From: Moss, Stephen R
Sent: 06 November 2018 16:47
To: Whittaker , Sarah
Subject: FW: Pogmoor - Flow reduction %ges

Sarah

Calculations as included in the e-mail below, and I did'nt send this through last time, just the headline figures.

The 40 to 45% reductions comes from the modelling whereby in Test 1 the junction works with 55% of traffic and in Test 2 it works with 60% of traffic.

Hope that makes semse.

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From: O'Brien, James (Newcastle)
Sent: 19 September 2018 18:02
To: Thorpe, Katherine (Transportation); Entwistle, Brad; Cuckson, Chris; Moss, Stephen R
Subject: RE: Pogmoor - Additional Highways Fees

Hi all

Pogmoor test 1& 2 results below (and models attached).

The simple task became a bit of a head scratcher as the double/ triple cycling in Test 2 was initially making the results worse, which didn't make sense given the flows.

To cut a long story short, it was eventually tracked down to incorrect giveway parameters on the College exit, which meant that 'improving' the main junction resulted in worse results for the network. This was because more eastbound mainline vehicles were able to get through the main junction, putting additional pressure on the College exit RTers, and LinSig tries in vain to balance the network. Once correct giveway parameters were added, the issue reduces significantly, allowing some benefit to be realised across the overall network results.

Hope that makes sense.

Test 1			
AM		PM	
Traffic %	PRC	Traffic %	PRC
100	-72.6	100	-75.9
95	-64.8	95	-66.7
90	-55.4	90	-57.4
85	-46.7	85	-48.1
80	-38.9	80	-40.7
75	-29.6	75	-33.3
70	-20.8	70	-24.1
65	-13	65	-14.8
60	-3.6	60	-2.3
55	5.3	55	6.7

Test 1 result. 'Worst case' i.e. Running all stages the junction/ network 'works' with 55% of the current traffic

Test 2			
DD Stage 1		1 in 3 in AM	
		1 in 2 in PM	
AM		PM	
Traffic %	PRC	Traffic %	PRC
100	-72.2	100	-75.9
95	-64.8	95	-66.7
90	-53.7	90	-57.4
85	-46.3	85	-48.1
70	-14.4	70	-24.1
65	-6.2	65	-5.5
60	1.5	60	2.5

Test 2 result. Assuming a more realistic operation, the junction/ network 'works' with 60% of the current traffic.

James

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Attached models:

Pogmoor

Test 1			
AM		PM	
Traffic %	PRC	Traffic %	PRC
100	-72.6	100	-75.9
95	-64.8	95	-66.7
90	-55.4	90	-57.4
85	-46.7	85	-48.1
80	-38.9	80	-40.7
75	-29.6	75	-33.3
70	-20.8	70	-24.1
65	-13	65	-14.8
60	-3.6	60	-2.3
55	5.3	55	6.7

AM factoring percentag 1

	A	B	C	D	E	Tot			A	B	C	D	E	Tot
A	0	245	60	147	398	850		A	0	245	60	147	398	850
B	27	0	181	44	478	730		B	27	0	181	44	478	730
C	66	106	0	56	48	276		C	66	106	0	56	48	276
D	226	66	51	0	350	693		D	226	66	51	0	350	693
E	462	815	43	361	0	1681		E	462	815	43	361	0	1681
Tot	781	1232	335	608	1274	4230		Tot	781	1232	335	608	1274	4230

PM factoring percentag 1

	A	B	C	D	E	Tot			A	B	C	D	E	Tot
A	0	85	18	312	325	740		A	0	85	18	312	325	740
B	77	0	58	83	723	941		B	77	0	58	83	723	941
C	18	31	0	16	13	78		C	18	31	0	16	13	78
D	186	80	15	0	381	662		D	186	80	15	0	381	662
E	531	899	13	398	0	1841		E	531	899	13	398	0	1841
Tot	812	1095	104	809	1442	4262		Tot	812	1095	104	809	1442	4262

Test 2			
DD Stage 1		1 in 3 in AM	
		1 in 2 in PM	
AM		PM	
Traffic %	PRC	Traffic %	PRC
100	-72.2	100	-75.9
95	-64.8	95	-66.7
90	-53.7	90	-57.4
85	-46.3	85	-48.1
70	-14.4	70	-24.1
65	-6.2	65	-5.5
60	1.5	60	2.5

AM Optimised timings										
all cycles as base				Optimised without stage 1						
	start	end	duration	start	end	duration		End times		
1	9	32	23				9	32		
3	32	42	10	0	18	18		42	147	267
2	42	87	45	18	51	33		87	180	300
4	87	112	25	51	102	51		112	231	351
5	112	9	17	102	0	18		129	249	369

PM optimised timings									
all cycles as base				Optimised without stage 1					
	start	end	duration	start	end	duration		End times	
1	105	1	16				225	1	
3	1	15	14	9	36	27		15	132
2	15	67	52	36	78	42		67	174
4	67	89	22	78	112	34		89	208
5	89	105	16	112	9	17		105	225

Results

Pogmoor

Test 1			
AM		PM	
Traffic %	PRC	Traffic %	PRC
100	-97.9	100	-76.3
95	-88	95	-70.4
90	-78.1	90	-60.1
85	-68.3	85	-51.9
80	-58.3	80	-42.6
75	-48.6	75	-33.3
70	-38.7	70	-24.1
65	-28.7	65	-16.7
60	-18.8	60	-5.9
55	-9.1	55	2.8
50	1		

AM factoring percentag 1

	A	B	C	D	E	Tot			A	B	C	D	E	Tot
A	0	245	60	147	398	850		A	0	245	60	147	398	850
B	27	0	181	44	478	730		B	27	0	181	44	478	730
C	66	106	0	56	48	276		C	66	106	0	56	48	276
D	226	66	51	0	350	693		D	226	66	51	0	350	693
E	462	815	43	361	0	1681		E	462	815	43	361	0	1681
Tot	781	1232	335	608	1274	4230		Tot	781	1232	335	608	1274	4230

PM factoring percentag 1

	A	B	C	D	E	Tot			A	B	C	D	E	Tot
A	0	85	18	312	325	740		A	0	85	18	312	325	740
B	77	0	58	83	723	941		B	77	0	58	83	723	941
C	18	31	0	16	13	78		C	18	31	0	16	13	78
D	186	80	15	0	381	662		D	186	80	15	0	381	662
E	531	899	13	398	0	1841		E	531	899	13	398	0	1841
Tot	812	1095	104	809	1442	4262		Tot	812	1095	104	809	1442	4262

Test 2			
Stage 1 runs		1 in 3 in AM	
		1 in 2 in PM	
AM		PM	
Traffic %	PRC	Traffic %	PRC
100	-109.4	100	-71.9
95	-99.1	95	-70.4
90	-88.6	90	-61.1
85	-78.2	85	-51.9
80	-67.7	80	-42.6
75	-57.3	75	-33.3
70	-46.9	70	-24.1
65	-36.3	65	-16.7
60	-25.8	60	-3.3
55	-15.5	55	5.5
50	-4.9		
45	5.9		

AM Optimised timings										
all cycles as base				Optimised without stage 1						
	start	end	duration	start	end	duration		End times		
1	9	32	23				9	32		
3	32	42	10	0	18	18		42	147	267
2	42	87	45	18	51	33		87	180	300
4	87	112	25	51	102	51		112	231	351
5	112	9	17	102	0	18		129	249	369

PM optimised timings									
all cycles as base				Optimised without stage 1					
	start	end	duration	start	end	duration		End times	
1	105	1	16				225	1	
3	1	15	14	9	36	27		15	132
2	15	67	52	36	78	42		67	174
4	67	89	22	78	112	34		89	208
5	89	105	16	112	9	17		105	225

SS

AM cycle time calculation

			cycle time	120							
	start	end	duration	%	% no 1	duration	Final duration		end		
1	9	32	23	0.19				9	32		
2	32	42	10	0.08	0.1	12	13		42	142	262
3	42	87	45	0.38	0.47	56	56		87	198	318
4	87	112	25	0.21	0.26	31	31		112	229	349
5	112	9	17	0.14	0.17	20	20		129	249	369
			check	1	1	113	120				

Stream 2

stage	start	end	
1	64	51	107
2	51	64	13

PM cycle time calculation

			cycle time	120						
	start	end	duration	%	% no 1	duration	Final duration		end	
1	105	1	16	0.1333					1	
2	1	15	14	0.1167	0.1346	16	17		15	122
3	15	67	52	0.4333	0.5	60	60		67	182
4	67	89	22	0.1833	0.2115	25	25		89	207
5	89	105	16	0.1333	0.1538	18	18		105	225
			check	1	1	119	120			

Stream 2

stage	start	end
1	66	53
2	53	66

AM cycle time calculation

			cycle time	120							
	start	end	duration	%	% no 1	duration	Final duration		end		
1	9	32	23	0.19				9	32		
2	32	42	10	0.08	0.1	12	10		42	139	259
3	42	87	45	0.38	0.47	56	45		87	184	304
4	87	112	25	0.21	0.26	31	48		112	232	352
5	112	9	17	0.14	0.17	20	17		129	249	369
			check	1	1	113	120				

Stream 2

AM Optimised timings										
all cycles as base				Optimised without stage 1						
	start	end	duration	start	end	duration		End times		
1	9	32	23				9	32		
2	32	42	10	9	51	42		42	171	337
3	42	87	45	5	47	42		87	213	379
4	87	112	25	47	87	40		112	253	419
5	112	9	17	87	9	42		129	295	461

1	9	32	23				9	32		
3	32	42	10	0	18	18		42	147	267
2	42	87	45	18	51	33		87	180	300
4	87	112	25	51	102	51		112	231	351
5	112	9	17	102	0	18		129	249	369

PM Optimised timings										
all cycles as base				Optimised without stage 1						
	start	end	duration	start	end	duration		End times		
1	105	1	16				225	1		
3	1	15	14	9	36	27		15	132	
2	15	67	52	36	78	42		67	174	
4	67	89	22	78	112	34		89	208	
5	89	105	16	112	9	17		105	225	

Superseded calculations