

Buckingham Group Contracting
Limited

**170248 Headbolt Lane New
Station GRIP 4**

Transport Assessment

170248-ARU-REP-EHW-000003

Final | 30 June 2021

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 276726

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1 Introduction

Arup has been commissioned by Buckingham Group Contracting Limited (BGCL) on behalf of Network Rail to produce a Transport Assessment (TA) to assess the highway and transport impacts of the proposed new railway station at Headbolt Lane.

Headbolt Lane is an infrastructure project that will extend the Merseyrail network from the existing terminating station at Kirkby to a new station to be constructed at Headbolt Lane.

The existing rail corridor comprises a single line. The Merseyrail network will be extended east from the existing terminating station at Kirkby, and a new turnout will provide access to a new twin-track arrangement.

The existing Northern Rail platform at Kirkby station will be decommissioned and a new station interchange provided at Headbolt Lane. This new station will comprise three platforms, with two platform faces serving Merseyrail and a single platform face serving Northern Rail. Buffer stops will be provided to Merseyrail and Northern Rail to delineate between the two Train Operating Companies. The platforms will be connected by a station access arrangement replicating the operational functionality at the existing Kirkby station.

A new 300 space car park and public transport interchange facilities will be provided at Headbolt Lane. Parking facilities for 100 cycles will be provided with passive provision for a further 200 spaces.

The scheme has been developed to GRIP 3 by Network Rail. BGCL has been appointed to develop the design to GRIP 4, who in turn have appointed Arup to undertake design services.

1.1 Site location

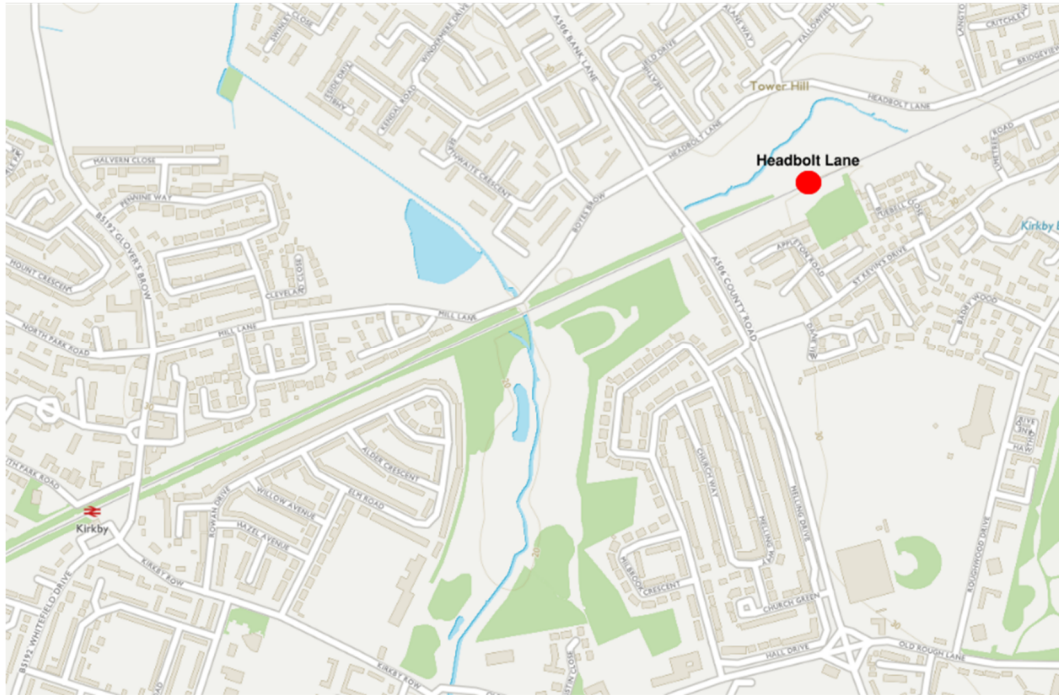
Headbolt Lane lies within the in the Northwood area of Kirkby, Merseyside.

The site is located on green space bounded by the A506 to the west, Headbolt Lane to the north and east and the Kirkby Branch railway line to the south. Kirkby Brook crosses under the railway and into the site from the south-east, before running through the centre of the site and leaving the site downstream to the west.

The surrounding area is primarily low-density housing, with Kirkby town centre located approximately 800m to the south of the site.

The site location is shown in Figure 1.

Figure 1: Site location



1.2 Scope of this report

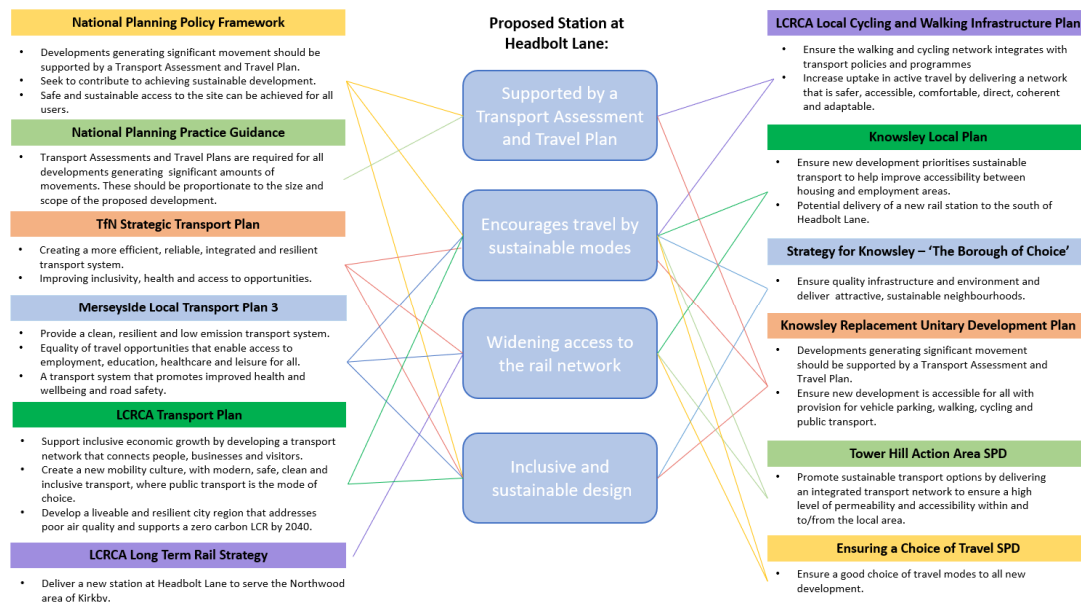
The scope of this assessment has been agreed with Knowsley Metropolitan Borough Council (KMBC) as the highway authority. A scoping meeting was held with Arup and KMBC on 5th February 2021, the minutes of which are provided in Appendix A. The purpose of this TA is to set out the existing conditions in the vicinity of the site and assess the accessibility of the proposed development by all available transport modes. An assessment of the transport impacts associated with the development has also been undertaken.

The structure of this report is as follows:

- **Section 2** discusses relevant national and local planning policy with regards to the site;
- **Section 3** sets out the existing transport at the site and surrounding area;
- **Section 4** presents the development proposals;
- **Section 5** sets out the methodology used to derive the trip generation and distribution of traffic associated with the development;
- **Section 6** presents an assessment of the highway impact of the proposed development; and
- **Section 7** draws a conclusion to the report.

2 Policy review

The proposed development has been designed with full regard to national and local transport and planning policies. A summary of the key relevant policies is provided below. A detailed analysis of these policies in relation to the proposed development is shown in Appendix C.



All relevant policy documents emphasise the need for sustainable development in accessible locations. The proposed development itself would provide a sustainable travel option for local residents and increased accessibility for all its users.

National and local policy identifies the need for all developments that generate a significant level of vehicle movements to provide a Transport Statement or Transport Assessment and Travel Plan. This Transport Assessment has been produced in support of the proposals and details the sustainable credentials of the site, as well as its anticipated highway impact. A Travel Plan has also been prepared for the development to encourage access by sustainable modes through a variety of measures.

Similarly, a key theme across all policy documents is ensuring development supports inclusive and sustainable access. Policy states that developments should seek to improve people’s health, wellbeing and environment by reducing traffic emissions, improving road safety and creating safer places for cycling and walking.

The aim of the proposed development is to minimise long vehicle trips and encourage multi-modal trips by more sustainable modes, which fully supports these key policies. Access to the site by all modes has been considered and designed for. The provision of cycle infrastructure, cycle parking, and electric vehicle charging further enhances the sustainability of the development.

The policy review demonstrates that the proposed station development at Headbolt Lane aligns with both national and local policies.

3 Existing conditions

This section outlines the baseline conditions on and in the vicinity of the development site. This assessment been undertaken entirely as a desktop review due to COVID-19 restrictions. Infrastructure and conditions are explored relating to highways, walking, cycling and public transport.

A completed 'Accessibility Assessment Form' is provided in Appendix C.

3.1 Site information

The proposed development site is an area of green space with a pedestrian route traversing from east to west. Headbolt Lane runs in an east-west alignment along the northern boundary of the site, connecting with the A506 to the west and Pingwood Lane / Dale Lane to the east.

To the north of the development site is the residential area of Tower Hill. To the south is the rail line running east to west with the residential area of Northwood and Kirkby town centre beyond. Kirkby rail station and surrounding residential areas lie to the west, and agricultural land and the William Brothers Industrial Park lie to the east.

Figure 2 shows the key transport infrastructure serving the development site

Figure 2: Key transport infrastructure



3.2 Active travel

Figure 3 provides an overview of the key walking and cycling infrastructure serving the development site.

Figure 3: Active travel infrastructure serving the development site

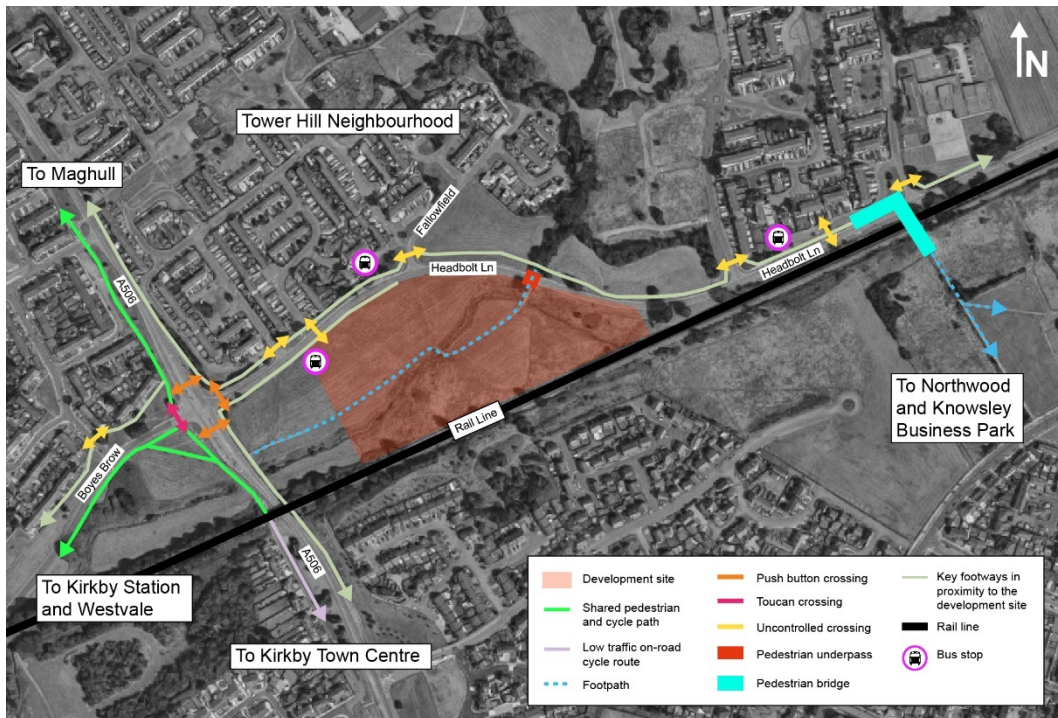
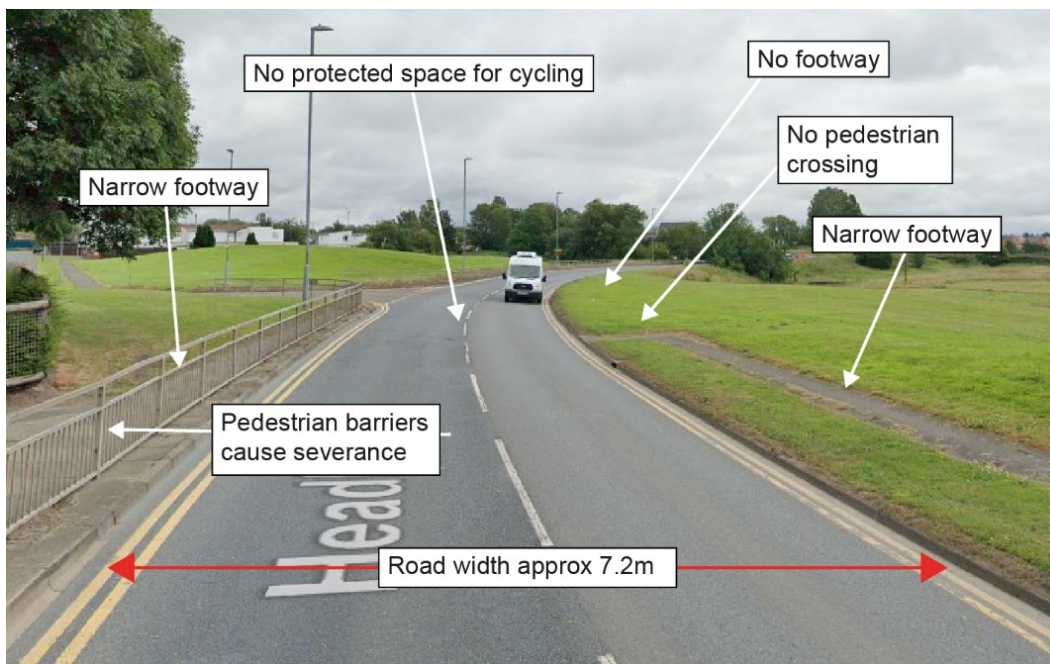


Figure 4 provides an overview of existing conditions on Headbolt Lane.

The footway on the northern side of Headbolt Lane is below the recommended 2m minimum width and guardrails separate the footways from the road, creating a degree of severance between the residential areas to the north and the proposed development site.

Figure 4: Analysis of existing conditions on Headbolt Lane

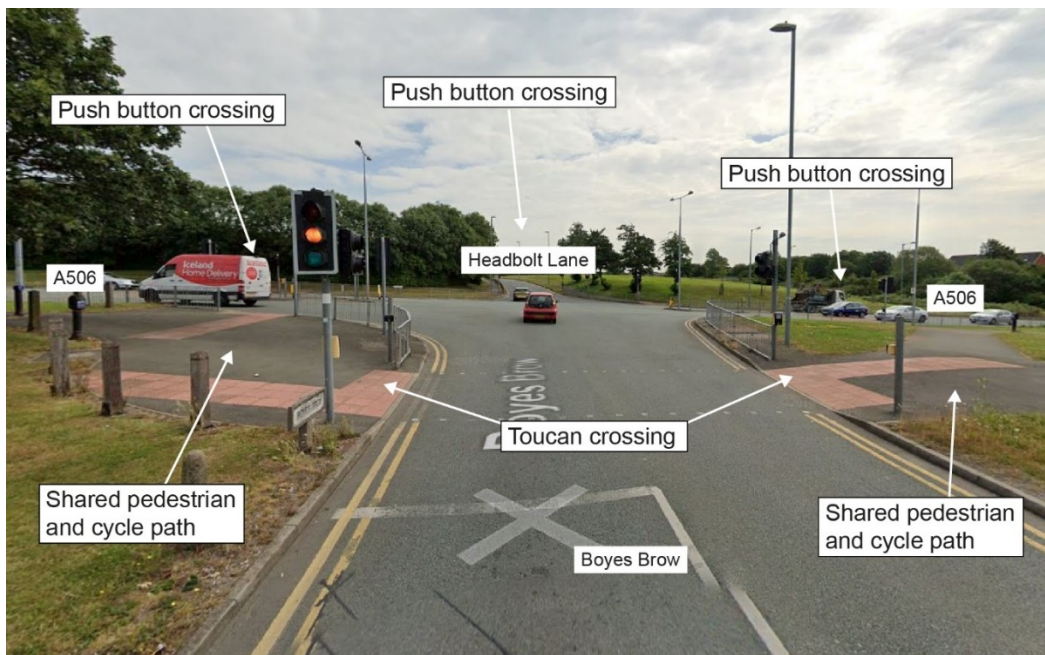


Source: Google Maps (2021)

There is a limited section of footway (approx. 220m) on the southern side of Headbolt Lane from the junction with the A506 to Fallowfield. At its eastern extent, the footway ends without providing access to the footways on the opposite side of the road.

There are three uncontrolled crossings with dropped kerbs and tactile paving along the length of the road and signalised pedestrian crossings on all arms of the A506 / Boyes Brow / Headbolt Lane junction, as shown in Figure 5.

Figure 5: Pedestrian and cycle crossings at A506 / Headbolt Lane / Boyes Brow junction



Source: Google Maps (2021)

The rail line to the south of the proposed development site causes a degree of severance for areas to the north and south. There is a pedestrian bridge approximately 300m to the east of the development site which provides access over Headbolt Lane and the rail line, as shown in Figure 6. It provides a link between the site and the Northwood area to the south, including Knowsley Business Park beyond.

Figure 6: Pedestrian bridge located to the east of the development site



Source: Google Maps (2021)

There is an existing footpath that runs in an east-west alignment across the development site from the A506 to the junction of Headbolt Lane and Southcroft Drive, as shown in Figure 7. The footway is relatively narrow with an uneven surface. At its western end the path uses an underpass below the highway, which although minimises conflict with vehicles, may be an unattractive route choice for some pedestrians. It is understood that KMBC plans to close the underpass and raise the footpath to the level of the road.

Figure 7: Footway crossing the development site, viewed looking east from the A506



Source: Google Maps (2021)

There is a shared use pedestrian and cycle path to the west of the development site along the A506 (see Figure 8), providing a link towards Kirkby town centre to the south and neighbourhoods to the north of the proposed development site. There is a toucan crossing on the western arm of the Headbolt Lane / A506 / Boyes Brow junction.

A shared footway / cycleway is also in place on Boyes Brow on approach to the A506. However, there are no cycle crossings on the northern or southern arms of the Headbolt Lane / A506 / Boyes Brow junction meaning there is no formal cycle connection across the A506.

Figure 8: Shared use pedestrian and cycle path located to the north of the A506 / Headbolt Lane / Boyes Brow junction



Source: Google Maps (2021)

The Tower Hill area to north of development site has a street network which encourages low traffic speeds, creating a more pleasant environment for pedestrians and cyclists.

3.3 Public transport

3.3.1 Bus

The number 20 bus is the only service which serves Headbolt Lane, connecting Tower Hill with Liverpool city centre via Kirkby. The service runs in an eastbound direction on Headbolt Lane before circling Tower Hill via Pingwood Drive and Shevington's Lane, returning to Liverpool via the A506.

Figure 9: Bus stop on northern side of Headbolt Lane



Source: Google Maps (2021)

There are three bus stops on the northern side of Headbolt Lane and a bus stop on the southern side of Headbolt Lane adjacent to the junction with Freckleton Drive. The stop on the southern side of Headbolt Lane is not currently operational.

The 14a, 14c, and 133 bus services operate along the A506. These services can be accessed from bus stops adjacent to Windemere Drive in a northerly direction and adjacent to St Kevin's Drive in a southerly direction. Both stops are approximately 400m walk from the proposed development site.

The number 21 service operates to the south of the proposed development site, connecting the Northwood area with Liverpool. Currently, accessing this service requires crossing the rail line over the pedestrian bridge approximately 300m to the east of the proposed development site.

Table 1 provides further details of the bus services serving the area around the development site.

Table 1: Bus services operating in the vicinity of the site

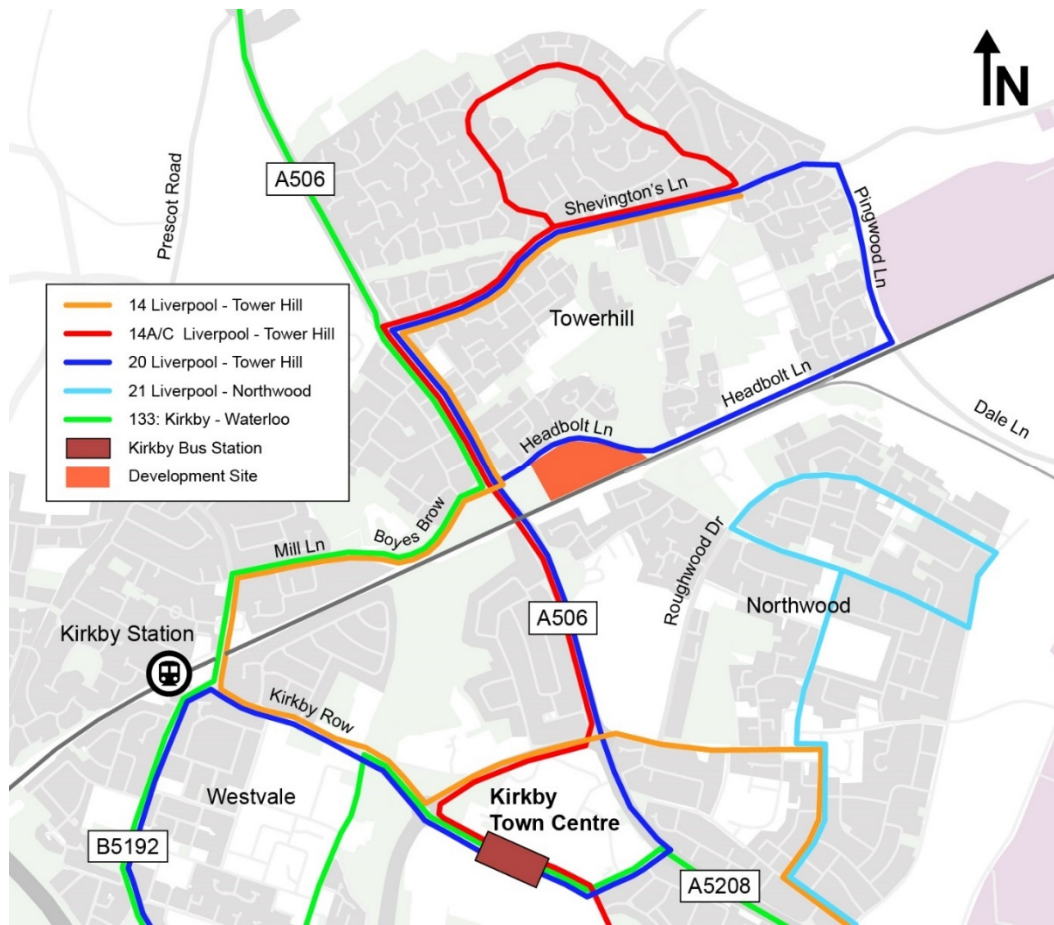
Service	Route	Stop location	Service frequency*
14**	Liverpool – Tower Hill	Boyes Brow	0
14A / 14C	Liverpool – Tower Hill	A506	2
20	Liverpool – Tower Hill	Headbolt Lane (towards Tower Hill) A506 (towards Liverpool)	5
21	Liverpool – Northwood	Roughwood Drive	5
133	Waterloo – Kirkby	Boyes Brow	1

*Services per hour in one direction

**14 only runs to and from Tower Hill before 6am.

Bus routes operating in the local area are shown in Figure 10.

Figure 10: Bus routes in proximity to the proposed development site



3.3.2 Rail

Kirkby Rail Station lies 1.3km to the southwest of the development site. It is the current terminus of the Merseyrail Northern Line and the Kirkby Branch Line from Wigan. It serves as an interchange between Merseyrail services from Liverpool Central and Northern services from Manchester Victoria via Wigan Wallgate.

There are four services per hour from Kirkby to Liverpool Central and one service per hour to Wigan Wallgate. There are also infrequent services between Manchester Victoria with two services arriving at Kirkby and four services departing on weekdays between 06:00 and 10:00. Two services also arrive at Kirkby from Manchester Victoria and one service departs between 18:00 and 20:00. The proposed Headbolt Lane station will serve as the future terminus of these services.

3.4 Vehicle access

3.4.1 Local highway network

Headbolt Lane is a two-way single carriageway road, providing access to several residential areas within Tower Hill. The road is subject to a 30mph speed limit.

At its western end, Headbolt Lane connects with the A506 Bank Lane. This is the main vehicle route accessing M58 Junction 1 and Maghull to the north and Kirkby town centre, Knowsley Business Park, and the residential areas of Northwood and Southdene to the south. Boyes Brow forms the western arm of the junction of Headbolt Lane and the A506 Bank Lane.

At its eastern end, Headbolt Lane joins Pingwood Lane and Dale Lane via a priority-controlled T-junction. Dale Lane leads south providing access to Knowsley Business Park and on towards the A580 East Lancashire Road. Pingwood Lane provides access to Shevington's Lane and Stopgate Lane to the north.

Figure 11: Local highway network



3.4.2 Wider network

The wider highway network includes the M57, M58, and M62 motorways as well as the A580 East Lancashire Road. These routes connect the proposed development site with Liverpool to the west and Manchester to the east.

As previously noted, the Strategic Road Network can be directly accessed directly from the northern end of A506 Bank Lane via M58 Junction 1.

Figure 12: Wider highway network



3.4.3 Parking / waiting restrictions

There are currently no parking or waiting opportunities on Headbolt Lane, with double yellow lines on both sides of the carriageway for the entire length.

There are limited on-street parking restrictions in the residential area of Tower Hill, directly north of the proposed development site. The only restrictions are no stopping outside the entrance to Eastcroft Park Primary School between 08:00-17:00. Similarly, in the Northwood area to the south of the rail line, parking restrictions are limited to areas outside schools as well as at junctions on Roughwood Drive. There are permitted parking zones in areas adjacent to Kirkby town centre to the southwest, restricting parking to those with permits.

3.4.4 Highway safety

Personal injury accident data for May 2016 to December 2020, has been provided by KMBC. The study area comprises the local highway network in the vicinity of

Headbolt Lane. An overview of the locations of all collisions within the study area is presented in Table 2 and Figure 13.

Table 2: Annual recorded collisions by severity

Severity	2016	2017	2018	2019	2020	Total
Fatal	1	0	1	0	0	2
Serious	0	2	1	1	0	4
Slight	2	4	4	1	9	20
Total	3	6	6	2	9	26

Figure 13: Road traffic collisions (May 2016 – December 2020)



Over the course of the study period, a total of 26 collisions have been recorded within the study area. Of these collisions, two were fatal, four resulted in serious injury, and the remainder resulted in slight injury.

Table 3 and Table 4 present more detailed information on the collisions recorded at specific locations within the study network.

Table 3: Recorded collisions by mode

Location	No. of recorded collisions	No. of each mode involved in recorded collisions				
		Pedestrian	Cycle	Motorcycle	Car	LGV / HGV
A506 / St Kevin's Drive	4	1	0	2	6	1
A506 / Headbolt Lane	2	0	1	0	3	0
Shevington's Lane / Pingwood Drive / Stopgate Lane	4	0	2	0	4	1
A506 / Shevington's Lane	1	0	0	0	2	0
Headbolt Lane / Stopgate Lane / Dale Lane	1	0	0	0	2	2
A506 County Road	1	1	0	0	1	0
Headbolt Lane	1	0	0	0	2	0
A506 Bank Lane	5	2	0	0	7	1
Shevington's Lane	3	1	0	0	3	1
Domingo Drive	1	1	0	0	1	0
Chamberlain Drive	1	1	0	0	2	0
Pingwood Lane	2	1	0	0	1	1
Total	26	8	3	2	34	7

Table 4: Recorded collisions by severity

Location	No. of recorded collisions	Severity		
		Slight	Serious	Fatal
A506 / St Kevin's Drive	4	3	0	1
A506 / Headbolt Lane	2	2	0	0
Shevington's Lane / Pingwood Drive / Stopgate Lane	4	4	0	0
A506 / Shevington's Lane	1	1	0	0
Headbolt Lane / Stopgate Lane / Dale Lane	1	1	0	0
A506 County Road	1	1	0	0
Headbolt Lane	1	1	0	0
A506 Bank Lane	5	5	0	0
Shevington's Lane	3	2	1	0
Domingo Drive	1	0	1	0
Chamberlain Drive	1	0	1	0
Pingwood Lane	2	0	1	1
Total	26	20	4	2

The data shows that two fatalities have been recorded within the study area in the last five years. These incidents occurred at the County Road / St Kevin's Drive junction and Pingwood Lane, and both involved a pedestrian being struck by a vehicle. At the time of both collisions, the weather was fine, although the road surface was wet. Both incidents occurred after dark, but the areas were well lit with street lighting. Although regrettable, there is no indication that either of these fatalities occurred as a result of an issue with the highway layout or condition.

The area with the most recorded collisions is the A506 Bank Lane and County Road, which includes the junctions with Shevington's Lane, Headbolt Lane and St Kevin's Drive. This is a highly trafficked road, and as such, the number of accidents recorded on the A506 across five years is not out of the expected range for a road of this type, and is therefore not considered to be indicative of a highway safety issue.

A cluster of collisions is shown in the vicinity of the Shevington's Lane / Pingwood Drive / Stopgate Lane junction. All of these incidents resulted in slight injury. Contributing factors for these incidents are listed as including an inexperienced driver misunderstanding signage; failure of a driver to judge another vehicle's path; mud on the road; and possible inebriation. There is no indication that any of these collisions occurred as a result of an issue with the highway layout or condition.

Overall, whilst there are some clusters of road traffic collisions, there are no identified common contributing factors and the number of incidents does not fall outside what would be expected for a study area of this size over a five-year study period.

4 Proposed Development

The proposed development comprises a new rail station at Headbolt Lane, to facilitate the extension of the Merseyrail network beyond the existing terminating station at Kirkby. The proposed station comprises three platforms, with two platform faces serving Merseyrail and a single platform face serving Northern Rail.

The proposed station car park layout is shown in Drawing Ref. 170248-15854-ZZ-ZZZ-DRG-C-HW-053010 in Appendix D.

4.1 Rail services

A summary of the rail services that will be provided by the proposed station is shown in Table 5.

Table 5: Headbolt Lane station rail service summary

Line	Weekday / Saturday services	Sunday service frequency
Merseyrail	4 services per hour in each direction to / from Headbolt Lane and Liverpool Central	2 services per hour in each direction to / from Headbolt Lane and Liverpool Central
Northern	1 service per hour in each direction to / from Headbolt Lane and Wigan Wallgate	1 service per hour in each direction to / from Headbolt Lane and Wigan Wallgate

4.2 Car parking

A new 300 space car park is proposed to serve the new station at Headbolt Lane. A car parking accumulation exercise has been undertaken to support the development of the design and the allocation of car parking spaces. Further information is provided in Section 5.6.

30no. of the proposed parking spaces will be disabled access bays, comprising 15no. blue badge spaces and 15no. enlarged bays. 12no. electric vehicle charging bays will be provided on site.

In addition to the 300 space car park, 3no. staff spaces and 2no. Network Rail maintenance bays are to be provided, along with a parking area for 5no. motorcycles.

A taxi and pick-up / drop-off area is also proposed outside the station building, with space for 4no. vehicles.

4.2.1 Waiting restrictions

During scoping discussions with KMBC, overspill parking associated with the proposed development was raised as a potential issue.

As identified in Section 3.4.3, waiting is not permitted at any time on the length of Headbolt Lane on both sides of the carriageway. There are, however, limited

restrictions to on-street parking across a number of local residential areas where overspill parking could potentially occur.

A parking accumulation exercise has been undertaken based on the anticipated vehicle trip generation of the proposed development, which is detailed in Section 5.6. This demonstrates that under the forecast parking demand, a daily peak car park occupancy of around 63% is expected. It is therefore considered that a reasonable level of spare parking capacity has been provided within the proposed station design to prevent the occurrence of overspill parking.

This represents a balanced approach between providing sufficient parking capacity, whilst not inducing additional traffic demand through overprovision of parking.

4.3 Vehicle access

Vehicular site access will be taken via a new access junction on Headbolt Lane, as shown in Drawing Ref. 170248-15854-ZZ-ZZZ-DRG-C-HW-053010 in Appendix D. The proposed site access junction is a signalised crossroads in the location of the existing priority-controlled T-junction of Fallowfield / Headbolt Lane.

The proposed access road is a 7.3m wide two-way carriageway, running in a north-south alignment through the development site. It provides access to the car parking areas, bus interchange and pick-up / drop-off area.

4.4 Bus

Proposals for bus facilities and services at Headbolt Lane station have been developed through discussions with Merseytravel.

A key feature of the new station design is that it will provide a high-quality bus-rail interchange facility, consisting of two bus stops directly in front of the station building accessed via a turning loop. The bus stops will be designed to the latest standards, incorporating enclosed passenger waiting shelters and high kerbs to minimise the step off the bus and ease passenger access.

With the provision of these facilities the station will be capable of accommodating up to 10 buses per hour, divided by direction of travel and destination. Merseytravel will also work with the bus operators through the Bus Alliance in order to integrate the station within the overall bus network.

The installation of MOVA at the proposed site access junction will help to prioritise buses accessing and egressing the site, therefore minimising delay for bus services.

4.5 Walking and Cycling

The new station access junction includes signalised pedestrian crossings on all arms of the crossroads.

It is understood that KMBC plans to deliver a new cycleway on the southern side of Headbolt Lane. The proposed station access junction design has been developed to enable the future cycleway to tie into the junction.

A 3m wide bi-directional cycleway is proposed alongside the vehicle access road. This will provide a continuous off-road cycle route between Headbolt Lane and the station cycle parking. Parking facilities for 100 cycles will be provided adjacent to the station building, with passive provision for a further 200 spaces.

Pedestrian footways are to be provided within the site on key desire lines. A series of zebra crossings are included within the design to facilitate safe and convenient pedestrian movements through the site.

The existing footpath which crosses the site from east to west will be diverted and incorporated into the site access proposals. The existing western footbridge over Kirkby Brook shall be removed and the eastern footbridge retained. An additional footbridge is proposed over Kirkby Brook to the east of the station building. The eastern bridge provides a link to the eastern section of Headbolt Lane and allows pedestrians arriving from this area to easily cross Kirkby Brook in order to reach the station building. A new uncontrolled crossing with dropped kerbs and tactile paving to provide a connection across Headbolt Lane and to the residential area to the east is also proposed.

An at-grade crossing within the station will provide a connection to/from Platform 2, and a new footway from the residential estate to the south will form a secondary access to the station.

5 Trip generation, distribution and assignment

This section of the TA presents the methodology for the assessment of the traffic impact of the proposed development. The forecast trip generation for the proposed development and the distribution of the forecast vehicle trips onto the highway network are reported in this section.

5.1 Study network

As agreed with KMBC, the following key junctions form the study network:

1. Headbolt Lane Station proposed access junction;
2. A506 Bank Lane / Headbolt Lane / A506 County Road / Boyes Brow signalised junction;
3. Stopgate Lane / Pingwood Lane / Shevington's Lane priority junction;
4. Pingwood Lane / Dale Lane / Headbolt Lane priority junction;
5. A506 County Road / St Kevin's Drive signalised junction.

5.2 Traffic Survey Data

Under the current situation with COVID-19, it is not considered that traffic surveys undertaken at this time will be representative of typical traffic levels. Alternative sources of data have therefore been agreed with KMBC for use in the assessment. A summary of the data obtained for each junction is provided in Table 6.

Table 6: Summary of baseline data

Survey location	Date of survey
Headbolt Lane / Fallowfield	January 2014
A506 Bank Lane / Headbolt Lane / A506 County Road / Boyes Brow	Thursday 17 th January 2019
Stopgate Lane / Pingwood Lane / Shevington's Lane	January 2014
Pingwood Lane / Dale Lane / Headbolt Lane	January 2014
A506 County Road / St Kevin's Drive	Thursday 17 th January 2019

From this data, the following peak periods for vehicle movements across the study network have been identified:

- AM Peak – 07:45-08:45
- PM Peak – 16:15-17:15

5.3 Assessment Years

TEMPRO software has been used to derive growth factors to be applied to the 2014 and 2019 traffic data (see Table 6) to represent traffic growth on the road

network up to 2021. This will form the base year assessment. An opening year assessment of 2023 and future year assessment of 2028 (five years post-opening) have been agreed with KMBC.

The growth factors for each assessment year are shown in Table 7.

Table 7: Growth factors

Assessment scenario	Growth period	Growth factors	
		AM Peak	PM Peak
2021 (Base)	2014-2021	1.0996	1.09895
	2019-2021	1.0315	1.03075
2023 (Opening)	2021-2023	1.02095	1.01955
2028 (Future)	2021-2028	1.06415	1.05925

Traffic flow diagrams showing the background traffic flows and factored 2023 and 2028 baseline traffic flows are provided in Appendix E.

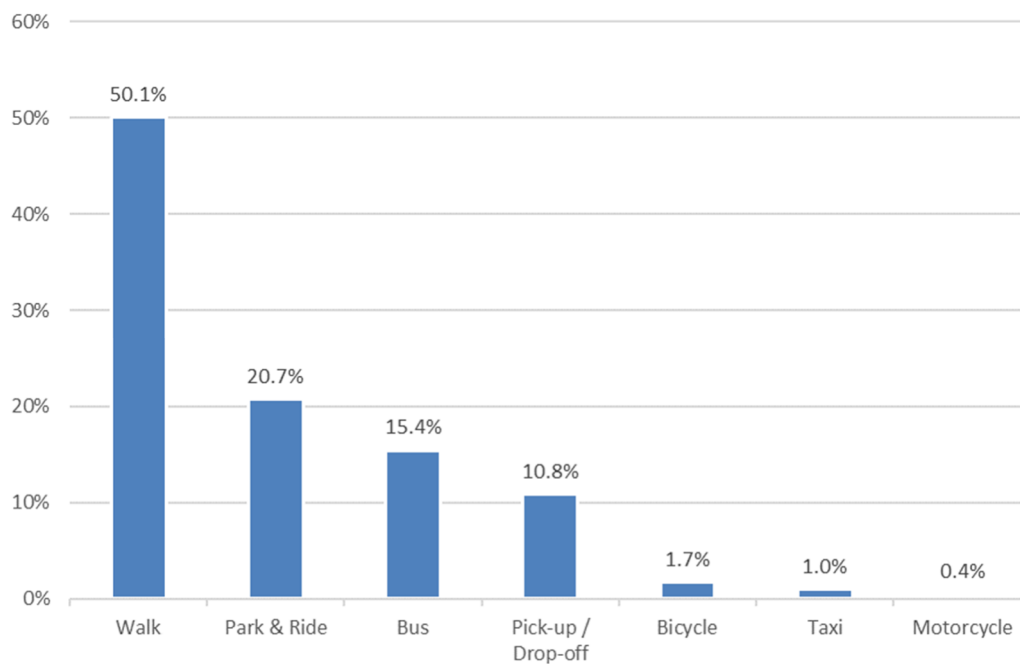
5.4 Mode Split

Mode split data to inform the trip generation assessment has been obtained from work undertaken as part of the Headbolt Lane Station Outline Business Case at GRIP 2. The access and egress mode split is based on:

1. The distribution of demand by distance from the station from the trip rate and catchment analysis;
2. Estimates of how this demand by distance band then splits by journey purpose; and
3. National Rail Traveller Survey analysis of access / egress mode choices by journey purpose and distance band from the comparator station selected for the trip rate analysis.

The resultant mode split is shown in Figure 14.

Figure 14: Passenger access / egress mode split



5.5 Trip generation

Forecast passenger demand data has been obtained from the Pedestrian Flow Analysis (Document Ref. 170248-ARU-REP-EMF-000001) for the proposed station at Headbolt Lane. The pedestrian flow analysis considers an annual passenger demand of c.803 & Ride / Drop-off,000 in 2024 and c.806,000 in 2030, based on GRIP 2 analysis outputs. Daily arrival and departure profiles have been derived from these outputs.

The daily trip profile for 2030 forms the basis of the trip generation assessment and is shown in Table 8. The 2030 scenario is considered to represent a 'worst case'.

Table 8: Person trip generation

Time	Arrivals	Departures	Two-way
05:00-06:00	12	0	12
06:00-07:00	71	18	89
07:00-08:00	184	32	216
08:00-09:00	257	44	301
09:00-10:00	182	22	205
10:00-11:00	72	16	88
11:00-12:00	87	29	117
12:00-13:00	79	44	123
13:00-14:00	56	37	93
14:00-15:00	52	82	134
15:00-16:00	41	103	144
16:00-17:00	48	165	214
17:00-18:00	72	273	346
18:00-19:00	54	113	167
19:00-20:00	22	69	91
20:00-21:00	10	45	54
21:00-22:00	9	36	45
22:00-23:00	6	30	36
23:00-00:00	3	41	45
Total	1,318	1,202	2,520

As shown in Table 8, the morning peak hour occurs between 08:00 and 09:00, with 257 and 44 passengers arriving and departing the proposed station, respectively. The evening peak occurs between 17:00 and 18:00, with 72 and 273 arrivals and departures.

It should be noted that the development evening peak (17:00-18:00) falls slightly later than the network evening peak (16:15-17:15). To ensure a robust assessment, the vehicle movements forecast in the development evening peak have been used in the assessment of the network peak. This is considered to represent a worst case.

In order to predict the number of vehicle trips to and from the proposed development, the mode split presented in Figure 14 has been applied to the person trip generation in

Table 8. It has been assumed that no park and ride departures occur before midday. All park and ride trips occurring pre-midday have therefore been redistributed proportionately across the rest of the day.

The subsequent arrivals and departures by mode during the weekday AM and PM peak periods are shown in Table 9.

Table 9: Trip generation by mode

Mode	Weekday AM Peak (08:00-09:00)			Weekday PM Peak (17:00-18:00)		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Walk	129	22	151	36	137	173
Park & Ride	53	9	62	15	57	72
Bus	40	7	47	11	42	53
Pick-up	0	5	5	0	30	30
Drop-off	28	0	28	8	0	8
Bicycle	4	1	5	1	5	6
Taxi	2	0	2	1	3	4
Motorcycle	1	0	1	0	1	1
Total	257	44	301	72	274	346

The vehicle trip generation (comprising all modes except walking and cycling) is shown in Table 10.

Table 10: Vehicle trip generation

Mode	Weekday AM Peak (08:00-09:00)			Weekday PM Peak (17:00-18:00)		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Park & Ride	53	0	53	15	65	80
Bus	4	4	8	4	4	8
Pick-up*	5	5	10	30	30	60
Drop-off*	28	28	56	8	8	16
Taxi*	2	2	4	3	3	6
Motorcycle	1	0	1	0	1	1
Total	93	39	132	60	111	171

* All Pick-up, drop-off and taxi trips assumed to arrive and depart within the same hour

The proposed station at Headbolt Lane is anticipated to generate 132 two-way vehicle trips in the weekday morning peak and 171 two-way trips in the weekday evening peak.

5.6 Car parking accumulation

Based on the daily vehicle trip generation associated with the Park & Ride facility, a car parking accumulation assessment has been undertaken to understand the potential parking demand of the proposed development. The results of the analysis are shown in Table 11.

Table 11: Car parking accumulation

Time	Arrivals	Departures	Accumulation
05:00-06:00	2	0	2
06:00-07:00	15	0	17
07:00-08:00	38	0	55
08:00-09:00	53	0	108
09:00-10:00	38	0	146
10:00-11:00	15	0	161
11:00-12:00	18	0	179
12:00-13:00	16	11	185
13:00-14:00	12	9	188
14:00-15:00	11	20	179
15:00-16:00	8	25	162
16:00-17:00	10	40	133
17:00-18:00	15	65	82
18:00-19:00	11	27	67
19:00-20:00	5	16	55
20:00-21:00	2	11	46
21:00-22:00	2	9	39
22:00-23:00	1	7	33
23:00-00:00	1	10	24

Table 11 shows that the maximum number of vehicles anticipated to park at the proposed development is 188, which occurs between 13:00-14:00. This is lower than the proposed car parking provision of 300 spaces, however, providing some additional parking capacity will lessen the risk of overspill parking occurring on surrounding residential streets should demand increase in future.

It is considered that the proposed parking provision of 300 spaces ensures a balanced and conservative approach to car parking at the site.

5.7 Trip distribution

The trip distribution has been derived based on assumptions from the Skelmersdale Rail Link Business Case 2015. Use of this distribution has been agreed with KMBC. The trip distribution is shown in Table 12.

Table 12: Trip distribution

Route	Trip distribution
A506 County Road (south)	48.3%
Shevington's Lane (west)	18.5%
Shevington's Lane (east)	9.0%
Windermere Drive (off A506 Bank Lane)	8.0%
Freckleton Drive (off Headbolt Lane)	7.2%
A506 Bank Lane (north)	4.4%
Dale Lane (south)	3.7%
Boyes Brow (west)	0.7%
Stopgate Lane (east)	0.2%

The trip distribution has been applied to the proposed development trips shown in Table 10. The resultant traffic flows are presented in Appendix E.

5.8 Committed development

The following committed developments have been identified for consideration within the assessment. It should be noted that some of these developments have now been completed, however, it has been agreed with KMBC to retain them within the assessment due to the use of traffic survey data collected in 2014 and 2019, prior to any of these developments being completed.

As the growth factors derived from TEMPRO (See Section 5.3) represent employment and housing growth, it is possible that some of the traffic associated with the below committed developments has already been accounted for within the background traffic flows. Notwithstanding, all committed developments have been considered and this assessment therefore represents a 'worst case'.

Traffic flow diagrams showing the committed development traffic flows are provided in Appendix E.

5.8.1 Land east of Maghull

The committed development site at land east of Maghull is bound by School Lane to the north, the M58 J1 to the east, Poverty Lane to the south and the Merseyrail Northern Line to the west. The site lies approximately 3km to the north west of the Headbolt Lane site and access between the sites can be taken via the A506 and Maghull Lane.

The wider site is allocated in the Sefton Local Plan for a minimum of 1,400 homes and a 20ha business park, with a new link road connecting Poverty Lane and School Lane.

A hybrid application (Planning Ref. DC/2020/01778) was submitted in September 2020 seeking full planning permission for the demolition of existing buildings and the construction of 841 dwellings, new vehicle accesses via Poverty lane and ancillary infrastructure, and outline planning permission for an older

persons housing scheme with ancillary infrastructure. The application is a re-submission of an application originally submitted in 2017 (Planning Ref. DC/2017/01532).

A Transport Assessment (Document Ref. WYG, A083347) was produced for the proposed development in August 2018. The proposed development in Kirkby town centre results in additional flows, as well as a reduction in flows in some locations, on the local highway network surrounding the proposed development. It has therefore been included within the assessment as a committed development.

5.8.2 Kirkby town centre redevelopment

A planning application (Planning Ref. 17/00559/FUL) was submitted in 2017 for 130,000 sq. ft mixed-use development comprising a 45,000 sq. ft supermarket, and 80,000 sq. ft of retail, with associated car parking and public realm improvements. A significant proportion of the proposed development has been completed.

The proposed development in Kirkby town centre results in additional flows on the local highway network surrounding the proposed development at Headbolt Lane. It has therefore been included within the assessment as a committed development.

5.8.3 Bank Lane residential development

The Bank Lane residential development (Planning Ref. 13/00393/OUT and 14/00874/REM) is located 650m to the northwest of Headbolt Lane and comprises 195 dwellings. The development is due for completion imminently.

The residential development at Bank Lane is anticipated to result in additional flows on the local highway network surrounding the proposed development at Headbolt Lane. It has therefore been included within the assessment as a committed development.

5.8.4 Tower Hill residential development

The Tower Hill residential development (Planning Ref. 15/00570/HYB) comprises a total of 359 dwellings. Vehicle access to 200 of the units is via 2no. junctions on Shevington's Lane. The remaining units are accessed via 1no. existing (at Langton Road) and 2no. new priority-controlled junctions on Headbolt Lane. Phases 1 and 2 have been completed, whilst approximately two thirds of Phase 3 dwellings are yet to be built.

The residential development at Tower Hill is anticipated to result in additional flows on the local highway network surrounding the proposed development at Headbolt Lane. It has therefore been considered within the assessment.

5.8.5 St Kevin's Drive residential development

The St Kevin's Drive residential development (Planning Ref. 17/00201/FUL) lies to the south of the Headbolt Lane development site, on the southern side of the

rail line. The development comprises 173 dwellings to be accessed via St Kevin's Drive. Approximately half to two thirds of the proposed units for Phases 1-4 are yet to be built.

The residential development at St Kevin's Drive is anticipated to result in additional flows on the local highway network surrounding the proposed development at Headbolt Lane. It has therefore been included within the assessment.

5.8.6 Academy Business Park

A mixed-use development is proposed at the Academy Business Park (Planning Ref. 19/00337/OUT), which lies on the western edge of Knowsley Industrial Park. The proposed development comprises a drive-through restaurant, kiosk / sandwich shop, self-storage unit, showroom units, and a mix of employment / business / trade counter units.

The proposed mixed-use development at Academy Business Park is not anticipated to result in additional flows on the assessment network surrounding the proposed development at Headbolt Lane. It has therefore been excluded from the assessment.

5.8.7 PLP Knowsley

The PLP Knowsley site was granted planning permission (Planning Ref. 20/00124/FUL) in May 2020 for 80,000sqm GIA of B8 warehouse. The Transport Assessment produced in support of the proposals (Document Ref. Hydrock, 11647-HYD-XX-XX-RP-TP-5001-P2) demonstrates that no additional traffic would be anticipated to enter the assessment network surrounding the proposed development at Headbolt Lane. The PLP Knowsley site has therefore been excluded from the assessment.

5.9 Future provision

A Network Rail requirement (CRD Ref. 170248-HBL-CRD-REQ-003) for the project is to demonstrate that the proposed station design can safely operate with 3 million passengers per annum for future provision.

As described in Section 5.5, the GRIP 2 demand analysis outputs indicate that an annual demand of c.803,000 and c.806,000 is forecast for the proposed station in 2024 and 2030, respectively. This is significantly lower than the design requirement to accommodate 3 million passengers per annum.

Notwithstanding, a trip generation assessment has been undertaken to understand the potential traffic impact that could be expected under the 'future provision' scenario with a 500-space car park.

The parking accumulation exercise in Section 5.6 identified that the peak accumulation is anticipated to occur between 13:00-14:00 with 188 vehicles parked at the site. A factor of 2.67 has been calculated to represent an uplift from 188 parked vehicles to 500 parked vehicles to test the 'future provision' scenario.

This has been applied to the arrival / departure profile shown in Table 11, the results of which are shown in Table 13.

Table 13: Car parking accumulation – ‘future provision’

Time	Arrivals	Departures	Accumulation
05:00-06:00	7	0	7
06:00-07:00	39	0	46
07:00-08:00	102	0	147
08:00-09:00	142	0	289
09:00-10:00	101	0	389
10:00-11:00	40	0	429
11:00-12:00	48	0	477
12:00-13:00	44	28	493
13:00-14:00	31	24	500
14:00-15:00	29	53	476
15:00-16:00	23	66	433
16:00-17:00	27	105	354
17:00-18:00	40	174	220
18:00-19:00	30	72	178
19:00-20:00	12	44	146
20:00-21:00	5	28	123
21:00-22:00	5	23	105
22:00-23:00	3	19	89
23:00-00:00	2	26	65

This factor has also been applied to all other vehicle modes, excluding bus. The subsequent weekday morning and evening trip generation for the ‘future provision’ scenario is shown in Table 14.

Table 14: Vehicle trip generation – ‘future provision’

Mode	Weekday AM Peak (08:00-09:00)			Weekday PM Peak (17:00-18:00)		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Park & Ride	142	0	142	40	174	214
Bus	4	4	8	4	4	8
Pick-up	13	13	26	79	79	158
Drop-off	74	74	148	21	21	42
Taxi	7	7	14	9	9	18
Motorcycle	3	0	3	1	3	4
Total	242	98	340	153	290	443

Under the ‘future provision’ scenario, the proposed station at Headbolt Lane is anticipated to generate 340 two-way vehicle trips in the weekday morning peak and 443 two-way trips in the weekday evening peak.

For clarity, the planning application is for a 300 space car park, which provides sufficient capacity based on the forecast demand up to 2030. The ‘future provision’ scenario has been undertaken as a sensitivity test outside of the planning application to ensure the proposed station access junction could theoretically accommodate an increase in demand in future. However, this scenario is unlikely to occur. Should this additional level of demand materialise, a new planning application would be proposed.

6 Highway impact

As agreed with KMBC, traffic modelling has been undertaken for the following junctions:

1. Headbolt Lane Station Access junction;
2. A506 Bank Lane / Headbolt Lane / County Road / Boyes Brow signalised junction;
3. Stopgate Lane / Pingwood Lane / Shevington's Lane priority junction;
4. Pingwood Lane / Dale Lane / Headbolt Lane priority junction; and
5. A506 County Road / St Kevin's Drive.

Operational assessments of junctions within the study network have been undertaken using Junctions 9 and LinSig v3 modelling software, as appropriate. Where a junction is a roundabout or priority controlled, it has been assessed in 'Junctions 9' modelling software, which calculates the Ratio of Flow to Capacity (RFC) and average queues experienced by all vehicles on each arm of a junction. The RFC is a key indicator of the likely performance of a turning movement at a junction under a given set of traffic flows. It is generally accepted that a junction approach with an RFC value of less than 0.85 is operating within its practical capacity. A modelled RFC of greater than 1.0 indicates that an approach is operating in excess of theoretical capacity.

Where a junction is under traffic signal control 'LinSig' software has been used. LinSig is used to indicate the performance of a signalised junction under a given set of traffic flows. The software calculates the 'degree of saturation' (DoS), expressed as a percentage, for each approach to a junction. Approaches where the degree of saturation is forecast to exceed 90% are considered over-capacity. Alongside this the 'mean maximum queue' (MMQ), is calculated, to represent the average position of the furthest vehicle from the stop line in each cycle.

Junction modelling outputs are provided in Appendix F.

6.1 Assessment scenarios

A summary of each assessment scenario considered in the junction modelling exercise is provided in Table 15.

Table 15: Assessment scenarios

Assessment scenario	Description
2023 Base	Background traffic flows with growth applied to 2023
2023 Base + Committed Development	Background traffic flows with growth applied to 2023, plus committed development flows.
2023 Base + Committed Development + Proposed Development	As above, including the vehicle trips associated with the proposed station development.
2028 Base	Background traffic flows with growth applied to 2028
2028 Base + Committed Development	Background traffic flows with growth applied to 2028, plus committed development flows.
2028 Base + Committed Development + Proposed Development	As above, including the vehicle trips associated with the proposed station development with 300 parking spaces.
2028 'Future Provision'	As above, including the vehicle trips associated with the proposed station development with 500 parking spaces.

6.2 Headbolt Lane Station Access

The proposed site access junction expands on the existing Headbolt Lane / Fallowfield priority-controlled T-junction to deliver a new signalised crossroad junction. The proposed layout is illustrated in Appendix D.

The new junction comprises single lane approaches on all arms. Pedestrian crossings are proposed on all arms of the junction, with an all-red pedestrian phase every cycle. A cycle time of 90 seconds has been modelled for all scenarios.

Junction modelling results for the proposed access junction are shown in Table 16.

Table 16: Headbolt Lane station access junction – modelling results

Approach	Weekday AM Peak			Weekday PM Peak		
	DoS	MMQ (pcu)	Delay (pcu/Hr)	DoS	MMQ (pcu)	Delay (pcu/Hr)
2023 Base + Committed Development + Proposed Development						
Headbolt Lane (E)	38.7%	6	5.23	44.1%	7	6.27
Station Access	24.5%	1		42.8%	3	
Headbolt Lane (W)	46.5%	7		43.6%	7	
Fallowfield	17.9%	1		8.3%	0	
2028 Base + Committed Development + Proposed Development						
Headbolt Lane (E)	40.2%	7	5.47	45.9%	7	6.51
Station Access	24.5%	1		42.8%	3	
Headbolt Lane (W)	48.4%	8		44.9%	7	
Fallowfield	19.3%	1		8.9%	0	
2028 Base + Committed Development + Proposed Development (Future Provision)						
Headbolt Lane (E)	43.7%	7	9.40	53.7%	9	14.08
Station Access	61.5%	3		85.3%	10	
Headbolt Lane (W)	74.4%	13		79.5%	12	
Fallowfield	19.3%	1		8.9%	0	

The modelling results indicate that the proposed station access junction is anticipated to operate well within capacity in both 2023 and 2028, should the station come forward as proposed with a 300-space car park. The results also demonstrate that should an additional 200 parking spaces be provided in future, the proposed access junction could continue to operate within capacity.

6.2.1 Sensitivity Test

Through consultation with Merseytravel, a concern was raised regarding potential delay for buses egressing the site during busy periods. In order to address this concern, a sensitivity test of the proposed site access junction has been undertaken.

The site access junction has been modelled using LinSig software, which is an industry-standard tool. However, the software assesses junctions over an hour period, dividing the total hourly traffic flow evenly across the hour.

Given the nature of a rail station, the traffic demand at the proposed development is not expected to be uniform across an hourly period, with peaks occurring shortly after the arrival of a train at the station. The sensitivity test has been developed in order to model these characteristics more robustly.

To inform the sensitivity test, the forecast traffic flows at the site access junction have been uplifted to represent an approximate 15-minute peak period for traffic exiting the site. Passenger boarding and alighting data for Kirkby station, which

can be considered broadly comparable to the proposed station at Headbolt Lane, has been used to derive factors to uplift the proposed development traffic flows. Analysis of the Kirkby station data is shown in Table 17.

Note that ‘arrivals’ refers to passengers arriving at the station to catch a train, whilst ‘departures’ refers to passengers leaving the station after alighting a train.

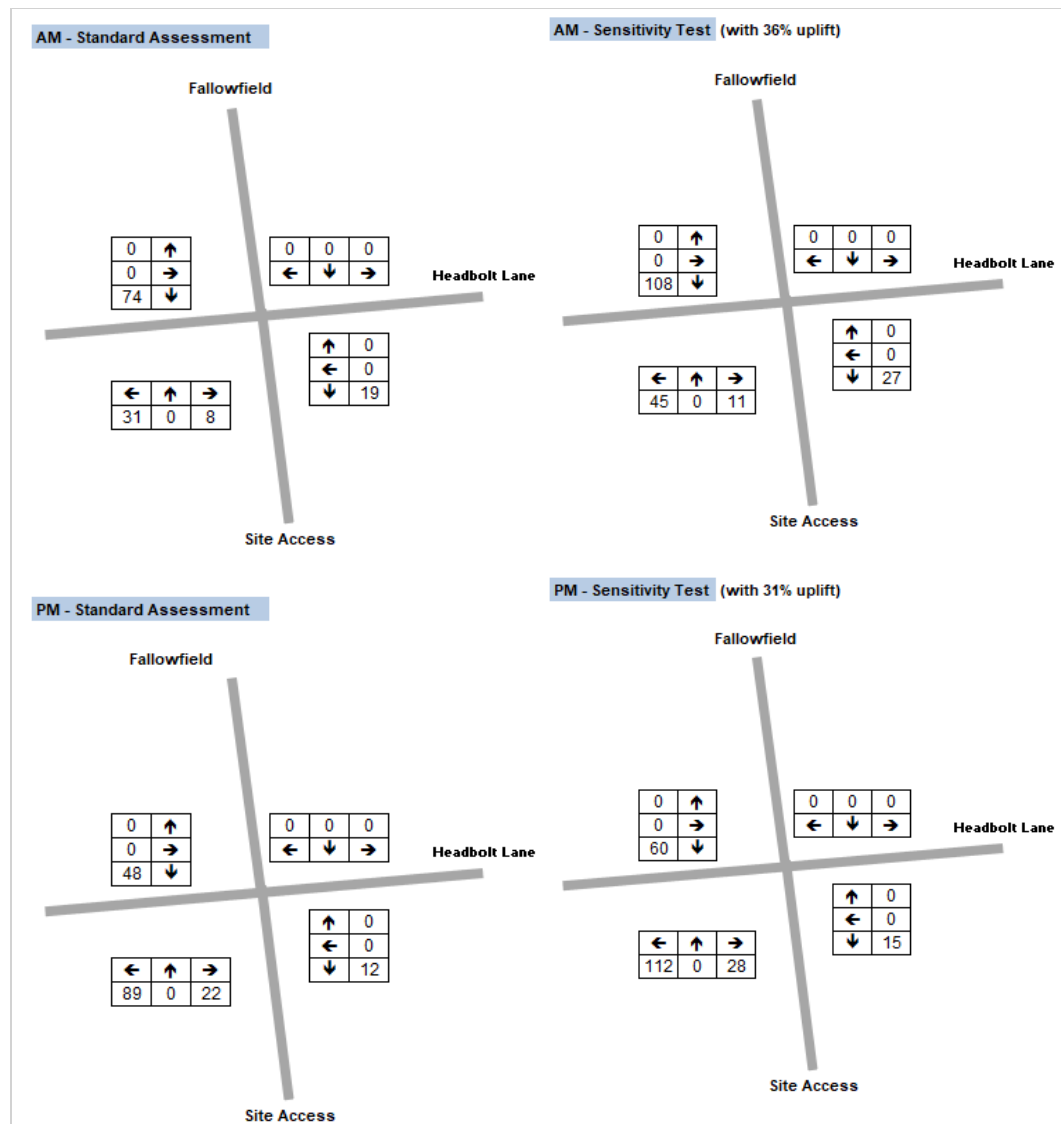
Table 17: Kirkby station boarding and alighting data

Time	Kirkby station survey data			Percentage split		
	Arr	Dep	Two-way	Arr	Dep	Two-way
Weekday AM Peak						
07:45-08:00	114	12	126	20%	16%	20%
08:00-08:15	213	21	234	37%	28%	36%
08:15-08:30	158	18	176	28%	24%	27%
08:30-08:45	84	25	109	15%	33%	17%
Weekday PM Peak						
16:15-16:30	44	75	119	40%	21%	25%
16:30-16:45	0	93	93	0%	26%	20%
16:45-17:00	21	89	110	19%	25%	23%
17:00-17:15	44	104	148	40%	29%	31%

The analysis shows that around 36% of the total AM peak hour journeys to /from Kirkby occur within a peak 15-minute period. Whilst in the PM peak, 31% of the total peak hour trips occur within the peak 15-minute period.

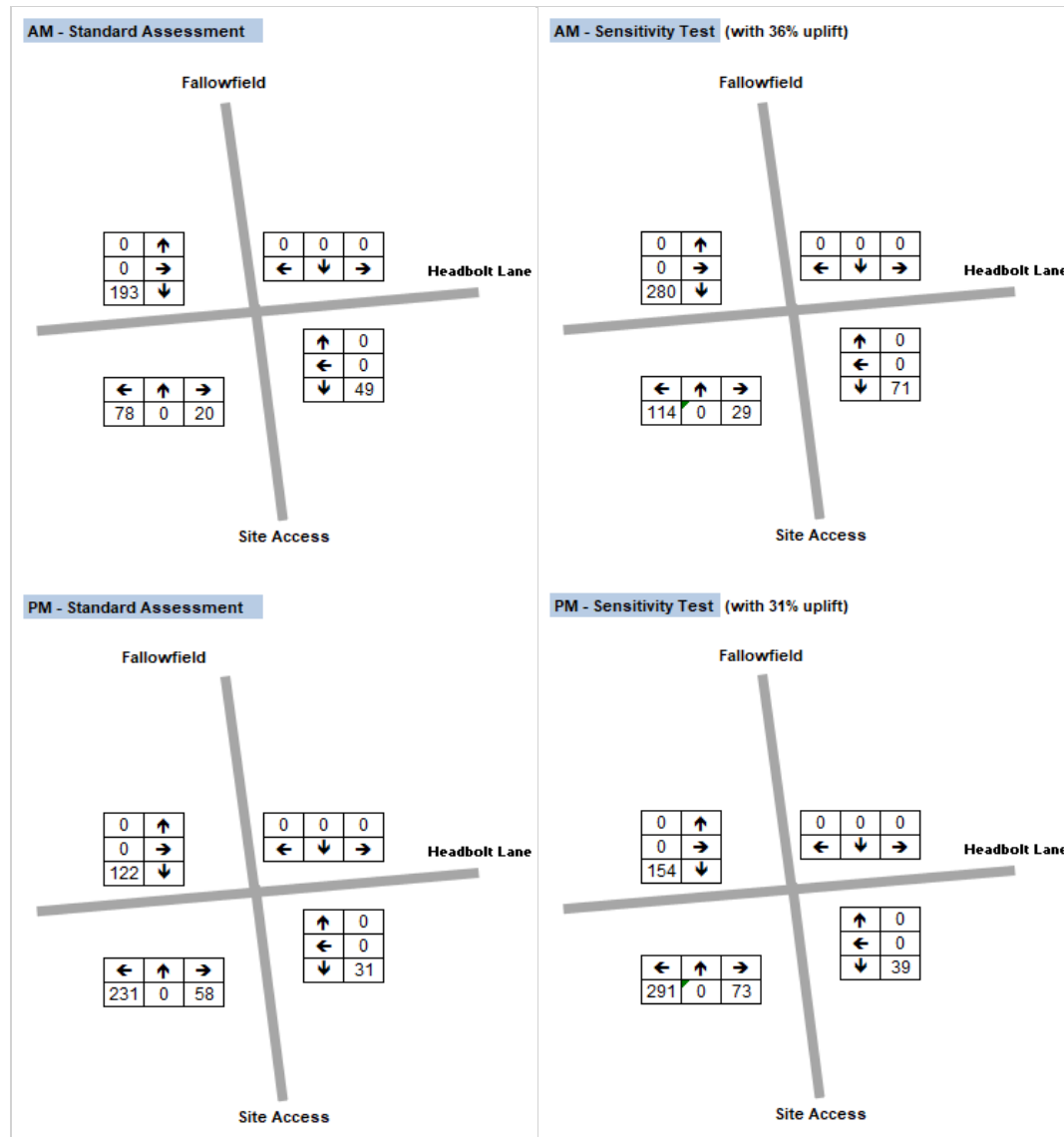
These percentages have been used to uplift the total hourly flows previously used in the standard assessment of the proposed station access junction in Section 6.2. This approach will ensure that the LinSig modelling considers the full impact of the identified peak AM and PM 15-minute periods. A comparison of the flows used in the standard assessment and the sensitivity test is provided in Figure 15.

Figure 15: Comparison of traffic flows used in standard assessment and sensitivity test



The same process has been undertaken for the 'Future Provision' scenario, providing an absolute 'worst case'. A comparison of the flows used in the 'Future Provision' standard assessment and sensitivity test is shown in Figure 16.

Figure 16: Comparison of traffic flows used in standard assessment and sensitivity test under 'Future Provision' scenario



Junction modelling results for the proposed access junction sensitivity test are shown in Table 18.

Table 18: Headbolt Lane station access junction – sensitivity test

Approach	Weekday AM Peak			Weekday PM Peak		
	DoS	MMQ (pcu)	Delay (pcu/Hr)	DoS	MMQ (pcu)	Delay (pcu/Hr)
2023 Base + Committed Development + Proposed Development						
Headbolt Lane (E)	39.6%	6	6.09	44.5%	7	6.97
Station Access	35.1%	2		54.0%	4	
Headbolt Lane (W)	54.8%	9		46.5%	7	
Fallowfield	17.9%	1		8.3%	0	
2028 Base + Committed Development + Proposed Development						
Headbolt Lane (E)	41.1%	7	6.34	47.4%	8	7.31
Station Access	35.1%	2		50.2%	4	
Headbolt Lane (W)	56.0%	9		49.9%	7	
Fallowfield	19.3%	1		8.9%	0	
2028 Base + Committed Development + Proposed Development (‘Future Provision’)						
Headbolt Lane (E)	46.2%	8	17.44	58.1%	9	31.03
Station Access	89.7%	7		96.1%	16	
Headbolt Lane (W)	92.4%	21		101.4%	25	
Fallowfield	19.3%	1		8.9%	0	

The sensitivity test modelling indicates that the proposed station access junction is anticipated to operate well within capacity in both 2023 and 2028, should the station come forward as proposed with a 300-space car park. Furthermore, the above assessments assume an all-red pedestrian phase every cycle, which is unlikely to occur in reality. The junction could therefore be expected to operate more efficiently than the results suggest.

In the 'Future Provision' scenario, the results show that the traffic associated with an additional 200 parking spaces at the site would cause the proposed access junction to exceed capacity. However, as previously mentioned this scenario is unlikely to occur. If this level of additional demand were to materialise, a review of the junction cycle time could be undertaken to improve the operation of the access junction.

The installation of MOVA at the proposed site access junction will also help to prioritise buses accessing and egressing the site, therefore minimising delay for bus services.

6.3 A506 / Headbolt Lane / Boyes Brow

This junction is a signalised crossroad located to the northwest of the development site at the western end of Headbolt Lane. The junction operates with a 90 second cycle. There are signalised pedestrian crossings on all four arms of the junction. In reality these crossings may not be called every cycle due to there being no

demand on some cycles. However, in order to assess a worst-case, the modelling assumes that an 'all-red' pedestrian stage is called every cycle.

A summary of the modelling results for this junction are shown in Table 19.

Table 19: A506 / Headbolt Lane / Boyes Brow – modelling results

Approach	Weekday AM Peak			Weekday PM Peak		
	DoS	MMQ (pcu)	Total Delay (pcu/Hr)	DoS	MMQ (pcu)	Total Delay (pcu/Hr)
2023 Base						
A506 County Road	40.3%	5	15.08	57.5%	8	29.29
A506 Bank Lane	57.4%	6		93.4%	10	
Boyes Brow	45.6%	4		70.7%	7	
Headbolt Lane	58.7%	6		93.1%	13	
2023 Base + Committed Development						
A506 County Road	49.0%	7	19.58	67.1%	12	96.53
A506 Bank Lane	70.3%	8		128.2%	21	
Boyes Brow	54.2%	5		106.1%	20	
Headbolt Lane	69.7%	7		127.6%	48	
2023 Base + Committed Development + Proposed Development						
A506 County Road	52.1%	7	21.75	70.8%	14	124.41
A506 Bank Lane	76.1%	9		142.8%	26	
Boyes Brow	51.3%	5		90.9%	10	
Headbolt Lane	74.6%	8		140.9%	77	
2028 Base						
A506 County Road	40.6%	5	16.00	59.6%	9	37.73
A506 Bank Lane	62.0%	6		103.9%	11	
Boyes Brow	47.1%	5		73.4%	8	
Headbolt Lane	61.4%	6		98.8%	16	
2028 Base + Committed Development						
A506 County Road	49.4%	7	20.76	68.9%	13	114.82
A506 Bank Lane	73.6%	9		140.8%	26	
Boyes Brow	59.7%	5		110.2%	25	
Headbolt Lane	77.8%	8		132.8%	55	
2028 Base + Committed Development + Proposed Development						
A506 County Road	53.8%	7	23.04	70.3%	14	152.14
A506 Bank Lane	81.2%	9		150.6%	30	
Boyes Brow	52.9%	5		101.7%	16	
Headbolt Lane	77.7%	8		156.5%	95	

2028 Base + Committed Development + Proposed Development ('Future Provision')						
A506 County Road	130.2%	36	169.06	100.7%	33	297.14
A506 Bank Lane	134.3%	57		175.0%	86	
Boyes Brow	82.2%	7		73.7%	8	
Headbolt Lane	141.2%	62		172.3%	145	

The results demonstrate that in the 2023 and 2028 assessment years with the addition of the committed development, the junction is expected to operate over capacity with degrees of saturation of over 100% on the A506 Bank Lane, Boyes Brow and Headbolt Lane arms in the PM Peak.

The addition of the proposed station traffic does demonstrate some increases in queueing and degree of saturation, but this is not considered significant in the context of the 'worst case' assessment presented. It is noted that the cumulative impact of the committed development traffic within the assessment results in the junction operating over 100% capacity.

It is also worth noting that the proposed station development is likely to attract car journeys that were already on the local highway network and would divert to the station car park upon opening, although this effect has not been modelled.

It is therefore considered that the traffic associated with the proposed development can be accommodated at the A506 / Headbolt Lane / Boyes Brow junction without significant impact on the future baseline situation.

6.4 Stopgate Lane / Pingwood Lane / Shevington's Lane

The Stopgate Lane / Pingwood Lane / Shevington's Lane junction is a priority-controlled T-junction located approximately 1.2km to the northeast of the development site. Junctions 9 modelling results for this junction are shown in Table 20.

Table 20: Stopgate Lane / Pingwood Lane / Shevington's Lane – Junctions 9 modelling results

Approach	Weekday AM Peak		Weekday PM Peak	
	RFC	Queue (PCU)	RFC	Queue (PCU)
2023 Base				
Shevington's Lane - Left turn out	0.16	0	0.02	0
Shevington's Lane - Right turn out	0.81	4	0.21	0
Stopgate Lane	0.03	0	0.06	0
2023 Base + Committed Development				
Shevington's Lane - Left turn out	0.16	0	0.02	0
Shevington's Lane - Right turn out	0.81	4	0.21	0
Stopgate Lane	0.03	0	0.06	0

2023 Base + Committed Development + Proposed Development				
Shevington's Lane - Left turn out	0.18	0	0.02	0
Shevington's Lane - Right turn out	0.84	5	0.22	0
Stopgate Lane	0.03	0	0.06	0
2028 Base				
Shevington's Lane - Left turn out	0.21	0	0.02	0
Shevington's Lane - Right turn out	0.86	5	0.22	0
Stopgate Lane	0.03	0	0.06	0
2028 Base + Committed Development				
Shevington's Lane - Left turn out	0.21	0	0.02	0
Shevington's Lane - Right turn out	0.86	5	0.22	0
Stopgate Lane	0.03	0	0.06	0
2028 Base + Committed Development + Proposed Development				
Shevington's Lane - Left turn out	0.24	0	0.02	0
Shevington's Lane - Right turn out	0.87	6	0.23	0
Stopgate Lane	0.03	0	0.06	0
2028 Base + Committed Development + Proposed Development (Future Provision)				
Shevington's Lane - Left turn out	0.34	0	0.02	0
Shevington's Lane - Right turn out	0.90	7	0.25	0
Stopgate Lane	0.03	0	0.06	0

The results demonstrate that in 2023, the junction is shown to operate within capacity under all assessment scenarios. In the 2028 assessment year, and with the addition of committed development traffic, the junction is expected to operate over capacity with an RFC of over 0.85 on the Shevington's Lane approach in the AM Peak. The addition of the proposed station traffic does demonstrate a minor increase in queueing and RFC, but this is considered to be negligible.

It is therefore concluded that the traffic associated with the proposed development can be accommodated at the Stopgate Lane / Pingwood Lane / Shevington's Lane junction without significant impact on the future baseline situation.

6.5 Pingwood Lane / Dale Lane / Headbolt Lane

This priority-controlled T-junction lies at the eastern end of Headbolt Lane, approximately 850m to the east of the development site. Junctions 9 modelling results for the Pingwood Lane / Dale Lane / Headbolt Lane junction are shown in Table 21.

Table 21: Pingwood Lane / Dale Lane / Headbolt Lane – Junctions 9 modelling results

Approach	Weekday AM Peak		Weekday PM Peak	
	RFC	Queue (PCU)	RFC	Queue (PCU)
2023 Base				
Headbolt Lane - Left turn out	0.15	0	0.26	0
Headbolt Lane - Right turn out	0.15	0	0.07	0
Pingwood Lane	0.47	1	0.27	0
2023 Base + Committed Development				
Headbolt Lane - Left turn out	0.15	0	0.26	0
Headbolt Lane - Right turn out	0.15	0	0.07	0
Pingwood Lane	0.47	1	0.27	0
2023 Base + Committed Development + Proposed Development				
Headbolt Lane - Left turn out	0.15	0	0.28	0
Headbolt Lane - Right turn out	0.15	0	0.08	0
Pingwood Lane	0.49	1	0.28	1
2028 Base				
Headbolt Lane - Left turn out	0.15	0	0.27	0
Headbolt Lane - Right turn out	0.16	0	0.07	0
Pingwood Lane	0.50	1	0.28	1
2028 Base + Committed Development				
Headbolt Lane - Left turn out	0.15	0	0.27	0
Headbolt Lane - Right turn out	0.16	0	0.07	0
Pingwood Lane	0.50	1	0.28	1
2028 Base + Committed Development + Proposed Development				
Headbolt Lane - Left turn out	0.16	0	0.29	0
Headbolt Lane - Right turn out	0.16	0	0.08	0
Pingwood Lane	0.52	1	0.29	1
2028 Base + Committed Development + Proposed Development (Future Provision)				
Headbolt Lane - Left turn out	0.17	0	0.32	1
Headbolt Lane - Right turn out	0.17	0	0.10	0
Pingwood Lane	0.55	2	0.31	1

The modelling results indicate that the Pingwood Lane / Dale Lane / Headbolt Lane junction is anticipated to operate with significant reserve capacity in all assessment scenarios. The addition of traffic associated with the proposed development is demonstrated to have a negligible impact on the overall operation of the junction.

6.6 A506 County Road / St Kevin's Drive

This is a three-arm signalised junction providing access to the St Kevin's Drive residential estate from the A506 County Road. LinSig modelling results for the junction are shown in Table 22.

Table 22: A506 County Road / St Kevin's Drive – LinSig modelling results

Approach	Weekday AM Peak			Weekday PM Peak		
	MMQ (pcu)	Total Delay (pcu/Hr)	MMQ (pcu)	Total Delay (pcu/Hr)	MMQ (pcu)	Total Delay (pcu/Hr)
2023 Base						
A506 County Road (N)	32.5%	4	8.19	28.3%	4	9.21
A506 County Road (S)	49.7%	8		76.1%	17	
St Kevin’s Drive	50.7%	4		36.9%	2	
2023 Base + Committed Development						
A506 County Road (N)	55.1%	8	16.91	44.2%	7	64.67
A506 County Road (S)	79.0%	17		107.2%	79	
St Kevin’s Drive	74.4%	8		63.2%	3	
2023 Base + Committed Development + Proposed Development						
A506 County Road (N)	54.7%	8	17.20	47.1%	8	79.73
A506 County Road (S)	81.9%	19		109.8%	94	
St Kevin’s Drive	79.1%	8		63.2%	3	
2028 Base						
A506 County Road (N)	33.8%	5	8.65	29.4%	4	9.98
A506 County Road (S)	51.8%	9		79.1%	19	
St Kevin’s Drive	52.7%	5		38.7%	2	
2028 Base + Committed Development						
A506 County Road (N)	54.9%	8	17.71	45.3%	7	82.11
A506 County Road (S)	79.3%	18		110.3%	96	
St Kevin’s Drive	81.1%%	9		64.9%	4	
2028 Base + Committed Development + Proposed Development						
A506 County Road (N)	56.1%	9	19.04	48.3%	8	97.67
A506 County Road (S)	84.0%	20		112.9%	111	
St Kevin’s Drive	81.1%	89		64.9%	4	
2028 Base + Committed Development + Proposed Development (Future Provision)						
A506 County Road (N)	56.3%	9	22.01	53.0%	9	122.35
A506 County Road (S)	89.6%	24		116.9%	135	
St Kevin’s Drive	86.5%	10		64.9%	4	

The results demonstrate that in the 2023 and 2028 assessment years with the addition of committed development traffic, the junction is expected to operate over capacity with a degree of saturation of over 100% on the A506 County Road (S) approach in the PM Peak.

The addition of the proposed station traffic does demonstrate some increases in queueing and degree of saturation, but this is not considered significant in the context of the 'worst case' assessment presented. It is also worth noting that the proposed station development is likely to attract car journeys that were already on the local highway network and would divert to the station car park upon opening, although this effect has not been modelled.

It is therefore considered that the traffic associated with the proposed development can be accommodated at the A506 County Road / St Kevin's Drive junction without significant impact on the future baseline situation.

7 Conclusion

Arup has been commissioned by Buckingham Group Contracting Limited on behalf of Network Rail to produce a Transport Assessment to assess the highway and transport impacts of the proposed new railway station at Headbolt Lane.

The policy review has demonstrated that the proposed development aligns with planning policy and guidance at both a national and local level. A Travel Plan has been produced alongside the TA to help encourage walking, cycling and public transport use to / from the proposed station.

The site layout has been developed with the aim of enhancing the connectivity of the new station by walking and cycling, and proposals for bus facilities have been developed through consultation with Merseytravel.

The trip generation assessment has shown that the new station is anticipated to generate around 2,500 daily person trips. In terms of vehicle trips, the station is expected to generate 132 and 171 two-way vehicle movements during the weekday morning and evening peak hours, respectively.

A new signalised crossroad junction is proposed on Headbolt Lane to serve as the site access. The new junction comprises single lane approaches with signalised pedestrian crossings on all arms. Modelling of the junction has demonstrated that the proposed layout provides sufficient capacity to accommodate the forecast traffic demand up to 2028.

Junction modelling has also been undertaken for four existing junctions on the local highway network. The modelling results demonstrate that the traffic associated with the proposed development can be accommodated at these junctions without significant impact on the future baseline situation.

Overall, therefore, it is concluded that the impacts of proposed development traffic can be accommodated, and that the proposed development is acceptable in transport terms.

Appendix A

Scoping Meeting Minutes

Project title	Headbolt Lane Station	Job number 276736
Meeting name and number	Transport Scope	File reference TRA-001
Location	MS Teams	Time and date 10:00-11:00 5 February 2021
Purpose of meeting	Discussion of scope of Transport Assessment	
Present	Maria Barry (KMBC) Rachel Cornfoot (Arup)	James Tate (Arup)
Apologies	n/a	
Circulation	Those present	

- Action
- Study network**

Agreed the following junctions should be included in the assessment and those with significant development impact to be modelled:

 - Headbolt Lane Station proposed access junction;
 - A506 Bank Lane / Headbolt Lane / A506 County Road / Boyes Brow signalised junction;
 - Stopgate Lane / Pingwood Lane / Shevington's Lane priority junction;
 - Pingwood Lane / Dale Lane / Headbolt Lane priority junction;
 - A506 Bank Lane / Shevington's Lane signalised junction; and
 - A506 County Road / St Kevin's Drive signalised junction.

Requests for signal timing data and junction layouts should be directed to KMBC (Michaela Gray). MB to provide contact details

MB
 - Traffic data**

Traffic survey data from 2014 and 2019 is acceptable to use as new surveys cannot currently be undertaken.

Prepared by Rachel Cornfoot
Date of circulation n/a

Minutes

Project title	Job number	Date of Meeting
Headbolt Lane Station	276736	5 February 2021

		Action
3.	Assessment years Agreed to assess opening year and +5 years after opening.	
4.	Committed development Due to traffic survey data being from 2014/2019, the same committed developments as considered in the Motts TA should be included in the assessment, despite some now being built out. RC to email list of committed developments to MB.	RC
5.	Trip generation Agreed to assess 300 space and 500 space car park scenarios. RC outlined proposed methodology to derive trip generation: - Derive hourly and daily passenger demand from Pedestrian Flow Analysis based on GRIP 2 analysis outputs. - Apply mode split from draft Headbolt Lane Station OBC to understand number of vehicle trips. - Undertake parking accumulation exercise for 300 space scenario. - Sensitivity testing – factor up vehicle arrivals and departures from parking accumulation exercise for a max. 500 accumulation scenario. MB broadly agreed with methodology but outlined importance of demonstrating that the forecast parking demand can be accommodated within the site.	
6.	Trip distribution Trip distribution will be based on that from Motts TA, which was calculated using 2015 OBC and 2011 Census data.	
7.	Personal injury accident data RC outlined that the client holds accident data for Jan 2014-Dec 2018. MB advised that new data would be required to cover latest available five-year period. RC to request.	RC
8.	Car parking provision 300 spaces with passive provision for further 200 spaces is considered acceptable if robust justification is provided within the Transport Assessment (TA). Some EV charging spaces should be provided from day one, with passive provision to meet potential future demand.	

Minutes

Project title

Job number

Date of Meeting

Headbolt Lane Station

276736

5 February 2021

Action

Potential impacts of overspill parking require consideration.

9. **Cycle parking**

100 cycle parking spaces with passive provision for further 200 spaces is considered acceptable, depending on forecast cycle trips outlined in TA. Cycle parking should be high quality, secure and sheltered.

10. **Pedestrian / Cycle Access**

Provision of pedestrian access to south west should be explored.

Provision of pedestrian access onto to Headbolt Lane from west side of car park should be explored.

MB

A segregated cycleway is proposed on Headbolt Lane (by KMBC). MB to provide update on this via email. HBL station proposals should tie into this scheme.

11. **Public Transport**

Discussions regarding rerouting of bus services to serve the site should be directed to Merseytravel (Steve Cook). MB to provide contact and can attend meeting if required.

MB

12. **AOB**

KMBC require an accessibility questionnaire to be submitted with the Transport Assessment. This can be obtained from KMBC's 'Ensuring Choice of Travel SPD'.

A Travel Plan will be required to support the planning application.

Appendix B

Policy Review

National Planning Policy Framework

The National Planning Policy Framework (NPPF) was originally published by the Department for Communities and Local Government (DCLG) in March 2012, with the most recent revision being published in February 2019.

The NPPF details the Government's planning policies for England and how these are to be applied. The document seeks to contribute to promoting sustainable transport, and states that 'transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

- the potential impacts of development on transport networks can be addressed;
- opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;
- opportunities to promote walking, cycling and public transport use are identified and pursued;
- the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and
- patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places.'

Paragraph 109 states that 'development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe'.

In addition, paragraph 110 sets out development design guidelines. Where practical, developments should be designed to:

- 'give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitate access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;
- address the needs of people with disabilities and reduced mobility in relation to all modes of transport;
- create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards; and
- allow for the efficient delivery of goods, and access by service and emergency vehicles.'

The development site is located within a residential area and the proposed development seeks to enhance the connectivity of the area by public transport. A number of measures to promote sustainable travel to / from the station, such as cycle parking facilities and appropriate bus provision, have been incorporated into the proposals. A comprehensive Travel Plan has also been produced for the proposed development.

National Planning Practice Guidance

The National Planning Practice Guidance (NPPG) was last updated in October 2019 and contains guidance on Travel Plans and Transport Assessments, setting out that they are required for all developments which generate significant amounts of movements. The NPPG states that these should be:

- Proportionate to the size and scope of the proposed development to which they relate and build on existing information wherever possible;
- Established at the earliest practicable possible stage of a development proposal;
- Be tailored to particular local circumstances (other locally-determined factors and information beyond those which are set out in this guidance may need to be considered in these studies provided there is robust evidence for doing so locally); and
- Be brought forward through collaborative ongoing working between the local planning authority/transport authority, transport operators, rail network operators, Highways Agency where there may be implications for the strategic road network and other relevant bodies. Engaging communities and local businesses in Travel Plans, Transport Assessments and Statements can be beneficial in positively supporting higher levels of walking and cycling (which in turn can encourage greater social inclusion, community cohesion and healthier communities).

A Transport Assessment and accompanying Travel Plan have been developed in line with this guidance to appropriately assess the potential transport impacts of the proposals and promote a sustainable development.

TfN Strategic Transport Plan

The Strategic Transport Plan (STP) sets out Transport for the North's (TfN) investment priorities for transport across the North and identifies key areas for enhanced connectivity.

The objectives of the STP are to:

- Transform economic performance;
- Create a more efficient, reliable, integrated and resilient transport system;
- Improve inclusivity, health and access to opportunities; and
- Promote the built, historic and natural environment.

By providing a new rail station with facilities for bus interchange, the proposed development will contribute to TfN's aim of creating a more efficient and integrated transport system. It will also improve access to a range of opportunities for residents. This enhanced connectivity and accessibility will support transformational economic growth in the North.

Merseyside Local Transport Plan 3

The Merseyside LTP3, adopted in April 2011, outlines the transport strategy for Merseyside. The LTP3 is a collaborative strategy created by the five Merseyside Local Authorities, which includes Knowsley Metropolitan Borough Council.

The plan sets out a vision for Merseyside's transport network:

‘A city region committed to a low carbon future which has a transport network and mobility culture that positively contributes to a thriving economy and the health and wellbeing of its citizens and where sustainable travel is the option of choice.’

The above vision will be achieved by pursuing six goals:

1. Create conditions to enable sustainable economic growth by supporting the priorities of the Liverpool City Region, the Local Enterprise Partnership and the Local Strategic Partnerships.
2. Provide a clean, resilient and low emission transport system.
3. Ensure the transport system promotes health and wellbeing and road safety.
4. Ensure equal travel opportunities for all and promote a transport network that enables access to employment, education, healthcare, leisure and recreation for all.
5. Ensure the transport system supports economic success for the LCR through the efficient movement of people and goods.
6. Maintain assets to a high standard.

The proposed rail station at Headbolt Lane will provide a new, convenient and sustainable transport option for local people. It will increase the accessibility of a range of opportunities, which in turn which help to support economic growth in the LCR.

LCRCA Transport Plan

The Liverpool City Region Combined Authority (LCRCA) Transport Plan (2019) sets out a strategic framework and delivery plan for transport in the LCR. The strategic objectives of the plan include:

- supporting inclusive economic growth by developing a transport network that connects people, businesses and visitors;
- creating a new mobility culture with modern, safe, clean and inclusive transport, where public transport is the mode of choice, which in turn will help to enhance health and wellbeing;
- developing a liveable and reliant city region that addresses poor air quality and supports a zero carbon LCR by 2040;
- providing a safe, well maintained and resilient transport network.

The LCRCA Transport Plan emphasises the importance of connecting people, business and visitors whilst promoting sustainability, health and wellbeing. The proposed development itself would provide a sustainable travel option for local residents and increased accessibility for all its users, which will help to support the LCRCA’s goal of making public transport the mode of choice.

LCRCA Long Term Rail Strategy

The LCRCA Long Term Rail Strategy, most recently updated in April 2018, has been developed to ensure the rail network meets the LCR’s needs for the next 30 years and

beyond. It seeks to support the development of the network to increase connectivity, capacity and frequency to generate a clustering effect and in turn, increased productivity.

The Strategy notes areas of weaker connectivity within the LCR, including the Merseyrail line to Kirkby, which should be prioritised for growth.

It also identifies some existing constraints on the rail network, such as lack of connectivity between places where people live and employment areas. The Strategy goes on to identify how a new station at Headbolt Lane would open up the rail network to a population that does not currently have easy access to it. It is therefore considered that the proposed station at Headbolt Lane is an important component to achieving the aims of the LCRCA Long Term Rail Strategy.

LCRCA Local Cycling and Walking Infrastructure Plan

The Local Cycling and Walking Infrastructure Plan (LCWIP) is a ‘strategic approach to developing a cohesive network of high standard active travel routes across the region’ between 2019-29. The LCWIP has been developed in accordance with the Department for Transport’s Cycling and Walking Investment Strategy.

A key objective of the LCWIP is to develop a walking and cycling network that increases active travel by providing safe, accessible, comfortable, direct and coherent routes.

The proposed station at Headbolt Lane has been developed with the aim of maximising the connectivity of the site for pedestrians and cyclists, for example, through the provision of new pedestrian crossing infrastructure on Headbolt Lane and high-quality cycle parking adjacent to the station building. It is therefore considered that the proposals align with the aims of the LCWIP.

Knowsley Local Plan: Core Strategy

The Knowsley Local Plan Core Strategy (2016) sets out a strategic framework for the development of Knowsley up to 2028 and beyond.

Strategic Objective 6 relates to sustainable transport. It states that new development should seek to prioritise sustainable transport to help improve accessibility between housing and employment areas, as well as shopping leisure, healthcare, education and other services.

The Core Strategy contains a number of policies pertaining to transport and the proposed development.

Policy SD1 states that a positive approach will be adopted when considering development proposals, in accordance with the NPPF’s presumption in favour of sustainable development. Planning applications that accord with Local Plan policies will be approved without delay.

Policy CS7 states that planning powers will be used to support an integrated and sustainable transport system within the borough that:

- supports the development needs of the borough up to 2029;
- enables people to travel by walking, cycling and public transport;
- enhances road safety;

- strives to reduce carbon emissions; and
- supports local people's health and wellbeing.

New development will need to be:

- located and designed to maximise accessibility by sustainable modes, with developer contributions required where deficiencies are identified;
- designed to ensure large scale proposals are in the most accessible locations;
- supported by a Transport Assessment and Travel Plan;
- compliant with adopted parking standards; and
- supported by measures to reduce carbon emissions and improve air quality.

The Council will work with partners to deliver schemes which support the Merseyside LTP3 priorities including:

- improvements to the rail network such as electrification, improvements to stations and interchange facilities and provision of Park and Ride facilities;
- enhanced bus provision, including improved facilities and enhancement of key bus routes through Quality Bus Partnerships and Quality Bus Contracts; and
- provision of walking and cycling routes as part of the Green Infrastructure Network.

Policy CS8 seeks to maximise the benefits of green infrastructure for the borough. Planning powers will be used to manage and enhance green infrastructure in order to provide sustainable transport links between residential areas, employment areas, community services and leisure opportunities.

Policy CS12 identifies Tower Hill as a principal regeneration area. Redevelopment of the area will be supported through:

- public realm and green infrastructure enhancements with a focus on quality, accessibility and integration with new development;
- infrastructure improvements including enhanced public transport, walking and cycling provision to increase accessibility in Tower Hill and surrounding area; and
- flexibility to integrate the potential delivery of a new rail station / Park and Ride facility to the south of Headbolt Lane.

Policy CS19 sets out the expectations for design quality and accessibility in new development:

- complement and enhance existing green infrastructure where possible;
- create places that facilitate social interaction and active lifestyles, and integrate high quality public realm; and
- deliver safe and convenient routes for movement that prioritise walking, cycling and public transport and meet the needs of all users.

Strategy for Knowsley: ‘The Borough of Choice’

The Strategy for Knowsley: The Borough of Choice, adopted in 2013, focuses on actions to deliver the short-term priorities for the borough. By 2023, the Strategy wants Knowsley to have:

- attractive, sustainable neighbourhoods and vibrant, welcoming town centres;
- residents who are enabled to make positive lifestyle choices;
- high quality employment areas to support economic growth in the LCR; and
- narrowed the deprivation gap between areas in Knowsley and elsewhere.

The proposed development would provide sustainable travel options for the local community, whilst improving accessibility to a wider range of opportunities for residents. It is therefore considered to be in accordance with the Strategy for Knowsley: The Borough of Choice.

Knowsley Replacement Unitary Development Plan

The Knowsley Replacement Unitary Development Plan (UDP), adopted in June 2006, sets out KMBC’s strategy for development in the borough. Following the adoption of the Knowsley Local Plan, 39 UDP policies remain active, a number of which pertain to transport and new development.

Policy T5 states that all major traffic generating developments should be well located for access by walking, cycling and public transport.

Policy T7 outlines how new development should seek to enhance the walking and cycling network in order to promote health and wellbeing for all.

Policy T8 states that any development proposals that generate a material increase in traffic on the highway network should be supported by a Transport Assessment, and any associated impacts mitigated as appropriate. Similarly, **Policy T9** states that all major traffic generating developments must be supported by a Travel Plan.

Policy T10 outlines how new development must provide suitable access for the less mobile in accordance with the Disability Discrimination Act 1995 and its successors.

By providing new rail connections, the proposed development would support a number of the policies outlined in the UDP. The proposals have been developed to ensure sustainable and inclusive access for users of the station.

Furthermore, a Transport Assessment and Travel Plan have been produced to support the planning application for the new station.

The proposed development is therefore considered to be in accordance with the above policies outlined in the UDP.

Ensuring a Choice of Travel SPD

The ‘Ensuring a Choice of Travel’ Supplementary Planning Document was published by KMBC in 2010. It sets out how new developments can satisfy the accessibility requirements of policies within the Knowsley Replacement Unitary Development Plan.

The main objective of the SPD is to ensure a good choice of travel modes to all new development. The proposed development includes provision for access by a range of sustainable travel modes, including rail, bus, walking and cycling.

The SPD states that parking areas should be designed to ensure pedestrians and cyclists are given priority over motor vehicles where possible. The internal layout of the proposed development has been designed as such. A 3m wide bi-directional cycleway is proposed alongside the vehicle access road and dedicated pedestrian footways and zebra crossings are provided throughout the car park.

In terms of cycle parking, the SPD states that a wide range of cycle storage options should be considered when designing facilities. A high level of cycle parking provision is proposed adjacent to the station building to ensure convenient access for cyclists.

Tower Hill Action Area SPD

The Tower Hill (Kirkby) Action Area Supplementary Planning Document was published by KMBC in April 2007. The purpose of the SPD is to guide future development proposals for the Tower Hill Action Area. The objectives of the SPD include:

- **Urban quality** – to provide a high quality, sustainable and accessible village centre that serves as the focus for the wider Tower Hill regeneration. This requires the delivery of comprehensive development, redevelopment and improvement.
- **Community cohesion** – to create attractive, safe, and well-designed neighbourhoods with good connectivity to each other and the village centre. This requires the delivery of high-quality, accessible public realm that provides facilities for the whole community.
- **Sustainable transport** – to promote sustainable transport by providing an integrated, well-connected network of roads, footways, cycleways, and public transport facilities that ensure permeability and accessibility within and to / from Tower Hill.

The SPD also notes the aspiration for a rail station to be provided on the Headbolt Lane site. It states the importance of providing a bus link within the proposed station site to enhance connectivity within Tower Hill.

Appendix C

Accessibility Assessment Form

Accessibility Assessment Form

Access on foot			Points	Score	Justification for Scoring
Location	<u>Residential Development:</u> Is the site within 800m of a district or local centre (see Accessibility Maps) OR <u>Non-residential development:</u> Is the density of existing local housing (i.e. within 800m) more than 30 houses per hectare (see Accessibility Maps)	Yes	2	2	Existing local housing generally at density of more than 30 houses per hectare, as per KMBC Accessibility Maps.
		No	0		
Internal layout	Does 'circulation' and access inside the sites reflect direct, safe and easy to use pedestrian routes for all, with priority given to pedestrians when they have to cross roads or cycle routes?	Yes	1	1	A series of footways and zebra crossings are proposed throughout the site to facilitate safe pedestrian movements.
		No	0		
External layout	Are there barriers between site and local facilities or housing, which restrict pedestrian access? Examples include no dropped kerbs at crossings or on desire lines; steep gradients; a lack of a formal crossing where there is heavy traffic; security concerns, e.g. lack of lighting	Yes	-1	1	There is a current lack of crossing provision on Headbolt Lane, and sections with no footway on the southern side of Headbolt Lane. The proposed development includes a new site access junction on Headbolt Lane with signalised pedestrian crossings on all arms of the junction. A new uncontrolled crossing with dropped kerbs and tactile paving is also proposed on Headbolt Lane to the east of the
		No	1		

					site, providing access to the residential area to the northeast The proposed southern access to the station will significantly improve north-south connectivity between the residential areas to the north and south and the station.
				Total Score	4
				Minimum score required	4

Comments or action needed to correct any shortfall

N/A

Access by Cycle			Points	Score	Justification for Scoring
Location	<u>Residential Development</u> : Is the site within 1500m of a district or local centre (see Accessibility Maps)	Yes	2	2	Existing local housing generally at density of more than 30 houses per hectare, as per KMBC Accessibility Maps.
	<u>Or</u> <u>Non-residential development</u> : Is the density of existing local housing (e.g. within 1500m) more than 30 houses per hectare (see Accessibility Maps)	No	0		
Internal layout	Does 'circulation' and access inside the site reflect appropriate and direct cycle routes, with priority given to cyclists where they meet motor vehicles?	Yes	1	1	A 3m wide bi-directional cycleway is proposed alongside the vehicle access road, providing a continuous off-road cycle route through the site.
		No	0		
External	Is the development	Yes	1	1	

Access	within 400m of an existing or proposed designated cycle route and/ or proposes to create a link to a cycle route, or develop a route.	No	-1		that KMBC plans to deliver a new cycleway on the southern side of Headbolt Lane. The proposed station access junction design has been developed to enable the future cycleway to tie into the junction.
Other	Development includes cycle parking, shower facilities, and lockers for cyclists.	Yes	1	1	Parking facilities for 100 cycles will be provided adjacent to the station building, with passive provision for a further 200 spaces.
		No	0		
	Total Score			5	
	Minimum score required			5	
Comments or action needed to correct any shortfall					
N/A					

Access by Public Transport			Points	Score	Justification for Scoring
Location and access to public transport	Is the site within a 200m walk of a bus or tram stop, and/or within 400m of a rail station?	Yes	2	2	There are existing bus stops within 200m of the site on Headbolt Lane. The proposed development will provide a new rail connection for the local area. 2no. bus stops are to be provided on site.
		No	0		
	Are there barriers on direct pedestrian routes to bus or tram stops or rail stations e.g. a lack of dropped kerbs, footpaths less than 2m wide, a lack of formal crossings and / or bus stop infrastructure.	Yes	0	1	There is a current lack of crossing provision on Headbolt Lane, and sections with no footway on the southern side of Headbolt Lane
		No	1		

					However, the aforementioned pedestrian crossing proposals will improve access to existing bus stops on Headbolt Lane. The proposed bus stops on site are located adjacent to the station building and are therefore easily accessible.
Frequency	High (four or more bus or tram services or trains an hour)		2	2	As a rail station with a bus interchange facility, the proposed development will be highly accessible by public transport. It is envisaged that the station will be served by c.5-6 trains and c.10 buses per hour.
	Medium (two or three bus or tram services or trains an hour)		1		
	Low (less than two bus or tram services or trains an hour)		0		
Other	The proposal contributes to bus priority measures serving the site	Yes	1	1	2no.bus stops and a bus turning loop are provided on site. The station access junction has been designed to provide sufficient capacity to minimise delay to buses.
		No	0		
	The proposal contributes to bus stops, bus interchange, tram facilities or bus or rail stations in the vicinity and/or provides bus stops or bus interchange in the site	Yes	1	1	As a rail station with a bus interchange facility, the proposed development will be highly accessible by public transport
		No	0		
	The proposal contributes to an existing or new	Yes	1	0	
		No	0		

	supported bus service				
	Total Score			7	
	Minimum score required			6	
Comments or action needed to correct any shortfall					
N/A					

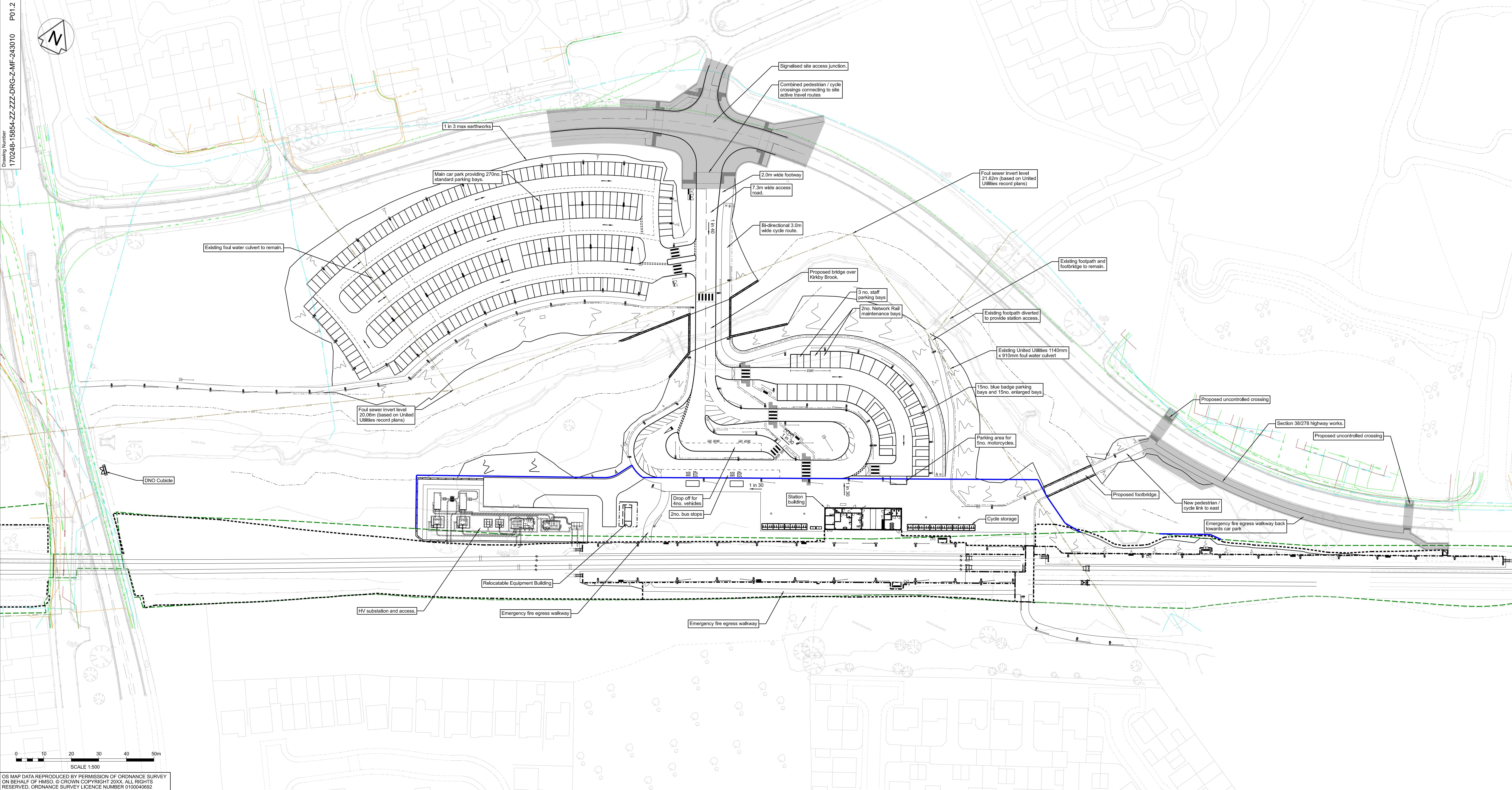
Parking			Points	Score	Justification for Scoring
Parking	The off-street parking provided is as advised in Section 4 for that development type	Yes	1	n/a	Section 4 does not provide parking standards for rail stations.
		No	0		
	The off-street parking provided is less than 75% of the amount advised in Section 4 for that development type (or shares parking provision with another development).	Yes	2	n/a	As above.
		No	0		
	For development in controlled parking zones:				
	Is the proposal for a car free development?	Yes	1	0	
		No	0		
	Does it support the control or removal of on-street parking spaces (inc provision of disabled spaces) or contributes to other identified measures in the local parking strategy (including car clubs)	Yes	1	0	
		No	0		
	Total Score			n/a	
	Minimum score required			1	

Comments or action needed to correct any shortfall.

KMBC does not provide parking standards for rail stations. The suitability of the parking provision is detailed and justified in the Transport Assessment supporting the planning application. The TA includes details of trip forecasting and a parking accumulation exercise.

Appendix D

Car Park Layout



Legend/Notes

1. Do not scale from this drawing.
2. All dimensions are in millimetres unless shown otherwise.

Key:

- Existing Network Rail Boundary
- Proposed Network Rail boundary alterations
- Works subject to Section 278 Agreement
- Seating
- CCTV Column
- Lighting Column

Key (Utilities):

- Existing BT Network
- Existing Surface Water Sewer
- Existing Foul Sewer
- Existing Potable Water
- Existing LV Electric
- Existing HV Electric
- Existing Virgin Media
- Existing Low Pressure Gas

Rev	Date	Description of Revisions	Drawn	Chkd	Appr	Stability
P01.2	18/07/21	First Revision	---	---	---	---
Status						S0
Issued for Planning						

NetworkRail

Authorised: --- Signed: --- Date: ---

Contractor(s): **Ove Arup & Partners**

Location/Level: No Specific Location

Type: CAD Drawing Sub-type: Plan

Role: General (non-disciplinary) Discipline: Multi-Functional

Volume/System: No Specific Volume or System

Phasing: Proposed Grip Stage: 4

Project: Headbolt Lane

Contract No.: **170248**

Contract Title: **Headbolt Lane**

Drawing Title: **Planning Application Drawing**
Car Park and Access Layout

Designed	Signed	Date
---	---	---
Drawn	Signed	Date
---	---	---
Checked	Signed	Date
---	---	---
Approved	Signed	Date
---	---	---

Scales(s): ELR & Mileage **WKL2 28.1232 to 29.0913**

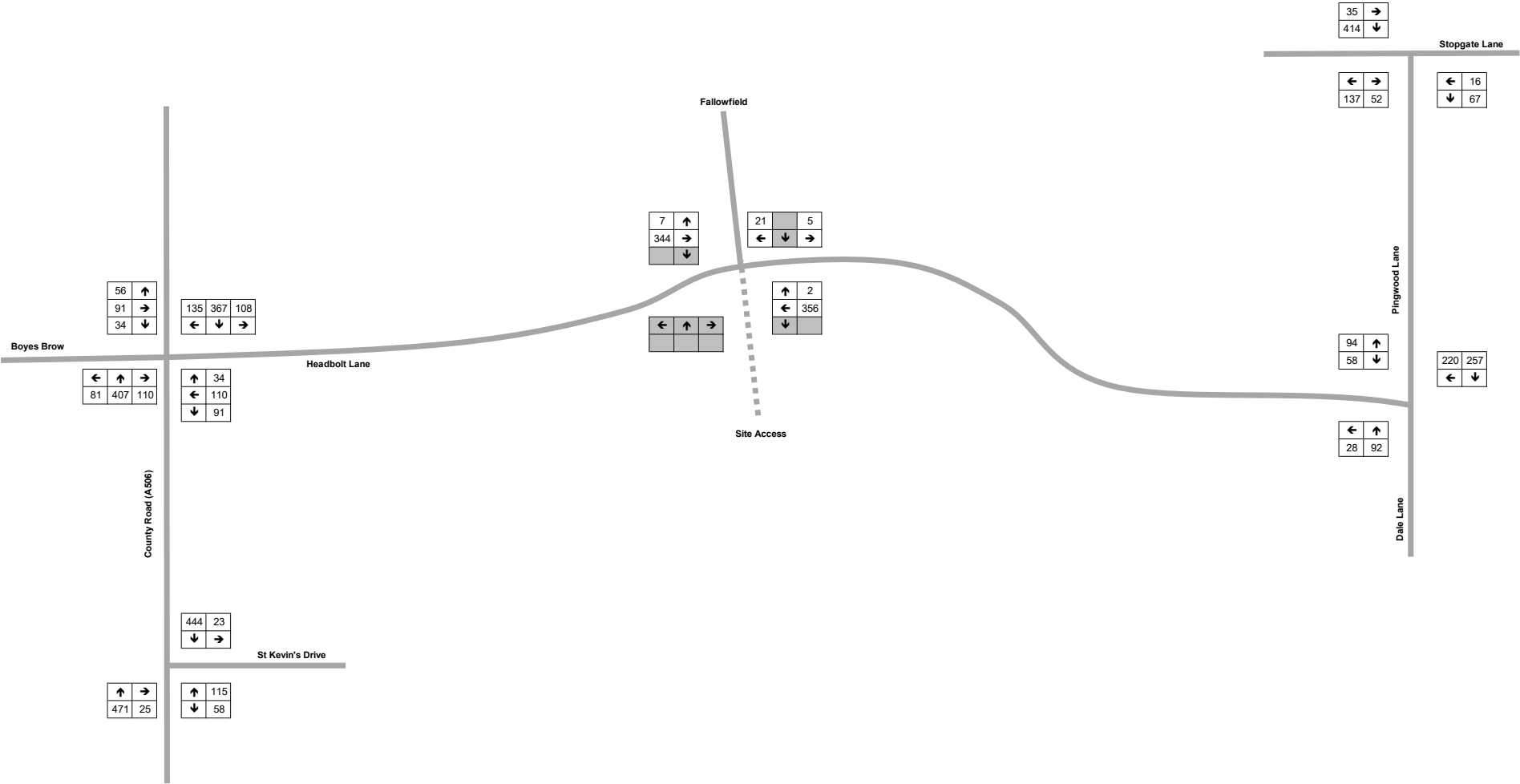
Alternative Reference: Sheet of Revision

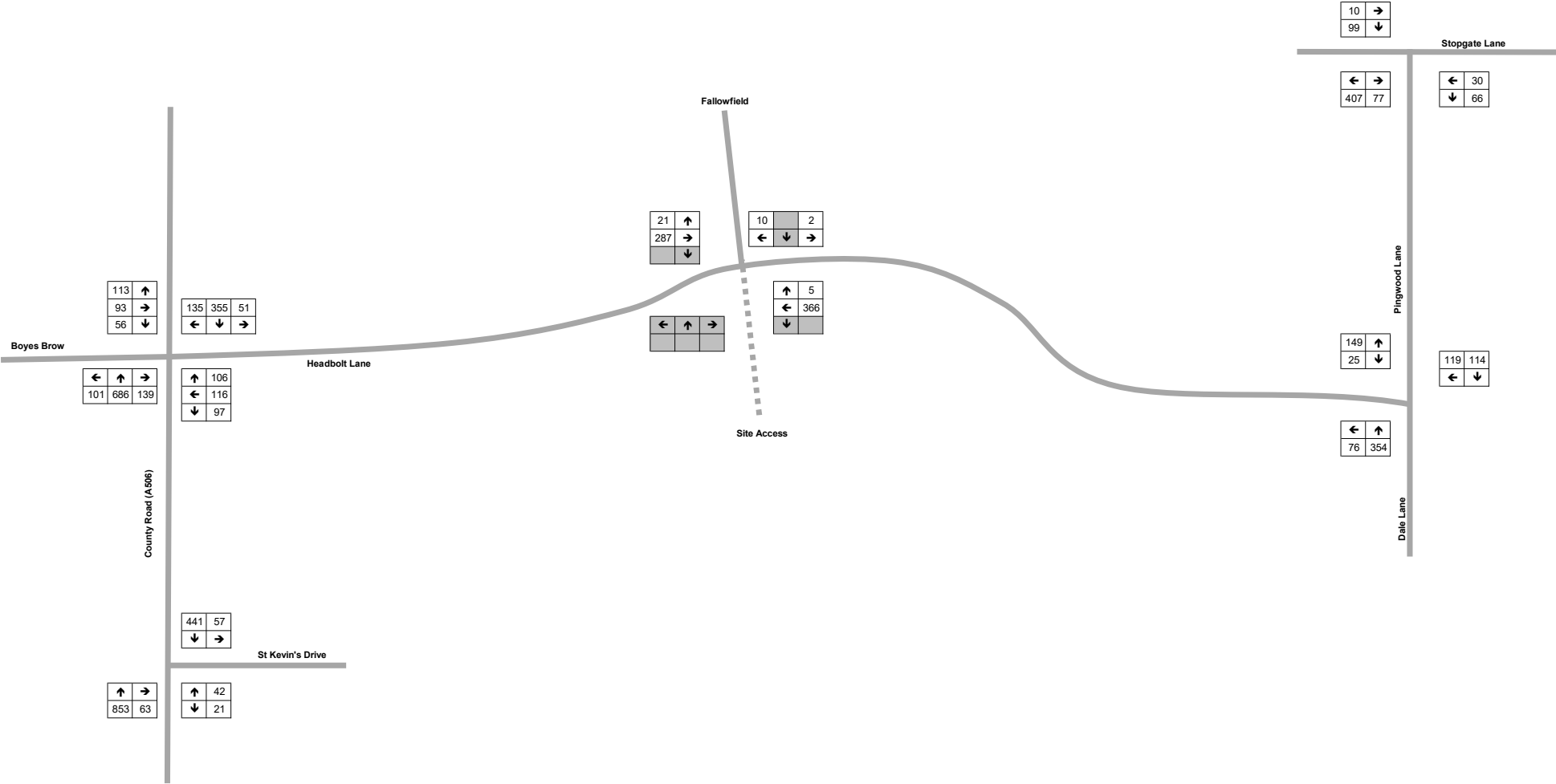
Drawing Number: 170248-15854-ZZZ-DRG-Z-MF-243010

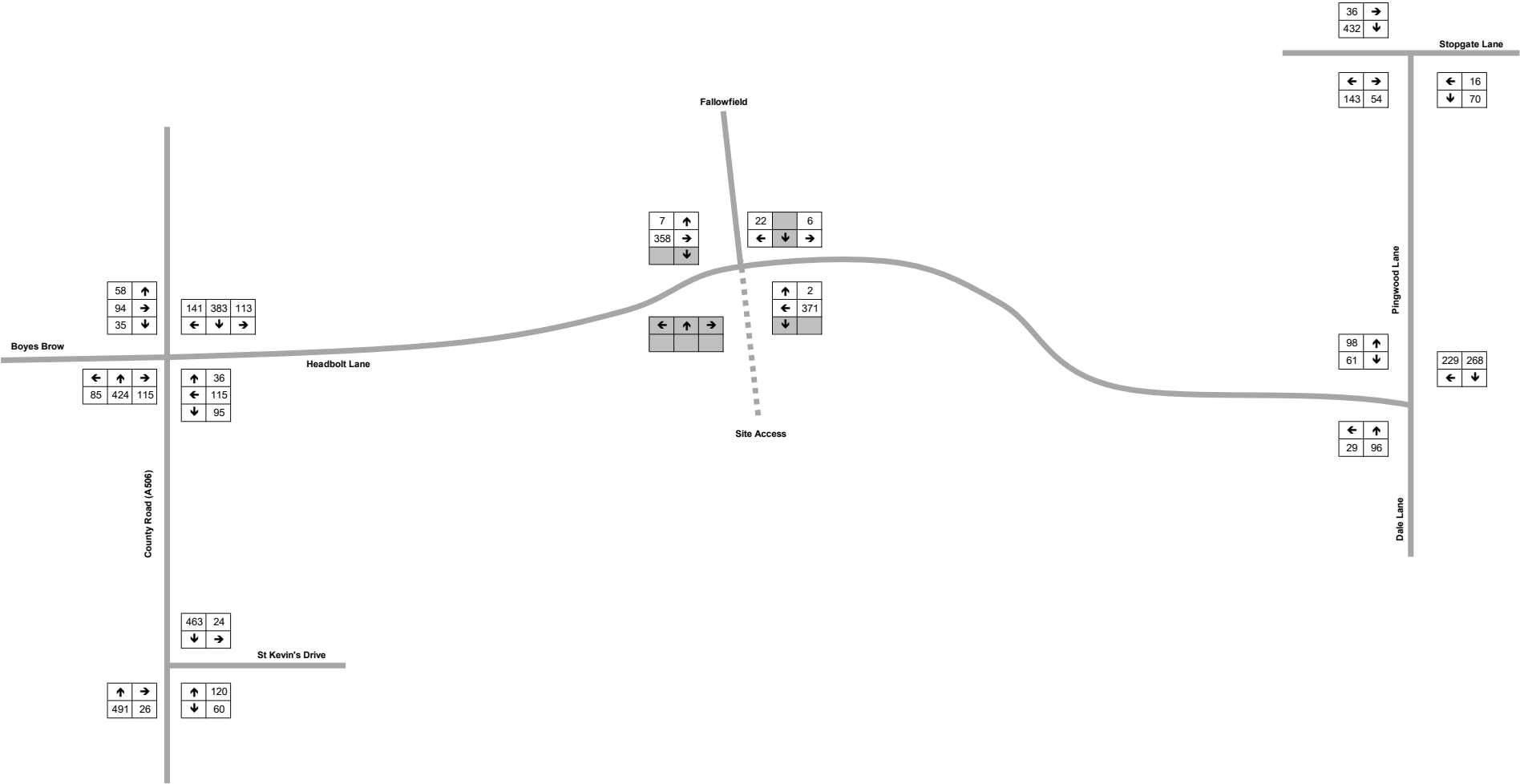
Revision: P01.2

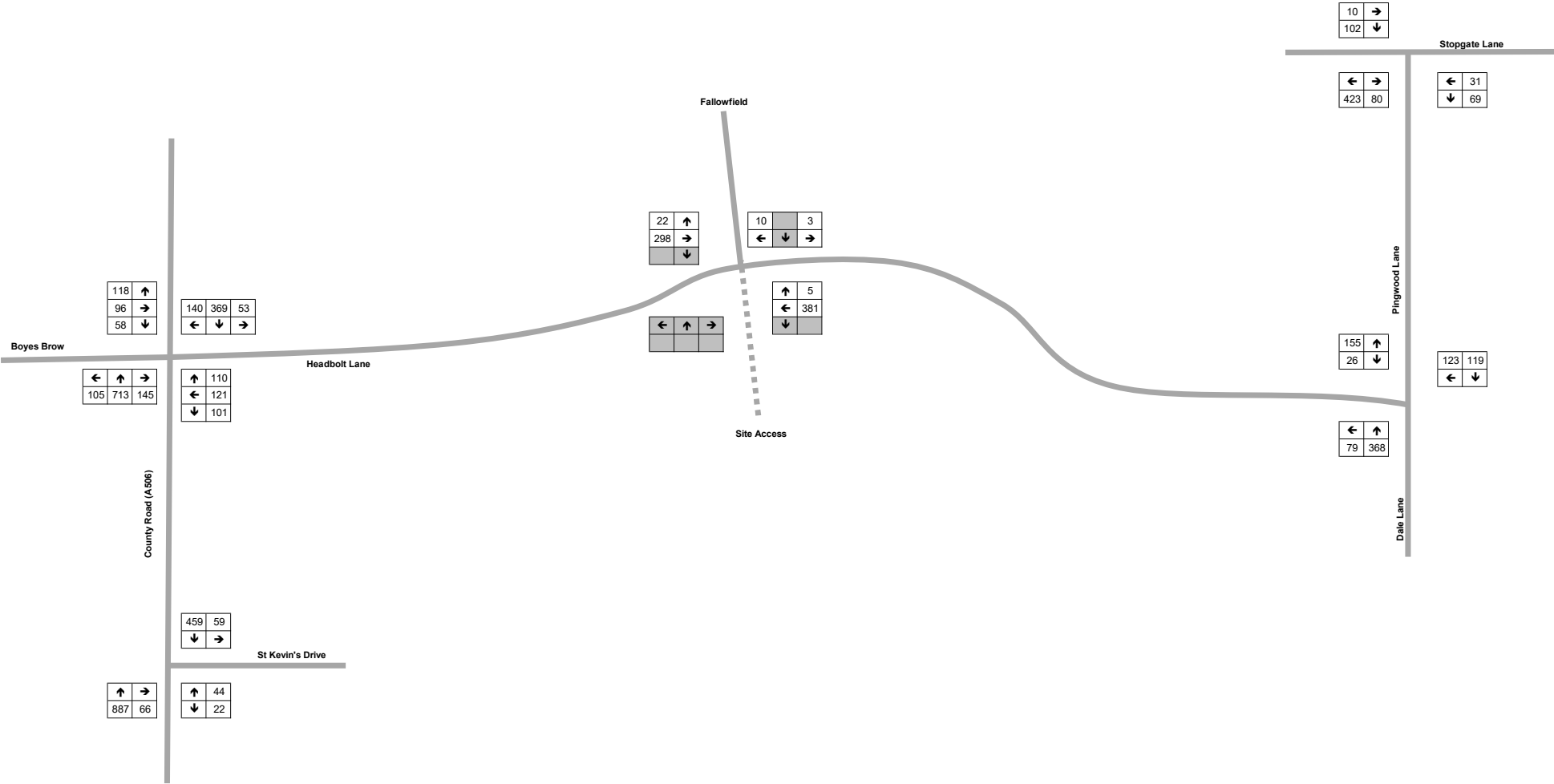
Appendix E

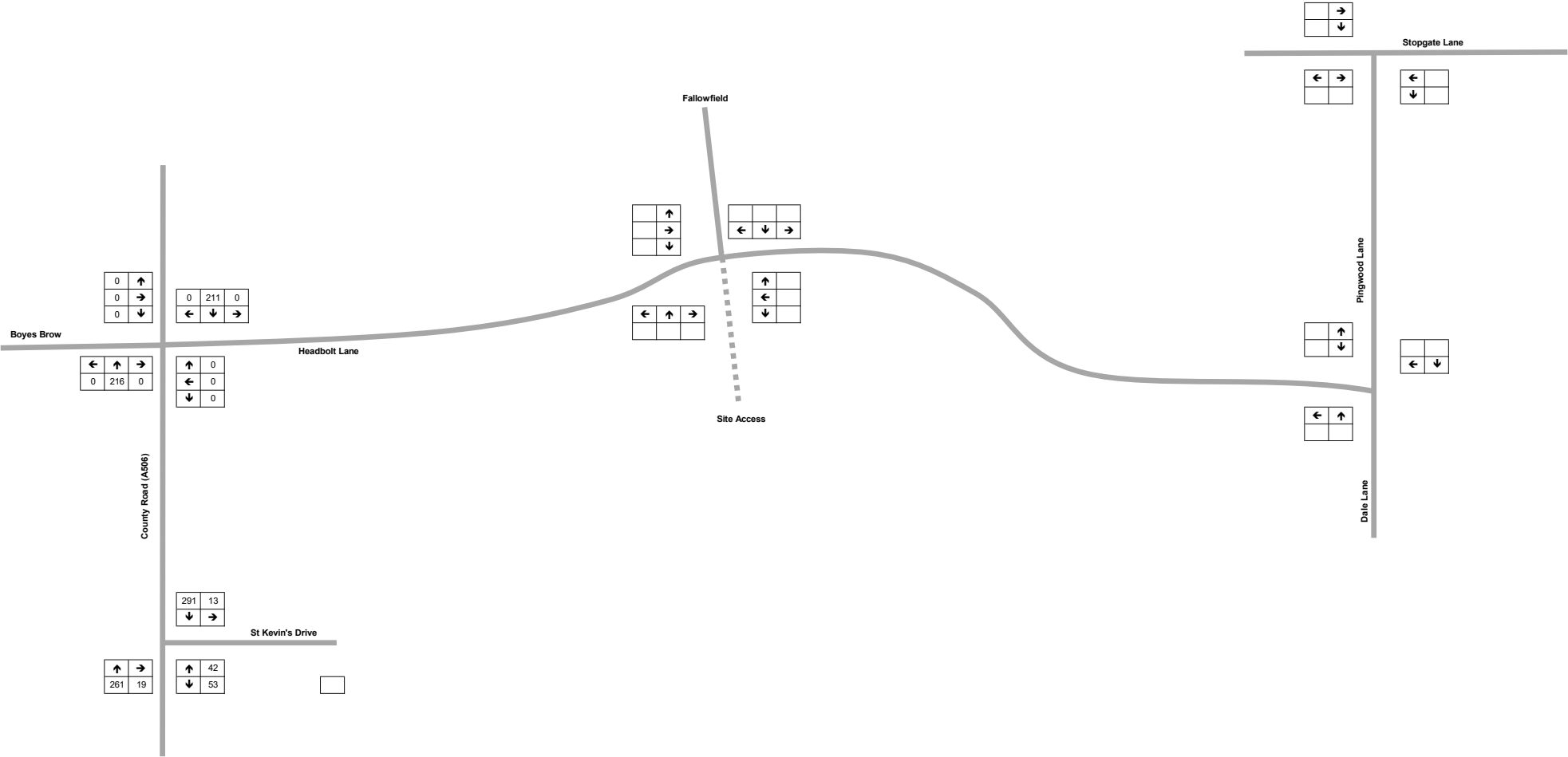
Traffic Flow Diagrams

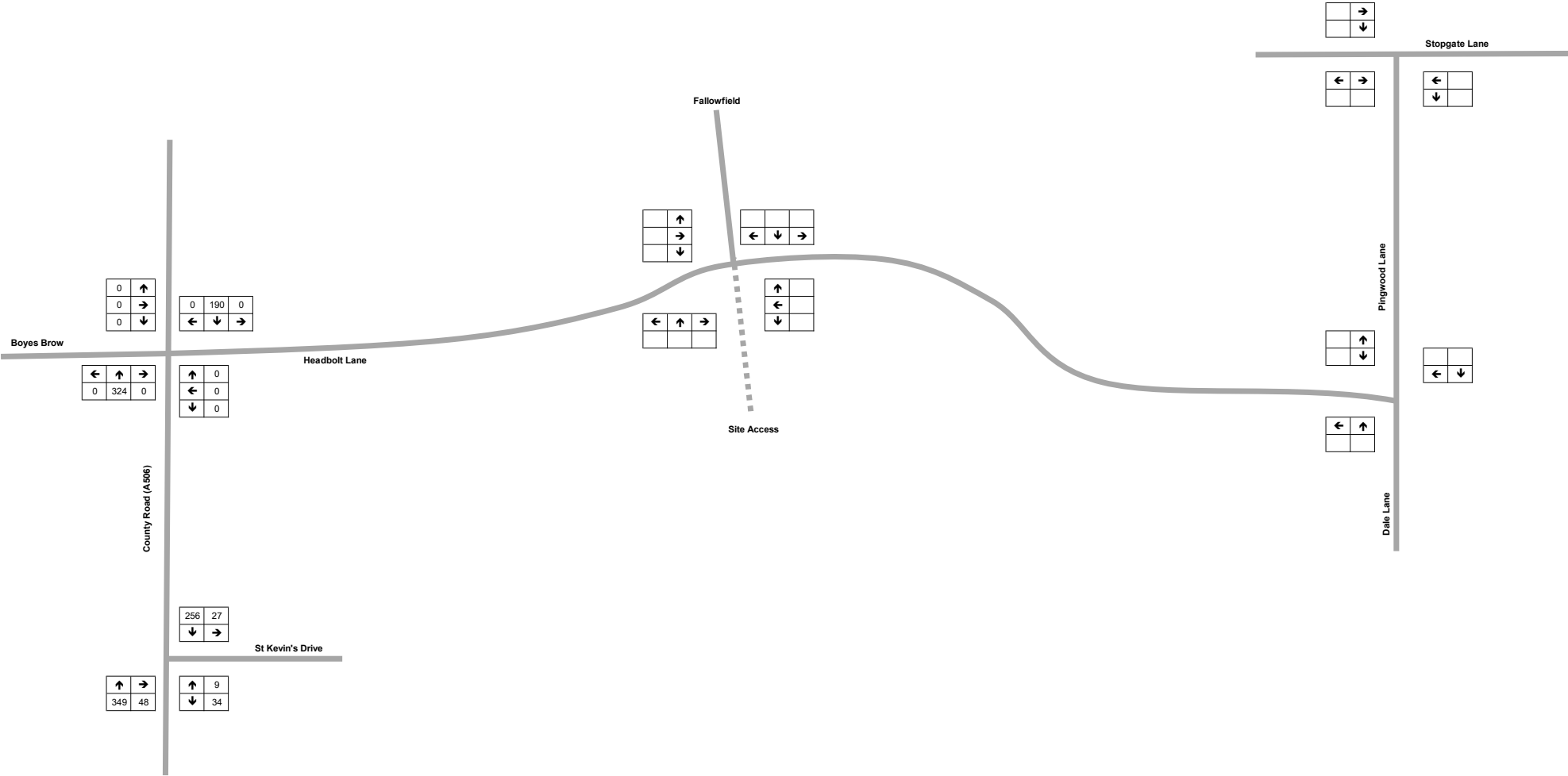


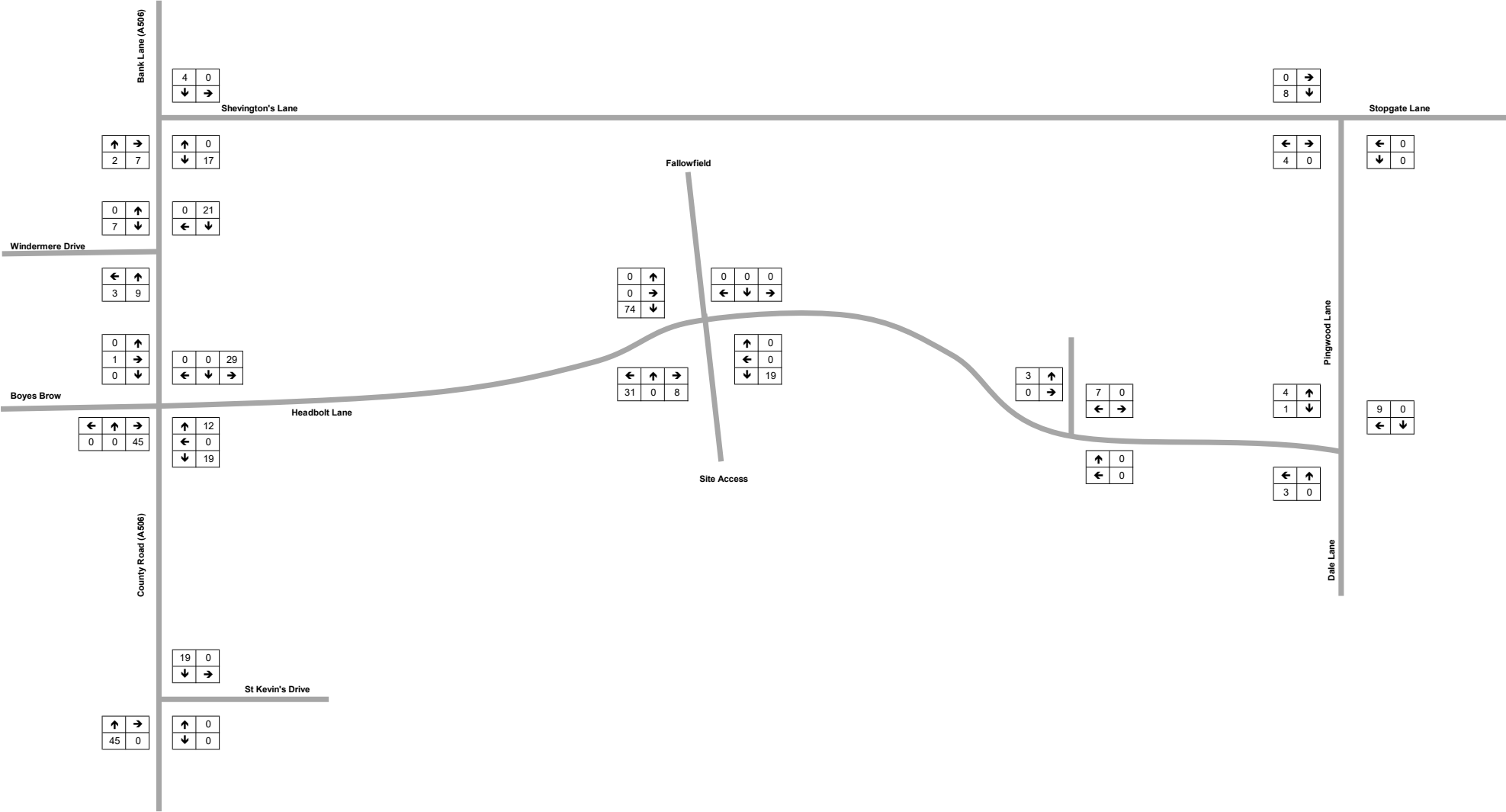


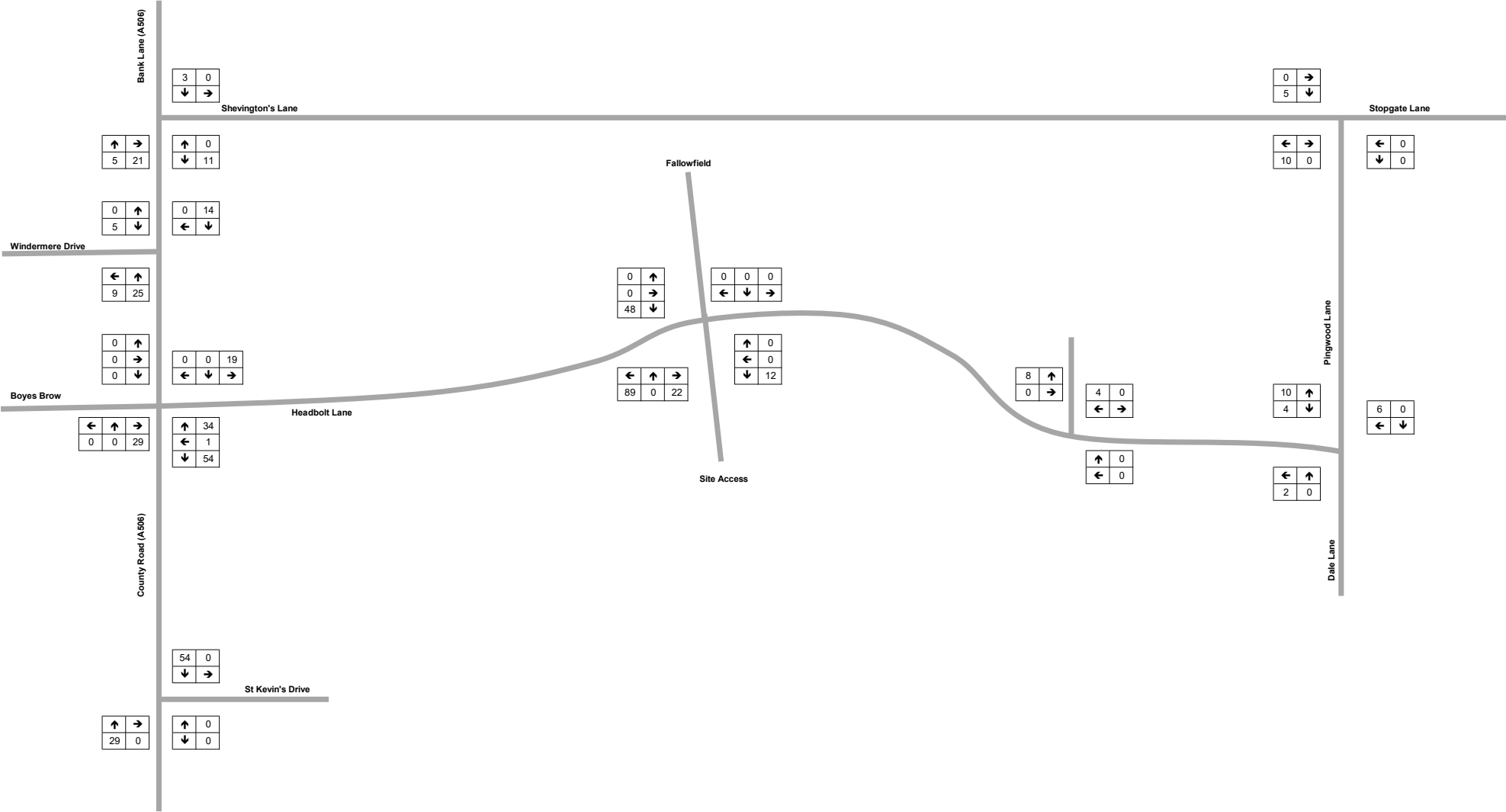


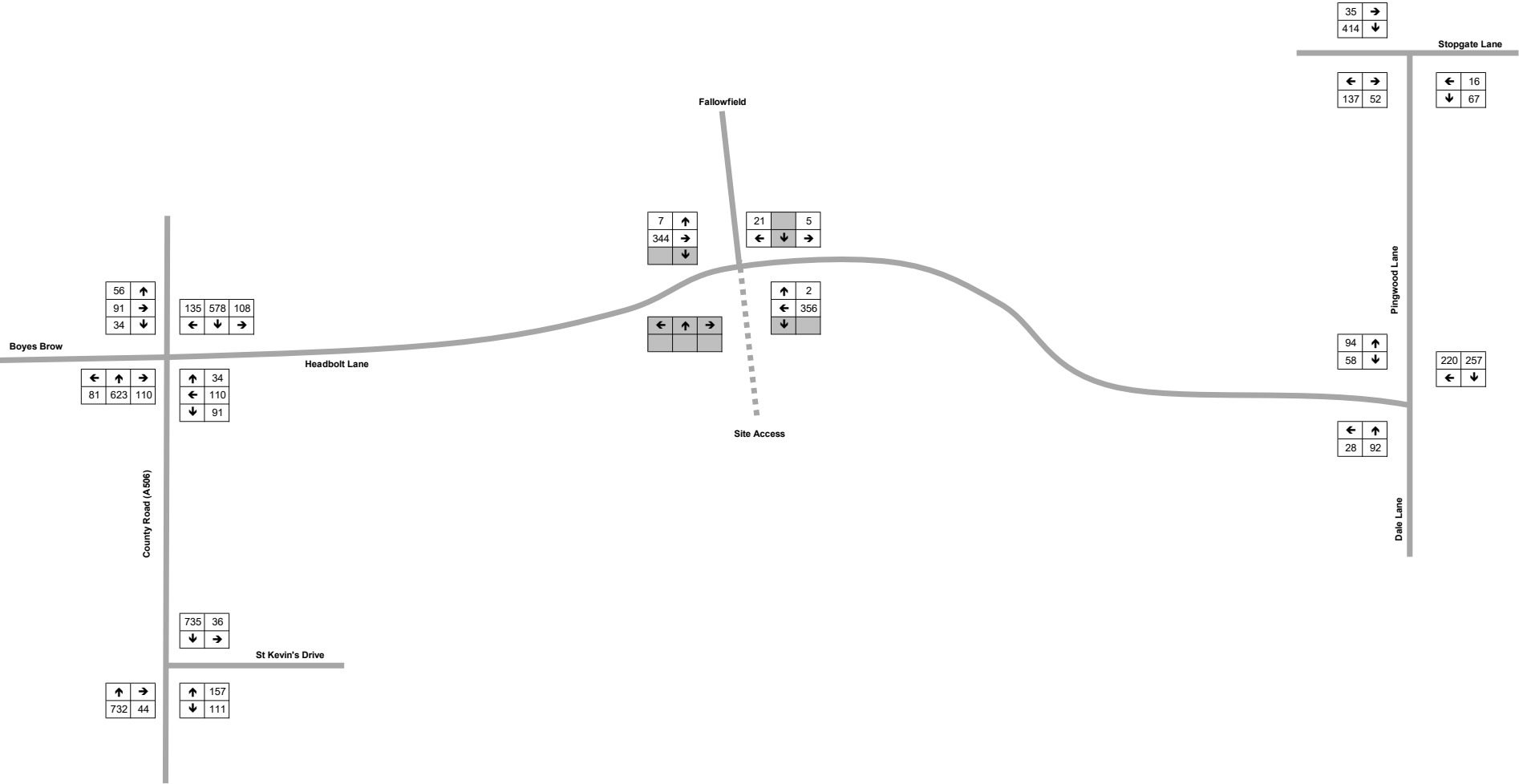


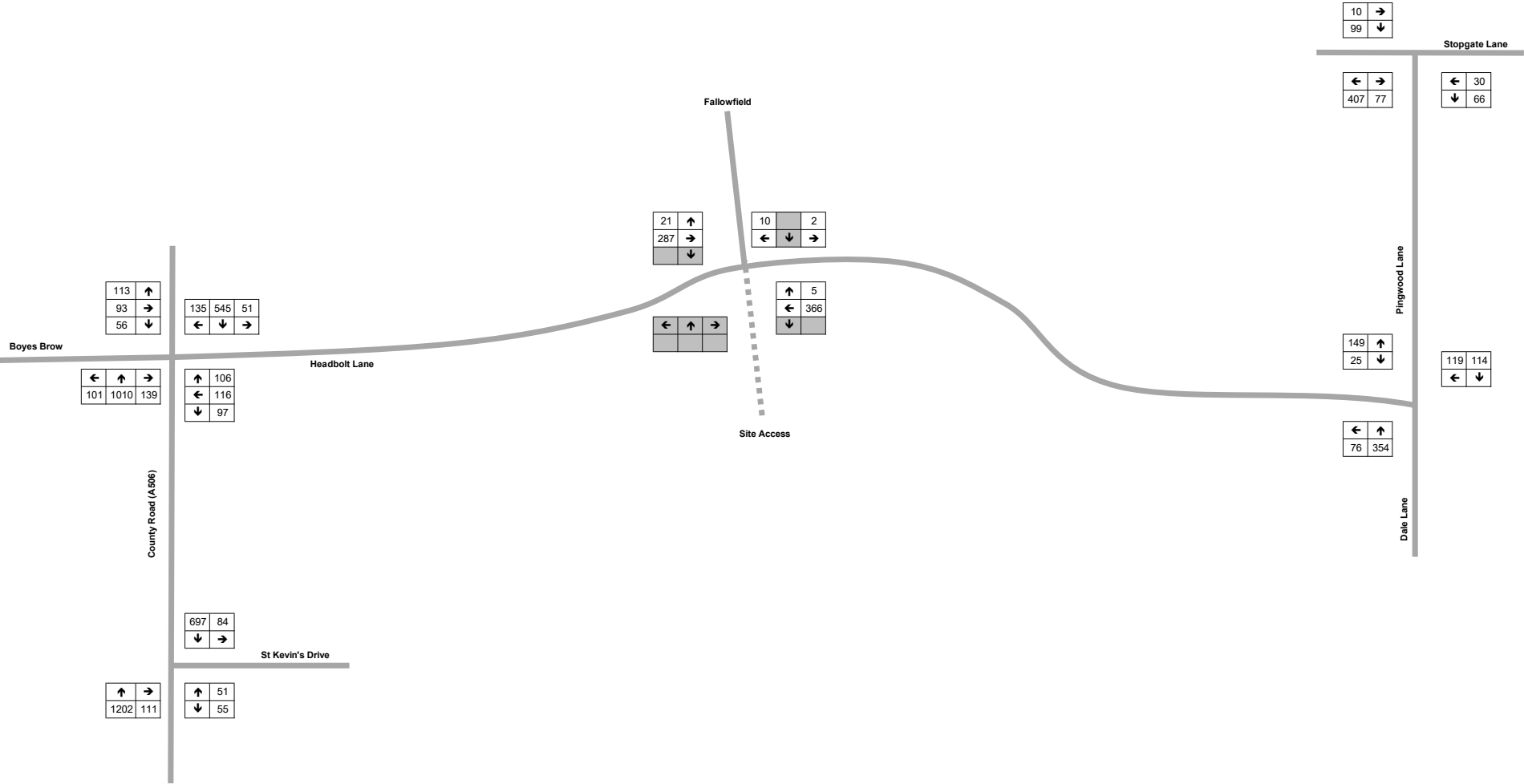


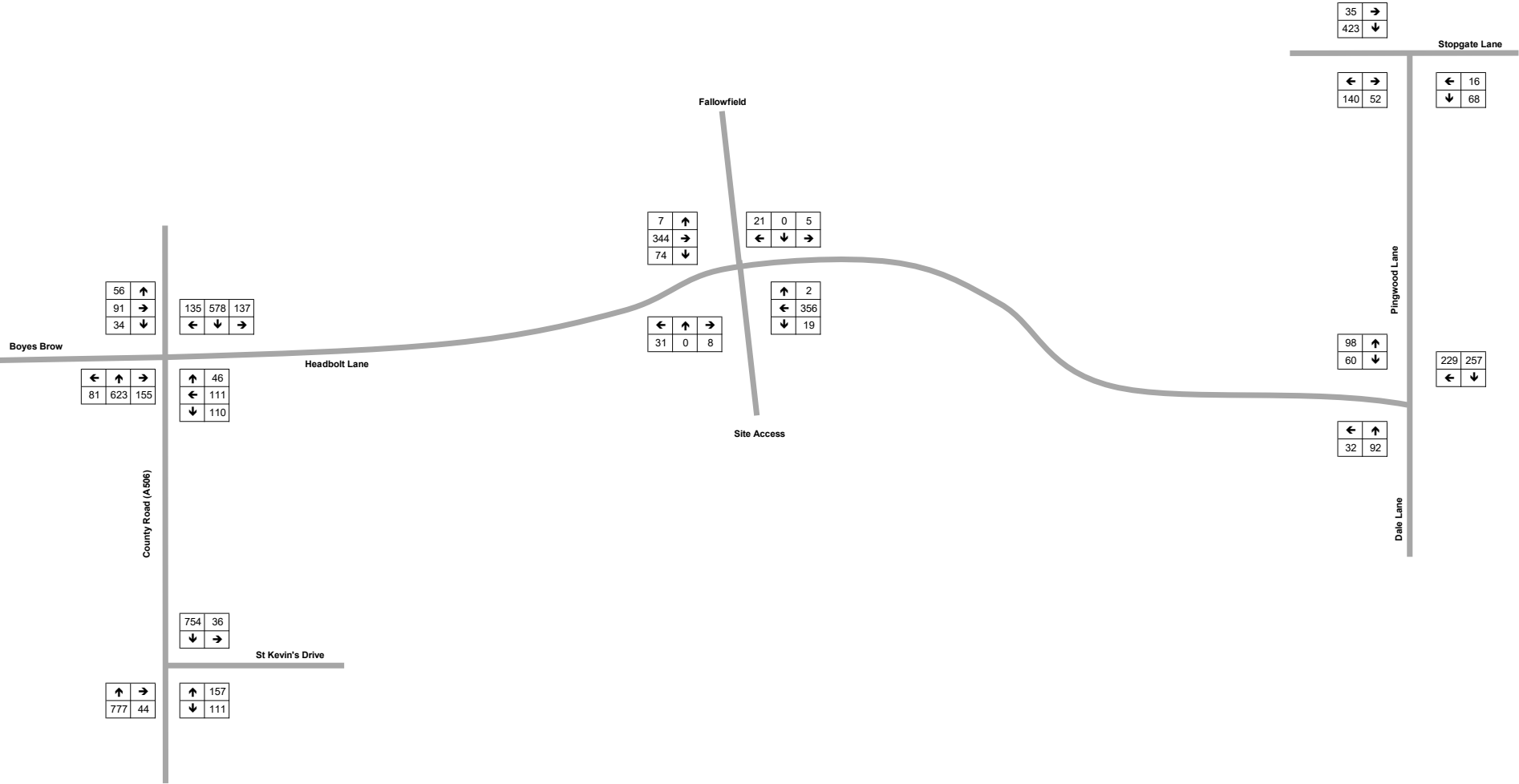


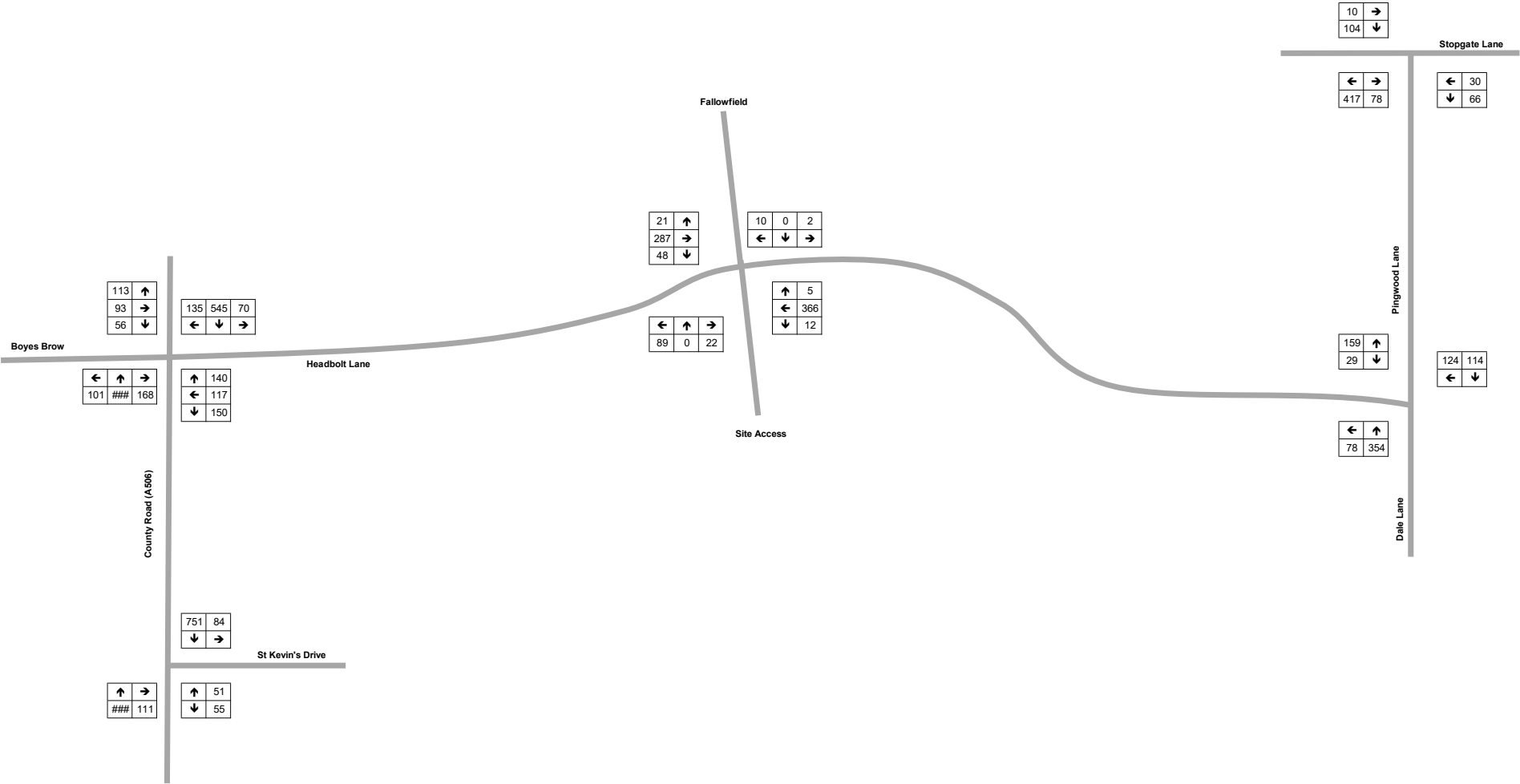


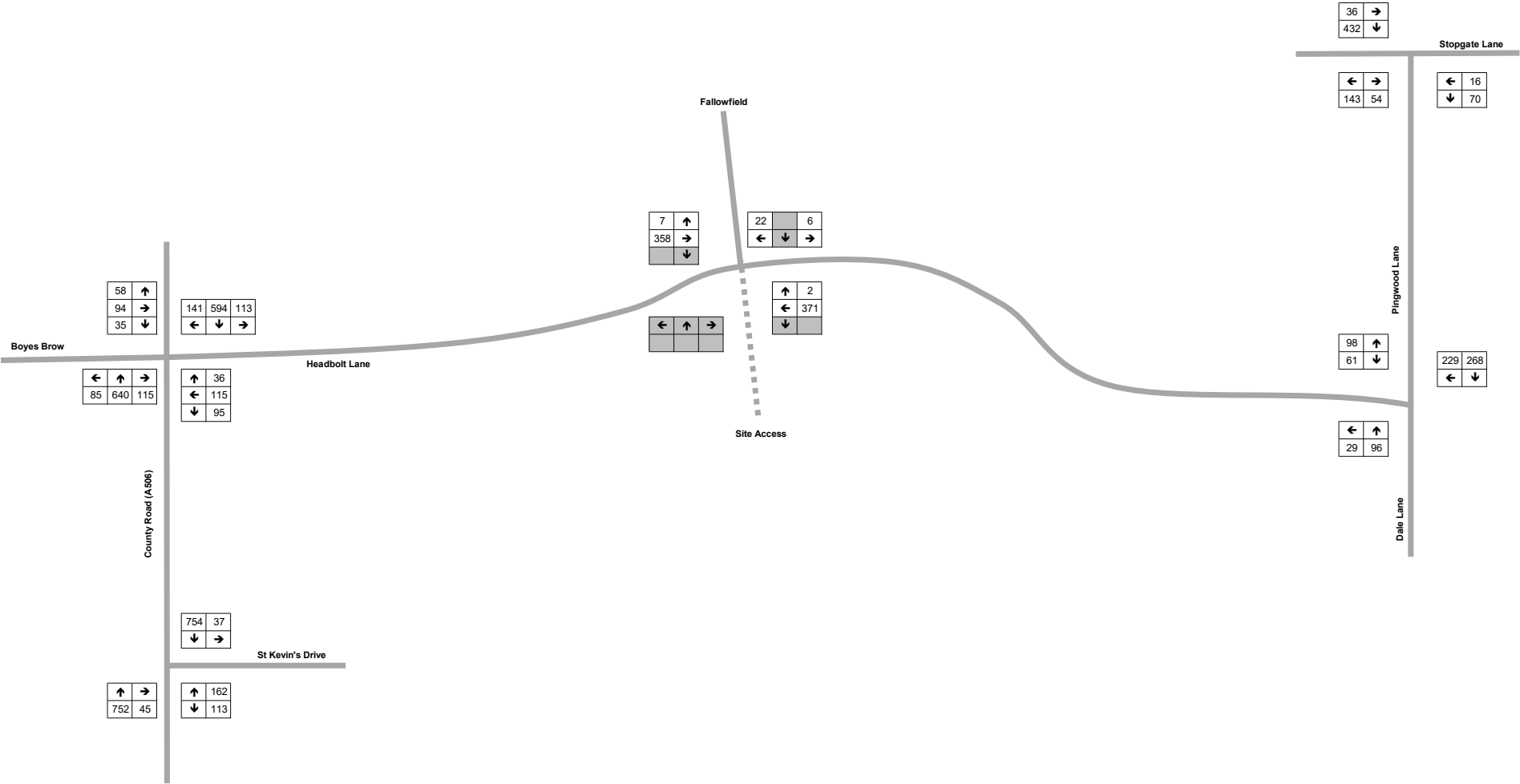


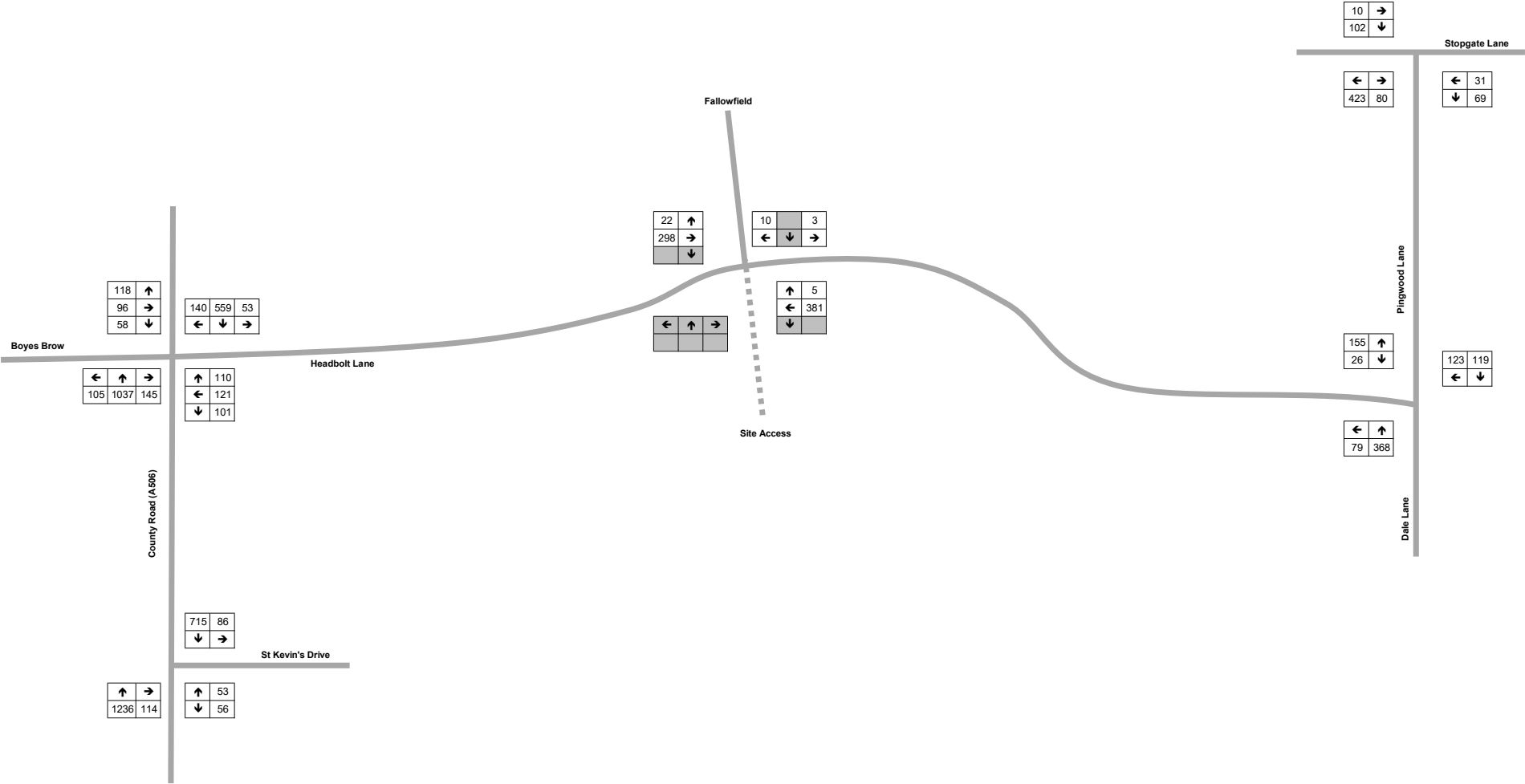


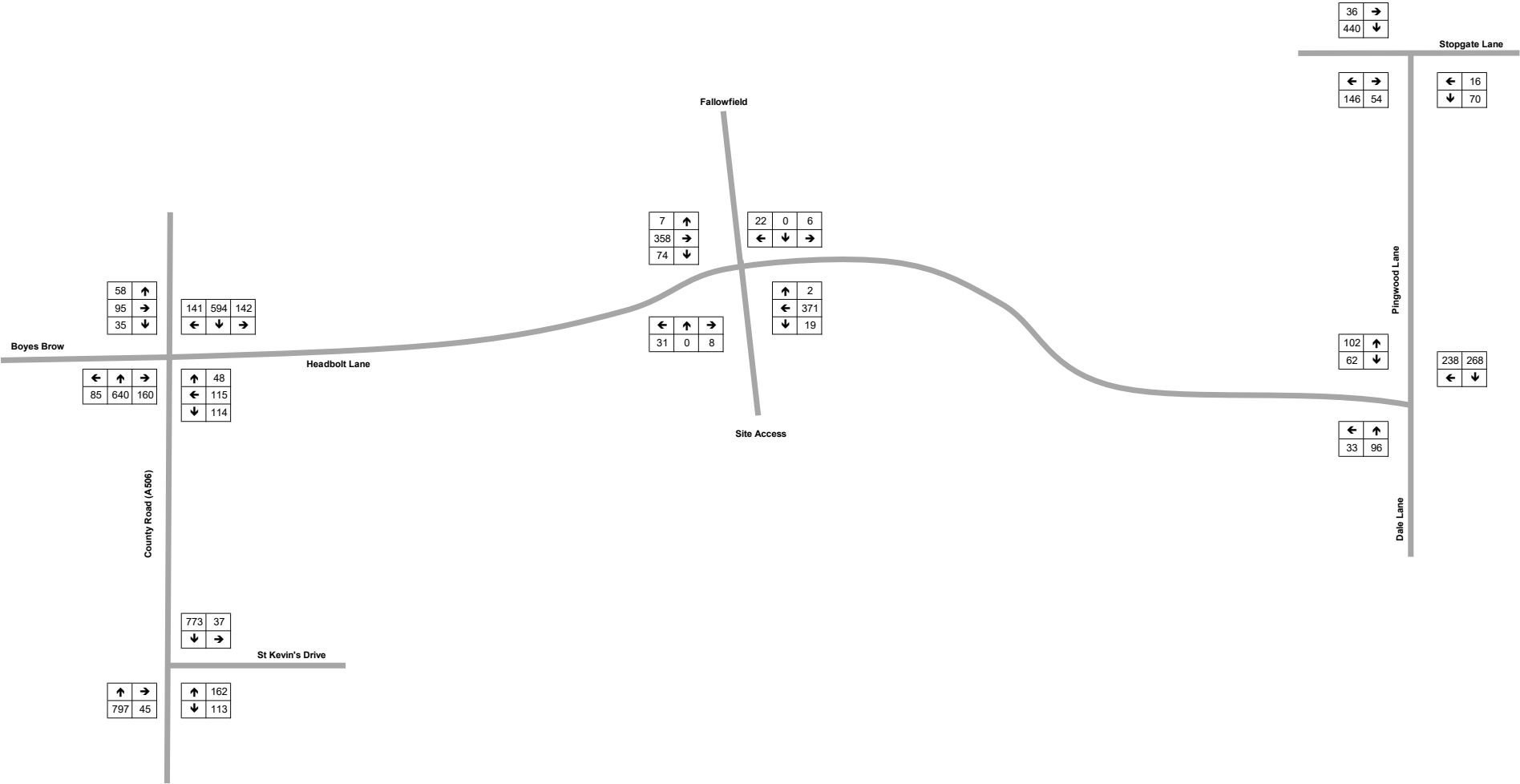


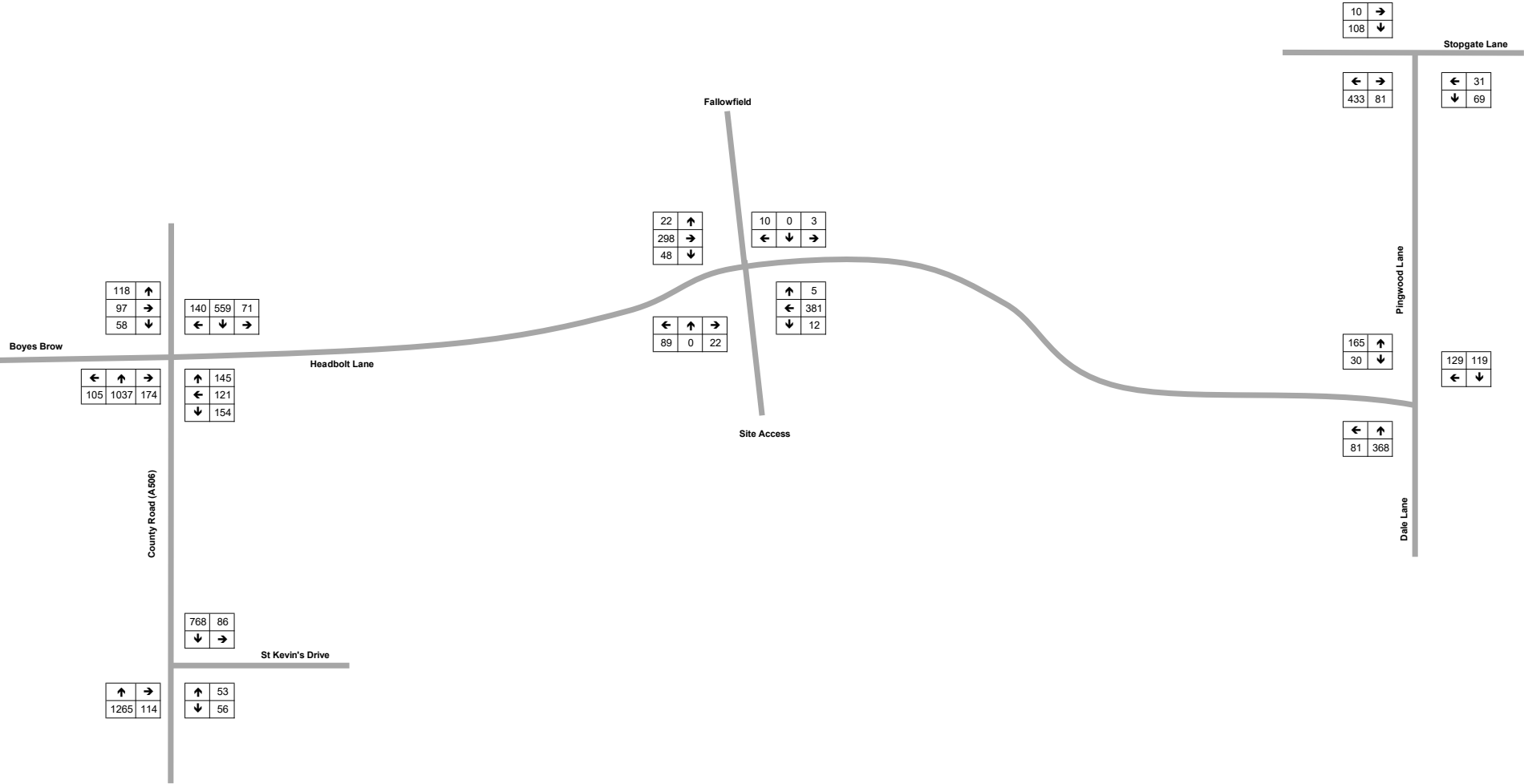


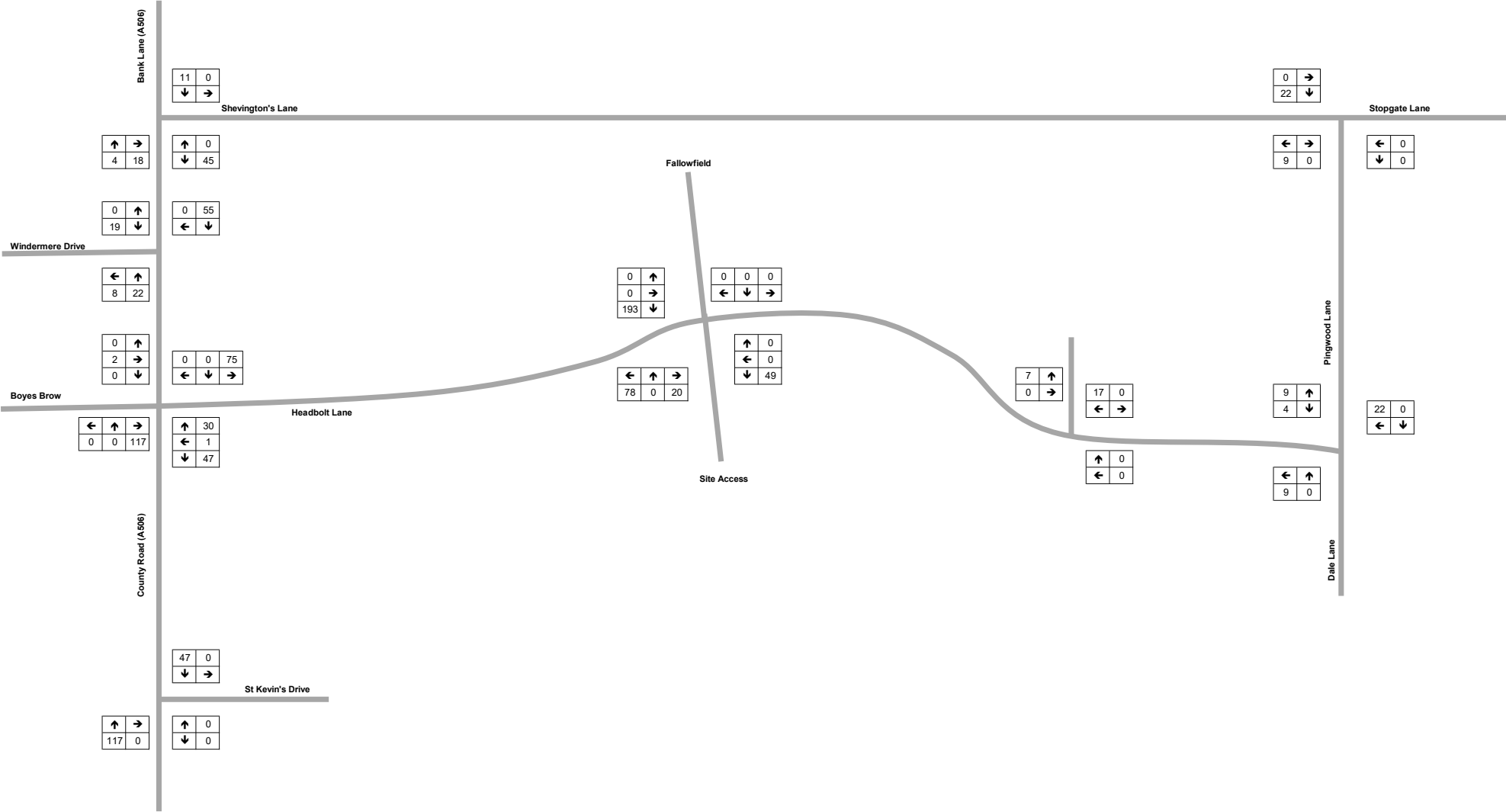


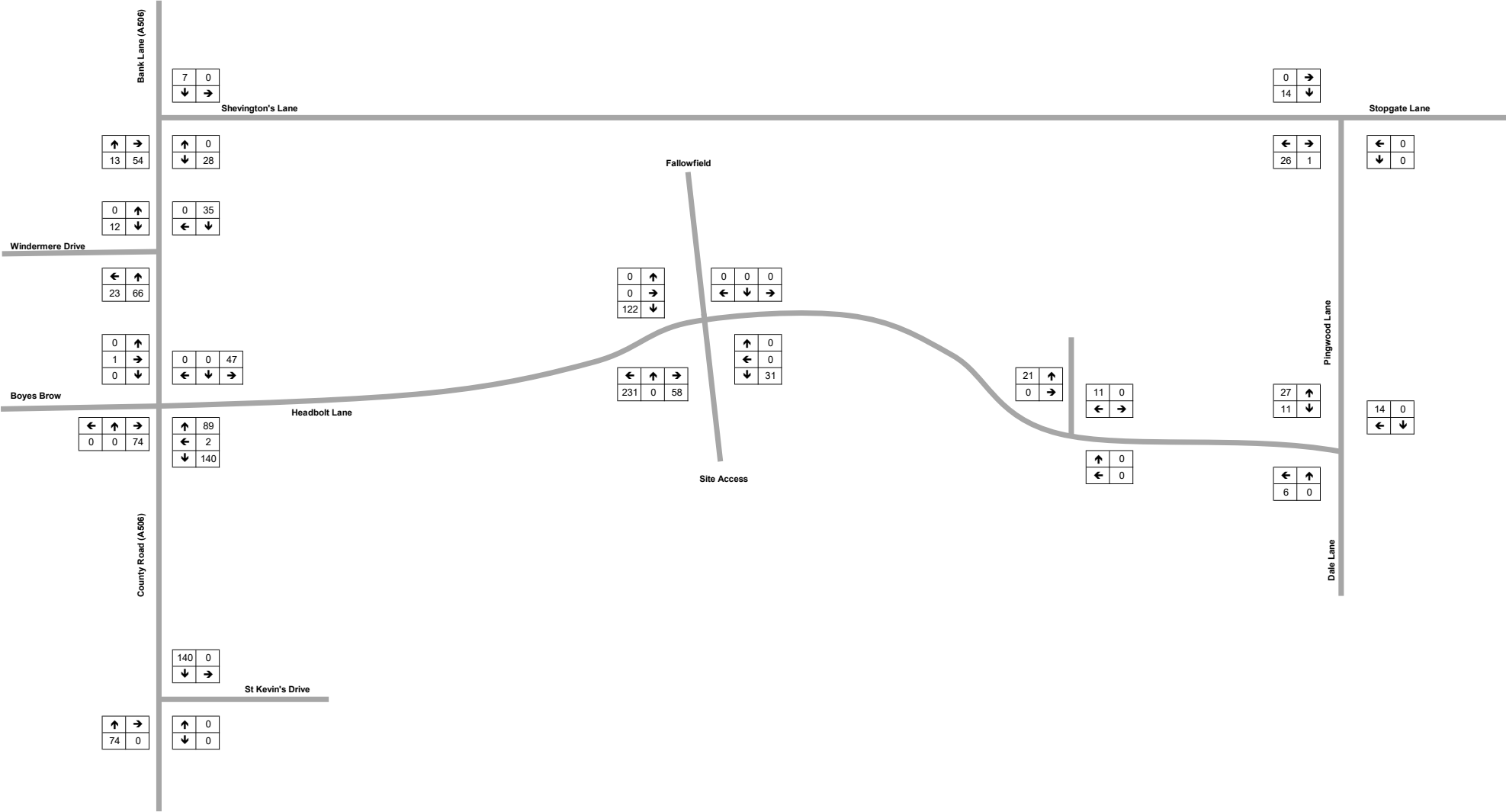


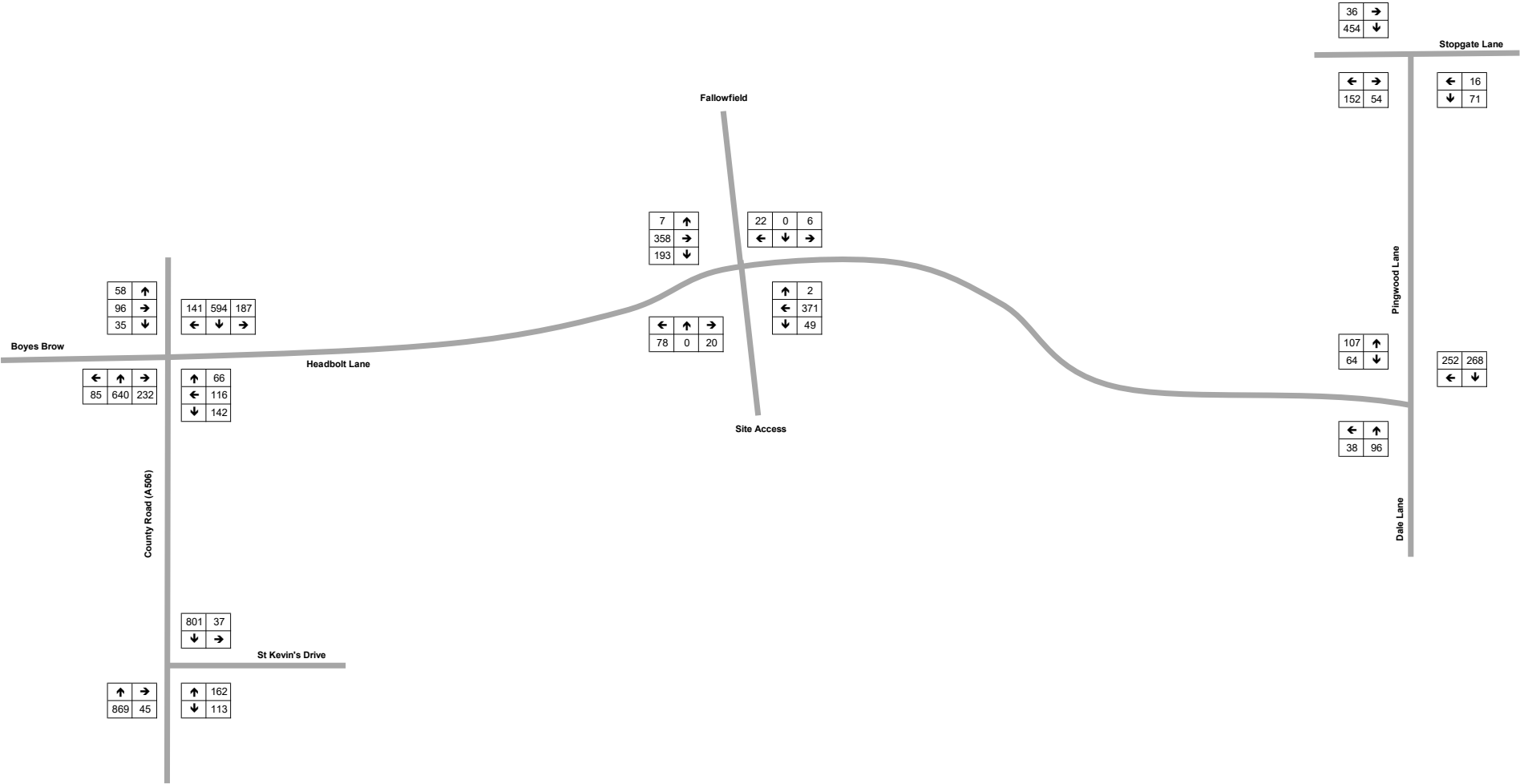


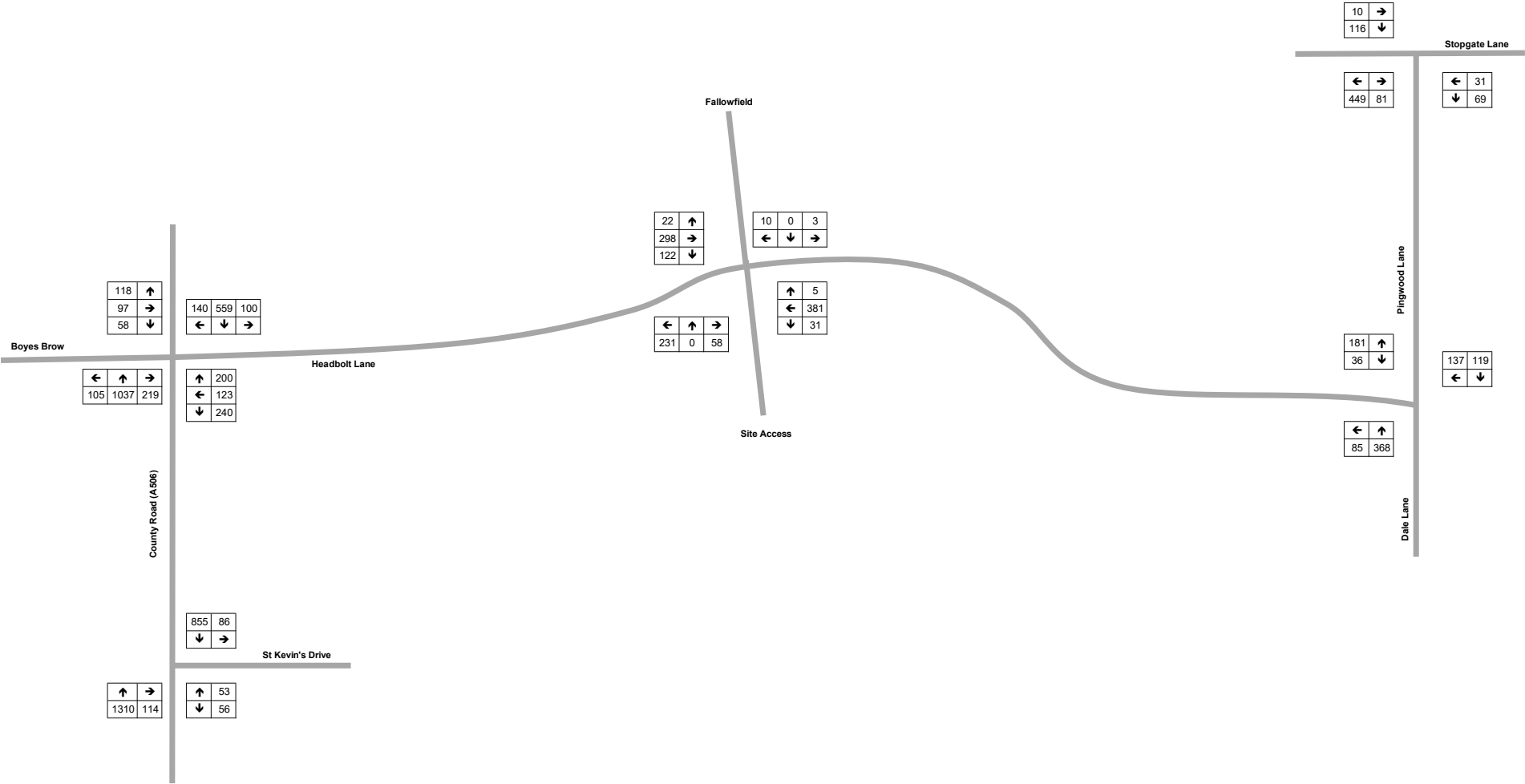












Appendix F

Junction Modelling Outputs

Basic Results Summary

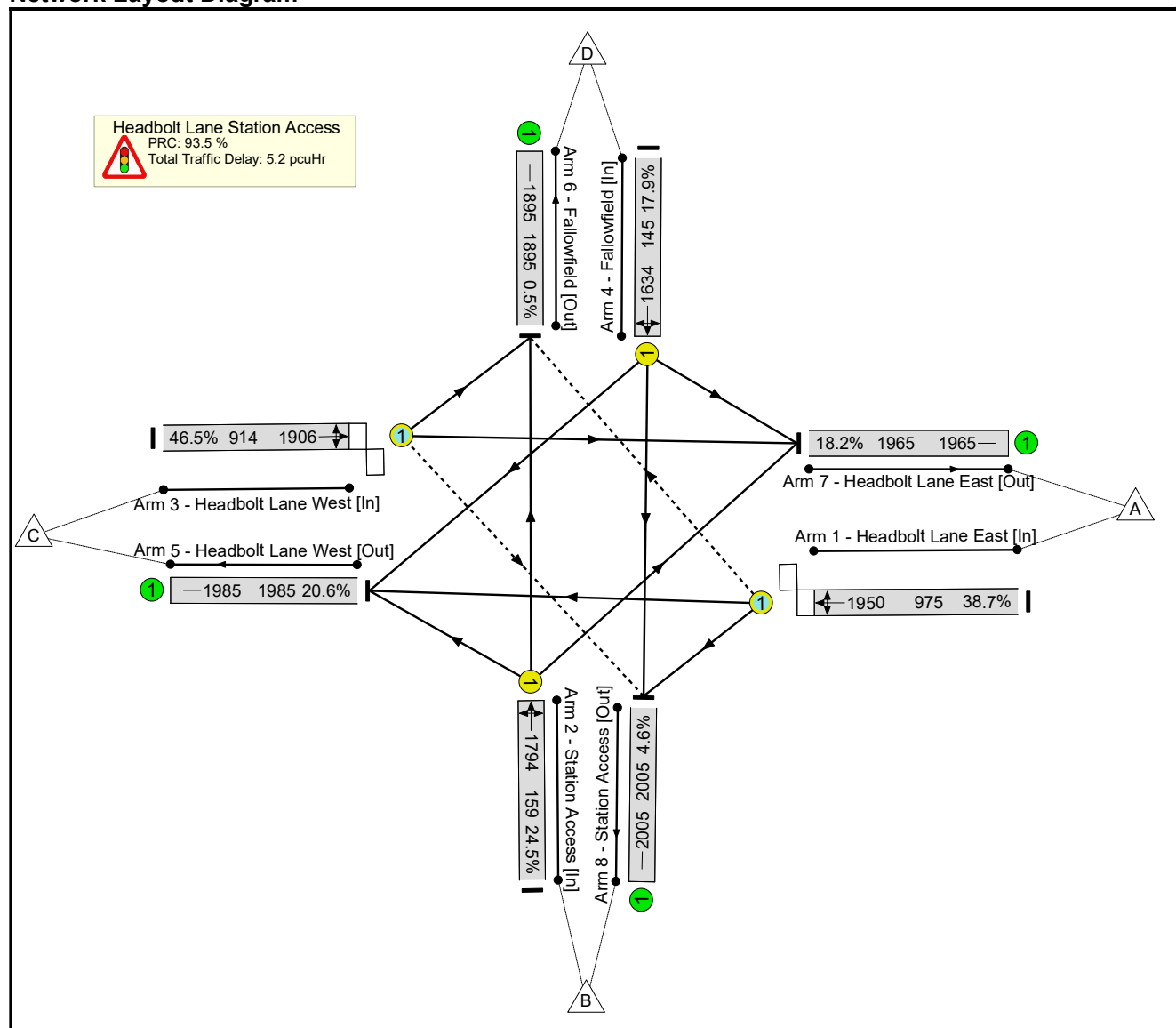
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
File name:	Headbolt Lane - Station Access Junction.lsg3x
Author:	
Company:	
Address:	
Notes:	

Scenario 1: '2023 AM Base + Committed + Development' (FG13: '2023 AM Base + Committed + Development', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Network Results

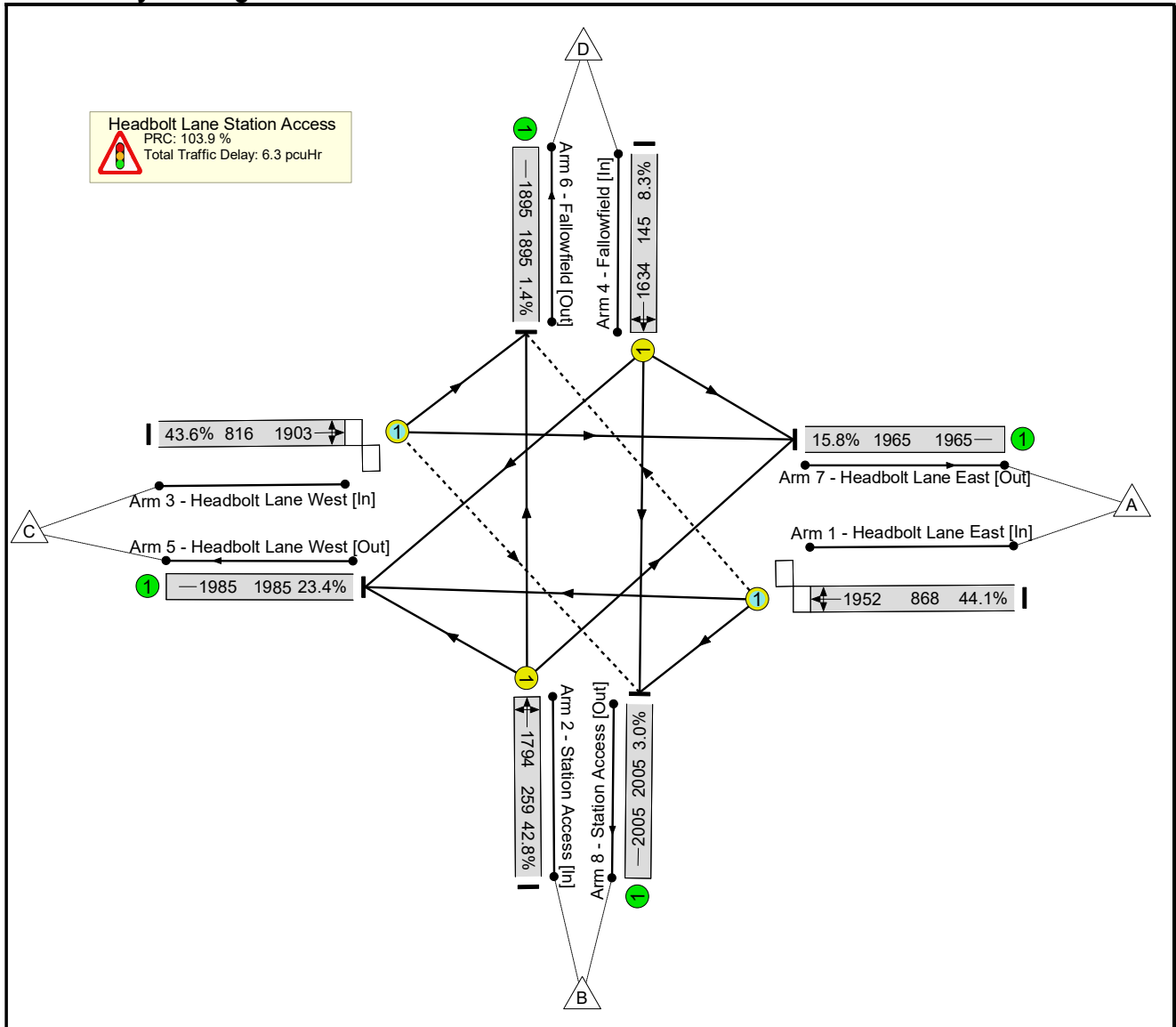
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	46.5%	75	0	1	5.2	-	-
Headbolt Lane Station Access	-	-	-		-	-	-	-	-	-	46.5%	75	0	1	5.2	-	-
1/1	Headbolt Lane East [In] Ahead Right Left	O	B		1	44	-	377	1950	975	38.7%	2	0	0	1.8	17.0	6.1
2/1	Station Access [In] Left Ahead Right	U	C		1	7	-	39	1794	159	24.5%	-	-	-	0.6	53.1	1.1
3/1	Headbolt Lane West [In] Left Ahead Right	O	A		1	44	-	425	1906	914	46.5%	73	0	1	2.2	18.8	7.2
4/1	Fallowfield [In] Right Left Ahead	U	D		1	7	-	26	1634	145	17.9%	-	-	-	0.4	53.1	0.7
5/1	Headbolt Lane West [Out]	U	-		-	-	-	408	1985	1985	20.6%	-	-	-	0.1	1.1	0.1
6/1	Fallowfield [Out]	U	-		-	-	-	9	1895	1895	0.5%	-	-	-	0.0	1.0	0.0
7/1	Headbolt Lane East [Out]	U	-		-	-	-	357	1965	1965	18.2%	-	-	-	0.1	1.1	0.1
8/1	Station Access [Out]	U	-		-	-	-	93	2005	2005	4.6%	-	-	-	0.0	0.9	0.0
C1 PRC for Signalled Lanes (%): 93.5 Total Delay for Signalled Lanes (pcuHr): 4.96 Cycle Time (s): 90 PRC Over All Lanes (%): 93.5 Total Delay Over All Lanes(pcuHr): 5.23																	

Basic Results Summary

Scenario 2: '2023 PM Base + Committed + Development' (FG14: '2023 PM Base + Committed + Development',

Plan 1: 'Network Control Plan 1')

Network Layout Diagram



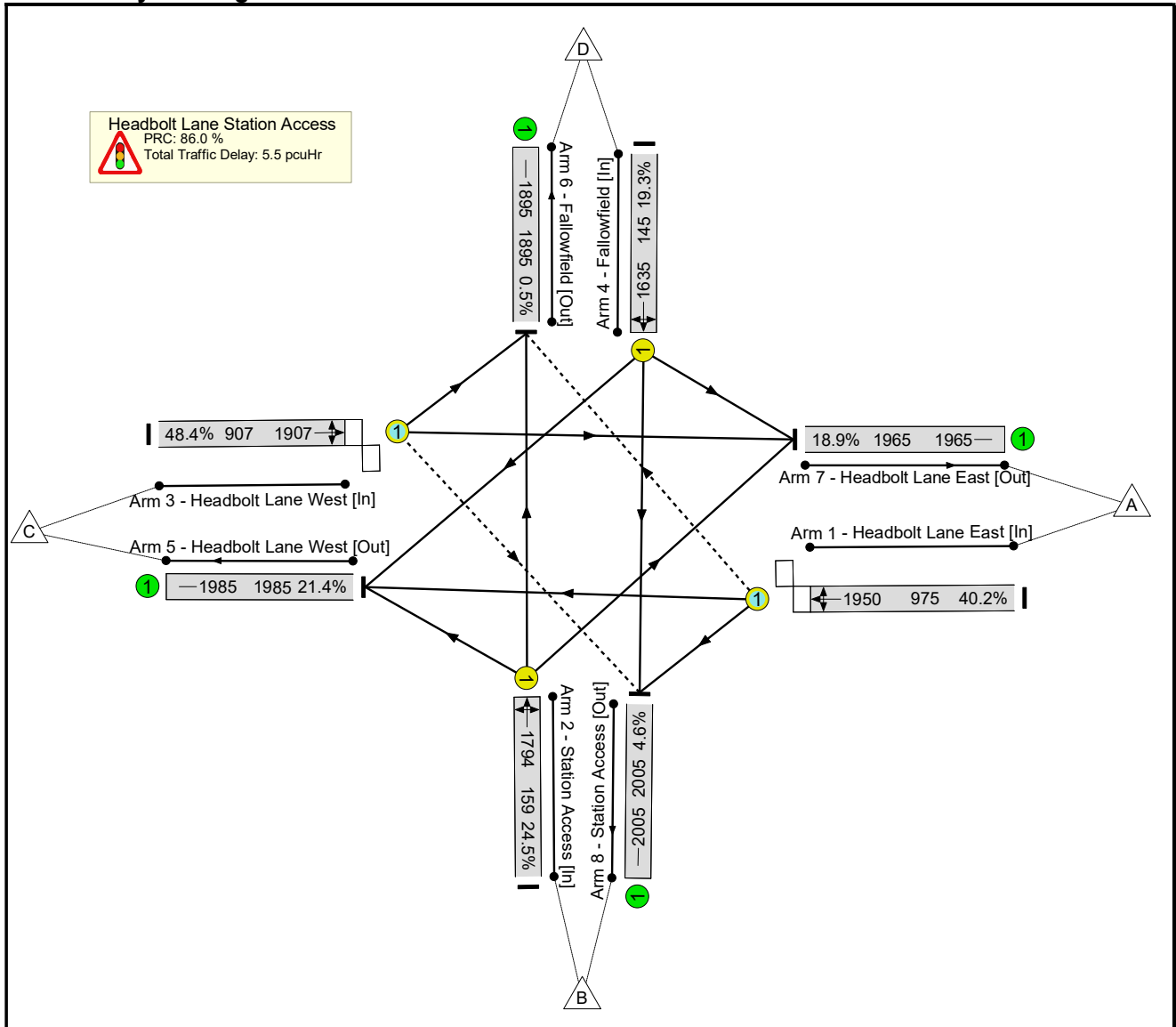
Network Results

[illegible]

Basic Results Summary

Scenario 3: '2028 AM Base + Committed + Development (300 Spaces)' (FG15: '2028 AM Base + Committed + Development', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



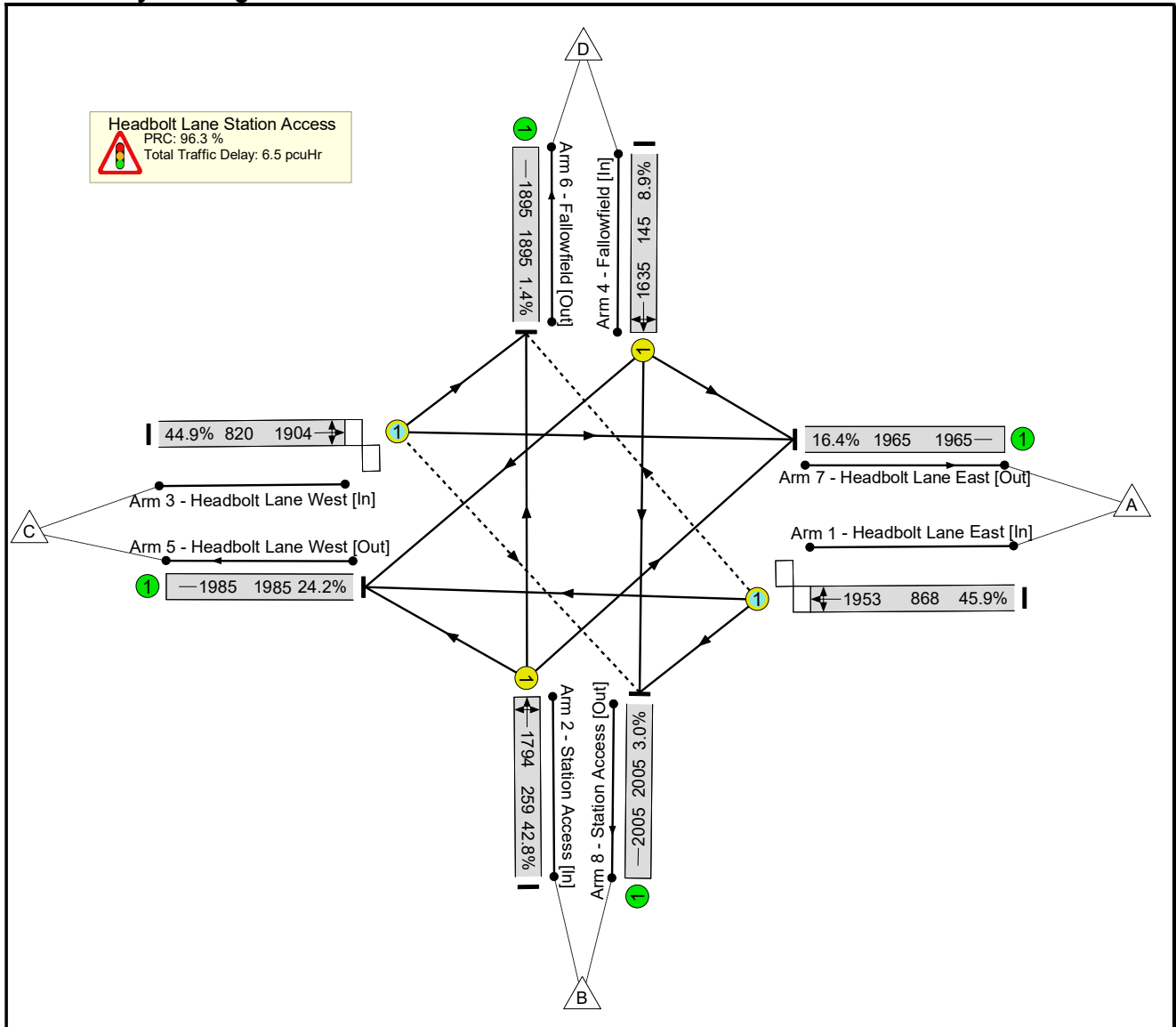
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	48.4%	75	0	1	5.5	-	-
Headbolt Lane Station Access	-	-	-		-	-	-	-	-	-	48.4%	75	0	1	5.5	-	-
1/1	Headbolt Lane East [In] Ahead Right Left	O	B		1	44	-	392	1950	975	40.2%	2	0	0	1.9	17.2	6.4
2/1	Station Access [In] Left Ahead Right	U	C		1	7	-	39	1794	159	24.5%	-	-	-	0.6	53.1	1.1
3/1	Headbolt Lane West [In] Left Ahead Right	O	A		1	44	-	439	1907	907	48.4%	73	0	1	2.3	19.1	7.5
4/1	Fallowfield [In] Right Left Ahead	U	D		1	7	-	28	1635	145	19.3%	-	-	-	0.4	53.4	0.8
5/1	Headbolt Lane West [Out]	U	-		-	-	-	424	1985	1985	21.4%	-	-	-	0.1	1.2	0.1
6/1	Fallowfield [Out]	U	-		-	-	-	9	1895	1895	0.5%	-	-	-	0.0	1.0	0.0
7/1	Headbolt Lane East [Out]	U	-		-	-	-	372	1965	1965	18.9%	-	-	-	0.1	1.1	0.1
8/1	Station Access [Out]	U	-		-	-	-	93	2005	2005	4.6%	-	-	-	0.0	0.9	0.0
C1 PRC for Signalled Lanes (%): 86.0 Total Delay for Signalled Lanes (pcuHr): 5.19 Cycle Time (s): 90 PRC Over All Lanes (%): 86.0 Total Delay Over All Lanes(pcuHr): 5.47																	

Basic Results Summary

Scenario 4: '2028 PM Base + Committed + Development (300 Spaces)' (FG16: '2028 PM Base + Committed + Development', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



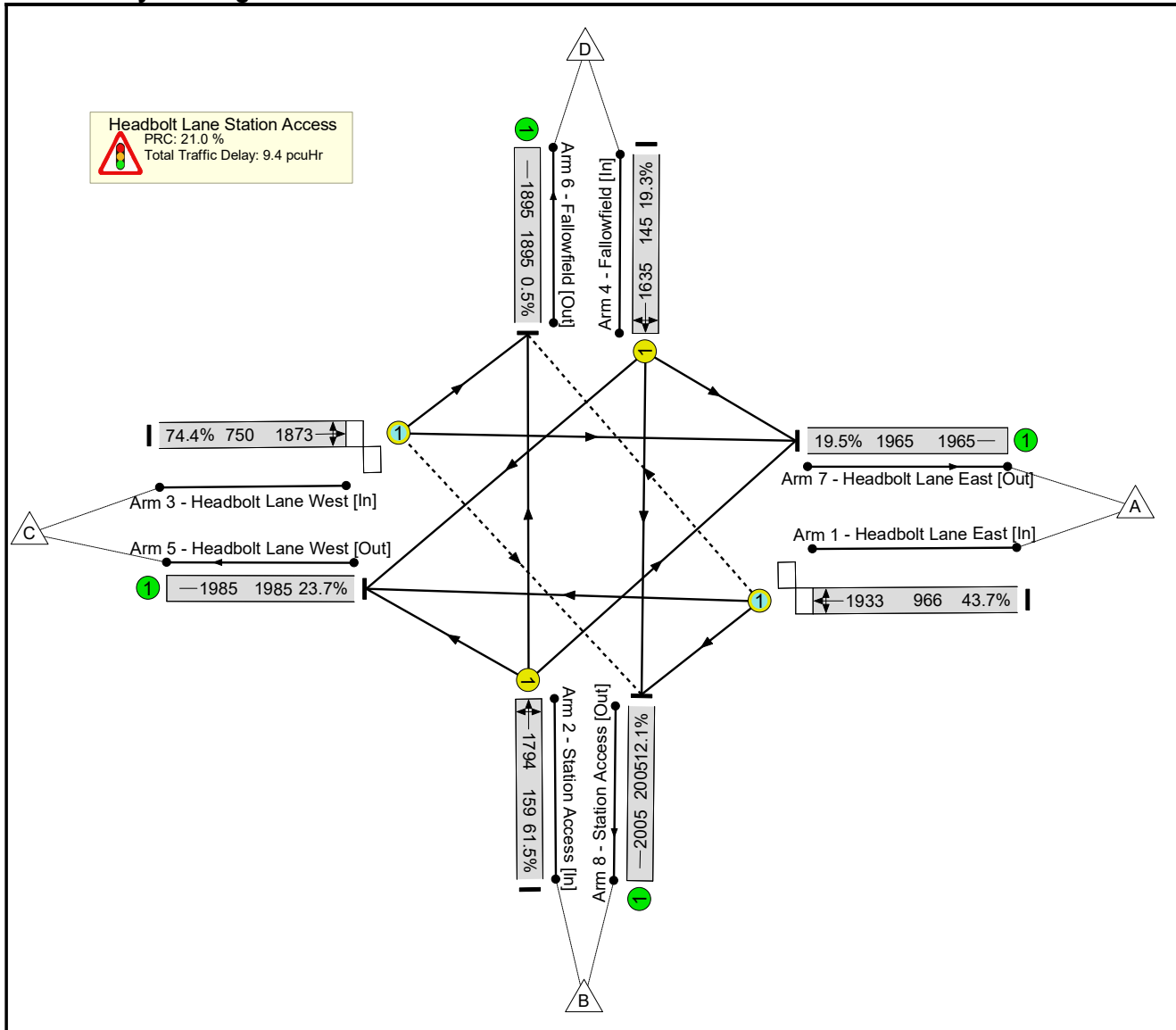
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	45.9%	52	0	1	6.5	-	-
Headbolt Lane Station Access	-	-	-		-	-	-	-	-	-	45.9%	52	0	1	6.5	-	-
1/1	Headbolt Lane East [In] Ahead Right Left	O	B		1	39	-	398	1953	868	45.9%	5	0	0	2.4	21.3	7.3
2/1	Station Access [In] Left Ahead Right	U	C		1	12	-	111	1794	259	42.8%	-	-	-	1.5	47.2	2.9
3/1	Headbolt Lane West [In] Left Ahead Right	O	A		1	39	-	368	1904	820	44.9%	47	0	1	2.2	21.8	6.6
4/1	Fallowfield [In] Right Left Ahead	U	D		1	7	-	13	1635	145	8.9%	-	-	-	0.2	51.4	0.3
5/1	Headbolt Lane West [Out]	U	-		-	-	-	480	1985	1985	24.2%	-	-	-	0.2	1.2	0.2
6/1	Fallowfield [Out]	U	-		-	-	-	27	1895	1895	1.4%	-	-	-	0.0	1.0	0.0
7/1	Headbolt Lane East [Out]	U	-		-	-	-	323	1965	1965	16.4%	-	-	-	0.1	1.1	0.1
8/1	Station Access [Out]	U	-		-	-	-	60	2005	2005	3.0%	-	-	-	0.0	0.9	0.0
C1 PRC for Signalled Lanes (%): 96.3 Total Delay for Signalled Lanes (pcuHr): 6.23 PRC Over All Lanes (%): 96.3 Total Delay Over All Lanes(pcuHr): 6.51 Cycle Time (s): 90																	

Basic Results Summary

Scenario 5: '2028 AM Base + Committed + Development (500 Spaces)' (FG19: '2028 AM Base + Committed + Development (Future Provision)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



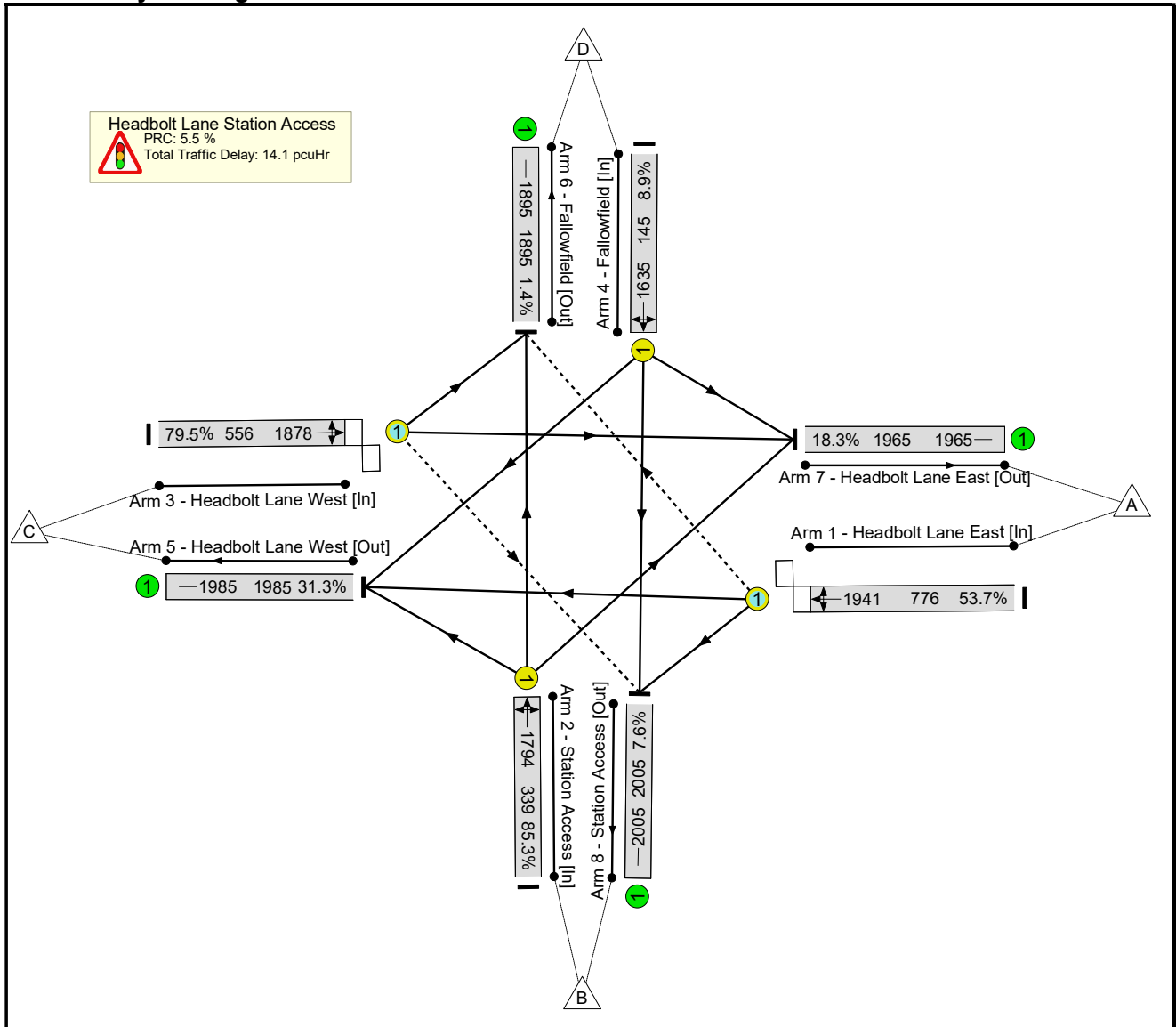
Network Results

[illegible]

Basic Results Summary

Scenario 6: '2028 PM Base + Committed + Development (500 Spaces)' (FG20: '2028 PM Base + Committed + Development (Future Provision)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	85.3%	126	0	1	14.1	-	-
Headbolt Lane Station Access	-	-	-		-	-	-	-	-	-	85.3%	126	0	1	14.1	-	-
1/1	Headbolt Lane East [In] Ahead Right Left	O	B		1	35	-	417	1941	776	53.7%	5	0	0	3.0	25.6	8.5
2/1	Station Access [In] Left Ahead Right	U	C		1	16	-	289	1794	339	85.3%	-	-	-	5.5	68.0	9.6
3/1	Headbolt Lane West [In] Left Ahead Right	O	A		1	35	-	442	1878	556	79.5%	121	0	1	5.1	41.3	11.9
4/1	Fallowfield [In] Right Left Ahead	U	D		1	7	-	13	1635	145	8.9%	-	-	-	0.2	51.4	0.3
5/1	Headbolt Lane West [Out]	U	-		-	-	-	622	1985	1985	31.3%	-	-	-	0.2	1.3	0.2
6/1	Fallowfield [Out]	U	-		-	-	-	27	1895	1895	1.4%	-	-	-	0.0	1.0	0.0
7/1	Headbolt Lane East [Out]	U	-		-	-	-	359	1965	1965	18.3%	-	-	-	0.1	1.1	0.1
8/1	Station Access [Out]	U	-		-	-	-	153	2005	2005	7.6%	-	-	-	0.0	1.0	0.0
C1 PRC for Signalled Lanes (%): 5.5 Total Delay for Signalled Lanes (pcuHr): 13.69 Cycle Time (s): 90 PRC Over All Lanes (%): 5.5 Total Delay Over All Lanes(pcuHr): 14.08																	

Basic Results Summary

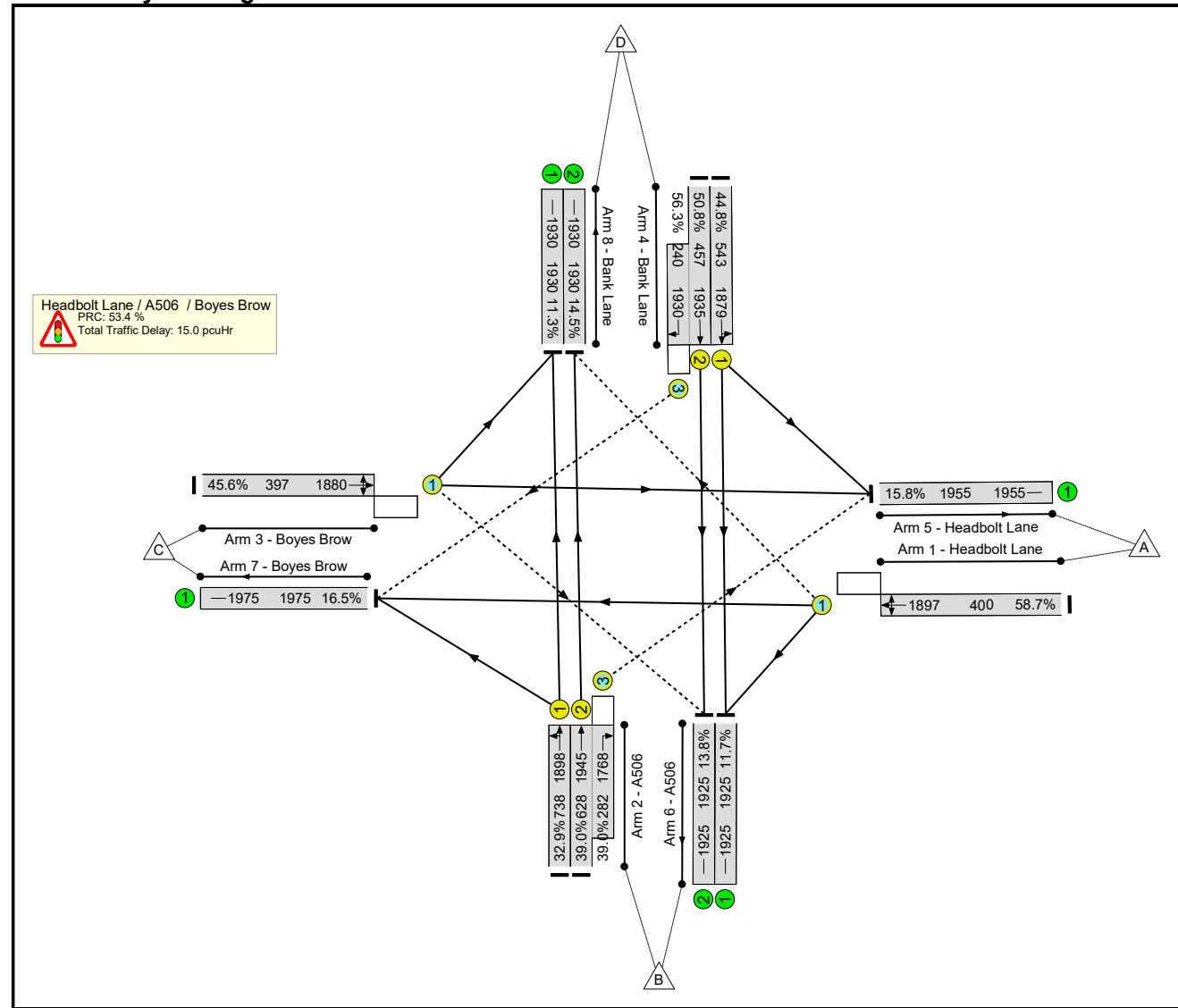
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
File name:	Headbolt Lane_Boyes Brow_A506.lsg3x
Author:	
Company:	
Address:	
Notes:	

Scenario 1: '2023 AM Base' (FG1: '2023 AM Base', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



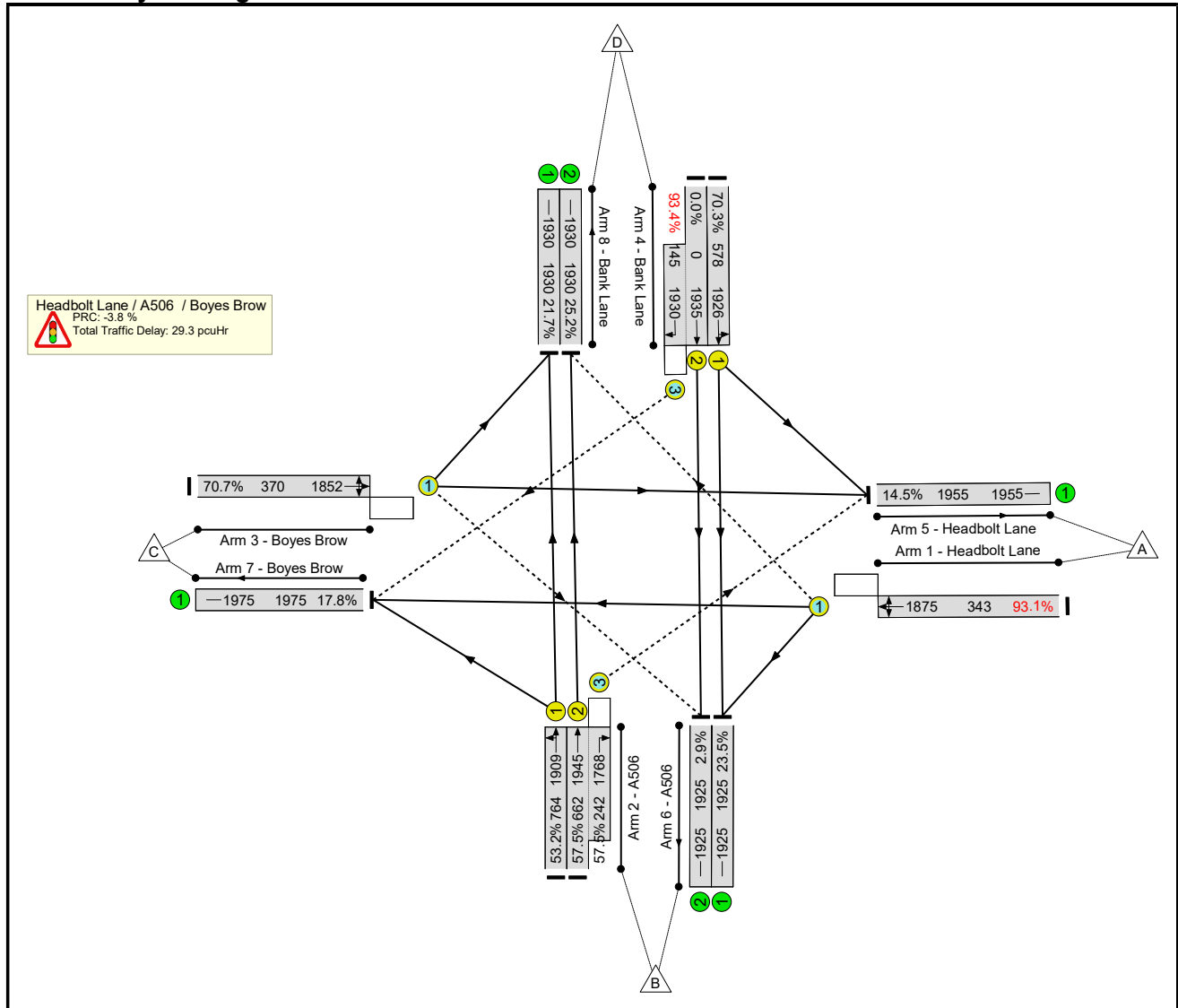
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	58.7%	301	9	3	15.0	-	-
Headbolt Lane / A506 / Boyes Brow	-	-	-		-	-	-	-	-	-	58.7%	301	9	3	15.0	-	-
1/1	Headbolt Lane Left Ahead Right	O	C		1	18	-	235	1897	400	58.7%	34	0	0	2.8	43.1	6.0
2/1	A506 Left Ahead	U	A		1	34	-	243	1898	738	32.9%	-	-	-	1.5	22.9	4.5
2/2+2/3	A506 Right Ahead	U+O	A	K	1	34	4	355	1945:1768	628+282	39.0 : 39.0%	99	9	2	2.4 (1.5+0.9)	24.8 (22.5:29.9)	4.5
3/1	Boyes Brow Ahead Right Left	O	D		1	18	-	181	1880	397	45.6%	34	0	0	2.0	40.4	4.3
4/1	Bank Lane Left Ahead	U	B		1	25	-	243	1879	543	44.8%	-	-	-	2.2	32.1	5.3
4/2+4/3	Bank Lane Ahead Right	U+O	B	L	1	25	0	367	1935:1930	457+240	50.8 : 56.3%	135	0	0	3.5 (2.0+1.5)	34.3 (31.3:39.4)	5.2
5/1	Headbolt Lane	U	-		-	-	-	309	1955	1955	15.8%	-	-	-	0.1	1.1	0.1
6/1	A506	U	-		-	-	-	226	1925	1925	11.7%	-	-	-	0.1	1.1	0.1
6/2	A506	U	-		-	-	-	266	1925	1925	13.8%	-	-	-	0.1	1.1	0.1
7/1	Boyes Brow	U	-		-	-	-	326	1975	1975	16.5%	-	-	-	0.1	1.1	0.1
8/1	Bank Lane	U	-		-	-	-	218	1930	1930	11.3%	-	-	-	0.1	1.1	0.1
8/2	Bank Lane	U	-		-	-	-	279	1930	1930	14.5%	-	-	-	0.1	1.1	0.1
C1			PRC for Signalled Lanes (%):		53.4		53.4		Total Delay for Signalled Lanes (pcuHr):			14.50	Cycle Time (s):		90		
			PRC Over All Lanes (%):		53.4				Total Delay Over All Lanes(pcuHr):			14.99					

Basic Results Summary

Scenario 2: '2023 PM Base' (FG2: '2023 PM Base', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



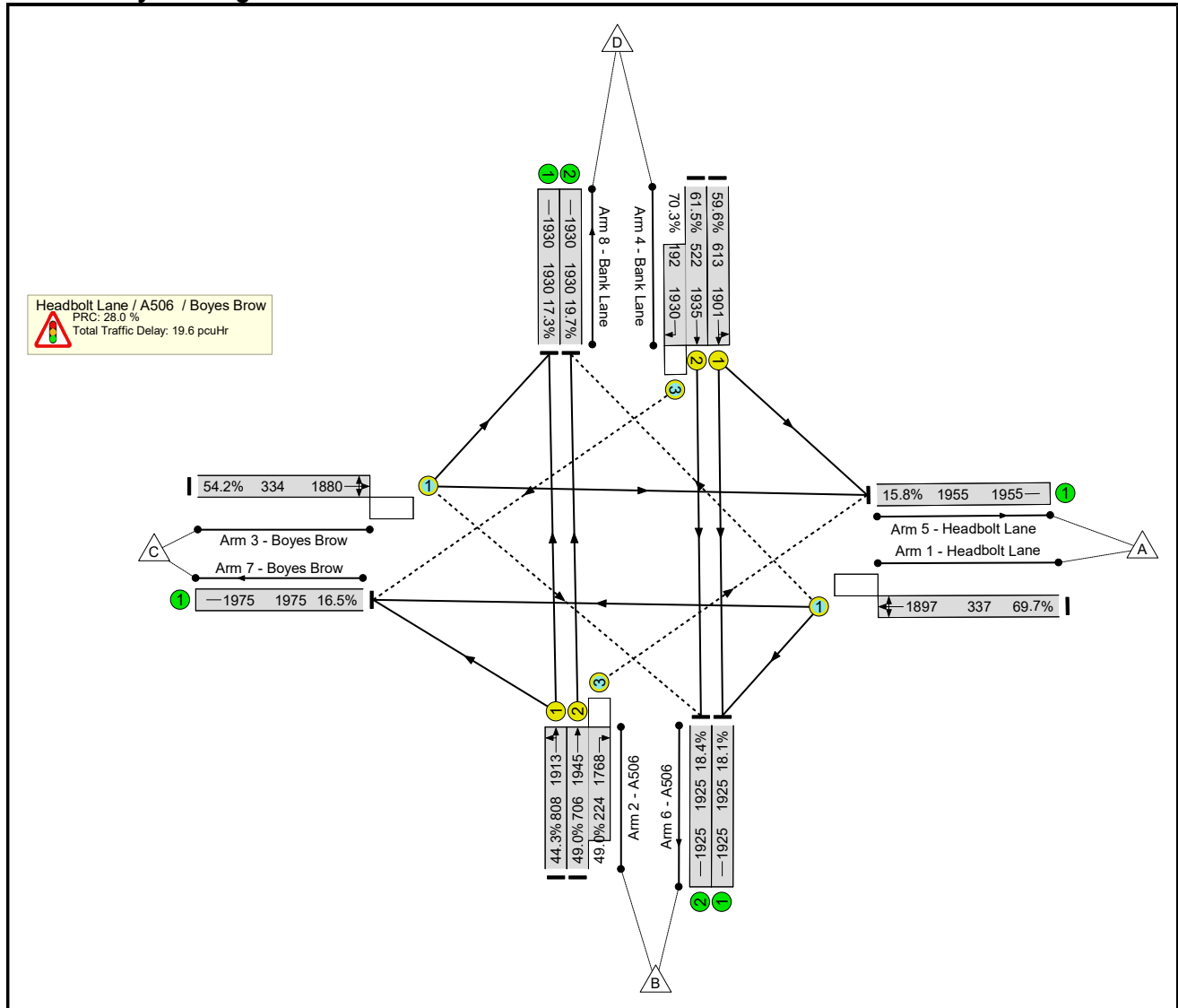
Network Results

[illegible]

Basic Results Summary

Scenario 3: '2023 AM Base + Com' (FG7: '2023 AM Base + Com', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



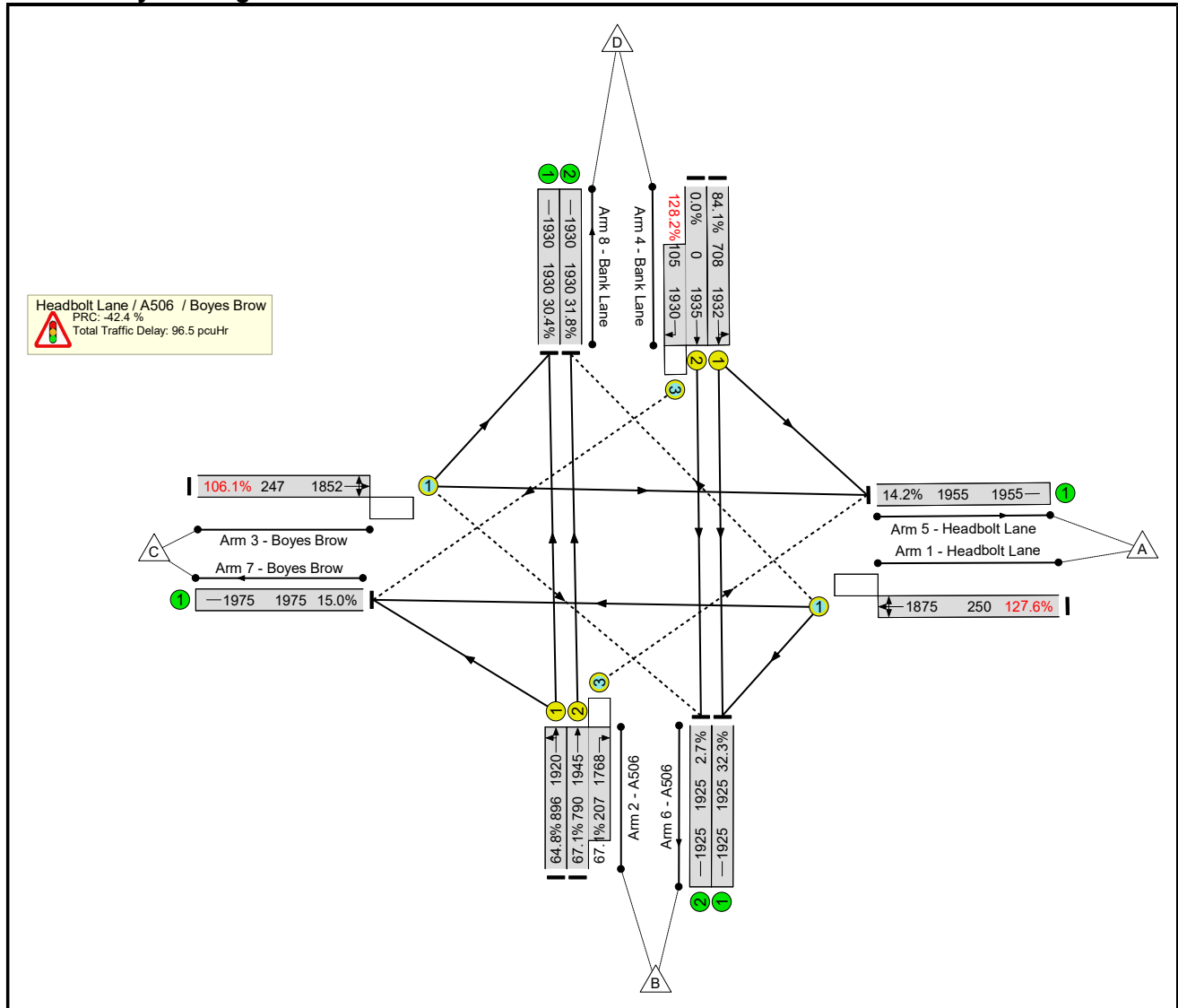
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	70.3%	301	9	3	19.6	-	-
Headbolt Lane / A506 / Boyes Brow	-	-	-		-	-	-	-	-	-	70.3%	301	9	3	19.6	-	-
1/1	Headbolt Lane Left Ahead Right	O	C		1	15	-	235	1897	337	69.7%	34	0	0	3.4	52.4	6.6
2/1	A506 Left Ahead	U	A		1	37	-	358	1913	808	44.3%	-	-	-	2.2	22.5	6.7
2/2+2/3	A506 Right Ahead	U+O	A	K	1	37	4	456	1945:1768	706+224	49.0 : 49.0%	99	9	2	3.1 (2.1+1.0)	24.8 (22.1:33.5)	6.5
3/1	Boyes Brow Ahead Right Left	O	D		1	15	-	181	1880	334	54.2%	34	0	0	2.3	46.5	4.7
4/1	Bank Lane Left Ahead	U	B		1	28	-	365	1901	613	59.6%	-	-	-	3.3	32.8	8.3
4/2+4/3	Bank Lane Ahead Right	U+O	B	L	1	28	0	456	1935:1930	522+192	61.5 : 70.3%	135	0	0	4.5 (2.8+1.6)	35.3 (31.7:44.0)	7.4
5/1	Headbolt Lane	U	-		-	-	-	309	1955	1955	15.8%	-	-	-	0.1	1.1	0.1
6/1	A506	U	-		-	-	-	348	1925	1925	18.1%	-	-	-	0.1	1.1	0.1
6/2	A506	U	-		-	-	-	355	1925	1925	18.4%	-	-	-	0.1	1.1	0.1
7/1	Boyes Brow	U	-		-	-	-	326	1975	1975	16.5%	-	-	-	0.1	1.1	0.1
8/1	Bank Lane	U	-		-	-	-	333	1930	1930	17.3%	-	-	-	0.1	1.1	0.1
8/2	Bank Lane	U	-		-	-	-	380	1930	1930	19.7%	-	-	-	0.1	1.2	0.1
C1			PRC for Signalled Lanes (%):		28.0		28.0		Total Delay for Signalled Lanes (pcuHr):			18.94	Cycle Time (s):		90		
			PRC Over All Lanes (%):				28.0		Total Delay Over All Lanes(pcuHr):			19.58					

Basic Results Summary

Scenario 4: '2023 PM Base + Com' (FG8: '2023 PM Base + Com', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



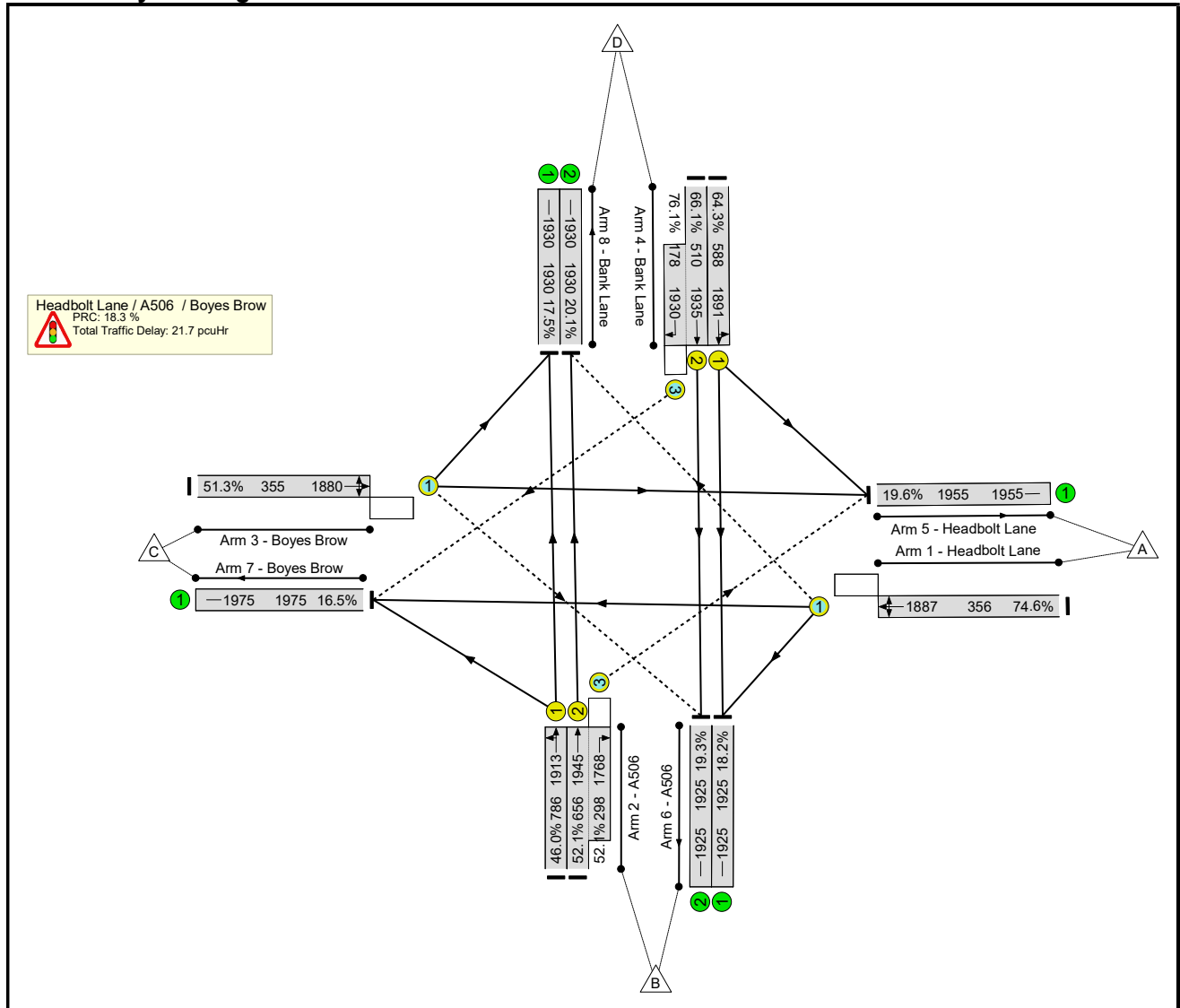
Network Results

C1	PRC for Signalled Lanes (%):	-42.4	Total Delay for Signalled Lanes (pcuHr):	95.66	Cycle Time (s):	90
	PRC Over All Lanes (%):	-42.4	Total Delay Over All Lanes(pcuHr):	96.53		

Basic Results Summary

Scenario 5: '2023 AM Base + Com + Dev' (FG9: '2023 AM Base + Com + Dev', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



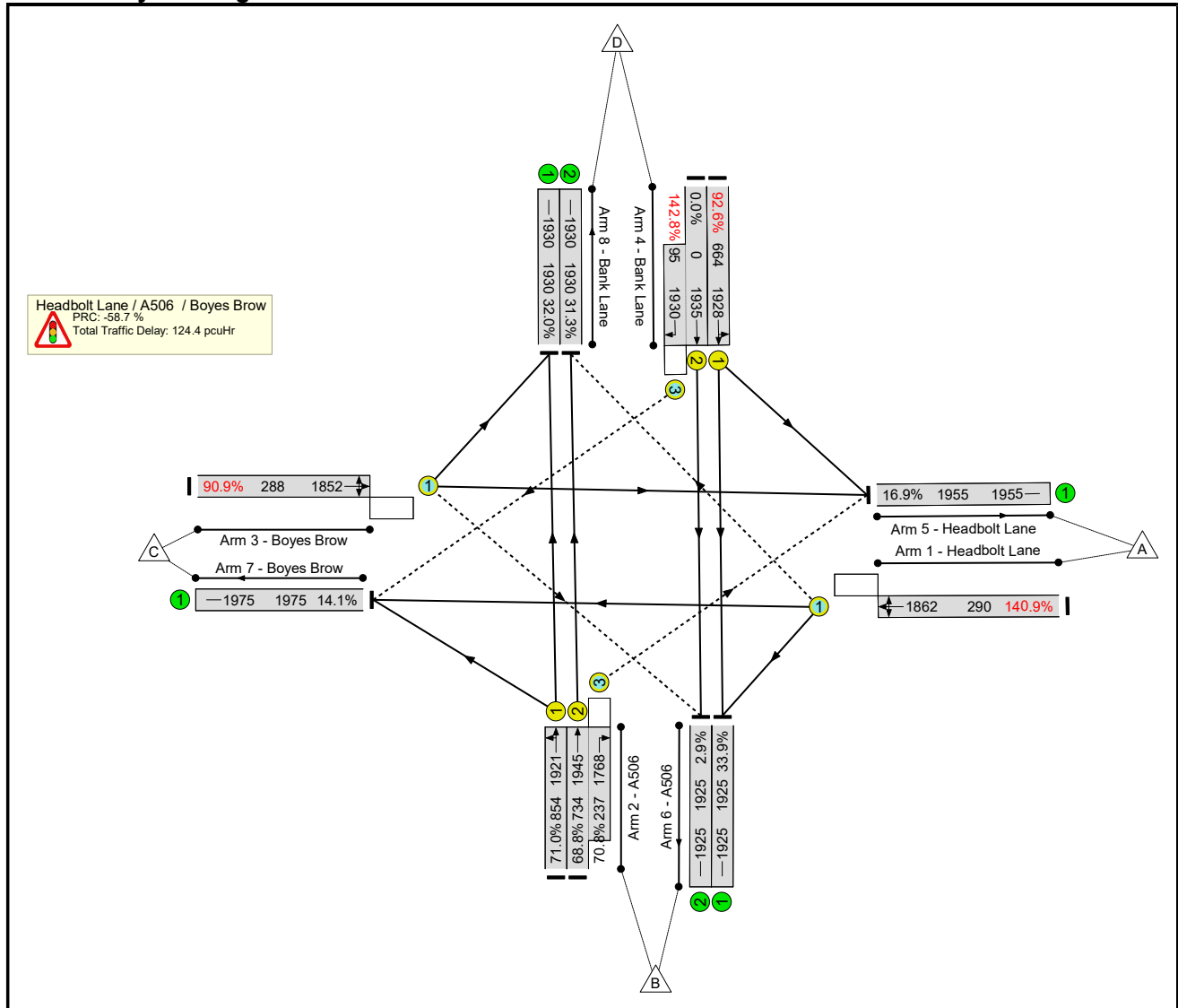
Network Results

[illegible]

Basic Results Summary

Scenario 6: '2023 PM Base + Com + Dev' (FG10: '2023 PM Base + Com + Dev', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



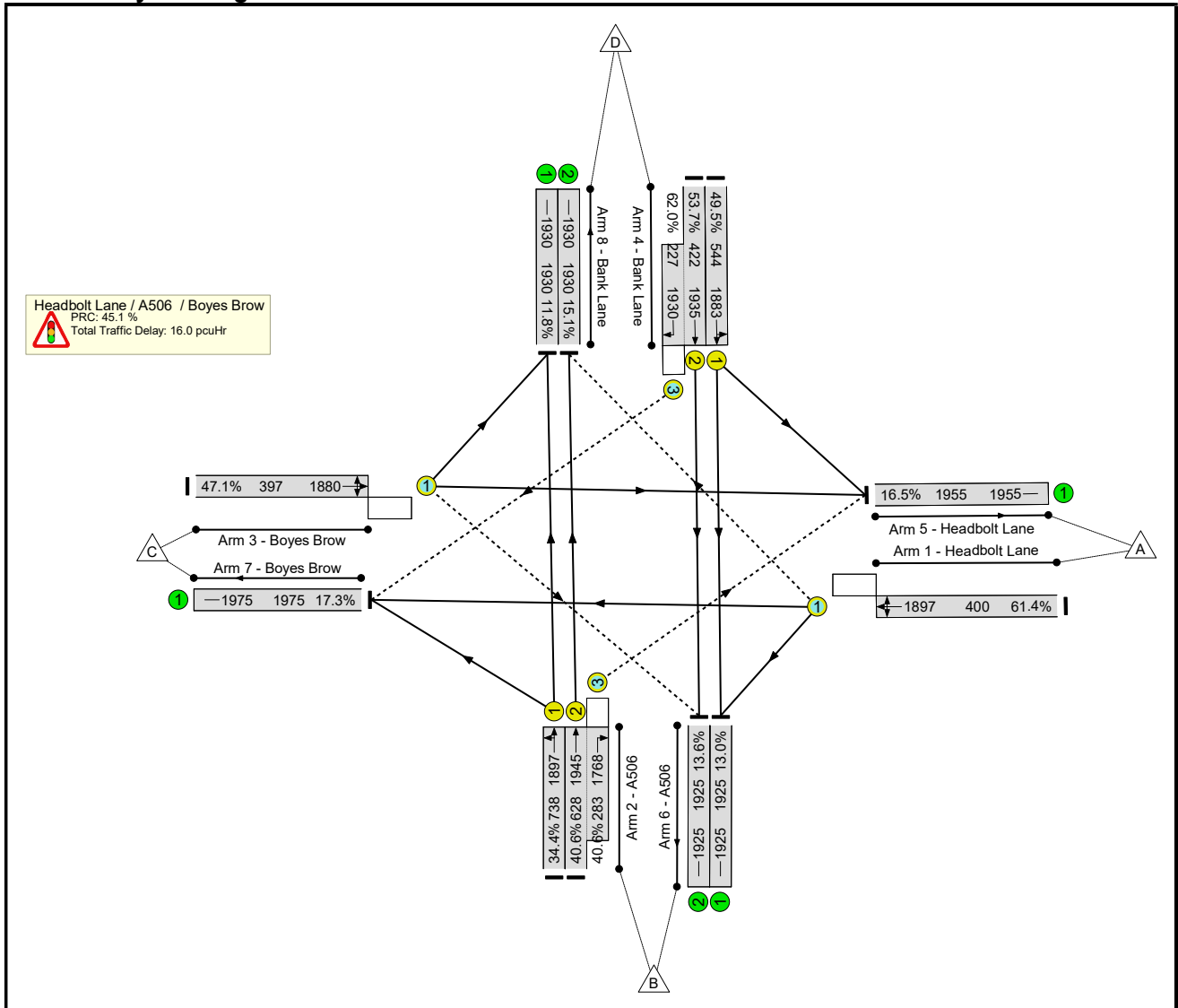
Network Results

Cycle Time (s): 90

Basic Results Summary

Scenario 7: '2028 AM Base' (FG11: '2028 AM Base', Plan 1: 'Network Control Plan 1')

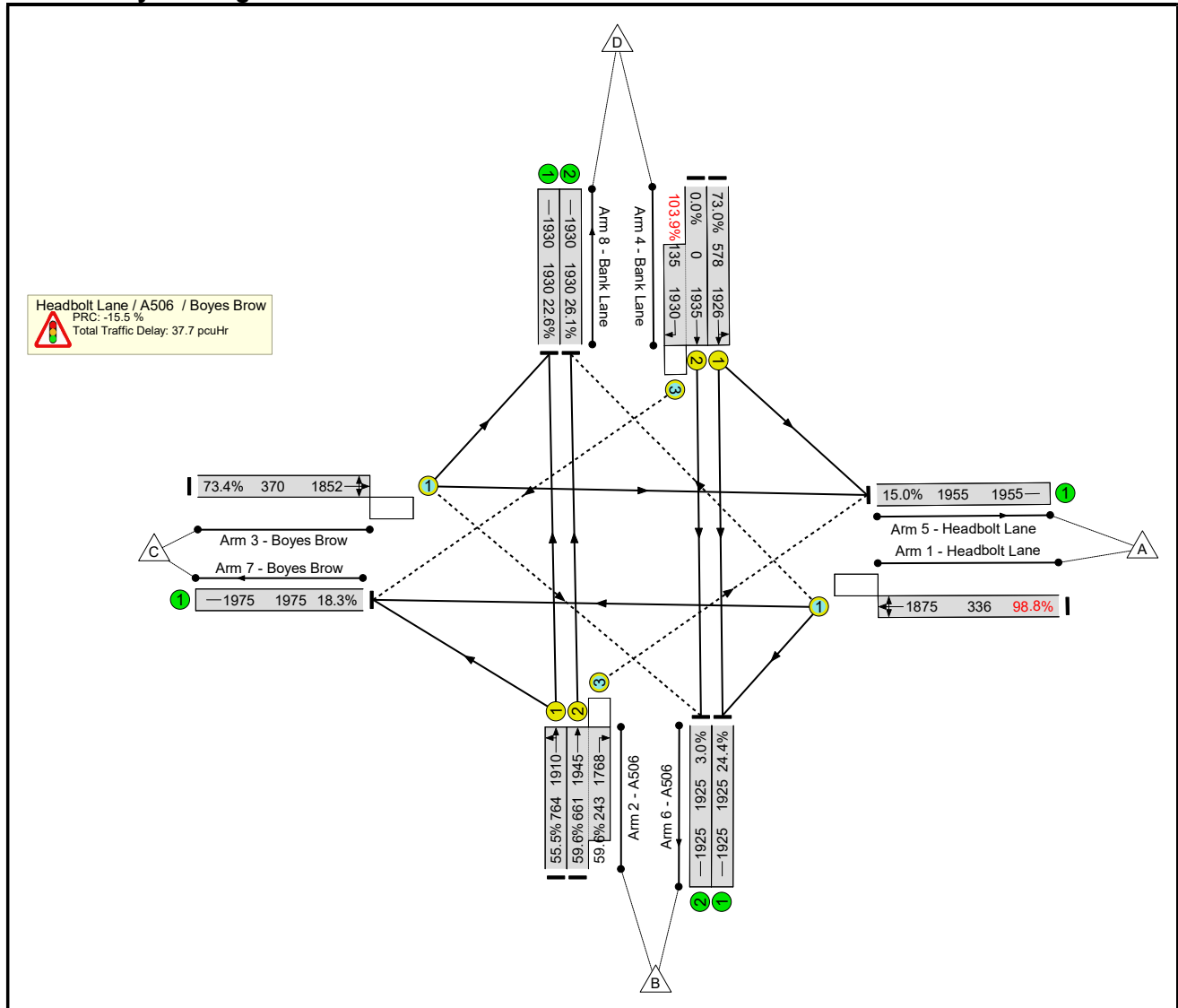
Network Layout Diagram



Basic Results Summary

Scenario 8: '2028 PM Base' (FG12: '2028 PM Base', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



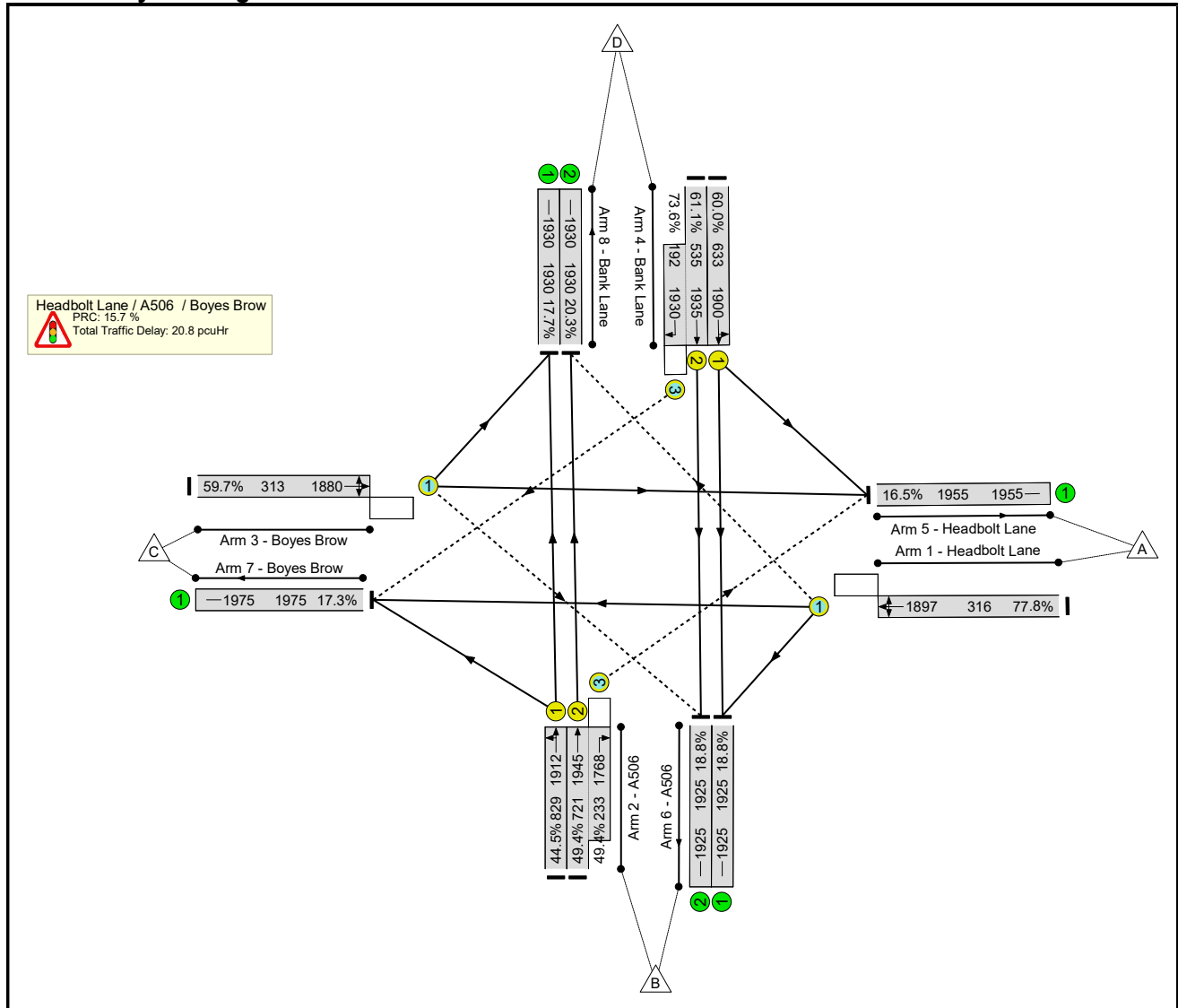
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network	-	-	-		-	-	-	-	-	-	103.9%	339	44	65	37.7	-	-	
Headbolt Lane / A506 / Boyes Brow	-	-	-		-	-	-	-	-	-	103.9%	339	44	65	37.7	-	-	
1/1	Headbolt Lane Left Ahead Right	O	C		1	17	-	332	1875	336	98.8%	74	0	36	11.7	126.4	16.4	
2/1	A506 Left Ahead	U	A		1	35	-	424	1910	764	55.5%	-	-	-	3.1	26.1	8.7	
2/2+2/3	A506 Right Ahead	U+O	A	K	1	35	4	539	1945:1768	661+243	59.6 : 59.6%	98	44	3	4.3 (2.8+1.6)	28.8 (25.2:38.5)	8.1	
3/1	Boyes Brow Ahead Right Left	O	D		1	17	-	272	1852	370	73.4%	45	0	13	4.0	53.1	7.7	
4/1	Bank Lane Left Ahead	U	B		1	26	-	422	1926	578	73.0%	-	-	-	4.6	39.6	10.7	
4/2+4/3	Bank Lane Ahead Right	U+O	B	L	1	26	0	140	1935:1930	0+135	0.0 : 103.9%	122	0	13	9.3 (0.0+9.3)	240.0 (0.0:240.0)	11.0	
5/1	Headbolt Lane	U	-		-	-	-	294	1955	1955	15.0%	-	-	-	0.1	1.1	0.1	
6/1	A506	U	-		-	-	-	470	1925	1925	24.4%	-	-	-	0.2	1.2	0.2	
6/2	A506	U	-		-	-	-	58	1925	1925	3.0%	-	-	-	0.0	1.0	0.0	
7/1	Boyes Brow	U	-		-	-	-	366	1975	1975	18.3%	-	-	-	0.1	1.1	0.1	
8/1	Bank Lane	U	-		-	-	-	437	1930	1930	22.6%	-	-	-	0.1	1.2	0.1	
8/2	Bank Lane	U	-		-	-	-	504	1930	1930	26.1%	-	-	-	0.2	1.3	0.2	
C1			PRC for Signalled Lanes (%):		-15.5		PRC Over All Lanes (%):		-15.5		Total Delay for Signalled Lanes (pcuHr):		37.03		Cycle Time (s):		90	
											Total Delay Over All Lanes(pcuHr):		37.73					

Basic Results Summary

Scenario 9: '2028 AM Base + Com' (FG13: '2028 AM Base + Com', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



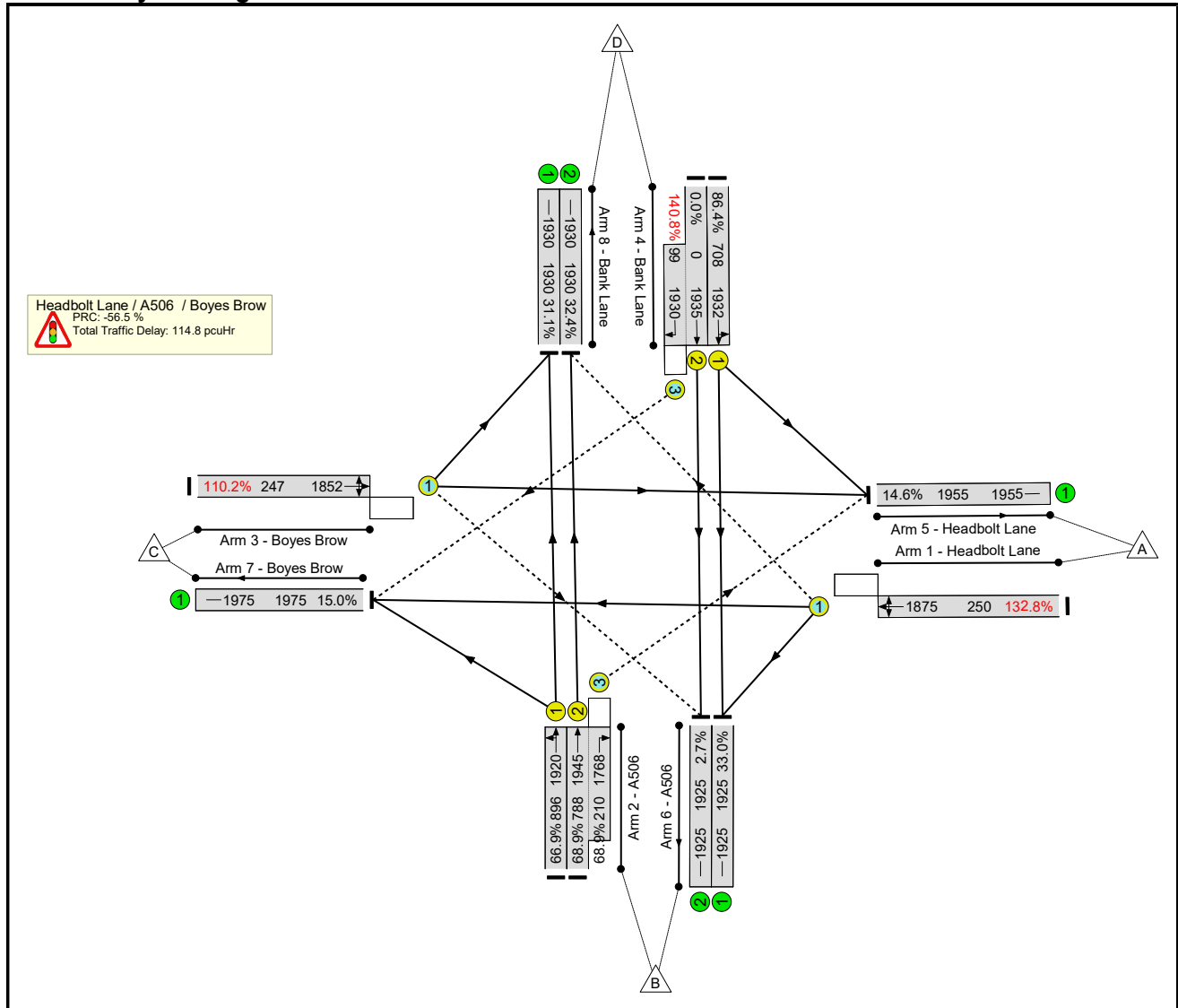
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	77.8%	315	9	3	20.8	-	-
Headbolt Lane / A506 / Boyes Brow	-	-	-		-	-	-	-	-	-	77.8%	315	9	3	20.8	-	-
1/1	Headbolt Lane Left Ahead Right	O	C		1	14	-	246	1897	316	77.8%	36	0	0	4.2	60.8	7.5
2/1	A506 Left Ahead	U	A		1	38	-	369	1912	829	44.5%	-	-	-	2.2	21.8	6.9
2/2+2/3	A506 Right Ahead	U+O	A	K	1	38	4	471	1945:1768	721+233	49.4 : 49.4%	103	9	3	3.2 (2.1+1.1)	24.2 (21.4:33.0)	6.6
3/1	Boyes Brow Ahead Right Left	O	D		1	14	-	187	1880	313	59.7%	35	0	0	2.6	50.1	5.0
4/1	Bank Lane Left Ahead	U	B		1	29	-	380	1900	633	60.0%	-	-	-	3.4	32.1	8.7
4/2+4/3	Bank Lane Ahead Right	U+O	B	L	1	29	0	468	1935:1930	535+192	61.1 : 73.6%	141	0	0	4.5 (2.8+1.7)	35.0 (31.0:44.2)	7.4
5/1	Headbolt Lane	U	-		-	-	-	322	1955	1955	16.5%	-	-	-	0.1	1.1	0.1
6/1	A506	U	-		-	-	-	362	1925	1925	18.8%	-	-	-	0.1	1.2	0.1
6/2	A506	U	-		-	-	-	362	1925	1925	18.8%	-	-	-	0.1	1.2	0.1
7/1	Boyes Brow	U	-		-	-	-	341	1975	1975	17.3%	-	-	-	0.1	1.1	0.1
8/1	Bank Lane	U	-		-	-	-	342	1930	1930	17.7%	-	-	-	0.1	1.1	0.1
8/2	Bank Lane	U	-		-	-	-	392	1930	1930	20.3%	-	-	-	0.1	1.2	0.1
C1				PRC for Signalled Lanes (%):		15.7		Total Delay for Signalled Lanes (pcuHr):		20.09		Cycle Time (s):		90			
				PRC Over All Lanes (%):		15.7		Total Delay Over All Lanes(pcuHr):		20.76							

Basic Results Summary

Scenario 10: '2028 PM Base + Com' (FG14: '2028 PM Base + Com', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



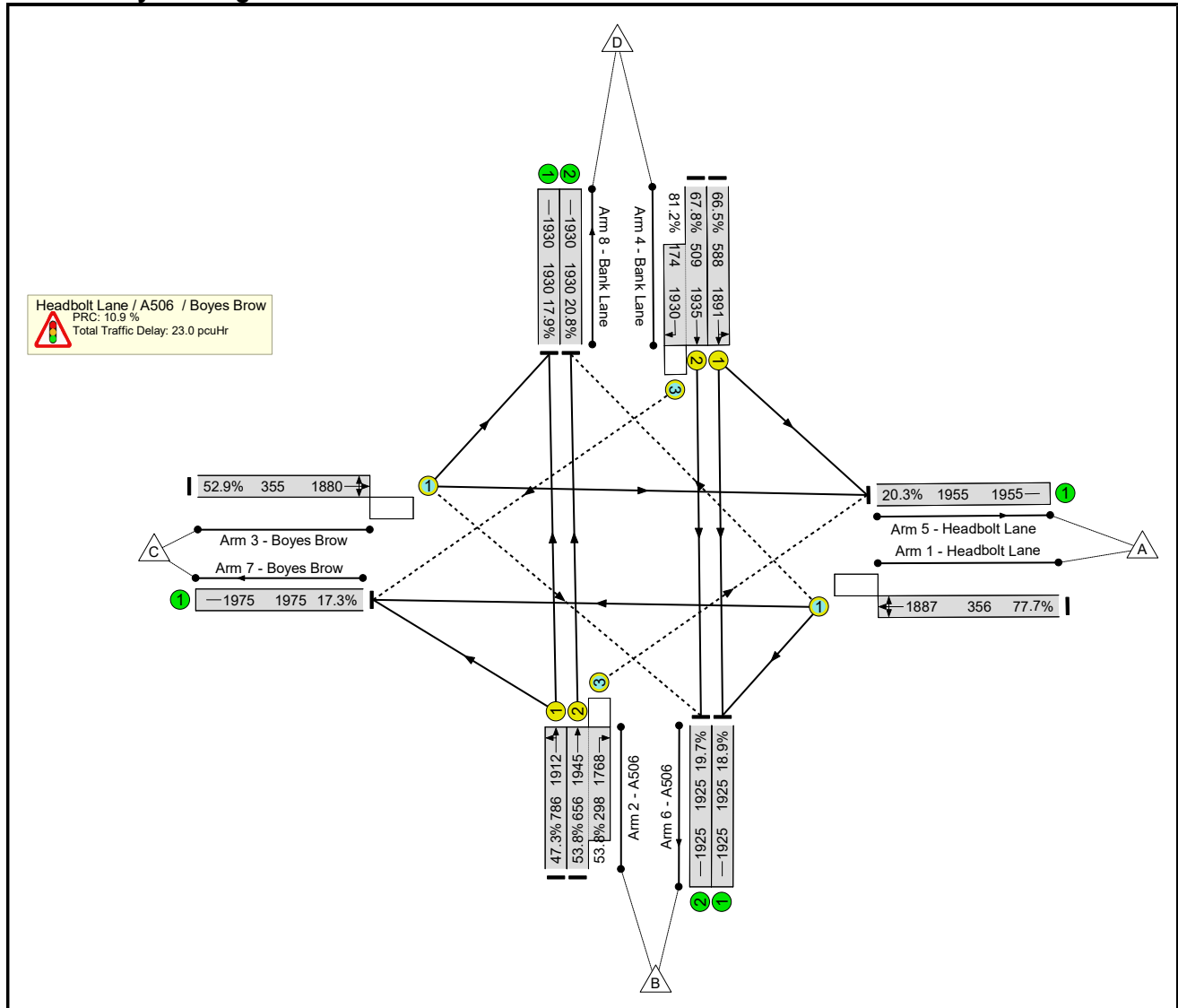
Network Results

C1	PRC for Signalled Lanes (%):	-56.5	Total Delay for Signalled Lanes (pcuHr):	113.93	Cycle Time (s):	90
	PRC Over All Lanes (%):	-56.5	Total Delay Over All Lanes(pcuHr):	114.82		

Basic Results Summary

Scenario 11: '2028 AM Base + Com + Dev' (FG15: '2028 AM Base + Com + Dev', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



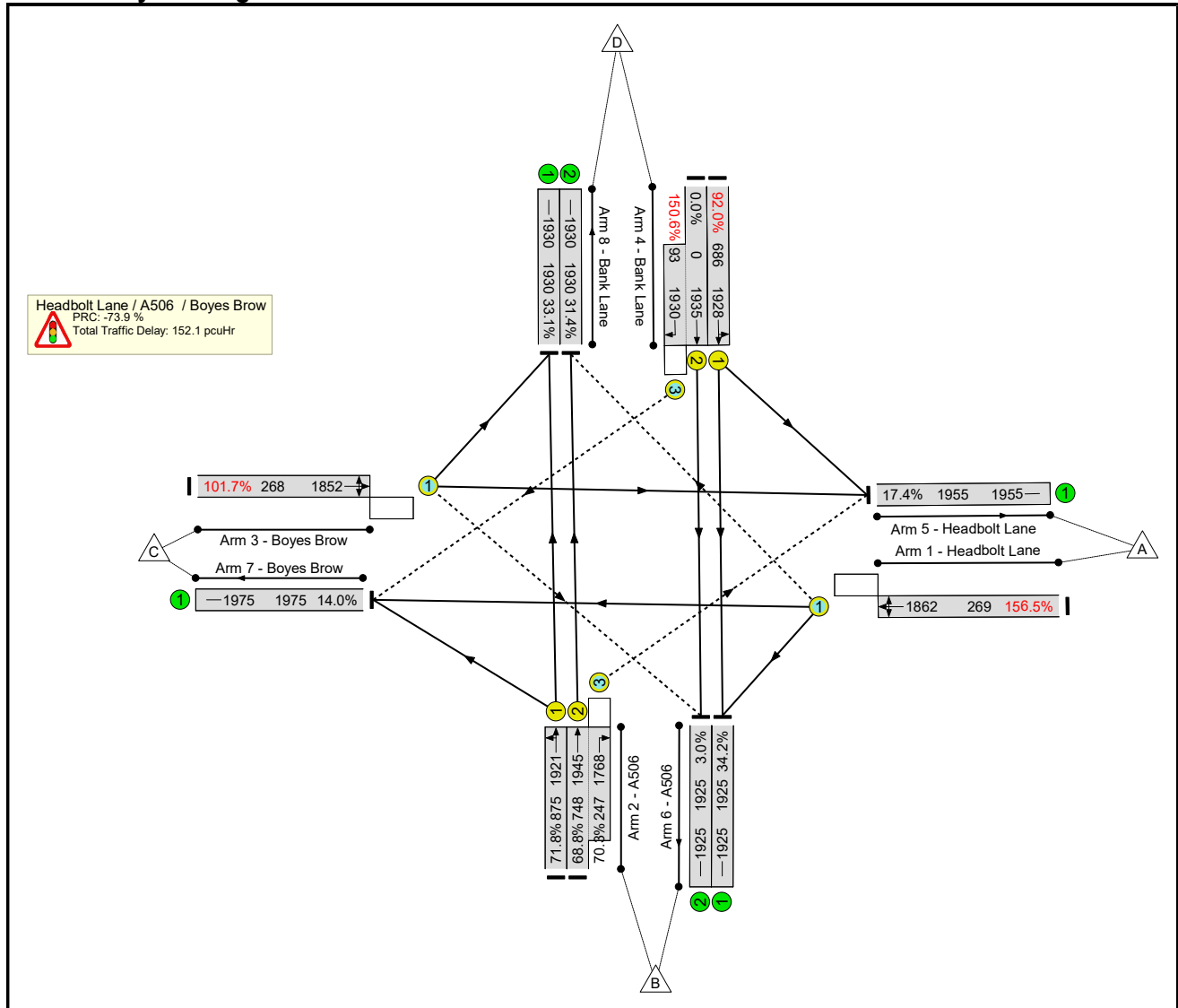
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	81.2%	305	74	4	23.0	-	-
Headbolt Lane / A506 / Boyes Brow	-	-	-		-	-	-	-	-	-	81.2%	305	74	4	23.0	-	-
1/1	Headbolt Lane Left Ahead Right	O	C		1	16	-	277	1887	356	77.7%	47	0	1	4.4	56.9	8.2
2/1	A506 Left Ahead	U	A		1	36	-	372	1912	786	47.3%	-	-	-	2.5	23.7	7.2
2/2+2/3	A506 Right Ahead	U+O	A	K	1	36	4	513	1945:1768	656+298	53.8 : 53.8%	82	74	4	4.0 (2.3+1.7)	27.8 (23.1:38.2)	6.9
3/1	Boyes Brow Ahead Right Left	O	D		1	16	-	188	1880	355	52.9%	35	0	0	2.4	45.1	4.8
4/1	Bank Lane Left Ahead	U	B		1	27	-	391	1891	588	66.5%	-	-	-	3.9	36.0	9.5
4/2+4/3	Bank Lane Ahead Right	U+O	B	L	1	27	0	486	1935:1930	509+174	67.8 : 81.2%	141	0	0	5.3 (3.4+1.9)	39.0 (35.0:48.8)	8.6
5/1	Headbolt Lane	U	-		-	-	-	397	1955	1955	20.3%	-	-	-	0.1	1.2	0.1
6/1	A506	U	-		-	-	-	363	1925	1925	18.9%	-	-	-	0.1	1.2	0.1
6/2	A506	U	-		-	-	-	380	1925	1925	19.7%	-	-	-	0.1	1.2	0.1
7/1	Boyes Brow	U	-		-	-	-	341	1975	1975	17.3%	-	-	-	0.1	1.1	0.1
8/1	Bank Lane	U	-		-	-	-	345	1930	1930	17.9%	-	-	-	0.1	1.1	0.1
8/2	Bank Lane	U	-		-	-	-	401	1930	1930	20.8%	-	-	-	0.1	1.2	0.1
C1 PRC for Signalled Lanes (%): 10.9 Total Delay for Signalled Lanes (pcuHr): 22.33 Cycle Time (s): 90 PRC Over All Lanes (%): 10.9 Total Delay Over All Lanes(pcuHr): 23.04																	

Basic Results Summary

Scenario 12: '2028 PM Base + Com + Dev' (FG16: '2028 PM Base + Com + Dev', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



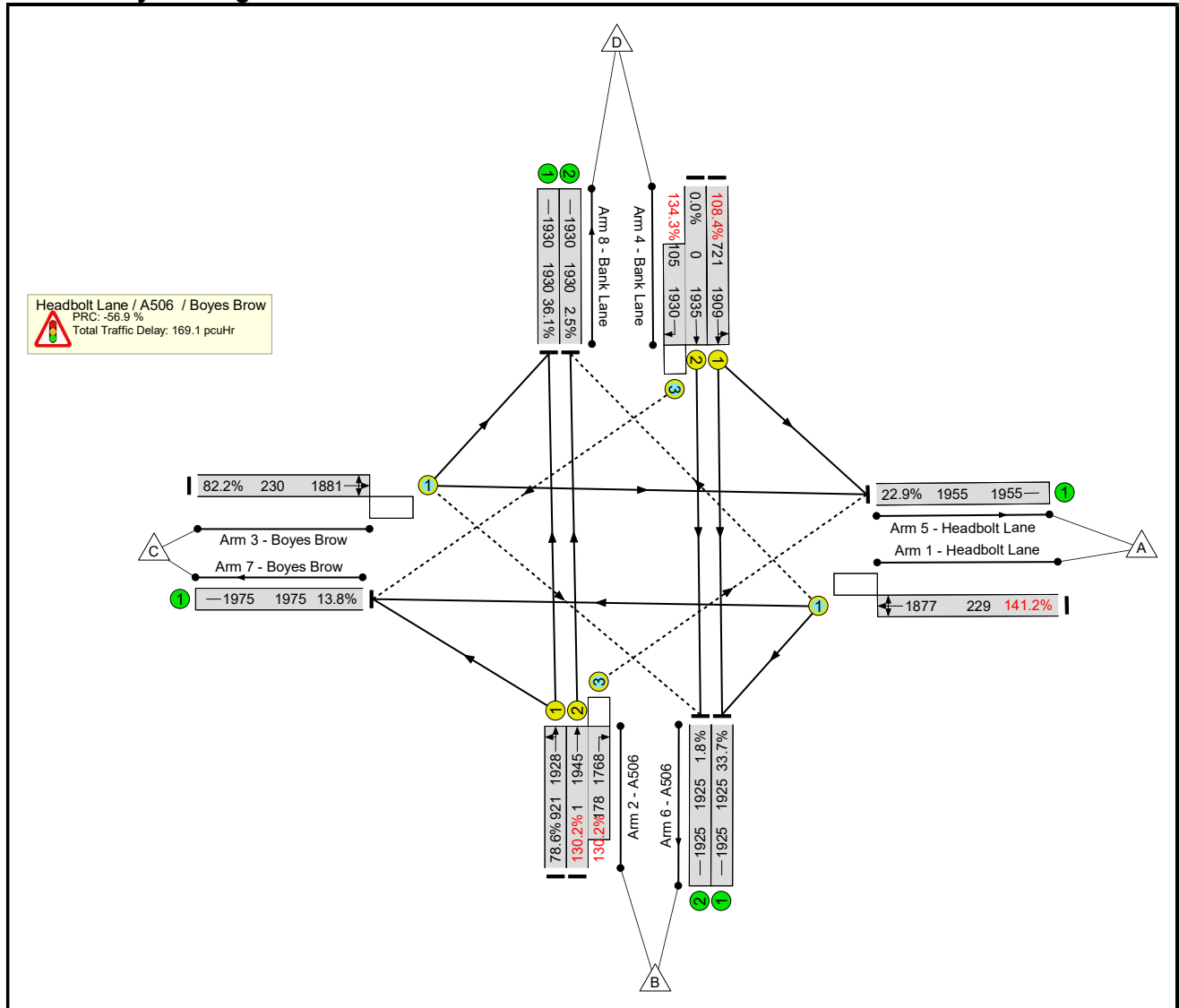
Network Results

[illegible]

Basic Results Summary

Scenario 13: '2028 AM Base + Com + Dev (Future Provision)' (FG19: '2028 AM Base + Com + Dev (Future Provision)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



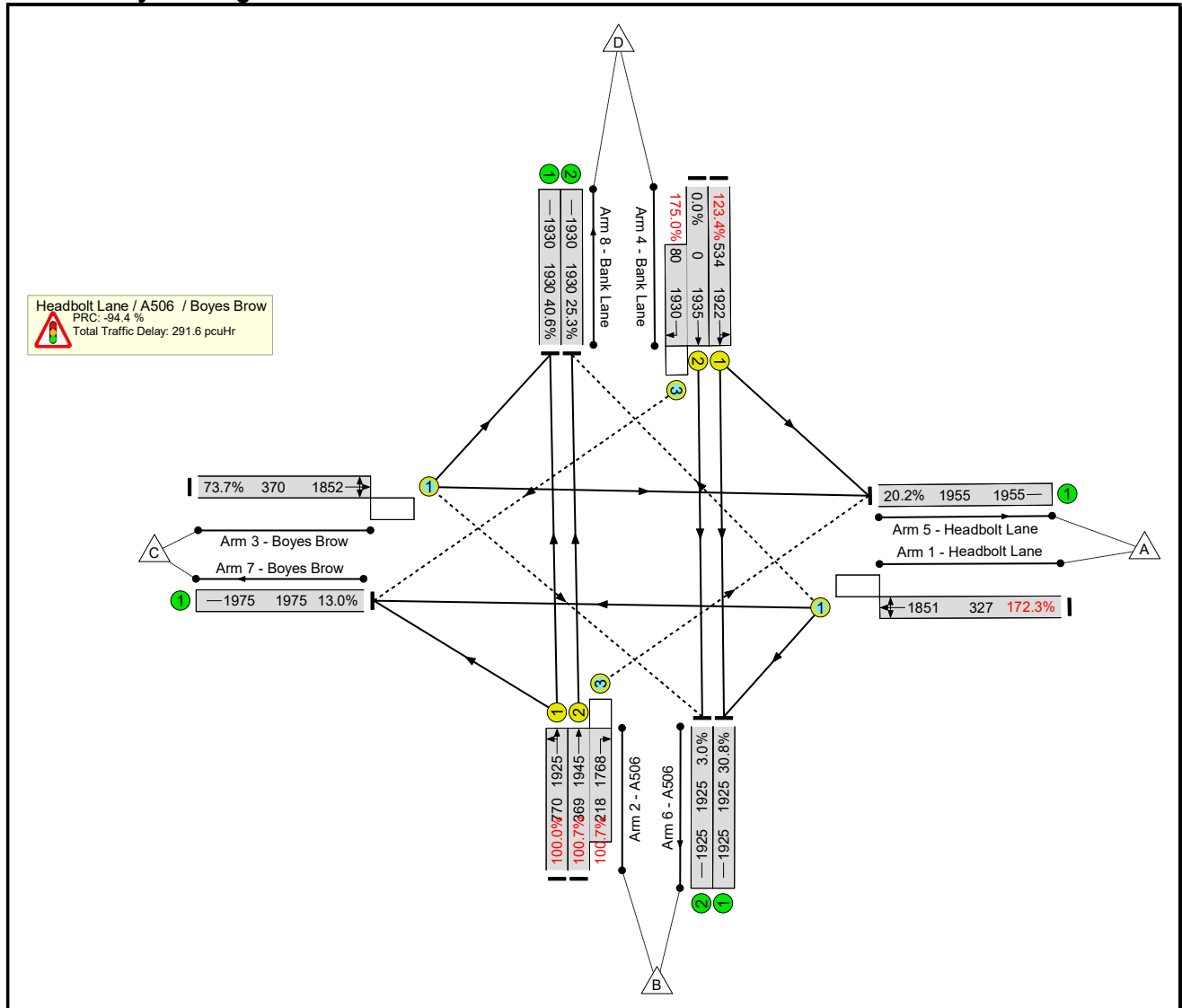
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	141.2%	133	138	95	169.1	-	-
Headbolt Lane / A506 / Boyes Brow	-	-	-		-	-	-	-	-	-	141.2%	133	138	95	169.1	-	-
1/1	Headbolt Lane Left Ahead Right	O	C		1	10	-	324	1877	229	141.2%	29	0	18	57.4	637.4	61.5
2/1	A506 Left Ahead	U	A		1	42	-	724	1928	921	78.6%	-	-	-	5.8	28.6	16.9
2/2+2/3	A506 Right Ahead	U+O	A	K	1	42	4	233	1945:1768	1+178	130.2 : 130.2%	0	138	41	33.6 (0.1+33.4)	518.4 (460.8:518.7)	36.2
3/1	Boyes Brow Ahead Right Left	O	D		1	10	-	189	1881	230	82.2%	0	0	35	4.2	79.6	6.7
4/1	Bank Lane Left Ahead	U	B		1	33	-	782	1909	721	108.4%	-	-	-	44.5	204.8	56.9
4/2+4/3	Bank Lane Ahead Right	U+O	B	L	1	33	0	141	1935:1930	0+105	0.0 : 134.3%	104	0	1	22.9 (0.0+22.9)	585.5 (0.0:585.5)	24.2
5/1	Headbolt Lane	U	-		-	-	-	516	1955	1955	22.9%	-	-	-	0.1	1.2	0.1
6/1	A506	U	-		-	-	-	736	1925	1925	33.7%	-	-	-	0.3	1.4	0.3
6/2	A506	U	-		-	-	-	35	1925	1925	1.8%	-	-	-	0.0	1.0	0.0
7/1	Boyes Brow	U	-		-	-	-	342	1975	1975	13.8%	-	-	-	0.1	1.1	0.1
8/1	Bank Lane	U	-		-	-	-	697	1930	1930	36.1%	-	-	-	0.3	1.5	0.3
8/2	Bank Lane	U	-		-	-	-	67	1930	1930	2.5%	-	-	-	0.0	1.0	0.0
C1 PRC for Signalled Lanes (%): -56.9 Total Delay for Signalled Lanes (pcuHr): 168.28 Cycle Time (s): 90 PRC Over All Lanes (%): -56.9 Total Delay Over All Lanes(pcuHr): 169.06																	

Basic Results Summary

Scenario 14: '2028 PM Base + Com + Dev (Future Provision)' (FG20: '2028 PM Base + Com + Dev (Future Provision)', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Network Results

[illegible]

Junctions 9	
PICADY 9 - Priority Intersection Module	
Version: 9.5.1.7462 © Copyright TRL Limited, 2019	
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Filename: Shevington_Stopgate_Pingwood.j9

Path: C:\Users\rachel.cornfoot\Arup\HBL New Station - Project Files\01 Engineering\04 Internal Project Data\Transport Planning\Junction Models

Report generation date: 14/05/2021 15:40:24

»2021 Base, AM
 »2021 Base, PM
 »2023 Base, AM
 »2023 Base, PM
 »2028 Base, AM
 »2028 Base, PM
 »2023 Base + Com, AM
 »2023 Base + Com, PM
 »2028 Base + Com, AM
 »2028 Base + Com, PM
 »2023 Base + Com + Dev, AM
 »2023 Base + Com + Dev, PM
 »2028 Base + Com + Dev, AM
 »2028 Base + Com + Dev, PM
 »2028 Base + Com + Dev (500 Spaces), AM
 »2028 Base + Com + Dev (500 Spaces), PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2021 Base									
Stream B-C	D1	0.2	16.66	0.15	C	D2	0.0	7.49	0.02	A
Stream B-A		3.7	31.41	0.80	D		0.3	8.76	0.21	A
Stream C-AB		0.0	5.74	0.03	A		0.1	6.75	0.06	A
	2023 Base									
Stream B-C	D3	0.2	17.80	0.16	C	D4	0.0	7.52	0.02	A
Stream B-A		4.0	33.04	0.81	D		0.3	8.83	0.21	A
Stream C-AB		0.0	5.76	0.03	A		0.1	6.78	0.06	A
	2028 Base									
Stream B-C	D5	0.3	24.58	0.21	C	D6	0.0	7.58	0.02	A
Stream B-A		5.2	41.91	0.86	E		0.3	8.98	0.22	A
Stream C-AB		0.0	5.78	0.03	A		0.1	6.85	0.06	A
	2023 Base + Com									
Stream B-C	D7	0.2	17.80	0.16	C	D8	0.0	7.52	0.02	A
Stream B-A		4.0	33.04	0.81	D		0.3	8.83	0.21	A
Stream C-AB		0.0	5.76	0.03	A		0.1	6.78	0.06	A
	2028 Base + Com									
Stream B-C	D9	0.3	24.58	0.21	C	D10	0.0	7.58	0.02	A
Stream B-A		5.2	41.91	0.86	E		0.3	8.98	0.22	A
Stream C-AB		0.0	5.78	0.03	A		0.1	6.85	0.06	A
	2023 Base + Com + Dev									
Stream B-C	D11	0.2	20.81	0.18	C	D12	0.0	7.57	0.02	A
Stream B-A		4.6	37.56	0.84	E		0.3	8.97	0.22	A
Stream C-AB		0.0	5.76	0.03	A		0.1	6.82	0.06	A
	2028 Base + Com + Dev									
Stream B-C	D13	0.3	29.15	0.24	D	D14	0.0	7.63	0.02	A
Stream B-A		5.8	46.04	0.87	E		0.3	9.15	0.23	A
Stream C-AB		0.0	5.78	0.03	A		0.1	6.89	0.06	A
	2028 Base + Com + Dev (500 Spaces)									
Stream B-C	D15	0.5	45.74	0.34	E	D16	0.0	7.71	0.02	A
Stream B-A		7.1	55.16	0.90	F		0.3	9.39	0.25	A
Stream C-AB		0.0	5.80	0.03	A		0.1	6.95	0.06	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

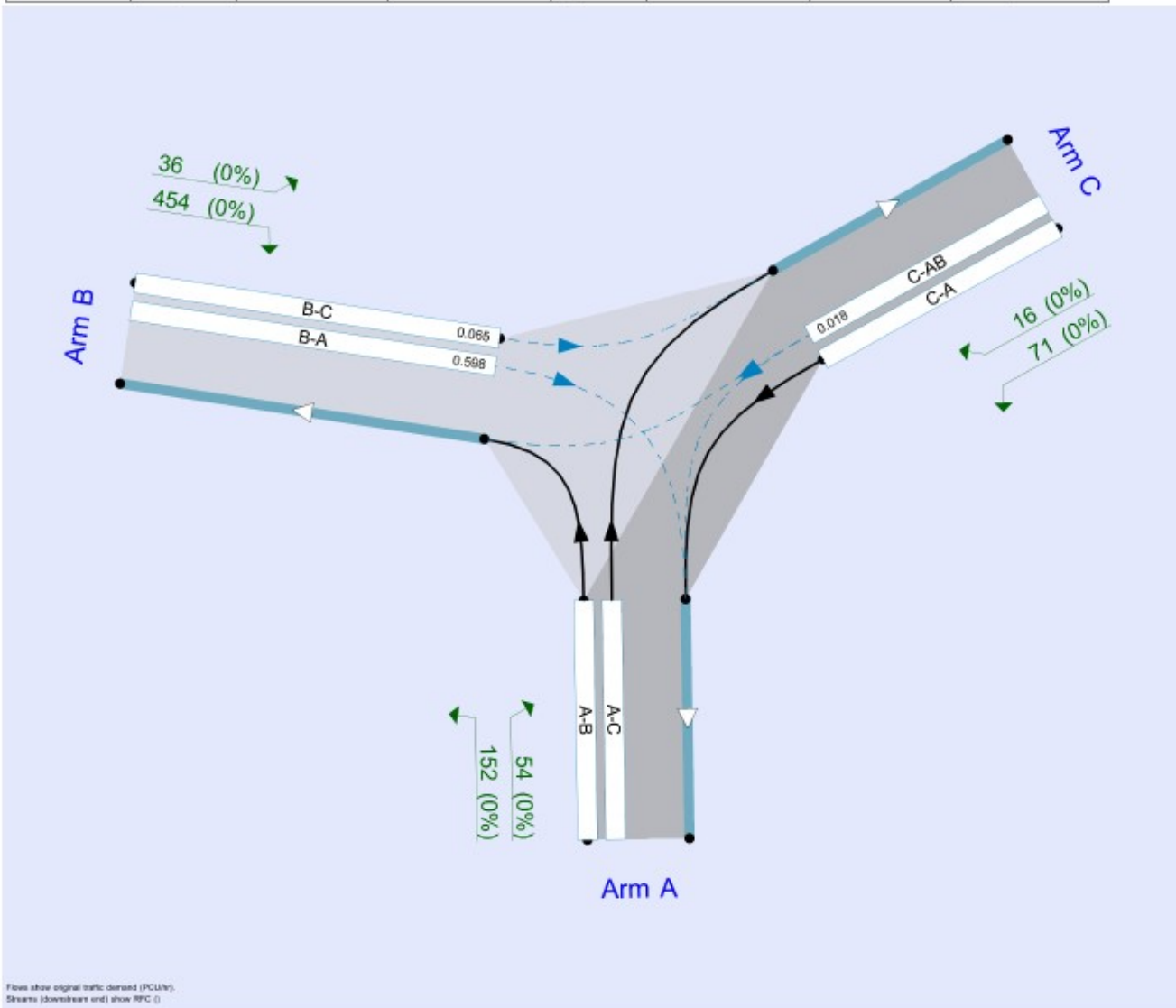
File summary

File Description

Title	
Location	
Site number	
Date	18/03/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\Rachel.Cornfoot
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021 Base	AM	ONE HOUR	07:30	09:00	15
D2	2021 Base	PM	ONE HOUR	16:00	17:30	15
D3	2023 Base	AM	ONE HOUR	07:30	09:00	15
D4	2023 Base	PM	ONE HOUR	16:00	17:30	15
D5	2028 Base	AM	ONE HOUR	07:30	09:00	15
D6	2028 Base	PM	ONE HOUR	16:00	17:30	15
D7	2023 Base + Com	AM	ONE HOUR	07:30	09:00	15
D8	2023 Base + Com	PM	ONE HOUR	16:00	17:30	15
D9	2028 Base + Com	AM	ONE HOUR	07:30	09:00	15
D10	2028 Base + Com	PM	ONE HOUR	16:00	17:30	15
D11	2023 Base + Com + Dev	AM	ONE HOUR	07:30	09:00	15
D12	2023 Base + Com + Dev	PM	ONE HOUR	16:00	17:30	15
D13	2028 Base + Com + Dev	AM	ONE HOUR	07:30	09:00	15
D14	2028 Base + Com + Dev	PM	ONE HOUR	16:00	17:30	15
D15	2028 Base + Com + Dev (500 Spaces)	AM	ONE HOUR	07:30	09:00	15
D16	2028 Base + Com + Dev (500 Spaces)	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2021 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		18.99	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Pingwood Lane	Pingwood Lane	Major
B	Shevington's Lane	Shevington's Lane	Minor
C	Stopgate Lane	Stopgate Lane	Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.70		✓	2.90	120.0	✓	1.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	5.80	4.60	4.55	4.20	✓	2.00	60	58

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	611	0.103	0.260	0.164	0.372
B-C	570	0.081	0.204	-	-
C-B	692	0.248	0.248	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021 Base	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	185	100.000
B		✓	440	100.000
C		✓	81	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	134	51
	B	408	0	34
	C	66	15	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.15	18.88	0.2	C
B-A	0.80	31.41	3.7	D
C-AB	0.03	5.74	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	446	0.057	25	0.1	8.544	A
B-A	306	578	0.529	301	1.1	12.826	B
C-AB	11	659	0.017	11	0.0	5.559	A
C-A	50			50			
A-B	101			101			
A-C	38			38			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	389	0.079	30	0.1	10.036	B
B-A	365	571	0.639	363	1.7	17.032	C
C-AB	14	652	0.021	13	0.0	5.634	A
C-A	59			59			
A-B	120			120			
A-C	46			46			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	37	265	0.141	37	0.2	15.743	C
B-A	447	559	0.800	440	3.5	28.663	D
C-AB	17	644	0.026	17	0.0	5.739	A
C-A	73			73			
A-B	148			148			
A-C	56			56			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	37	253	0.148	37	0.2	16.663	C
B-A	447	559	0.800	446	3.7	31.406	D
C-AB	17	644	0.026	17	0.0	5.739	A
C-A	73			73			
A-B	148			148			
A-C	56			56			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	375	0.081	31	0.1	10.457	B
B-A	365	567	0.643	372	1.9	19.062	C
C-AB	14	652	0.021	14	0.0	5.636	A
C-A	59			59			
A-B	120			120			
A-C	46			46			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	440	0.058	26	0.1	8.700	A
B-A	308	574	0.533	309	1.2	13.714	B
C-AB	11	659	0.017	11	0.0	5.562	A
C-A	50			50			
A-B	101			101			
A-C	38			38			

2021 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.67	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2021 Base	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	475	100.000
B		✓	107	100.000
C		✓	95	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	399	78
	B	97	0	10
	C	65	30	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.49	0.0	A
B-A	0.21	8.76	0.3	A
C-AB	0.06	6.75	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	518	0.015	7	0.0	7.052	A
B-A	73	547	0.134	72	0.2	7.582	A
C-AB	23	605	0.037	22	0.0	6.173	A
C-A	49			49			
A-B	300			300			
A-C	57			57			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	507	0.018	9	0.0	7.229	A
B-A	87	535	0.163	87	0.2	8.042	A
C-AB	27	589	0.046	27	0.0	6.405	A
C-A	58			58			
A-B	359			359			
A-C	68			68			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	491	0.022	11	0.0	7.492	A
B-A	107	518	0.206	107	0.3	8.747	A
C-AB	33	567	0.059	33	0.1	6.747	A
C-A	71			71			
A-B	439			439			
A-C	84			84			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	491	0.022	11	0.0	7.493	A
B-A	107	518	0.206	107	0.3	8.757	A
C-AB	33	567	0.059	33	0.1	6.747	A
C-A	71			71			
A-B	439			439			
A-C	84			84			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	507	0.018	9	0.0	7.234	A
B-A	87	535	0.163	87	0.2	8.058	A
C-AB	27	589	0.046	27	0.0	6.409	A
C-A	58			58			
A-B	359			359			
A-C	68			68			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	518	0.015	8	0.0	7.058	A
B-A	73	547	0.134	73	0.2	7.606	A
C-AB	23	605	0.037	23	0.0	6.177	A
C-A	49			49			
A-B	300			300			
A-C	57			57			

2023 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		19.97	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2023 Base	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	189	100.000
B		✓	449	100.000
C		✓	83	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	137	52
	B	414	0	35
	C	67	18	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.16	17.80	0.2	C
B-A	0.81	33.04	4.0	D
C-AB	0.03	5.76	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	442	0.060	26	0.1	8.652	A
B-A	312	577	0.540	307	1.1	13.133	B
C-AB	12	658	0.018	12	0.0	5.572	A
C-A	50			50			
A-B	103			103			
A-C	39			39			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	381	0.083	31	0.1	10.298	B
B-A	372	570	0.653	370	1.8	17.689	C
C-AB	14	652	0.022	14	0.0	5.649	A
C-A	60			60			
A-B	123			123			
A-C	47			47			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	254	0.152	38	0.2	16.656	C
B-A	456	561	0.812	448	3.7	29.902	D
C-AB	18	643	0.027	18	0.0	5.758	A
C-A	74			74			
A-B	151			151			
A-C	57			57			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	241	0.160	38	0.2	17.799	C
B-A	456	561	0.812	455	4.0	33.044	D
C-AB	18	643	0.027	18	0.0	5.758	A
C-A	74			74			
A-B	151			151			
A-C	57			57			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	366	0.086	32	0.1	10.799	B
B-A	372	566	0.657	380	2.0	20.030	C
C-AB	14	652	0.022	14	0.0	5.651	A
C-A	60			60			
A-B	123			123			
A-C	47			47			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	436	0.060	26	0.1	8.792	A
B-A	312	577	0.540	315	1.2	13.903	B
C-AB	12	658	0.018	12	0.0	5.574	A
C-A	50			50			
A-B	103			103			
A-C	39			39			

2023 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.67	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2023 Base	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	484	100.000
B		✓	109	100.000
C		✓	96	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	407	77
	B	99	0	10
	C	66	30	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.52	0.0	A
B-A	0.21	8.83	0.3	A
C-AB	0.06	6.78	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	517	0.015	7	0.0	7.070	A
B-A	75	546	0.137	74	0.2	7.618	A
C-AB	23	604	0.038	23	0.0	6.191	A
C-A	50			50			
A-B	306			306			
A-C	58			58			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	505	0.018	9	0.0	7.251	A
B-A	89	534	0.167	89	0.2	8.094	A
C-AB	27	587	0.046	27	0.0	6.427	A
C-A	59			59			
A-B	366			366			
A-C	69			69			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	490	0.022	11	0.0	7.520	A
B-A	109	517	0.211	109	0.3	8.819	A
C-AB	33	564	0.059	33	0.1	6.777	A
C-A	72			72			
A-B	448			448			
A-C	85			85			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	490	0.022	11	0.0	7.521	A
B-A	109	517	0.211	109	0.3	8.830	A
C-AB	33	564	0.059	33	0.1	6.777	A
C-A	72			72			
A-B	448			448			
A-C	85			85			

Continued on next page

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	505	0.018	9	0.0	7.253	A
B-A	89	534	0.167	89	0.2	8.108	A
C-AB	27	587	0.046	27	0.0	6.428	A
C-A	59			59			
A-B	366			366			
A-C	69			69			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	516	0.015	8	0.0	7.073	A
B-A	75	546	0.137	75	0.2	7.643	A
C-AB	23	604	0.038	23	0.0	6.197	A
C-A	50			50			
A-B	306			306			
A-C	58			58			

2028 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		25.41	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2028 Base	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	197	100.000
B		✓	468	100.000
C		✓	86	100.000

Origin-Destination Data

Demand (PCU/hr)

	To		
	A	B	C
From	A	0	143
	B	432	0
	C	70	16

Vehicle Mix

Heavy Vehicle Percentages

	To		
	A	B	C
From	A	0	0
	B	0	0
	C	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.21	24.58	0.3	C
B-A	0.86	41.91	5.2	E
C-AB	0.03	5.78	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	429	0.063	27	0.1	8.941	A
B-A	325	572	0.569	320	1.3	14.044	B
C-AB	12	657	0.018	12	0.0	5.584	A
C-A	53			53			
A-B	108			108			
A-C	41			41			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	358	0.090	32	0.1	11.054	B
B-A	388	565	0.687	385	2.1	19.661	C
C-AB	14	650	0.022	14	0.0	5.664	A
C-A	63			63			
A-B	129			129			
A-C	49			49			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	207	0.192	39	0.2	21.477	C
B-A	476	555	0.856	465	4.7	36.062	E
C-AB	18	641	0.028	18	0.0	5.777	A
C-A	77			77			
A-B	157			157			
A-C	59			59			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	186	0.213	40	0.3	24.585	C
B-A	476	555	0.856	474	5.2	41.911	E
C-AB	18	641	0.028	18	0.0	5.777	A
C-A	77			77			
A-B	157			157			
A-C	59			59			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	338	0.096	33	0.1	11.808	B
B-A	388	565	0.687	400	2.3	23.058	C
C-AB	14	650	0.022	14	0.0	5.665	A
C-A	63			63			
A-B	129			129			
A-C	49			49			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	422	0.064	27	0.1	9.130	A
B-A	325	572	0.569	329	1.4	15.066	C
C-AB	12	657	0.018	12	0.0	5.585	A
C-A	53			53			
A-B	108			108			
A-C	41			41			

2028 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.69	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2028 Base	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	503	100.000
B		✓	112	100.000
C		✓	100	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	423	80
	B	102	0	10
	C	69	31	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.58	0.0	A
B-A	0.22	8.98	0.3	A
C-AB	0.08	6.85	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	514	0.015	7	0.0	7.103	A
B-A	77	544	0.141	76	0.2	7.689	A
C-AB	23	600	0.039	23	0.0	6.236	A
C-A	52			52			
A-B	318			318			
A-C	60			60			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	503	0.018	9	0.0	7.292	A
B-A	92	531	0.173	92	0.2	8.189	A
C-AB	28	583	0.048	28	0.1	6.484	A
C-A	62			62			
A-B	380			380			
A-C	72			72			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	486	0.023	11	0.0	7.575	A
B-A	112	513	0.219	112	0.3	8.964	A
C-AB	34	560	0.062	34	0.1	6.854	A
C-A	76			76			
A-B	466			466			
A-C	88			88			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	486	0.023	11	0.0	7.576	A
B-A	112	513	0.219	112	0.3	8.977	A
C-AB	34	560	0.062	34	0.1	6.854	A
C-A	76			76			
A-B	466			466			
A-C	88			88			

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17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	502	0.018	9	0.0	7.297	A
B-A	92	531	0.173	92	0.2	8.207	A
C-AB	28	583	0.048	28	0.1	6.488	A
C-A	62			62			
A-B	380			380			
A-C	72			72			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	514	0.015	8	0.0	7.109	A
B-A	77	544	0.141	77	0.2	7.719	A
C-AB	23	600	0.039	23	0.0	6.239	A
C-A	52			52			
A-B	318			318			
A-C	60			60			

2023 Base + Com, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		19.97	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2023 Base + Com	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	189	100.000
B		✓	449	100.000
C		✓	83	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	137	52
	B	414	0	35
	C	67	18	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.16	17.80	0.2	C
B-A	0.81	33.04	4.0	D
C-AB	0.03	5.76	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	442	0.060	26	0.1	8.652	A
B-A	312	577	0.540	307	1.1	13.133	B
C-AB	12	658	0.018	12	0.0	5.572	A
C-A	50			50			
A-B	103			103			
A-C	39			39			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	381	0.083	31	0.1	10.298	B
B-A	372	570	0.653	370	1.8	17.689	C
C-AB	14	652	0.022	14	0.0	5.649	A
C-A	60			60			
A-B	123			123			
A-C	47			47			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	254	0.152	38	0.2	16.656	C
B-A	456	561	0.812	448	3.7	29.902	D
C-AB	18	643	0.027	18	0.0	5.758	A
C-A	74			74			
A-B	151			151			
A-C	57			57			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	241	0.160	38	0.2	17.799	C
B-A	456	561	0.812	455	4.0	33.044	D
C-AB	18	643	0.027	18	0.0	5.758	A
C-A	74			74			
A-B	151			151			
A-C	57			57			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	366	0.086	32	0.1	10.799	B
B-A	372	566	0.657	380	2.0	20.030	C
C-AB	14	652	0.022	14	0.0	5.651	A
C-A	60			60			
A-B	123			123			
A-C	47			47			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	436	0.060	26	0.1	8.792	A
B-A	312	577	0.540	315	1.2	13.903	B
C-AB	12	658	0.018	12	0.0	5.574	A
C-A	50			50			
A-B	103			103			
A-C	39			39			

2023 Base + Com, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.67	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2023 Base + Com	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	484	100.000
B		✓	109	100.000
C		✓	96	100.000

Origin-Destination Data

Demand (PCU/hr)

	To		
	A	B	C
From	A	0	407
	B	99	0
	C	66	30

Vehicle Mix

Heavy Vehicle Percentages

	To		
	A	B	C
From	A	0	0
	B	0	0
	C	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.52	0.0	A
B-A	0.21	8.83	0.3	A
C-AB	0.06	6.78	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	517	0.015	7	0.0	7.070	A
B-A	75	546	0.137	74	0.2	7.618	A
C-AB	23	604	0.038	23	0.0	6.191	A
C-A	50			50			
A-B	306			306			
A-C	58			58			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	505	0.018	9	0.0	7.251	A
B-A	89	534	0.167	89	0.2	8.094	A
C-AB	27	587	0.046	27	0.0	6.427	A
C-A	59			59			
A-B	366			366			
A-C	69			69			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	490	0.022	11	0.0	7.520	A
B-A	109	517	0.211	109	0.3	8.819	A
C-AB	33	564	0.059	33	0.1	6.777	A
C-A	72			72			
A-B	448			448			
A-C	85			85			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	490	0.022	11	0.0	7.521	A
B-A	109	517	0.211	109	0.3	8.830	A
C-AB	33	564	0.059	33	0.1	6.777	A
C-A	72			72			
A-B	448			448			
A-C	85			85			

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17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	505	0.018	9	0.0	7.253	A
B-A	89	534	0.167	89	0.2	8.108	A
C-AB	27	587	0.046	27	0.0	6.428	A
C-A	59			59			
A-B	366			366			
A-C	69			69			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	516	0.015	8	0.0	7.073	A
B-A	75	546	0.137	75	0.2	7.643	A
C-AB	23	604	0.038	23	0.0	6.197	A
C-A	50			50			
A-B	306			306			
A-C	58			58			

2028 Base + Com, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		25.41	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D9	2028 Base + Com	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	197	100.000
B		✓	468	100.000
C		✓	86	100.000

Origin-Destination Data

Demand (PCU/hr)

	To		
	A	B	C
From	A	0	143
	B	432	0
	C	70	16

Vehicle Mix

Heavy Vehicle Percentages

	To		
	A	B	C
From	A	0	0
	B	0	0
	C	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.21	24.58	0.3	C
B-A	0.86	41.91	5.2	E
C-AB	0.03	5.78	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	429	0.063	27	0.1	8.941	A
B-A	325	572	0.569	320	1.3	14.044	B
C-AB	12	657	0.018	12	0.0	5.584	A
C-A	53			53			
A-B	108			108			
A-C	41			41			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	358	0.090	32	0.1	11.054	B
B-A	388	565	0.687	385	2.1	19.661	C
C-AB	14	650	0.022	14	0.0	5.684	A
C-A	63			63			
A-B	129			129			
A-C	49			49			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	207	0.192	39	0.2	21.477	C
B-A	476	555	0.856	465	4.7	36.062	E
C-AB	18	641	0.028	18	0.0	5.777	A
C-A	77			77			
A-B	157			157			
A-C	59			59			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	188	0.213	40	0.3	24.585	C
B-A	476	555	0.856	474	5.2	41.911	E
C-AB	18	641	0.028	18	0.0	5.777	A
C-A	77			77			
A-B	157			157			
A-C	59			59			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	338	0.096	33	0.1	11.808	B
B-A	388	565	0.687	400	2.3	23.058	C
C-AB	14	650	0.022	14	0.0	5.665	A
C-A	63			63			
A-B	129			129			
A-C	49			49			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	422	0.064	27	0.1	9.130	A
B-A	325	572	0.569	329	1.4	15.066	C
C-AB	12	657	0.018	12	0.0	5.585	A
C-A	53			53			
A-B	108			108			
A-C	41			41			

2028 Base + Com, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.69	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D10	2028 Base + Com	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	503	100.000
B		✓	112	100.000
C		✓	100	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	423	80
	B	102	0	10
	C	69	31	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.58	0.0	A
B-A	0.22	8.98	0.3	A
C-AB	0.06	6.85	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	514	0.015	7	0.0	7.103	A
B-A	77	544	0.141	76	0.2	7.689	A
C-AB	23	600	0.039	23	0.0	6.236	A
C-A	52			52			
A-B	318			318			
A-C	60			60			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	503	0.018	9	0.0	7.292	A
B-A	92	531	0.173	92	0.2	8.189	A
C-AB	28	583	0.048	28	0.1	6.484	A
C-A	62			62			
A-B	380			380			
A-C	72			72			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	486	0.023	11	0.0	7.575	A
B-A	112	513	0.219	112	0.3	8.964	A
C-AB	34	560	0.062	34	0.1	6.854	A
C-A	76			76			
A-B	466			466			
A-C	88			88			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	486	0.023	11	0.0	7.576	A
B-A	112	513	0.219	112	0.3	8.977	A
C-AB	34	560	0.062	34	0.1	6.854	A
C-A	76			76			
A-B	466			466			
A-C	88			88			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	502	0.018	9	0.0	7.297	A
B-A	92	531	0.173	92	0.2	8.207	A
C-AB	28	583	0.048	28	0.1	6.488	A
C-A	62			62			
A-B	380			380			
A-C	72			72			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	514	0.015	8	0.0	7.109	A
B-A	77	544	0.141	77	0.2	7.719	A
C-AB	23	600	0.039	23	0.0	6.239	A
C-A	52			52			
A-B	318			318			
A-C	60			60			

2023 Base + Com + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		22.76	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D11	2023 Base + Com + Dev	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	192	100.000
B		✓	458	100.000
C		✓	84	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	140	52
	B	423	0	35
	C	68	16	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.18	20.81	0.2	C
B-A	0.84	37.58	4.6	E
C-AB	0.03	5.76	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	435	0.061	26	0.1	8.799	A
B-A	318	573	0.556	314	1.2	13.657	B
C-AB	12	658	0.018	12	0.0	5.577	A
C-A	51			51			
A-B	105			105			
A-C	39			39			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	368	0.085	31	0.1	10.683	B
B-A	380	566	0.672	377	1.9	18.778	C
C-AB	14	651	0.022	14	0.0	5.655	A
C-A	61			61			
A-B	126			126			
A-C	47			47			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	228	0.169	38	0.2	18.871	C
B-A	466	557	0.836	457	4.2	33.137	D
C-AB	18	642	0.028	18	0.0	5.765	A
C-A	75			75			
A-B	154			154			
A-C	57			57			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	39	211	0.182	38	0.2	20.808	C
B-A	466	557	0.836	464	4.6	37.557	E
C-AB	18	642	0.028	18	0.0	5.765	A
C-A	75			75			
A-B	154			154			
A-C	57			57			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	31	353	0.089	32	0.1	11.241	B
B-A	380	566	0.672	390	2.2	21.405	C
C-AB	14	651	0.022	14	0.0	5.657	A
C-A	61			61			
A-B	126			126			
A-C	47			47			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	26	428	0.062	26	0.1	8.961	A
B-A	318	573	0.556	322	1.3	14.550	B
C-AB	12	658	0.018	12	0.0	5.579	A
C-A	51			51			
A-B	105			105			
A-C	39			39			

2023 Base + Com + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.72	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D12	2023 Base + Com + Dev	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	495	100.000
B		✓	114	100.000
C		✓	96	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	417	78
	B	104	0	10
	C	66	30	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.57	0.0	A
B-A	0.22	8.97	0.3	A
C-AB	0.06	6.82	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	514	0.015	7	0.0	7.101	A
B-A	78	545	0.144	78	0.2	7.686	A
C-AB	23	602	0.038	23	0.0	6.213	A
C-A	50			50			
A-B	314			314			
A-C	59			59			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	503	0.018	9	0.0	7.289	A
B-A	93	533	0.175	93	0.2	8.186	A
C-AB	27	585	0.046	27	0.0	6.455	A
C-A	59			59			
A-B	375			375			
A-C	70			70			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	486	0.023	11	0.0	7.571	A
B-A	115	516	0.222	114	0.3	8.961	A
C-AB	33	561	0.059	33	0.1	6.816	A
C-A	72			72			
A-B	459			459			
A-C	86			86			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	486	0.023	11	0.0	7.572	A
B-A	115	516	0.222	114	0.3	8.973	A
C-AB	33	561	0.059	33	0.1	6.816	A
C-A	72			72			
A-B	459			459			
A-C	86			86			

Unsignalised level of service

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	503	0.018	9	0.0	7.292	A
B-A	93	533	0.175	94	0.2	8.204	A
C-AB	27	585	0.046	27	0.0	6.459	A
C-A	59			59			
A-B	375			375			
A-C	70			70			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	514	0.015	8	0.0	7.108	A
B-A	78	545	0.144	78	0.2	7.716	A
C-AB	23	602	0.038	23	0.0	6.216	A
C-A	50			50			
A-B	314			314			
A-C	59			59			

2028 Base + Com + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		28.08	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D13	2028 Base + Com + Dev	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	200	100.000
B		✓	478	100.000
C		✓	88	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	148	54
	B	440	0	38
	C	70	18	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.24	29.15	0.3	D
B-A	0.87	46.04	5.8	E
C-AB	0.03	5.78	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	424	0.064	27	0.1	9.057	A
B-A	331	572	0.580	326	1.3	14.364	B
C-AB	12	656	0.018	12	0.0	5.589	A
C-A	53			53			
A-B	110			110			
A-C	41			41			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	348	0.093	32	0.1	11.385	B
B-A	396	565	0.700	392	2.2	20.424	C
C-AB	14	649	0.022	14	0.0	5.670	A
C-A	63			63			
A-B	131			131			
A-C	49			49			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	188	0.211	39	0.3	24.141	C
B-A	484	555	0.873	472	5.2	38.692	E
C-AB	18	640	0.028	18	0.0	5.785	A
C-A	77			77			
A-B	161			161			
A-C	59			59			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	163	0.244	39	0.3	29.153	D
B-A	484	555	0.873	482	5.8	46.042	E
C-AB	18	640	0.028	18	0.0	5.785	A
C-A	77			77			
A-B	161			161			
A-C	59			59			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	325	0.099	33	0.1	12.349	B
B-A	396	565	0.700	409	2.5	24.656	C
C-AB	14	649	0.022	14	0.0	5.673	A
C-A	63			63			
A-B	131			131			
A-C	49			49			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	416	0.065	27	0.1	9.271	A
B-A	331	572	0.579	336	1.4	15.514	C
C-AB	12	656	0.018	12	0.0	5.589	A
C-A	53			53			
A-B	110			110			
A-C	41			41			

2028 Base + Com + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.75	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D14	2028 Base + Com + Dev	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	514	100.000
B		✓	118	100.000
C		✓	100	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	433	81
	B	108	0	10
	C	69	31	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.63	0.0	A
B-A	0.23	9.15	0.3	A
C-AB	0.06	6.89	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	512	0.015	7	0.0	7.138	A
B-A	81	543	0.150	81	0.2	7.771	A
C-AB	23	598	0.039	23	0.0	6.258	A
C-A	52			52			
A-B	326			326			
A-C	61			61			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	500	0.018	9	0.0	7.336	A
B-A	97	530	0.183	97	0.2	8.304	A
C-AB	28	581	0.048	28	0.1	6.513	A
C-A	62			62			
A-B	389			389			
A-C	73			73			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	483	0.023	11	0.0	7.633	A
B-A	119	512	0.232	119	0.3	9.135	A
C-AB	34	557	0.062	34	0.1	6.893	A
C-A	76			76			
A-B	477			477			
A-C	89			89			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	482	0.023	11	0.0	7.635	A
B-A	119	512	0.232	119	0.3	9.150	A
C-AB	34	557	0.062	34	0.1	6.893	A
C-A	76			76			
A-B	477			477			
A-C	89			89			

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17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	499	0.018	9	0.0	7.342	A
B-A	97	530	0.183	97	0.2	8.324	A
C-AB	28	581	0.048	28	0.1	6.514	A
C-A	62			62			
A-B	389			389			
A-C	73			73			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	511	0.015	8	0.0	7.142	A
B-A	81	543	0.150	82	0.2	7.803	A
C-AB	23	598	0.039	23	0.0	6.264	A
C-A	52			52			
A-B	328			328			
A-C	61			61			

2028 Base + Com + Dev (500 Spaces), AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		34.20	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D15	2028 Base + Com + Dev (500 Spaces)	AM	ONE HOUR	07:30	09:00	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	206	100.000
B		✓	490	100.000
C		✓	87	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	152	54
	B	454	0	36
	C	71	16	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.34	45.74	0.5	E
B-A	0.90	55.16	7.1	F
C-AB	0.03	5.80	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	415	0.065	27	0.1	9.278	A
B-A	342	571	0.598	338	1.4	14.973	B
C-AB	12	655	0.018	12	0.0	5.599	A
C-A	53			53			
A-B	114			114			
A-C	41			41			

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	331	0.098	32	0.1	12.055	B
B-A	408	564	0.723	404	2.4	21.923	C
C-AB	14	648	0.022	14	0.0	5.682	A
C-A	64			64			
A-B	137			137			
A-C	49			49			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	151	0.262	39	0.3	31.803	D
B-A	500	555	0.901	485	6.2	44.079	E
C-AB	18	638	0.028	18	0.0	5.800	A
C-A	78			78			
A-B	167			167			
A-C	59			59			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	117	0.338	39	0.5	45.739	E
B-A	500	555	0.901	496	7.1	55.159	F
C-AB	18	638	0.028	18	0.0	5.800	A
C-A	78			78			
A-B	167			167			
A-C	59			59			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	299	0.108	34	0.1	13.636	B
B-A	408	564	0.723	425	2.8	28.395	D
C-AB	14	648	0.022	14	0.0	5.685	A
C-A	64			64			
A-B	137			137			
A-C	49			49			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	404	0.067	27	0.1	9.550	A
B-A	342	571	0.598	347	1.5	16.395	C
C-AB	12	655	0.018	12	0.0	5.599	A
C-A	53			53			
A-B	114			114			
A-C	41			41			

2028 Base + Com + Dev (500 Spaces), PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Shevington's Lane / Pingwood Lane / Stopgate Lane	T-Junction	Two-way		1.83	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D16	2028 Base + Com + Dev (500 Spaces)	PM	ONE HOUR	16:00	17:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	530	100.000
B		✓	126	100.000
C		✓	100	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	449	81
	B	116	0	10
	C	69	31	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.02	7.71	0.0	A
B-A	0.25	9.39	0.3	A
C-AB	0.06	6.95	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	509	0.015	7	0.0	7.185	A
B-A	87	543	0.161	87	0.2	7.883	A
C-AB	23	595	0.039	23	0.0	6.290	A
C-A	52			52			
A-B	338			338			
A-C	61			61			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	496	0.018	9	0.0	7.394	A
B-A	104	529	0.197	104	0.2	8.461	A
C-AB	28	577	0.049	28	0.1	6.555	A
C-A	62			62			
A-B	404			404			
A-C	73			73			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	478	0.023	11	0.0	7.712	A
B-A	128	511	0.250	127	0.3	9.373	A
C-AB	34	552	0.062	34	0.1	6.951	A
C-A	76			76			
A-B	494			494			
A-C	89			89			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	11	478	0.023	11	0.0	7.714	A
B-A	128	511	0.250	128	0.3	9.390	A
C-AB	34	552	0.062	34	0.1	6.954	A
C-A	76			76			
A-B	494			494			
A-C	89			89			

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17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	9	496	0.018	9	0.0	7.400	A
B-A	104	529	0.197	105	0.2	8.483	A
C-AB	28	577	0.049	28	0.1	6.559	A
C-A	62			62			
A-B	404			404			
A-C	73			73			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	8	508	0.015	8	0.0	7.189	A
B-A	87	542	0.161	88	0.2	7.918	A
C-AB	23	595	0.039	23	0.0	6.296	A
C-A	52			52			
A-B	338			338			
A-C	61			61			