

Appendix O
TUBA Outputs

Baseline Scenario							
A515/Windmill Road/North Avenue PICADY							
AM PEAK							
A515/Windmill Road/North Avenue PICADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
Windmill Lane	Centre	D	55	0.11	10%	10.25	564
A515 South	Centre	A	320	0.09	8%	8.30	2,656
North Avenue	Centre	B	15	0.03	3%	12.04	181
A515 North		C	357	0.59	29%	7.27	2,595
						Delay Seconds	5,996
	PCU		747	8.03	0.133773762		

Interpeak							
A515/Windmill Road/North Avenue PICADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
Windmill Lane	Centre	D	30	0.06	5%	9.49	285
A515 South	Centre	A	339	0.05	5%	7.71	2,614
North Avenue	Centre	B	12	0.02	2%	10.29	123
A515 North		C	315	0.33	17%	6.17	1,944
						Delay Seconds	4,965
	PCU		696	7.13	0.118903736		

PM PEAK							
A515/Windmill Road/North Avenue PICADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
Windmill Lane	Centre	D	41	0.09	8%	10.25	420
A515 South	Centre	A	440	0.08	8%	8.08	3,555
North Avenue	Centre	B	8	0.01	1%	11.28	90
A515 North		C	330	0.52	26%	7.31	2,412
						Delay Seconds	6,478
	PCU		819	7.91	0.131827228		

Off Peak							
A515/Windmill Road/North Avenue							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
							0
						Delay Seconds	0
	PCU		0	#DIV/0!	#DIV/0!		

A515/Windmill Road/North Avenue PICADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			5995.74	Seconds
Cost Per Hour	1	£21.96	1.67	Hours
Cost Per AM Period	3	£65.89	5.00	
Inter Peak			4965.42	Seconds
Cost Per Hour	1	£17.33	1.38	Hours
Cost Per IP Period	6	£103.98	8.28	
PM Peak			6477.99	Seconds
Cost Per Hour	1	£22.35	1.80	Hours
Cost Per PM Period	3	£67.06	5.40	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£236.92		
Total Cost Per Year		£61,600.35		
Total Overall Cost Per Year		£61,600.35		

Baseline Scenario							
		A515/B5035 King St PICADY					
AM PEAK		A515/B5035 King St PICADY					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A515 North	Centre	A	PCU 252	PCU 0	RFC 0%	on Link 0.00	By Lane 0
B5035 King St	Centre	B	182	0.29	23%	12.07	2,197
A515 South	Centre	C	388	0.56	28%	6.56	2,545
						Delay Seconds	4,742
	PCU		822	5.77	0.096148013		

Interpeak		A515/B5035 King St PICADY					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A515 North	Centre	A	PCU 259	PCU 0	RFC 0%	on Link 0.00	By Lane 0
B5035 King St	Centre	B	120	0.16	14%	10.79	1,295
A515 South	Centre	C	345	0.08	8%	1.97	680
						Delay Seconds	1,974
	PCU		724	2.73	0.045452348		

PM PEAK		A515/B5035 King St PICADY					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A515 North	Centre	A	PCU 245	PCU 0	RFC 0%	on Link 0.00	By Lane 0
B5035 King St	Centre	B	195	0.31	24%	12.64	2,465
A515 South	Centre	C	478	0.78	44%	3.76	1,797
							0
						Delay Seconds	4,262
	PCU		918	4.64	0.077379811		

Off Peak			A515/B5035 King St				
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A608 East	Centre	A	PCU	PCU	RFC	on Link	By Lane
A608 West	Centre	B					
Willow Drive	Centre	C					
						Delay Seconds	
	PCU		0!	#DIV/0!	#DIV/0!		

A515/B5035 King St PICADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			4742.02	Seconds
Cost Per Hour	1	£17.24	1.32	Hours
Cost Per AM Period	3	£51.72	3.95	
Inter Peak			1974.45	Seconds
Cost Per Hour	1	£6.87	0.55	Hours
Cost Per IP Period	6	£41.21	3.29	
PM Peak			4262.08	Seconds
Cost Per Hour	1	£14.68	1.18	Hours
Cost Per PM Period	3	£44.04	3.55	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£136.97		
Total Cost Per Year		£35,613.46		
Total Overall Cost Per Year		£35,613.46		

Baseline Scenario							
AM PEAK		A515/Church StreetLinsing					
		A515/Church StreetLinsing					
		Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
Road	Position	Link	PCU	PCU	RFC	on Link	By Lane
A515 East	Centre	A	0	0	0%	0.00	0
A515 South	Centre	B	194	4.7	49%	39.20	7,605
Church Street	Centre	C	455	8.1	51%	19.10	8,691
						Delay Seconds	14,095
	PCU		649	21.72	0.361978287		

Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak		A515/Church Street Linsing					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A515 East	Centre	A	0	0	0%	0.00	0
A515 South	Centre	B	194	4.6	46%	37.60	7,294
Church Street	Centre	C	406	7.1	46%	19.00	7,714
						Delay Seconds	15,008
	PCU		600	25.01	0.4169		

PM PEAK		A515/Church Street Linsing					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A515 East	Centre	A	PCU	PCU	RFC	on Link	By Lane
			0	0	0%	0.00	
A515 South	Centre	B	194	5	57%	45.40	8,808
Church Street	Centre	C	545	9.7	57%	18.40	10,028
						Delay Seconds	16,820
	PCU		739	22.76	0.379345756		

Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak							
A515/Church Street							
A515/Church StreetLinsing							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
						Delay Seconds	0
PCU			0	#DIV/0!	#DIV/0!		

A515/Church StreetLinsing				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			14095.43	Seconds
Cost Per Hour	1	£51.63	3.92	Hours
Cost Per AM Period	3	£154.90	11.75	
Inter Peak			15008.40	Seconds
Cost Per Hour	1	£52.36	4.17	Hours
Cost Per IP Period	6	£314.16	25.01	
PM Peak			16820.19	Seconds
Cost Per Hour	1	£57.94	4.67	Hours
Cost Per PM Period	3	£173.81	14.02	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£642.86		
Total Cost Per Year		£167,144.76		
Total Overall Cost Per Year		£167,144.76		

Baseline Scenario

A515/St Johns Sreet	PICADY
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AM PEAK

A515/St Johns Sreet PICADY

Link		A515 St Johns Street (North)					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A515 West	Centre	A	580	0	0%	0.00	0
A515 North	Centre	B	210	0.49	33%	7.71	1,611
St Johns St	Centre	C	0	0	0%	0.00	0
						Delay Seconds	1,401

PCU		790	1.77	0.029546867
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Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak

A515/St Johns Sreet	PICADY
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Road		Position	Link	Number PCU	Queue Length PCU	Existing Operation RFC	Delay Seconds on Link	Total Delay By Lane
A515 West	Centre	A		531	0	0%	0.00	
A515 North	Centre	B		274	0.73	43%	8.84	2,42
St Johns St	Centre	C		0	0	0%	0.00	
							Delay Seconds	2,42

PCU		805	3.01	0.05014824
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PM PEAK

A515/St. Johns Street	PICADY
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NEW PEAK		A515 ST JOHNS STREET			TOTAL DELAY		
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A515 West	Centre	A	670	PCU	RFC	on Link	By Lane
				0	0%	0.00	0
A515 North	Centre	B	231	0.57	37%	8.19	1,899
St Johns St	Centre	C	0	0	0%	0.00	0
							0
						Delay Seconds	1.68

PCU		901	1.88	0.031251531
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Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak

A515/St. Johns Street

Main Road		Access Points					Total Delay	
Road	Position	Link	Number PCU	Queue Length PCU	Existing Operation RFC	Delay Seconds on Link	Total Delay By Lane	
A608 East	Centre	A						
A608 West	Centre	B						
Willow Drive	Centre	C						
						Delay Seconds		

PCU		0	#DIV/0!	#DIV/0!
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A15/St Johns Sreet PICADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			1400.52	Seconds
Cost Per Hour	1	£5.13	0.39	Hours
Cost Per AM Period	3	£15.39	1.17	
Inter Peak			2422.16	Seconds
Cost Per Hour	1	£8.45	0.67	Hours
Cost Per IP Period	6	£50.70	4.04	
PM Peak			1689.46	Seconds
Cost Per Hour	1	£5.82	0.47	Hours
Cost Per PM Period	3	£17.46	1.41	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£83.55		
Total Cost Per Year		£21,722.87		

Total Overall Cost Per Year	£21,722.87
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Baseline Scenario						
Cockayne Rd/Park Rd/St Jo PICADY						
AM PEAK						
Cockayne Rd/Park Rd/St Johns StPICADY						
Road	Position	Link	Number	Queue Length	Existing Operation	Total Delay
			PCU	PCU	RFC	By Lane
Cockayne Rd	Centre	C	274	0	0%	0
Park Rd	Centre	A	298	0	0%	0
St Johns St	Centre	B	367	1.15	54%	5,949
					Delay Seconds	5,146
PCU			939	5.48	0.091337337	

Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak						
Cockayne Rd/Park Rd/St Johns St PICADY						
Road	Position	Link	Number	Queue Length	Existing Operation	Total Delay
			PCU	PCU	RFC	By Lane
Cockayne Rd	Centre	C	198	0	0%	0
Park Rd	Centre	A	168	0	0%	0
St Johns St	Centre	B	410	1.56	61%	6,929
					Delay Seconds	6,929
PCU			776	8.93	0.148818729	

PM PEAK						
Cockayne Rd/Park Rd/St Johns St PICADY						
Road	Position	Link	Number	Queue Length	Existing Operation	Total Delay
			PCU	PCU	RFC	By Lane
Cockayne Rd	Centre	C	245	0	0%	0
Park Rd	Centre	A	196	0	0%	0
St Johns St	Centre	B	360	1.15	54%	5,292
					Delay Seconds	4,726
PCU			801	5.90	0.098330337	

Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak						
Cockayne Rd/Park Rd/St Johns St						
Road	Position	Link	Number	Queue Length	Existing Operation	Total Delay
			PCU	PCU	RFC	By Lane
A608 East	Centre	A				0
A608 West	Centre	B				0
Willow Drive	Centre	C				0
					Delay Seconds	0
PCU			0	#DIV/0!	#DIV/0!	

Cockayne Rd/Park Rd/St Johns StPICADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			5145.95	Seconds
Cost Per Hour	1	£18.39	1.43	Hours
Cost Per AM Period	3	£55.16	4.29	
Inter Peak			6929.00	Seconds
Cost Per Hour	1	£23.80	1.92	Hours
Cost Per IP Period	6	£142.78	11.55	
PM Peak			4725.76	Seconds
Cost Per Hour	1	£16.09	1.31	Hours
Cost Per PM Period	3	£48.27	3.94	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£246.21		
Total Cost Per Year		£64,014.69		
Total Overall Cost Per Year		£64,014.69		

Baseline Scenario

Park Rd/Belper Rd/Sturston Linsing

AM PEAK

Park Rd/Belper Rd/Sturston Rd Linsing

Link		Park Rd/Belper Rd/Sturston Rd - Existing					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
Park Rd	Centre	A	PCU	PCU	RFC	on Link	By Lane
			514	11.3	67%	27.60	14,186
Belper Rd	Centre	B	364	6.2	42%	21.50	7,826
Sturston Rd	Centre	C	429	7.9	49%	29.60	12,698
						Delay Seconds	30,025

PCU		1307	22.97	0.382872252
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Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak

Park Rd/Belper Rd/Sturston Rd	Linsing
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Road	Position	Link	Number PCU	Queue Length PCU	Existing Operation RFC	Delay Seconds on Link	Total Delay By Lane
Park Rd	Centre	A	541	11.6	68%	26.10	14,120
Belper Rd	Centre	B	205	3.3	23%	19.20	3,936
Sturston Rd	Centre	C	328	6.3	40%	29.80	9,774
						Delav Seconds	27,831

PCU		1074	25.91	0.431882371
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PM PEAK

Park Rd/Belper Rd/Sturston Rd	Linsing
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Link Peak		Park Rd/Belper Rd/Sturston Rd		Existing		Delay Seconds		Total Delay	
Road	Position	Link	Number	Queue Length	Existing Operation				
Park Rd	Centre	A	PCU	PCU	RFC		on Link		By Lane
			515	11.3	68%		27.60		14,214
Belper Rd	Centre	B	252	4	27%		18.40		4,637
Sturston Rd	Centre	C	428	8.2	49%		29.00		12,412
									0
							Delay Seconds		27,918

PCU		1195	23.36	0.389367927
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Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak

Park Rd/Belper Rd/Sturston Rd

Road			Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
	Position	Link	PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
							0
						Delay Seconds	0

PCU		0	#DIV/0!	#DIV/0!
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Park Rd/Belper Rd/Sturston Rd Linsing				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			30024.84	Seconds
Cost Per Hour	1	£107.33	8.34	Hours
Cost Per AM Period	3	£322.00	25.02	
Inter Peak			27830.50	Seconds
Cost Per Hour	1	£95.27	7.73	Hours
Cost Per IP Period	6	£571.61	46.38	
PM Peak			27917.68	Seconds
Cost Per Hour	1	£95.32	7.75	Hours
Cost Per PM Period	3	£285.95	23.26	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£1,179.57		
Total Cost Per Year		£306,687.28		

Total Overall Cost Per Year	£306,687.28
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Baseline Scenario							
A515/Sturston Rd/Derby Rd. Linsing							
AM PEAK							
A515/Sturston Rd/Derby Rd/Old Hill Linsing							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	PRC	on Link	By Lane
A515 West	Centre	A	342	6.4	44%	23.10	7,900
A515 North	Centre	B	65	1.3	13%	29.30	1,905
Sturston Rd	Centre	C	742	20.5	89%	34.70	25,747
Derby Rd		D	360	11.1	85%	58.50	21,060
Old Hill		E	1	0	0%	0.00	0
						Delay Seconds	48,969
PCU			1510	32.43	0.540501838		

Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak							
A515/Sturston Rd/Derby Rd/Old Hill Linsing							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	PRC	on Link	By Lane
A515 West	Centre	A	332	6	41%	22.30	7,404
A515 North	Centre	B	43	0.9	10%	30.90	31
Sturston Rd	Centre	C	659	15.9	77%	20.40	13,444
Derby Rd		D	310	9	79%	53.70	16,647
Old Hill		E	0	0	0%	0.00	0
						Delay Seconds	37,525
PCU			1344	27.92	0.465341022		

PM PEAK							
A515/Sturston Rd/Derby Rd/Old Hill Linsing							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	PRC	on Link	By Lane
A515 West	Centre	A	430	8.9	65%	30.20	12,986
A515 North	Centre	B	68	1.3	14%	29.40	1,999
Sturston Rd	Centre	C	675	17.6	83%	28.40	19,170
Derby Rd		D	359	10.8	83%	56.30	20,212
Old Hill		E	0	0	0%	0.00	0
						Delay Seconds	48,550
PCU			1532	31.69	0.528172777		

Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak							
A515/Sturston Rd/Derby Rd/Old Hill							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
							0
						Delay Seconds	0
PCU			0	#DIV/0!	#DIV/0!		

A515/Sturston Rd/Derby Rd/Old Hill Linsing				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			48969.47	Seconds
Cost Per Hour	1	£175.47	13.60	Hours
Cost Per AM Period	3	£526.42	40.81	
Inter Peak			37525.10	Seconds
Cost Per Hour	1	£128.19	10.42	Hours
Cost Per IP Period	6	£769.11	62.54	
PM Peak			48549.64	Seconds
Cost Per Hour	1	£165.76	13.49	Hours
Cost Per PM Period	3	£497.28	40.46	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£1,792.81		
Total Cost Per Year		£466,131.86		
Total Overall Cost Per Year		£466,131.86		

Baseline Scenario							
		Derby Rd/A52		ARCADY			
AM PEAK		Derby Rd/A52 ARCADY					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A52 West	Centre	A	415	0.35	26%	2.69	1,116
A52 East	Centre	B	423	0.3	23%	2.34	990
Derby Road	Centre	C	545	0.89	47%	5.36	2,921
						Delay Seconds	4,349
	PCU		1383	3.14	0.052406303		

Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak							
Derby Rd/A52 ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A52 West	Centre	A	324	0.31	24%	2.53	820
A52 East	Centre	B	404	0.21	18%	2.17	877
Derby Road	Centre	C	377	0.46	32%	4.00	1,508
						Delay Seconds	3,204
PCU			1105	2.90	0.048331825		

PM PEAK							
Derby Rd/A52 ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A52 West	Centre	A	478	0.62	38%	3.31	1,582
A52 East	Centre	B	610	0.37	27%	2.55	1,556
Derby Road	Centre	C	613	1.16	54%	6.25	3,831
							0
						Delay Seconds	6,223
PCU			1701	3.66	0.06097643		

Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak							
Derby Rd/A52 ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
							0
							0
						Delay Seconds	0
PCU			0	#DIV/0!	#DIV/0!		

Derby Rd/A52 ARCADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			4348.68	Seconds
Cost Per Hour	1	£15.73	1.21	Hours
Cost Per AM Period	3	£47.19	3.62	
Inter Peak			3204.40	Seconds
Cost Per Hour	1	£11.10	0.89	Hours
Cost Per IP Period	6	£66.62	5.34	
PM Peak			6223.25	Seconds
Cost Per Hour	1	£21.29	1.73	Hours
Cost Per PM Period	3	£63.86	5.19	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£177.68		
Total Cost Per Year		£46,196.68		
Total Overall Cost Per Year		£46,196.68		

Baseline Scenario

A515/ Station Road	ARCADY
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AM PEAK

A515/ Station Road ARCADY

Link		PC10 Station Road - A515					
			Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
Road	Position	Link	PCU	PCU	RFC	on Link	By Lane
A515 East	Centre	C	381	1.7	63%	14.89	5,673
A515 West	Centre	A	483	1.7	63%	11.69	5,646
Station Road	Centre	B	71	0.19	16%	8.79	624
						Delay Seconds	10,331

PCI		935	11.05	0.184154799
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Interpeak

A515/ Station Road ARCADY

		Number		Queue Length	Existing Operation	Delay Seconds	Total Delay
Road	Position	Link	PCU	PCU	RFC	on Link	By Lane
A515 East	Centre	C	408	2.39	71%	19.74	8,054
A515 West	Centre	A	460	1.51	61%	10.88	5,005
Station Road	Centre	B	171	0.56	36%	10.79	1,845
						Delay Seconds	14,904

PCU		1039	14.34	0.239072987
-----	--	------	-------	-------------

PM PEAK

A515/ Station Road ARCADY

Five Year		A515 Station Road - A Road					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A515 East	Centre	C	400	2.29	70%	19.29	7,716
A515 West	Centre	A	460	1.49	60%	10.71	4,927
Station Road	Centre	B	197	0.7	42%	11.80	2,325
							0
						Delay Seconds	13,366

BCU		1057	12.64	0.210749126
-----	--	------	-------	-------------

Off Peak

A515/ Station Road ARCADY

On Peak		7:15 Station Road - A608				
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds
			PCU	PCU	RFC	on Link
A608 East	Centre	A				
A608 West	Centre	B				
Willow Drive	Centre	C				
						Delay Seconds
						0

PCI		0	#DIV/0!	#DIV/0!
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A515/ Station Road ARCADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			10331.08	Seconds
Cost Per Hour	1	£37.15	2.87	Hours
Cost Per AM Period	3	£111.46	8.61	
Inter Peak			14903.81	Seconds
Cost Per Hour	1	£50.73	4.14	Hours
Cost Per IP Period	6	£304.40	24.84	
PM Peak			13365.71	Seconds
Cost Per Hour	1	£45.65	3.71	Hours
Cost Per PM Period	3	£136.95	11.14	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£552.81		
Total Cost Per Year		£143,731.63		

Total Overall Cost Per Year	£143,731.63
------------------------------------	--------------------

Baseline Scenario							
Church Street/ Station Road PICADY							
AM PEAK							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
Church Street East	Centre	A	21	0	0%	0.00	0
Station Road	Centre	B	209	0.47	32%	8.82	1,843
Church Street West	Centre	C	326	0.11	7%	4.82	1,571
						Delay Seconds	2,954
PCU			556	5.31	0.088540632		

Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak							
Church Street/ Station Ro: PICADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
Church Street East	Centre	A	37	0	0%	0.00	0
Station Road	Centre	B	234	0.57	36%	9.12	2,134
Church Street West	Centre	C	231	0.12	8%	5.20	1,201
						Delay Seconds	3,335
PCU			502	6.64	0.110733068		

PM PEAK							
Church Street/ Station Ro: PICADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
Church Street East	Centre	A	42	0	0%	0.00	0
Station Road	Centre	B	278	0.84	46%	11.05	3,072
Church Street West	Centre	C	321	0.78	44%	3.76	1,207
							0
						Delay Seconds	3,821
PCU			641	5.96	0.099350546		

Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak							
Church Street/ Station Road							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
							0
						Delay Seconds	0
PCU			0	#DIV/0!	#DIV/0!		

Church Street/ Station Road PICADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			2953.72	Seconds
Cost Per Hour	1	£10.64	0.82	Hours
Cost Per AM Period	3	£31.91	2.46	
Inter Peak			3335.28	Seconds
Cost Per Hour	1	£11.39	0.93	Hours
Cost Per IP Period	6	£68.33	5.56	
PM Peak			3821.02	Seconds
Cost Per Hour	1	£13.01	1.06	Hours
Cost Per PM Period	3	£39.03	3.18	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£139.28		
Total Cost Per Year		£36,212.22		
Total Overall Cost Per Year		£36,212.22		

Baseline Scenario							
		A52/Mayfield		ARCADY			
AM PEAK		A52/Mayfield ARCADY					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A52 North	Centre	A	PCU 413	PCU 0.4	RFC 29%	on Link 3.19	By Lane 1,317
A52 West	Centre	B	572	0.67	40%	3.86	2,208
Mayfield Road	Centre	C	288	0.37	27%	4.18	1,204
						Delay Seconds	4,091
	PCU		1273	3.21	0.053558313		

Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak							
A52/Mayfield ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A52 North	Centre	A	420	0.41	29%	3.17	1,331
A52 West	Centre	B	428	0.42	30%	3.25	1,391
Mayfield Road	Centre	C	197	0.21	18%	3.53	695
						Delay Seconds	3,418
PCU			1045	3.27	0.054510526		

PM PEAK							
A52/Mayfield ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A52 North	Centre	A	617	0.77	44%	4.09	2,524
A52 West	Centre	B	560	0.65	40%	3.82	2,139
Mayfield Road	Centre	C	328	0.45	31%	4.47	1,466
						Delay Seconds	5,473
PCU			1505	3.64	0.060610175		

Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak							
A52/Mayfield ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
						Delay Seconds	0
PCU			0	#DIV/0!	#DIV/0!		

A52/Mayfield ARCADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			4090.78	Seconds
Cost Per Hour	1	£14.69	1.14	Hours
Cost Per AM Period	3	£44.07	3.41	
Inter Peak			3417.81	Seconds
Cost Per Hour	1	£11.73	0.95	Hours
Cost Per IP Period	6	£70.40	5.70	
PM Peak			5473.10	Seconds
Cost Per Hour	1	£18.69	1.52	Hours
Cost Per PM Period	3	£56.06	4.56	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£170.53		
Total Cost Per Year		£44,338.55		
Total Overall Cost Per Year		£44,338.55		

Baseline Scenario							
		A515/A52		ARCADY			
AM PEAK		A515/A52 ARCADY					
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
A515 East	Centre	A	PCU 415	PCU 0.57	RFC 37%	on Link 4.54	By Lane 1,884
A52 South	Centre	B	376	0.54	35%	4.71	1,771
A515 West	Centre	C	466	0.31	24%	2.19	1,021
A52 North	Centre	D	614	1.27	56%	6.80	4,175
						Delay Seconds	7,656
		PCU	1871	4.09	0.068198308		

Note: A factor of 0.865 has been applied to translate peak hour delays to peak period delays

Interpeak							
A515/A52 ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A515 East	Centre	A	494	0.66	40%	4.36	2,154
A52 South	Centre	B	312	0.41	29%	4.30	1,342
A515 West	Centre	C	410	0.27	21%	2.14	877
A52 North	Centre	D	488	0.75	43%	5.07	2,474
						Delay Seconds	6,847
PCU			1704	4.02	0.066969875		

PM PEAK							
A515/A52 ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A515 East	Centre	A	538	0.86	46%	5.24	2,819
A52 South	Centre	B	562	1.15	54%	6.73	3,782
A515 West	Centre	C	494	0.4	28%	2.62	1,294
A52 North	Centre	D	667	1.66	63%	8.20	5,469
						Delay Seconds	11,935
PCU			2261	5.28	0.087977286		

Note: A factor of 0.893 has been applied to translate peak hour delays to peak period delays

Off Peak							
A515/A52 ARCADY							
Road	Position	Link	Number	Queue Length	Existing Operation	Delay Seconds	Total Delay
			PCU	PCU	RFC	on Link	By Lane
A608 East	Centre	A					0
A608 West	Centre	B					0
Willow Drive	Centre	C					0
							0
						Delay Seconds	0
PCU			0	#DIV/0!	#DIV/0!		

A515/A52 ARCADY				
Total Delays	Number of Hours	Cost (2010 Market)	Delay	
AM Peak			7655.94	Seconds
Cost Per Hour	1	£26.84	2.13	Hours
Cost Per AM Period	3	£80.53	6.38	
Inter Peak			6847.00	Seconds
Cost Per Hour	1	£23.59	1.90	Hours
Cost Per IP Period	6	£141.55	11.41	
PM Peak			11935.00	Seconds
Cost Per Hour	1	£40.86	3.32	Hours
Cost Per PM Period	3	£122.58	9.95	
Off Peak			0.00	Seconds
Cost Per Hour	1	£0.00	0.00	Hours
Cost Per OP Period	12	£0.00	0.00	
Total Cost Per Day	24	£344.66		
Total Cost Per Year		£89,610.48		
Total Overall Cost Per Year		£89,610.48		

Appendix P
Forecast Traffic Flow Diagrams (Non Bypass)

Figure 9: Forecast Traffic Flows (Without Bypass) - AM Peak in PCUs/s

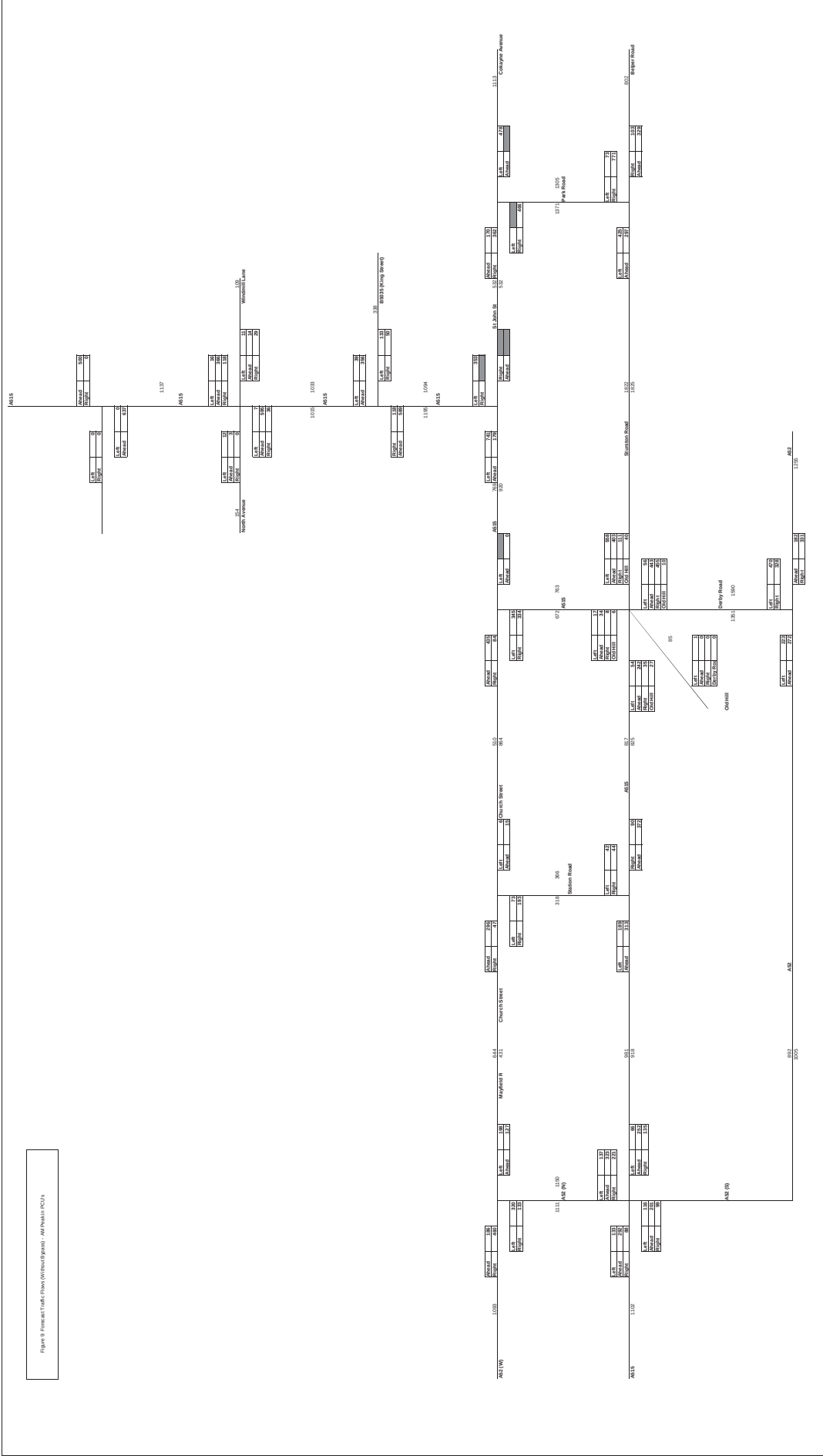


Figure 20: Proposed Traffic Flow (Without Bypass) - PM Peak in Q2/24

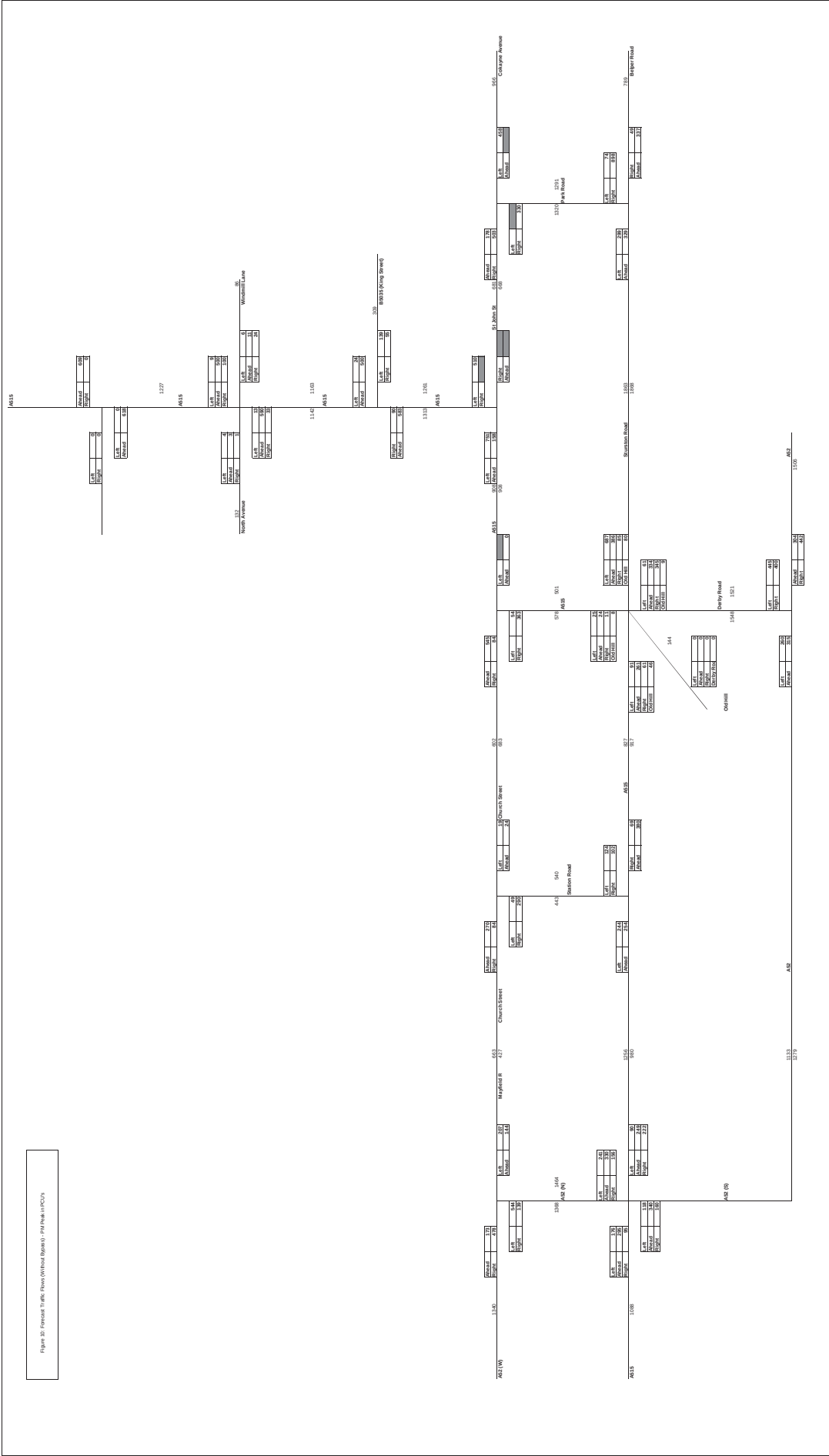
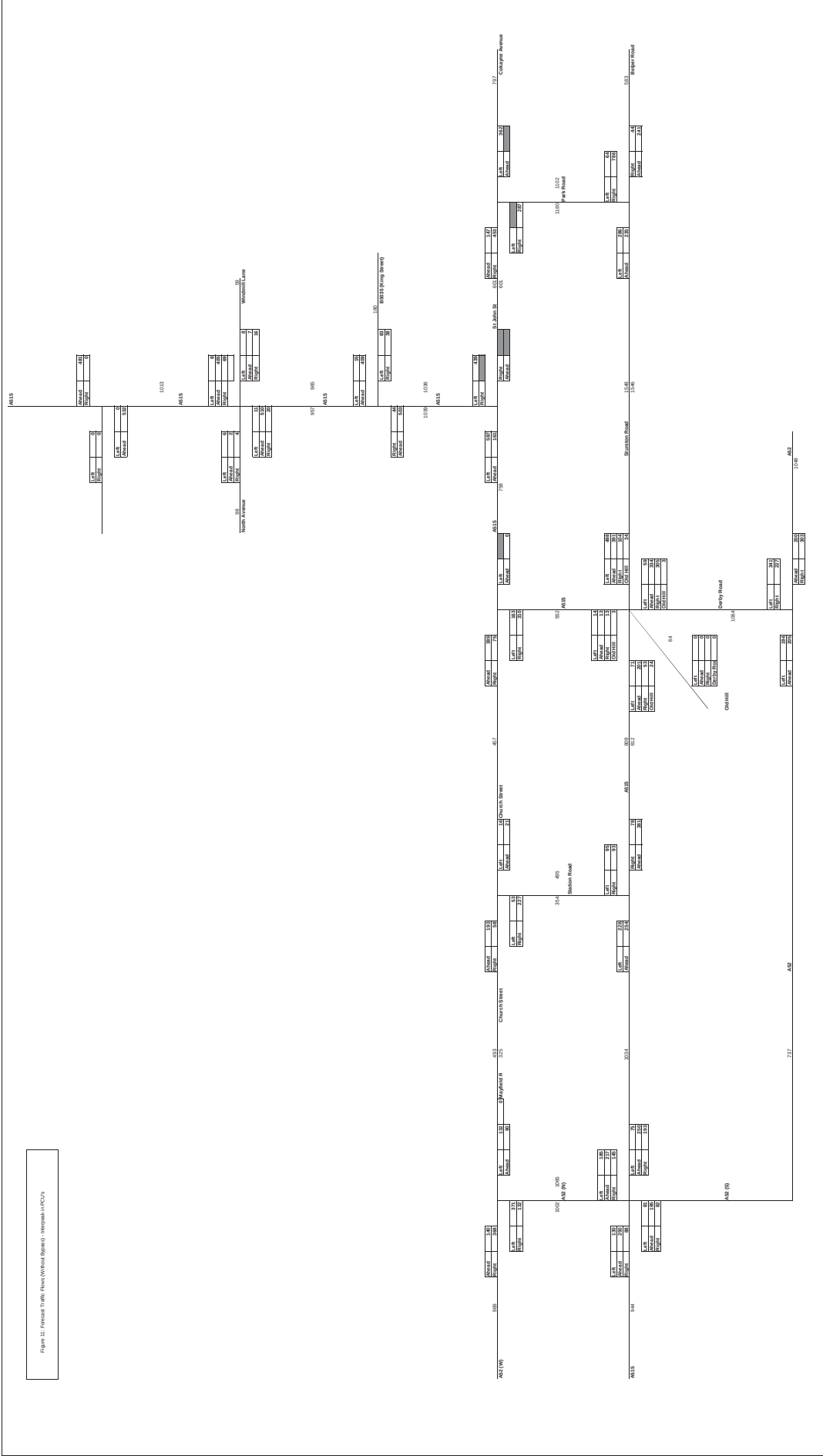


Figure 11: Forecast Traffic Flows (Without Bypass) - Interpeak in PCU's



Appendix Q
Drawings of Bypass Options

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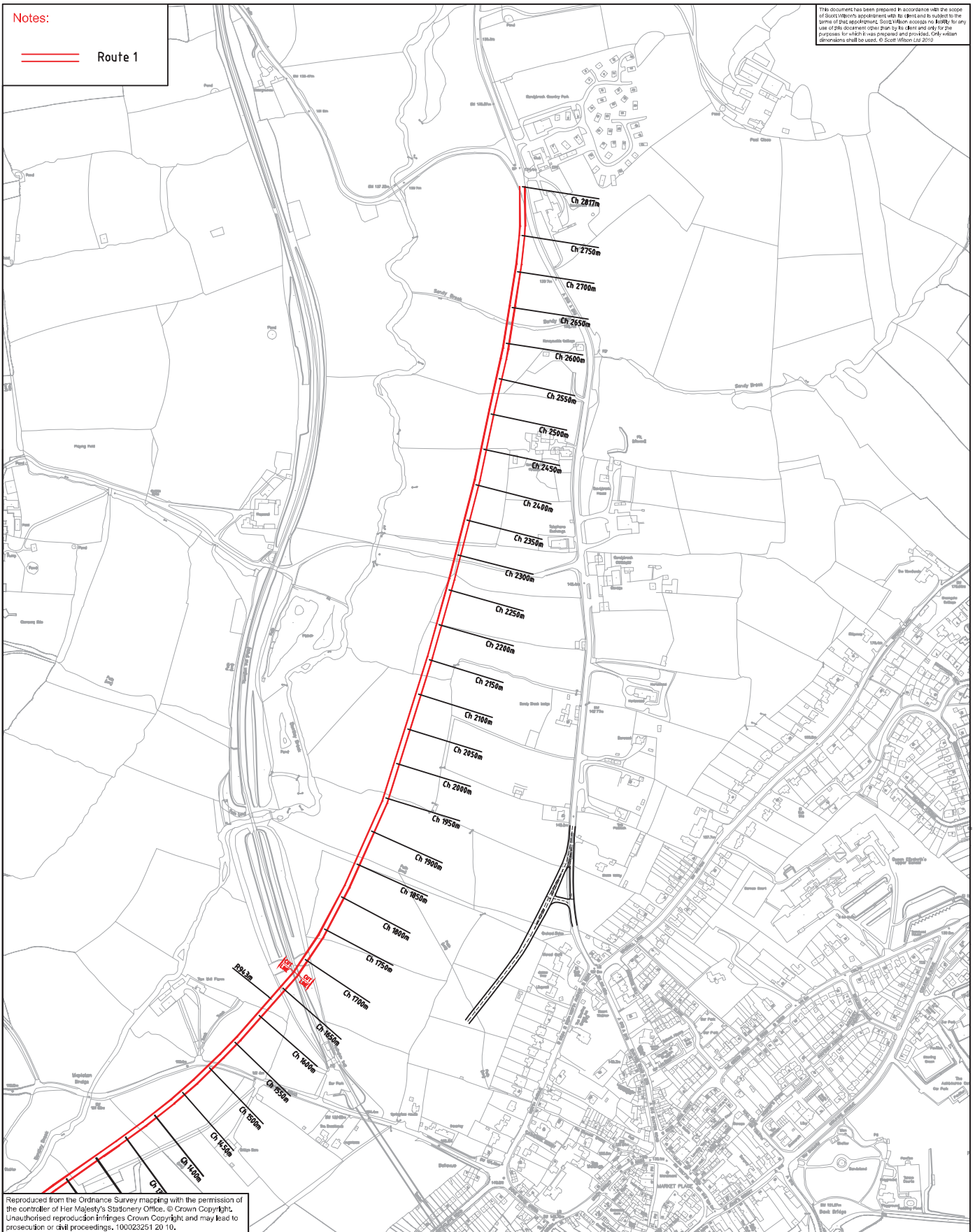
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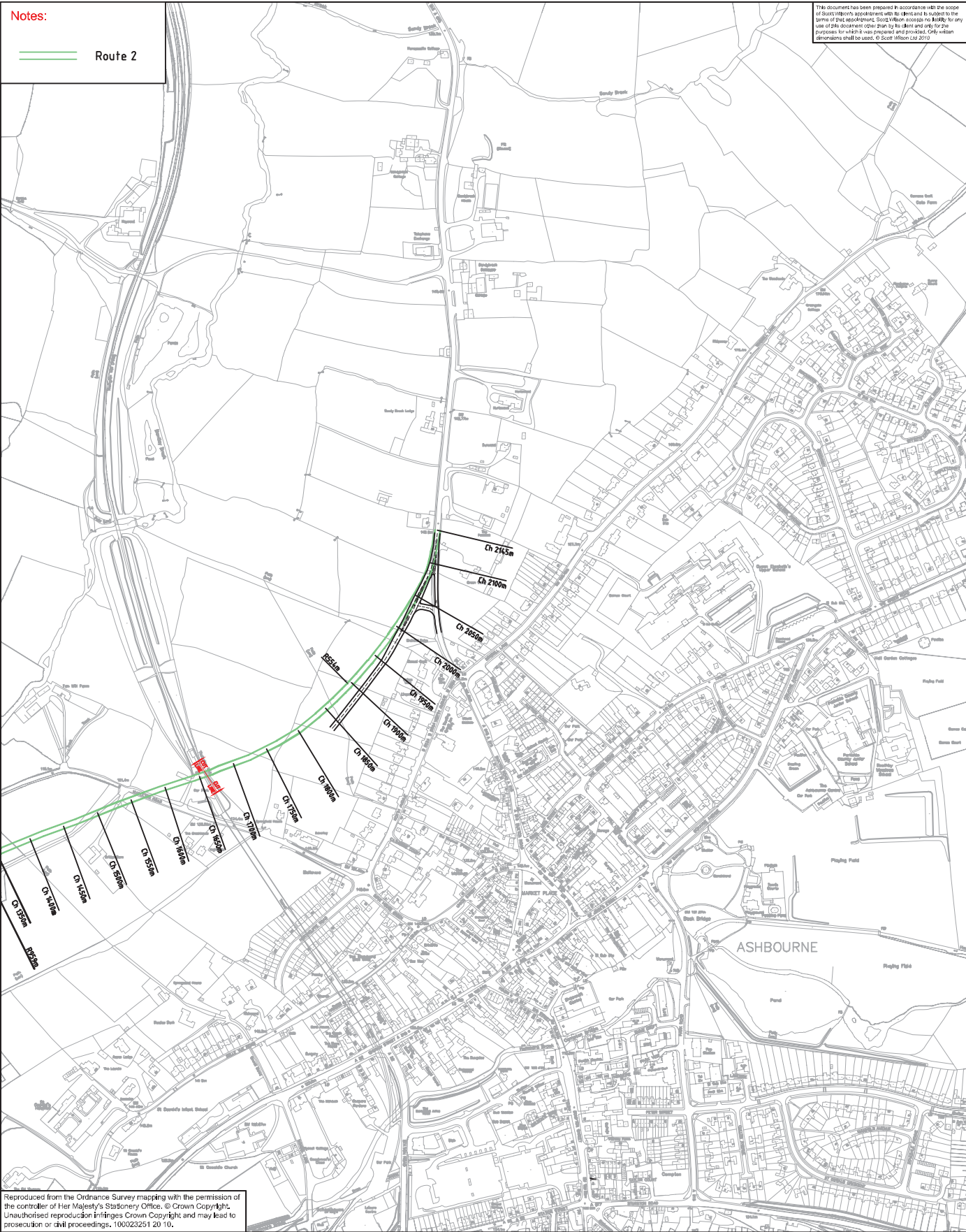
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- Route 3

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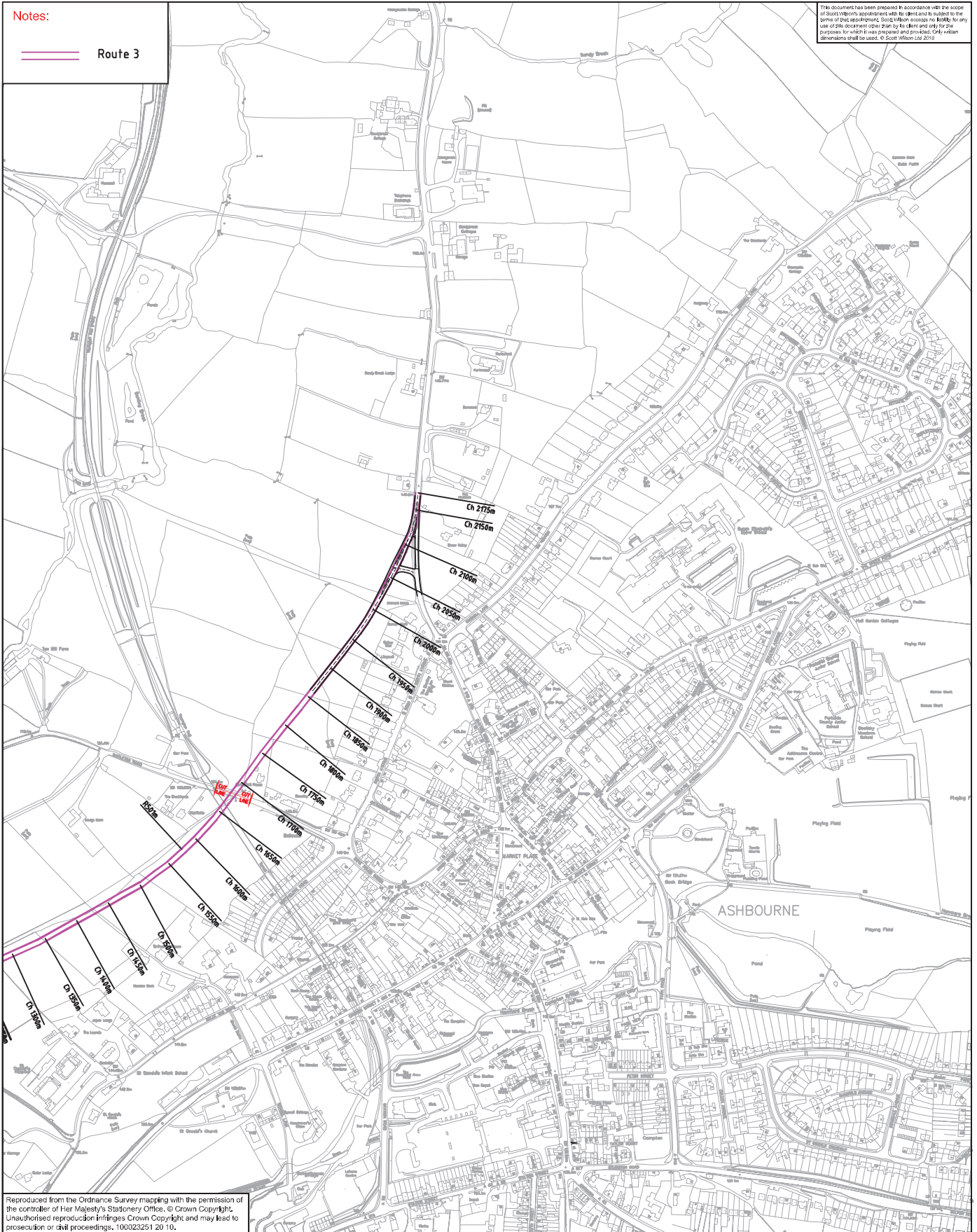
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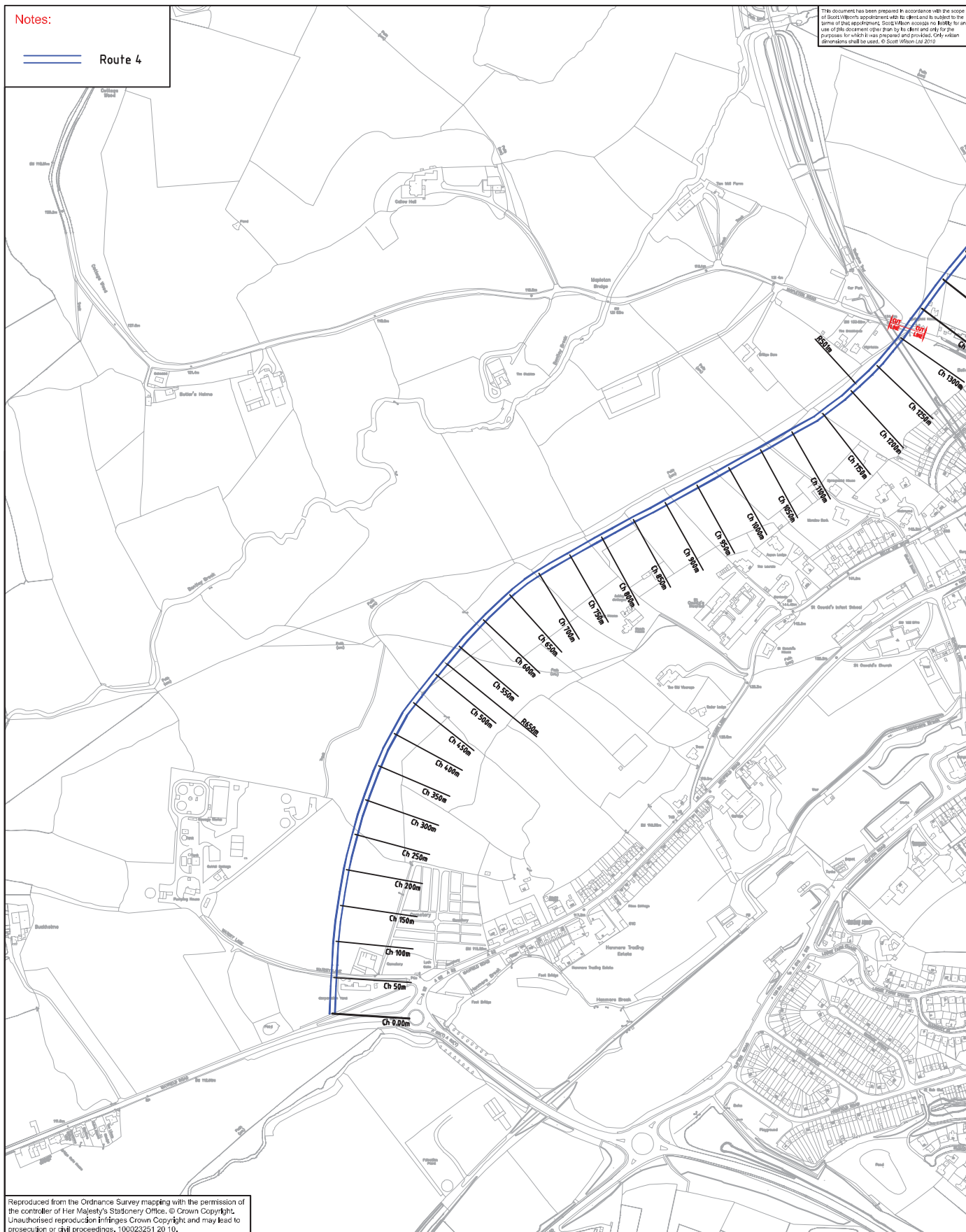
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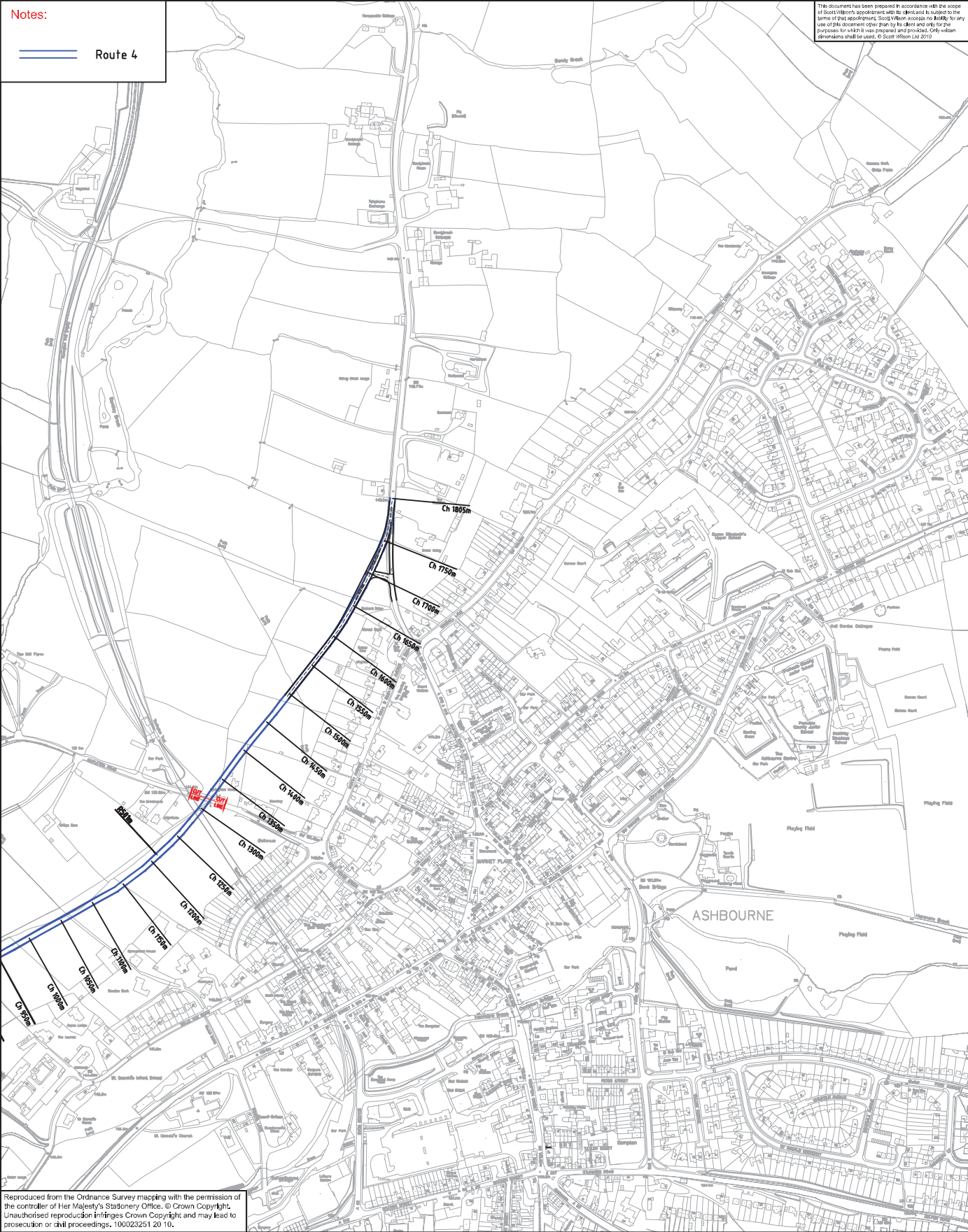
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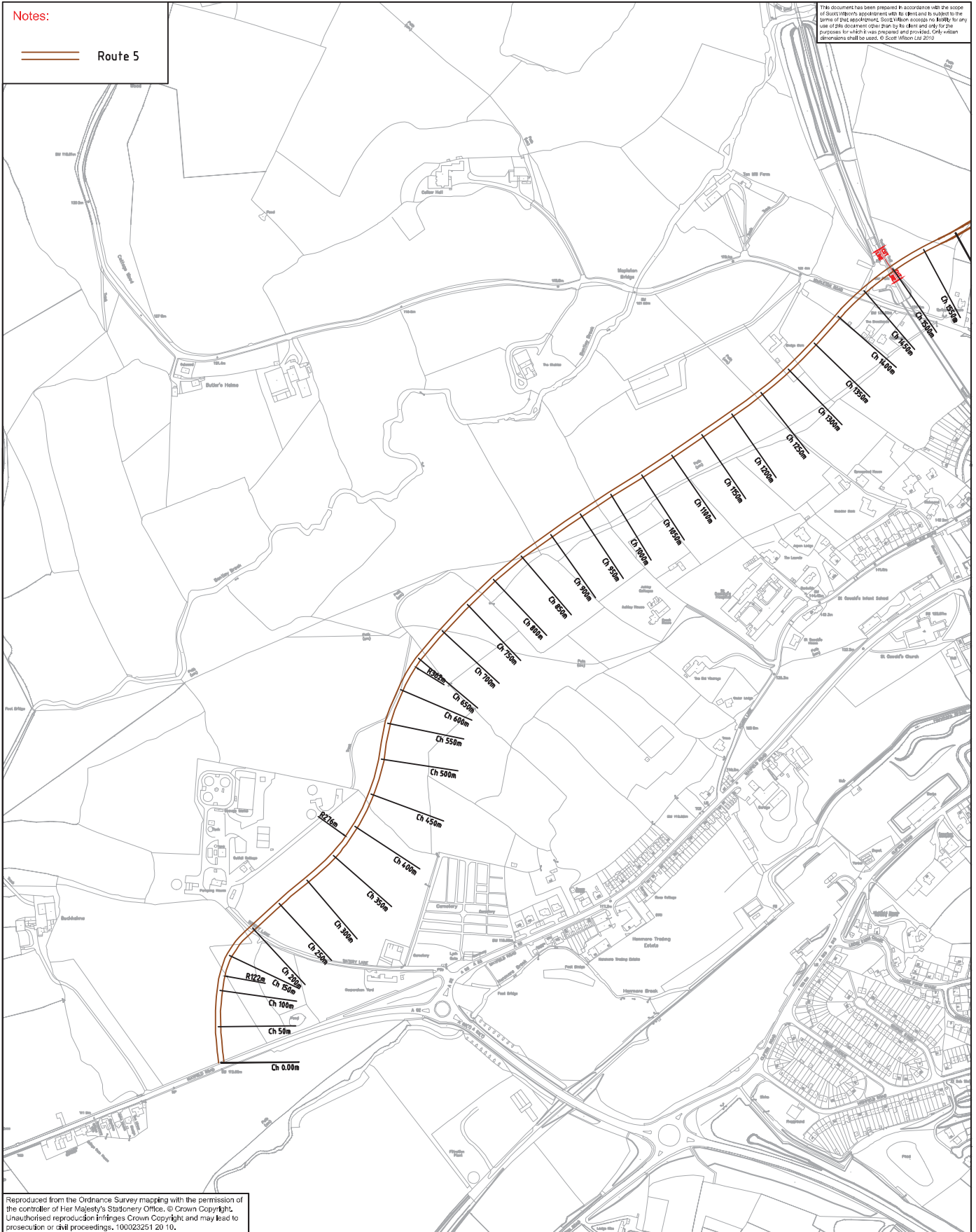
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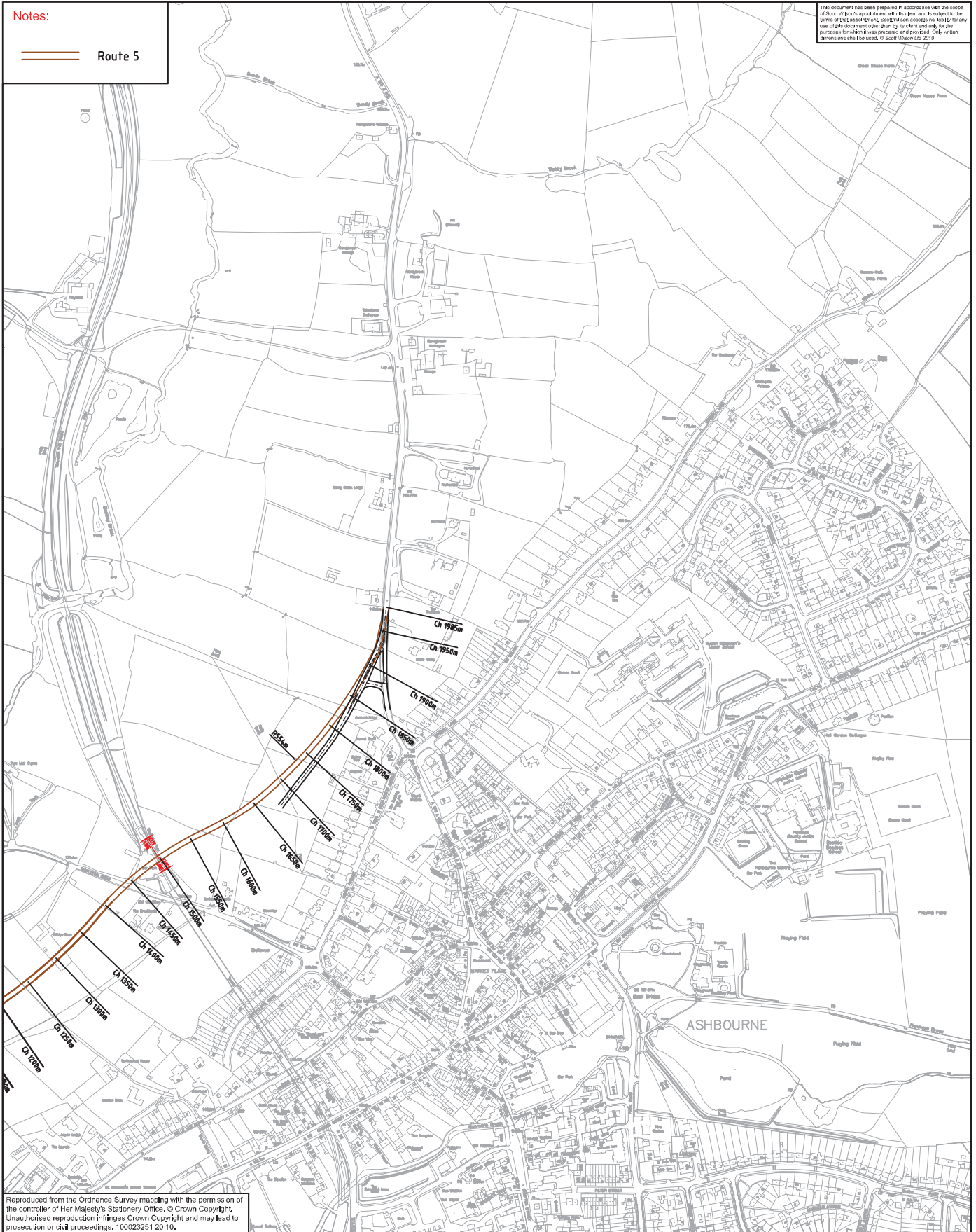
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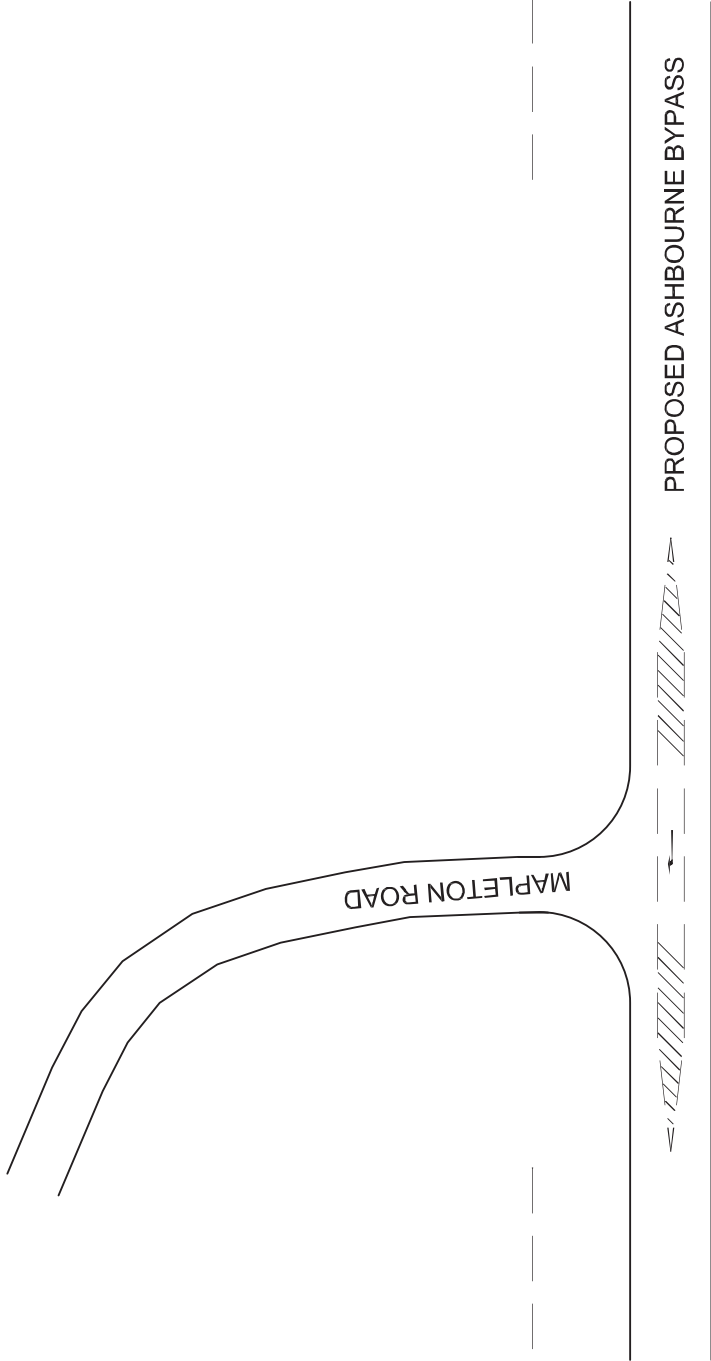
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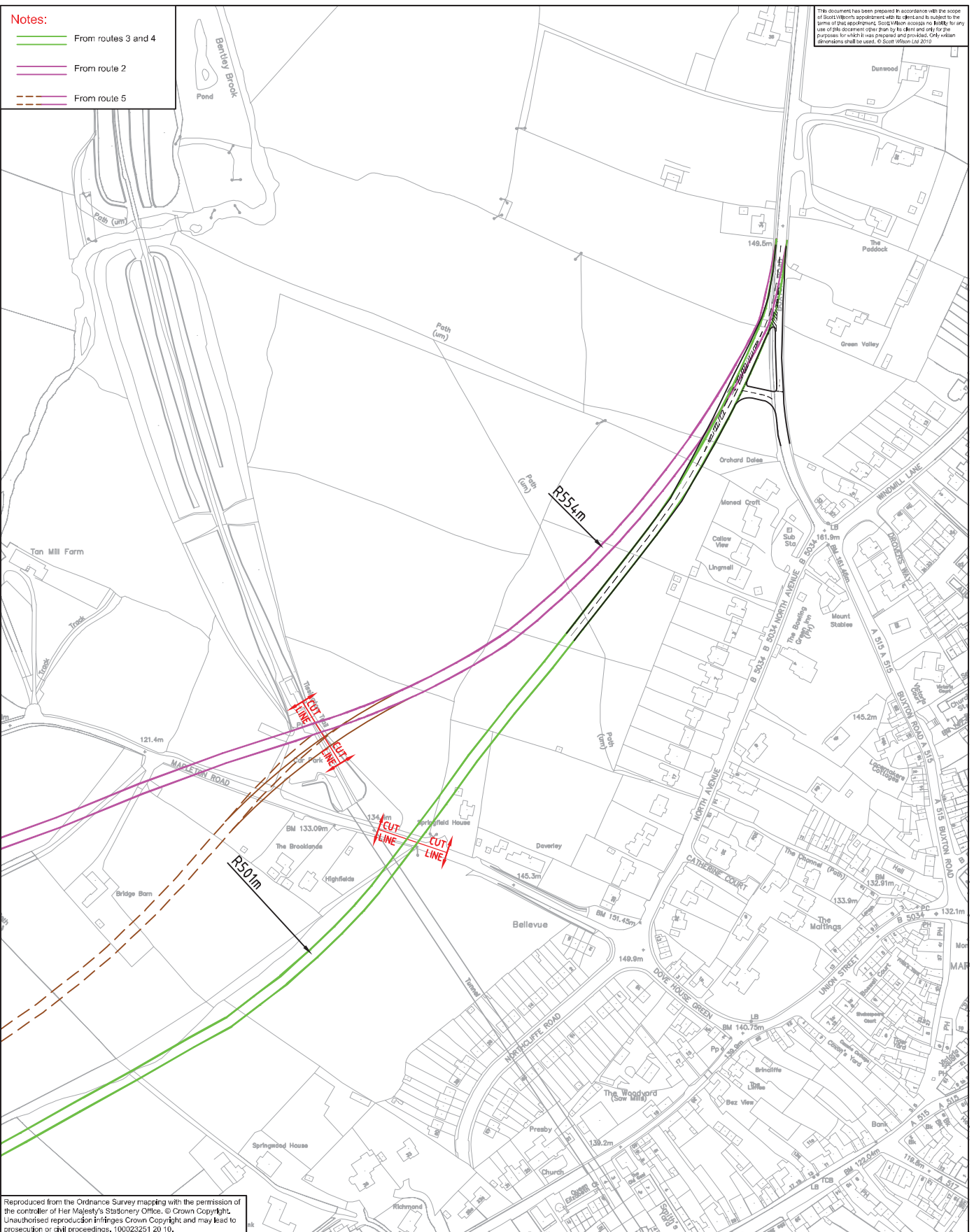


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IAN STEPHENSON Strategic Director – Environmental Services		PROPOSED ASHBOURNE BY-PASS		MAPLETON ROAD / ASHBOURNE BY-PASS JUNCTION		Scale at A4 : <table><tr><td>Drawn</td><td>Approved</td><td>Revision</td></tr><tr><td>RD</td><td></td><td></td></tr><tr><td>Checked</td><td>Date</td><td>Date</td></tr><tr><td></td><td>05/03/10</td><td></td></tr></table>				Drawn	Approved	Revision	RD			Checked	Date	Date		05/03/10	
Drawn	Approved	Revision																			
RD																					
Checked	Date	Date																			
	05/03/10																				
						Scott Wilson www.scottwilson.com															

Notes:

- From routes 3 and 4
- From route 2
- From route 5



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DERBYSHIRE COUNTY COUNCIL

**HIGHWAYS & TRANSPORTATION
CONSULTANCY SERVICES**

CONSULTANT TO



IAN STEPHENSON
Strategic Director – Environmental Services

D130439/J1

Scale at A3 : 1:2500

Drw RD	App	Rev
Chk	Date 01/03/10	Date



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Job Title

ASHBOURNE BY-PASS

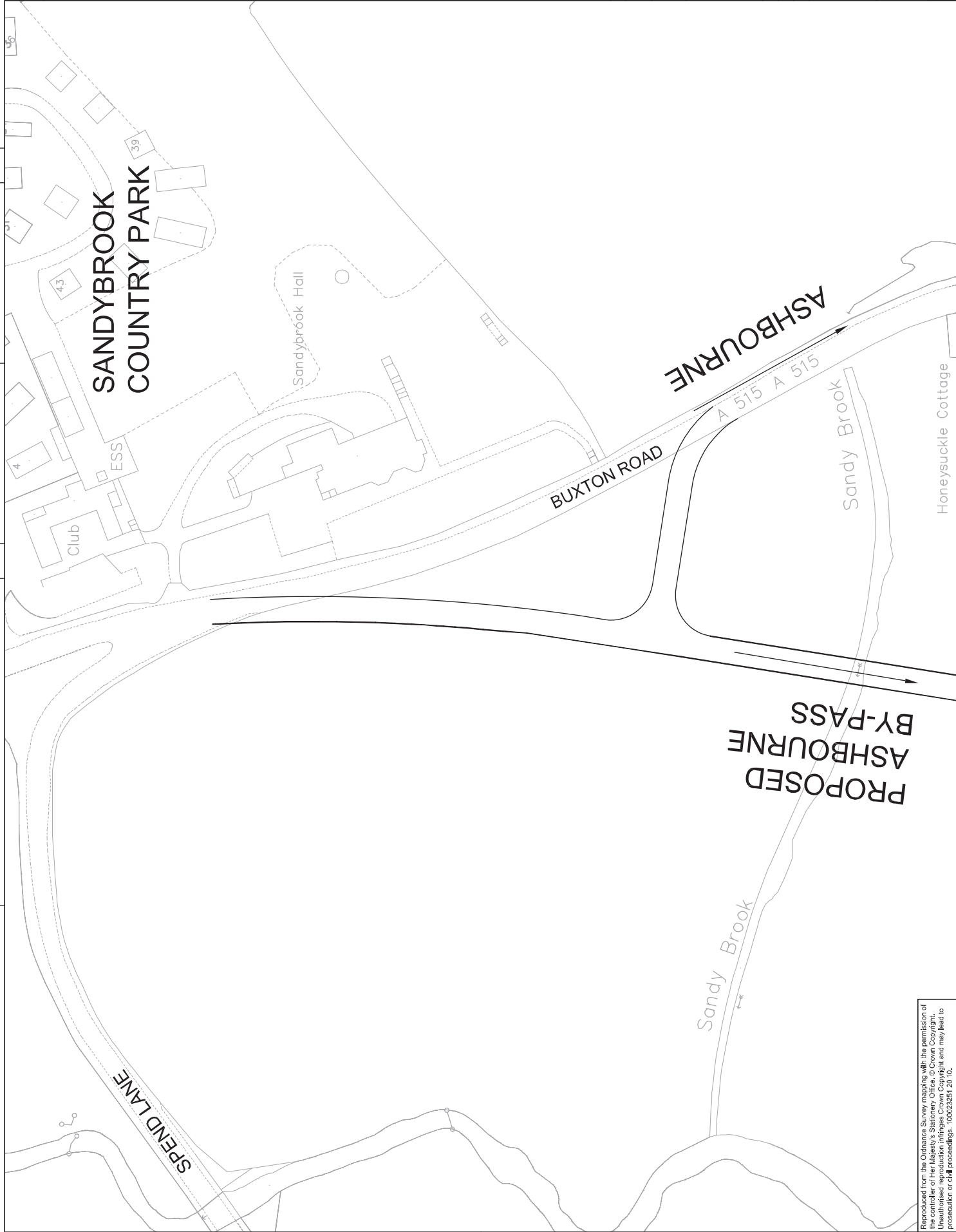
Drawing Title

**ROUTES TO FIRST JUNCTION
BUXTON ROAD
NORTH OF B5034 NORTH AVENUE**

Plot Date :
AutoCAD File Name :

DCC-A3-L-H

NOTES



Revision Details	By	Date	Suffix
	Check		
Drawing Status			

Drawing Status

Job Title **ASHBOURNE BY-PASS**

Drawing Title

Scale at A3	
1:1000	
Drawn	Approved
RD	
Stage 1 check	Stage 2 check
Date	

CONSULTANT TO:

IAN STEPHENSON
Strategic Director – Environmental Services

Scott Wilson Ltd
Dingle Road Business Centre
Dingle Road, Nethack
Dunfermline, Fife, UK
Telephone: (01650) 761761
Fax: (01650) 761788
www.scott-wilson.com

The logo for Scott Wilson Ltd features the company name in a stylized, overlapping manner. 'Scott' is in white on a red background, and 'Wilson' is in red on a white background, creating a 3D effect.



PROPOSED
ASHBOURNE
BY-PASS

252 MAYFIELD ROAD
DERBY

STOKE ON TRENT

NOTES

NOTES

Revision Details

Drawn By

Checked By

Approved By

Project Title

Project No

Project Name

Project Description

Project Location

Project Status

Project Date

Project Author

Project Reviewer

Project Manager

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Project History

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Page 1 of 1

Appendix R
Forecast Traffic Flow Diagrams (with Bypass)

Figure 12: Forecast Traffic Flows With Bypass - AM Peak in PCUS

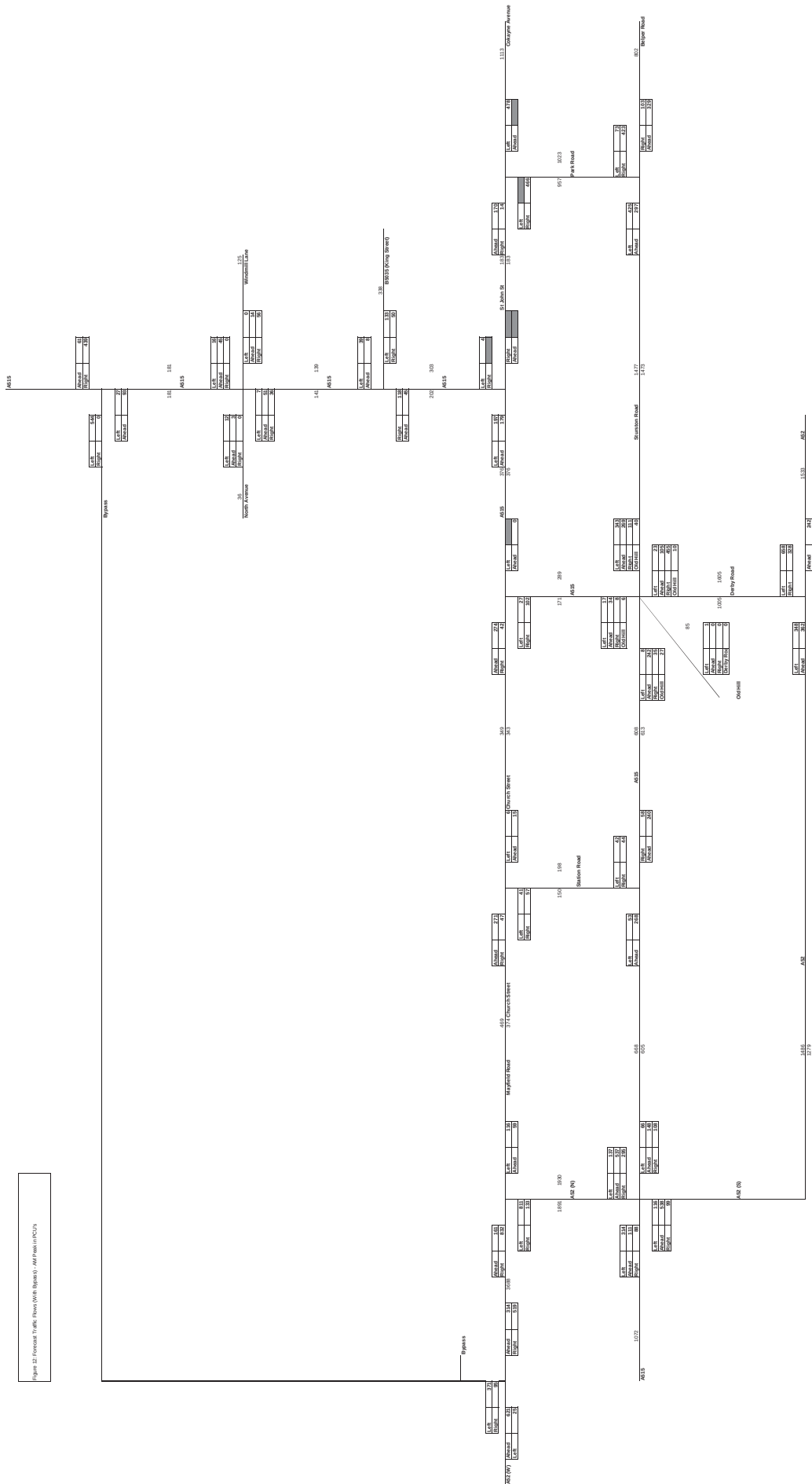


Figure 13: Forecast Traffic Flows With Bypass - PM Peak in PCUS

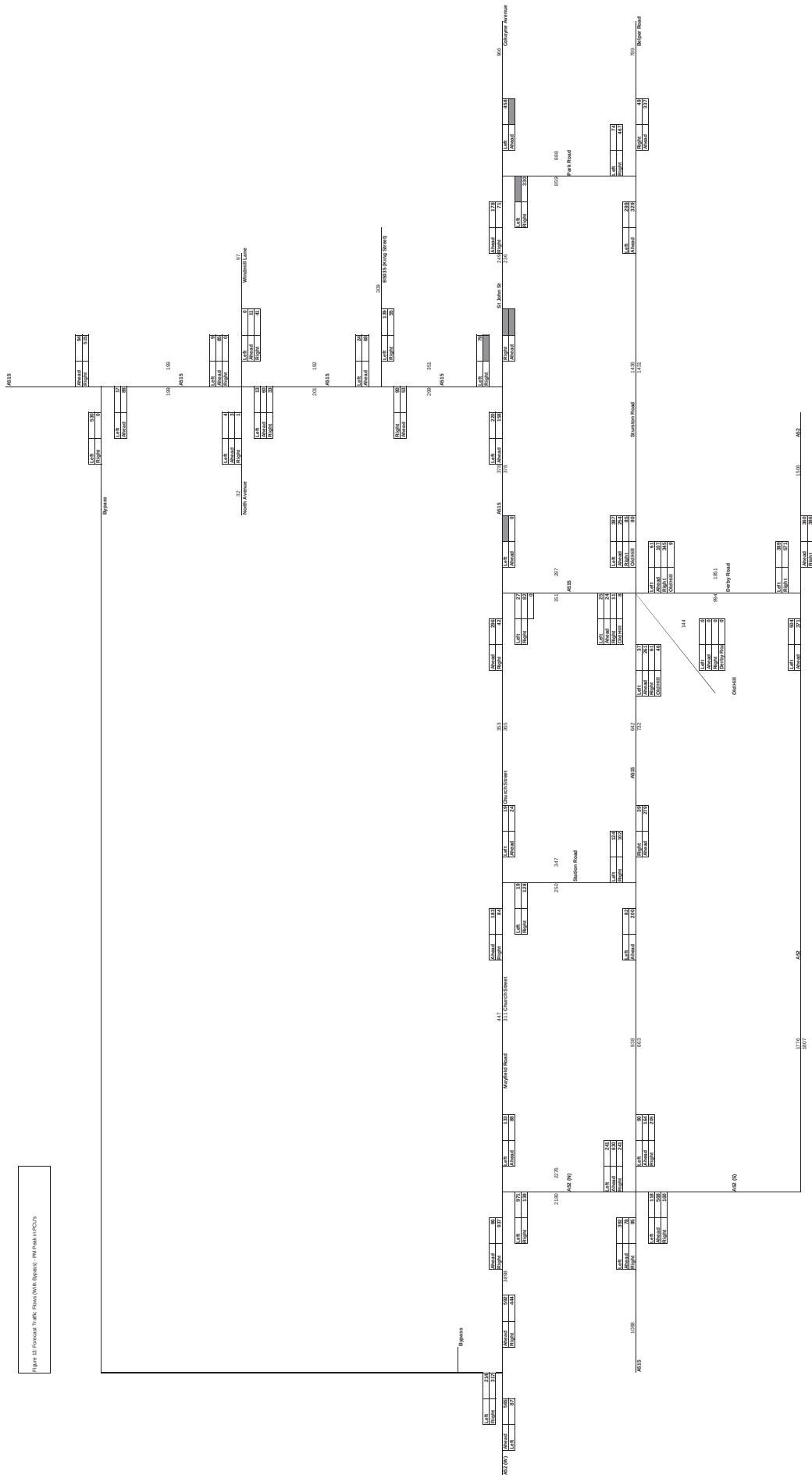
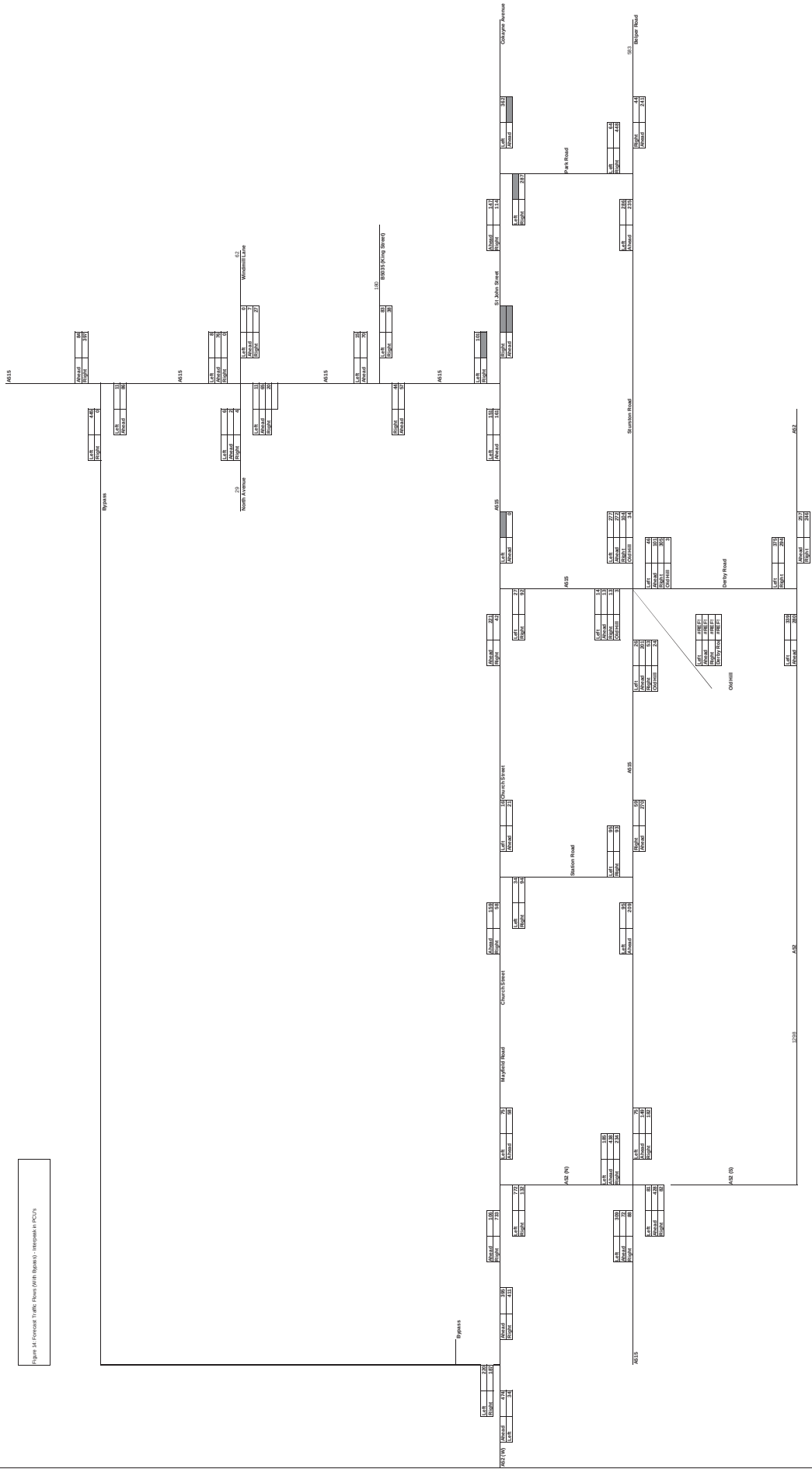


Figure 3-6 Forecast Traffic From OVR Region's Interchange to PCV's

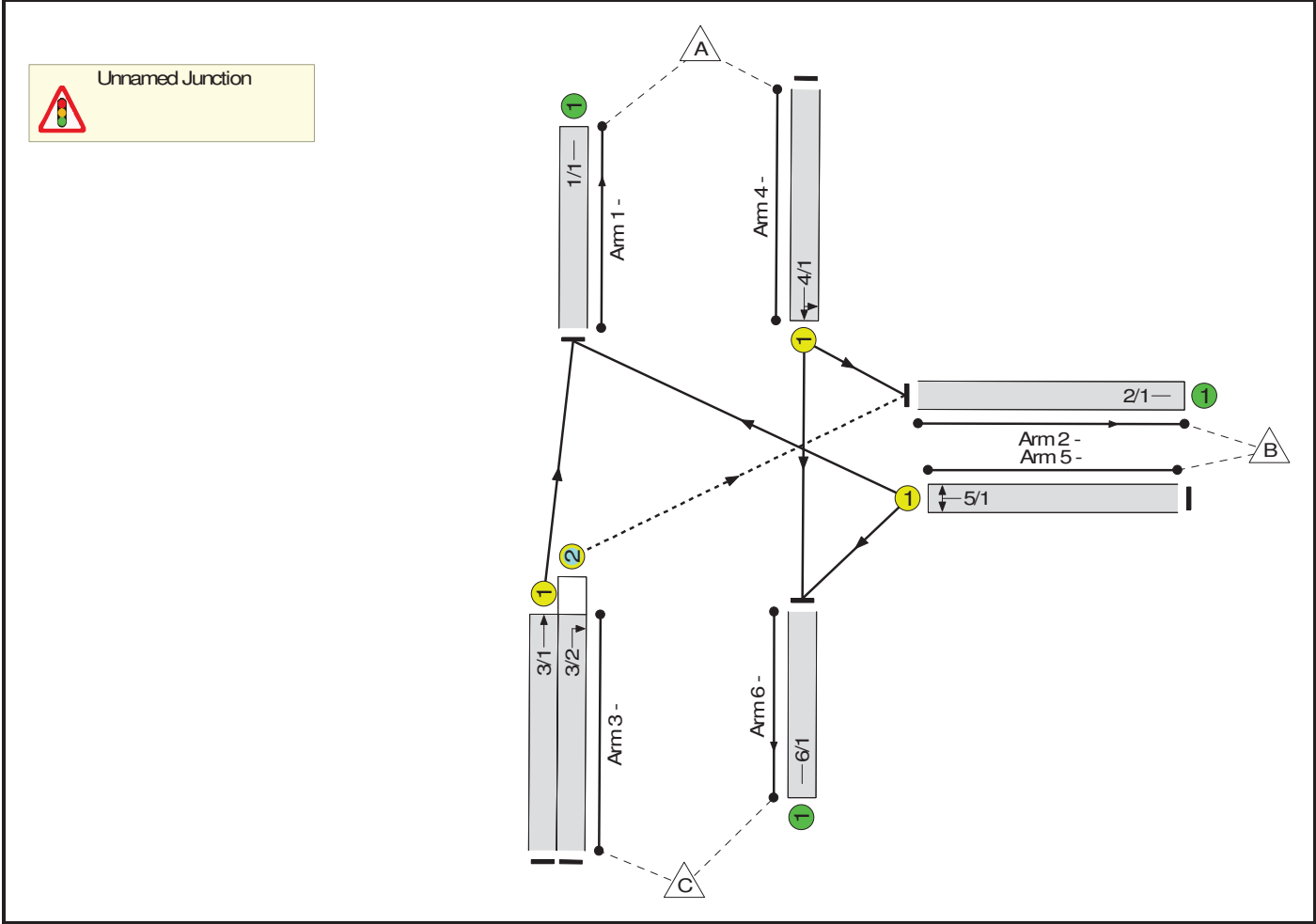


Appendix S
Northern Bypass Junction Capacity Results

User and Project Details

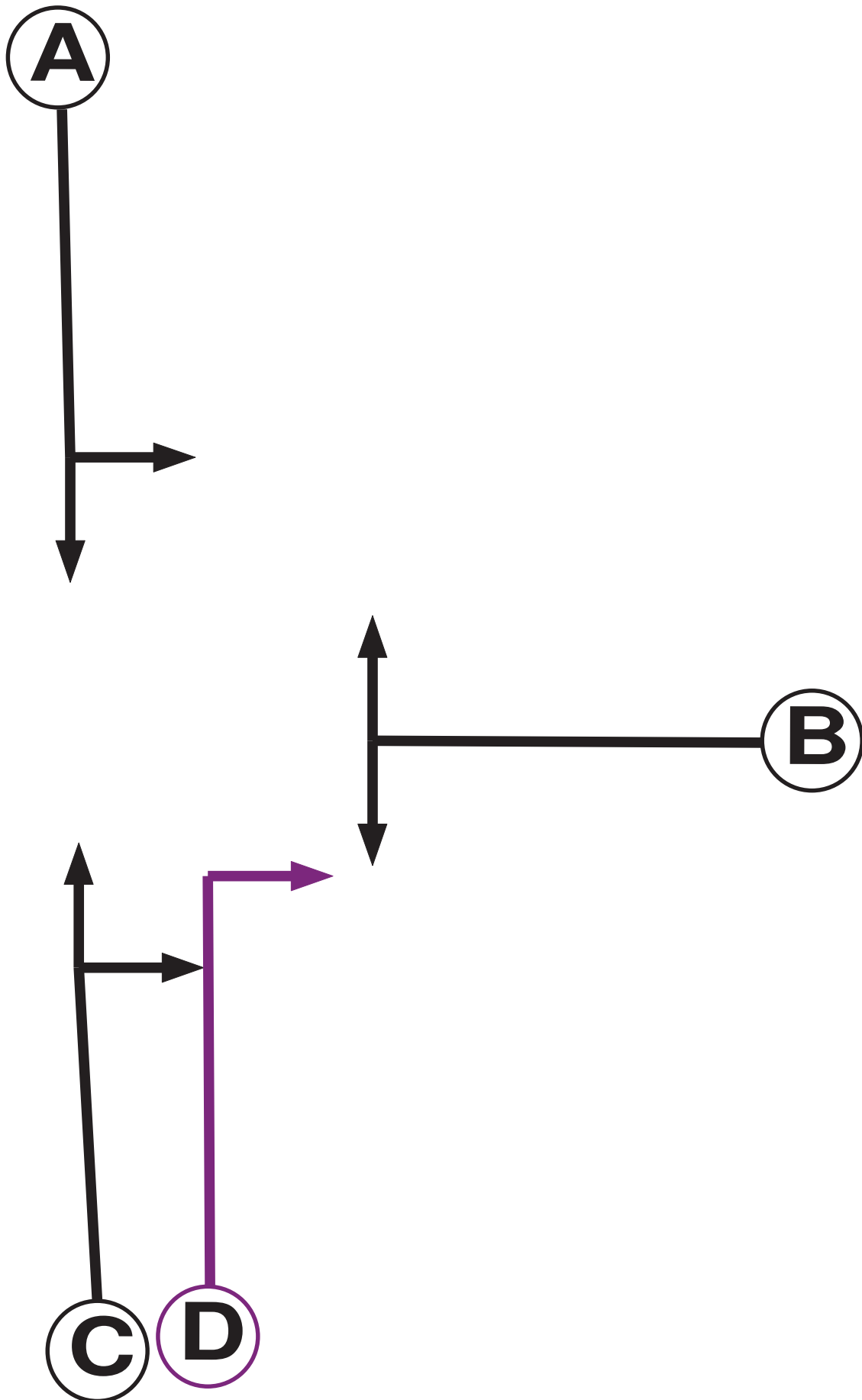
Project:	
Title:	
Location:	
File name:	Bypass Northern End.lsg3x
Author:	
Company:	
Address:	
Notes:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Full Input Data And Results

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	Ind. Arrow	C	4	4

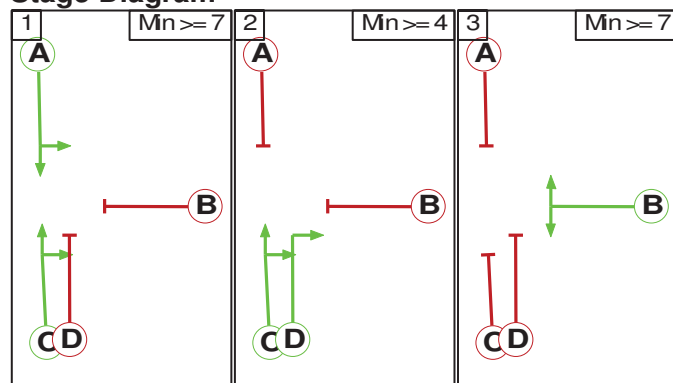
Phase Intergreens Matrix

	Starting Phase				
Terminating Phase		A	B	C	D
	A		7	-	7
	B	7		7	7
	C	-	7		-
	D	7	7	-	

Phases in Stage

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

Stage Diagram



Phase Delays

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

Prohibited Stage Change

	To Stage			
From Stage		1	2	3
	1		7	7
	2	7		7
	3	7	7	

Give-Way Lane Input Data

Junction: Unnamed Junction											
Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
3/2	2/1 (Right)	1439	0	4/1	1.09	All	2.00	-	0.50	2	2.00

Lane Input Data

Junction: Unnamed Junction												
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1	U		2	3	60.0	Inf	-	-	-	-	-	-
2/1	U		2	3	60.0	Inf	-	-	-	-	-	-
3/1	U	C	2	3	60.0	User	1800	-	-	-	-	-
3/2	O	C D	2	3	60.0	User	1800	-	-	-	-	-
4/1	U	A	2	3	60.0	User	1800	-	-	-	-	-
5/1	U	B	2	3	60.0	User	1800	-	-	-	-	-
6/1	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'Design Bypass AM'	08:00	09:00	01:00	
2: 'Design Bypass PM'	17:00	18:00	01:00	
3: 'Design Bypass Interpeak'	12:00	13:00	01:00	

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

Traffic Flows, Desired

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	61	439	500
	B	93	0	27	120
	C	544	0	0	544
	Tot.	637	61	466	1164

Traffic Lane Flows

Lane	Scenario 1: AM
Junction: Unnamed Junction	
1/1	637
2/1	61
3/1	544
3/2	0
4/1	500
5/1	120
6/1	466

Lane Saturation Flows

Junction: Unnamed Junction								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1	Infinite Saturation Flow						Inf	Inf
2/1	Infinite Saturation Flow						Inf	Inf
3/1	This lane uses a directly entered Saturation Flow						1800	1800
3/2	This lane uses a directly entered Saturation Flow						1800	1800
4/1	This lane uses a directly entered Saturation Flow						1800	1800
5/1	This lane uses a directly entered Saturation Flow						1800	1800
6/1	Infinite Saturation Flow						Inf	Inf

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

Traffic Flows, Desired

Desired Flow :

Origin	Destination				
		A	B	C	Tot.
	A	0	94	515	609
	B	88	0	17	105
	C	530	0	0	530
	Tot.	618	94	532	1244

Traffic Lane Flows

Lane	Scenario 2: PM
Junction: Unnamed Junction	
1/1	618
2/1	94
3/1	530
3/2	0
4/1	609
5/1	105
6/1	532

Lane Saturation Flows

Junction: Unnamed Junction								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1	Infinite Saturation Flow						Inf	Inf
2/1	Infinite Saturation Flow						Inf	Inf
3/1	This lane uses a directly entered Saturation Flow						1800	1800
3/2	This lane uses a directly entered Saturation Flow						1800	1800
4/1	This lane uses a directly entered Saturation Flow						1800	1800
5/1	This lane uses a directly entered Saturation Flow						1800	1800
6/1	Infinite Saturation Flow						Inf	Inf

Scenario 3: 'Interpeak' (FG3: 'Design Bypass Interpeak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

Origin	Destination				
		A	B	C	Tot.
	A	0	84	397	481
	B	86	0	11	97
	C	445	0	0	445
	Tot.	531	84	408	1023

Traffic Lane Flows

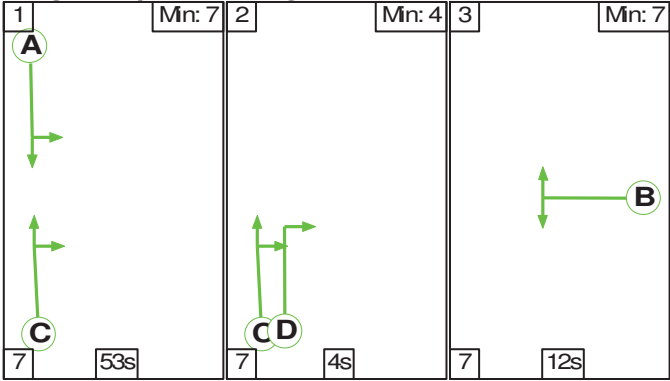
Lane	Scenario 3: Interpeak
Junction: Unnamed Junction	
1/1	531
2/1	84
3/1	445
3/2	0
4/1	481
5/1	97
6/1	408

Lane Saturation Flows

Junction: Unnamed Junction								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1	Infinite Saturation Flow						Inf	Inf
2/1	Infinite Saturation Flow						Inf	Inf
3/1	This lane uses a directly entered Saturation Flow						1800	1800
3/2	This lane uses a directly entered Saturation Flow						1800	1800
4/1	This lane uses a directly entered Saturation Flow						1800	1800
5/1	This lane uses a directly entered Saturation Flow						1800	1800
6/1	Infinite Saturation Flow						Inf	Inf

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

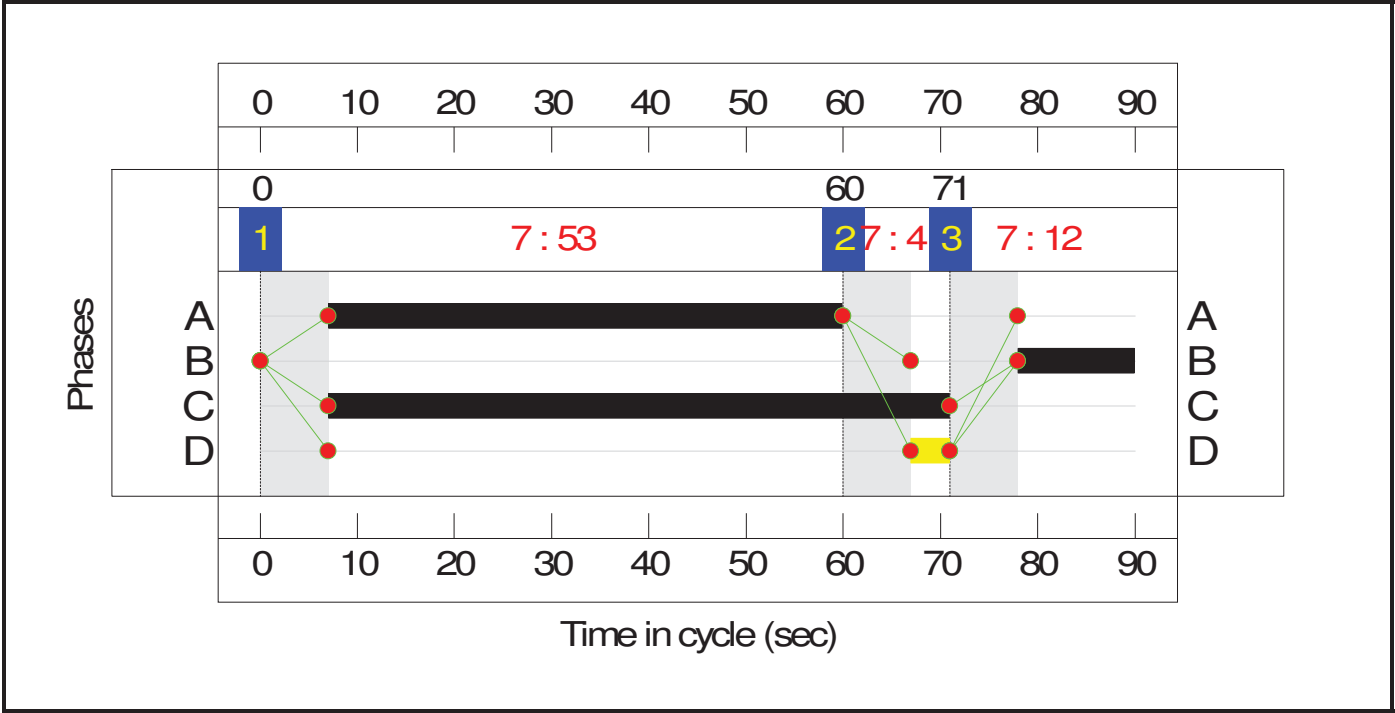
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	53	4	12
Change Point	0	60	71

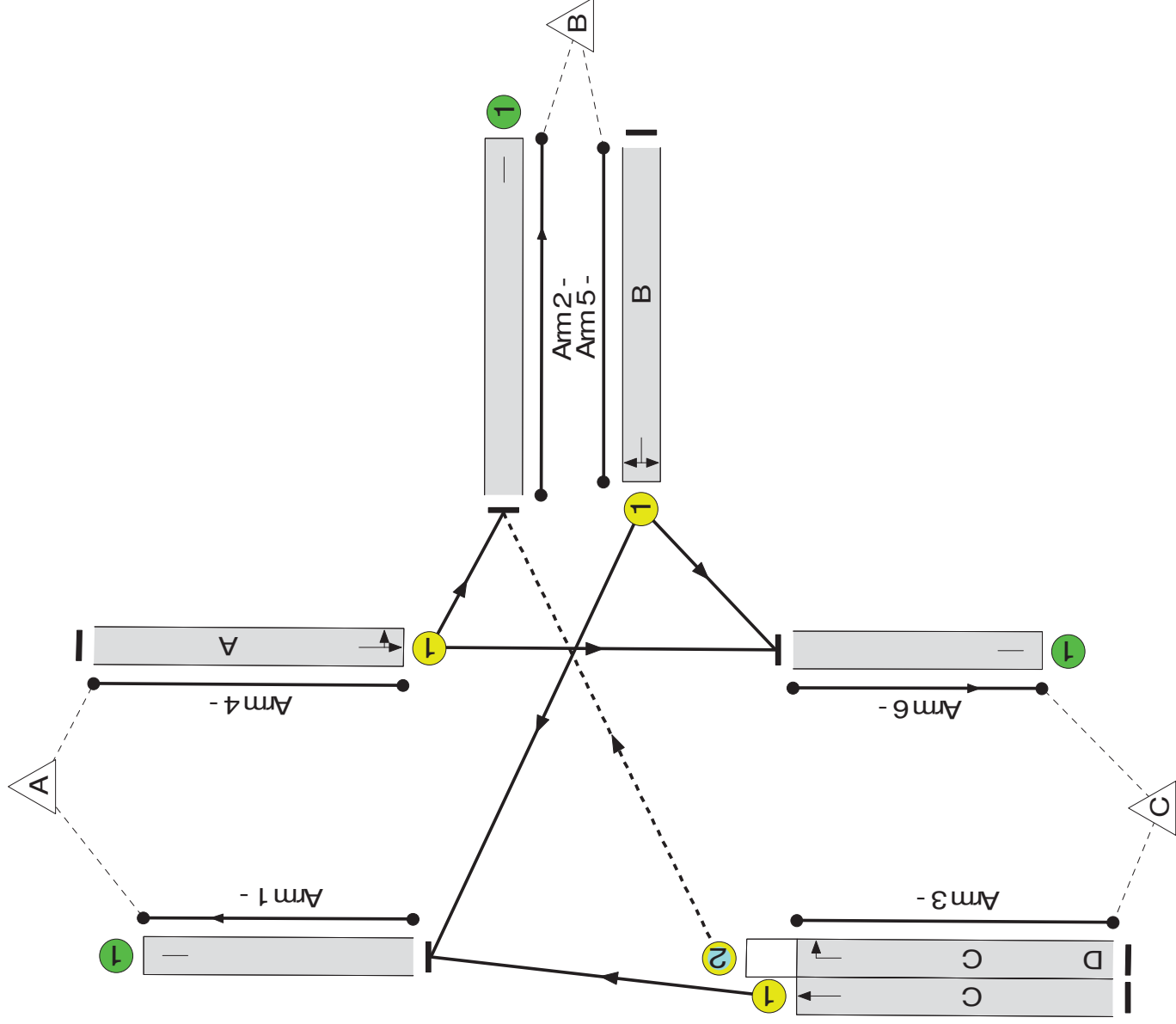
Signal Timings Diagram



Full Input Data And Results



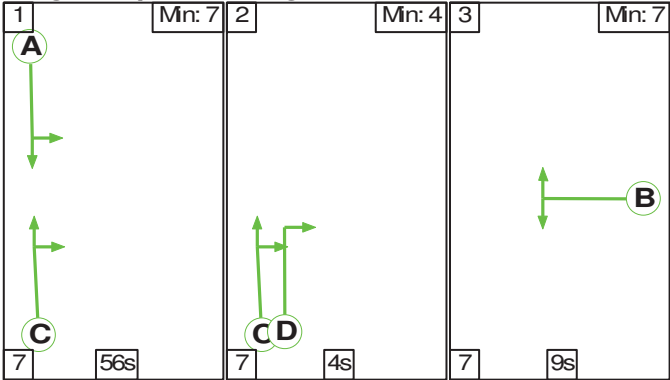
Unnamed Junction
PRC: 94.4 %
Total Traffic Delay: 4.5 pcu.Hr



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	-	-		-	-	-	-	-	-	46.3%
Unnamed Junction	-	-	N/A	-	-		-	-	-	-	-	-	46.3%
1/1		U	N/A	N/A	-		-	-	-	637	Inf	Inf	0.0%
2/1		U	N/A	N/A	-		-	-	-	61	Inf	Inf	0.0%
3/1	Ahead	U	N/A	N/A	C		1	64	-	544	1800	1300	41.8%
3/2	Right	O	N/A	N/A	C	D	1	64	4	0	1800	791	0.0%
4/1	Left Ahead	U	N/A	N/A	A		1	53	-	500	1800	1080	46.3%
5/1	Right Left	U	N/A	N/A	B		1	12	-	120	1800	260	46.2%
6/1		U	N/A	N/A	-		-	-	-	466	Inf	Inf	0.0%
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	-	-	0	0	0	3.3	1.2	0.0	4.5	-	-	-	-
Unnamed Junction	-	-	0	0	0	3.3	1.2	0.0	4.5	-	-	-	-
1/1	637	637	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	61	61	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	544	544	-	-	-	0.8	0.4	-	1.1	7.4	5.3	0.4	5.6
3/2	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4/1	500	500	-	-	-	1.4	0.4	-	1.8	13.1	6.8	0.4	7.2
5/1	120	120	-	-	-	1.2	0.4	-	1.6	48.1	2.7	0.4	3.2
6/1	466	466	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
C1				PRC for Signalled Lanes (%): 94.4	94.4	Total Delay for Signalled Lanes (pcuHr): 4.53			4.53	Cycle Time (s): 90			
				PRC Over All Lanes (%):	94.4	Total Delay Over All Lanes (pcuHr):			4.53				

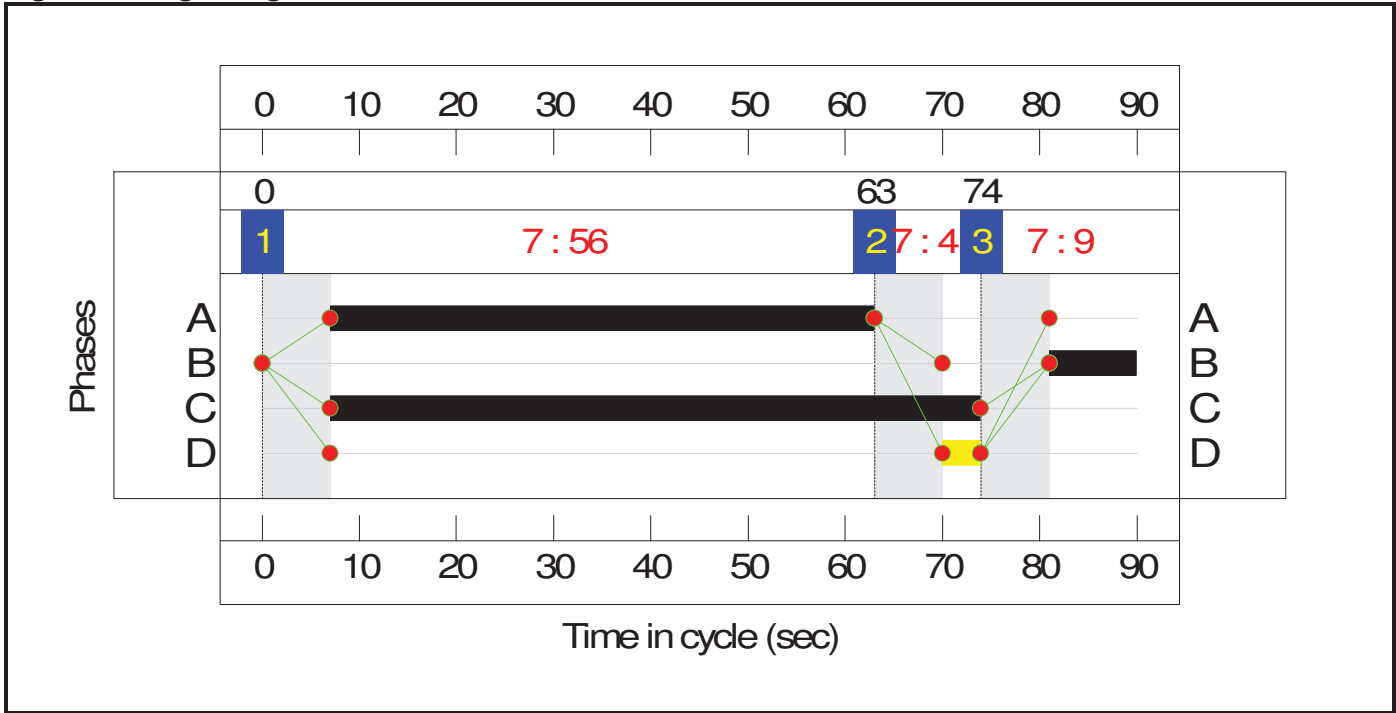
Stage Sequence Diagram

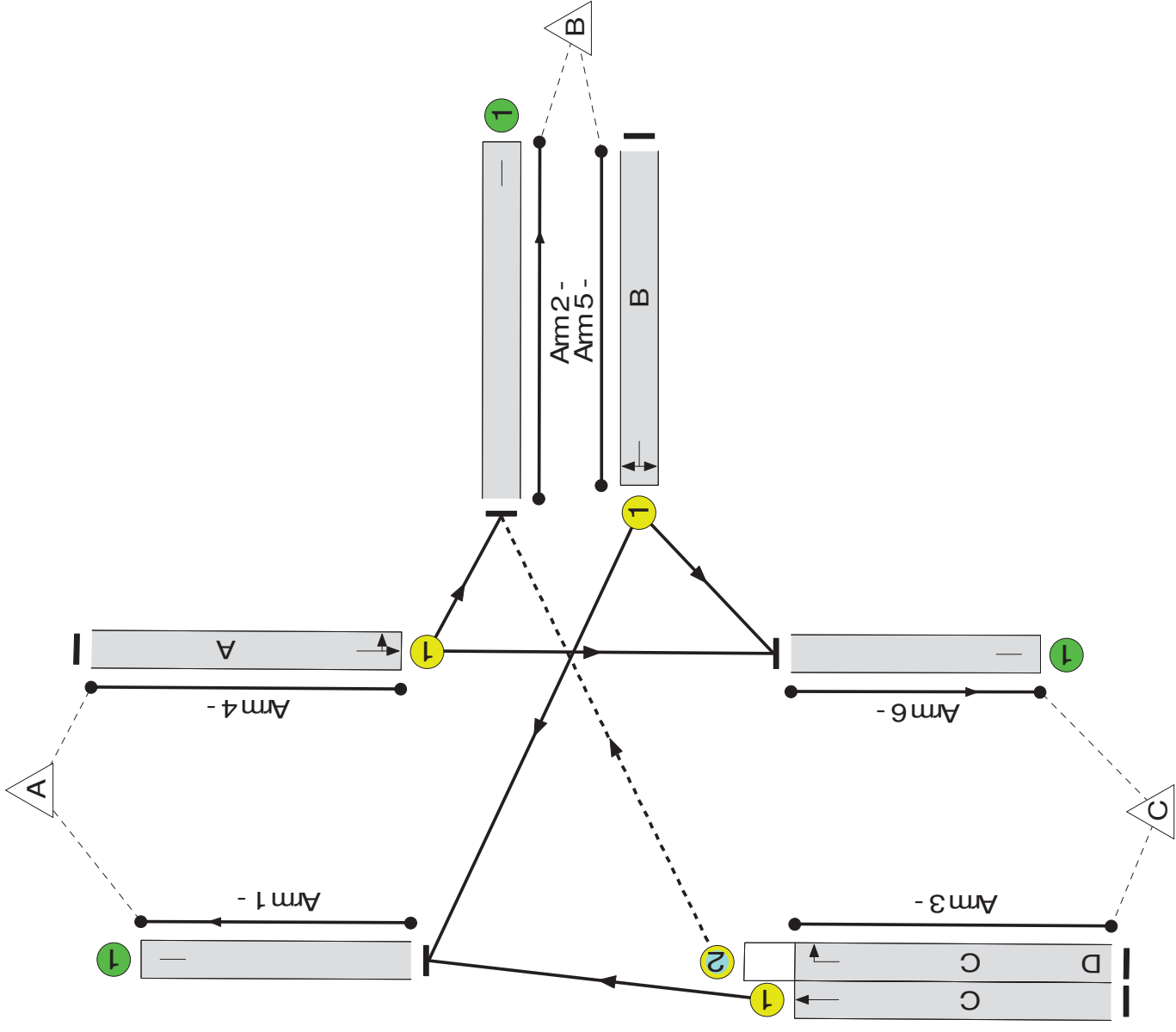


Stage Timings

Stage	1	2	3
Duration	56	4	9
Change Point	0	63	74

Signal Timings Diagram






 Unnamed Junction
 PRC: 68.5 %
 Total Traffic Delay: 4.6 pout/r

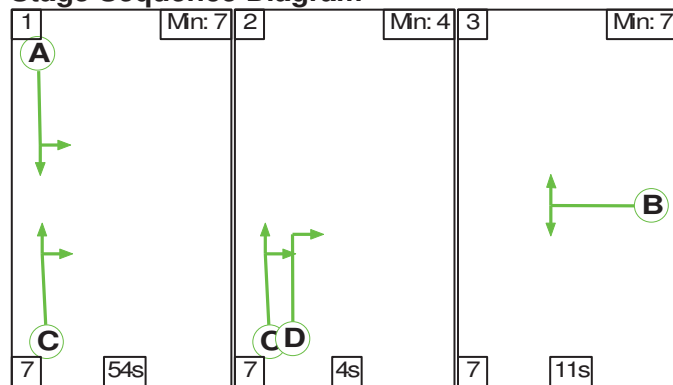
Network Results

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	-	-		-	-	-	-	-	-	53.4%
Unnamed Junction	-	-	N/A	-	-		-	-	-	-	-	-	53.4%
1/1		U	N/A	N/A	-		-	-	-	618	Inf	Inf	0.0%
2/1		U	N/A	N/A	-		-	-	-	94	Inf	Inf	0.0%
3/1	Ahead	U	N/A	N/A	C		1	67	-	530	1800	1360	39.0%
3/2	Right	O	N/A	N/A	C	D	1	67	4	0	1800	742	0.0%
4/1	Left Ahead	U	N/A	N/A	A		1	56	-	609	1800	1140	53.4%
5/1	Right Left	U	N/A	N/A	B		1	9	-	105	1800	200	52.5%
6/1		U	N/A	N/A	-		-	-	-	532	Inf	Inf	0.0%
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	-	-	0	0	0	3.2	1.4	0.0	4.6	-	-	-	-
Unnamed Junction	-	-	0	0	0	3.2	1.4	0.0	4.6	-	-	-	-
1/1	618	618	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	94	94	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	530	530	-	-	-	0.6	0.3	-	0.9	6.0	4.6	0.3	4.9
3/2	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4/1	609	609	-	-	-	1.5	0.6	-	2.1	12.5	8.3	0.6	8.9
5/1	105	105	-	-	-	1.1	0.5	-	1.6	56.5	2.5	0.5	3.0
6/1	532	532	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
C1				PRC for Signalled Lanes (%): 68.5 PRC Over All Lanes (%): 68.5	68.5 68.5	Total Delay for Signalled Lanes (pcuHr): 4.65 Total Delay Over All Lanes (pcuHr): 4.65			Cycle Time (s): 90				

Full Input Data And Results

Scenario 3: 'Interpeak' (FG3: 'Design Bypass Interpeak', Plan 1: 'Network Control Plan 1')

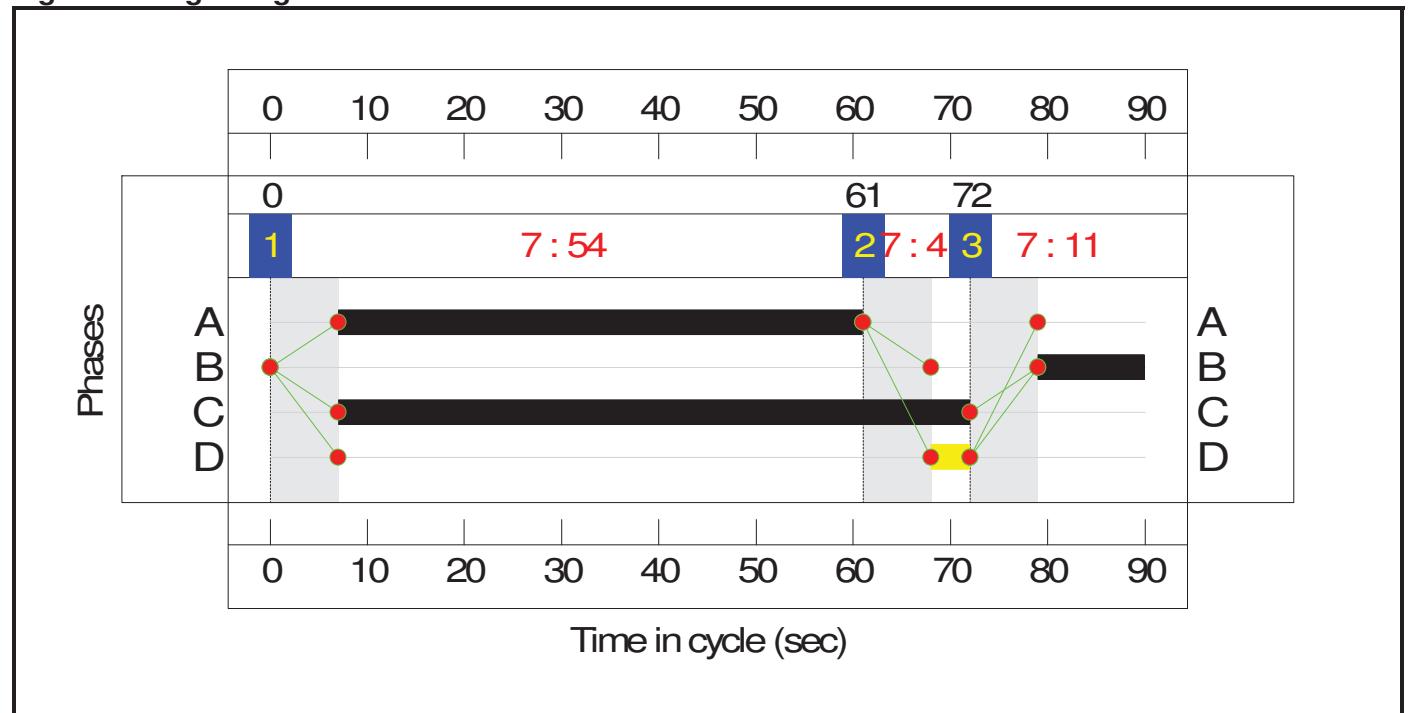
Stage Sequence Diagram



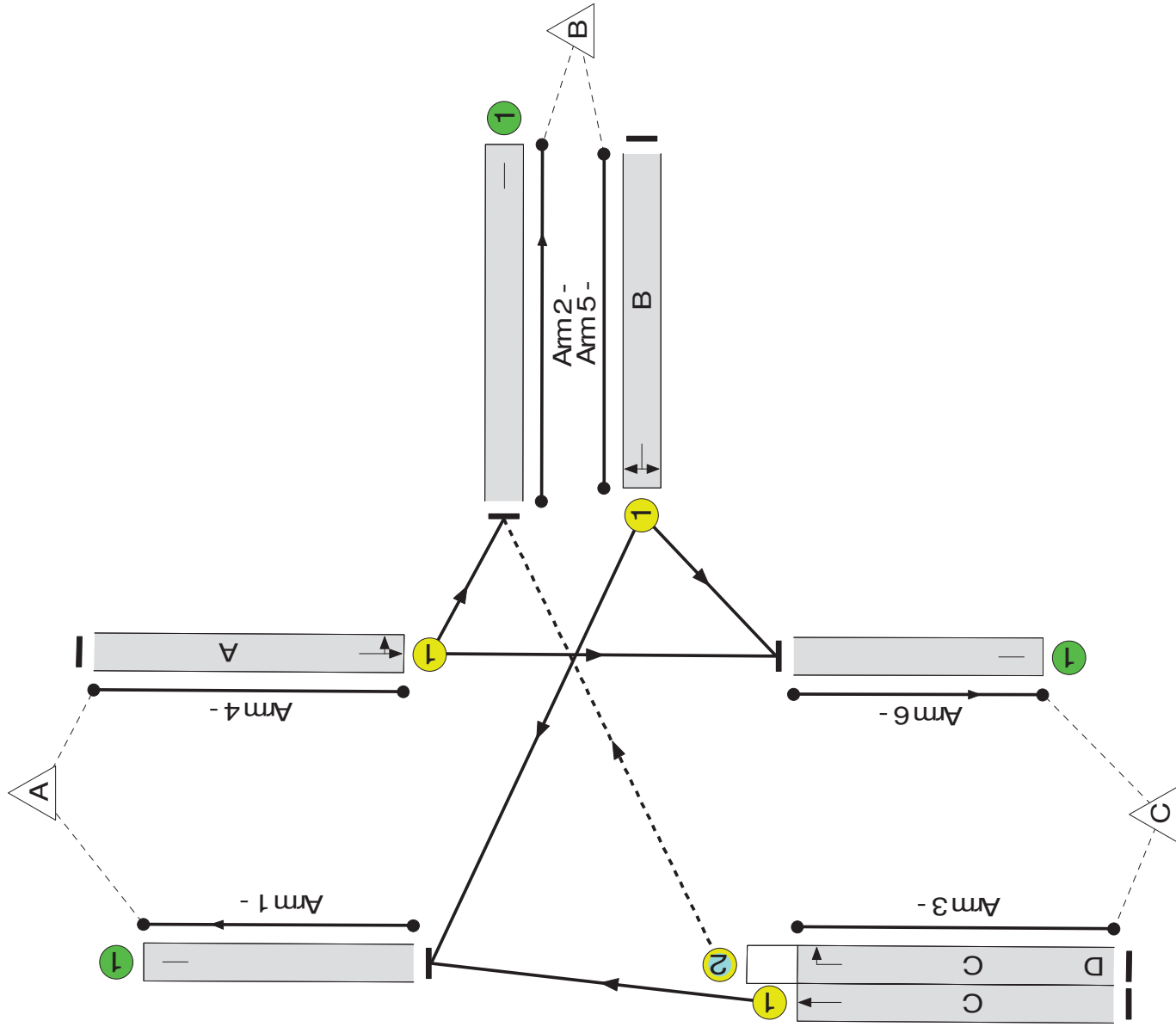
Stage Timings

Stage	1	2	3
Duration	54	4	11
Change Point	0	61	72

Signal Timings Diagram



Full Input Data And Results



Unnamed Junction
PRC: 105.8 %
Total Traffic Delay: 3.7 pcu/h

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	-	-		-	-	-	-	-	-	43.7%
Unnamed Junction	-	-	N/A	-	-		-	-	-	-	-	-	43.7%
1/1		U	N/A	N/A	-		-	-	-	531	Inf	Inf	0.0%
2/1		U	N/A	N/A	-		-	-	-	84	Inf	Inf	0.0%
3/1	Ahead	U	N/A	N/A	C		1	65	-	445	1800	1320	33.7%
3/2	Right	O	N/A	N/A	C	D	1	65	4	0	1800	826	0.0%
4/1	Left Ahead	U	N/A	N/A	A		1	54	-	481	1800	1100	43.7%
5/1	Right Left	U	N/A	N/A	B		1	11	-	97	1800	240	40.4%
6/1		U	N/A	N/A	-		-	-	-	408	Inf	Inf	0.0%
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	-	-	0	0	0	2.7	1.0	0.0	3.7	-	-	-	-
Unnamed Junction	-	-	0	0	0	2.7	1.0	0.0	3.7	-	-	-	-
1/1	531	531	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
2/1	84	84	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
3/1	445	445	-	-	-	0.5	0.3	-	0.8	6.3	3.8	0.3	4.1
3/2	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4/1	481	481	-	-	-	1.2	0.4	-	1.6	12.2	6.3	0.4	6.7
5/1	97	97	-	-	-	1.0	0.3	-	1.3	48.3	2.2	0.3	2.5
6/1	408	408	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
C1				PRC for Signalled Lanes (%): 105.8 PRC Over All Lanes (%): 105.8	Total Delay for Signalled Lanes (pcuHr): 3.71 Total Delay Over All Lanes (pcuHr): 3.71		Cycle Time (s): 90						

Appendix T
Southern Bypass Junction Capacity Results

Junctions 9							
ARCADY 9 - Roundabout Module							
Version: 9.0.2.5947 © Copyright TRL Limited, 2017							
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 770558 software@trl.co.uk www.trlsoftware.co.uk							
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution							

Filename: Bypass South.j9

Path: X:\47074388 Derbyshire CC\60547092_Ashbourne Bypass\02 - Analysis\Junction Models\Future Year - Bypass

Report generation date: 04/06/2018 16:55:03

- »(Default Analysis Set) - Bypass, AM
- »(Default Analysis Set) - Bypass, PM
- »(Default Analysis Set) - Bypass, Interpeak

Summary of junction performance

	AM					PM					Interpeak				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)
A1 - Bypass															
Arm 1	1.2	4.58	0.54	A	4.77	2.2	6.94	0.69	A	5.98	1.1	4.45	0.52	A	4.19
Arm 2	0.5	3.85	0.35	A		0.9	5.37	0.47	A		0.5	3.81	0.32	A	
Arm 3	1.1	5.70	0.53	A		1.0	4.93	0.50	A		0.6	4.07	0.39	A	

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	02/08/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ross.paradise
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	Bypass	AM	ONE HOUR	08:00	09:30	15
D2	Bypass	PM	ONE HOUR	17:00	18:30	15
D3	Bypass	Interpeak	ONE HOUR	11:45	13:15	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	(Default Analysis Set)	100.000

(Default Analysis Set) - Bypass, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	1, 2, 3	4.77	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	(untitled)	A52 E
2	(untitled)	A52 W
3	(untitled)	Mayfield Road

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.50	7.20	15.0	30.0	40.0	28.8	
2	3.50	7.20	15.0	30.0	40.0	38.3	
3	3.50	7.20	15.0	30.0	40.0	51.4	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.652	1722
2	0.631	1666
3	0.602	1589

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)
D1	Bypass	AM	ONE HOUR	08:00	09:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	833	100.000
2		✓	466	100.000
3		✓	646	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	1	2	3	
From	1	0	519	314
	2	371	0	95
	3	621	25	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	1	2	3	
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.54	4.58	1.2	A
2	0.35	3.85	0.5	A
3	0.53	5.70	1.1	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	627	19	1709	0.367	625	0.6	3.312	A
2	351	236	1517	0.231	350	0.3	3.080	A
3	486	278	1422	0.342	484	0.5	3.832	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	749	22	1707	0.439	748	0.8	3.750	A
2	419	282	1488	0.282	419	0.4	3.366	A
3	581	333	1389	0.418	580	0.7	4.447	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	917	27	1704	0.538	916	1.2	4.560	A
2	513	345	1448	0.354	512	0.5	3.845	A
3	711	408	1344	0.529	710	1.1	5.666	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	917	28	1704	0.538	917	1.2	4.577	A
2	513	346	1448	0.354	513	0.5	3.851	A
3	711	408	1343	0.530	711	1.1	5.695	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	749	23	1707	0.439	750	0.8	3.771	A
2	419	283	1487	0.282	420	0.4	3.375	A
3	581	334	1388	0.418	582	0.7	4.477	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	627	19	1709	0.367	628	0.6	3.330	A
2	351	237	1517	0.231	351	0.3	3.091	A
3	486	280	1421	0.342	487	0.5	3.860	A

(Default Analysis Set) - Bypass, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	1, 2, 3	5.98	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)
D2	Bypass	PM	ONE HOUR	17:00	18:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	1036	100.000
2		✓	531	100.000
3		✓	652	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	1	2	3	
From	1	0	444	592
	2	214	0	317
	3	565	87	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	1	2	3	
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.69	6.94	2.2	A
2	0.47	5.37	0.9	A
3	0.50	4.93	1.0	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	780	65	1679	0.465	777	0.9	3.974	A
2	400	444	1386	0.288	398	0.4	3.638	A
3	491	160	1493	0.329	489	0.5	3.581	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	931	78	1671	0.557	930	1.2	4.850	A
2	477	531	1331	0.359	477	0.6	4.214	A
3	586	192	1474	0.398	585	0.7	4.051	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1141	96	1659	0.687	1137	2.1	6.846	A
2	585	650	1256	0.466	583	0.9	5.344	A
3	718	235	1448	0.496	717	1.0	4.917	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	1141	96	1659	0.688	1141	2.2	6.940	A
2	585	652	1254	0.466	585	0.9	5.373	A
3	718	236	1447	0.496	718	1.0	4.934	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	931	78	1670	0.558	935	1.3	4.919	A
2	477	534	1329	0.359	479	0.6	4.242	A
3	586	193	1473	0.398	587	0.7	4.069	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	780	66	1679	0.465	782	0.9	4.020	A
2	400	447	1384	0.289	400	0.4	3.661	A
3	491	161	1492	0.329	492	0.5	3.602	A

(Default Analysis Set) - Bypass, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs.

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	1, 2, 3	4.19	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	Bypass	Interpeak	ONE HOUR	11:45	13:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	806	100.000
2		✓	407	100.000
3		✓	508	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1	2	3
From	1	0	411	395
	2	220	0	187
	3	474	34	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		1	2	3
From	1	0	0	0
	2	0	0	0
	3	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1	0.52	4.45	1.1	A
2	0.32	3.81	0.5	A
3	0.39	4.07	0.6	A

Main Results for each time segment

11:45 - 12:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	607	26	1705	0.356	605	0.5	3.264	A
2	306	296	1479	0.207	305	0.3	3.064	A
3	382	165	1490	0.257	381	0.3	3.242	A

12:00 - 12:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	725	31	1702	0.426	724	0.7	3.680	A
2	366	355	1442	0.254	366	0.3	3.344	A
3	457	198	1470	0.311	456	0.4	3.548	A

12:15 - 12:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	887	37	1697	0.523	886	1.1	4.431	A
2	448	434	1392	0.322	448	0.5	3.810	A
3	559	242	1444	0.387	559	0.6	4.064	A

12:30 - 12:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	887	37	1697	0.523	887	1.1	4.445	A
2	448	435	1391	0.322	448	0.5	3.815	A
3	559	242	1443	0.388	559	0.6	4.071	A

12:45 - 13:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	725	31	1702	0.426	726	0.7	3.694	A
2	366	356	1441	0.254	366	0.3	3.352	A
3	457	198	1470	0.311	457	0.5	3.556	A

13:00 - 13:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1	607	26	1705	0.356	608	0.6	3.282	A
2	306	298	1478	0.207	307	0.3	3.073	A
3	382	166	1489	0.257	383	0.3	3.253	A