

N03: Junction Modelling Note

Site: Unit K6 Lower Road, Northfleet
Prepared by: JE
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Date: 11th July 2022

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1.0 Introduction

- 1.1 This Junction Modelling Technical Note has been prepared on behalf of Jackson Lifts Group to accompany a planning application for a proposed commercial development at Unit K6 Lower Road, Northfleet (herein referred to as 'the site'). A pre-application review on highway matters for the scheme was requested from Kent County Council in November 2021. A formal response from highways officers indicated that off-site junction analysis was required to support a planning application (KCC response dated 27th January 2022). Item 10 of the KCC response specifically requested a traffic survey and associated modelling of the Lower Road/Stonebridge Road signal junction to assess its capacity with the proposed development. This technical note sets out the details of the traffic modelling, drawing on material prepared in the submitted Transport Statement for the Unit K6 Lower Road planning application.
- 1.2 The site is situated approximately 3.2 kilometres west of Gravesend and approximately 7.3 kilometres east of Dartford within Northfleet Industrial Estate. The site is located to the east of Lower Road and to the south of an unnamed road which connects with Lower Road to the west. The site falls within the administrative boundaries of Gravesham Borough Council (Local Authority) and Kent County Council (County Highway Authority).
- 1.3 The site currently comprises a single storey building which accommodates an industrial unit with ancillary office space to the front. An area of hardstanding to the rear of the building is also included within the site boundary, this is accessed via an existing access road which connects with the unnamed road to the east of the site. The proposals seek to retain the existing warehouse on the ground floor to be used by Jackson Lift Group, with an office extension above resulting in two additional storeys. Access to the site will be achieved from the existing access road which links to the unnamed road to the east of the site. The proposals also include a multi-storey car park on the area of hardstanding to the rear of the building. Appropriate levels of car and cycle parking will be provided in accordance with relevant standards.
- 1.4 Following this introduction, this technical note covers trip generation and distribution, as well as the modelling of the Lower Road/Galley Hill Road/Stonebridge Road signalised junction using LinSig 3 modelling software. The layout of the junction is shown in Figure 1.1.



Figure 1.1: Lower Road/Galley Hill Road/Stonebridge Road Signalised Junction Layout

2.0 Trip Generation, Distribution and Assignment

Trip Generation

- 2.1 The proposed trip generation potential of the site was calculated in the Transport Statement submitted with the planning application. This calculation made use of the TRICS database using the category '02 – Employment: A Office'. The TRICS output is summarised in Table 2.1.

Mode of Travel	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)		Weekday Daily Movements	
	Arr	Dep	Arr	Dep	Arr	Dep
Total Person Trip Rates	4.280	0.310	0.392	4.672	21.534	21.045
Total Person Trips	80	6	7	87	400	391
Vehicular Trip Rates	3.104	0.408	0.490	3.365	15.978	15.55
Vehicular Trips (OGV/LGV)	58 (1)	8 (1)	9 (0)	63 (0)	297 (8)	289 (7)

Table 2.1: Proposed Office Use – Trip Rates and Resultant Trips

- 2.2 To support the above trip attraction, the census data for the category 'Method of travel to work (Workday population)' has been used. The Census modal split of travel is summarised in Table 2.2. The total person trips identified in Table 2.1 for both the weekday morning and evening peak hours have been assigned based on the Census modal split percentages and are also summarised in Table 2.1.

Mode of Travel	Census Modal Split	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)		Weekday Daily Movements	
		Arr	Dep	Arr	Dep	Arr	Dep
Driving a car or van	73.8%	59	4	5	64	295	289
On foot	7.0%	6	0	0	6	28	27
Bus, minibus or coach	5.9%	5	0	0	5	24	23
Passenger in a car or van	5.7%	5	0	0	5	23	22
Train	2.6%	2	0	0	2	10	10
Bicycle	2.4%	2	0	0	2	10	9
Motorcycle, scooter or moped	1.6%	1	0	0	1	6	6
Other method of travel to work	0.5%	0	0	0	0	2	2
Taxi	0.4%	0	0	0	0	2	2
Underground, metro, light rail or tram	0.2%	0	0	0	0	1	1
TOTAL	100%	80	6	7	87	400	391

Table 2.2: Census Data Modal Split - Gravesham 001 super output area

- 2.3 The Gravesham 001 super output area experiences a similar proportion of car driver trips in comparison with site selected within TRICS.

Trip Distribution and Assignment

- 2.4 Within the Transport Statement, the trips summarised in Table 2.2 were distributed onto the network with reference to relevant Census data (2011 output) for 'Location of Usual Residence and Place of Work'. The location of place of work was restricted to the 'Gravesham 001 super output area- middle layer' within the Gravesham district. This is the most detailed level of census data available for assessing travel patterns. Table 2.3 demonstrates percentage split of vehicular trips at the Lower Road/A226 junction based on this census data.

Direction of Travel	Percentage Split of Trips
East along the A226	86.7%
West along the A226	13.3%
TOTAL	100%

Table 2.3: Census Data - 'Location of Usual Residence and Place of Work'

- 2.5 Table 2.4 summarises the distribution of vehicular trips associated with the proposed development. To be robust the vehicular trips are based on the census modal split summarised in Table 2.2.

Direction of Travel	Weekday AM Peak (08:00-09:00)		Weekday PM Peak (17:00-18:00)	
	Arr	Dep	Arr	Dep
East along the A226	51	3	4	55
West along the A226	8	1	1	9
TOTAL	59	4	5	64

Table 2.4: Development Traffic Distribution

- 2.6 Table 2.4 demonstrates that the majority of development related traffic will travel east along the A226. The proposed development could generate circa 54 two-way vehicle movements travelling east along Stonebridge Road within the weekday morning peak and 9 two-way vehicle movements travelling west along Galley Hill Road. Whilst in the evening peak hour, the proposed development could generate circa 59 two-way vehicle movements east along Stonebridge Road and 10 west along Galley Hill Road. A breakdown of the movements through the junction is presented in Table 2.5.

Junction Approach	Movement	Weekday AM Peak (08:00-09:00)	Weekday PM Peak (17:00-18:00)
A226 Galley Hill Road	Left turn	51	1
A226 Stonebridge Road	Right turn	8	4
Lower Road	Left turn	3	55
	Right turn	1	9

Table 2.5: Development Traffic at A226 / Lower Road junction

- 2.7 When the flows are assigned to the junction the key increases will be on the right turn lane on A226 Stonebridge Road in the AM peak (51 vehicles) and the left turn lane from Lower Road in the PM peak (55 vehicles). The Lower Road/A226 junction has a signal cycle time in the order of 90 seconds per cycle, therefore in the peak times, this would amount to just over one additional vehicle on the Stonebridge Road right turn and Lower Road left turn lane per cycle.

3.0 Junction Modelling

Overview

- 3.1 The Lower Road/Galley Hill Road/Stonebridge Road signalised junction has been assessed using LinSig software. The software expresses the relationship between traffic flow and the capacity of a junction as a ratio, referred to as the Degree of Saturation (% Sat or DoS). Based upon these results it also predicts the anticipated queue lengths (mean maximum queue, MMQ) and delays that are likely to occur at a junction. In addition, LinSig shows the Practical Reserve Capacity (PRC) of the junction as a percentage, which indicates the amount of residual capacity that a junction has. LinSig assumes that PRC is reached at 90% degree of saturation whereas a degree of saturation of 1 (or 100%) is the actual theoretical capacity of the junction. A positive PRC value indicates that the junction is operating at less than a 90% degree of saturation, whereas a negative PRC value indicates that the junction is operating at greater than a 90% degree of saturation.
- 3.2 The highway impact assessment presented in this section considers the impact of the additional traffic on the operation of the highway network local to the site during weekday morning and afternoon peak hours (07:30-08:30 and 16:15-17:15 hours). Modelling output results are included at [Appendix A](#).

Assessment Scenarios

- 3.3 The modelling includes an assessment of the 2022 baseline position during the weekday morning (AM) and afternoon (PM) peak hours based on recorded traffic flows. Modelling has then been completed for the future year 2027 both 'without' and 'with' development. Traffic surveys were carried out at the junction on Wednesday 11th May 2022 and survey information is available on request.
- 3.4 The 'without development' scenarios are based on observed traffic flows. Growth has then been applied to these flows (based on growth rates extracted from TEMPro). The development flows summarised in Table 2.5 have then been added to the 'without development' scenarios, to derive the 'with development' flows.

Growth

- 3.5 Growth rates from Trip End Model Presentation Program (TEMPro) have been extracted for the local area, which are summarised in the table below. Appropriate rates were applied to the 2022 traffic survey (baseline) data to establish the 2027 future year. These growth rates were agreed at pre-application stage.

Assessment Period	Forecast Period	TEMPro Growth Rate
Morning Peak Hour (07:30-08:30)	2022 to 2027	1.0407
Afternoon Peak Hour (16:15-17:15)	2022 to 2027	1.0430

Table 3.1: TEMPro Growth Rates for Northfleet

Modelling Results

2022 Baseline

- 3.6 The junction has been modelled in the base year (2022) and the results are presented in Table 3.2.

Arm	AM Peak (07:30-08:30)				PM Peak (16:15-17:15)			
	PRC (%)	Degree Sat (%)	Total Delay (pcuHr)	Mean Max Queue (pcu)	PRC (%)	Degree Sat (%)	Total Delay (pcuHr)	Mean Max Queue (pcu)
Lower Road	49.0	22.6	0.7	2	132.0	38.6	2.0	5
Stonebridge Road		60.4	2.2	4		38.8	1.4	4
Galley Hill Road		59.4	3.5	10		38.2	1.8	6

Table 3.2: Lower Road/Galley Hill Road/Stonebridge Road (2022 Operation AM & PM Peak Hour)

- 3.7 Table 3.2 shows that the existing junction operates well within its theoretical capacity, with the maximum recorded degree of saturation of 60.4% recorded on the Stonebridge Road arm in the weekday morning peak considerably lower than the 90% threshold. The maximum recorded queue is 9.7pcu on the Galley Hill Road arm in the weekday morning peak, however, given the low degree of saturation values this would be expected to clear during the green phase on this arm. Delays on all arms are negligible.

2027 Scenarios

- 3.8 The junction has also been modelled in 2027, both without and with traffic associated with the proposed development. The results are summarised in Table 3.3.

Arm	AM Peak (07:30-08:30)				PM Peak (16:15-17:15)			
	PRC (%)	Degree Sat (%)	Total Delay (pcuHr)	Mean Max Queue (pcu)	PRC (%)	Degree Sat (%)	Total Delay (pcuHr)	Mean Max Queue (pcu)
Without Development								
Lower Road	43.4	23.5	0.8	2	122.7	40.2	2.1	5
Stonebridge Road		62.8	2.3	5		40.4	1.5	4
Galley Hill Road		61.8	3.8	10		39.9	1.9	6
With Development								
Lower Road	30.1	24.4	0.8	2	107.7	43.3	2.4	6
Stonebridge Road		69.2	2.9	7		43.1	1.7	5
Galley Hill Road		68.1	4.4	11		42.7	2.1	7

Table 3.3: Lower Road/Galley Hill Road/Stonebridge Road (2027 Operation AM & PM Peak Hour)

- 3.9 Table 3.3 shows that the junction continues to operate well within its theoretical capacity in both the 2027 with and without development scenarios. The maximum recorded degree of saturation of 69.2% recorded on the Stonebridge Road arm in the weekday morning peak is considerably lower than the 90% threshold. The maximum recorded queue is 11.3pcu on the Galley Hill Road arm in the weekday morning peak, however, as with the existing scenario, this would be expected to clear during the green phase on the arm. Delays on all arms are negligible.
- 3.10 The maximum increase in degree of saturation is 6.4% on the Stonebridge Road arm in the weekday morning peak, the greatest increase in mean maximum queue is 2.2pcu on the same arm in weekday morning and the largest increase in delay is 0.6pcuHr on both the Stonebridge Road and Galley Hill Road arms in the weekday morning peak. The Stonebridge Road approach accommodates the right-turn inbound flows and the existing traffic lane can accommodate some 7 vehicles before it blocks the through-flow of traffic. The predicted maximum queue for both the ahead and right turn lane is 7 vehicles in 2027 (AM peak with development) therefore the proposed development will not impact on the operation of the junction.
- 3.11 These values will not result in any material adverse disruption to the free-flow of traffic on the local highway network and certainly not the 'severe' impact referenced in the NPPF.

4.0 Summary and Conclusions

- 4.1 This Junction Modelling Technical Note has been prepared on behalf of Jackson Lifts Group to accompany a planning application for a proposed commercial development at Unit K6 Lower Road, Northfleet.
- 4.2 This Technical Note considers the impact of traffic associated with the proposed development at the Lower Road/Galley Hill Road/Stonebridge Road signalised junction on weekday network peak hours. It concludes that the junction operates within theoretical capacity in the 2027 with and without development scenarios.
- 4.3 Against this background, it is considered that the proposed development will not result in any material adverse disruption to the free-flow of traffic on the local highway network and certainly not the 'severe' impact referenced in the NPPF. In this regard it is considered that the proposed development is consistent with national and local transportation policies with respect to traffic impact.

Gravesham Borough Council

Appendix A

LinSig 3 Modelling Output

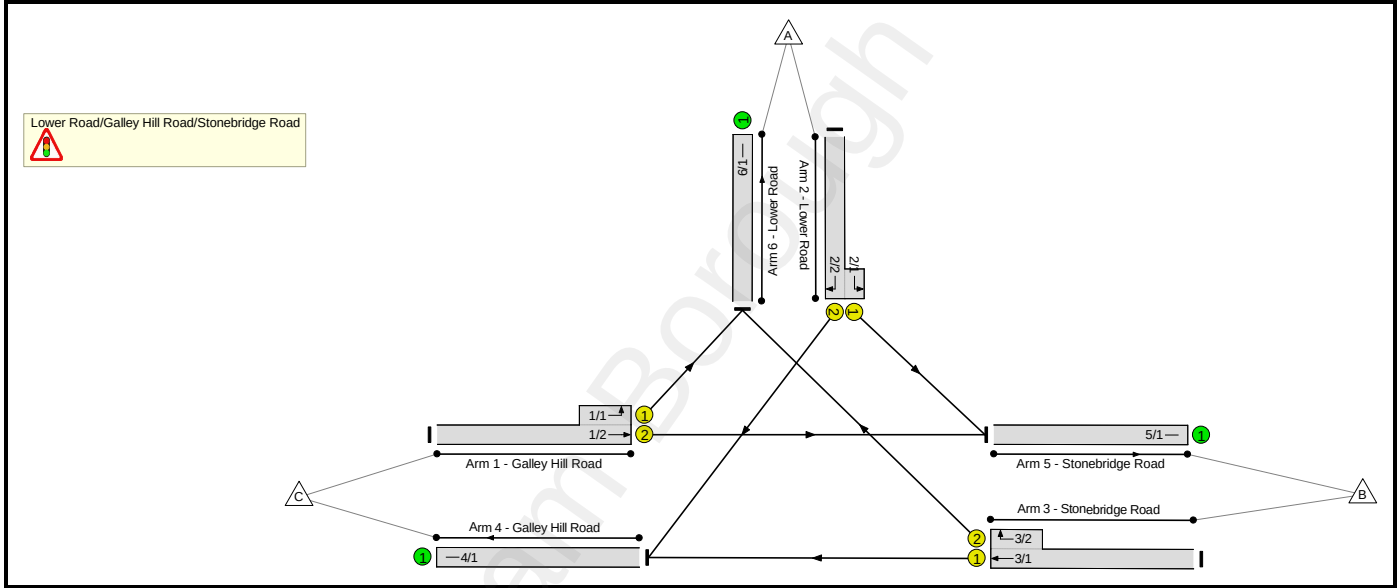
Full Input Data And Results

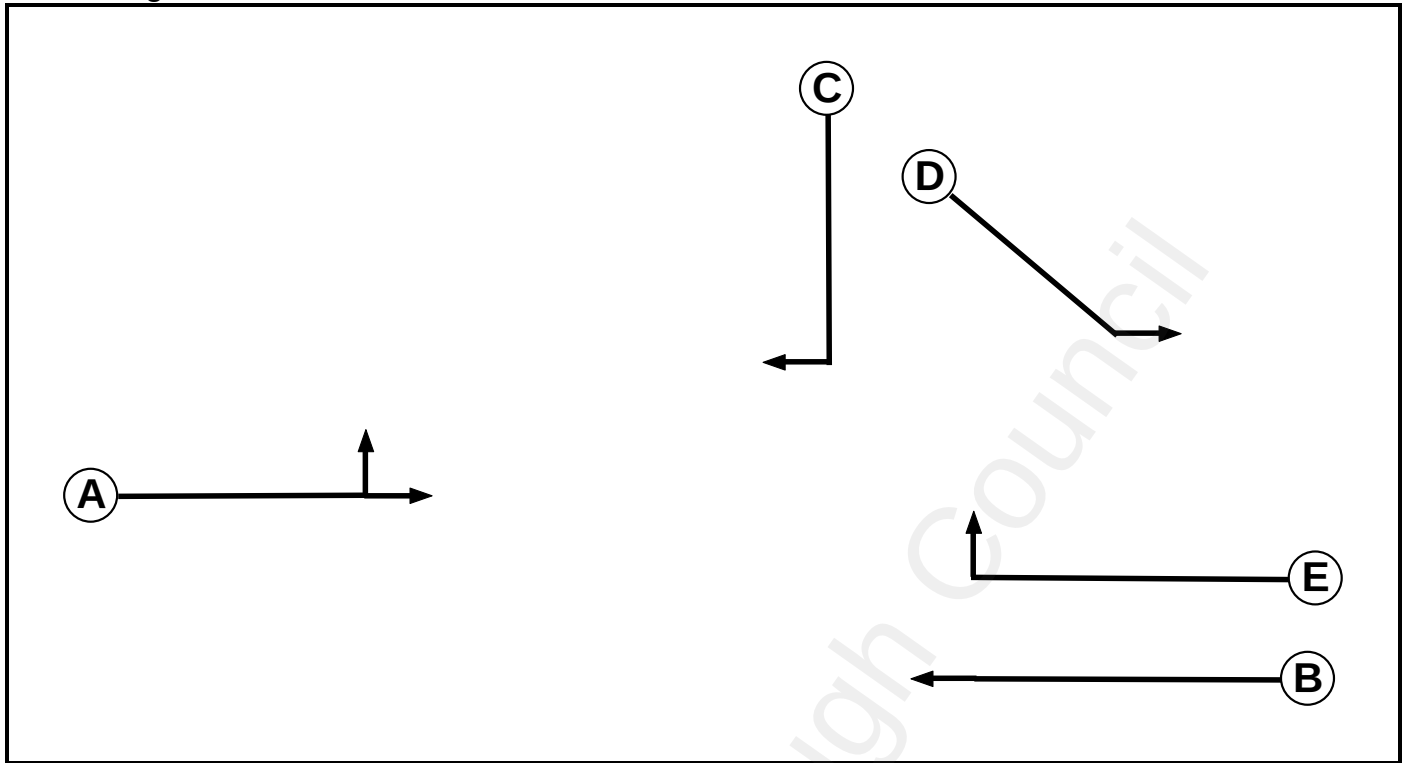
Full Input Data And Results

User and Project Details

Project:	Lower Road, Northfleet
Title:	Proposed Commercial Development
Location:	
Client:	Jackson Lift Group
Additional detail:	
File name:	M01-wanort-LinSig Model 22-06-06.lsg3x
Author:	JE
Company:	Motion
Address:	84 North Street, Guildford

Network Layout Diagram



Phase Diagram**Phase Input Data**

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		4	4

Phase Intergreens Matrix

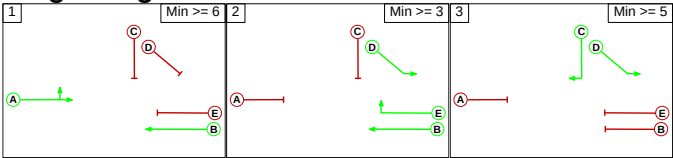
Terminating Phase	Starting Phase					
		A	B	C	D	E
	A		-	6	8	7
	B	-		6	-	-
	C	6	7		-	7
	D	6	-	-		-
	E	7	-	6	-	

Phases in Stage

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

Full Input Data And Results

Stage Diagram



Phase Delays

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

Prohibited Stage Change

	To Stage		
	1	2	3
From Stage	1	8	8
	2	7	6
	3	7	7

Full Input Data And Results

Give-Way Lane Input Data

Junction: Lower Road/Galley Hill Road/Stonebridge Road

There are no Opposed Lanes in this Junction

Gravesham Borough Council

Full Input Data And Results

Lane Input Data

Junction: Lower Road/Galley Hill Road/Stonebridge Road												
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (Galley Hill Road)	U	A	2	3	4.0	Geom	-	4.36	0.00	Y	Arm 6 Left	12.00
1/2 (Galley Hill Road)	U	A	2	3	18.6	User	2024	-	-	-	-	-
2/1 (Lower Road)	U	D	2	3	2.3	Geom	-	5.00	0.00	Y	Arm 5 Left	20.00
2/2 (Lower Road)	U	C	2	3	174.0	Geom	-	5.00	0.00	Y	Arm 4 Right	12.00
3/1 (Stonebridge Road)	U	B	2	3	40.0	User	2043	-	-	-	-	-
3/2 (Stonebridge Road)	U	E	2	3	4.0	Geom	-	4.00	0.00	Y	Arm 6 Right	8.00
4/1 (Galley Hill Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Stonebridge Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Lower Road)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2022 Baseline AM'	07:30	08:30	01:00	
2: '2022 Baseline PM'	16:15	17:15	01:00	
3: '2027 Baseline AM'	07:30	08:30	01:00	F1*1.0407
4: '2027 Baseline PM'	16:15	17:15	01:00	F2*1.043
7: '2022 with Development AM'	07:30	08:30	01:00	F1+F5
8: '2022 with Development PM'	16:15	17:15	01:00	F2+F6
9: '2027 with Development AM'	07:30	08:30	01:00	F3+F5
10: '2027 with Development PM'	16:15	17:15	01:00	F4+F6

Scenario 1: '2022 Baseline AM' (FG1: '2022 Baseline AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	89	25	114
	B	183	0	419	602
	C	57	433	0	490
	Tot.	240	522	444	1206

Traffic Lane Flows

Lane	Scenario 1: 2022 Baseline AM
Junction: Lower Road/Galley Hill Road/Stonebridge Road	
1/1 (short)	57
1/2 (with short)	490(In) 433(Out)
2/1 (short)	89
2/2 (with short)	114(In) 25(Out)
3/1 (with short)	602(In) 419(Out)
3/2 (short)	183
4/1	444
5/1	522
6/1	240

Lane Saturation Flows

Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2022 Baseline PM' (FG2: '2022 Baseline PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	206	48	254
	B	72	0	424	496
	C	20	378	0	398
	Tot.	92	584	472	1148

Traffic Lane Flows

Lane	Scenario 2: 2022 Baseline PM
Junction: Lower Road/Galley Hill Road/Stonebridge Road	
1/1 (short)	20
1/2 (with short)	398(In) 378(Out)
2/1 (short)	206
2/2 (with short)	254(In) 48(Out)
3/1 (with short)	496(In) 424(Out)
3/2 (short)	72
4/1	472
5/1	584
6/1	92

Lane Saturation Flows

Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 3: '2027 Baseline AM' (FG3: '2027 Baseline AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	93	26	119
	B	190	0	436	626
	C	59	451	0	510
	Tot.	249	544	462	1255

Traffic Lane Flows

Lane	Scenario 3: 2027 Baseline AM
Junction: Lower Road/Galley Hill Road/Stonebridge Road	
1/1 (short)	59
1/2 (with short)	510(In) 451(Out)
2/1 (short)	93
2/2 (with short)	119(In) 26(Out)
3/1 (with short)	626(In) 436(Out)
3/2 (short)	190
4/1	462
5/1	544
6/1	249

Lane Saturation Flows

Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 4: '2027 Baseline PM' (FG4: '2027 Baseline PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
	A	B	C	Tot.	
Origin	A	0	215	50	265
	B	75	0	442	517
	C	21	394	0	415
	Tot.	96	609	492	1197

Traffic Lane Flows

Lane	Scenario 4: 2027 Baseline PM
Junction: Lower Road/Galley Hill Road/Stonebridge Road	
1/1 (short)	21
1/2 (with short)	415(In) 394(Out)
2/1 (short)	215
2/2 (with short)	265(In) 50(Out)
3/1 (with short)	517(In) 442(Out)
3/2 (short)	75
4/1	492
5/1	609
6/1	96

Lane Saturation Flows

Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 5: '2022 with Development AM' (FG7: '2022 with Development AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	92	26	118
	B	234	0	419	653
	C	65	433	0	498
	Tot.	299	525	445	1269

Traffic Lane Flows

Lane	Scenario 5: 2022 with Development AM
Junction: Lower Road/Galley Hill Road/Stonebridge Road	
1/1 (short)	65
1/2 (with short)	498(In) 433(Out)
2/1 (short)	92
2/2 (with short)	118(In) 26(Out)
3/1 (with short)	653(In) 419(Out)
3/2 (short)	234
4/1	445
5/1	525
6/1	299

Lane Saturation Flows

Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 6: '2022 with Development PM' (FG8: '2022 with Development PM', Plan 1: 'Network Control Plan 1')
Traffic Flows, Desired
Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	261	57	318
	B	76	0	424	500
	C	21	378	0	399
	Tot.	97	639	481	1217

Lane Saturation Flows

Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 7: '2027 with Development AM' (FG9: '2027 with Development AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	96	27	123
	B	241	0	436	677
	C	67	451	0	518
	Tot.	308	547	463	1318

Traffic Lane Flows

Lane	Scenario 7: 2027 with Development AM
Junction: Lower Road/Galley Hill Road/Stonebridge Road	
1/1 (short)	67
1/2 (with short)	518(In) 451(Out)
2/1 (short)	96
2/2 (with short)	123(In) 27(Out)
3/1 (with short)	677(In) 436(Out)
3/2 (short)	241
4/1	463
5/1	547
6/1	308

Lane Saturation Flows

Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 8: '2027 with Development PM' (FG10: '2027 with Development PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

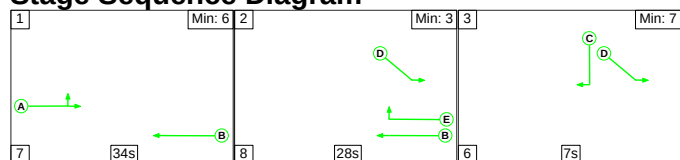
	Destination				
		A	B	C	Tot.
Origin	A	0	270	59	329
	B	79	0	442	521
	C	22	394	0	416
	Tot.	101	664	501	1266

Traffic Lane Flows

Lane	Scenario 8: 2027 with Development PM
Junction: Lower Road/Galley Hill Road/Stonebridge Road	
1/1 (short)	22
1/2 (with short)	416(In) 394(Out)
2/1 (short)	270
2/2 (with short)	329(In) 59(Out)
3/1 (with short)	521(In) 442(Out)
3/2 (short)	79
4/1	501
5/1	664
6/1	101

Lane Saturation Flows

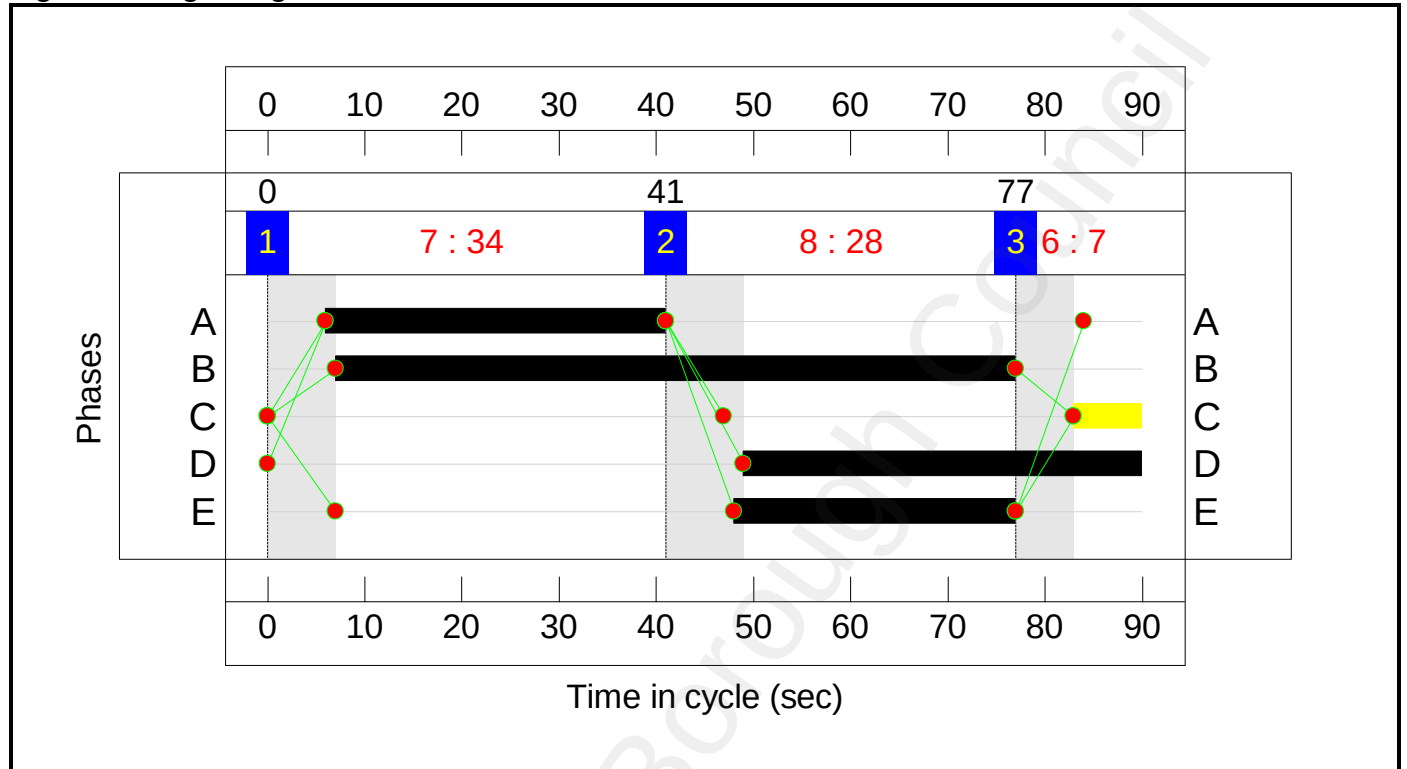
Junction: Lower Road/Galley Hill Road/Stonebridge Road								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Galley Hill Road)	4.36	0.00	Y	Arm 6 Left	12.00	100.0 %	1823	1823
1/2 (Galley Hill Road Lane 2)	This lane uses a directly entered Saturation Flow						2024	2024
2/1 (Lower Road)	5.00	0.00	Y	Arm 5 Left	20.00	100.0 %	1967	1967
2/2 (Lower Road)	5.00	0.00	Y	Arm 4 Right	12.00	100.0 %	1880	1880
3/1 (Stonebridge Road Lane 1)	This lane uses a directly entered Saturation Flow						2043	2043
3/2 (Stonebridge Road)	4.00	0.00	Y	Arm 6 Right	8.00	100.0 %	1697	1697
4/1 (Galley Hill Road Lane 1)	Infinite Saturation Flow						Inf	Inf
5/1 (Stonebridge Road Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Lower Road Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 1: '2022 Baseline AM' (FG1: '2022 Baseline AM', Plan 1: 'Network Control Plan 1')**Stage Sequence Diagram**

Stage Timings

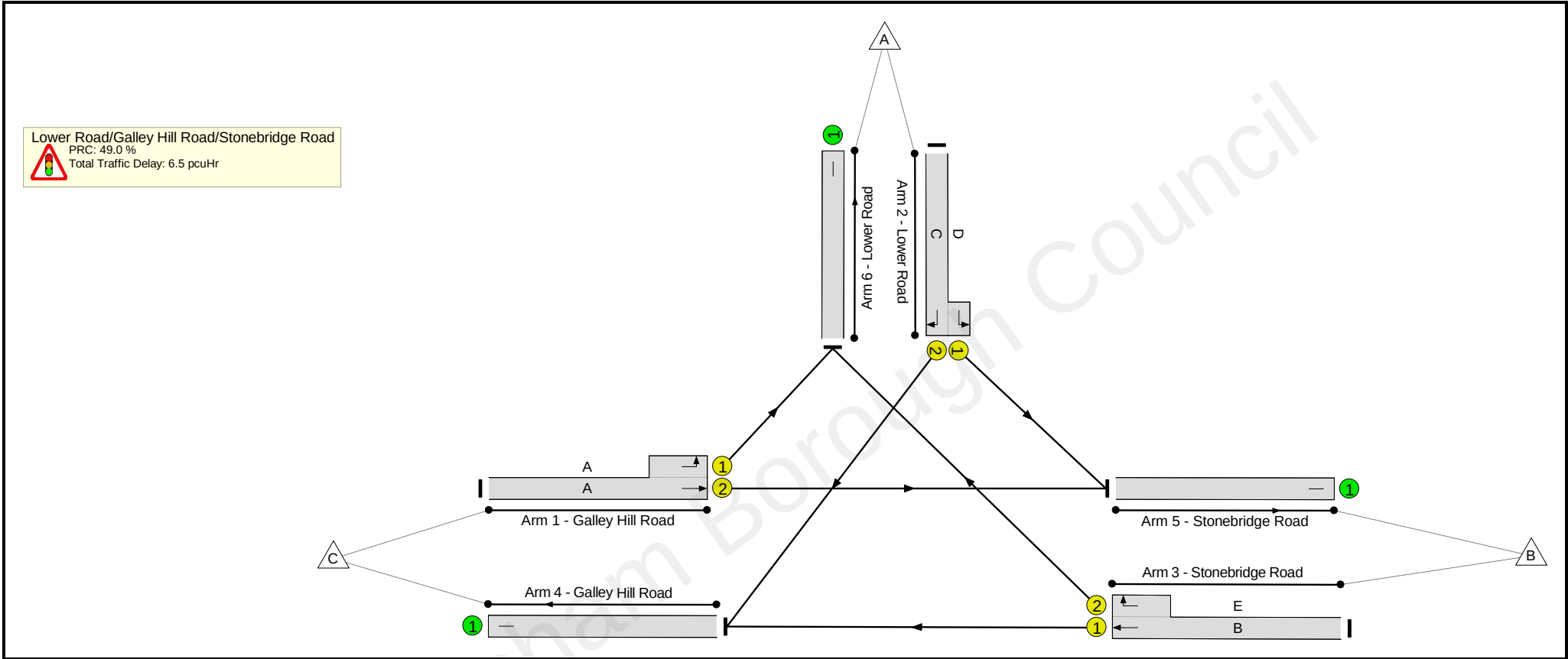
Stage	1	2	3
Duration	34	28	7
Change Point	0	41	77

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

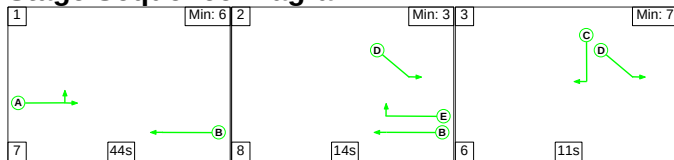
Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	60.4%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	60.4%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	35	-	490	2024:1823	729+96	59.4 : 59.4%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	7:41	-	114	1880:1967	111+394	22.6 : 22.6%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	70:29	-	602	2043:1697	694+303	60.4 : 60.4%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	444	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	522	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	240	Inf	Inf	0.0%

Full Input Data And Results

Scenario 2: '2022 Baseline PM' (FG2: '2022 Baseline PM', Plan 1: 'Network Control Plan 1')

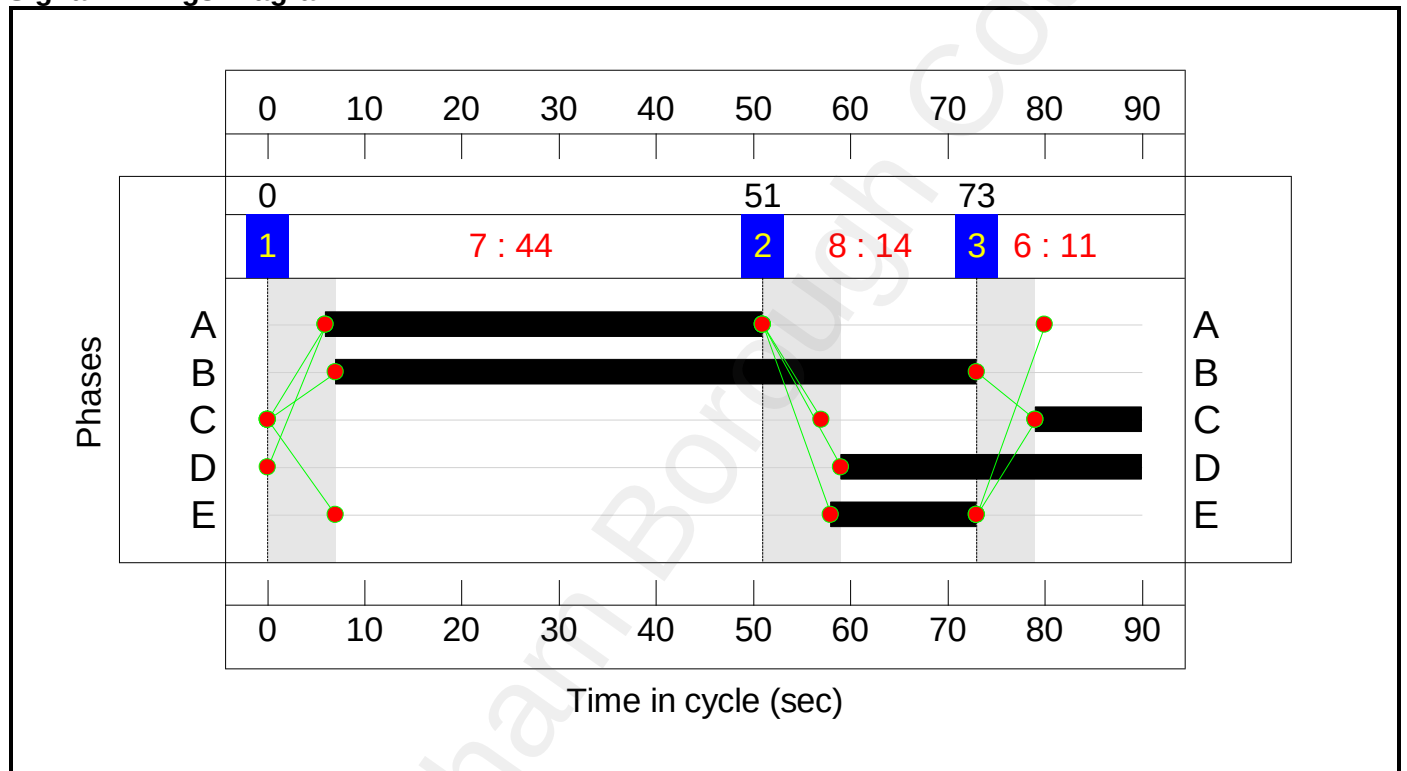
Stage Sequence Diagram



Stage Timings

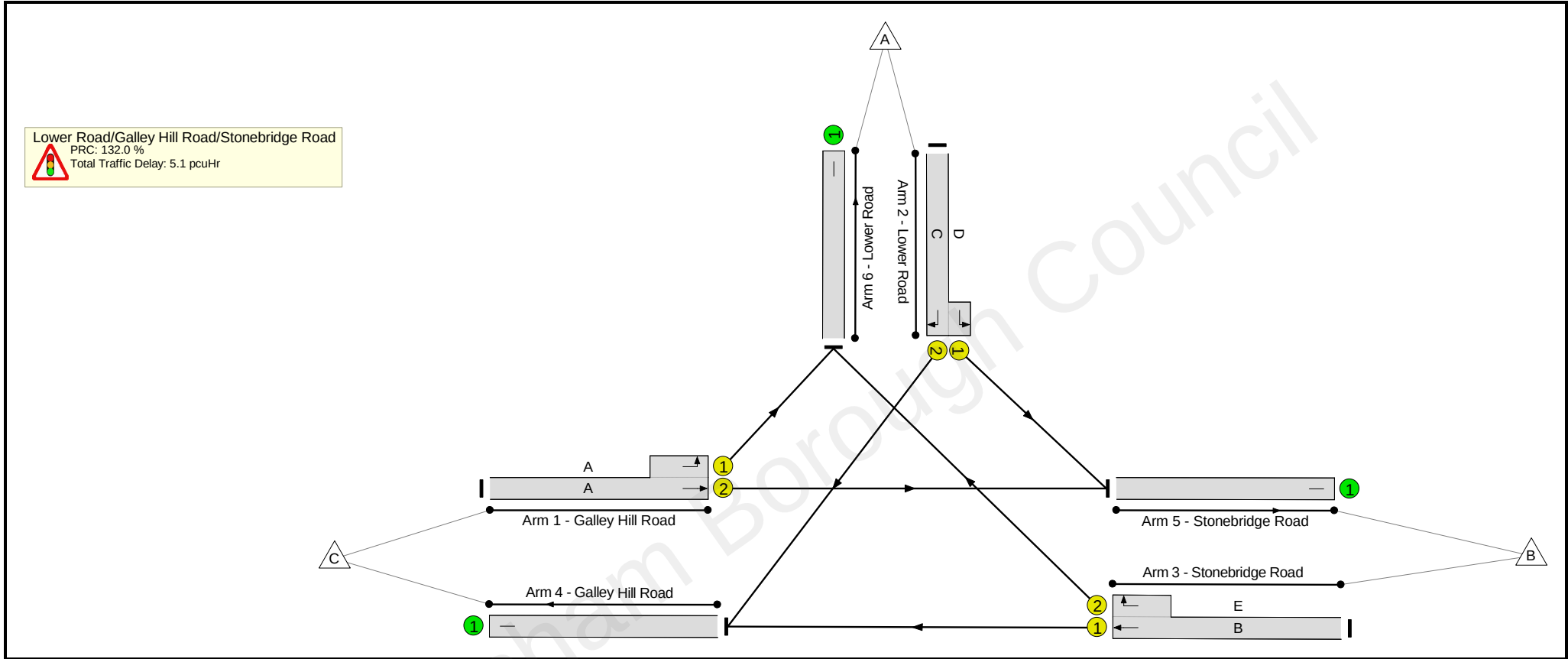
Stage	1	2	3
Duration	44	14	11
Change Point	0	51	73

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	38.8%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	38.8%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	45	-	398	2024:1823	988+52	38.2 : 38.2%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	11:31	-	254	1880:1967	124+534	38.6 : 38.6%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	66:15	-	496	2043:1697	1093+186	38.8 : 38.8%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	472	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	584	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	92	Inf	Inf	0.0%

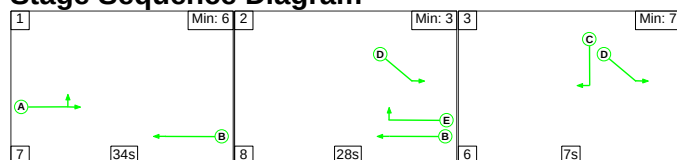
Full Input Data And Results

[illegible]

Full Input Data And Results

Scenario 3: '2027 Baseline AM' (FG3: '2027 Baseline AM', Plan 1: 'Network Control Plan 1')

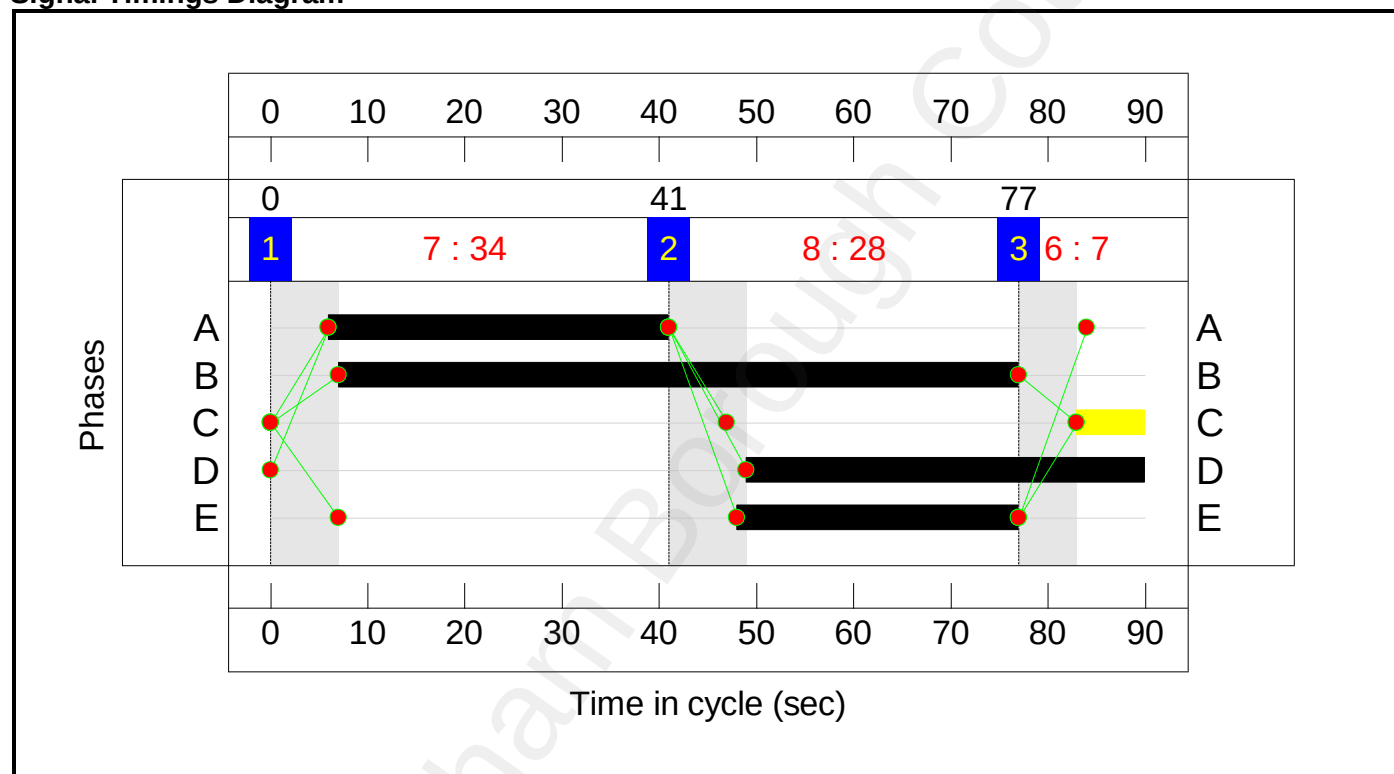
Stage Sequence Diagram



Stage Timings

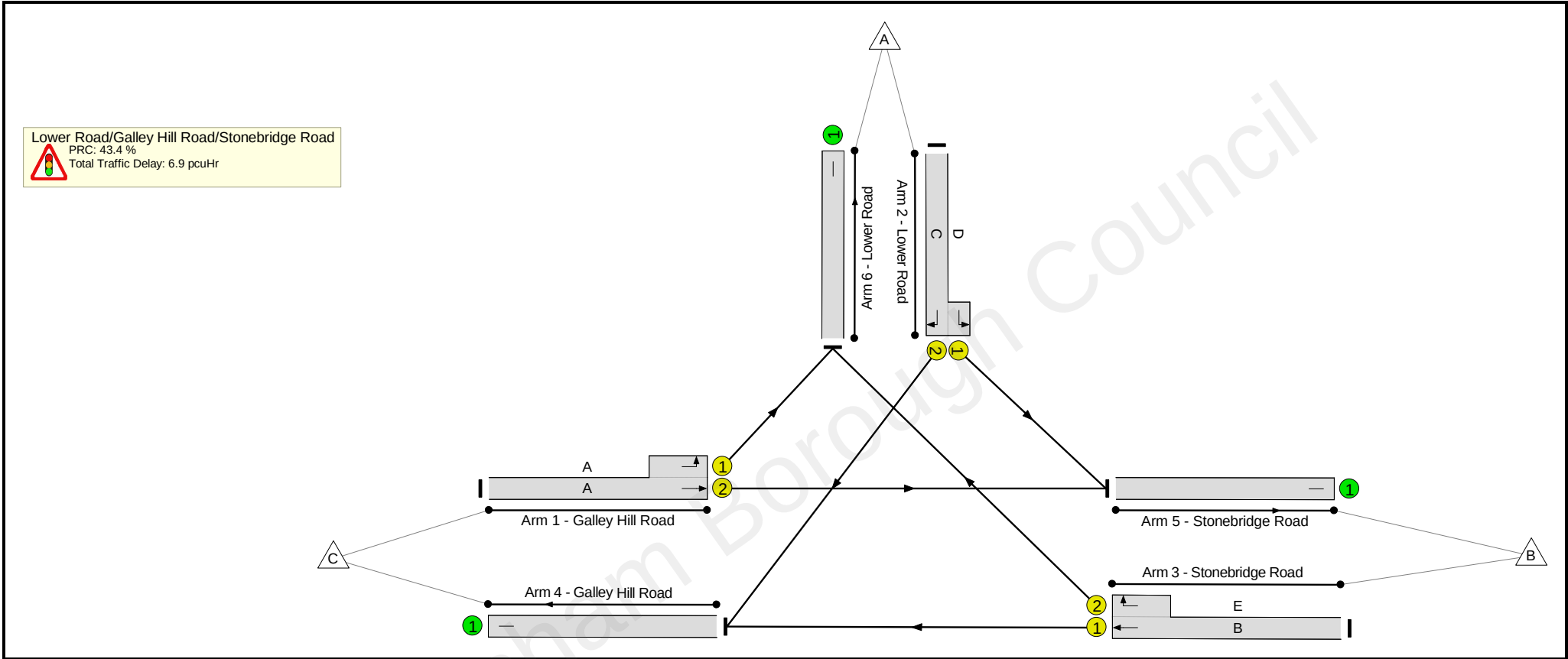
Stage	1	2	3
Duration	34	28	7
Change Point	0	41	77

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	62.8%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	62.8%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	35	-	510	2024:1823	729+95	61.8 : 61.8%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	7:41	-	119	1880:1967	110+395	23.5 : 23.5%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	70:29	-	626	2043:1697	695+303	62.8 : 62.8%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	462	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	544	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	249	Inf	Inf	0.0%

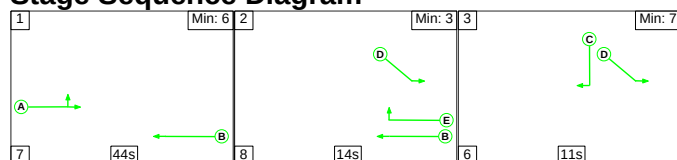
Full Input Data And Results

[illegible]

Full Input Data And Results

Scenario 4: '2027 Baseline PM' (FG4: '2027 Baseline PM', Plan 1: 'Network Control Plan 1')

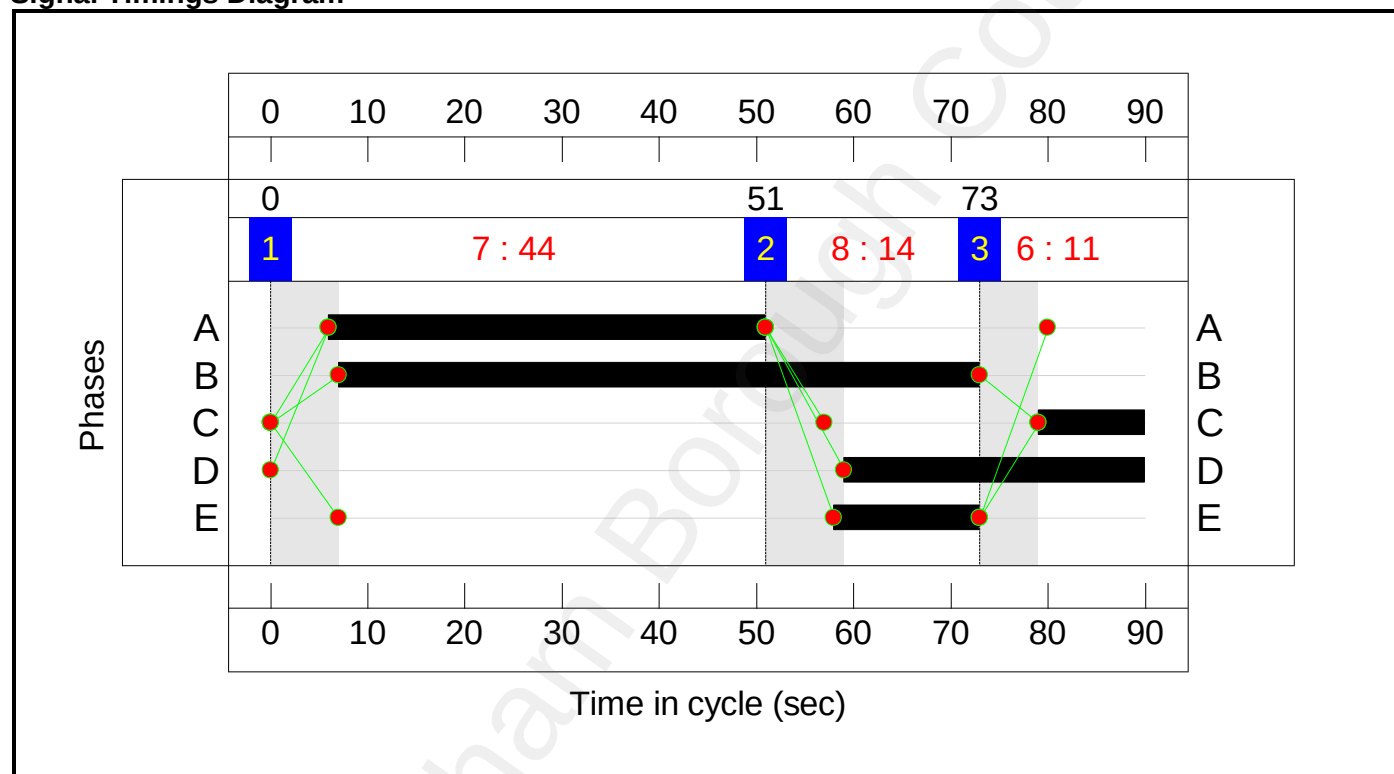
Stage Sequence Diagram



Stage Timings

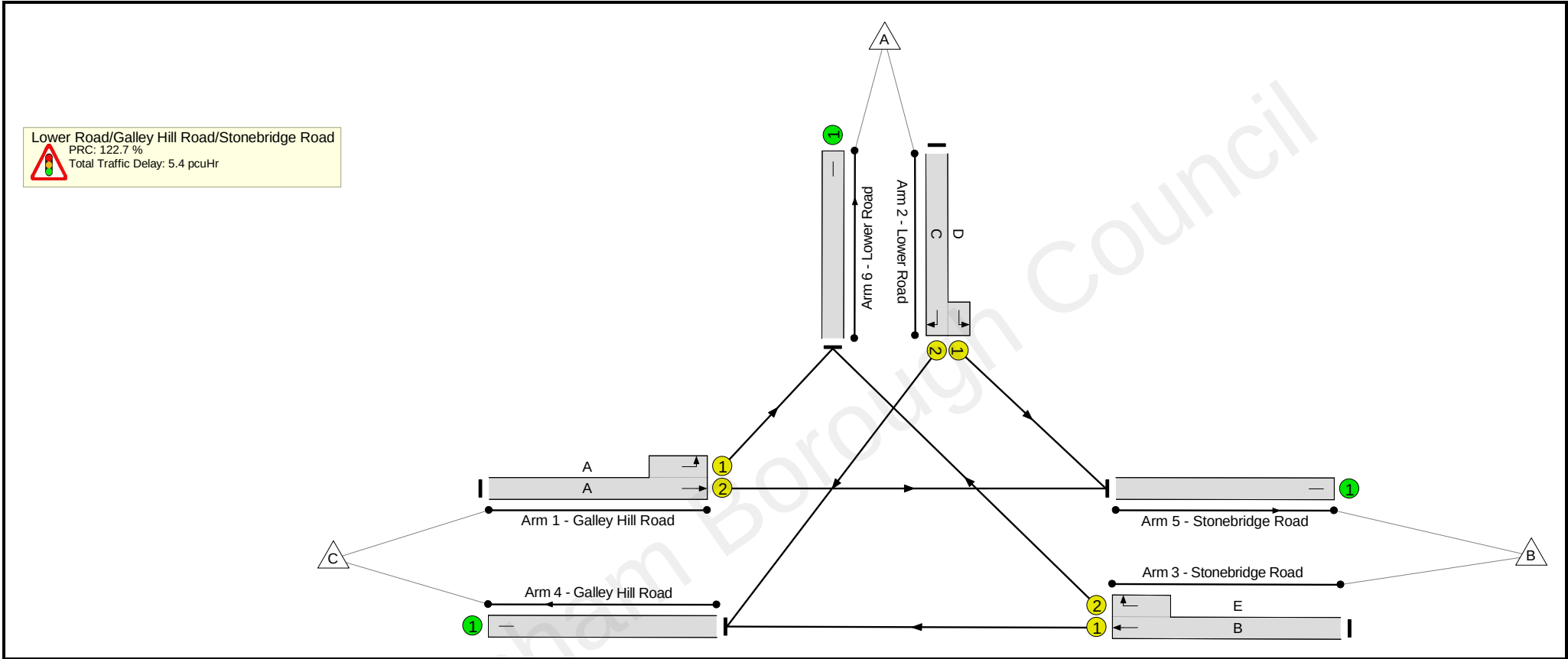
Stage	1	2	3
Duration	44	14	11
Change Point	0	51	73

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	40.4%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	40.4%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	45	-	415	2024:1823	988+53	39.9 : 39.9%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	11:31	-	265	1880:1967	124+535	40.2 : 40.2%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	66:15	-	517	2043:1697	1094+186	40.4 : 40.4%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	492	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	609	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	96	Inf	Inf	0.0%

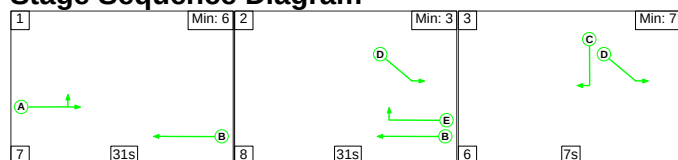
Full Input Data And Results

[illegible]

Full Input Data And Results

Scenario 5: '2022 with Development AM' (FG7: '2022 with Development AM', Plan 1: 'Network Control Plan 1')

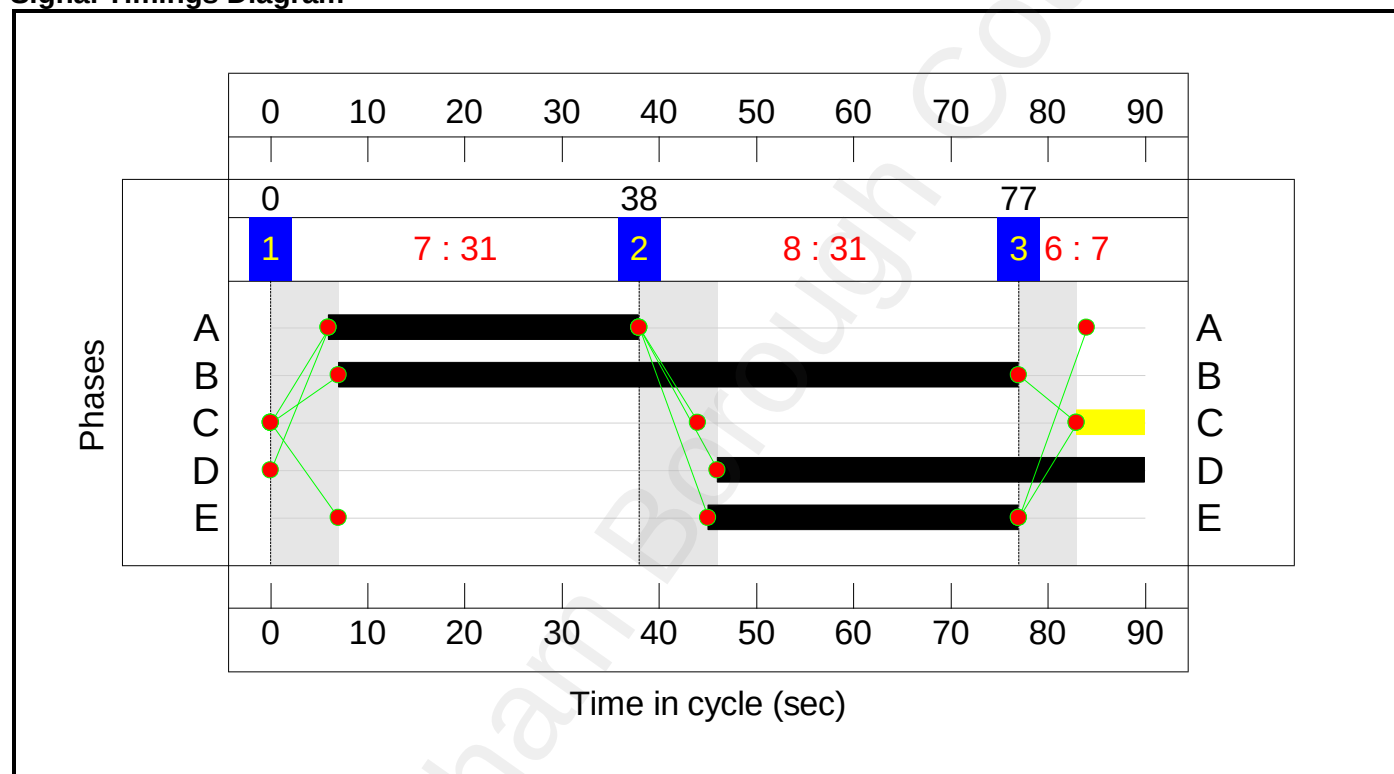
Stage Sequence Diagram



Stage Timings

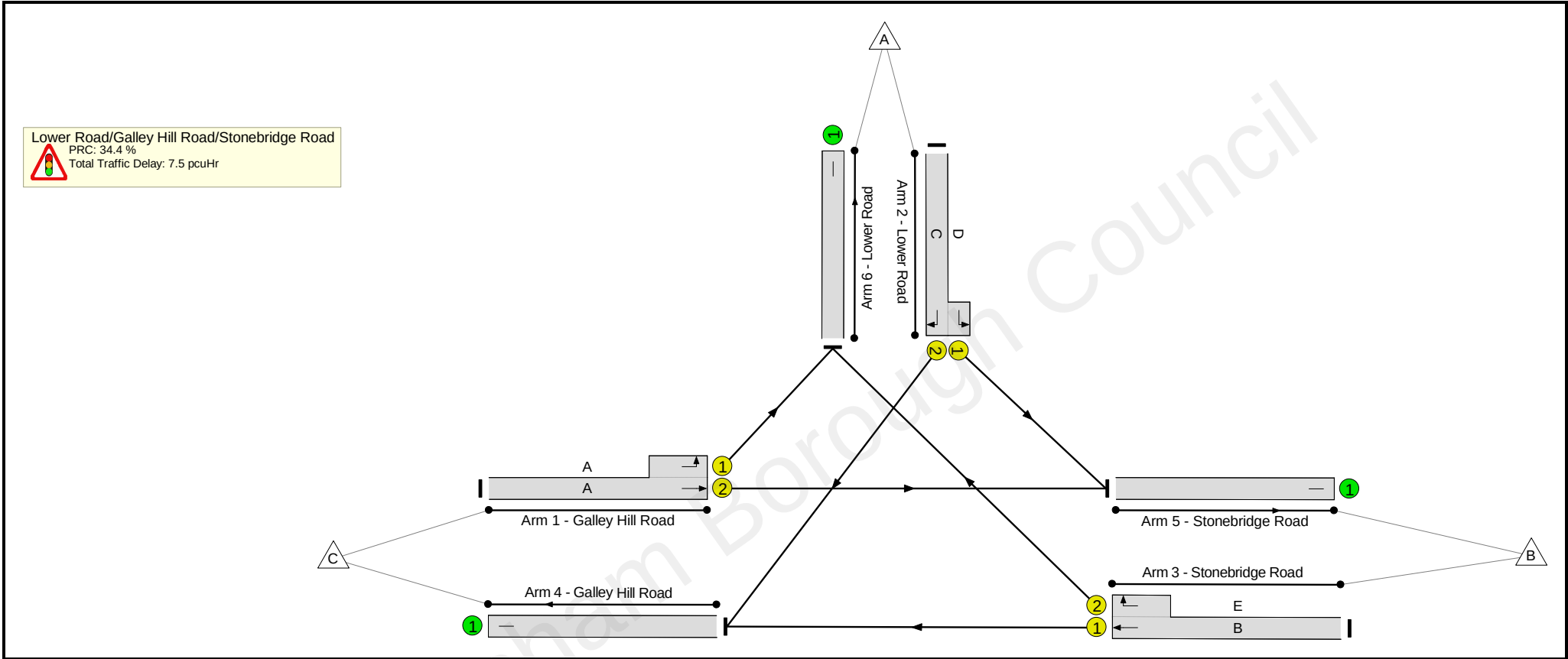
Stage	1	2	3
Duration	31	31	7
Change Point	0	38	77

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	66.9%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	66.9%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	32	-	498	2024:1823	661+99	65.5 : 65.5%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	7:44	-	118	1880:1967	111+392	23.5 : 23.5%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	70:32	-	653	2043:1697	626+350	66.9 : 66.9%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	445	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	525	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	299	Inf	Inf	0.0%

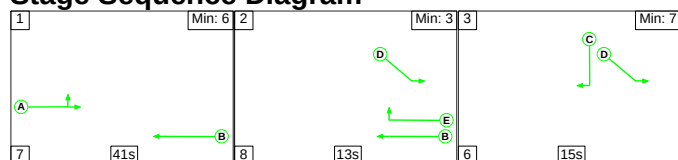
Full Input Data And Results

[illegible]

Full Input Data And Results

Scenario 6: '2022 with Development PM' (FG8: '2022 with Development PM', Plan 1: 'Network Control Plan 1')

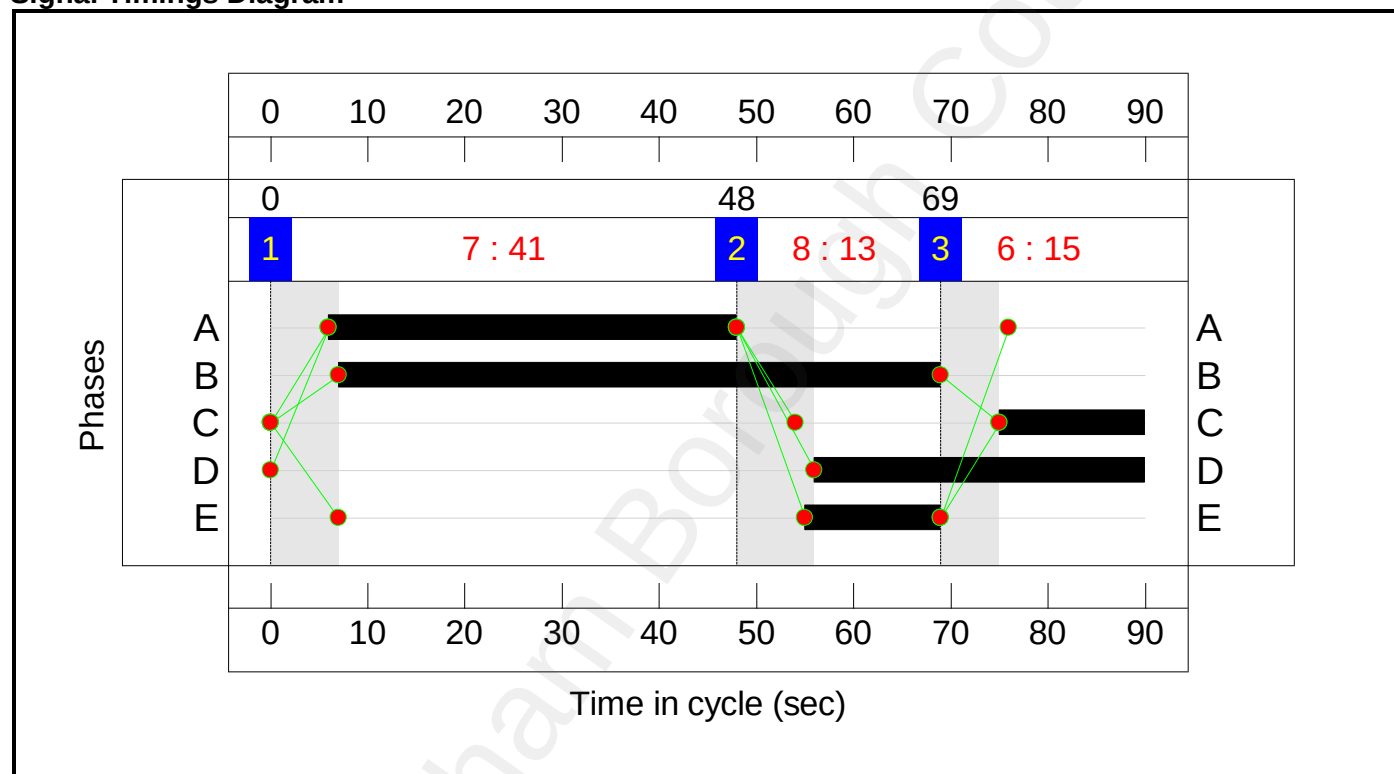
Stage Sequence Diagram



Stage Timings

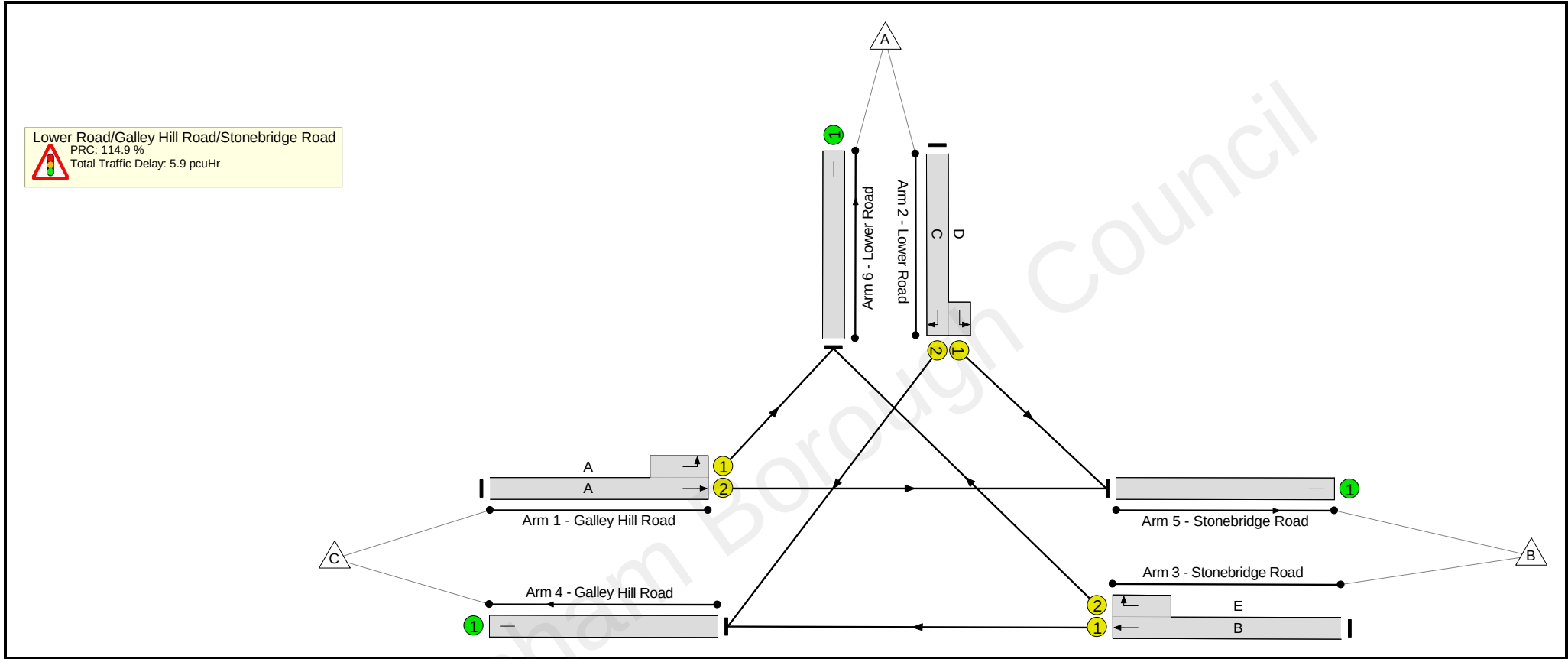
Stage	1	2	3
Duration	41	13	15
Change Point	0	48	69

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	41.9%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	41.9%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	42	-	399	2024:1823	923+51	41.0 : 41.0%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	15:34	-	318	1880:1967	136+623	41.9 : 41.9%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	62:14	-	500	2043:1697	1023+183	41.4 : 41.4%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	481	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	639	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	97	Inf	Inf	0.0%

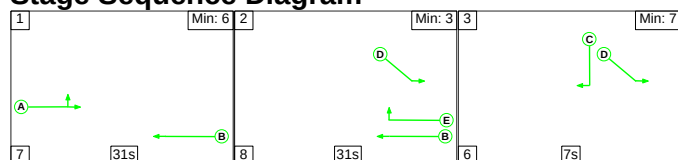
Full Input Data And Results

[illegible]

Full Input Data And Results

Scenario 7: '2027 with Development AM' (FG9: '2027 with Development AM', Plan 1: 'Network Control Plan 1')

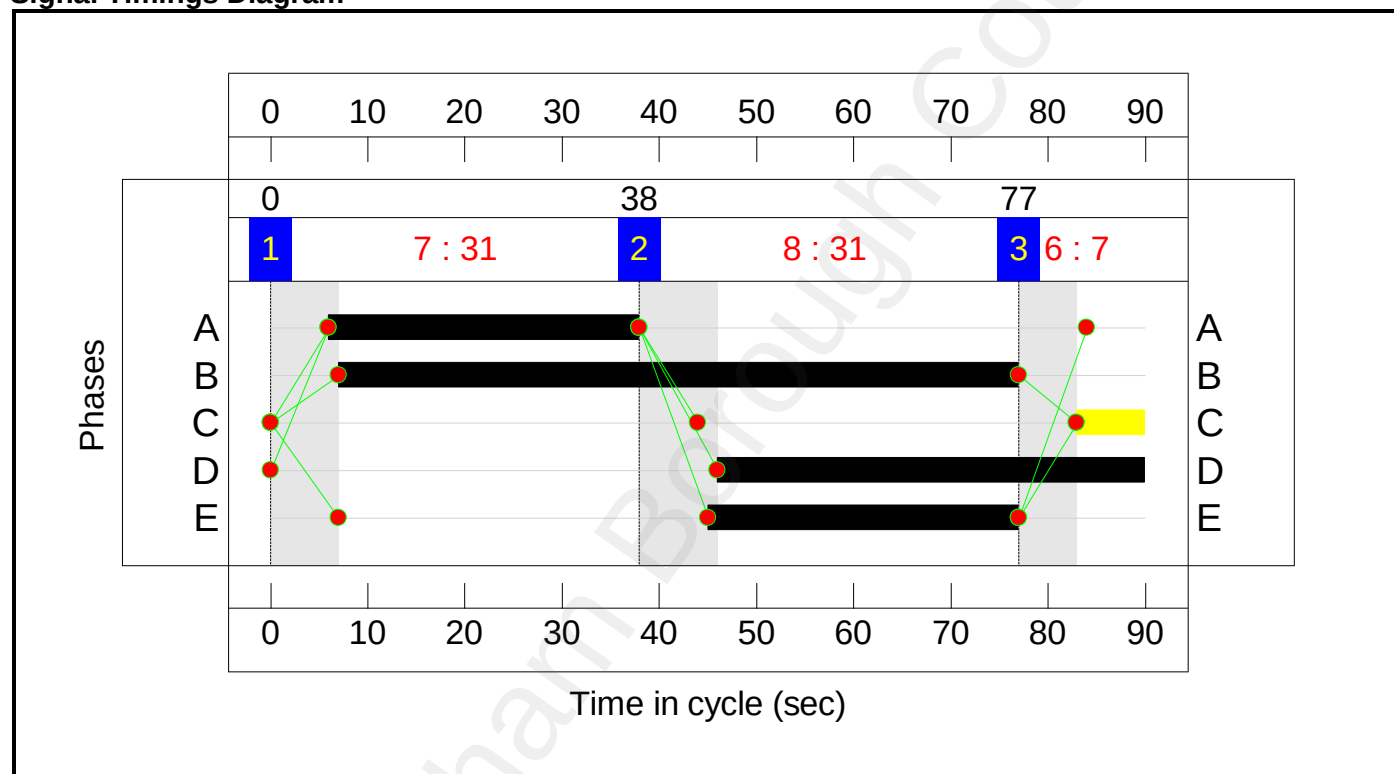
Stage Sequence Diagram



Stage Timings

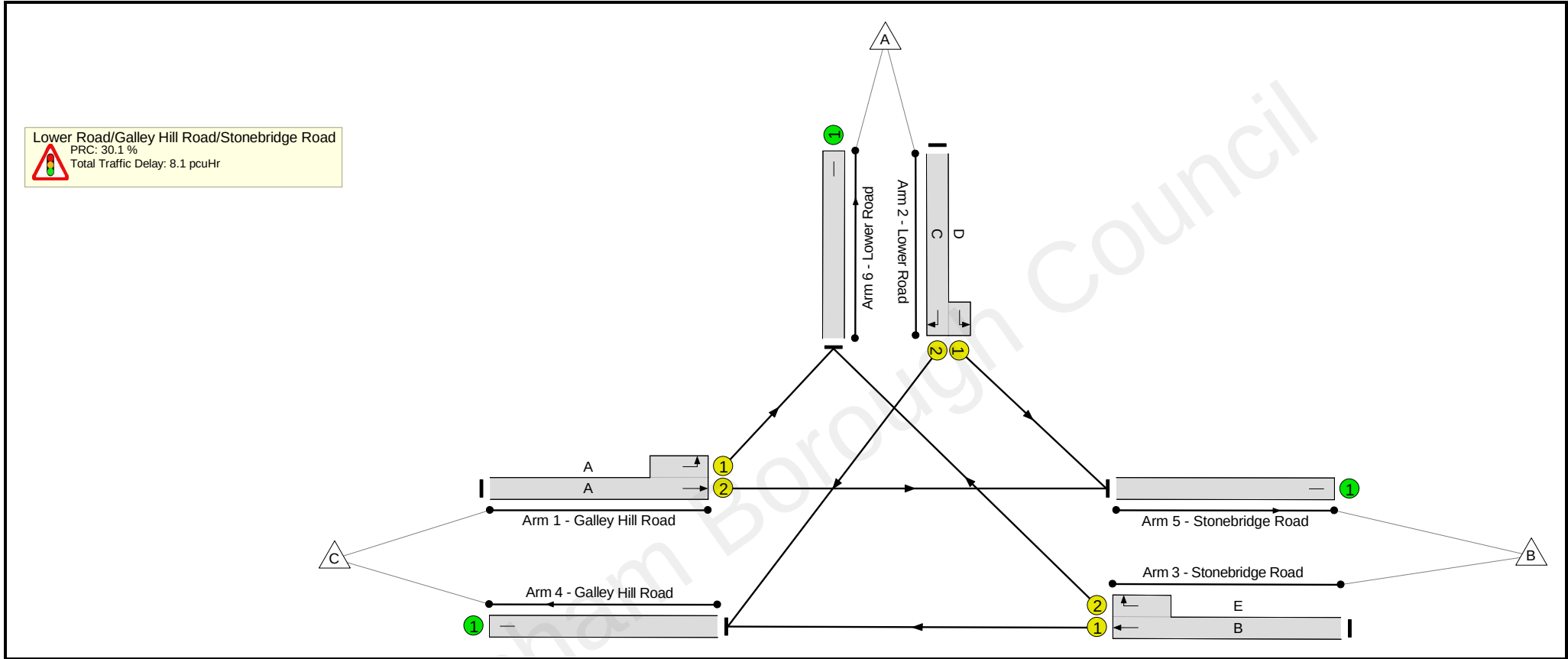
Stage	1	2	3
Duration	31	31	7
Change Point	0	38	77

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	69.2%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	69.2%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	32	-	518	2024:1823	662+98	68.1 : 68.1%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	7:44	-	123	1880:1967	111+393	24.4 : 24.4%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	70:32	-	677	2043:1697	630+348	69.2 : 69.2%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	463	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	547	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	308	Inf	Inf	0.0%

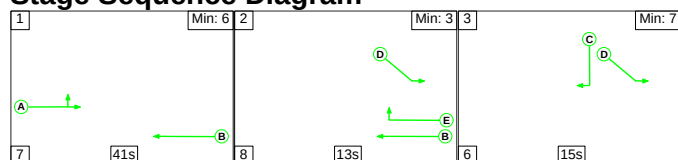
Full Input Data And Results

[illegible]

Full Input Data And Results

Scenario 8: '2027 with Development PM' (FG10: '2027 with Development PM', Plan 1: 'Network Control Plan 1')

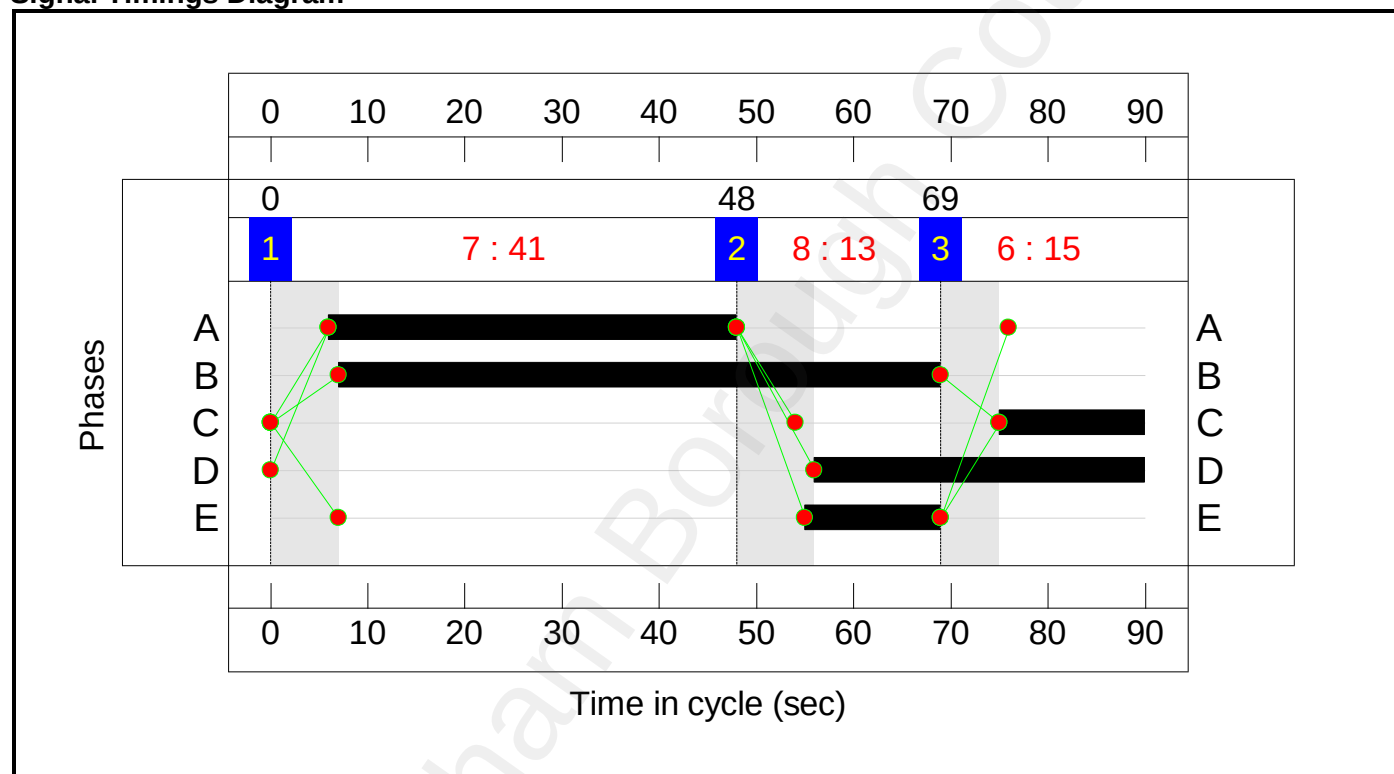
Stage Sequence Diagram



Stage Timings

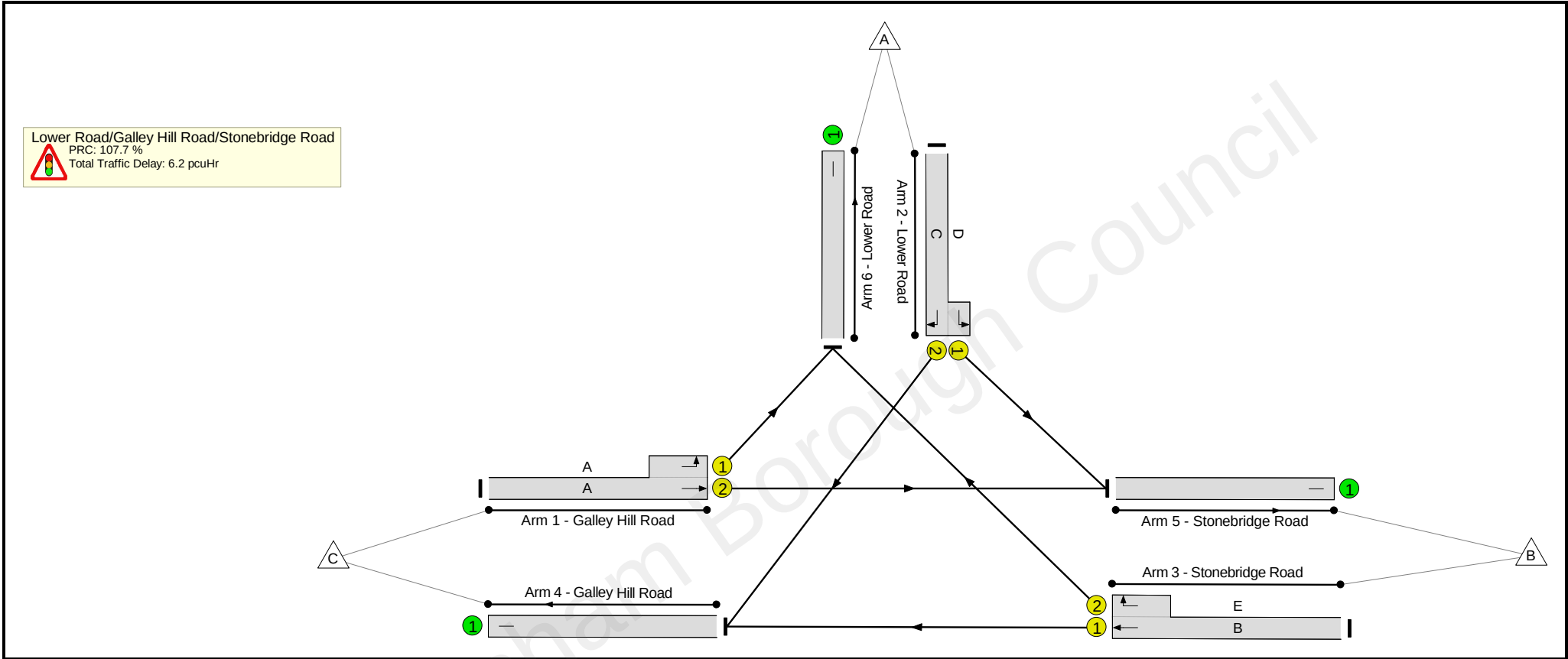
Stage	1	2	3
Duration	41	13	15
Change Point	0	48	69

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Proposed Commercial Development	-	-	N/A	-	-		-	-	-	-	-	-	43.3%
Lower Road/Galley Hill Road/Stonebridge Road	-	-	N/A	-	-		-	-	-	-	-	-	43.3%
1/2+1/1	Galley Hill Road Ahead Left	U	N/A	N/A	A		1	42	-	416	2024:1823	922+52	42.7 : 42.7%
2/2+2/1	Lower Road Right Left	U	N/A	N/A	C D		1	15:34	-	329	1880:1967	136+623	43.3 : 43.3%
3/1+3/2	Stonebridge Road Ahead Right	U	N/A	N/A	B E		1	62:14	-	521	2043:1697	1026+183	43.1 : 43.1%
4/1	Galley Hill Road	U	N/A	N/A	-		-	-	-	501	Inf	Inf	0.0%
5/1	Stonebridge Road	U	N/A	N/A	-		-	-	-	664	Inf	Inf	0.0%
6/1	Lower Road	U	N/A	N/A	-		-	-	-	101	Inf	Inf	0.0%

Full Input Data And Results

[illegible]