

Highways Technical Note

Manchester City Council Planning Application Reference: 138712/FO/2023

B&M Home Store, Burnage

26th January 2024

Introduction

Andrew Moseley Associates (AMA) has been commissioned to prepare a Highways Technical Note (HTN) in relation to the above planning application for the erection of a residential development of up to 112 dwellings with associated access, parking, landscaping and drainage following demolition of the existing B&M retail unit and associated garden centre at Kingsway, Burnage.

The application was submitted in December 2023 and was supported by a Transport Assessment (TA) and Travel Plan (TP) prepared by AMA. Since submission, Transport for Greater Manchester (TfGM) have raised a query in relation to the LinSig model of the A34 Kingsway / Talbot Road / Grangethorpe Drive signalised junction undertaken to support the TA.

Upon review, it was noticed that some discrepancies existed between the model and the signal timing data provided by TfGM. The LinSig model has therefore been updated to reflect the signal timing data. This HTN sets out the updated modelling results. The full model outputs are included at **Appendix A** of this report.

A34 Kingsway / Talbot Road / Grangethorpe Drive Modelling Results

The results of the updated modelling exercise are summarised in **Table 1**.

Table 1 A34 Kingsway / Talbot Road / Grangethorpe Drive Capacity Modelling Results

Scenario	Link	AM Peak		PM Peak	
		DoS	MMQ	DoS	MMQ
2023 Base	A34 Kingsway N	76.4%	12	79.4%	21
	Grangethorpe Drive	75.1%	9	70.7%	7
	A34 Kingsway S	75.9%	18	64.1%	11
	Talbot Road	63.9%	8	79.6%	9
	PRC	17.8%		13.0%	
	Total Delay (pcu/hr)	29.8		30.4	
2028 Do Nothing	A34 Kingsway N	81.2%	14	89.7%	28
	Grangethorpe Drive	79.9%	10	87.9%	10
	A34 Kingsway S	82.6%	21	76.3%	14
	Talbot Road	65.3%	8	69.9%	9
	PRC	9.0%		0.3%	
	Total Delay (pcu/hr)	34.9		40.4	
2028 Do Minimum	A34 Kingsway N	72.2%	13	82.6%	23
	Grangethorpe Drive	73.1%	9	72.9%	7
	A34 Kingsway S	77.0%	19	56.1%	10
	Talbot Road	63.9%	9	79.0%	10
	PRC	16.9%		9.0%	
	Total Delay (pcu/hr)	31.18		31.31	

Whilst the above results differ from those submitted within the TA, the same conclusions can be drawn. The junction is shown to operate within capacity at the current time, with modest queueing experienced on the A34 Kingsway arms. The junction is expected to continue to operate well in the future during the AM peak, albeit with less spare capacity. During the PM peak, the junction is expected to operate very close to its operational capacity.

Once the development flows are considered, and the signalised crossing of Talbot Road is included, the junction is expected to operate better than in the 2028 Do Nothing scenario in the both network peak hours. Queues on the A34 Kingsway arms and Grangethorpe Drive arm are expected to reduce, along with overall delay at the junction.

The proposals are therefore expected to have a beneficial impact on the operation of this junction, given that they will result in a net reduction in vehicle trips accessing the site when compared with the existing use.

Appendix A

LinSig Outputs

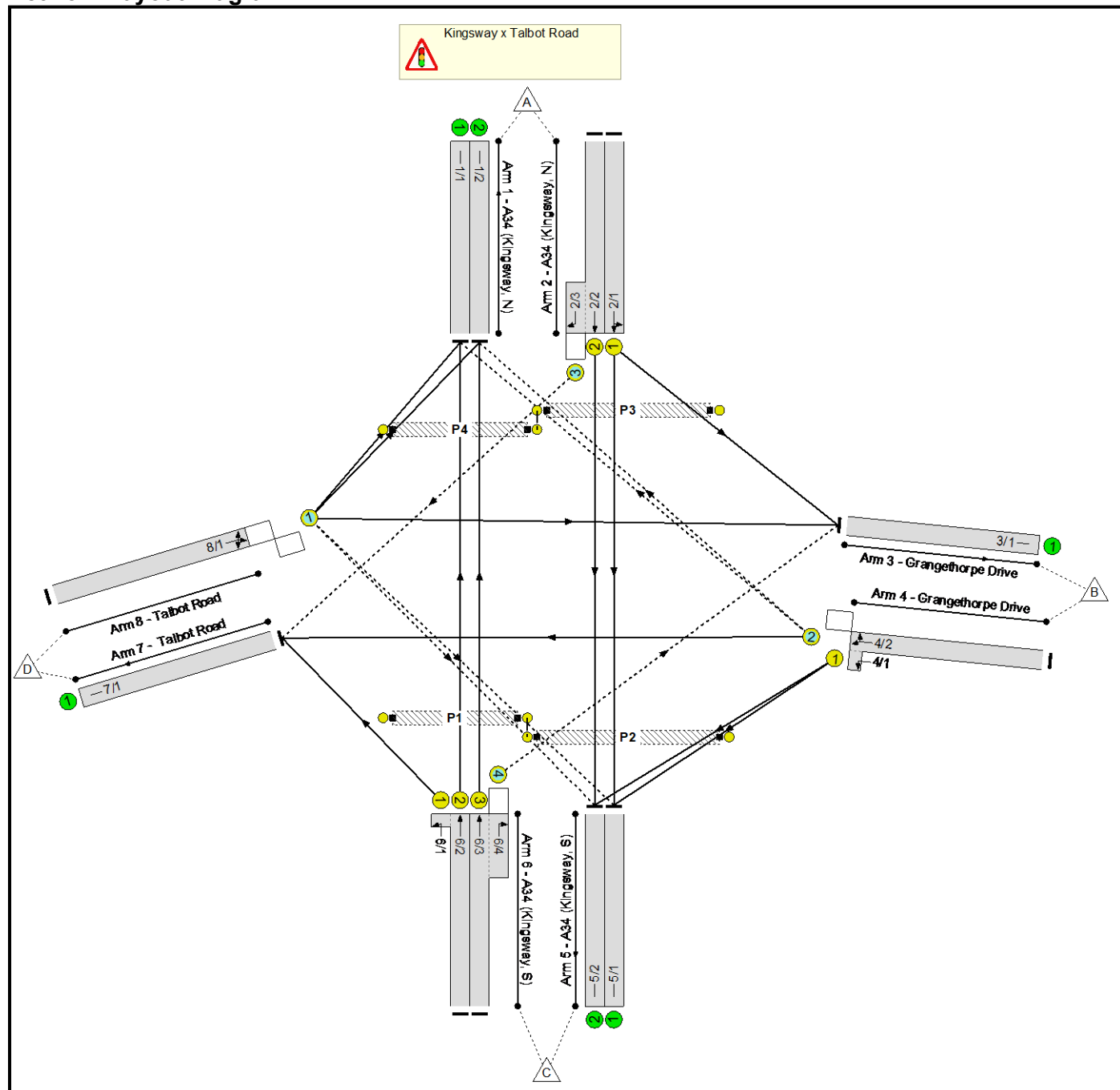
Full Input Data And Results

Full Input Data And Results

User and Project Details

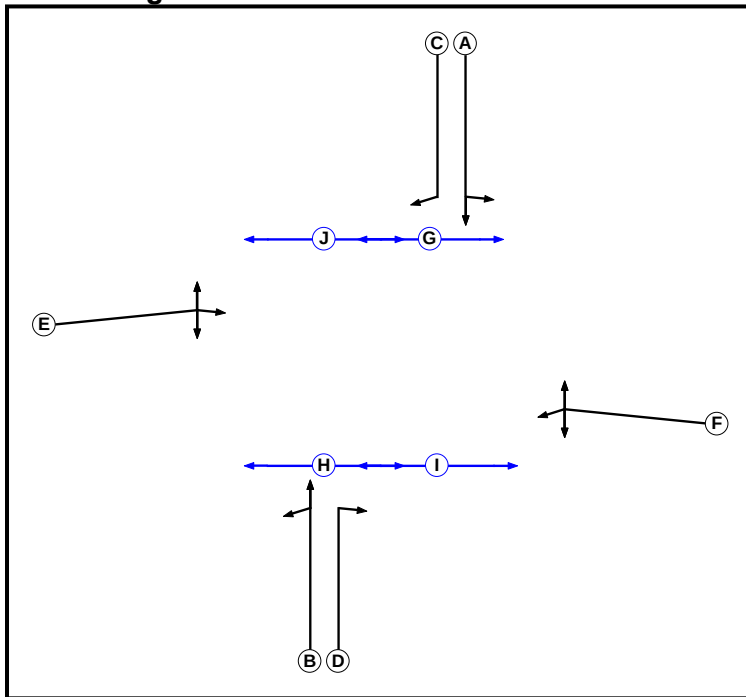
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Title:	
Location:	
Additional detail:	
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Author:	
Company:	
Address:	

Network Layout Diagram



Full Input Data And Results

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		7	7
F	Traffic		7	7
G	Pedestrian		4	4
H	Pedestrian		4	4
I	Pedestrian		4	4
J	Pedestrian		4	0

Phase Intergreens Matrix

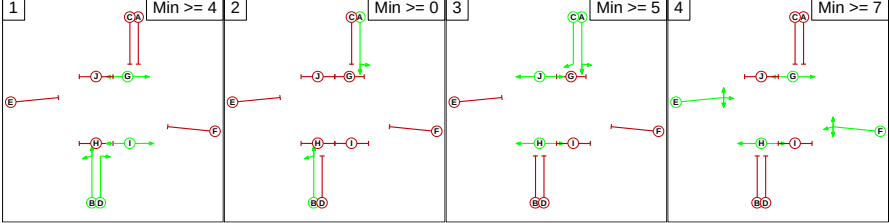
	Starting Phase									
	A	B	C	D	E	F	G	H	I	J
Terminating Phase	A	-	-	7	9	9	7	-	10	-
	B	-	7	-	9	9	-	7	-	9
	C	-	10	-	8	7	7	-	-	-
	D	8	-	-	7	7	-	7	-	-
	E	7	7	7	7	-	-	-	10	7
	F	7	7	7	7	-	-	-	6	9
	G	7	-	7	-	-	-	-	-	-
	H	-	7	-	7	-	-	-	-	-
	I	9	-	-	-	9	9	-	-	-
	J	-	6	-	-	6	6	-	-	-

Full Input Data And Results

Phases in Stage

Stage No.	Phases in Stage
1	B D G I
2	A B
3	A C H J
4	E F G H

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	D	Losing	1	1
1	2	G	Losing	2	2
1	3	G	Losing	2	2
3	1	H	Losing	3	3
3	1	J	Losing	4	4
3	2	H	Losing	3	3
3	2	J	Losing	4	4
3	4	J	Losing	4	4

Prohibited Stage Change

From Stage	To Stage			
	1	2	3	4
	1	9	9	9
	2	10	9	9
	3	10	10	10
	4	10	7	9

Give-Way Lane Input Data

Junction: Kingsway x Talbot Road											
Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Movmnts	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RT F	Right Turn Movement (s)	Max Turns in Intergreen (PCU)
2/3 (A34 (Kingsway, N))	7/1 (Right)	1439	0	6/2	1.09	All	2.00	-	0.50	2	2.00
				6/3	1.09	All					
				6/1	1.09	All					
4/2 (Granthorpe Drive)	1/1 (Right)	1439	0	8/1	1.09	To 1/1 (Left) To 1/2 (Left) To 3/1 (Ahead)	2.00	2.00	0.50	2	2.00
	1/2 (Right)	1439	0	8/1	1.09	To 1/1 (Left) To 1/2 (Left) To 3/1 (Ahead)					
6/4 (A34 (Kingsway, S))	3/1 (Right)	1439	0	2/1	1.09	All	2.00	-	0.50	2	2.00
				2/2	1.09	All					
8/1 (Talbot Road)	5/1 (Right)	1439	0	4/1	1.09	All	4.00	2.00	0.50	4	2.00
				4/2	1.09	To 7/1 (Ahead)					
				4/1	1.09	All					
	5/2 (Right)	1439	0	4/2	1.09	To 7/1 (Ahead)					

Lane Input Data

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N))	U		2	3	60.0	Inf	-	-	-	-	-	-
1/2 (A34 (Kingsway, N))	U		2	3	60.0	Inf	-	-	-	-	-	-
2/1 (A34 (Kingsway, N))	U	A	2	3	60.0	Geom	-	3.30	0.00	Y	Arm 3 Left	13.00
											Arm 5 Ahead	Inf
2/2 (A34 (Kingsway, N))	U	A	2	3	60.0	Geom	-	3.30	0.00	N	Arm 5 Ahead	Inf

Full Input Data And Results

2/3 (A34 (Kingsway, N))	O	C	2	3	4.0	Geom	-	3.20	0.00	N	Arm 7 Right	21.00
3/1 (Grangethorpe Drive)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (Grangethorpe Drive)	U	F	2	3	1.0	Geom	-	4.00	0.00	Y	Arm 5 Left	10.00
4/2 (Grangethorpe Drive)	O	F	2	3	60.0	Geom	-	3.30	0.00	Y	Arm 1 Right	9.00
											Arm 7 Ahead	Inf
5/1 (A34 (Kingsway, S))	U		2	3	60.0	Inf	-	-	-	-	-	-
5/2 (A34 (Kingsway, S))	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (A34 (Kingsway, S))	U	B	2	3	1.0	Geom	-	5.00	0.00	Y	Arm 7 Left	10.00
6/2 (A34 (Kingsway, S))	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 1 Ahead	Inf
6/3 (A34 (Kingsway, S))	U	B	2	3	60.0	Geom	-	3.25	0.00	N	Arm 1 Ahead	Inf
6/4 (A34 (Kingsway, S))	O	D	2	3	5.0	Geom	-	3.20	0.00	N	Arm 3 Right	14.00
7/1 (Talbot Road)	U		2	3	60.0	Inf	-	-	-	-	-	-
											Arm 1 Left	33.00
8/1 (Talbot Road)	O	E	2	3	60.0	Geom	-	3.60	0.00	Y	Arm 3 Ahead	Inf
											Arm 5 Right	11.00

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2023 Base AM'	08:00	09:00	01:00	
2: '2023 Base PM'	17:00	18:00	01:00	
3: '2028 Base AM'	08:00	09:00	01:00	
4: '2028 Base PM'	17:00	18:00	01:00	

Full Input Data And Results

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

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	60	853	129	1042
	B	90	0	45	145	280
	C	1253	76	0	21	1350
	D	84	148	38	0	270
	Tot.	1427	284	936	295	2942

Traffic Lane Flows

Lane	Scenario 1: 2023 AM
Junction: Kingsway x Talbot Road	
1/1	714
1/2	713
2/1	457
2/2 (with short)	585(In) 456(Out)
2/3 (short)	129
3/1	284
4/1 (short)	45
4/2 (with short)	280(In) 235(Out)
5/1	439
5/2	497
6/1 (short)	21
6/2 (with short)	648(In) 627(Out)
6/3 (with short)	702(In) 626(Out)
6/4 (short)	76
7/1	295
8/1	270

Full Input Data And Results

Lane Saturation Flows

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N) Lane 1)	Infinite Saturation Flow						Inf	Inf
1/2 (A34 (Kingsway, N) Lane 2)	Infinite Saturation Flow						Inf	Inf
2/1 (A34 (Kingsway, N))	3.30	0.00	Y	Arm 3 Left	13.00	13.1 %	1916	1916
				Arm 5 Ahead	Inf	86.9 %		
2/2 (A34 (Kingsway, N))	3.30	0.00	N	Arm 5 Ahead	Inf	100.0 %	2085	2085
2/3 (A34 (Kingsway, N))	3.20	0.00	N	Arm 7 Right	21.00	100.0 %	1937	1937
3/1 (Grangethorpe Drive Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Grangethorpe Drive)	4.00	0.00	Y	Arm 5 Left	10.00	100.0 %	1752	1752
4/2 (Grangethorpe Drive)	3.30	0.00	Y	Arm 1 Right	9.00	38.3 %	1828	1828
				Arm 7 Ahead	Inf	61.7 %		
5/1 (A34 (Kingsway, S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (A34 (Kingsway, S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A34 (Kingsway, S))	5.00	0.00	Y	Arm 7 Left	10.00	100.0 %	1839	1839
6/2 (A34 (Kingsway, S))	3.25	0.00	Y	Arm 1 Ahead	Inf	100.0 %	1940	1940
6/3 (A34 (Kingsway, S))	3.25	0.00	N	Arm 1 Ahead	Inf	100.0 %	2080	2080
6/4 (A34 (Kingsway, S))	3.20	0.00	N	Arm 3 Right	14.00	100.0 %	1874	1874
7/1 (Talbot Road Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Talbot Road)	3.60	0.00	Y	Arm 1 Left	33.00	31.1 %	1911	1911
				Arm 3 Ahead	Inf	54.8 %		
				Arm 5 Right	11.00	14.1 %		

Full Input Data And Results

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

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	94	1309	175	1578
	B	59	0	40	125	224
	C	797	90	0	32	919
	D	78	160	27	0	265
	Tot.	934	344	1376	332	2986

Traffic Lane Flows

Lane	Scenario 2: 2023 PM
Junction: Kingsway x Talbot Road	
1/1	468
1/2	466
2/1	702
2/2 (with short)	876(In) 701(Out)
2/3 (short)	175
3/1	344
4/1 (short)	40
4/2 (with short)	224(In) 184(Out)
5/1	642
5/2	734
6/1 (short)	32
6/2 (with short)	431(In) 399(Out)
6/3 (with short)	488(In) 398(Out)
6/4 (short)	90
7/1	332
8/1	265

Full Input Data And Results

Lane Saturation Flows

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N) Lane 1)	Infinite Saturation Flow						Inf	Inf
1/2 (A34 (Kingsway, N) Lane 2)	Infinite Saturation Flow						Inf	Inf
2/1 (A34 (Kingsway, N))	3.30	0.00	Y	Arm 3 Left	13.00	13.4 %	1915	1915
				Arm 5 Ahead	Inf	86.6 %		
2/2 (A34 (Kingsway, N))	3.30	0.00	N	Arm 5 Ahead	Inf	100.0 %	2085	2085
2/3 (A34 (Kingsway, N))	3.20	0.00	N	Arm 7 Right	21.00	100.0 %	1937	1937
3/1 (Grangethorpe Drive Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Grangethorpe Drive)	4.00	0.00	Y	Arm 5 Left	10.00	100.0 %	1752	1752
4/2 (Grangethorpe Drive)	3.30	0.00	Y	Arm 1 Right	9.00	32.1 %	1846	1846
				Arm 7 Ahead	Inf	67.9 %		
5/1 (A34 (Kingsway, S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (A34 (Kingsway, S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A34 (Kingsway, S))	5.00	0.00	Y	Arm 7 Left	10.00	100.0 %	1839	1839
6/2 (A34 (Kingsway, S))	3.25	0.00	Y	Arm 1 Ahead	Inf	100.0 %	1940	1940
6/3 (A34 (Kingsway, S))	3.25	0.00	N	Arm 1 Ahead	Inf	100.0 %	2080	2080
6/4 (A34 (Kingsway, S))	3.20	0.00	N	Arm 3 Right	14.00	100.0 %	1874	1874
7/1 (Talbot Road Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Talbot Road)	3.60	0.00	Y	Arm 1 Left	33.00	29.4 %	1923	1923
				Arm 3 Ahead	Inf	60.4 %		
				Arm 5 Right	11.00	10.2 %		

Full Input Data And Results

Scenario 3: '2028 Base AM' (FG3: '2028 Base AM', Plan 1: 'Existing')

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	64	909	137	1110
	B	96	0	49	154	299
	C	1335	81	0	22	1438
	D	89	158	41	0	288
	Tot.	1520	303	999	313	3135

Traffic Lane Flows

Lane	Scenario 3: 2028 Base AM
Junction: Kingsway x Talbot Road	
1/1	761
1/2	759
2/1	487
2/2 (with short)	623(In) 486(Out)
2/3 (short)	137
3/1	303
4/1 (short)	49
4/2 (with short)	299(In) 250(Out)
5/1	469
5/2	530
6/1 (short)	22
6/2 (with short)	690(In) 668(Out)
6/3 (with short)	748(In) 667(Out)
6/4 (short)	81
7/1	313
8/1	288

Full Input Data And Results

Lane Saturation Flows

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N) Lane 1)	Infinite Saturation Flow						Inf	Inf
1/2 (A34 (Kingsway, N) Lane 2)	Infinite Saturation Flow						Inf	Inf
2/1 (A34 (Kingsway, N))	3.30	0.00	Y	Arm 3 Left	13.00	13.1 %	1916	1916
				Arm 5 Ahead	Inf	86.9 %		
2/2 (A34 (Kingsway, N))	3.30	0.00	N	Arm 5 Ahead	Inf	100.0 %	2085	2085
2/3 (A34 (Kingsway, N))	3.20	0.00	N	Arm 7 Right	21.00	100.0 %	1937	1937
3/1 (Grangethorpe Drive Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Grangethorpe Drive)	4.00	0.00	Y	Arm 5 Left	10.00	100.0 %	1752	1752
4/2 (Grangethorpe Drive)	3.30	0.00	Y	Arm 1 Right	9.00	38.4 %	1828	1828
				Arm 7 Ahead	Inf	61.6 %		
5/1 (A34 (Kingsway, S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (A34 (Kingsway, S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A34 (Kingsway, S))	5.00	0.00	Y	Arm 7 Left	10.00	100.0 %	1839	1839
6/2 (A34 (Kingsway, S))	3.25	0.00	Y	Arm 1 Ahead	Inf	100.0 %	1940	1940
6/3 (A34 (Kingsway, S))	3.25	0.00	N	Arm 1 Ahead	Inf	100.0 %	2080	2080
6/4 (A34 (Kingsway, S))	3.20	0.00	N	Arm 3 Right	14.00	100.0 %	1874	1874
7/1 (Talbot Road Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Talbot Road)	3.60	0.00	Y	Arm 1 Left	33.00	30.9 %	1911	1911
				Arm 3 Ahead	Inf	54.9 %		
				Arm 5 Right	11.00	14.2 %		

Full Input Data And Results

Scenario 4: '2028 Base PM' (FG4: '2028 Base PM', Plan 1: 'Existing')

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	100	1396	187	1683
	B	96	0	43	134	273
	C	850	96	0	34	980
	D	84	171	29	0	284
	Tot.	1030	367	1468	355	3220

Traffic Lane Flows

Lane	Scenario 4: 2028 Base PM
Junction: Kingsway x Talbot Road	
1/1	515
1/2	515
2/1	748
2/2 (with short)	935(In) 748(Out)
2/3 (short)	187
3/1	367
4/1 (short)	43
4/2 (with short)	273(In) 230(Out)
5/1	685
5/2	783
6/1 (short)	34
6/2 (with short)	459(In) 425(Out)
6/3 (with short)	521(In) 425(Out)
6/4 (short)	96
7/1	355
8/1	284

Full Input Data And Results

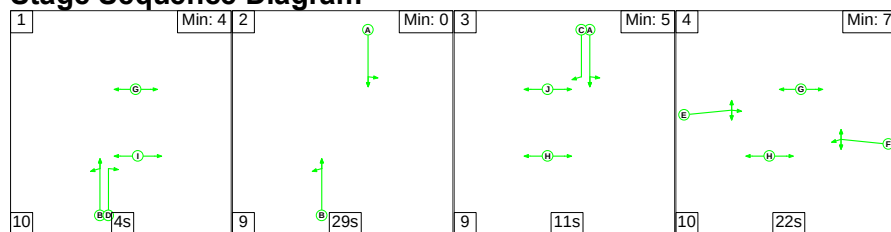
Lane Saturation Flows

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N) Lane 1)	Infinite Saturation Flow						Inf	Inf
1/2 (A34 (Kingsway, N) Lane 2)	Infinite Saturation Flow						Inf	Inf
2/1 (A34 (Kingsway, N))	3.30	0.00	Y	Arm 3 Left	13.00	13.4 %	1915	1915
				Arm 5 Ahead	Inf	86.6 %		
2/2 (A34 (Kingsway, N))	3.30	0.00	N	Arm 5 Ahead	Inf	100.0 %	2085	2085
2/3 (A34 (Kingsway, N))	3.20	0.00	N	Arm 7 Right	21.00	100.0 %	1937	1937
3/1 (Grangethorpe Drive Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Grangethorpe Drive)	4.00	0.00	Y	Arm 5 Left	10.00	100.0 %	1752	1752
4/2 (Grangethorpe Drive)	3.30	0.00	Y	Arm 1 Right	9.00	41.7 %	1818	1818
				Arm 7 Ahead	Inf	58.3 %		
5/1 (A34 (Kingsway, S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (A34 (Kingsway, S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A34 (Kingsway, S))	5.00	0.00	Y	Arm 7 Left	10.00	100.0 %	1839	1839
6/2 (A34 (Kingsway, S))	3.25	0.00	Y	Arm 1 Ahead	Inf	100.0 %	1940	1940
6/3 (A34 (Kingsway, S))	3.25	0.00	N	Arm 1 Ahead	Inf	100.0 %	2080	2080
6/4 (A34 (Kingsway, S))	3.20	0.00	N	Arm 3 Right	14.00	100.0 %	1874	1874
7/1 (Talbot Road Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Talbot Road)	3.60	0.00	Y	Arm 1 Left	33.00	29.6 %	1922	1922
				Arm 3 Ahead	Inf	60.2 %		
				Arm 5 Right	11.00	10.2 %		

Full Input Data And Results

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

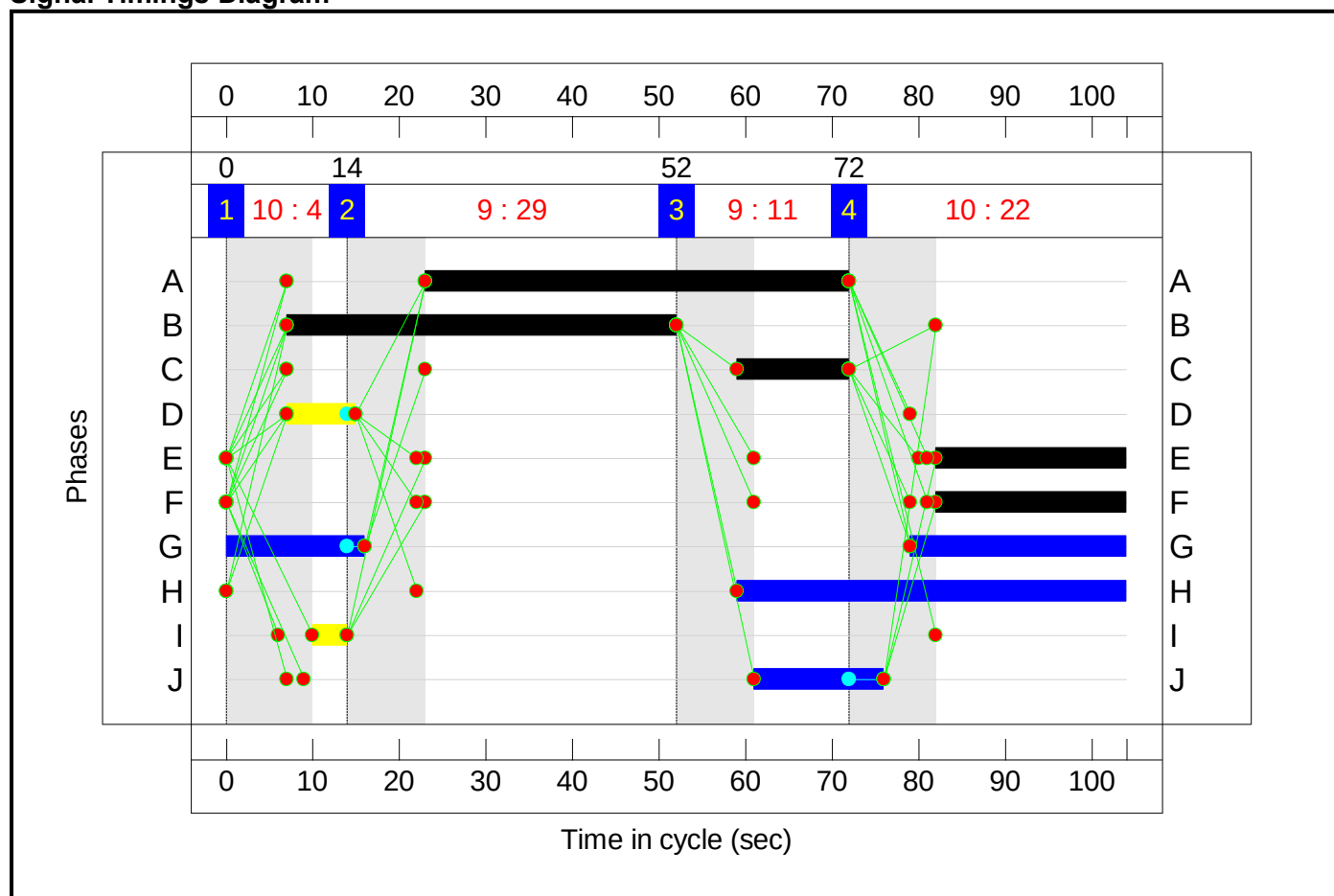
Stage Sequence Diagram



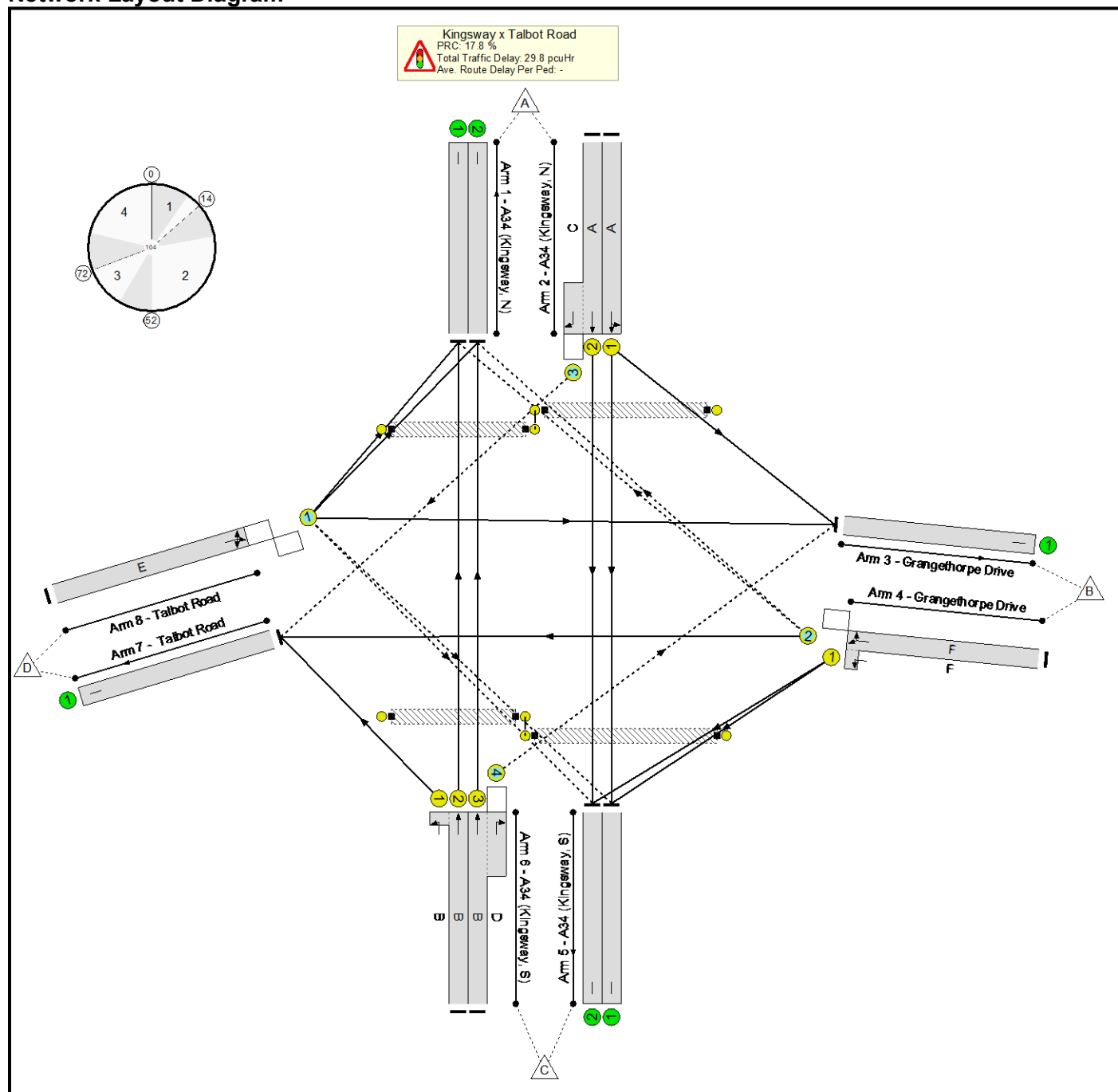
Stage Timings

Stage	1	2	3	4
Duration	4	29	11	22
Change Point	0	14	52	72

Signal Timings Diagram



Full Input Data And Results **Network Layout Diagram**



Full Input Data And Results

Network Results

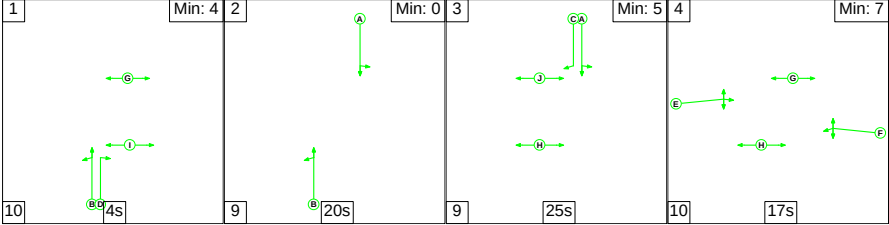
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	76.4 %
Kingsway x Talbot Road	-	-	N/A	-	-		-	-	-	-	-	-	76.4 %
1/1	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	714	Inf	Inf	0.0%
1/2	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	713	Inf	Inf	0.0%
2/1	A34 (Kingsway, N) Left Ahead	U	N/A	N/A	A		1	49	-	457	1916	921	49.6 %
2/2+2/3	A34 (Kingsway, N) Ahead Right	U+O	N/A	N/A	A C		1	49:13	-	585	2085:1937	597+169	76.4 : 76.4 %
3/1	Grangethorpe Drive	U	N/A	N/A	-		-	-	-	284	Inf	Inf	0.0%
4/2+4/1	Grangethorpe Drive Right Left Ahead	O+U	N/A	N/A	F		1	22	-	280	1828:1752	313+60	75.1 : 75.1 %
5/1	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	439	Inf	Inf	0.0%
5/2	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	497	Inf	Inf	0.0%
6/2+6/1	A34 (Kingsway, S) Ahead Left	U	N/A	N/A	B		1	45	-	648	1940:1839	827+28	75.8 : 75.8 %
6/3+6/4	A34 (Kingsway, S) Ahead Right	U+O	N/A	N/A	B D		1	45:8	-	702	2080:1874	825+100	75.9 : 75.9 %
7/1	Talbot Road	U	N/A	N/A	-		-	-	-	295	Inf	Inf	0.0%
8/1	Talbot Road Left Ahead Right	O	N/A	N/A	E		1	22	-	270	1911	423	63.9 %
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		1	45	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	4	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	G		1	41	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	15	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	127	203	3	22.1	7.5	0.2	29.8	-	-	-	-
Kingsway x Talbot Road	-	-	127	203	3	22.1	7.5	0.2	29.8	-	-	-	-
1/1	714	714	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
1/2	713	713	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	457	457	-	-	-	2.3	0.5	-	2.8	22.3	8.9	0.5	9.4
2/2+2/3	585	585	0	127	2	3.8	1.6	0.0	5.4	33.4	10.6	1.6	12.2
3/1	284	284	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2+4/1	280	280	90	0	0	2.9	1.5	0.2	4.5	58.3	7.2	1.5	8.7
5/1	439	439	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	497	497	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2+6/1	648	648	-	-	-	4.4	1.5	-	5.9	32.9	15.6	1.5	17.2
6/3+6/4	702	702	0	76	0	5.9	1.5	0.0	7.5	38.2	16.2	1.5	17.7
7/1	295	295	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	270	270	37	0	1	2.8	0.9	0.0	3.7	49.0	7.1	0.9	7.9
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
C1 PRC for Signalled Lanes (%): 17.8 Total Delay for Signalled Lanes (pcuHr):													
29.84Cycle Time (s): 104													
PRC Over All Lanes (%): 17.8 Total Delay Over All Lanes(pcuHr):													
29.84													

Full Input Data And Results
Scenario 2: '2023 PM' (FG2: '2023 Base PM', Plan 1: 'Existing')

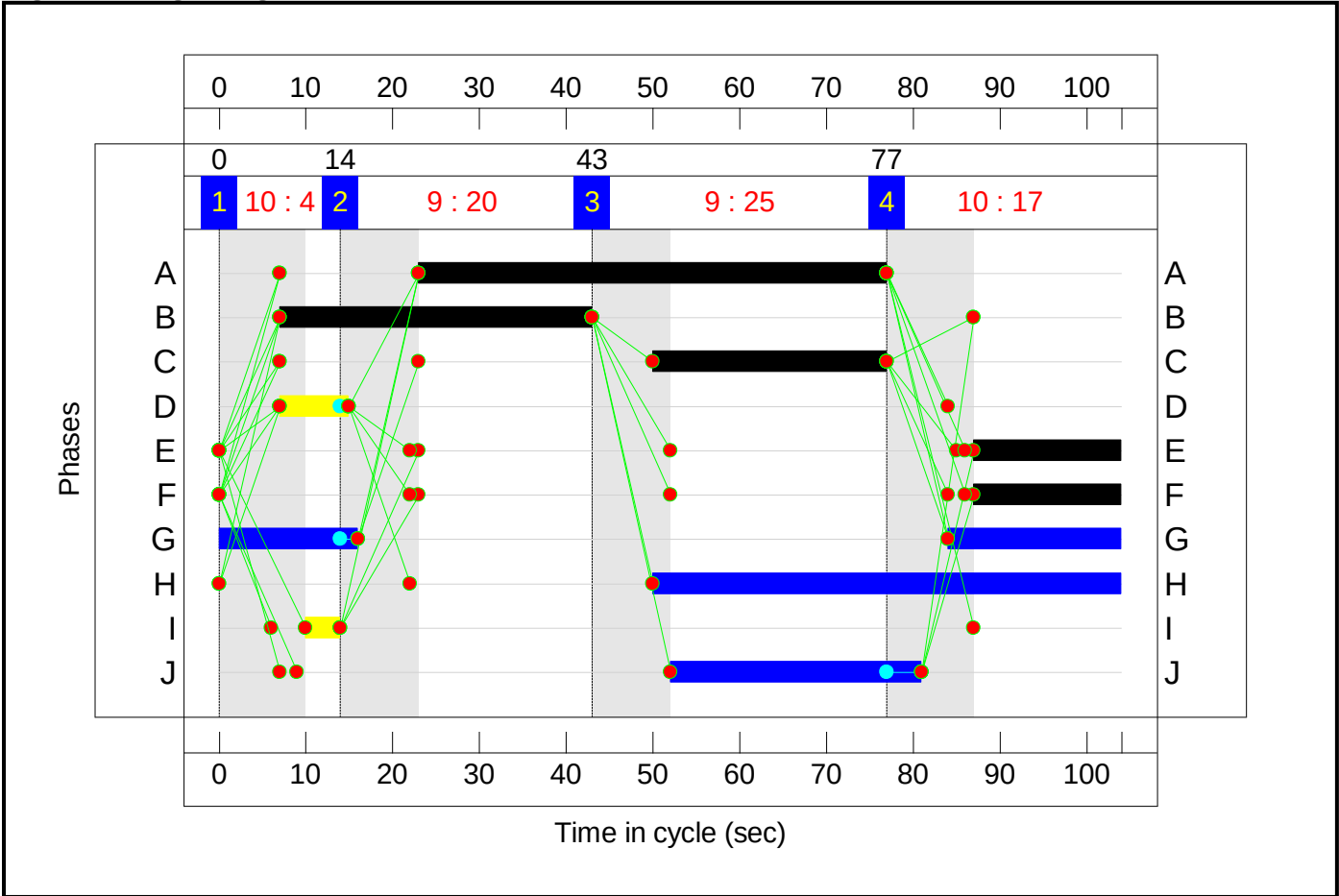
Stage Sequence Diagram



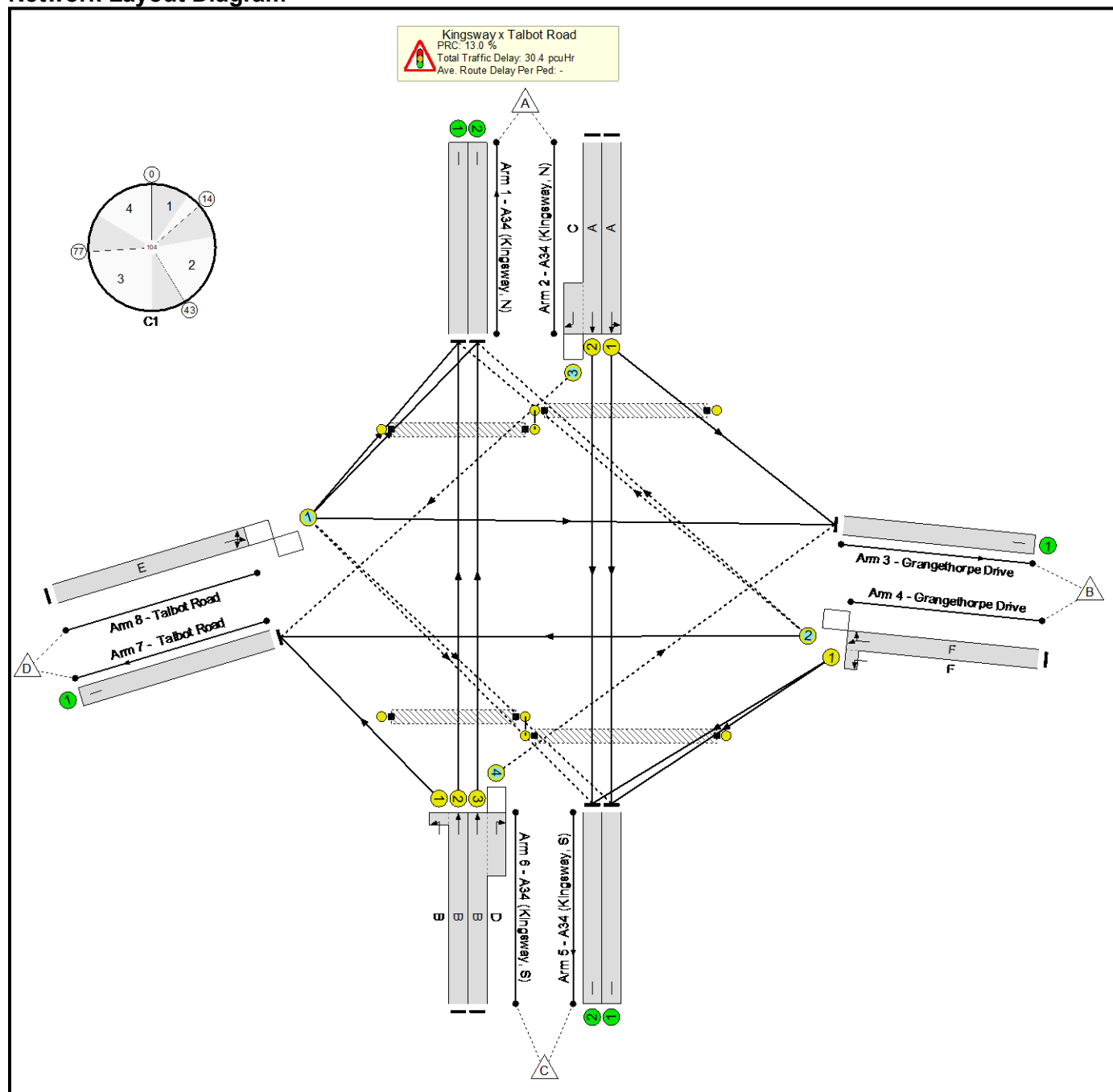
Stage Timings

Stage	1	2	3	4
Duration	4	20	25	17
Change Point	0	14	43	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	-	-	N/A	-	-		-	-	-	-	-	-	79.6 %
Kingsway x Talbot Road	-	-	N/A	-	-		-	-	-	-	-	-	79.6 %
1/1	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	468	Inf	Inf	0.0%
1/2	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	466	Inf	Inf	0.0%
2/1	A34 (Kingsway, N) Left Ahead	U	N/A	N/A	A		1	54	-	702	1915	1013	69.3 %
2/2+2/3	A34 (Kingsway, N) Ahead Right	U+O	N/A	N/A	A C		1	54:27	-	876	2085:1937	883+220	79.4 : 79.4 %
3/1	Grangethorpe Drive	U	N/A	N/A	-		-	-	-	344	Inf	Inf	0.0%
4/2+4/1	Grangethorpe Drive Right Left Ahead	O+U	N/A	N/A	F		1	17	-	224	1846:1752	260+57	70.7 : 70.7 %
5/1	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	642	Inf	Inf	0.0%
5/2	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	734	Inf	Inf	0.0%
6/2+6/1	A34 (Kingsway, S) Ahead Left	U	N/A	N/A	B		1	36	-	431	1940:1839	637+51	62.7 : 62.7 %
6/3+6/4	A34 (Kingsway, S) Ahead Right	U+O	N/A	N/A	B D		1	36:8	-	488	2080:1874	621+140	64.1 : 64.1 %
7/1	Talbot Road	U	N/A	N/A	-		-	-	-	332	Inf	Inf	0.0%
8/1	Talbot Road Left Ahead Right	O	N/A	N/A	E		1	17	-	265	1923	333	79.6 %
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		1	54	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	4	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	G		1	36	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	29	-	0	-	0	0.0%

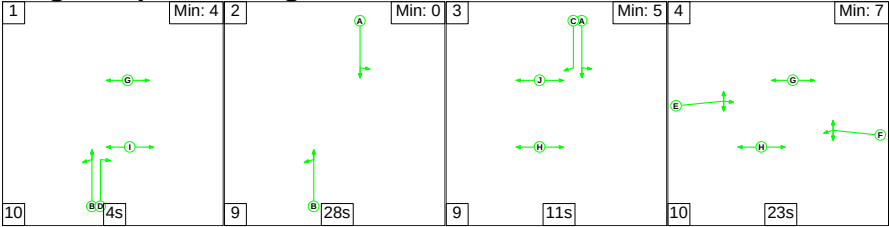
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Overs at Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Overs at Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	60	262	29	22.5	7.8	0.2	30.4	-	-	-	-
Kingsway x Talbot Road	-	-	60	262	29	22.5	7.8	0.2	30.4	-	-	-	-
1/1	468	468	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
1/2	466	466	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	702	702	-	-	-	3.6	1.1	-	4.7	24.0	15.0	1.1	16.1
2/2+2/3	876	876	0	172	3	5.2	1.9	0.0	7.1	29.0	19.2	1.9	21.1
3/1	344	344	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2+4/1	224	224	33	0	26	2.5	1.2	0.1	3.8	61.1	5.8	1.2	7.0
5/1	642	642	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	734	734	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2+6/1	431	431	-	-	-	3.3	0.8	-	4.2	34.7	10.2	0.8	11.1
6/3+6/4	488	488	0	90	0	4.9	0.9	0.0	5.8	42.6	10.4	0.9	11.3
7/1	332	332	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	265	265	26	0	1	3.0	1.9	0.0	4.9	66.8	7.3	1.9	9.1
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
C1 PRC for Signalled Lanes (%): 13.0 Total Delay for Signalled Lanes (pcuHr):													
30.39Cycle Time (s): 104													
PRC Over All Lanes (%): 13.0 Total Delay Over All Lanes(pcuHr):													
30.39													

C1	PRC for Signalled Lanes (%):	13.0	Total Delay for Signalled Lanes (pcuHr):
30.39	Cycle Time (s):	104	
	PRC Over All Lanes (%):	13.0	Total Delay Over All Lanes (pcuHr):
		30.39	

Full Input Data And Results

Scenario 3: '2028 Base AM' (FG3: '2028 Base AM', Plan 1: 'Existing')

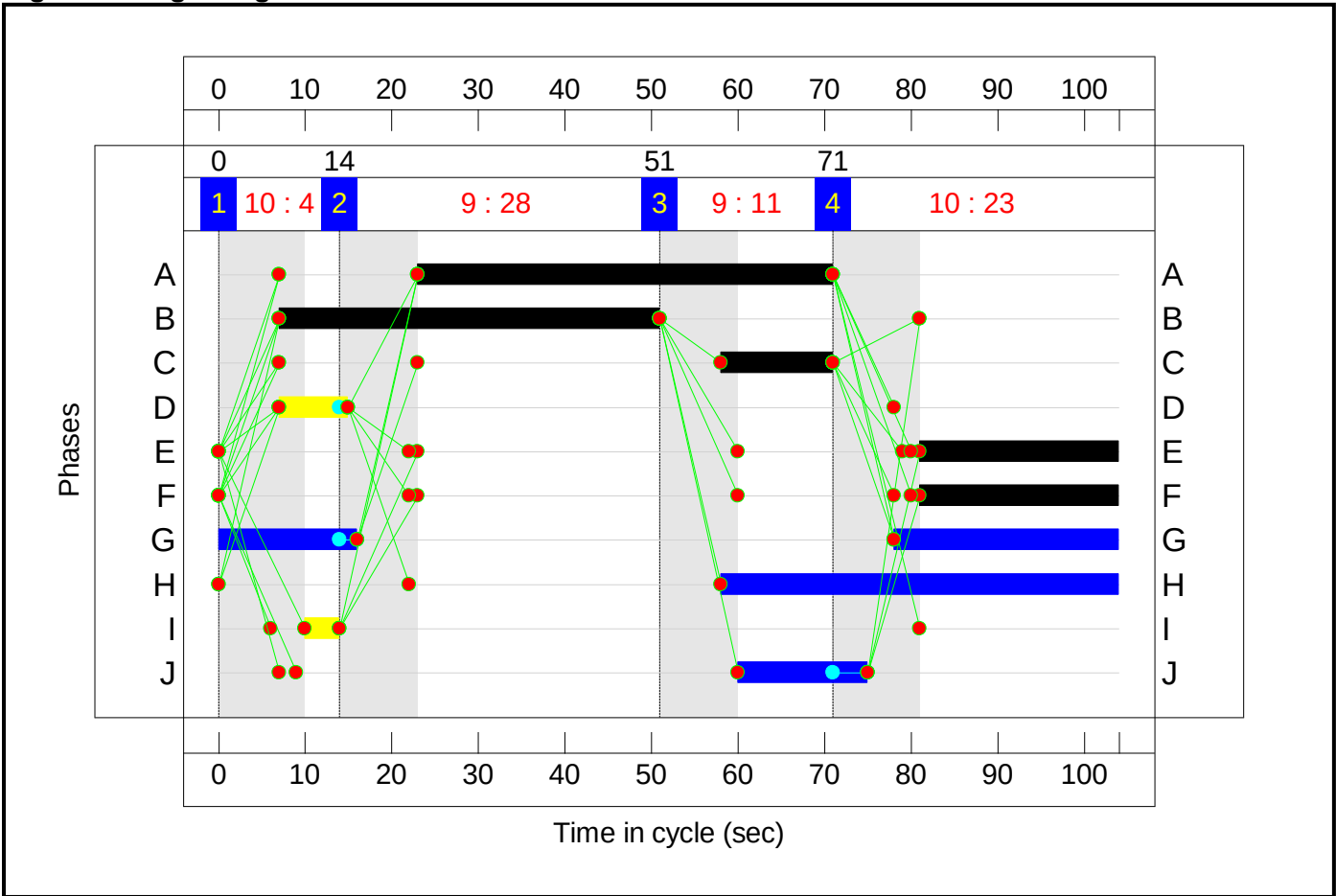
Stage Sequence Diagram



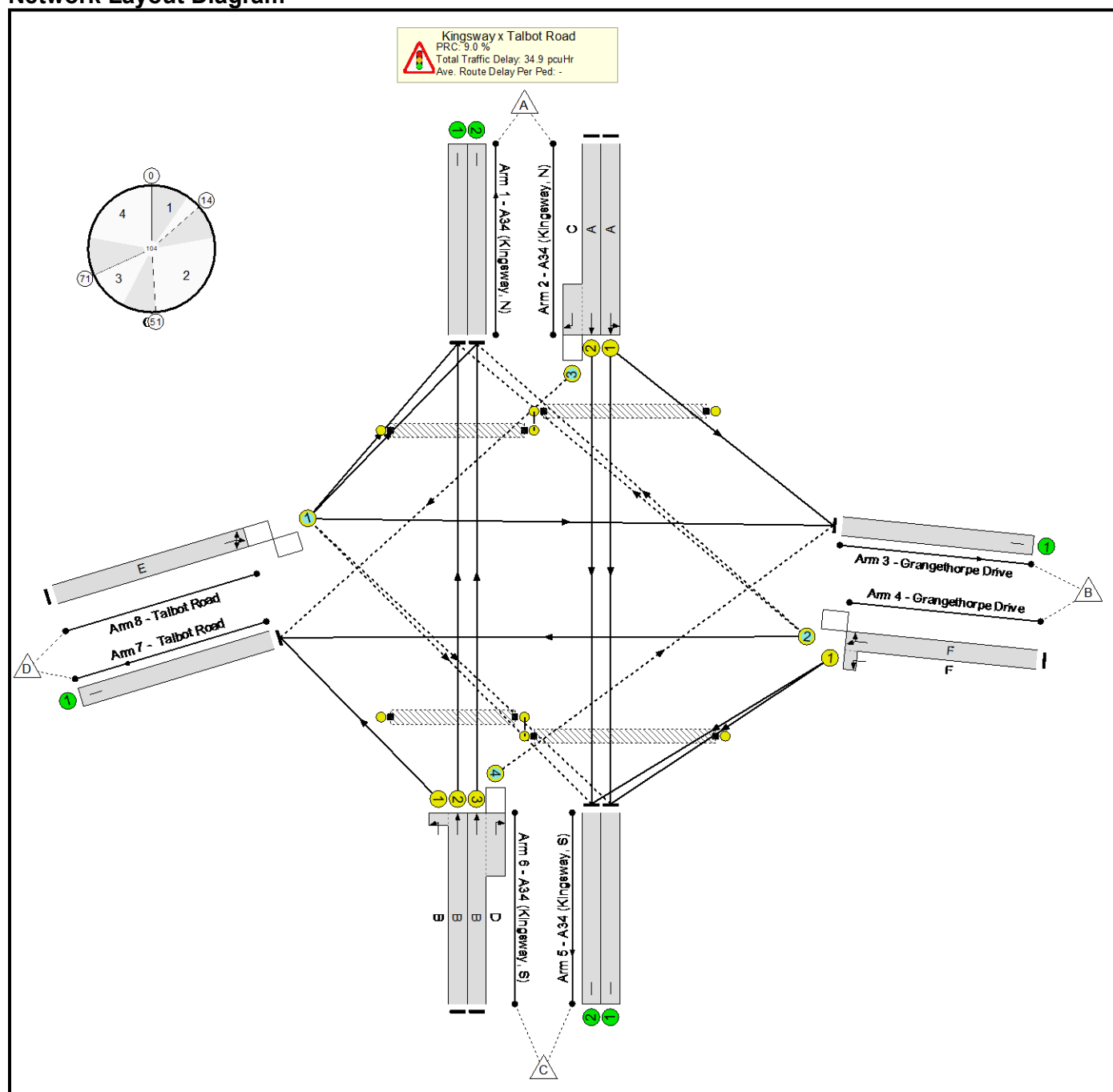
Stage Timings

Stage	1	2	3	4
Duration	4	28	11	23
Change Point	0	14	51	71

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	-	-	N/A	-	-		-	-	-	-	-	-	82.6 %
Kingsway x Talbot Road	-	-	N/A	-	-		-	-	-	-	-	-	82.6 %
1/1	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	761	Inf	Inf	0.0%
1/2	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	759	Inf	Inf	0.0%
2/1	A34 (Kingsway, N) Left Ahead	U	N/A	N/A	A		1	48	-	487	1916	903	53.9 %
2/2+2/3	A34 (Kingsway, N) Ahead Right	U+O	N/A	N/A	A C		1	48:13	-	623	2085:1937	599+169	81.2 : 81.2 %
3/1	Grangethorpe Drive	U	N/A	N/A	-		-	-	-	303	Inf	Inf	0.0%
4/2+4/1	Grangethorpe Drive Right Left Ahead	O+U	N/A	N/A	F		1	23	-	299	1828:1752	313+61	79.9 : 79.9 %
5/1	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	469	Inf	Inf	0.0%
5/2	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	530	Inf	Inf	0.0%
6/2+6/1	A34 (Kingsway, S) Ahead Left	U	N/A	N/A	B		1	44	-	690	1940:1839	810+27	82.5 : 82.5 %
6/3+6/4	A34 (Kingsway, S) Ahead Right	U+O	N/A	N/A	B D		1	44:8	-	748	2080:1874	808+98	82.6 : 82.6 %
7/1	Talbot Road	U	N/A	N/A	-		-	-	-	313	Inf	Inf	0.0%
8/1	Talbot Road Left Ahead Right	O	N/A	N/A	E		1	23	-	288	1911	441	65.3 %
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		1	46	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	4	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	G		1	42	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	15	-	0	-	0	0.0%

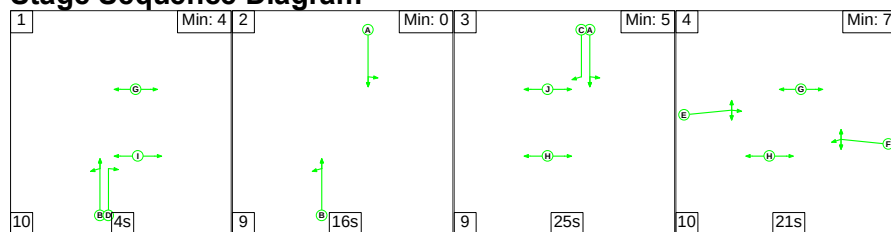
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Overs at Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Overs at Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	136	215	3	24.5	10.1	0.3	34.9	-	-	-	-
Kingsway x Talbot Road	-	-	136	215	3	24.5	10.1	0.3	34.9	-	-	-	-
1/1	761	761	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
1/2	759	759	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	487	487	-	-	-	2.6	0.6	-	3.2	23.8	9.9	0.6	10.5
2/2+2/3	623	623	0	134	3	4.3	2.1	0.0	6.3	36.7	12.0	2.1	14.1
3/1	303	303	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2+4/1	299	299	96	0	0	3.0	1.9	0.2	5.2	62.1	7.7	1.9	9.6
5/1	469	469	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	530	530	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2+6/1	690	690	-	-	-	5.0	2.3	-	7.3	38.0	17.4	2.3	19.7
6/3+6/4	748	748	0	81	0	6.7	2.3	0.0	9.0	43.2	18.3	2.3	20.6
7/1	313	313	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	288	288	40	0	1	2.9	0.9	0.0	3.9	48.4	7.5	0.9	8.4
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
C1 PRC for Signalled Lanes (%): 9.0 Total Delay for Signalled Lanes (pcuHr):													
34.85Cycle Time (s): 104													
PRC Over All Lanes (%): 9.0 Total Delay Over All Lanes(pcuHr):													
34.85													

C1	PRC for Signalled Lanes (%):	9.0	Total Delay for Signalled Lanes (pcuHr):
34.85	Cycle Time (s):	104	
	PRC Over All Lanes (%):	9.0	Total Delay Over All Lanes(pcuHr):
		34.85	

Full Input Data And Results

Scenario 4: '2028 Base PM' (FG4: '2028 Base PM', Plan 1: 'Existing')

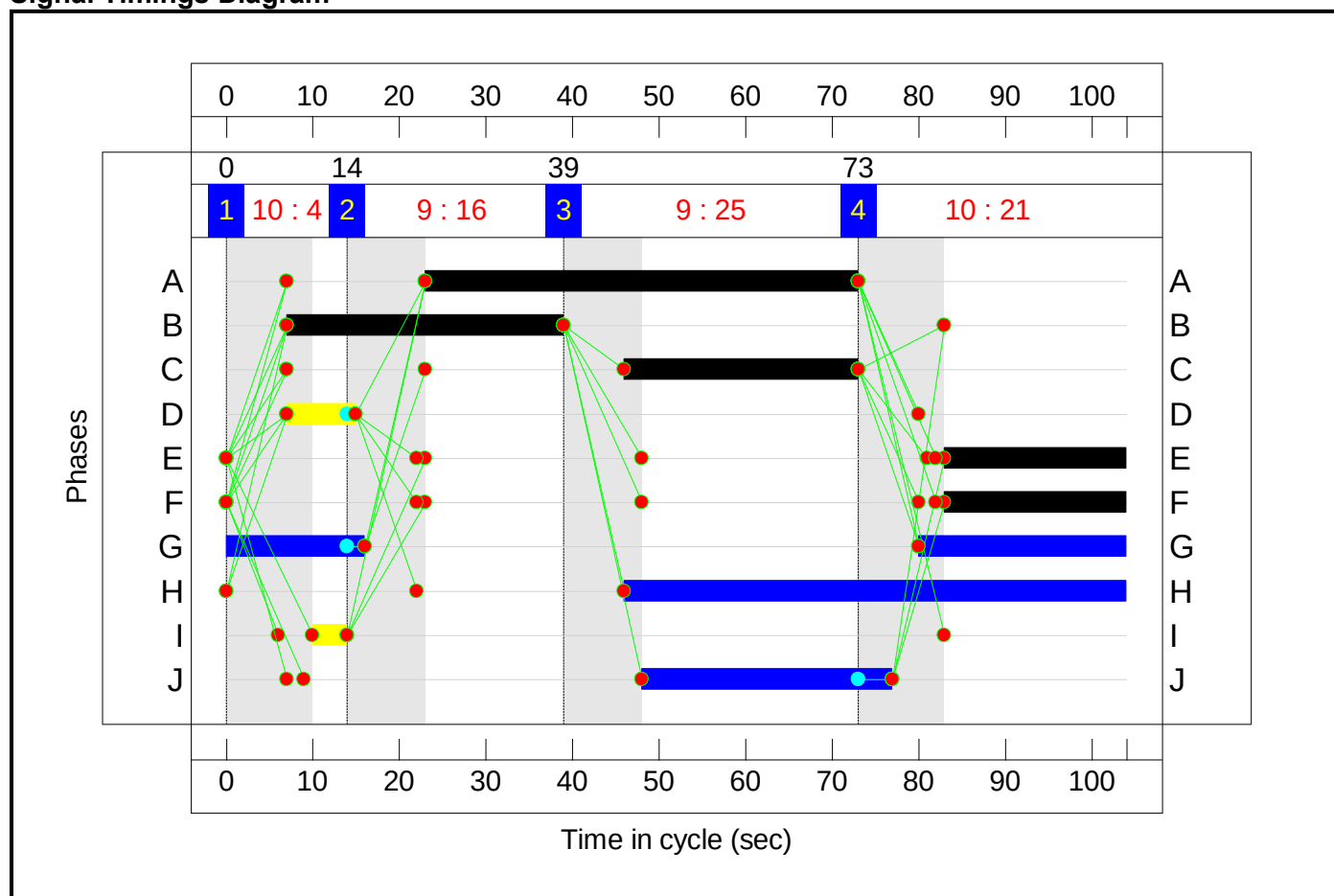
Stage Sequence Diagram



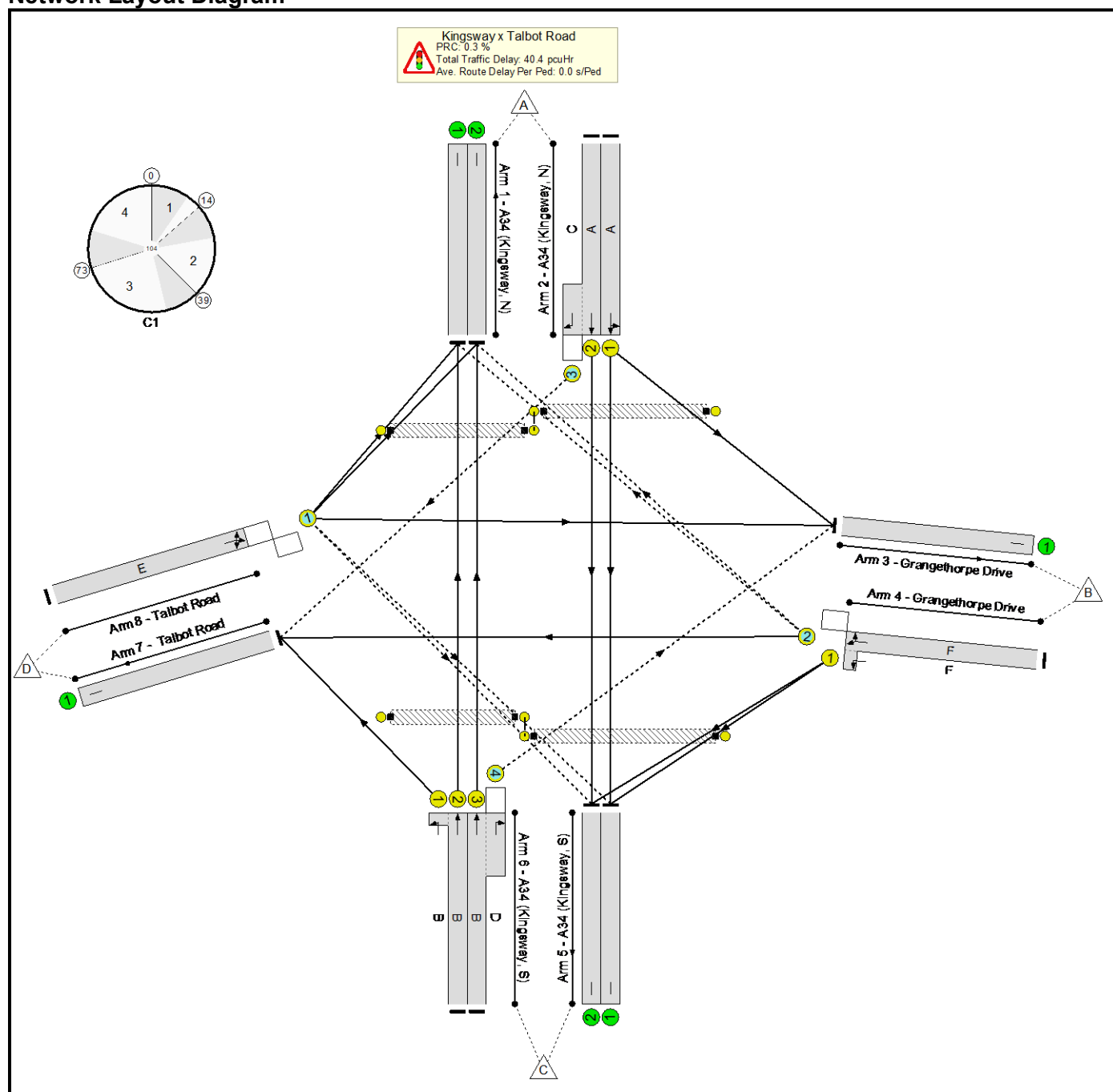
Stage Timings

Stage	1	2	3	4
Duration	4	16	25	21
Change Point	0	14	39	73

Signal Timings Diagram



Full Input Data And Results Network Layout Diagram



Full Input Data And Results

Network Results

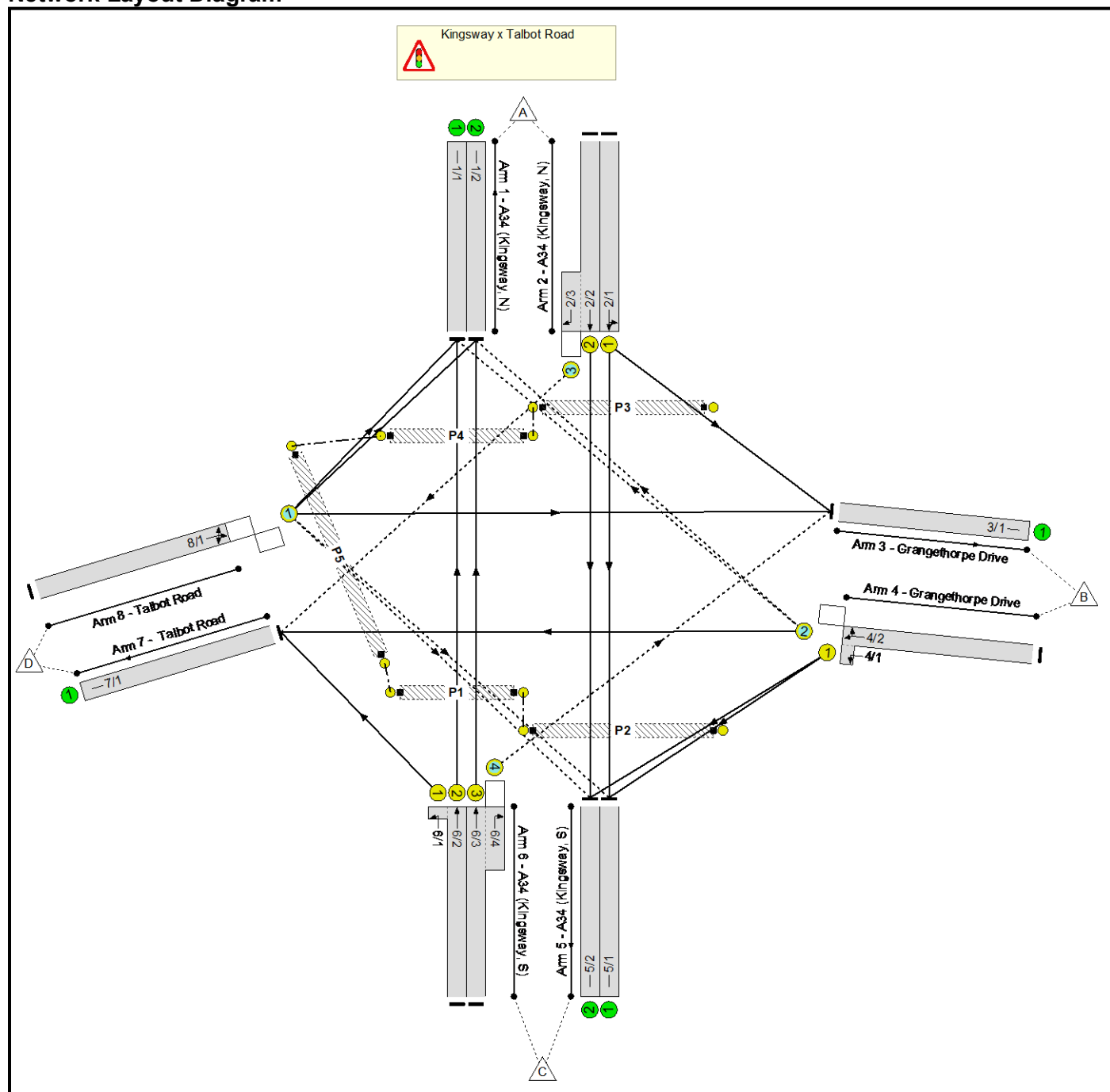
Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	89.7 %
Kingsway x Talbot Road	-	-	N/A	-	-		-	-	-	-	-	-	89.7 %
1/1	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	515	Inf	Inf	0.0%
1/2	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	515	Inf	Inf	0.0%
2/1	A34 (Kingsway, N) Left Ahead	U	N/A	N/A	A		1	50	-	748	1915	939	79.7 %
2/2+2/3	A34 (Kingsway, N) Ahead Right	U+O	N/A	N/A	A C		1	50:27	-	935	2085:1937	834+208	89.7 : 89.7 %
3/1	Grangethorpe Drive	U	N/A	N/A	-		-	-	-	367	Inf	Inf	0.0%
4/2+4/1	Grangethorpe Drive Right Left Ahead	O+U	N/A	N/A	F		1	21	-	273	1818:1752	262+49	87.9 : 87.9 %
5/1	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	685	Inf	Inf	0.0%
5/2	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	783	Inf	Inf	0.0%
6/2+6/1	A34 (Kingsway, S) Ahead Left	U	N/A	N/A	B		1	32	-	459	1940:1839	568+45	74.8 : 74.8 %
6/3+6/4	A34 (Kingsway, S) Ahead Right	U+O	N/A	N/A	B D		1	32:8	-	521	2080:1874	557+126	76.3 : 76.3 %
7/1	Talbot Road	U	N/A	N/A	-		-	-	-	355	Inf	Inf	0.0%
8/1	Talbot Road Left Ahead Right	O	N/A	N/A	E		1	21	-	284	1922	407	69.9 %
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		1	58	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	4	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	G		1	40	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	29	-	0	-	0	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Overs at Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Overs at Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	104	279	25	26.9	13.3	0.2	40.4	-	-	-	-
Kingsway x Talbot Road	-	-	104	279	25	26.9	13.3	0.2	40.4	-	-	-	-
1/1	515	515	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
1/2	515	515	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	748	748	-	-	-	4.6	1.9	-	6.5	31.4	17.9	1.9	19.8
2/2+2/3	935	935	0	183	4	6.5	4.1	0.0	10.5	40.6	23.4	4.1	27.5
3/1	367	367	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2+4/1	273	273	75	0	21	2.9	3.1	0.2	6.2	82.1	7.1	3.1	10.2
5/1	685	685	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	783	783	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2+6/1	459	459	-	-	-	4.1	1.5	-	5.5	43.2	11.8	1.5	13.2
6/3+6/4	521	521	0	96	0	5.9	1.6	0.0	7.5	51.6	12.2	1.6	13.8
7/1	355	355	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	284	284	28	0	1	3.0	1.1	0.0	4.1	52.4	7.6	1.1	8.7
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
C1 PRC for Signalled Lanes (%): 0.3 Total Delay for Signalled Lanes (pcuHr):													
40.40Cycle Time (s): 104													
PRC Over All Lanes (%): 0.3 Total Delay Over All Lanes(pcuHr):													
40.40													

C1	PRC for Signalled Lanes (%):	0.3	Total Delay for Signalled Lanes (pcuHr):
40.40	Cycle Time (s):	104	
	PRC Over All Lanes (%):	0.3	Total Delay Over All Lanes (pcuHr):
		40.40	

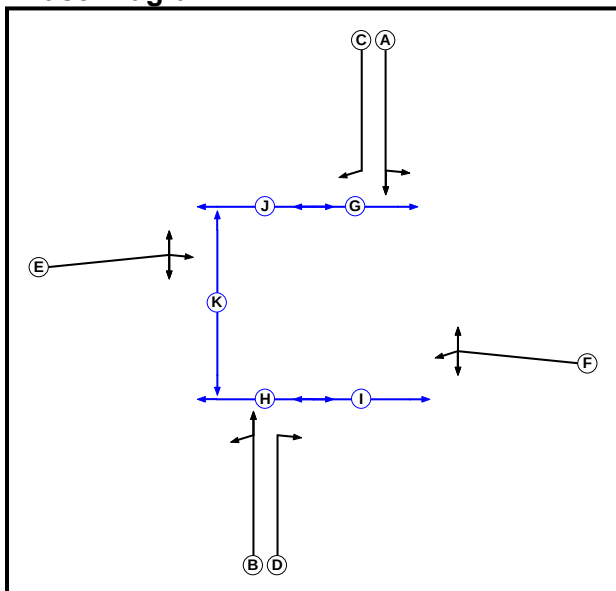
Project:	
Title:	
Location:	
Additional detail:	
File name:	Kingsway, Burnage - Proposed Model Stages.lsg3x
Author:	
Company:	
Address:	

Network Layout Diagram



Full Input Data And Results

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		7	7
F	Traffic		7	7
G	Pedestrian		4	4
H	Pedestrian		4	4
I	Pedestrian		4	4
J	Pedestrian		4	0
K	Pedestrian		4	4

Phase Intergreens Matrix

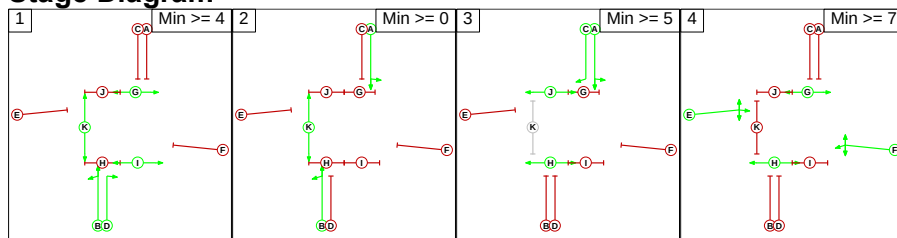
	Starting Phase										
	A	B	C	D	E	F	G	H	I	J	K
Terminating Phase	A	-	-	7	9	9	7	-	10	-	-
	B	-	-	7	-	9	9	-	7	-	9
	C	-	10	-	8	7	7	-	-	-	-
	D	8	-	-	7	7	-	7	-	-	-
	E	7	7	7	7	-	-	-	10	7	5
	F	7	7	7	7	-	-	-	6	9	8
	G	7	-	7	-	-	-	-	-	-	-
	H	-	7	-	7	-	-	-	-	-	-
	I	9	-	-	-	9	9	-	-	-	-
	J	-	6	-	-	6	6	-	-	-	-
	K	-	-	-	-	9	9	-	-	-	-

Full Input Data And Results

Phases in Stage

Stage No.	Phases in Stage
1	B D G I K
2	A B K
3	A C H J
4	E F G H

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	D	Losing	1	1
1	2	G	Losing	2	2
1	3	G	Losing	2	2
3	1	H	Losing	3	3
3	1	J	Losing	4	4
3	2	H	Losing	3	3
3	2	J	Losing	4	4
3	4	J	Losing	4	4

Prohibited Stage Change

From Stage	To Stage			
	1	2	3	4
	1	9	9	9
	2	10	9	9
	3	10	10	10
	4	10	8	9

Give-Way Lane Input Data

Junction: Kingsway x Talbot Road											
Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Movmnts	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RT F	Right Turn Movement (s)	Max Turns in Intergreen (PCU)
2/3 (A34 (Kingsway, N))	7/1 (Right)	1439	0	6/2 6/3	1.09 1.09	All All	2.00	-	0.50	2	2.00

Full Input Data And Results

4/2 (Grangethorpe Drive)	1/1 (Right)	1439	0	8/1	1.09	To 1/1 (Left) To 1/2 (Left) To 3/1 (Ahead)	2.00	2.00	0.5 0	2	2.00
	1/2 (Right)	1439	0	8/1	1.09	To 1/1 (Left) To 1/2 (Left) To 3/1 (Ahead)					
6/4 (A34 (Kingsway, S))	3/1 (Right)	1439	0	2/1	1.09	All	2.00	-	0.5 0	2	2.00
8/1 (Talbot Road)	5/1 (Right)	1439	0	2/2	1.09	All	4.00	2.00	0.5 0	4	2.00
				4/1	1.09	All					
				4/2	1.09	To 7/1 (Ahead)					
	5/2 (Right)	1439	0	4/1	1.09	All					
				4/2	1.09	To 7/1 (Ahead)					

Lane Input Data

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N))	U		2	3	60.0	Inf	-	-	-	-	-	-
1/2 (A34 (Kingsway, N))	U		2	3	60.0	Inf	-	-	-	-	-	-
2/1 (A34 (Kingsway, N))	U	A	2	3	60.0	Geom	-	3.30	0.00	Y	Arm 3 Left Arm 5 Ahead	13.00 Inf
2/2 (A34 (Kingsway, N))	U	A	2	3	60.0	Geom	-	3.30	0.00	N	Arm 5 Ahead	Inf
2/3 (A34 (Kingsway, N))	O	C	2	3	4.7	Geom	-	3.20	0.00	N	Arm 7 Right	21.00
3/1 (Grangethorpe Drive)	U		2	3	60.0	Inf	-	-	-	-	-	-
4/1 (Grangethorpe Drive)	U	F	2	3	1.0	Geom	-	4.00	0.00	Y	Arm 5 Left	10.00
4/2 (Grangethorpe Drive)	O	F	2	3	60.0	Geom	-	3.30	0.00	Y	Arm 1 Right	9.00

Full Input Data And Results

Drive)												Arm 7 Ahead	Inf
5/1 (A34 (Kingsway, S))	U		2	3	60.0	Inf	-	-	-	-	-	-	-
5/2 (A34 (Kingsway, S))	U		2	3	60.0	Inf	-	-	-	-	-	-	-
6/1 (A34 (Kingsway, S))	U	B	2	3	1.0	Geom	-	5.00	0.00	Y		Arm 7 Left	10.00
6/2 (A34 (Kingsway, S))	U	B	2	3	60.0	Geom	-	3.25	0.00	Y		Arm 1 Ahead	Inf
6/3 (A34 (Kingsway, S))	U	B	2	3	60.0	Geom	-	3.25	0.00	N		Arm 1 Ahead	Inf
6/4 (A34 (Kingsway, S))	O	D	2	3	5.0	Geom	-	3.20	0.00	N		Arm 3 Right	14.00
7/1 (Talbot Road)	U		2	3	60.0	Inf	-	-	-	-		-	-
8/1 (Talbot Road)	O	E	2	3	60.0	Geom	-	3.60	0.00	Y		Arm 1 Left	33.00
												Arm 3 Ahead	Inf
												Arm 5 Right	11.00

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2028 Base + Dev AM'	08:00	09:00	01:00	
2: '2028 Base + Dev PM'	17:00	18:00	01:00	

Full Input Data And Results

Scenario 1: '2028 Base + Dev AM' (FG1: '2028 Base + Dev AM', Plan 1: 'Proposed')

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	64	909	121	1094
	B	96	0	49	152	297
	C	1326	80	0	22	1428
	D	104	160	41	0	305
	Tot.	1526	304	999	295	3124

Traffic Lane Flows

Lane	Scenario 1: 2028 Base + Dev AM
Junction: Kingsway x Talbot Road	
1/1	763
1/2	763
2/1	487
2/2 (with short)	607(In) 486(Out)
2/3 (short)	121
3/1	304
4/1 (short)	49
4/2 (with short)	297(In) 248(Out)
5/1	469
5/2	530
6/1 (short)	22
6/2 (with short)	685(In) 663(Out)
6/3 (with short)	743(In) 663(Out)
6/4 (short)	80
7/1	295
8/1	305

Full Input Data And Results

Lane Saturation Flows

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N) Lane 1)	Infinite Saturation Flow						Inf	Inf
1/2 (A34 (Kingsway, N) Lane 2)	Infinite Saturation Flow						Inf	Inf
2/1 (A34 (Kingsway, N))	3.30	0.00	Y	Arm 3 Left	13.00	13.1 %	1916	1916
				Arm 5 Ahead	Inf	86.9 %		
2/2 (A34 (Kingsway, N))	3.30	0.00	N	Arm 5 Ahead	Inf	100.0 %	2085	2085
2/3 (A34 (Kingsway, N))	3.20	0.00	N	Arm 7 Right	21.00	100.0 %	1937	1937
3/1 (Grangethorpe Drive Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Grangethorpe Drive)	4.00	0.00	Y	Arm 5 Left	10.00	100.0 %	1752	1752
4/2 (Grangethorpe Drive)	3.30	0.00	Y	Arm 1 Right	9.00	38.7 %	1827	1827
				Arm 7 Ahead	Inf	61.3 %		
5/1 (A34 (Kingsway, S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (A34 (Kingsway, S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A34 (Kingsway, S))	5.00	0.00	Y	Arm 7 Left	10.00	100.0 %	1839	1839
6/2 (A34 (Kingsway, S))	3.25	0.00	Y	Arm 1 Ahead	Inf	100.0 %	1940	1940
6/3 (A34 (Kingsway, S))	3.25	0.00	N	Arm 1 Ahead	Inf	100.0 %	2080	2080
6/4 (A34 (Kingsway, S))	3.20	0.00	N	Arm 3 Right	14.00	100.0 %	1874	1874
7/1 (Talbot Road Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Talbot Road)	3.60	0.00	Y	Arm 1 Left	33.00	34.1 %	1910	1910
				Arm 3 Ahead	Inf	52.5 %		
				Arm 5 Right	11.00	13.4 %		

Full Input Data And Results

Scenario 2: '2028 Base + Dev PM' (FG2: '2028 Base + Dev PM', Plan 1: 'Proposed')

Traffic Flows, Desired

Desired Flow :

Origin	Destination					
		A	B	C	D	Tot.
	A	0	100	1396	155	1651
	B	63	0	43	130	236
	C	811	91	0	34	936
	D	91	172	29	0	292
	Tot.	965	363	1468	319	3115

Traffic Lane Flows

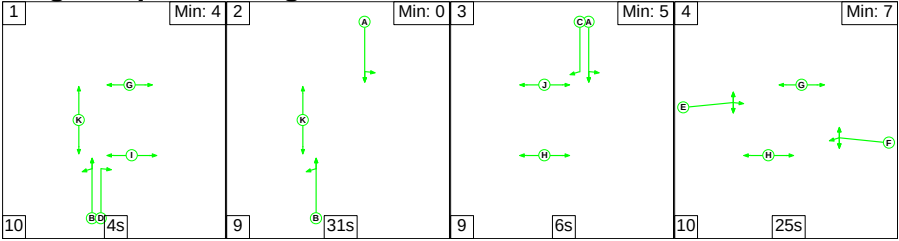
Lane	Scenario 2: 2028 Base + Dev PM
Junction: Kingsway x Talbot Road	
1/1	484
1/2	481
2/1	748
2/2 (with short)	903(In) 748(Out)
2/3 (short)	155
3/1	363
4/1 (short)	43
4/2 (with short)	236(In) 193(Out)
5/1	685
5/2	783
6/1 (short)	34
6/2 (with short)	440(In) 406(Out)
6/3 (with short)	496(In) 405(Out)
6/4 (short)	91
7/1	319
8/1	292

Full Input Data And Results

Lane Saturation Flows

Junction: Kingsway x Talbot 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 (A34 (Kingsway, N) Lane 1)	Infinite Saturation Flow						Inf	Inf
1/2 (A34 (Kingsway, N) Lane 2)	Infinite Saturation Flow						Inf	Inf
2/1 (A34 (Kingsway, N))	3.30	0.00	Y	Arm 3 Left	13.00	13.4 %	1915	1915
				Arm 5 Ahead	Inf	86.6 %		
2/2 (A34 (Kingsway, N))	3.30	0.00	N	Arm 5 Ahead	Inf	100.0 %	2085	2085
2/3 (A34 (Kingsway, N))	3.20	0.00	N	Arm 7 Right	21.00	100.0 %	1937	1937
3/1 (Grangethorpe Drive Lane 1)	Infinite Saturation Flow						Inf	Inf
4/1 (Grangethorpe Drive)	4.00	0.00	Y	Arm 5 Left	10.00	100.0 %	1752	1752
4/2 (Grangethorpe Drive)	3.30	0.00	Y	Arm 1 Right	9.00	32.6 %	1845	1845
				Arm 7 Ahead	Inf	67.4 %		
5/1 (A34 (Kingsway, S) Lane 1)	Infinite Saturation Flow						Inf	Inf
5/2 (A34 (Kingsway, S) Lane 2)	Infinite Saturation Flow						Inf	Inf
6/1 (A34 (Kingsway, S))	5.00	0.00	Y	Arm 7 Left	10.00	100.0 %	1839	1839
6/2 (A34 (Kingsway, S))	3.25	0.00	Y	Arm 1 Ahead	Inf	100.0 %	1940	1940
6/3 (A34 (Kingsway, S))	3.25	0.00	N	Arm 1 Ahead	Inf	100.0 %	2080	2080
6/4 (A34 (Kingsway, S))	3.20	0.00	N	Arm 3 Right	14.00	100.0 %	1874	1874
7/1 (Talbot Road Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Talbot Road)	3.60	0.00	Y	Arm 1 Left	33.00	31.2 %	1922	1922
				Arm 3 Ahead	Inf	58.9 %		
				Arm 5 Right	11.00	9.9 %		

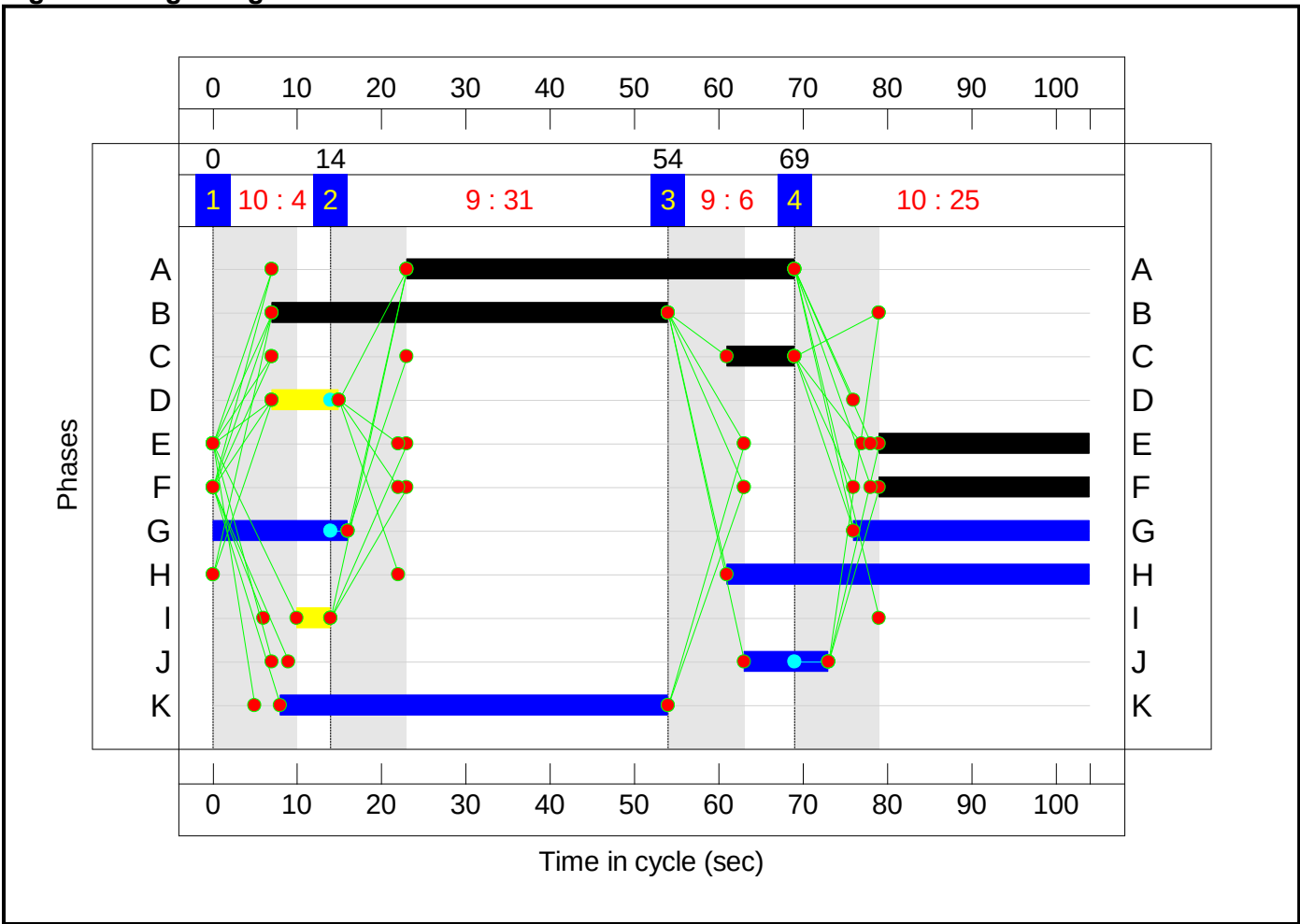
Stage Sequence Diagram



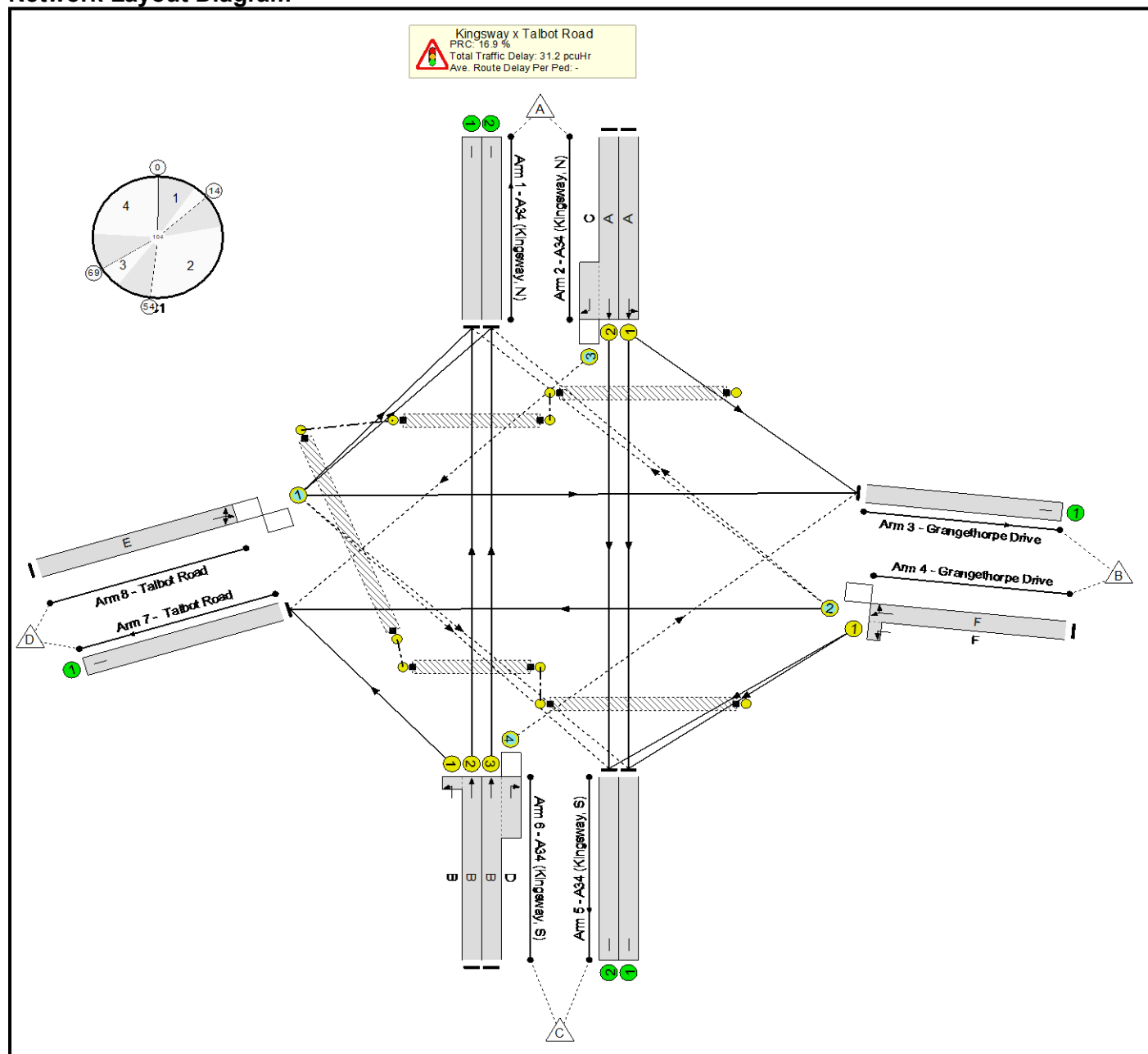
Stage Timings

Stage	1	2	3	4
Duration	4	31	6	25
Change Point	0	14	54	69

Signal Timings Diagram



Full Input Data And Results **Network Layout Diagram**



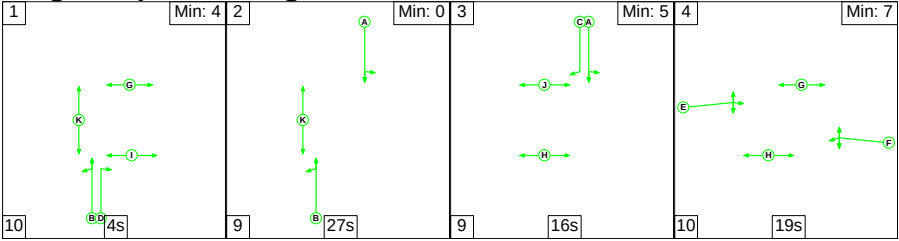
Full Input Data And Results
Network Results

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	-	-	N/A	-	-		-	-	-	-	-	-	77.0 %
Kingsway x Talbot Road	-	-	N/A	-	-		-	-	-	-	-	-	77.0 %
1/1	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	763	Inf	Inf	0.0%
1/2	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	763	Inf	Inf	0.0%
2/1	A34 (Kingsway, N) Left Ahead	U	N/A	N/A	A		1	46	-	487	1916	866	56.2 %
2/2+2/3	A34 (Kingsway, N) Ahead Right	U+O	N/A	N/A	A C		1	46:8	-	607	2085:1937	673+168	72.2 : 72.2 %
3/1	Grange Thorpe Drive	U	N/A	N/A	-		-	-	-	304	Inf	Inf	0.0%
4/2+4/1	Grange Thorpe Drive Right Left Ahead	O+U	N/A	N/A	F		1	25	-	297	1827:1752	339+67	73.1 : 73.1 %
5/1	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	469	Inf	Inf	0.0%
5/2	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	530	Inf	Inf	0.0%
6/2+6/1	A34 (Kingsway, S) Ahead Left	U	N/A	N/A	B		1	47	-	685	1940:1839	864+29	76.8 : 76.8 %
6/3+6/4	A34 (Kingsway, S) Ahead Right	U+O	N/A	N/A	B D		1	47:8	-	743	2080:1874	861+104	77.0 : 77.0 %
7/1	Talbot Road	U	N/A	N/A	-		-	-	-	295	Inf	Inf	0.0%
8/1	Talbot Road Left Ahead Right	O	N/A	N/A	E		1	25	-	305	1910	478	63.9 %
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		1	43	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	4	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	G		1	44	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	10	-	0	-	0	0.0%
Ped Link: P5	Unnamed Ped Link	-	N/A	-	K		1	46	-	0	-	0	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Overs at Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Overs at Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	136	199	3	23.5	7.4	0.3	31.2	-	-	-	-
Kingsway x Talbot Road	-	-	136	199	3	23.5	7.4	0.3	31.2	-	-	-	-
1/1	763	763	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
1/2	763	763	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	487	487	-	-	-	2.8	0.6	-	3.5	25.7	10.3	0.6	10.9
2/2+2/3	607	607	0	119	2	4.4	1.3	0.0	5.6	33.4	11.8	1.3	13.1
3/1	304	304	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2+4/1	297	297	96	0	0	2.9	1.3	0.2	4.4	53.6	7.4	1.3	8.7
5/1	469	469	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	530	530	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2+6/1	685	685	-	-	-	4.5	1.6	-	6.1	31.9	16.3	1.6	18.0
6/3+6/4	743	743	0	80	0	6.1	1.7	0.0	7.7	37.4	17.1	1.7	18.8
7/1	295	295	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	305	305	40	0	1	2.9	0.9	0.0	3.9	45.6	7.8	0.9	8.7
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
C1 PRC for Signalled Lanes (%): 16.9 Total Delay for Signalled Lanes (pcuHr):													
31.18Cycle Time (s): 104													
PRC Over All Lanes (%): 16.9 Total Delay Over All Lanes(pcuHr):													
31.18													

C1	PRC for Signalled Lanes (%):	16.9	Total Delay for Signalled Lanes (pcuHr):
31.18	Cycle Time (s):	104	
	PRC Over All Lanes (%):	16.9	Total Delay Over All Lanes(pcuHr):
		31.18	

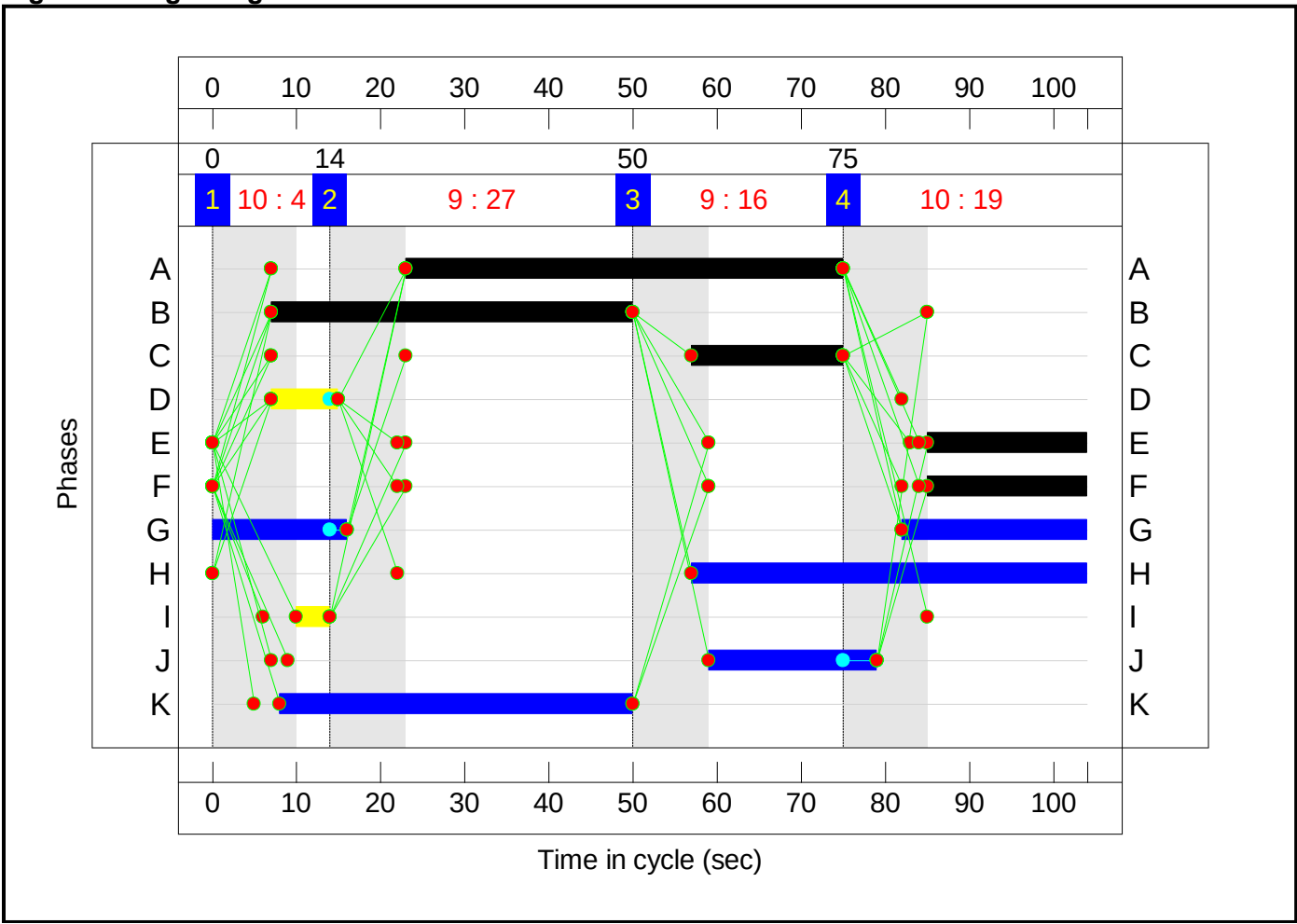
Stage Sequence Diagram



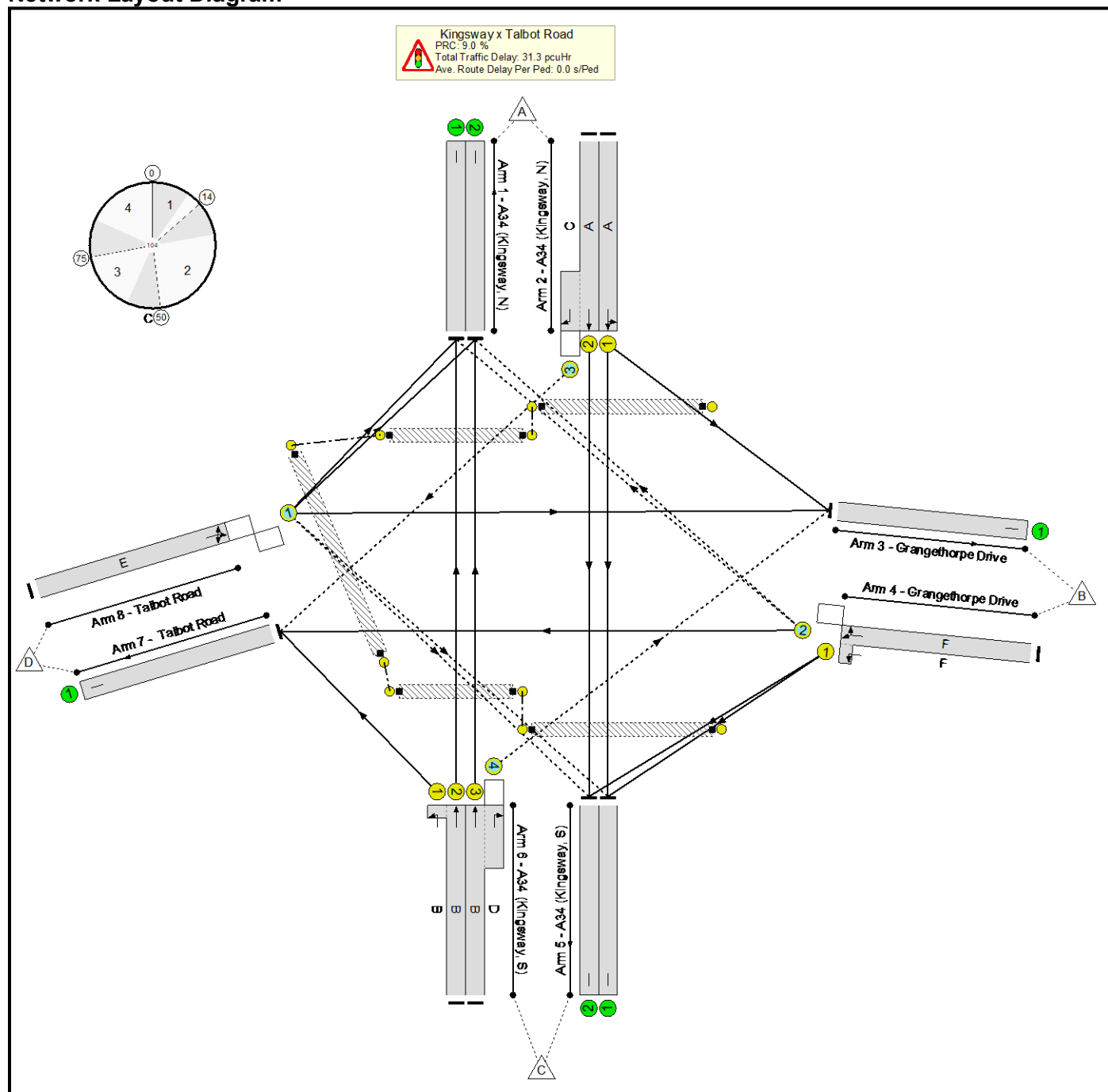
Stage Timings

Stage	1	2	3	4
Duration	4	27	16	19
Change Point	0	14	50	75

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	-	-	N/A	-	-		-	-	-	-	-	-	82.6 %
Kingsway x Talbot Road	-	-	N/A	-	-		-	-	-	-	-	-	82.6 %
1/1	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	484	Inf	Inf	0.0%
1/2	A34 (Kingsway, N)	U	N/A	N/A	-		-	-	-	481	Inf	Inf	0.0%
2/1	A34 (Kingsway, N) Left Ahead	U	N/A	N/A	A		1	52	-	748	1915	976	76.6 %
2/2+2/3	A34 (Kingsway, N) Ahead Right	U+O	N/A	N/A	A C		1	52:18	-	903	2085:1937	906+188	82.6 : 82.6 %
3/1	Grange Thorpe Drive	U	N/A	N/A	-		-	-	-	363	Inf	Inf	0.0%
4/2+4/1	Grange Thorpe Drive Right Left Ahead	O+U	N/A	N/A	F		1	19	-	236	1845:1752	265+59	72.9 : 72.9 %
5/1	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	685	Inf	Inf	0.0%
5/2	A34 (Kingsway, S)	U	N/A	N/A	-		-	-	-	783	Inf	Inf	0.0%
6/2+6/1	A34 (Kingsway, S) Ahead Left	U	N/A	N/A	B		1	43	-	440	1940:1839	754+63	53.8 : 53.8 %
6/3+6/4	A34 (Kingsway, S) Ahead Right	U+O	N/A	N/A	B D		1	43:8	-	496	2080:1874	733+162	55.2 : 56.1 %
7/1	Talbot Road	U	N/A	N/A	-		-	-	-	319	Inf	Inf	0.0%
8/1	Talbot Road Left Ahead Right	O	N/A	N/A	E		1	19	-	292	1922	370	79.0 %
Ped Link: P1	Unnamed Ped Link	-	N/A	-	H		1	47	-	0	-	0	0.0%
Ped Link: P2	Unnamed Ped Link	-	N/A	-	I		1	4	-	0	-	0	0.0%
Ped Link: P3	Unnamed Ped Link	-	N/A	-	G		1	38	-	0	-	0	0.0%
Ped Link: P4	Unnamed Ped Link	-	N/A	-	J		1	20	-	0	-	0	0.0%
Ped Link: P5	Unnamed Ped Link	-	N/A	-	K		1	42	-	0	-	0	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Overs at Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Overs at Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	68	243	27	22.9	8.2	0.2	31.3	-	-	-	-
Kingsway x Talbot Road	-	-	68	243	27	22.9	8.2	0.2	31.3	-	-	-	-
1/1	484	484	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
1/2	481	481	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	748	748	-	-	-	4.3	1.6	-	5.9	28.3	17.2	1.6	18.9
2/2+2/3	903	903	0	152	3	5.9	2.3	0.0	8.2	32.8	20.6	2.3	22.9
3/1	363	363	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
4/2+4/1	236	236	39	0	24	2.5	1.3	0.2	4.0	60.8	6.0	1.3	7.3
5/1	685	685	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/2	783	783	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2+6/1	440	440	-	-	-	2.7	0.6	-	3.3	27.1	9.3	0.6	9.9
6/3+6/4	496	496	0	91	0	4.2	0.6	0.0	4.8	35.0	9.3	0.6	10.0
7/1	319	319	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	292	292	28	0	1	3.2	1.8	0.0	5.1	62.6	8.0	1.8	9.8
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P3	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P4	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P5	0	0	-	-	-	-	-	-	-	-	-	-	-
C1 PRC for Signalled Lanes (%): 9.0 Total Delay for Signalled Lanes (pcuHr):													
31.31Cycle Time (s): 104													
PRC Over All Lanes (%): 9.0 Total Delay Over All Lanes(pcuHr):													
31.31													

C1	PRC for Signalled Lanes (%):	9.0	Total Delay for Signalled Lanes (pcuHr):
31.31	Cycle Time (s):	104	
	PRC Over All Lanes (%):	9.0	Total Delay Over All Lanes(pcuHr):
		31.31	