Barnsley Metropolitan Borough Council

Carlton Masterplan Framework

Shaw Lane / Church Street Junction Assessment

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1 Introduction

Arup have been commissioned by Barnsley Metropolitan Borough Council (BMBC) to undertake assessment of the Church Street / Shaw Lane / Fish Dam Lane junction as part of ongoing work to develop the Masterplan Framework for a site at Carlton, to the north east of Barnsley.

1.1 Background

The Carlton Masterplan Framework currently includes two movement framework options that each provide new highway connectivity to access the proposed development. These proposals have been identified based on the understanding that the existing highway infrastructure, specifically the Church Street / Shaw Lane / Fish Dam Lane junction, cannot accommodate the additional traffic that will result from the development. However, additional analysis is required to test this understanding, and provide evidence to support the proposals. The analysis will also inform the phasing strategy of the masterplan framework.

A set of figures, drawings and appendices, referenced in the following sections, are provided at the end of this document.

2 Existing Situation

2.1 Site Location / Existing Junction

The Church Street / Shaw Lane / Fish Dam Lane junction is located in Carlton, around 6km to the north east of Barnsley town centre (refer to Image 1). It is a three-arm priority-controlled junction.

The B6132 Church Street provides the major arm northern approach, connecting Carlton to Royston and other villages between Barnsley and Wakefield. Fish Dam Lane provides the major arm southern approach, linking Carlton to Barnsley town centre via Burton Road and the A61. Church Street and Fish Dam Lane are single carriageway roads with a single lane approach to the junction.

The minor arm, Shaw Lane, is a narrow single carriageway that heads east from the junction and joins the A628 approximately 2km from the junction for strategic connections between Doncaster, Wakefield and Barnsley. Approximately 900m east of the junction, Shaw Lane passes under a rail bridge with a 4.8m height restriction and where the carriageway narrows to single lane with the eastbound approach having priority.

Image 1: Site Context

Source: Ordnance Survey 2021

2.2 Base Year Traffic Data

Traffic turning count surveys were undertaken at the junction in June 2021. However, given the uncertainties of representative traffic conditions as a result of the Covid-19 pandemic, a review of historical traffic data in the vicinity of the junction has been undertaken.

2.2.1 Historical ATC Data

BMBC have provided historical ATC data for site BF17, a permanent counter located on Fish Dam Lane close to the Premier Food site and south of the Shaw Lane junction. Data was provided for the period between May 2018 and May 2019. The data provides hourly traffic flow in both northbound and southbound directions on Fish Dam Lane.

The data outputs indicated partial or zero flows recorded on a number of dates throughout the period, therefore, the data was analysed by reviewing the traffic counts where data is available for whole weeks during neutral months comprising:

- 2 weeks in May 2018
- 2 weeks in June 2018
- 2 weeks in September 2018
- 2 weeks in April 2019

Average flows for the AM peak hour (08:00-09:00hrs) and PM peak hour (17:00-18:00hrs) in both the northbound and southbound direction during these periods were extracted and compared.

2.2.2 2018 Survey Data

This survey data comprised of manual classified turning counts recorded at the Church Street / Shaw Lane / Fish Dam Lane junction on a weekday in November 2018. The data was recorded along all arms of the junction in the AM and PM peak periods (07:00-10:00hrs and 16:00-18:00hrs) in 15-minute intervals.

This survey data was used to determine the northbound and southbound AM and PM peak hour flows on the Fish Dam Lane approach, to be broadly consistent with the ATC data location.

2.2.3 2021 Survey Data

This survey data comprised of manual classified turning counts recorded at the Church Street / Shaw Lane / Fish Dam Lane junction on a weekday in June 2021. The data was recorded along all arms of the junction in the AM and PM peak periods (07:00-10:00hrs and 16:00-19:00hrs) in 15-minute intervals.

Again, this survey data was used to determine the northbound and southbound AM and PM peak hour flows on the Fish Dam Lane approach, to be broadly consistent with the ATC data location.

2.2.4 Summary

The detailed June 2021 traffic survey data is provided at Appendix A and analysis of the different data sources is provided at Appendix B. Table 1 below provides a summary of the northbound and southbound flows for the AM and PM peak hours for each of the data sets above.

Table 1: Traffic Count Data Summary

	2018 ATC	2019 ATC	2018 Survey	2021 Survey
Northbound				
08:00 - 09:00	400	422	438	429
17:00 - 18:00	308	334	410	450
Southbound				
08:00 - 09:00	402	436	436	446
17:00 - 18:00	423	443	306	443

Analysis of the data indicates that the traffic counts are broadly consistent across the different data sets. The AM peak hour flows are consistent in both the northbound and southbound direction across all datasets. There is more variation in the PM peak hour flows, although the 2018 and 2021 surveys data are broadly consistent in the northbound direction and the 2018 ATC, 2019 ATC and 2021 survey consistent in the southbound direction. The 2021 survey data is generally slightly higher than the historical traffic data.

On this basis, it is considered that the June 2021 traffic flows have recovered from the covid-19 pandemic reductions observed in 2020 and early 2021. The surveyed traffic data is considered representative and has been used for ongoing assessments and modelling of the junction.

3 2021 Base Year Assessment

The operation of the existing priority junction at Church Street / Shaw Lane / Fish Dam Lane has been assessed through junction modelling.

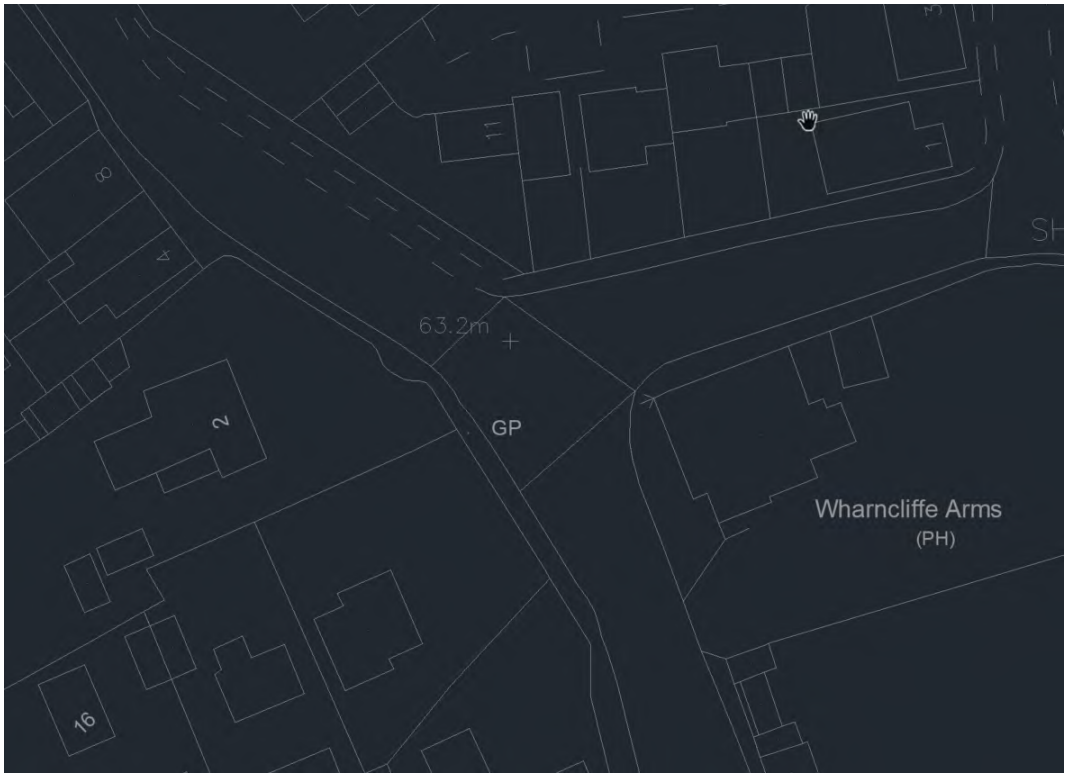
The existing junction has been modelled using the PICADY programme within the software Junctions 9. Junctions 9 is used to indicate the performance of a priority junction / roundabout / mini roundabout under a given set of traffic flows. The software calculates the maximum Ratio of Flow to Capacity (RFC), maximum delay (in seconds), maximum queueing in Passenger Car Units (PCU) and the maximum Level of Service (LoS) for each traffic flow stream.

The junction has been built in Junctions 9 with Church Street (Arm A) and Fish Dam Lane (Arm C) as major arms and Shaw Lane (Arm B) as the minor arm. The highway geometry of the junction was measured from OS mapping data provided by BMBC.

Image 2: Existing Church Street / Shaw Lane / Fish Dam Lane Junction

Source: Google Earth 2021

Image 3: Existing Church Street / Shaw Lane / Fish Dam Lane OS Mapping



Source: OS Mapping

The origin-destination traffic flow data in PCU was taken from the 2021 survey data, as outlined in Section 2.2.4 and provided at Appendix A. An AM peak hour between 08:00 and 09:00hrs and a PM peak hour between 17:00 and 18:00hrs were used. The traffic flows used in the model are presented in Table 2 and on Figures 1 and 2. The proportion of heavy vehicles was derived separately from the survey data and was input into the model.

Table 2: 2021 Traffic Flows

Origin	Destination		
	Church Street	Shaw Lane	Fish Dam Lane
AM			
A - Church Street	-	249	418
B - Shaw Lane	210	-	39
C - Fish Dam Lane	416	26	-
PM			
A - Church Street	-	272	409
B - Shaw Lane	264	-	42
C - Fish Dam Lane	403	52	-

A summary of the junction performance in the 2021 Base Year scenario has been provided in Table 3 below and detailed outputs provided at Appendix C.

Table 3: Existing Junction Modelling Results Summary for 2021 Base Year

Stream	Maximum RFC	Maximum Delay (s)	Maximum Queue (PCU)	Maximum LoS
AM				
B-C	0.17	19.59	0.2	C
B-A	0.65	30.15	1.9	D
C-AB	0.08	5.69	0.2	A
PM				
B-C	0.34	41.14	0.5	E
B-A	0.84	58.93	4.4	F
C-AB	0.17	5.54	0.4	A

The junction modelling indicates that in the AM peak hour the junction is operating within capacity (RFC < 0.85) with minor queues and delays of 20-30 seconds on the Shaw Lane approach (Arm B). In the PM peak hour, the modelling indicates the junction is broadly operating within capacity, however Shaw Lane is close to operating at practical capacity with queues of 5PCU, delays of 45-60 seconds and a low LoS (E and F) indicating the junction is not performing well.

While the modelling results show that the junction performs broadly within capacity, the 2021 survey data shows that there is queueing at the junction in both the AM and PM peak hours. The maximum queues of 11 PCU and 3 PCU were recorded in the AM peak along the Shaw Lane right and left turns respectively. Similarly, maximum queues of 9 PCU and 2 PCU were recorded in the PM peak.

Since the maximum queues shown in the modelling results are not completely consistent with the observed queueing from the survey footage, further consideration of the junction validation was undertaken based on TRL guidance. It is noted that Intercept Adjustments could be applied to some traffic flow streams to reduce the capacity and increase the queues. This approach is not recommended as in order to apply intercepts, changes are required to the model such that it no longer fully reflects the junction geometry (Shaw Lane flare and blocking queues removed). It is also noted that TRL advice is that queues are an average so are unlikely to validate to just one day's survey data. While the level of queuing is not fully validated to the observed queues, they are not dissimilar in absolute terms and some delay and queues are forecast. Therefore, the model with the original junction geometry and parameters have been used for future year assessment.

Future year assessment has been undertaken for 2033, in line with the BMBC Local Plan future year. The 2033 Do Minimum and Do Something traffic flows were assessed in the model to consider future operation, as set out in the following chapters.

4 2033 Do-Minimum Assessment

The existing priority junction has been modelled under a 2033 Do-Minimum scenario, which reflects performance of the junction with traffic flows projected from 2021 to 2033. Traffic growth factors have been applied to the 2021 Base traffic flows with no additional traffic flows through the junction from local committed development.

4.1 Traffic Flows

The current traffic flows through the Church Street / Shaw Lane / Fish Dam Lane junction which were used in the Base scenario have been projected to 2033 using local traffic growth factors from Trip End Model Presentation Program (TEMPro). The growth factors for car trips (as a driver) used are summarised in Table 4. The origin-destination trip end type was used for weekday AM (07:00-10:00hrs) and PM (16:00-19:00hrs) peak periods.

Table 4: TEMPro Growth Factors, Barnsley 2021 - 2033

Level	Name	Growth Factors	
		AM	PM
District	Barnsley	1.0889	1.0888

No details of additional committed development traffic have been provided by BMBC. Therefore, the TEMPro growth factors only have been applied to the Base year traffic flows to arrive at the 2033 Do-Minimum traffic flows through the junction. These are presented in Table 5 and on Figures 3 and 4.

Table 5: 2033 Do-Minimum Traffic Flows

	Church Street	Shaw Lane	Fish Dam Lane
AM			
A - Church Street	-	271	455
B - Shaw Lane	229	-	42
C - Fish Dam Lane	453	28	-
PM			
A - Church Street	-	296	446
B - Shaw Lane	287	-	45
C - Fish Dam Lane	439	57	-

4.2 Junction Assessment

The future operation of the existing junction has been assessed using the Junctions 9 programme. A summary of the junction performance in the 2033 Do Minimum scenario has been provided in Table 6 below and detailed outputs provided at Appendix C.

Table 6: 2033 Do-Minimum Priority Junction Modelling Results Summary

Stream	Maximum RFC	Maximum Delay (s)	Maximum Queue (PCU)	Maximum LoS
AM				
B-C	0.24	28.99	0.4	D
B-A	0.75	44.18	2.9	E
C-AB	0.10	5.67	0.2	A
PM				
B-C	0.90	254.74	3.4	F
B-A	0.98	125.28	10.6	F
C-AB	0.20	5.59	0.5	A

The results of the modelling for the AM peak hour show that while the junction is generally forecast to operate within capacity there are some delays and a poor LoS forecast on Shaw Lane. In the PM peak hour, the junction is forecast to operate over capacity with RFCs of 0.90 and 0.98 on Shaw Lane, high delays and a poor LoS.

It is noted that since the Junctions 9 model under forecasts the level of queuing in the Base year from that observed, there may also be additional queuing at the junction from that forecast in the Do Minimum model.

4.3 Mitigation Assessment

As queuing at the junction is observed in the Base Year and the Do Minimum assessment indicates that the junction will operate over capacity and result in significant delay and some queueing, two alternative options have been considered in order to mitigate the issues. The alternative junction types identified are:

- Converting the priority junction into a mini roundabout
- Introducing traffic signal controls at the junction

These two options have been tested using junction modelling software and the performances have been assessed. The details are given in Sections 4.3.1 and 4.3.2.

4.3.1 Mini roundabout

A mini roundabout at the Church Street / Shaw Lane / Fish Dam Lane junction has been considered and high level assessment undertaken using Junctions 9.

The traffic flows projected to 2033, as explained in Section 4.1, have been used to model the mini roundabout and approximate geometries determined from the OS mapping. A summary of the performance of the mini roundabout in the 2033 Do Minimum scenario, is provided in Table 7 with model outputs provided at Appendix D.

Table 7: 2033 Do-Minimum Mini Roundabout Modelling Results Summary

Stream	Maximum RFC	Maximum Delay (s)	Maximum Queue (PCU)	Maximum LoS
AM				
B-C	0.98	76.63	16.4	F
B-A	0.69	27.37	2.2	D
C-AB	0.41	4.91	0.7	A
PM				
B-C	1.03	114.73	26.6	F
B-A	0.82	41.33	3.9	E
C-AB	0.45	5.37	0.8	A

It is noted that the mini roundabout has unbalanced flows, as Arms A and C have 81% of the total flow for the roundabout and therefore does not operate well as a roundabout.

The results of the assessment show the junction operating over capacity in both the AM and PM peak hour assessments. Significant queues are forecast on Arm B Shaw Lane with high delays and poor LoS. It is not considered that this mitigation option provides any improvement on the existing priority-controlled junction arrangement and has therefore not been considered further.

4.3.2 Traffic Signals

The theoretical provision of traffic signal controls at the junction has been undertaken using the software LinSig (v3.2.39.0). An indicative layout of the proposed junction has been developed as shown on the Shaw Lane Junction Drawing in Drawing 1. Consideration of design of the signals is provided in Section 5.6.

The traffic flows projected to 2033, as explained in Section 4.1, have been used within the LinSig model with geometries and inter-greens measured from the indicative layout. A 90-second cycle time is assumed with an all-red pedestrian crossing phase. A summary of the performance of the signalised junction in the 2033 DM scenario, is provided in Table 8 and model outputs provide at Appendix E. LinSig provides the degree of saturation (DoS, %) and mean maximum queue (MMQ in PCU) along each lane.

Table 8: Signalised Junction Performance Summary (Do Minimum)

Lane	Lane Description	Movement(s)	AM Peak		PM Peak	
			DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
1/1	Shaw Lane Westbound	Right, Left	67.6	7.3	74.6	9.1
2/1	Church Street Southbound	Left, Ahead	70.1	14.9	74.9	16.3
5/1	Fish Dam Lane Northbound	Right, Ahead	45.8	8.0	52.1	8.8

The results show that the junction is forecast to operate within capacity in both the AM and PM peak hours in the 2033 Do Minimum scenario, although some queues are forecast. In the AM peak hour, the Shaw Lane and Church Street approaches are forecast to operate at approx. 70% capacity with queues of 7 and 15 PCUs respectively. In the PM peak hour, the Shaw Lane and Church Street approaches are forecast to operate at approx. 75% capacity with queues of 9 and 16 PCUs respectively.

The results show that the mitigation scheme comprising the introduction of signals at the junction is forecast to operate within capacity in both the AM and PM peak hours in the 2033 Do Minimum scenario, although some queuing is forecast.

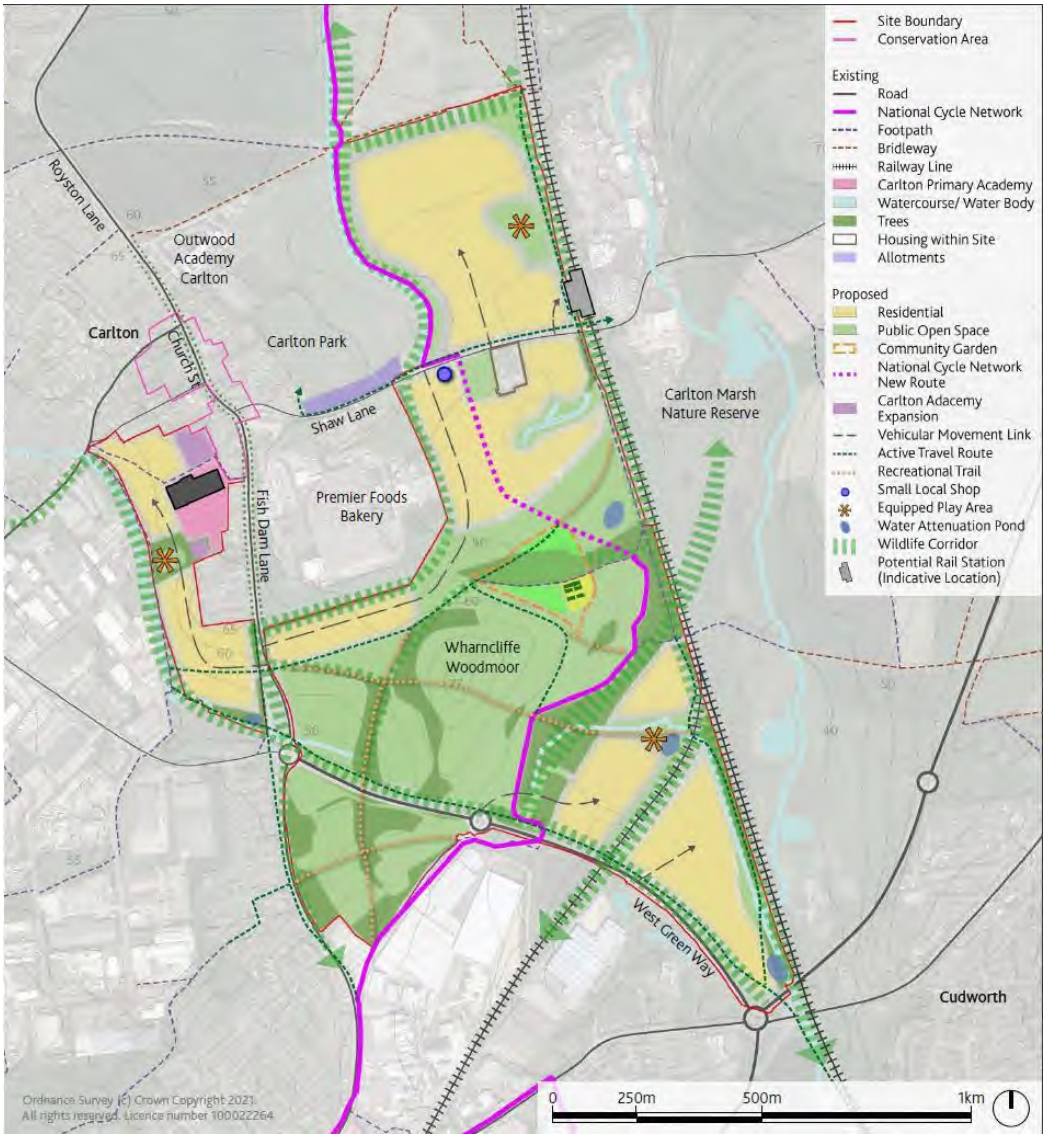
5 2033 Do-Something Assessment

Future year assessments of the existing and signal control mitigation scheme have been undertaken to understand the future operation of the junction with the proposed development at Carlton and understand the potential for capacity improvements.

5.1 Development Proposals

Assessment of the impact of the proposed scheme on the operation of the Church Street / Shaw Lane / Fish Dam Lane junction is based on the indicative Masterplan layout developed in June 2021, comprising 1,906 dwellings across a number of plots, as shown on the layout below.

Image 4: Residential Land Parcels in the Development Site (June 2021)



Source: Draft Masterplan Framework by Gillespies

5.2 Trip Generation

Vehicular trips associated with residential use have been estimated using the TRICS database (TRICS 7.8.2) and 2011 Census journey to work mode share, as explained below and detailed in Appendix F.

5.2.1 Person Trip Rates

Considering the location of the development, sites from Greater London, Scotland, Ireland and Wales have been removed from the TRICS site selection. The site selection criteria are summarised in Table 9.

Table 9: TRICS Site Selection Criteria

TRICS Land Use and Category	Selected Location	Number of Sites
03 – Residential A – Houses privately owned	Suburban Area	17
	Edge of Town	35

Average person trip rates in the AM and PM peak hours from the selected sites have been extracted and are shown in the table below.

Table 10: Person Trip Rates from TRICS

	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Person trip rates (per dwelling)	0.210	0.722	0.982	0.592	0.263	0.855
Trips (1906 dwellings)	400	1471	1872	1128	501	1629

5.2.2 Mode Share

2011 Census Journey to Work data from the Middle Super Output Area (MSOA) (E02001510 : Barnsley 002) containing the development site shows that the mode share of driving a car or a van is 72%. This mode share has been applied to the trip rates from TRICS to arrive at the forecast trip rates of cars/vans from the proposed development sites, which are summarised in Table 11 along with the total forecast trips.

Table 11: Vehicle Trip Rates from TRICS

	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicle trip rates (per dwelling)	0.15	0.55	0.70	0.42	0.19	0.61
Trips (1906 dwellings)	286	1048	1334	801	362	1163

These average trip rates have been applied to the development proposals to estimate the trip generation from each residential land parcel. This is summarised in Table 14 in Section 5.3.1.

5.3 Trip Distribution

A trip distribution exercise was carried out using the Journey to Work Census data for Barnsley 002 (representing the site, as mentioned in Section 5.2.2) to identify key destinations for residents from the site. The 2017 Aecom study[1] reviewed the Census data which showed the distribution as presented in Table 12.

Table 12: Trip Distribution from Barnsley 002 to Key Destinations

Destination	Distribution
Selby	1.2%
Doncaster	2.4%
Rotherham	6.4%
Sheffield	5.6%
Bradford	0.4%
Kirklees	3.0%
Leeds	6%
Wakefield	19.9%
Shropshire	0.3%
Barnsley	54.8%

The above destinations were broadly grouped into north, south, east and west directions in order to identify the potential routes that vehicles from the development would use for their trips. The resulting distribution is summarised in Table 13.

[1] Traffic modelling of Royston and Carlton Masterplan undertaken by Aecom using the strategic Barnsley Transport Model.

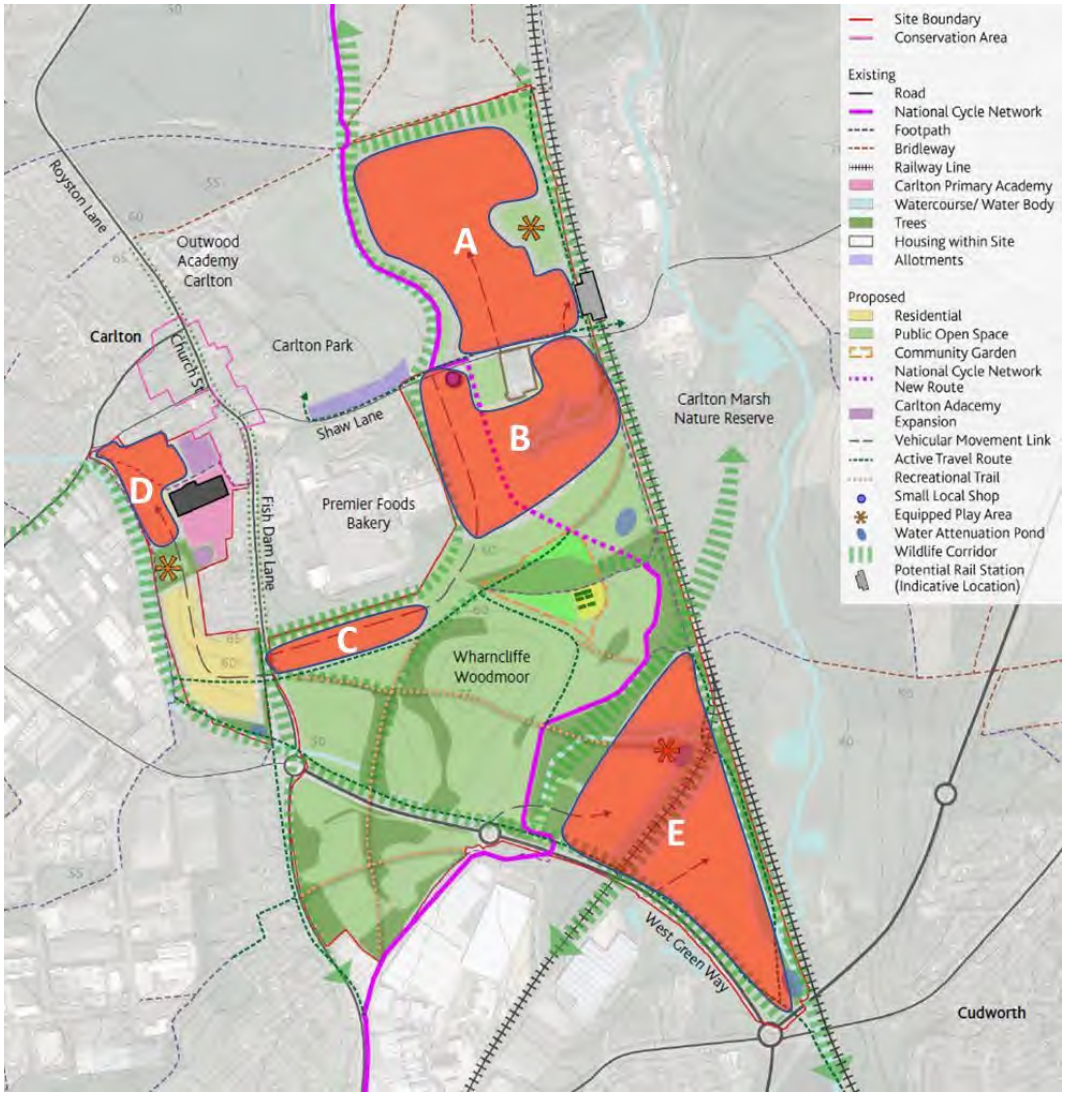
Table 13: Trip Distribution from Barnsley 002 in Each Direction

Direction	Distribution
North	26.3%
South	67.1%
East	3.6%
West	3.0%

5.3.1 Local Trip Generation

The residential plots within the development site have been grouped into five different land parcels, A to E, based on the location of each plot within the site. This is shown in the image below.

Image 5: Land Parcels Grouped for Assessment



The trip generation from each land parcel has been calculated using the trip rates per dwelling derived from TRICS and the number of dwellings provided in the indicative masterplan. The resulting trip generation is provided in Table 14.

Table 14: Trip Generation from all Residential Plots

		AM			PM		
Plot	**Number of Dwellings**	**Arrivals**	**Departures**	**Total**	**Arrivals**	**Departures**	**Total**
A	584	88	323	411	248	110	358
B	412	62	228	290	175	78	252
C	124	19	69	87	53	23	76
D	268	40	148	189	114	51	164
E	518	78	287	365	220	98	317

*Note, slight inconsistencies due to rounding

5.3.2 Local Distribution

The trip distribution from the MSOA Barnsley 002, as shown in Table 13, has been applied to trips from each of the five land parcels to identify the number of trips that would utilise each road link connecting to the site and specifically the forecast trips through the Church Street / Shaw Lane / Fish Dam Lane junction. The trip distribution for the different parcels is shown on Figures 5, 6 and 7 and the resulting trips for each land parcel are shown on Figures 8 – 13 for both the AM and PM peak hours.

5.4 Do Something Traffic Flows

The development traffic flow through the network in the AM and PM peak hours have been combined with the 2033 Do-Minimum flows to arrive at the total traffic flow through the Church Street / Shaw Lane / Fish Dam Lane junction in the Do-Something scenario. The resulting flows are summarised in Table 15 and shown on Figures 14 and 15.

Table 15: 2033 DS Traffic Flows

	Destination		
Origin	**Church Street**	**Shaw Lane**	**Fish Dam Lane**
AM			
Church Street	-	315	491
Shaw Lane	390	-	414
Fish Dam Lane	585	136	-
PM			
Church Street	-	420	547
Shaw Lane	342	-	177
Fish Dam Lane	484	343	-

5.5 Junction Assessment

A 2033 Do Something assessment has been undertaken to consider operation of the existing junction and the proposed signal control mitigation scheme.

5.5.1 Existing Junction

Assessment of operation of the existing priority-controlled junction in the Junctions 9 programme with the modelling results summarised in Table 16 below.

Table 16: 2033 Do-Something Priority Junction Modelling Results Summary

Stream	Maximum RFC	Maximum Delay (s)	Maximum Queue (PCU)	Maximum LoS
AM				
B-C	2.39	3698	250.3	F
B-A	2.39	3698	235.8	F
C-AB	0.55	9.28	2.6	A
PM				
B-C	2.95	3695	105.7	F
B-A	2.97	3673	203.4	F
C-AB	1.26	485	108.2	F

With the addition of the Carlton development traffic flows the existing priority junction is predicted to operate significantly over capacity in 2033 in both the AM and PM peak hours. The RFCs on the Shaw Lane approaches are over 2 with very significant queues and delays.

5.5.2 Mitigation Junction

Assessment of operation of the proposed traffic signal-controlled mitigation scheme at the junction has been undertaken within LinSig. The 2033 Do-Something traffic flows, as explained in Section 5.4, have been used within the LinSig model with geometries and inter-greens measured from the indicative layout. A 120 second cycle time is assumed with an all-red pedestrian crossing phase. A summary of the performance of the signalised junction in the 2033 DS scenario, is provided in Table 17.

Table 17: Signalised Junction Performance Summary (DS)

Item	Lane Description	Movement(s)	AM Peak		PM Peak	
			DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
1/1	Shaw Lane Westbound	Right, Left	133.7	141.9	194.2	159.9
2/1	Church Street Southbound	Left, Ahead	82.3	25.1	73.5	22.9
5/1	Fish Dam Lane Northbound	Right, Ahead	133.6	122.6	193.2	247.8

With the addition of the Carlton development traffic flows the proposed mitigation scheme is predicted to operate over capacity in 2033 in both the AM and PM peak hours. The DoSs on the Shaw Lane and Fish Dam Lane approaches are high with significant queues forecast.

The results of the junction assessment for the 2033 Do Something scenario show that the existing priority-controlled junction is predicted to operate very significantly over capacity. The traffic signal control mitigation scheme does appear to improve capacity slightly, but the junction is still predicted to operate significantly over capacity with the addition of the Carlton site development traffic.

5.6 Design Considerations

Further consideration of the traffic signal control mitigation proposals has been undertaken including consultation with BMBC Officers as noted below.

Highway Layout

A number of design issues are noted with the indicative highway layout as a result of existing constraints of the junction. These are set out below and noted on the Shaw Lane Junction Drawing:

- The existing buildings and boundary walls of surrounding properties restrict intervisibility at the junction. As a result, suitable sight for pedestrians of cars which may skip the lights will not be provided.
- Shaw Lane narrows to the east of the junction which may prevent larger vehicles from passing each other and therefore may result in issues with queuing etc at the junction.
- The plan shows indicative primary signal head locations – this reduces the footway widths to circa 1.2m in some places. Additional secondary head locations could further restrict the footway widths in some locations. This is below the desirable minimum and provides constraint for those with reduced mobility, pushchairs etc as well potentially restricting safe access for maintenance etc.

- Local accesses to properties, including the shared access to the two homes at the former pub and 2 Church Street, exit into the junction. These would need to be incorporated into the signal design.
- Bus stops located close to the junction on the Shaw Lane and Fish Dam Lane approaches would need to be relocated.

As a result of these issues the BMBC Traffic Signals team have stated that the indictive scheme would not be acceptable.

Conservation

The junction is located in the Carlton conservation area therefore the views of the BMBC Conservation officer have been sought. The following concerns were raised regarding the proposal to introduce signals at the existing junction:

- Traffic signals at the junction may result in traffic queues in all directions, specifically long queues to the north extending into the heart of the conservation area around Stud Farm, Churchfield Gardens and St. John's Church, would introduce visual harm.
- The necessary infrastructure (signal heads, control boxes, road markings etc.) would also introduce some minor harm to the setting of the conservation area.
- To accommodate the alterations, there are a number of intervisibility issues caused by standing buildings or historic walls as well as areas of footpath that are quite narrow at certain pinch points (as noted above). The conservation officer would not support measures to alleviate these issues, such as removal of walls or structures that contribute to the conservation area.

5.7 Summary

While the proposed signal mitigation scheme does offer some capacity improvements, it does not provide capacity to accommodate the full Carlton development traffic. In addition, there are significant highway design issues and concerns regarding the impact on the conservation area.

6 Summary and Conclusions

The Carlton site Masterplan Framework currently includes two movement framework options that each provide new highway connectivity to access the proposed development. These proposals have been identified based on the understanding that the additional highway infrastructure, specifically the Church Street / Shaw Lane / Fish Dam Lane junction, cannot accommodate the additional traffic that will result from the development. This report provides additional analysis to test this understanding and provide evidence to support the proposals.

Traffic surveys were undertaken at the Church Street / Shaw Lane / Fish Dam Lane junction in June 2021 and junction assessments undertaken for the 2021 Base Year and 2033 Future Years, both without (Do Minimum) and with (Do Something) the Carlton development traffic.

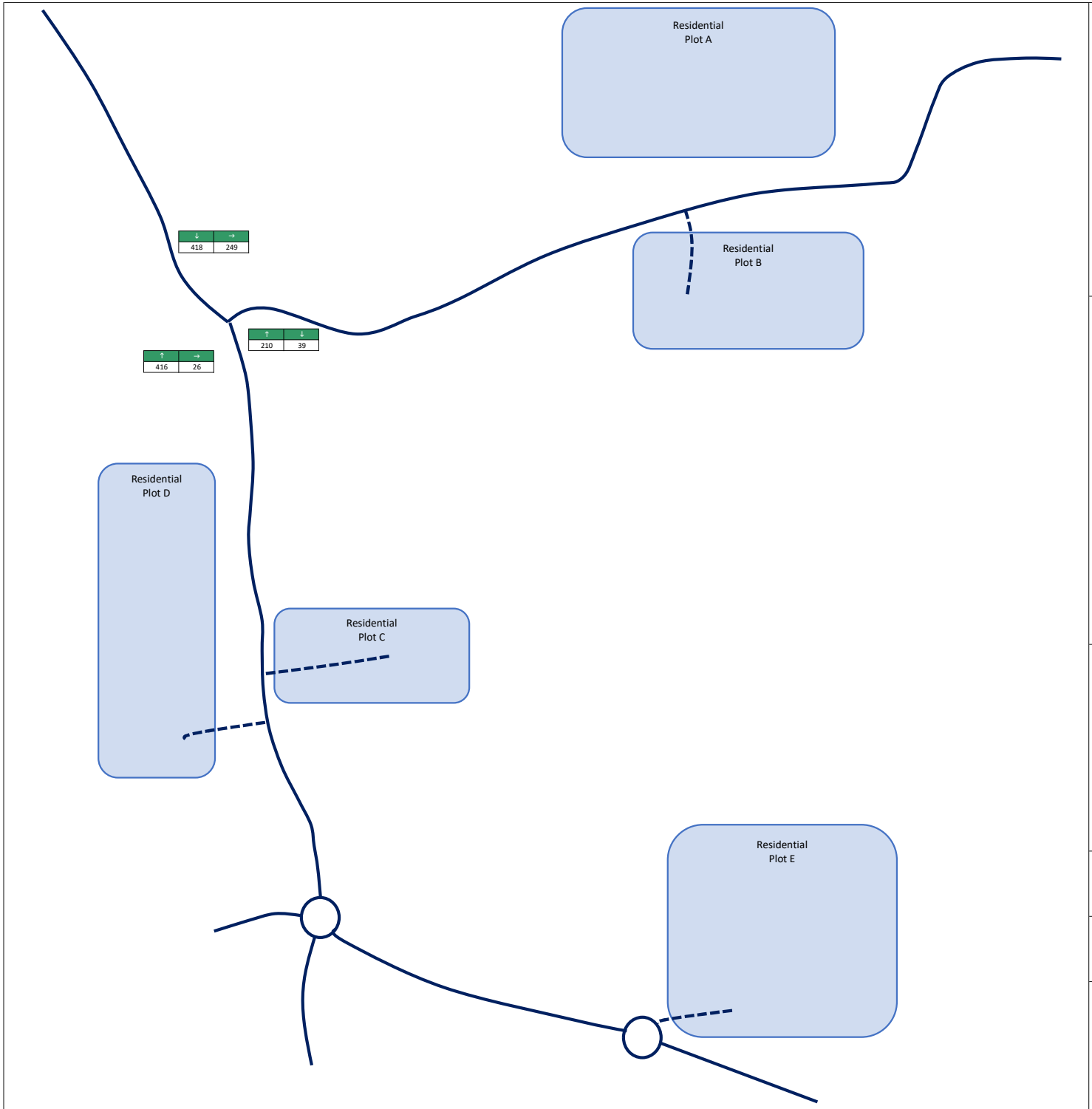
The existing priority-controlled junction is already congested with queuing observed during the surveys. The junction is predicted to operate over capacity in 2033 Do Minimum and with the addition of Carlton development traffic is forecast to be very significantly over capacity in 2033 Do Something.

Options have been explored to reconfigure this junction, namely introduction of a mini roundabout or signalisation. However, the former does not provide capacity improvements, whilst the latter is deemed unacceptable in terms of highway operation, safety and heritage conservation issues.

The conclusion from this assessment, therefore, is that alternative access(es) to the Carlton site are required. These should provide access both for the Carlton development parcels as well as opportunities for existing traffic to divert away from the Church Street / Shaw Lane / Fish Dam Lane junction.

More detailed assessment of access options and how existing and future development traffic will distribute on the highway network is required. It is also noted, that if existing traffic diverts from Shaw Lane through the site, this will potentially change the nature/function of the access route through the site with broader design implications for the site.

Figures



ARUP

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Fax: +44 (0)1132428573
www.arup.com

Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Base (2021) AM Trip Distribution

Scale @A4:

Not to Scale

Drawing Status:

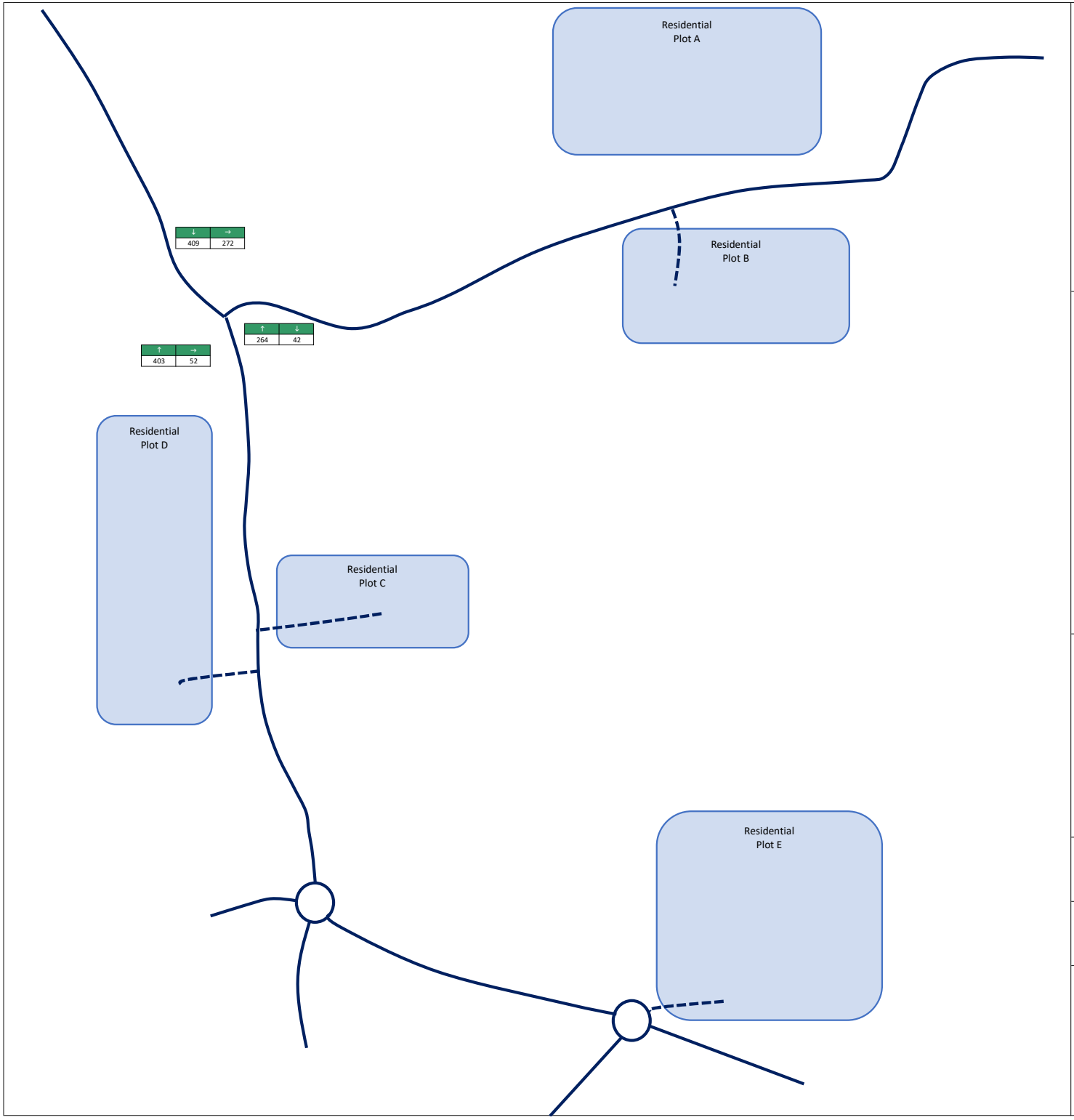
For Information

Job Number:

279211-00

Drawing Number:

Figure 1



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Issue:

Issue

Date:

19/08/2021

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Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Base (2021) PM Trip Distribution

Scale @A4:

Not to Scale

Drawing Status:

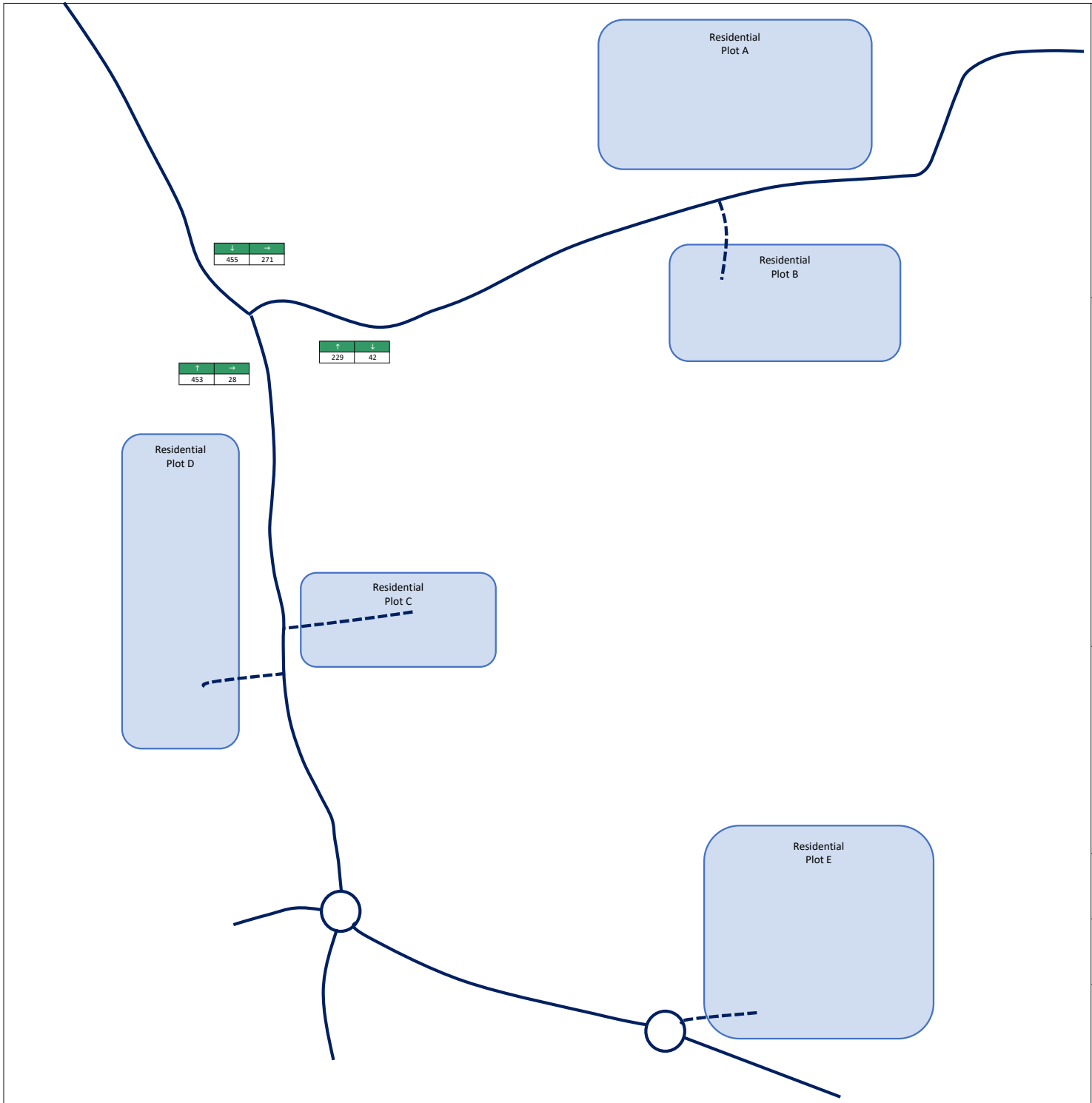
For Information

Job Number:

279211-00

Drawing Number:

Figure 2



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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

2033 (DM) AM Trip Distribution

Scale @A4:

Not to Scale

Drawing Status:

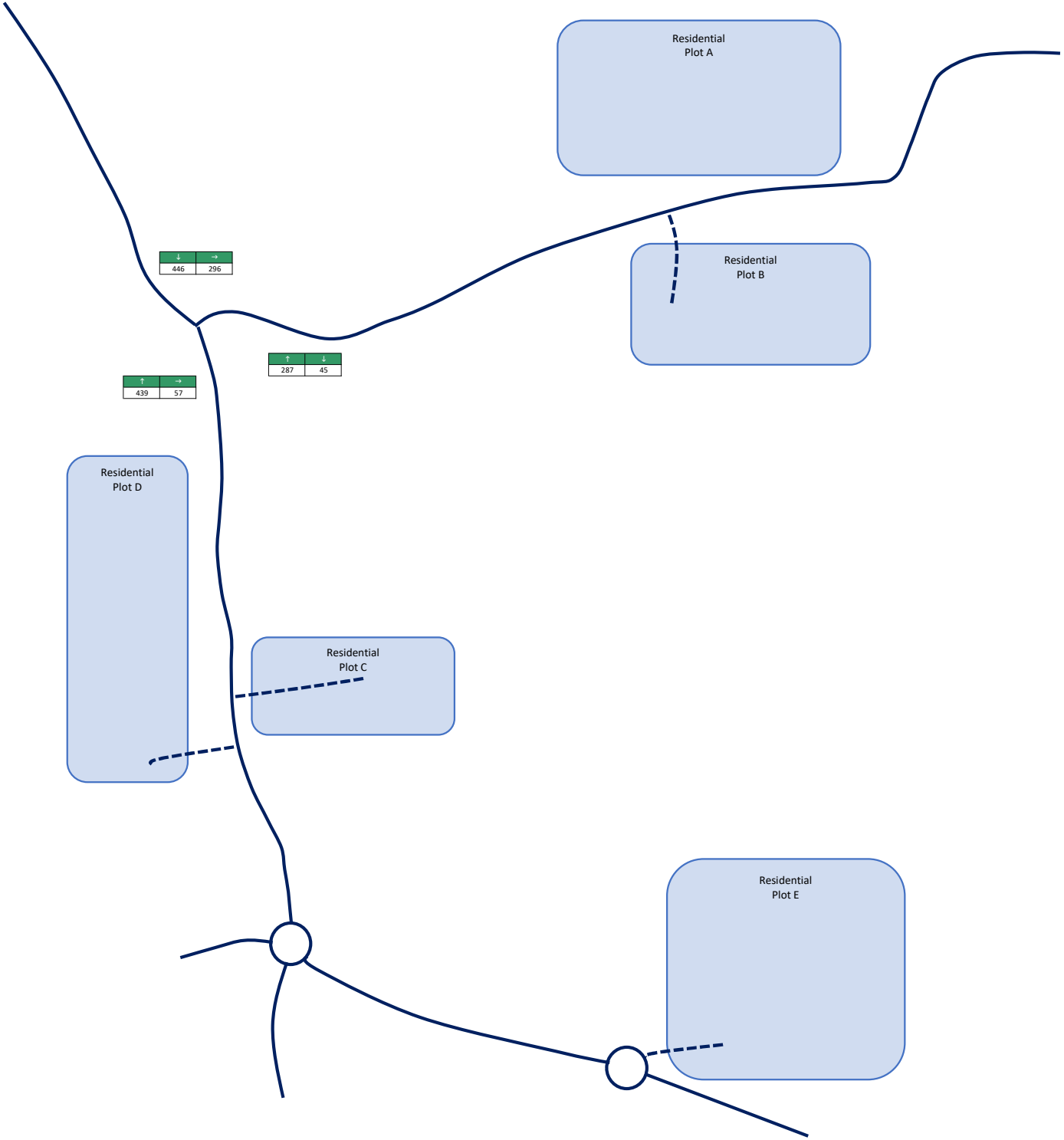
For Information

Job Number:

279211-00

Drawing Number:

Figure 3



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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

2033 (DM) PM Trip Distribution

Scale @A4:

Not to Scale

Drawing Status:

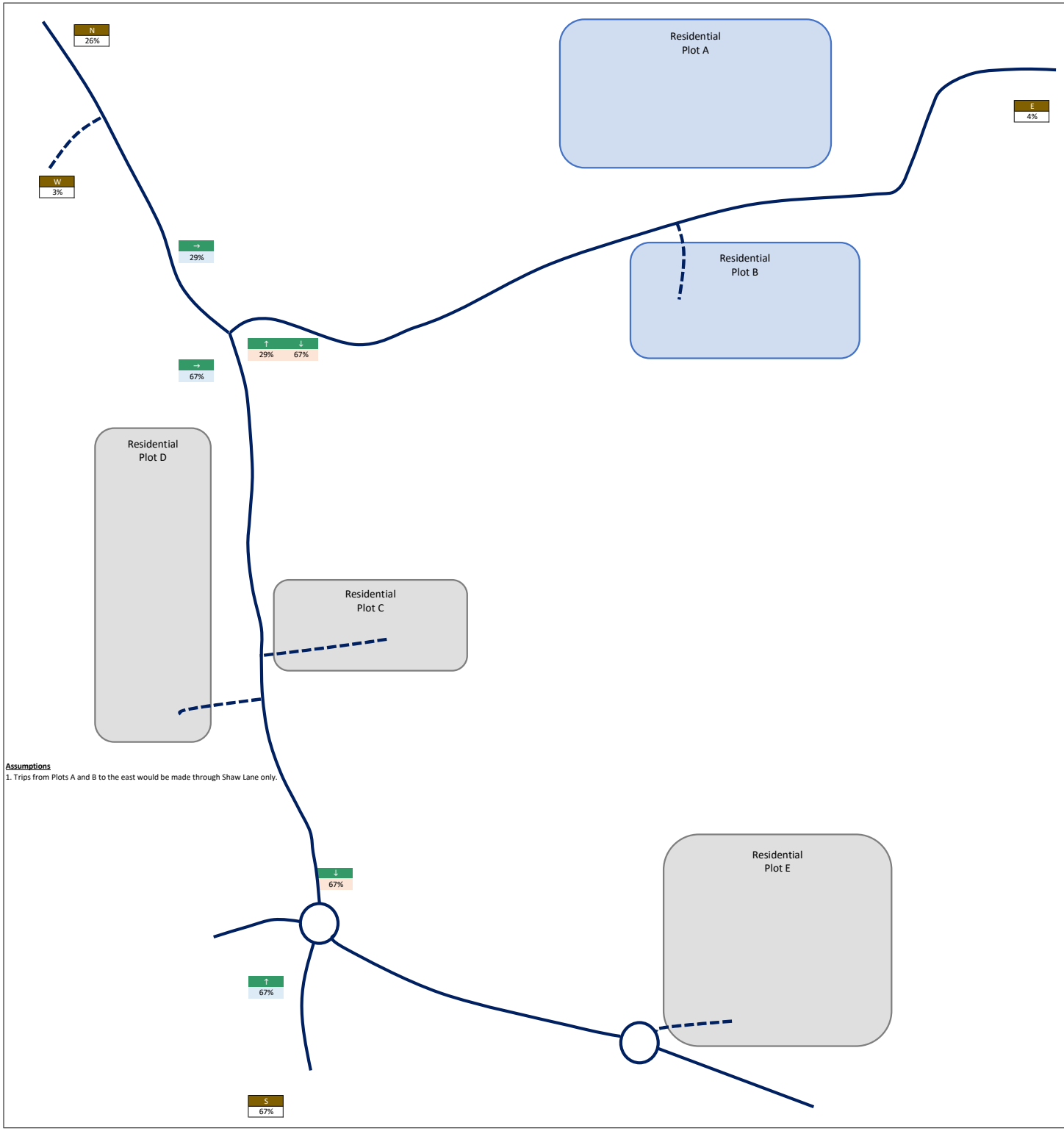
For Information

Job Number:

279211-00

Drawing Number:

Figure 4



Assumptions

1. Trips from Plots A and B to the east would be made through Shaw Lane only.

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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Trip Distribution - Parcels A&B

Scale @A4:

Not to Scale

Drawing Status:

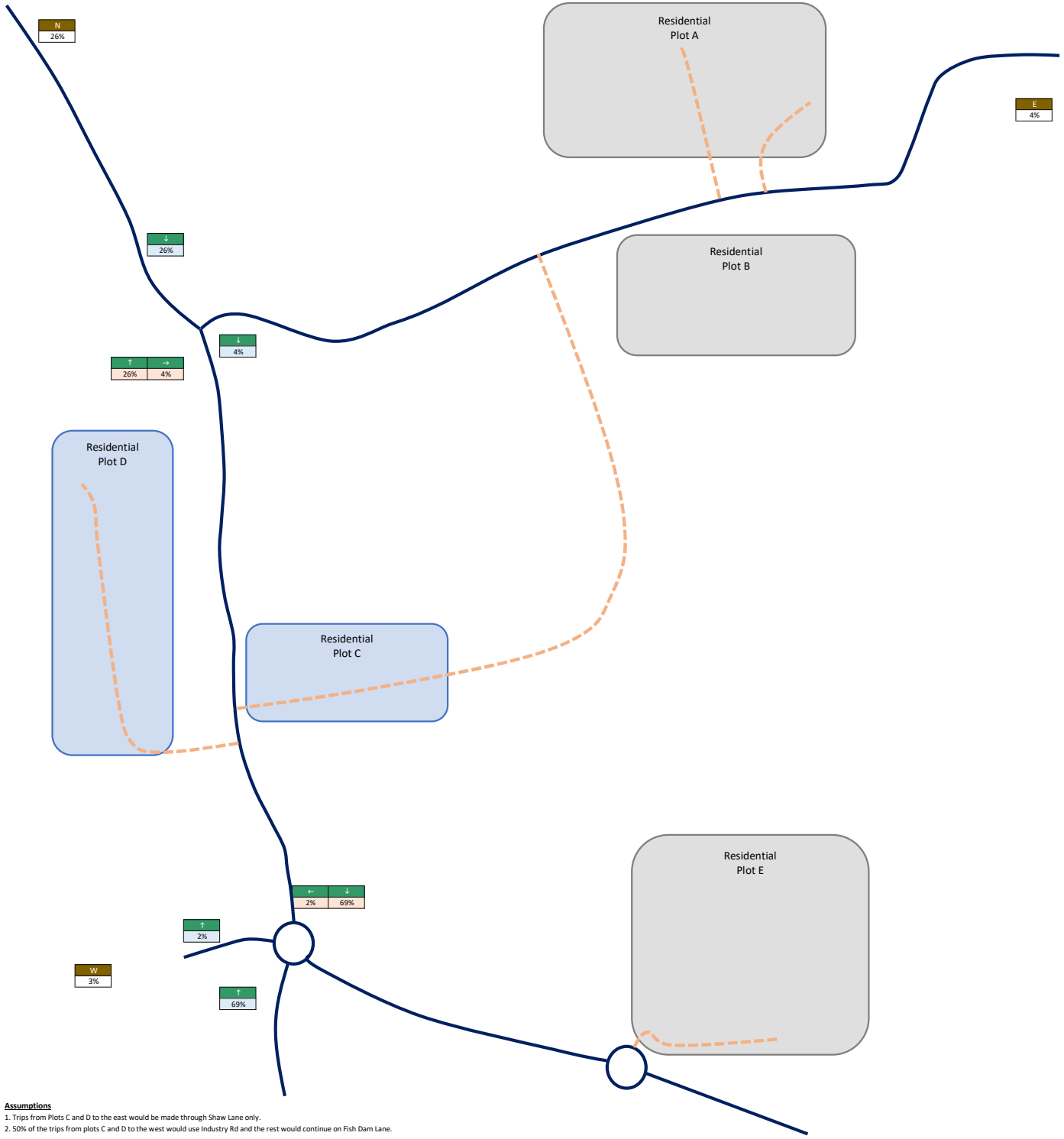
For Information

Job Number:

279211-00

Drawing Number:

Figure 5



Assumptions

1. Trips from Plots C and D to the east would be made through Shaw Lane only.
2. 50% of the trips from plots C and D to the west would use Industry Rd and the rest would continue on Fish Dam Lane.

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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Trip Distribution - Parcels C&D

Scale @A4:

Not to Scale

Drawing Status:

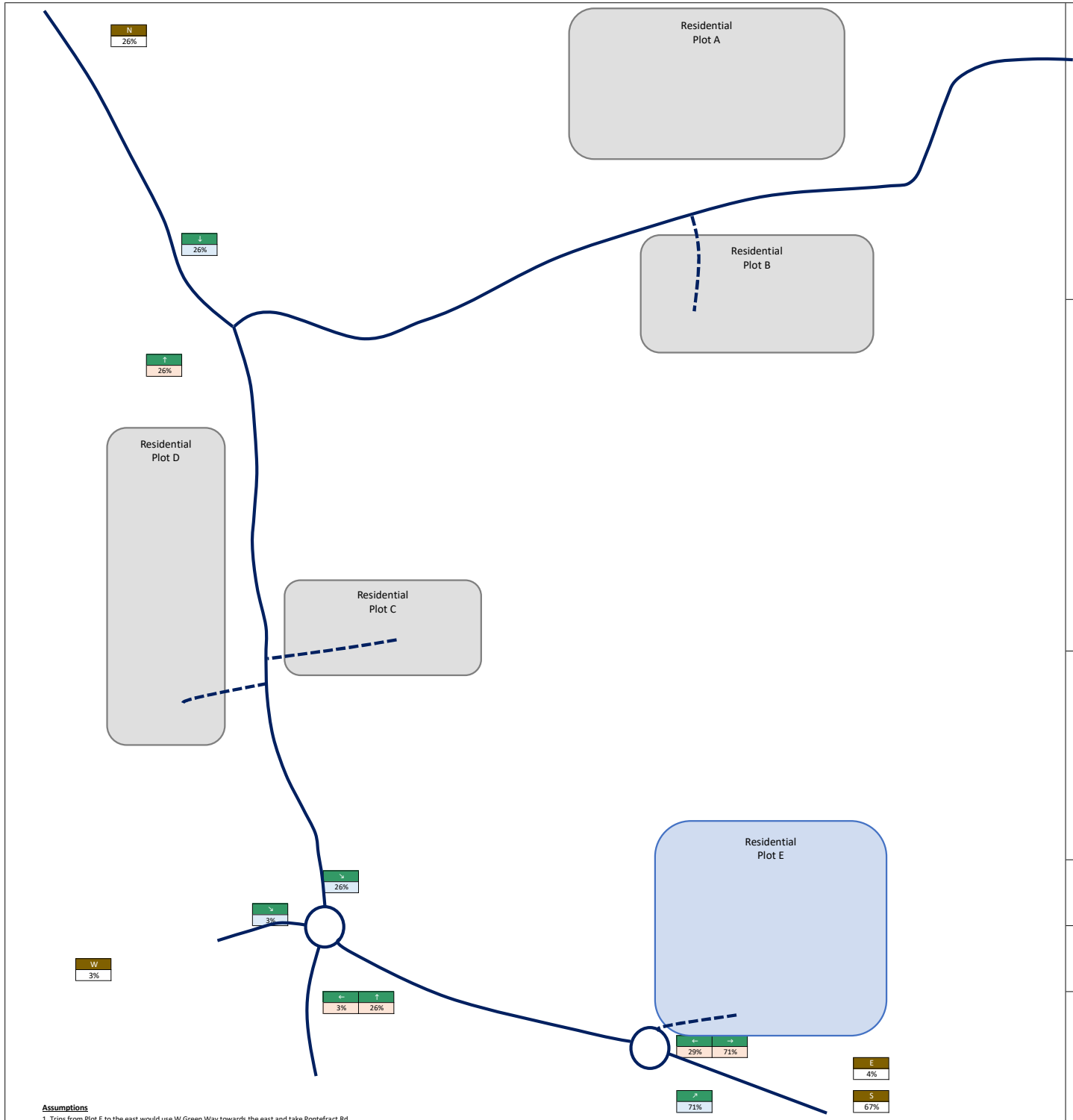
For Information

Job Number:

279211-00

Drawing Number:

Figure 6



Assumptions

1. Trips from Plot E to the east would use W Green Way towards the east and take Pontefract Rd.
2. All trips from Plot E to the west would use the Industry Rd.

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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Trip Distribution - Parcels E

Scale @A4:

Not to Scale

Drawing Status:

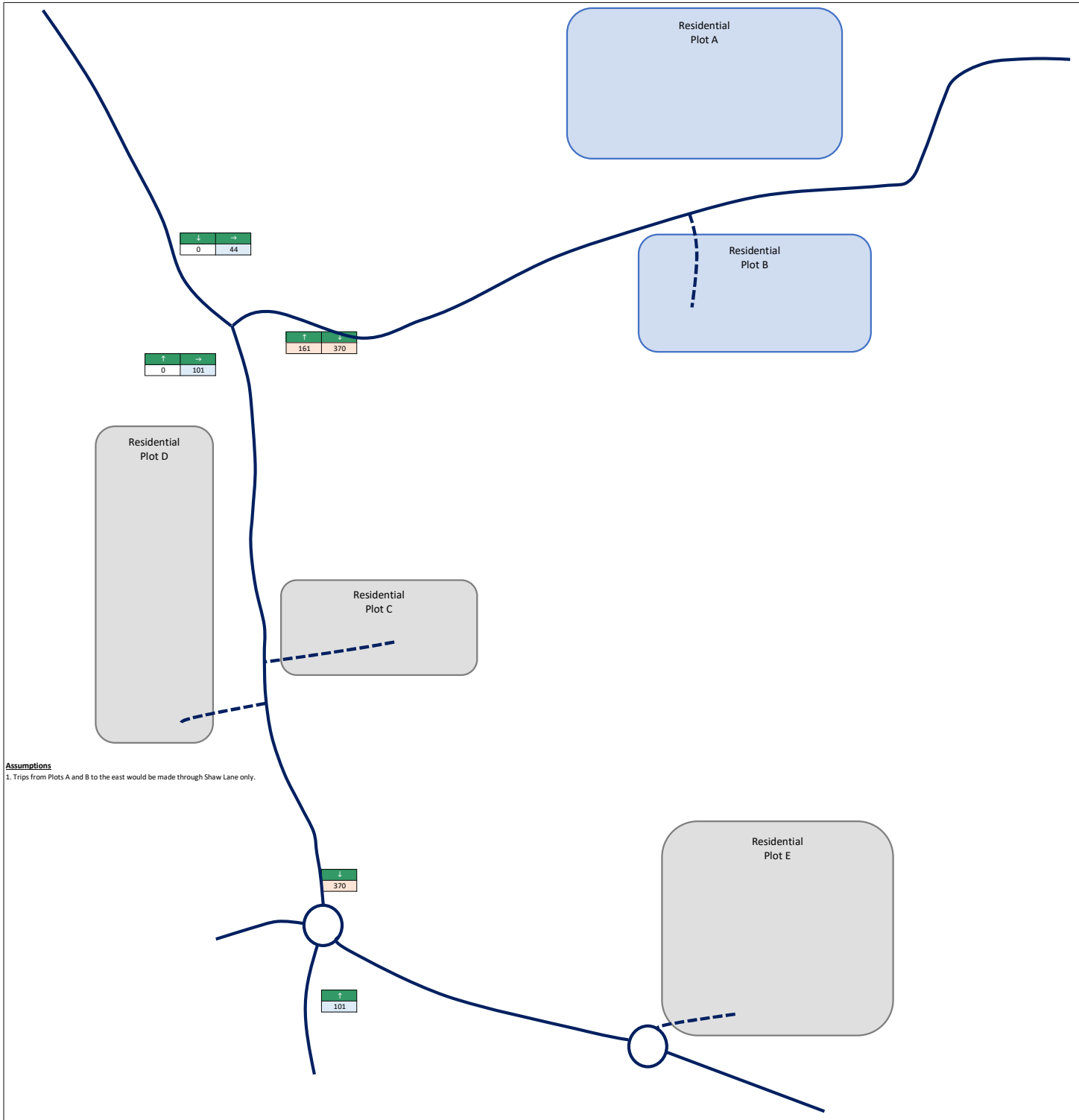
For Information

Job Number:

279211-00

Drawing Number:

Figure 7



Assumptions

1. Trips from Plots A and B to the east would be made through Shaw Lane only.

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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Development Trips - Parcels A&B - AM Peak Hour

Scale @A4:

Not to Scale

Drawing Status:

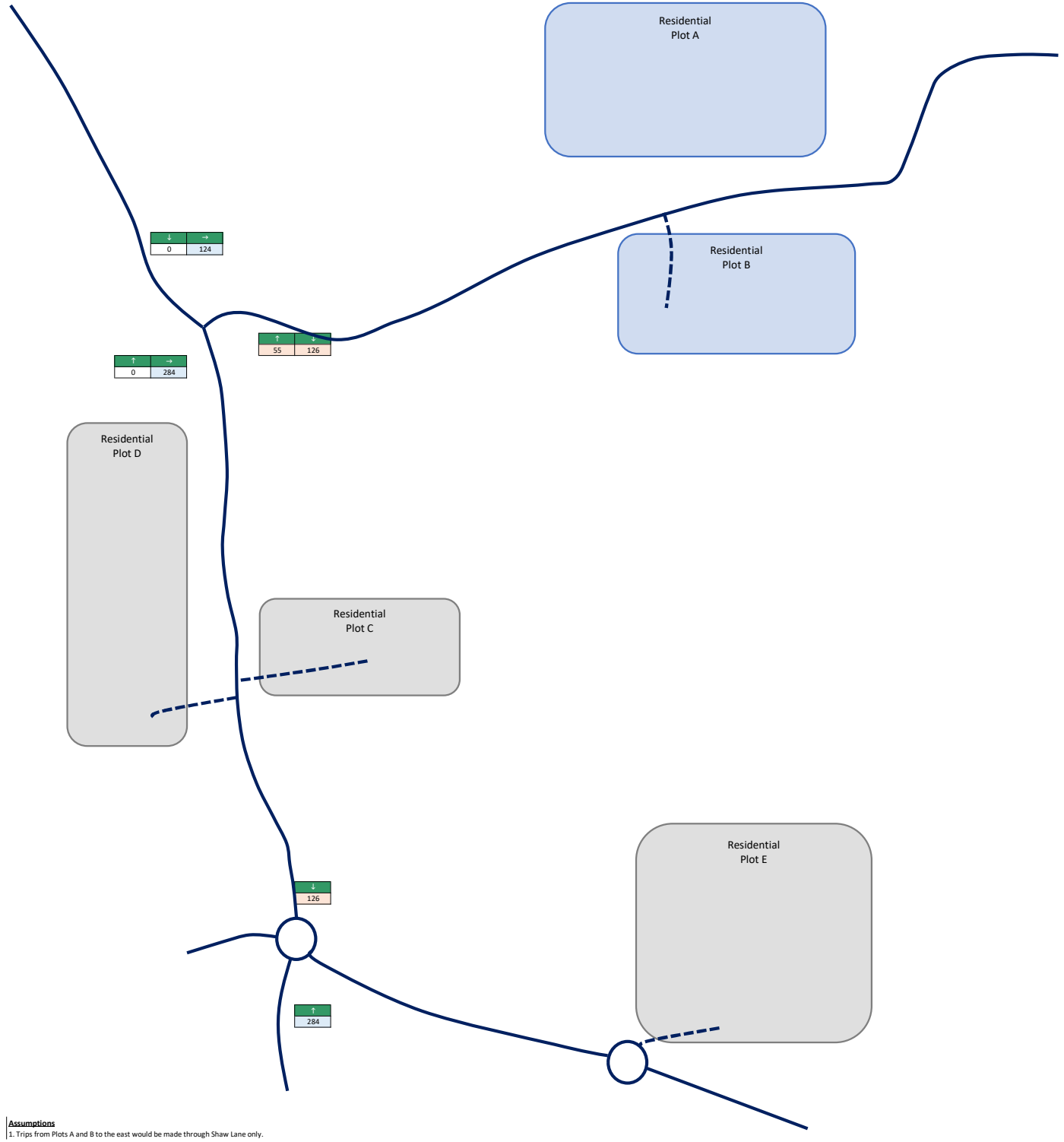
For Information

Job Number:

279211-00

Drawing Number:

Figure 8



Assumptions

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Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Development Trips - Parcels A&B - PM Peak Hour

Scale @A4:

Not to Scale

Drawing Status:

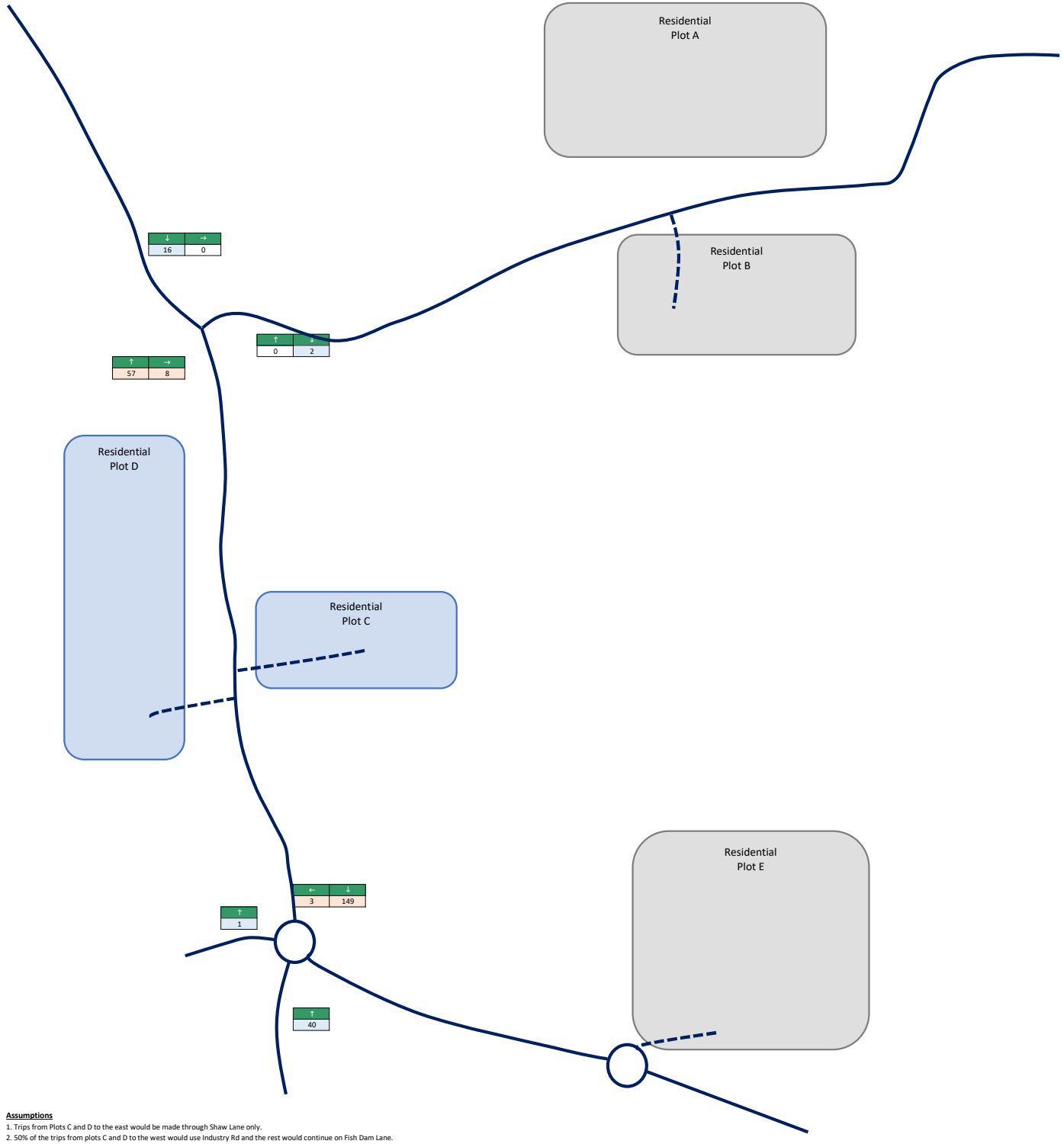
For Information

Job Number:

279211-00

Drawing Number:

Figure 9



Assumptions

1. Trips from Plots C and D to the east would be made through Shaw Lane only.
2. 50% of the trips from plots C and D to the west would use Industry Rd and the rest would continue on Fish Dam Lane.

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Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Development Trips - Parcels C&D - AM Peak Hour

Scale @A4:

Not to Scale

Drawing Status:

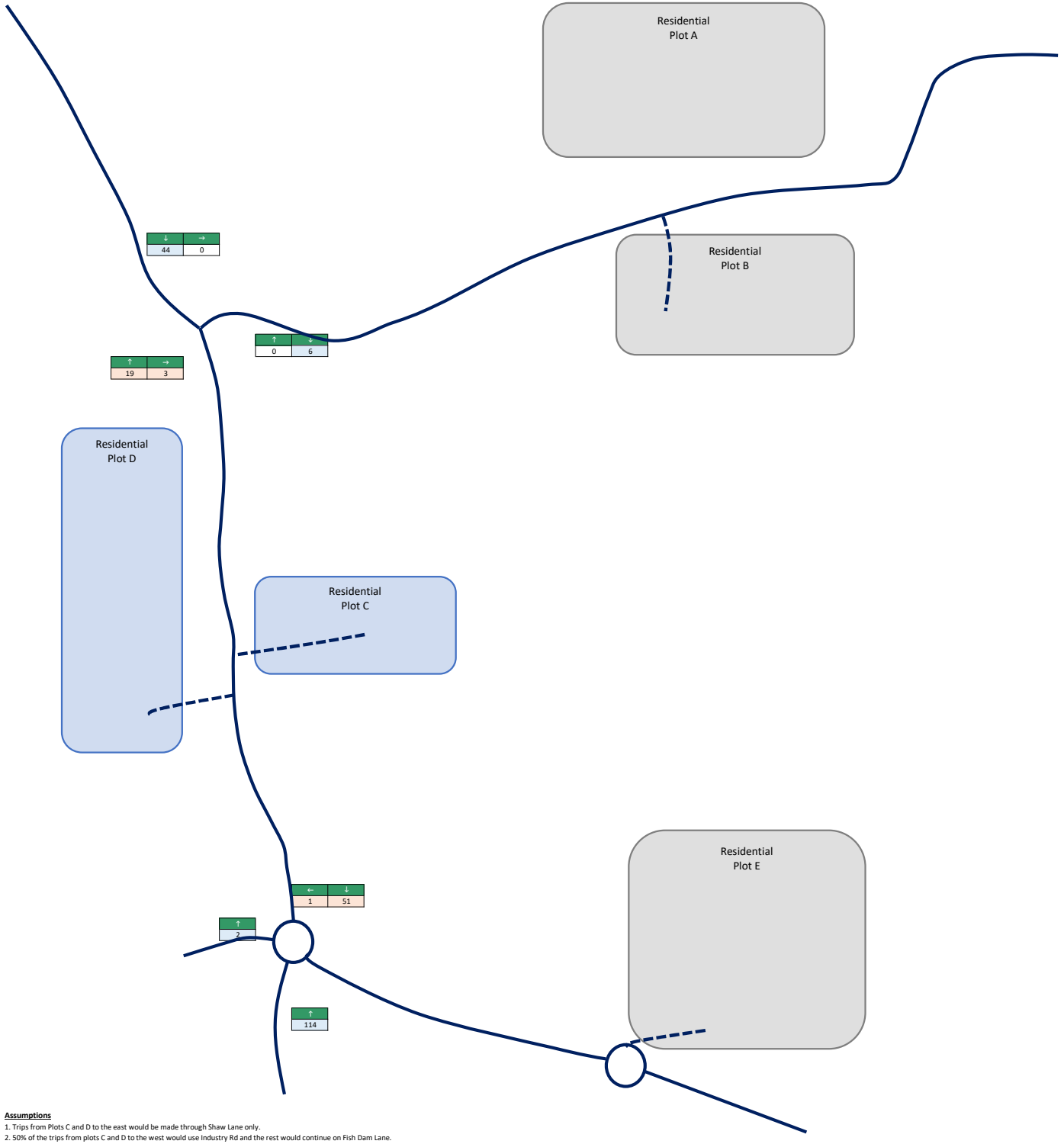
For Information

Job Number:

279211-00

Drawing Number:

Figure 10



Assumptions

1. Trips from Plots C and D to the east would be made through Shaw Lane only.
2. 50% of the trips from plots C and D to the west would use Industry Rd and the rest would continue on Fish Dam Lane.

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Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Development Trips - Parcels C&D - PM Peak Hour

Scale @A4:

Not to Scale

Drawing Status:

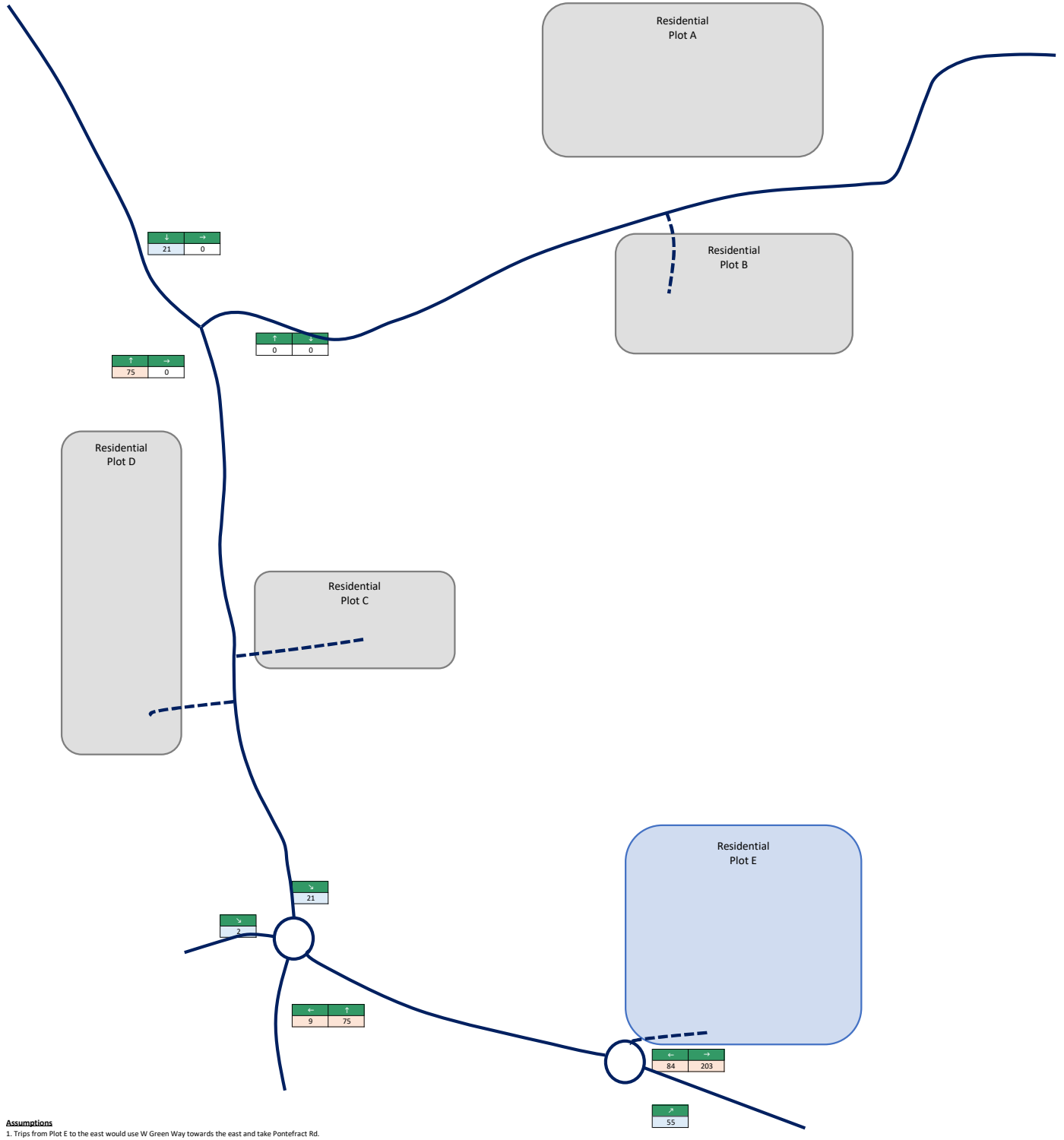
For Information

Job Number:

279211-00

Drawing Number:

Figure 11



Assumptions

1. Trips from Plot E to the east would use W Green Way towards the east and take Pontefract Rd.
2. All trips from Plot E to the west would use the Industry Rd.

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Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Development Trips - Parcels E - AM Peak Hour

Scale @A4:

Not to Scale

Drawing Status:

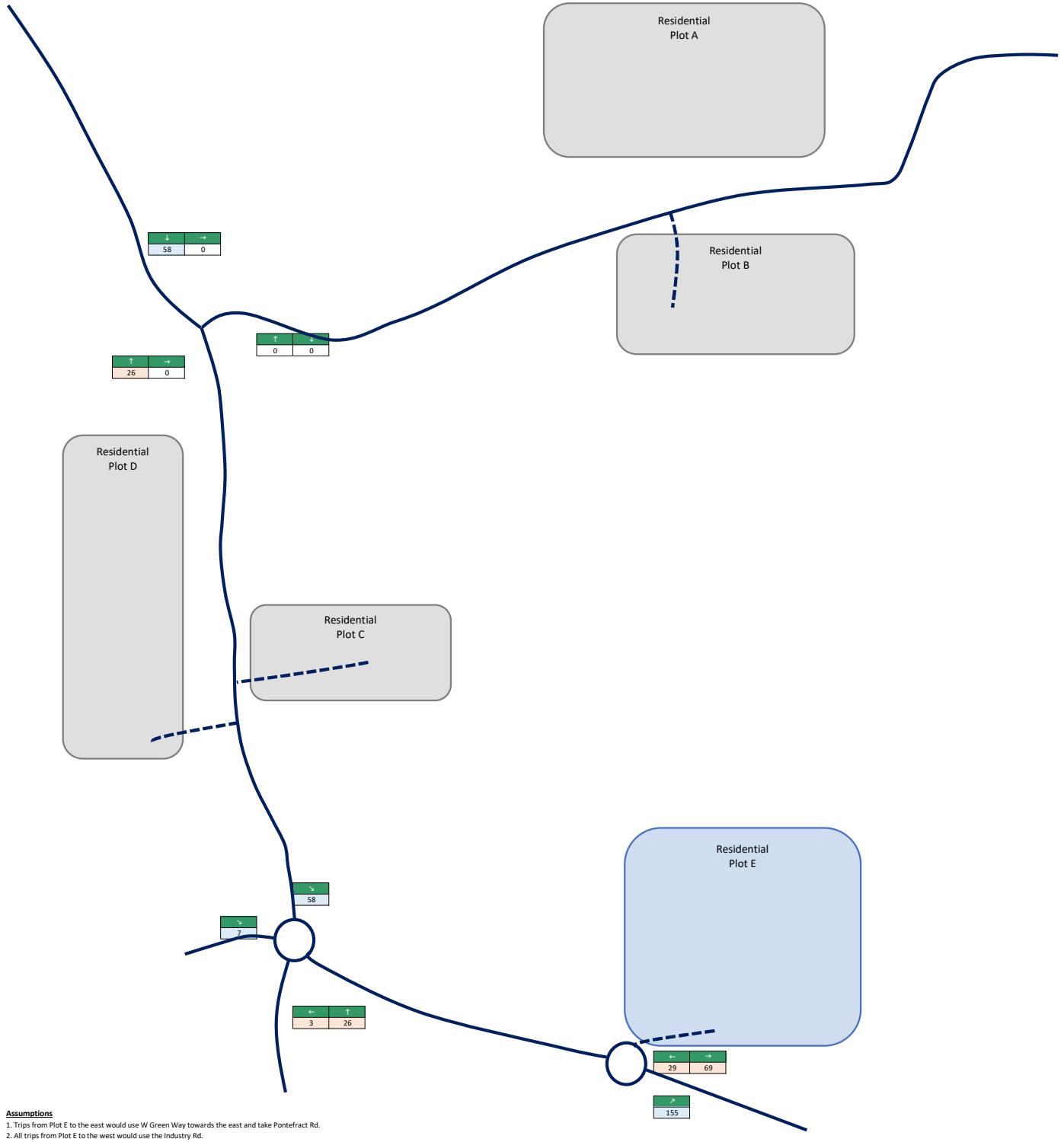
For Information

Job Number:

279211-00

Drawing Number:

Figure 12



Assumptions

1. Trips from Plot E to the east would use W Green Way towards the east and take Pontefract Rd.
2. All trips from Plot E to the west would use the Industry Rd.

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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

Development Trips - Parcels E - PM Peak Hour

Scale @A4:

Not to Scale

Drawing Status:

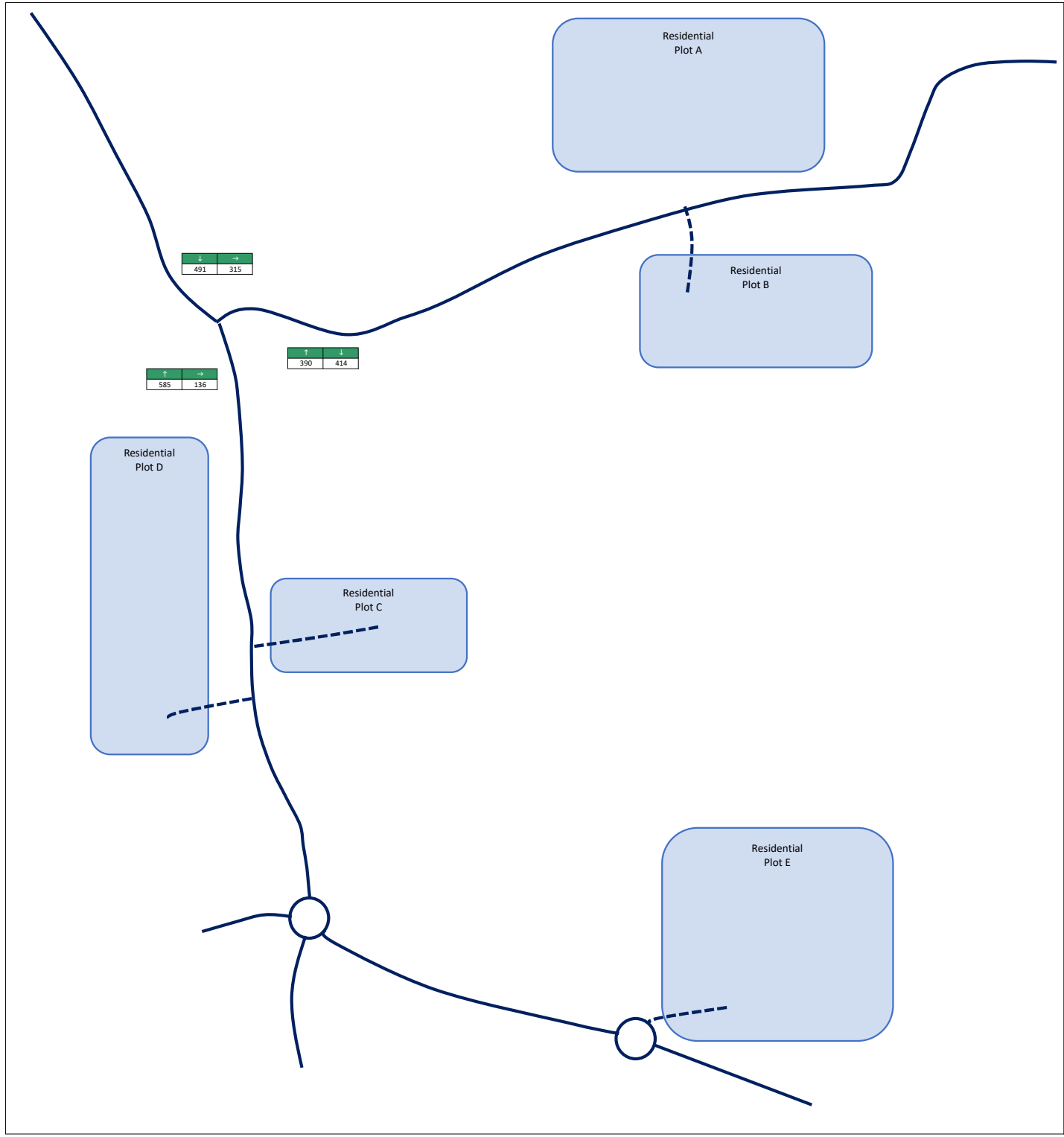
For Information

Job Number:

279211-00

Drawing Number:

Figure 13



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Fax: +44 (0)1132428573
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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

2033 (DS) AM Trip Distribution

Scale @A4:

Not to Scale

Drawing Status:

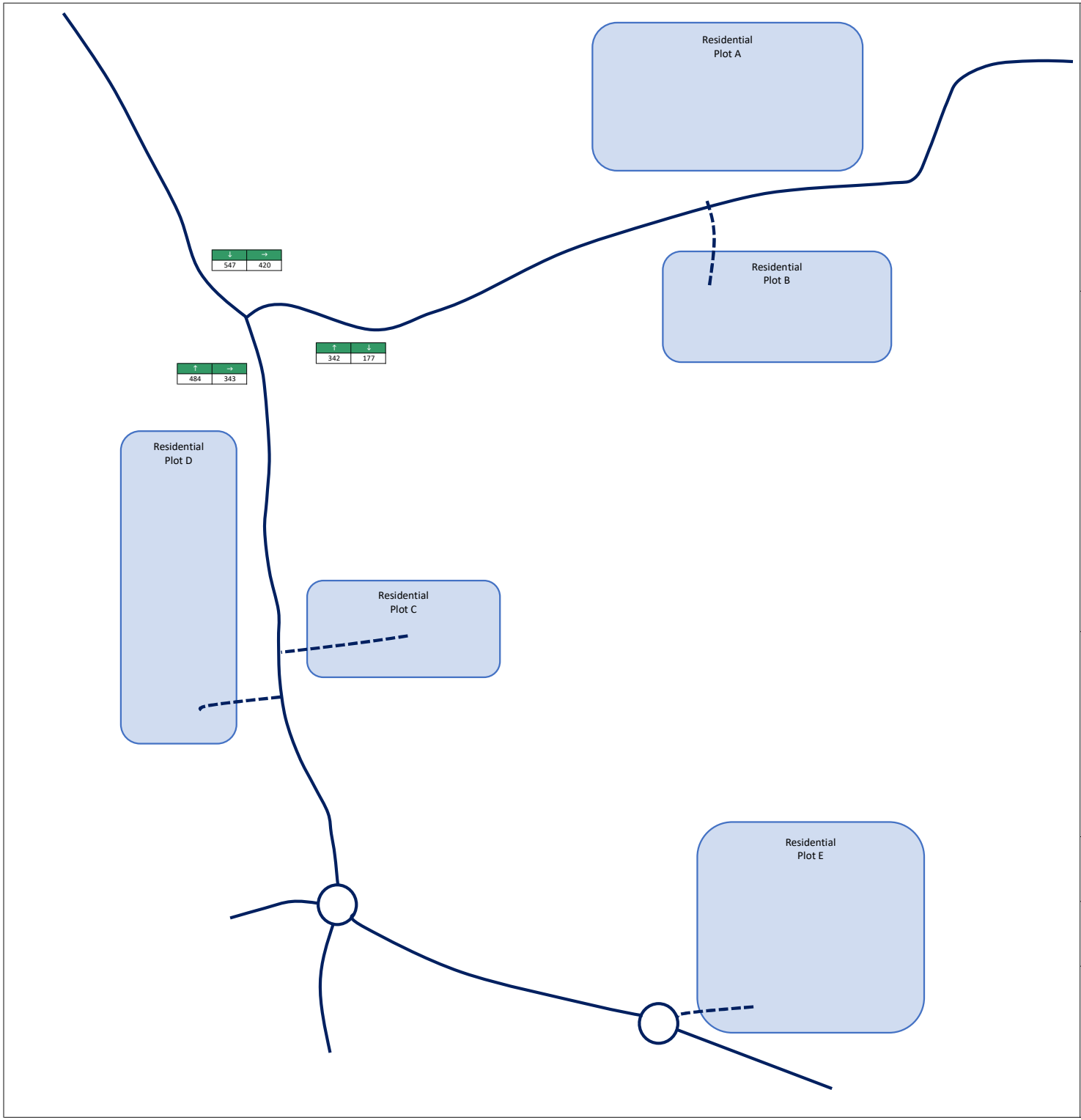
For Information

Job Number:

279211-00

Drawing Number:

Figure 14



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Issue:

Issue

Date:

19/08/2021

Prepared by:

GA

Checked by:

SB

Approved by:

NH

Client:

Barnsley Metropolitan Borough Council

Project Title:

Carlton Masterplan Framework

Drawing Title:

2033 (DS) AM Trip Distribution

Scale @A4:

Not to Scale

Drawing Status:

For Information

Job Number:

279211-00

Drawing Number:

Figure 15

Drawings

Drawing 1 - Shaw Lane Junction

A1

FTA Design Articulated Vehicle (1998)

0%

4.100

4.462

Proposed stopline

Proposed pedestrian crossing

Existing boundary wall provides inter-visibility restriction.

1.442

5.362

3.894

1.977

Proposed stopline

Proposed pedestrian crossing

Existing building provides inter-visibility restriction.

1

2

3

2%

-3%

5.643

Existing highway width provides restriction for large vehicle movements which may have implications on operation of the signal junction.

Existing boundary wall provides inter-visibility restriction.

Proposed pedestrian crossing

1.247

Sub-standard footway widths between the signal poles and existing back of highway.

4.365

4.411

-8%

Proposed stopline

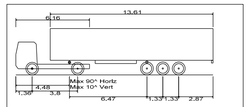
0%

GP

Wharncliffe Arms

(PH)

Vehicle Diagram



FTA Design Articulated Vehicle (1998)

Overall Length	16.480m
Overall Width	2.550m
Overall Body Height	3.870m
Min Body Ground Clearance	0.515m
Max Track Width	2.470m
Lock to Lock Time	3.00s
Kerb to Kerb Turning Radius	6.550m

Rev	Date	By	Chkd	Appd
A	29/07/21	GC	CW	-

For info

ARUP

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Client
BMBS

Project Title
Carlton Masterplan Framework

Drawing Title
Shaw Lane
Signalised Junction

Scale at A1 1:125

Role Civil

Suitability - S0 - Initial non-contractual

Arup Job No **279211-00**

Rev **A**

Name **Shaw Lane Junction Dwg**

Do not scale

\\GlobalEurope\Sheffield\Jobs\279000\279211-00\2 Arup\0-20 CAD\0_Drawings\Shaw Lane Junction Dwg.dgn

Appendix A

2021 Survey Data

Barnsley, South Yorkshire
Classified Junction Count

Site 1 of 1
Shaw Lane
Fish Dam Lane
Church Street

Lat/Long
lat 53.585337° lon -1.446307°

Date
Thursday 17 June 2021

Weather
Cloudy
Temp: 14°C

0700 - 1000 (Weekday AM Peak)

	Movement 1.1: Left from Shaw Lane to Fish Dam Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
0700 - 0715	0	0	3	0	2	0	0	0	5	5.00
0715 - 0730	0	0	1	0	0	1	0	0	2	2.50
0730 - 0745	1	0	8	0	1	0	0	0	10	9.20
0745 - 0800	0	1	13	0	1	1	2	0	18	20.50
Hourly Total	**1**	**1**	**25**	**0**	**4**	**2**	**2**	**0**	35	37.20
Hourly Average	**0.25**	**0.25**	**6.25**	**0.00**	**1.00**	**0.50**	**0.50**	**0.00**	**8.75**	**9.30**
0800 - 0815	0	0	6	0	1	1	0	0	8	8.50
0815 - 0830	0	0	6	0	0	0	0	0	6	6.00
0830 - 0845	0	0	10	0	1	0	2	0	13	15.60
0845 - 0900	0	0	3	0	1	0	2	0	6	8.60
Hourly Total	**0**	**0**	**25**	**0**	**3**	**1**	**4**	**0**	33	38.70
Hourly Average	**0.00**	**0.00**	**6.25**	**0.00**	**0.75**	**0.25**	**1.00**	**0.00**	**8.25**	**9.68**
0900 - 0915	0	0	2	0	5	1	0	0	8	8.50
0915 - 0930	0	0	4	0	2	0	1	0	7	8.30
0930 - 0945	0	0	3	0	4	0	1	0	8	9.30
0945 - 1000	0	0	6	0	1	1	1	0	9	10.80
Hourly Total	**0**	**0**	**15**	**0**	**12**	**2**	**3**	**0**	32	36.90
Hourly Average	**0.00**	**0.00**	**3.75**	**0.00**	**3.00**	**0.50**	**0.75**	**0.00**	**8.00**	**9.23**

Session Total	**1**	**1**	**65**	**0**	**19**	**5**	**9**	**0**	100	112.80
Session Average	**0.08**	**0.08**	**5.42**	**0.00**	**1.58**	**0.42**	**0.75**	**0.00**	**8.33**	**9.40**

Date
Thursday 17 June 2021

Weather
Sunny Intervals
Temp: 16°C

1600 - 1900 (Weekday PM Peak)

	Movement 1.1: Left from Shaw Lane to Fish Dam Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
1600 - 1615	0	0	5	0	3	0	0	0	8	8.00
1615 - 1630	0	0	8	0	4	0	0	0	12	12.00
1630 - 1645	0	0	6	0	2	1	1	0	10	11.80
1645 - 1700	0	0	8	0	1	0	1	0	10	11.30
Hourly Total	**0**	**0**	**27**	**0**	**10**	**1**	**2**	**0**	40	43.10
Hourly Average	**0.00**	**0.00**	**6.75**	**0.00**	**2.50**	**0.25**	**0.50**	**0.00**	**10.00**	**10.78**
1700 - 1715	1	0	4	0	2	0	1	0	8	8.50
1715 - 1730	0	0	19	0	1	0	0	0	20	20.00
1730 - 1745	0	0	5	0	0	0	0	0	5	5.00
1745 - 1800	0	0	6	0	2	0	0	0	8	8.00
Hourly Total	**1**	**0**	**34**	**0**	**5**	**0**	**1**	**0**	41	41.50
Hourly Average	**0.25**	**0.00**	**8.50**	**0.00**	**1.25**	**0.00**	**0.25**	**0.00**	**10.25**	**10.38**
1800 - 1815	0	0	4	0	1	0	1	0	6	7.30
1815 - 1830	1	0	4	0	0	0	0	0	5	4.20
1830 - 1845	0	0	1	0	2	0	0	0	3	3.00
1845 - 1900	0	0	4	0	2	0	0	0	6	6.00
Hourly Total	**1**	**0**	**13**	**0**	**5**	**0**	**1**	**0**	20	20.50
Hourly Average	**0.25**	**0.00**	**3.25**	**0.00**	**1.25**	**0.00**	**0.25**	**0.00**	**5.00**	**5.13**

Session Total	**2**	**0**	**74**	**0**	**20**	**1**	**4**	**0**	101	105.10
Session Average	**0.17**	**0.00**	**6.17**	**0.00**	**1.67**	**0.08**	**0.33**	**0.00**	**8.42**	**8.76**

Barnsley, South Yorkshire
Classified Junction Count

Site 1 of 1
Shaw Lane
Fish Dam Lane
Church Street

Lat/Long
lat 53.585337° lon -1.446307°

Date
Thursday 17 June 2021

Weather
Cloudy
Temp: 14°C

0700 - 1000 (Weekday AM Peak)

	Movement 1.2: Right from Shaw Lane to Church Street								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
0700 - 0715	1	1	24	1	7	1	0	0	35	34.10
0715 - 0730	0	0	35	0	5	2	1	0	43	45.30
0730 - 0745	0	0	35	1	12	0	0	0	48	48.00
0745 - 0800	0	0	39	0	11	1	1	0	52	53.80
Hourly Total	**1**	**1**	**133**	**2**	**35**	**4**	**2**	**0**	178	181.20
Hourly Average	**0.25**	**0.25**	**33.25**	**0.50**	**8.75**	**1.00**	**0.50**	**0.00**	**44.50**	**45.30**
0800 - 0815	0	0	48	1	11	0	1	0	61	62.30
0815 - 0830	1	0	35	0	7	1	1	0	45	46.00
0830 - 0845	0	0	43	0	3	2	0	0	48	49.00
0845 - 0900	0	0	35	2	12	1	1	0	51	52.80
Hourly Total	**1**	**0**	**161**	**3**	**33**	**4**	**3**	**0**	205	210.10
Hourly Average	**0.25**	**0.00**	**40.25**	**0.75**	**8.25**	**1.00**	**0.75**	**0.00**	**51.25**	**52.53**
0900 - 0915	0	0	32	0	9	0	0	0	41	41.00
0915 - 0930	1	0	40	1	7	0	0	0	49	48.20
0930 - 0945	0	0	27	0	9	1	0	0	37	37.50
0945 - 1000	0	0	24	0	4	1	0	0	29	29.50
Hourly Total	**1**	**0**	**123**	**1**	**29**	**2**	**0**	**0**	156	156.20
Hourly Average	**0.25**	**0.00**	**30.75**	**0.25**	**7.25**	**0.50**	**0.00**	**0.00**	**39.00**	**39.05**

Session Total	**3**	**1**	**417**	**6**	**97**	**10**	**5**	**0**	539	547.50
Session Average	**0.25**	**0.08**	**34.75**	**0.50**	**8.08**	**0.83**	**0.42**	**0.00**	**44.92**	**45.63**

Date
Thursday 17 June 2021

Weather
Sunny Intervals
Temp: 16°C

1600 - 1900 (Weekday PM Peak)

	Movement 1.2: Right from Shaw Lane to Church Street								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
1600 - 1615	0	0	59	1	12	0	0	0	72	72.00
1615 - 1630	0	1	61	0	10	0	0	0	72	71.40
1630 - 1645	0	0	32	0	10	0	0	0	42	42.00
1645 - 1700	1	1	61	0	12	2	0	0	77	76.60
Hourly Total	**1**	**2**	**213**	**1**	**44**	**2**	**0**	**0**	263	262.00
Hourly Average	**0.25**	**0.50**	**53.25**	**0.25**	**11.00**	**0.50**	**0.00**	**0.00**	**65.75**	**65.50**
1700 - 1715	2	1	50	0	8	1	0	0	62	60.30
1715 - 1730	0	0	63	1	11	1	0	0	76	76.50
1730 - 1745	1	0	58	0	9	0	0	0	68	67.20
1745 - 1800	0	2	50	0	9	0	0	0	61	59.80
Hourly Total	**3**	**3**	**221**	**1**	**37**	**2**	**0**	**0**	267	263.80
Hourly Average	**0.75**	**0.75**	**55.25**	**0.25**	**9.25**	**0.50**	**0.00**	**0.00**	**66.75**	**65.95**
1800 - 1815	0	0	53	0	8	0	0	0	61	61.00
1815 - 1830	3	0	47	1	11	2	0	0	64	62.60
1830 - 1845	0	0	33	0	8	1	0	0	42	42.50
1845 - 1900	0	0	32	0	2	0	0	0	34	34.00
Hourly Total	**3**	**0**	**165**	**1**	**29**	**3**	**0**	**0**	201	200.10
Hourly Average	**0.75**	**0.00**	**41.25**	**0.25**	**7.25**	**0.75**	**0.00**	**0.00**	**50.25**	**50.03**

Session Total	**7**	**5**	**599**	**3**	**110**	**7**	**0**	**0**	731	725.90
Session Average	**0.58**	**0.42**	**49.92**	**0.25**	**9.17**	**0.58**	**0.00**	**0.00**	**60.92**	**60.49**

Barnsley, South Yorkshire
Classified Junction Count

Site 1 of 1
Shaw Lane
Fish Dam Lane
Church Street

Lat/Long
lat 53.585337° lon -1.446307°

Date
Thursday 17 June 2021

Weather
Cloudy
Temp: 14°C

0700 - 1000 (Weekday AM Peak)

	Movement 1.3: Northbound from Fish Dam Lane to Church Street								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
0700 - 0715	0	1	30	0	10	0	0	0	41	40.40
0715 - 0730	0	0	45	0	4	0	1	4	54	59.30
0730 - 0745	0	0	54	1	12	0	0	0	67	67.00
0745 - 0800	0	0	68	1	15	1	0	1	86	87.50
Hourly Total	**0**	**1**	**197**	**2**	**41**	**1**	**1**	**5**	248	254.20
Hourly Average	**0.00**	**0.25**	**49.25**	**0.50**	**10.25**	**0.25**	**0.25**	**1.25**	**62.00**	**63.55**
0800 - 0815	0	1	112	2	19	1	0	2	137	138.90
0815 - 0830	0	0	66	0	11	2	0	1	80	82.00
0830 - 0845	0	0	75	1	14	0	2	1	93	96.60
0845 - 0900	0	0	80	1	14	1	0	1	97	98.50
Hourly Total	**0**	**1**	**333**	**4**	**58**	**4**	**2**	**5**	407	416.00
Hourly Average	**0.00**	**0.25**	**83.25**	**1.00**	**14.50**	**1.00**	**0.50**	**1.25**	**101.75**	**104.00**
0900 - 0915	0	0	42	0	11	0	0	2	55	57.00
0915 - 0930	0	0	32	0	8	0	0	1	41	42.00
0930 - 0945	1	0	50	0	11	2	0	1	65	66.20
0945 - 1000	0	0	44	0	11	1	1	1	58	60.80
Hourly Total	**1**	**0**	**168**	**0**	**41**	**3**	**1**	**5**	219	226.00
Hourly Average	**0.25**	**0.00**	**42.00**	**0.00**	**10.25**	**0.75**	**0.25**	**1.25**	**54.75**	**56.50**

Session Total	**1**	**2**	**698**	**6**	**140**	**8**	**4**	**15**	**874**	**896.20**
Session Average	**0.08**	**0.17**	**58.17**	**0.50**	**11.67**	**0.67**	**0.33**	**1.25**	**72.83**	**74.68**

Date
Thursday 17 June 2021

Weather
Sunny Intervals
Temp: 16°C

1600 - 1900 (Weekday PM Peak)

	Movement 1.3: Northbound from Fish Dam Lane to Church Street								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
1600 - 1615	0	0	78	1	13	0	0	2	94	96.00
1615 - 1630	1	0	75	0	14	1	1	2	94	97.00
1630 - 1645	0	0	65	0	13	1	1	1	81	83.80
1645 - 1700	4	1	67	0	11	0	0	1	84	81.20
Hourly Total	**5**	**1**	**285**	**1**	**51**	**2**	**2**	**6**	353	358.00
Hourly Average	**1.25**	**0.25**	**71.25**	**0.25**	**12.75**	**0.50**	**0.50**	**1.50**	**88.25**	**89.50**
1700 - 1715	0	1	91	0	20	0	0	1	113	113.40
1715 - 1730	0	0	77	1	7	0	0	2	87	89.00
1730 - 1745	0	0	83	0	10	0	0	0	93	93.00
1745 - 1800	0	0	94	0	6	1	1	2	104	107.80
Hourly Total	**0**	**1**	**345**	**1**	**43**	**1**	**1**	**5**	397	403.20
Hourly Average	**0.00**	**0.25**	**86.25**	**0.25**	**10.75**	**0.25**	**0.25**	**1.25**	**99.25**	**100.80**
1800 - 1815	0	1	78	1	9	0	0	1	90	90.40
1815 - 1830	1	2	71	1	9	0	1	1	86	86.30
1830 - 1845	0	0	53	0	9	0	0	0	62	62.00
1845 - 1900	0	1	51	0	8	0	0	1	61	61.40
Hourly Total	**1**	**4**	**253**	**2**	**35**	**0**	**1**	**3**	299	300.10
Hourly Average	**0.25**	**1.00**	**63.25**	**0.50**	**8.75**	**0.00**	**0.25**	**0.75**	**74.75**	**75.03**

Session Total	**6**	**6**	**883**	**4**	**129**	**3**	**4**	**14**	**1049**	**1061.30**
Session Average	**0.50**	**0.50**	**73.58**	**0.33**	**10.75**	**0.25**	**0.33**	**1.17**	**87.42**	**88.44**

Barnsley, South Yorkshire
Classified Junction Count

Site 1 of 1
Shaw Lane
Fish Dam Lane
Church Street

Lat/Long
lat 53.585337° lon -1.446307°

Date
Thursday 17 June 2021

Weather
Cloudy
Temp: 14°C

0700 - 1000 (Weekday AM Peak)

	Movement 1.4: Right from Fish Dam Lane to Shaw Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
0700 - 0715	0	0	2	0	0	0	1	0	3	4.30
0715 - 0730	0	0	2	0	2	1	1	0	6	7.80
0730 - 0745	0	1	2	0	3	0	4	0	10	14.60
0745 - 0800	0	0	3	0	1	2	0	0	6	7.00
Hourly Total	**0**	**1**	**9**	**0**	**6**	**3**	**6**	**0**	25	33.70
Hourly Average	**0.00**	**0.25**	**2.25**	**0.00**	**1.50**	**0.75**	**1.50**	**0.00**	6.25	8.43
0800 - 0815	0	0	2	0	0	1	0	0	3	3.50
0815 - 0830	0	0	3	0	1	0	1	0	5	6.30
0830 - 0845	0	0	2	0	1	1	1	0	5	6.80
0845 - 0900	0	0	5	0	4	0	0	0	9	9.00
Hourly Total	**0**	**0**	**12**	**0**	**6**	**2**	**2**	**0**	22	25.60
Hourly Average	**0.00**	**0.00**	**3.00**	**0.00**	**1.50**	**0.50**	**0.50**	**0.00**	5.50	6.40
0900 - 0915	0	0	3	0	1	1	0	0	5	5.50
0915 - 0930	0	0	3	0	3	0	2	0	8	10.60
0930 - 0945	0	2	2	0	2	1	0	0	7	6.30
0945 - 1000	1	0	1	0	3	1	1	0	7	8.00
Hourly Total	**1**	**2**	**9**	**0**	**9**	**3**	**3**	**0**	27	30.40
Hourly Average	**0.25**	**0.50**	**2.25**	**0.00**	**2.25**	**0.75**	**0.75**	**0.00**	6.75	7.60

Session Total	**1**	**3**	**30**	**0**	**21**	**8**	**11**	**0**	74	89.70
Session Average	**0.08**	**0.25**	**2.50**	**0.00**	**1.75**	**0.67**	**0.92**	**0.00**	6.17	7.48

Date
Thursday 17 June 2021

Weather
Sunny Intervals
Temp: 16°C

1600 - 1900 (Weekday PM Peak)

	Movement 1.4: Right from Fish Dam Lane to Shaw Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
1600 - 1615	0	0	8	0	3	0	1	0	12	13.30
1615 - 1630	0	0	12	0	1	1	1	0	15	16.80
1630 - 1645	0	0	7	0	0	0	1	0	8	9.30
1645 - 1700	0	2	11	0	0	0	0	0	13	11.80
Hourly Total	**0**	**2**	**38**	**0**	**4**	**1**	**3**	**0**	48	51.20
Hourly Average	**0.00**	**0.50**	**9.50**	**0.00**	**1.00**	**0.25**	**0.75**	**0.00**	12.00	12.80
1700 - 1715	0	1	18	0	1	0	0	0	20	19.40
1715 - 1730	0	0	4	0	4	0	0	0	8	8.00
1730 - 1745	0	0	12	0	1	0	0	0	13	13.00
1745 - 1800	0	0	10	0	2	0	0	0	12	12.00
Hourly Total	**0**	**1**	**44**	**0**	**8**	**0**	**0**	**0**	53	52.40
Hourly Average	**0.00**	**0.25**	**11.00**	**0.00**	**2.00**	**0.00**	**0.00**	**0.00**	13.25	13.10
1800 - 1815	1	0	18	1	0	0	0	0	20	19.20
1815 - 1830	0	0	8	1	1	0	0	0	10	10.00
1830 - 1845	0	0	7	0	0	0	0	0	7	7.00
1845 - 1900	0	0	4	0	1	0	0	0	5	5.00
Hourly Total	**1**	**0**	**37**	**2**	**2**	**0**	**0**	**0**	42	41.20
Hourly Average	**0.25**	**0.00**	**9.25**	**0.50**	**0.50**	**0.00**	**0.00**	**0.00**	10.50	10.30

Session Total	**1**	**3**	**119**	**2**	**14**	**1**	**3**	**0**	143	144.80
Session Average	**0.08**	**0.25**	**9.92**	**0.17**	**1.17**	**0.08**	**0.25**	**0.00**	11.92	12.07

Barnsley, South Yorkshire
Classified Junction Count

Site 1 of 1
Shaw Lane
Fish Dam Lane
Church Street

Lat/Long
lat 53.585337° lon -1.446307°

Date
Thursday 17 June 2021

Weather
Cloudy
Temp: 14°C

0700 - 1000 (Weekday AM Peak)

	Movement 1.5: Left from Church Street to Shaw Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
0700 - 0715	0	0	34	1	12	1	0	0	48	48.50
0715 - 0730	0	0	39	0	16	1	0	1	57	58.50
0730 - 0745	1	0	44	0	15	1	0	0	61	60.70
0745 - 0800	0	0	61	0	11	1	0	0	73	73.50
Hourly Total	**1**	**0**	**178**	**1**	**54**	**4**	**0**	**1**	239	241.20
Hourly Average	**0.25**	**0.00**	**44.50**	**0.25**	**13.50**	**1.00**	**0.00**	**0.25**	**59.75**	**60.30**
0800 - 0815	0	0	58	2	7	0	0	0	67	67.00
0815 - 0830	0	0	39	1	15	1	0	0	56	56.50
0830 - 0845	0	1	55	0	7	0	0	0	63	62.40
0845 - 0900	0	0	55	0	4	1	1	0	61	62.80
Hourly Total	**0**	**1**	**207**	**3**	**33**	**2**	**1**	**0**	247	248.70
Hourly Average	**0.00**	**0.25**	**51.75**	**0.75**	**8.25**	**0.50**	**0.25**	**0.00**	**61.75**	**62.18**
0900 - 0915	0	0	35	0	8	0	0	0	43	43.00
0915 - 0930	0	0	34	0	14	2	0	0	50	51.00
0930 - 0945	0	0	28	1	9	1	1	0	40	41.80
0945 - 1000	0	0	36	0	4	2	0	0	42	43.00
Hourly Total	**0**	**0**	**133**	**1**	**35**	**5**	**1**	**0**	175	178.80
Hourly Average	**0.00**	**0.00**	**33.25**	**0.25**	**8.75**	**1.25**	**0.25**	**0.00**	**43.75**	**44.70**

Session Total	**1**	**1**	**518**	**5**	**122**	**11**	**2**	**1**	**661**	**668.70**
Session Average	**0.08**	**0.08**	**43.17**	**0.42**	**10.17**	**0.92**	**0.17**	**0.08**	**55.08**	**55.73**

Date
Thursday 17 June 2021

Weather
Sunny Intervals
Temp: 16°C

1600 - 1900 (Weekday PM Peak)

	Movement 1.5: Left from Church Street to Shaw Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
1600 - 1615	0	0	56	0	18	0	0	0	74	74.00
1615 - 1630	0	0	45	2	9	0	1	0	57	58.30
1630 - 1645	0	0	50	0	17	0	0	0	67	67.00
1645 - 1700	0	0	50	0	19	0	1	0	70	71.30
Hourly Total	**0**	**0**	**201**	**2**	**63**	**0**	**2**	**0**	268	270.60
Hourly Average	**0.00**	**0.00**	**50.25**	**0.50**	**15.75**	**0.00**	**0.50**	**0.00**	**67.00**	**67.65**
1700 - 1715	0	0	59	2	10	1	0	0	72	72.50
1715 - 1730	1	1	56	1	7	0	0	0	66	64.60
1730 - 1745	0	1	61	1	14	0	0	0	77	76.40
1745 - 1800	0	0	50	2	5	1	0	0	58	58.50
Hourly Total	**1**	**2**	**226**	**6**	**36**	**2**	**0**	**0**	273	272.00
Hourly Average	**0.25**	**0.50**	**56.50**	**1.50**	**9.00**	**0.50**	**0.00**	**0.00**	**68.25**	**68.00**
1800 - 1815	0	4	34	0	9	0	0	0	47	44.60
1815 - 1830	1	0	45	0	5	0	1	0	52	52.50
1830 - 1845	0	0	40	0	9	1	0	0	50	50.50
1845 - 1900	0	1	32	0	2	0	0	0	35	34.40
Hourly Total	**1**	**5**	**151**	**0**	**25**	**1**	**1**	**0**	184	182.00
Hourly Average	**0.25**	**1.25**	**37.75**	**0.00**	**6.25**	**0.25**	**0.25**	**0.00**	**46.00**	**45.50**

Session Total	**2**	**7**	**578**	**8**	**124**	**3**	**3**	**0**	**725**	**724.60**
Session Average	**0.17**	**0.58**	**48.17**	**0.67**	**10.33**	**0.25**	**0.25**	**0.00**	**60.42**	**60.38**

Barnsley, South Yorkshire
Classified Junction Count

Site 1 of 1
Shaw Lane
Fish Dam Lane
Church Street

Lat/Long
lat 53.585337° lon -1.446307°

Date
Thursday 17 June 2021

Weather
Cloudy
Temp: 14°C

0700 - 1000 (Weekday AM Peak)

	Movement 1.6: Southbound from Church Street to Fish Dam Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
0700 - 0715	0	0	27	0	9	0	0	1	37	38.00
0715 - 0730	0	0	43	2	16	1	0	1	63	64.50
0730 - 0745	1	0	65	0	16	1	0	1	84	84.70
0745 - 0800	0	0	63	0	21	0	1	5	90	96.30
Hourly Total	**1**	**0**	**198**	**2**	**62**	**2**	**1**	**8**	**274**	**283.50**
Hourly Average	**0.25**	**0.00**	**49.50**	**0.50**	**15.50**	**0.50**	**0.25**	**2.00**	**68.50**	**70.88**
0800 - 0815	0	0	92	0	11	0	0	1	104	105.00
0815 - 0830	1	2	93	1	16	3	0	3	119	121.50
0830 - 0845	0	0	86	0	11	0	0	0	97	97.00
0845 - 0900	1	1	70	0	17	2	0	2	93	94.60
Hourly Total	**2**	**3**	**341**	**1**	**55**	**5**	**0**	**6**	**413**	**418.10**
Hourly Average	**0.50**	**0.75**	**85.25**	**0.25**	**13.75**	**1.25**	**0.00**	**1.50**	**103.25**	**104.53**
0900 - 0915	0	0	62	2	16	1	0	1	82	83.50
0915 - 0930	0	0	51	0	9	1	1	2	64	67.80
0930 - 0945	0	0	58	1	2	1	0	1	63	64.50
0945 - 1000	0	0	46	0	7	5	1	1	60	64.80
Hourly Total	**0**	**0**	**217**	**3**	**34**	**8**	**2**	**5**	**269**	**280.60**
Hourly Average	**0.00**	**0.00**	**54.25**	**0.75**	**8.50**	**2.00**	**0.50**	**1.25**	**67.25**	**70.15**

Session Total	**3**	**3**	**756**	**6**	**151**	**15**	**3**	**19**	**956**	**982.20**
Session Average	**0.25**	**0.25**	**63.00**	**0.50**	**12.58**	**1.25**	**0.25**	**1.58**	**79.67**	**81.85**

Date
Thursday 17 June 2021

Weather
Sunny Intervals
Temp: 16°C

1600 - 1900 (Weekday PM Peak)

	Movement 1.6: Southbound from Church Street to Fish Dam Lane								Original Data	
TIME	P/CYCLE	M/CYCLE	CAR	TAXI	LGV	OGV1	OGV2	BUS/COACH	TOTAL	PCU TOTAL
1600 - 1615	1	0	87	0	13	2	1	1	105	107.50
1615 - 1630	0	0	73	0	13	3	2	2	93	99.10
1630 - 1645	0	1	61	2	15	0	2	2	83	87.00
1645 - 1700	0	0	73	0	13	1	0	1	88	89.50
Hourly Total	**1**	**1**	**294**	**2**	**54**	**6**	**5**	**6**	**369**	**383.10**
Hourly Average	**0.25**	**0.25**	**73.50**	**0.50**	**13.50**	**1.50**	**1.25**	**1.50**	**92.25**	**95.78**
1700 - 1715	0	0	72	1	11	0	0	1	85	86.00
1715 - 1730	0	0	75	0	18	0	1	2	96	99.30
1730 - 1745	0	1	103	0	19	0	0	2	125	126.40
1745 - 1800	2	0	76	0	15	0	1	2	96	97.70
Hourly Total	**2**	**1**	**326**	**1**	**63**	**0**	**2**	**7**	**402**	**409.40**
Hourly Average	**0.50**	**0.25**	**81.50**	**0.25**	**15.75**	**0.00**	**0.50**	**1.75**	**100.50**	**102.35**
1800 - 1815	0	0	85	1	12	0	0	0	98	98.00
1815 - 1830	0	0	53	0	9	0	0	0	62	62.00
1830 - 1845	0	0	67	0	6	1	0	1	75	76.50
1845 - 1900	0	0	64	0	6	0	0	0	70	70.00
Hourly Total	**0**	**0**	**269**	**1**	**33**	**1**	**0**	**1**	**305**	**306.50**
Hourly Average	**0.00**	**0.00**	**67.25**	**0.25**	**8.25**	**0.25**	**0.00**	**0.25**	**76.25**	**76.63**

Session Total	**3**	**2**	**889**	**4**	**150**	**7**	**7**	**14**	**1076**	**1099.00**
Session Average	**0.25**	**0.17**	**74.08**	**0.33**	**12.50**	**0.58**	**0.58**	**1.17**	**89.67**	**91.58**

Appendix B

Traffic Data Analysis

Multi-Day Volume Report BARN_PERM 000000000017 2018-05-07 to 2019-05-07

Site Name	BF17
Site ID	000000000017
Grid	436787409781
Description	Fish Dam Lane, Carlton
Setup	17_Pvr
Lanes	Lane: Northbound
Time Period	1 hour
Class	Any
Exclude data:	None

	Weekday average flow									
Time	May 2018 week 2	May 2018 week 3	June 2018 week 2	June 2018 week 3	Sept 2018 week 2	Sept 2018 week 3	**2018 average**	Week commencing 08/04/**2019**	Week commencing 29/04/**2019**	**2019 Average**
00:00:00	15.2	14.8	15.2	15	14	17.8	15	16	18	17
01:00:00	5	7.2	5.8	5.2	6.4	4.6	6	6	6.6	7
02:00:00	7.4	7	7.6	7.6	6	6	7	7	5.8	6
03:00:00	8.8	9.6	7.8	6.2	9.8	7.8	8	8	9.6	9
04:00:00	15.4	16.6	17	20.6	18.6	14.8	17	17	16	16
05:00:00	68.8	68.6	69.8	69	70.6	63.2	68	66	73.2	70
06:00:00	157.6	154.6	147.6	133.2	137	130.8	143	146	150.8	148
07:00:00	299.4	277.8	276.6	271.2	266	282.2	279	290	321.6	306
08:00:00	416	408	400.6	372.8	398.6	402	**400**	407	437.4	**422**
09:00:00	301.8	278.6	271	268.2	268.2	271	276	270	303.6	287
10:00:00	265.6	242.4	246.8	246.2	232.2	238.6	245	261	273	267
11:00:00	266.2	245	252.8	251.6	245.2	251.6	252	265	291.6	279
12:00:00	266.8	256.2	264.6	263.6	249.2	253.4	259	273	292.8	283
13:00:00	265.6	260.4	250.4	246.8	242	252.2	253	267	291.6	279
14:00:00	295.8	279.4	281.4	277.2	309.2	291.4	289	306	336.8	322
15:00:00	348.2	356.4	327	328	327.4	347.8	**339**	366	373	**370**
16:00:00	332.4	304.8	298.6	306	291.2	294	305	301	360.4	331
17:00:00	317.2	299.8	310.8	306.8	314.6	296	**308**	305	364.2	**334**
18:00:00	275.6	263.4	263.4	254.4	286.6	253	266	270	266	268
19:00:00	207.2	195	192.6	174.6	218.2	192.4	197	209	198	204
20:00:00	145	141.4	140.4	133.8	138.8	116	136	134	127.4	131
21:00:00	94.2	82.6	103	97	87.2	88.2	92	87	86.2	87
22:00:00	64	64	64.4	67.2	61.4	53.4	62	64	62	63
23:00:00	33.6	37	35.4	35.8	30.2	30	34	39	36.8	38

Multi-Day Volume Report BARN_PERM 000000000017 2018-05-07 to 2019-05-07

Site Name BF17
Site ID 000000000017
Grid 436787409781

Description Fish Dam Lane, Carlton

Setup 17_Pvr
Lanes Lane: Southbound

Time Period 1 hour
Class Any

Exclude data: None

	Weekday average flow									
Time	May 2018 week 2	May 2018 week 3	June 2018 week 2	June 2018 week 3	Sept 2018 week 2	Sept 2018 week 3	**2018 average**	Week commencing 08/04/**2019**	Week commencing 29/04/**2019**	**2019 Average**
00:00:00	10.2	13.6	21.6	14.8	15	15.6	**15**	15	17.2	16
01:00:00	6.6	7.6	8.4	6	8	5.4	**7**	7	9.2	8
02:00:00	7.8	9.4	5.4	8.4	6.4	8.8	**8**	8	5.8	7
03:00:00	7	8.2	7.6	5.2	8	7.4	**7**	6	8.4	7
04:00:00	19.8	23.6	18.2	20.6	18.8	16.2	**20**	18	18	18
05:00:00	128.8	129	121.4	127.6	128.6	132.6	**128**	119	142.6	131
06:00:00	147.8	132.2	148.6	136	143	148.6	**143**	137	148.6	143
07:00:00	297.6	286.6	270.2	269	270.4	276.4	**278**	292	333	313
08:00:00	414.2	413.2	402	388.2	393.6	400.6	**402**	434	437.4	**436**
09:00:00	255.6	248.4	238.4	246	254.4	242.6	**248**	276	268.2	272
10:00:00	245	231	237.8	239.8	226.8	234.4	**236**	247	262.8	255
11:00:00	255	249.4	252.8	255.8	250.6	240.8	**251**	266	275.6	271
12:00:00	277.8	280	259.8	271.2	260.8	265.6	**269**	285	303.6	294
13:00:00	311.8	315.4	300.8	299.8	296.6	295.8	**303**	318	325.6	322
14:00:00	397.2	400.8	398.6	372	393.6	394.8	**393**	405	399.6	403
15:00:00	356.2	347.6	337.8	349.2	332.6	337	**343**	376	372.8	**375**
16:00:00	389.2	392.4	394.6	373.2	380	372.6	**384**	417	430.8	424
17:00:00	435.4	401.6	430.6	420	423.2	424.6	**423**	437	448	**443**
18:00:00	290.6	289	292.2	291.6	321.8	297.6	**297**	311	313.6	312
19:00:00	215.2	212.4	199.2	193.2	211.4	203.6	**206**	203	201	202
20:00:00	168.6	161.4	152.6	144.8	152	139.8	**153**	164	150.4	157
21:00:00	143	140.6	136.2	129.2	130	119	**133**	126	120.2	123
22:00:00	93.4	106.4	87.2	103	94.4	80.4	**94**	88	95.4	92
23:00:00	36.4	41.4	41.6	34.4	33.8	36.8	**37**	40	35.8	38

9406 / Shaw Lane
NOV 2018
MANUAL CLASSIFIED COUNT

SITE: 1
LOCATION: B6132 Church Street/Shaw Lane
DATE: 13/11/2018
DAY: TUESDAY

Time	Traffic Flow	
	Northbound	Southbound
07:00	50	57
07:15	65	78
07:30	76	78
07:45	102	87
07:00-08:00 H/TOT	**293**	**300**
08:00	138	112
08:15	97	127
08:30	98	123
08:45	105	74
08:00-09:00 H/TOT	**438**	**436**
09:00	53	79
09:15	61	57
09:30	48	81
09:45	63	63
09:00-10:00 H/TOT	**225**	**280**
16:00	131	67
16:15	92	80
16:30	105	60
16:45	74	70
16:00-17:00 H/TOT	**402**	**277**
17:00	137	76
17:15	96	71
17:30	83	91
17:45	94	68
17:00-18:00 H/TOT	**410**	**306**

Barnsley, South Yorkshire

Classified Junction Count

Site 1 of 1

Shaw Lane

Fish Dam Lane

Church Street

Time	Traffic Flow	
	Northbound	Southbound
07:00	44	42
07:15	60	65
07:30	77	94
07:45	92	108
07:00-08:00 Hourly total	**273**	**309**
08:00	140	112
08:15	85	125
08:30	98	110
08:45	106	99
08:00-09:00 Hourly total	**429**	**446**
09:00	60	90
09:15	49	71
09:30	72	71
09:45	65	69
09:00-10:00 Hourly total	**246**	**301**

16:00	106	113
16:15	109	105
16:30	89	93
16:45	97	98
16:00-17:00 Hourly total	**401**	**409**
17:00	133	93
17:15	95	116
17:30	106	130
17:45	116	104
17:00-18:00 Hourly total	**450**	**443**
18:00	110	104
18:15	96	67
18:30	69	78
18:45	66	76
18:00-19:00 Hourly total	**341**	**325**

	Northbound				Southbound			
	2018 ATC	2019 ATC	2018 Survey	2021 Survey	2018 ATC	2019 ATC	2018 Survey	2021 Survey
08:00 - 09:00	400	422	**438**	429	402	436	436	**446**
17:00 - 18:00	308	334	410	**450**	423	442.5	306	**443.0**

Appendix C

Junctions9 Assessment -
Existing Priority Junction

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

Filename: 2021-07-20 Shaw Lane_DM.j9
Path: \\global\europe\Sheffield\Jobs\279000\279211-00\0 Arup\0-11 Transport\0-11-07 Calcs-Specs\Junction Modelling
Report generation date: 11/08/2021 13:01:05

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2021							
Stream B-C	0.2	19.59	0.17	C	0.5	41.14	0.34	E
Stream B-A	1.9	30.15	0.65	D	4.4	58.93	0.84	F
Stream C-AB	0.2	5.69	0.08	A	0.4	5.54	0.17	A
	2033 DM							
Stream B-C	0.4	28.99	0.24	D	3.4	254.74	0.90	F
Stream B-A	2.9	44.18	0.75	E	10.6	125.28	0.98	F
Stream C-AB	0.2	5.67	0.10	A	0.5	5.59	0.20	A
	2033 DS							
Stream B-C	250.3	3697.48	2.39	F	105.7	3695.00	2.95	F
Stream B-A	235.8	3697.92	2.39	F	203.4	3672.56	2.97	F
Stream C-AB	2.6	9.28	0.55	A	108.2	484.94	1.26	F

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	20/07/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\Gopika.Avanoor
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

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	AM	ONE HOUR	07:45	09:15	15
D2	2021	PM	ONE HOUR	16:45	18:15	15
D3	2033 DM	AM	ONE HOUR	07:45	09:15	15
D4	2033 DM	PM	ONE HOUR	16:45	18:15	15
D5	2033 DS	AM	ONE HOUR	07:45	09:15	15
D6	2033 DS	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2021, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		5.45	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Church Street		Major
B	Shaw Lane		Minor
C	Fish Dam Lane		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	9.30			55.4	✓	0.00

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	7.85	5.00	4.60	4.40	4.10		1.00	20	20

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	553	0.086	0.218	0.137	0.312
1	B-C	526	0.069	0.174	-	-
1	C-B	606	0.201	0.201	-	-

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	AM	ONE HOUR	07:45	09:15	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		✓	667	100.000
B		✓	249	100.000
C		✓	442	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	**B**	**C**
From	**A**	0	249	418
	B	210	0	39
	C	416	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	**B**	**C**
From	**A**	0	1	1
	B	3	0	15
	C	1	18	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.17	19.59	0.2	C
B-A	0.65	30.15	1.9	D
C-AB	0.08	5.69	0.2	A
C-A				
A-B				
A-C				

Main Results for each time segment

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	29	392	0.075	29	0.1	11.400	B
B-A	158	418	0.378	156	0.6	13.983	B
C-AB	34	730	0.047	34	0.1	5.688	A
C-A	298			298			
A-B	187			187			
A-C	315			315			

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	35	346	0.101	35	0.1	13.313	B
B-A	189	391	0.482	188	0.9	18.066	C
C-AB	46	759	0.061	46	0.1	5.532	A
C-A	351			351			
A-B	224			224			
A-C	376			376			

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	43	259	0.166	43	0.2	19.082	C
B-A	231	353	0.655	228	1.8	28.749	D
C-AB	67	800	0.084	67	0.2	5.318	A
C-A	419			419			
A-B	274			274			
A-C	460			460			

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	43	254	0.169	43	0.2	19.591	C
B-A	231	353	0.655	231	1.9	30.146	D
C-AB	67	800	0.084	67	0.2	5.292	A
C-A	419			419			
A-B	274			274			
A-C	460			460			

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	35	341	0.103	35	0.1	13.572	B
B-A	189	391	0.482	192	1.0	18.927	C
C-AB	46	759	0.061	47	0.1	5.466	A
C-A	351			351			
A-B	224			224			
A-C	376			376			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	389	0.076	30	0.1	11.524	B
B-A	158	418	0.378	160	0.6	14.401	B
C-AB	34	731	0.047	35	0.1	5.660	A
C-A	298			298			
A-B	187			187			
A-C	315			315			

2021, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		12.39	B

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	PM	ONE HOUR	16:45	18:15	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		✓	681	100.000
B		✓	306	100.000
C		✓	455	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	272	409
	B	264	0	42
	C	403	52	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	0
	B	1	0	2
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.34	41.14	0.5	E
B-A	0.84	58.93	4.4	F
C-AB	0.17	5.54	0.4	A
C-A				
A-B				
A-C				

Main Results for each time segment

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	32	360	0.088	31	0.1	11.141	B
B-A	199	416	0.478	195	0.9	16.224	C
C-AB	68	722	0.094	67	0.2	5.520	A
C-A	275			275			
A-B	205			205			
A-C	308			308			

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	38	293	0.129	38	0.1	14.368	B
B-A	237	388	0.612	235	1.5	23.426	C
C-AB	91	748	0.122	91	0.3	5.507	A
C-A	318			318			
A-B	245			245			
A-C	368			368			

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	46	154	0.300	45	0.4	33.423	D
B-A	291	347	0.838	281	3.9	49.064	E
C-AB	132	787	0.168	131	0.4	5.527	A
C-A	369			369			
A-B	299			299			
A-C	450			450			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	135	0.343	46	0.5	41.139	E
B-A	291	346	0.839	289	4.4	58.926	F
C-AB	132	787	0.168	132	0.4	5.541	A
C-A	369			369			
A-B	299			299			
A-C	450			450			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	275	0.137	39	0.2	15.653	C
B-A	237	387	0.613	248	1.7	27.873	D
C-AB	91	749	0.122	92	0.3	5.526	A
C-A	318			318			
A-B	245			245			

A-C	368			368			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	354	0.089	32	0.1	11.397	B
B-A	199	416	0.478	202	1.0	17.212	C
C-AB	68	722	0.094	68	0.2	5.540	A
C-A	275			275			
A-B	205			205			
A-C	308			308			

2033 DM, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		7.91	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)
D3	2033 DM	AM	ONE HOUR	07:45	09:15	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		✓	726	100.000
B		✓	271	100.000
C		✓	481	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	271	455
	B	229	0	42
	C	453	28	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	1
	B	4	0	16
	C	2	20	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.24	28.99	0.4	D
B-A	0.75	44.18	2.9	E
C-AB	0.10	5.67	0.2	A
C-A				
A-B				
A-C				

Main Results for each time segment

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	373	0.085	31	0.1	12.220	B
B-A	172	406	0.424	169	0.7	15.610	C
C-AB	39	743	0.052	39	0.1	5.672	A
C-A	323			323			
A-B	204			204			
A-C	343			343			

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	38	315	0.120	38	0.2	15.049	C
B-A	206	377	0.546	204	1.2	21.429	C
C-AB	53	775	0.069	53	0.1	5.505	A
C-A	379			379			
A-B	244			244			
A-C	409			409			

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	46	201	0.230	46	0.3	26.801	D
B-A	252	334	0.754	246	2.7	39.803	E
C-AB	79	821	0.096	79	0.2	5.290	A
C-A	451			451			
A-B	298			298			
A-C	501			501			

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	46	190	0.243	46	0.4	28.991	D
B-A	252	334	0.755	251	2.9	44.176	E
C-AB	79	821	0.096	79	0.2	5.263	A
C-A	450			450			
A-B	298			298			
A-C	501			501			

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	38	305	0.124	39	0.2	15.722	C
B-A	206	377	0.547	212	1.3	23.570	C
C-AB	53	775	0.069	54	0.1	5.439	A
C-A	379			379			
A-B	244			244			

A-C	409			409			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	368	0.086	32	0.1	12.425	B
B-A	172	406	0.424	175	0.8	16.288	C
C-AB	39	743	0.053	39	0.1	5.640	A
C-A	323			323			
A-B	204			204			
A-C	343			343			

2033 DM, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		30.65	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)
D4	2033 DM	PM	ONE HOUR	16:45	18:15	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		✓	742	100.000
B		✓	332	100.000
C		✓	496	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	296	446
	B	287	0	45
	C	439	57	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	1
	B	1	0	3
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.90	254.74	3.4	F
B-A	0.98	125.28	10.6	F
C-AB	0.20	5.59	0.5	A
C-A				
A-B				
A-C				

Main Results for each time segment

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	34	334	0.102	33	0.1	12.329	B
B-A	216	403	0.536	212	1.1	18.581	C
C-AB	78	734	0.106	77	0.2	5.509	A
C-A	295			295			
A-B	223			223			
A-C	336			336			

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	40	246	0.165	40	0.2	17.994	C
B-A	258	372	0.694	254	2.1	29.923	D
C-AB	107	763	0.140	106	0.3	5.513	A
C-A	339			339			
A-B	266			266			
A-C	401			401			

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	50	55	0.902	40	2.6	193.500	F
B-A	316	326	0.969	294	7.6	81.538	F
C-AB	158	807	0.195	157	0.5	5.581	A
C-A	389			389			
A-B	326			326			
A-C	491			491			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	50	56	0.887	46	3.4	254.745	F
B-A	316	323	0.979	304	10.6	125.282	F
C-AB	158	807	0.196	158	0.5	5.594	A
C-A	388			388			
A-B	326			326			
A-C	491			491			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	185	0.219	53	0.3	30.616	D
B-A	258	366	0.705	289	2.8	58.044	F
C-AB	107	764	0.140	108	0.3	5.536	A
C-A	339			339			
A-B	266			266			

A-C	401			401			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	34	322	0.105	35	0.1	12.923	B
B-A	216	403	0.536	222	1.2	20.745	C
C-AB	79	734	0.107	79	0.2	5.533	A
C-A	295			295			
A-B	223			223			
A-C	336			336			

2033 DS, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		1276.93	F

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	2033 DS	AM	ONE HOUR	07:45	09:15	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		✓	806	100.000
B		✓	804	100.000
C		✓	721	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	315	491
	B	390	0	414
	C	585	136	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	1
	B	4	0	8
	C	2	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	2.39	3697.48	250.3	F
B-A	2.39	3697.92	235.8	F
C-AB	0.55	9.28	2.6	A
C-A				
A-B				
A-C				

Main Results for each time segment

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	312	238	1.311	226	21.3	198.301	F
B-A	294	224	1.311	213	20.1	199.310	F
C-AB	226	806	0.280	223	0.7	6.507	A
C-A	317			317			
A-B	237			237			
A-C	370			370			

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	372	218	1.710	217	60.1	748.453	F
B-A	351	205	1.709	205	56.6	749.615	F
C-AB	322	853	0.378	320	1.2	7.149	A
C-A	326			326			
A-B	283			283			
A-C	441			441			

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	456	191	2.386	191	126.3	1777.471	F
B-A	429	180	2.386	180	119.0	1778.217	F
C-AB	506	921	0.550	501	2.5	9.081	A
C-A	288			288			
A-B	347			347			
A-C	541			541			

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	456	191	2.392	191	192.6	2697.381	F
B-A	429	180	2.391	180	181.4	2697.962	F
C-AB	510	924	0.552	510	2.6	9.277	A
C-A	284			284			
A-B	347			347			
A-C	541			541			

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	372	217	1.714	217	231.3	3327.194	F
B-A	351	205	1.714	205	217.9	3327.696	F
C-AB	326	857	0.380	331	1.3	7.269	A
C-A	323			323			
A-B	283			283			

A-C	441			441			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	312	236	1.323	236	250.3	3697.482	F
B-A	294	222	1.322	222	235.8	3697.922	F
C-AB	228	808	0.282	230	0.8	6.590	A
C-A	315			315			
A-B	237			237			
A-C	370			370			

2033 DS, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		994.53	F

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	2033 DS	PM	ONE HOUR	16:45	18:15	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		✓	967	100.000
B		✓	519	100.000
C		✓	827	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	420	547
	B	342	0	177
	C	484	343	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	1
	B	1	0	3
	C	1	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	2.95	3695.00	105.7	F
B-A	2.97	3672.56	203.4	F
C-AB	1.26	484.94	108.2	F
C-A				
A-B				
A-C				

Main Results for each time segment

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	133	133	1.005	112	5.4	130.164	F
B-A	257	256	1.005	227	7.7	89.738	F
C-AB	515	731	0.704	502	3.3	15.511	C
C-A	108			108			
A-B	316			316			
A-C	412			412			

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	159	115	1.378	113	17.0	456.600	F
B-A	307	216	1.424	214	31.1	397.735	F
C-AB	729	767	0.951	693	12.4	44.962	E
C-A	14			14			
A-B	378			378			
A-C	492			492			

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	195	84	2.326	84	44.8	1548.933	F
B-A	377	160	2.357	160	85.3	1496.000	F
C-AB	911	722	1.260	716	61.0	195.382	F
C-A	0			0			
A-B	462			462			
A-C	602			602			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	195	66	2.952	66	77.0	2740.682	F
B-A	377	127	2.973	127	147.8	2708.912	F
C-AB	911	723	1.260	722	108.2	421.845	F
C-A	0			0			
A-B	462			462			
A-C	602			602			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	159	78	2.044	78	97.3	3379.380	F
B-A	307	150	2.053	150	187.2	3352.781	F
C-AB	743	777	0.957	766	102.5	484.939	F
C-A	0			0			
A-B	378			378			

A-C	492			492			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	133	100	1.332	100	105.7	3695.000	F
B-A	257	193	1.337	193	203.4	3672.557	F
C-AB	623	815	0.764	803	57.4	356.846	F
C-A	0			0			
A-B	316			316			
A-C	412			412			

Appendix D

Junctions9 Assessment - Mini Roundabout Mitigation

Junctions 9

ARCADY 9 - Roundabout Module

Filename: 2021-07-22 Mini-roundabout Shaw Lane.j9
Path: \\global\europe\Sheffield\Jobs\279000\279211-00\0 Arup\0-11 Transport\0-11-07 Calcs-Specs\Junction Modelling
Report generation date: 11/08/2021 13:42:07

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2033 DS							
Arm A	84.3	389.16	1.20	F	379.3	1996.28	1.77	F
Arm B	406.5	3093.37	1.93	F	33.1	213.01	1.08	F
Arm C	1.6	7.18	0.61	A	3.1	12.73	0.76	B
	2033 DM							
Arm A	16.4	76.63	0.98	F	26.6	114.73	1.03	F
Arm B	2.2	27.37	0.69	D	3.9	41.33	0.82	E
Arm C	0.7	4.91	0.41	A	0.8	5.37	0.45	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	22/07/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\Gopika.Avanoor
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

Analysis Options

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9			0.85	36.00	20.00

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

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	2033 DM	AM	ONE HOUR	07:45	09:15	15

2033 DM, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms A and C have 81% of the total flow for the roundabout for one or more time segments]

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		A, B, C	44.26	E

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
A	untitled	
B	untitled	
C	untitled	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
A	4.40	3.10	4.80	2.0	17.60	12.40	0.0	
B	4.40	3.10	4.80	2.0	13.10	8.91	0.0	
C	4.50	4.30	5.90	5.0	17.00	20.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.618	834
B	0.612	736
C	0.973	1529

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

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		✓	726	100.000
B		✓	271	100.000

C		✓	481	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	271	455
	B	229	0	42
	C	453	28	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	1	1
	B	4	0	16
	C	2	20	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	0.98	76.63	16.4	F
B	0.69	27.37	2.2	D
C	0.41	4.91	0.7	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	547	21	821	0.666	539	1.9	12.558	B
B	204	338	529	0.385	201	0.6	11.518	B
C	362	170	1363	0.266	361	0.4	3.691	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	653	25	819	0.797	646	3.6	20.267	C
B	244	405	488	0.499	242	1.0	15.368	C
C	432	205	1330	0.325	432	0.5	4.125	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	799	31	815	0.981	764	12.4	50.964	F
B	298	479	443	0.674	294	2.0	24.962	C
C	530	249	1287	0.412	529	0.7	4.880	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	799	31	815	0.981	783	16.4	76.630	F

B	298	491	436	0.685	298	2.2	27.372	D
C	530	252	1284	0.412	530	0.7	4.910	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	653	25	819	0.797	700	4.5	37.977	E
B	244	439	467	0.521	248	1.2	17.604	C
C	432	209	1325	0.326	433	0.5	4.157	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
A	547	21	821	0.666	556	2.1	14.175	B
B	204	349	523	0.390	206	0.7	12.092	B
C	362	174	1359	0.266	363	0.4	3.717	A

Appendix E

LinSig Assessment - Signal Control Mitigation

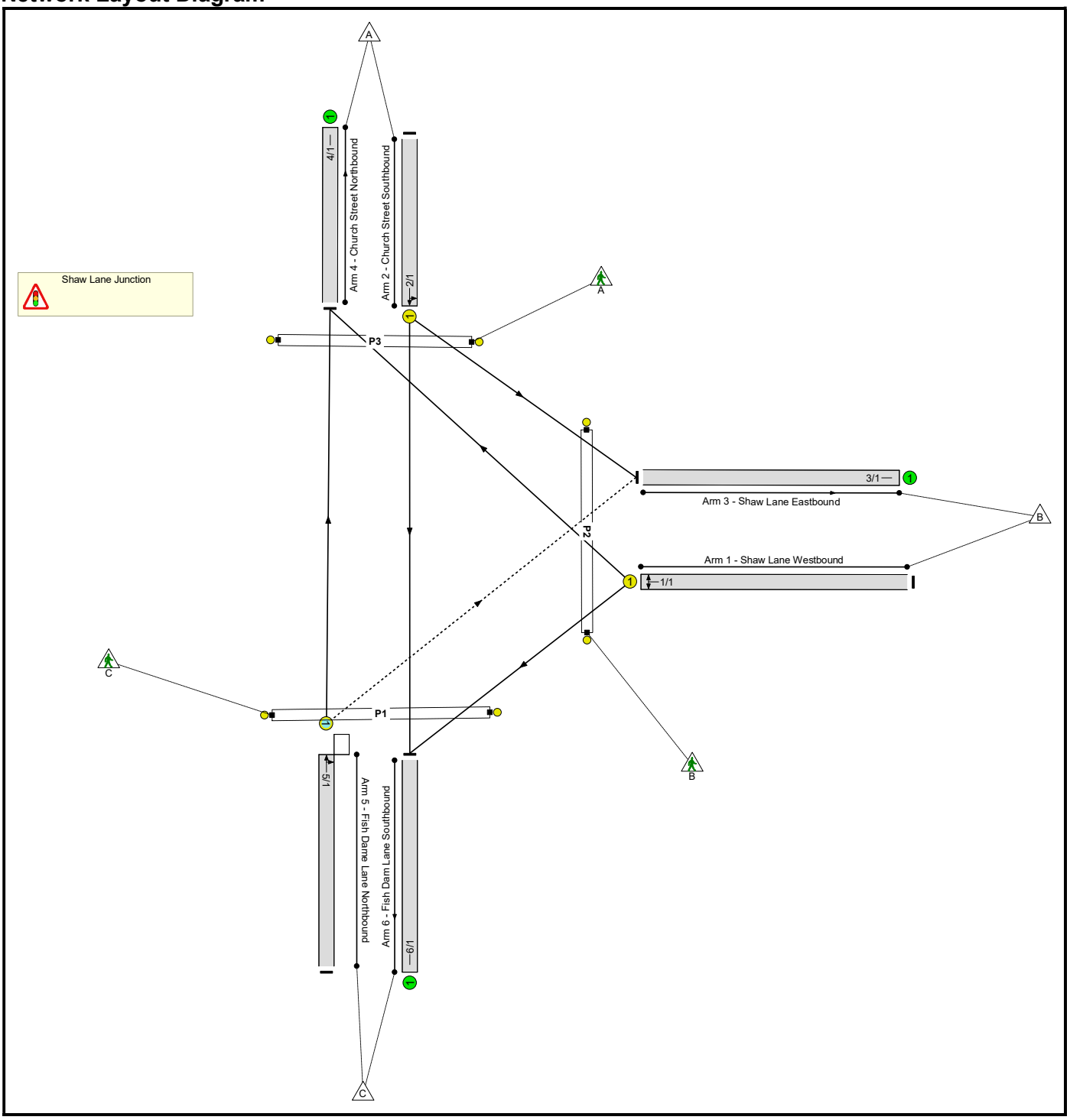
Full Input Data And Results

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	2021-07-23 Shaw Lane Signalised Junction_DM.lsg3x
Author:	
Company:	
Address:	

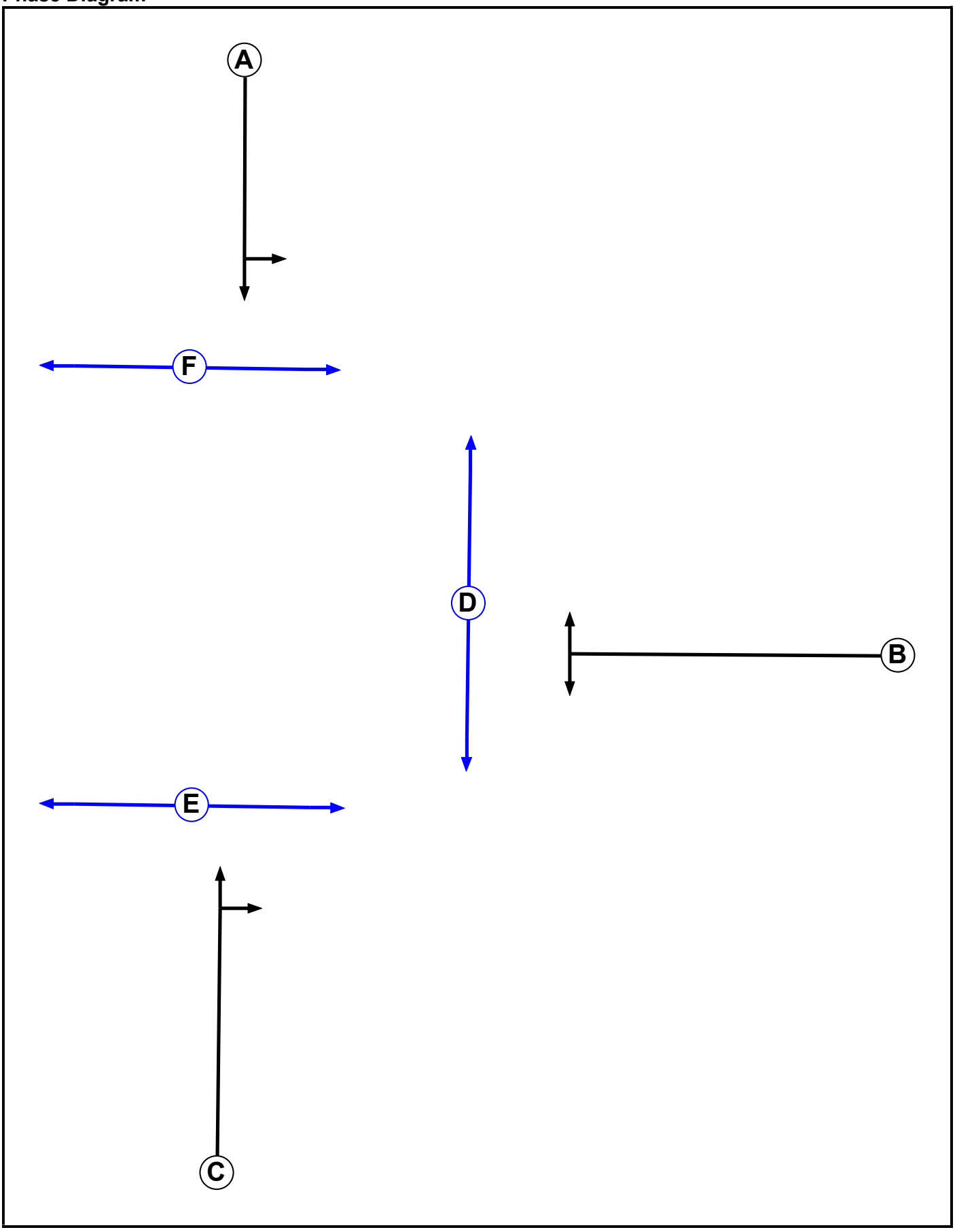
Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Full Input Data And Results

Phase Input Data

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	1		7	7
D	Pedestrian	1		5	5
E	Pedestrian	1		5	5
F	Pedestrian	1		5	5

Phase Intergreens Matrix

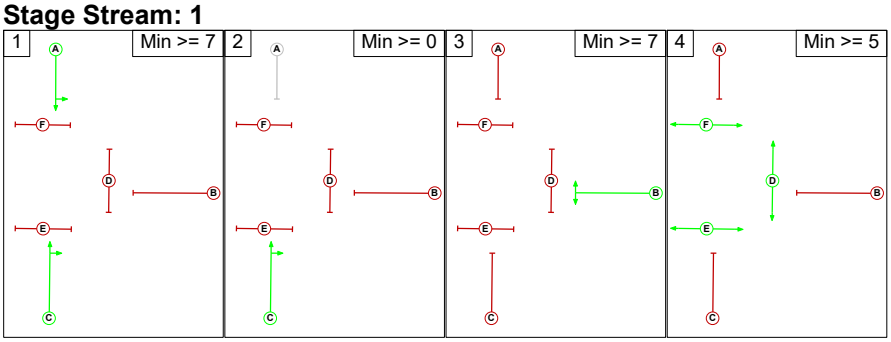
		Starting Phase					
		A	B	C	D	E	F
Terminating Phase	A		7	-	6	6	5
	B	7		7	5	6	6
	C	-	7		6	5	6
	D	10	10	10		-	-
	E	10	10	10	-		-
	F	9	9	9	-	-	

Phases in Stage

Stream	Stage No.	Phases in Stage
1	1	A C
1	2	C
1	3	B
1	4	D E F

Stage Diagram

Stage Stream: 1



Phase Delays

Stage Stream: 1

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Full Input Data And Results

Prohibited Stage Change

Stage Stream: 1

		To Stage			
		1	2	3	4
From Stage	1		0	7	6
	2	2		7	6
	3	7	7		6
	4	10	10	10	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Shaw Lane Junction											
Lane	**Movement**	**Max Flow when Giving Way (PCU/Hr)**	**Min Flow when Giving Way (PCU/Hr)**	**Opposing Lane**	**Opp. Lane Coeff.**	**Opp. Mvmnts.**	**Right Turn Storage (PCU)**	**Non-Blocking Storage (PCU)**	**RTF**	**Right Turn Move up (s)**	**Max Turns in Intergreen (PCU)**
5/1 (Fish Dame Lane Northbound)	3/1 (Right)	1439	0	2/1	1.09	All	2.00	2.00	0.50	2	2.00

Full Input Data And Results

Lane Input Data

Junction: Shaw Lane Junction												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (Shaw Lane Westbound)	U	B	2	3	60.0	Geom	-	3.89	0.00	Y	Arm 4 Right	Inf
											Arm 6 Left	Inf
2/1 (Church Street Southbound)	U	A	2	3	60.0	Geom	-	4.10	0.00	Y	Arm 3 Left	Inf
											Arm 6 Ahead	Inf
3/1 (Shaw Lane Eastbound)	U		2	3	60.0	Geom	-	4.60	0.00	Y		
4/1 (Church Street Northbound)	U		2	3	60.0	Geom	-	4.50	0.00	Y		
5/1 (Fish Dame Lane Northbound)	O	C	2	3	60.0	Geom	-	4.41	0.00	Y	Arm 3 Right	Inf
											Arm 4 Ahead	Inf
6/1 (Fish Dam Lane Southbound)	U		2	3	60.0	Geom	-	4.50	0.00	Y		

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2033 DS (AM)'	08:00	09:00	01:00	
2: '2033 DS (PM)'	17:00	18:00	01:00	
3: '2033 DM (AM)'	08:00	09:00	01:00	
4: '2033 DM (PM)'	17:00	18:00	01:00	

Scenario 1: '2033 DS (AM)' (FG1: '2033 DS (AM)', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	315	491	806
	B	390	0	414	804
	C	585	136	0	721
	Tot.	975	451	905	2331

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2033 DS (AM)
Junction: Shaw Lane Junction	
1/1	804
2/1	806
3/1	451
4/1	975
5/1	721
6/1	905

Lane Saturation Flows

Junction: Shaw Lane Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Shaw Lane Westbound)	3.89	0.00	Y	Arm 4 Right	Inf	48.5 %	2004	2004
				Arm 6 Left	Inf	51.5 %		
2/1 (Church Street Southbound)	4.10	0.00	Y	Arm 3 Left	Inf	39.1 %	2025	2025
				Arm 6 Ahead	Inf	60.9 %		
3/1 (Shaw Lane Eastbound)	4.60	0.00	Y				2075	2075
4/1 (Church Street Northbound)	4.50	0.00	Y				2065	2065
5/1 (Fish Dame Lane Northbound)	4.41	0.00	Y	Arm 3 Right	Inf	18.9 %	2056	2056
				Arm 4 Ahead	Inf	81.1 %		
6/1 (Fish Dam Lane Southbound)	4.50	0.00	Y				2065	2065

Scenario 2: '2033 DS (PM)' (FG2: '2033 DS (PM)', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	420	547	967
	B	342	0	177	519
	C	484	343	0	827
	Tot.	826	763	724	2313

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2033 DS (PM)
Junction: Shaw Lane Junction	
1/1	519
2/1	967
3/1	763
4/1	826
5/1	827
6/1	724

Lane Saturation Flows

Junction: Shaw Lane Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Shaw Lane Westbound)	3.89	0.00	Y	Arm 4 Right	Inf	65.9 %	2004	2004
				Arm 6 Left	Inf	34.1 %		
2/1 (Church Street Southbound)	4.10	0.00	Y	Arm 3 Left	Inf	43.4 %	2025	2025
				Arm 6 Ahead	Inf	56.6 %		
3/1 (Shaw Lane Eastbound)	4.60	0.00	Y				2075	2075
4/1 (Church Street Northbound)	4.50	0.00	Y				2065	2065
5/1 (Fish Dame Lane Northbound)	4.41	0.00	Y	Arm 3 Right	Inf	41.5 %	2056	2056
				Arm 4 Ahead	Inf	58.5 %		
6/1 (Fish Dam Lane Southbound)	4.50	0.00	Y				2065	2065

Scenario 3: '2033 DM (AM)' (FG3: '2033 DM (AM)', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	271	455	726
	B	229	0	42	271
	C	453	28	0	481
	Tot.	682	299	497	1478

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 3: 2033 DM (AM)
Junction: Shaw Lane Junction	
1/1	271
2/1	726
3/1	299
4/1	682
5/1	481
6/1	497

Lane Saturation Flows

Junction: Shaw Lane Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Shaw Lane Westbound)	3.89	0.00	Y	Arm 4 Right	Inf	84.5 %	2004	2004
				Arm 6 Left	Inf	15.5 %		
2/1 (Church Street Southbound)	4.10	0.00	Y	Arm 3 Left	Inf	37.3 %	2025	2025
				Arm 6 Ahead	Inf	62.7 %		
3/1 (Shaw Lane Eastbound)	4.60	0.00	Y				2075	2075
4/1 (Church Street Northbound)	4.50	0.00	Y				2065	2065
5/1 (Fish Dame Lane Northbound)	4.41	0.00	Y	Arm 3 Right	Inf	5.8 %	2056	2056
				Arm 4 Ahead	Inf	94.2 %		
6/1 (Fish Dam Lane Southbound)	4.50	0.00	Y				2065	2065

Scenario 4: '2033 DM (PM)' (FG4: '2033 DM (PM)', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	296	446	742
	B	287	0	45	332
	C	439	57	0	496
	Tot.	726	353	491	1570

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 2033 DM (PM)
Junction: Shaw Lane Junction	
1/1	332
2/1	742
3/1	353
4/1	726
5/1	496
6/1	491

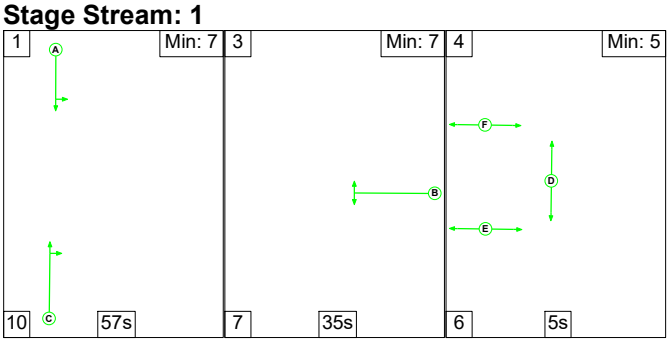
Lane Saturation Flows

Junction: Shaw Lane Junction								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (Shaw Lane Westbound)	3.89	0.00	Y	Arm 4 Right	Inf	86.4 %	2004	2004
				Arm 6 Left	Inf	13.6 %		
2/1 (Church Street Southbound)	4.10	0.00	Y	Arm 3 Left	Inf	39.9 %	2025	2025
				Arm 6 Ahead	Inf	60.1 %		
3/1 (Shaw Lane Eastbound)	4.60	0.00	Y				2075	2075
4/1 (Church Street Northbound)	4.50	0.00	Y				2065	2065
5/1 (Fish Dame Lane Northbound)	4.41	0.00	Y	Arm 3 Right	Inf	11.5 %	2056	2056
				Arm 4 Ahead	Inf	88.5 %		
6/1 (Fish Dam Lane Southbound)	4.50	0.00	Y				2065	2065

Scenario 1: '2033 DS (AM)' (FG1: '2033 DS (AM)', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1



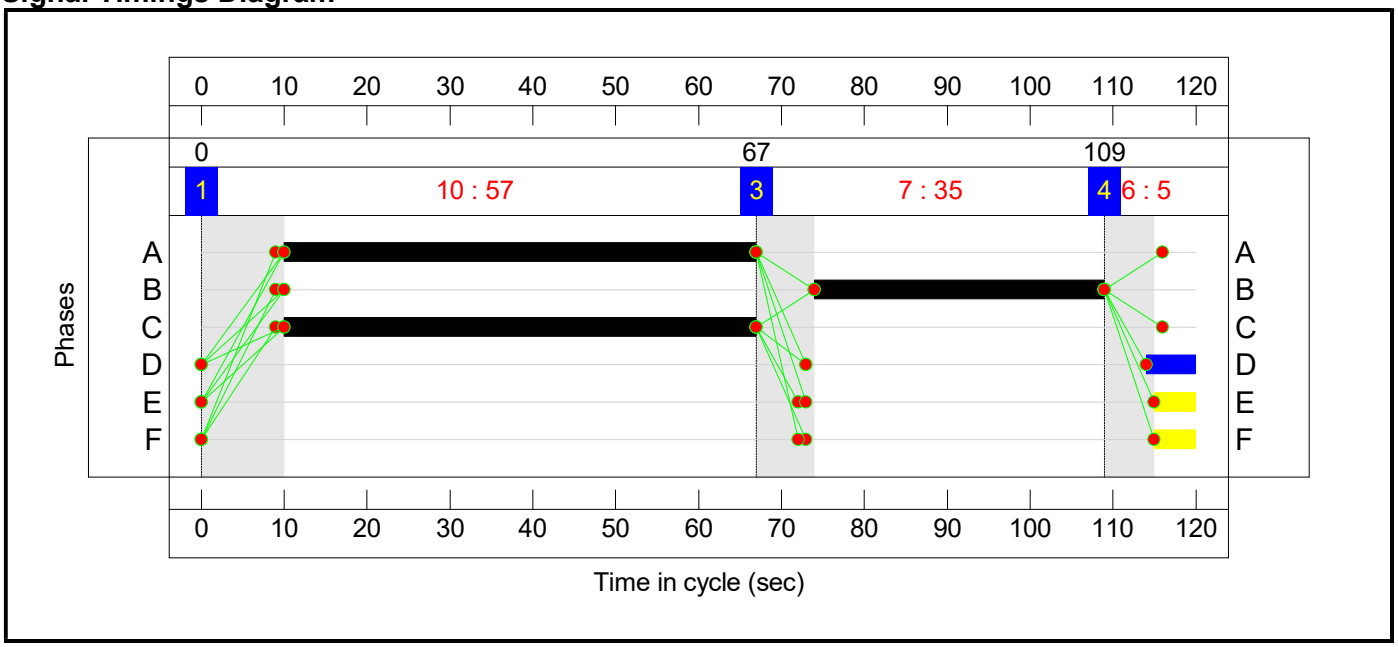
Stage Timings

Stage Stream: 1

Stage	1	3	4
Duration	57	35	5
Change Point	0	67	109

Full Input Data And Results

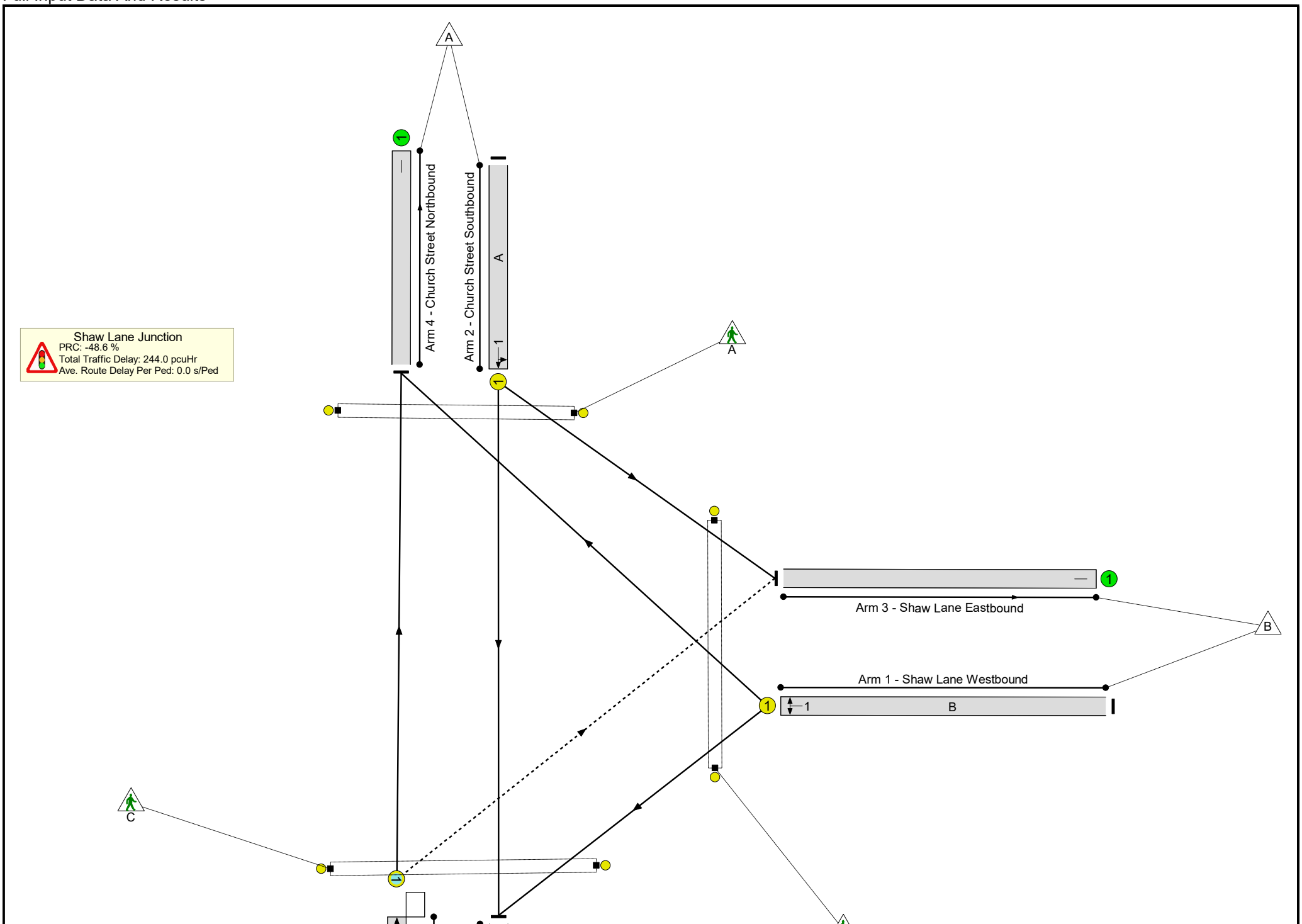
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**133.7%**
Shaw Lane Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**133.7%**
1/1	Shaw Lane Westbound Right Left	U	1	N/A	B		1	35	-	804	2004	601	133.7%
2/1	Church Street Southbound Left Ahead	U	1	N/A	A		1	57	-	806	2025	979	82.3%
3/1	Shaw Lane Eastbound	U	N/A	N/A	-		-	-	-	451	2075	2075	20.1%
4/1	Church Street Northbound	U	N/A	N/A	-		-	-	-	975	2065	2065	35.3%
5/1	Fish Dame Lane Northbound Right Ahead	O	1	N/A	C		1	57	-	721	2056	540	133.6%
6/1	Fish Dam Lane Southbound	U	N/A	N/A	-		-	-	-	905	2065	2065	38.8%
Ped Link: P1	Fish Dam Lane Ped	-	1	-	E		1	5	-	0	-	0	0.0%
Ped Link: P2	Shaw Lane Ped	-	1	-	D		1	6	-	0	-	0	0.0%
Ped Link: P3	Church Street	-	1	-	F		1	5	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**79**	**0**	**22**	**44.5**	**198.9**	**0.7**	**244.0**	**-**	**-**	**-**	**-**
Shaw Lane Junction	**-**	**-**	**79**	**0**	**22**	**44.5**	**198.9**	**0.7**	**244.0**	**-**	**-**	**-**	**-**
1/1	804	601	-	-	-	22.6	103.3	-	126.0	564.0	38.5	103.3	141.9
2/1	806	806	-	-	-	6.0	2.3	-	8.2	36.8	22.8	2.3	25.1
3/1	417	417	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
4/1	730	730	-	-	-	0.0	0.3	-	0.3	1.3	0.0	0.3	0.3
5/1	721	540	79	0	22	15.9	92.5	0.7	109.2	545.0	30.1	92.5	122.6
6/1	801	801	-	-	-	0.0	0.3	-	0.3	1.4	0.0	0.3	0.3
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

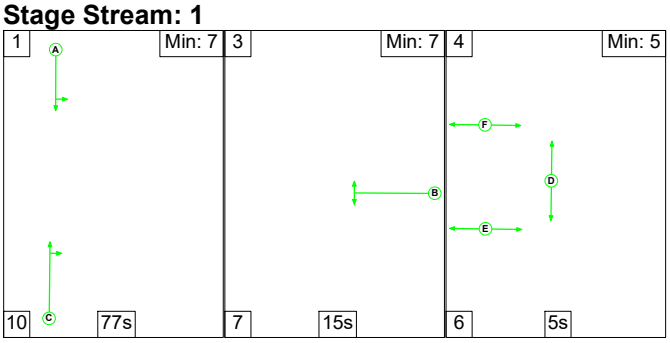
C1 Stream: 1 PRC for Signalled Lanes (%): -48.6 Total Delay for Signalled Lanes (pcuHr): 243.33 Cycle Time (s): 120
PRC Over All Lanes (%): -48.6 Total Delay Over All Lanes(pcuHr): 244.05

Full Input Data And Results

Scenario 2: '2033 DS (PM)' (FG2: '2033 DS (PM)', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1

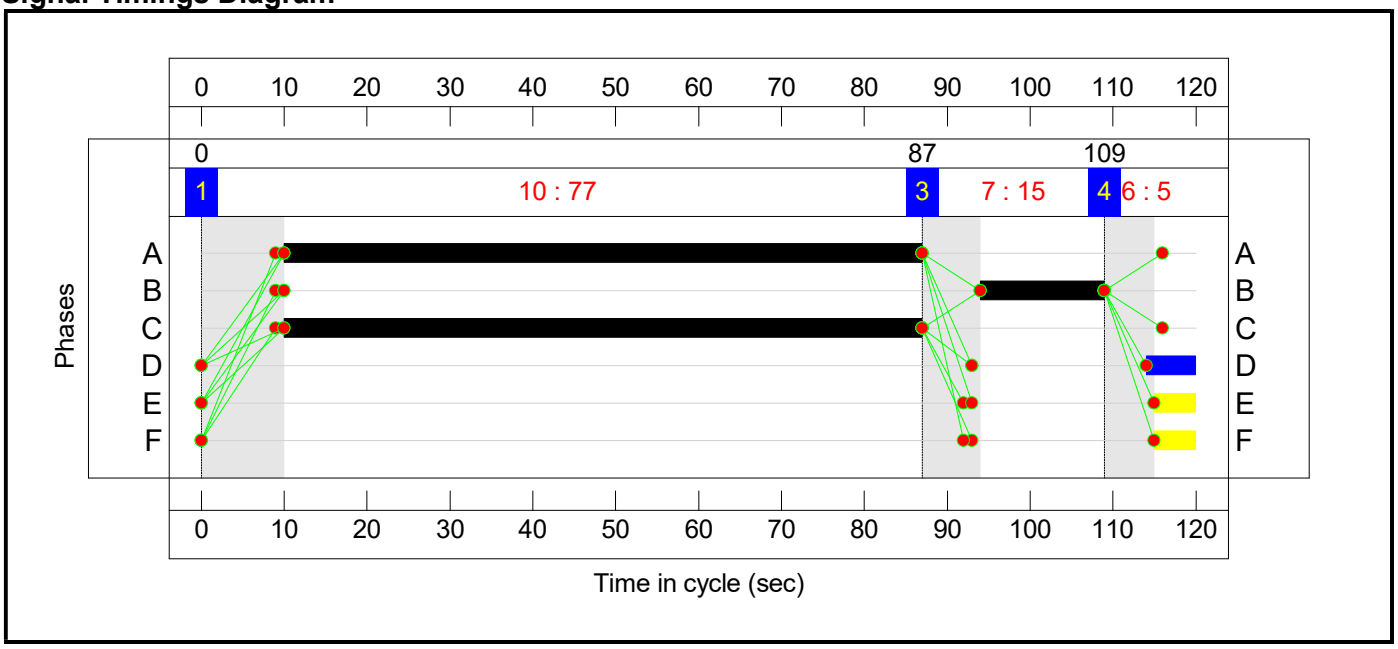


Stage Timings

Stage Stream: 1

Stage	1	3	4
Duration	77	15	5
Change Point	0	87	109

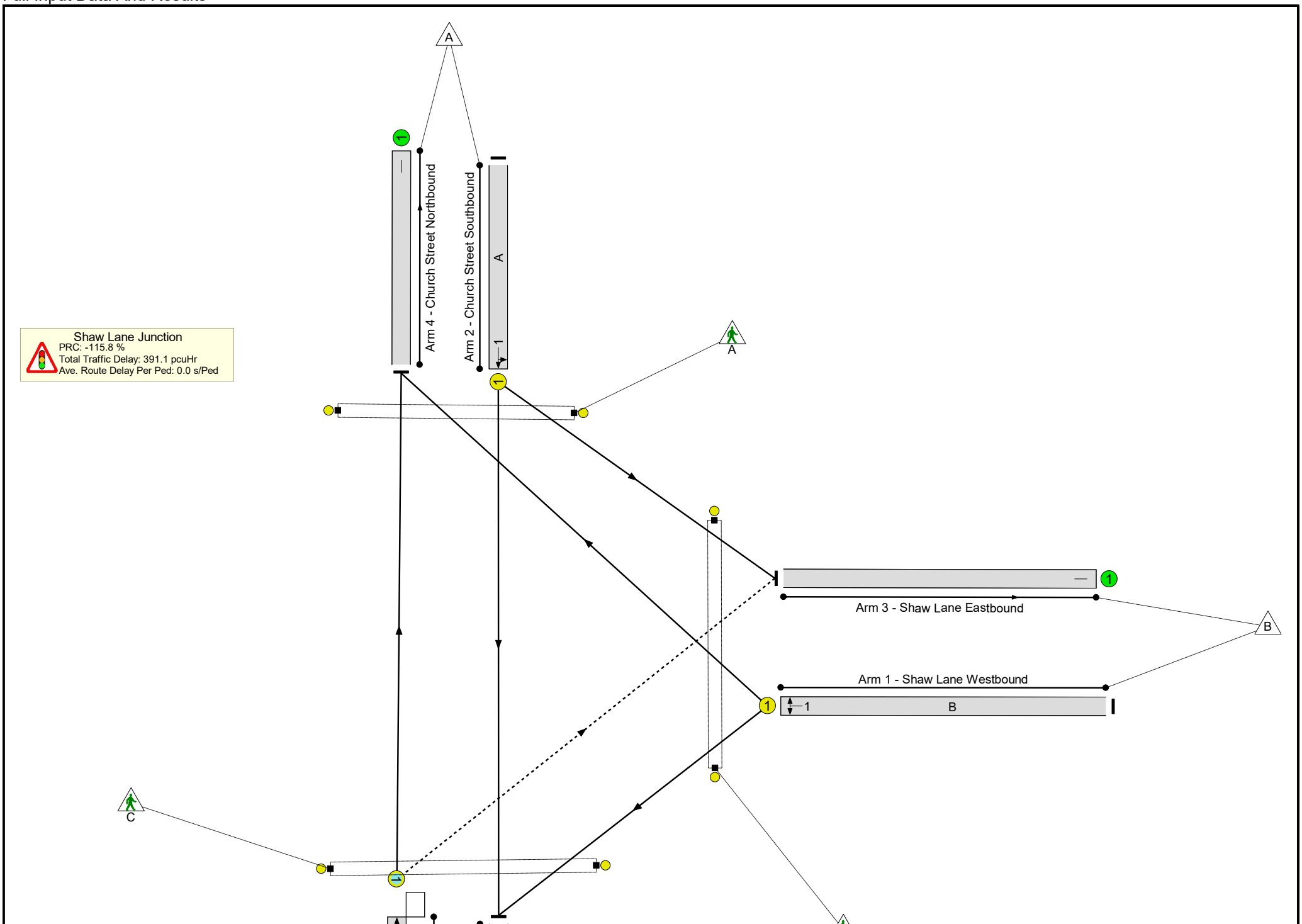
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**194.2%**
Shaw Lane Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**194.2%**
1/1	Shaw Lane Westbound Right Left	U	1	N/A	B		1	15	-	519	2004	267	194.2%
2/1	Church Street Southbound Left Ahead	U	1	N/A	A		1	77	-	967	2025	1316	73.5%
3/1	Shaw Lane Eastbound	U	N/A	N/A	-		-	-	-	763	2075	2075	28.8%
4/1	Church Street Northbound	U	N/A	N/A	-		-	-	-	826	2065	2065	20.7%
5/1	Fish Dame Lane Northbound Right Ahead	O	1	N/A	C		1	77	-	827	2056	428	193.2%
6/1	Fish Dam Lane Southbound	U	N/A	N/A	-		-	-	-	724	2065	2065	30.9%
Ped Link: P1	Fish Dam Lane Ped	-	1	-	E		1	5	-	0	-	0	0.0%
Ped Link: P2	Shaw Lane Ped	-	1	-	D		1	6	-	0	-	0	0.0%
Ped Link: P3	Church Street	-	1	-	F		1	5	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**125**	**0**	**52**	**60.5**	**329.4**	**1.2**	**391.1**	**-**	**-**	**-**	**-**
Shaw Lane Junction	**-**	**-**	**125**	**0**	**52**	**60.5**	**329.4**	**1.2**	**391.1**	**-**	**-**	**-**	**-**
1/1	519	267	-	-	-	24.3	126.9	-	151.2	1048.8	32.9	126.9	159.9
2/1	967	967	-	-	-	3.8	1.4	-	5.2	19.2	21.5	1.4	22.9
3/1	598	598	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2
4/1	427	427	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
5/1	827	428	125	0	52	32.5	200.5	1.2	234.2	1019.3	47.3	200.5	247.8
6/1	638	638	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

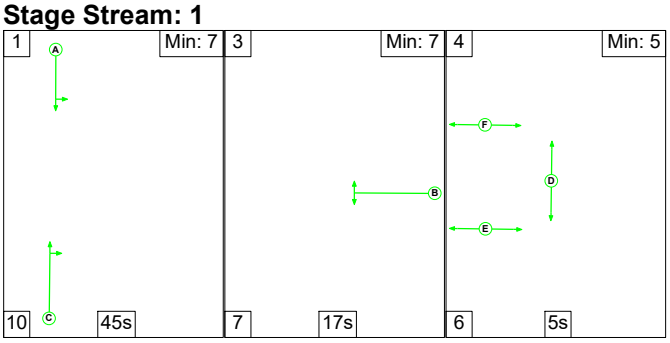
C1 Stream: 1 PRC for Signalled Lanes (%): -115.8 Total Delay for Signalled Lanes (pcuHr): 390.52 Cycle Time (s): 120
PRC Over All Lanes (%): -115.8 Total Delay Over All Lanes(pcuHr): 391.08

Full Input Data And Results

Scenario 3: '2033 DM (AM)' (FG3: '2033 DM (AM)', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1

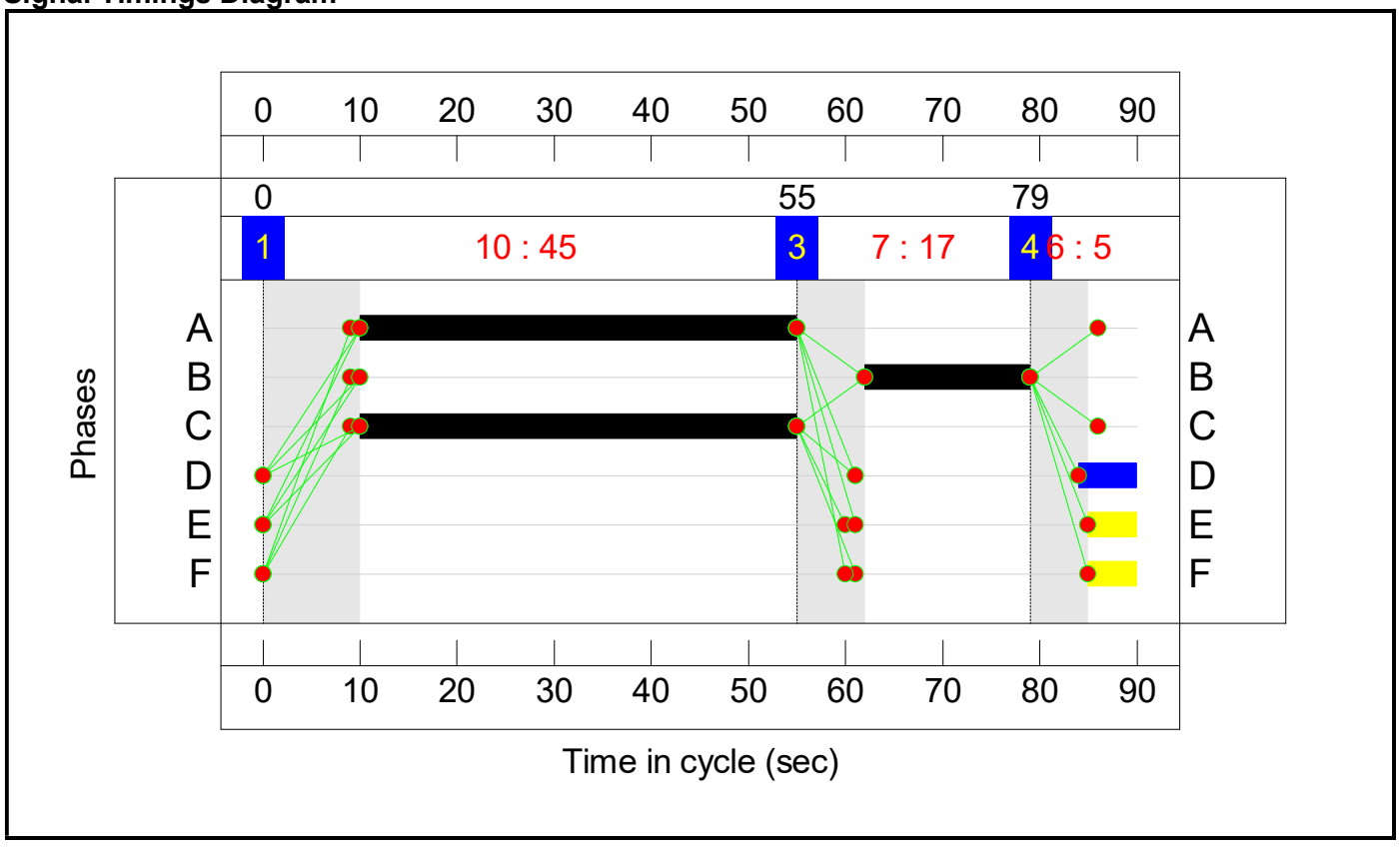


Stage Timings

Stage Stream: 1

Stage	1	3	4
Duration	45	17	5
Change Point	0	55	79

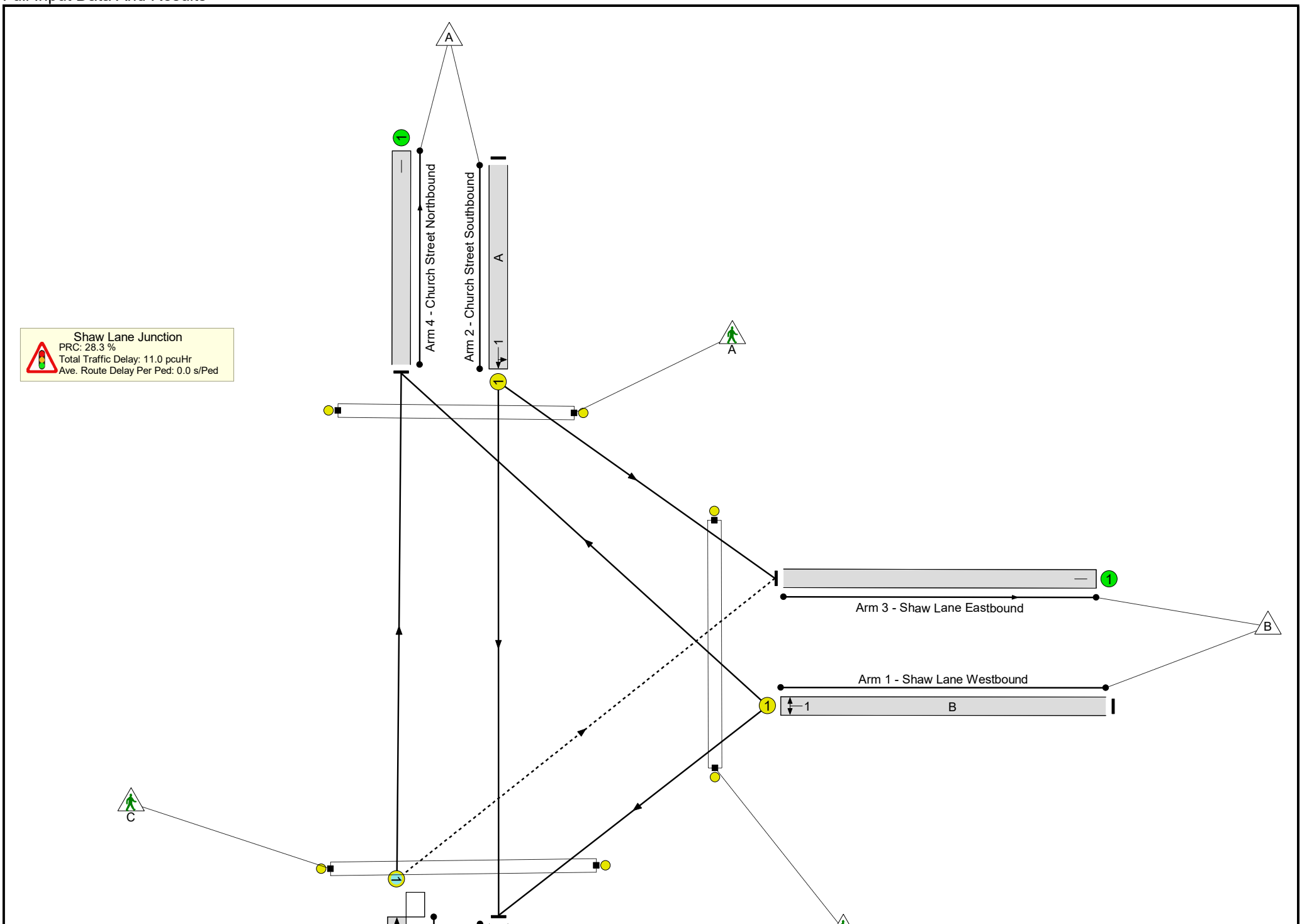
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	**N/A**	-	-		-	-	-	-	-	-	**70.1%**
Shaw Lane Junction	-	-	**N/A**	-	-		-	-	-	-	-	-	**70.1%**
1/1	Shaw Lane Westbound Right Left	U	1	N/A	B		1	17	-	271	2004	401	67.6%
2/1	Church Street Southbound Left Ahead	U	1	N/A	A		1	45	-	726	2025	1035	70.1%
3/1	Shaw Lane Eastbound	U	N/A	N/A	-		-	-	-	299	2075	2075	14.4%
4/1	Church Street Northbound	U	N/A	N/A	-		-	-	-	682	2065	2065	33.0%
5/1	Fish Dame Lane Northbound Right Ahead	O	1	N/A	C		1	45	-	481	2056	1051	45.8%
6/1	Fish Dam Lane Southbound	U	N/A	N/A	-		-	-	-	497	2065	2065	24.1%
Ped Link: P1	Fish Dam Lane Ped	-	1	-	E		1	5	-	0	-	0	0.0%
Ped Link: P2	Shaw Lane Ped	-	1	-	D		1	6	-	0	-	0	0.0%
Ped Link: P3	Church Street	-	1	-	F		1	5	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**28**	**0**	**0**	**7.8**	**3.1**	**0.1**	**11.0**	**-**	**-**	**-**	**-**
Shaw Lane Junction	**-**	**-**	**28**	**0**	**0**	**7.8**	**3.1**	**0.1**	**11.0**	**-**	**-**	**-**	**-**
1/1	271	271	-	-	-	2.5	1.0	-	3.5	47.0	6.2	1.0	7.3
2/1	726	726	-	-	-	3.4	1.2	-	4.5	22.6	13.7	1.2	14.9
3/1	299	299	-	-	-	0.0	0.1	-	0.1	1.0	0.0	0.1	0.1
4/1	682	682	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
5/1	481	481	28	0	0	1.9	0.4	0.1	2.4	18.0	7.6	0.4	8.0
6/1	497	497	-	-	-	0.0	0.2	-	0.2	1.1	0.0	0.2	0.2
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

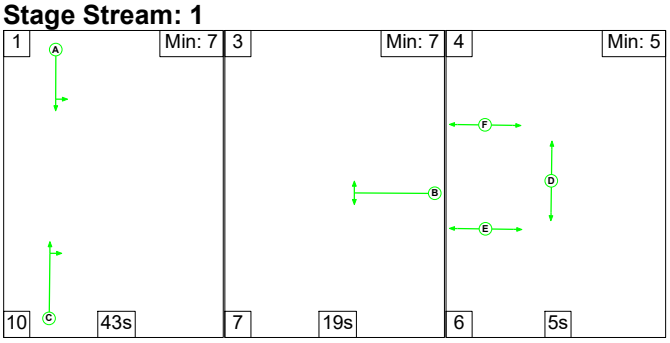
C1 Stream: 1 PRC for Signalled Lanes (%): 28.3 Total Delay for Signalled Lanes (pcuHr): 10.49 Cycle Time (s): 90
PRC Over All Lanes (%): 28.3 Total Delay Over All Lanes(pcuHr): 10.98

Full Input Data And Results

Scenario 4: '2033 DM (PM)' (FG4: '2033 DM (PM)', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

Stage Stream: 1

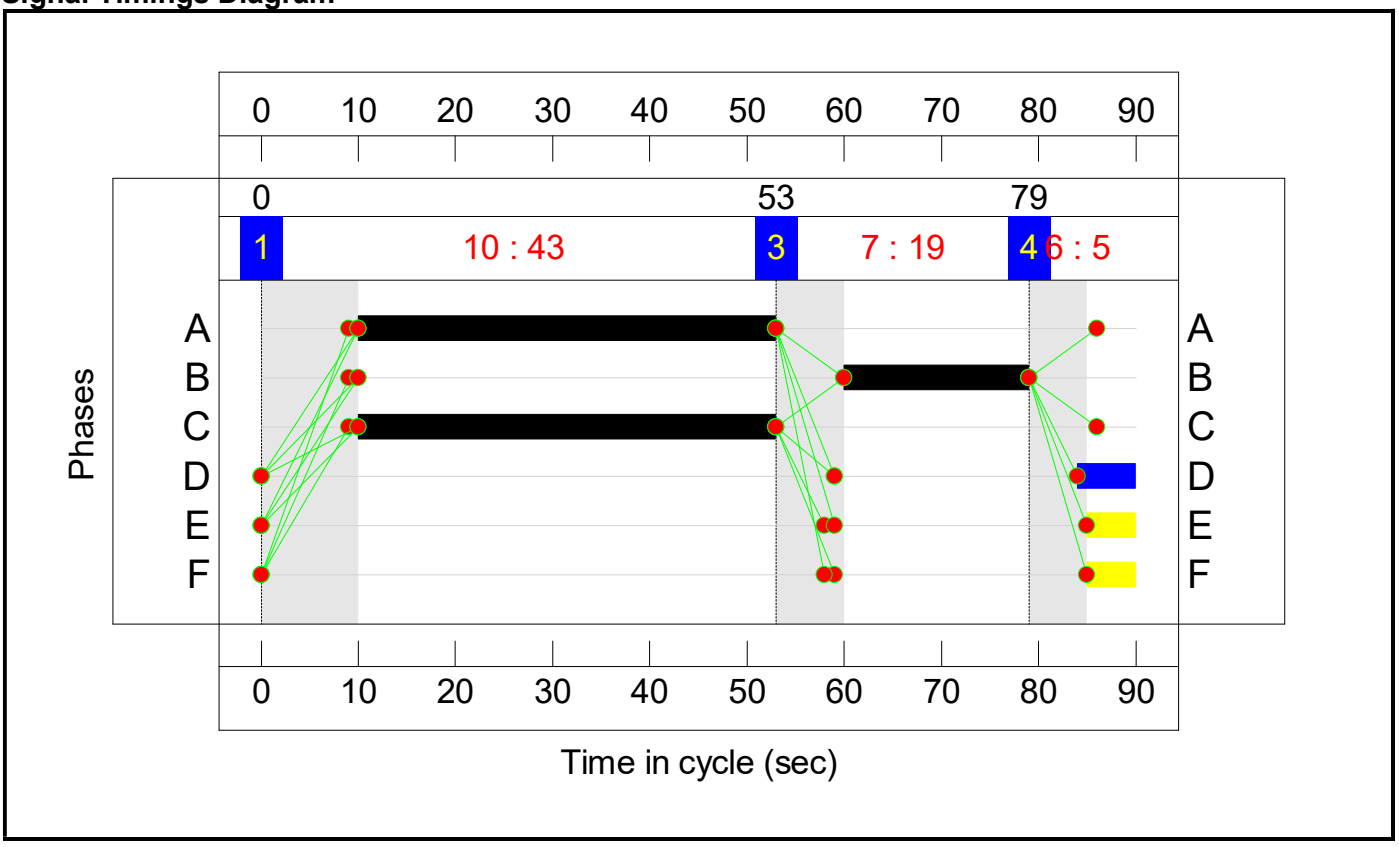


Stage Timings

Stage Stream: 1

Stage	1	3	4
Duration	43	19	5
Change Point	0	53	79

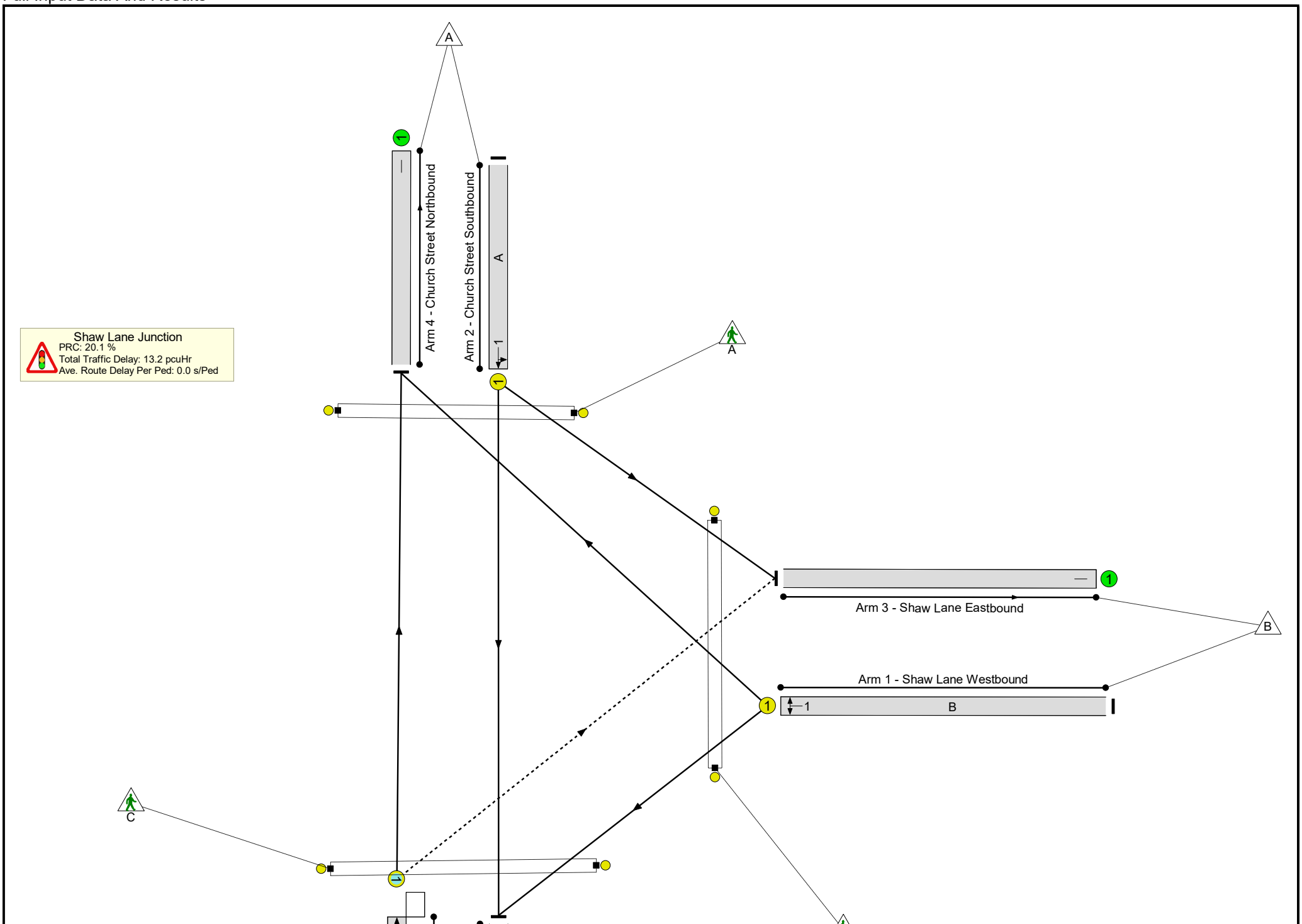
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**74.9%**
Shaw Lane Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**74.9%**
1/1	Shaw Lane Westbound Right Left	U	1	N/A	B		1	19	-	332	2004	445	74.6%
2/1	Church Street Southbound Left Ahead	U	1	N/A	A		1	43	-	742	2025	990	74.9%
3/1	Shaw Lane Eastbound	U	N/A	N/A	-		-	-	-	353	2075	2075	17.0%
4/1	Church Street Northbound	U	N/A	N/A	-		-	-	-	726	2065	2065	35.2%
5/1	Fish Dame Lane Northbound Right Ahead	O	1	N/A	C		1	43	-	496	2056	952	52.1%
6/1	Fish Dam Lane Southbound	U	N/A	N/A	-		-	-	-	491	2065	2065	23.8%
Ped Link: P1	Fish Dam Lane Ped	-	1	-	E		1	5	-	0	-	0	0.0%
Ped Link: P2	Shaw Lane Ped	-	1	-	D		1	6	-	0	-	0	0.0%
Ped Link: P3	Church Street	-	1	-	F		1	5	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**57**	**0**	**0**	**9.0**	**4.0**	**0.3**	**13.2**	**-**	**-**	**-**	**-**
Shaw Lane Junction	**-**	**-**	**57**	**0**	**0**	**9.0**	**4.0**	**0.3**	**13.2**	**-**	**-**	**-**	**-**
1/1	332	332	-	-	-	3.0	1.4	-	4.4	48.1	7.7	1.4	9.1
2/1	742	742	-	-	-	3.8	1.5	-	5.3	25.7	14.8	1.5	16.3
3/1	353	353	-	-	-	0.0	0.1	-	0.1	1.0	0.0	0.1	0.1
4/1	726	726	-	-	-	0.0	0.3	-	0.3	1.3	0.0	0.3	0.3
5/1	496	496	57	0	0	2.1	0.5	0.3	2.9	21.4	8.3	0.5	8.8
6/1	491	491	-	-	-	0.0	0.2	-	0.2	1.1	0.0	0.2	0.2
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 Stream: 1 PRC for Signalled Lanes (%): 20.1 Total Delay for Signalled Lanes (pcuHr): 12.69 Cycle Time (s): 90
PRC Over All Lanes (%): 20.1 Total Delay Over All Lanes(pcuHr): 13.22

Appendix F

Trip Generation Calcs

TRICS 7.8.2
Trip Rate Par: No of Dwellings

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
Calculation Factor: 1 DWELLS
Count Type: TOTAL PEOPLE

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00-01:00									
01:00-02:00									
02:00-03:00									
03:00-04:00									
04:00-05:00									
05:00-06:00									
06:00-07:00									
07:00-08:00	52	131	0.109	52	131	0.508	52	131	0.617
08:00-09:00	52	131	0.21	52	131	0.772	52	131	0.982
09:00-10:00	52	131	0.217	52	131	0.291	52	131	0.508
10:00-11:00	52	131	0.189	52	131	0.256	52	131	0.445
11:00-12:00	52	131	0.2	52	131	0.223	52	131	0.423
12:00-13:00	52	131	0.241	52	131	0.228	52	131	0.469
13:00-14:00	52	131	0.241	52	131	0.229	52	131	0.47
14:00-15:00	52	131	0.259	52	131	0.276	52	131	0.535
15:00-16:00	52	131	0.527	52	131	0.294	52	131	0.821
16:00-17:00	52	131	0.528	52	131	0.272	52	131	0.8
17:00-18:00	52	131	0.592	52	131	0.263	52	131	0.855
18:00-19:00	52	131	0.514	52	131	0.287	52	131	0.801
19:00-20:00									
20:00-21:00									
21:00-22:00									
22:00-23:00									
23:00-24:00									
Daily Trip Rates:			3.827			3.899			7.726

Journey to work census data mode share:

Method of Travel to Work	Number	
All categories: Metho	4,372	2,538
Work mainly at or fro	59	
Underground, metro,	0	0%
Train	27	1%
Bus, minibus or coac	163	6%
Taxi	16	1%
Motorcycle, scooter c	32	1%
Driving a car or van	1,819	72%
Passenger in a car o	195	8%
Bicycle	23	1%
On foot	250	10%
Other method of trav	13	1%
Not in employment	1,775	

Vehicle trip rates:

Time	Arrival	Departure	Total
08:00-09:00	0.15	0.55	0.70
17:00-18:00	0.42	0.19	0.61

Trip generation (number of vehicles)

Residential Plot	Number of dwellings	AM			PM		
		Arrivals	Departures	Total	Arrivals	Departures	Total
A	584	88	323	411	248	110	358
B	412	62	228	290	175	78	252
C	124	19	69	87	53	23	76
D	268	40	148	189	114	51	164
E	518	78	287	365	220	98	317
	1906						