On behalf of County Members

COM15021

Hitchin Industrial Area Transport Study

On behalf of County Members
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1 Executive Summary

The Integrated Transport Projects team of Hertfordshire County Council (HCC) has been appointed by Councillor Derrick Ashley and Councillor Judi Billing to undertake a transport study to investigate options for improving access to the Hitchin industrial estate via a new access road and improvements to the Cadwell crossroads.

Five options for providing a new access road were considered, along with seven traffic management options to improve the Cadwell crossroads, including Do Nothing. Having assessed the impacts of the access road options in combination with the traffic management options, reviewed the advantages and disadvantages of each as well as costs and risks to delivery, the following conclusions were drawn.

If providing additional capacity and removing HGVs from Grove Road is the priority, the option combination comprising the link to Stotfold Road (Option A / A1), banning turning movements between Grove Road and Cadwell Lane (Option 3) and an HGV ban on Grove Road (Option 2) is preferred. This option combination provides a second point of access to the industrial estate which would not have a headroom restriction, provides connectivity between Wilbury Way and Cadwell Lane and increases road network capacity at the Cadwell crossroads. There are however some disadvantages, including potential rat running on Girdle Road and Hillfield Avenue and some inconvenience for cyclists. In addition, there is re-routing of traffic travelling between Hitchin and north-west Letchworth through the industrial estate, which was not a scheme objective.

If traffic using the link to Stotfold Road as a through route is a concern, the Cadwell crossroads could be left in its existing form (Option 1) therefore acting as a constraint on network capacity, making the link road a less attractive route for through traffic. The industrial estate would still have the benefit of the new unconstrained link to Stotfold Road (Option A / A1) providing additional highway capacity for accessing the industrial estate, and enabling an HGV ban to be implemented on Grove Road (Option 2). This option combination (A / A1, 1 and 2) would have the benefit that it would not impact on cyclists or cause rat running on Girdle Road and Hillfield Avenue.

2 Introduction

2.1 Objective / Commission

The purpose of this transport study is to investigate options for improving access to the Hitchin industrial estate via a new access road, and improvements to the Cadwell Lane / Wilbury Way / Woolgrove Road / Grove Road junction (Cadwell crossroads). The study has been commissioned by:

- Derrick Ashley - Executive Member Environment, Planning and Transport Hertfordshire County Council, County Councillor Hitchin South; and
- Judi Billing Councillor, Hertfordshire County Council (Hitchin North electoral division).

2.2 Background

2.2.1 Policy

This study has been prepared with consideration to documents including the Hitchin Urban Transport Plan (UTP) – May 2011. The following extracts from the Hitchin UTP are relevant to this study:

In Table 4.2 (Walking Problems), Item W9: *Lack of islands and pedestrian lights phase at the Cadwell Lane crossroads.*

In Table 4.6 (Highways Problems), the following are identified:

- Cadwell Lane seen as being inappropriate for HGV'S and causes community severance (H1).
- Lack of a pedestrian phase on Cadwell Lane and Walsworth Road crossroads (H3).
- HGV's route through residential areas (H4).
- HGV's unable to negotiate Woolgrove Road bridge (H27).

In Table 7.3, the following is included as a longer term consideration: *Provide an access road from Stotfold Road to the employment area.*

In Table 7.4 (Assessed Short Term UTP Schemes) and Table 8.2 (Walking schemes and policies to be delivered in the first 5 years), Scheme Ref: WM6.1 includes *Upgrade the crossing facilities at the Cadwell Lane crossroads*.

In Table 7.5 (Medium Term UTP Schemes) and Table 8.5 (Highway schemes and policies to be delivered in the first 5 years), Scheme Ref: HM32 includes *Improve operation of Cadwell Lane junction to minimise the impact of HGV's on the local area and improve crossings.*

2.2.2 Supporting Studies

The potential for providing a new access road to the Hitchin industrial estate and options for improving the operation of the Cadwell crossroads have been considered in a number of previous reports, namely:

- Potential Improvements to Cadwell Lane / Grove Road / Wilbury Way / Woolgrove Road Junction, November 2009 (AECOM);
- Hitchin Urban Transport Plan – Cadwell Lane Corridor Study – up to 2014, February 2011 (AECOM);
- Hitchin Urban Transport Plan, May 2011 (AECOM); and
- North Hertfordshire District Council Preferred Option Housing Assessment – Transport Modelling Report 2014 – Update 2, January 2015 (AECOM).

The work undertaken in each report, including the options tested and the conclusions are summarised below:

Potential Improvements to Cadwell Lane / Grove Road / Wilbury Way / Woolgrove Road Junction – November 2009

AECOM was commissioned by HCC in partnership with North Hertfordshire District Council to undertake an update of the Hitchin UTP. As part of the UTP update, a range of schemes were considered to prepare the town for the potential growth as set out by the Regional Spatial Strategy. Two of the schemes considered were upgrades to the Cadwell crossroads, and the provision of a link road between Stotfold Road and the Hitchin industrial estate. At the time that the report was written, the Hitchin rail flyover was in the planning stages, so recommendations with regard to the Stotfold Road link were high level in nature.

The report was based on 2008 traffic flows which were growthed to 2031 using Tempro and NRTF growth factors. Two scenarios for the Cadwell crossroads were tested using LinSig:

- Do Minimum (no network improvements); and
- Minor Improvements, where lane reassignment was considered on Grove Road.

The following Do Something (DS) scenarios were tested for the link road:

- DS1: New access road between Stotfold Road and Wilbury Way;
- DS2: New access road between Stotfold Road and Cadwell Lane;
- DS3: New access road between Stotfold Road and Industrial Estate (Wilbury Way and Cadwell Lane);

- DS3 Signals Optimised: DS3 option with the signals at Cadwell crossroads optimised; and

- DS3a: DS3 option with a HGV ban at the junction.

The 2009 report concluded that minor improvements to the Cadwell crossroads could be provided within the highway boundary, with a view to improving HGV manoeuvres through the junction. These improvements took the form of kerbline widening between Grove Road and Cadwell Lane. The report also stated that the best way to reduce the percentage of HGVs travelling through the junction would be the provision of the new link road, although it was considered at the time to be difficult to justify economically.

Hitchin UTP – Cadwell Lane Corridor Study 2011 Report

In 2011, as a continuation of the work which had been undertaken in 2009, AECOM were commissioned by HCC to establish a set of mitigation measures for the Cadwell crossroads to address a number of existing issues. As the Stotfold Road link was not planned for short term implementation, any options requiring the inclusion of the link road were discounted from the modelling process. Testing of the options was undertaken using 2014 flows in the Stevenage and Hitchin Urban Transport Model (SHUM), with further detailed analysis undertaken using LinSig.

The following options were considered:

- Option 1: Banned HGV turns between Grove Road and Cadwell Lane (both directions), with an HGV weight restriction along Grove Road and signal optimisation to include pedestrian facilities;

- Option 2: Banned turns between Grove Road and Cadwell Lane (all vehicles in both directions), with an HGV weight restriction on Grove Road and signal optimisation to include pedestrian facilities; and

- Option 3: All right turns banned, and signal optimisation to include pedestrian facilities.

However, as the banned movements would have required the construction of the link road from Stotfold Rd to accommodate HGV traffic, the above options were discounted from the testing process prior to modelling. Instead, the following fourth option was tested and identified as the preferred option:

- Option 4: Banned right turn movements from Grove Road to Woolgrove Road, and Wilbury Way to Cadwell Lane, and signal optimisation to include pedestrian facilities.

The report also stated that the junction would become overloaded by 2014 without the inclusion of signalised pedestrian crossings. Nevertheless, the puffin crossings have been installed, together with kerb realignment on the corner of the junction between Grove Road and Cadwell Lane.

Hitchin Urban Transport Plan, May 2011

This document built on the Cadwell Lane Corridor Study. Option 4, which was the preferred option was discounted following comments from local members that the banning of right turn movements by HGVs was not acceptable.

As a result Option 4 was revised to remove the right turn bans whilst retaining the improved pedestrian crossing provision. This option was called Option 5, and the operation of the junction was tested using 2014 traffic flows. It was noted that the introduction of pedestrian phases in every cycle would considerably worsen the operation of the Woolgrove Road and Grove Road approaches to the junction in the AM peak. In the PM peak the junction was observed to be operating within capacity albeit with slightly reduced capacity.

In the Hitchin UTP, Volume 1, Section 7 (Programme of Measures Required), the following is identified:

- Table 7.3 (Longer Term Considerations) includes *Provide an access road from Stotfold Road to the employment area*.
- Table 7.4 (Assessed Short Term UTP Schemes) includes *Upgrade the crossing facilities at the Cadwell Lane crossroads* (Scheme Ref: WM6.1).
- Table 7.5 (Medium Term UTP Schemes) includes *Improve operation of Cadwell Lane junction to minimise the impact of HGV's on the local area and improve crossings* (Scheme Ref: HM32).

North Hertfordshire District Council Preferred Option Housing Assessment – Transport Modelling Report 2014 – Update 2, January 2015

In 2012, AECOM were commissioned by North Herts District Council (NHDC) to look at future transport issues across the district, responding to housing development forecasts and informing the development of the Core Strategy. In particular the report aimed to identify transport related issues and to suggest mitigation proposals.

A set of proposals was accepted as the Preferred Option development proposal and in 2014 NHDC requested an updated development assessment - the Interim Transport Modelling Report - based on the Preferred Option and the latest SHUM forecasting model which was updated in January 2014 and approved by the Highways Agency in March 2014.

AECOM produced an updated report in January 2015 which included consideration of the impacts of the Stevenage Borough development assumptions. Within the updated report, the Cadwell crossroads was highlighted as a problem location in the 2031 test year. It was suggested within the report that Cadwell Lane and Wilbury Way should be linked at their northern ends to balance traffic flows at the signalised junction, where lane reallocation was suggested as a mitigation measure.

The above studies identified the following problems with the existing industrial estate access roads:

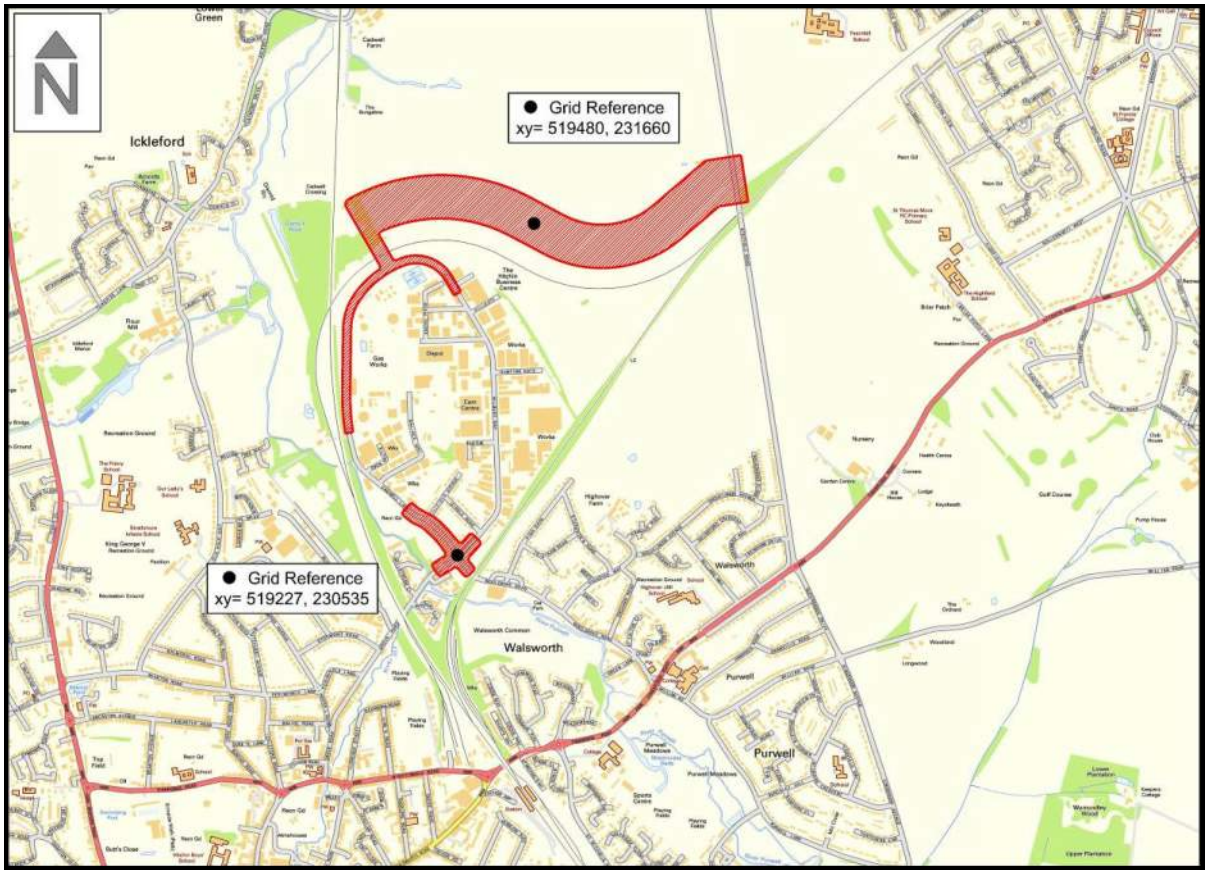
- Tight turning radii for HGV at the Cadwell crossroads (identified in the 2009 report);
- Higher than average proportion of HGVs for the road type (identified in the 2009 report);
- Capacity problems at the Cadwell crossroads resulting in delays and congestion (identified in the 2009, 2011 and 2015 reports);
- Substandard designs of the roads around the industrial area, leading to problems particularly for larger vehicles (identified in the UTP); and
- Residents perceive that HGVs using the Cadwell crossroads at peak times are an issue and affect the local area (identified in consultation for UTP).

3 Study Area

3.1 Existing Environment

The area under consideration in this study comprises the following locations in Hitchin, approximately 2 km north-east of the town centre:

- The four arm signalised junction between Cadwell Lane, Wilbury Way, Woolgrove Road and Grove Road, which is the existing access point to the industrial area; and
- The area to the north and east of the industrial area between Cadwell Lane, Wilbury Way and Stotfold Road.



The Cadwell crossroads is traffic signal controlled and includes pedestrian crossings on all approach arms. There are two entry lanes on Wilbury Way, Woolgrove Road and Grove Road and one entry lane on Cadwell Lane. On the corner of Grove Road and Cadwell Lane there are some local shops and the edge of the road carriageway is marked by a high kerb to prevent overrunning by HGVs. Pedestrian railings are provided around the junction to guide pedestrians to the signal controlled facilities.

Image 1 – View of HGV turning into Cadwell Lane from Grove Road

Image 2 – View of signal controlled junction from Cadwell Lane

Cadwell Lane is a two-lane single carriageway, which has a north-west / south-east orientation. The road provides access to the western side of the industrial area and connects with the Wilbury Way / Woolgrove Road / Grove Road junction at its southern end, and at the northern extent, enters the National Grid Operational Centre.

Residential properties form the frontage along Cadwell Lane for a distance of some 200 m from the junction, at which point it provides access to Hillfield Avenue, a residential cul-de-sac on the north. On-street parking occurs along the eastern kerbline of Cadwell Lane, reducing the effective width of the road, and this makes it difficult for HGVs to pass vehicles travelling in the opposite direction or queuing on approach to the junction.

Image 3 – View of Cadwell Lane looking north

Image 4 - View of Cadwell Lane looking south

Beyond Hillfield Avenue, Cadwell Lane mainly provides access to industrial access roads and premises on the east side. On the west side, there is a playing field with a sports pavilion. Cadwell Lane has a single lane approach to the junction with Wilbury Way / Woolgrove Road and Grove Road.

Wilbury Way is a wide two-lane single carriageway which has a north / south orientation and is a cul de sac. The road provides access to the eastern side of the industrial estate and connects with Cadwell Lane, Woolgrove Road and Grove Road via the signal controlled junction at its southern end. At the northern end, Wilbury Way enters a private car park. The road has two lanes marked on approach to the junction.

Image 5 – View of Wilbury Way looking west towards signal controlled junction

Image 6 - View of Wilbury Way looking east

Residential properties front Wilbury Way for the first 150 m from the junction with Cadwell Lane, Woolgrove Road and Grove Road, after which Wilbury Way provides access to industrial premises and access roads. Off-street parking is provided along the residential frontage.

Woolgrove Road is a two-lane single carriageway which runs from the north-west to south-east, between the Cadwell crossroads and the A505. Woolgrove Road has some residential frontage on the east side and there is Walsworth Common and a bowling club to the west. The road passes under a railway bridge approximately 80 m south of the junction with Cadwell Lane, Wilbury Way and Grove Road. The railway bridge imposes a headroom restriction of 13 feet (3.96 m) and also narrows the road carriageway. Woolgrove Road has a reasonably steep gradient and two lanes on approach to the junction.

Image 7 – View of Woolgrove Road looking north towards signal controlled junction

Image 8 - View of Woolgrove Road looking south towards railway bridge

Grove Road is a two-lane single carriageway which has a north-east / south-west orientation and connects to the A505 Nightingale Road at its southern end. The road has residential frontage with on street parking along part of its length and this narrows the effective road width. Grove Road passes under a railway bridge which has no headroom restriction and widens to include two lanes on approach to the Cadwell Lane, Wilbury Way and Grove Road junction. Grove Road provides the only route into the industrial area that has no headroom restriction.

Image 9 – View of Grove Road looking west

Image 10 - View of Grove Road looking east towards signal controlled junction

Cadwell Lane, Wilbury Way, Woolgrove Road and Grove Road are all subject to a 30 mph speed limit, with street lighting present around the junction.

The Hitchin rail flyover, which was completed in 2013, passes to the north of the industrial estate. The rail flyover branches off the west side of the East Coast Main Line before crossing over it and the Anglian Water access road, and joining the London to Cambridge line just west of Stotfold Road.

Image 11 – View of rail flyover from Stotfold Road

Stotfold Road is a two-lane single carriageway connecting with the A505 to the south, and the A507 to the north. The road has residential frontage on the west side for the first 450 m north of the A505, but beyond that point the road is rural in nature, routed through open fields. Stotfold Road has a straight alignment from the A505 as it heads north, passing under the London to Cambridge railway bridge. The road has an undulating vertical alignment, with a dip under the railway bridge. There is no headroom constraint under the railway bridge.

Image 12 – View of Stotfold Road looking south

Image 13 - View of Stotfold Road looking north

Stotfold Road is subject to a 30 mph speed limit at its southern extent, with the national speed limit coming into force from a point at the north edge of the built up area.

3.1.1 TRO Information

All four roads at the signal controlled junction are subject to limited waiting parking restrictions (Monday to Saturday 8 am – 6 pm) which cover the extents of the junction. These restrictions extend into Cadwell Lane for a distance of some 50 m on both sides, and into Grove Road for approximately 140 m along both sides at which point there are double yellow line markings. Along Woolgrove Road, the limited waiting restrictions

extend along the northern kerb to a point 15 m west of the railway bridge, and on the southern kerb to a point 15 m east of the railway bridge. On Wilbury Way the limited waiting restrictions cover both sides of the carriageway along the whole length of the road.

Stotfold Road is not subject to any waiting restrictions along either side of the carriageway in the rural section.

3.2 Facilities for Non-Motorised Users (NMUs)

3.2.1 Pedestrian Facilities

Footways are provided on both sides of Cadwell Lane, Wilbury Way, Woolgrove Road and Grove Road at the junction, along with puffin crossings and pedestrian guard railing.

Beyond the junction, there are footpaths on both sides of Cadwell Lane, Grove Road, Wilbury Way and Woolgrove Road, but on Cadwell Lane this reduces to a footpath on the eastern side only, where the southern footway ends at the playing field.

There are no footpaths on the rural section of Stotfold Road.

3.2.2 Cycling Facilities

There are no dedicated cycle facilities provided at the Cadwell crossroads, or within the local site vicinity, or on Stotfold Road.

3.3 Passenger Transport Facilities

3.3.1 Bus Services

Bus stops are located on Grove Road to the south west of the Cadwell crossroads, near Millstream Close, and on Woolgrove Road opposite the junction with Walsworth Common. A number of bus stops are also located on Wilbury Way to the north of the junction, although no formal shelter is provided at any of these stops. No bus routes operate on Cadwell Lane.

Table 1: Bus Routes

Service Number	Route	Hourly Frequency (One-Way)		
		Weekday	Saturday	Sunday
81	Westmill Estate – Purwell	1	1	-
81A	Westmill Estate – Purwell	1	1	-
89	Henlow Camp - Hitchin	1 (Morning and Evening Only)	-	-

Grove Road and Woolgrove Road are served by the 81, 81A and 89 bus routes, whilst Wilbury Way is served by the 89 route only. Both the 81 and 81A services operate on an hourly frequency during weekdays and Saturdays. The number 89 service operates

as a limited service on weekdays, with one bus in the morning peak hour and two buses in the evening.

The 81 and 81A bus routes travel between Grove Road and Woolgrove Road, and the 89 bus route passes between Grove Road and Wilbury Way.

There are no bus stops on the rural section of Stotfold Road, although buses do operate along the route.

3.4 Land and Legal considerations

In the vicinity of the Cadwell Lane, Wilbury Way, Woolgrove Road and Grove Road junction, the highway boundary generally runs along the back of footway on Woolgrove Road and Grove Road.

On Cadwell Lane, the highway boundary on the west side is set at approximately 3.5 m back from the kerbline in front of the shops. Beyond the shops the highway boundary is marked by the back of footway, which is also the case on the east side. The extent of the public highway on Cadwell Lane ends at the access to the National Grid Operational Centre.

On Wilbury Way the highway boundary is at the back of the footway on the north side, and on the south side is set back from the footway, behind a verge strip. The extent of the public highway on Wilbury Way ends at the private car park.

The highway boundary generally runs to the rear of a reasonably wide verge along Stotfold Road in the rural section.

The highway boundary is shown on plans included in Appendix A.

3.5 Environmental Constraints

For the access road options, it is likely that an investigation similar to an Environmental Impact Assessment would be required. This would need to be defined through the environmental screening / scoping process with the Local Planning Authority.

There are no environmental constraints at the Cadwell crossroads, where any traffic management works would be within the highway land.

The environmental constraints plan is included in Appendix B.

4 Data and Analysis

4.1 Data

As part of this transport study, existing data was gathered for the study area. This included a site visit, traffic, pedestrian and cycle surveys, and obtaining collision data. The section below provides details of the data obtained.

- Traffic: Classified turning counts and queue surveys were undertaken at the Cadwell crossroads on Wednesday 27th January 2016, between the hours of 7 am and 10 am, and 4 pm and 7 pm;
- Non-Motorised User Surveys: Pedestrian and cycle surveys were undertaken on Wednesday 27th January 2016, between the hours of 7 am and 10 am, and 4 pm and 7 pm to record crossing movements across all arms of the Cadwell crossroads; and
- Personal Injury Collision Data: Records were obtained for the five year period between 1st July 2010 and 30th June 2015.

4.2 Data Analysis

The following section of the report analyses the data collected.

4.2.1 Site Observations

Observations on site identified the following issues:

- There is a headroom restriction of 13 feet (3.96 m) at the railway bridge over Woolgrove Road, meaning the only unconstrained route into the industrial estate for HGVs above this height is via Grove Road;
- Grove Road has residential frontage and on-street parking along part of its length which narrows the effective road width, and is less than ideal as a route for HGVs accessing the industrial estate;
- The left turn from Grove Road to Cadwell Lane is tight, with space limited by the kerbline radius and vehicles waiting at the signals on Cadwell Lane (particularly HGVs);
- The constrained nature of the Cadwell crossroads means that the traffic signal stoplines have to be set further back, which increases the intergreens and reduces vehicular capacity; and
- On street parking on Cadwell Lane reduces the available road width, which can cause issues for HGVs heading into the industrial estate where queues occasionally block back to the junction with Wilbury Way, Woolgrove Road and Grove Road.

4.2.2 Classified Turning Count and Queue Survey

4.2.2.1 General Traffic Volumes

The classified turning count showed that the AM and PM peak hours were 8 am to 9 am, and 4:45 pm to 5:45 pm. The traffic volumes on each of the approach arms to the Cadwell crossroads are summarised in the table below.

Table 2: Traffic Volumes – Cadwell crossroads

Approach	Movement	Traffic Volumes (PCU)	
		AM Peak Hour	PM Peak Hour
Cadwell Lane	Entry	109	178
	Exit	193	121
	Total	**302**	**299**
Wilbury Way	Entry	91	952
	Exit	719	167
	Total	**810**	**1119**
Woolgrove Road	Entry	677	361
	Exit	311	574
	Total	**988**	**935**
Grove Road	Entry	712	233
	Exit	366	862
	Total	**1078**	**1095**

The survey showed that the highest traffic flows occurred on Grove Road in the AM peak hour and Wilbury Way in the PM peak hour. The lowest traffic flows were on Cadwell Lane in both the AM and PM peak hours.

Overall, the total traffic passing through (entering) the signalised junction in the AM peak hour (1,589 PCUs) was approximately 8% less than in the PM peak hour (1,724 PCUs).

In the AM peak hour, the largest turning movements were the ahead movement from Grove Road to Wilbury Way with 381 PCUs, and the right turn movement between Woolgrove Road and Wilbury Way with 325 PCUs. In the PM peak hour the largest turning movements were the ahead movement from Wilbury Way to Grove Road (529 PCUs) and the left turn from Wilbury Way to Woolgrove Road (420 PCUs).

4.2.2.2 HGV Volumes

The number of HGVs recorded over the six hour survey period on each of the approach arms to the Cadwell crossroads are shown in the table below.

Table 3: HGV Volumes – Cadwell crossroads

Approach	Movement	HGV Volumes (Vehicles)	
		AM (7-10am)	PM (4-7pm)
Cadwell Lane	Entry	36	2
Wilbury Way	Entry	34	20
Woolgrove Road	Entry	11	3
Grove Road	Entry	35	5
Total	**Entry**	**116**	**30**

The survey showed that between 7 am and 10 am there were 116 HGVs that entered the junction. In the period between 4 pm and 7 pm there were 30 HGVs that entered the junction.

In the three hour AM period, the highest volume of HGVs entering the junction was on Cadwell Lane with some 36 vehicles. There was a similar number of HGVs entering the junction in the AM period from Grove Road (35) and Wilbury Way (34). Only 11 HGVs entered from Woolgrove Road, which may in part reflect the headroom restriction imposed by the railway bridge.

In the three hour PM period, the highest volume of HGVs entering the junction were from Wilbury Way, which reflects vehicles leaving the industrial estate towards the end of the working day.

The HGV data also showed that there were 7 HGVs that made the tight left turn manoeuvre between Grove Road and Cadwell Lane between 7 am and 10 am. There were no HGVs that made the left turn manoeuvre between 4 pm and 7 pm. The survey therefore indicates that this tight turning manoeuvre is reasonably infrequent.

4.2.2.3 Queue Lengths

The observed vehicular queues on each of the approach arms to the Cadwell crossroads in the AM and PM peak hours are shown in the table below.

Table 4: Queues – Cadwell crossroads

Approach	Lane	Max/Min Queue	Queues (Veh)	
			AM Peak Hour	PM Peak Hour
Cadwell Lane	Single Lane	Maximum	6	23
		Minimum	2	3
Wilbury Way	Nearside	Maximum	13	134
		Minimum	3	7
	Middle	Maximum	9	72
		Minimum	3	10
Woolgrove Road	Nearside	Maximum	23	30 *
		Minimum	7	11
	Middle	Maximum	13	6
		Minimum	6	2
Grove Road	Nearside	Maximum	32	5
		Minimum	6	1
	Middle	Maximum	19	36
		Minimum	3	4

* Alignment of Woolgrove Road prevented survey enumerator from recording beyond a 30 vehicle queue

The queue survey showed the following:

- Sizeable queues were recorded in the AM and PM peak hours, but queue lengths were generally higher in the PM peak hour;
- In the AM peak hour the longest queue was recorded on Grove Road, where there was a maximum queue length of 32 vehicles in the nearside lane;
- In the PM peak hour the longest queue was recorded on Wilbury Way, where there was a maximum queue length of 134 vehicles in the nearside lane;
- Queues on Woolgrove Road were longest in the PM peak hour where the maximum queue length was at least 30 vehicles for a period of 25 minutes in the nearside lane; and
- Queues on Cadwell Lane were generally the lowest in both the AM and PM peak hours, with a maximum recorded length of 6 and 23 vehicles in the AM and PM peaks respectively.

The turning count and queue length data is included in Appendix C.

4.2.3 Junction Capacity

The operation of the existing Cadwell crossroads in the weekday AM and PM peak hour has been modelled using LinSig. The signal staging and timings used in the model were provided by Ringway, with the junction having a 72 second cycle time in both the AM and PM peak periods. The signal staging also includes an all red phase every cycle for pedestrians.

The operational performance of the junction was determined by the Degree of Saturation and queue lengths. The results of the analysis are shown in the table below and the detailed printout is included in Appendix D.

Table 5: LinSig results for Cadwell crossroads – 2016 Existing Traffic Flows AM and PM Peak

Arm	AM Peak Hour			PM Peak Hour		
	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)
Cadwell Lane	84.1	4	99	72.9	5	53
Wilbury Way	33.5	1	29	104.8	41	141
Woolgrove Road	96.5	15	69	73.8	6	36
Grove Road	86.7	12	39	70.0	3	30
Overall PRC (%):	-7.3			-16.5		
Cycle Time (secs)	72			72		

The results show that the existing signalised junction is operating above its theoretical capacity threshold (Degree of Saturation = 90%) in the AM and PM peak hours. The predicted mean maximum queue lengths are considered to be a reasonable representation of those recorded on site.

4.2.4 Pedestrian and Cycle Surveys

Two-way pedestrian and cycle crossing movements were recorded on the four approach arms to the junction. On Cadwell Lane, Wilbury Way and Woolgrove Road, crossing movements were recorded at the following locations:

- Section 1: At the signalised crossing point; and
- Section 2: Between the signalised crossing and a point 30 m back from the stop line.

On Grove Road, pedestrian and cycle movements were recorded at the signal controlled crossing only, as beyond this point pedestrian guard railing is provided over a distance of some 20 m.

The results of the survey are summarised in the table below, and the detailed survey data is included in Appendix C.

Table 6: Pedestrian and Cycle Survey Results

Road	Section	Movement	Pedestrians (Total 6 hour count)	Cyclists (Total 6 hour count)
Cadwell Lane	1	Eastbound	46	5
		Westbound	53	6
	2	Eastbound	12	3
		Westbound	5	5
Wilbury Way	1	Northbound	27	9
		Southbound	9	0
	2	Northbound	11	10
		Southbound	2	0
Woolgrove Road	1	Eastbound	124	4
		Westbound	162	8
	2	Eastbound	2	0
		Westbound	6	17
Grove Road	1	Northbound	47	7
		Southbound	34	2
Total			**540**	**76**

The results show that for the six hour survey period, the highest number of pedestrian crossing movements occurred on Woolgrove Road, where there were 294 crossing movements, of which 286 used the signalised crossing.

The second busiest location for pedestrian crossing movements was Cadwell Lane where there were 116 crossing movements, of which 99 were at the signalised crossing. Pedestrian activity was lowest on Wilbury Way where there were 49 crossing movements in the six hour survey period. Overall, the majority of pedestrians used the signalised crossings.

Cycle crossing movements were highest on Woolgrove Road with 29 movements recorded during the six hour survey period. Of these, 12 took place at the signalised crossing. There were 19 cycle crossing movements on both Cadwell Lane and Wilbury Way, and nine on Grove Road. Overall, there was less use of the signalised crossings by cyclists.

4.2.5 Collision Data

The collision data shows that there have been six recorded collisions in the immediate vicinity of the Cadwell crossroads in the latest five year period, as shown in Appendix E. There have been a further three collisions on Stotfold Road in the area north of the railway bridge, where the proposed access road junction would be located in the latest five year period. The analysis shows:

Cadwell crossroads

- One of the collisions was classed as serious;
- Three of the collisions involved pedestrians; and
- None of the collisions involved cyclists.

Stotfold Road

- One of the collisions was classed as serious;
- None of the collisions involved pedestrians or cyclists.

A summary of the personal injury collisions by location and severity is shown in the table below.

Table 7: Personal Incident Summary

Location		Severity		
		Slight	Serious	Fatal
Cadwell Lane	Signalised Junction	2	-	-
Wilbury Way		1	-	-
Woolgrove Road		-	-	-
Grove Road		2	1	-
Stotfold Road		2	1	-

The pedestrian incident on Grove Road was attributed to a pedestrian running into the path of an oncoming vehicle, without looking. The causes of the two pedestrian collisions on Cadwell Lane were identified as a vehicle leaving a private access and striking a pedestrian crossing on Cadwell Lane at a point away from the signalised junction, and a pedestrian in the process of crossing the road having to avoid an oncoming speeding car.

A total of three vehicular collisions were recorded at the signalised junction. Of these, two were rear end shunts, whilst the other involved a driver travelling through a red signal and colliding with an oncoming car.

In summary, there was no common location or cause of the collisions in the vicinity of the Cadwell crossroads and therefore no discernable collision clusters or patterns.

Of the three incidents recorded on Stotfold Road, the serious incident was attributed to a driver being impaired by alcohol and losing control of their vehicle. Of the two slight incidents, one was attributed to a new driver losing control whilst avoiding an animal in the carriageway, with the other attributed to a motorcyclist hitting a patch of water.

In summary, there was no common location or cause of the collisions and therefore no discernable collision clusters or patterns on Stotfold Road north of the railway bridge.

4.3 Stakeholder Feedback and Evaluation

The following HCC Officers / departments have been consulted as part of the study process:

- Study Sponsor, Dan Tancock for comments on the proposed options;
- Road safety team; and
- Street lighting team.

No further consultation has been undertaken at this stage.

4.4 Problem Verification

The analysis of the data shows that:

4.4.1 Cadwell crossroads

- There is a headroom restriction of 13 feet (3.96 m) at the railway bridge over Woolgrove Road;
- Grove Road has residential frontage and on-street parking which narrows the effective road width;
- The left turn from Grove Road to Cadwell Lane is tight for HGVs;
- The constrained nature of the Cadwell crossroads means that the traffic signal stoplines have to be set further back;
- On street parking on Cadwell Lane reduces the available road width;
- The highest two-way traffic flows were on Grove Road in the AM peak hour (1,078 PCUs) and Wilbury Way (1,119 PCUs) in the PM peak hour;

- The largest turning movements were from Grove Road to Wilbury Way (381 PCUs) in the AM peak hour and Wilbury Way to Grove Road (529 PCUs) in the PM peak hour;
- There were 116 HGVs (7 am to 10 am) and 30 HGVs (4 pm to 7 pm) passing through the Cadwell crossroads;
- There was significant queuing recorded at the Cadwell crossroads, particularly in the PM peak hour;
- The Cadwell crossroads operates above its theoretical capacity threshold in the AM and PM peak hours.
- The highest pedestrian crossing movements were on Woolgrove Road (294), and Cadwell Lane (116);
- Cycle crossing movements were generally low across all approach arms;
- There were six collisions at the Cadwell crossroads in the five year period, of which three involved pedestrians; and
- There were three collisions on Stotfold Road north of the railway bridge in the five year period, of which none involved pedestrians or cyclists.

4.4.2 Area to North of Industrial Estate

Although there is no data for the area to the north of the industrial estate, constraints would include:

- Third party land owners;
- Existing accesses e.g. to the National Grid Operational Centre, Anglian Water;
- Environmental constraints that would be defined through the environmental screening / scoping exercise; and
- The Network Rail flyover.

5 Design Options and Assessment

The options identified in the previous reports have been reviewed and where considered appropriate, have been included in this study. In addition, new options have been identified. The options tested comprise a combination of access road configurations and traffic management measures at the Cadwell crossroads. The access road options are set out in section 5.1, and the traffic management options are set in section 5.2.

5.1 Access Road Options

- Option A: Link to Stotfold Road with connection to Wilbury Way and Cadwell Lane;
- Option B: Link to Stotfold Road (HGV only) with connection to Wilbury Way and Cadwell Lane;
- Option C: Connection between Cadwell Lane and Wilbury Way, and no Link to Stotfold Road;
- Option D: Link between Wilbury Way and Stotfold Road only; and
- Option E: Link between Cadwell Lane and Stotfold Road only.

Option A: Link to Stotfold Road with connection to Wilbury Way and Cadwell Lane

An indicative layout for Option A is shown on Drawings COM-15021-S1-005-A3 to COM-15021-S1-008-A3 as provided in Appendix F.

The eastern end of the proposed link road is located on Stotfold Road In the approximate location of the existing construction access bellmouth, north of the railway bridge. The junction with Stotfold Road is in the form of a roundabout. From this point, the link road heads west and would be 6.5 m wide with an alignment based on a 40 mph design speed, which generally runs parallel to the rail flyover.

A two arm roundabout is proposed at the western extent of the link road, north of the rail flyover and in the location of the Anglian Water site. This roundabout is provided to enable a suitable alignment for the southern arm of the link road to pass between piers on the rail flyover, where the clear headroom is greatest. It would also enable a gateway to a lower speed limit, and would offer the potential for a future development access to the north.

The southern arm of the link road would pass under the rail flyover in a similar location to the existing Anglian Water access road, where there is a minimum clear headroom of 5.3 m. The alignment of the southern arm of the link road is based on a 30 mph design speed. Having passed beneath the rail flyover, two alignment options have been produced to give access to the industrial estate, namely:

- Option A1: Direct link to Wilbury Way (connection to Cadwell Lane); and
- Option A2: Loop road (between Cadwell Lane and Wilbury Way) with link road (to Stotfold Road).

A 3 m wide shared footway / cycleway would be provided on the southern side of the link road.

Option A1: Direct link to Wilbury Way (connection to Cadwell Lane)

An indicative layout for Option A1 is shown on Drawing COM-15021-S1-007-A3 as provided in Appendix F.

Having passed beneath the rail flyover, the southern arm of the link road swings east to link directly into the end of the Wilbury Way cul de sac, where there is a private car park. The private car park would be removed to facilitate the connection to the link road, which would result in the loss of approximately 16 spaces. The junction between the link road and Cadwell Lane would be a priority junction with a right turn ghost island on Wilbury Way. The extension to Cadwell Lane would be 6.5 m wide, and the alignment would be based on a 30 mph design speed. The road passes around the edge of the National Grid site, with the vehicular entrance to National Grid reconfigured to enable the connection with Cadwell Lane.

A 3 m footway / cycleway would be provided along the link road and extension to Cadwell Lane.

Option A2: Loop Road (between Cadwell Lane and Wilbury Way) with Link Road (to Stotfold Road)

An indicative layout for Option A2 is shown on Drawing COM-15021-S1-008-A3 as provided in Appendix F.

In Option A2, Cadwell Lane and Wilbury Way would be joined to form a loop road, with a connection to the southern arm of the link road via a three-arm roundabout. The tie in to Cadwell Lane and Wilbury Way would be the same as in Option A1. Like in option A1, a 3 m footway / cycleway would be provided

The advantages and disadvantages of Option A, A1 and A2 in general are:

Advantages	Disadvantages
• Provides a second access to the industrial estate	• Third party land required
• Provides an unconstrained access (no height or width restriction)	• Loss of private parking
• Provides access to Wilbury Way and Cadwell Lane	• Reconfiguration of National Grid access required
• Re-routes general traffic reducing traffic flows elsewhere on the network	• Attracts more traffic to the Cadwell crossroads
• Potentially opens up land to the north of the rail flyover to development	• The nature of industrial estate activities is not well suited to a route that could be used by through traffic / commuters
	• Considerable infrastructure required
	• The parameters of the Network Rail structure will need to be evaluated and a BAPA (Basic Asset Protection Agreement) will be required – which is time consuming and costly.

The advantages and disadvantages of the Option A1 layout are:

Advantages	Disadvantages
• Gives priority to the busier road i.e. Wilbury Way	
• Wilbury Way is a better standard of road than Cadwell Lane	

The advantages and disadvantages of the Option A2 layout are:

Advantages	Disadvantages
• Encourages slower speeds on entry to the industrial estate	• May result in more traffic using Cadwell Lane for through movements between Hitchin and the north
• Provides more junction capacity	

Option B: Link to Stotfold Road (HGV only) with connection to Wilbury Way and Cadwell Lane

Option B is the same as Option A, except that HGVs only would be permitted to use the link road.

The advantages and disadvantages of Option B are:

Advantages	Disadvantages
• Provides a second access to the industrial estate	• Third party land required
• Provides an unconstrained access (no height or width restriction)	• Loss of private parking
• Provides access to Wilbury Way and Cadwell Lane	• Reconfiguration of National Grid access required
• Potentially reduces traffic on the Cadwell crossroads	• Considerable infrastructure required for relatively low use
• Potentially opens up land to the north of the rail flyover to development	

Option C: Connection between Cadwell Lane and Wilbury Way, and no Link to Stotfold Road

An indicative layout for Option C is shown on Drawing COM-15021-S1-009-A3 as provided in Appendix F.

In Option C, Cadwell Lane and Wilbury Way would be joined to form a loop road which would be 6.5 m wide and would have an alignment based on a 30 mph design speed. The road alignment would pass around the edge of the National Grid site, with the vehicular entrance to National Grid being reconfigured like in Options A1 and A2. The tie in to Wilbury Way would also be the same as in Option A1 and A2. A connection to the Anglian Water access road could be provided off the loop road.

The advantages and disadvantages of Option C are:

Advantages	Disadvantages
• Improves connectivity between the two sides of the industrial estate	• Third party land required
• Reduces the need for HGVs to U turn	• Loss of private parking
	• Reconfiguration of National Grid access required
	• No new unconstrained access
	• Considerable infrastructure required for low use

Option D: Link between Wilbury Way and Stotfold Road only

An indicative layout for Option D is shown on Drawing COM-15021-S1-010-A3 as provided in Appendix F.

In Option D, the link road between Stotfold Road and the two-arm roundabout north of the rail flyover would be the same as in Option A. The southern arm of the link road which passes beneath the rail flyover and heads east to link directly into the end of the Wilbury Way, would be similar to Option A1, except that there would be no widening to accommodate the junction with Cadwell Lane.

The advantages and disadvantages of Option D are:

Advantages	Disadvantages
• Provides a second access to the industrial estate	• Third party land required
• Provides an unconstrained access (no height or width restriction)	• Loss of private parking
• Provides access to Wilbury Way	• Cadwell Lane could only be accessed off the Cadwell crossroads
• Re-routes general traffic reducing traffic flows elsewhere on the network	• Attracts more traffic to the Cadwell crossroads
• Potentially opens up land to the north of the rail flyover to development	• The nature of industrial estate activities is not well suited to a route that could be used by through traffic / commuters
	• Considerable infrastructure required

Option E: Link between Cadwell Lane and Stotfold Road only

An indicative layout for Option E is shown on Drawing COM-15021-S1-011-A3 as provided in Appendix F.

In Option E, the link road between Stotfold Road and the two-arm roundabout north of the rail flyover would be the same as Option A. The southern arm of the link road swings west to provide a direct link into Cadwell Lane, where the National Grid access is located. Like in Options A1 and A2, the National Grid access would be reconfigured to enable the connection to Cadwell Lane. A 3 m footway / cycleway would be provided along the south side of the link road.

The advantages and disadvantages of Option E are:

Advantages	Disadvantages
• Provides a second access to the industrial estate	• Third party land required
• Provides an unconstrained access (no height or width restriction)	• Reconfiguration of National Grid access required
• Provides access to Cadwell Lane	• Wilbury Way could only be accessed off the Cadwell crossroads
• Re-routes general traffic reducing traffic flows elsewhere on the network	• Attracts more traffic to the Cadwell crossroads
• Potentially opens up land to the north of the rail flyover to development	• Single lane approach on Cadwell crossroads (capacity constraint)
	• Nature of Cadwell Lane not ideal for through route
	• The nature of industrial estate activities is not well suited to a route used by through traffic / commuters
	• Considerable infrastructure required

5.2 Cadwell Crossroads Traffic Management Options

- Option 1: All movements allowed as existing (Do Nothing);
- Option 2: HGV weight restriction on Grove Road;
- Option 3: Ban turning movements between Grove Road and Cadwell Lane;
- Option 4: Ban all right turns;
- Option 5: Ban right turns between Grove Road and Woolgrove Road, and Wilbury Way and Cadwell Lane;
- Option 6: Cadwell Lane one way southbound (southern end only); and
- Option 7: Lower Woolgrove Road under bridge and ban HGVs on Grove Road.

In addition to the above seven options, two further options were identified and these were:

- Implementing an HGV restriction on Grove Road and Woolgrove Road; and
- Implementing a peak hour waiting restriction on Cadwell Lane to ease turning movements and the flow of traffic.

For the following reasons these options were not considered further:

HGV Restriction on Grove Road and Woolgrove Road

The impacts, advantages and disadvantages of implementing an HGV restriction on Woolgrove Road as well as Grove Road would be similar to Option 2, as the number of HGVs currently using Woolgrove Road are relatively low.

Waiting Restriction on Cadwell Lane

- One house on Cadwell Lane has no off road parking whilst others have space for only one vehicle, which means there is likely to be unavoidable demand for on-street parking;
- Removal of parking in residential streets is often a contentious issue;
- The issue with turning movements and the flow of traffic is not only limited to the peak hours; and
- The restrictions would not assist the tight left turn as there are already waiting restrictions in place close to the junction.

Option 1: All movements allowed as existing (Do Nothing)

This option would retain the existing layout and operation of the Cadwell crossroads. No improvements are proposed as part of this option.

The advantages and disadvantages of Option 1 are:

Advantages	Disadvantages
• Uses existing infrastructure	• No improvement to operation of junction
• Cost	• No improvement to the environs for residents on Grove Road
	• No improvement to the tight left turn into Cadwell Lane

Option 2: HGV weight restriction on Grove Road

Option 2 comprises a 7.5 tonne weight restriction on Grove Road. This could only be implemented if the link to Stotfold Road was constructed, as the headroom restriction on Woolgrove Road would prevent some HGVs from accessing the industrial estate.

The advantages and disadvantages of Option 2 are:

Advantages	Disadvantages
• HGVs removed from Grove Road	• Needs provision of a new unconstrained access to industrial estate
• Improvement to operation of left turn into Cadwell Lane	
• Improvement to environs for residents on Grove Road	

Option 3: Ban turning movements between Grove Road and Cadwell Lane

An indicative layout for Option 3 is shown on Drawing COM-15021-S1-001-A3 as provided in Appendix F.

Option 3 comprises a ban on the left turn movement from Grove Road to Cadwell Lane, and the right turn movement from Cadwell Lane to Grove Road. Minor kerb realignment is proposed on the corner of Grove Road / Cadwell Lane to further reinforce the ban on left turns, along with changes to the road markings and signal heads. In addition, there would be widening of the pedestrian crossings to 2.4 m, and diverge and merge facilities provided for cyclists to access the footway in order to bypass the banned turns. Cyclists would have to dismount as they travel along the footway.

In practical terms this option could only be implemented if the link to Stotfold Road was provided, as the headroom restriction on Woolgrove Road would potentially prevent some HGVs from accessing Cadwell Lane – unless they used Wilbury Way to turn around when entering and leaving the industrial estate. Alternatively, a loop road connecting Cadwell Lane and Wilbury Way could resolve the issue.

The advantages and disadvantages of Option 3 are:

Advantages	Disadvantages
• Removes tight left turn manoeuvre into Cadwell Lane	• 'Tall' HGVs would have to U turn in Wilbury Way to access Cadwell Lane and vice versa
	• General traffic would have to access Cadwell Lane from Woolgrove Road, U turn in Wilbury Way or rat run via residential streets (Girdle Road and Hillfield Avenue)
	• Needs provision of a new unconstrained access to industrial estate to avoid U turning in Wilbury Way
	• Potential impact on utilities and drainage
	• Minor inconvenience for residents on Cadwell Lane
	• Cyclists travelling between Grove Road and Cadwell Lane would have to dismount

Option 4: Ban all right turns

An indicative layout for Option 4 is shown on Drawing COM-15021-S1-002-A3 as provided in Appendix F.

Option 4 comprises a ban on the following right turn movements:

- Grove Road to Woolgrove Road;
- Cadwell Lane to Grove Road;
- Wilbury Way to Cadwell Lane; and
- Woolgrove Road to Wilbury Way.

In practical terms this option could only be implemented if the link to Stotfold Road was provided, as the headroom restriction on Woolgrove Road would potentially prevent some HGVs from leaving Cadwell Lane – unless they used Wilbury Way to turn around. Alternatively, a loop road connecting Cadwell Lane and Wilbury Way could resolve the issue.

Changes to road markings and signal heads are proposed to reflect the banned turns. In addition, there would be widening of the pedestrian crossings to 2.4 m, and diverge and merge facilities provided for cyclists to access the footway in order to bypass the banned right turns from Cadwell Lane, Wilbury Way and Grove Road. The footway width is not sufficient to include a diverge facility for right turning cyclists from Grove Road. Where diverges are provided, cyclists would have to dismount.

The right turn ban between Grove Road and Woolgrove Road would affect the 81 bus route, and the ban between Woolgrove Road and Wilbury Way would affect the 89 bus route.

The advantages and disadvantages of Option 4 are:

Advantages	Disadvantages
• Potential improved junction operation	• Tight left turn manoeuvre into Cadwell Lane remains
	• 'Tall' HGVs would have to U turn in Wilbury Way to leave Cadwell Lane
	• General traffic leaving Cadwell Lane for Grove Road may U turn in Wilbury Way or use residential streets
	• All HGVs destined for Wilbury Way would have to U turn in Cadwell Lane or use Grove Road (impact on residents)
	• General traffic on Woolgrove Road and destined for Wilbury Way would have to use Grove Road, U turn in Cadwell Lane or rat run via residential streets (Girdle Road and Hillfield Avenue)
	• Grove Road to Woolgrove Road traffic would have to re-route via the A505 or U turn on Cadwell Lane / Wilbury Way or rat run via residential streets (Girdle Road and Hillfield Avenue)
	• Potential impact on utilities
	• There is no right turn facility for cyclists from Grove Road
	• Right turning cyclists from Cadwell Lane, Wilbury Way and Woolgrove Road would have to dismount
	• The 89 bus would need to be rerouted
	• The 81 bus would need to be rerouted

Option 5: Ban right turns between Grove Road and Woolgrove Road, and Wilbury Way and Cadwell Lane

An indicative layout for Option 5 is shown on Drawing COM-15021-S1-003-A3 as provided in Appendix F.

Option 5 comprises a ban on the right turn movements from Grove Road to Woolgrove Road, and Wilbury Way to Cadwell Lane. Changes to road markings and signal heads are proposed to reflect the banned turns. In addition, there would be widening of the

pedestrian crossings to 2.4 m, and diverge and merge facilities provided for cyclists to access the footway in order to bypass the banned right turn from Wilbury Way. The footway width is not sufficient to include a diverge facility for right turning cyclists from Grove Road. Where the diverge is provided on Wilbury Way, cyclists would have to dismount. The right turn ban between Grove Road and Woolgrove Road would affect the 81 bus route.

The advantages and disadvantages of this option are:

Advantages	Disadvantages
• Potential improved junction operation	• Grove Road to Woolgrove Road traffic would have to re-route via the A505 or U turn on Cadwell Lane / Wilbury Way or rat run via residential streets (Girdle Road and Hillfield Avenue)
	• Very few vehicles turn between Wilbury Way and Cadwell Lane (little benefit)
	• Potential impact on utilities
	• There is no right turn facility for cyclists from Grove Road
	• Right turning cyclists from Wilbury Way would have to dismount
	• The 81 bus would need to be rerouted

Option 6: Cadwell Lane one way southbound (southern end only)

An indicative layout for Option 6 is shown on Drawing COM-15021-S1-004-A3 as provided in Appendix F.

In Option 6, Cadwell Lane would operate as one way southbound between Hillfield Avenue and the junction with Wilbury Way, Woolgrove Road and Grove Road. There would be two southbound lanes in the one way section, with an HGV U turning facility on Cadwell Lane, just north of Hillfield Avenue. The provision of the U turn facility would affect car parking and a sports pavilion building, which are in third party land.

At the Cadwell crossroads, there would be changes to road markings and signal heads to reflect Cadwell Lane being southbound only. In addition, there would be widening of the pedestrian crossings to 2.4 m, and diverge facilities provided for cyclists to access the footway from Wilbury Way, Woolgrove Road and Grove Road, where they would dismount to navigate the junction. Once on Cadwell Lane and past the shops, the footway would be upgraded to a footway / cycleway, before returning to the road carriageway at the end of the one way section.

This option could only be implemented if the link to Stotfold Road was constructed, or if there was a loop road linking Cadwell Lane and Wilbury Way.

The advantages and disadvantages of Option 6 are:

Advantages	Disadvantages
• Potential improved operation of junction	• Third party land required
• Removes tight left turn manoeuvre into Cadwell Lane	• Loss of parking
	• Loss of sports pavilion
	• Needs a new unconstrained access to Cadwell Lane
	• General traffic may rat run via residential streets (Girdle Road and Hillfield Avenue)
	• Potential impact on utilities, street lighting and drainage
	• Cyclists would have to dismount to enter Cadwell Lane or cycle along the residential streets of Girdle Road and Hillfield Avenue
	• Conflict with vehicles parked on the Cadwell Lane footway

Option 7: Lower Woolgrove Road under bridge and ban HGVs on Grove Road

In Option 7, Woolgrove Road would be lowered to remove the headroom restriction under the railway bridge, and a 7.5 tonne weight restriction would be implemented on Grove Road.

The advantages and disadvantages of Option 7 are:

Advantages	Disadvantages
• Provides an unconstrained access to the industrial estate	• Significant road lowering required (>1.5 m)
• HGVs removed from Grove Road	• Foundation and structure of bridge unknown. Full investigation would be required to understand whether underpinning the structure is feasible
• Improvement to operation of left turn into Cadwell Lane	• Gradient on north side of bridge potentially prohibitive
	• Impact on utilities and drainage
	• No improvement to operation of Cadwell crossroads

5.3 Option Combinations

The potential option combinations are shown in the table below.

Table 8: Potential Option Combinations

Options		A	B	C	D	E
		Link to Stotfold Road, connection to Cadwell Lane and Wilbury Way	Option A but HGV only	Connection between Cadwell Lane and Wilbury Way only	Link between Wilbury Way and Stotfold Road only	Link between Cadwell Lane and Stotfold Road only
1	Junction as existing	Y	Y	Y	Y	Y
2	HGV weight restriction Grove Road	Y	Y	N	Y	Y
3	Banned turns Grove Road and Cadwell Lane	Y	Y	Y	Y	Y
4	All right turns banned	Y	Y	Y	Y	Y
5	Banned right turns Grove Road to Wilbury Way and Wilbury Way to Cadwell Lane	Y	Y	Y	Y	Y
6	Cadwell Lane one way southbound	Y	Y	Y	N	Y
7	Lower Woolgrove Road under bridge	Y	Y	Y	Y	Y

N means that the options are not compatible

5.4 Modelling Assessment

5.4.1 Strategic Modelling

The impact of the proposed access road options in combination with the traffic management options at the Cadwell crossroads was assessed using the Welwyn / Hatfield and Stevenage / Hitchin (WHaSH) SATURN model.

Due to the number of option combinations, it was decided that the WHaSH modelling would be focussed on testing access road Option A - Link to Stotfold Road with connection to Wilbury Way and Cadwell Lane, with the following traffic management options at the Cadwell crossroads.

- Option 2: HGV weight restriction on Grove Road;
- Option 3: Ban turning movements between Grove Road and Cadwell Lane;
- Option 4: Ban all right turns;
- Option 5: Ban right turns between Grove Road and Woolgrove Road, and Wilbury Way and Cadwell Lane; and

- Option 6: Cadwell Lane one way southbound (southern end only).

Option A was selected as the access road option to test because it would offer the most accessibility to the industrial estate, and was therefore likely to have the greatest impact in comparison with the other options. The traffic impacts for the other access road options (B to E) in combination with the traffic management options are qualitatively assessed. The Option A layout tested in the WHaSH model is A1 with the link road directly connecting into Wilbury Way, and Cadwell Lane joining Wilbury Way as the minor arm of a priority junction.

The WHaSH model tests were carried out for the 2031 future year and included a baseline option (Do Nothing) to establish the impacts in terms of vehicle routing, capacity and delay.

At the time of preparing this report, the WHaSH model included two traffic signal stages for the Cadwell crossroads and did not include the pedestrian stage. This is likely to make the route through this junction more attractive, as there would be less time delay for vehicles, and as a result, the model may overestimate the amount of non-industrial estate traffic that would use the route.

The combined options are referenced as follows in the WHaSH modelling:

- DS1 - Access Road Option A with Traffic Management Option 2;
- DS2 – Access Road Option A with Traffic Management Option 3;
- DS3 – Access Road Option A with Traffic Management Option 4;
- DS4 – Access Road Option A with Traffic Management Option 5; and
- DS5 – Access Road Option A with Traffic Management Option 6.

5.4.1.1 Forecast traffic Flows

The 2031 traffic flows predicted by the WHaSH model for the various scenarios are shown in the table below for the AM peak hour. The 2016 existing traffic flows are also included for comparison purposes. It should be noted that the traffic flows on Grove Road, Cadwell Lane, Wilbury Way and Woolgrove Road are those on the approaches to the signalised junction.

Table 9: WHaSH Model – Predicted Traffic Flows 2031 AM Peak Hour

AM		2031 Traffic Flow (pcu)					
Location	**Direction**	**DN**	**DS1**	**DS2**	**DS3**	**DS4**	**DS5**
Grove Road	Eastbound (Entry)	1165	1007	995	1003	993	1010
	Westbound (Exit)	703	1023	1057	1053	1061	1070
Cadwell Lane	Southbound (Entry)	117	157	43	234	230	92
	Northbound (Exit)	324	435	11	721	607	-
Wilbury Way	Westbound (Entry)	207	474	580	542	538	505
	Eastbound (Exit)	655	462	948	471	604	907
Woolgrove Road	Northbound (Entry)	700	700	700	700	700	700
	Southbound (Exit)	506	399	294	235	188	326
Link Road	Westbound	-	650	593	601	572	580
	Eastbound	-	238	246	326	329	205

The total AM peak traffic entering the Cadwell crossroads in the 2031 Do nothing scenario is 2,189 PCUs. This is an increase of circa 37% compared to the 1,589 PCUs recorded in the 2016 surveys.

In all the combined option scenarios, the total AM peak traffic flows at the junction would increase compared to the 2031 Do nothing scenario, ranging from 2,307 PCUs with Cadwell Lane operating as one way southbound (DS5) to 2,479 PCUs with all right turns banned (DS3). This indicates that the link road is being used as a through route to other destinations in the AM peak hour. Option DS2 with banned turning movements between Grove Road and Cadwell Lane had the second lowest total traffic flow of 2,318 PCUs.

Overall, the difference between the lowest and highest total AM peak traffic flows at the junction in the five combined option scenarios is relatively small – 172 PCUs (approximately 7%).

On Grove Road, AM peak traffic flows in both directions are around 1,000 vehicles in all the combined option scenarios.

On Cadwell Lane, AM peak traffic flows are very low in scenario DS2, which reflects the banned turning movements between Grove Road and Cadwell Lane. In scenario DS5, the northbound traffic flow is zero, as the road is one way southbound at the southern end. In the other scenarios traffic flows remain reasonably low on the southbound carriageway, ranging between 157 and 234 PCUs. For the northbound carriageway, the traffic flows in DS1, DS3 and DS4 are much higher, ranging from 435 with the HGV weight restriction on Grove Road (DS1) to 721 with all right turns banned (DS3).

On Wilbury Way, traffic flows on the westbound carriageway range between 474 PCUs with the weight restriction on Grove Road (DS1) to 580 PCUs with turning movements banned between Cadwell Lane and Wilbury Way (DS2). For the eastbound carriageway traffic flows are greater than 900 PCUs in scenarios DS2 and DS5, which is likely to be the result of the ban on turning movements between Grove Road and Cadwell Lane in DS2, and Cadwell Lane being southbound only in DS5, meaning traffic re-routes onto Wilbury Way.

For Woolgrove Road, the northbound flow is constant at 700 PCUs in all the combined option scenarios. This is due to the railway bridge over Woolgrove Road narrowing the road width. On the southbound carriageway traffic flows range between 188 in DS4 to 399 in DS1.

On the link road, the westbound traffic flows are generally double those on the eastbound carriageway for all combined options in the AM peak hour. Westbound traffic flows range between 572 and 650 PCUs and eastbound flows range between 205 and 329 PCUs.

The 2031 PM peak hour traffic flows are shown in the table below.

Table 10: WHaSH Model – Predicted Traffic Flows PM Peak Hour

PM		2031 Traffic Flow (pcu)					
Location	**Direction**	**DN**	**DS1**	**DS2**	**DS3**	**DS4**	**DS5**
Grove Road	Eastbound	521	798	878	978	931	866
	Westbound	908	932	1041	1029	1051	1066
Cadwell Lane	Southbound	584	365	392	205	442	301
	Northbound	112	486	0	667	598	-
Wilbury Way	Westbound	754	732	834	1129	840	731
	Eastbound	341	241	770	311	334	562
Woolgrove Road	Northbound	288	363	311	299	318	304
	Southbound	712	577	601	603	548	565
Link Road	Westbound	-	211	311	323	280	319
	Eastbound	-	723	734	845	808	727

The total PM peak traffic entering the Cadwell crossroads in the 2031 Do nothing scenario is 2,147 PCUs. This is an increase of circa 25% compared to the 1,724 PCUs recorded in the 2016 surveys.

In all the combined option scenarios, the total PM peak traffic flows at the junction would increase compared to the 2031 Do nothing scenario, ranging from 2,202 PCUs with Cadwell Lane operating as one way southbound (DS5) to 2,611 PCUs with all right turns banned (DS3). Like in the AM peak hour, this indicates that the link road is being

used as a through route to other destinations. Option DS2 with banned turning movements between Grove Road and Cadwell Lane had the second lowest total traffic flow of 2,258 PCUs.

Overall, the difference between the lowest and highest total traffic flows at the junction in the five combined option scenarios was more marked in the PM peak hour compared to the AM peak. The difference was 409 PCUs (approximately 19%).

On Grove Road, PM peak traffic flows are reasonably high in both directions, with traffic ranging between 798 and 978 PCUs eastbound and 932 and 1,066 PCUs westbound in the various scenarios.

On Cadwell Lane, northbound traffic flows are zero in scenario DS2, which in part reflects the banned turning movements between Grove Road and Cadwell Lane, and in scenario DS5, as the road is one way southbound at the southern end. In the other scenarios traffic flows are reasonably high on the northbound carriageway ranging between 486 PCUs in DS1 and 667 PCUs in DS3. For the southbound carriageway, traffic flows range between 205 PCUs in DS3 and 442 PCUs in DS4.

On Wilbury Way, traffic flows on the westbound carriageway are generally between 730 PCUs and 840 PCUs for the various scenarios, but the traffic flow in DS3 is significantly higher at 1,129 PCUs. This may in part be due to traffic wanting to access Grove Road, when a ban on all right turns would prevent access from Cadwell Lane. However, this movement is also banned in DS1. For the eastbound carriageway, traffic flows range from a low of 241 PCUs in DS1 to 770 PCUs in DS2. The highest flow in DS2 is likely to be due to the ban on turning movements between Grove Road and Cadwell Lane, which will mean that traffic will transfer to Wilbury Way.

For Woolgrove Road, traffic flows in both directions are reasonably similar for all scenarios and in both directions. The northbound flow ranges between 299 PCUs in DS3 to 363 PCUs in DS1, and the southbound flow ranges between 548 PCUs in DS4 and 603 in DS3.

On the link road, the eastbound traffic flows are more than double those on the westbound carriageway for all combined options in the PM peak hour. Westbound traffic flows range between 211 and 323 PCUs and eastbound flows range between 723 and 845 PCUs.

5.4.1.2 Flow Difference Compared to Do Nothing

The table below shows the traffic flow difference between the Do Nothing scenario and the combined option scenarios at the Cadwell crossroads in the AM peak hour.

Table 11: Flow Difference between Do Nothing and Combined Option Scenarios – AM Peak

AM		Flow Difference (pcu)				
Location	**Direction**	**DS1-DN**	**DS2-DN**	**DS3-DN**	**DS4-DN**	**DS5-DN**
Grove Road	Eastbound (Entry)	-158	-171	-162	-172	-155
	Westbound (Exit)	320	354	350	358	367
Cadwell Lane	Southbound (Entry)	49	-74	117	113	-25
	Northbound (Exit)	110	-313	396	283	-
Wilbury Way	Westbound (Entry)	267	373	335	332	298
	Eastbound (Exit)	-193	293	-184	-51	252
Woolgrove Road	Northbound (Entry)	0	0	0	0	0
	Southbound (Exit)	-106	-211	-271	-317	-180

On Grove Road, eastbound AM peak traffic flows are shown to decrease by more than 150 PCUs in all scenarios compared to the Do Nothing, whilst the westbound traffic flows would increase by more than 300 PCUs, which reflects the attractiveness of the link road and Wilbury Way as a new route into Hitchin. It should be noted that the large increase in westbound traffic on Grove Road would have an impact on the operation of the A505 / Grove Road junction and other junctions along the route.

On Cadwell Lane, northbound and southbound traffic flows would decrease in DS2 and DS5 compared to the Do Nothing, whilst there would be increases in the other scenarios. This reflects the restricted movements to Cadwell Lane in these scenarios.

On Wilbury Way, westbound traffic flows would increase by circa 300 PCUs in all scenarios compared to the Do nothing, which reflects the attractiveness of the link road and Wilbury Way as a new route into Hitchin. Eastbound traffic flows are reduced in scenarios DS1, DS3 and DS4.

On Woolgrove Road the northbound traffic flow is unchanged from the Do Nothing scenario due to the northbound flow being at capacity (due to the narrowing under the railway bridge). Traffic flows on the southbound carriageway are reduced in all scenarios.

The PM peak hour differences in traffic flows are shown in the table below.

Table 12: Difference between Do Nothing and Combined Option Scenarios – PM Peak

PM		Flow Difference (pcu)				
Location	**Direction**	**DS1-DN**	**DS2-DN**	**DS3-DN**	**DS4-DN**	**DS5-DN**
Grove Road	Eastbound (Entry)	277	356	457	410	345
	Westbound (Exit)	14	124	111	134	148
Cadwell Lane	Southbound (Entry)	-219	-192	-379	-141	-283
	Northbound (Exit)	374	-111	556	486	-
Wilbury Way	Westbound (Entry)	-22	80	375	86	-23
	Eastbound (Exit)	-100	429	-30	-7	221
Woolgrove Road	Northbound (Entry)	75	23	10	30	16
	Southbound (Exit)	-134	-111	-108	-164	-147

On Grove Road, eastbound PM peak traffic flows are shown to increase significantly in all scenarios compared to the Do Nothing, whilst the westbound traffic flows would experience a modest increase. The significant increase in eastbound traffic is a reflection of the attractiveness of the link road as a new route out of Hitchin in the PM peak. The large increase in traffic on Grove Road would have an impact on the operation of the A505 / Grove Road junction and other junctions along the route.

On Cadwell Lane, southbound traffic flows are shown to decrease significantly in all scenarios compared to the Do Nothing. For the northbound carriageway traffic flows would be reduced in DS2 and DS5 and this reflects the restricted movements to Cadwell Lane in these scenarios. There would be significant increases in DS1, DS3 and DS4.

On Wilbury Way, eastbound traffic flows are forecast to decrease in DS1, DS3 and DS4 compared to the Do Nothing. However there are significant increases in DS2 and DS5, where turning movements from Grove Road to Cadwell Lane are banned. For these two scenarios, it appears that the increases are due to the attractiveness of the link road for trips out of Hitchin in the PM peak hour. In scenarios DS1, DS3 and DS4, traffic using the link road is travelling via Cadwell Lane rather than Wilbury Way. For westbound traffic, there is a reduction in traffic flows in DS1 and DS5 compared to the Do Nothing, and an increase in DS2, DS3 and DS4.

On Woolgrove Road the northbound traffic flow increases slightly in all scenarios compared to the Do Nothing, whilst traffic flows on the southbound carriageway are reduced by more than 100 PCUs in all scenarios.

5.4.1.3 Link Capacity

A volume to capacity (V / C) ratio for each road link is shown in the tables below for the AM and PM peak hours. A link with a capacity ratio of greater than 85 is considered to be over its capacity.

Table 13: WHaSH Model – Volume / Capacity Ratio - 2031 AM Peak Hour

AM		2031 Traffic Flow (pcu)					
Location	**Direction**	**DN**	**DS1**	**DS2**	**DS3**	**DS4**	**DS5**
Grove Road	Eastbound (Entry)	89	101	99	80	75	97
	Westbound (Exit)	53	83	87	86	88	88
Cadwell Lane	Southbound (Entry)	82	93	8	37	100	100
	Northbound (Exit)	23	31	1	55	45	-
Wilbury Way	Westbound (Entry)	23	58	68	43	40	37
	Eastbound (Exit)	47	33	70	36	44	67
Woolgrove Road	Northbound (Entry)	69	66	68	59	67	64
	Southbound (Exit)	72	57	42	34	27	47
Link Road	Westbound	-	40	37	37	36	36
	Eastbound	-	16	17	22	22	14

In the 2031 AM peak Do Nothing scenario, only the eastbound carriageway of Grove Road would be over its capacity.

In link capacity terms, scenario DS3 would operate best in the AM peak hour, with just one link, the westbound carriageway of Grove Road, marginally over capacity.

Table 14: WHaSH Model – Volume / Capacity Ratio - 2031 PM Peak Hour

PM		2031 Traffic Flow (pcu)					
Location	**Direction**	**DN**	**DS1**	**DS2**	**DS3**	**DS4**	**DS5**
Grove Road	Eastbound (Entry)	64	101	91	58	70	80
	Westbound (Exit)	68	75	85	87	88	87
Cadwell Lane	Southbound (Entry)	103	101	87	50	100	100
	Northbound (Exit)	8	38	0	51	46	-
Wilbury Way	Westbound (Entry)	69	90	81	67	63	50
	Eastbound (Exit)	26	18	58	24	25	41
Woolgrove Road	Northbound (Entry)	38	41	58	39	33	32
	Southbound (Exit)	102	82	86	86	78	81
Link Road	Westbound	-	13	20	21	18	21
	Eastbound	-	47	48	55	53	48

In the 2031 PM peak Do Nothing scenario, there would be capacity issues on the southbound carriageways of Cadwell Lane and Woolgrove Road.

In link capacity terms, scenario DS3 would operate best in the PM peak hour, with the westbound carriageway of Grove Road and the southbound carriageway of Woolgrove Road, marginally above their capacity.

5.4.1.4 Wider Impacts

The WHaSH model indicates the following main impacts in the wider area as a result of scenarios DS1 to DS5. The impacts are similar for all the combined option scenarios.

2031 AM Peak Hour

- An increase in the southbound flow on Icknield Way / Stotfold Road north of the proposed link road;
- A large decrease in the westbound / southbound flow on Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (from north-west Letchworth through Ickleford to Hitchin);
- A large decrease in the southbound flow on Stotfold Road south of the proposed link road;
- A large decrease in the eastbound flow on the A505 west of Stotfold Road, and
- A large decrease in the eastbound flow on the A505 east of Stotfold Road.

The wider impacts indicate that traffic, particularly from the north-east, re-routes from Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (the route through Ickleford) to Stotfold Road and the link road.

There is also some re-routing from Stotfold Road (south of the proposed link road) and the A505, which leads to a decrease in the total traffic flows on these routes.

2031 PM Peak Hour

- A large increase in the northbound and southbound flow on Stotfold Road north of the proposed link road;
- A large decrease in the eastbound / northbound flow on Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (from Hitchin through Ickleford to north-west Letchworth);
- A large decrease in the westbound / southbound flow on Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (from north-west Letchworth through Ickleford to Hitchin);
- A large decrease in the northbound flow on Stotfold Road south of the proposed link road; and
- A large decrease in the eastbound flow on the A505 west of Stotfold Road.

In the PM peak hour the results indicate that the link road attracts traffic entering and leaving the industrial estate and Hitchin. There is a significant amount of traffic in both directions that re-routes from Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (the route through Ickleford) onto Stotfold Road and the link road.

Like in the AM peak hour, there is also some re-routing from Stotfold Road (south of the proposed link road) and the A505, which leads to a decrease in the total traffic flows on these routes.

5.4.1.5 WHaSH Modelling Summary

Traffic Volumes

The WHaSH model suggests significant growth in traffic between 2016 and 2031 at the Cadwell crossroads in the Do Nothing scenario.

In the 2031 AM and PM peak hours, traffic flows at the junction would increase from the Do Nothing scenario in all the combined options DS1 to DS5. The traffic flows would be lowest in DS5 with Cadwell Lane southbound only, and highest in DS3, where all right turns are banned.

The results indicate that the link to Stotfold Road is attracting traffic to use Wilbury Way or Cadwell Lane as a route between Hitchin and the north in all the combined improvement options DS1 to DS5. In the AM peak hour, the westbound traffic flow (inbound to Hitchin) on the link road is dominant, whilst in the PM peak hour, the eastbound flow (outbound) is dominant. As a consequence, in the AM peak hour, there are increases in traffic (compared to Do Nothing) on the westbound carriageway of Wilbury Way in DS1 to DS5. In the PM peak hour, traffic passing through the area travels northbound on Cadwell Lane in DS1, DS3 and DS4 and eastbound on Wilbury Way in DS2, when turning movements into Cadwell Lane are banned, and DS5, when Cadwell Lane is one way southbound.

Link Capacity

In the 2031 Do Nothing scenario, link capacity issues are predicted on the eastbound carriageway of Grove Road in the AM peak hour. There are more link capacity issues forecast in each of DS1, DS2, DS4 and DS5, but in DS3, where all right turn movements are banned, there would be a capacity issue on the westbound carriageway of Grove Road only. In the PM peak hour, there are two link capacity issues forecast in the Do Nothing scenario. Scenario DS3 would also have two capacity issues, but the magnitude would be less than the Do Nothing.

Wider Impacts

In the AM peak hour, the wider impacts indicate that traffic, particularly from the north, re-routes from Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (the route through Ickleford) to Stotfold Road and the link road. There is also some re-routing from Stotfold Road (south of the proposed link road) and the A505, which leads to a decrease in the total traffic flows on these routes.

In the PM peak hour the results indicate that the link road attracts traffic entering and leaving the industrial estate / Hitchin. There is a significant amount of traffic in both directions that re-routes from Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (the route through Ickleford) onto Stotfold Road and the link road. Traffic also re-routes from the A505 and southern section of Stotfold Road.

5.4.2 Junction Capacity Analysis

The purpose of the strategic (WHaSH) modelling was to identify changes to traffic flow on the road network, as a result of the proposed combined options. Junction capacity assessments have been used to assess the impact of the traffic flow changes on the following junctions:

- Cadwell crossroads;
- Stotfold Road / Link Road junction; and
- Link Road / Wilbury Way / Cadwell Lane junction.

For the Link Road / Wilbury Way / Cadwell Lane junction, analysis has been based on layout Option A1 i.e. with a direct link to Wilbury Way and a connection via a priority junction to Cadwell Lane.

The junctions therefore comprise a signal controlled junction (Cadwell crossroads) a roundabout (Stotfold Road / Link Road junction) and a priority junction (Link Road / Wilbury Way / Cadwell Lane junction). The signal controlled junction has been tested using LinSig and the roundabout and priority junction has been tested using Junctions 9.

The turning movements used in the junction capacity analysis were taken from the WHaSH model outputs and the following traffic flow scenarios have been tested:

- 2031 Do Nothing (Cadwell crossroads only); and
- 2031 DS1 to DS5.

The operational performance of the junctions was determined by the Degree of Saturation (traffic signals) and the queue lengths, and Ratio of Flow to Capacity (roundabout and priority junctions).

The results of the analysis are shown in section 5.4.2.1 to 5.4.2.6 and the detailed analysis is shown in Appendix C.

5.4.2.1 2031 Do nothing

Cadwell crossroads

Table 15: LinSig results for 2031 Do Nothing AM and PM Peak

Arm	AM Peak Hour			PM Peak Hour		
	Deg of Sat (%)	Mean Max. Queue (pcu)	Delay (sec per pcu)	Deg of Sat (%)	Mean Max. Queue (pcu)	Delay (sec per pcu)
Cadwell Lane	129.7	18	529	195.5	***	971
Wilbury Way	32.8	3	24	83.3	12	34
Woolgrove Road	143.7	***	615	77.6	7	43
Grove Road	150.7	***	574	104.0	14	60
Overall PRC (%):	-67.4			-117.2		
Cycle Time (secs)	72			72		

* Analysis based on existing signal timings

** Pedestrian crossings run every cycle

*** Predicted queue lengths exceed 100 PCUs

The results show that in the Do Nothing scenario, the junction would operate well above its theoretical capacity threshold in the AM and PM peak hours. There is a considerable worsening of the junction performance compared to the 2016 scenario. In the AM peak there would be capacity problems on Cadwell Lane, Grove Road and Woolgrove Road, and in the PM peak, Cadwell Lane and Grove Road.

5.4.2.2 DS1: Access Road Option A with HGV weight restriction on Grove Road (Option 2)

Cadwell crossroads

Table 16: LinSig results for 2031 DS1 AM and PM Peak

Arm	AM Peak Hour			PM Peak Hour		
	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)
Cadwell Lane	86.4	6	94	126.6	53	464
Wilbury Way	62.7	11	29	76.1	11	33
Woolgrove Road	154.0	***	722	88.1	12	59
Grove Road	114.0	***	393	128.6	***	467
Overall PRC (%):	-71.1			-42.9		
Cycle Time (secs)	90			90		

* Signal timings based on 90 second cycle time used in WHaSH model

** Pedestrian crossings run every cycle

*** Predicted queue lengths exceed 100 PCUs

The results show that in the DS1 scenario, with signal timings adjusted to improve efficiency, the junction would operate well above its theoretical capacity in the AM and PM peak hours. In the AM peak hour there would be capacity problems on Woolgrove Road and Grove Road, and in the PM peak there would be issues on Cadwell Lane and Grove Road. The junction would operate slightly worse than Do Nothing in the AM peak, but the operation would be much improved in the PM peak hour. The performance of the Do Nothing option could however also be improved up to a point by adjusting the signal timings.

Note: The changes to the signal timings include increasing the cycle time from 72 seconds to 90 seconds, which will increase the waiting time for pedestrians by 18 seconds compared to existing. The pedestrian flows are not particularly high, and this is

considered a reasonable compromise between providing vehicular capacity and pedestrian convenience.

Stotfold Road / Link Road junction

Table 17: Junctions 9 results for 2031 DS1 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Stotfold Road (South)	0.34	1	0.03	0
Link Road	0.22	0	0.62	2
Stotfold Road (North)	0.65	2	0.37	1

The results show that in the DS1 scenario, the junction would operate within its theoretical capacity (Ratio of Flow to Capacity = 0.85) in the AM and PM peak hours.

Link Road / Wilbury Way / Cadwell Lane junction

Table 18: Junctions 9 results for 2031 DS1 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max. Queue (pcu)	Max RFC	Max. Queue (pcu)
Link Road (North) right turn	0.35	1	0.46	1
Link Road (North) ahead	0.02	0	0.05	0
Cadwell Lane	0.39	1	0.12	0

The results show that in the DS1 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

5.4.2.3 DS2: Access Road Option A with banned turning movements between Grove Road and Cadwell Lane

Cadwell crossroads

Table 19: LinSig results for 2031 DS2 AM and PM Peak

Arm	AM Peak Hour			PM Peak Hour		
	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)
Cadwell Lane	6.0	1	21	97.8	18	**
Wilbury Way	93.4	20	63	81.9	18	29
Woolgrove Road	96.7	23	67	90.8	12	79
Grove Road	7.2	1	25	96.1	29	57
Overall PRC (%):	-7.4			-8.7		
Cycle Time (secs)	90			90		

* Signal timings based on 90 second cycle time used in WHaSH model

** Pedestrian crossings run every cycle

The results show that in the DS2 scenario, with signal timings adjusted to improve efficiency, the junction would operate above its theoretical capacity in the AM and PM peak hours. In the AM peak hour there would be capacity problems on Wilbury Way and Woolgrove Road, and in the PM peak there would be issues on Cadwell Lane, Woolgrove Road and Grove Road. The results are considerably better than Do Nothing and DS1.

Stotfold Road / Link Road junction

Table 20: Junctions 9 results for 2031 DS2 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max. Queue (pcu)	Max RFC	Max. Queue (pcu)
Stotfold Road (South)	0.25	0	0.03	0
Link Road	0.22	0	0.63	2
Stotfold Road (North)	0.65	2	0.44	1

The results show that in the DS2 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

Link Road / Wilbury Way / Cadwell Lane junction

Table 21: Junctions 9 results for 2031 DS2 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Link Road (North) right turn	0.03	0	0.05	0
Link Road (North) ahead	0.11	0	0.11	0
Cadwell Lane	0.36	1	0.20	0

The results show that in the DS2 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

5.4.2.4 DS3: Access Road Option A with all right turns banned

Cadwell crossroads

Table 22: LinSig results for 2031 DS3 AM and PM Peak

Arm	AM Peak Hour			PM Peak Hour		
	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)
Cadwell Lane	33.1	5	24	53.9	5	42
Wilbury Way	87.7	17	50	94.3	27	40
Woolgrove Road	98.7	27	82	91.8	12	85
Grove Road	100.0	32	85	89.9	22	33
Overall PRC (%):	-11.2			-4.8		
Cycle Time (secs)	90			90		

* Signal timings based on 90 second cycle time used in WHaSH model

** Pedestrian crossings run every cycle

The results show that in the DS3 scenario, with signal timings adjusted to improve efficiency, the junction would operate above its theoretical capacity in the AM and PM peak hours. In the AM and PM peak hours there would be capacity problems on Wilbury Way, Woolgrove Road and Grove Road. The results are slightly worse than DS2 in the AM peak hour, and slightly better in the PM peak hour. The junction operation is considerably better than Do Nothing and DS1.

Stotfold Road / Link Road junction

Table 23: Junctions 9 results for 2031 DS3 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Stotfold Road (South)	0.28	0	0.04	0
Link Road	0.29	1	0.73	3
Stotfold Road (North)	0.65	2	0.45	1

The results show that in the DS3 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

Link Road / Wilbury Way / Cadwell Lane junction

Table 24: Junctions 9 results for 2031 DS3 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Link Road (North) right turn	0.50	1	0.76	3
Link Road (North) ahead	0.10	0	0.18	0
Cadwell Lane	0.37	1	0.01	0

The results show that in the DS3 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

5.4.2.5 DS4: Access Road Option A with banned right turns between Grove Road / Woolgrove Road and Wilbury Way / Cadwell Lane

Cadwell crossroads

Table 25: LinSig results for 2031 DS4 AM and PM Peak

Arm	AM Peak Hour			PM Peak Hour		
	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)
Cadwell Lane	113.1	24	310	109.6	37	242
Wilbury Way	81.3	13	42	86.0	14	37
Woolgrove Road	94.6	21	58	58.7	8	33
Grove Road	119.7	***	355	112.2	83	250
Overall PRC (%):	-33.0			-24.6		
Cycle Time (secs)	90			90		

* Signal timings based on 90 second cycle time used in WHaSH model

** Pedestrian crossings run every cycle

*** Predicted queue lengths exceed 100 PCUs

The results show that in the DS4 scenario, with signal timings adjusted to improve efficiency, the junction would operate well above its theoretical capacity in the AM and PM peak hours. In the AM peak hour there would be capacity problems on Cadwell Lane, Woolgrove Road and Grove Road, and in the PM peak there are problems on Cadwell Lane and Grove Road. The results are worse than DS2 and DS3, but better than DS1 and the Do Nothing scenario.

Stotfold Road / Link Road junction

Table 26: Junctions 9 results for 2031 DS4 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Stotfold Road (South)	0.24	0	0.03	0
Link Road	0.29	1	0.70	2
Stotfold Road (North)	0.65	2	0.43	1

The results show that in the DS4 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

Link Road / Wilbury Way / Cadwell Lane junction

Table 27: Junctions 9 results for 2031 DS4 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Link Road (North) right turn	0.49	1	0.67	2
Link Road (North) ahead	0.02	0	0.06	0
Cadwell Lane	0.32	1	0.05	0

The results show that in the DS4 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

5.4.2.6 DS5: Access Road Option A with Cadwell Lane one-way southbound (southern end only)

Cadwell crossroads

Table 28: LinSig results for 2031 DS5 AM and PM Peak

Arm	AM Peak Hour			PM Peak Hour		
	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)	Deg of Sat (%)	Mean Max Queue (pcu)	Delay (sec per pcu)
Cadwell Lane (Left, ahead)	5.0	0	55	51.4	3	97
Cadwell Lane (Right)	58.6	3	74	154.4	49	761
Wilbury Way	65.9	13	32	69.5	12	25
Woolgrove Road	161.8	***	800	143.3	62	660
Grove Road	154.4	***	360	150.9	***	660
Overall PRC (%):	-79.7			-71.5		
Cycle Time (secs)	100			100		

* Signal timings based on 100 second cycle time to accommodate additional stage for one way operation of Cadwell Lane

** Pedestrian crossings run every cycle

*** Predicted queue lengths exceed 100 PCUs

The results show that in the DS5 scenario, with signal timings adjusted to improve efficiency, the junction would operate well above its theoretical capacity in the AM and PM peak hours. In the AM and PM peak hours there would be capacity problems on Woolgrove Road and Grove Road, with the right turn on Cadwell Lane also above its capacity threshold in the PM peak hour. The results are the worst of all the combined option scenarios.

Stotfold Road / Link Road junction

Table 29: Junctions 9 results for 2031 DS5 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Stotfold Road (South)	0.29	0	0.04	0
Link Road	0.19	0	0.63	2
Stotfold Road (North)	0.65	2	0.44	1

The results show that in the DS5 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

Link Road / Wilbury Way / Cadwell Lane junction

Table 30: Junctions 9 results for 2031 DS5 AM and PM Peak

Arm	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
Link Road (North) right turn	0.03	0	0.04	0
Link Road (North) ahead	0.04	0	0.05	0
Cadwell Lane	0.36	1	0.01	0

The results show that in the DS5 scenario, the junction would operate within its theoretical capacity in the AM and PM peak hours.

5.4.2.7 Junction Analysis Summary

Cadwell crossroads

The analysis shows that in the 2031 Do Nothing scenario, the Cadwell crossroads would operate well above its theoretical capacity threshold.

With Link Road Option A and the various traffic management proposals, along with adjustments to the signal timings to improve efficiency, the junction operation is generally improved. Nevertheless, the junction would still operate above its theoretical capacity in the AM and PM peak hours in all the scenarios DS1 to DS5.

The operational performance of the junction was best in DS2: Access Road Option A with banned turning movements between Grove Road and Cadwell Lane, and DS3: Access Road Option A with all right turns banned.

In practice, it is likely that the capacity constraint imposed by the Cadwell crossroads will reduce the attractiveness of the link road to through traffic, and the volume of traffic predicted to transfer to this route in the WHaSH model, may not in reality occur.

It should also be noted that there are no physical improvement options available within the existing land constraints that would make a material difference to the operation of the junction.

Stotfold Road / Link Road junction and Link Road / Wilbury Way / Cadwell Lane junction

The Stotfold Road / Link Road junction and Link Road / Wilbury Way / Cadwell Lane junction would operate within their capacity in all the combined option scenarios.

5.4.3 Modelling Impacts – Other Combined Options

The table below summarises the modelling impacts of combining access road Option A with traffic management Options 1 to 7. The impacts of the combinations involving Options 2 to 6 are based on the WHaSH modelling results, whilst the other option combinations are based on a qualitative assessment.

Table 31: Summary of Combined Impacts – Access Road Option A and Traffic Management Options 1 to 7

Options			A
			Link to Stotfold Road, connection to Cadwell Lane and Wilbury Way
1	Junction as existing	Traffic Volume at Cadwell crossroads (PCUs)	Traffic volumes likely to be less than Options 2 to 6 as none of the conflicting movements are removed which reduces the junction capacity and attractiveness of the route
		Max V / C	The maximum V / C is likely to be similar to options 2 to 6 (approximately 100), as drivers will generally choose the routes that are quickest or shortest, therefore dispersing the impacts
		Cadwell crossroads Capacity (Max degree of saturation)	Likely to be worse than Options 2 to 6 as none of the conflicting movements are removed

2	HGV weight restriction Grove Road	Traffic Volume at Cadwell crossroads (PCUs)	AM 2338 PM 2258
		Max V / C	AM 101 PM 101
		Cadwell crossroads Capacity (Max degree of saturation)	AM 131.7 PM 117.4
3	Banned turns Grove Road and Cadwell Lane	Traffic Volume at Cadwell crossroads (PCUs)	AM 2318 PM 2415
		Max V / C	AM 99 PM 91
		Cadwell crossroads Capacity (Max degree of saturation)	AM 96.7 PM 97.8
4	All right turns banned	Traffic Volume at Cadwell crossroads (PCUs)	AM 2479 PM 2611
		Max V / C	AM 86 PM 87
		Cadwell crossroads Capacity (Max degree of saturation)	AM 100.0 PM 94.3
5	Banned right turns Grove Road to Wilbury Way and Wilbury Way to Cadwell Lane	Traffic Volume at Cadwell crossroads (PCUs)	AM 2461 PM 2531
		Max V / C	AM 100 PM 100
		Cadwell crossroads Capacity (Max degree of saturation)	AM 119.7 PM 112.2
6	Cadwell Lane one way southbound	Traffic Volume at Cadwell crossroads (PCUs)	AM 2307 PM 2202
		Max V / C	AM 100 PM 100
		Cadwell crossroads Capacity (Max degree of saturation)	AM 161.8 PM 154.4

7	Lower Woolgrove Road under bridge	Traffic volume at Cadwell crossroads (PCUs)	Traffic volumes likely to be less than Options 2 to 6 as none of the conflicting movements are removed which reduces the junction capacity and attractiveness of the route
		Max V / C	The maximum V / C is likely to be similar to options 2 to 6 (approximately 100), as drivers will generally choose the routes that are quickest or shortest, therefore dispersing the impacts
		Cadwell crossroads Capacity (Max degree of saturation)	Likely to be worse than Options 2 to 6 as none of the conflicting movements are removed

* New junctions i.e. Stotfold Road / Link Road and Link Road / Wilbury Way / Cadwell Lane have been excluded because they have been designed to operate within capacity

Option B combined with traffic management Options 1 to 7

Option B is the same as Option A except that the link road would only be used by HGVs. By comparison with the impacts predicted for the Option A combinations, the following qualitative conclusions on the Option B combined impacts can be drawn.

- The wider re-routing of traffic would be much less than Option A;
- Traffic volumes at the Cadwell crossroads would be less than Option A;
- V / C ratios on links are likely to vary significantly from Option A due to the lesser re-routing of traffic, although the maximum value is likely to remain similar as motorists will generally choose the routes that are quickest or shortest; and
- The operation of the Cadwell Lane junction could be better than Option A, as there would not be the through traffic travelling between the north and Hitchin.

Option C combined with traffic management Options 1 to 7

Option C provides a connection between Wilbury Way and Cadwell Lane only, forming a loop. By comparison with the impacts predicted for the Option A combinations, the following qualitative conclusions on the Option C combined impacts can be drawn.

- Re-routing of traffic would be much less than Option A and localised to the Cadwell crossroads;
- Traffic volumes at the Cadwell crossroads would be less than in Option A;
- V / C ratios on links are likely to vary significantly from Option A as the Cadwell crossroads would remain the only access to the industrial estate; and
- The operation of the Cadwell crossroads could be better than Option A, as there would not be the through traffic travelling between the north and Hitchin.

Option D combined with traffic management Options 1 to 7

Option D provides a connection between Stotfold Road and Wilbury Way. By comparison with the impacts predicted for the Option A combinations, the following qualitative conclusions on the Option D combined impacts can be drawn.

- There will be re-routing of traffic to the link road but it may be slightly less than in Option A, due to there being only one route through the industrial estate (Wilbury Way), which will put pressure on this route, and the Cadwell crossroads;
- Traffic volumes at the Cadwell crossroads may be less than in Option A, due to the link road connecting into Wilbury Way only;
- V / C ratios on links are likely to follow a similar pattern to Option A, although Wilbury Way in particular may have a higher value;
- The operation of the Cadwell crossroads is likely to be worse than Option A, due to through traffic movements being focussed on Wilbury Way.

Option E combined with traffic management Options 1 to 7

Option E provides a connection between Stotfold Road and Cadwell Lane. By comparison with the impacts predicted for the Option A combinations, the following qualitative conclusions on the Option E combined impacts can be drawn.

- There will be a re-routing of traffic to the link road but it is likely to be less than in Option A, due to there being only one route through the industrial estate (Cadwell Lane), and the capacity constraint imposed by the single lane entry on the approach to the Cadwell crossroads;
- Traffic volumes at the Cadwell crossroads are likely to be less than in Option A, as Cadwell Lane only has a single lane entry to the junction and a tight left turn for vehicles entering from Grove Road;
- V / C ratios on links are likely to follow a similar pattern to Option A, although Cadwell Lane in particular may have a higher value;
- The operation of the Cadwell crossroads is likely to be worse than Option A due to through traffic movements being focussed on Cadwell Lane.

5.5 Costs

The estimated cost of each option is shown in the table below.

Table 32: Cost Estimates

Option	Cost (£ exc VAT)
Access Road	
A / A1	6,037,000
A / A2	6,098,000
B	As Option A / A1 or A / A2
C	1,624,000
D (incl A)	4,680,000
E (incl A)	5,557,000
Traffic Management	
1	N/A
2	10,000
3	21,000
4	16,000
5	15,000
6	200,000
7	* See below

Note: The cost of the access road options have various exclusions (see below) which can significantly increase the scheme costs shown above.

* Option 7 has not been priced, as a full investigation of the structure would be required to understand whether it is feasible to underpin the bridge, and if it is, the scope of work required to underpin the structure.

Notes:

- The costs for each option include 15% allowance for contractor preliminaries, overheads and profit. It is assumed that construction works would be carried out as a single package i.e. access road option and traffic management option together.
- A 40% contingency has been allowed for the traffic management options. A 44% contingency has been allowed for the access road options.
- No allowance has been made in Options A / A1, A / A2, D and E for the cost of a BAPA Agreement.
- An allowance has been made for traffic management.

- Some allowance has been made for works to utility company apparatus but this would need to be confirmed via detailed design and consultation with utility companies.
- Some allowance has been made for an upgrade of street lighting at the Cadwell crossroads, and new street lighting has been included for the access road options.
- No allowance has been made for inflation, land costs, legal fees, third party fees, design or maintenance costs / commuted sums.
- No allowance has been made for bulk earthworks i.e. it is assumed that the proposed access roads would follow the existing ground levels.
- A breakdown of the total cost for each option is included in Appendix G.

5.6 Risks

The following assumptions have been made in preparing this report:

- Proposals are based on OS mapping and the potential for adjusting kerblines etc will need to be checked with topographical survey data;
- The vertical visibility splay at the link road junction on Stotfold Road needs to be checked with topographical survey data;
- The location of the rail flyover is shown indicatively. The location of the roundabout and alignment of the southern link (between the piers) depends on the precise location of the flyover and associated piers, which would need to be confirmed with topographical survey data;
- The gradient of the land where the access road option alignments are located would need to be confirmed by topographical survey to establish the extent of earthworks required;
- Confirmation of third party landowners affected;

- The acquisition of third party land in relation to all the access road options, and traffic management Option 6;
- Network Rail, National Grid and Anglian Water would support the proposals;
- Works to utilities apparatus is unknown;
- TRO changes could be made;
- Road safety audit would need to be carried out;
- Street lighting requirements – upgrade and new lighting to be confirmed; and
- It is assumed that Councillors, residents and businesses would support the proposals.

The risks associated with each option are shown in the table below, along with a high level judgement on the risk to the delivery of the project. The Do Nothing option is excluded.

Table 33: Risks associated with each option

Options	Risks	Level of Risk (High, Medium, Low)
Access Road Options		
A (incl A1 and A2)	• Impact on third party land	H
	• Impact on utility apparatus	H
	• Impact on drainage	M
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	H
	• Cost uncertainty	H
B	• Impact on third party land	H
	• Impact on utility apparatus	H
	• Impact on drainage	M
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	H
	• Cost uncertainty	H
C	• Impact on third party land	H
	• Impact on utility apparatus	H
	• Impact on drainage	M
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	H
	• Cost uncertainty	H
D	• Impact on third party land	H
	• Impact on utility apparatus	H
	• Impact on drainage	M
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	H
	• Cost uncertainty	H

E	• Impact on third party land	H
	• Impact on utility apparatus	H
	• Impact on drainage	M
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	H
	• Cost uncertainty	H
Traffic Management Options		
2	• Impact on third party land	L
	• Impact on utility apparatus	L
	• Impact on drainage	L
	• Councillor and public support unknown	L
	• Delivery timeline uncertainty	L
	• Cost uncertainty	L
3	• Impact on third party land	L
	• Impact on utility apparatus	L
	• Impact on drainage	M
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	L
	• Cost uncertainty	L
4	• Impact on third party land	L
	• Impact on utility apparatus	L
	• Impact on drainage	L
	• Councillor and public support unknown	H
	• Delivery timeline uncertainty	M
	• Cost uncertainty	L
5	• Impact on third party land	L
	• Impact on utility apparatus	L
	• Impact on drainage	L
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	M
	• Cost uncertainty	L

6	• Impact on third party land	H
	• Impact on utility apparatus	M
	• Impact on drainage	M
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	H
	• Cost uncertainty	H
7	• Impact on third party land	L
	• Impact on utility apparatus	H
	• Impact on drainage	H
	• Councillor and public support unknown	M
	• Delivery timeline uncertainty	H
	• Cost uncertainty	H

6 Conclusion and Recommendations

6.1 Conclusions

A transport study was carried out to investigate options for improving access to the Hitchin industrial estate via a new access road and improvements to the Cadwell crossroads.

6.1.1 Data Analysis

Collision, traffic, pedestrian and cycle data was collected and this showed:

- There is a headroom restriction of 13 feet (3.96 m) at the railway bridge over Woolgrove Road;
- Grove Road has residential frontage and on-street parking which narrows the effective road width;
- The left turn from Grove Road to Cadwell Lane is tight for HGVs;
- The constrained nature of the Cadwell crossroads means that the traffic signal stoplines have to be set further back;
- On street parking on Cadwell Lane reduces the available road width;
- The highest traffic flows were on Grove Road in the AM peak hour (1,078 PCUs) and Wilbury Way (1,119 PCUs) in the PM peak hour;
- The largest turning movements were from Grove Road to Wilbury Way (381 PCUs) in the AM peak hour and Wilbury Way to Grove Road (529 PCUs) in the PM peak hour;
- There were 116 HGVs (7 am to 10 am) and 30 HGVs (4 pm to 7 pm) passing through the Cadwell crossroads;
- There was significant queuing recorded at the Cadwell crossroads, particularly in the PM peak hour;
- The Cadwell crossroads operates above its theoretical capacity threshold in the AM and PM peak hours;
- The highest pedestrian crossing movements were on Woolgrove Road (294), and Cadwell Lane (116);
- Cycle crossing movements were generally low across all approach arms;
- There were six collisions at the Cadwell crossroads in the five year period, of which three involved pedestrians; and

- There were three collisions on Stotfold Road north of the railway bridge in the five year period, of which none involved pedestrians or cyclists.

6.1.2 Options

6.1.2.1 Access Road Options

The options identified included:

- Option A: Link to Stotfold Road with connection to Wilbury Way and Cadwell Lane;
- Option B: Link to Stotfold Road (HGV only) with connection to Wilbury Way and Cadwell Lane;
- Option C: Connection between Cadwell Lane and Wilbury Way, and no Link to Stotfold Road;
- Option D: Link between Wilbury Way and Stotfold Road only; and
- Option E: Link between Cadwell Lane and Stotfold Road only.

6.1.2.2 Traffic Management Options

The options identified included:

- Option 1: All movements allowed as existing (Do Nothing);
- Option 2: HGV weight restriction on Grove Road;
- Option 3: Ban turning movements between Grove Road and Cadwell Lane;
- Option 4: Ban all right turns;
- Option 5: Ban right turns between Grove Road and Woolgrove Road, and Wilbury Way and Cadwell Lane;
- Option 6: Cadwell Lane one way southbound (southern end only); and
- Option 7: Lower Woolgrove Road under bridge and ban HGVs on Grove Road.

An indicative / outline design was prepared for each option where appropriate, and the advantages and disadvantages of each identified, together with a broad estimate of the cost and identification of risks to delivery. A high level summary of each individual option is provided in the table below.

Table 34: Overall Option Summary

Option	Pros	Cons	Cost	Risk
Access Road Options				
A	Provides second access, no height restriction, connects with Wilbury way and Cadwell Lane, re-routes traffic flows reducing traffic with benefits elsewhere, opens up land for development	Third party land required, loss of parking, National Grid access needs reconfiguring, encourages non industrial estate traffic to pass through	H	H
A1	Gives priority to busier and better standard of road (Wilbury way)			
A2	Encourages slower speeds on entry to industrial estate, provides more junction capacity	May result in more traffic using Cadwell Lane		
B	Provides second access, no height restriction, connects with Wilbury way and Cadwell Lane, potentially reduces traffic on Cadwell crossroads, opens up land for development	Third party land required, loss of parking, National Grid access needs reconfiguring, considerable new infrastructure for low use	H	H
C	Improves connectivity, reduces the need for HGVs to U turn	Third party land required, loss of parking, National Grid access needs reconfiguring, no new unconstrained access	H	H
D	Provides second access, no height restriction, connects with Wilbury way, re-routes traffic flows reducing traffic with benefits elsewhere, opens up land for development	Third party land required, loss of parking, National Grid access needs reconfiguring, Cadwell Lane only accessible from Wilbury Way / Woolgrove Road / Grove Road junction, encourages non industrial estate traffic to pass through	H	H
E	Provides second access, no height restriction, connects with Cadwell Lane, re-routes traffic flows reducing traffic with benefits elsewhere, opens up land for development	Third party land required, loss of parking, National Grid access needs reconfiguring, Wilbury Way only accessible from Cadwell Lane / Woolgrove Road / Grove Road junction, encourages non industrial estate traffic to pass through, capacity constraint on Cadwell Lane approach to Wilbury Way / Woolgrove Road / Grove Road junction	H	H
Traffic Management Options				
1	Uses existing infrastructure, cost	No improvement to operation of Cadwell crossroads	N/A	N/A
2	HGVs removed from Grove Road, junction operation improved, improved environs for residents	New unconstrained access required	L	L

3	Removes tight left turn into Cadwell Lane (junction operation improved)	HGV U turns in Wilbury Way required, general traffic would have to access Cadwell Lane from Woolgrove Road, U turn in Wilbury Way or rat run via residential streets (Girdle Road and Hillfield Avenue), minor inconvenience for residents, cyclists have to dismount	L	L
4	Potential improved junction operation	Tight left turn into Cadwell Lane remains, HGV U turns in Wilbury Way and Cadwell Lane required, some general traffic would need to re-route, U turn or rat run via residential streets (Girdle Road and Hillfield Avenue), no right turn facility for cyclists from Grove Road, right turning cyclists have to dismount, 81 and 89 bus routes would need rerouting	L	L
5	Potential improved junction operation	Grove Road to Woolgrove Road traffic would have to re-route, U turn or rat run via residential streets (Girdle Road and Hillfield Avenue), no right turn facility for cyclists from Grove Road, right turning cyclists from Wilbury Way have to dismount, 81 bus route would need rerouting	L	L
6	Potential improved junction operation, removes tight left turn into Cadwell Lane	Third party land required, loss of parking, loss of sports pavilion, needs a new unconstrained access to Cadwell Lane, cyclists have to dismount to enter Cadwell Lane or rat run via residential streets (Girdle Road and Hillfield Avenue), conflict with vehicles parked on the Cadwell Lane footway	H	H
7	Provides unconstrained access to the industrial estate, HGVs removed from Grove Road, Improvements to operation of left turn into Cadwell Lane	Significant road lowering required, existing gradient on north side of bridge already steep, impact on utilities and drainage, no improvement to operation of junction	H	H

6.1.3 Assessment of Options

The access road and traffic management options were assessed in combination to establish the impact on traffic flows and road network capacity in 2031. An impact assessment was carried out using the WHaSH model and tests were undertaken for access road Option A (link to Stotfold Road with connection to Wilbury Way and Cadwell Lane), combined with traffic management options 2 to 6 only. A qualitative impact assessment was carried out for the other combined option scenarios. The results of the WHaSH modelling indicated the following:

- The link road leads to re-routing of traffic to / from the industrial estate and wider area in Hitchin in all combined option scenarios. Traffic to and from the north-east

re-routes from Wilbury Hills Road / Bedford Road, Arlesey New Road, Arlesey Road and Water Lane (between Hitchin and north-west Letchworth via Ickleford) to Stotfold Road and the link road. In addition, there is some re-routing from the A505 and Stotfold Road (south of the proposed link road) to the link road. The re-routing also leads to a significant increase in traffic on Grove Road, and this would have an impact on the operation of the A505 / Grove Road junction and other junctions along the route;

- Analysis of V / C ratios for the link road, Cadwell Lane, Wilbury Way, Woolgrove Road and Grove Road showed that there were link capacity issues in all scenarios. Option 4, with all right turns banned had the least over capacity links. The link road operated within capacity in all combined option scenarios;

- The volume of traffic at the Cadwell crossroads was increased in all combined option scenarios;

- The Cadwell crossroads was well over its capacity in the 2031 Do Nothing scenario. For the combined options, the signal timings were adjusted to improve efficiency, but the junction still operated above its capacity in all scenarios. The operational performance of the junction was best with banned turning movements between Grove Road and Cadwell Lane (Option 3) and when all right turns were banned (Option 4). Both options operated better than the Do Nothing scenario. The alteration to the signal timings would increase the waiting time for pedestrians by circa 18 seconds;

- It should be noted that at the time of preparing this report, the WHaSH model did not reflect the pedestrian phase that is part of the Cadwell crossroads staging. It is therefore likely to make the route through this junction more attractive, as there would be less time delay for vehicles, and as a result, the model may overestimate the amount of non-industrial estate traffic that would use the route. In practice, it is likely that the capacity constraint imposed by the Cadwell crossroads will reduce the attractiveness of the link road to through traffic, and the volume of traffic predicted to transfer to this route in the WHaSH model, may not in reality occur. The operation of the junction in the combined option scenarios may therefore be better than the results shown in the report.

- The Stotfold Road / Link Road junction and Link Road / Wilbury Way / Cadwell Lane junction would operate within their capacity in all the combined option scenarios; and

The qualitative assessment of Option A with Option 1 (junction as existing) and Option 7 (lowering Woolgrove Road with HGV ban on Grove Road) concluded that there would be less traffic at the Cadwell crossroads than in Options 2 to 6 because the capacity would be less as none of the conflicting movements would be removed.

A qualitative assessment of the combined impacts of access road options B to E and traffic management Options 1 to 7, enabled the following conclusions to be drawn:

- For Option B (as Option A but for HGV only) combinations, the operation of the Cadwell crossroads would potentially be better than Option A in all scenarios, as there would not be general traffic passing through the industrial estate. There would not however be benefits on other routes into and out of Hitchin.

- For Option C (connection between Cadwell Lane and Wilbury Way only) combinations, the operation of the Cadwell crossroads would potentially be better than Option A in all scenarios, as there would not be general traffic passing through the industrial estate. However it is likely to be worse than Option B because all traffic passes through the junction. Option C would not offer benefits on the wider road network.

- For Option D (link between Wilbury Way and Stotfold Road only) combinations, the operation of the Cadwell crossroads would potentially be worse than Option A in all scenarios due to all through traffic being focussed on Wilbury Way.

- For Option E (link between Cadwell Lane and Stotfold Road only) combinations, the operation of the Cadwell crossroads would potentially be worse than Option A in all scenarios due to all through traffic being focussed on Cadwell Lane, where there is only a single lane approach to the junction.

6.2 Recommendation

The most beneficial access road and traffic management combination in terms of road network capacity and operation would be Option A / A1 (link to Stotfold Road with connections to Wilbury Way and Cadwell Lane) with either Option 3 (banned turning movements between Grove Road and Cadwell Lane) or Option 4 (All right turns banned). Based on the forecast traffic flows, neither of these combinations would result in the Cadwell crossroads operating within its theoretical capacity threshold in 2031. However, operation of the existing junction in the 2031 Do Nothing scenario would be much worse, even with the cycle time extended to 90 seconds as proposed for the combined options.

Option 4 has more capacity than Option 3, because it removes more of the conflicting movements i.e. all the right turns. It does not however remove the tight left turn from Grove Road into Cadwell Lane, which is achieved in Option 3.

It should be noted that the additional capacity at the Cadwell Crossroads provided by Options 3 and 4 in combination with the Option A / A1 link to Stotfold Road results in traffic travelling to / from north-west Letchworth using the new link road as a rat run rather than driving through Ickleford. Whilst this reduces the amount of traffic along the route through Ickleford, it was not an objective of the transport study, and may not be considered a benefit, as it draws traffic through the industrial estate.

In addition, both options 3 and 4 could result in cars and light goods vehicles rat running along the residential streets of Girdle Road and Hillfield Avenue to avoid the turning bans. There may however be ways to reduce the likelihood of this through the use of traffic management, which would need to be investigated. Options 3 and 4 would also have an adverse effect on cyclists. This is particularly the case in Option 4, where all right turns are banned. In effect, cyclists would be directed onto the footways where they would have to dismount and cross via the pedestrian crossings to make the turns, which is not ideal. Bus routes would also be impacted in Option 4, although they could potentially be re-routed through the industrial estate with Cadwell Lane and Wilbury Way connected via the Option A / A1 link to Stotfold Road.

If providing additional capacity and removing HGVs from Grove Road is the priority, the option combination comprising the link to Stotfold Road (Option A / A1), banning turning movements between Grove Road and Cadwell Lane (Option 3) and an HGV ban on Grove Road (Option 2) is preferred. This option combination provides a second point of access to the industrial estate which would not have a headroom restriction, provides connectivity between Wilbury Way and Cadwell Lane and increases road network capacity at the Cadwell crossroads. There are however some disadvantages, including potential rat running on Girdle Road and Hillfield Avenue and some inconvenience for cyclists. In addition, there is re-routing of traffic travelling between Hitchin and north-west Letchworth through the industrial estate, which was not a scheme objective.

If traffic using the link to Stotfold Road as a through route is a concern, the Cadwell crossroads could be left in its existing form (Option 1) therefore acting as a constraint on network capacity, making the link road a less attractive route for through traffic. The industrial estate would still have the benefit of the new unconstrained link to Stotfold Road (Option A / A1) providing additional highway capacity for accessing the industrial estate, and enabling an HGV ban to be implemented on Grove Road (Option 2). This option combination (A / A1, 1 and 2) would have the benefit that it would not impact on cyclists or cause rat running on Girdle Road and Hillfield Avenue.

6.3 Action Plan

The components of the option combinations would be deliverable via different mechanisms.

The traffic management option at Cadwell crossroads and on Grove Road could follow the standard HCC Integrated Transport Projects procedure for delivery, as the works are small scale and within the existing highway boundary.

The access road option would require planning permission, land acquisition (potentially a Compulsory Purchase Order and Public Inquiry), and delivery would fall under the HCC Major Projects Gateways. There are six gateways from inception to completion, and this report would form part of Gateway 1: Inception. Further details of the Major Projects Gateways are given in Appendix H.

Appendix A: Highway Boundary Plan

Cadwell Lane / Grove Road
Wilbury Way / Woolgrove Road
Hitchin

HITCHIN 026

HITCHIN 089

Meters

0 105 210 420 630 840

N W E S

Scale at A2

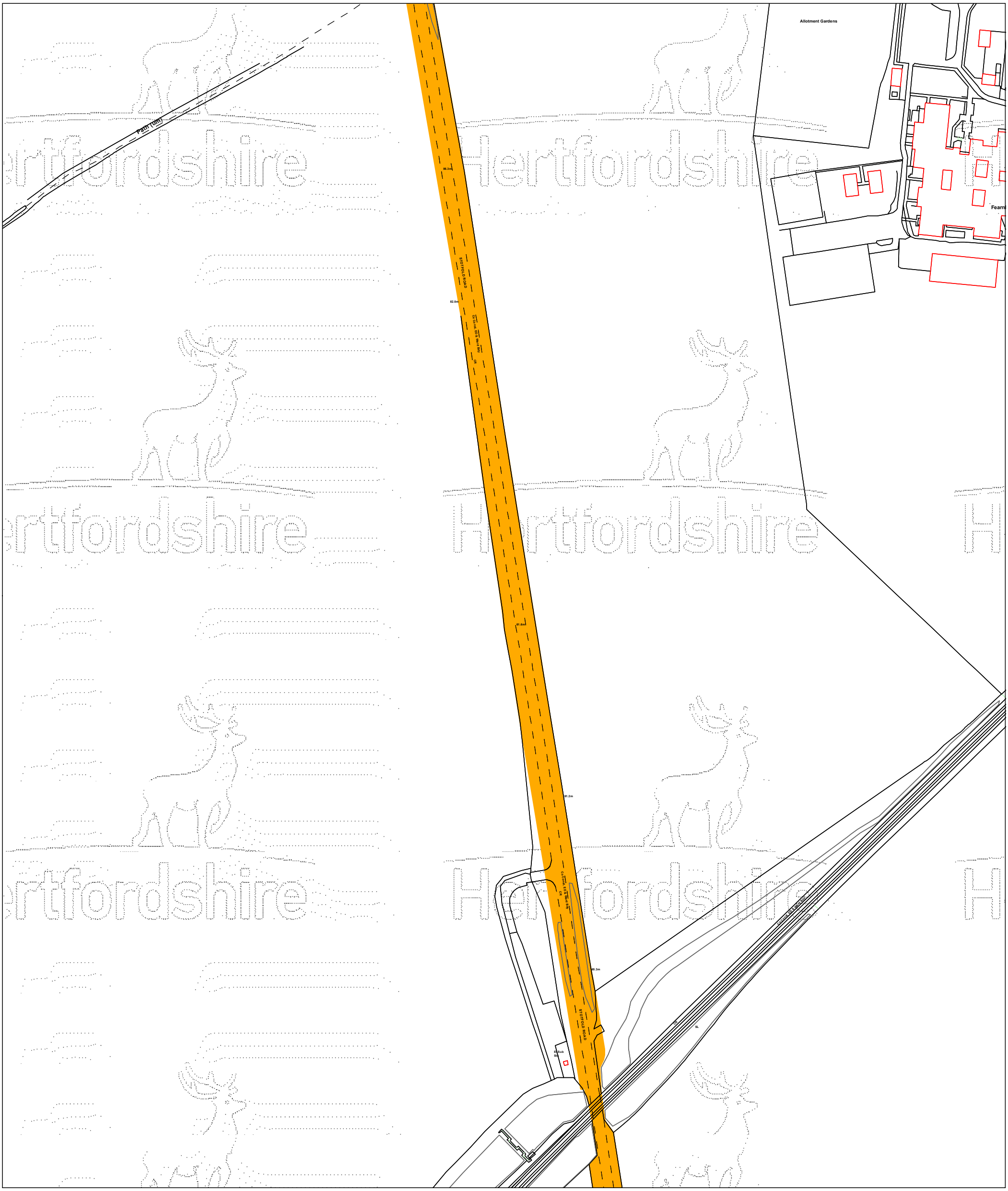
1:2,500

For reference purposes only.
No further copies may be made.
Produced by Highway Boundaries & Land Charges
Hertfordshire County Council

Date: 20/04/2016

The Rights of Way information on this plan is based on information from the Definitive Map of Public Rights of Way. The accuracy of this plan cannot be guaranteed. If in doubt the Definitive Map should be consulted.

Hertfordshire



0 50 100 200 300 400 Meters

Stotfold Road
Hitchin / Letchworth Garden City

N
W E
S

Scale at A3

1:2,500

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Hertfordshire County Council
Date: 14/10/2015

The Rights of Way information on this plan is based on information from the Definitive Map of Public Rights of Way. The accuracy of this plan cannot be guaranteed. If in doubt the Definitive Map should be consulted.

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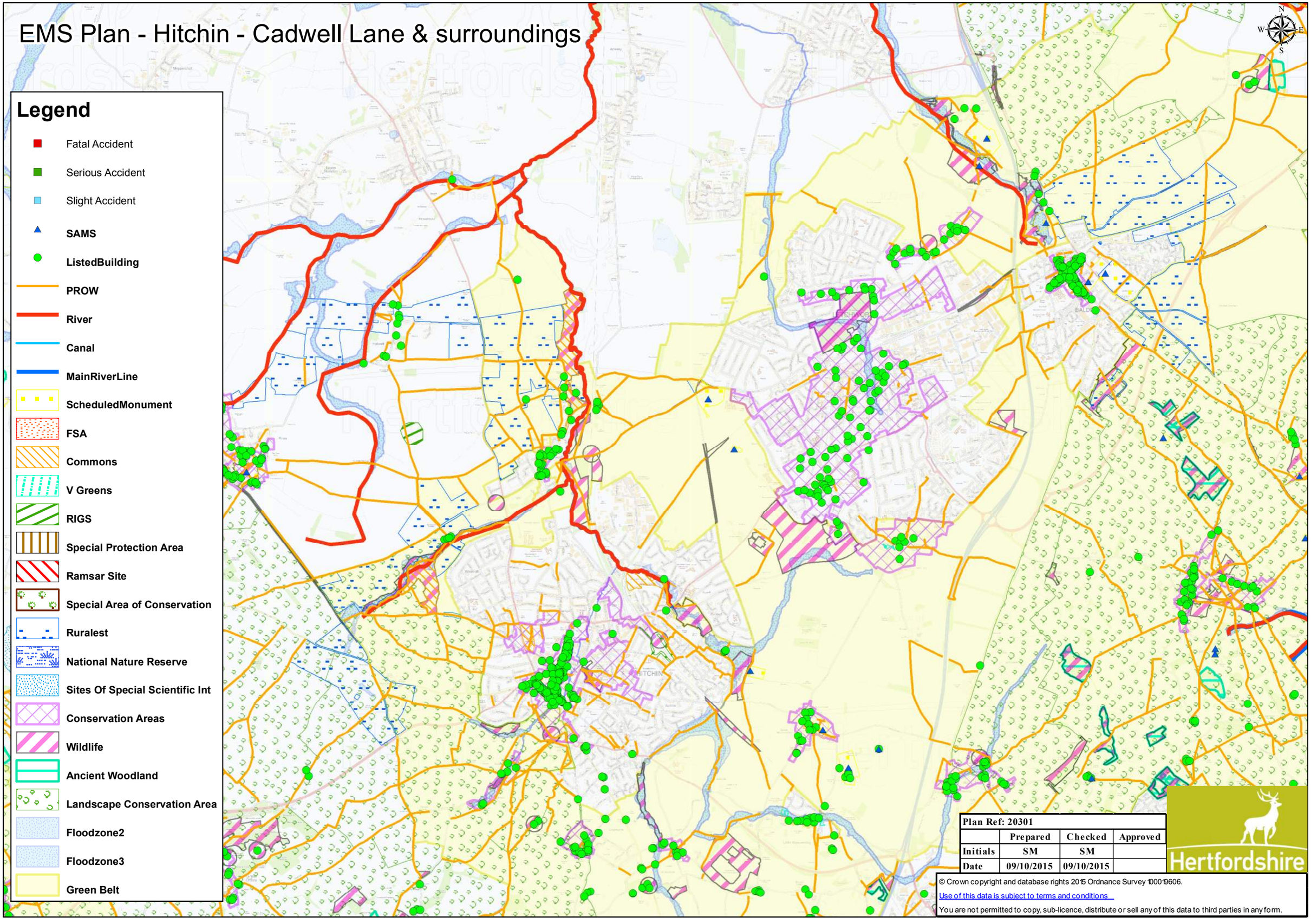
Appendix B: Environmental Constraints Plan

EMS Plan - Hitchin - Cadwell Lane & surroundings



Legend

- Fatal Accident
- Serious Accident
- Slight Accident
- SAMS
- ListedBuilding
- PROW
- River
- Canal
- MainRiverLine
- ScheduledMonument
- FSA
- Commons
- V Greens
- RIGS
- Special Protection Area
- Ramsar Site
- Special Area of Conservation
- Ruralest
- National Nature Reserve
- Sites Of Special Scientific Int
- Conservation Areas
- Wildlife
- Ancient Woodland
- Landscape Conservation Area
- Floodzone2
- Floodzone3
- Green Belt

Plan Ref: 20301			
	Prepared	Checked	Approved
Initials	SM	SM	
Date	09/10/2015	09/10/2015	

Hertfordshire

Appendix C: Survey Data

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

07:00 - 10:00

Road No. U369 **Location** Cadwell Lane, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Enumerators

Comments:

		LEFT								**STRAIGHT ON**								**RIGHT**									**TOTALS**
		INTO Wilbury Way								**TO** Woolgrove Road								**INTO** Grove Road									
		FROM Cadwell Lane								**FROM** Cadwell Lane								**FROM** Cadwell Lane									
							HCV								**HCV**								**HCV**				
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	15 mins	
07:00		-	-	1	-	-	-	-	**1**	-	-	3	-	1	-	2	**6**	-	-	6	-	1	1	4	**12**	07:00	**19**
07:15		-	-	5	-	2	-	-	**7**	1	-	1	-	-	-	-	**1**	-	-	6	-	3	3	2	**14**	07:15	**22**
07:30		-	-	2	-	-	-	-	**2**	-	-	1	-	1	-	1	**3**	-	-	11	-	1	-	4	**16**	07:30	**21**
07:45		-	-	4	-	2	-	-	**6**	-	-	1	-	-	-	-	**1**	-	-	11	-	6	1	-	**18**	07:45	**25**
08:00		-	-	2	-	2	1	-	**5**	-	-	3	-	1	1	1	**6**	-	-	2	-	4	1	3	**10**	08:00	**21**
08:15		-	-	2	-	1	-	-	**3**	-	-	3	-	4	1	1	**9**	-	-	8	-	2	-	2	**12**	08:15	**24**
08:30		-	-	1	-	2	-	-	**3**	-	-	6	-	3	-	-	**9**	-	-	5	-	10	1	2	**18**	08:30	**30**
08:45		-	-	1	-	1	-	-	**2**	-	-	8	-	1	-	1	**10**	-	-	5	-	5	2	-	**12**	08:45	**24**
09:00		-	-	1	-	3	-	-	**4**	-	-	8	-	4	-	-	**12**	-	-	1	-	7	-	5	**13**	09:00	**29**
09:15		-	-	2	-	1	-	-	**3**	-	-	4	-	2	-	1	**7**	-	-	10	-	5	3	2	**20**	09:15	**30**
09:30		-	-	2	-	1	-	-	**3**	1	-	4	-	6	-	-	**10**	-	-	8	-	2	2	2	**14**	09:30	**27**
09:45		-	-	1	-	-	-	1	**2**	-	-	3	-	3	-	1	**7**	-	-	7	-	12	2	1	**22**	09:45	**31**
Sheet total		**0**	**0**	**24**	**0**	**15**	**1**	**1**	**41**	**2**	**0**	**45**	**0**	**26**	**2**	**8**	**81**	**0**	**0**	**80**	**0**	**58**	**16**	**27**	**181**		**303**

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

16:00 - 20:00

Road No. U369 **Location** Cadwell Lane, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Enumerators

Comments:

		LEFT								**STRAIGHT ON**								**RIGHT**									**TOTALS**
		INTO Wilbury Road								**TO** Woolgrove Road								**INTO** Grove Road									
		FROM Cadwell Lane								**FROM** Cadwell Lane								**FROM** Cadwell Lane									
							HCV								**HCV**								**HCV**				
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	15 mins	
16:00		-	-	2	-	1	1	-	**4**	-	-	25	-	5	-	-	**30**	-	-	15	-	9	2	-	**26**	16:00	**60**
16:15		-	-	-	-	1	-	-	**1**	-	-	8	-	2	-	-	**10**	-	-	16	-	8	2	-	**26**	16:15	**37**
16:30		-	-	1	-	-	-	-	**1**	1	-	21	-	2	-	-	**23**	-	-	22	-	10	2	2	**36**	16:30	**60**
16:45		-	-	-	-	-	-	-	**0**	-	-	13	-	3	-	-	**16**	-	-	12	-	10	-	-	**22**	16:45	**38**
17:00		-	-	-	-	-	-	-	**0**	-	-	18	-	4	-	-	**22**	-	-	22	-	3	-	-	**25**	17:00	**47**
17:15		-	-	-	-	-	-	-	**0**	1	1	22	-	4	-	-	**27**	-	-	24	-	-	-	-	**24**	17:15	**51**
17:30		-	-	-	-	1	-	-	**1**	1	-	16	-	3	-	-	**19**	2	-	18	-	4	-	-	**22**	17:30	**42**
17:45		-	-	-	-	-	-	-	**0**	-	-	8	-	4	-	-	**12**	-	-	21	-	4	-	-	**25**	17:45	**37**
18:00		-	-	2	-	-	-	-	**2**	-	-	13	-	4	-	-	**17**	-	-	4	-	3	-	-	**7**	18:00	**26**
18:15		-	-	-	-	-	-	-	**0**	-	-	2	-	-	-	-	**2**	-	-	4	-	3	-	-	**7**	18:15	**9**
18:30		-	-	-	-	-	-	-	**0**	-	-	4	-	-	-	-	**4**	-	-	5	-	2	-	-	**7**	18:30	**11**
18:45		-	-	1	-	-	-	-	**1**	-	-	2	-	1	-	-	**3**	-	-	4	-	1	-	-	**5**	18:45	**9**
Sheet total		**0**	**0**	**6**	**0**	**3**	**1**	**0**	**10**	**3**	**1**	**152**	**0**	**32**	**0**	**0**	**185**	**2**	**0**	**167**	**0**	**57**	**6**	**2**	**232**		**427**

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

07:00 - 10:00

Road No. U369 **Location** Wilbury Way, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Recorded by: Enumerators

Comments:

		LEFT								STRAIGHT ON								RIGHT									TOTALS
		INTO Woolgrove Road FROM Wilbury Way								TO Grove Road FROM Wilbury Way								INTO Cadwell Lane FROM Wilbury Way									
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	HCV <3 TON	HCV >3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	HCV <3 TON	HCV >3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	HCV <3 TON	HCV >3 TON CHEVRON	TOTAL excl P/C	15 mins	
07:00		-	-	1	-	2	-	-	**3**	-	-	3	-	4	1	2	**10**	-	-	-	-	-	-	1	**1**	07:00	**14**
07:15		-	-	6	-	-	-	-	**6**	1	-	4	-	1	-	1	**6**	-	-	-	-	1	-	-	**1**	07:15	**13**
07:30		-	1	2	-	1	-	2	**6**	1	-	7	-	2	-	2	**11**	-	-	1	-	1	-	-	**2**	07:30	**19**
07:45		-	-	4	-	1	-	2	**7**	-	-	12	-	5	-	3	**20**	-	-	-	-	-	1	-	**1**	07:45	**28**
08:00		-	-	2	-	-	-	1	**3**	-	-	2	-	2	1	3	**8**	-	-	-	-	-	-	-	**0**	08:00	**11**
08:15		-	-	12	-	6	-	-	**18**	1	-	11	-	4	1	3	**19**	-	-	-	-	1	-	-	**1**	08:15	**38**
08:30		-	-	4	-	4	1	-	**9**	-	-	2	-	-	-	-	**2**	-	-	-	-	-	-	-	**0**	08:30	**11**
08:45		-	-	2	-	4	-	1	**7**	-	-	5	-	7	1	1	**14**	-	-	-	-	1	-	-	**1**	08:45	**22**
09:00		-	-	2	-	3	-	1	**6**	-	-	6	-	10	-	2	**18**	-	-	1	-	1	-	-	**2**	09:00	**26**
09:15		-	-	6	-	5	-	-	**11**	-	-	11	-	6	1	2	**20**	-	-	1	-	-	-	1	**2**	09:15	**33**
09:30		-	-	12	-	2	-	-	**14**	-	-	14	-	10	-	2	**26**	-	-	-	-	1	-	-	**1**	09:30	**41**
09:45		-	-	6	-	5	-	1	**12**	-	-	14	-	9	1	3	**27**	-	-	1	-	1	-	-	**2**	09:45	**41**
Sheet total		**0**	**1**	**59**	**0**	**33**	**1**	**8**	**102**	**3**	**0**	**91**	**0**	**60**	**6**	**24**	**181**	**0**	**0**	**4**	**0**	**7**	**1**	**2**	**14**		**297**

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

16:00 - 20:00

Road No. U369 **Location** Wilbury Way, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Recorded by: Enumerators

Comments:

		LEFT								**STRAIGHT ON**								**RIGHT**									**TOTALS**
		INTO Woolgove Road								**TO** Grove Road								**INTO** Cadwell Lane									
		FROM Wilbury Way								**FROM** Wilbury Way								**FROM** Wilbury Way									
							HCV								**HCV**								**HCV**				
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	15 mins	
16:00		-	-	28	-	6	-	-	**34**	-	-	56	-	5	-	2	**63**	-	-	1	-	1	-	-	**2**	16:00	**2**
16:15		2	-	34	-	3	-	1	**38**	2	-	40	-	9	4	2	**55**	-	-	-	-	-	-	-	**0**	16:15	**93**
16:30		2	2	96	-	7	-	-	**105**	3	-	111	-	14	-	3	**128**	1	-	1	-	-	-	-	**1**	16:30	**234**
16:45		1	1	82	-	2	-	-	**85**	2	1	82	-	8	1	1	**93**	-	-	-	-	1	-	-	**1**	16:45	**179**
17:00		2	-	147	-	13	-	-	**160**	1	-	178	-	12	-	2	**192**	-	-	-	-	-	-	-	**0**	17:00	**352**
17:15		-	1	61	4	8	-	-	**74**	1	-	109	-	5	-	2	**116**	-	-	-	-	-	-	-	**0**	17:15	**190**
17:30		1	-	90	-	7	-	-	**97**	-	-	107	-	12	-	2	**121**	-	-	2	-	-	-	-	**2**	17:30	**220**
17:45		-	-	44	-	3	-	-	**47**	-	-	71	-	5	-	1	**77**	-	-	1	-	-	-	-	**1**	17:45	**125**
18:00		1	-	39	-	2	-	-	**41**	1	-	74	-	1	-	2	**77**	-	-	2	-	-	-	-	**2**	18:00	**120**
18:15		3	-	26	1	1	-	1	**29**	1	-	47	-	5	-	1	**53**	-	-	-	-	-	-	-	**0**	18:15	**82**
18:30		3	-	31	-	1	-	-	**32**	-	-	34	-	2	-	-	**36**	-	-	-	-	-	-	-	**0**	18:30	**68**
18:45		-	-	19	-	2	-	-	**21**	-	-	20	-	-	-	-	**20**	-	-	2	-	-	-	-	**2**	18:45	**43**
Sheet total		**15**	**4**	**697**	**5**	**55**	**0**	**2**	**763**	**11**	**1**	**929**	**0**	**78**	**5**	**18**	**1031**	**1**	**0**	**9**	**0**	**2**	**0**	**0**	**11**		**1805**

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

07:00 - 10:00

Road No. U369 **Location** Woolgrove Road, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Recorded by: Enumerators

Comments:

		LEFT								STRAIGHT ON								RIGHT									TOTALS
		INTO Grove Road								TO Cadwell Lane								INTO Wilbury Way									
		FROM Woolgrove Road								FROM Woolgrove Road								FROM Woolgrove Road									
							HCV								HCV								HCV				
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	15 mins	
07:00		-	-	14	-	1	-	-	**15**	1	-	7	-	-	1	-	**8**	-	-	20	-	3	1	-	**24**	07:00	**47**
07:15		-	-	19	-	4	-	-	**23**	-	-	17	-	1	1	-	**19**	-	-	51	-	2	-	1	**54**	07:15	**96**
07:30		-	-	27	-	4	-	-	**31**	-	-	27	-	5	-	-	**32**	1	1	52	-	5	2	-	**60**	07:30	**123**
07:45		-	-	33	-	2	-	-	**35**	-	1	22	-	8	1	-	**32**	-	-	79	-	3	-	-	**82**	07:45	**149**
08:00		-	-	44	-	3	-	-	**47**	-	-	21	-	5	2	-	**28**	-	1	71	-	10	-	-	**82**	08:00	**157**
08:15		-	-	66	-	2	-	-	**68**	-	-	14	-	7	1	-	**22**	-	-	59	-	3	-	-	**62**	08:15	**152**
08:30		2	-	73	1	2	1	-	**77**	1	-	15	-	6	1	-	**22**	-	-	76	-	8	1	1	**86**	08:30	**185**
08:45		1	1	57	1	4	-	-	**63**	1	-	13	-	8	2	-	**23**	1	-	82	1	10	-	-	**93**	08:45	**179**
09:00		1	-	41	-	3	1	-	**45**	-	-	10	-	5	1	1	**17**	-	-	45	-	6	2	-	**53**	09:00	**115**
09:15		-	-	27	-	4	-	-	**31**	-	-	7	-	7	2	-	**16**	-	-	28	-	4	-	2	**34**	09:15	**81**
09:30		2	-	18	1	3	-	1	**23**	-	-	6	-	8	-	2	**16**	-	-	18	-	5	-	1	**24**	09:30	**63**
09:45		-	-	25	-	4	-	1	**30**	-	-	6	-	4	1	1	**12**	-	-	22	-	3	1	-	**26**	09:45	**68**
Sheet total		**6**	**1**	**444**	**3**	**36**	**2**	**2**	**488**	**3**	**1**	**165**	**0**	**64**	**13**	**4**	**247**	**2**	**2**	**603**	**1**	**62**	**7**	**5**	**680**		**1415**

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

16:00 - 20:00

Road No. U369 **Location** Woolgrove Road, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Recorded by: Enumerators

Comments:

		LEFT								STRAIGHT ON								RIGHT									TOTALS
		INTO Grove Road								TO Cadwell Lane								INTO Wilbury Way									
		FROM Woolgrove Road								FROM Woolgrove Road								FROM Woolgrave Road									
							HCV								HCV								HCV				
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	15 mins	
16:00		-	-	39	1	4	-	-	**44**	-	-	1	-	2	-	-	**3**	-	-	12	-	4	1	-	**17**	16:00	**64**
16:15		-	-	34	2	2	1	-	**39**	-	-	4	-	3	1	-	**8**	-	-	15	-	3	-	-	**18**	16:15	**65**
16:30		1	-	41	-	8	-	-	**49**	-	-	7	-	2	-	1	**10**	-	-	16	-	1	-	-	**17**	16:30	**76**
16:45		-	-	49	-	8	1	-	**58**	-	-	5	-	-	-	-	**5**	-	-	23	-	2	-	-	**25**	16:45	**88**
17:00		-	-	52	-	9	-	1	**62**	-	-	11	-	-	-	1	**12**	-	-	16	-	2	-	-	**18**	17:00	**92**
17:15		1	-	59	-	6	1	-	**66**	-	-	5	-	-	-	-	**5**	-	-	27	-	2	-	-	**29**	17:15	**100**
17:30		-	-	51	1	-	-	-	**52**	-	-	4	-	2	-	-	**6**	-	-	20	-	-	-	-	**20**	17:30	**78**
17:45		1	-	72	-	3	-	-	**75**	-	-	8	-	2	-	-	**10**	-	-	22	-	-	-	-	**22**	17:45	**107**
18:00		-	1	46	-	4	-	-	**51**	1	-	2	-	2	-	-	**4**	-	-	15	-	-	-	-	**15**	18:00	**70**
18:15		-	-	28	1	4	-	-	**33**	-	-	3	-	-	-	-	**3**	-	-	12	-	1	1	-	**14**	18:15	**50**
18:30		1	-	28	1	6	-	-	**35**	-	-	1	-	3	-	-	**4**	-	-	8	-	-	-	-	**8**	18:30	**47**
18:45		-	-	40	1	2	-	-	**43**	-	-	5	-	1	-	-	**6**	-	-	13	-	1	-	-	**14**	18:45	**63**
Sheet total		**4**	**1**	**539**	**7**	**56**	**3**	**1**	**607**	**1**	**0**	**56**	**0**	**17**	**1**	**2**	**76**	**0**	**0**	**199**	**0**	**16**	**2**	**0**	**217**		**900**

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

07:00 - 10:00

Road No. U369 **Location** Grove Road, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Recorded by: Enumerators

Comments:

		LEFT								STRAIGHT ON								RIGHT									TOTALS
		INTO Cadwell Lane								TO Wilbury Way								INTO Woolgrove Road									
		FROM Grove Road								FROM Grove Road								FROM Grove Road									
							HCV								HCV								HCV				
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	15 mins	
07:00		-	-	2	-	-	-	-	**2**	-	-	3	-	1	-	-	**4**	-	-	2	-	1	-	-	**3**	07:00	**9**
07:15		-	-	10	-	6	3	2	**21**	-	-	45	-	3	2	2	**52**	-	-	14	-	-	-	-	**14**	07:15	**87**
07:30		-	-	12	-	5	1	-	**18**	-	1	39	-	3	1	1	**45**	-	1	19	-	2	-	-	**22**	07:30	**85**
07:45		-	-	8	-	2	-	-	**10**	2	-	60	-	8	-	-	**68**	-	-	21	2	3	-	-	**26**	07:45	**104**
08:00		-	-	16	-	5	2	1	**24**	-	1	74	-	7	1	2	**85**	-	-	52	3	6	-	1	**62**	08:00	**171**
08:15		1	-	9	-	7	-	1	**17**	-	-	88	-	8	-	1	**97**	1	-	47	-	4	1	1	**53**	08:15	**167**
08:30		-	-	7	-	3	1	2	**13**	1	1	70	-	6	4	3	**84**	1	-	52	-	1	-	1	**54**	08:30	**151**
08:45		-	-	27	-	2	3	3	**35**	-	-	86	1	9	-	6	**102**	1	-	57	1	1	-	-	**59**	08:45	**196**
09:00		-	-	14	-	5	-	-	**19**	-	-	49	-	12	2	2	**65**	-	-	18	-	-	-	1	**19**	09:00	**103**
09:15		-	-	9	-	4	2	1	**16**	-	-	41	-	8	3	1	**53**	-	-	13	-	6	-	1	**20**	09:15	**89**
09:30		-	-	8	-	3	-	-	**11**	-	-	28	-	8	-	1	**37**	-	-	12	-	4	1	-	**17**	09:30	**65**
09:45		-	-	3	-	1	-	-	**4**	-	-	14	-	5	1	1	**21**	-	-	13	-	4	-	-	**17**	09:45	**42**
Sheet total		**1**	**0**	**125**	**0**	**43**	**12**	**10**	**190**	**3**	**3**	**597**	**1**	**78**	**14**	**20**	**713**	**3**	**1**	**320**	**6**	**32**	**2**	**5**	**366**		**1269**

TRAFFIC SURVEY - JUNCTION (CLASSIFIED)

16:00 - 20:00

Road No. U369 **Location** Cadwell Lane, Hitchin

Day & Date Wednesday 27th Jan 2016 **Weather** Overcast

Job No 15-213 **Grid Ref:** 20

Recorded by: Enumerators

Comments:

		LEFT								STRAIGHT ON								RIGHT									TOTALS
		INTO Cadwell Road FROM Grove Road								TO Wilbury Way FROM Grove Road								INTO FROM									
							HCV								HCV								HCV				
15 mins	COMM	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	P/C	M/C	CARS	PSV	LCV	<3 TON	>3 TON CHEVRON	TOTAL excl P/C	15 mins	
16:00		-	-	5	-	2	-	-	**7**	-	-	13	-	10	-	1	**24**	-	-	24	-	2	-	-	**26**	16:00	**26**
16:15		-	-	14	-	6	-	-	**20**	-	-	23	-	5	-	-	**28**	-	-	23	-	1	-	-	**24**	16:15	**72**
16:30		-	-	21	-	3	-	-	**24**	-	-	11	-	1	-	-	**12**	1	-	9	-	1	-	-	**10**	16:30	**46**
16:45		-	-	18	-	4	-	-	**22**	-	-	9	-	2	-	-	**11**	-	-	16	-	5	-	-	**21**	16:45	**54**
17:00		-	-	16	-	2	-	-	**18**	-	-	8	1	2	-	-	**11**	-	-	12	-	3	-	-	**15**	17:00	**44**
17:15		-	-	9	-	7	-	-	**16**	-	-	13	-	4	-	1	**18**	-	-	11	-	1	-	-	**12**	17:15	**46**
17:30		-	-	25	-	8	-	-	**33**	-	-	24	-	6	-	1	**31**	1	-	18	-	4	-	-	**22**	17:30	**86**
17:45		-	-	29	-	-	-	-	**29**	1	-	14	-	9	-	-	**23**	-	-	15	-	6	-	-	**21**	17:45	**73**
18:00		-	-	10	-	1	-	-	**11**	-	-	16	-	7	-	-	**23**	-	1	9	-	6	-	-	**16**	18:00	**50**
18:15		-	-	18	1	2	-	2	**23**	-	-	12	-	4	-	-	**16**	-	-	11	-	7	-	-	**18**	18:15	**57**
18:30		-	-	11	-	2	-	-	**13**	-	-	9	-	2	-	-	**11**	-	-	8	-	5	-	-	**13**	18:30	**37**
18:45		2	-	32	-	1	-	-	**33**	-	-	7	-	2	-	-	**9**	-	-	7	-	4	-	-	**11**	18:45	**53**
Sheet total		**2**	**0**	**208**	**1**	**38**	**0**	**2**	**249**	**1**	**0**	**159**	**1**	**54**	**0**	**3**	**217**	**2**	**1**	**163**	**0**	**45**	**0**	**0**	**209**		**675**

GRID 20 **JOB NO** 15-213

VEHICLE QUEUE LENGTHS AT JUNCTIONS

PEAK AM & PM (5 mins)

Location: Cadwell Lane, Hitchin

Date: Wednesday 27th January 2016

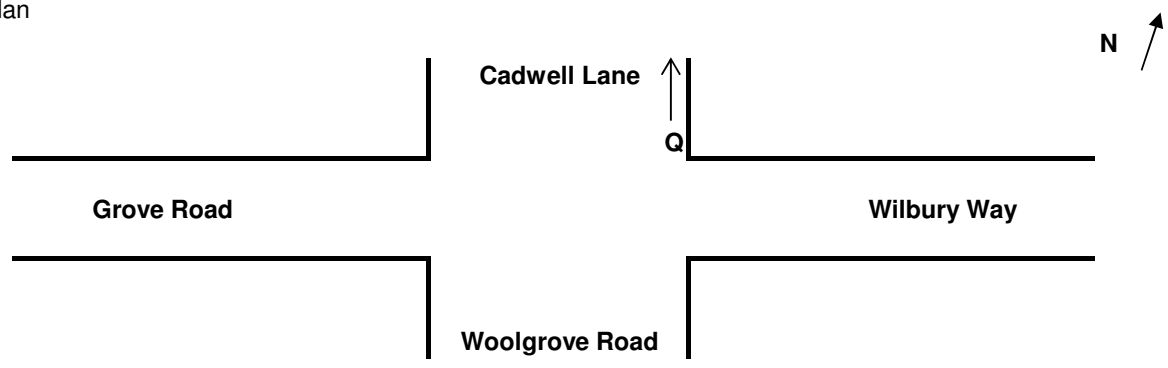
Weather: Windy

Recorded By: Enumerators

Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane
07:00	-	3	-	**08:30**	-	3	-	**16:00**	-	11	-	**17:30**	-	16	-
07:05	-	3	-	08:35	-	6	-	16:05	-	9	-	17:35	-	15	-
07:10	-	2	-	08:40	-	2	-	16:10	-	3	-	17:40	-	9	-
07:15	-	2	-	**08:45**	-	3	-	**16:15**	-	5	-	**17:45**	-	9	-
07:20	-	4	-	08:50	-	4	-	16:20	-	8	-	17:50	-	3	-
07:25	-	-	-	08:55	-	5	-	16:25	-	6	-	17:55	-	4	-
07:30	-	4	-	**09:00**	-	2	-	**16:30**	-	17	-	**18:00**	-	5	-
07:35	-	2	-	09:05	-	3	-	16:35	-	20	-	18:05	-	6	-
07:40	-	5	-	09:10	-	3	-	16:40	-	9	-	18:10	-	4	-
07:45	-	2	-	**09:15**	-	4	-	**16:45**	-	7	-	**18:15**	-	2	-
07:50	-	2	-	09:20	-	3	-	16:50	-	6	-	18:20	-	-	-
07:55	-	3	-	09:25	-	6	-	16:55	-	5	-	18:25	-	-	-
08:00	-	4	-	**09:30**	-	3	-	**17:00**	-	19	-	**18:30**	-	3	-
08:05	-	2	-	09:35	-	2	-	17:05	-	23	-	18:35	-	-	-
08:10	-	4	-	09:40	-	4	-	17:10	-	17	-	18:40	-	-	-
08:15	-	5	-	**09:45**	-	3	-	**17:15**	-	8	-	**18:45**	-	2	-
08:20	-	5	-	09:50	-	2	-	17:20	-	6	-	18:50	-	2	-
08:25	-	3	-	09:55	-	5	-	17:25	-	9	-	18:55	-	-	-

Comments, observations:

Sketch plan



GRID 20 **JOB NO** 15-213

VEHICLE QUEUE LENGTHS AT JUNCTIONS

PEAK AM & PM (5 mins)

Location: Wilbury Way, Hitchin

Date: Wednesday 27th January 2016

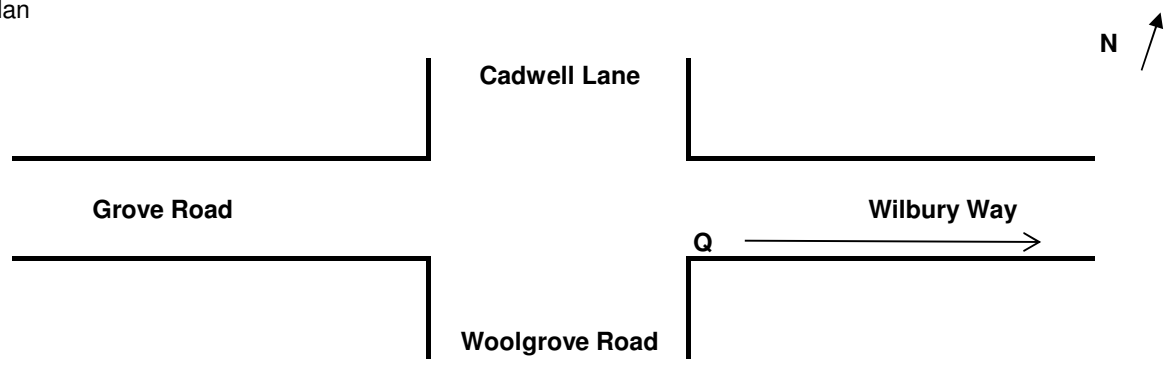
Weather: Windy

Recorded By: Enumerators

Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane
07:00	1	2	-	**08:30**	10	8	-	**16:00**	15	31	-	**17:30**	134	61	-
07:05	-	4	-	08:35	9	3	-	16:05	14	27	-	17:35	24	37	-
07:10	-	4	-	08:40	6	8	-	16:10	8	17	-	17:40	18	34	-
07:15	1	3	-	**08:45**	8	7	-	**16:15**	22	25	-	**17:45**	17	21	-
07:20	-	2	-	08:50	3	9	-	16:20	9	22	-	17:50	7	12	-
07:25	2	4	-	08:55	7	8	-	16:25	10	13	-	17:55	13	14	-
07:30	1	4	-	**09:00**	9	7	-	**16:30**	39	36	-	**18:00**	5	10	-
07:35	1	3	-	09:05	6	15	-	16:35	41	56	-	18:05	4	7	-
07:40	8	6	-	09:10	4	11	-	16:40	21	24	-	18:10	5	4	-
07:45	-	10	-	**09:15**	8	14	-	**16:45**	41	37	-	**18:15**	2	5	-
07:50	2	10	-	09:20	5	10	-	16:50	9	10	-	18:20	2	3	-
07:55	4	9	-	09:25	3	7	-	16:55	34	42	-	18:25	1	1	-
08:00	5	15	-	**09:30**	5	10	-	**17:00**	50	72	-	**18:30**	1	5	-
08:05	8	3	-	09:35	11	13	-	17:05	36	47	-	18:35	3	3	-
08:10	5	6	-	09:40	7	10	-	17:10	41	47	-	18:40	4	7	-
08:15	4	4	-	**09:45**	2	9	-	**17:15**	61	66	-	**18:45**	3	2	-
08:20	7	8	-	09:50	10	10	-	17:20	34	65	-	18:50	2	5	-
08:25	13	9	-	09:55	8	12	-	17:25	132	60	-	18:55	3	4	-

Comments, observations:

Sketch plan



GRID 20 **JOB NO** 15-213

VEHICLE QUEUE LENGTHS AT JUNCTIONS

PEAK AM & PM (5 mins)

Location: Woolgrove Road, Hitchin

Date: Wednesday 27th January 2016

Weather: Windy

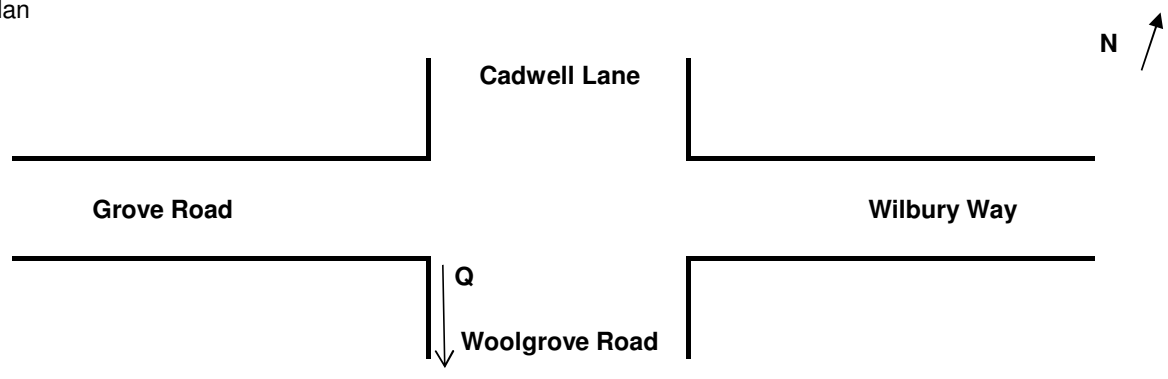
Recorded By: Enumerators

Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane
07:00	3	3	-	**08:30**	8	13	-	**16:00**	4	1	-	**17:30**	27	4	-
07:05	3	3	-	08:35	9	12	-	16:05	7	3	-	17:35	18	4	-
07:10	3	5	-	08:40	23	12	-	16:10	8	4	-	17:40	30	3	-
07:15	3	7	-	**08:45**	22	9	-	**16:15**	7	3	-	**17:45**	24	6	-
07:20	5	9	-	08:50	23	10	-	16:20	6	2	-	17:50	11	2	-
07:25	9	4	-	08:55	8	12	-	16:25	7	2	-	17:55	20	3	-
07:30	7	4	-	**09:00**	10	11	-	**16:30**	7	7	-	**18:00**	8	1	-
07:35	2	7	-	09:05	9	8	-	16:35	6	1	-	18:05	11	1	-
07:40	8	9	-	09:10	5	6	-	16:40	7	2	-	18:10	5	2	-
07:45	9	9	-	**09:15**	5	5	-	**16:45**	11	4	-	**18:15**	5	3	-
07:50	10	7	-	09:20	6	4	-	16:50	11	5	-	18:20	5	3	-
07:55	5	14	-	09:25	5	2	-	16:55	30	4	-	18:25	8	1	-
08:00	7	7	-	**09:30**	4	6	-	**17:00**	30	4	-	**18:30**	6	1	-
08:05	7	6	-	09:35	9	4	-	17:05	30	3	-	18:35	6	1	-
08:10	9	7	-	09:40	5	1	-	17:10	30	2	-	18:40	6	2	-
08:15	13	11	-	**09:45**	8	3	-	**17:15**	30	4	-	**18:45**	4	3	-
08:20	14	8	-	09:50	6	4	-	17:20	30	4	-	18:50	8	5	-
08:25	8	9	-	09:55	5	1	-	17:25	30	5	-	18:55	6	2	-

Comments, observations:

Curve in the road meant that the enumerator could not see further than 30 vehicles

Sketch plan



GRID 20 **JOB NO** 15-213

VEHICLE QUEUE LENGTHS AT JUNCTIONS

PEAK AM & PM (5 mins)

Location: Grove Road, Hitchin

Date: Wednesday 27th January 2016

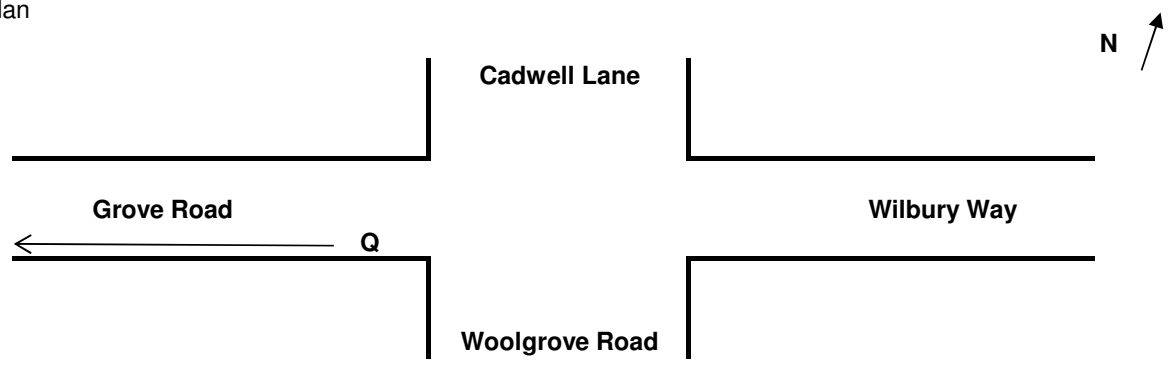
Weather: Windy

Recorded By: Enumerators

Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane	Start Time	near side lane	middle lane	off Side lane
07:00	3	-	2	**08:30**	20	-	19	**16:00**	4	-	2	**17:30**	4	-	7
07:05	8	-	3	08:35	21	-	12	16:05	2	-	4	17:35	3	-	17
07:10	9	-	4	08:40	6	-	5	16:10	6	-	2	17:40	3	-	18
07:15	11	-	4	**08:45**	13	-	8	**16:15**	3	-	2	**17:45**	1	-	9
07:20	14	-	3	08:50	13	-	8	16:20	6	-	6	17:50	2	-	6
07:25	8	-	3	08:55	22	-	7	16:25	1	-	4	17:55	2	-	5
07:30	9	-	4	**09:00**	12	-	4	**16:30**	6	-	3	**18:00**	2	-	6
07:35	11	-	4	09:05	7	-	2	16:35	4	-	8	18:05	3	-	5
07:40	8	-	8	09:10	9	-	2	16:40	2	-	5	18:10	3	-	6
07:45	13	-	4	**09:15**	7	-	5	**16:45**	5	-	6	**18:15**	2	-	4
07:50	8	-	5	09:20	7	-	4	16:50	3	-	4	18:20	6	-	1
07:55	16	-	7	09:25	12	-	5	16:55	3	-	7	18:25	-	-	3
08:00	10	-	3	**09:30**	5	-	3	**17:00**	3	-	9	**18:30**	2	-	1
08:05	11	-	3	09:35	11	-	2	17:05	5	-	21	18:35	2	-	6
08:10	15	-	11	09:40	4	-	4	17:10	1	-	26	18:40	4	-	3
08:15	16	-	11	**09:45**	7	-	5	**17:15**	3	-	27	**18:45**	3	-	7
08:20	23	-	10	09:50	3	-	3	17:20	5	-	36	18:50	1	-	10
08:25	32	-	6	09:55	7	-	3	17:25	3	-	4	18:55	2	-	7

Comments, observations:

Sketch plan



PEDESTRIANS CROSSING ROAD

Road No U 369 **Location** Cadwell Lane, Hitchin

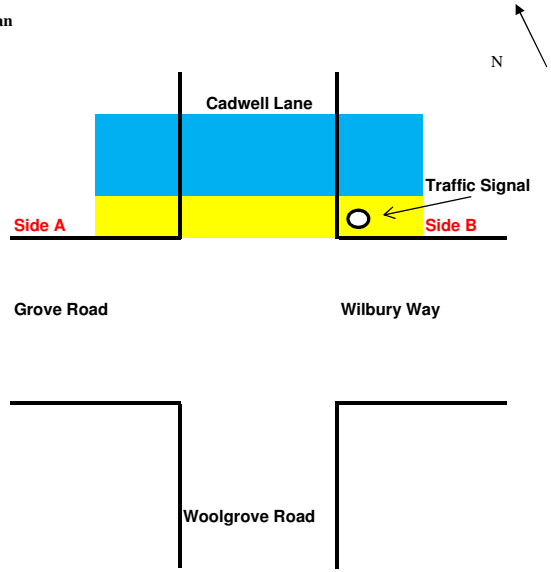
Day & Date Wednesday 27th January **Weather** Wet, Windy

Crossing Pedestrians crossing A to B and B to A at traffic signal **Job No.** 15-213

Recorded by Enumerators **Grid Ref.** 20

A to B				B to A			
Adult	Aged/ Dis.	Child	Hour Comm.	Adult	Aged/ Dis.	Child	TOTAL
3	0	0	**07:00**	1	0	0	**4**
0	0	0	**07:15**	0	0	0	**0**
2	0	0	**07:30**	0	0	0	**2**
2	0	0	**07:45**	1	0	0	**3**
6	0	1	**08:00**	3	0	3	**13**
2	0	0	**08:15**	1	0	6	**9**
2	0	0	**08:30**	1	0	0	**3**
3	0	0	**08:45**	0	0	0	**3**
2	0	0	**09:00**	2	1	1	**6**
2	0	0	**09:15**	1	0	0	**3**
0	0	0	**09:30**	0	0	0	**0**
1	0	0	**09:45**	4	0	0	**5**
25	**0**	**1**	**TOTAL**	**14**	**1**	**10**	**51**

Sketch Plan



PEDESTRIANS CROSSING ROAD

Road No U 369 **Location** Cadwell Lane, Hitchin

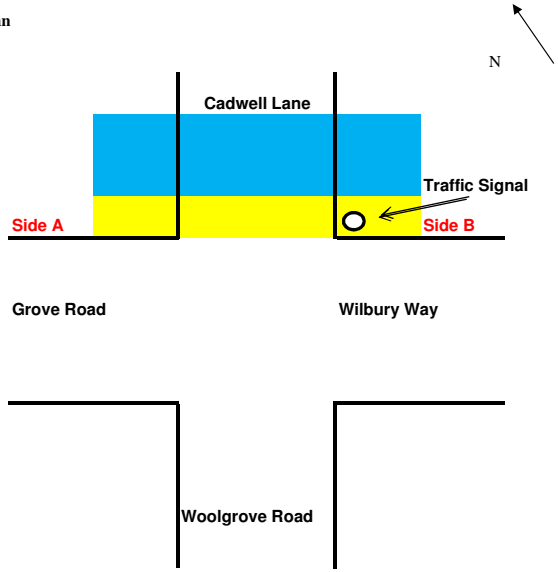
Day & Date Wednesday 27th January **Weather** Wet, Windy

Crossing Pedestrians crossing A to B and B to A at traffic signal **Job No.** 15-213

Recorded by Enumerators **Grid Ref.** 20

A to B				B to A			
Adult	Aged/ Dis.	Child	Hour Comm.	Adult	Aged/ Dis.	Child	TOTAL
0	0	3	**16:00**	0	0	0	**3**
0	0	0	**16:15**	1	0	0	**1**
2	0	0	**16:30**	3	0	1	**6**
1	0	0	**16:45**	1	0	0	**2**
2	0	0	**17:00**	1	0	0	**3**
2	0	0	**17:15**	3	0	4	**9**
2	0	0	**17:30**	2	0	0	**4**
1	0	0	**17:45**	3	0	0	**4**
5	0	0	**18:00**	3	0	2	**10**
1	0	0	**18:15**	1	0	0	**2**
1	0	0	**18:30**	2	0	0	**3**
0	0	0	**18:45**	1	0	0	**1**
17	**0**	**3**	**TOTAL**	**21**	**0**	**7**	**48**

Sketch Plan



PEDESTRIANS CROSSING ROAD

Road No U 369 **Location** Cadwell Lane, Hitchin

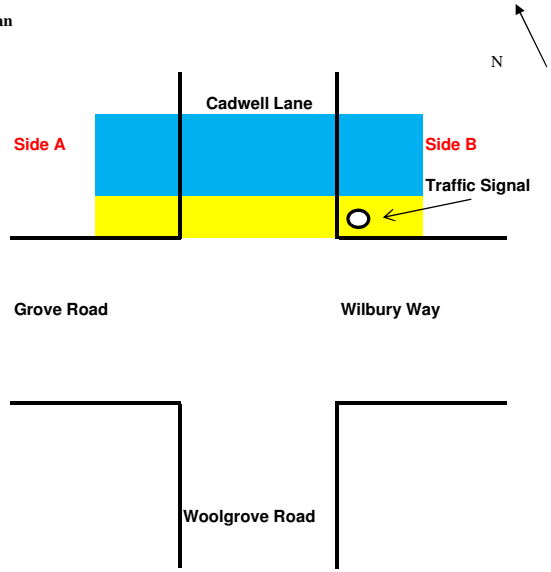
Day & Date Wednesday 27th January **Weather** Wet, Windy

Crossing Pedestrians crossing A to B and B to A up to 20m back from traffic signal **Job No.** 15-213

Recorded by Enumerators **Grid Ref.** 20

A to B				B to A			
Adult	Aged/ Dis.	Child	Hour Comm.	Adult	Aged/ Dis.	Child	TOTAL
0	0	0	**07:00**	0	0	0	**0**
0	0	0	**07:15**	0	0	0	**0**
0	0	0	**07:30**	0	0	0	**0**
1	0	0	**07:45**	0	0	0	**1**
0	0	0	**08:00**	0	0	0	**0**
1	0	0	**08:15**	0	0	0	**1**
0	0	0	**08:30**	0	0	0	**0**
2	0	0	**08:45**	0	0	0	**2**
0	0	0	**09:00**	0	0	0	**0**
1	0	0	**09:15**	1	0	0	**2**
0	0	0	**09:30**	0	0	0	**0**
1	0	0	**09:45**	0	0	0	**1**
6	**0**	**0**	**TOTAL**	**1**	**0**	**0**	**7**

Sketch Plan



PEDESTRIANS CROSSING ROAD

Road No U 369 **Location** Cadwell Lane, Hitchin

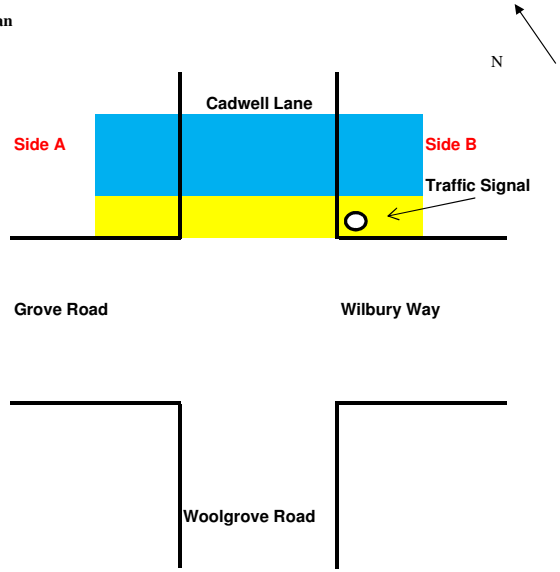
Day & Date Wednesday 27th January **Weather** Wet, Windy

Crossing Pedestrians crossing A to B and B to A up to 20m back from traffic signal **Job No.** 15-213

Recorded by Enumerators **Grid Ref.** 20

A to B				B to A			
Adult	Aged/ Dis.	Child	Hour Comm.	Adult	Aged/ Dis.	Child	TOTAL
0	0	0	**16:00**	0	0	0	**0**
0	0	0	**16:15**	0	0	0	**0**
0	0	0	**16:30**	0	0	0	**0**
0	0	0	**16:45**	0	0	0	**0**
1	0	0	**17:00**	1	0	0	**2**
1	0	0	**17:15**	1	0	0	**2**
0	0	0	**17:30**	0	0	0	**0**
0	0	0	**17:45**	0	0	0	**0**
2	0	2	**18:00**	2	0	0	**6**
0	0	0	**18:15**	0	0	0	**0**
0	0	0	**18:30**	0	0	0	**0**
0	0	0	**18:45**	0	0	0	**0**
4	**0**	**2**	**TOTAL**	**4**	**0**	**0**	**10**

Sketch Plan



Appendix D: Junction Analysis

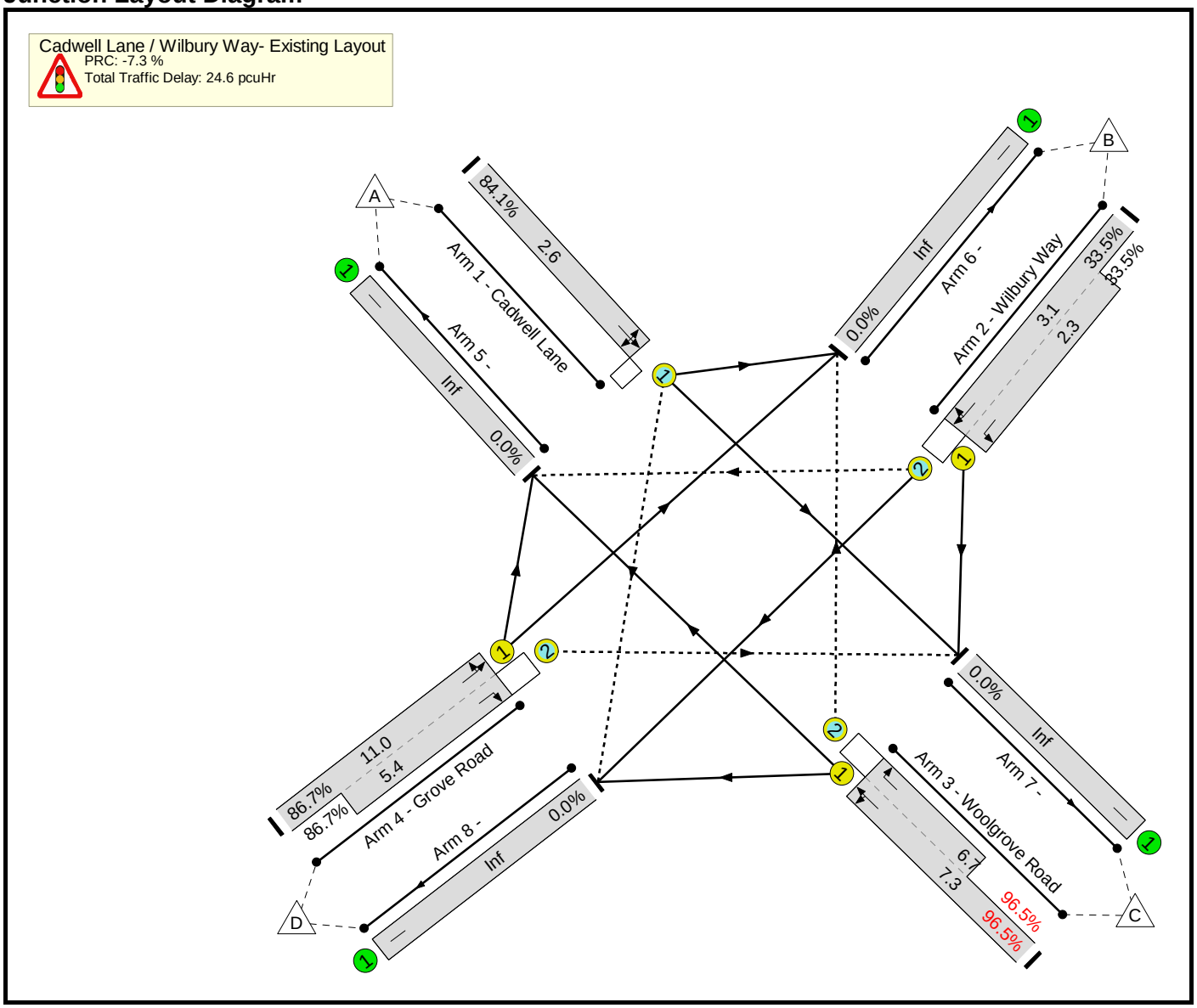
Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
File name:	2016-11-10 Crossroads Existing_Validated.lsg3x
Author:	
Company:	
Address:	
Notes:	

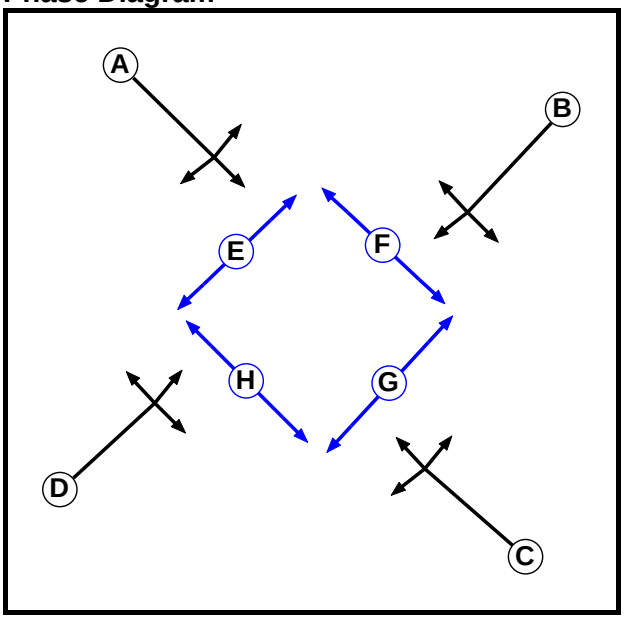
Scenario 1: '2016 AM' (FG1: '2016 AM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

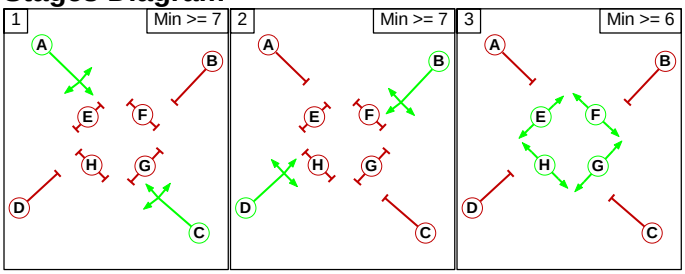


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**96.5%**	**591**	**0**	**30**	**24.6**	-	-
Cadwell Lane / Wilbury Way- Existing Layout	-	-	-		-	-	-	-	-	-	**96.5%**	**591**	**0**	**30**	**24.6**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	20	-	109	1810	130	84.1%	36	0	23	3.0	99.0	3.8
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	20	-	91	2097:1747	155+116	33.5 : 33.5%	2	0	0	0.7	28.8	1.0
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	20	-	677	1250:1600	365+337	96.5 : 96.5%	325	0	0	13.1	69.4	15.1
4/1+4/2	Grove Road Left Ahead Right	U+O	D		1	20	-	712	1902:1800	550+271	86.7 : 86.7%	228	0	7	7.8	39.3	12.1

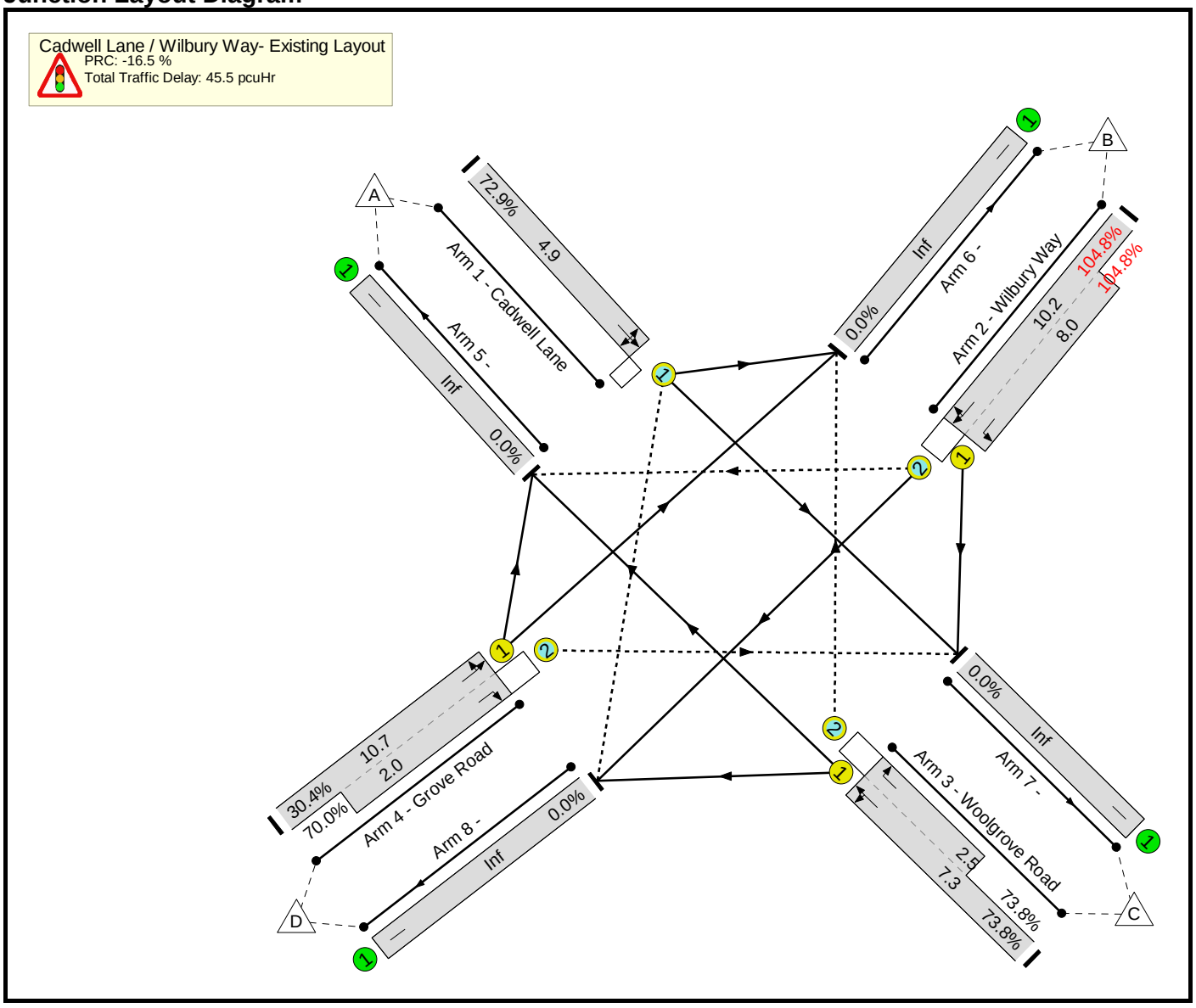
C1 PRC for Signalled Lanes (%): -7.3 Total Delay for Signalled Lanes (pcuHr): 24.55 Cycle Time (s): 72

PRC Over All Lanes (%): -7.3 Total Delay Over All Lanes(pcuHr): 24.55

Basic Results Summary

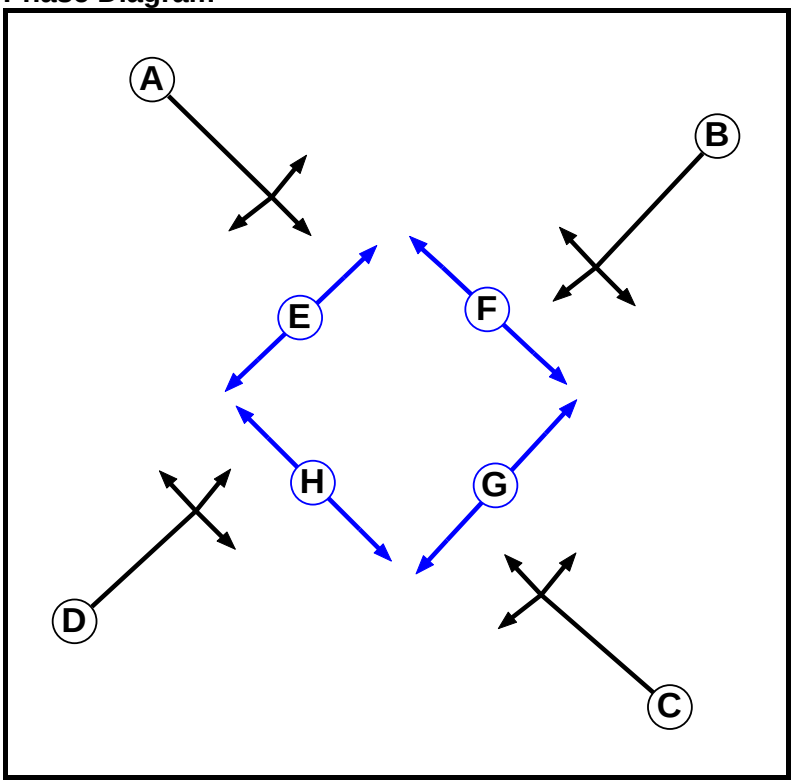
Scenario 2: '2016 PM' (FG2: '2016 PM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

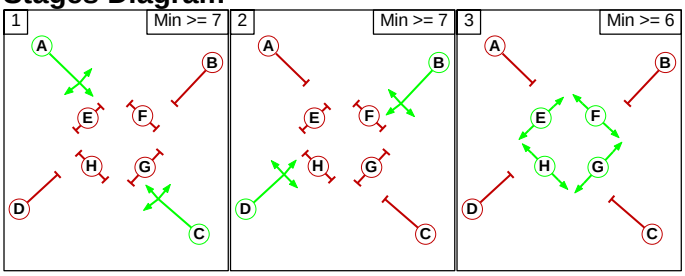


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**104.8%**	**187**	**0**	**71**	**45.5**	-	-
Cadwell Lane / Wilbury Way- Existing Layout	-	-	-		-	-	-	-	-	-	**104.8%**	**187**	**0**	**71**	**45.5**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	20	-	178	1843	244	72.9%	93	0	0	2.6	53.3	4.7
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	20	-	952	2104:1747	508+401	104.8 : 104.8%	2	0	1	37.3	141.1	41.0
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	20	-	361	1250:1600	365+125	73.8 : 73.8%	92	0	0	3.6	36.2	6.2
4/1+4/2	Grove Road Left Ahead Right	U+O	D		1	20	-	233	1840:1800	537+100	30.4 : 70.0%	0	0	70	1.9	29.6	2.8

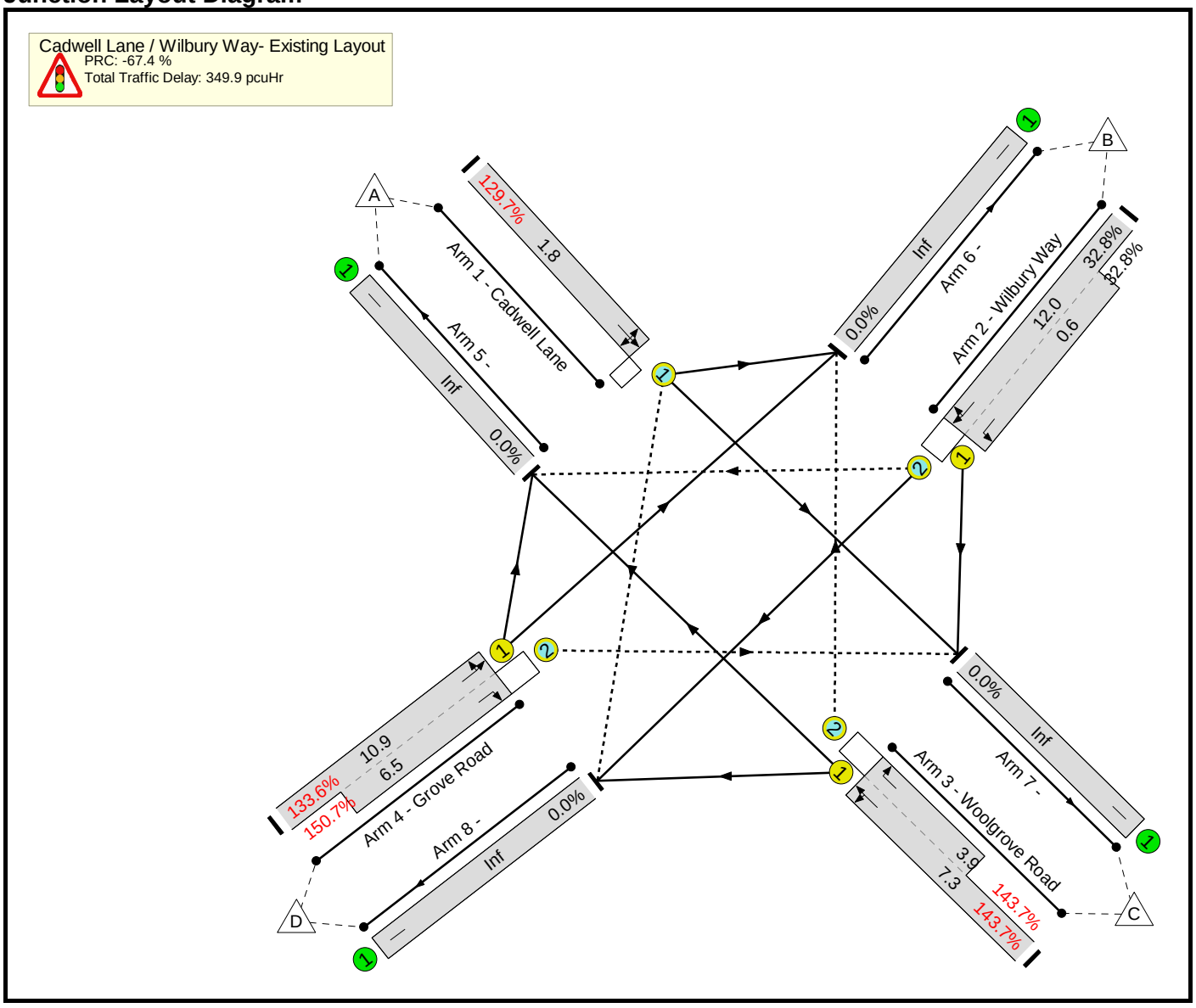
C1 PRC for Signalled Lanes (%): -16.5 Total Delay for Signalled Lanes (pcuHr): 45.48 Cycle Time (s): 72

PRC Over All Lanes (%): -16.5 Total Delay Over All Lanes(pcuHr): 45.48

Basic Results Summary

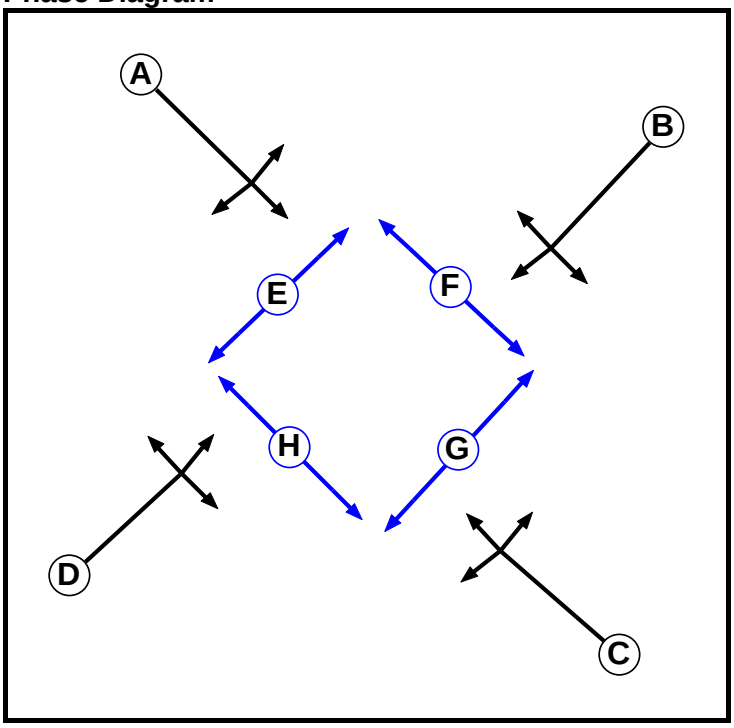
Scenario 3: '2031 AM (DM)' (FG3: '2031 AM (DM)', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

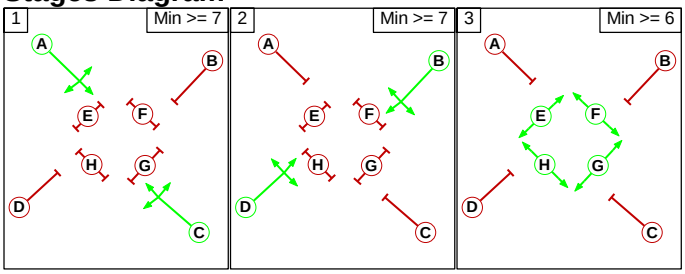


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**150.7%**	**477**	**0**	**114**	**349.9**	-	-
Cadwell Lane / Wilbury Way- Existing Layout	-	-	-		-	-	-	-	-	-	**150.7%**	**477**	**0**	**114**	**349.9**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	20	-	116	1790	89	129.7%	22	0	48	17.0	529.1	18.0
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	20	-	207	2105:1747	600+30	32.8 : 32.8%	0	0	0	1.4	24.1	3.3
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	20	-	803	1250:1600	365+194	143.7 : 143.7%	194	0	0	137.1	614.5	143.8
4/1+4/2	Grove Road Left Ahead Right	U+O	D		1	20	-	1219	1865:1800	544+326	133.6 : 150.7%	260	0	66	194.4	574.1	202.5

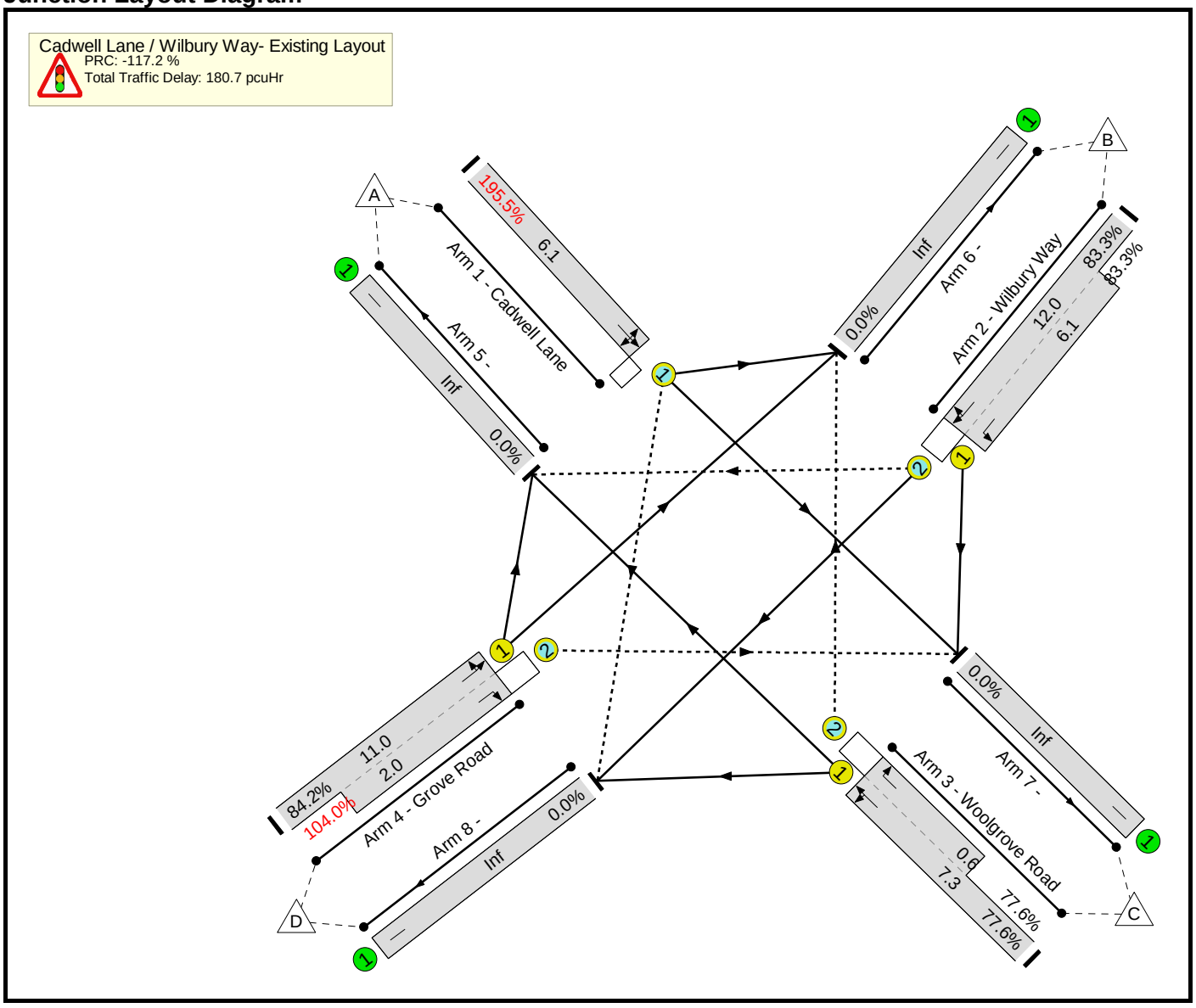
C1 PRC for Signalled Lanes (%): -67.4 Total Delay for Signalled Lanes (pcuHr): 349.89 Cycle Time (s): 72

PRC Over All Lanes (%): -67.4 Total Delay Over All Lanes(pcuHr): 349.89

Basic Results Summary

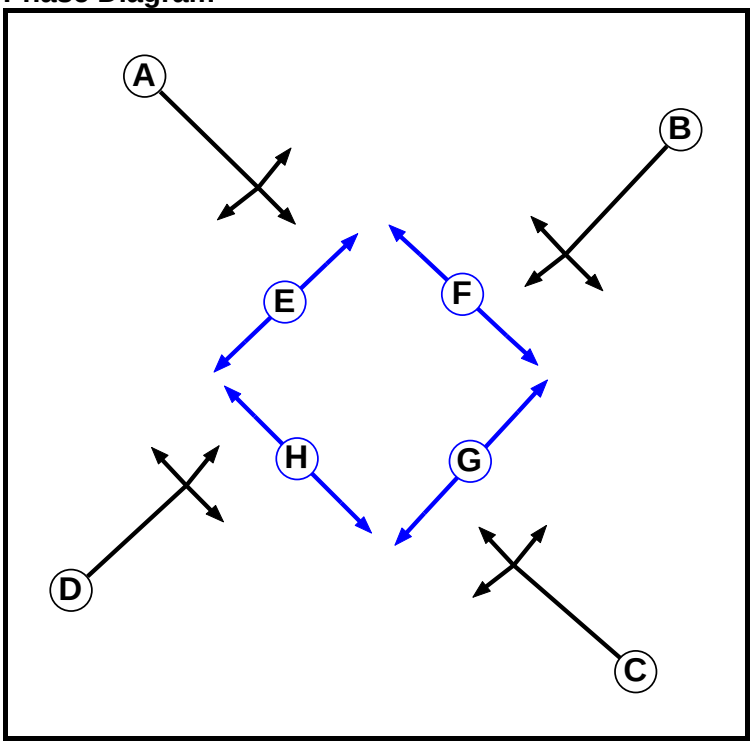
Scenario 4: '2031 PM (DM)' (FG4: '2031 PM (DM)', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

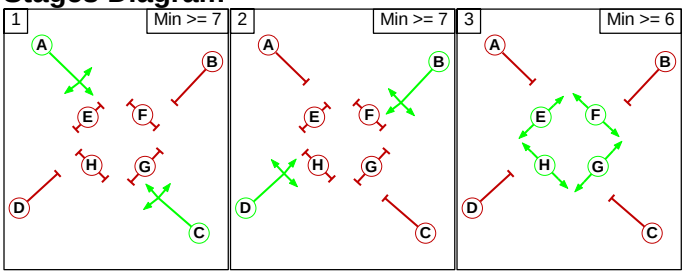


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**195.5%**	**148**	**0**	**74**	**180.7**	-	-
Cadwell Lane / Wilbury Way- Existing Layout	-	-	-		-	-	-	-	-	-	**195.5%**	**148**	**0**	**74**	**180.7**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	20	-	595	1888	304	195.5%	99	0	0	160.5	970.8	164.3
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	20	-	754	2105:1747	600+305	83.3 : 83.3%	0	0	0	7.2	34.4	11.6
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	20	-	306	1250:1600	365+30	77.6 : 77.6%	23	0	0	3.6	42.9	6.8
4/1+4/2	Grove Road Left Ahead Right	U+O	D		1	20	-	567	1893:1800	550+100	84.2 : 104.0%	26	0	74	9.4	59.7	13.8

C1

PRC for Signalled Lanes (%): -117.2
PRC Over All Lanes (%): -117.2

Total Delay for Signalled Lanes (pcuHr): 180.71
Total Delay Over All Lanes(pcuHr): 180.71

Cycle Time (s): 72

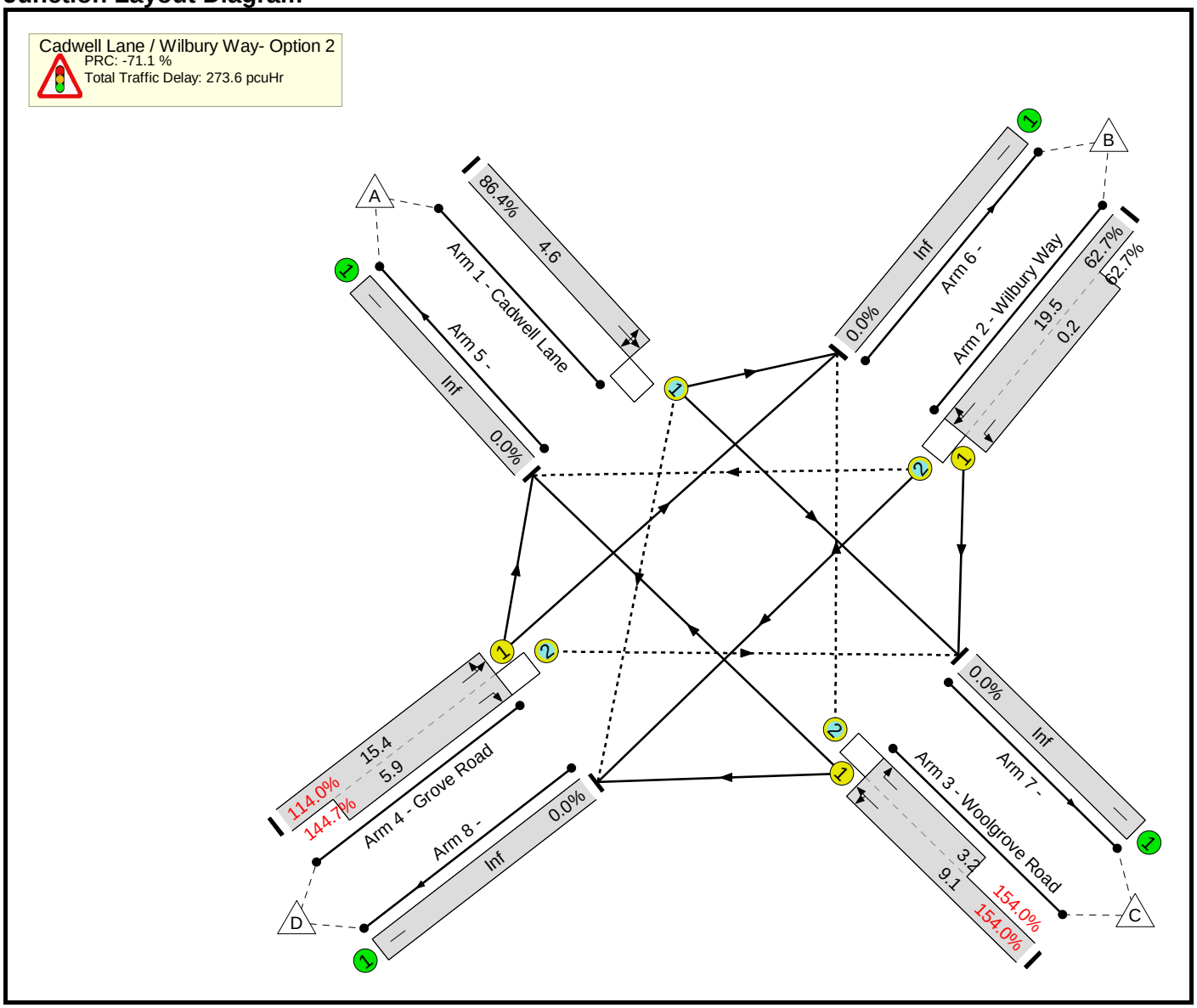
Basic Results Summary

User and Project Details

Project:	**Hitchin Link Road**
Title:	**Option 2- Do Something 1**
Location:	
File name:	2016-11-10 Crossroads Opt2.lsg3x
Author:	
Company:	
Address:	
Notes:	

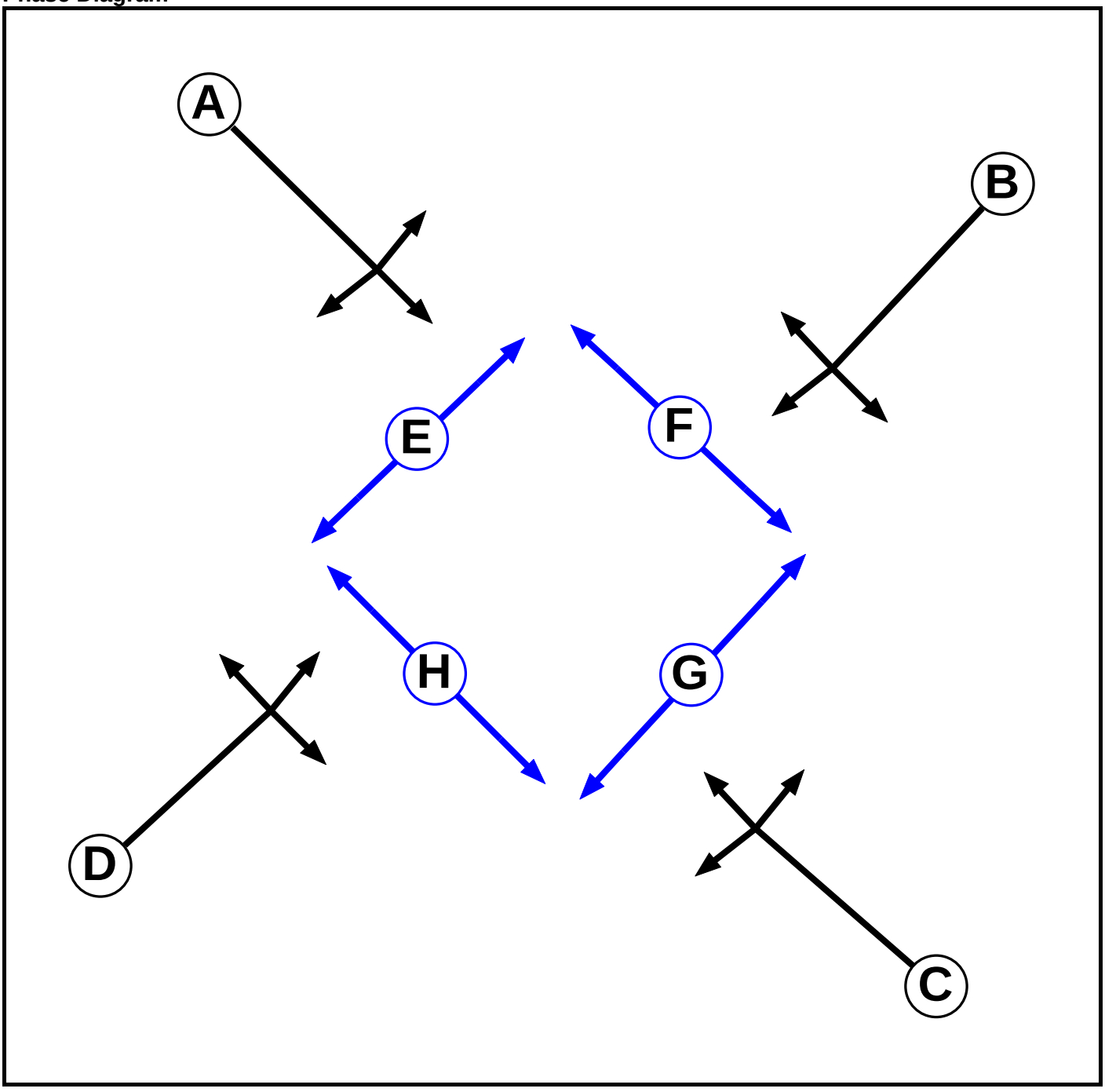
Scenario 1: '2031 AM' (FG1: '2031 AM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

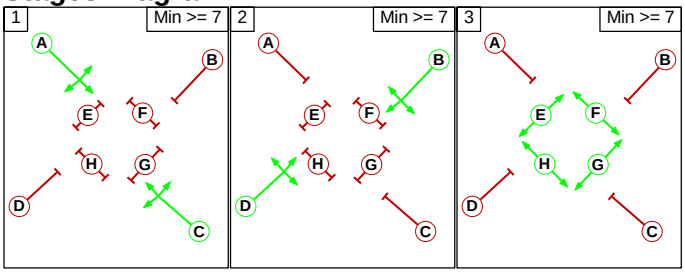


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**154.0%**	**340**	**0**	**117**	**273.6**	-	-
Cadwell Lane / Wilbury Way- Option 2	-	-	-		-	-	-	-	-	-	**154.0%**	**340**	**0**	**117**	**273.6**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	26	-	160	1833	185	86.4%	35	0	57	4.2	93.7	5.7
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	33	-	495	2105:1747	780+10	62.7 : 62.7%	0	0	0	3.9	28.7	10.6
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	26	-	755	1250:1600	364+127	154.0 : 154.0%	127	0	0	151.4	721.9	159.6
4/1+4/2	Grove Road Left Ahead Right	U+O	D		1	33	-	1046	1834:1800	616+238	114.0 : 144.7%	178	0	60	114.1	392.6	125.8

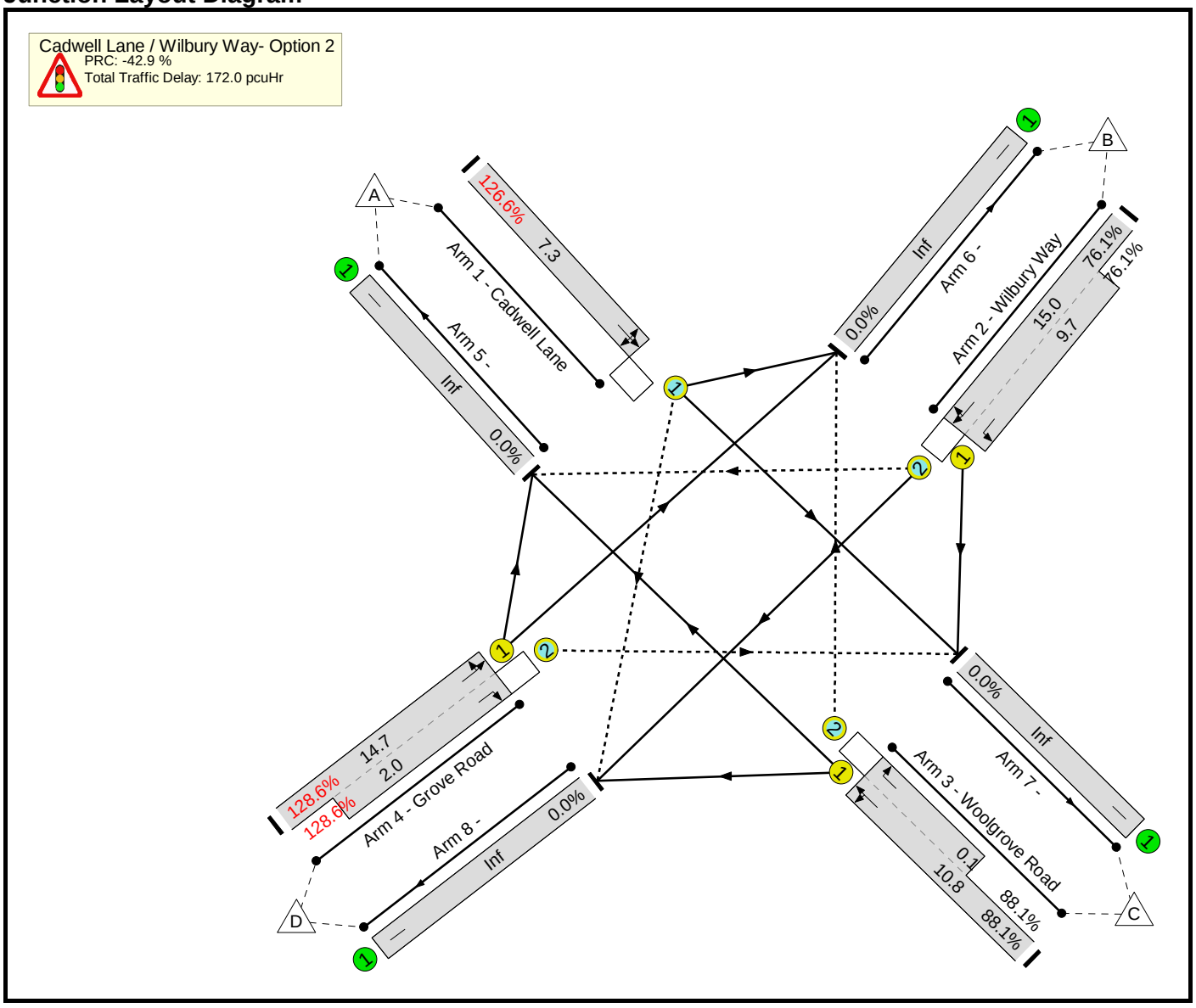
C1 PRC for Signalled Lanes (%): -71.1 Total Delay for Signalled Lanes (pcuHr): 273.60 Cycle Time (s): 90

PRC Over All Lanes (%): -71.1 Total Delay Over All Lanes(pcuHr): 273.60

Basic Results Summary

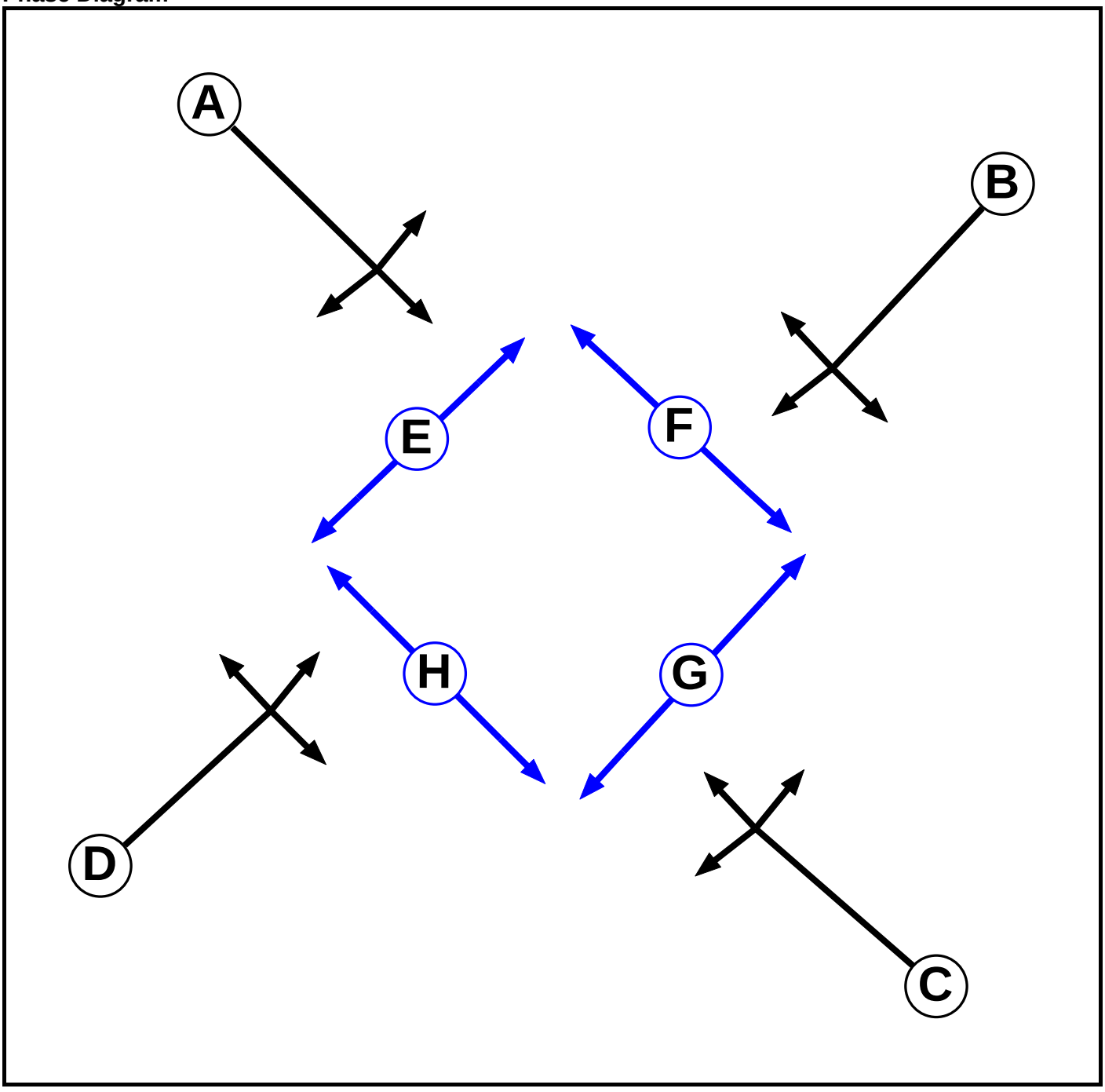
Scenario 2: '2031 PM' (FG2: '2031 PM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

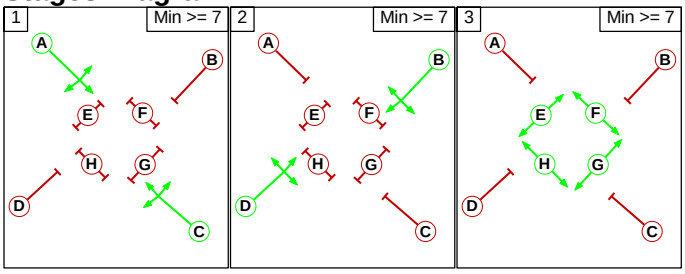


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**128.6%**	**162**	**0**	**49**	**172.0**	-	-
Cadwell Lane / Wilbury Way- Option 2	-	-	-		-	-	-	-	-	-	**128.6%**	**162**	**0**	**49**	**172.0**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	30	-	372	1863	294	126.6%	83	0	46	48.0	464.2	52.6
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	29	-	750	2105:1747	598+388	76.1 : 76.1%	0	0	0	6.8	32.5	11.2
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	30	-	383	1250:1600	430+5	88.1 : 88.1%	4	0	0	6.2	58.5	12.2
4/1+4/2	Grove Road Left Ahead Right	U+O	D		1	29	-	856	1820:1800	587+79	128.6 : 128.6%	76	0	3	111.0	466.9	124.9

C1 PRC for Signalled Lanes (%): -42.9 Total Delay for Signalled Lanes (pcuHr): 171.97 Cycle Time (s): 90
PRC Over All Lanes (%): -42.9 Total Delay Over All Lanes(pcuHr): 171.97

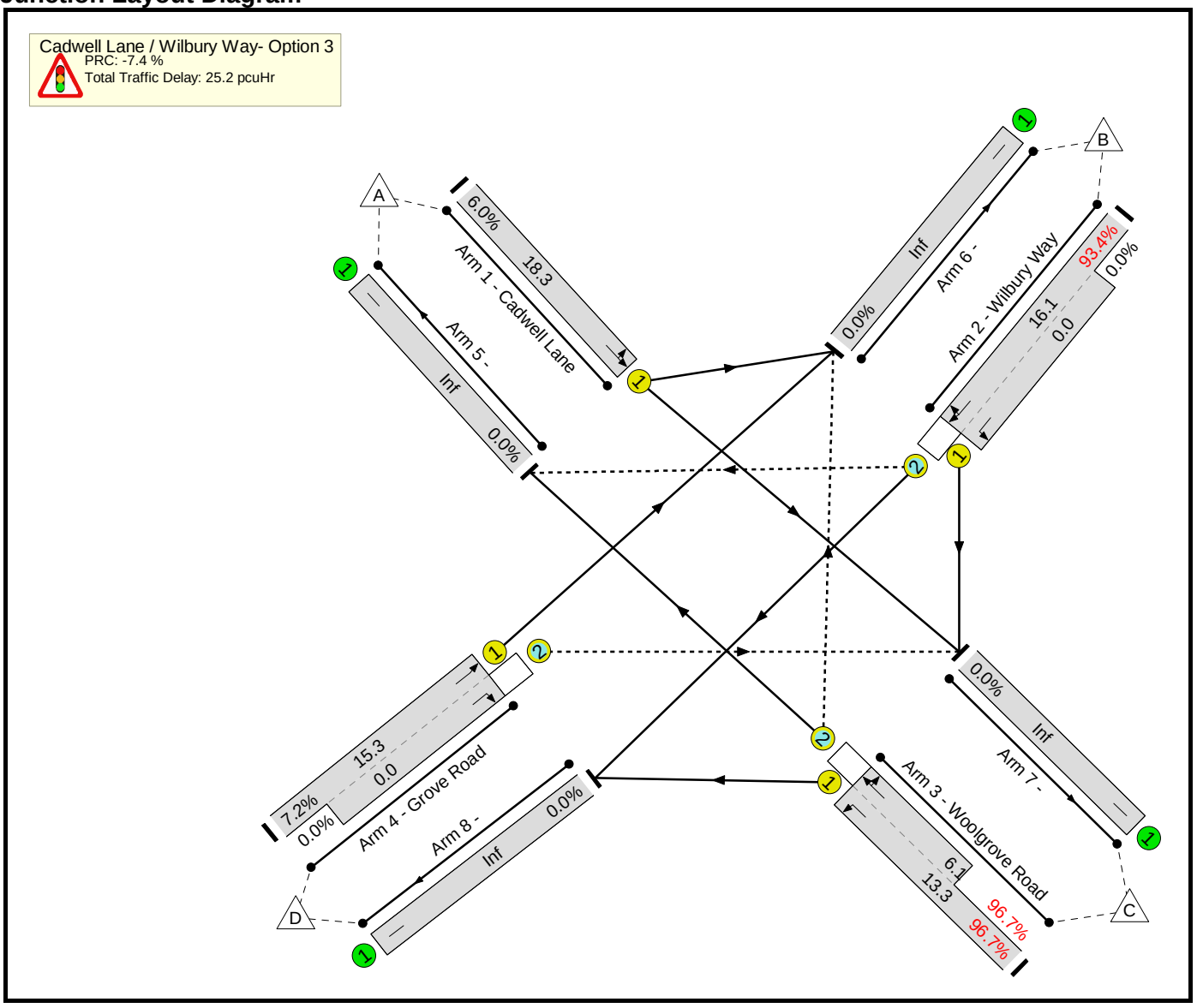
Basic Results Summary

User and Project Details

Project:	**Hitchin Link Road**
Title:	**Option 3- Do Something 2**
Location:	
File name:	2016-11-10 Crossroads Opt3.lsg3x
Author:	
Company:	
Address:	
Notes:	

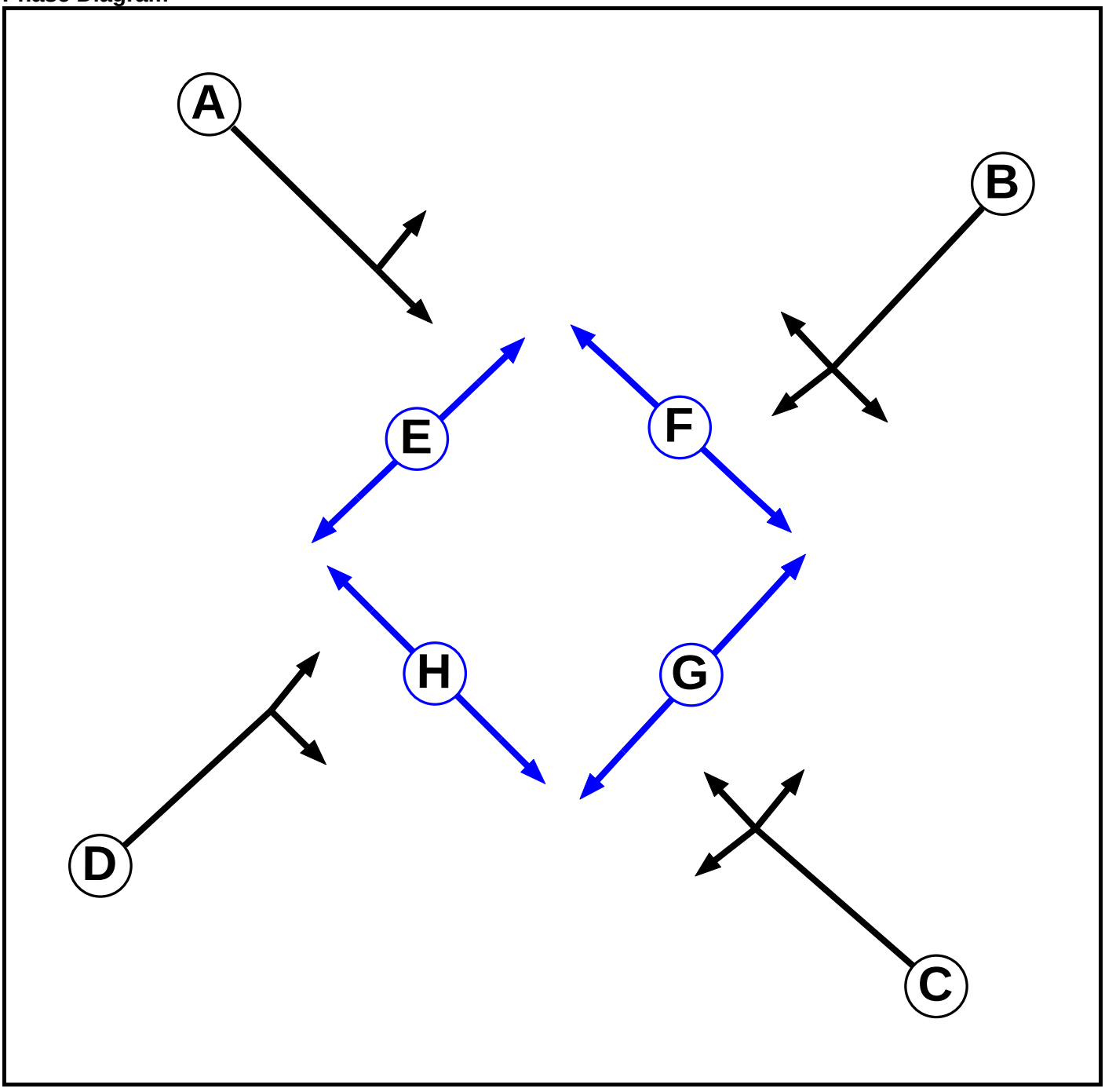
Scenario 1: '2031 AM' (FG1: '2031 AM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

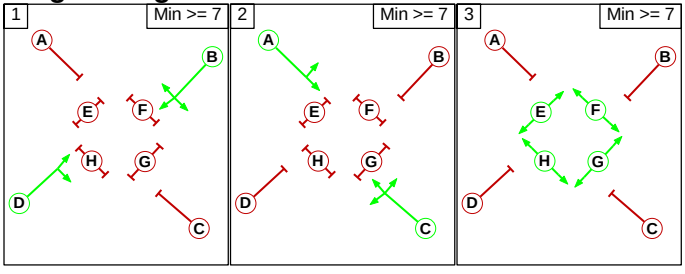


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**96.7%**	**219**	**0**	**5**	**25.2**	-	-
Cadwell Lane / Wilbury Way- Option 3	-	-	-		-	-	-	-	-	-	**96.7%**	**219**	**0**	**5**	**25.2**	-	-
1/1	Cadwell Lane Left Ahead	U	A		1	32	-	44	1995	732	6.0%	-	-	-	0.3	21.1	0.7
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	27	-	601	2105:1965	644+0	93.4 : 0.0%	0	0	0	10.6	63.4	20.2
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	32	-	752	1702:1877	534+244	96.7 : 96.7%	219	0	5	14.1	67.4	23.2
4/1+4/2	Grove Road Ahead Right	U+O	D		1	27	-	44	1965:2105	611+0	7.2 : 0.0%	0	0	0	0.3	25.1	0.8

C1

PRC for Signalled Lanes (%): -7.4
PRC Over All Lanes (%): -7.4

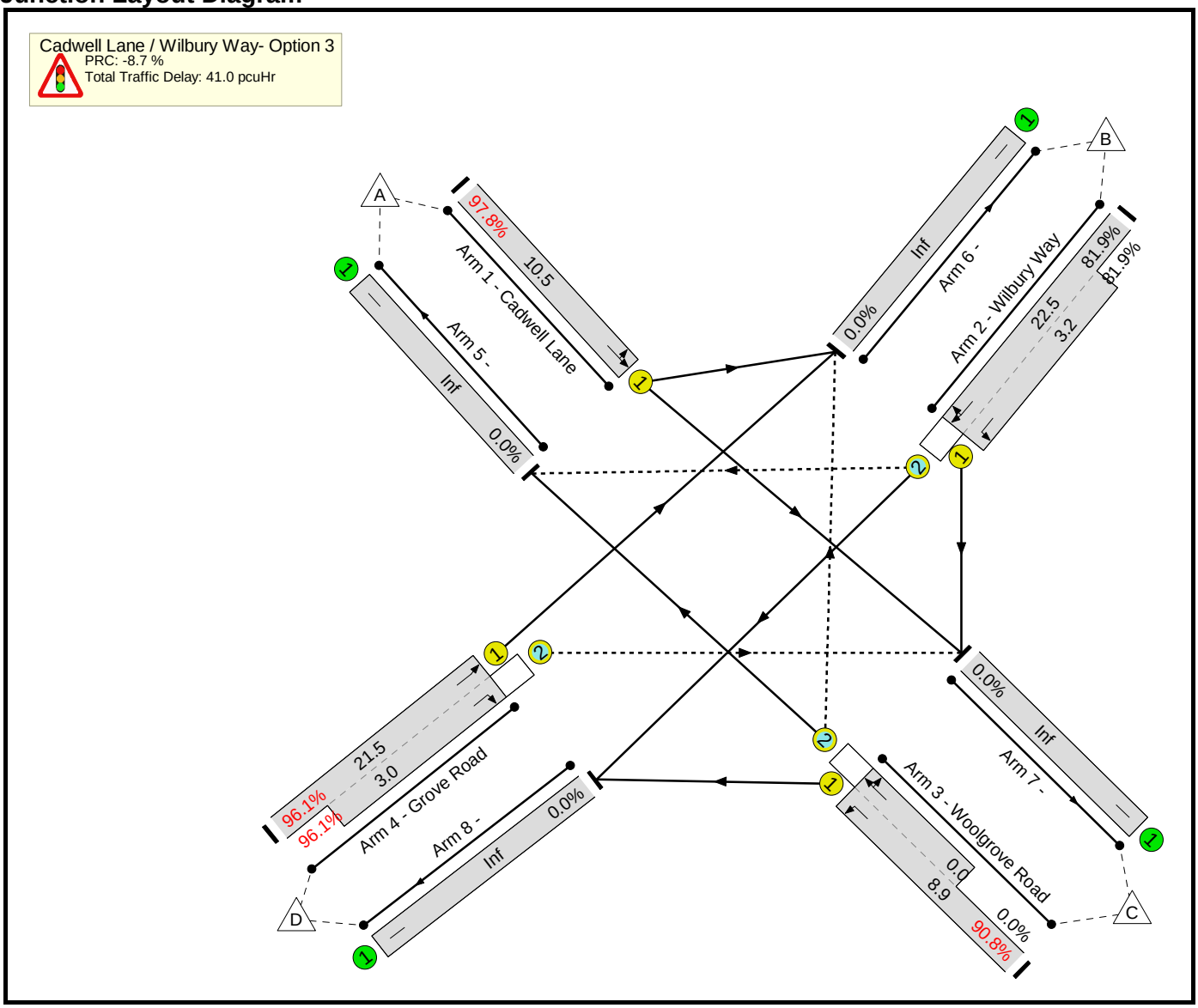
Total Delay for Signalled Lanes (pcuHr): 25.23
Total Delay Over All Lanes(pcuHr): 25.23

Cycle Time (s): 90

Basic Results Summary

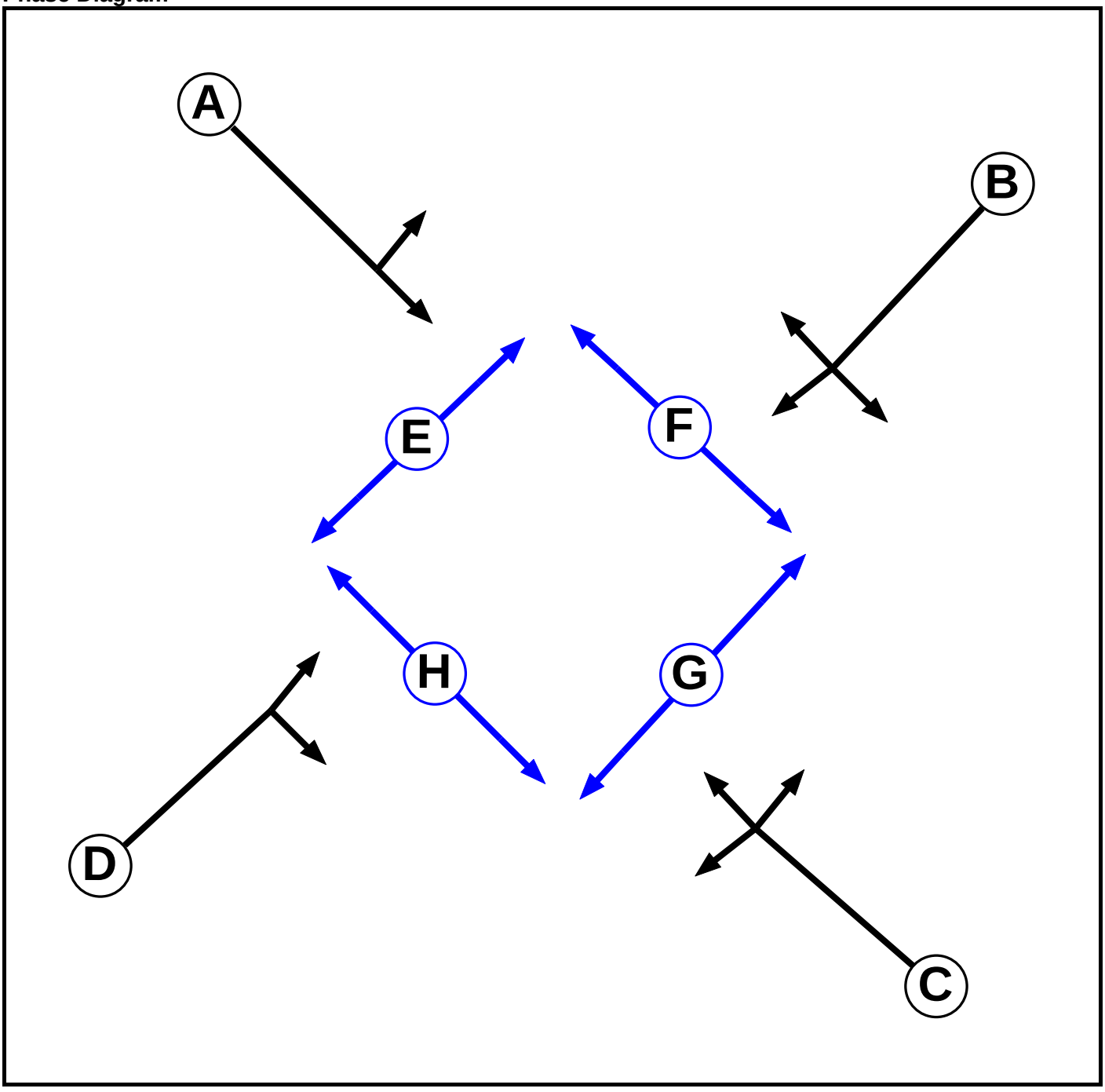
Scenario 2: '2031 PM' (FG2: '2031 PM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

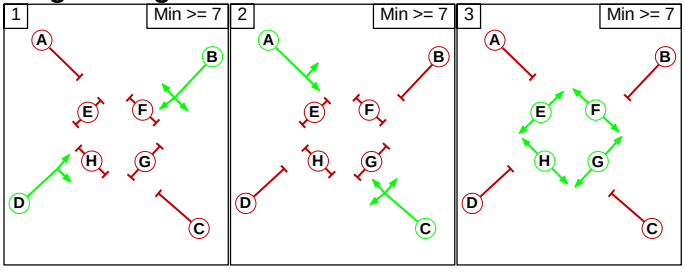


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**97.8%**	**66**	**0**	**50**	**41.0**	-	-
Cadwell Lane / Wilbury Way- Option 3	-	-	-		-	-	-	-	-	-	**97.8%**	**66**	**0**	**50**	**41.0**	-	-
1/1	Cadwell Lane Left Ahead	U	A		1	18	-	412	1995	421	97.8%	-	-	-	12.2	106.2	18.3
2/2+2/1	Wilbury Way Right Left Ahead	O+U	B		1	41	-	843	2105:1786	901+128	81.9 : 81.9%	0	0	0	6.7	28.7	18.4
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	18	-	325	1702:2055	358+0	90.8 : 0.0%	0	0	0	7.1	78.7	11.8
4/1+4/2	Grove Road Ahead Right	U+O	D		1	41	-	944	1965:1914	862+121	96.1 : 96.1%	66	0	50	15.0	57.3	29.4

C1

PRC for Signalled Lanes (%): -8.7
PRC Over All Lanes (%): -8.7

Total Delay for Signalled Lanes (pcuHr): 41.01
Total Delay Over All Lanes(pcuHr): 41.01

Cycle Time (s): 90

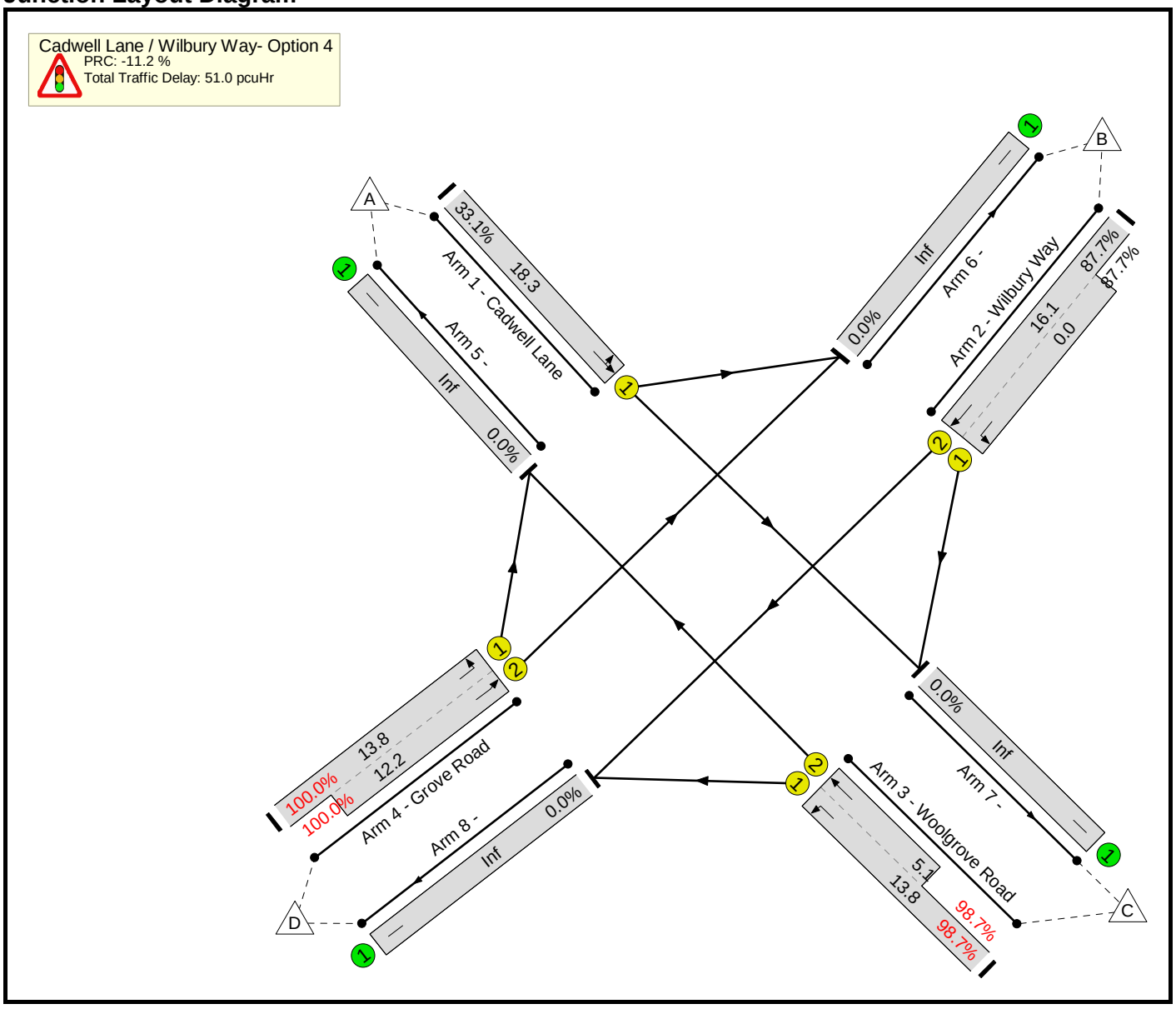
Basic Results Summary

User and Project Details

Project:	**Hitchin Link Road**
Title:	**Option 4- Do Something 3**
Location:	
File name:	2016-11-10 Crossroads Opt4.lsg3x
Author:	
Company:	
Address:	
Notes:	

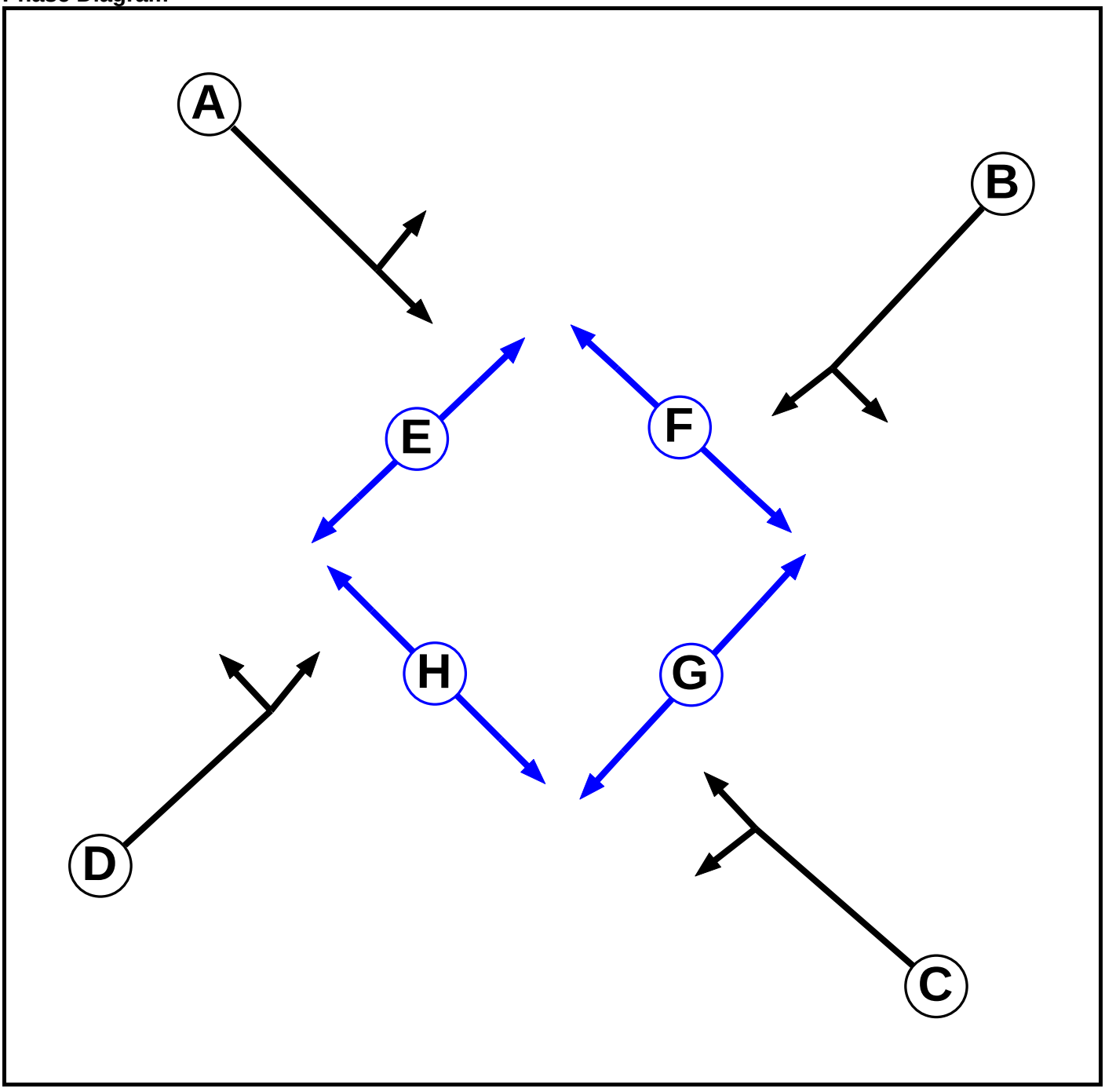
Scenario 1: '2031 AM' (FG1: '2031 AM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

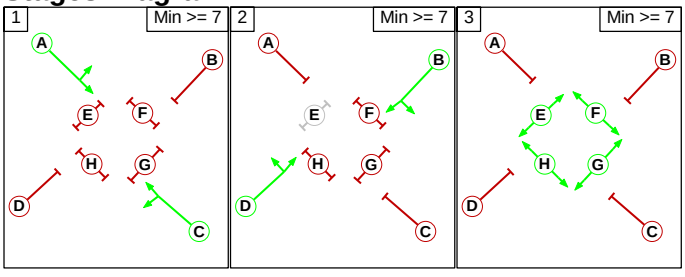


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**100.0%**	**0**	**0**	**0**	**51.0**	-	-
Cadwell Lane / Wilbury Way- Option 4	-	-	-		-	-	-	-	-	-	**100.0%**	**0**	**0**	**0**	**51.0**	-	-
1/1	Cadwell Lane Left Ahead	U	A		1	32	-	242	1995	732	33.1%	-	-	-	1.6	24.2	4.5
2/2+2/1	Wilbury Way Left Ahead	U	B		1	27	-	565	2105:1786	643+1	87.7 : 87.7%	-	-	-	7.9	50.1	16.7
3/1+3/2	Woolgrove Road Ahead Left	U	C		1	32	-	745	1702:2055	552+203	98.7 : 98.7%	-	-	-	16.9	81.5	26.9
4/1+4/2	Grove Road Left Ahead	U	D		1	27	-	1040	1965:2105	552+488	100.0 : 100.0%	-	-	-	24.6	85.2	32.0

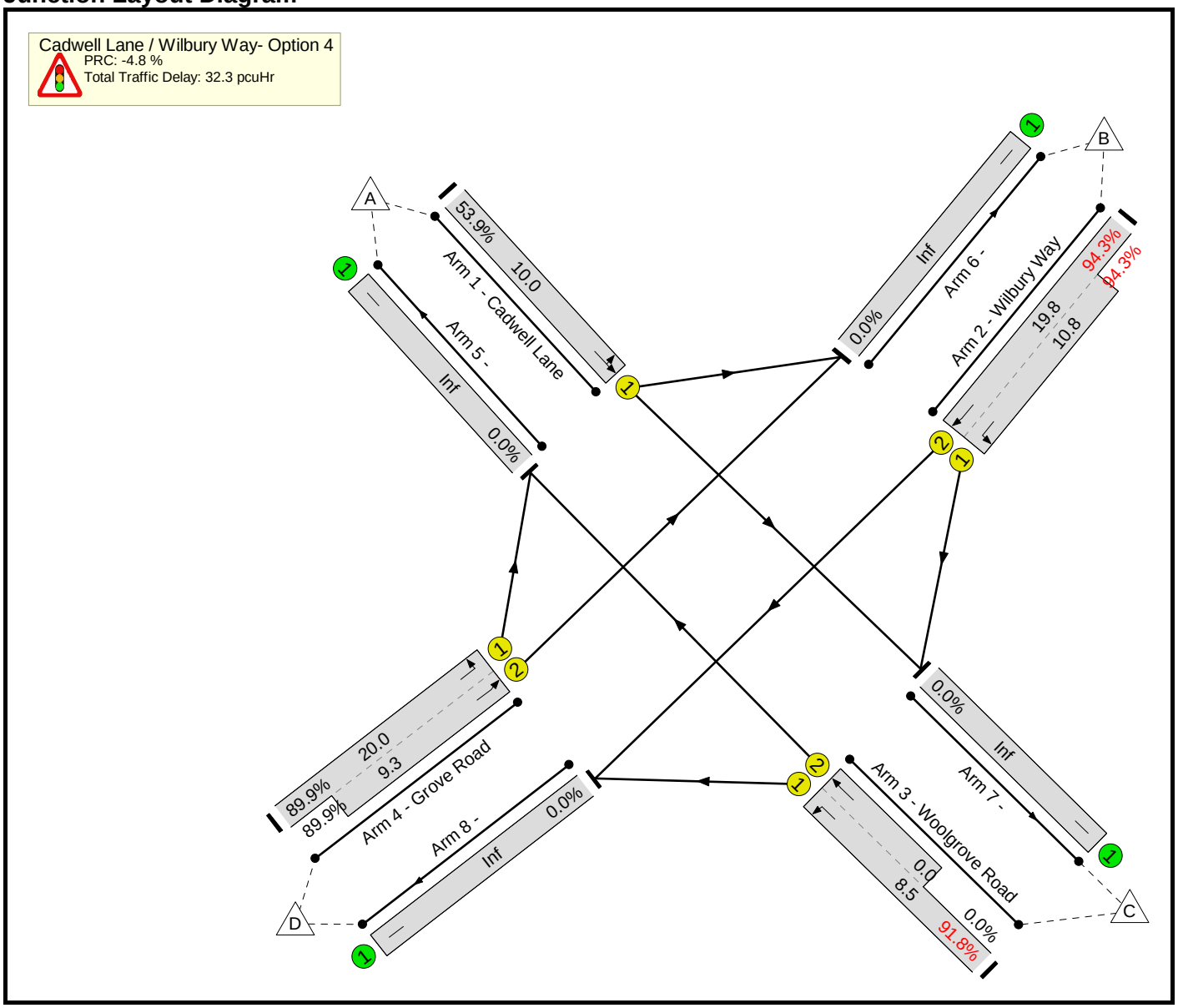
C1

PRC for Signalled Lanes (%): -11.2
PRC Over All Lanes (%): -11.2

Total Delay for Signalled Lanes (pcuHr): 50.98
Total Delay Over All Lanes(pcuHr): 50.98

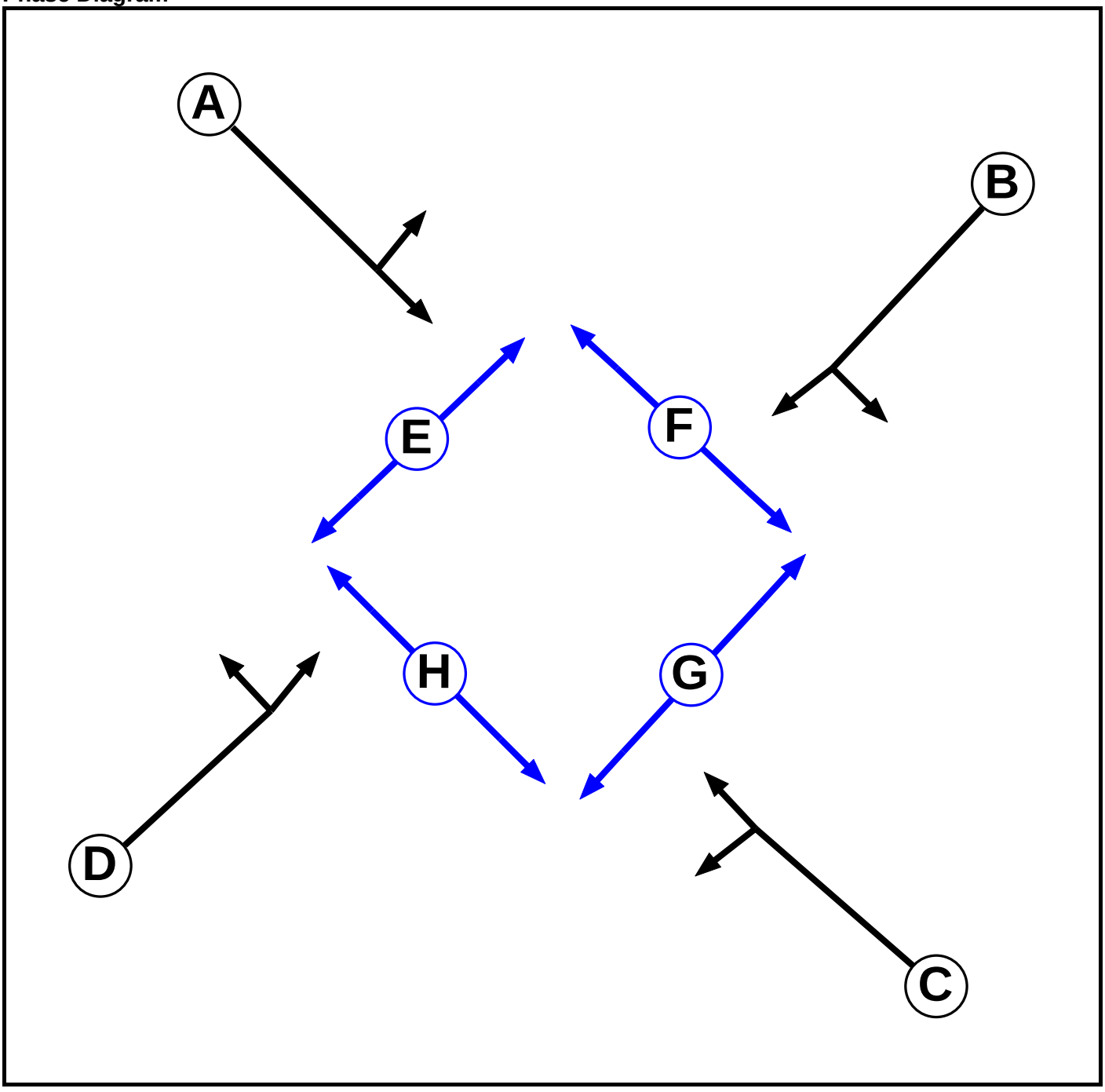
Cycle Time (s): 90

Basic Results Summary
Scenario 2: '2031 PM' (FG2: '2031 PM', Plan 1: 'Network Control Plan 1')
Junction Layout Diagram

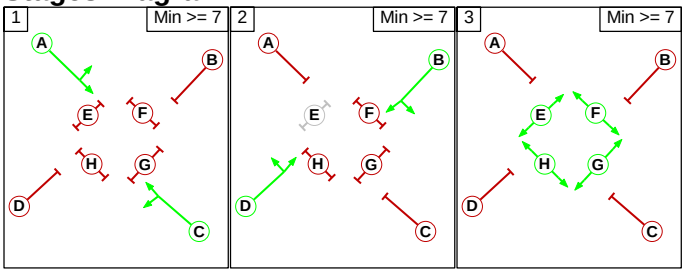


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**94.3%**	**0**	**0**	**0**	**32.3**	-	-
Cadwell Lane / Wilbury Way- Option 4	-	-	-		-	-	-	-	-	-	**94.3%**	**0**	**0**	**0**	**32.3**	-	-
1/1	Cadwell Lane Left Ahead	U	A		1	17	-	215	1995	399	53.9%	-	-	-	2.5	42.0	5.4
2/2+2/1	Wilbury Way Left Ahead	U	B		1	42	-	1156	2105:1786	793+433	94.3 : 94.3%	-	-	-	12.9	40.3	26.9
3/1+3/2	Woolgrove Road Ahead Left	U	C		1	17	-	311	1702:2055	339+0	91.8 : 0.0%	-	-	-	7.3	84.6	11.9
4/1+4/2	Grove Road Left Ahead	U	D		1	42	-	1054	1965:2105	800+373	89.9 : 89.9%	-	-	-	9.5	32.5	21.7

C1

PRC for Signalled Lanes (%): -4.8
PRC Over All Lanes (%): -4.8

Total Delay for Signalled Lanes (pcuHr): 32.29
Total Delay Over All Lanes(pcuHr): 32.29

Cycle Time (s): 90

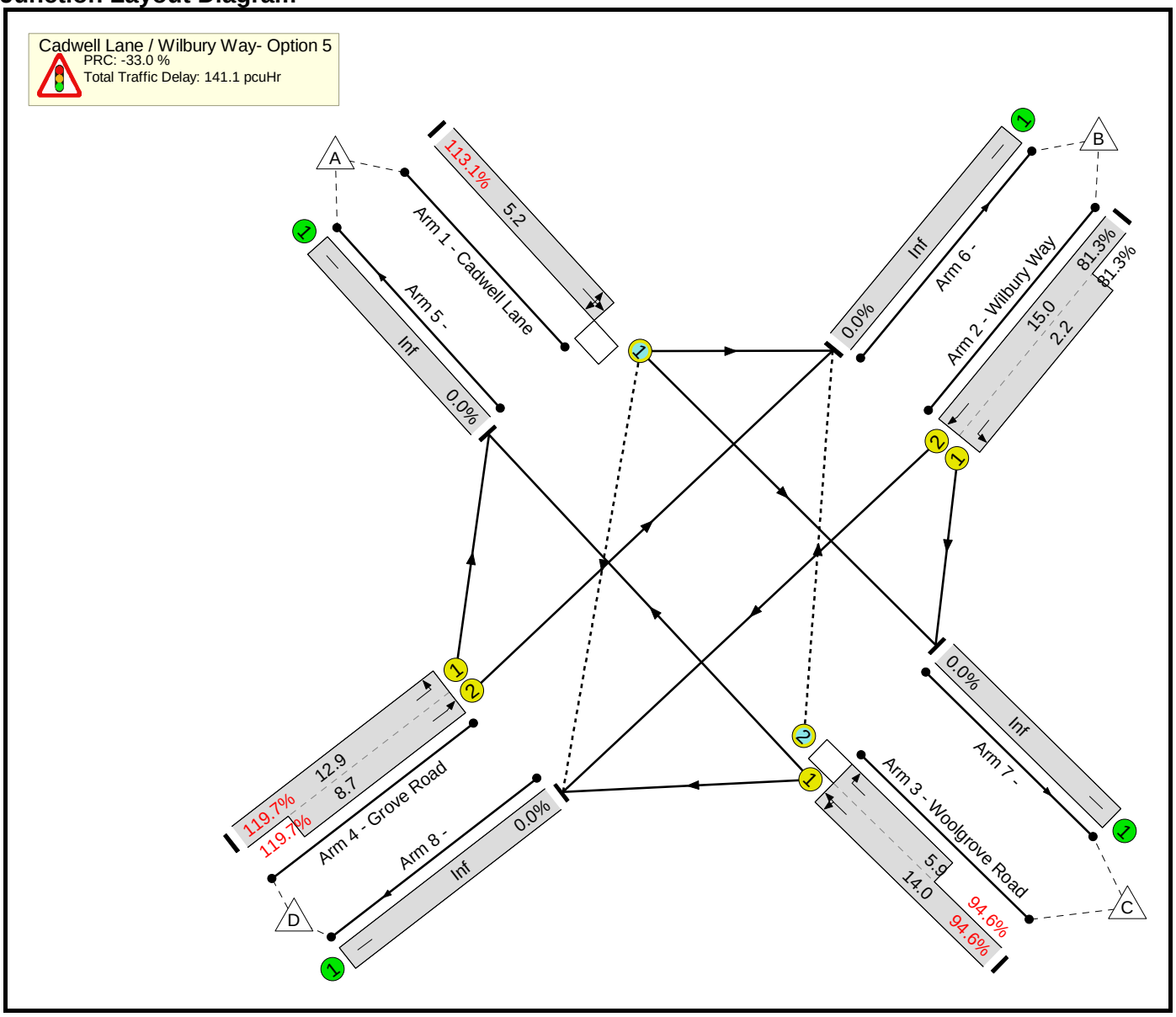
Basic Results Summary

User and Project Details

Project:	**Hitchin Link Road**
Title:	**Option 5- Do Something 4**
Location:	
File name:	2016-11-10 Crossroads Opt5.lsg3x
Author:	
Company:	
Address:	
Notes:	

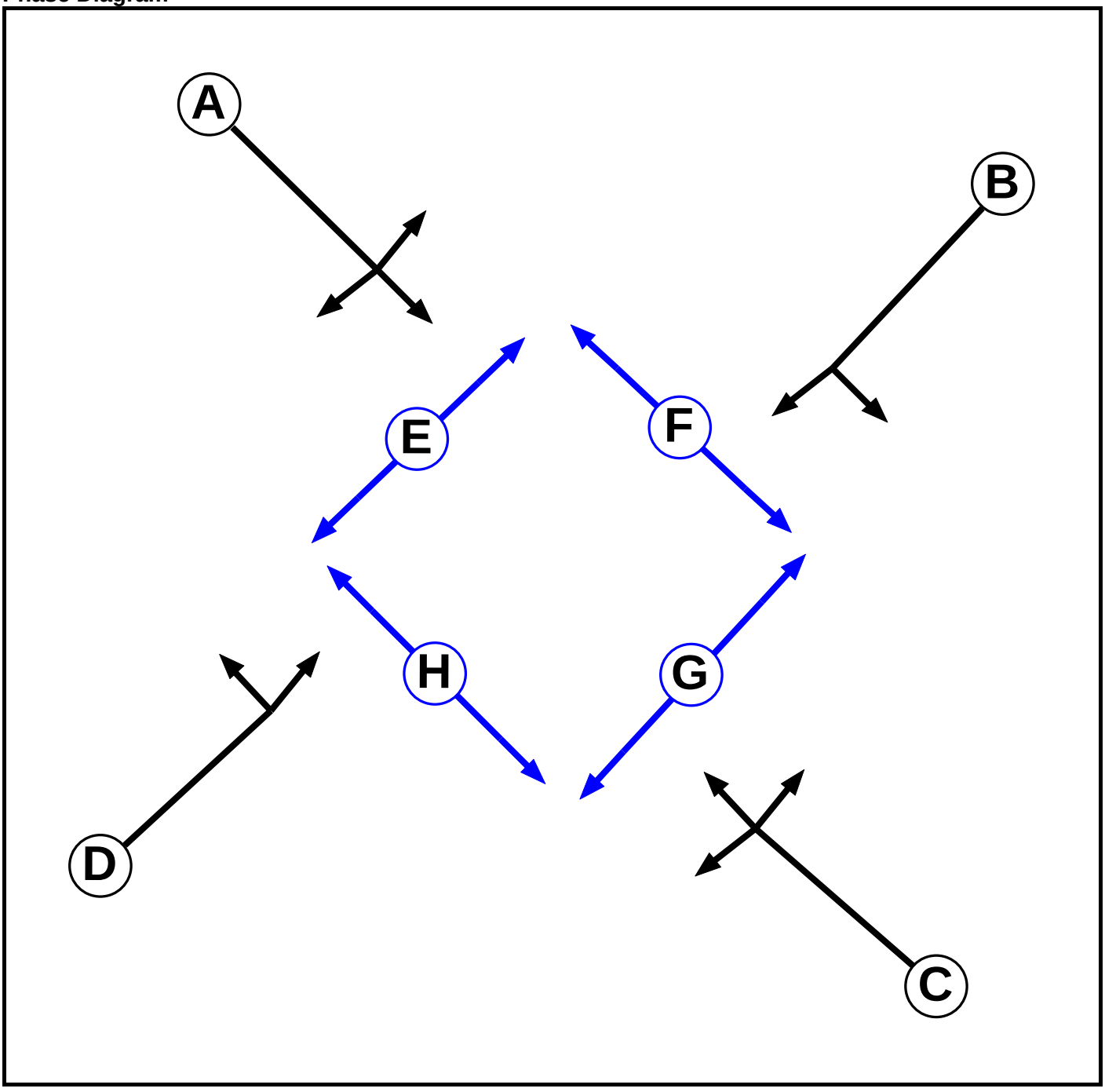
Scenario 1: '2031 AM' (FG1: '2031 AM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

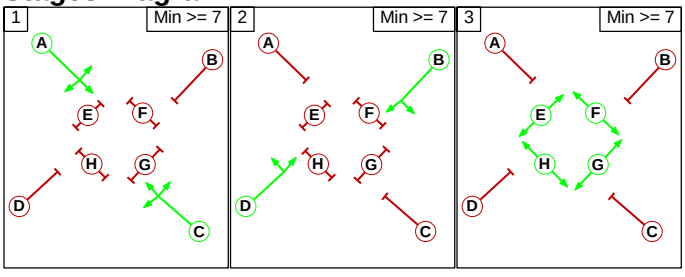


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**119.7%**	**269**	**0**	**57**	**141.1**	-	-
Cadwell Lane / Wilbury Way- Option 5	-	-	-		-	-	-	-	-	-	**119.7%**	**269**	**0**	**57**	**141.1**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	33	-	237	1903	210	113.1%	45	0	57	20.4	309.6	23.8
2/2+2/1	Wilbury Way Left Ahead	U	B		1	26	-	560	2105:1786	599+90	81.3 : 81.3%	-	-	-	6.4	41.5	13.1
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	33	-	752	1706:2055	558+237	94.6 : 94.6%	224	0	0	12.0	57.6	21.2
4/1+4/2	Grove Road Left Ahead	U	D		1	26	-	1038	1786:2105	518+349	119.7 : 119.7%	-	-	-	102.2	354.5	114.0

C1

PRC for Signalled Lanes (%): -33.0
PRC Over All Lanes (%): -33.0

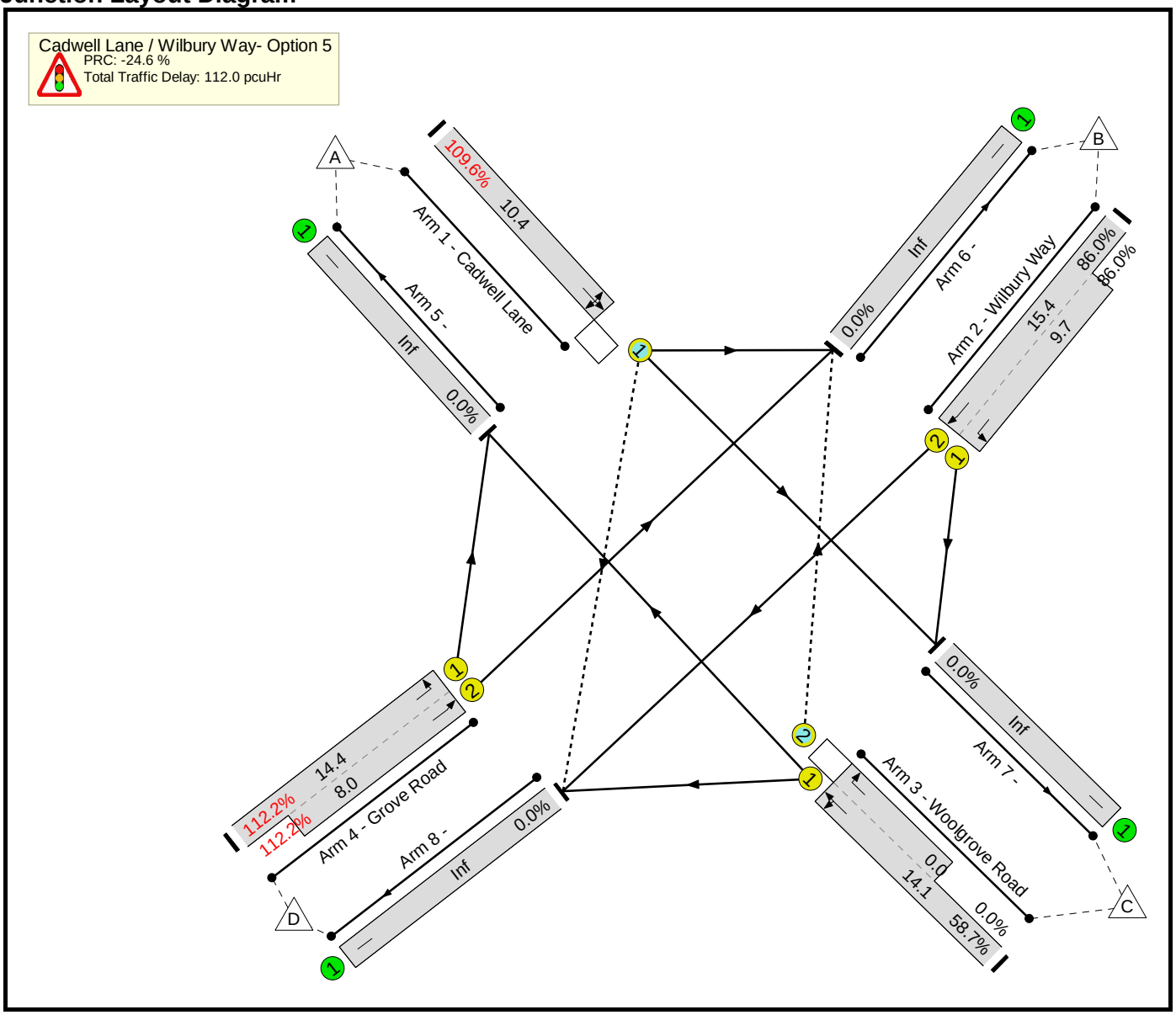
Total Delay for Signalled Lanes (pcuHr): 141.10
Total Delay Over All Lanes(pcuHr): 141.10

Cycle Time (s): 90

Basic Results Summary

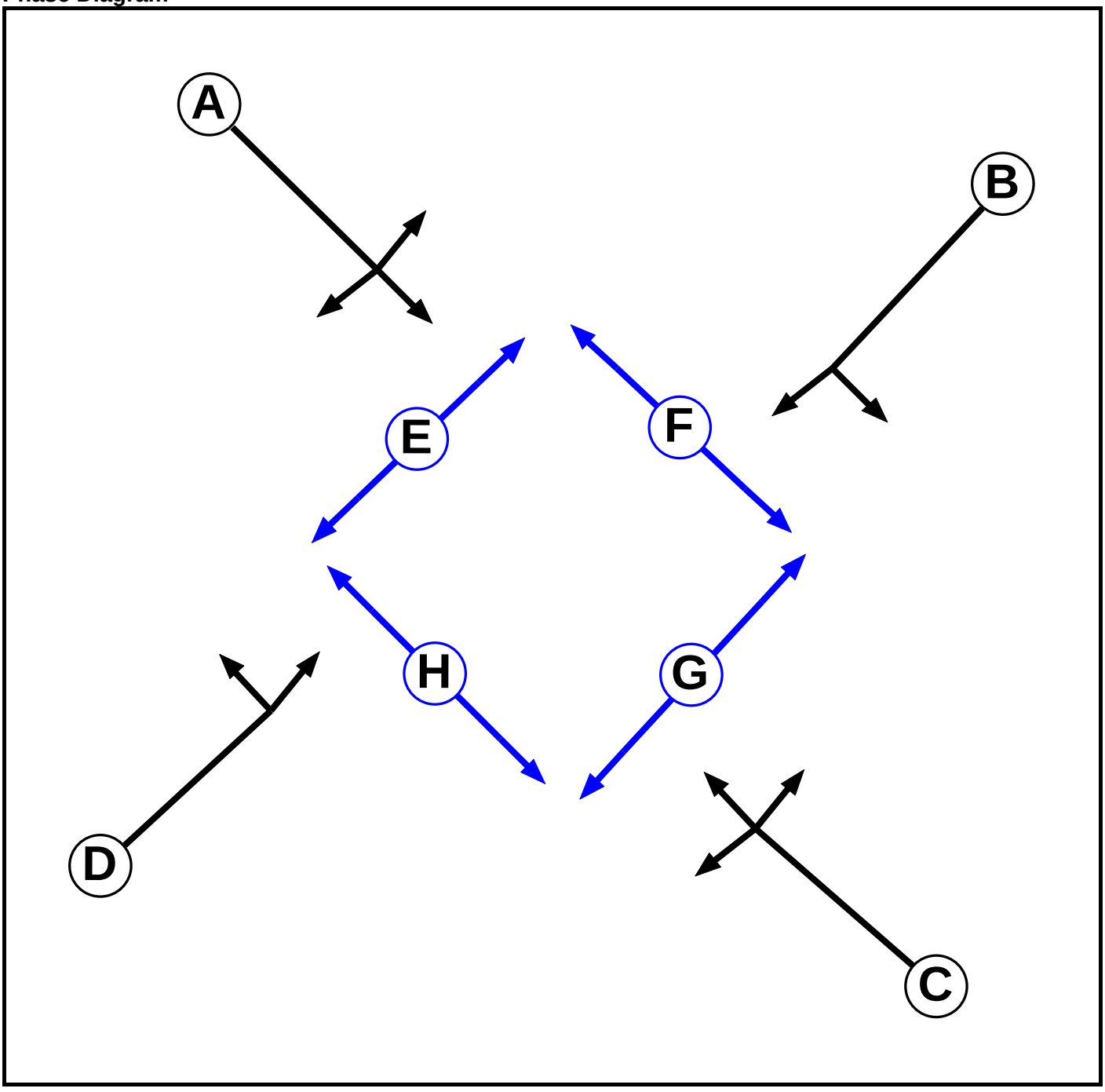
Scenario 2: '2031 PM' (FG2: '2031 PM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

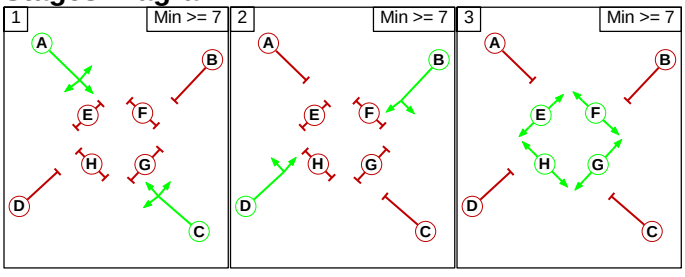


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**112.2%**	**183**	**0**	**23**	**112.0**	-	-
Cadwell Lane / Wilbury Way- Option 5	-	-	-		-	-	-	-	-	-	**112.2%**	**183**	**0**	**23**	**112.0**	-	-
1/1	Cadwell Lane Left Ahead Right	O	A		1	29	-	455	1901	415	109.6%	183	0	23	30.5	241.7	36.9
2/2+2/1	Wilbury Way Left Ahead	U	B		1	30	-	861	2105:1786	614+387	86.0 : 86.0%	-	-	-	8.9	37.3	14.4
3/1+3/2	Woolgrove Road Ahead Right Left	U+O	C		1	29	-	332	1702:2055	566+0	58.7 : 0.0%	0	0	0	3.0	32.5	7.5
4/1+4/2	Grove Road Left Ahead	U	D		1	30	-	1004	1786:2105	574+321	112.2 : 112.2%	-	-	-	69.6	249.5	83.1

C1

PRC for Signalled Lanes (%): -24.6
PRC Over All Lanes (%): -24.6

Total Delay for Signalled Lanes (pcuHr): 112.05
Total Delay Over All Lanes(pcuHr): 112.05

Cycle Time (s): 90

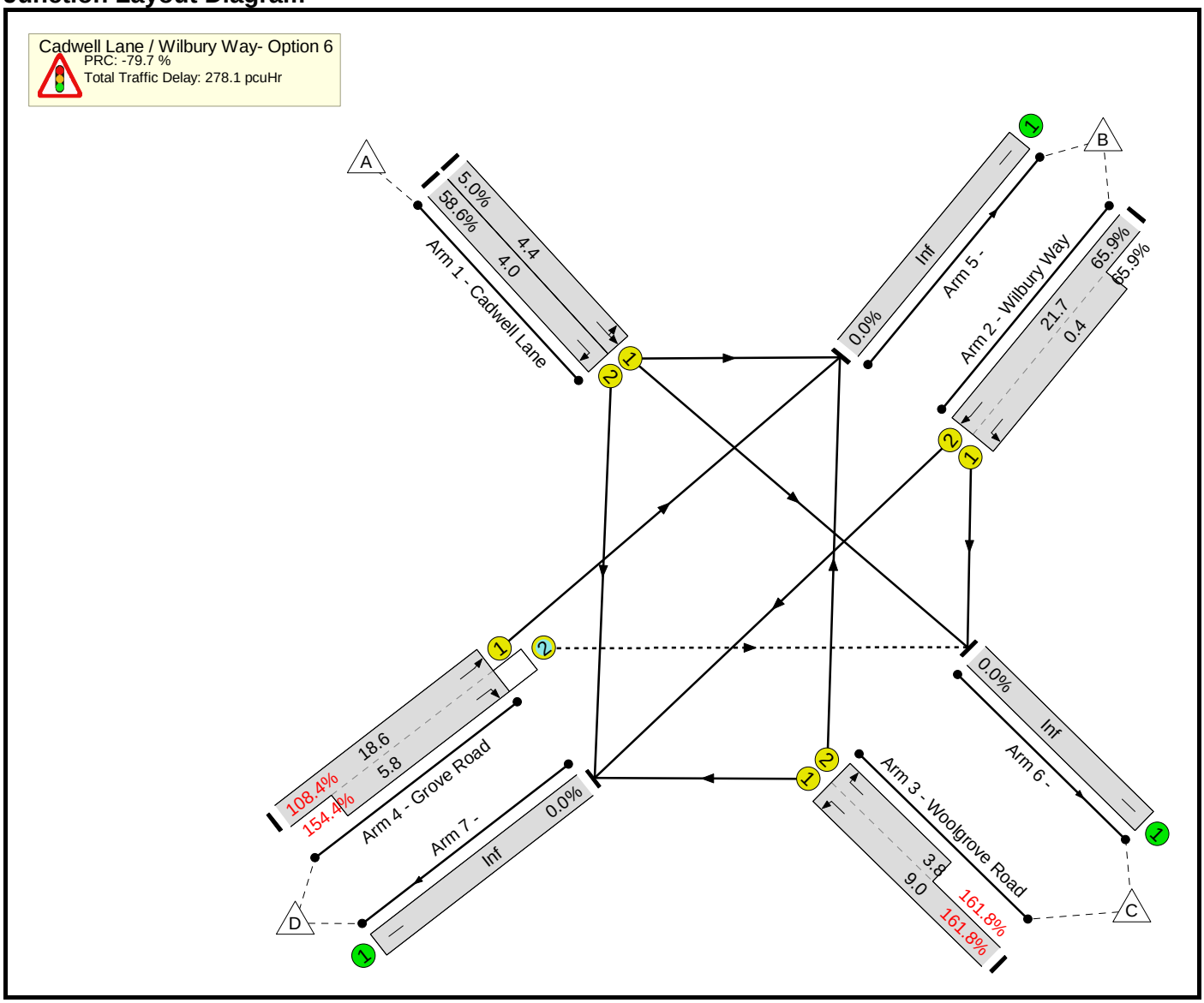
Basic Results Summary

User and Project Details

Project:	**Hitchin Link Road**
Title:	**Option 6- Do Something 5**
Location:	
File name:	2016-11-10 Crossroads Opt6.lsg3x
Author:	
Company:	
Address:	
Notes:	

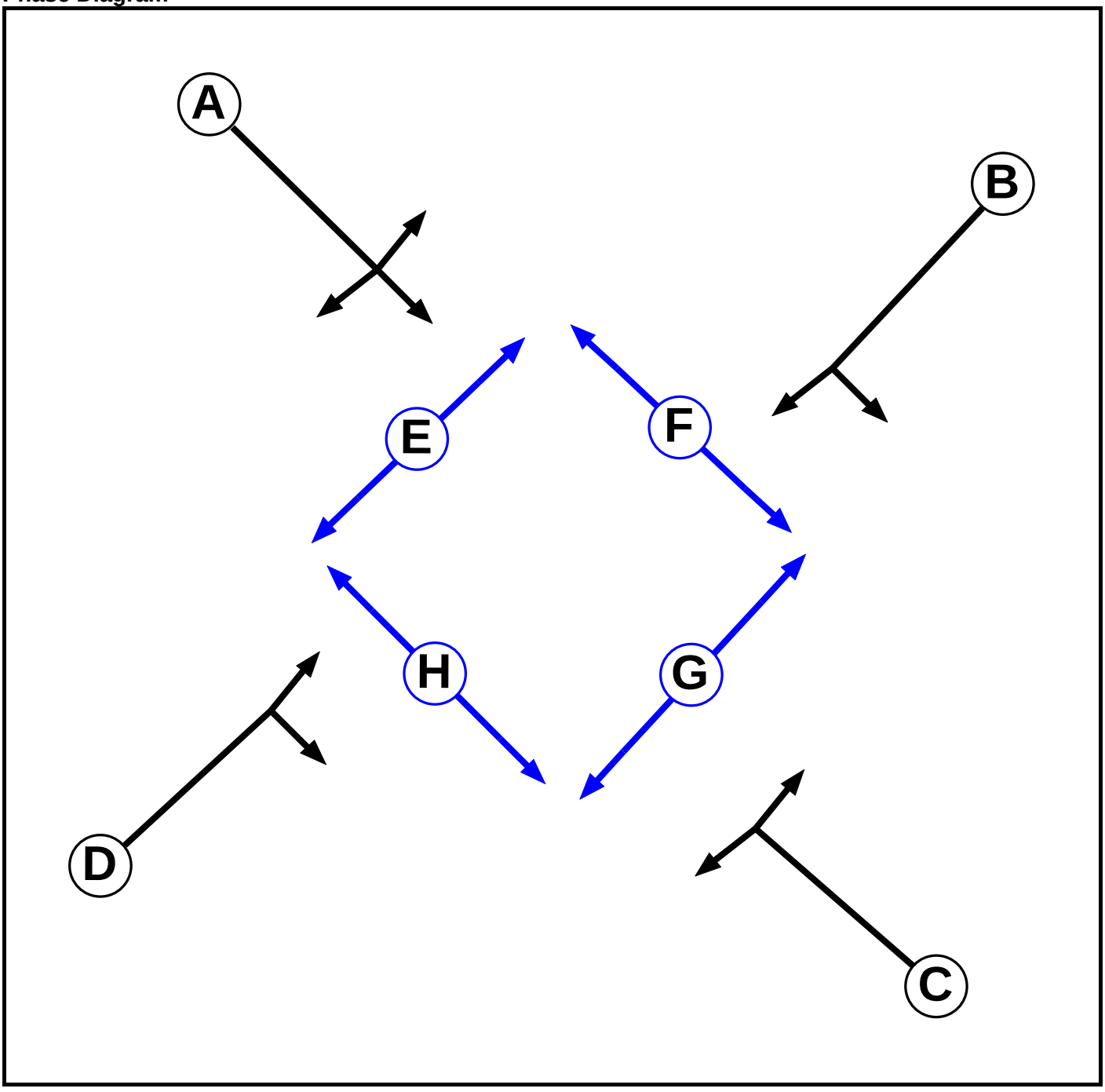
Scenario 1: '2031 AM' (FG1: '2031 AM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

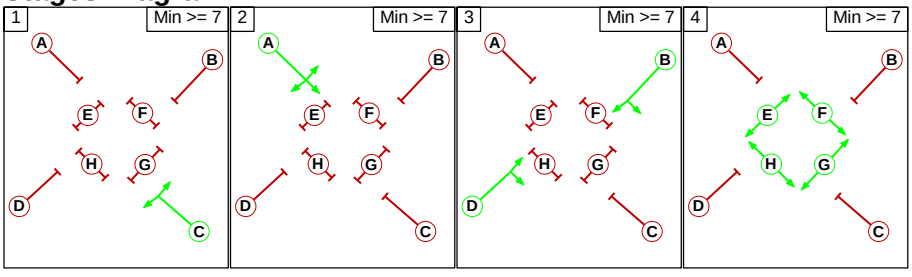


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**161.8%**	**155**	**0**	**55**	**278.1**	-	-
Cadwell Lane / Wilbury Way- Option 6	-	-	-		-	-	-	-	-	-	**161.8%**	**155**	**0**	**55**	**278.1**	-	-
1/1	Cadwell Lane Left Ahead	U	A		1	7	-	8	1995	160	5.0%	-	-	-	0.1	54.7	0.2
1/2	Cadwell Lane Right	U	A		1	7	-	85	1814	145	58.6%	-	-	-	1.7	73.7	3.0
2/2+2/1	Wilbury Way Left Ahead	U	B		1	37	-	525	2105:1786	782+15	65.9 : 65.9%	-	-	-	4.7	31.9	12.7
3/1+3/2	Woolgrove Road Right Left	U	C		1	19	-	751	1702:2055	326+138	161.8 : 161.8%	-	-	-	166.8	799.6	172.0
4/1+4/2	Grove Road Ahead Right	U+O	D		1	38	-	1047	1965:2105	668+209	108.4 : 154.4%	155	0	55	104.8	360.3	116.8

C1

PRC for Signalled Lanes (%): -79.7
PRC Over All Lanes (%): -79.7

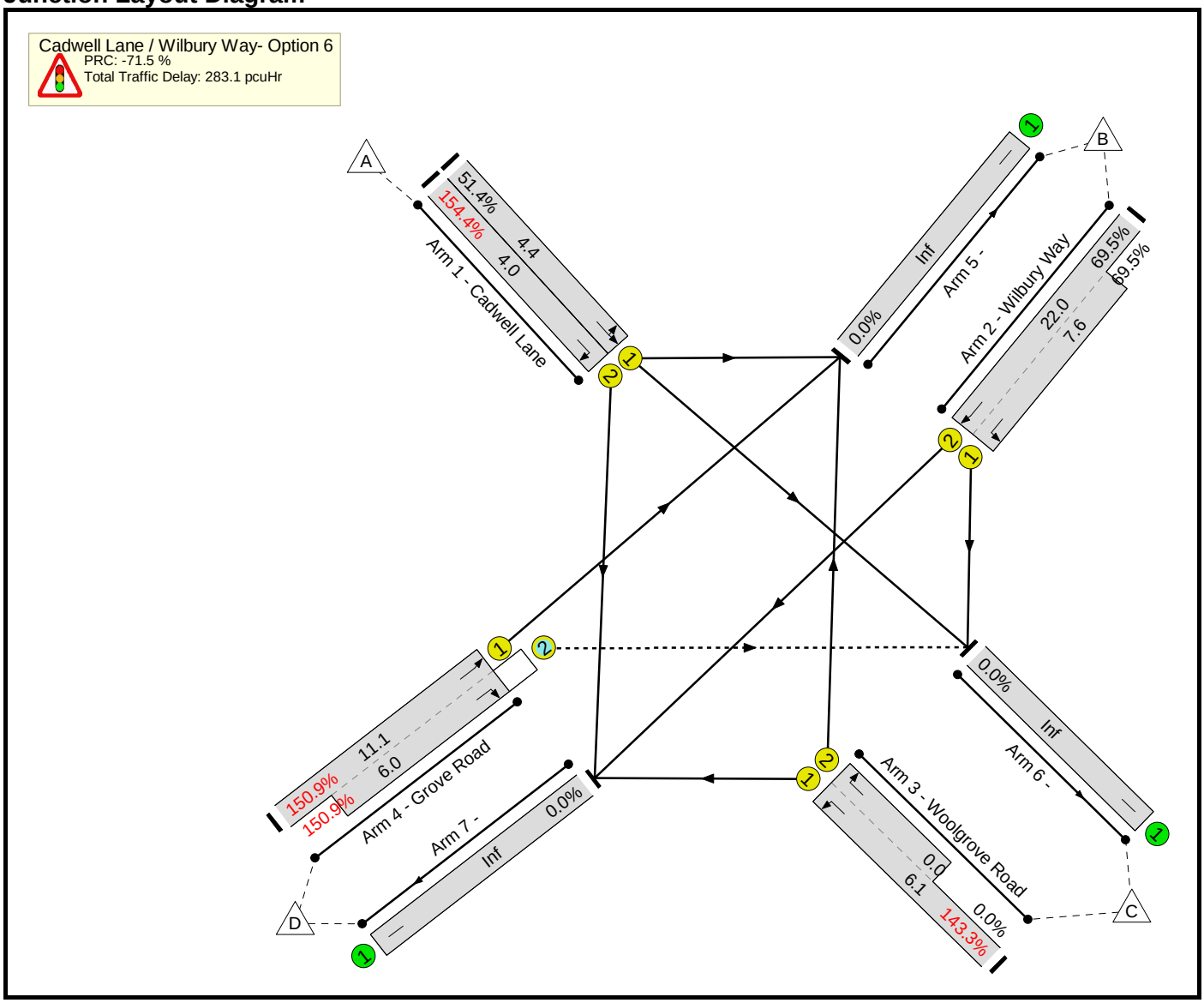
Total Delay for Signalled Lanes (pcuHr): 278.09
Total Delay Over All Lanes(pcuHr): 278.09

Cycle Time (s): 100

Basic Results Summary

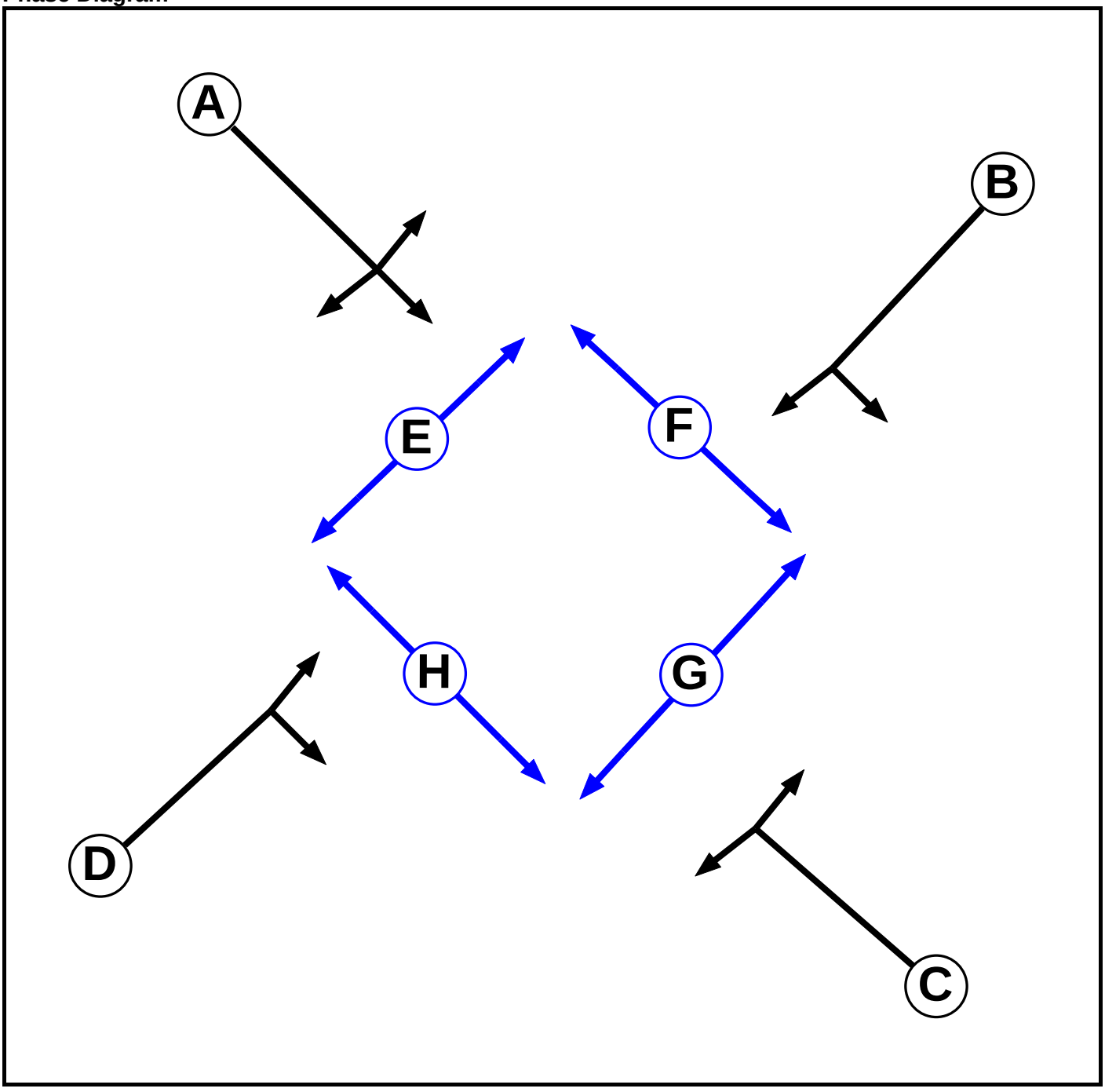
Scenario 2: '2031 PM' (FG2: '2031 PM', Plan 1: 'Network Control Plan 1')

Junction Layout Diagram

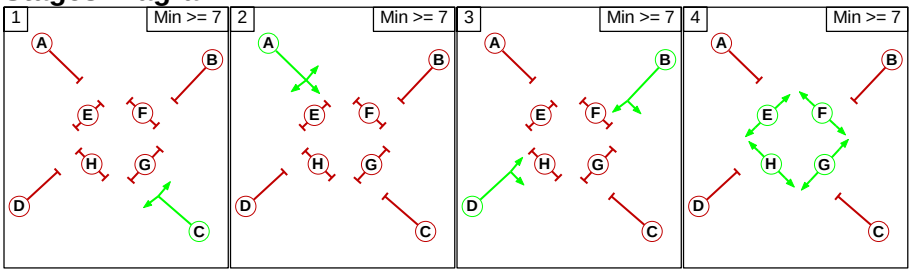


Basic Results Summary

Phase Diagram



Stages Diagram



Basic Results Summary

Link Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**154.4%**	**158**	**0**	**59**	**283.1**	-	-
Cadwell Lane / Wilbury Way- Option 6	-	-	-		-	-	-	-	-	-	**154.4%**	**158**	**0**	**59**	**283.1**	-	-
1/1	Cadwell Lane Left Ahead	U	A		1	7	-	82	1995	160	51.4%	-	-	-	1.5	67.0	2.7
1/2	Cadwell Lane Right	U	A		1	7	-	224	1814	145	154.4%	-	-	-	47.3	760.5	49.2
2/2+2/1	Wilbury Way Left Ahead	U	B		1	44	-	740	2105:1786	790+275	69.5 : 69.5%	-	-	-	5.1	25.1	12.4
3/1+3/2	Woolgrove Road Right Left	U	C		1	12	-	317	1702:2055	221+0	143.3 : 0.0%	-	-	-	58.1	660.3	61.7
4/1+4/2	Grove Road Ahead Right	U+O	D		1	45	-	933	1965:2105	401+217	150.9 : 150.9%	158	0	59	170.9	659.5	172.8

C1

PRC for Signalled Lanes (%): -71.5
PRC Over All Lanes (%): -71.5

Total Delay for Signalled Lanes (pcuHr): 283.06
Total Delay Over All Lanes(pcuHr): 283.06

Cycle Time (s): 100

Junctions 9

ARCADY 9 - Roundabout Module

Filename: 2016-12-07 Stotfold Road-Link Road_Rbout.j9
Path: C:\CADtools_Ustn\Plots
Report generation date: 20/12/2016 12:06:06

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	DS1							
A - Stotfold Road (S)	0.4	4.98	0.29	A	0.0	3.01	0.03	A
B - Link Road	0.2	2.52	0.16	A	0.8	3.65	0.45	A
C - Stotfold Road (N)	0.9	3.54	0.45	A	0.4	2.60	0.26	A
	DS2							
A - Stotfold Road (S)	0.3	4.08	0.21	A	0.0	3.02	0.03	A
B - Link Road	0.2	2.72	0.16	A	0.9	3.76	0.45	A
C - Stotfold Road (N)	0.9	3.65	0.46	A	0.5	2.84	0.30	A
	DS3							
A - Stotfold Road (S)	0.3	4.16	0.24	A	0.0	3.01	0.03	A
B - Link Road	0.3	2.82	0.21	A	1.2	4.34	0.53	A
C - Stotfold Road (N)	0.9	3.67	0.45	A	0.5	2.87	0.31	A
	DS4							
A - Stotfold Road (S)	0.3	4.00	0.20	A	0.0	2.96	0.02	A
B - Link Road	0.3	2.82	0.21	A	1.0	4.10	0.50	A
C - Stotfold Road (N)	0.9	3.67	0.45	A	0.5	2.83	0.30	A
	DS5							
A - Stotfold Road (S)	0.3	4.24	0.25	A	0.0	3.04	0.03	A
B - Link Road	0.2	2.75	0.13	A	0.8	3.74	0.45	A
C - Stotfold Road (N)	0.9	3.64	0.45	A	0.5	2.85	0.31	A

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

File summary

File Description

Title	(untitled)

Location	
Site number	
Date	07/12/2016
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\neil.scott
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
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	DS1	AM	ONE HOUR	07:45	09:15	15	✓
D2	DS1	PM	ONE HOUR	16:45	18:15	15	✓
D3	DS2	AM	ONE HOUR	07:45	09:15	15	✓
D4	DS2	PM	ONE HOUR	16:45	18:15	15	✓
D5	DS3	AM	ONE HOUR	07:45	09:15	15	✓
D6	DS3	PM	ONE HOUR	16:45	18:15	15	✓
D7	DS4	AM	ONE HOUR	07:45	09:15	15	✓
D8	DS4	PM	ONE HOUR	16:45	18:15	15	✓
D9	DS5	AM	ONE HOUR	07:45	09:15	15	✓
D10	DS5	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

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

DS1, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	Stotfold Road (S)	
B	Link Road	
C	Stotfold Road (N)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A - Stotfold Road (S)	3.65	5.00	15.0	25.0	40.0	30.0	
B - Link Road	3.65	7.00	25.0	25.0	40.0	30.0	
C - Stotfold Road (N)	3.65	7.30	30.0	25.0	40.0	30.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A - Stotfold Road (S)	0.592	1437
B - Link Road	0.672	1834
C - Stotfold Road (N)	0.689	1921

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	DS1	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)

A - Stotfold Road (S)		ONE HOUR	✓	292	100.000
B - Link Road		ONE HOUR	✓	249	100.000
C - Stotfold Road (N)		ONE HOUR	✓	793	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	193	99
	B - Link Road	0	0	249
	C - Stotfold Road (N)	301	492	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	10	10
	B - Link Road	4	0	4
	C - Stotfold Road (N)	3	3	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.29	4.98	0.4	A	268	402
B - Link Road	0.16	2.52	0.2	A	228	343
C - Stotfold Road (N)	0.45	3.54	0.9	A	728	1092

Main Results for each time segment

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	220	55	369	1219	0.180	219	226	0.0	0.2	3.958	A
B - Link Road	187	47	74	1784	0.105	187	514	0.0	0.1	2.344	A
C - Stotfold Road (N)	597	149	0	1921	0.311	595	261	0.0	0.5	2.794	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	263	66	442	1176	0.223	262	270	0.2	0.3	4.334	A
B - Link Road	224	56	89	1774	0.126	224	615	0.1	0.1	2.414	A
C - Stotfold Road (N)	713	178	0	1921	0.371	712	313	0.5	0.6	3.067	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	321	80	541	1117	0.288	321	331	0.3	0.4	4.972	A
B - Link Road	274	69	109	1761	0.156	274	753	0.1	0.2	2.517	A
C - Stotfold Road (N)	873	218	0	1921	0.455	872	383	0.6	0.9	3.533	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	321	80	542	1117	0.288	321	331	0.4	0.4	4.980	A
B - Link Road	274	69	109	1761	0.156	274	754	0.2	0.2	2.517	A
C - Stotfold Road (N)	873	218	0	1921	0.455	873	383	0.9	0.9	3.539	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	263	66	443	1175	0.223	263	271	0.4	0.3	4.345	A
B - Link Road	224	56	89	1774	0.126	224	617	0.2	0.2	2.414	A
C - Stotfold Road (N)	713	178	0	1921	0.371	714	313	0.9	0.6	3.077	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	220	55	371	1218	0.181	220	227	0.3	0.2	3.970	A
B - Link Road	187	47	75	1784	0.105	188	516	0.2	0.1	2.346	A
C - Stotfold Road (N)	597	149	0	1921	0.311	598	262	0.6	0.5	2.803	A

DS1, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.25	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	DS1	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	32	100.000
B - Link Road		ONE HOUR	✓	739	100.000
C - Stotfold Road (N)		ONE HOUR	✓	443	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	13	19
	B - Link Road	13	0	726
	C - Stotfold Road (N)	239	204	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	6	6
	B - Link Road	2	0	2
	C - Stotfold Road (N)	3	3	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.03	3.01	0.0	A	29	44
B - Link Road	0.45	3.65	0.8	A	678	1017
C - Stotfold Road (N)	0.26	2.60	0.4	A	407	610

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	24	6	153	1347	0.018	24	189	0.0	0.0	2.884	A
B - Link Road	556	139	14	1825	0.305	555	163	0.0	0.4	2.888	A
C - Stotfold Road (N)	334	83	10	1914	0.174	333	559	0.0	0.2	2.344	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	29	7	183	1329	0.022	29	226	0.0	0.0	2.934	A
B - Link Road	664	166	17	1823	0.364	664	195	0.4	0.6	3.166	A
C - Stotfold Road (N)	398	100	12	1913	0.208	398	669	0.2	0.3	2.448	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	35	9	224	1304	0.027	35	277	0.0	0.0	3.005	A
B - Link Road	814	203	21	1820	0.447	813	239	0.6	0.8	3.641	A
C - Stotfold Road (N)	488	122	14	1911	0.255	487	819	0.3	0.4	2.605	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	35	9	225	1304	0.027	35	277	0.0	0.0	3.006	A
B - Link Road	814	203	21	1820	0.447	814	239	0.8	0.8	3.647	A
C - Stotfold Road (N)	488	122	14	1911	0.255	488	820	0.4	0.4	2.605	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	29	7	184	1329	0.022	29	227	0.0	0.0	2.934	A
B - Link Road	664	166	17	1823	0.364	665	195	0.8	0.6	3.174	A
C - Stotfold Road (N)	398	100	12	1913	0.208	399	671	0.4	0.3	2.451	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	24	6	154	1346	0.018	24	190	0.0	0.0	2.885	A
B - Link Road	556	139	14	1825	0.305	557	163	0.6	0.4	2.899	A
C - Stotfold Road (N)	334	83	10	1914	0.174	334	561	0.3	0.2	2.348	A

DS2, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.53	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	DS2	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	214	100.000
B - Link Road		ONE HOUR	✓	256	100.000
C - Stotfold Road (N)		ONE HOUR	✓	794	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	136	78
	B - Link Road	0	0	256
	C - Stotfold Road (N)	304	490	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	0	0
	B - Link Road	13	0	13
	C - Stotfold Road (N)	6	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.21	4.08	0.3	A	196	295
B - Link Road	0.16	2.72	0.2	A	235	352
C - Stotfold Road (N)	0.46	3.65	0.9	A	729	1093

Main Results for each time segment

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	161	40	368	1220	0.132	161	228	0.0	0.2	3.397	A
B - Link Road	193	48	59	1795	0.107	192	470	0.0	0.1	2.538	A
C - Stotfold Road (N)	598	149	0	1921	0.311	596	251	0.0	0.5	2.877	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	192	48	440	1177	0.163	192	273	0.2	0.2	3.656	A
B - Link Road	230	58	70	1787	0.129	230	562	0.1	0.2	2.612	A
C - Stotfold Road (N)	714	178	0	1921	0.372	713	300	0.5	0.6	3.158	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	236	59	539	1118	0.211	235	334	0.2	0.3	4.077	A
B - Link Road	282	70	86	1777	0.159	282	688	0.2	0.2	2.721	A
C - Stotfold Road (N)	874	219	0	1921	0.455	873	367	0.6	0.9	3.640	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	236	59	539	1118	0.211	236	335	0.3	0.3	4.080	A
B - Link Road	282	70	86	1776	0.159	282	689	0.2	0.2	2.721	A
C - Stotfold Road (N)	874	219	0	1921	0.455	874	368	0.9	0.9	3.645	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	192	48	441	1176	0.164	193	274	0.3	0.2	3.660	A
B - Link Road	230	58	70	1787	0.129	230	564	0.2	0.2	2.615	A
C - Stotfold Road (N)	714	178	0	1921	0.372	715	301	0.9	0.6	3.166	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	161	40	369	1219	0.132	161	229	0.2	0.2	3.406	A
B - Link Road	193	48	59	1795	0.107	193	472	0.2	0.1	2.539	A
C - Stotfold Road (N)	598	149	0	1921	0.311	598	252	0.6	0.5	2.886	A

DS2, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.37	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	DS2	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	31	100.000
B - Link Road		ONE HOUR	✓	751	100.000
C - Stotfold Road (N)		ONE HOUR	✓	529	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	14	17
	B - Link Road	12	0	739
	C - Stotfold Road (N)	224	305	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	1	1
	B - Link Road	4	0	4
	C - Stotfold Road (N)	5	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.03	3.02	0.0	A	28	43
B - Link Road	0.45	3.76	0.9	A	689	1034
C - Stotfold Road (N)	0.30	2.84	0.5	A	485	728

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	23	6	229	1302	0.018	23	177	0.0	0.0	2.843	A
B - Link Road	565	141	13	1826	0.310	564	239	0.0	0.5	2.963	A
C - Stotfold Road (N)	398	100	9	1914	0.208	397	567	0.0	0.3	2.490	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	28	7	274	1275	0.022	28	212	0.0	0.0	2.914	A
B - Link Road	675	169	15	1824	0.370	675	287	0.5	0.6	3.255	A
C - Stotfold Road (N)	476	119	11	1913	0.249	475	679	0.3	0.3	2.628	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	34	9	336	1239	0.028	34	260	0.0	0.0	3.017	A
B - Link Road	827	207	19	1822	0.454	826	351	0.6	0.9	3.757	A
C - Stotfold Road (N)	582	146	13	1911	0.305	582	831	0.3	0.5	2.843	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	34	9	336	1239	0.028	34	260	0.0	0.0	3.018	A
B - Link Road	827	207	19	1822	0.454	827	351	0.9	0.9	3.762	A
C - Stotfold Road (N)	582	146	13	1911	0.305	582	832	0.5	0.5	2.843	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	28	7	274	1275	0.022	28	212	0.0	0.0	2.917	A
B - Link Road	675	169	15	1824	0.370	676	287	0.9	0.6	3.266	A
C - Stotfold Road (N)	476	119	11	1913	0.249	476	681	0.5	0.3	2.632	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	23	6	230	1301	0.018	23	178	0.0	0.0	2.844	A
B - Link Road	565	141	13	1826	0.310	566	240	0.6	0.5	2.973	A
C - Stotfold Road (N)	398	100	9	1914	0.208	399	570	0.3	0.3	2.493	A

DS3, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.55	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	DS3	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	244	100.000
B - Link Road		ONE HOUR	✓	338	100.000
C - Stotfold Road (N)		ONE HOUR	✓	791	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	168	76
	B - Link Road	0	0	338
	C - Stotfold Road (N)	325	466	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	0	0
	B - Link Road	10	0	10
	C - Stotfold Road (N)	7	7	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.24	4.16	0.3	A	224	336
B - Link Road	0.21	2.82	0.3	A	310	465
C - Stotfold Road (N)	0.45	3.67	0.9	A	726	1089

Main Results for each time segment

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	184	46	350	1230	0.149	183	244	0.0	0.2	3.436	A
B - Link Road	254	64	57	1796	0.142	254	476	0.0	0.2	2.566	A
C - Stotfold Road (N)	596	149	0	1921	0.310	594	311	0.0	0.5	2.899	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	219	55	419	1189	0.184	219	292	0.2	0.2	3.709	A
B - Link Road	304	76	68	1788	0.170	304	569	0.2	0.2	2.667	A
C - Stotfold Road (N)	711	178	0	1921	0.370	711	372	0.5	0.6	3.181	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	269	67	512	1134	0.237	268	357	0.2	0.3	4.159	A
B - Link Road	372	93	84	1778	0.209	372	697	0.2	0.3	2.816	A
C - Stotfold Road (N)	871	218	0	1921	0.453	870	455	0.6	0.9	3.663	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	269	67	513	1133	0.237	269	358	0.3	0.3	4.162	A
B - Link Road	372	93	84	1778	0.209	372	698	0.3	0.3	2.816	A
C - Stotfold Road (N)	871	218	0	1921	0.453	871	456	0.9	0.9	3.668	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	219	55	420	1189	0.185	220	293	0.3	0.2	3.717	A
B - Link Road	304	76	68	1788	0.170	304	571	0.3	0.2	2.670	A
C - Stotfold Road (N)	711	178	0	1921	0.370	712	373	0.9	0.6	3.191	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	184	46	351	1229	0.149	184	245	0.2	0.2	3.445	A
B - Link Road	254	64	57	1796	0.142	255	478	0.2	0.2	2.569	A
C - Stotfold Road (N)	596	149	0	1921	0.310	596	312	0.6	0.5	2.909	A

DS3, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.76	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	DS3	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	37	100.000
B - Link Road		ONE HOUR	✓	872	100.000
C - Stotfold Road (N)		ONE HOUR	✓	537	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	22	15
	B - Link Road	16	0	856
	C - Stotfold Road (N)	227	310	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	0	0
	B - Link Road	4	0	4
	C - Stotfold Road (N)	5	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.03	3.01	0.0	A	34	51
B - Link Road	0.53	4.34	1.2	A	800	1200
C - Stotfold Road (N)	0.31	2.87	0.5	A	493	739

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	28	7	233	1300	0.021	28	182	0.0	0.0	2.830	A
B - Link Road	656	164	11	1827	0.359	654	249	0.0	0.6	3.186	A
C - Stotfold Road (N)	404	101	12	1912	0.211	403	653	0.0	0.3	2.504	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	33	8	279	1272	0.026	33	218	0.0	0.0	2.904	A
B - Link Road	784	196	13	1825	0.430	783	298	0.6	0.8	3.592	A
C - Stotfold Road (N)	483	121	14	1911	0.253	482	782	0.3	0.4	2.646	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	41	10	341	1235	0.033	41	267	0.0	0.0	3.012	A
B - Link Road	960	240	17	1823	0.527	959	365	0.8	1.1	4.324	A
C - Stotfold Road (N)	591	148	18	1908	0.310	591	958	0.4	0.5	2.869	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	41	10	341	1235	0.033	41	268	0.0	0.0	3.013	A
B - Link Road	960	240	17	1823	0.527	960	366	1.1	1.2	4.338	A
C - Stotfold Road (N)	591	148	18	1908	0.310	591	959	0.5	0.5	2.869	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	33	8	279	1272	0.026	33	219	0.0	0.0	2.907	A
B - Link Road	784	196	13	1825	0.430	785	299	1.2	0.8	3.607	A
C - Stotfold Road (N)	483	121	14	1911	0.253	483	784	0.5	0.4	2.648	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	28	7	234	1299	0.021	28	183	0.0	0.0	2.831	A
B - Link Road	656	164	11	1827	0.359	657	250	0.8	0.6	3.203	A
C - Stotfold Road (N)	404	101	12	1912	0.211	405	657	0.4	0.3	2.507	A

DS4, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.50	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	DS4	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	209	100.000
B - Link Road		ONE HOUR	✓	341	100.000
C - Stotfold Road (N)		ONE HOUR	✓	791	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	134	75
	B - Link Road	0	0	341
	C - Stotfold Road (N)	321	470	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	0	0
	B - Link Road	10	0	10
	C - Stotfold Road (N)	7	7	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.20	4.00	0.3	A	192	288
B - Link Road	0.21	2.82	0.3	A	313	469
C - Stotfold Road (N)	0.45	3.67	0.9	A	726	1089

Main Results for each time segment

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	157	39	353	1229	0.128	157	241	0.0	0.1	3.357	A
B - Link Road	257	64	56	1796	0.143	256	453	0.0	0.2	2.569	A
C - Stotfold Road (N)	596	149	0	1921	0.310	594	312	0.0	0.5	2.899	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	188	47	422	1187	0.158	188	288	0.1	0.2	3.601	A
B - Link Road	307	77	67	1789	0.171	306	543	0.2	0.2	2.670	A
C - Stotfold Road (N)	711	178	0	1921	0.370	711	374	0.5	0.6	3.181	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	230	58	517	1131	0.203	230	353	0.2	0.3	3.993	A
B - Link Road	375	94	82	1779	0.211	375	664	0.2	0.3	2.821	A
C - Stotfold Road (N)	871	218	0	1921	0.453	870	458	0.6	0.9	3.663	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	230	58	517	1131	0.203	230	353	0.3	0.3	3.996	A
B - Link Road	375	94	83	1779	0.211	375	665	0.3	0.3	2.821	A
C - Stotfold Road (N)	871	218	0	1921	0.453	871	458	0.9	0.9	3.668	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	188	47	423	1187	0.158	188	289	0.3	0.2	3.604	A
B - Link Road	307	77	68	1789	0.171	307	544	0.3	0.2	2.672	A
C - Stotfold Road (N)	711	178	0	1921	0.370	712	374	0.9	0.6	3.191	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	157	39	354	1228	0.128	158	242	0.2	0.1	3.363	A
B - Link Road	257	64	57	1796	0.143	257	455	0.2	0.2	2.574	A
C - Stotfold Road (N)	596	149	0	1921	0.310	596	313	0.6	0.5	2.909	A

DS4, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.59	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	DS4	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	28	100.000
B - Link Road		ONE HOUR	✓	833	100.000
C - Stotfold Road (N)		ONE HOUR	✓	523	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	12	16
	B - Link Road	12	0	821
	C - Stotfold Road (N)	247	276	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	1	1
	B - Link Road	3	0	3
	C - Stotfold Road (N)	5	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.02	2.96	0.0	A	26	39
B - Link Road	0.50	4.10	1.0	A	764	1147
C - Stotfold Road (N)	0.30	2.83	0.5	A	480	720

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	21	5	207	1315	0.016	21	194	0.0	0.0	2.810	A
B - Link Road	627	157	12	1826	0.343	625	216	0.0	0.5	3.082	A
C - Stotfold Road (N)	394	98	9	1914	0.206	393	628	0.0	0.3	2.483	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	25	6	248	1291	0.020	25	233	0.0	0.0	2.872	A
B - Link Road	749	187	14	1824	0.410	748	259	0.5	0.7	3.443	A
C - Stotfold Road (N)	470	118	11	1913	0.246	470	752	0.3	0.3	2.619	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	31	8	304	1258	0.025	31	285	0.0	0.0	2.963	A
B - Link Road	917	229	18	1822	0.503	916	317	0.7	1.0	4.085	A
C - Stotfold Road (N)	576	144	13	1911	0.301	575	920	0.3	0.5	2.829	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	31	8	304	1257	0.025	31	285	0.0	0.0	2.963	A
B - Link Road	917	229	18	1822	0.503	917	317	1.0	1.0	4.096	A
C - Stotfold Road (N)	576	144	13	1911	0.301	576	922	0.5	0.5	2.829	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	25	6	248	1290	0.020	25	233	0.0	0.0	2.875	A
B - Link Road	749	187	14	1824	0.410	750	259	1.0	0.7	3.454	A
C - Stotfold Road (N)	470	118	11	1913	0.246	471	754	0.5	0.3	2.622	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	21	5	208	1314	0.016	21	195	0.0	0.0	2.813	A
B - Link Road	627	157	12	1826	0.343	628	217	0.7	0.5	3.095	A
C - Stotfold Road (N)	394	98	9	1914	0.206	394	631	0.3	0.3	2.488	A

DS5, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.61	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	DS5	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	257	100.000
B - Link Road		ONE HOUR	✓	213	100.000
C - Stotfold Road (N)		ONE HOUR	✓	792	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	144	113
	B - Link Road	0	0	213
	C - Stotfold Road (N)	324	468	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	0	0
	B - Link Road	16	0	16
	C - Stotfold Road (N)	6	6	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.25	4.24	0.3	A	236	354
B - Link Road	0.13	2.75	0.2	A	195	293
C - Stotfold Road (N)	0.45	3.64	0.9	A	727	1090

Main Results for each time segment

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	193	48	351	1229	0.157	193	243	0.0	0.2	3.471	A
B - Link Road	160	40	85	1777	0.090	160	459	0.0	0.1	2.582	A
C - Stotfold Road (N)	596	149	0	1921	0.310	594	245	0.0	0.5	2.874	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	231	58	420	1188	0.194	231	291	0.2	0.2	3.759	A
B - Link Road	191	48	101	1766	0.108	191	550	0.1	0.1	2.651	A
C - Stotfold Road (N)	712	178	0	1921	0.371	711	293	0.5	0.6	3.154	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	283	71	515	1133	0.250	283	356	0.2	0.3	4.233	A
B - Link Road	235	59	124	1751	0.134	234	673	0.1	0.2	2.753	A
C - Stotfold Road (N)	872	218	0	1921	0.454	871	359	0.6	0.9	3.632	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	283	71	515	1132	0.250	283	357	0.3	0.3	4.238	A
B - Link Road	235	59	124	1751	0.134	235	674	0.2	0.2	2.753	A
C - Stotfold Road (N)	872	218	0	1921	0.454	872	359	0.9	0.9	3.638	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	231	58	421	1188	0.195	231	292	0.3	0.2	3.764	A
B - Link Road	191	48	102	1766	0.108	192	551	0.2	0.1	2.654	A
C - Stotfold Road (N)	712	178	0	1921	0.371	713	293	0.9	0.6	3.164	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	193	48	353	1229	0.157	194	244	0.2	0.2	3.481	A
B - Link Road	160	40	85	1777	0.090	160	461	0.1	0.1	2.583	A
C - Stotfold Road (N)	596	149	0	1921	0.310	597	246	0.6	0.5	2.883	A

DS5, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	Standard Roundabout	A,B,C	3.36	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	DS5	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Stotfold Road (S)		ONE HOUR	✓	36	100.000
B - Link Road		ONE HOUR	✓	745	100.000
C - Stotfold Road (N)		ONE HOUR	✓	534	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	18	18
	B - Link Road	12	0	733
	C - Stotfold Road (N)	223	311	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Stotfold Road (S)	B - Link Road	C - Stotfold Road (N)
From	A - Stotfold Road (S)	0	1	1
	B - Link Road	4	0	4
	C - Stotfold Road (N)	5	5	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - Stotfold Road (S)	0.03	3.04	0.0	A	33	50
B - Link Road	0.45	3.74	0.8	A	684	1025
C - Stotfold Road (N)	0.31	2.85	0.5	A	490	735

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	27	7	233	1299	0.021	27	176	0.0	0.0	2.857	A
B - Link Road	561	140	14	1825	0.307	559	247	0.0	0.5	2.953	A
C - Stotfold Road (N)	402	101	9	1914	0.210	401	564	0.0	0.3	2.496	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	32	8	279	1272	0.025	32	211	0.0	0.0	2.932	A
B - Link Road	670	167	16	1823	0.367	669	296	0.5	0.6	3.242	A
C - Stotfold Road (N)	480	120	11	1913	0.251	480	675	0.3	0.4	2.637	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	40	10	342	1235	0.032	40	259	0.0	0.0	3.041	A
B - Link Road	820	205	20	1821	0.450	819	362	0.6	0.8	3.735	A
C - Stotfold Road (N)	588	147	13	1911	0.308	587	826	0.4	0.5	2.855	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	40	10	342	1235	0.032	40	259	0.0	0.0	3.042	A
B - Link Road	820	205	20	1821	0.450	820	362	0.8	0.8	3.740	A
C - Stotfold Road (N)	588	147	13	1911	0.308	588	827	0.5	0.5	2.855	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	32	8	280	1272	0.025	32	211	0.0	0.0	2.933	A
B - Link Road	670	167	16	1823	0.367	671	296	0.8	0.6	3.252	A
C - Stotfold Road (N)	480	120	11	1913	0.251	481	676	0.5	0.4	2.640	A

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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - Stotfold Road (S)	27	7	234	1299	0.021	27	177	0.0	0.0	2.861	A
B - Link Road	561	140	14	1825	0.307	561	248	0.6	0.5	2.963	A
C - Stotfold Road (N)	402	101	9	1914	0.210	402	566	0.4	0.3	2.501	A

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: 2016-12-07 Option A1 Direct Link to Wilbury Way.j9
Path: C:\CADtools_Ustn\Plots
Report generation date: 20/12/2016 12:04:15

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	DS1							
Stream B-C	0.6	7.67	0.35	A	0.9	11.87	0.46	B
Stream B-A	0.0	14.15	0.02	B	0.1	15.73	0.05	C
Stream C-AB	0.7	8.09	0.39	A	0.1	7.22	0.12	A
	DS2							
Stream B-C	0.1	12.78	0.03	B	0.1	15.21	0.05	C
Stream B-A	0.2	20.17	0.11	C	0.2	23.79	0.11	C
Stream C-AB	0.6	9.15	0.36	A	0.3	9.62	0.20	A
	DS3							
Stream B-C	1.1	11.33	0.50	B	3.4	28.64	0.76	D
Stream B-A	0.1	17.04	0.10	C	0.2	27.61	0.18	D
Stream C-AB	0.6	8.27	0.37	A	0.0	6.69	0.01	A
	DS4							
Stream B-C	1.0	10.31	0.49	B	2.1	19.46	0.67	C
Stream B-A	0.0	15.03	0.02	C	0.1	19.85	0.06	C
Stream C-AB	0.5	7.63	0.32	A	0.1	7.02	0.05	A
	DS5							
Stream B-C	0.0	8.87	0.03	A	0.1	11.25	0.04	B
Stream B-A	0.1	17.85	0.04	C	0.1	20.17	0.05	C
Stream C-AB	0.6	8.97	0.36	A	0.0	7.82	0.01	A

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

File summary

File Description

Title	(untitled)

Location	
Site number	
Date	07/12/2016
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\neil.scott
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
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	DS1	AM	ONE HOUR	07:45	09:15	15	✓
D2	DS1	PM	ONE HOUR	16:45	18:15	15	✓
D3	DS2	AM	ONE HOUR	07:45	09:15	15	✓
D4	DS2	PM	ONE HOUR	16:45	18:15	15	✓
D5	DS3	AM	ONE HOUR	07:45	09:15	15	✓
D6	DS3	PM	ONE HOUR	16:45	18:15	15	✓
D7	DS4	AM	ONE HOUR	07:45	09:15	15	✓
D8	DS4	PM	ONE HOUR	16:45	18:15	15	✓
D9	DS5	AM	ONE HOUR	07:45	09:15	15	✓
D10	DS5	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

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

DS1, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	4.31	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Wilbury Way		Major
B	Cadwell Lane		Minor
C	Link Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Link Road	8.00		✓	4.00	100.0	✓	8.00

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

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Cadwell Lane	One lane plus flare	5.00	4.50	4.00	3.65	3.65		2.00	90	90

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	393	0.065	0.165	0.104	0.236
1	B-C	756	0.106	0.268	-	-
1	C-B	756	0.267	0.267	-	-

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

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

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically

D1	DS1	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	16	100.000
B - Cadwell Lane		ONE HOUR	✓	247	100.000
C - Link Road		ONE HOUR	✓	685	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	**B - Cadwell Lane**	**C - Link Road**
From	**A - Wilbury Way**	0	8	8
	B - Cadwell Lane	6	0	241
	C - Link Road	419	266	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	**B - Cadwell Lane**	**C - Link Road**
From	**A - Wilbury Way**	0	8	8
	B - Cadwell Lane	3	0	3
	C - Link Road	3	3	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.35	7.67	0.6	A	221	332
B-A	0.02	14.15	0.0	B	6	8
C-AB	0.39	8.09	0.7	A	244	366
C-A					384	577
A-B					7	11
A-C					7	11

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	181	45	752	0.241	180	0.0	0.3	6.475	A
B-A	5	1	310	0.015	4	0.0	0.0	12.125	B
C-AB	200	50	752	0.266	199	0.0	0.4	6.680	A
C-A	315	79			315				
A-B	6	2			6				
A-C	6	2			6				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	217	54	750	0.289	216	0.3	0.4	6.939	A
B-A	5	1	293	0.018	5	0.0	0.0	12.887	B
C-AB	239	60	752	0.318	239	0.4	0.5	7.219	A
C-A	377	94			377				
A-B	7	2			7				
A-C	7	2			7				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	265	66	749	0.354	265	0.4	0.6	7.654	A
B-A	7	2	269	0.025	7	0.0	0.0	14.132	B
C-AB	293	73	751	0.390	292	0.5	0.6	8.067	A
C-A	461	115			461				
A-B	9	2			9				
A-C	9	2			9				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	265	66	749	0.354	265	0.6	0.6	7.672	A
B-A	7	2	269	0.025	7	0.0	0.0	14.145	B
C-AB	293	73	751	0.390	293	0.6	0.7	8.091	A
C-A	461	115			461				
A-B	9	2			9				
A-C	9	2			9				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	217	54	750	0.289	217	0.6	0.4	6.962	A
B-A	5	1	293	0.018	5	0.0	0.0	12.904	B
C-AB	239	60	752	0.318	240	0.7	0.5	7.253	A
C-A	377	94			377				
A-B	7	2			7				
A-C	7	2			7				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	181	45	751	0.241	182	0.4	0.3	6.515	A
B-A	5	1	310	0.015	5	0.0	0.0	12.149	B
C-AB	200	50	752	0.266	201	0.5	0.4	6.725	A
C-A	315	79			315				
A-B	6	2			6				
A-C	6	2			6				

DS1, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	3.34	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	DS1	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	596	100.000
B - Cadwell Lane		ONE HOUR	✓	258	100.000
C - Link Road		ONE HOUR	✓	217	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	103	493
	B - Cadwell Lane	11	0	247
	C - Link Road	152	65	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	1	1
	B - Cadwell Lane	5	0	5
	C - Link Road	2	2	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.46	11.87	0.9	B	227	340
B-A	0.05	15.73	0.1	C	10	15
C-AB	0.12	7.22	0.1	A	60	89
C-A					139	209
A-B					95	142
A-C					452	679

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	186	46	643	0.289	184	0.0	0.4	8.218	A
B-A	8	2	304	0.027	8	0.0	0.0	12.757	B
C-AB	49	12	636	0.077	49	0.0	0.1	6.252	A
C-A	114	29			114				
A-B	78	19			78				
A-C	371	93			371				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	222	56	621	0.358	221	0.4	0.6	9.452	A
B-A	10	2	284	0.035	10	0.0	0.0	13.780	B
C-AB	58	15	612	0.095	58	0.1	0.1	6.627	A
C-A	137	34			137				
A-B	93	23			93				
A-C	443	111			443				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	272	68	590	0.461	271	0.6	0.9	11.779	B
B-A	12	3	253	0.048	12	0.0	0.1	15.709	C
C-AB	72	18	580	0.123	71	0.1	0.1	7.214	A
C-A	167	42			167				
A-B	113	28			113				
A-C	543	136			543				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	272	68	590	0.461	272	0.9	0.9	11.866	B
B-A	12	3	252	0.048	12	0.1	0.1	15.733	C
C-AB	72	18	580	0.123	72	0.1	0.1	7.217	A
C-A	167	42			167				
A-B	113	28			113				
A-C	543	136			543				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	222	56	621	0.358	223	0.9	0.6	9.539	A

B-A	10	2	284	0.035	10	0.1	0.0	13.799	B
C-AB	58	15	612	0.095	59	0.1	0.1	6.630	A
C-A	137	34			137				
A-B	93	23			93				
A-C	443	111			443				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	186	46	642	0.289	187	0.6	0.4	8.305	A
B-A	8	2	304	0.027	8	0.0	0.0	12.771	B
C-AB	49	12	636	0.077	49	0.1	0.1	6.261	A
C-A	114	29			114				
A-B	78	19			78				
A-C	371	93			371				

DS2, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	2.97	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	DS2	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	302	100.000
B - Cadwell Lane		ONE HOUR	✓	50	100.000
C - Link Road		ONE HOUR	✓	626	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	62	240
	B - Cadwell Lane	34	0	16
	C - Link Road	406	220	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	27	27
	B - Cadwell Lane	73	0	73
	C - Link Road	8	8	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.03	12.78	0.1	B	15	22
B-A	0.11	20.17	0.2	C	31	47
C-AB	0.36	9.15	0.6	A	202	303
C-A					373	559
A-B					57	85
A-C					220	330

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	12	3	531	0.023	12	0.0	0.0	12.003	B
B-A	26	6	416	0.062	25	0.0	0.1	15.927	C
C-AB	166	41	695	0.238	164	0.0	0.3	7.310	A
C-A	306	76			306				
A-B	47	12			47				
A-C	181	45			181				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	14	4	520	0.028	14	0.0	0.0	12.318	B
B-A	31	8	386	0.079	30	0.1	0.1	17.483	C
C-AB	198	49	683	0.290	197	0.3	0.4	7.998	A
C-A	365	91			365				
A-B	56	14			56				
A-C	216	54			216				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	18	4	505	0.035	18	0.0	0.1	12.773	B
B-A	37	9	346	0.108	37	0.1	0.2	20.114	C
C-AB	242	61	667	0.363	242	0.4	0.6	9.125	A
C-A	447	112			447				
A-B	68	17			68				
A-C	264	66			264				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	18	4	505	0.035	18	0.1	0.1	12.783	B
B-A	37	9	346	0.108	37	0.2	0.2	20.166	C
C-AB	242	61	667	0.363	242	0.6	0.6	9.154	A
C-A	447	112			447				
A-B	68	17			68				
A-C	264	66			264				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	14	4	519	0.028	14	0.1	0.0	12.335	B

B-A	31	8	386	0.079	31	0.2	0.2	17.526	C
C-AB	198	49	683	0.290	198	0.6	0.4	8.034	A
C-A	365	91			365				
A-B	56	14			56				
A-C	216	54			216				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	12	3	530	0.023	12	0.0	0.0	12.027	B
B-A	26	6	415	0.062	26	0.2	0.1	15.988	C
C-AB	166	41	695	0.238	166	0.4	0.3	7.356	A
C-A	306	76			306				
A-B	47	12			47				
A-C	181	45			181				

DS2, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	1.49	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	DS2	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	862	100.000
B - Cadwell Lane		ONE HOUR	✓	48	100.000
C - Link Road		ONE HOUR	✓	320	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	130	732
	B - Cadwell Lane	29	0	19
	C - Link Road	231	89	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	5	5
	B - Cadwell Lane	63	0	63
	C - Link Road	8	8	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.05	15.21	0.1	C	17	26
B-A	0.11	23.79	0.2	C	27	40
C-AB	0.20	9.62	0.3	A	82	123
C-A					212	318
A-B					119	179
A-C					672	1008

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	14	4	471	0.030	14	0.0	0.1	12.838	B
B-A	22	5	363	0.060	21	0.0	0.1	17.159	C
C-AB	67	17	582	0.115	66	0.0	0.1	7.531	A
C-A	174	43			174				
A-B	98	24			98				
A-C	551	138			551				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	17	4	444	0.038	17	0.1	0.1	13.733	B
B-A	26	7	327	0.080	26	0.1	0.1	19.447	C
C-AB	80	20	549	0.146	80	0.1	0.2	8.293	A
C-A	208	52			208				
A-B	117	29			117				
A-C	658	165			658				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	21	5	407	0.051	21	0.1	0.1	15.188	C
B-A	32	8	279	0.115	32	0.1	0.2	23.740	C
C-AB	98	24	502	0.195	98	0.2	0.3	9.610	A
C-A	254	64			254				
A-B	143	36			143				
A-C	806	201			806				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	21	5	407	0.051	21	0.1	0.1	15.207	C
B-A	32	8	279	0.115	32	0.2	0.2	23.788	C
C-AB	98	24	502	0.195	98	0.3	0.3	9.623	A
C-A	254	64			254				
A-B	143	36			143				
A-C	806	201			806				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	17	4	444	0.039	17	0.1	0.1	13.760	B

B-A	26	7	328	0.080	26	0.2	0.1	19.494	C
C-AB	80	20	549	0.146	80	0.3	0.2	8.310	A
C-A	208	52			208				
A-B	117	29			117				
A-C	658	165			658				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	14	4	470	0.030	14	0.1	0.1	12.870	B
B-A	22	5	363	0.060	22	0.1	0.1	17.218	C
C-AB	67	17	582	0.115	67	0.2	0.1	7.551	A
C-A	174	43			174				
A-B	98	24			98				
A-C	551	138			551				

DS3, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	6.24	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	DS3	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	16	100.000
B - Cadwell Lane		ONE HOUR	✓	355	100.000
C - Link Road		ONE HOUR	✓	635	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	8	8
	B - Cadwell Lane	25	0	330
	C - Link Road	380	255	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	6	6
	B - Cadwell Lane	15	0	15
	C - Link Road	8	8	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.50	11.33	1.1	B	303	454
B-A	0.10	17.04	0.1	C	23	34
C-AB	0.37	8.27	0.6	A	234	351
C-A					349	523
A-B					7	11
A-C					7	11

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	248	62	737	0.337	246	0.0	0.6	8.388	A
B-A	19	5	321	0.059	19	0.0	0.1	13.659	B
C-AB	192	48	752	0.255	191	0.0	0.4	6.900	A
C-A	286	72			286				
A-B	6	2			6				
A-C	6	2			6				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	297	74	734	0.404	296	0.6	0.8	9.434	A
B-A	22	6	301	0.075	22	0.1	0.1	14.832	B
C-AB	229	57	752	0.305	229	0.4	0.5	7.427	A
C-A	342	85			342				
A-B	7	2			7				
A-C	7	2			7				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	363	91	729	0.499	362	0.8	1.1	11.244	B
B-A	28	7	271	0.102	27	0.1	0.1	16.995	C
C-AB	281	70	751	0.374	280	0.5	0.6	8.242	A
C-A	418	105			418				
A-B	9	2			9				
A-C	9	2			9				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	363	91	729	0.499	363	1.1	1.1	11.330	B
B-A	28	7	270	0.102	28	0.1	0.1	17.044	C
C-AB	281	70	751	0.374	281	0.6	0.6	8.265	A
C-A	418	105			418				
A-B	9	2			9				
A-C	9	2			9				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	297	74	734	0.404	298	1.1	0.8	9.530	A

B-A	22	6	301	0.075	23	0.1	0.1	14.884	B
C-AB	229	57	752	0.305	230	0.6	0.5	7.457	A
C-A	342	85			342				
A-B	7	2			7				
A-C	7	2			7				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	248	62	737	0.337	249	0.8	0.6	8.501	A
B-A	19	5	321	0.059	19	0.1	0.1	13.718	B
C-AB	192	48	752	0.255	192	0.5	0.4	6.949	A
C-A	286	72			286				
A-B	6	2			6				
A-C	6	2			6				

DS3, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	9.30	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	DS3	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	570	100.000
B - Cadwell Lane		ONE HOUR	✓	434	100.000
C - Link Road		ONE HOUR	✓	333	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	103	467
	B - Cadwell Lane	29	0	405
	C - Link Road	327	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	13	13
	B - Cadwell Lane	11	0	11
	C - Link Road	8	8	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.76	28.64	3.4	D	372	557
B-A	0.18	27.61	0.2	D	27	40
C-AB	0.01	6.69	0.0	A	6	8
C-A					300	450
A-B					95	142
A-C					429	643

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	305	76	638	0.478	301	0.0	1.0	11.727	B
B-A	22	5	295	0.074	21	0.0	0.1	14.577	B
C-AB	5	1	641	0.007	4	0.0	0.0	6.108	A
C-A	246	62			246				
A-B	78	19			78				
A-C	352	88			352				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	364	91	615	0.592	362	1.0	1.5	15.631	C
B-A	26	7	258	0.101	26	0.1	0.1	17.224	C
C-AB	5	1	619	0.009	5	0.0	0.0	6.338	A
C-A	294	73			294				
A-B	93	23			93				
A-C	420	105			420				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	446	111	583	0.765	439	1.5	3.2	26.550	D
B-A	32	8	182	0.176	32	0.1	0.2	26.528	D
C-AB	7	2	588	0.011	7	0.0	0.0	6.687	A
C-A	360	90			360				
A-B	113	28			113				
A-C	514	129			514				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	446	111	583	0.765	445	3.2	3.4	28.638	D
B-A	32	8	177	0.181	32	0.2	0.2	27.610	D
C-AB	7	2	588	0.011	7	0.0	0.0	6.687	A
C-A	360	90			360				
A-B	113	28			113				
A-C	514	129			514				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	364	91	615	0.592	371	3.4	1.7	16.811	C

B-A	26	7	254	0.103	27	0.2	0.1	17.601	C
C-AB	5	1	619	0.009	5	0.0	0.0	6.341	A
C-A	294	73			294				
A-B	93	23			93				
A-C	420	105			420				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	305	76	638	0.478	307	1.7	1.0	12.196	B
B-A	22	5	294	0.074	22	0.1	0.1	14.707	B
C-AB	5	1	641	0.007	5	0.0	0.0	6.110	A
C-A	246	62			246				
A-B	78	19			78				
A-C	352	88			352				

DS4, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	5.38	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	DS4	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	17	100.000
B - Cadwell Lane		ONE HOUR	✓	338	100.000
C - Link Road		ONE HOUR	✓	604	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	8	9
	B - Cadwell Lane	6	0	332
	C - Link Road	389	215	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	10	10
	B - Cadwell Lane	10	0	10
	C - Link Road	9	9	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.49	10.31	1.0	B	305	457
B-A	0.02	15.03	0.0	C	6	8
C-AB	0.32	7.63	0.5	A	197	296
C-A					357	535
A-B					7	11
A-C					8	12

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	250	62	752	0.332	248	0.0	0.5	7.817	A
B-A	5	1	317	0.014	4	0.0	0.0	12.681	B
C-AB	162	40	752	0.215	161	0.0	0.3	6.619	A
C-A	293	73			293				
A-B	6	2			6				
A-C	7	2			7				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	298	75	751	0.397	298	0.5	0.7	8.722	A
B-A	5	1	298	0.018	5	0.0	0.0	13.510	B
C-AB	193	48	752	0.257	193	0.3	0.4	7.022	A
C-A	350	87			350				
A-B	7	2			7				
A-C	8	2			8				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	366	91	749	0.488	364	0.7	1.0	10.250	B
B-A	7	2	270	0.024	7	0.0	0.0	15.012	C
C-AB	237	59	751	0.315	236	0.4	0.5	7.621	A
C-A	428	107			428				
A-B	9	2			9				
A-C	10	2			10				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	366	91	749	0.488	365	1.0	1.0	10.313	B
B-A	7	2	270	0.024	7	0.0	0.0	15.035	C
C-AB	237	59	751	0.315	237	0.5	0.5	7.633	A
C-A	428	107			428				
A-B	9	2			9				
A-C	10	2			10				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	298	75	751	0.397	300	1.0	0.7	8.798	A

B-A	5	1	298	0.018	5	0.0	0.0	13.531	B
C-AB	193	48	752	0.257	194	0.5	0.4	7.039	A
C-A	350	87			350				
A-B	7	2			7				
A-C	8	2			8				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	250	62	752	0.332	251	0.7	0.6	7.909	A
B-A	5	1	316	0.014	5	0.0	0.0	12.713	B
C-AB	162	40	752	0.215	162	0.4	0.3	6.653	A
C-A	293	73			293				
A-B	6	2			6				
A-C	7	2			7				

DS4, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	6.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	DS4	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	572	100.000
B - Cadwell Lane		ONE HOUR	✓	374	100.000
C - Link Road		ONE HOUR	✓	288	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	103	469
	B - Cadwell Lane	11	0	363
	C - Link Road	262	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	10	10
	B - Cadwell Lane	8	0	8
	C - Link Road	9	9	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.67	19.46	2.1	C	333	500
B-A	0.06	19.85	0.1	C	10	15
C-AB	0.05	7.02	0.1	A	24	36
C-A					240	361
A-B					95	142
A-C					430	646

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	273	68	649	0.421	270	0.0	0.8	10.189	B
B-A	8	2	295	0.028	8	0.0	0.0	13.545	B
C-AB	20	5	641	0.031	19	0.0	0.0	6.315	A
C-A	197	49			197				
A-B	78	19			78				
A-C	353	88			353				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	326	82	628	0.520	325	0.8	1.1	12.771	B
B-A	10	2	266	0.037	10	0.0	0.0	15.200	C
C-AB	23	6	618	0.038	23	0.0	0.0	6.596	A
C-A	236	59			236				
A-B	93	23			93				
A-C	422	105			422				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	400	100	599	0.668	396	1.1	2.0	18.844	C
B-A	12	3	210	0.058	12	0.0	0.1	19.634	C
C-AB	29	7	587	0.049	29	0.0	0.1	7.022	A
C-A	288	72			288				
A-B	113	28			113				
A-C	516	129			516				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	400	100	599	0.668	399	2.0	2.1	19.458	C
B-A	12	3	208	0.058	12	0.1	0.1	19.846	C
C-AB	29	7	587	0.049	29	0.1	0.1	7.022	A
C-A	288	72			288				
A-B	113	28			113				
A-C	516	129			516				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	326	82	628	0.520	330	2.1	1.2	13.211	B

B-A	10	2	264	0.037	10	0.1	0.0	15.306	C
C-AB	23	6	618	0.038	23	0.1	0.0	6.599	A
C-A	236	59			236				
A-B	93	23			93				
A-C	422	105			422				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	273	68	649	0.421	275	1.2	0.8	10.447	B
B-A	8	2	294	0.028	8	0.0	0.0	13.598	B
C-AB	20	5	641	0.031	20	0.0	0.0	6.321	A
C-A	197	49			197				
A-B	78	19			78				
A-C	353	88			353				

DS5, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	2.61	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	DS5	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	258	100.000
B - Cadwell Lane		ONE HOUR	✓	27	100.000
C - Link Road		ONE HOUR	✓	613	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	62	196
	B - Cadwell Lane	10	0	17
	C - Link Road	389	224	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	31	31
	B - Cadwell Lane	47	0	47
	C - Link Road	8	8	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.03	8.87	0.0	A	16	23
B-A	0.04	17.85	0.1	C	9	14
C-AB	0.36	8.97	0.6	A	206	308
C-A					357	535
A-B					57	85
A-C					180	270

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	13	3	637	0.020	13	0.0	0.0	8.480	A
B-A	8	2	363	0.021	7	0.0	0.0	14.859	B
C-AB	169	42	704	0.240	167	0.0	0.3	7.230	A
C-A	293	73			293				
A-B	47	12			47				
A-C	148	37			148				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	15	4	628	0.024	15	0.0	0.0	8.641	A
B-A	9	2	340	0.026	9	0.0	0.0	15.986	C
C-AB	201	50	694	0.290	201	0.3	0.4	7.884	A
C-A	350	87			350				
A-B	56	14			56				
A-C	176	44			176				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	19	5	615	0.030	19	0.0	0.0	8.867	A
B-A	11	3	308	0.036	11	0.0	0.1	17.833	C
C-AB	247	62	680	0.363	246	0.4	0.6	8.945	A
C-A	428	107			428				
A-B	68	17			68				
A-C	216	54			216				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	19	5	615	0.030	19	0.0	0.0	8.871	A
B-A	11	3	308	0.036	11	0.1	0.1	17.847	C
C-AB	247	62	680	0.363	247	0.6	0.6	8.973	A
C-A	428	107			428				
A-B	68	17			68				
A-C	216	54			216				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	15	4	627	0.024	15	0.0	0.0	8.651	A

B-A	9	2	340	0.026	9	0.1	0.0	15.997	C
C-AB	201	50	694	0.290	202	0.6	0.4	7.919	A
C-A	350	87			350				
A-B	56	14			56				
A-C	176	44			176				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	13	3	636	0.020	13	0.0	0.0	8.494	A
B-A	8	2	363	0.021	8	0.0	0.0	14.874	B
C-AB	169	42	704	0.240	169	0.4	0.3	7.279	A
C-A	293	73			293				
A-B	47	12			47				
A-C	148	37			148				

DS5, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Indicative Link Rd South- Option 1	T-Junction	Two-way	0.40	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	DS5	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	Average Demand (PCU/hr)	Scaling Factor (%)
A - Wilbury Way		ONE HOUR	✓	856	100.000
B - Cadwell Lane		ONE HOUR	✓	30	100.000
C - Link Road		ONE HOUR	✓	329	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	130	726
	B - Cadwell Lane	11	0	19
	C - Link Road	323	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Wilbury Way	B - Cadwell Lane	C - Link Road
From	A - Wilbury Way	0	6	6
	B - Cadwell Lane	40	0	40
	C - Link Road	8	8	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.04	11.25	0.1	B	17	26
B-A	0.05	20.17	0.1	C	10	15
C-AB	0.01	7.82	0.0	A	6	8
C-A					296	445
A-B					119	179
A-C					666	999

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	14	4	537	0.027	14	0.0	0.0	9.642	A
B-A	8	2	332	0.025	8	0.0	0.0	15.578	C
C-AB	5	1	583	0.008	4	0.0	0.0	6.715	A
C-A	243	61			243				
A-B	98	24			98				
A-C	547	137			547				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	17	4	508	0.034	17	0.0	0.0	10.261	B
B-A	10	2	302	0.033	10	0.0	0.0	17.223	C
C-AB	5	1	550	0.010	5	0.0	0.0	7.138	A
C-A	290	73			290				
A-B	117	29			117				
A-C	653	163			653				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	21	5	469	0.045	21	0.0	0.1	11.244	B
B-A	12	3	262	0.046	12	0.0	0.1	20.167	C
C-AB	7	2	504	0.013	7	0.0	0.0	7.820	A
C-A	356	89			356				
A-B	143	36			143				
A-C	799	200			799				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	21	5	469	0.045	21	0.1	0.1	11.252	B
B-A	12	3	262	0.046	12	0.1	0.1	20.170	C
C-AB	7	2	504	0.013	7	0.0	0.0	7.820	A
C-A	356	89			356				
A-B	143	36			143				
A-C	799	200			799				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	17	4	508	0.034	17	0.1	0.0	10.274	B

B-A	10	2	303	0.033	10	0.1	0.0	17.223	C
C-AB	5	1	550	0.010	5	0.0	0.0	7.141	A
C-A	290	73			290				
A-B	117	29			117				
A-C	653	163			653				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
B-C	14	4	536	0.027	14	0.0	0.0	9.659	A
B-A	8	2	332	0.025	8	0.0	0.0	15.577	C
C-AB	5	1	583	0.008	5	0.0	0.0	6.715	A
C-A	243	61			243				
A-B	98	24			98				
A-C	547	137			547				

Appendix E: Accident Data

Grove Road, Cadwell Lane, Woolgrove Road Hitchin

Legend

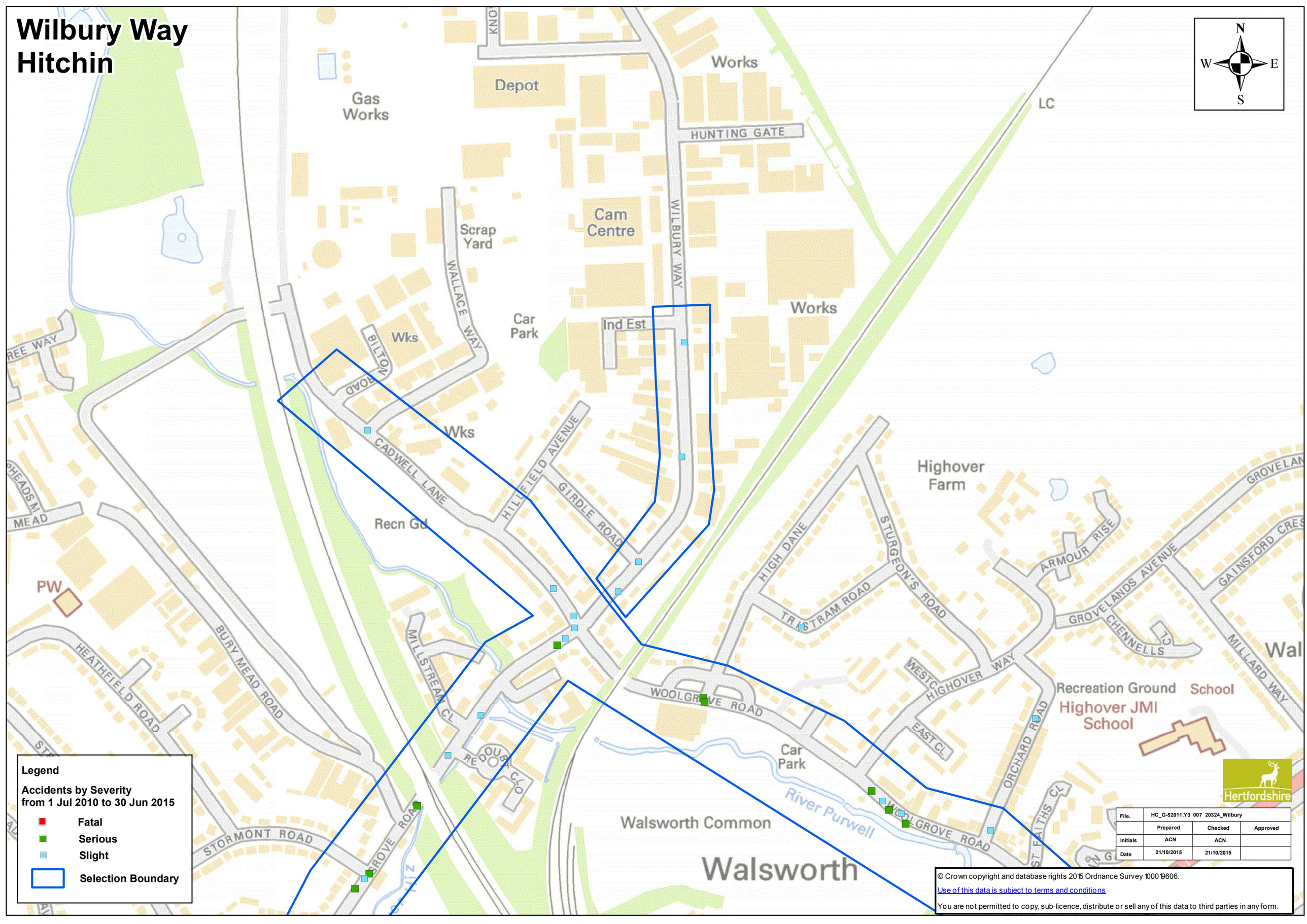
Accidents by Severity from 1 Jul 2010 to 30 Jun 2015

- Fatal
- Serious
- Slight
- Selection Boundary

N
W E
S

File.	HC_G-52011.Y3 007 20324_Grove		
	Prepared	Checked	Approved
Initials	ACN	ACN	
Date	19/10/2015	19/10/2015	

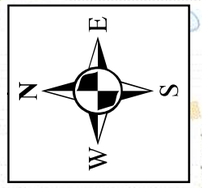
Wilbury Way
Hitchin



Hertfordshire

File.	HC_G-52011.Y3 007 20324_Wilbury		
	Prepared	Checked	Approved
Initials	ACN	ACN	
Date	21/10/2015	21/10/2015	

Stotfold Road
Hitchin



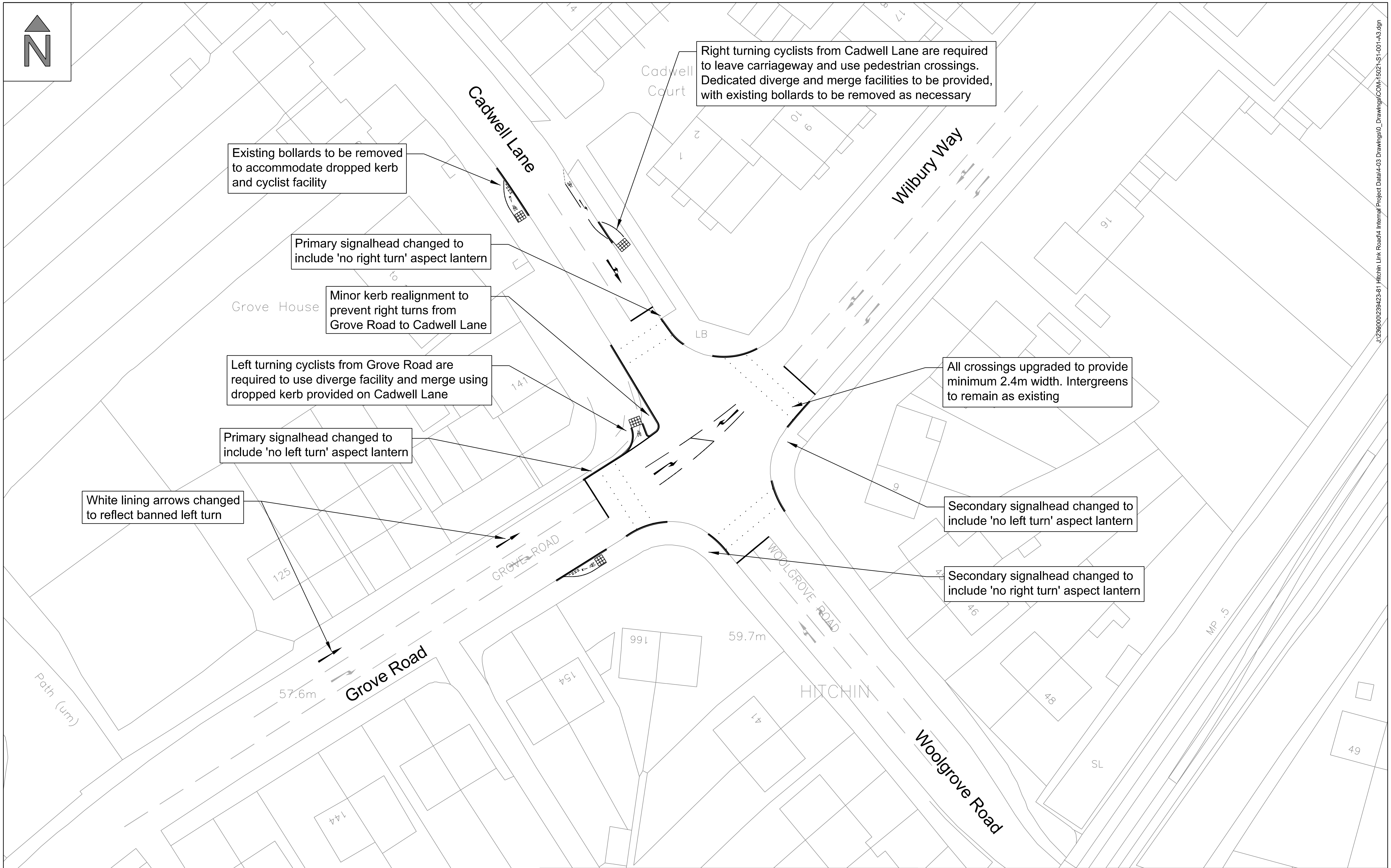
Legend

Accidents by Severity from 1 Jul 2010 to 30 Jun 2015

- Fatal
- Serious
- Slight
- Selection Boundary

File.	HC_G-52011.Y3 007 20324_Stotfold		
	Prepared	Checked	Approved
Initials	ACN	ACN	
Date	19/10/2015	19/10/2015	

Appendix F: Drawings


N
Cadwell Lane
Wilbury Way
Grove Road
Woolgrove Road
Cadwell Court
Grove House
HITCHIN
Path (um)
57.6m
59.7m
Right turning cyclists from Cadwell Lane are required to leave carriageway and use pedestrian crossings. Dedicated diverge and merge facilities to be provided, with existing bollards to be removed as necessary
Existing bollards to be removed to accommodate dropped kerb and cyclist facility
Primary signalhead changed to include 'no right turn' aspect lantern
Minor kerb realignment to prevent right turns from Grove Road to Cadwell Lane
Left turning cyclists from Grove Road are required to use diverge facility and merge using dropped kerb provided on Cadwell Lane
Primary signalhead changed to include 'no left turn' aspect lantern
White lining arrows changed to reflect banned left turn
All crossings upgraded to provide minimum 2.4m width. Intergreens to remain as existing
Secondary signalhead changed to include 'no left turn' aspect lantern
Secondary signalhead changed to include 'no right turn' aspect lantern

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	Cycle Facilities Added	RB	03/17
R2	Minor Amendments	RB	05/17

Hertfordshire

COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Drawn	Designed	Approved	Revision Date	Scale
NS	NS	RB	12/16	1:500

Project
COM15021: Hitchin Industrial Area Access Road

Sheet
Junction Option 3: Banned Turns Between Grove Road and Cadwell Lane

Drawing No.	Sheet. No.	Revision
COM-15021-S1-001-A3	001	R2

Original Sheet Size A3 [420x297] Plot Date

N

Cadwell Lane

Cadwell Court

Wilbury Way

Existing bollards to be removed to accommodate dropped kerbs and cyclist facility

Right turning cyclists from Cadwell Lane are required to leave carriageway and use pedestrian crossings. Dedicated diverge and merge facilities to be provided

All pedestrian crossings upgraded to minimum 2.4m width. Intergreens to remain as existing

White lining arrows changed to reflect banned right turn

Right turning cyclists from Wilbury Way are required to leave carriageway and use pedestrian crossings. Dedicated diverge and merge facilities to be provided

Minor kerb realignment to provide merge onto carriageway for cyclists

Primary and secondary signalheads changed to include 'no right turn' aspect lantern

White lining arrows and lane assignment changed to reflect banned right turn

White lining arrows and lane assignment changed to reflect banned right turn

Grove Road

GROVE ROAD

WOOLGROVE ROAD

57.6m

59.7m

Existing pedestrian guard railing to be cut back / removed to accommodate dropped kerb and cyclist facility

Right turning cyclists from Woolgrove Road are required to leave carriageway and use pedestrian crossings. Dedicated diverge and merge facilities to be provided

Woolgrove Road

HITCHIN

Path (um)

MP .5

150 mm
100
50
10 mm
0

J:\23600\239423-81 Hitchin Link Road\4 Internal Project Data\4-03 Drawings\0_Drawings\COM-15021-S1-002-A3.dgn

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	Cycle Facilities Added	RB	03/17
R2	Minor Amendments	RB	05/17

Hertfordshire

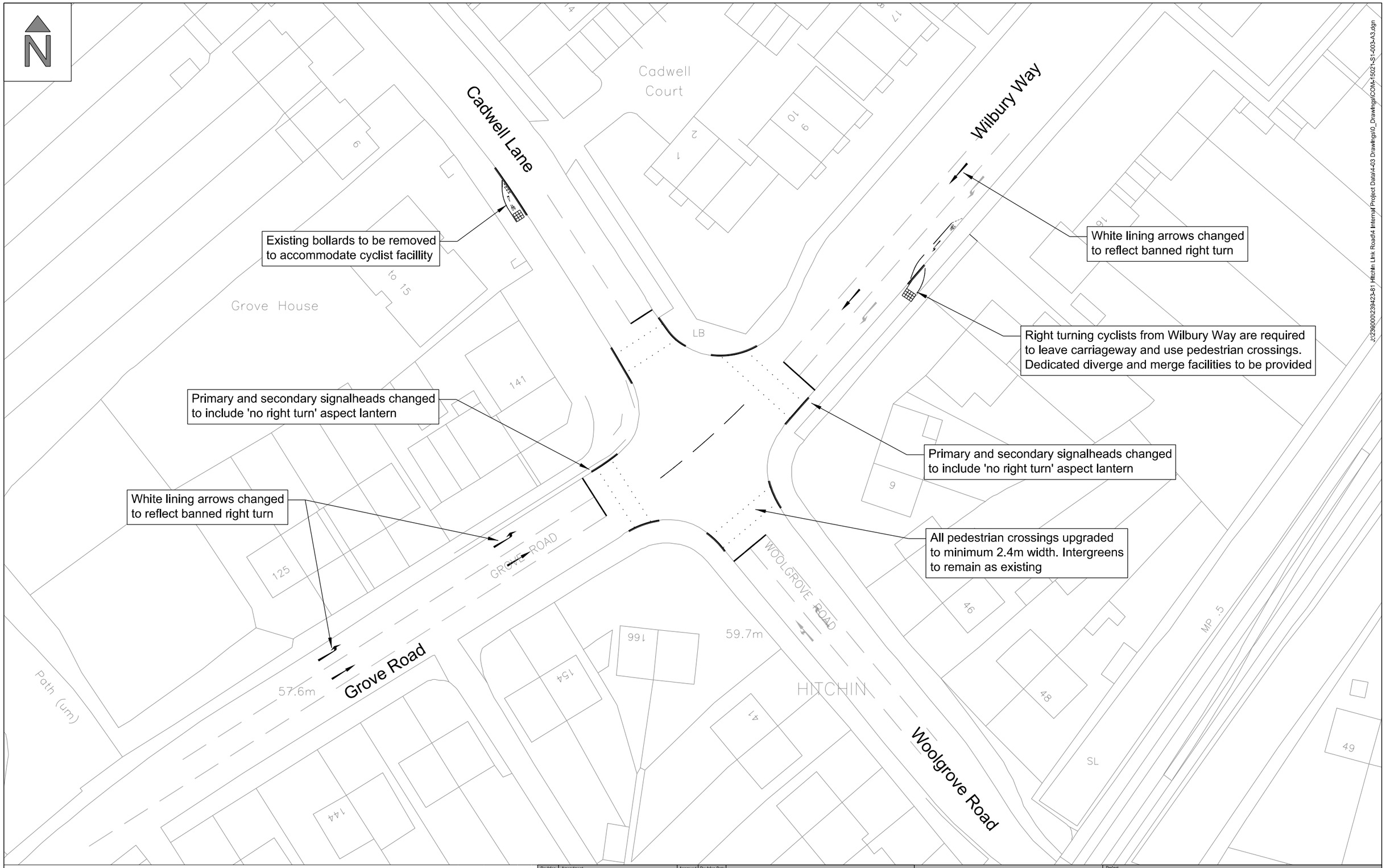
COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Junction Option 4: Banned Right Turns

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:500	COM-15021-S1-002-A3	002	R2

Original Sheet Size A3 [420x297] Plot Date



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Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	Cycle Facilities Added	RB	03/17
R2	Minor Amendments	RB	05/17

COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Option 5: Banned Right Turns Between Grove Rd / Woolgrove Rd and Wilbury Way / Cadwell Ln

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:500	COM-15021-S1-003-A3	003	R2

Original Sheet Size A3 [420x297] Plot Date

3.0m wide shared footway / cycleway to be provided along south side of Cadwell Lane, within proposed one-way section. Bollards within footway to be removed to provide additional width

Right turning cyclists from Wilbury Way are required to leave carriageway and use pedestrian crossings. Dedicated diverge and merge facilities to be provided

All pedestrian crossings upgraded to minimum 2.4m width. Intergreens to remain as existing

Primary signalhead changed to include 'no right turn' aspect lantern, with secondary signalhead to include 'no left turn' aspect

Additional primary signalhead to be provided

Minor kerbline amendments to prevent left turn into Cadwell Lane

Left turning cyclists from Grove Road / ahead cyclists from Woolgrove Road required to use diverge facility and use proposed shared footway / cycleway facility

Loss of approx. 15 perpendicular parking spaces

Turning head provided for southbound vehicles on Cadwell Lane- suitable for articulated vehicles

Third party sports pavilion affected

3.0m wide shared footway / cycleway along south side of Cadwell Lane to continue up to west of Hillfield Avenue, with merge onto carriageway

One-way southbound gate and associated signage to be provided to east of junction with Hillfield Avenue

Primary signalhead changed to include 'no left turn' aspect lantern. Secondary signalhead to include 'no right turn' aspect

White lining arrows changed to reflect banned right turn

Primary and secondary signalheads changed to include double headed 'left turn' and 'right turn' aspect lanterns

White lining arrows and lane assignment changed to reflect banned left turn

White lining arrows and lane assignment changed to reflect no ahead movement

Cadwell Lane

Wilbury Way

Cadwell Court

Grove Road

Woolgrove Road

Hillfield Ave

CADWELL LANE

HITCHIN

Pavilion

59.7m

Key:

Highway Boundary

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	Cycle Facilities Added	RB	03/17
R2	Minor Amendments	RB	05/17

COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Option 6: Cadwell Lane One-Way Southbound from Hillfield Avenue

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:500	COM-15021-S1-004-A3	004	R2

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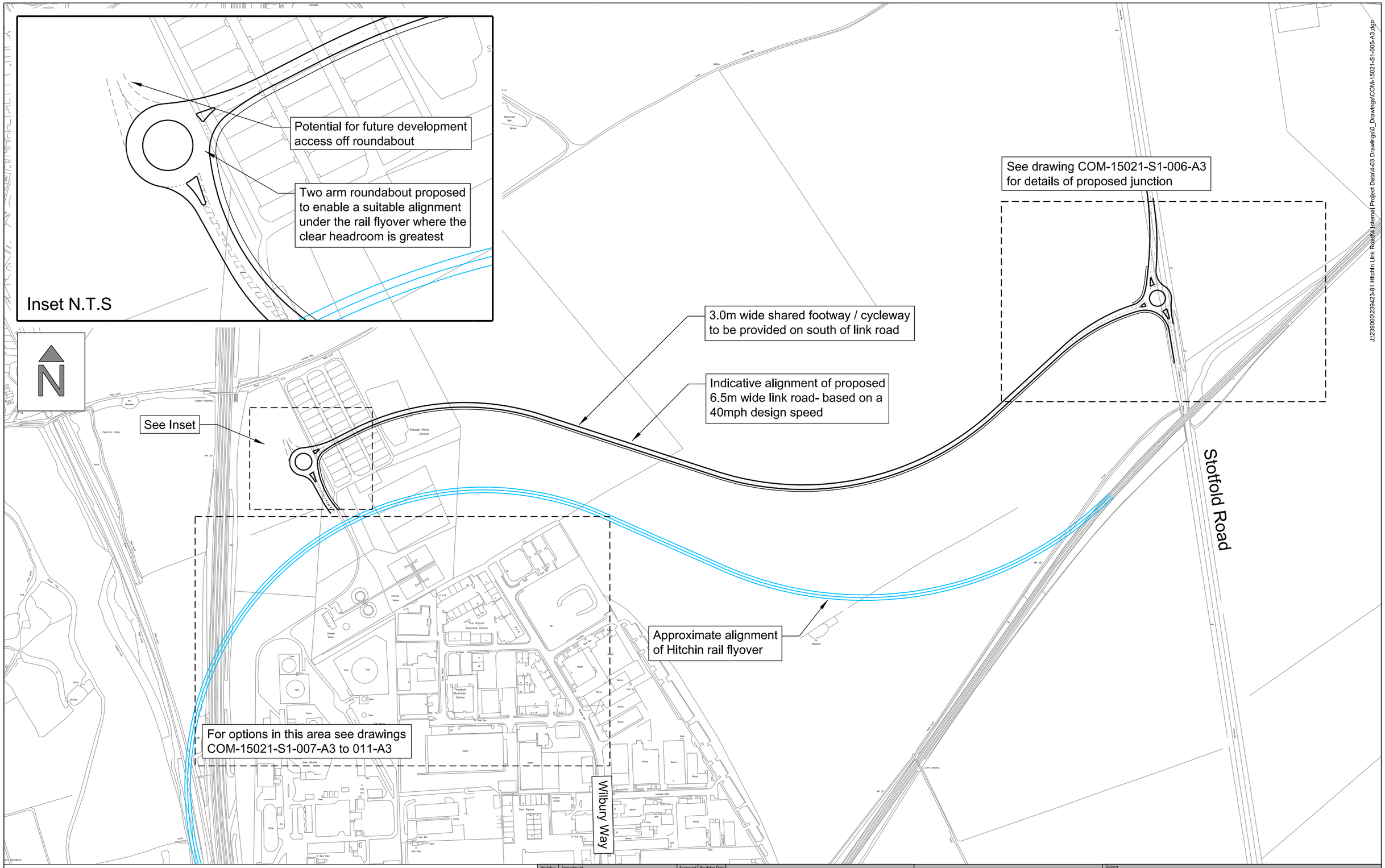
Original Sheet Size A3 [420x297] Plot Date



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Notes:

1. Link road alignment is in third party land.
2. The southern arm of the link road would pass beneath the rail flyover in a similar location to the existing Anglian Water access road, where there is a minimum headroom clearance of 5.3m. See Hitchin Alliance drawing no. 102390-TGP-DRG-CV-110005 Rev. Z01

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	MInor Amendments	RB	12/16
R2	Footway / Cycleway Added	RB	03/17

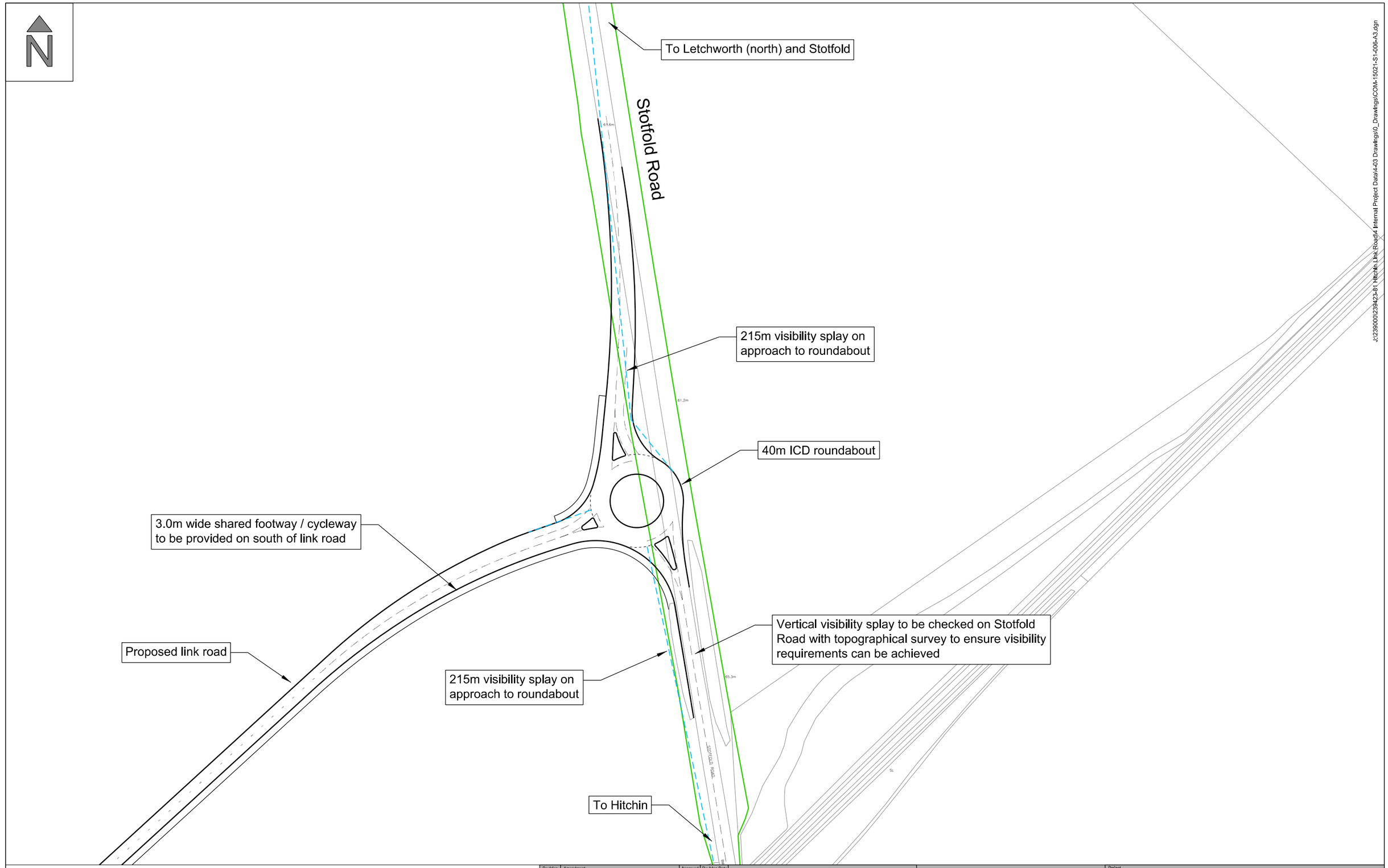
Hertfordshire
COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Stotfold Road / Hitchin Industrial Estate
Option A: Indicative Link Road- North of Flyover

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:5000	COM-15021-S1-005-A3	005	R2

Original Sheet Size A3 [420x297] Plot Date



Key:

Highway Boundary

Note:

1. Link road alignment and Stotfold Rd roundabout is in third party land.

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	MInor Amendments	RB	12/16
R2	Footway / Cycleway Added	RB	03/17

Hertfordshire

COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Stotfold Road / Hitchin Industrial Estate
Option A: Link Road- Stotfold Road Junction

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:1500	COM-15021-S1-006-A3	006	R2

Original Sheet Size A3 [420x297] Plot Date

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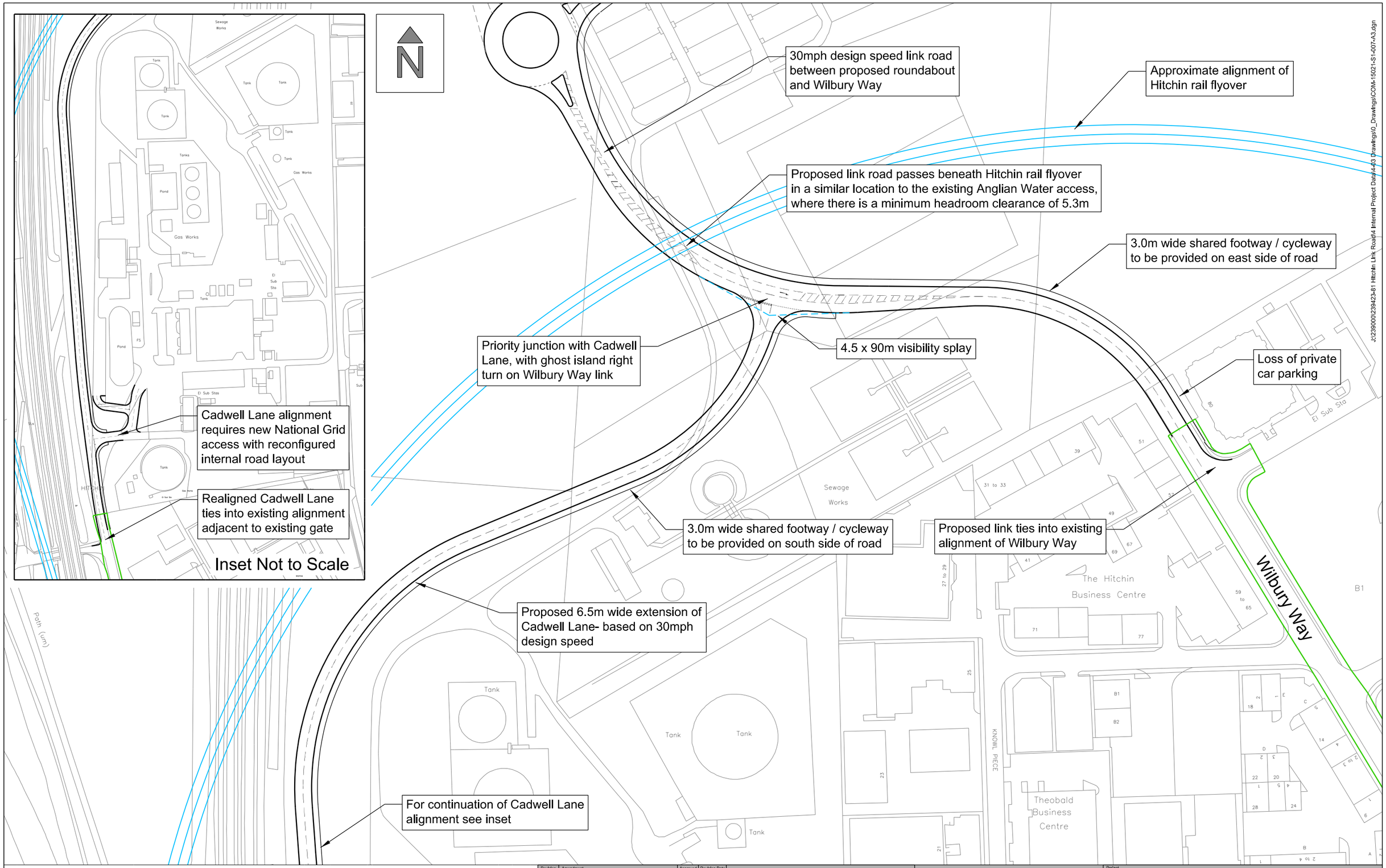


J:\2360000\239423-B1 Hitchin Link Road\4 Internal Project Data\4-03 Drawings\0_Drawings\COM-15021-S1-007-A3.dgn

Key:

Highway Boundary

Notes:

1. Link road alignment is in third party land.
2. For details of proposed link road to north of flyover see drawing COM-15021-S1-005-A3

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	MInor Amendments	RB	12/16
R2	Minor Amendments	RB	03/17

Hertfordshire

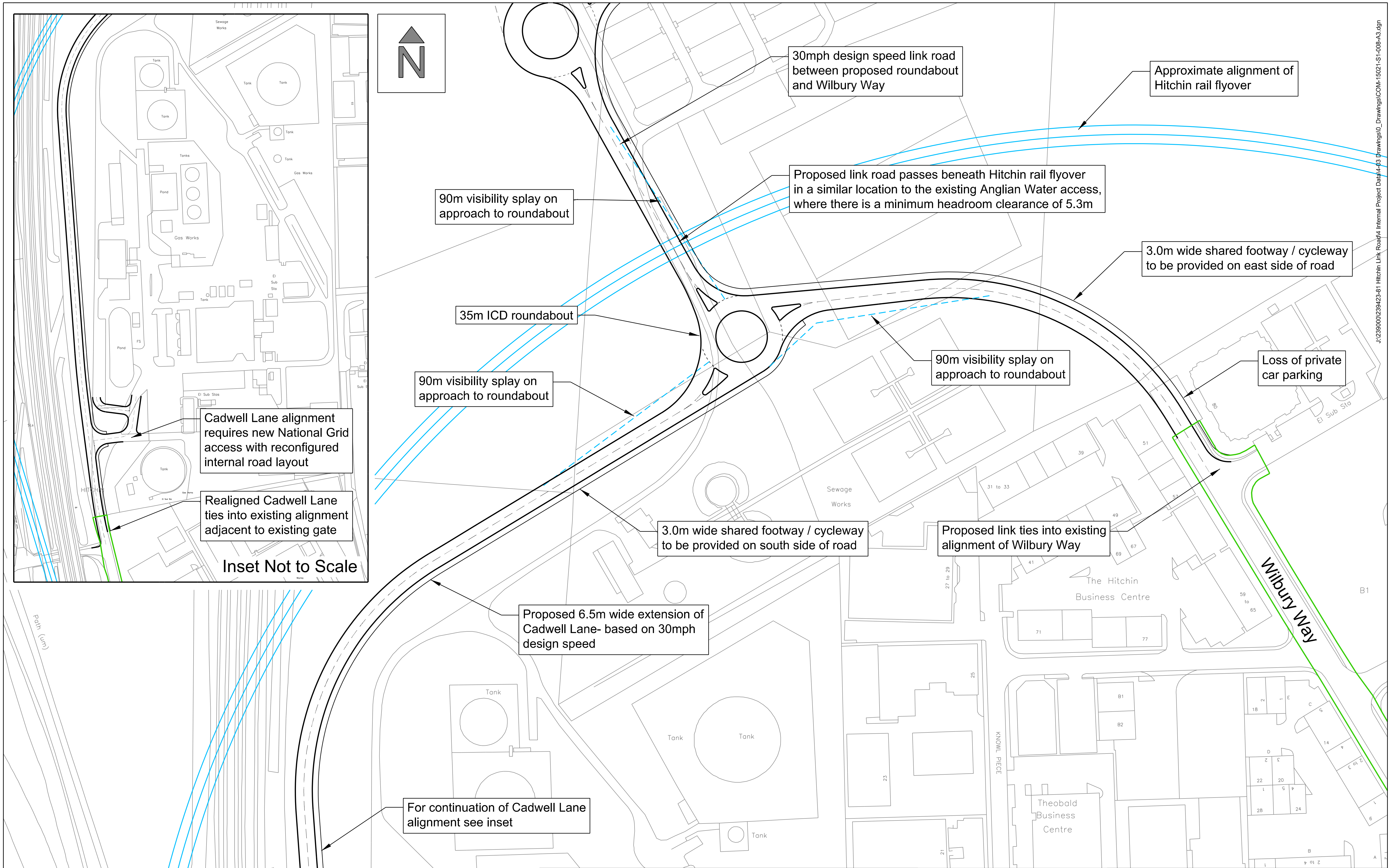
COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Indicative Link Rd Alignment- South of Flyover - Option A1: Direct Link to Wilbury Way

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:1250	COM-15021-S1-007-A3	007	R2

Original Sheet Size A3 [420x297] Plot Date



30mph design speed link road between proposed roundabout and Wilbury Way
Approximate alignment of Hitchin rail flyover
Proposed link road passes beneath Hitchin rail flyover in a similar location to the existing Anglian Water access, where there is a minimum headroom clearance of 5.3m
90m visibility splay on approach to roundabout
3.0m wide shared footway / cycleway to be provided on east side of road
35m ICD roundabout
90m visibility splay on approach to roundabout
90m visibility splay on approach to roundabout
Loss of private car parking
Cadwell Lane alignment requires new National Grid access with reconfigured internal road layout
Realigned Cadwell Lane ties into existing alignment adjacent to existing gate
Inset Not to Scale
3.0m wide shared footway / cycleway to be provided on south side of road
Proposed link ties into existing alignment of Wilbury Way
Wilbury Way
The Hitchin Business Centre
Sewage Works
Proposed 6.5m wide extension of Cadwell Lane- based on 30mph design speed
For continuation of Cadwell Lane alignment see inset
Theobald Business Centre
KNOWL PIECE
Tank
El Sub Sta
N

Key:

Highway Boundary

Notes:

1. Link road alignment is in third party land.
2. For details of proposed link road to north of flyover see drawing COM-15021-S1-005-A3

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	Minor Amendments	RB	12/16
R2	Minor Amendments	RB	03/17

Hertfordshire

COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Indicative Link Rd Alignment- South of Flyover - Option A2: Loop with Link Road

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet No.	Revision
NS	NS	RB	12/16	1:1250	COM-15021-S1-008-A3	008	R2

Original Sheet Size A3 [420x297] Plot Date

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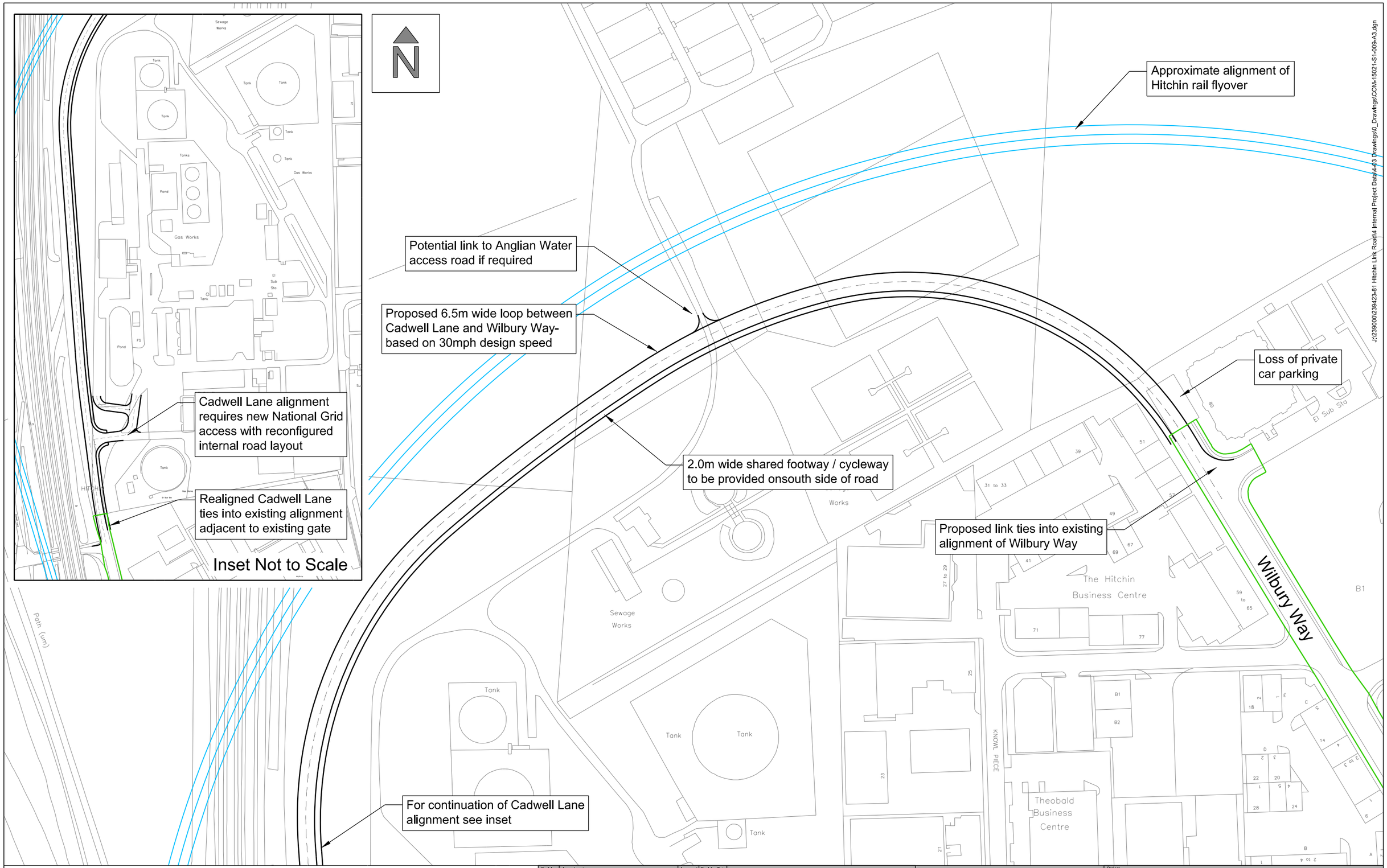


150 mm
100
50
0
10 mm

J:\23\000\239423-81 Hitchin Link Road\4 Internal Project Data\4-03 Drawings\0_Drawings\COM-15021-S1-009-A3.dgn

Key:

Highway Boundary

Note:

1. Loop road alignment is in third party land until it connects to Wilbury Way and Cadwell Lane

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	MInor Amendments	RB	12/16
R2	Minor Amendments	RB	03/17
R3	Minor Amendments	RB	05/17

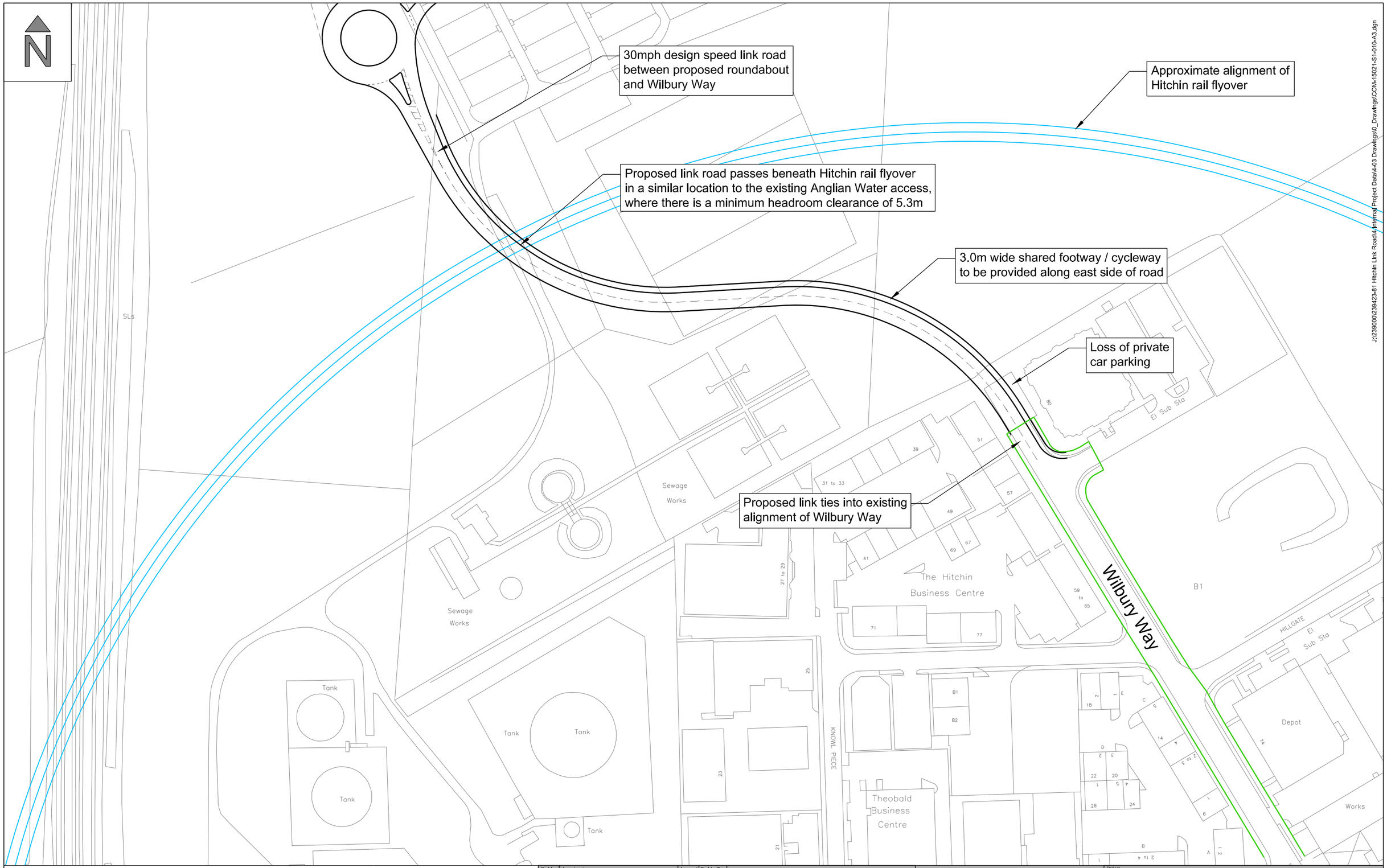
COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Option C: Loop Road Between Cadwell Lane / Wilbury Way Only

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:1250	COM-15021-S1-009-A3	009	R3

Original Sheet Size A3 [420x297] Plot Date



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Key:

Highway Boundary

Note:

1. Link road alignment is in third party land until it connects with Wilbury Way

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	MInor Amendments	RB	12/16
R2	Minor Amendments	RB	03/17

Hertfordshire

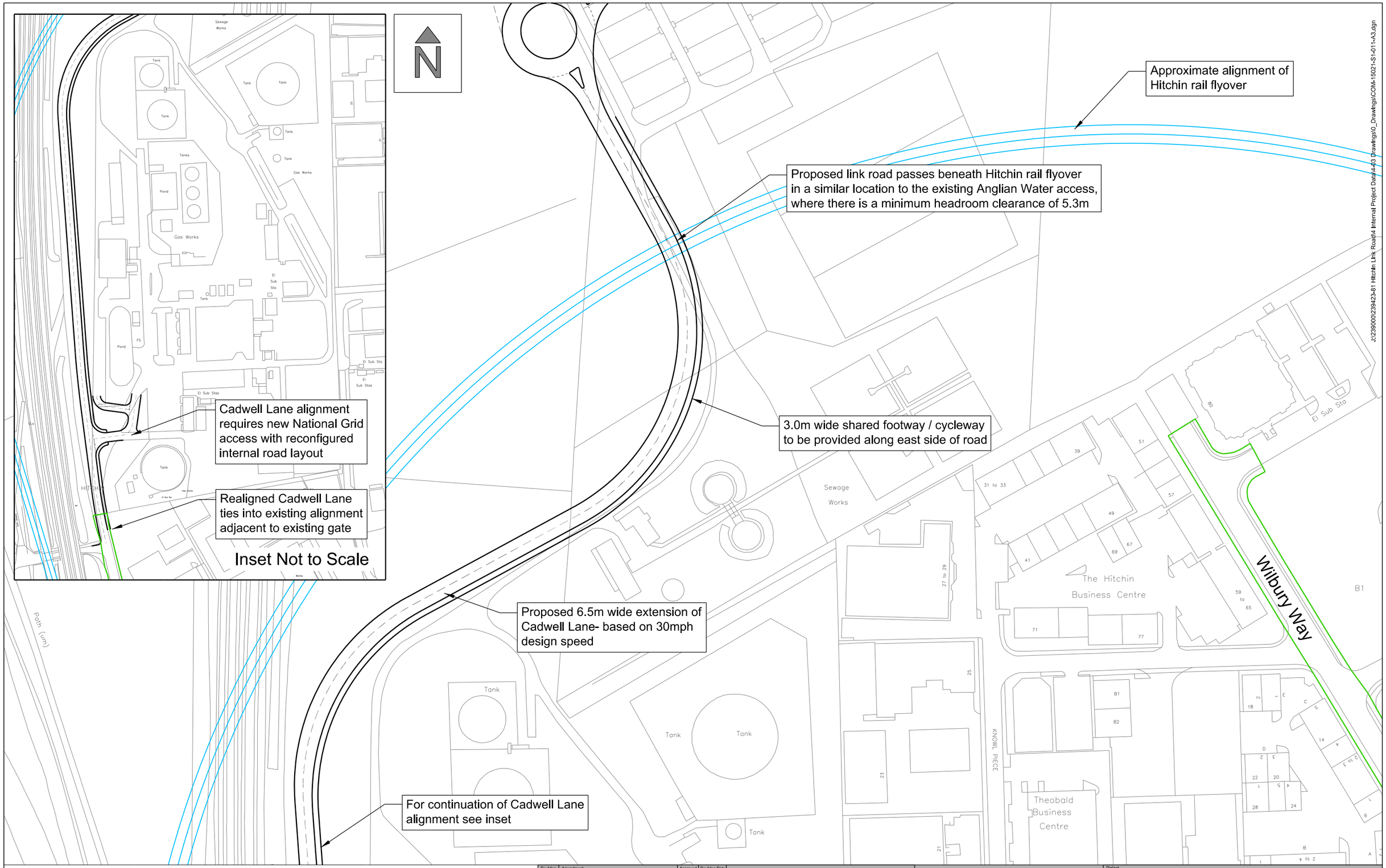
COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Indicative Link Rd Alignment- South of Flyover - Option D: Direct Link to Wilbury Way Only

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:1250	COM-15021-S1-010-A3	010	R2

Original Sheet Size A3 [420x297] Plot Date



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Key:

Highway Boundary

Notes:

1. Link road alignment is in third party land.
2. For details of proposed link road to north of flyover see drawing COM-15021-S1-005-A3

Revision	Amendment	Approved	Revision Date
R0	First Issue	RB	12/16
R1	MInor Amendments	RB	12/16
R2	Minor Amendments	RB	03/17

Hertfordshire

COUNTY HALL
Pegs Lane
Hertford, Herts
SG13 8DN
Phone: 01992 555555

Project: COM15021: Hitchin Industrial Area Access Road

Sheet: Indicative Link Rd Alignment- South of Flyover - Option E: Direct Link to Cadwell Lane Only

Drawn	Designed	Approved	Revision Date	Scale	Drawing No.	Sheet. No.	Revision
NS	NS	RB	12/16	1:1250	COM-15021-S1-011-A3	011	R2

Original Sheet Size A3 [420x297] Plot Date

Appendix G:Cost Estimate

ARUP

	Job No:	*Sheet No:*
	239423-81	**1**
Job Title:	*Element:*	*Base Date of Estimate:*
Hitchin Industrial Area Access Road	***Traffic Management Options and New Link Road Options***	*Q4 2016*
Cost Plan:	*Made by:*	*Date:*
Preliminary Cost Estimate	**AN/CIB**	*26/06/2017*

		Traffic Management Options					**New Link Road Options**				
Description		**Junction Option 2 - HGV prohibition on one road (£)**	**Junction Option 3 - Banned Turns Between Grove Road and Cadwell Lane (£)**	**Junction Option 4 - Banned Right Turns (£)**	**Junction Option 5 - Banned Right Turns Between Grove Road/Woolgrove Road and Wilbury Way/Cadwell Lane (£)**	**Junction Option 6 - Cadwell Lane One-Way Southbound from Hillfield Avenue. (£)**	**Option A1: Direct link to Wilbury Way (£)**	**Option A2: Loop with Link Road (£)**	**Option C: Loop Road Between Cadwell Lane / Wilbury Way Only (£)**	**Option D: Direct Link to Wilbury Way only (£)**	**Option E: Direct Link to Cadwell Lane only (£)**
Traffic Management Options		£5,000	£4,361	£2,240	£1,822	£107,800					
New Link Road Options							£3,575,409	£3,612,286	£950,517	£2,775,825	£3,295,721
Lighting Upgrades			£6,000	£6,000	£6,000	£9,000					
Sub-total		**£5,000**	**£10,361**	**£8,240**	**£7,822**	**£116,800**	**£3,575,409**	**£3,612,286**	**£950,517**	**£2,775,825**	**£3,295,721**
Cost Indices Uplift (Q2 15 - Q4 16)	2%	£100	£200	£200	£200	£2,300					
Traffic Management		£1,250	£2,500	£1,250	£1,250	£5,000	£70,000	£70,000	£30,000	£50,000	£60,000
Preliminaries & Contractors OHP - Traffic Management Options	15%	£950	£1,960	£1,450	£1,390	£18,620					
Preliminaries & Contractors OHP - Link Road Options	15%						£546,810	£552,340	£147,080	£423,870	£503,360
Sub-total		£7,300	£15,021	£11,140	£10,662	£142,720	£4,192,219	£4,234,626	£1,127,597	£3,249,695	£3,859,081
Optimism Bias	40% 44%	£2,900	£6,000	£4,460	£4,260	£57,090	£1,844,580	£1,863,240	£496,140	£1,429,870	£1,698,000
ESTIMATED COST (£)	**(ROUNDED)**	**£10,000**	**£21,000**	**£16,000**	**£15,000**	**£200,000**	**£6,037,000**	**£6,098,000**	**£1,624,000**	**£4,680,000**	**£5,557,000**

Appendix H: Major Projects Gateways

Major Projects Gateways

It is proposed that a series of formal project Stages and Gateways are introduced to ensure effective programme management and governance for major projects funded via Hertfordshire's LEP and, or Hertfordshire County Council.

In order for a project to progress from one stage to another it will be required to gain approval from the appropriate bodies to pass through the gateway.

Table 1 below sets out the recommended Stages and Gateways

Table 1: Project Stages & Gateways	
Stages	**Gateways**
Stage 1: Initiation	
	Gateway 1: Inception
Stage 2: Option Testing	
	Gateway 2: Feasibility
Stage 3: Preferred Option Business Case	
	Gateway 3: Programme Entry
Stage 4: Design	
	Gateway 4: Conditional Approval
Stage 5: Procurement	
	Gateway 5: Final Approval
Stage 6: Delivery	
	Gateway 6: Completion
Stage 7: Maintain & Operate	

The promoting body will be required to provide evidence that it has met the criteria required to pass through each Gateway.

Gateway 1: Inception

- Need Established
- Objectives Identified
- Policy Context In Place
- Options for Testing Identified
- Option Testing Methodology Identified
- Governance Framework Completed Quantitatively for Stage 2 and Indicatively for later stages where possible.
- Indicative Programme to Gateways 2,3,4,5 & 6 identified
- Budgets, Funding and Cashflow in Place for Stage 2.
- Consultation and Communication Strategy for Stage 2 agreed

Governance Framework Stage 2				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 3				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 4				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 5				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 6				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 7				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Gateway 2: Feasibility

Options Tested

- Preferred Option Selected and Agreed
- Consultation and Communication Strategy for Stage 3 Identified
- Scope and Scale of Business Case Appraisal Identified and Agreed
- Governance Framework Completed Quantitatively for Stage3, Qualitatively for Stage 4 and Indicatively Stages 5,6 & 7
- Budget, Funding & Cash Flow Requirements for Stage 3 in place
- Indicative Budget, Funding & Cash Flow Requirements for Stages 4,5,6 & 7 Identified
- Updated Programme to Gateways 3 to 6

Governance Framework Stage 3				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Governance Framework Stage 4				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 5				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 6				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Indicative Governance Framework Stage 7				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Gateway 3: Programme Entry

- Business Case Approved
- Updated Budget, Funding and Cashflow Requirements Identified for Stage 4
- Indicative Budget, Funding and Cashflow Requirements Identified for Stages 5, 6 & 7
- Approvals to Seek Statutory Powers Secured
- All Legal Agreements Identified
- Consultation and Communication Strategy for Stage 4 Identified
- Post Completion Monitoring Regime Identified
- Governance Framework Completed Quantitatively for Stage 4 and Qualitatively for Stages 5, 6 &7

Governance Framework Stage 4				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Governance Framework Stage 5				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Governance Framework Stage 6				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Governance Framework Stage 7				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Gateway 4: Conditional Approval

- Statutory Powers Achieved
- Asset Register in Place
- Project Risk Register and Quantified Risk Register in Place
- Updated Budget, Funding and Cashflow Requirements Identified for Stage 5, 6 & 7
- Health & Safety Duties Identified
- Governance Framework Completed Quantitatively for Stages 5, 6 & 7

Governance Framework Stage 5				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Governance Framework Stage 6				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Governance Framework Stage 7				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Gateway 5: Full Approval

- Tenders Returned and Evaluated
- Risk Register and QRA updated
- Funding Approvals Secured
- Legal Agreements in Place
- Governance Frameworks Completed Quantitatively for Stages 6 & 7
- Contract Management Governance Identified
- Communications Strategy for Stage 6 identified

Governance Framework Stage 6				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Governance Framework Stage 7				
Organisation	Promoter / Partner / Stakeholder / Consultee	Role	Funding £k	Risks

Gateway 6: Completion

- Assets Adopted, Transferred and Accepted into Maintenance, as appropriate
- Contract Maintenance Period Completed
- Final Accounts Settled
- LEP & LTB Funding Responsibilities Discharged
- Monitoring Regime in Place

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