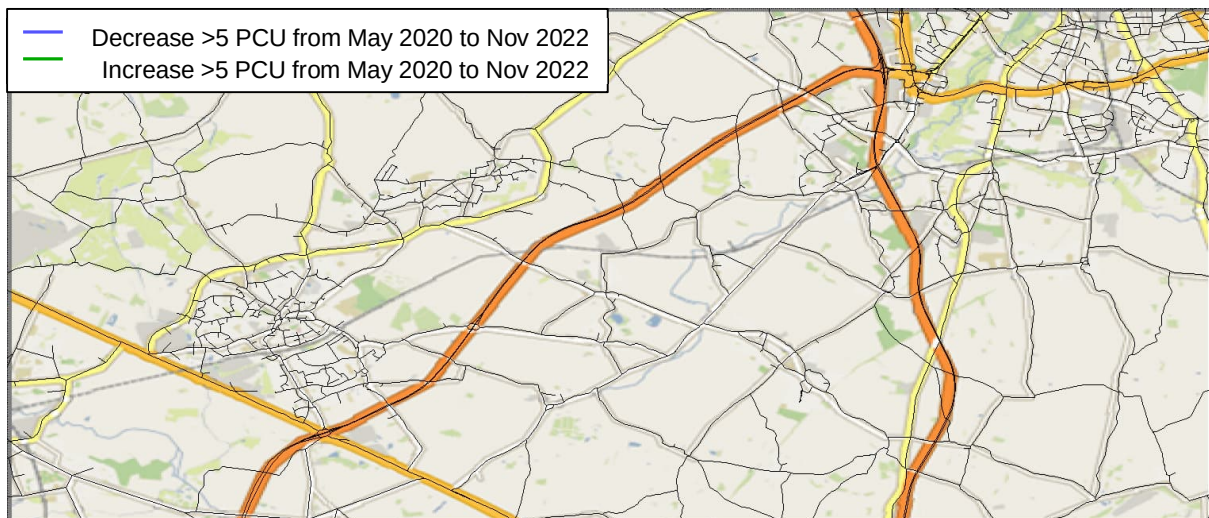
Appendix B - Modelled Flow Difference (Base Year with May 2020 Databook vs Base Year with November 2022 Databook)

Figure B 1: AM Peak Actual Flow Differences



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Figure B 2: PM Peak Actual Flow Differences



Map contains Ordnance Survey data ©Crown copyright and database right 2022



TECHNICAL NOTE 2

DATE:	14 November 2023	CONFIDENTIALITY:	Public
SUBJECT:	Proposed Study Area for Junction Assessment		
PROJECT:	Earl Shilton Sustainable Urban Extension	AUTHOR:	Bev Coupe
CHECKED:	Grace Smith	APPROVED:	Neil Hall

Appendix B

UNCERTAINTY LOG V1.2

PlanID	Authority	District	Source	SourceID	ModelID	Settlement	PlanningApplicationNumber	Location	Description	Majority	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014	Year 2015	Year 2016	Year 2017	Year 2018	Year 2019	Year 2020	Year 2021	Year 2022	Year 2023	Year 2024	Year 2025	Year 2026	Year 2027	Year 2028	Year 2029	Year 2030	Year 2031	Year 2032	Year 2033	Year 2034	Year 2035	Year 2036	Year 2037	Year 2038	Year 2039	Year 2040	Year 2041	Year 2042	Year 2043	Year 2044	Year 2045	Year 2046	Year 2047	Year 2048	Year 2049	Year 2050	Year 2051	Total	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83	Sh84	Sh85	Sh86	Sh87	Sh88	Sh89	Sh90	Sh91	Sh92	Sh93	Sh94	Sh95	Sh96	Sh97	Sh98	Sh99	Sh00	Sh01	Sh02	Sh03	Sh04	Sh05	Sh06	Sh07	Sh08	Sh09	Sh10	Sh11	Sh12	Sh13	Sh14	Sh15	Sh16	Sh17	Sh18	Sh19	Sh20	Sh21	Sh22	Sh23	Sh24	Sh25	Sh26	Sh27	Sh28	Sh29	Sh30	Sh31	Sh32	Sh33	Sh34	Sh35	Sh36	Sh37	Sh38	Sh39	Sh40	Sh41	Sh42	Sh43	Sh44	Sh45	Sh46	Sh47	Sh48	Sh49	Sh50	Sh51	Sh52	Sh53	Sh54	Sh55	Sh56	Sh57	Sh58	Sh59	Sh60	Sh61	Sh62	Sh63	Sh64	Sh65	Sh66	Sh67	Sh68	Sh69	Sh70	Sh71	Sh72	Sh73	Sh74	Sh75	Sh76	Sh77	Sh78	Sh79	Sh80	Sh81	Sh82	Sh83
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Core Scenario Highway Network Scheme Assumptions

Location	Scheme Name	Certainty	Timescale	First Forecast Year	Include
Hinckley & Bosworth	RGF/MIRA, A5 Redgate Junction at A444 to Higham Lane Junction	Complete	Jan-15	2015	Y
Catthorpe	M1 J19	Complete	2016-2017	2017	Y
Nottingham	A453 upgrade - including removal of temporary 40mph speed limit	Complete	Sep-15	2016	Y
Kegworth	M1 J24	Complete	Oct-14	2015	Y
Hinckley & Bosworth	A5 Dodwells and Longshoot junctions	Complete	2016	2016	Y
Nottingham	M1 J23a-J25 SMART motorway	Complete	2018	2019	Y
Warwickshire	M6 J2-J4 SMART motorway	Complete	2017-2020	2021	Y
Various	M1 J16-J19	Complete	2019	2019	Y
Leicestershire	A5 widening to dual carriageway near Hinckley	Hypothetical	2020-2023	2026	N
Daventry	DIRFT III - Daventry International Rail Freight Terminal	Complete	2016	2016	Y
Loughborough	Loughborough Integrated Transport Scheme – not including LIRR	Complete	2013	2014	Y
Cotes	A60 Nottingham Road/Loughborough reduction of speed limit traffic calming features	Complete	2016	2016	Y
Earl Shilton	Access arrangements for SUE/Highway improvements for SUE	Near Certain	2023-2035	2026	N
Barwell	Access arrangements for SUE/Highway improvements for SUE	Near Certain	2023-2035	2026	Y
Lubbesthorpe	Access arrangements for SUE including strategic traffic link to the A563 Lubbesthorpe Way	Near Certain	2017-2026	2021	Y
SRFI	Southern access for new development	Complete	2016-2018	2019	Y
Loughborough	A512 widening B591 to M1 J23, improvements to J23 and completion of dualling thereafter to either Snell's Nook Lane or Epinal Way junction	Complete	2017-2020	2021	Y
Castle Donington	Western Link Road from Back lane to Tops Hill, NWLDC package of measures to help mitigate planned growth	Complete	2020	2021	Y
Lubbesthorpe	Link across M69 to join north and south of the Lubbesthorpe development	More than Likely	2026-2031	2031	Y
Earl Shilton & Barwell	Highway improvements for SUE (Ashby Road/ Normandy Way)	More than Likely	2023-2035	2026	N
Lubbesthorpe	Highway improvements for SUE (Mill Hill/ Warren Park, Meridian South/ A563, A47/A563)	Near Certain	2017-2023	2026	Y
Kegworth	Kegworth Bypass	Complete	2017-2019	2019	Y
SRFI	Highway improvements for new development	Complete	2016-2019	2021	Y
Loughborough	West of Loughborough SUE (access from the north via the A6 roundabout)	More than Likely	2022	2022	Y
Loughborough	Access connection for the Science Park via the A512 roundabout	Near Certain	2031	2031	Y
Loughborough	West of Loughborough SUE (connection to the northern arm of the A512 roundabout)	More than Likely	2036	2036	Y
North West Leicestershire	M1 J22	Complete	2016	2016	Y
North West Leicestershire	A42 J13	Complete	2017	2018	Y
Blaby	Leicester North West Project Phase 1	Complete	2015-2016	2016	Y
Blaby	Desford Crossroads	Reasonably Foreseeable	2026	2026	N
Harborough	Harborough Strategic Development Area	Near Certain	up to 2021	2021	Y
Charnwood	North of Birstall SUE (Broadnook SUE)	Near Certain	2021-2026	2026	Y
Charnwood	Mountsorrel Lane, Rothley Link Road	Complete	up to 2021	2021	Y
Charnwood	A512 junction improvements	Complete	2016-2021	2021	Y
Hinckley	Hinckley Area Project Phase 1-3	Complete	2014-2017	2018	Y
Blaby	Glenfield Park/Optimus Point S278 works	Complete	2014-2016	2016	Y
North of East Leicester	North of East Leicester Development Network – Thorpebury SUE	Near Certain	2025	2026	Y
Charnwood	A6 Loughborough Road Bus Lane and Parking Controls	Complete	2016	2016	Y
Leicester City	Removal of Belgrave Flyover	Complete	2014-2015	2016	Y
Leicester City	Saffron Lane - Old Velodrome Improvements	Complete	2016	2016	Y
Leicester City	Traffic Calming Schemes	Complete	2016-2021	2016	Y
Leicester City	East of Hamilton Development Improvements	Complete	2016	2017	Y
Leicester City	Pedestrianisation of Hotel Street, Pedestrianisation of St Martins	Complete	2016	2016	Y
Leicester City	Haymarket/Charles Street Bus Station development	Complete	2016	2016	Y
Leicester City	Existing & proposed 20mph zones	Complete	2012-2016	2016	Y
Leicester City	St Nicholas Circle	Complete	2015	2016	Y
Leicester City	Welford Road	Complete	2018	2021	Y
Leicester City	Waterside Development	More than Likely	mid-2020s	2026	Y
Leicester City	Belgrave Gate South	Complete	2019	2020	Y
Leicester City	Belvoir Street	Complete	2017	2018	Y
Leicester City	York Road/Bonnars Lane/Grange Road	Complete	2019	2019	Y
Leicester City	King St	Complete	2018	2018	Y
Leicester City	Lancaster Road	Complete	2019	2020	Y
Leicester City	Mansfield Street & Church Gate	Complete	2020	2021	Y
Leicester City	SMBS Access to Burleys Way	Complete	2019	2021	Y
Leicester City	Vaughan Way	Complete	2019	2020	Y
Leicester City	Ashton Green	Near Certain	2021-2031	2021	Y
Leicester City	London Road	Complete	2019	2020	Y
Leicester City	LNW2 Ravensbridge Drive / Blackbird Road	Complete	2019	2020	Y
Melton	Melton Mowbray Distributor Road (Northern Section) (Nottingham Road to A607)	Near Certain	2024-2026	2026	Y
Melton	Melton Mowbray Distributor Road (Eastern Section) (A607 to Burton Road)	Near Certain	2024-2026	2026	Y

This scheme contains coding for an upgrade of the A47 / Ashby Road signalised junction only.

Melton	Melton Mowbray Southern Link Road (Burton Road to Leicester Road)	More than Likely	2025	2026	Y
Melton	Gladman’s Site Access (Leicester Road and Kirby Lane)	Complete	2018-2020	2021	Y
Leicester City	Beaumont Leys Anstey Lane Improvements	Complete	2019	2021	Y
Hinckley	Rugby Road Corridor Improvements – Phase 4	Complete	2022	2023	Y
Leicester City	Putney Road West Improvements	Near Certain	2021-2022	2022	Y
Lutterworth	Frank Whittle Roundabout approaches (Magna Park)	Complete	2018-2020	2021	Y
Lutterworth	Lutterworth East Development (Development Access (A4304, Gilmorton Road and A426))	More than Likely	2021-2026	2026	Y
Lutterworth	Lutterworth East Development Associated Mitigations	Near Certain	2031	2031	Y
Lutterworth	Lutterworth East Development (Link Road between A4304 and A426)	More than Likely	2021-2026	2031	Y
Lutterworth	Lutterworth East Development (Gilmorton Road bridge bus restriction)	More than Likely	2021-2026	2026	Y
Bardon Hill	Interlink Way East junction	Complete	2016	2016	Y
Bardon Hill	Bardon Hill Link Road North Section	Near Certain	2021-2026	2026	Y
Coalville	Hoo Ash Roundabout	More than Likely	2021-2026	2025	Y
Coalville	Thornborough Road Roundabout	More than Likely	2021-2026	2025	Y
Coalville	Dual Carriageway from Thornborough Rd to Whitwick Road	More than Likely	2021-2026	2025	Y
Coalville	Whitwick Road Roundabout	More than Likely	2021-2026	2025	Y
Coalville	Broom Leys Road Junction	More than Likely	2021-2026	2025	Y
Coalville	Bardon Link Road Junction	More than Likely	2021-2026	2025	Y
Coalville	Bardon Link Road Southern Section	Near Certain	2024-2026	2026	Y
Coalville	Birch Tree Roundabout	More than Likely	2019-2024	2025	Y
Coalville	Flying Horse Roundabout	More than Likely	2021-2026	2025	Y
Coalville	Fieldhead Roundabout	More than Likely	2021-2026	2025	Y
Granby Street	Granby Street/Halford Street Improvements	Complete	2017	2018	Y
Loughborough	Alan Moss Road	Complete	2017	2018	Y
Hinckley	DPD A5 Access	Complete	2017	2021	Y
Leicester Forest East	Ratby Lane/Wembley Road junction	Complete	2017/18	2019	Y
Leicester City	Abbey Park Road Cycle Provision	Complete	2020	2021	Y
Blaby	A47/Kirby Lane Tesco Express	Complete	2020	2021	Y
Leicester City	Abbey Street	Complete	2021	2021	Y
Leicester City	A50 Groby Road Bus Lane	Near Certain	2022	2022	Y
Harborough	Magna Park Extension Access - Mere Lane, Lutterworth	Complete	2021	2021	Y
Harborough	Magna Park Extension Access - A5, Lutterworth	Near Certain	2026	2026	Y
Blaby	Highway improvements for Lubbesthorpe SUE (A47/Braunstone Lane/Ratby Lane, A5460/M1 J21)	Complete	2017-2021	2021	Y
Blaby	Foxhunter Roundabout Eastbound Approach	Complete	2019	2021	Y
Harborough	B4114/B581 Signalisation Improvement, Broughton Astley	Near Certain	2023	2026	Y
Blaby	Everards Meadow Access	Complete	2018	2021	Y
Blaby	Hastings Fields Blaby DPD Site Access	More than likely	2022	2026	Y
Blaby	West of St Johns (Blaby DPD) Site Access	More than likely	2026	2026	Y
Harborough	Wigston Direction for Growth Site Access	Near certain	2026	2026	Y
Blaby	Everard Way Closure, Fosse Park	Near certain	2020	2020	Y
NWL	Money Hill Site Access A511	More than likely	2025	2026	Y
Derbyshire	Wragley Way (South Derbyshire) SUE Access A50	More than likely	2030	2031	Y
Derbyshire	Boulton Moor (South Derbyshire) SUE Access	Complete	2014	2014	Y
Derbyshire	Clifton (Rushcliffe) SUE Access	Near Certain	2022	2022	Y
Derbyshire	EMIP A50 (Freeport)	Reasonably Foreseeable	2030	2030	N
Derbyshire	West Derbyshire SUE Access A38	Complete	2014	2014	Y
Derbyshire	Toton Innovation Hub (HS2)	More than likely	2030	2031	Y
Nottinghamshire	Ratcliffe Power Station A453 (Freeport)	Reasonably foreseeable	2030	2030	N
Rugby	Rugby Radio Station - A5 Access	Near Certain	2022	2022	Y
Rugby	Rugby Radio Station - A423 Access	Complete	2016-2019	2016	Y
Leicester City	Buckminster Rd/Brading Rd Safer Streets	Complete	2022	2022	Y
Blaby	A50 Groby Road bus gate	Complete	2015	2015	Y
North West Leicestershire	Mercia Park	Complete	2020	2020	Y
Leicester City	Western Park Golf Course	More than Likely	2029	2029	Y
Harborough	Kettering Road Signalisation	Complete	2020	2021	Y
M6 J10-13	M6 J10-13, M54-Stafford ALR	Near Certain	2021	2021	Y
M54-M6 Toll	M54-M6 Toll, link road min 2 lane motorway	More than Likely	2024	2024	Y
M1 J28-31	M1 J28-31, Mansfield to Sheffield ALR	Complete	2016	2016	Y
M6 J13-J15	M6 J13-15, Stafford South to Stoke South ALR	Near Certain	2022	2022	Y
M1 J13-16	M1 J13-16, Milton Keynes South to J16 ALR	Near Certain	2022	2022	Y
M40 M42	M40-M42, M40 J16-M42 J3 ALR	More than Likely	2026	2026	Y
A46 Coventry	A46 Coventry, remove Binley and Walsgrove roundabouts & upgrade	More than Likely	2026	2026	Y
M6 J10-13	Walsall M6 Junction 10 issues	Complete	2014	2014	Y
A46 Toll Bar End	A46 Toll Bar End, grade separated junction and 3 lane highway	Complete	2021	2021	Y
Newark N	A46 Newark, dualling Newark North bypass	More than Likely	2026	2031	Y
Newark S	South of Newark, A1-A46 link S of Newark; part completed	More than Likely	2031	2031	Y

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Lincoln E	East of Lincoln, A15-A158 link; part completed	Complete	2020	2021	Y
Lincoln S	South of Lincoln, A158-A46 link	More than Likely	2027	2031	Y
Grantham S	South of Grantham, A1-A52 link; part completed	Near Certain	2016-2023	2023	Y
Nottingham	Dualling A453	Complete	2016	2016	Y
Nuneaton and Bedworth Borough	Coton Arches	Complete	2021	2021	Y
Nuneaton and Bedworth Borough	A4254b Eastboro Way P1	Complete	2024	2024	Y
Nuneaton and Bedworth Borough	College Street / A444	Near Certain	2023	2023	Y
Nuneaton and Bedworth Borough	Transforming Nuneaton	Near Certain	2026	2026	Y
Nuneaton and Bedworth Borough	Croft Road/Greenmoor Road Priority	Complete	2031	2031	Y
Nuneaton and Bedworth Borough	A47 Old Hinckley Road	Near Certain	2023-2024	2024	Y
Nuneaton and Bedworth Borough	Coventry Road / Gipsy Lane	More than Likely	2026	2026	Y
Nuneaton and Bedworth Borough	A4254 / B4114/Eastboro Way	Near Certain	2026	2026	Y
Nuneaton and Bedworth Borough	Nuneaton Northern Sites Link Road	Near Certain	2026	2026	Y
North Warwickshire	B5000 Market Street/Bridge St Signals	Reasonably Foreseeable	2026	2026	N
North Warwickshire	A5 Dualling between Grendon and Dordon and Dordon junction	Near Certain	2026	2033	Y
North Warwickshire	A5 Dualling, Grendon to Atherstone	Reasonably Foreseeable	2031	2031	N
Rugby Borough	A426/A4071 Avon Mill Roundabout/Newbold Road/Hunters Lane Priority Junction	Near Certain	2026	2026	Y
Rugby Borough	Ashlawn Road/Hillmorton Road	Complete	2021	2021	Y
Rugby Borough	A5 Northern Access to DIRFT III	More than Likely	2021	2021	Y
Rugby Borough	A5/A428 Halfway House Roundabout	Complete	2026	2026	Y
Rugby Borough	M1 Junction 18	Reasonably Foreseeable	2031	2031	N
Rugby Borough	M6 to Coton House	Complete	2021	2021	Y
Rugby Borough	A5 Southern Access to DIRFT III	Complete	2021	2021	Y
M6 J2	Update coding of M6 J2 Ansty interchange to include signalised roundabout	Complete	2020	2021	Y
Nuneaton and Bedworth Borough	Callendar Farm Phase 2	Near Certain	2031	2031	Y
Nuneaton and Bedworth Borough	Bermuda Connectivity Project	Near Certain	2022	2026	Y
Charnwood	Shuttle signals at the old railway bridge on Tickow Lane	Near Certain	2022	2022	Y
Charnwood	Buttercup Lane	Complete	2021-2022	2022	Y
Hinckley & Bosworth	A47 roundabout between Wykin Road and Outlands Drive	Complete	2020-2021	2021	Y
Hinckley & Bosworth	A47/Dan's Lane	Near Certain	2023	2023	Y
Hinckley & Bosworth	A47 speed limit reduction	Complete	2020	2020	Y
Newbold Verdon	B582 Barlestone Road / B585 Bosworth Lane signalisation	Near Certain	2023	2023	Y

Date

This appears to be bringing the junction up to the current arrangement, not Anstey Park mitigation



TECHNICAL NOTE 2

DATE:	14 November 2023	CONFIDENTIALITY:	Public
SUBJECT:	Proposed Study Area for Junction Assessment		
PROJECT:	Earl Shilton Sustainable Urban Extension	AUTHOR:	Bev Coupe
CHECKED:	Grace Smith	APPROVED:	Neil Hall

Appendix C

FORECASTING REPORT

PRTM

Transport Modelling

Earl Shilton Sustainable Urban Extension (SUE)

Forecasting Report

Quality Information

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Approved by

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Revision History

Revision	Revision date	Details	Authorised	Name	Position
v1.0	13-07-2023	For issue	Yes	Mark Dazeley	Regional Director
v2.0	14-09-2023	Revised text in response to client comments			

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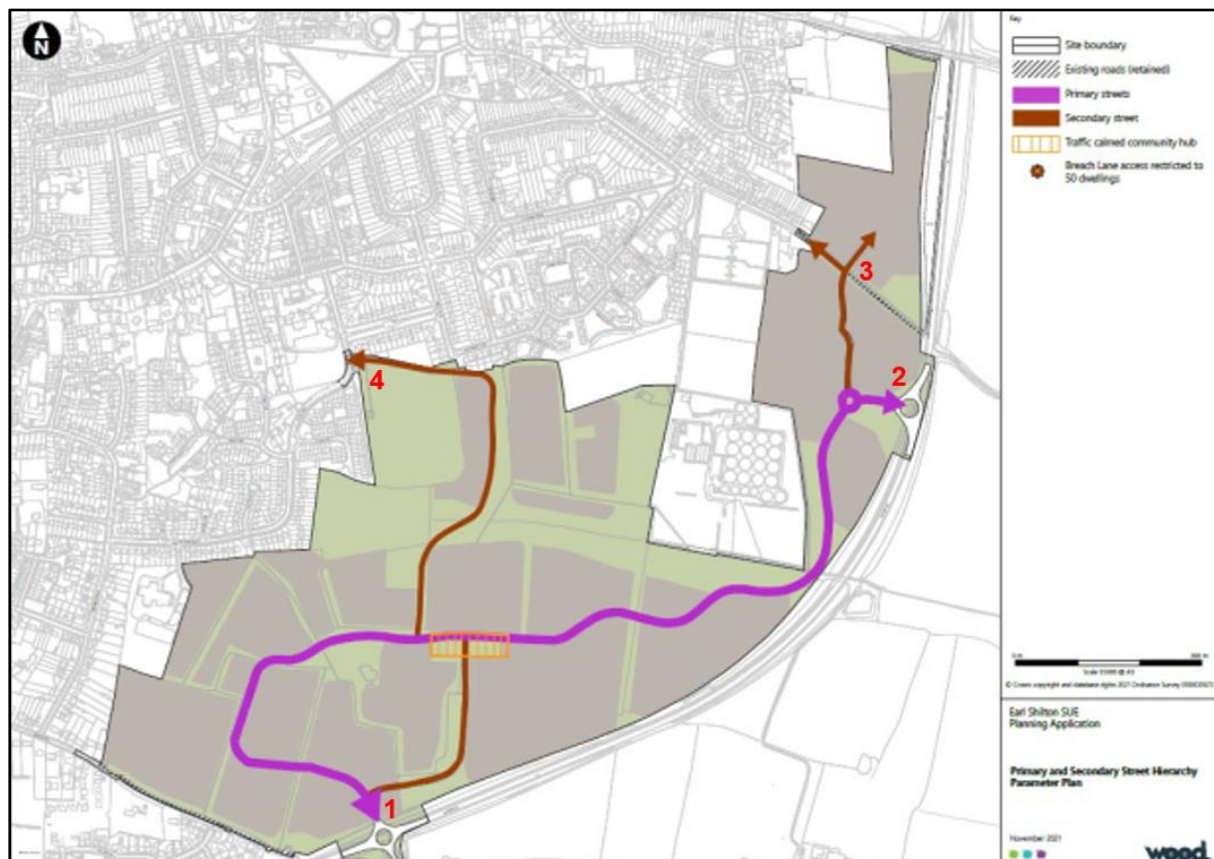
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Section 1 – Introduction

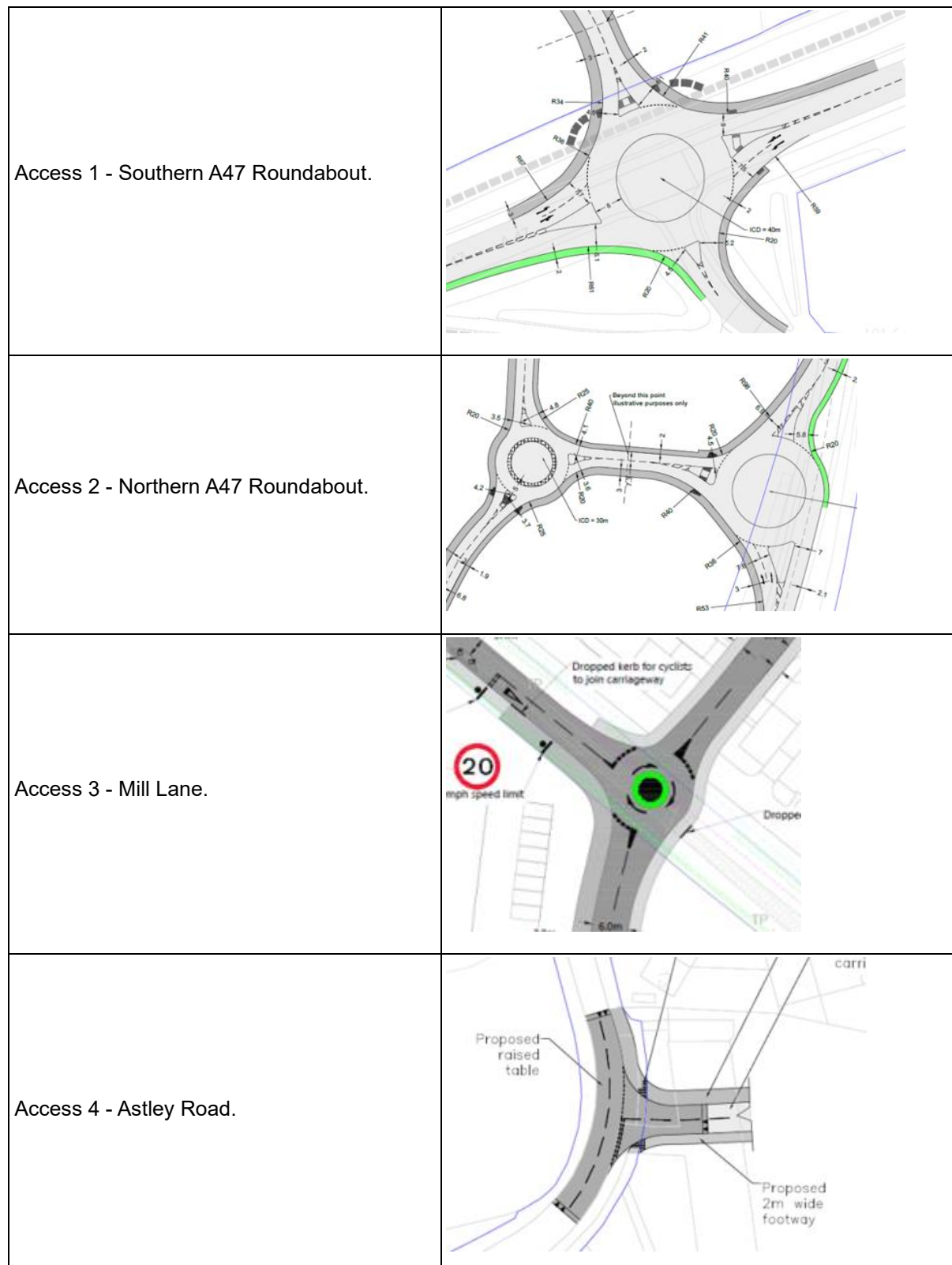
1.1 Background

- 1.1.1 Bloor Homes, Jelson Homes and Barwood Land are seeking planning permission from Hinckley & Bosworth Borough Council (HBBC) for a mixed-use development of an allocated site, known as the Earl Shilton Sustainable Urban Extension (SUE), located to the south-east of Earl Shilton, Leicestershire. The proposed development includes a mix of uses including 1,500 dwellings, employment and education. The scheme is expected to build out by 2036.
- 1.1.2 Figure 1.1 shows the site location and illustrative layout of the proposed development including the internal road network. The four access junction layouts to the proposed development are shown in Figure 1.2 and include:
- Access 1 - the Southern A47 Roundabout;
 - Access 2 - the Northern A47 Roundabout;
 - Access 3 - Mill Lane; and
 - Access 4 - Astley Road.
- 1.1.3 The full SUE allocation is for up to 1,600 dwellings, including land held by Earl Shilton Town Council and Persimmon Homes. To fully assess impacts from development traffic in and around Earl Shilton the full 1,600 dwellings has been included as part of this assessment.
- 1.1.4 AECOM has been commissioned to undertake strategic modelling to assess the potential traffic impacts of the proposed development using the Pan-Regional Transport Model (PRTM v2.3) for the AM and PM Peak hours.

Figure 1.1: Indicative Layout and Highway Access of the Proposed Development¹



¹ 'Earl Shilton SUE Access Strategy Technical Note v2.pdf'

Figure 1.2: Proposed Development Access Junction Layouts²

²Adapted from figures contained in the Earl Shilton SUE Access Strategy Technical Note v2.pdf

- 1.1.5 Within this assessment of the proposed development at Earl Shilton SUE, four forecast scenarios have been produced as shown in Table 1.1.

Table 1.1: Forecast Model Scenarios

Forecast Year	Scenario	Proposed Development (1,600 dwellings)	Four Access Junctions and Internal Network
2026	Without Development	x	x
	With Development	✓	✓
2036	Without Development	x	x
	With Development	✓	✓

- 1.1.6 This report is the Forecasting Report which documents the forecast model results for the PRTM strategic modelling assessment of the proposed development at Earl Shilton SUE. This report follows the Earl Shilton SUE Base Year Model Review Report³ which details the calibrated 2014 base year model review performance in the vicinity of the proposed development site.

1.2 Structure of the Report

- 1.2.1 Following the introduction, this report contains the following sections:

- Section 2 – Forecast Approach and Assumptions: this section details the forecast assumptions adopted within this assessment of the proposed development, including the assumed development trip generation and trip distribution.
- Section 3 – Forecast Model Results: this section details the forecast results requested as part of the brief.
- Section 4 – Summary of the PRTM Assessment: this section provides a summary of the assessment of the proposed development.

³ PRTM – Earl Shilton SUE - Base Year Review v1.11 (2022-11-30)

Section 2 – Forecast Approach and Assumptions

2.1 Introduction

- 2.1.1 This section sets out the forecast assumptions applied for this application for the PRTM, and the methodology adopted to create the required model forecasts.
- 2.1.2 In addition to the calibrated 2014 base year model, the following forecast model scenarios have been produced:
- 2026 'Without Development';
 - 2026 'With Development';
 - 2036 'Without Development'; and
 - 2036 'With Development'.
- 2.1.3 The 'Without Development' forecasts have made use of the highway, public transport, and variable demand model components of the PRTM. The forecasts therefore include the response of travel demand to forecast changes in the costs of travel (including congestion, fuel prices and public transport fares) and changes in assumed highway and public transport infrastructure over time. Section 2.2 provides the 'Without Development' assumptions applied.
- 2.1.4 To produce the 'With Development' forecasts, the highway demand for the proposed development has been added to the 2026 'Without Development', and 2036 'Without Development' highway demand matrices and assigned in the PRTM highway model. Sections 2.3 to 2.5 provide the highway network and demand assumptions for the proposed development.
- 2.1.5 As documented in the Earl Shilton SUE Base Year Model Review Report⁴, a sensitivity test using the latest available TAG databook at the time, November 2022, was used to update the economic parameters for the PRTM highway assignment model and variable demand model. This sensitivity test showed no material effect in the overall base year model performance.
- 2.1.6 For forecast modelling, the economic parameters for the PRTM highway assignment model and variable demand model have been updated to the latest available at the time: November 2022 TAG databook.

2.2 'Without Development' Assumptions

- 2.2.1 The forecast planning data and infrastructure schemes, in the format of an Uncertainty Log, used to produce the forecast 'Without Development' scenarios, were reviewed by the client.
- 2.2.2 Appendix A presents the planning data assumptions (residential and employment) within Hinckley and Bosworth Borough Council that have been incorporated in the PRTM forecast year models. Given the number of developments in the Uncertainty Log, the reporting of the planning data has been limited to residential sites with more than 500 dwellings and employment sites with more than 750 jobs. All available data that should be used in the modelling, irrespective of size, have been used in the model forecasts. The complete list of the planning assumptions is included in the Earl Shilton SUE Uncertainty Log v1.3⁵.
- 2.2.3 The Uncertainty Log has been agreed by stakeholders including Leicester County Council Highway Development Management (LCC HDM) and Warwickshire County Council (WCC)⁶.
- 2.2.4 Appendix B presents the forecast assumptions for highway and public transport networks for this application.
- 2.2.5 The trip forecasting process contained within the PRTM uses forecasts of population, households, and jobs to generate estimates of future travel demand. Planning forecasts (containing measures of housing and development) were unconstrained (NTEM minimum⁷) for this application as noted in the proposal⁸.

⁴ PRTM – Earl Shilton SUE – Base Year Review v1.11 (2022-11-30)

⁵ Earl Shilton SUE Uncertainty Log v1.3.xlsx

⁶ Uncertainty Log agreed by LCC HDM on 21/02/2023 and WCC on 3rd March 2023.

⁷ In the event that the planning data lead to below NTEM / TEMPro growth, the model reverts to NTEM / TEMPro as minimum.

⁸ PRTM Fee Proposal – Earl Shilton SUE v2.0 (2022-10-12)

2.3 Proposed Development Access Assumptions

- 2.3.1 To produce the 'With Development' networks for 2026 and 2036, the four assumed site access junctions and internal highway network for the proposed development, as shown in Figure 1.2 and Figure 1.1 respectively, were added in the relevant 'Without Development' networks. The internal road network to and from Access 3 and Access 4 will include traffic management features to discourage through-traffic.
- 2.3.2 Seven development zones have been used to represent the proposed Earl Shilton SUE development with four development zones representing housing and three development zones to represent employment, retail (the urban centre) and education.

2.4 Proposed Development Trip Generation Assumptions

- 2.4.1 Trip generation data for the proposed development, with internal trips removed⁹, are provided in Table 2.1. These have been added to the relevant 'Without Development' highway demand matrices to form the 'With Development' highway demand matrices for the 2026 and 2036 forecast years and assigned in the PRTM highway model.

Table 2.1: Development Trip Generation

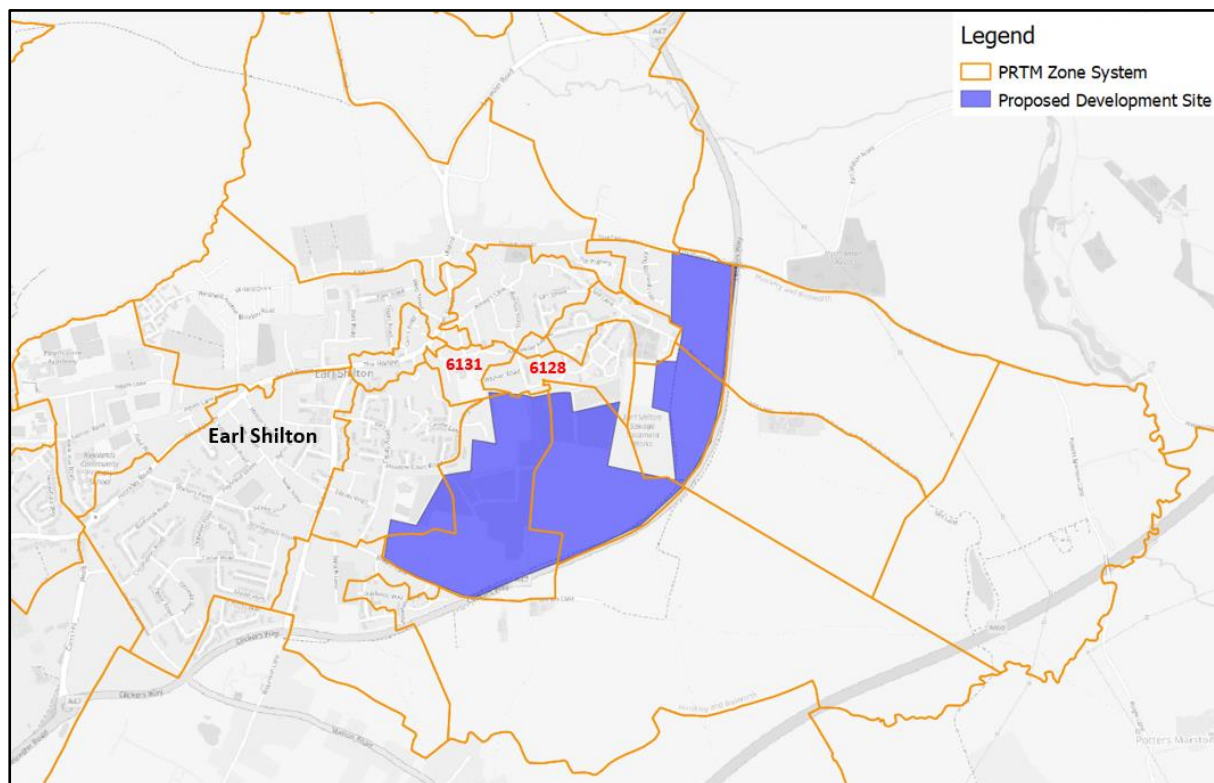
	Car Trips (in vehicles)			HGV Trips (in vehicles)		
	Departing (Out)	Arriving (In)	Total	Departing (Out)	Arriving (In)	Total
Residential Application sites (1,600 dwellings)						
AM Peak hour (08:00 to 09:00)	642	204	847	0	0	0
PM Peak hour (17:00 to 18:00)	251	619	870	0	0	0
Employment						
AM Peak hour (08:00 to 09:00)	42	108	150	12	9	21
PM Peak hour (17:00 to 18:00)	110	34	144	7	10	17
Retail						
AM Peak hour (08:00 to 09:00)	120	124	245	2	2	4
PM Peak hour (17:00 to 18:00)	141	136	277	1	1	2
Primary School (420 pupils)						
AM Peak hour (08:00 to 09:00)	37	60	97	0	0	0
PM Peak hour (17:00 to 18:00)	10	5	15	0	0	0
Total						
AM Peak hour (08:00 to 09:00)	841	496	1,339	14	11	25
PM Peak hour (17:00 to 18:00)	512	794	1,306	8	11	19

⁹ As agreed with LCC HDM on 15th June 2023

2.5 Proposed Development Trip Distribution Assumptions

- 2.5.1 It was agreed with LCC HDM¹⁰ and National Highways (NH)¹¹ that the development trip distributions for the five development zones containing housing and education trips are to be based on existing PRTM 'parent zones' taken from the 'Without Development' scenarios. Zone 6128 has been selected as the parent zone for housing as it contains a large proportion of residential trips, and zone 6131 was selected for education trips as it contains a significant proportion of primary school trips. Figure 2.1 shows the location of the two parent zones selected for the development trip distribution.
- 2.5.2 It was also agreed with LCC HDM and NH that the in-built PRTM gravity model would be used to provide development trip distributions for the two development zones containing employment and retail.

Figure 2.1: Parent Zones for Development Trip Distributions



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- 2.5.3 Figure 2.2 to Figure 2.5 show the forecast development trip distribution on the highway network for the 2026 and 2036 'With Development' scenarios. As expected, these figures show that the majority of development trips route via the A47 (between 50-60%).
- 2.5.4 These figures also show that the proposed trip distribution is very similar between the 2026 and 2036 scenarios. The proportions presented below are based on the 2036 'With Development' scenario, the assumed full build out year. The proportion of proposed development trips forecast to route to / from the development include:
- 30% of trips are forecast to route west via the A47 to / from Hinckley in both the AM and PM Peak hours;
 - 20% of trips are forecast to route east via the A47 to / from Leicester in the AM Peak hour;
 - 25-30% of trips are forecast to route east via the A47 to / from Leicester in the PM Peak hour;
 - 23-27% of trips are forecast to route via Astley Road in both the AM and PM Peak hours, with the majority of trips to / from the proposed 'urban centre'; and
 - 10% of trips are forecast to route via Mill Lane in both the AM and PM Peak hours;

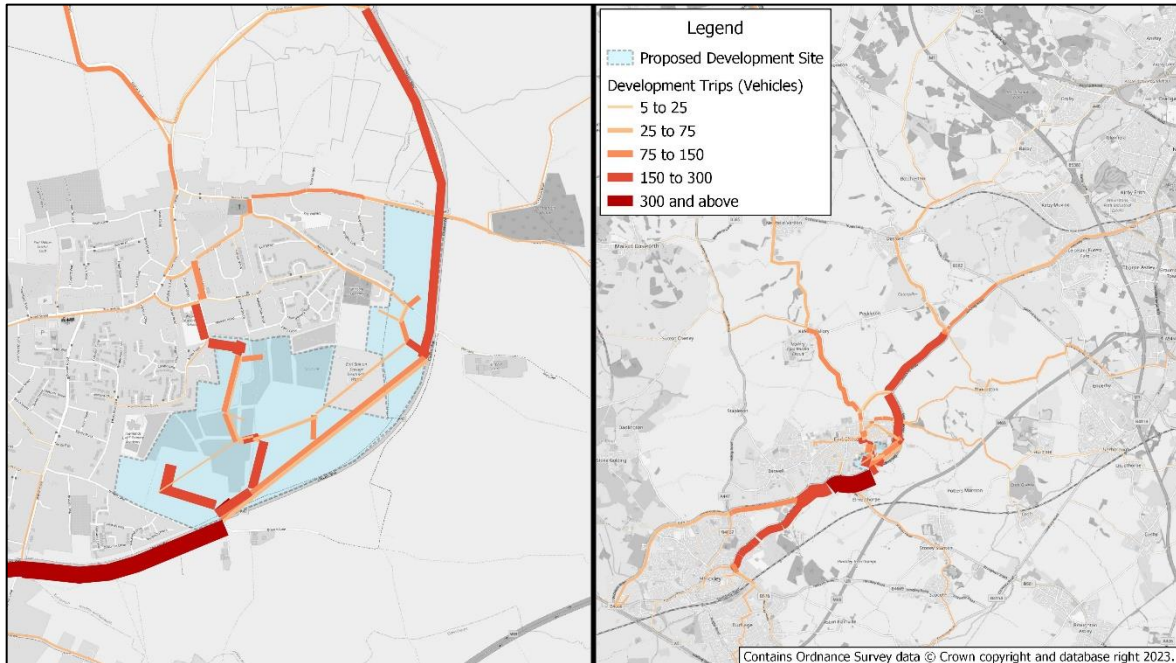
¹⁰ Development trip distribution agreed by LCC HDM on 26/05/2023.

¹¹ Development trip distribution agreed by NH on 09/06/2023.

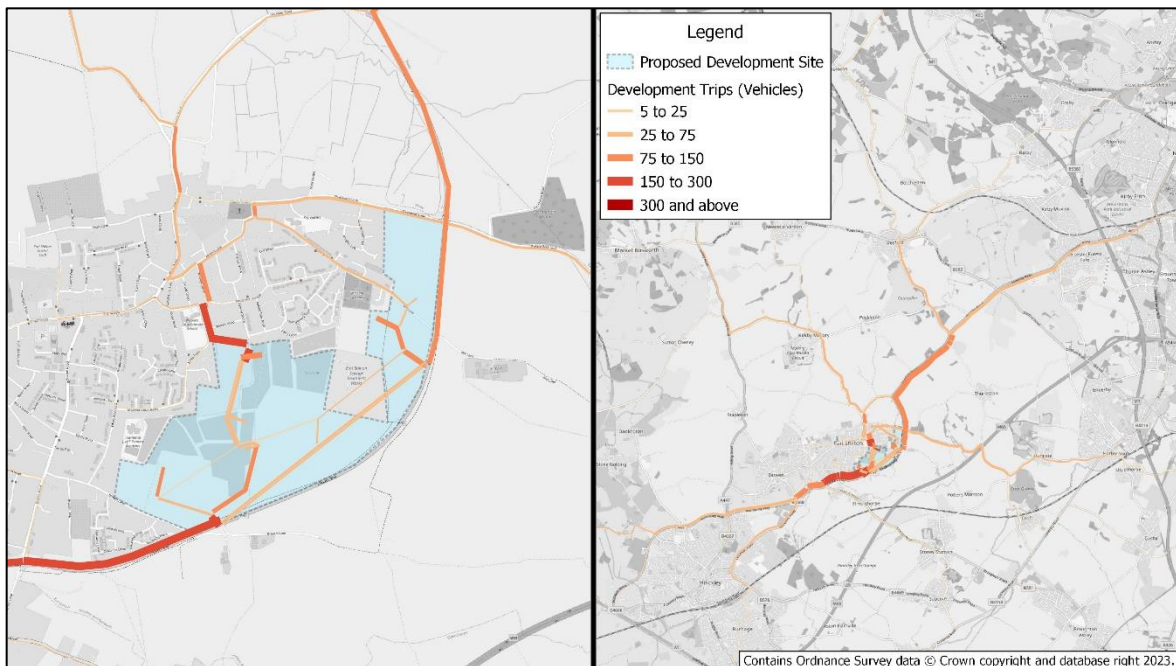
2.5.5 In addition to the immediate access roads:

- 12-24% are forecast to route via Shilton Road to / from Kirkby Mallory and Newbold Verdon;
- 10% are forecast to route via Thurlaston Lane to access villages to the south such as Stoney Stanton, Sapcote, Enderby and Narborough

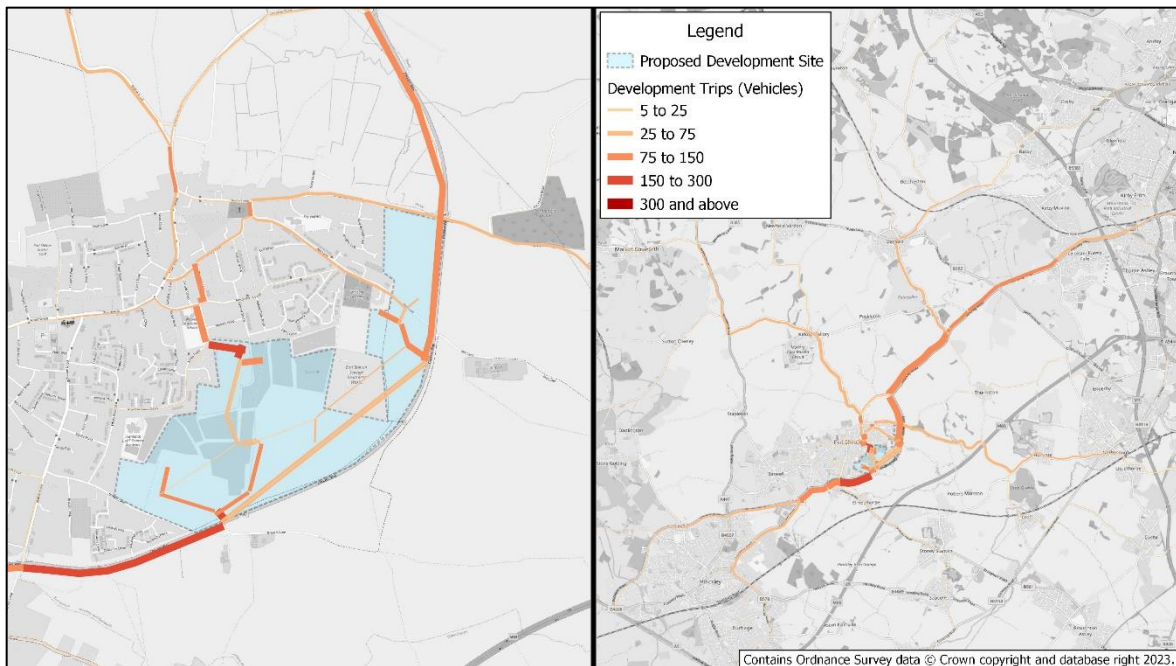
2.5.6 The full build out trip generation assumptions provided in Table 2.1 have been applied to both the 2026 and 2036 'With Development' scenarios. As expected, the trip distributions are similar in both 'With Development' scenario forecast years. The largest number of development trips have been forecast on the A47 to the west of the proposed Southern A47 Roundabout (Access 1) with approximately 375 vehicles travelling west from the development in the AM Peak hour and 350 vehicles travelling east to the development in the PM Peak hour. On the A47 to the north of the proposed Northern A47 Roundabout (Access 2) in the AM Peak hour, approximately 200 vehicles travel north from the development and in the PM Peak hour approximately 220 vehicles travel south to the development.

Figure 2.2: Trip Distribution to and from the Proposed Development for 2026 (AM)**2026 'With Development' (AM) – From the Development**

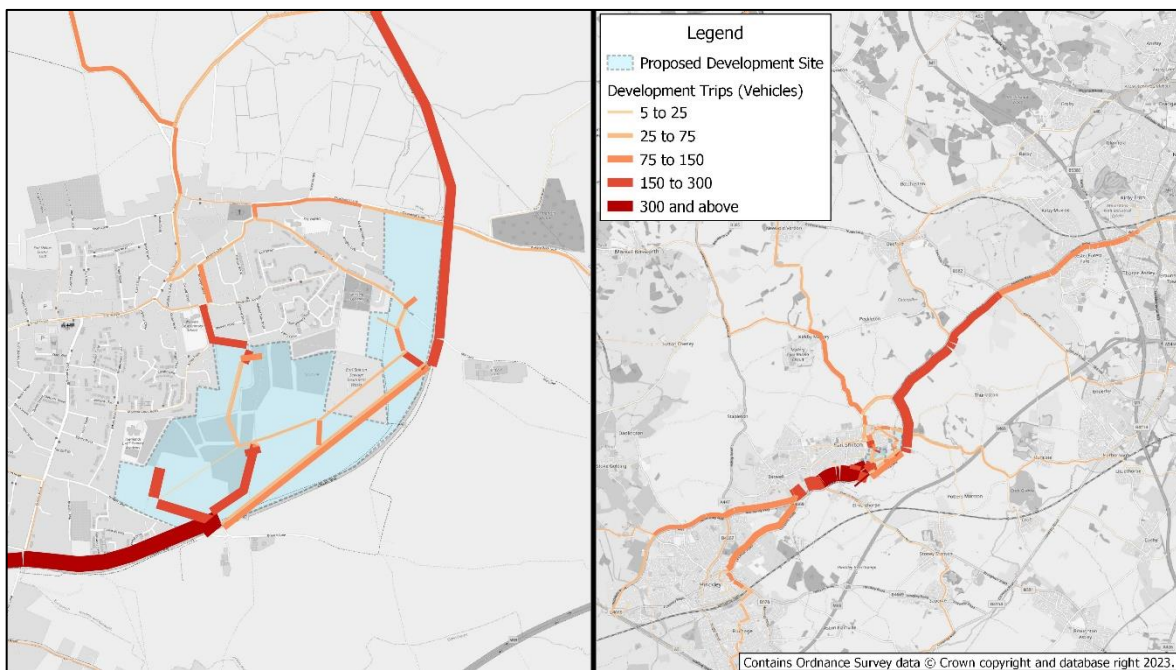
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2026 'With Development' (AM) – To the Development

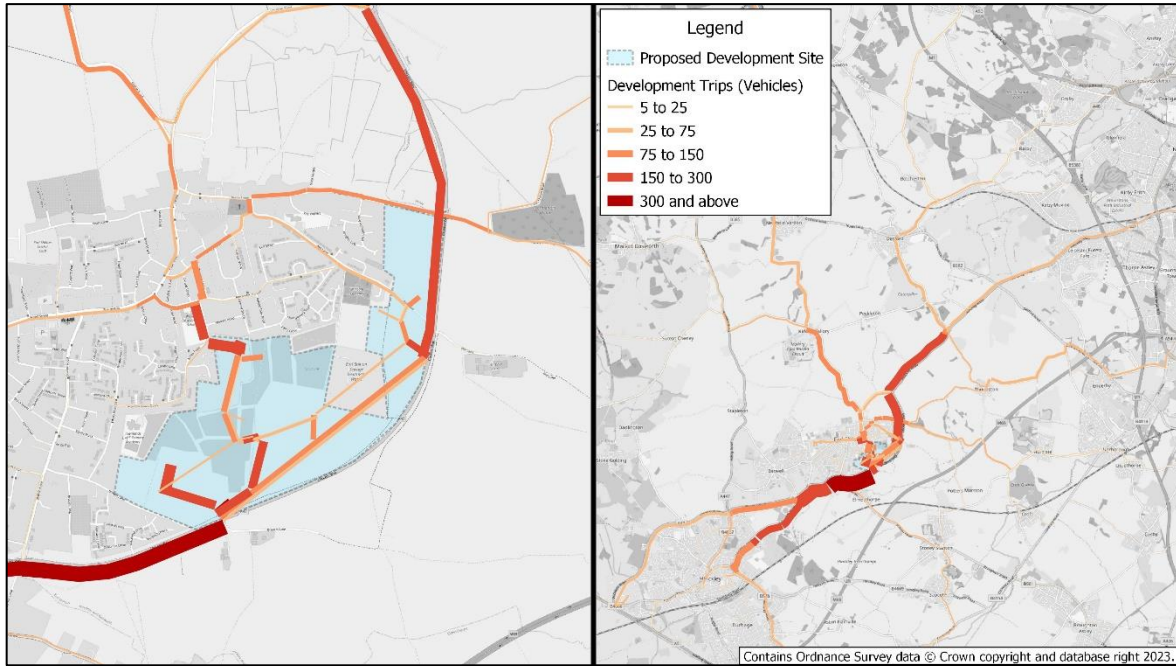
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Figure 2.3: Trip Distribution to and from the Proposed Development for 2026 (PM)**2026 'With Development' (PM) – From the Development**

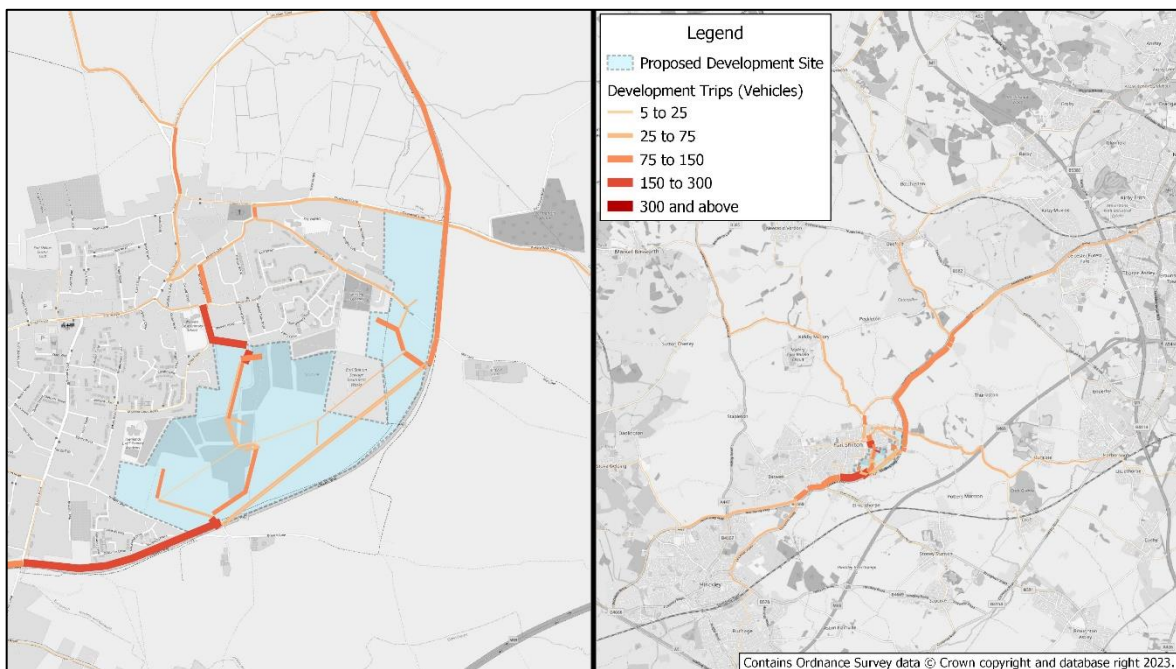
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2026 'With Development' (PM) – To the Development

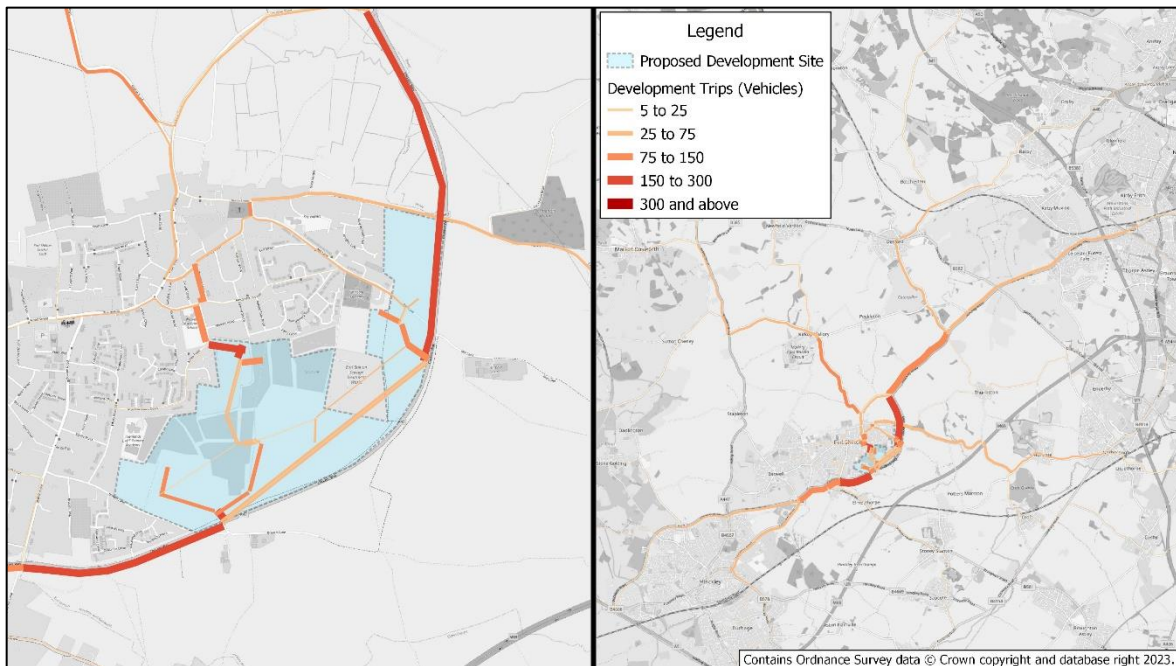
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Figure 2.4: Trip Distribution to and from the Proposed Development for 2036 (AM)**2036 'With Development' (AM) – From the Development**

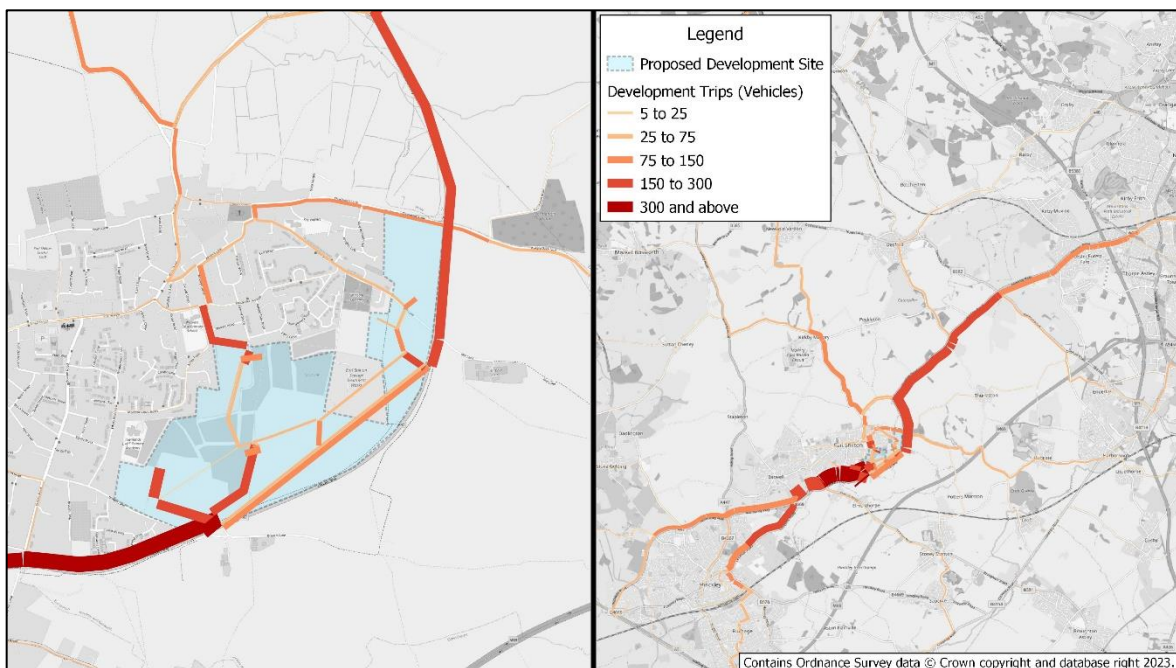
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2036 'With Development' (AM) – To the Development

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Figure 2.5: Trip Distribution to and from the Proposed Development for 2036 (PM)**2036 'With Development' (PM) – From the Development**

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2036 'With Development' (PM) – To the Development

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Section 3 – Forecast Model Results

3.1 Introduction

3.1.1 This section details the forecast model results for the proposed development at Earl Shilton SUE for the AM Peak (08:00 to 09:00) and PM Peak (17:00 to 18:00) hours. The analysis includes:

- the routing of the forecast development traffic in the 2026 and 2036 'With Development' forecasts (Section 2.5 and Section 3.2);
- the forecast flow changes in 2026 and 2036 between the 'With Development' and 'Without Development' scenarios (Section 3.3);
- an assessment of the Area of Influence (Aol) (Section 3.4);
- the forecast delay changes in 2026 and 2036 between the 'With Development' and 'Without Development' scenarios (Section 3.5);
- the forecast maximum node volume-capacity ratios in 2026 and 2036 'Without Development' and 'With Development' scenarios (Section 3.6); and
- the forecast turning flows and volume-capacity ratios at selected junctions (Section 3.7).

3.2 Forecast Development Traffic

3.2.1 Figure 2.2 to Figure 2.5 in Section 2 illustrate the assigned forecast trip distribution to and from the proposed development in 2026 and 2036 for both AM and PM Peak hours. The figures show that traffic generated by the proposed development is forecast to:

- route to and from the Hinckley in the west via the A47 (30% of development trips);
- route east towards Leicester via the A47 (20-30% of development trips);
- route north towards Kirkby Mallory and Newbold Verdon via Shilton Road (12-24% of development trips); and
- route east towards villages and towns such as Sapcote, Stoney Stanton, Narborough and Enderby via Thurlaston Lane (10% of development trips).

3.3 Forecast Flow Change

3.3.1 Figure 3.1 and Figure 3.2 show the forecast flow changes in 2026 and 2036 between the 'With Development' and 'Without Development' scenarios for the AM and PM Peak hours. Red bandwidth represents an increase in traffic flow in the 'With Development' scenario and green bandwidth represents a decrease.

3.3.2 As expected, the largest increases in flows are forecast along the road links in the immediate vicinity of the proposed development, such as the A47, Astley Road, Mill Lane, Leicester Road, Shilton Road and Thurlaston Lane.

3.3.3 In the 2026 'With Development' scenario, the A47 west of the proposed Southern A47 Roundabout (Access 1) has a forecast increase in two-way traffic of approximately 280 vehicles and 260 vehicles for the AM Peak hour and PM Peak hour respectively. Two-way traffic on the A47 to the north of the proposed Northern A47 Roundabout (Access 2) is forecast to increase by 40 vehicles and 90 vehicles in the AM and PM Peak hours respectively. Traffic on Astley Road (Access 4) and Vicarage Road is forecast to increase by approximately 420 vehicles and 250 vehicles, respectively in the AM Peak hour. In the PM Peak hour, two-way traffic flow on these two roads is forecast to increase by 360 vehicles and 250 vehicles respectively.

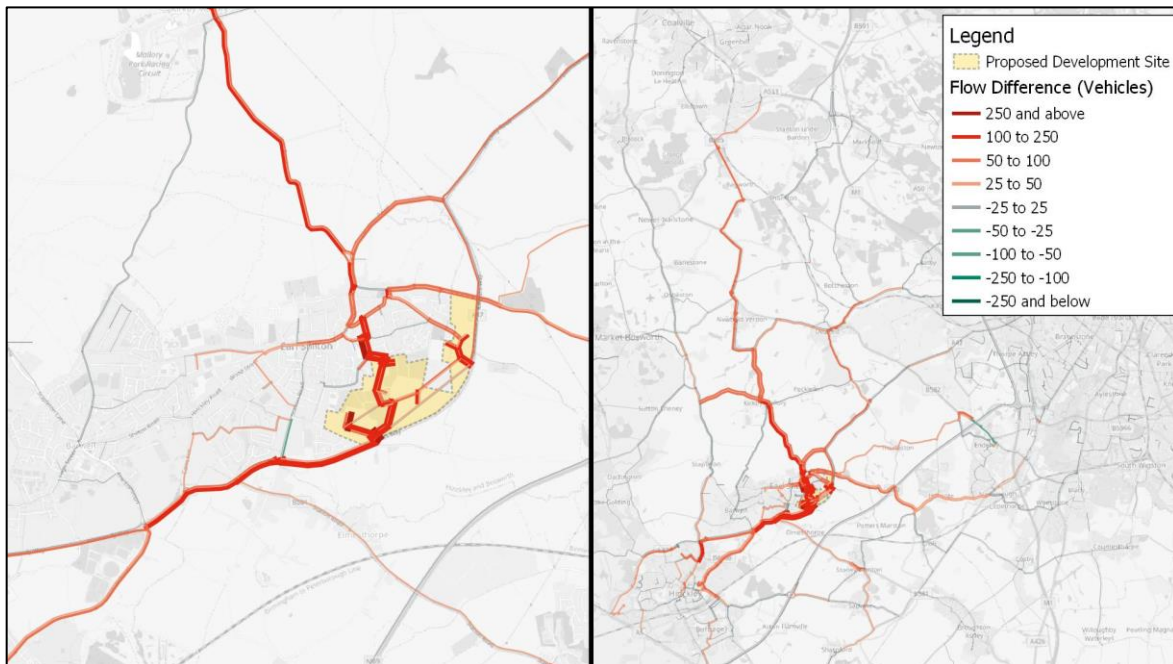
3.3.4 In the 2036 'With Development' scenario, the A47 west of the proposed Southern A47 Roundabout (Access 1) has a forecast increase in two-way traffic flow of 180 vehicles and 240 vehicles in the AM and PM Peak hours, respectively. Two-way traffic on the A47 to the north of the proposed Northern A47 Roundabout (Access 2) is forecast to decrease by 10 vehicles and increase by 90 vehicles in the AM and PM Peak hours respectively. The forecast increase in two-way traffic on Astley Road (Access 4) is approximately 440 vehicles and 370 vehicles in the AM Peak hour and PM Peak hour respectively.

3.3.5 In the AM Peak hour, westbound traffic on the A47, east of the proposed Southern A47 Roundabout, has been forecast to decrease by 20 and 70 vehicles in the 2026 and 2036 scenarios respectively. This

is due to non-development traffic re-routing onto alternative routes to avoid junctions on the A47 that are forecast to have higher delays and / or reduced capacity on the A47 as a result of additional development traffic. In particular, there is an increase in volume-capacity ratio on the A47 in the westbound direction at the A47 / Wilkinson Lane signalised junction. In the 2036 AM Peak hour, and as indicated in Figure 3.7, volume-capacity ratios increase from 78% to 100% between the 'Without Development' and 'With Development' scenarios respectively. This junction is acting as a constraint on non-development traffic

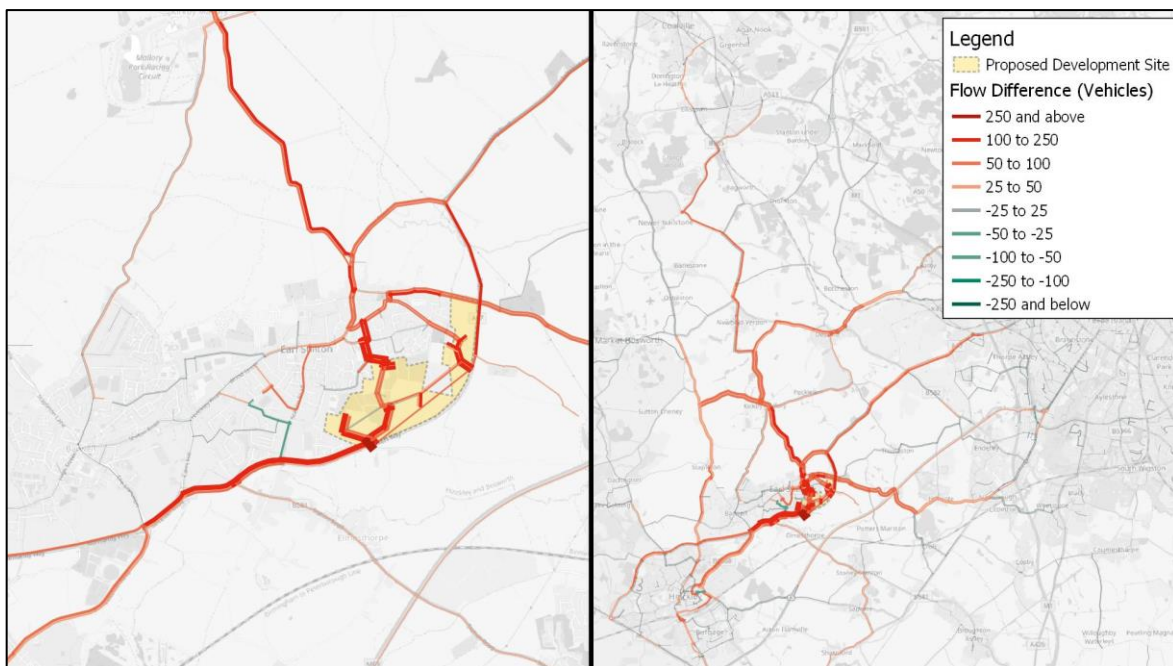
Figure 3.1: Forecast Flow Change for 2026 'With Development' minus 'Without Development' Scenarios

AM Peak hour



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PM Peak hour



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