local transport projects

traffic engineering and transport planning

North Lincolnshire Council

Barton Link Road
Technical Note

May 2021

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Barton Link Road Technical Note

May 2021

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LTP PROJECT TEAM

As part of our commitment to quality the following team of transport professionals was assembled specifically for the delivery of this project. Relevant qualifications are shown and CVs are available upon request to demonstrate our experience and credentials.

Team Member	LTP Designation	Qualifications
Nigel Wilson	*Technical Director (Project Manager)*	*CEng FICE MCIHT FIHE*
Mike Raynor	*Senior Transport Planner*	*BA(Hons) MIHE*
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BARTON LINK ROAD
TECHNICAL NOTE

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1. INTRODUCTION

1.1 Background

1.1.1 Local Transport Projects Ltd has been commissioned by North Lincolnshire Council (NLC) to undertake assessment work and produce a Technical Note that considers potential options to provide a Link Road to the south of Barton-upon-Humber to support proposed residential development aspirations. The work that has informed this Technical Note follows on from a number of previous commissions, including the Barton Highways Masterplan (LTP, 2018), Barton Link Road Preliminary Design Layout Briefing Note (LTP, 2020a) and Barton Southern Access Road, North Lincolnshire Feasibility Design Assessment Summary Note (LTP, 2020b).

1.1.2 This Technical Note provides an appraisal of the link road options against the agreed link road objectives in Section 2 with the results of the requested traffic assessments presented in Section 3.

2. LINK ROAD OPTIONS APPRAISAL

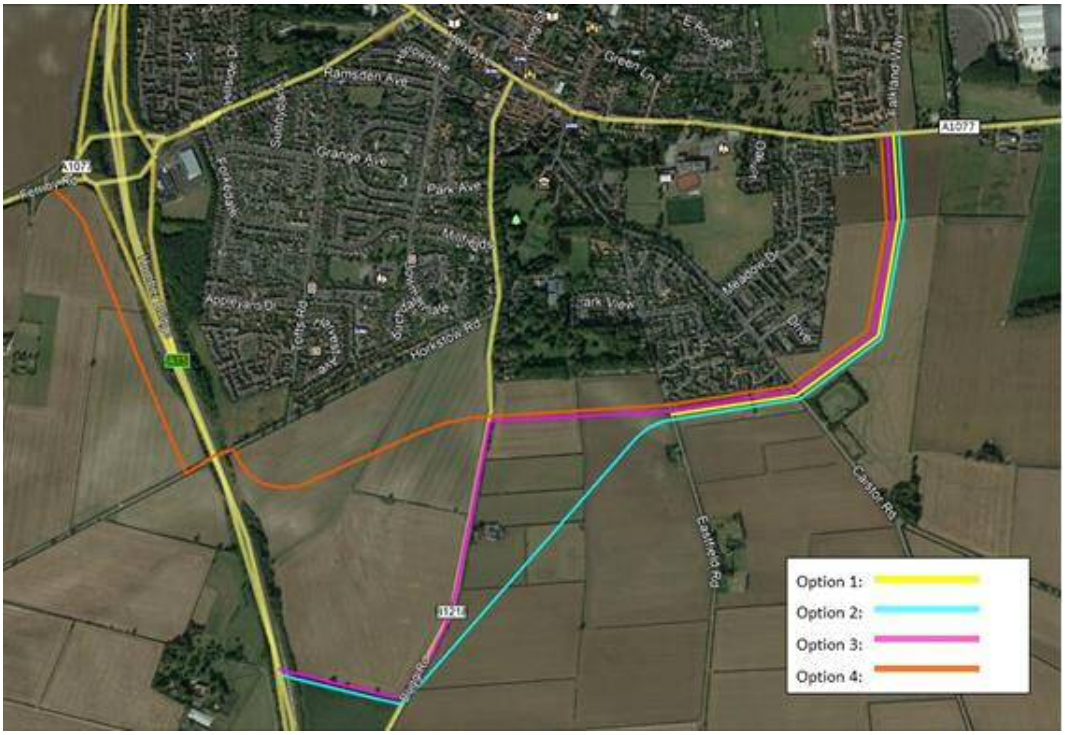
2.1 Introduction

2.1.1 This section of the report considers four potential Link Road options to support proposed housing development in Barton upon Humber. Options 1, 2 and 3 were identified by NLC for appraisal within the original study brief. Option 4 was included during the study as a potentially lower cost alternative option for comparative purposes.

2.1.2 The proposed alignment of the link road options is shown in Figure 1 and are summarised as follows:

- **Option 1:** A1077 at Falkland Way to Eastfield Road via an alignment close to the southern boundary of the existing settlement. Further details on the link road element of this proposal are detailed in the draft LTP report: *'Barton Southern Access Road Feasibility Design Note'* (February 2020).
- **Option 2:** A1077 at Falkland Way to Eastfield Road and then via a direct diagonal alignment between Eastfield Road and B1218 Brigg Road with further connection spur linking the B1218 to the A15 via a new interchange junction in the vicinity of Barton Hill Farm.
- **Option 3:** A1077 at Falkland Way to B1218 Brigg Road via an alignment close to the southern boundary of the existing settlement plus highway improvements on the B1218 between the proposed Link Road junction and a new connection spur linking the B1218 to the A15 via a new interchange junction in the vicinity of Barton Hill Farm.
- **Option 4:** A1077 at Falkland Way to B1218 Brigg Road via an alignment close to the southern boundary of the existing settlement continuing towards Horkstow Road to cross the A15 via an additional new bridge and connecting to the existing A15/A1077 Barton interchange via a new road length on the west-side of the A15 between Horkstow Road and the A1077. This scheme was initially considered in the LTP report *'Barton upon Humber Highways Masterplan A1077 Corridor & Potential Link Road'* (May 2018) and is included in the appraisal for comparative purposes as a potentially lower cost scheme.

Figure 1: Barton Link Road Options



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2.1.3 The appraisal of the Link Road options includes:

- identification of the level of highway work required to provide the new highway infrastructure including the sections of the proposed link road, improvements to B1218 and provision of a new interchange on the A15;
- budgetary costing for the highway works;
- Identification of potential land acquisition requirements including budgetary purchase costs; and
- an appraisal of the relative benefits and disbenefits of the proposals and how the schemes meet the overarching housing and link road objectives.

2.2 Feasibility Design

2.2.1 Feasibility designs of the Options 1, 2 & 3 at 1:1000 scale are provided in Appendix 1 and, as requested by NLC, include sub-options which provide alternative layout arrangements for the junction between the link road and Eastfield Road as follows:

- Options 1A, 2A & 3A: Eastfield Road two-way operation where it joins the link road; and
- Option 1B, 2B & 3B: Eastfield Road one-way southbound where it joins the link road (i.e. no access to Eastfield Road from the link road.)

2.2.2 For the purposes of this Technical Note the following assessments and appraisal consider the feasibility designs indicated in Option 1A, 2A and 3A.

2.2.3 The proposed road alignment and junctions indicated have been designed, as far as reasonably practical, to the standards set out in the Design Manual for Roads and Bridges (DMRB). It needs to be stressed that the designs provided are for outline feasibility and costing purposes only and will require significant design development based on detailed topographic and geotechnical data in order to fully ascertain if the schemes are deliverable. Key assumptions and risks with respect to the current designs include:

- the design speed of the link road would be 70kph and the road would be subject to a 40mph speed limit;
- the carriageway would be 7.3m wide with a 3.0m cycle/footways and a 2.0m service strip to either side;
- the minimum horizontal curvature of the link road would be 255m being one step below the minimum desirable radius;
- the topography of the land and existing cutting at the A15 allows the interchange overbridge to be provided at a height of 6m or less above the A15 carriageway and allows for the provision of both on and off-slip roads of suitable length between the existing Horkstow Road and B1299 Brigg Road over bridges.

2.2.4 A feasibility design of Option 4 has not been developed as part of this study; however, the alignment of this option is shown in Figure 1. Table 1 provides a summary of the key elements of infrastructure included in the proposed link road options.

Table 1: Proposed Link Road Options - Scheme Elements

Scheme element	Option 1	Option 2	Option 3	Option 4
7.3m wide all-purpose road with 3.0m cycle/footways and 2.0m service strip	1.4km	2.9km	2.7km	3.3km
6.0m single carriageway slip-road		2.0km	2.0km	
Roundabout junction (4-arm)	1 No.	4 No.	4 No.	2 No.
Roundabout junction (3-arm)			1 No.	3 No.
Priority junction	3 No.	4 No.	4 No.	4 No.
Reinforced concrete bridge with pre-cast beams		1 No.	1 No.	1 No.

2.3 Budgetary Cost Estimates

2.3.1 Table 2 and Table 3 provides a sectional breakdown summary of estimated scheme costs for the Link Road options. The costs are based on item price rates provided in SPONs Civil Engineering and Highway Works Price Book 2020 and are presented in 2021 prices based on the Building Cost Information Service (BCIS) 5-year forecast 2020 to 2021 tender price increase rate of 2.4%.

2.3.2 Optimism Bias of 44% has been applied to the costs to reflect the early feasibility design stage of the Link Road option proposals. This value is consistent with DfT WebTAG guidance on local roads scheme costings at feasibility design stage.

2.3.3 The cost estimates include an allowance of 12% of the estimated construction costs for professional design fees.

2.3.4 The costs for potential diversion and/or protection of Statutory Undertakers (SUs) equipment and services are not included and would need to be obtained through the relevant New Roads and Street Works Act 1991 (NRSWA91) notice process (i.e. C3/C4 notices).

Table 2: Link Road Option 1-3: Budgetary Cost Estimates (2021 prices)

Scheme Section	Option 1 (£)	Option 2 (£)	Option 3 (£)
A1077 Barrow Road to Eastfield Road	3,541,400	3,541,400	3,541,400
Eastfield Road to Brigg Road	-	2,924,500	1,919,300
Brigg Road Improvement	-	-	871,100
Brigg Road Spur	-	1,121,500	1,014,000
A15 Interchange:			
Earthworks	-	*7,778,100*	*7,778,100*
Bridge	-	*3,110,400*	*3,110,400*
Highways	-	*4,100,400*	*4,100,400*
Sub-total (A15 Interchange)		14,989,000	14,989,000
Sub-total (Construction works)	**3,541,400**	**22,576,400**	**22,334,800**
Optimism Bias (44%)	1,558,200	9,933,600	9,827,300
Professional Fees (12%)	425,000	2,709,200	2,680,200
Total	**5,524,600**	**35,219,200**	**34,842,300**

Table 3: Link Road Option 4: Budgetary cost estimate (2021 prices)

Scheme Section	Option 4 (£)
A1077 Barrow Road to Eastfield Road	3,541,400
Eastfield Road to Brigg Road	1,919,300
Brigg Road to Horkstow Road	2,029,000
Horkstow Road Bridge	2,073,600
Horkstow Road to A1077	2,749,700
Sub-total (Construction works)	**12,313,000**
Optimism Bias (44%)	5,417,700
Professional Fees (12%)	1,477,600
Total	**19,208,300**

2.4 Third Party Land Requirements

2.4.1 Table 4 identifies the estimated extents of 3rd party land required to construct the proposed link road options together with estimated cost of purchase.

Table 4: Third Party Land Requirements

Option	Area (m2)	Area (Acres)	Land Type	Value (£/acre)*	Cost (£)
Option 1	29,019.53	7.17	Agricultural	8,800.00	63,103.76
Option 2	84,343.84	20.84	Agricultural	8,800.00	183,407.99
Option 3	71,772.00	17.74	Agricultural	8,800.00	156,070.18
Option 4	57,728.08	14.26	Agricultural	8,800.00	125,531.28

* The Farmland Market: Savills 2021 - quotes prime arable land at £8,800 per acre.

2.5 Link Road Option Appraisal

2.5.1 Table 5 provides an assessment of the relative benefits and disbenefits of the link road options.

Table 5: Link Road Options - Benefits and Disbenefits

Option	Benefits	Disbenefits
Option 1	• Supports delivery of proposed housing development. • Lower cost scheme. • Scheme could be delivered in 3 to 5-year timescale. • Provides first part of potential longer link road scheme to south of Barton.	• Provides negligible benefit in reducing traffic and environmental impacts related to the proposed development. • Resultant development traffic would create significant traffic impacts on the A1077 following completion of 584 dwellings in 2030. • Scheme construction costs greater than those normally required for development access road.
Option 2	• Supports delivery of proposed housing development. • Provides some benefits in reducing traffic and environmental impacts related to the proposed development. • Provides improved access to east side of Barton and surrounding area from north, west and south. • Supports potential wider economic benefits in terms of further development, employment and productivity.	• Very high scheme costs due to grade separated interchange, associated earthworks and greater road length. • High planning and delivery risks. • Long delivery timescale (est. 5-10 years). • Distance to connection to A15 reduces attractiveness of proposed route as an alternative to using A1077 resulting in residual traffic and environmental impacts in Barton. • Resultant development traffic has the potential to create traffic impacts on the A1077 following completion of 954 dwellings in 2035.
Option 3	• Supports delivery of proposed housing development. • Provides some benefits in reducing traffic and environmental impacts related to the proposed development. • Provides improved access to east side of Barton and surrounding area from north, west and south. • Supports potential wider economic benefits in terms of further development, employment and productivity.	• Very high scheme costs due to grade separated interchange, associated earthworks and greater road length. • High planning and delivery risks. • Long delivery timescale (est. 5-10 years). • Distance to connection to A15 reduces attractiveness of proposed route as an alternative to using A1077 resulting in residual traffic and environmental impacts in Barton. • Resultant development traffic has the potential to create traffic impacts on the A1077 following completion of 954 dwellings in 2035.
Alternative Option - Option 4	• Supports delivery of proposed housing development. • Provides some benefits in reducing traffic and environmental impacts related to the proposed development. • Provides improved access to east side of Barton and surrounding area from north, west and south. • Supports potential wider economic benefits in terms of further development, employment and productivity.	• High scheme costs due to bridge works and extended road length. • High planning and delivery risks. • Long delivery timescale (est. 5-10 years). • Distance to connection to A15 reduces attractiveness of proposed route as an alternative to using A1077 resulting in residual traffic and environmental impacts in Barton.

2.5.2 Appendix 2 provides an appraisal of the link road options based on the following link road objectives that were agreed with NLC as part of the development of the study brief.

Link Road objectives:
• Provides and/or supports transport connectivity across all modes between the land packages identified for housing development within the study area.
• Maximises land available for development within the land packages.
• Supports a phased approach to the development of the land packages within the Local Plan period.
• Supports transport connectivity to wider area and facilities across all modes.
• Aligns with the best practice residential development design principles (e.g. Manual for Streets) in terms of Layout and Connectivity.
• Minimises the traffic impacts (e.g. congestion, delay, road safety) on the adjacent highway network.
• Minimises the environmental impacts (e.g. air quality, noise/vibration, surface water) on adjacent premises.
• Provides a value for money solution in terms of both capital and operational costs.
• Is deliverable, at reasonable cost, within the timescales required to meet the proposed development programme.

2.5.3 In summary the appraisal results show:

- **Option 1:** the scheme supports the delivery of development proposals to the south of the town centre by providing a primary access road to identified land allocations that could be delivered for reasonable cost within 3-5 years. However, the road scheme would have negligible effect in mitigating potentially severe traffic impacts on the A1077 within Barton resulting from traffic generated by the new developments from 2030 onwards.
- **Option 2 & 3:** both these schemes support the delivery of development proposals to the south of the town centre and also improve opportunities to connect to the A15 which has the potential to support delivery of wider economic benefits in terms of induced investment, employment and productivity. However, the journey time and distance between the proposed development sites and the A15 provided by the proposed link road offers little journey time advantage for many trips which may result in traffic impacts continuing on the A1077 in Barton from 2030 onwards. In addition, the requirement to extend the link road to the south to link with the A15 plus the construction of a new interchange at the location of an existing cutting on the A15 adds significant cost to the scheme in terms of both earthworks (principally excavation and disposal of rock) and the provision of interchange infrastructure (e.g. bridge, roundabouts, slip roads).

- **Option 4:** this scheme offers the same types of benefits and disbenefits as Options 2 and 3 but is deliverable at lower cost than these options. Notwithstanding the above, the delivery costs are still significant with the scheme requiring the construction of a new bridge over the A15.

2.5.4 It should be noted that the potential provision of an interchange with the A15 to the south of the Horkstow Road bridge but north of the locations indicated in Option 2 and Option 3 would require the demolition of the existing Horkstow Road bridge in order to accommodate the northbound on-slip road and southbound off-slip road to/from the A15. Whilst it would be possible to replace the Horkstow Road bridge in its current position with a longer bridge deck or re-route Horkstow Road to the new alignment this would add further cost to the delivery of the scheme further reducing the value for money the link road scheme would provide. In addition, as indicated in the cost estimates for Options 2 and 3, the extents of excavation and disposal of rock material required to provide an interchange on the A15 within the road cutting between Horkstow Bridge and the B1218 Brigg Road overbridge significantly increases the construction costs of this type of road scheme in this location. It should also be noted that, the further south the proposed link road connects with the A15, the less benefit the scheme provides in terms of journey time savings as an alternative route to the A1077 for journeys to the north and west of Barton.

3. TRAFFIC ASSESSMENT

3.1 Introduction

3.1.1 This section provides a review and revalidation of the previous traffic modelling work for the A1077/Holydyke/Hungate mini-roundabout. A future year assessment considering the link road options has also been undertaken, including potential highway improvements at the mini-roundabout junction.

3.2 A1077/Holydyke/Hungate Mini-Roundabout - Existing Operation

3.2.1 A junction model that was previously produced to inform earlier Barton Link Road assessment work has been recalibrated to better reflect the existing peak hour queueing at the mini-roundabout. However, due to the COVID-19 pandemic, no representative queue length data could be captured to inform the recalibration exercise undertaken in this Technical Note. The junction capacity assessment has been undertaken using Junctions 9 modelling software (ARCADY module), which is a software package produced by Transport Research Laboratory (TRL) that provides an industry-standard method for assessing capacity, queuing and delay at priority junctions and roundabouts. An aerial image of the A1077/Holydyke/Hungate mini-roundabout can be seen in Figure 2.

Figure 2: A1077/Holydyke/Hungate Mini-Roundabout

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3.2.2 The geometric input parameters used to create the Junctions 9 model have been based on a combination of measurements obtained from scaled Ordnance Survey plans and scaled aerial imagery, verified on-site. The baseline peak hour traffic flows have been assessed against the existing junction layout, the results of which are summarised in Table 6 and the complete modelling output in Appendix 3.

Table 6: A1077/Holydyke/Hungate Mini Roundabout Modelling Results

Arm	2021 Base	
	Max. RFC	Max End Q
AM Peak (07:45-08:45)		
B1218 (Holydyke)	39.5%	0.7
Hungate	31.1%	0.5
A1077 (Holydyke)	61.6%	1.6
A1077 (Ferriby Road)	71.2%	2.5
OVERALL	**71.2%**	**2.5**
PM Peak (17:00-18:00)		
B1218 (Holydyke)	47.7%	0.9
Hungate	53.4%	1.1
A1077 (Holydyke)	70.6%	2.4
A1077 (Ferriby Road)	98.8%	18.6
OVERALL	**98.8%**	**18.6**

3.2.3 The capacity assessment results shown in Table 6 indicate that the existing mini-roundabout currently operates close to full capacity in the PM peak. The modelling results indicate that the maximum Ratio of Flow to Capacity (RFC) during the peak hours is likely to be 98.8% (PM peak), which is above the typical target level of 85% (to account for standard error in modelling), and just below the 100% RFC level of full capacity.

3.2.4 It is worthwhile noting that when unbalanced flows are present at mini-roundabouts, the Junctions 9 modelling software advises users to treat the results with caution. Notwithstanding the above, based on existing knowledge of the mini-roundabout and the A1077 corridor, it is considered that the mini-roundabout is currently operating (pre-COVID-19) at full capacity and therefore the results presented above provide a suitable baseline for assessment.

3.2.5 Furthermore, as part of the Wren Kitchens extension planning approval a S106 contribution of £250,000 has been secured towards A1077 corridor improvements, including the potential for capacity improvements at the mini-roundabout which could include replacing the mini-roundabout with a traffic signal junction.

3.3 NLC Residential Land Allocations

3.3.1 It is understood that NLC is in the process of refreshing its local plan and therefore a number of additional residential sites have been considered on top of the allocated sites within the adopted Housing and Employment Land Allocations Document (NLC, 2016). Full details of the residential land allocations considered in the future year assessments is provided in Table 7.

Table 7: NLC Residential Land Allocations

Emerging Local Plan Ref	Site Location	No. of Dwellings
H1C-29	Land to the rear of 13-19 Pasture Road	16
H1C-30	Coach and Horses Inn 86 - 88 High Street	18
H1C-31	7a, Marsh Lane	5
H1C-32	Bank House, 8 Holydyke	5
H1P-6	Pasture Road South	350
H1P-7	Land off Barrow Road	200
H1P-8	Land to the South of Barrow Road	213
H1P-9	Land at Caistor Road	360
H1P-10	Land between Caistor Road and Eastfield Road	98
Total		**1,265**

3.3.2 Table 7 shows that a total of 1,265 dwellings could potentially be provided within Barton which includes the allocated sites and ones currently proposed within the refreshed local plan proposals.

3.4 Residential Allocation Sites Vehicle Trip Generation

3.4.1 The vehicle trip generation potential of the allocated residential sites and the potential sites that are currently being considered as part of the refresh local plan proposals is outlined in Table 8 which have been obtained from the industry-standard TRICS database.

Table 8: Residential Allocation Sites Vehicle Trip Generation

Residential Sites	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Land to the rear of 13-19 Pasture Road (16 dwellings)	3	7	10	5	3	8
Coach and Horses Inn 86 - 88 High Street (18 dwellings)	3	6	9	7	4	11
7a, Marsh Lane (5 dwellings)	1	2	3	2	1	3
Bank House, 8 Holydyke (5 dwellings)	1	2	3	2	1	3
Pasture Road South (350 dwellings)	45	125	170	119	56	175
Land off Barrow Road (200 dwellings)	26	72	98	68	32	100
Land to the South of Barrow Road (213 dwellings)	27	76	103	72	34	106
Land at Caistor Road (360 dwellings)	46	129	175	122	58	180
Land between Caistor Road and Eastfield Road (98 dwellings)	13	35	48	33	16	49
Overall Development (1,265 dwellings)	**165**	**454**	**619**	**430**	**205**	**635**

3.4.2 Table 8 shows that the allocated and potential residential sites in Barton could be expected to generate up to 619 two-way vehicle trips in the AM peak hour (08:00-09:00) and 635 in the PM peak hour (17:00-18:00).

3.5 Trip Distribution & Assignment with Link Road Options

3.5.1 The likely distribution of vehicle trips associated with the housing allocation sites has been predicted utilising a gravity model based upon commuting patterns of existing residents within the *'North Lincolnshire 001'* Middle-Layer Super Output Area (MSOA). *'Location of usual residence and place of work by method of travel to work'* data from the 2011 National Census (ONS, 2014) indicates the proportion of local residents travelling to each workplace destination (MSOAs and local authority districts) by mode of travel.

3.5.2 This trip distribution data has been combined with an assessment of route choice (traffic assignment) to determine the likely distribution of development traffic across the highway network including consideration of the three link road options. The predicted traffic assignment has been undertaken utilising journey planning tools to help determine the relative attractiveness of alternative routes, with consideration of influences such as the location and size of settlements and employment areas within each workplace destination and known existing traffic conditions on the relevant routes. The likely redistribution of vehicle trips associated with vehicles currently utilising the A1077 corridor that would instead use the link road options has also been considered. The overall reduction in traffic flows at the key local junctions on the A1077 corridor is outlined in Table 9 when considered against the link road options. It should be noted that the potential implementation of Option 1 of the link road is not expected to result in any changes to current traffic patterns on the local highway network and vehicles associated with the residential allocations would still utilise the A1077 corridor as the primary access to the sites and Options 2 & 3 would be expected to result in the same distribution due to the proposals being relatively similar in nature.

Table 9: Link Road Impact at Key Local Junctions

Junction	Link Road Option 2 & 3
AM Peak	
A15/A1077 Interchange	-232
A1077/Holydyke/Hungate mini-roundabout	-237
PM Peak	
A15/A1077 Interchange	-226
A1077/Holydyke/Hungate mini-roundabout	-226

3.5.3 The projections in Table 9 show a large reduction in the number of vehicle movements at the key local junctions, in particular at the A1077/Holdyke/Hungate mini-roundabout with flows expected to reduce by approximately 11.5% in the AM peak and 9.3% in the PM peak.

3.6 Assessment Scenarios

3.6.1 In order to establish the impact of the link road options on the operation of the A1077/Holydyke/Hungate mini-roundabout, a number of assessments have been undertaken. The link road options have been assessed against an appraisal year of 2038. The potential link road options have been tested against the following weekday AM and PM peak hour traffic flow scenarios:

- ***2026 Interim Year Assessment:*** *'2021 Base'* traffic flows, growthed to 2026 with the addition of traffic associated with the Wren Kitchens extension and the traffic associated with the build-out of the residential allocations outlined within the adopted Housing and Employment Land Allocations DPD (NLC, 2016);
- ***2038 Do Minimum:*** *'2021 Base'* traffic flows, growthed to 2038 with the addition of traffic associated with the Wren Kitchens extension and the traffic associated with the allocated residential sites and also those proposed in the refreshed local plan; and
- ***2038 Do Something (With Link Road Option 1, 2 & 3):*** *'2038 Do Minimum'* traffic flows, with the addition of the three link road options and the likely distribution of the residential site allocations and also redistribution of existing vehicle trips utilising the A1077 corridor.

3.6.2 The traffic flows at 2021, 2026 and 2038 have been predicted using the DfT's *'National Traffic Model'* (NTM) and *'Road Traffic Forecasts'* (RTFs). The growth factor obtained from the NTM has been adjusted to reflect local circumstances from the local Middle-Layer Super Output Area (MSOA) *'North Lincolnshire 001'*, using TEMPro (v7.2b) software (Ref: Yorkshire & Humber Dataset Version 7.2).

3.7 A1077/Holydyke/Hungate Mini-Roundabout - Existing Layout

3.7.1 The future peak hour traffic flows have been assessed against the existing junction layout, the results of which are summarised in Table 10 and the complete modelling output in Appendix 3.

Table 10: A1077/Holydyke/Hungate Mini Roundabout Modelling Results

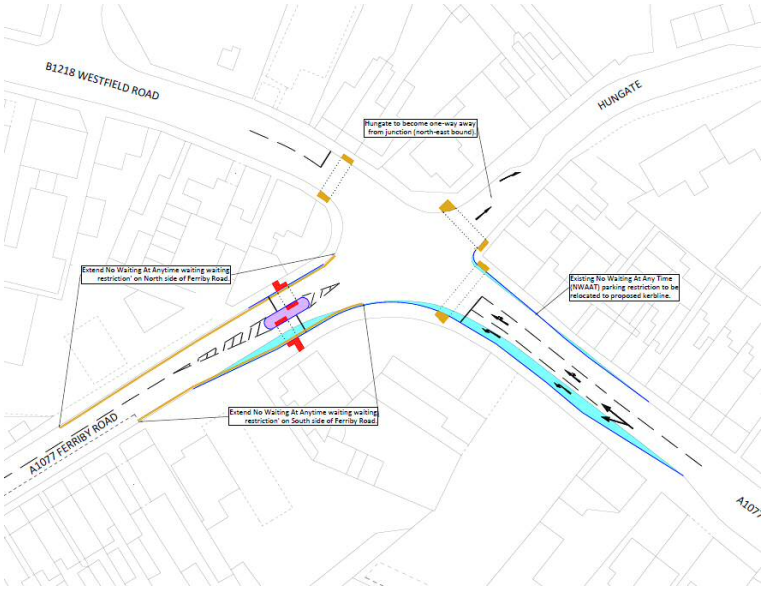
Arm	2026 Interim Year Assessment		2038 Do Minimum		2038 Do Something (With Link Road Option 1)		2038 Do Something (With Link Road Option 2 & 3)	
	Max. RFC	Max End Q	Max. RFC	Max End Q	Max. RFC	Max End Q	Max. RFC	Max End Q
AM Peak (07:45-08:45)								
B1218 (Holydyke)	43.7%	0.8	50.9%	1.0	50.9%	1.0	47.0%	0.9
Hungate	39.2%	0.6	57.4%	1.3	57.4%	1.3	44.5%	0.8
A1077 (Holydyke)	67.4%	2.1	101.2%	24.7	101.2%	24.7	83.5%	4.9
A1077 (Ferriby Road)	77.2%	3.4	91.7%	9.1	91.7%	9.1	81.6%	4.3
OVERALL	**77.2%**	**3.4**	**101.2%**	**24.7**	**101.2%**	**24.7**	**83.5%**	**4.9**
PM Peak (17:00-18:00)								
B1218 (Holydyke)	50.0%	1.0	54.7%	1.2	54.7%	1.2	53.5%	1.1
Hungate	59.7%	1.4	83.7%	3.8	83.7%	3.8	74.1%	2.5
A1077 (Holydyke)	76.3%	3.1	93.7%	10.7	93.7%	10.7	81.4%	4.2
A1077 (Ferriby Road)	105.6%	38.8	138.9%	241.6	138.9%	241.6	124.3%	127.1
OVERALL	**105.6%**	**38.8**	**138.9%**	**241.6**	**138.9%**	**241.6**	**124.3%**	**127.1**

3.7.2 The capacity assessment results shown in Table 10 indicate that the existing mini-roundabout would be expected to operate considerably over capacity in the future year without link road Options 2 or 3 coming forward. The introduction of link road Option 2 or Option 3 would be expected to show significant capacity benefits due to the redistribution of existing vehicle trips on the A1077 corridor and trips associated with the residential allocation sites, however it would still be expected to operate above 100% full capacity in the PM peak and therefore a highway improvement scheme is likely to be required irrespective of whether the link road is delivered.

3.8 Potential Signalised Junction Option

3.8.1 A potential improvement scheme at the A1077/Holydyke/Hungate junction would see the introduction of a signalised junction. As part of the scheme, Hungate would form a one-way egress. Figure 3 provides an outline feasibility design for the proposed signalised junction with the full drawing attached as Appendix 4.

Figure 3: Potential Signalised Junction Option



3.8.2 In order to assess the ability of the proposed signalised junction option to accommodate the baseline and future year traffic flows, a junction capacity assessment has been undertaken using the industry-standard LinSig v3, a design and assessment tool for traffic signal junctions. The geometric input parameters for the model have been based on the feasibility drawing attached as Appendix 4.

3.8.3 A total of three stages will be in operation at the junction during the AM and PM peak hours and it has been assumed that all stages are called every cycle with an assumed cycle time of 90 seconds. The stages are as follows:

- Stage 1: A1077 (Ferriby Road) & A1077 (Holydyke);
- Stage 2: A1077 (Holydyke) & Pedestrians across A1077 (Ferriby Road); and
- Stage 3: Holydyke & Internal A1077 (Ferriby Road) Link.

3.8.4 The baseline and future peak hour traffic flows have been assessed against the proposed junction layout, the results of which are summarised in Table 11 and the complete modelling output is provided in Appendix 5.

Table 11: Signalised Junction Modelling Results

Movement From	2021 Base		2026 Do Minimum		2038 Do Minimum		2038 Do Something (Link Road Option 1)		2038 Do Something (Link Road Option 2 & 3)	
	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)	DoS (%)	MMQ (PCU)
AM PEAK										
A1077 (W)	66.2%	12.3	71.7%	13.9	81.3%	18.1	81.3%	18.1	75.5%	15.2
Holydyke	65.3%	8.5	70.3%	9.6	79.6%	11.0	79.6%	11.0	73.5%	10.2
A1077 (E)	57.6%	6.1	58.7%	7.0	69.9%	13.9	69.9%	13.9	61.7%	9.9
A1077 (W) Internal	39.8%	1.9	43.2%	2.1	60.8%	4.2	60.8%	4.2	51.6%	2.9
PRC	**+36.0%**		**+25.5%**		**+10.7%**		**+10.7%**		**+19.2%**	
PM PEAK										
A1077 (W)	84.0%	19.9	89.6%	23.4	110.1%	88.7	110.1%	88.7	100.6%	43.4
Holydyke	84.9%	11.8	88.2%	13.0	105.9%	28.9	105.9%	28.9	100.6%	21.4
A1077 (E)	63.8%	7.6	66.1%	8.5	69.1%	10.6	69.1%	10.6	69.1%	8.8
A1077 (W) Internal	46.4%	2.4	49.6%	2.8	57.8%	3.7	57.8%	3.7	52.2%	3.0
PRC	**+6.0%**		**+0.5%**		**-22.3%**		**-22.3%**		**-11.8%**	

3.8.5 The Degree of Saturation (DoS) quoted within Table 11 is a ratio of the demand to capacity on each approach to the junction, with a value of 100% meaning that demand and capacity are equal. The Mean Max Queue (MMQ) is a measurement of the average maximum queue likely to occur across all cycles of the modelled scenario.

3.8.6 The results of the capacity assessments presented in Table 11 indicate that the signalised junction would be expected to operate with levels of reserve capacity in the AM peak with all three link road options. The link road Options 2 & 3 scenario shows that the DoS on both the A1077 (W) and Holydyke arms would be slightly over 100% and therefore considerably better than the operation of the existing mini-roundabout layout in the same scenario.

3.9 Summary

3.9.1 The assessments presented in Section 3 demonstrate that the existing mini-roundabout would be expected to operate considerably over capacity in the future year without link road Options 2 or 3 coming forward and the introduction of the future residential allocations coming forward. The introduction of link road Option 2 or Option 3 would be expected to show significant capacity benefits due to the redistribution of existing vehicle trips on the A1077 corridor to the link road and trips associated with the residential allocation sites, however it would still be expected to operate above 100% full capacity in the PM peak and therefore a highway improvement scheme is likely to be required irrespective of whether the link road is delivered.

3.9.2 A junction improvement option in the form of a signalised junction has been considered within this Technical Note and the results indicate that the signalised junction would be expected to operate with levels of reserve capacity in the AM peak with all three link road options. The link road Options 2 & 3 scenario, shows that the DoS on both the A1077 (W) and Holydyke arms would be slightly over 100% and therefore considerably better than the operation of the existing mini-roundabout layout in the same future year scenario.

4. REFERENCES

CIHT (Chartered Institution of Highways and Transportation), 2010. Manual for Streets 2: Wider Application of the Principles.

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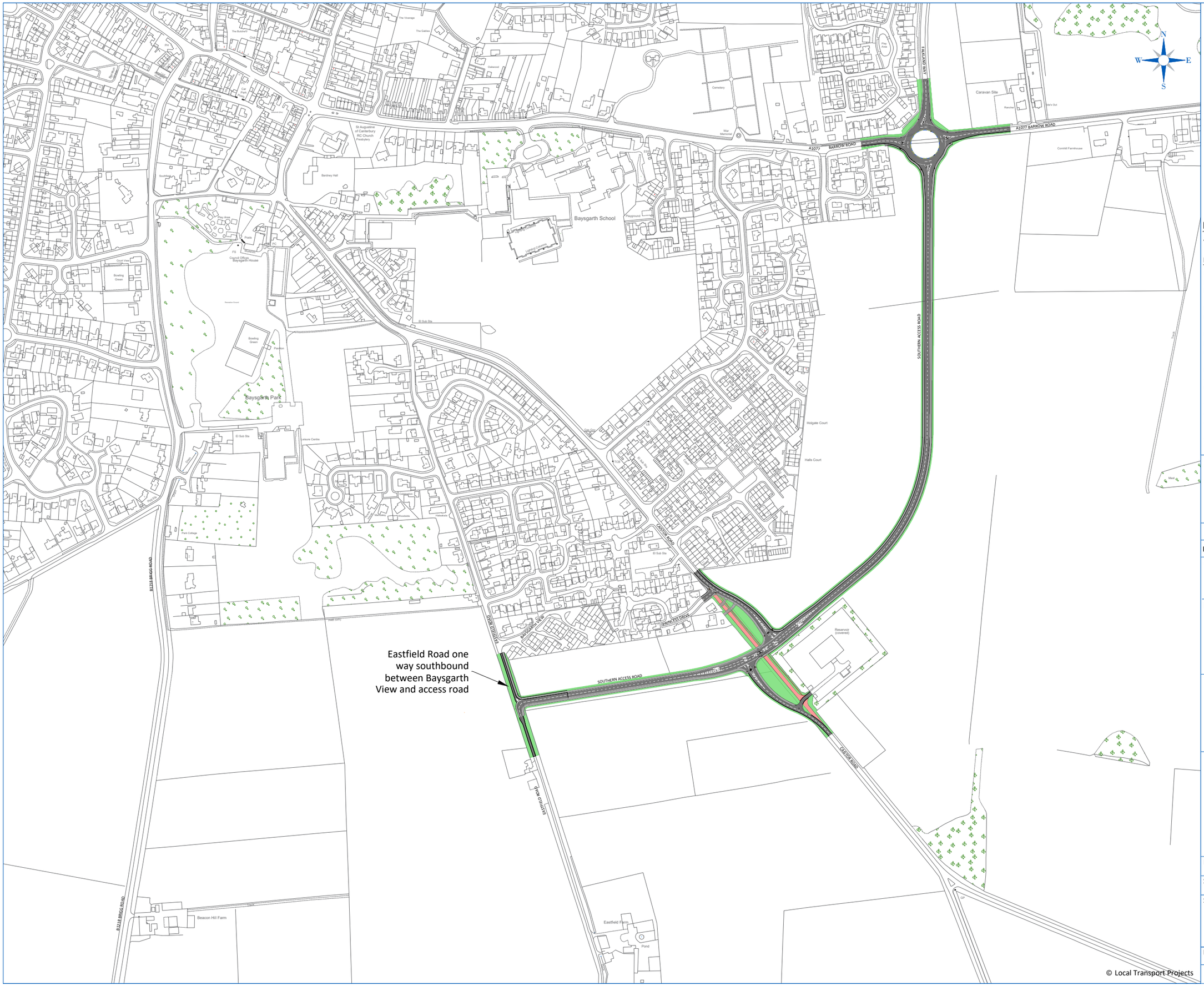
LTP, 2020b. Barton Southern Access Road, North Lincolnshire Feasibility Design Assessment Summary Note.

LTP, 2018. Barton Highways Masterplan.

NLC (North Lincolnshire Council), 2016. Housing and Employment Land Allocations Development Plan Document.

TCL, 2016. TRICS Good Practice Guide 2016.

Appendix 1 – Feasibility Designs



10mm

A3

Key:

- Proposed Carriageway Construction
- Proposed 3m Shared Use Footway / Cycle Track
- Proposed 2m Verge
- Existing Highway
- Proposed Roundabout Centre Island
- Existing road carriageway / footway removal

Notes:

Area of Scheme: 41164m² (4.11ha)

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vi. Based on ordinance survey.

Rev.	Date	By	Chk	Description
0	.	-	-	-

Client: North Lincolnshire Council

Project: Barton Southern Access Road

Title: Access Road Option 1B - (Eastfield Road One Way Southbound at Access Road)

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Project	Job	Drawing	Sheet	Revision
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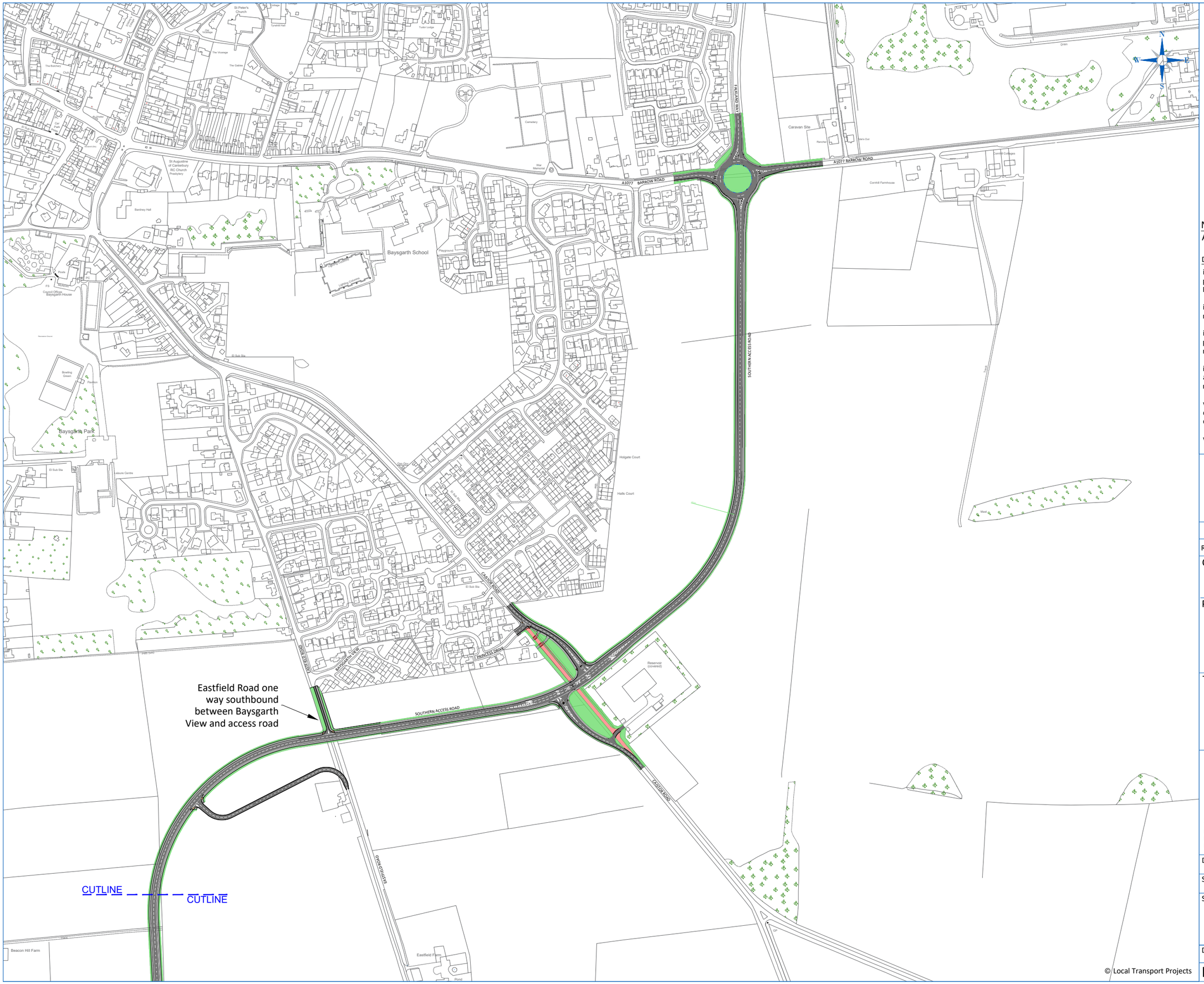

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A3

Key:

- Proposed Carriageway Construction
- Proposed 3m Shared Use Footway / Cycle Track
- Proposed 2m Verge
- Existing Highway
- Proposed Roundabout Centre Island
- Existing road carriageway / footway removal

Notes:

Area of Scheme: 128573m² (12.86ha)

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Client: North Lincolnshire Council

Project: Barton Southern Access Road

Title: Access Road Option 2B (Eastfield Road One Way Southbound at Access Road) Sheet 1 of 2

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Status: DRAFT CONCEPT

Drawing number: LTP / 3628 / P2 / 2B .01 0

Project	Job	Drawing	Sheet	Revision
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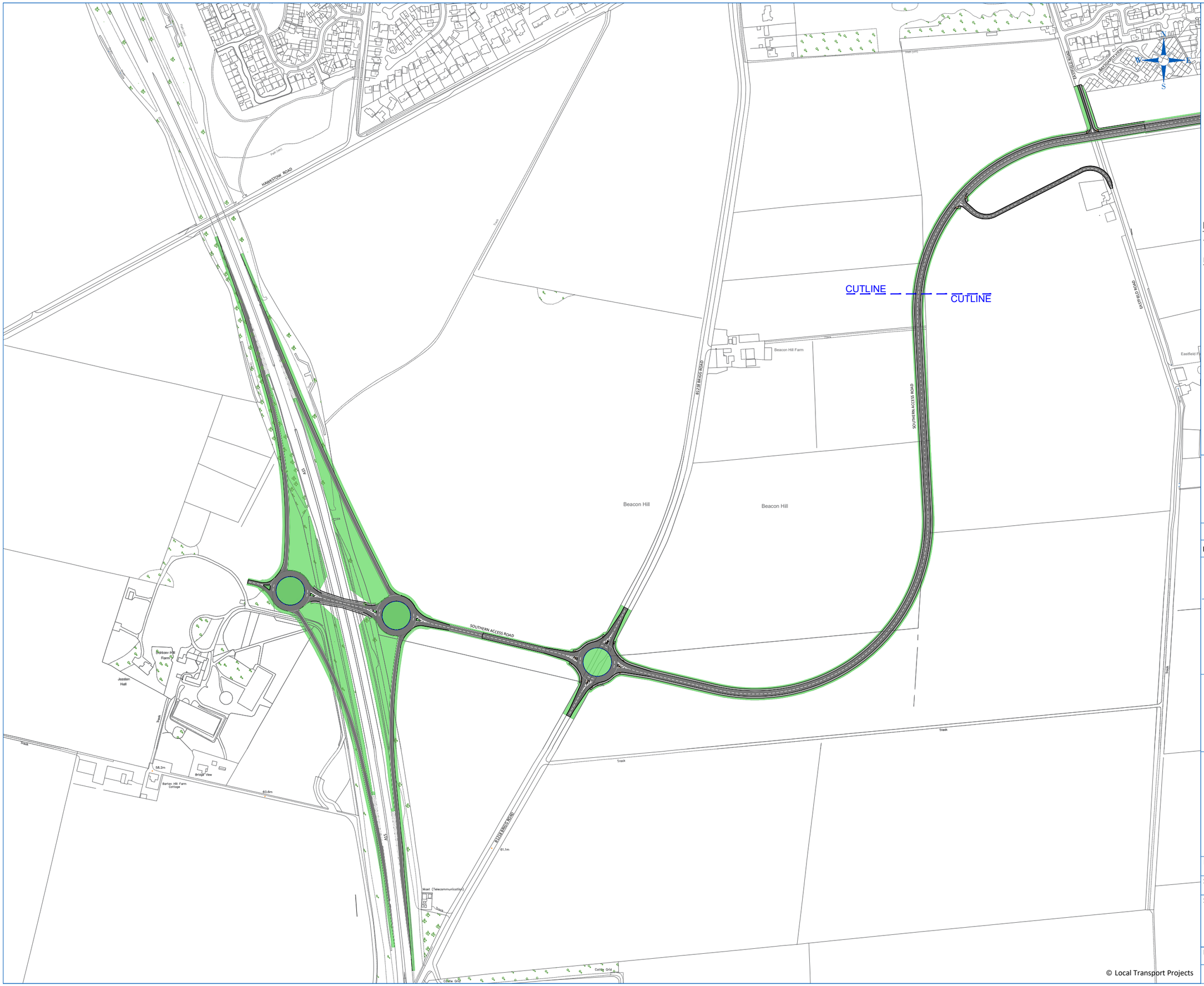

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- Proposed 2m Verge
- Existing Highway
- Proposed Roundabout Centre Island
- Existing road carriageway / footway removal

Notes:

Area of Scheme: 128573m² (12.86ha)

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Client: North Lincolnshire Council

Project: Barton Southern Access Road

Title: Access Road Option 2B (Eastfield Road One Way Southbound at Access Road) Sheet 2 of 2

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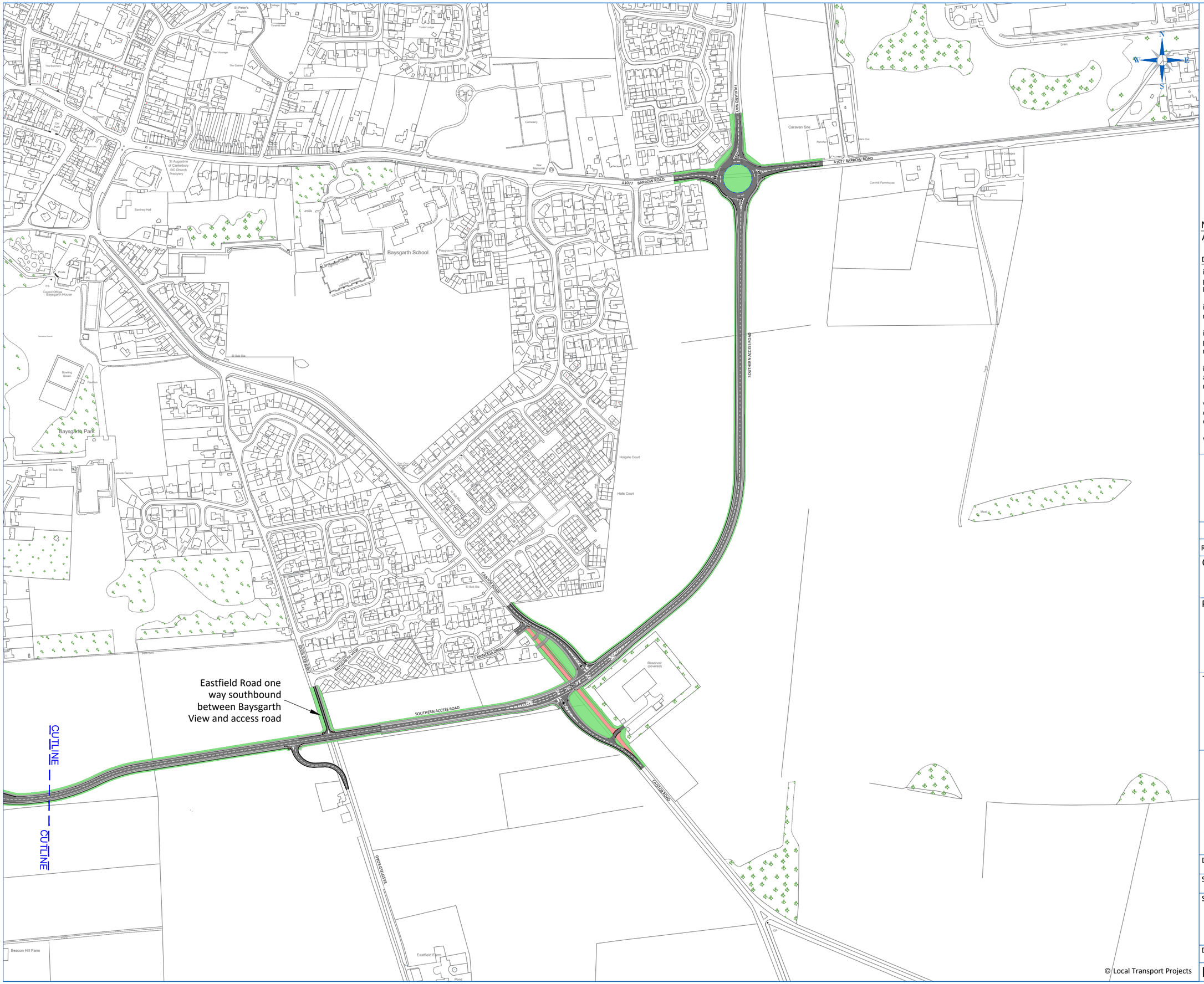
Drawing number: LTP / 3628 / P2 / 2B .02 0



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A3

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- Proposed 3m Shared Use Footway / Cycle Track
- Proposed 2m Verge
- Existing Highway
- Proposed Roundabout Centre Island
- Existing road carriageway / footway removal

Notes:

Area of Scheme: 130961m² (13.09ha)

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Client: North Lincolnshire Council

Project: Barton Southern Access Road

Title: Access Road Option 3B (Eastfield Road One Way Southbound at Access Road) Sheet 1 of 2

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Project	Job	Drawing	Sheet	Revision
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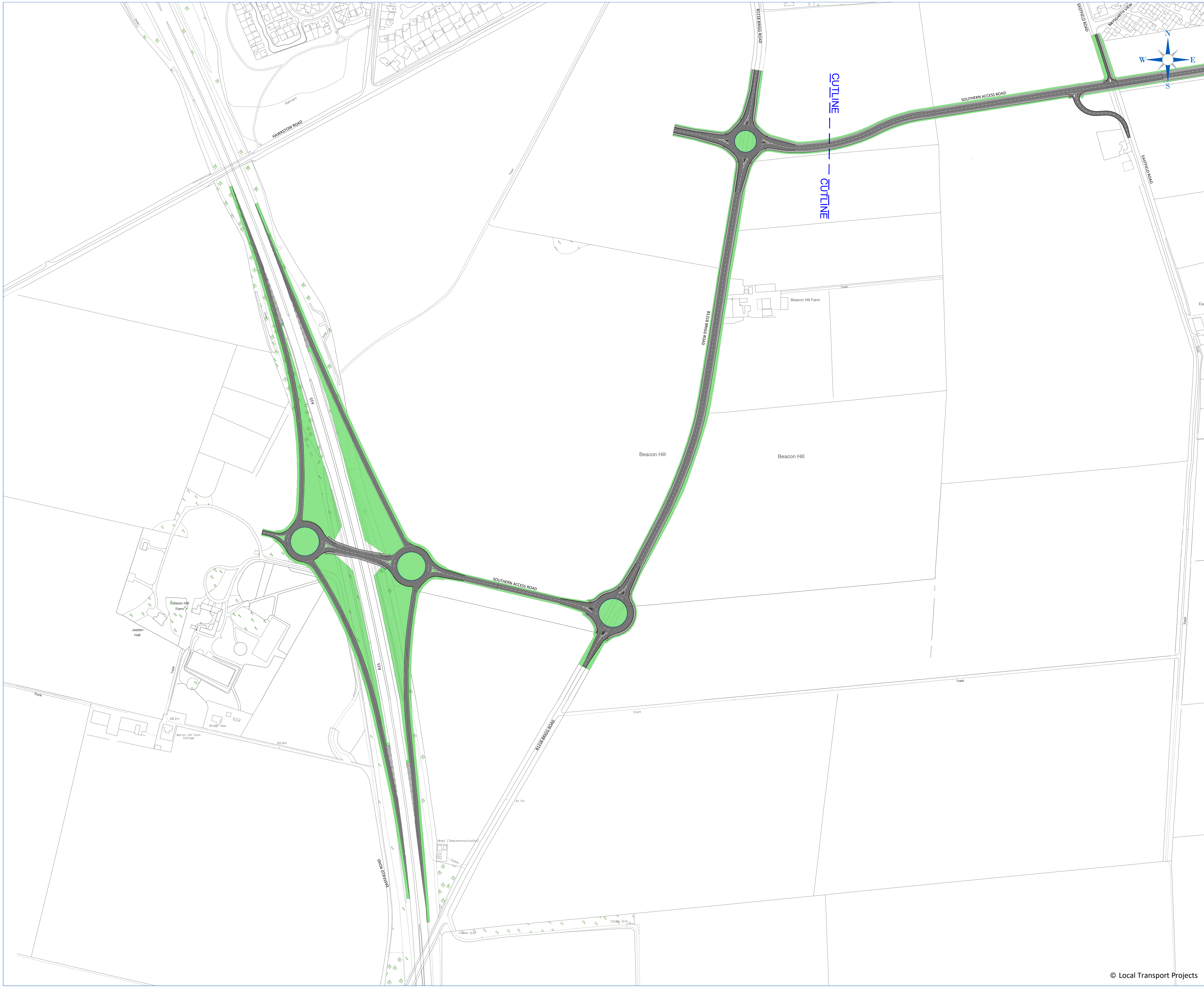

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Client

North Lincolnshire Council

Project

Barton Southern Access Road

Title

Access Road Option 3B
(Eastfield Road One Way
Southbound at Access Road)
Sheet 2 of 2

local transport projects

traffic engineering and transport planning

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Drawn: CW | Date: 22/01/21

Scale: 1 : 5000 | Checked: NW | Approved: TK

Status

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Drawing number

Project	Job	Drawing	Sheet	Revision
LTP/3628	P2	3B	.02	0

Appendix 2 – Link Road Options Appraisal

Link Road Objectives	Option 1 (Score)	Option 1 (Comments)	Option 2 (Score)	Option 2 (Comments)	Option 3 (Score)	Option 3 (Comments)	Option 4 (Score)	Alternative Option - Option 3 (Comments)
Provides and/or supports transport connectivity across all modes between the land packages identified for housing development within the study area.	3	Option 1 provides infrastructure to support development of both existing and potential land allocations.	3	Option 2 provides infrastructure to support development of both existing and potential land allocations.	3	Option 3 provides infrastructure to support development of both existing and potential land allocations.	3	Option 4 provides infrastructure to support development of both existing and potential land allocations.
Maximises land available for development within the land packages.	2	Option 1 detailed alignment to be determined but initial proposals demonstrate how land packages could be developed on either side of proposed link road.	1	Option 2 crosses through potential future land packages that may be more fully developed if Link Road followed Option 3 alignment.	2	Option 3 detailed alignment to be determined but initial proposals demonstrate how land packages could be developed on either side of proposed link road.	2	Option 4 detailed alignment to be determined but initial proposals demonstrate how land packages could be developed on either side of proposed link road.
Supports a phased approach to the development of the land packages within the Local Plan period.	-2	Option 1 would be beneficial in allowing development to commence but would generate traffic impacts within Barton town centre that would need to be addressed/mitigated through local network improvements (e.g. Holydyke proposed traffic signals). Assessment of the traffic impacts indicates that the traffic impacts are likely to be mitigated by the current Holydyke junction proposals up until 2030 (i.e. construction of 584 dwellings) following which the generated traffic demands would be greater than the Holydyke junction capacity resulting in high levels of queuing and delay.	-2	Option 2 would be beneficial in allowing development to commence but would not provide a sufficiently attractive alternative route to wholly mitigate development related traffic impacts within Barton town centre. Assessment of traffic impacts indicates that they are likely to be mitigated by a combination of the link road scheme and the current Holydyke junction proposals up until 2035 (i.e. construction of 954 dwellings) following which the generated traffic demands would be greater than the Holydyke junction capacity resulting in high levels of queuing and delay.	-2	Option 3 would be beneficial in allowing development to commence but would not provide a sufficiently attractive alternative route to wholly mitigate development related traffic impacts within Barton town centre. Assessment of traffic impacts indicates that they are likely to be mitigated by a combination of the link road scheme and the current Holydyke junction proposals up until 2035 (i.e. construction of 954 dwellings) following which the generated traffic demands would be greater than the Holydyke junction capacity resulting in high levels of queuing and delay.	-2	A traffic assessment has not been undertaken for Option 4 but, given the link road route length involved, the results are likely to be similar for those for Options 2 and 3. Option 4 would be beneficial in allowing development to commence but would not provide a sufficiently attractive alternative route to wholly mitigate development related traffic impacts within Barton town centre. Traffic impacts are likely to be mitigated by a combination of the link road scheme and the current Holydyke junction proposals following which the generated traffic demands would be greater than the Holydyke junction capacity resulting in high levels of queuing and delay.
Supports transport connectivity to wider area and facilities across all modes.	-2	Option 1 would be beneficial in providing access to the new development area but would generate traffic impacts in terms of reduced capacity and increased delays/queuing on the A1077.	-2	Option 2 would be beneficial in allowing development to commence but would not provide a sufficiently attractive alternative route to mitigate development related traffic impacts within Barton town centre that would reduce capacity and increase delays/queuing on the A1077.	-2	Option 3 would be beneficial in allowing development to commence but would not provide a sufficiently attractive alternative route to mitigate development related traffic impacts within Barton town centre that would reduce capacity and increase delays/queuing on the A1077.	-2	Option 4 would be beneficial in allowing development to commence but would not provide a sufficiently attractive alternative route to mitigate development related traffic impacts within Barton town centre that would reduce capacity and increase delays/queuing on the A1077.
Aligns with the best practice residential development design principles (e.g. Manual for Streets) in terms of Layout and Connectivity.	2	Option 1 would support development that aligns with best practice design principles.	2	Option 2 would support development that aligns with best practice design principles.	2	Option 3 would support development that aligns with best practice design principles.	2	Option 4 would support development that aligns with best practice design principles.
Minimises the traffic impacts (e.g. congestion, delay, road safety) on the adjacent highway network.	-3	Development delivered as a result of Option 1 would increase traffic flows on the A1077 and generate traffic impacts in terms of reduced capacity and increased delays/queuing. Assessment of the traffic impacts indicates that the traffic impacts are likely to be mitigated by the current Holydyke junction proposals up until 2030 (i.e. construction of 584 dwellings) following which the traffic impacts will potentially become severe.	-2	Option 2 would both increase development related traffic movements on the highway network and provide alternative access options to the north, west and south. However, the distance to the proposed A15 interchange using the new link road would be potentially greater than if using the existing A1077 with the Holydyke junction improvement in place which means that traffic impacts on the A0177 would not be wholly mitigated by the proposed link road. Assessment of traffic impacts indicates that they are likely to be mitigated by a combination of the link road scheme and the current Holydyke junction proposals up until 2035 (i.e. construction of 954 dwellings) following which the generated traffic demands would be greater than the Holydyke junction capacity resulting in high levels of queuing and delay on the A1077. As a result it is considered that the scheme would have a net adverse impact in relation to traffic impacts.	-2	Option 2 would both increase development related traffic movements on the highway network and provide alternative access options to the north, west and south. However, the distance to the proposed A15 interchange using the new link road would be potentially greater than if using the existing A1077 with the Holydyke junction improvement in place which means that traffic impacts on the A0177 would not be wholly mitigated by the proposed link road. Assessment of traffic impacts indicates that they are likely to be mitigated by a combination of the link road scheme and the current Holydyke junction proposals up until 2035 (i.e. construction of 954 dwellings) following which the generated traffic demands would be greater than the Holydyke junction capacity resulting in high levels of queuing and delay on the A1077. As a result it is considered that the scheme would have a net adverse impact in relation to traffic impacts.	-2	A traffic assessment has not been undertaken for Option 4 but, given the link road route length involved, the results are likely to be similar for those for Options 2 and 3. Option 4 would both increase development related traffic movements on the highway network and provide alternative access options to the north, west and south. However, the distance to the proposed A15 interchange using the new link road would be potentially greater than if using the existing A1077 with the Holydyke junction improvement in place which means that traffic impacts on the A0177 would not be wholly mitigated by the proposed link road. Assessment of traffic impacts indicates that they are likely to be mitigated by a combination of the link road scheme and the current Holydyke junction proposals following which the generated traffic demands would be greater than the Holydyke junction capacity resulting in high levels of queuing and delay on the A1077.
Minimises the environmental impacts (e.g. air quality, noise/vibration, surface water) on adjacent premises.	-2	Development delivered as a result of Option 1 will increase traffic movements and delays on the A1077 through Barton and likely reduce air quality and increase traffic noise/vibration.	-1	Development delivered as a result of Option 2 will increase traffic movements and delays on the A1077 through Barton and likely reduce air quality and increase traffic noise/vibration.	-1	Development delivered as a result of Option 3 will increase traffic movements and delays on the A1077 through Barton and likely reduce air quality and increase traffic noise/vibration.	-1	Development delivered as a result of Option 4 will increase traffic movements and delays on the A1077 through Barton and likely reduce air quality and increase traffic noise/vibration. In addition, the proposed road scheme alignment would be near to existing residential properties adjacent to Horkstow Road.
Provides a value for money solution in terms of both capital and operational costs (Monetised Impacts)	-3	**Monetised Impacts:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised impacts (benefits/disbenefits) suggest the following: ***Land value*** - the road scheme will likely generate an increase in the value of the local land that is accessed by the scheme. ***Journey times*** - the traffic generated from the proposed 1,265 dwellings would result in traffic impacts in terms of reduced capacity and increased delays/queuing on the A1077. Traffic assessments indicate that improvements at key junctions (e.g. Holydyke) have the potential to accommodate the forecast traffic generation through to 2030, however, the overall increase in journey times would adversely impact on the overall cost-benefit assessment of the scheme.	-1	**Monetised Impacts:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised impacts (benefits/disbenefits) suggest the following: ***Land value*** - the road scheme will likely generate an increase in the value of the local land that is accessed by the scheme. ***Wider economic impacts*** - the road scheme has potential to support delivery of wider economic benefits in terms induced investment, employment and productivity in the local area. ***Journey times*** - on balance the road scheme is likely to have a net moderate adverse impact on journey times as, due to the distance to the proposed A15 interchange, the journey time associated with using the new link road to access the A15 would be potentially greater than if using the existing A1077 with the Holydyke junction improvement in place.	-1	**Monetised Impacts:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised impacts (benefits/disbenefits) suggest the following: ***Land value*** - the road scheme will likely generate an increase in the value of the local land that is accessed by the scheme. ***Wider economic impacts*** - the road scheme has potential to support delivery of wider economic benefits in terms induced investment, employment and productivity in the local area. ***Journey times*** - on balance the road scheme is likely to have a net moderate adverse impact on journey times as, due to the distance to the proposed A15 interchange, the journey time associated with using the new link road to access the A15 would be potentially greater than if using the existing A1077 with the Holydyke junction improvement in place.	-1	**Monetised Impacts:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised impacts (benefits/disbenefits) suggest the following: ***Land value*** - the road scheme will likely generate an increase in the value of the local land that is accessed by the scheme. ***Wider economic impacts*** - the road scheme has potential to support delivery of wider economic benefits in terms induced investment, employment and productivity in the local area. ***Journey times*** - on balance the road scheme is likely to have a net moderate adverse impact on journey times as, due to the distance to the proposed A15 interchange, the journey time associated with using the new link road to access the A15 would be potentially greater than if using the existing A1077 with the Holydyke junction improvement in place.
Provides a value for money solution in terms of both capital and operational costs (Monetised Costs) Is deliverable, at reasonable cost, within the timescales required to meet the proposed development programme (Estimated Construction Costs)	-1	**Monetised Costs:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised costs (i.e. estimated construction costs) suggest the following: ***Estimated construction costs:*** the scale of proposed infrastructure is designed to provide a potential first phase of a longer link road to the south of Barton and is therefore a step greater than that usually considered for residential development access. As a consequence the estimated scheme costs are higher than they might be than if the road was to serve as a Secondary Distributor Road for the development only.	-3	**Monetised Costs:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised costs (i.e. estimated construction costs) suggest the following: ***Estimated construction costs:*** the scale of proposed infrastructure is significant and includes the provision of a grade separated intersection with dumbbell roundabouts and overbridge providing connections to the north and south between the A15 and proposed Link Road. The proposed location of the interchange would necessitate excavation into rock within an existing deep cutting on the A15 to form the junction, provide footings for the overbridge and accommodate the slip roads. The location of the link road also requires that the proposed link road needs to extend south to join the A15 at the proposed interchange location which increases the scheme cost in terms of additional road length.	-3	**Monetised Costs:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised costs (i.e. estimated construction costs) suggest the following: ***Estimated construction costs:*** the scale of proposed infrastructure is significant and includes the provision of a grade separated intersection with dumbbell roundabouts and overbridge providing connections to the north and south between the A15 and proposed Link Road. The proposed location of the interchange would necessitate excavation into rock within an existing deep cutting on the A15 to form the junction, provide footings for the overbridge and accommodate the slip roads. The location of the link road also requires that the proposed link road needs to extend south to join the A15 at the proposed interchange location which increases the scheme cost in terms of additional road length. The costs of this are partially reduced as part of the works would consists of improvements to the existing B1218 Brigg Road.	-2	**Monetised Costs:** A quantitative economic appraisal of the scheme options has not been undertake, however, observations on the likely scale of monetised costs (i.e. estimated construction costs) suggest the following: ***Estimated construction costs:*** the scale of proposed infrastructure is significant although substantially less than that required for Options 2 and 3. The scheme includes the provision of an overbridge over the A15 together with roundabouts and connector road to the existing A15/A1077 Barton interchange.
Is deliverable, at reasonable cost, within the timescales required to meet the proposed development programme (Delivery Timescales)	1	**Timescales:** Pending further investigation and design there does not appear to be any significant engineering constraints that would impact on the deliverability of the Option 1 proposals to support the proposed development programme and it is considered that the delivery timescale for Option 1 would be 3-5 years.	-1	**Timescales:** the scale of infrastructure will require extensive planning, consultation and design together with a complex construction programme. Pending further investigation it is considered that the delivery timescale for Option 2 would be 5-10 years.	-1	Timescales: the scale of infrastructure will require extensive planning, consultation and design together with a complex construction programme. Pending further investigation it is considered that the delivery timescale for Option 3 would be 5-10 years.	-1	Timescales: the scale of infrastructure will require extensive planning, consultation and design together with a complex construction programme. Pending further investigation it is considered that the delivery timescale for Option 4 would be 5-10 years.
	3	Large beneficial impact	3	Large beneficial impact	3	Large beneficial impact	3	Large beneficial impact
	2	Moderate beneficial impact	2	Moderate beneficial impact	2	Moderate beneficial impact	2	Moderate beneficial impact
	1	Slight beneficial impact	1	Slight beneficial impact	1	Slight beneficial impact	1	Slight beneficial impact
	0	neutral	0	neutral	0	neutral	0	neutral
	-1	Slight adverse impact	-1	Slight adverse impact	-1	Slight adverse impact	-1	Slight adverse impact
	-2	Moderate adverse impact	-2	Moderate adverse impact	-2	Moderate adverse impact	-2	Moderate adverse impact
	-3	Large adverse impact	-3	Large adverse impact	-3	Large adverse impact	-3	Large adverse impact

Appendix 3 – Existing Junction Modelling Results

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: A1077 Holydyke Hungate Mini-Roundabout (2021).j9
Path: Z:\Projects\3628 Barton Link Road\Data\Junction Capacity Modelling
Report generation date: 29/01/2021 16:03:24

Summary of junction performance

	AM					PM				
	Set ID	Q (PCU)	Delay (s)	RFC	LOS	Set ID	Q (PCU)	Delay (s)	RFC	LOS
	Existing Layout - 2021 Base									
1 - B1218 (Holydyke)	D1	0.7	7.09	0.39	A	D2	0.9	8.77	0.48	A
2 - Hungate		0.5	16.79	0.31	C		1.1	31.01	0.53	D
3 - A1077 (Holydyke)		1.6	10.15	0.62	B		2.4	13.21	0.71	B
4 - A1077 (Ferriby Road)		2.5	13.99	0.71	B		18.6	76.02	0.99	F
	Existing Layout - 2026 Base									
1 - B1218 (Holydyke)	D3	0.7	7.29	0.41	A	D4	0.9	9.00	0.49	A
2 - Hungate		0.5	17.89	0.33	C		1.2	33.67	0.56	D
3 - A1077 (Holydyke)		1.7	10.62	0.63	B		2.5	13.84	0.72	B
4 - A1077 (Ferriby Road)		2.7	14.72	0.73	B		23.1	90.14	1.01	F
	Existing Layout - 2026 Do Minimum									
1 - B1218 (Holydyke)	D5	0.8	7.92	0.44	A	D6	1.0	9.31	0.50	A
2 - Hungate		0.6	21.75	0.39	C		1.4	38.18	0.60	E
3 - A1077 (Holydyke)		2.1	12.09	0.67	B		3.1	16.45	0.76	C
4 - A1077 (Ferriby Road)		3.4	17.65	0.77	C		38.8	136.64	1.06	F
	Existing Layout - 2038 Base									
1 - B1218 (Holydyke)	D7	0.9	8.54	0.47	A	D8	1.1	9.72	0.52	A
2 - Hungate		0.8	25.54	0.44	D		1.7	44.55	0.64	E
3 - A1077 (Holydyke)		2.5	13.70	0.71	B		3.9	19.56	0.80	C
4 - A1077 (Ferriby Road)		4.2	20.94	0.81	C		56.9	189.14	1.10	F
	Existing Layout - 2038 Do Minimum									
1 - B1218 (Holydyke)	D9	1.0	10.06	0.51	B	D10	1.2	10.81	0.55	B
2 - Hungate		1.3	43.49	0.57	E		3.8	105.80	0.84	F
3 - A1077 (Holydyke)		24.7	93.20	1.01	F		10.7	47.70	0.94	E
4 - A1077 (Ferriby Road)		9.1	41.62	0.92	E		241.6	901.10	1.39	F
	Existing Layout - 2038 Do Something (Option 1)									
1 - B1218 (Holydyke)	D11	1.0	10.06	0.51	B	D12	1.2	10.81	0.55	B
2 - Hungate		1.3	43.49	0.57	E		3.8	105.80	0.84	F
3 - A1077 (Holydyke)		24.7	93.20	1.01	F		10.7	47.70	0.94	E
4 - A1077 (Ferriby Road)		9.1	41.62	0.92	E		241.6	901.10	1.39	F
	Existing Layout - 2038 Do Something (Option 2 & 3)									
1 - B1218 (Holydyke)	D13	0.9	8.63	0.47	A	D14	1.1	10.30	0.54	B
2 - Hungate		0.8	26.26	0.45	D		2.5	67.58	0.74	F
3 - A1077 (Holydyke)		4.9	23.55	0.83	C		4.2	20.94	0.81	C
4 - A1077 (Ferriby Road)		4.3	21.69	0.82	C		127.1	497.82	1.24	F

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 Av. delay per arriving vehicle.

File summary

File Description

Title	A1077 Holydyke Hungate Mini-Roundabout
Location	Barton, North Lincolnshire
Site number	
Date	29/01/2021
Version	
Status	
Identifier	
Client	North Lincolnshire Council
Jobnumber	3628
Enumerator	LTP\MR
Description	

Units

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

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q threshold (PCU)
JUNCTIONS 9	5.75				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)	Run automatically
D1	2021 Base	AM	ONE HOUR	07:30	09:00	15	✓
D2	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2026 Base	AM	ONE HOUR	07:30	09:00	15	✓
D4	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓
D5	2026 Do Minimum	AM	ONE HOUR	07:30	09:00	15	✓
D6	2026 Do Minimum	PM	ONE HOUR	16:45	18:15	15	✓
D7	2038 Base	AM	ONE HOUR	07:30	09:00	15	✓
D8	2038 Base	PM	ONE HOUR	16:45	18:15	15	✓
D9	2038 Do Minimum	AM	ONE HOUR	07:30	09:00	15	✓
D10	2038 Do Minimum	PM	ONE HOUR	16:45	18:15	15	✓
D11	2038 Do Something (Option 1)	AM	ONE HOUR	07:30	09:00	15	✓
D12	2038 Do Something (Option 1)	PM	ONE HOUR	16:45	18:15	15	✓
D13	2038 Do Something (Option 2 & 3)	AM	ONE HOUR	07:30	09:00	15	✓
D14	2038 Do Something (Option 2 & 3)	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Existing Layout	✓	100.000	100.000

Existing Layout - 2021 Base, 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 3 and 4 have 74% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	11.43	B

Junction Network Options

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

Arms

Arms

Arm	Name	Description
1	B1218 (Holydyke)	
2	Hungate	
3	A1077 (Holydyke)	
4	A1077 (Ferriby Road)	

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
1 - B1218 (Holydyke)	4.20	3.90	6.50	4.1	13.20	8.70	0.0	
2 - Hungate	3.10	2.10	5.65	7.7	6.90	2.25	0.0	
3 - A1077 (Holydyke)	3.80	3.80	4.70	10.5	18.10	15.30	0.0	
4 - A1077 (Ferriby Road)	4.10	4.10	4.70	1.6	10.90	7.20	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - B1218 (Holydyke)	0.658	1208
2 - Hungate	0.610	784
3 - A1077 (Holydyke)	0.676	1141
4 - A1077 (Ferriby Road)	0.643	996

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

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)	Run automatically
D1	2021 Base	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	306	100.000
2 - Hungate		ONE HOUR	✓	90	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	535	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	598	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	10	119	177
	2 - Hungate	0	0	18	72
	3 - A1077 (Holydyke)	92	7	1	435
	4 - A1077 (Ferriby Road)	116	86	396	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	0	3	1
	2 - Hungate	0	0	13	0
	3 - A1077 (Holydyke)	1	0	0	4
	4 - A1077 (Ferriby Road)	6	2	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.39	7.09	0.7	A	281	421
2 - Hungate	0.31	16.79	0.5	C	83	124
3 - A1077 (Holydyke)	0.62	10.15	1.6	B	491	736
4 - A1077 (Ferriby Road)	0.71	13.99	2.5	B	549	823

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	230	58	366	967	0.238	229	155	0.0	0.3	4.953	A
2 - Hungate	68	17	518	468	0.145	67	77	0.0	0.2	9.180	A
3 - A1077 (Holydyke)	403	101	186	1015	0.397	400	399	0.0	0.7	6.027	A
4 - A1077 (Ferriby Road)	450	113	75	948	0.475	446	511	0.0	0.9	7.417	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	275	69	439	919	0.299	275	186	0.3	0.4	5.679	A
2 - Hungate	81	20	621	405	0.200	81	92	0.2	0.3	11.356	B
3 - A1077 (Holydyke)	481	120	223	990	0.486	480	479	0.7	1.0	7.281	A
4 - A1077 (Ferriby Road)	538	134	90	938	0.573	536	613	0.9	1.4	9.264	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	337	84	536	855	0.394	336	228	0.4	0.7	7.040	A
2 - Hungate	99	25	759	321	0.309	98	113	0.3	0.4	16.528	C
3 - A1077 (Holydyke)	589	147	273	956	0.616	586	585	1.0	1.6	9.993	A
4 - A1077 (Ferriby Road)	658	165	110	926	0.711	654	750	1.4	2.4	13.579	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	337	84	539	853	0.395	337	229	0.7	0.7	7.092	A
2 - Hungate	99	25	763	318	0.311	99	113	0.4	0.5	16.794	C
3 - A1077 (Holydyke)	589	147	274	956	0.616	589	588	1.6	1.6	10.146	B
4 - A1077 (Ferriby Road)	658	165	110	925	0.712	658	753	2.4	2.5	13.989	B

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	275	69	444	916	0.300	276	188	0.7	0.4	5.732	A
2 - Hungate	81	20	627	401	0.202	82	93	0.5	0.3	11.548	B
3 - A1077 (Holydyke)	481	120	225	989	0.486	484	483	1.6	1.0	7.403	A
4 - A1077 (Ferriby Road)	538	134	90	938	0.573	542	618	2.5	1.4	9.558	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	230	58	370	964	0.239	231	157	0.4	0.3	4.998	A
2 - Hungate	68	17	523	464	0.146	68	78	0.3	0.2	9.305	A
3 - A1077 (Holydyke)	403	101	188	1014	0.397	404	404	1.0	0.7	6.116	A
4 - A1077 (Ferriby Road)	450	113	76	948	0.475	452	516	1.4	1.0	7.590	A

Existing Layout - 2021 Base, PM

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 3 and 4 have 75% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	40.91	E

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D2	2021 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	341	100.000
2 - Hungate		ONE HOUR	✓	120	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	602	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	821	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	4	166	171
	2 - Hungate	4	1	20	95
	3 - A1077 (Holydyke)	98	11	1	492
	4 - A1077 (Ferriby Road)	240	110	471	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	33	0	0
	2 - Hungate	0	0	0	0
	3 - A1077 (Holydyke)	0	10	0	2
	4 - A1077 (Ferriby Road)	0	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.48	8.77	0.9	A	313	469
2 - Hungate	0.53	31.01	1.1	D	110	165
3 - A1077 (Holydyke)	0.71	13.21	2.4	B	552	829
4 - A1077 (Ferriby Road)	0.99	76.02	18.6	F	753	1130

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	442	917	0.280	255	255	0.0	0.4	5.441	A
2 - Hungate	90	23	603	416	0.217	89	94	0.0	0.3	10.990	B
3 - A1077 (Holydyke)	453	113	202	1004	0.451	450	490	0.0	0.8	6.577	A
4 - A1077 (Ferriby Road)	618	155	86	941	0.657	611	566	0.0	1.9	10.738	B

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	529	860	0.357	306	305	0.4	0.5	6.509	A
2 - Hungate	108	27	723	343	0.315	107	112	0.3	0.4	15.230	C
3 - A1077 (Holydyke)	541	135	243	977	0.554	540	587	0.8	1.2	8.348	A
4 - A1077 (Ferriby Road)	738	185	103	930	0.794	731	679	1.9	3.6	17.635	C

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	375	94	625	797	0.471	374	364	0.5	0.9	8.515	A
2 - Hungate	132	33	866	255	0.517	130	133	0.4	1.0	28.196	D
3 - A1077 (Holydyke)	663	166	296	941	0.704	658	700	1.2	2.3	12.782	B
4 - A1077 (Ferriby Road)	904	226	126	915	0.988	863	829	3.6	13.7	48.810	E

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	375	94	640	787	0.477	375	371	0.9	0.9	8.770	A
2 - Hungate	132	33	879	247	0.534	132	136	1.0	1.1	31.014	D
3 - A1077 (Holydyke)	663	166	298	939	0.706	663	713	2.3	2.4	13.207	B
4 - A1077 (Ferriby Road)	904	226	127	915	0.988	884	834	13.7	18.6	76.023	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	574	830	0.369	308	325	0.9	0.6	6.928	A
2 - Hungate	108	27	761	319	0.338	110	121	1.1	0.5	17.386	C
3 - A1077 (Holydyke)	541	135	246	974	0.555	546	625	2.4	1.3	8.628	A
4 - A1077 (Ferriby Road)	738	185	104	929	0.794	795	687	18.6	4.3	34.429	D

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	454	909	0.282	258	261	0.6	0.4	5.544	A
2 - Hungate	90	23	615	408	0.221	91	96	0.5	0.3	11.381	B
3 - A1077 (Holydyke)	453	113	205	1002	0.452	455	501	1.3	0.9	6.718	A
4 - A1077 (Ferriby Road)	618	155	87	940	0.657	627	573	4.3	2.0	11.900	B

Existing Layout - 2026 Base, 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 3 and 4 have 73% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	11.99	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D3	2026 Base	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	313	100.000
2 - Hungate		ONE HOUR	✓	93	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	546	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	609	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	10	122	181
	2 - Hungate	0	0	19	74
	3 - A1077 (Holydyke)	94	7	1	444
	4 - A1077 (Ferriby Road)	118	87	404	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	0	3	1
	2 - Hungate	0	0	13	0
	3 - A1077 (Holydyke)	1	0	0	4
	4 - A1077 (Ferriby Road)	6	2	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.41	7.29	0.7	A	287	431
2 - Hungate	0.33	17.89	0.5	C	85	128
3 - A1077 (Holydyke)	0.63	10.62	1.7	B	501	752
4 - A1077 (Ferriby Road)	0.73	14.72	2.7	B	559	838

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	236	59	373	963	0.245	234	158	0.0	0.3	5.017	A
2 - Hungate	70	18	529	461	0.152	69	78	0.0	0.2	9.396	A
3 - A1077 (Holydyke)	411	103	191	1012	0.406	408	408	0.0	0.7	6.138	A
4 - A1077 (Ferriby Road)	458	115	76	947	0.484	455	523	0.0	1.0	7.551	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	281	70	447	914	0.308	281	190	0.3	0.4	5.786	A
2 - Hungate	84	21	635	397	0.211	83	93	0.2	0.3	11.754	B
3 - A1077 (Holydyke)	491	123	229	986	0.498	490	489	0.7	1.0	7.477	A
4 - A1077 (Ferriby Road)	547	137	91	937	0.584	546	627	1.0	1.4	9.519	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	345	86	546	849	0.406	344	232	0.4	0.7	7.233	A
2 - Hungate	102	26	775	311	0.330	102	114	0.3	0.5	17.551	C
3 - A1077 (Holydyke)	601	150	280	952	0.632	598	597	1.0	1.7	10.442	B
4 - A1077 (Ferriby Road)	671	168	112	924	0.725	666	766	1.4	2.6	14.236	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	345	86	549	847	0.407	345	233	0.7	0.7	7.293	A
2 - Hungate	102	26	779	308	0.332	102	114	0.5	0.5	17.889	C
3 - A1077 (Holydyke)	601	150	281	951	0.632	601	601	1.7	1.7	10.624	B
4 - A1077 (Ferriby Road)	671	168	112	924	0.726	670	769	2.6	2.7	14.725	B

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	281	70	452	910	0.309	282	192	0.7	0.5	5.839	A
2 - Hungate	84	21	641	393	0.213	84	94	0.5	0.3	11.980	B
3 - A1077 (Holydyke)	491	123	230	985	0.498	494	495	1.7	1.0	7.620	A
4 - A1077 (Ferriby Road)	547	137	92	937	0.584	552	632	2.7	1.5	9.859	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	236	59	377	960	0.246	236	160	0.5	0.3	5.066	A
2 - Hungate	70	18	535	458	0.153	70	79	0.3	0.2	9.533	A
3 - A1077 (Holydyke)	411	103	193	1011	0.407	412	413	1.0	0.7	6.234	A
4 - A1077 (Ferriby Road)	458	115	77	947	0.484	461	528	1.5	1.0	7.740	A

Existing Layout - 2026 Base, PM

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 3 and 4 have 75% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	47.52	E

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D4	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	347	100.000
2 - Hungate		ONE HOUR	✓	122	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	611	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	836	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	4	169	174
	2 - Hungate	4	1	21	96
	3 - A1077 (Holydyke)	99	11	1	500
	4 - A1077 (Ferriby Road)	244	112	480	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	33	0	0
	2 - Hungate	0	0	0	0
	3 - A1077 (Holydyke)	0	10	0	2
	4 - A1077 (Ferriby Road)	0	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.49	9.00	0.9	A	318	478
2 - Hungate	0.56	33.67	1.2	D	112	168
3 - A1077 (Holydyke)	0.72	13.84	2.5	B	561	841
4 - A1077 (Ferriby Road)	1.01	90.14	23.1	F	767	1151

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	261	65	450	912	0.286	260	258	0.0	0.4	5.520	A
2 - Hungate	92	23	614	409	0.225	91	95	0.0	0.3	11.274	B
3 - A1077 (Holydyke)	460	115	205	1002	0.459	457	500	0.0	0.9	6.677	A
4 - A1077 (Ferriby Road)	629	157	87	940	0.669	622	575	0.0	2.0	11.101	B

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	312	78	538	854	0.365	311	309	0.4	0.6	6.647	A
2 - Hungate	110	27	736	335	0.327	109	114	0.3	0.5	15.874	C
3 - A1077 (Holydyke)	549	137	246	974	0.564	548	598	0.9	1.3	8.548	A
4 - A1077 (Ferriby Road)	752	188	104	929	0.809	744	690	2.0	3.9	18.778	C

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	382	96	631	793	0.482	381	367	0.6	0.9	8.733	A
2 - Hungate	134	34	878	248	0.541	132	134	0.5	1.1	30.298	D
3 - A1077 (Holydyke)	673	168	300	938	0.717	668	710	1.3	2.5	13.341	B
4 - A1077 (Ferriby Road)	920	230	127	915	1.006	872	841	3.9	16.1	54.612	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	382	96	646	783	0.488	382	374	0.9	0.9	9.003	A
2 - Hungate	134	34	891	240	0.559	134	137	1.1	1.2	33.669	D
3 - A1077 (Holydyke)	673	168	302	936	0.718	672	723	2.5	2.5	13.842	B
4 - A1077 (Ferriby Road)	920	230	128	914	1.007	893	847	16.1	23.1	90.137	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	312	78	595	816	0.382	313	334	0.9	0.6	7.195	A
2 - Hungate	110	27	784	306	0.359	112	125	1.2	0.6	18.833	C
3 - A1077 (Holydyke)	549	137	250	972	0.565	554	646	2.5	1.4	8.865	A
4 - A1077 (Ferriby Road)	752	188	105	928	0.809	824	699	23.1	4.9	45.854	E

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	261	65	463	903	0.289	262	265	0.6	0.4	5.639	A
2 - Hungate	92	23	628	401	0.229	93	98	0.6	0.3	11.732	B
3 - A1077 (Holydyke)	460	115	208	1000	0.460	462	512	1.4	0.9	6.832	A
4 - A1077 (Ferriby Road)	629	157	88	940	0.670	641	583	4.9	2.1	12.527	B

Existing Layout - 2026 Do Minimum, 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 3 and 4 have 74% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	14.03	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D5	2026 Do Minimum	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	326	100.000
2 - Hungate		ONE HOUR	✓	99	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	576	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	648	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	10	127	189
	2 - Hungate	0	0	20	79
	3 - A1077 (Holydyke)	94	7	1	474
	4 - A1077 (Ferriby Road)	122	90	436	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	0	3	1
	2 - Hungate	0	0	13	0
	3 - A1077 (Holydyke)	1	0	0	4
	4 - A1077 (Ferriby Road)	6	2	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.44	7.92	0.8	A	299	449
2 - Hungate	0.39	21.75	0.6	C	91	136
3 - A1077 (Holydyke)	0.67	12.09	2.1	B	529	793
4 - A1077 (Ferriby Road)	0.77	17.65	3.4	C	595	892

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	245	61	398	946	0.259	244	161	0.0	0.4	5.207	A
2 - Hungate	75	19	563	441	0.169	74	80	0.0	0.2	10.024	B
3 - A1077 (Holydyke)	434	108	200	1006	0.431	431	436	0.0	0.8	6.442	A
4 - A1077 (Ferriby Road)	488	122	76	947	0.515	484	555	0.0	1.1	8.010	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	293	73	478	893	0.328	293	194	0.4	0.5	6.090	A
2 - Hungate	89	22	675	372	0.239	89	96	0.2	0.3	12.978	B
3 - A1077 (Holydyke)	518	129	240	978	0.529	516	523	0.8	1.1	8.031	A
4 - A1077 (Ferriby Road)	583	146	91	937	0.621	580	665	1.1	1.7	10.424	B

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	359	90	583	825	0.435	358	236	0.5	0.8	7.826	A
2 - Hungate	109	27	824	281	0.388	108	117	0.3	0.6	21.094	C
3 - A1077 (Holydyke)	634	159	293	943	0.673	631	638	1.1	2.0	11.798	B
4 - A1077 (Ferriby Road)	713	178	112	924	0.772	707	812	1.7	3.3	16.751	C

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	359	90	588	821	0.437	359	238	0.8	0.8	7.916	A
2 - Hungate	109	27	829	278	0.392	109	118	0.6	0.6	21.753	C
3 - A1077 (Holydyke)	634	159	295	941	0.674	634	643	2.0	2.1	12.094	B
4 - A1077 (Ferriby Road)	713	178	112	924	0.772	713	817	3.3	3.4	17.652	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	293	73	485	889	0.330	294	196	0.8	0.5	6.173	A
2 - Hungate	89	22	682	367	0.242	90	97	0.6	0.3	13.353	B
3 - A1077 (Holydyke)	518	129	243	977	0.530	521	530	2.1	1.2	8.240	A
4 - A1077 (Ferriby Road)	583	146	92	937	0.622	589	672	3.4	1.8	10.970	B

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	245	61	404	942	0.261	246	163	0.5	0.4	5.267	A
2 - Hungate	75	19	569	437	0.171	75	81	0.3	0.2	10.208	B
3 - A1077 (Holydyke)	434	108	202	1004	0.432	435	442	1.2	0.8	6.564	A
4 - A1077 (Ferriby Road)	488	122	77	947	0.515	490	561	1.8	1.1	8.259	A

Existing Layout - 2026 Do Minimum, PM

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 3 and 4 have 76% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	69.21	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D6	2026 Do Minimum	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	352	100.000
2 - Hungate		ONE HOUR	✓	125	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	645	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	875	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	4	170	178
	2 - Hungate	4	1	21	99
	3 - A1077 (Holydyke)	102	11	1	531
	4 - A1077 (Ferriby Road)	252	117	506	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	33	0	0
	2 - Hungate	0	0	0	0
	3 - A1077 (Holydyke)	0	10	0	2
	4 - A1077 (Ferriby Road)	0	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.50	9.31	1.0	A	323	485
2 - Hungate	0.60	38.18	1.4	E	115	172
3 - A1077 (Holydyke)	0.76	16.45	3.1	C	592	888
4 - A1077 (Ferriby Road)	1.06	136.64	38.8	F	803	1204

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	265	66	472	897	0.295	263	266	0.0	0.4	5.680	A
2 - Hungate	94	24	637	395	0.238	93	99	0.0	0.3	11.858	B
3 - A1077 (Holydyke)	486	121	210	999	0.486	482	519	0.0	0.9	7.041	A
4 - A1077 (Ferriby Road)	659	165	89	939	0.702	650	603	0.0	2.3	12.167	B

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	316	79	564	837	0.378	316	318	0.4	0.6	6.918	A
2 - Hungate	112	28	762	319	0.352	111	118	0.3	0.5	17.283	C
3 - A1077 (Holydyke)	580	145	252	970	0.598	578	621	0.9	1.5	9.285	A
4 - A1077 (Ferriby Road)	787	197	107	928	0.848	776	724	2.3	4.9	22.463	C

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	388	97	646	783	0.495	386	371	0.6	1.0	9.059	A
2 - Hungate	138	34	896	237	0.580	135	136	0.5	1.3	34.163	D
3 - A1077 (Holydyke)	710	178	307	933	0.761	704	723	1.5	3.0	15.572	C
4 - A1077 (Ferriby Road)	963	241	130	913	1.056	887	881	4.9	23.9	72.680	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	388	97	658	775	0.500	387	377	1.0	1.0	9.306	A
2 - Hungate	138	34	907	230	0.597	137	138	1.3	1.4	38.176	E
3 - A1077 (Holydyke)	710	178	310	931	0.763	710	734	3.0	3.1	16.449	C
4 - A1077 (Ferriby Road)	963	241	131	912	1.056	904	889	23.9	38.8	136.640	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	316	79	656	776	0.408	318	357	1.0	0.7	7.893	A
2 - Hungate	112	28	838	272	0.413	115	136	1.4	0.7	23.252	C
3 - A1077 (Holydyke)	580	145	256	968	0.599	586	697	3.1	1.6	9.760	A
4 - A1077 (Ferriby Road)	787	197	108	927	0.849	905	734	38.8	9.1	103.690	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	265	66	498	880	0.301	266	278	0.7	0.4	5.887	A
2 - Hungate	94	24	660	381	0.247	96	104	0.7	0.3	12.682	B
3 - A1077 (Holydyke)	486	121	214	996	0.487	488	542	1.6	1.0	7.245	A
4 - A1077 (Ferriby Road)	659	165	90	938	0.702	685	612	9.1	2.5	15.680	C

Existing Layout - 2038 Base, 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 3 and 4 have 74% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	16.22	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D7	2038 Base	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	342	100.000
2 - Hungate		ONE HOUR	✓	102	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	601	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	676	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	11	133	198
	2 - Hungate	0	0	20	82
	3 - A1077 (Holydyke)	98	8	1	494
	4 - A1077 (Ferriby Road)	128	94	454	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	0	3	1
	2 - Hungate	0	0	13	0
	3 - A1077 (Holydyke)	1	0	0	4
	4 - A1077 (Ferriby Road)	6	2	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.47	8.54	0.9	A	314	471
2 - Hungate	0.44	25.54	0.8	D	94	140
3 - A1077 (Holydyke)	0.71	13.70	2.5	B	551	827
4 - A1077 (Ferriby Road)	0.81	20.94	4.2	C	620	930

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	415	935	0.275	256	169	0.0	0.4	5.384	A
2 - Hungate	77	19	587	426	0.180	76	84	0.0	0.2	10.504	B
3 - A1077 (Holydyke)	452	113	209	999	0.453	449	454	0.0	0.8	6.726	A
4 - A1077 (Ferriby Road)	509	127	80	945	0.539	504	578	0.0	1.2	8.418	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	498	880	0.349	307	202	0.4	0.5	6.382	A
2 - Hungate	92	23	704	354	0.259	91	101	0.2	0.4	13.975	B
3 - A1077 (Holydyke)	540	135	251	971	0.556	539	544	0.8	1.3	8.572	A
4 - A1077 (Ferriby Road)	608	152	96	934	0.650	605	694	1.2	1.9	11.276	B

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	606	809	0.465	375	247	0.5	0.9	8.416	A
2 - Hungate	112	28	859	260	0.432	111	123	0.4	0.7	24.418	C
3 - A1077 (Holydyke)	662	165	306	934	0.709	657	663	1.3	2.4	13.244	B
4 - A1077 (Ferriby Road)	744	186	117	921	0.808	736	846	1.9	4.0	19.411	C

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	613	805	0.468	376	249	0.9	0.9	8.544	A
2 - Hungate	112	28	865	256	0.438	112	124	0.7	0.8	25.535	D
3 - A1077 (Holydyke)	662	165	308	933	0.710	661	669	2.4	2.5	13.701	B
4 - A1077 (Ferriby Road)	744	186	118	920	0.809	744	852	4.0	4.2	20.940	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	508	874	0.352	309	206	0.9	0.6	6.496	A
2 - Hungate	92	23	714	348	0.263	93	103	0.8	0.4	14.524	B
3 - A1077 (Holydyke)	540	135	254	969	0.557	545	553	2.5	1.3	8.861	A
4 - A1077 (Ferriby Road)	608	152	97	934	0.651	616	702	4.2	2.0	12.103	B

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	422	930	0.277	258	171	0.6	0.4	5.454	A
2 - Hungate	77	19	594	421	0.182	77	86	0.4	0.2	10.731	B
3 - A1077 (Holydyke)	452	113	212	998	0.453	454	460	1.3	0.9	6.876	A
4 - A1077 (Ferriby Road)	509	127	81	944	0.539	512	585	2.0	1.2	8.731	A

Existing Layout - 2038 Base, PM

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 3 and 4 have 76% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	93.70	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D8	2038 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	366	100.000
2 - Hungate		ONE HOUR	✓	129	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	670	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	909	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	4	176	186
	2 - Hungate	4	1	21	103
	3 - A1077 (Holydyke)	106	12	1	551
	4 - A1077 (Ferriby Road)	262	122	525	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	33	0	0
	2 - Hungate	0	0	0	0
	3 - A1077 (Holydyke)	0	10	0	2
	4 - A1077 (Ferriby Road)	0	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.52	9.72	1.1	A	336	504
2 - Hungate	0.64	44.55	1.7	E	118	178
3 - A1077 (Holydyke)	0.80	19.56	3.9	C	615	922
4 - A1077 (Ferriby Road)	1.10	189.14	56.9	F	834	1251

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	490	886	0.311	274	276	0.0	0.4	5.884	A
2 - Hungate	97	24	661	381	0.255	96	103	0.0	0.3	12.579	B
3 - A1077 (Holydyke)	504	126	219	993	0.508	500	537	0.0	1.0	7.386	A
4 - A1077 (Ferriby Road)	684	171	93	937	0.731	674	627	0.0	2.6	13.314	B

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	584	824	0.399	328	330	0.4	0.7	7.272	A
2 - Hungate	116	29	789	302	0.384	115	123	0.3	0.6	19.107	C
3 - A1077 (Holydyke)	602	151	263	963	0.625	600	641	1.0	1.7	10.018	B
4 - A1077 (Ferriby Road)	817	204	111	925	0.884	803	752	2.6	6.1	26.960	D

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	651	780	0.517	401	377	0.7	1.1	9.507	A
2 - Hungate	142	36	914	226	0.629	138	138	0.6	1.5	39.571	E
3 - A1077 (Holydyke)	738	184	320	925	0.798	730	733	1.7	3.7	18.077	C
4 - A1077 (Ferriby Road)	1001	250	135	909	1.101	894	915	6.1	32.9	92.793	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	660	774	0.521	403	382	1.1	1.1	9.722	A
2 - Hungate	142	36	922	221	0.642	141	140	1.5	1.7	44.555	E
3 - A1077 (Holydyke)	738	184	323	922	0.800	737	741	3.7	3.9	19.560	C
4 - A1077 (Ferriby Road)	1001	250	136	908	1.102	905	924	32.9	56.9	189.141	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	659	775	0.425	330	362	1.1	0.8	8.147	A
2 - Hungate	116	29	852	264	0.439	119	137	1.7	0.8	25.392	D
3 - A1077 (Holydyke)	602	151	268	960	0.628	611	703	3.9	1.8	10.732	B
4 - A1077 (Ferriby Road)	817	204	113	923	0.885	907	765	56.9	34.3	183.314	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	587	822	0.335	277	317	0.8	0.5	6.628	A
2 - Hungate	97	24	742	331	0.293	99	122	0.8	0.4	15.583	C
3 - A1077 (Holydyke)	504	126	223	990	0.509	507	617	1.8	1.1	7.631	A
4 - A1077 (Ferriby Road)	684	171	94	936	0.731	810	636	34.3	3.0	49.897	E

Existing Layout - 2038 Do Minimum, 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 3 and 4 have 78% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	57.85	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D9	2038 Do Minimum	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	342	100.000
2 - Hungate		ONE HOUR	✓	102	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	857	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	769	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	11	133	198
	2 - Hungate	0	0	20	82
	3 - A1077 (Holydyke)	98	8	1	750
	4 - A1077 (Ferriby Road)	128	94	547	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	0	3	1
	2 - Hungate	0	0	13	0
	3 - A1077 (Holydyke)	1	0	0	4
	4 - A1077 (Ferriby Road)	6	2	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.51	10.06	1.0	B	314	471
2 - Hungate	0.57	43.49	1.3	E	94	140
3 - A1077 (Holydyke)	1.01	93.20	24.7	F	786	1180
4 - A1077 (Ferriby Road)	0.92	41.62	9.1	E	706	1058

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	484	890	0.289	256	168	0.0	0.4	5.763	A
2 - Hungate	77	19	656	384	0.200	76	84	0.0	0.3	11.919	B
3 - A1077 (Holydyke)	645	161	209	1000	0.645	638	522	0.0	1.8	10.118	B
4 - A1077 (Ferriby Road)	579	145	80	945	0.613	573	767	0.0	1.6	9.901	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	580	826	0.372	307	202	0.4	0.6	7.039	A
2 - Hungate	92	23	786	304	0.301	91	101	0.3	0.4	17.217	C
3 - A1077 (Holydyke)	770	193	251	971	0.793	763	626	1.8	3.6	17.312	C
4 - A1077 (Ferriby Road)	691	173	95	935	0.739	687	919	1.6	2.8	14.799	B

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	698	749	0.503	375	239	0.6	1.0	9.752	A
2 - Hungate	112	28	952	203	0.553	109	121	0.4	1.2	38.175	E
3 - A1077 (Holydyke)	944	236	305	935	1.009	891	756	3.6	16.8	54.980	F
4 - A1077 (Ferriby Road)	847	212	111	925	0.916	826	1085	2.8	7.9	32.716	D

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	711	740	0.509	376	244	1.0	1.0	10.065	B
2 - Hungate	112	28	964	196	0.574	112	124	1.2	1.3	43.494	E
3 - A1077 (Holydyke)	944	236	308	933	1.012	912	768	16.8	24.7	93.196	F
4 - A1077 (Ferriby Road)	847	212	114	923	0.917	842	1106	7.9	9.1	41.617	E

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	605	810	0.380	309	216	1.0	0.6	7.332	A
2 - Hungate	92	23	809	290	0.316	95	105	1.3	0.5	19.125	C
3 - A1077 (Holydyke)	770	193	255	968	0.796	851	648	24.7	4.6	43.437	E
4 - A1077 (Ferriby Road)	691	173	106	928	0.745	715	1000	9.1	3.2	19.239	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	495	883	0.292	258	172	0.6	0.4	5.873	A
2 - Hungate	77	19	667	377	0.204	78	86	0.5	0.3	12.345	B
3 - A1077 (Holydyke)	645	161	212	998	0.647	656	533	4.6	2.0	11.221	B
4 - A1077 (Ferriby Road)	579	145	82	943	0.614	585	786	3.2	1.7	10.629	B

Existing Layout - 2038 Do Minimum, PM

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 3 and 4 have 79% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	448.24	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D10	2038 Do Minimum	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	366	100.000
2 - Hungate		ONE HOUR	✓	130	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	786	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	1147	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	4	176	186
	2 - Hungate	4	1	22	103
	3 - A1077 (Holydyke)	106	12	1	667
	4 - A1077 (Ferriby Road)	262	122	763	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	33	0	0
	2 - Hungate	0	0	0	0
	3 - A1077 (Holydyke)	0	10	0	2
	4 - A1077 (Ferriby Road)	0	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.55	10.81	1.2	B	336	504
2 - Hungate	0.84	105.80	3.8	F	119	179
3 - A1077 (Holydyke)	0.94	47.70	10.7	E	721	1082
4 - A1077 (Ferriby Road)	1.39	901.10	241.6	F	1053	1579

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	652	779	0.354	273	272	0.0	0.5	7.110	A
2 - Hungate	98	24	824	281	0.349	96	101	0.0	0.5	19.257	C
3 - A1077 (Holydyke)	592	148	219	993	0.596	586	702	0.0	1.5	8.881	A
4 - A1077 (Ferriby Road)	864	216	92	937	0.922	832	712	0.0	8.0	28.914	D

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	717	736	0.447	328	307	0.5	0.8	8.817	A
2 - Hungate	117	29	933	215	0.544	115	112	0.5	1.1	35.114	E
3 - A1077 (Holydyke)	707	177	262	964	0.733	702	785	1.5	2.7	13.738	B
4 - A1077 (Ferriby Road)	1031	258	111	925	1.115	913	853	8.0	37.5	103.778	F

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	717	736	0.547	401	325	0.8	1.2	10.734	B
2 - Hungate	143	36	1004	171	0.835	135	115	1.1	3.3	83.382	F
3 - A1077 (Holydyke)	865	216	316	927	0.933	841	822	2.7	8.9	34.990	D
4 - A1077 (Ferriby Road)	1263	316	132	911	1.386	910	1024	37.5	125.7	331.698	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	717	737	0.547	403	328	1.2	1.2	10.815	B
2 - Hungate	143	36	1004	171	0.837	141	115	3.3	3.8	105.798	F
3 - A1077 (Holydyke)	865	216	322	923	0.937	858	823	8.9	10.7	47.703	E
4 - A1077 (Ferriby Road)	1263	316	135	909	1.389	909	1044	125.7	214.1	675.446	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	724	732	0.450	330	314	1.2	0.8	9.028	A
2 - Hungate	117	29	941	210	0.557	127	114	3.8	1.4	47.152	E
3 - A1077 (Holydyke)	707	177	273	956	0.739	737	794	10.7	3.1	18.761	C
4 - A1077 (Ferriby Road)	1031	258	116	921	1.119	921	894	214.1	241.6	889.518	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	729	728	0.378	276	297	0.8	0.6	8.007	A
2 - Hungate	98	24	894	238	0.410	100	112	1.4	0.7	26.540	D
3 - A1077 (Holydyke)	592	148	224	990	0.598	598	770	3.1	1.6	9.499	A
4 - A1077 (Ferriby Road)	864	216	94	935	0.923	932	727	241.6	224.6	901.096	F

Existing Layout - 2038 Do Something (Option 1), 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 3 and 4 have 78% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	57.85	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D11	2038 Do Something (Option 1)	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	342	100.000
2 - Hungate		ONE HOUR	✓	102	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	857	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	769	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	11	133	198
	2 - Hungate	0	0	20	82
	3 - A1077 (Holydyke)	98	8	1	750
	4 - A1077 (Ferriby Road)	128	94	547	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	0	3	1
	2 - Hungate	0	0	13	0
	3 - A1077 (Holydyke)	1	0	0	4
	4 - A1077 (Ferriby Road)	6	2	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.51	10.06	1.0	B	314	471
2 - Hungate	0.57	43.49	1.3	E	94	140
3 - A1077 (Holydyke)	1.01	93.20	24.7	F	786	1180
4 - A1077 (Ferriby Road)	0.92	41.62	9.1	E	706	1058

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	484	890	0.289	256	168	0.0	0.4	5.763	A
2 - Hungate	77	19	656	384	0.200	76	84	0.0	0.3	11.919	B
3 - A1077 (Holydyke)	645	161	209	1000	0.645	638	522	0.0	1.8	10.118	B
4 - A1077 (Ferriby Road)	579	145	80	945	0.613	573	767	0.0	1.6	9.901	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	580	826	0.372	307	202	0.4	0.6	7.039	A
2 - Hungate	92	23	786	304	0.301	91	101	0.3	0.4	17.217	C
3 - A1077 (Holydyke)	770	193	251	971	0.793	763	626	1.8	3.6	17.312	C
4 - A1077 (Ferriby Road)	691	173	95	935	0.739	687	919	1.6	2.8	14.799	B

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	698	749	0.503	375	239	0.6	1.0	9.752	A
2 - Hungate	112	28	952	203	0.553	109	121	0.4	1.2	38.175	E
3 - A1077 (Holydyke)	944	236	305	935	1.009	891	756	3.6	16.8	54.980	F
4 - A1077 (Ferriby Road)	847	212	111	925	0.916	826	1085	2.8	7.9	32.716	D

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	711	740	0.509	376	244	1.0	1.0	10.065	B
2 - Hungate	112	28	964	196	0.574	112	124	1.2	1.3	43.494	E
3 - A1077 (Holydyke)	944	236	308	933	1.012	912	768	16.8	24.7	93.196	F
4 - A1077 (Ferriby Road)	847	212	114	923	0.917	842	1106	7.9	9.1	41.617	E

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	605	810	0.380	309	216	1.0	0.6	7.332	A
2 - Hungate	92	23	809	290	0.316	95	105	1.3	0.5	19.125	C
3 - A1077 (Holydyke)	770	193	255	968	0.796	851	648	24.7	4.6	43.437	E
4 - A1077 (Ferriby Road)	691	173	106	928	0.745	715	1000	9.1	3.2	19.239	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	495	883	0.292	258	172	0.6	0.4	5.873	A
2 - Hungate	77	19	667	377	0.204	78	86	0.5	0.3	12.345	B
3 - A1077 (Holydyke)	645	161	212	998	0.647	656	533	4.6	2.0	11.221	B
4 - A1077 (Ferriby Road)	579	145	82	943	0.614	585	786	3.2	1.7	10.629	B

Existing Layout - 2038 Do Something (Option 1), PM

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 3 and 4 have 79% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	448.24	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D12	2038 Do Something (Option 1)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	366	100.000
2 - Hungate		ONE HOUR	✓	130	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	786	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	1147	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	4	176	186
	2 - Hungate	4	1	22	103
	3 - A1077 (Holydyke)	106	12	1	667
	4 - A1077 (Ferriby Road)	262	122	763	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	33	0	0
	2 - Hungate	0	0	0	0
	3 - A1077 (Holydyke)	0	10	0	2
	4 - A1077 (Ferriby Road)	0	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.55	10.81	1.2	B	336	504
2 - Hungate	0.84	105.80	3.8	F	119	179
3 - A1077 (Holydyke)	0.94	47.70	10.7	E	721	1082
4 - A1077 (Ferriby Road)	1.39	901.10	241.6	F	1053	1579

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	652	779	0.354	273	272	0.0	0.5	7.110	A
2 - Hungate	98	24	824	281	0.349	96	101	0.0	0.5	19.257	C
3 - A1077 (Holydyke)	592	148	219	993	0.596	586	702	0.0	1.5	8.881	A
4 - A1077 (Ferriby Road)	864	216	92	937	0.922	832	712	0.0	8.0	28.914	D

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	717	736	0.447	328	307	0.5	0.8	8.817	A
2 - Hungate	117	29	933	215	0.544	115	112	0.5	1.1	35.114	E
3 - A1077 (Holydyke)	707	177	262	964	0.733	702	785	1.5	2.7	13.738	B
4 - A1077 (Ferriby Road)	1031	258	111	925	1.115	913	853	8.0	37.5	103.778	F

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	717	736	0.547	401	325	0.8	1.2	10.734	B
2 - Hungate	143	36	1004	171	0.835	135	115	1.1	3.3	83.382	F
3 - A1077 (Holydyke)	865	216	316	927	0.933	841	822	2.7	8.9	34.990	D
4 - A1077 (Ferriby Road)	1263	316	132	911	1.386	910	1024	37.5	125.7	331.698	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	717	737	0.547	403	328	1.2	1.2	10.815	B
2 - Hungate	143	36	1004	171	0.837	141	115	3.3	3.8	105.798	F
3 - A1077 (Holydyke)	865	216	322	923	0.937	858	823	8.9	10.7	47.703	E
4 - A1077 (Ferriby Road)	1263	316	135	909	1.389	909	1044	125.7	214.1	675.446	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	724	732	0.450	330	314	1.2	0.8	9.028	A
2 - Hungate	117	29	941	210	0.557	127	114	3.8	1.4	47.152	E
3 - A1077 (Holydyke)	707	177	273	956	0.739	737	794	10.7	3.1	18.761	C
4 - A1077 (Ferriby Road)	1031	258	116	921	1.119	921	894	214.1	241.6	889.518	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	729	728	0.378	276	297	0.8	0.6	8.007	A
2 - Hungate	98	24	894	238	0.410	100	112	1.4	0.7	26.540	D
3 - A1077 (Holydyke)	592	148	224	990	0.598	598	770	3.1	1.6	9.499	A
4 - A1077 (Ferriby Road)	864	216	94	935	0.923	932	727	241.6	224.6	901.096	F

Existing Layout - 2038 Do Something (Option 2 & 3), 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 3 and 4 have 75% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	20.22	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D13	2038 Do Something (Option 2 & 3)	AM	ONE HOUR	07:30	09:00	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	342	100.000
2 - Hungate		ONE HOUR	✓	102	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	707	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	682	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	11	133	198
	2 - Hungate	0	0	20	82
	3 - A1077 (Holydyke)	98	8	1	600
	4 - A1077 (Ferriby Road)	128	94	460	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	0	3	1
	2 - Hungate	0	0	13	0
	3 - A1077 (Holydyke)	1	0	0	4
	4 - A1077 (Ferriby Road)	6	2	4	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.47	8.63	0.9	A	314	471
2 - Hungate	0.45	26.26	0.8	D	94	140
3 - A1077 (Holydyke)	0.83	23.55	4.9	C	649	973
4 - A1077 (Ferriby Road)	0.82	21.69	4.3	C	626	939

Main Results for each time segment

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	420	932	0.276	256	169	0.0	0.4	5.407	A
2 - Hungate	77	19	591	423	0.182	76	84	0.0	0.2	10.588	B
3 - A1077 (Holydyke)	532	133	209	999	0.533	528	458	0.0	1.2	7.825	A
4 - A1077 (Ferriby Road)	513	128	80	945	0.543	509	657	0.0	1.2	8.500	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	504	877	0.351	307	202	0.4	0.5	6.422	A
2 - Hungate	92	23	709	351	0.261	91	101	0.2	0.4	14.150	B
3 - A1077 (Holydyke)	636	159	251	971	0.654	633	550	1.2	1.9	10.908	B
4 - A1077 (Ferriby Road)	613	153	96	935	0.656	610	788	1.2	1.9	11.453	B

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	613	805	0.468	375	246	0.5	0.9	8.494	A
2 - Hungate	112	28	865	256	0.438	111	123	0.4	0.8	25.039	D
3 - A1077 (Holydyke)	778	195	306	934	0.834	768	669	1.9	4.6	21.178	C
4 - A1077 (Ferriby Road)	751	188	116	921	0.815	742	958	1.9	4.1	19.960	C

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	377	94	619	801	0.470	376	248	0.9	0.9	8.631	A
2 - Hungate	112	28	871	252	0.445	112	124	0.8	0.8	26.255	D
3 - A1077 (Holydyke)	778	195	308	933	0.835	777	675	4.6	4.9	23.551	C
4 - A1077 (Ferriby Road)	751	188	118	921	0.816	750	968	4.1	4.3	21.689	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	307	77	514	870	0.353	309	206	0.9	0.6	6.541	A
2 - Hungate	92	23	719	345	0.266	93	103	0.8	0.4	14.735	B
3 - A1077 (Holydyke)	636	159	254	969	0.656	647	559	4.9	2.0	11.931	B
4 - A1077 (Ferriby Road)	613	153	98	933	0.657	622	803	4.3	2.1	12.378	B

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	257	64	426	927	0.278	258	171	0.6	0.4	5.477	A
2 - Hungate	77	19	599	418	0.184	77	86	0.4	0.2	10.819	B
3 - A1077 (Holydyke)	532	133	212	998	0.533	536	465	2.0	1.2	8.121	A
4 - A1077 (Ferriby Road)	513	128	81	944	0.544	517	666	2.1	1.3	8.832	A

Existing Layout - 2038 Do Something (Option 2 & 3), PM

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 3 and 4 have 77% 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	A1077 Holydyke Hungate	Mini-roundabout		1, 2, 3, 4	243.92	F

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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)	Run automatically
D14	2038 Do Something (Option 2 & 3)	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - B1218 (Holydyke)		ONE HOUR	✓	366	100.000
2 - Hungate		ONE HOUR	✓	130	100.000
3 - A1077 (Holydyke)		ONE HOUR	✓	682	100.000
4 - A1077 (Ferriby Road)		ONE HOUR	✓	1026	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	4	176	186
	2 - Hungate	4	1	22	103
	3 - A1077 (Holydyke)	106	12	1	563
	4 - A1077 (Ferriby Road)	262	122	642	0

Vehicle Mix

HV %s

		To			
		1 - B1218 (Holydyke)	2 - Hungate	3 - A1077 (Holydyke)	4 - A1077 (Ferriby Road)
From	1 - B1218 (Holydyke)	0	33	0	0
	2 - Hungate	0	0	0	0
	3 - A1077 (Holydyke)	0	10	0	2
	4 - A1077 (Ferriby Road)	0	0	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - B1218 (Holydyke)	0.54	10.30	1.1	B	336	504
2 - Hungate	0.74	67.58	2.5	F	119	179
3 - A1077 (Holydyke)	0.81	20.94	4.2	C	626	939
4 - A1077 (Ferriby Road)	1.24	497.82	127.1	F	941	1412

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	573	831	0.332	274	275	0.0	0.5	6.455	A
2 - Hungate	98	24	744	330	0.297	96	103	0.0	0.4	15.310	C
3 - A1077 (Holydyke)	513	128	219	993	0.517	509	621	0.0	1.1	7.512	A
4 - A1077 (Ferriby Road)	772	193	93	937	0.825	756	636	0.0	4.2	18.592	C

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	667	769	0.428	328	323	0.5	0.7	8.161	A
2 - Hungate	117	29	875	250	0.468	115	120	0.4	0.8	26.408	D
3 - A1077 (Holydyke)	613	153	262	964	0.636	610	728	1.1	1.7	10.304	B
4 - A1077 (Ferriby Road)	922	231	111	925	0.997	879	762	4.2	15.1	52.635	F

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	690	754	0.534	401	351	0.7	1.1	10.193	B
2 - Hungate	143	36	965	195	0.735	138	126	0.8	2.2	57.965	F
3 - A1077 (Holydyke)	751	188	318	926	0.811	742	785	1.7	3.9	19.078	C
4 - A1077 (Ferriby Road)	1130	282	135	909	1.242	906	926	15.1	70.9	182.646	F

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	403	101	692	753	0.535	403	353	1.1	1.1	10.304	B
2 - Hungate	143	36	968	193	0.741	142	127	2.2	2.5	67.582	F
3 - A1077 (Holydyke)	751	188	323	923	0.814	750	787	3.9	4.2	20.943	C
4 - A1077 (Ferriby Road)	1130	282	136	908	1.243	908	936	70.9	126.3	397.297	F

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	329	82	697	749	0.439	330	335	1.1	0.8	8.647	A
2 - Hungate	117	29	903	233	0.502	123	125	2.5	1.1	34.077	D
3 - A1077 (Holydyke)	613	153	270	959	0.640	622	756	4.2	1.9	11.185	B
4 - A1077 (Ferriby Road)	922	231	113	923	0.999	919	779	126.3	127.1	497.820	F

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - B1218 (Holydyke)	276	69	702	746	0.369	276	320	0.8	0.6	7.697	A
2 - Hungate	98	24	855	262	0.373	100	123	1.1	0.6	22.401	C
3 - A1077 (Holydyke)	513	128	223	990	0.519	516	731	1.9	1.1	7.788	A
4 - A1077 (Ferriby Road)	772	193	94	936	0.825	928	646	127.1	88.1	418.467	F

Appendix 4 – Signalised Junction Drawing

B1218 WESTFIELD ROAD

HUNGATE

A1077 FERRIBY ROAD

A1077 HOLYDYKE

Hungate to become one-way away from junction (north-east bound).

Extend No Waiting At Anytime waiting waiting restriction' on North side of Ferriby Road.

Extend No Waiting At Anytime waiting waiting restriction' on South side of Ferriby Road.

Existing No Waiting At Any Time (NWAAT) parking restriction to be relocated to proposed kerbline.

Shelter

Key:-

- Proposed Kerbline
- Proposed Widening
- Proposed Pedestrian Refuge
- Proposed Road Markings
- Proposed Tactiles

10mm

A3

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ii. Reference should be made to the project's drawing register to ensure the latest drawing is being referred to.

iii. All dimensions are to be checked by the contractor prior to commencement of work. Any discrepancy shall be reported immediately to Local Transport Projects Ltd

iv. All work shall be carried out in accordance with local authority, statutory authority and health & safety requirements & regulations

v. Mapping supplied by Client

Rev.	Date	By	Chk	Description
0	-	-	-	-

Client: North Lincolnshire Council

Project: Barton Southern Access Road

Title: A1077 / B1218 Mini-Roundabout Signalised Junction Feasibility Design

local transport projects
traffic engineering and transport planning
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Drawn	Date
OA	27 01 21
Scale	Checked
1 : 250	NW

Status: DRAFT FEASIBILITY

Drawing number: LTP / 3628 / P3 / 01 .01 0

(Project / Job / Drawing / Sheet / Revision)

Appendix 5 – Proposed Junction Modelling

LTP LinSig Output

User and Project Details

Project:	**Barton Link Road**
Title:	**A1077/Holydyke/Hungate Signalised Junction Option**
Location:	Barton upon Humber, North Lincolnshire
Client:	North Lincolnshire Council
Additional detail:	
File name:	A1077 Holydyke Hungate Signalised Junction Option.lsg3x
Author:	MR
Company:	LTP
Address:	

Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Filter	B	4	0
E	Traffic		7	7
F	Pedestrian		6	6
G	Pedestrian		6	6

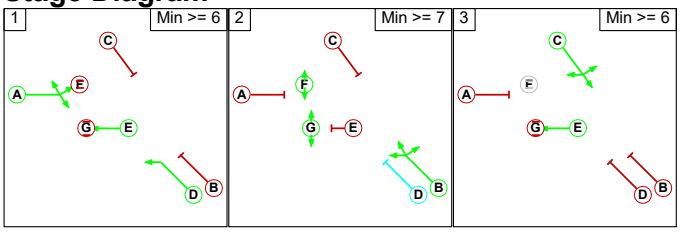
Phase Intergreens Matrix

		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		5	5	-	-	5	-
	B	5		5	-	-	-	-
	C	5	5		6	-	-	-
	D	-	-	5		-	-	-
	E	-	-	-	-		-	5
	F	5	-	-	-	-		-
	G	-	-	-	-	6	-	

Phases in Stage

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

Stage Diagram



Phase Delays

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

Prohibited Stage Change

	To Stage			
		1	2	3
From Stage	1		5	X
	2	6		6
	3	6	5	

Give-Way Lane Input Data

Junction: A1077/Holydyke/Hungate Signalised Junction Option
There are no Opposed Lanes in this Junction

Lane Input Data

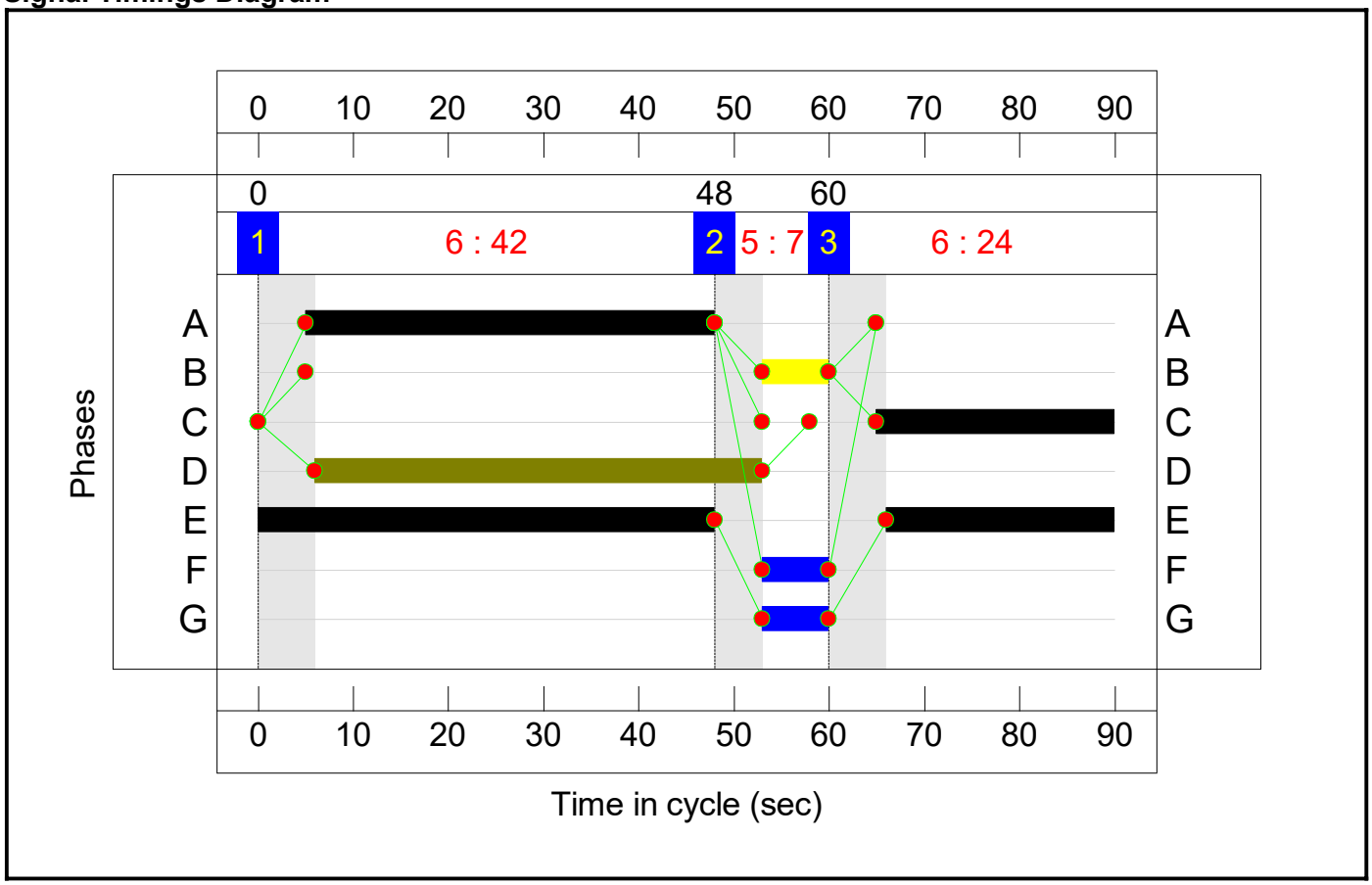
Junction: A1077/Holydyke/Hungate Signalised Junction Option												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (A1077 (W))	U	A	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 5 Left	10.41
											Arm 6 Ahead	Inf
											Arm 7 Right	28.00
2/1 (Holydyke)	U	C	2	3	60.0	Geom	-	3.85	0.00	Y	Arm 6 Left	12.00
											Arm 7 Ahead	Inf
											Arm 8 Right	12.90
3/1 (A1077 (E))	U	B D	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 8 Left	27.15
3/2 (A1077 (E))	U	B	2	3	5.8	Geom	-	3.50	0.00	Y	Arm 5 Ahead	Inf
											Arm 6 Right	6.65
4/1 (A1077 (W))	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Holydyke)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Hungate)	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (A1077 (E))	U		2	3	60.0	Inf	-	-	-	-	-	-
8/1 (A1077 (W) Internal)	U	E	2	3	3.0	Geom	-	4.00	0.00	Y	Arm 4 Ahead	Inf

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2021 Base AM'	07:45	08:45	01:00	
2: '2021 Base PM'	17:00	18:00	01:00	
3: '2026 Base AM'	07:45	08:45	01:00	
4: '2026 Base PM'	17:00	18:00	01:00	
5: '2026 Do Minimum AM'	07:45	08:45	01:00	
6: '2026 Do Minimum PM'	17:00	18:00	01:00	
7: '2038 Base AM'	07:45	08:45	01:00	
8: '2038 Base PM'	17:00	18:00	01:00	
9: '2038 Do Minimum AM'	07:45	08:45	01:00	
10: '2038 Do Minimum PM'	17:00	18:00	01:00	
11: '2038 Do Something (Option 1) AM'	07:45	08:45	01:00	
12: '2038 Do Something (Option 1) PM'	17:00	18:00	01:00	
13: '2038 Do Something (Option 2/3) AM'	07:45	08:45	01:00	
14: '2038 Do Something (Option 2/3) PM'	17:00	18:00	01:00	

Scenario 1: '2021 Base AM' (FG1: '2021 Base AM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

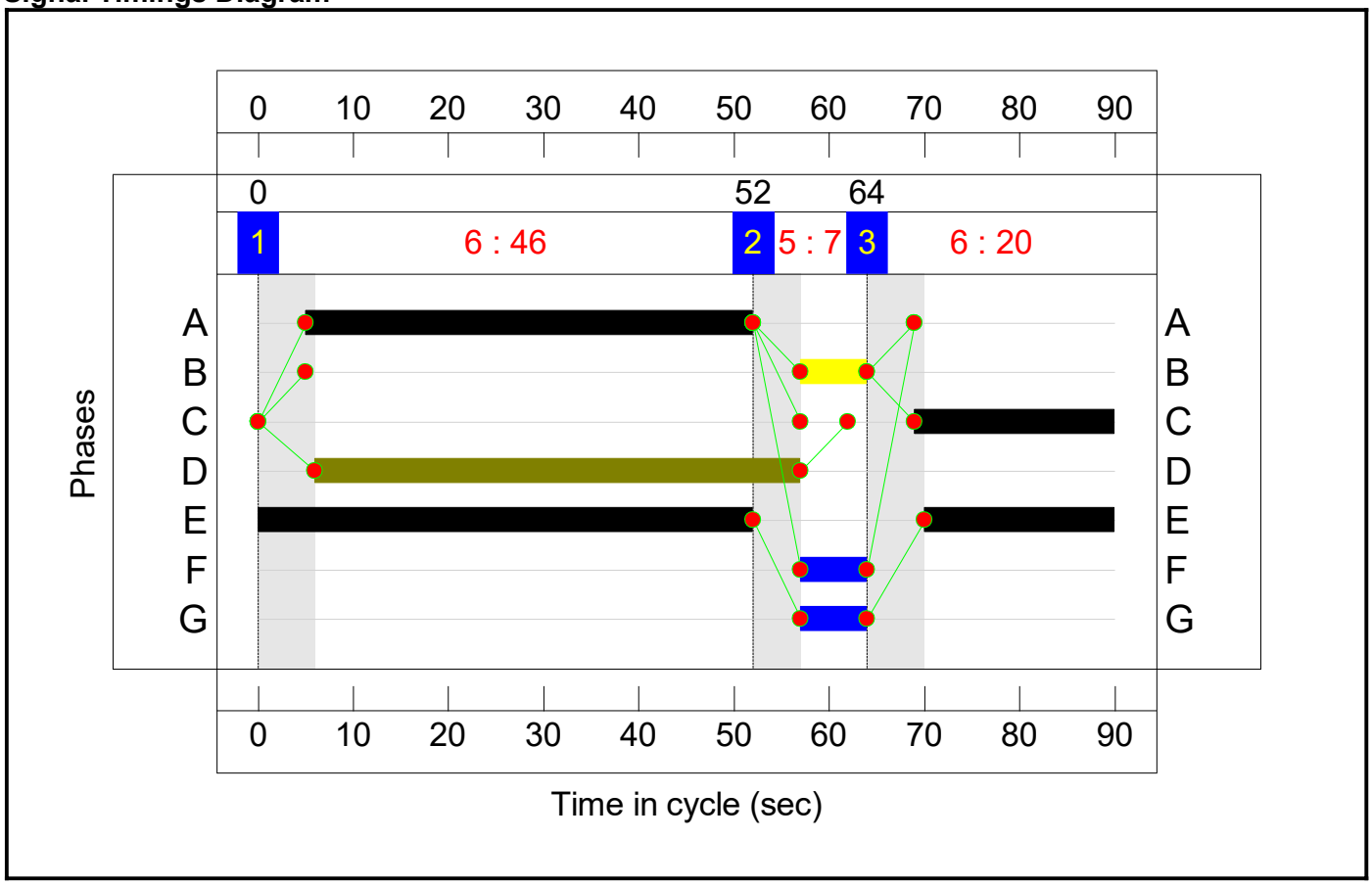
		Destination				
		A	B	C	D	Tot.
Origin	A	0	116	86	396	598
	B	214	0	10	127	351
	C	0	0	0	0	0
	D	436	92	7	0	535
	Tot.	650	208	103	523	1484

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	19.4 %	1848	1848
				Arm 6 Ahead	Inf	14.4 %		
				Arm 7 Right	28.00	66.2 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	2.8 %	1861	1861
				Arm 7 Ahead	Inf	36.2 %		
				Arm 8 Right	12.90	61.0 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	92.9 %	1934	1934
				Arm 6 Right	6.65	7.1 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 2: '2021 Base PM' (FG2: '2021 Base PM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

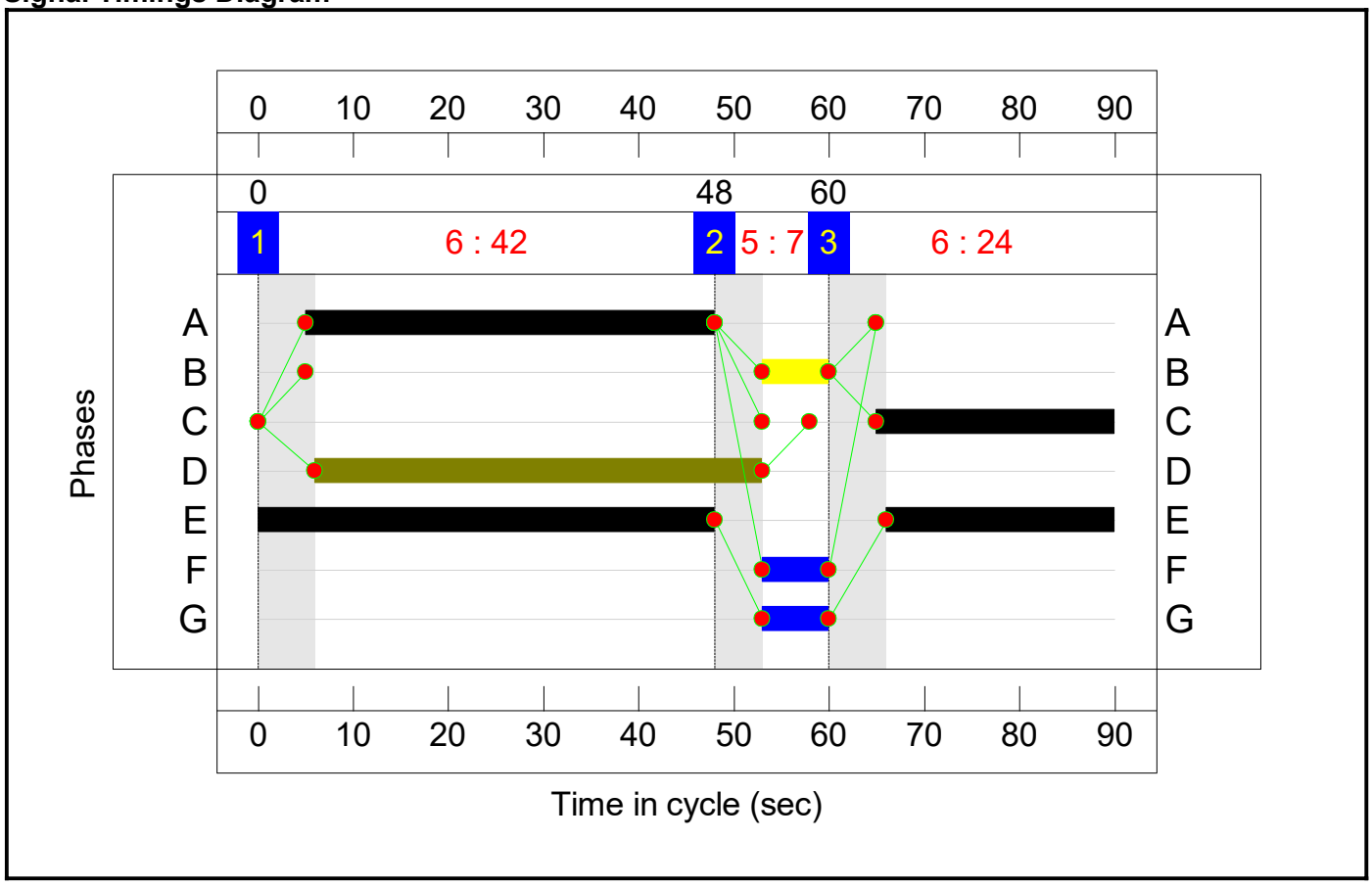
		Destination				
		A	B	C	D	Tot.
Origin	A	0	240	110	471	821
	B	219	0	4	166	389
	C	0	0	0	0	0
	D	540	98	11	0	649
	Tot.	759	338	125	637	1859

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	29.2 %	1832	1832
				Arm 6 Ahead	Inf	13.4 %		
				Arm 7 Right	28.00	57.4 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	1.0 %	1875	1875
				Arm 7 Ahead	Inf	42.7 %		
				Arm 8 Right	12.90	56.3 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	89.9 %	1921	1921
				Arm 6 Right	6.65	10.1 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 3: '2026 Base AM' (FG3: '2026 Base AM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

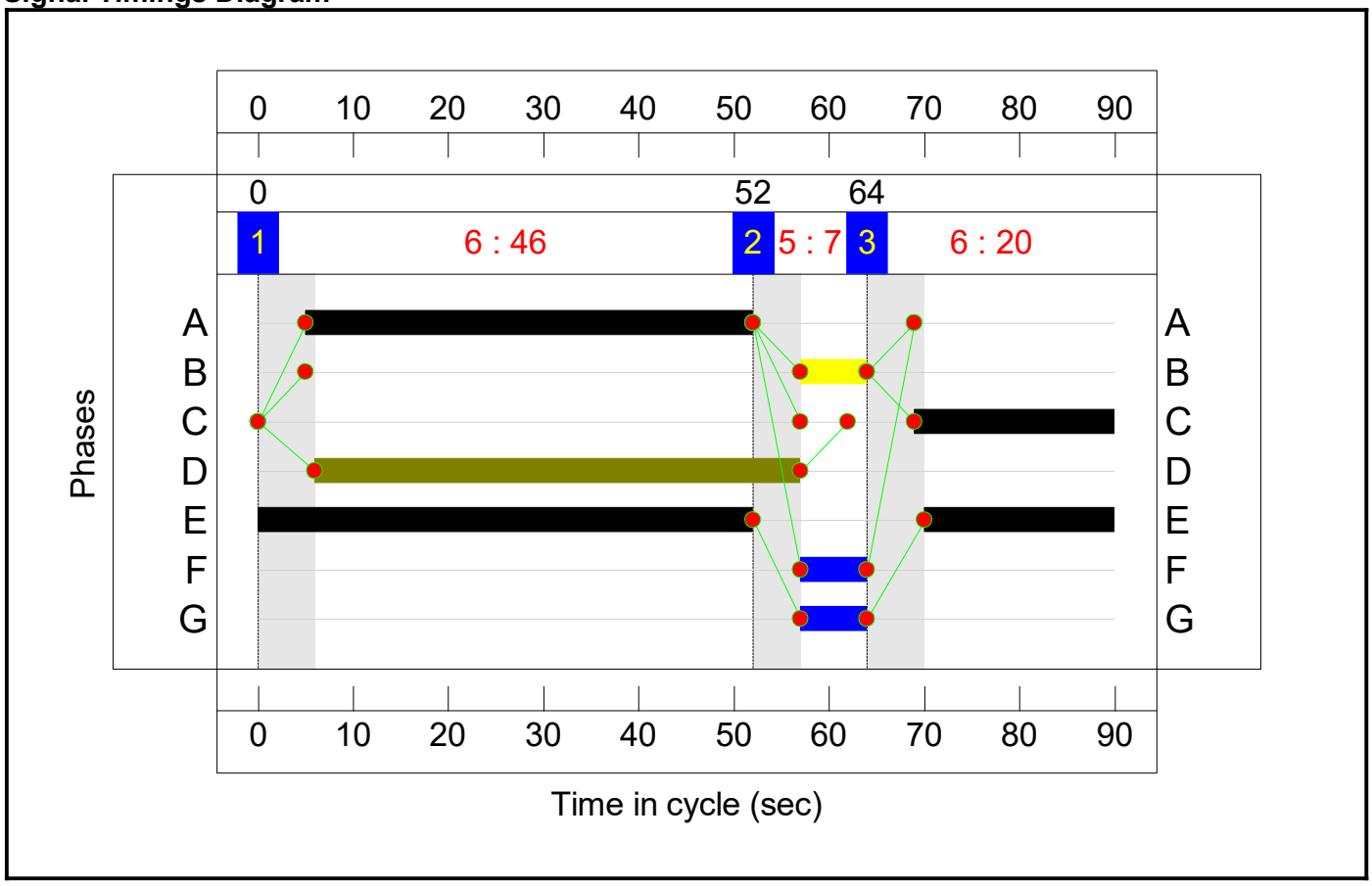
		Destination				
		A	B	C	D	Tot.
Origin	A	0	118	87	404	609
	B	218	0	10	130	358
	C	0	0	0	0	0
	D	444	94	7	0	545
	Tot.	662	212	104	534	1512

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	19.4 %	1848	1848
				Arm 6 Ahead	Inf	14.3 %		
				Arm 7 Right	28.00	66.3 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	2.8 %	1862	1862
				Arm 7 Ahead	Inf	36.3 %		
				Arm 8 Right	12.90	60.9 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	93.1 %	1935	1935
				Arm 6 Right	6.65	6.9 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 4: '2026 Base PM' (FG4: '2026 Base PM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

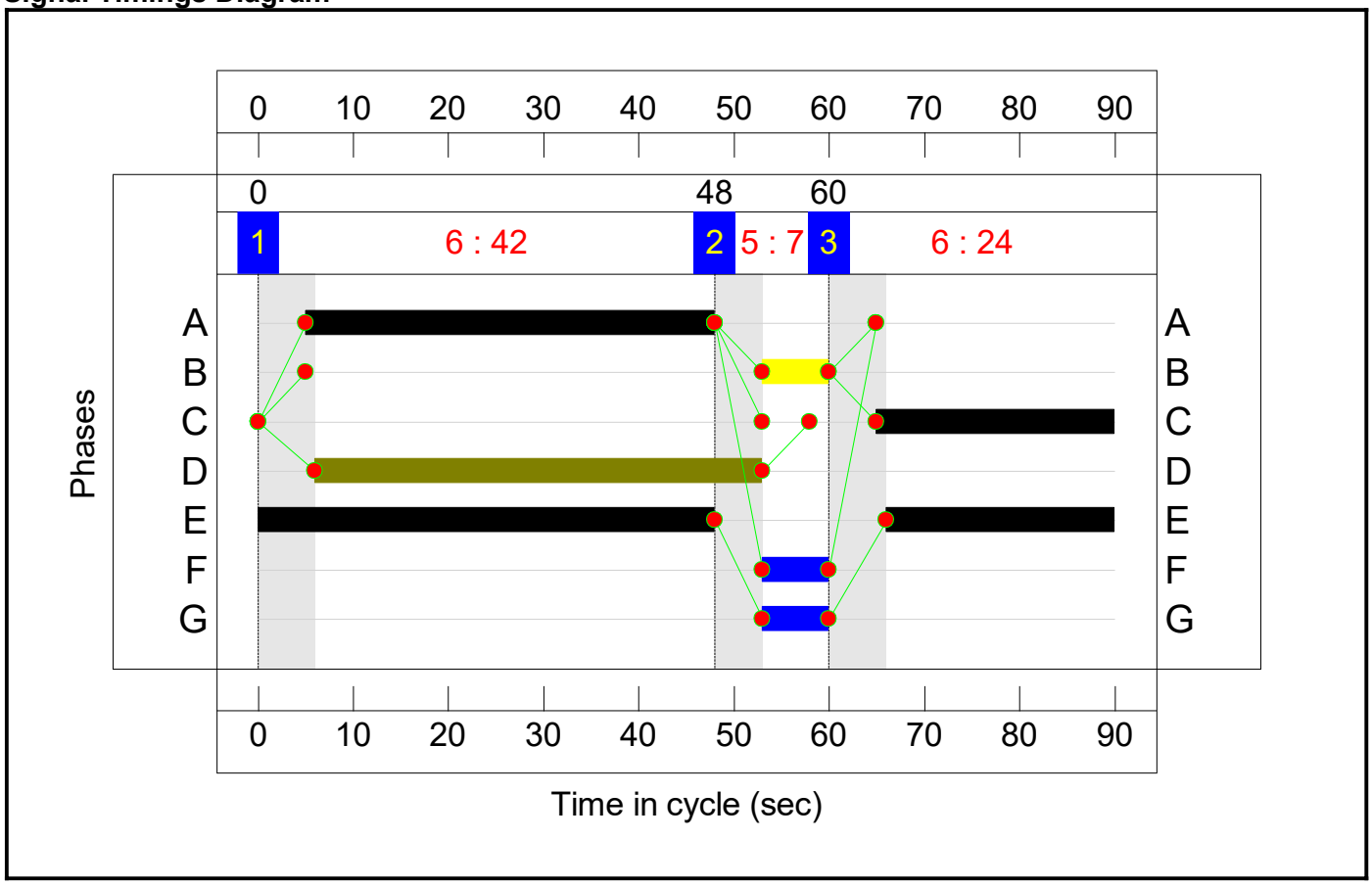
		Destination				
		A	B	C	D	Tot.
Origin	A	0	244	112	480	836
	B	223	0	4	169	396
	C	0	0	0	0	0
	D	550	99	11	0	660
	Tot.	773	343	127	649	1892

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	29.2 %	1832	1832
				Arm 6 Ahead	Inf	13.4 %		
				Arm 7 Right	28.00	57.4 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	1.0 %	1875	1875
				Arm 7 Ahead	Inf	42.7 %		
				Arm 8 Right	12.90	56.3 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	90.0 %	1922	1922
				Arm 6 Right	6.65	10.0 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 5: '2026 Do Minimum AM' (FG5: '2026 Do Minimum AM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

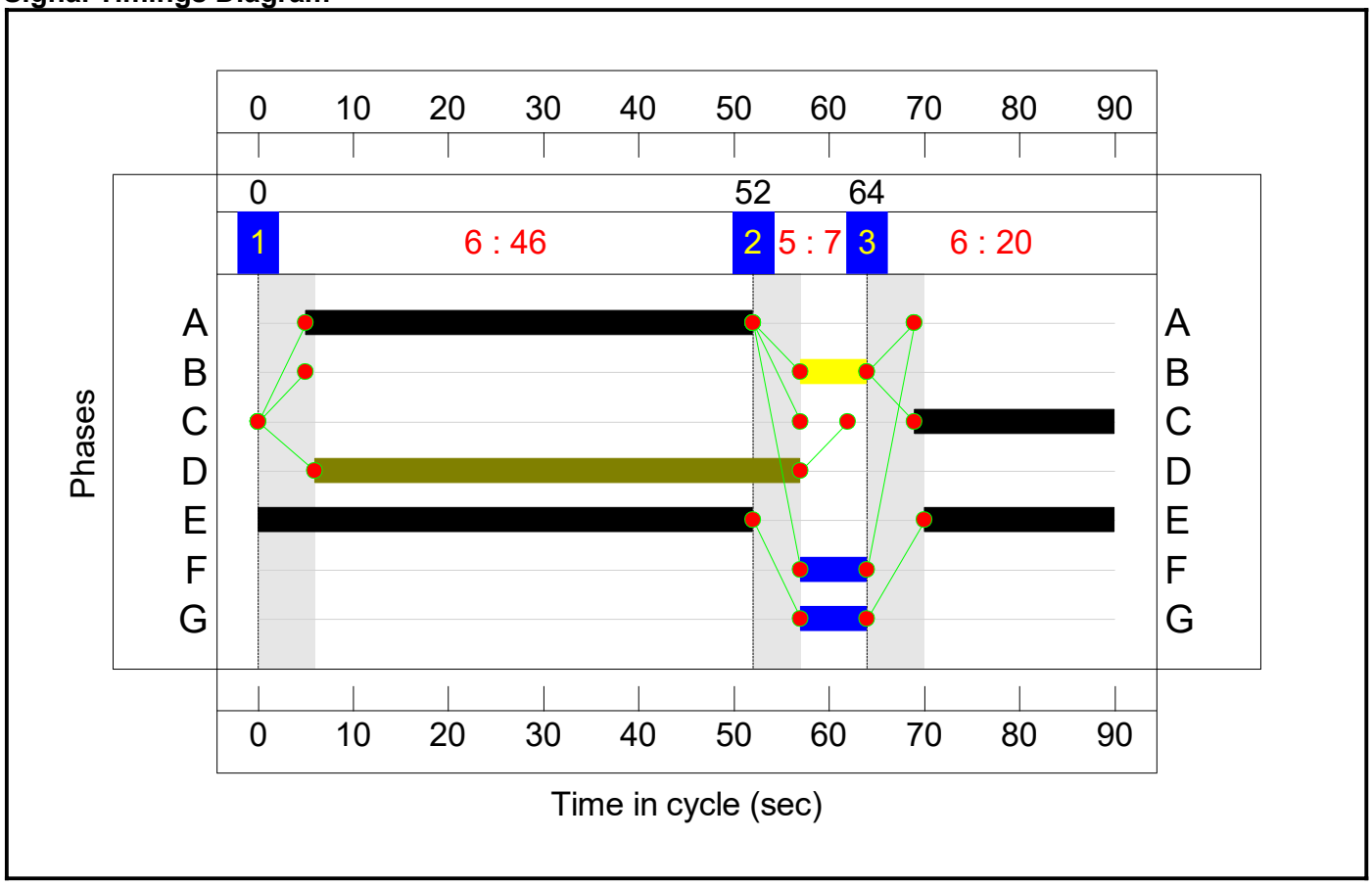
		Destination				
		A	B	C	D	Tot.
Origin	A	0	122	90	436	648
	B	232	0	10	136	378
	C	0	0	0	0	0
	D	474	94	7	0	575
	Tot.	706	216	107	572	1601

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	18.8 %	1848	1848
				Arm 6 Ahead	Inf	13.9 %		
				Arm 7 Right	28.00	67.3 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	2.6 %	1861	1861
				Arm 7 Ahead	Inf	36.0 %		
				Arm 8 Right	12.90	61.4 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	93.1 %	1935	1935
				Arm 6 Right	6.65	6.9 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 6: '2026 Do Minimum PM' (FG6: '2026 Do Minimum PM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

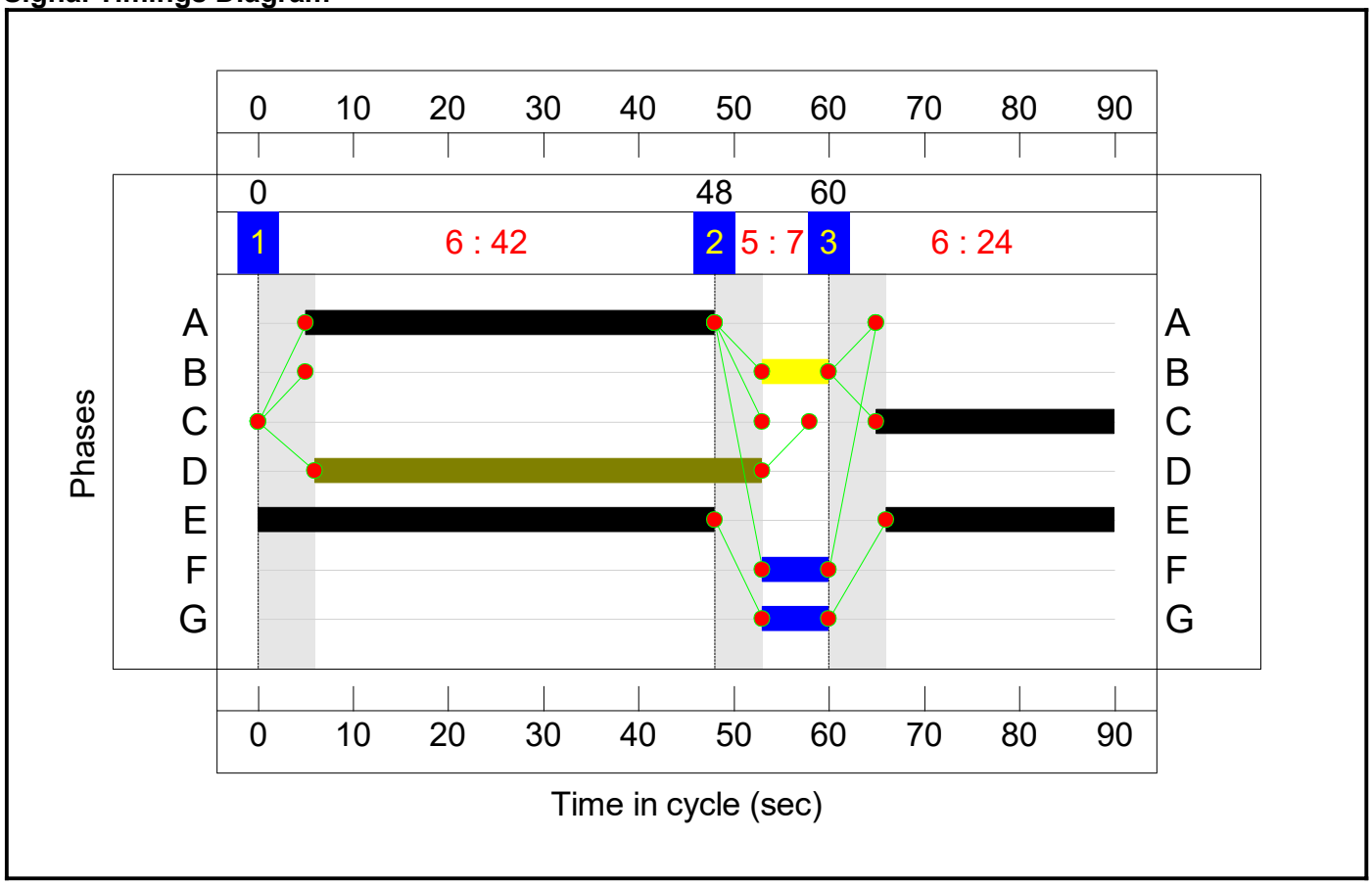
		Destination				
		A	B	C	D	Tot.
Origin	A	0	252	117	506	875
	B	230	0	4	170	404
	C	0	0	0	0	0
	D	581	102	11	0	694
	Tot.	811	354	132	676	1973

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	28.8 %	1832	1832
				Arm 6 Ahead	Inf	13.4 %		
				Arm 7 Right	28.00	57.8 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	1.0 %	1874	1874
				Arm 7 Ahead	Inf	42.1 %		
				Arm 8 Right	12.90	56.9 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	90.3 %	1923	1923
				Arm 6 Right	6.65	9.7 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 7: '2038 Base AM' (FG7: '2038 Base AM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

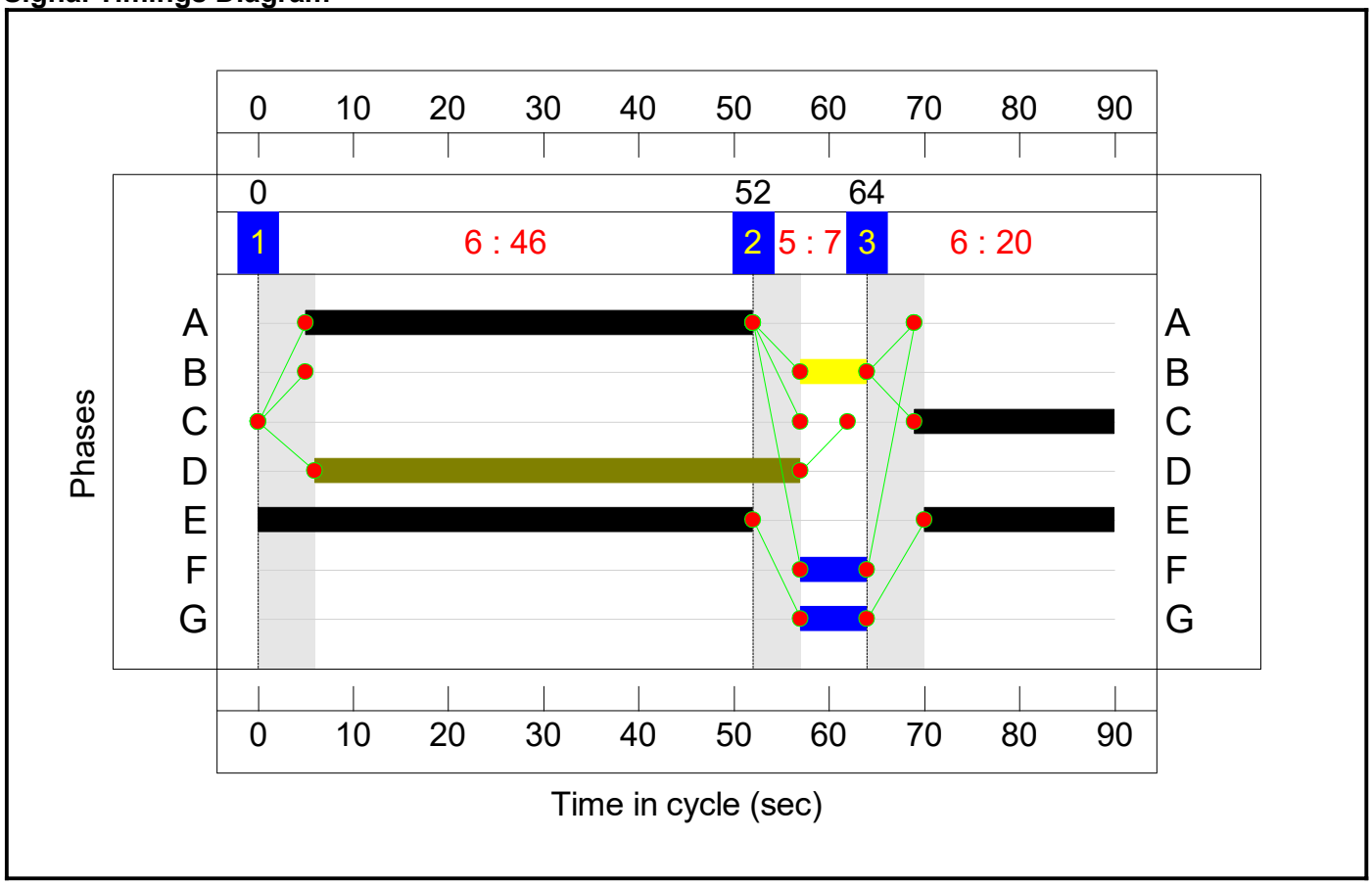
		Destination				
		A	B	C	D	Tot.
Origin	A	0	128	94	455	677
	B	242	0	11	142	395
	C	0	0	0	0	0
	D	495	98	8	0	601
	Tot.	737	226	113	597	1673

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	18.9 %	1848	1848
				Arm 6 Ahead	Inf	13.9 %		
				Arm 7 Right	28.00	67.2 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	2.8 %	1861	1861
				Arm 7 Ahead	Inf	35.9 %		
				Arm 8 Right	12.90	61.3 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	92.5 %	1932	1932
				Arm 6 Right	6.65	7.5 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 8: '2038 Base PM' (FG8: '2038 Base PM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

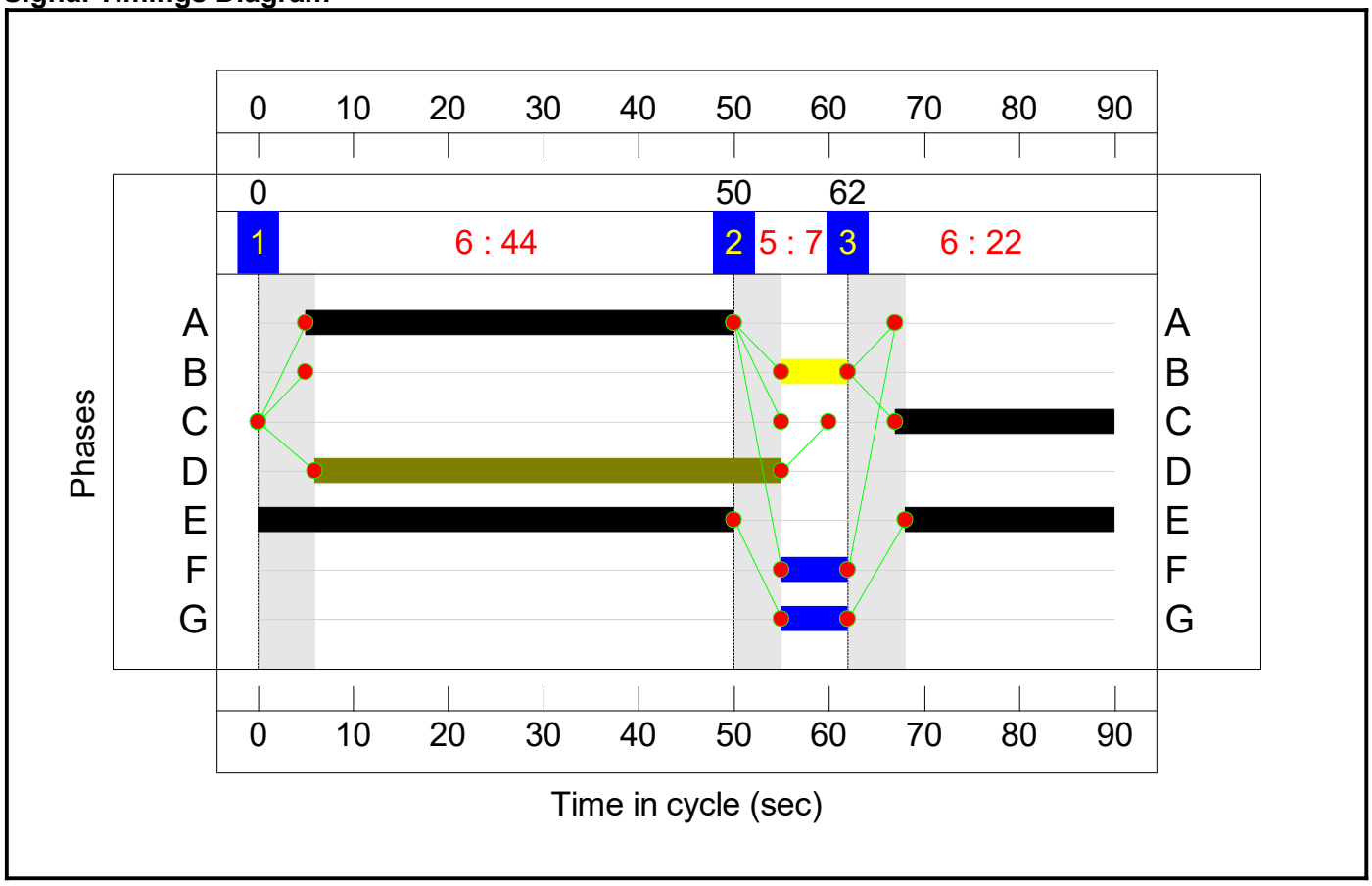
		Destination				
		A	B	C	D	Tot.
Origin	A	0	262	122	525	909
	B	239	0	4	176	419
	C	0	0	0	0	0
	D	602	106	12	0	720
	Tot.	841	368	138	701	2048

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	28.8 %	1832	1832
				Arm 6 Ahead	Inf	13.4 %		
				Arm 7 Right	28.00	57.8 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	1.0 %	1874	1874
				Arm 7 Ahead	Inf	42.0 %		
				Arm 8 Right	12.90	57.0 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	89.8 %	1921	1921
				Arm 6 Right	6.65	10.2 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 9: '2038 Do Minimum AM' (FG9: '2038 Do Minimum AM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

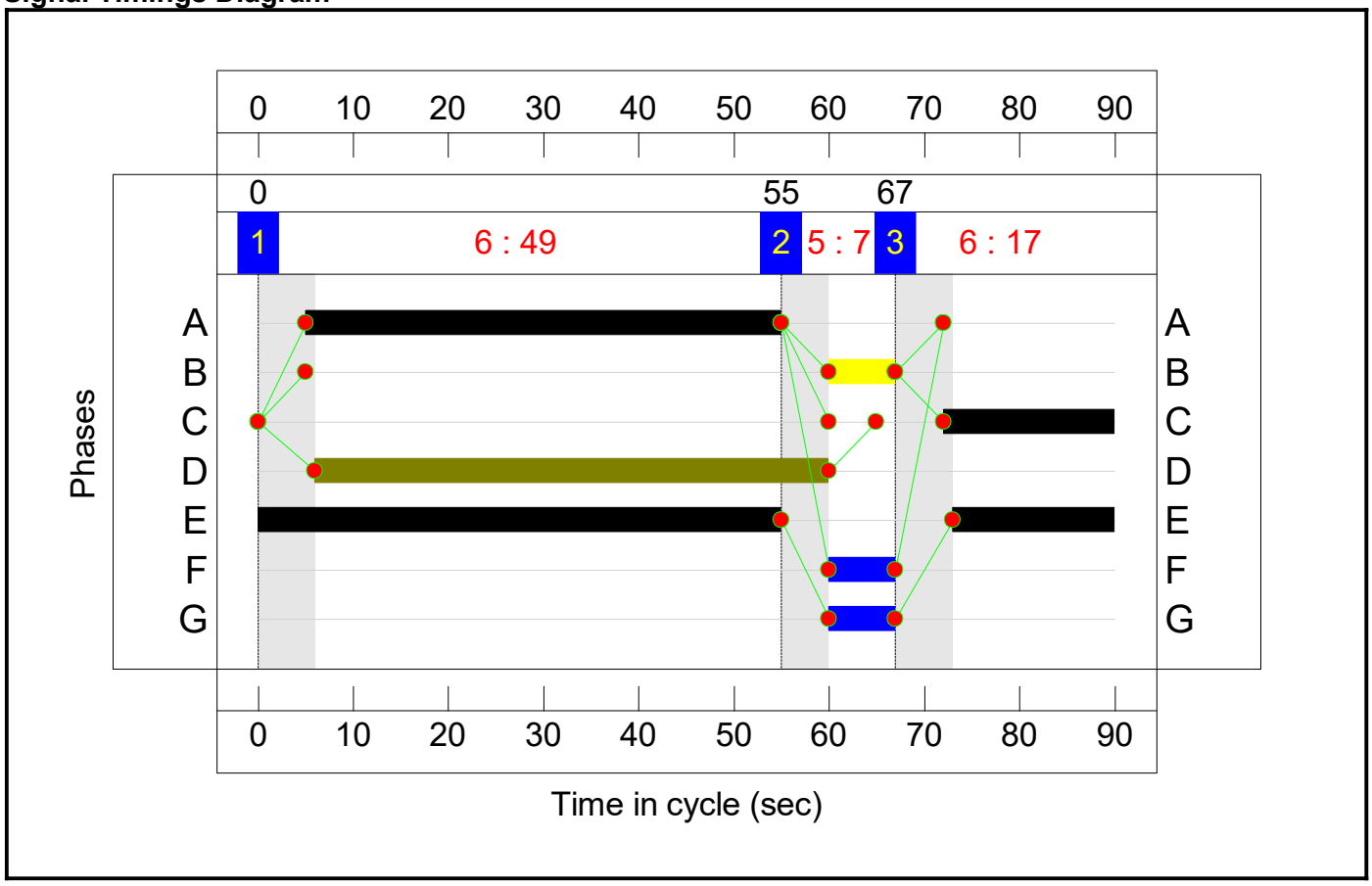
		Destination				
		A	B	C	D	Tot.
Origin	A	0	128	94	547	769
	B	242	0	11	142	395
	C	0	0	0	0	0
	D	751	98	8	0	857
	Tot.	993	226	113	689	2021

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	16.6 %	1850	1850
				Arm 6 Ahead	Inf	12.2 %		
				Arm 7 Right	28.00	71.1 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	2.8 %	1861	1861
				Arm 7 Ahead	Inf	35.9 %		
				Arm 8 Right	12.90	61.3 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	92.5 %	1932	1932
				Arm 6 Right	6.65	7.5 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 10: '2038 Do Minimum PM' (FG10: '2038 Do Minimum PM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

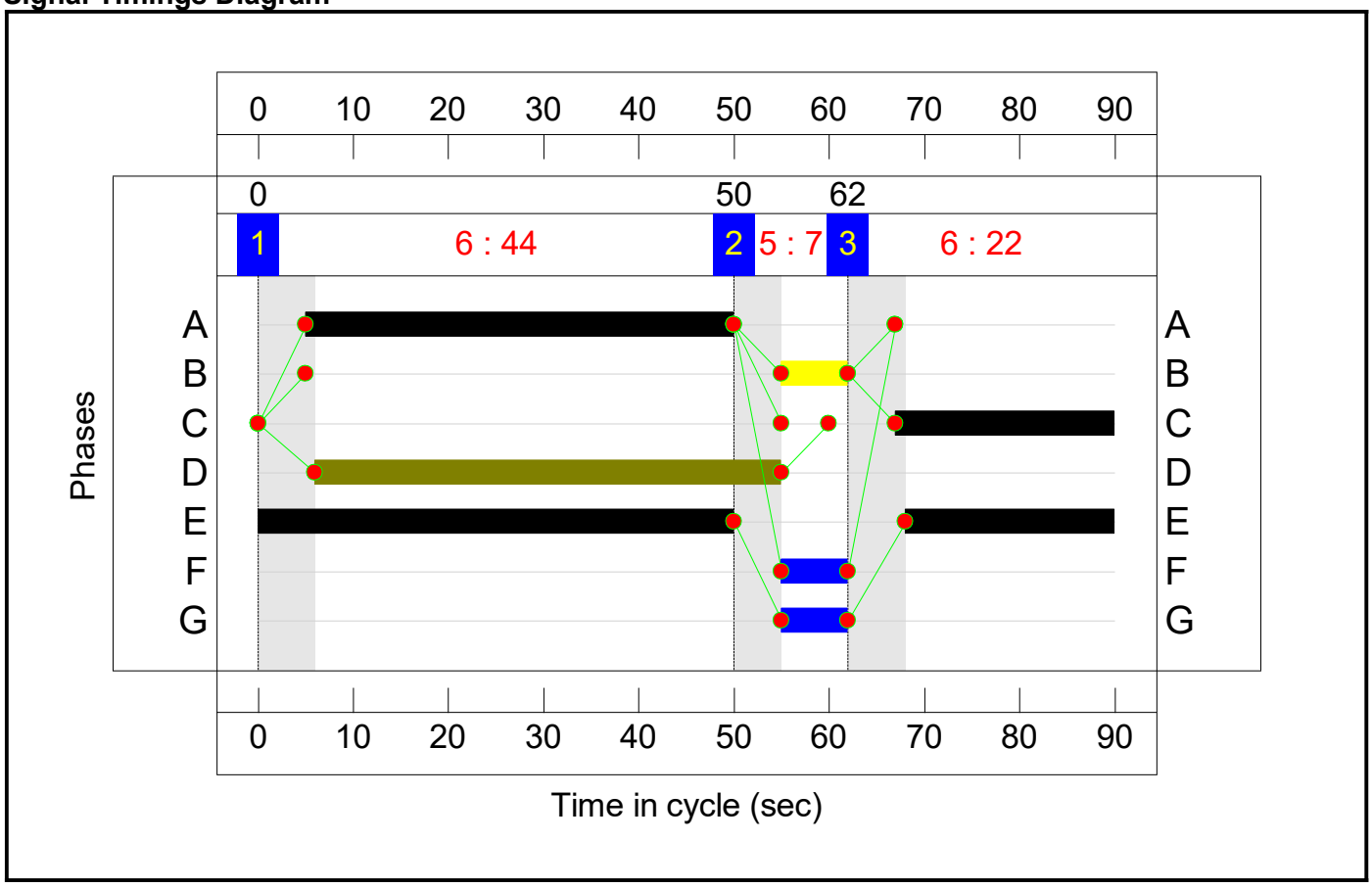
		Destination				
		A	B	C	D	Tot.
Origin	A	0	262	122	763	1147
	B	239	0	4	176	419
	C	0	0	0	0	0
	D	719	106	12	0	837
	Tot.	958	368	138	939	2403

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	22.8 %	1839	1839
				Arm 6 Ahead	Inf	10.6 %		
				Arm 7 Right	28.00	66.5 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	1.0 %	1874	1874
				Arm 7 Ahead	Inf	42.0 %		
				Arm 8 Right	12.90	57.0 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	89.8 %	1921	1921
				Arm 6 Right	6.65	10.2 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 11: '2038 Do Something (Option 1) AM' (FG11: '2038 Do Something (Option 1) AM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

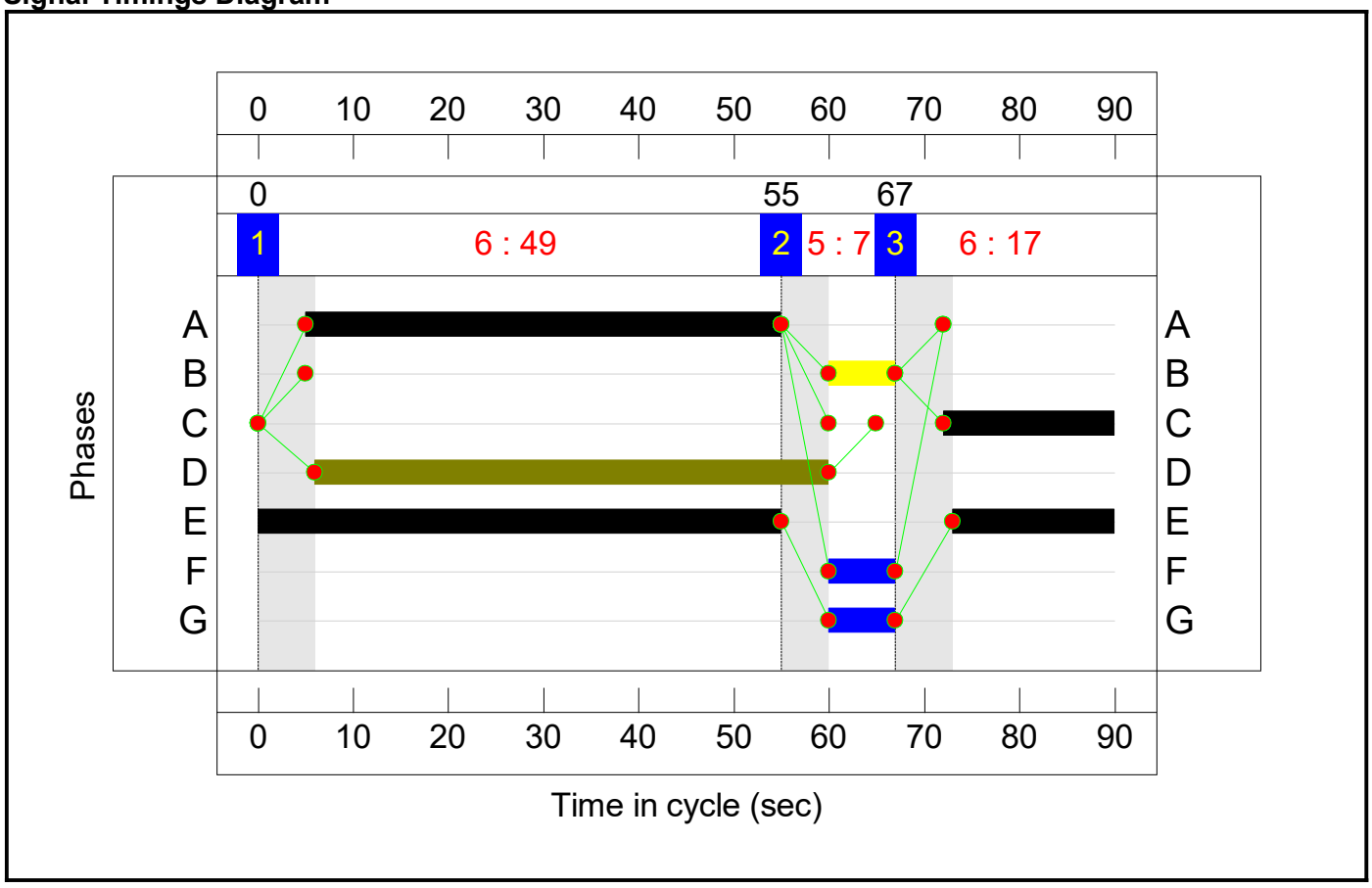
		Destination				
		A	B	C	D	Tot.
Origin	A	0	128	94	547	769
	B	242	0	11	142	395
	C	0	0	0	0	0
	D	751	98	8	0	857
	Tot.	993	226	113	689	2021

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	16.6 %	1850	1850
				Arm 6 Ahead	Inf	12.2 %		
				Arm 7 Right	28.00	71.1 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	2.8 %	1861	1861
				Arm 7 Ahead	Inf	35.9 %		
				Arm 8 Right	12.90	61.3 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	92.5 %	1932	1932
				Arm 6 Right	6.65	7.5 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 12: '2038 Do Something (Option 1) PM' (FG12: '2038 Do Something (Option 1) PM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

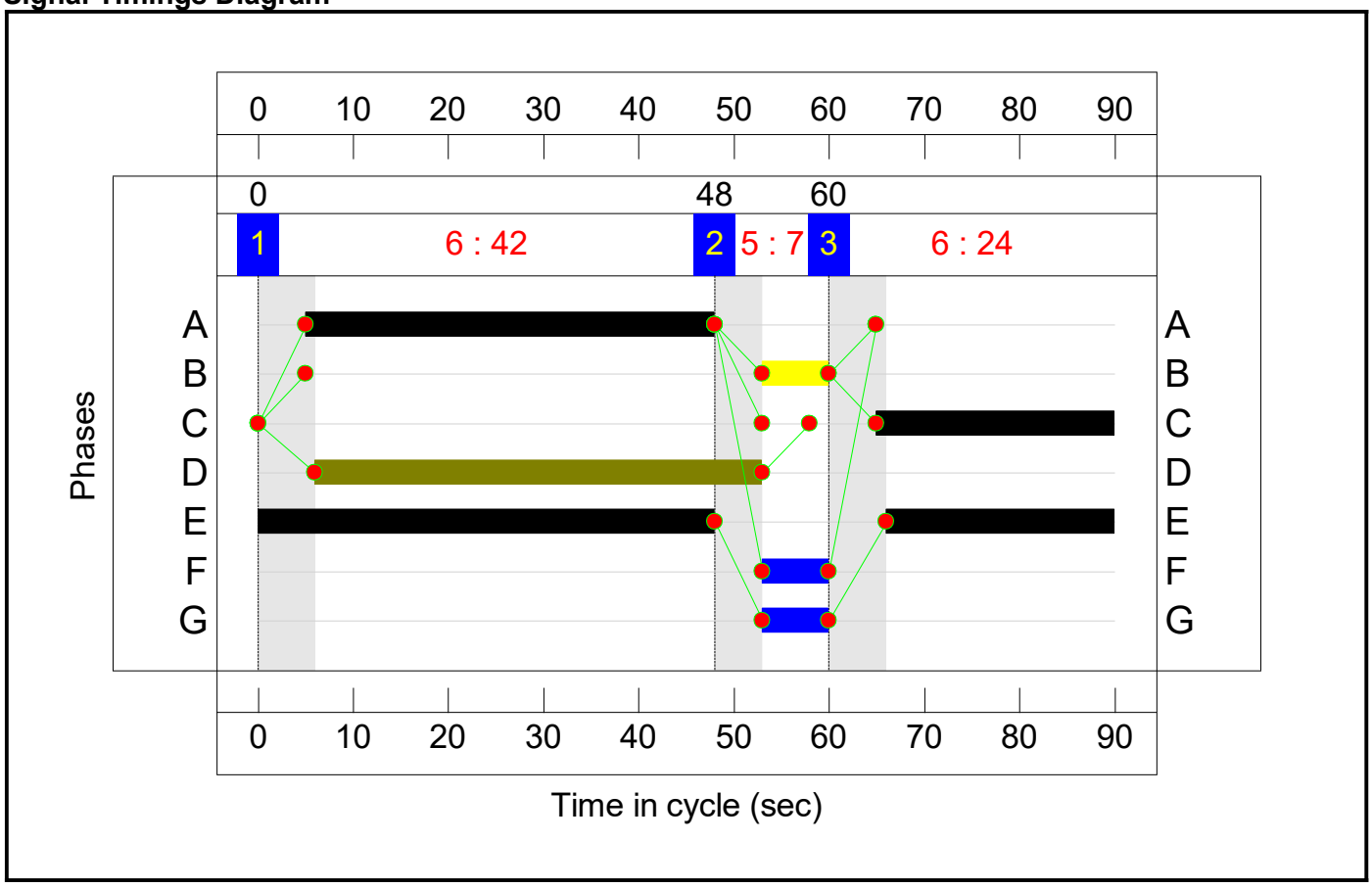
		Destination				
		A	B	C	D	Tot.
Origin	A	0	262	122	763	1147
	B	239	0	4	176	419
	C	0	0	0	0	0
	D	719	106	12	0	837
	Tot.	958	368	138	939	2403

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	22.8 %	1839	1839
				Arm 6 Ahead	Inf	10.6 %		
				Arm 7 Right	28.00	66.5 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	1.0 %	1874	1874
				Arm 7 Ahead	Inf	42.0 %		
				Arm 8 Right	12.90	57.0 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	89.8 %	1921	1921
				Arm 6 Right	6.65	10.2 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 13: '2038 Do Something (Option 2/3) AM' (FG13: '2038 Do Something (Option 2/3) AM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

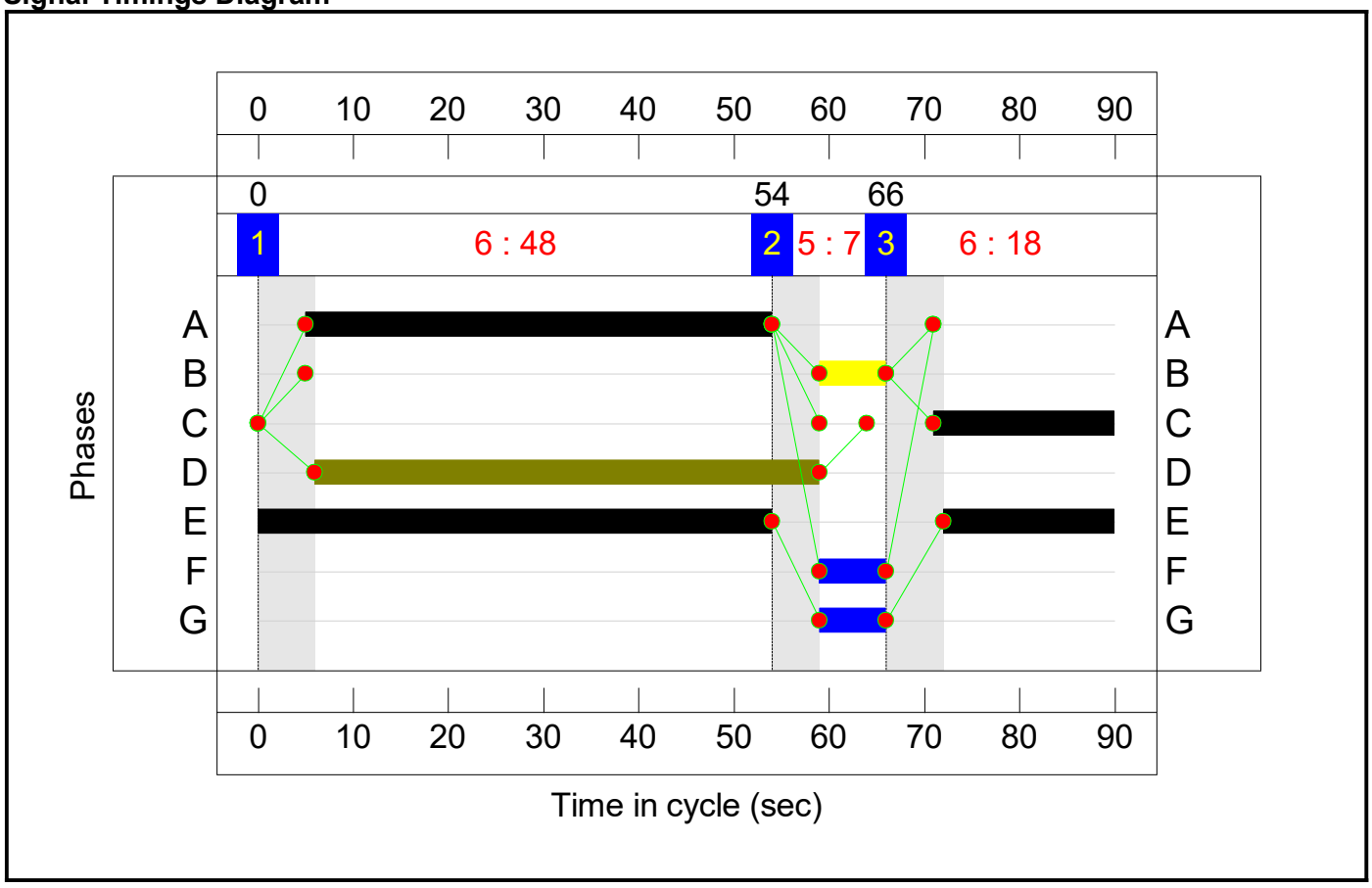
		Destination				
		A	B	C	D	Tot.
Origin	A	0	128	94	460	682
	B	242	0	11	142	395
	C	0	0	0	0	0
	D	601	98	8	0	707
	Tot.	843	226	113	602	1784

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	18.8 %	1848	1848
				Arm 6 Ahead	Inf	13.8 %		
				Arm 7 Right	28.00	67.4 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	2.8 %	1861	1861
				Arm 7 Ahead	Inf	35.9 %		
				Arm 8 Right	12.90	61.3 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	92.5 %	1932	1932
				Arm 6 Right	6.65	7.5 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Scenario 14: '2038 Do Something (Option 2/3) PM' (FG14: '2038 Do Something (Option 2/3) PM', Plan 1: 'Network Control Plan 1')

Signal Timings Diagram



Traffic Flows, Desired

Desired Flow :

		Destination				
		A	B	C	D	Tot.
Origin	A	0	262	122	642	1026
	B	239	0	4	176	419
	C	0	0	0	0	0
	D	616	106	12	0	734
	Tot.	855	368	138	818	2179

Lane Saturation Flows

Junction: A1077/Holydyke/Hungate Signalised Junction Option								
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 (A1077 (W))	3.50	0.00	Y	Arm 5 Left	10.41	25.5 %	1836	1836
				Arm 6 Ahead	Inf	11.9 %		
				Arm 7 Right	28.00	62.6 %		
2/1 (Holydyke)	3.85	0.00	Y	Arm 6 Left	12.00	1.0 %	1874	1874
				Arm 7 Ahead	Inf	42.0 %		
				Arm 8 Right	12.90	57.0 %		
3/1 (A1077 (E))	3.50	0.00	Y	Arm 8 Left	27.15	100.0 %	1862	1862
3/2 (A1077 (E))	3.50	0.00	Y	Arm 5 Ahead	Inf	89.8 %	1921	1921
				Arm 6 Right	6.65	10.2 %		
4/1 (A1077 (W) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Holydyke Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Hungate Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (A1077 (E) Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (A1077 (W) Internal)	4.00	0.00	Y	Arm 4 Ahead	Inf	100.0 %	2015	2015

Network Results

Scenario 1: '2021 Base AM' (FG1: '2021 Base AM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**66.2%**	-	-	**0**	**0**	**0**	**10.9**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**66.2%**	-	-	**0**	**0**	**0**	**10.9**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	43	-	598	1848	903	66.2%	598	598	-	-	-	3.9	23.2	12.3
2/1	Holydyke Left Ahead Right	U	C		1	25	-	351	1861	538	65.3%	351	351	-	-	-	3.7	37.6	8.5
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	54:7	47	535	1862:1934	757+172	57.6 : 57.6%	535	535	-	-	-	2.8	19.1	6.1
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	650	2015	1634	39.8%	650	650	-	-	-	0.5	3.0	1.9

C1

PRC for Signalled Lanes (%): 36.0
PRC Over All Lanes (%): 36.0

Total Delay for Signalled Lanes (pcuHr): 10.90
Total Delay Over All Lanes(pcuHr): 10.90

Cycle Time (s): 90

Scenario 2: '2021 Base PM' (FG2: '2021 Base PM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**84.9%**	-	-	**0**	**0**	**0**	**16.6**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**84.9%**	-	-	**0**	**0**	**0**	**16.6**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	47	-	821	1832	977	84.0%	821	821	-	-	-	6.6	28.9	19.9
2/1	Holydyke Left Ahead Right	U	C		1	21	-	389	1875	458	84.9%	389	389	-	-	-	6.1	56.6	11.8
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	58:7	51	649	1862:1921	846+171	63.8 : 63.8%	649	649	-	-	-	3.2	17.8	7.6
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	759	2015	1634	46.4%	759	759	-	-	-	0.7	3.3	2.4

C1 PRC for Signalled Lanes (%): 6.0 Total Delay for Signalled Lanes (pcuHr): 16.62 Cycle Time (s): 90
PRC Over All Lanes (%): 6.0 Total Delay Over All Lanes(pcuHr): 16.62

Scenario 3: '2026 Base AM' (FG3: '2026 Base AM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**67.4%**	-	-	**0**	**0**	**0**	**11.3**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**67.4%**	-	-	**0**	**0**	**0**	**11.3**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	43	-	609	1848	903	67.4%	609	609	-	-	-	4.0	23.6	12.5
2/1	Holydyke Left Ahead Right	U	C		1	25	-	358	1862	538	66.6%	358	358	-	-	-	3.8	38.1	8.8
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	54:7	47	545	1862:1935	756+172	58.7 : 58.7%	545	545	-	-	-	2.9	19.3	6.3
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	662	2015	1634	40.5%	662	662	-	-	-	0.6	3.0	2.0

C1 PRC for Signalled Lanes (%): 33.5 Total Delay for Signalled Lanes (pcuHr): 11.25 Cycle Time (s): 90
PRC Over All Lanes (%): 33.5 Total Delay Over All Lanes(pcuHr): 11.25

Scenario 4: '2026 Base PM' (FG4: '2026 Base PM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**86.4%**	-	-	**0**	**0**	**0**	**17.5**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**86.4%**	-	-	**0**	**0**	**0**	**17.5**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	47	-	836	1832	977	85.6%	836	836	-	-	-	7.0	30.3	20.7
2/1	Holydyke Left Ahead Right	U	C		1	21	-	396	1875	458	86.4%	396	396	-	-	-	6.5	59.0	12.4
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	58:7	51	660	1862:1922	854+171	64.4 : 64.4%	660	660	-	-	-	3.3	17.8	7.8
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	773	2015	1634	47.3%	773	773	-	-	-	0.7	3.4	2.5

C1 PRC for Signalled Lanes (%): 4.2 Total Delay for Signalled Lanes (pcuHr): 17.51 Cycle Time (s): 90
PRC Over All Lanes (%): 4.2 Total Delay Over All Lanes(pcuHr): 17.51

Scenario 5: '2026 Do Minimum AM' (FG5: '2026 Do Minimum AM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**71.7%**	-	-	**0**	**0**	**0**	**12.3**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**71.7%**	-	-	**0**	**0**	**0**	**12.3**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	43	-	648	1848	903	71.7%	648	648	-	-	-	4.5	25.1	13.9
2/1	Holydyke Left Ahead Right	U	C		1	25	-	378	1861	538	70.3%	378	378	-	-	-	4.2	39.7	9.6
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	54:7	47	575	1862:1935	807+172	58.7 : 58.7%	575	575	-	-	-	3.0	18.9	7.0
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	706	2015	1634	43.2%	706	706	-	-	-	0.6	3.1	2.1

C1

PRC for Signalled Lanes (%): 25.5
PRC Over All Lanes (%): 25.5

Total Delay for Signalled Lanes (pcuHr): 12.31
Total Delay Over All Lanes(pcuHr): 12.31

Cycle Time (s): 90

Scenario 6: '2026 Do Minimum PM' (FG6: '2026 Do Minimum PM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**89.6%**	-	-	**0**	**0**	**0**	**19.8**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**89.6%**	-	-	**0**	**0**	**0**	**19.8**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	47	-	875	1832	977	89.6%	875	875	-	-	-	8.5	35.1	23.4
2/1	Holydyke Left Ahead Right	U	C		1	21	-	404	1874	458	88.2%	404	404	-	-	-	7.0	62.4	13.0
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	58:7	51	694	1862:1923	879+171	66.1 : 66.1%	694	694	-	-	-	3.5	18.0	8.5
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	811	2015	1634	49.6%	811	811	-	-	-	0.8	3.5	2.8

C1 PRC for Signalled Lanes (%): 0.5 Total Delay for Signalled Lanes (pcuHr): 19.79 Cycle Time (s): 90
PRC Over All Lanes (%): 0.5 Total Delay Over All Lanes(pcuHr): 19.79

Scenario 7: '2038 Base AM' (FG7: '2038 Base AM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**74.9%**	-	-	**0**	**0**	**0**	**13.4**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**74.9%**	-	-	**0**	**0**	**0**	**13.4**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	43	-	677	1848	903	74.9%	677	677	-	-	-	5.0	26.4	15.0
2/1	Holydyke Left Ahead Right	U	C		1	25	-	395	1861	538	73.5%	395	395	-	-	-	4.5	41.3	10.2
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	54:7	47	601	1862:1932	802+172	61.7 : 61.7%	601	601	-	-	-	3.2	19.4	7.4
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	737	2015	1634	45.1%	737	737	-	-	-	0.7	3.2	2.2

C1 PRC for Signalled Lanes (%): 20.1 Total Delay for Signalled Lanes (pcuHr): 13.39 Cycle Time (s): 90
PRC Over All Lanes (%): 20.1 Total Delay Over All Lanes(pcuHr): 13.39

Scenario 8: '2038 Base PM' (FG8: '2038 Base PM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**93.0%**	-	-	**0**	**0**	**0**	**23.4**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**93.0%**	-	-	**0**	**0**	**0**	**23.4**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	47	-	909	1832	977	93.0%	909	909	-	-	-	10.6	42.1	26.7
2/1	Holydyke Left Ahead Right	U	C		1	21	-	419	1874	458	91.5%	419	419	-	-	-	8.2	70.7	14.5
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	58:7	51	720	1862:1921	871+171	69.1 : 69.1%	720	720	-	-	-	3.7	18.7	9.2
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	841	2015	1634	51.5%	841	841	-	-	-	0.8	3.6	2.9

C1 PRC for Signalled Lanes (%): -3.4 Total Delay for Signalled Lanes (pcuHr): 23.43 Cycle Time (s): 90
PRC Over All Lanes (%): -3.4 Total Delay Over All Lanes(pcuHr): 23.43

Scenario 9: '2038 Do Minimum AM' (FG9: '2038 Do Minimum AM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**81.3%**	-	-	**0**	**0**	**0**	**16.9**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**81.3%**	-	-	**0**	**0**	**0**	**16.9**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	45	-	769	1850	946	81.3%	769	769	-	-	-	6.1	28.4	18.1
2/1	Holydyke Left Ahead Right	U	C		1	23	-	395	1861	496	79.6%	395	395	-	-	-	5.3	47.9	11.0
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	56:7	49	857	1862:1932	1074+152	69.9 : 69.9%	857	857	-	-	-	4.5	18.7	13.9
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	993	2015	1634	60.8%	993	993	-	-	-	1.2	4.3	4.2

C1

PRC for Signalled Lanes (%): 10.7
PRC Over All Lanes (%): 10.7

Total Delay for Signalled Lanes (pcuHr): 16.95
Total Delay Over All Lanes(pcuHr): 16.95

Cycle Time (s): 90

Scenario 10: '2038 Do Minimum PM' (FG10: '2038 Do Minimum PM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queu (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**110.1%**	-	-	**0**	**0**	**0**	**95.6**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**110.1%**	-	-	**0**	**0**	**0**	**95.6**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	50	-	1147	1839	1042	110.1%	1147	1042	-	-	-	68.0	213.3	88.7
2/1	Holydyke Left Ahead Right	U	C		1	18	-	419	1874	396	105.9%	419	396	-	-	-	23.0	197.4	28.9
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	61:7	54	837	1862:1921	1143+171	62.9 : 69.1%	837	837	-	-	-	3.6	15.5	10.6
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	958	2015	1634	57.8%	945	945	-	-	-	1.1	4.1	3.7

C1 PRC for Signalled Lanes (%): -22.3 Total Delay for Signalled Lanes (pcuHr): 95.61 Cycle Time (s): 90
PRC Over All Lanes (%): -22.3 Total Delay Over All Lanes(pcuHr): 95.61

Scenario 11: '2038 Do Something (Option 1) AM' (FG11: '2038 Do Something (Option 1) AM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**81.3%**	-	-	**0**	**0**	**0**	**16.9**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**81.3%**	-	-	**0**	**0**	**0**	**16.9**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	45	-	769	1850	946	81.3%	769	769	-	-	-	6.1	28.4	18.1
2/1	Holydyke Left Ahead Right	U	C		1	23	-	395	1861	496	79.6%	395	395	-	-	-	5.3	47.9	11.0
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	56:7	49	857	1862:1932	1074+152	69.9 : 69.9%	857	857	-	-	-	4.5	18.7	13.9
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	993	2015	1634	60.8%	993	993	-	-	-	1.2	4.3	4.2

C1 PRC for Signalled Lanes (%): 10.7 Total Delay for Signalled Lanes (pcuHr): 16.95 Cycle Time (s): 90
PRC Over All Lanes (%): 10.7 Total Delay Over All Lanes(pcuHr): 16.95

Scenario 12: '2038 Do Something (Option 1) PM' (FG12: '2038 Do Something (Option 1) PM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queu (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**110.1%**	-	-	**0**	**0**	**0**	**95.6**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**110.1%**	-	-	**0**	**0**	**0**	**95.6**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	50	-	1147	1839	1042	110.1%	1147	1042	-	-	-	68.0	213.3	88.7
2/1	Holydyke Left Ahead Right	U	C		1	18	-	419	1874	396	105.9%	419	396	-	-	-	23.0	197.4	28.9
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	61:7	54	837	1862:1921	1143+171	62.9 : 69.1%	837	837	-	-	-	3.6	15.5	10.6
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	958	2015	1634	57.8%	945	945	-	-	-	1.1	4.1	3.7

C1 PRC for Signalled Lanes (%): -22.3 Total Delay for Signalled Lanes (pcuHr): 95.61 Cycle Time (s): 90
PRC Over All Lanes (%): -22.3 Total Delay Over All Lanes(pcuHr): 95.61

Scenario 13: '2038 Do Something (Option 2/3) AM' (FG13: '2038 Do Something (Option 2/3) AM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**75.5%**	-	-	**0**	**0**	**0**	**14.0**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**75.5%**	-	-	**0**	**0**	**0**	**14.0**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	43	-	682	1848	903	75.5%	682	682	-	-	-	5.0	26.6	15.2
2/1	Holydyke Left Ahead Right	U	C		1	25	-	395	1861	538	73.5%	395	395	-	-	-	4.5	41.3	10.2
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	54:7	47	707	1862:1932	1014+172	59.3 : 61.7%	707	707	-	-	-	3.6	18.2	9.9
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	843	2015	1634	51.6%	843	843	-	-	-	0.8	3.6	2.9

C1 PRC for Signalled Lanes (%): 19.2 Total Delay for Signalled Lanes (pcuHr): 14.00 Cycle Time (s): 90
PRC Over All Lanes (%): 19.2 Total Delay Over All Lanes(pcuHr): 14.00

Scenario 14: '2038 Do Something (Option 2/3) PM' (FG14: '2038 Do Something (Option 2/3) PM', Plan 1: 'Network Control Plan 1')

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**100.6%**	-	-	**0**	**0**	**0**	**43.1**	-	-
A1077/Holydyke/Hungate Signalised Junction Option	-	-	-		-	-	-	-	-	-	**100.6%**	-	-	**0**	**0**	**0**	**43.1**	-	-
1/1	A1077 (W) Left Ahead Right	U	A		1	49	-	1026	1836	1020	100.6%	1026	1020	-	-	-	23.5	82.6	43.4
2/1	Holydyke Left Ahead Right	U	C		1	19	-	419	1874	416	100.6%	419	416	-	-	-	15.1	129.7	21.4
3/1+3/2	A1077 (E) Ahead Right Left	U	B	D	1	60:7	53	734	1862:1921	891+171	69.1 : 69.1%	734	734	-	-	-	3.6	17.7	8.8
8/1	A1077 (W) Internal Ahead	U	E		1	72	-	855	2015	1634	52.2%	854	854	-	-	-	0.9	3.6	3.0

C1 PRC for Signalled Lanes (%): -11.8 Total Delay for Signalled Lanes (pcuHr): 43.11 Cycle Time (s): 90
PRC Over All Lanes (%): -11.8 Total Delay Over All Lanes(pcuHr): 43.11