

Appendix E: WSP - M66 J3 VISSIM Model Output Report

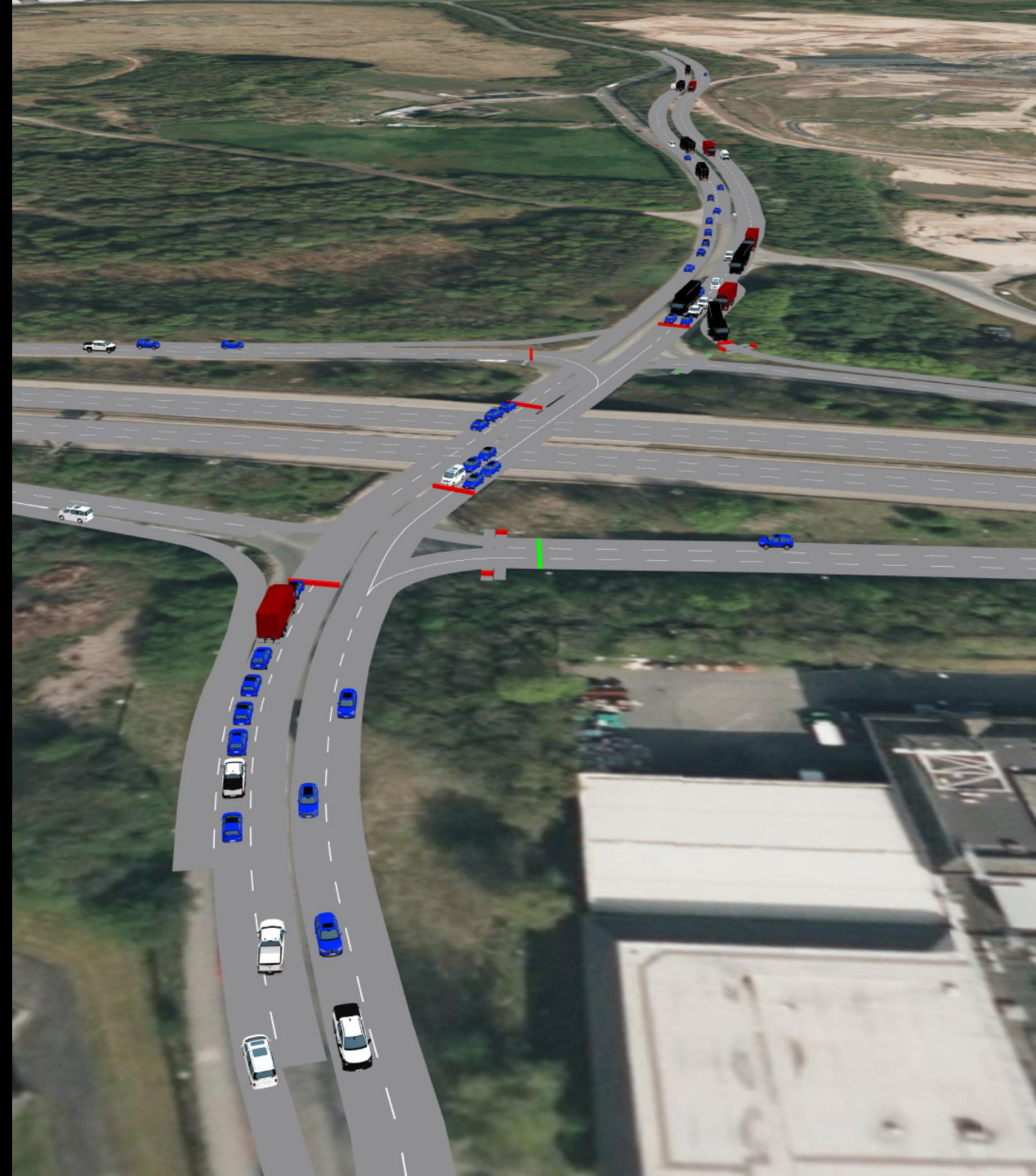


M66 J3

MODELLING RESULTS

2032 & 2039 FORECAST MODEL RESULTS

March 2025





2032 & 2039 NGTM Traffic Flow Scenarios

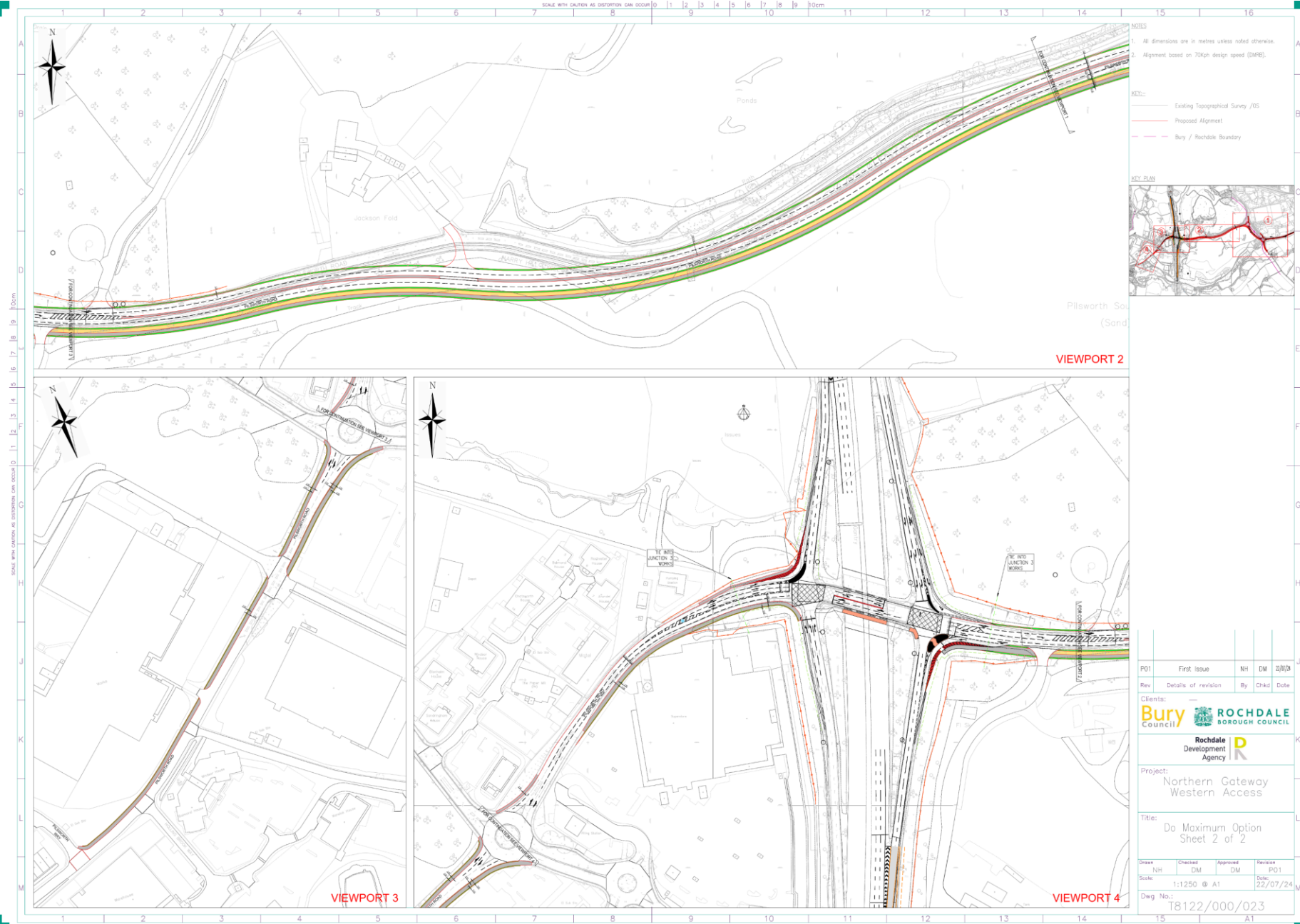
Scenario	Scenario name	Year	Traffic Flows NGTM	Design Change	Comments
1	2032 DM	2032	Run 5	Existing Layout	Do Minimum case no layout changes
2	2032 DS3a	2032	Run 8	PF2.2	Do Something 3 (JPA1.1 + JPA1.2), 395,000sqm of Industrial & No M62 Access Solution
3	2032 DS3b	2032	Run 9	PF2.2	Do Something 3 (JPA1.1 + JPA1.2) , 395,000sqm of Industrial & M62 Access Solution included
4	2039 DM	2039	Run 10	Existing Layout	Do Minimum case no layout changes
5	2039 DS3b	2039	Run 14	PF2.2	Do Something 3 (JPA1.1 + JPA1.2), Full Allocation & M62 Access Solution included
6	2039 DS3 – Policy On	2039	Run 21	PF2.2	Do Something 3 (JPA1.1 + JPA1.2), Full Allocation – Policy On Trip Rates & No M62 Access Solution







Current Proposed Improvement (PF2.2)



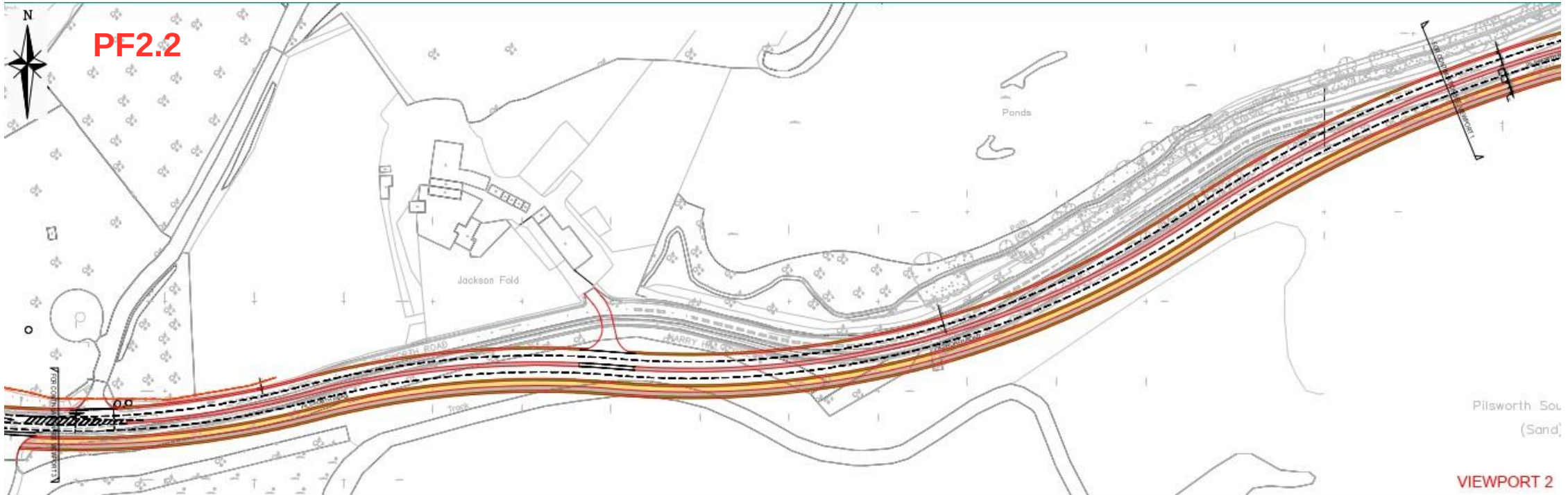


M66 J3

- Pilsworth Road two-lane exit westbound extends all the way from M66 J3 junction to Pilsworth Road / Roach Bank Road/ ASDA roundabout.
- The stop line for the westbound lane on Pilsworth Road has been moved back slightly.



Network Differences – Pilsworth Road East of M66 J3

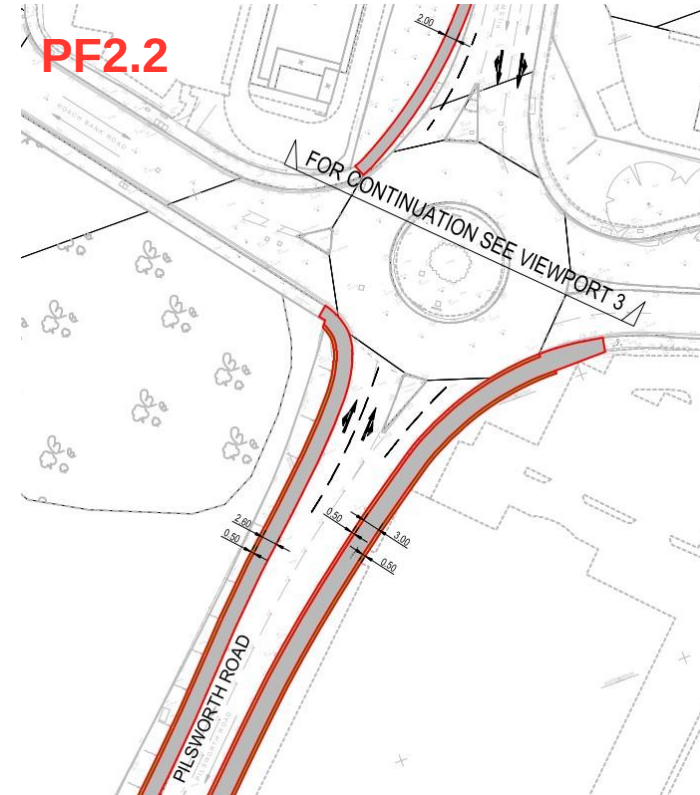


Pilsworth Road East of M66 J3

- Widening Pilsworth Road from single lane to have two lanes of traffic traveling in each direction
- Road alignment east of M66 J3 has changed.



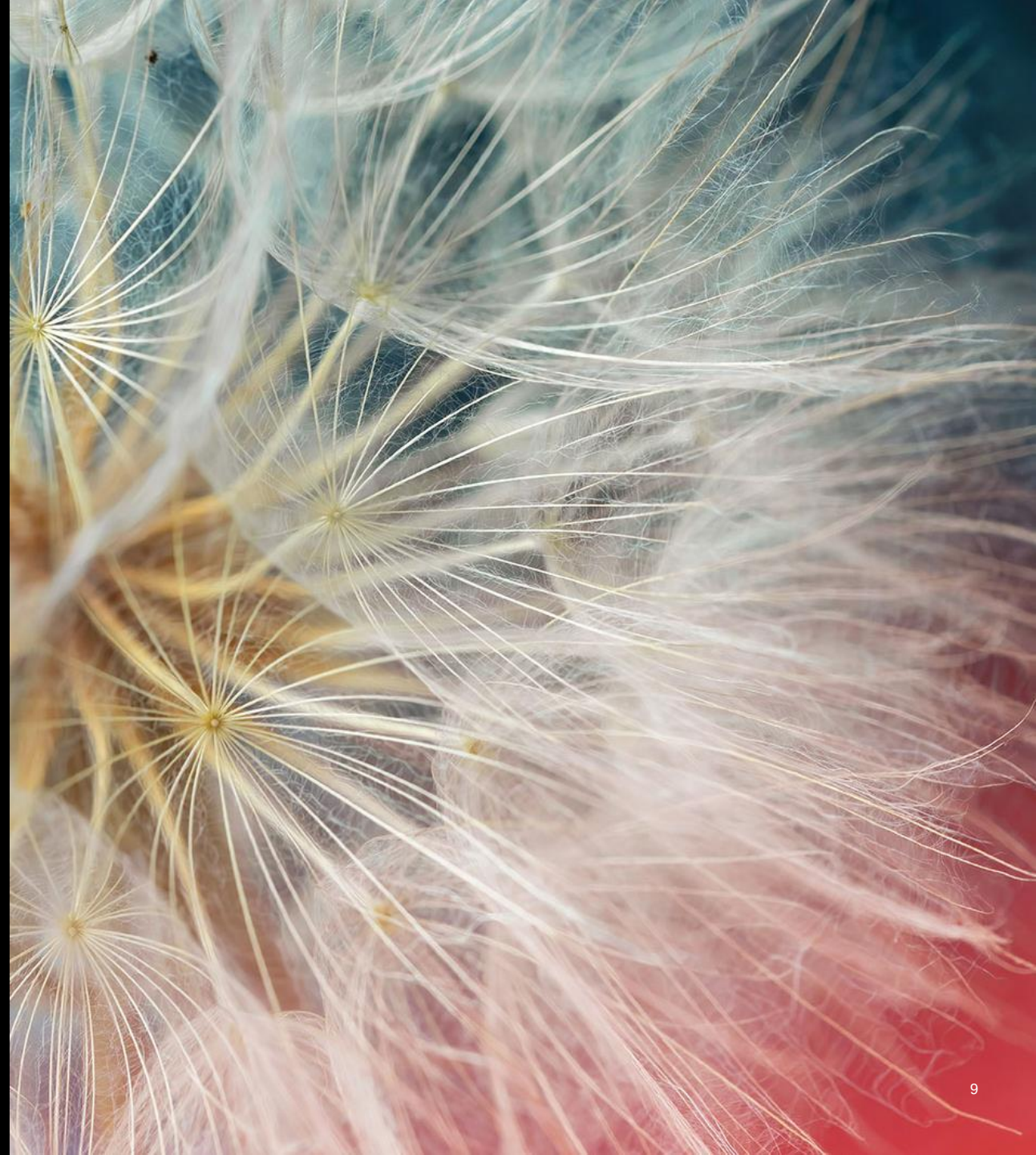
Network Differences – ASDA Roundabout



Pilsworth Road / Roach Bank Road / ASDA roundabout

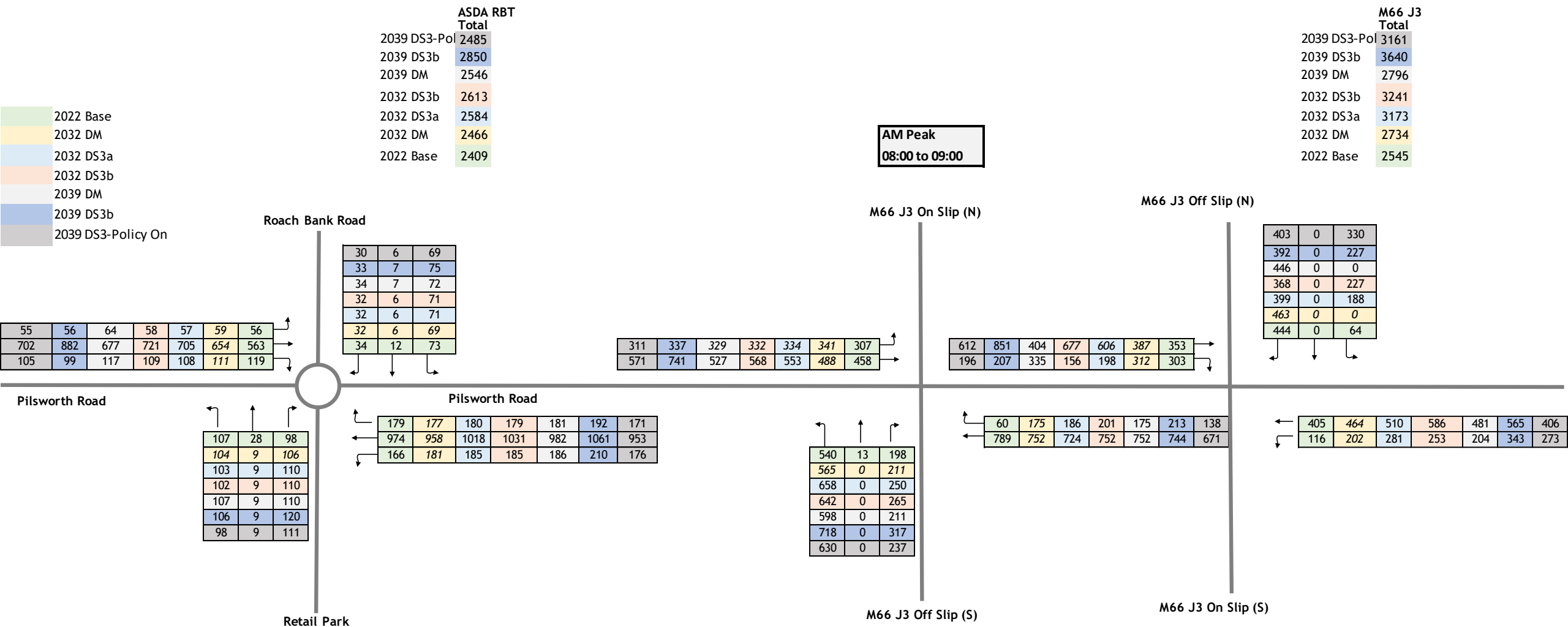
- Improve lane markings/arrows on Pilsworth Road entries northbound and southbound
 - Nearside – left turn/ahead
 - Offside – ahead/right turn
- Short section of two-lane exit marking on Pilsworth Road northbound and southbound

TRAFFIC FLOWS



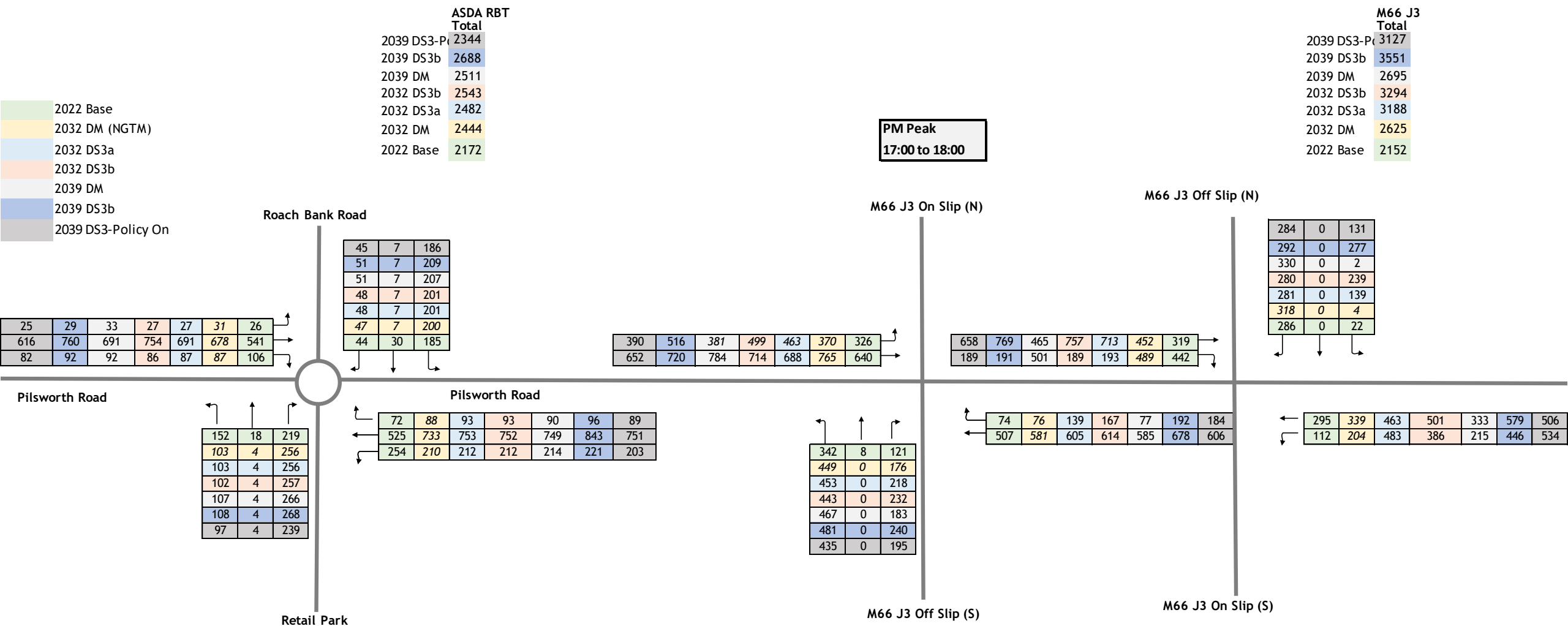


AM Peak Flow (08:00-09:00) – 6 scenarios

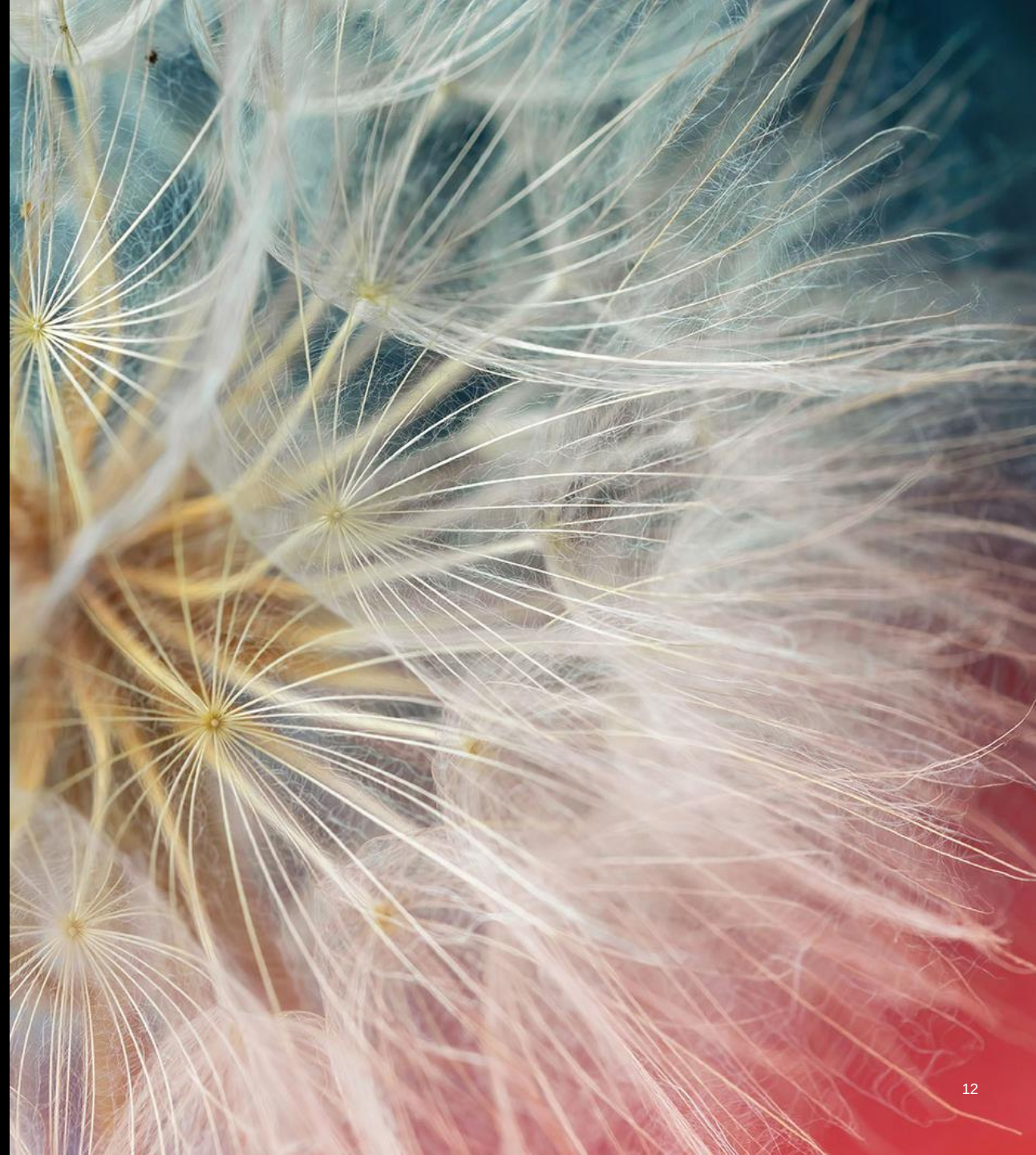




PM Peak Flow (17:00-18:00) – 6 scenarios



RESULTS COMPARISON





2032 & 2039 Forecast Models

Scenario	Scenario name	Year	Traffic Flows NGTM	Design	Comments
2032					
1	2032 DM	2032	Run 5	Existing Layout	Do Minimum case no layout changes
2	2032 DS3a	2032	Run 8	PF2.2	Do Something 3 (JPA1.1 + JPA1.2), 395,000sqm of Industrial & No M62 Access Solution
3	2032 DS3b	2032	Run 9	PF2.2	Do Something 3 (JPA1.1 + JPA1.2) , 395,000sqm of Industrial & M62 Access Solution included
4	2032 DS3a –v2	2032	Run 8	PF2.2	Same as Scenario 2 - Early cutoff of SB offslip signal to facilitate ped movement
5	2032 DS3b –v2	2032	Run 9	PF2.2	Same as Scenario 3 - Early cutoff of SB offslip signal to facilitate ped movement
6	2032 DS3a –v3	2032	Run 8	PF2.2	Same as Scenario 2 - Late start of EB Right Turn to SB onslip to facilitate ped movement
7	2032 DS3b –v3	2032	Run 9	PF2.2	Same as Scenario 3 - Late start of EB Right Turn to SB onslip to facilitate ped movement
2039					
8	2039 DM	2039	Run 10	Existing Layout	Do Minimum case no layout changes
9	2039 DS3b	2039	Run 14	PF2.2	Do Something 3 (JPA1.1 + JPA1.2), Full Allocation & M62 Access Solution included
10	2039 DS3 – Policy On	2039	Run 21	PF2.2	Do Something 3 (JPA1.1 + JPA1.2), Full Allocation – Policy On Trip Rates & No M62 Access Solution
11	2039 DS3b –v2	2039	Run 14	PF2.2	Same as Scenario 9 - Early cutoff of SB offslip signal to facilitate ped movement
12	2039 DS3 – Policy On –v2	2039	Run 21	PF2.2	Same as Scenario 10 - Early cutoff of SB offslip signal to facilitate ped movement
13	2039 DS3b –v3	2039	Run 14	PF2.2	Same as Scenario 9 - Late start of EB Right Turn to SB onslip to facilitate Ped movement
14	2039 DS3 – Policy On –v3	2039	Run 21	PF2.2	Same as Scenario 10 - Late start of EB Right Turn to SB onslip to facilitate Ped movement



2032 Overall Network Performance Statistics

Network Parameters	AM								PM							
	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3
Total Time Taken (s)	684876	964134	406578	421445	415953	427516	421373	428002	494106	606510	389431	405080	403881	426086	395901	408254
Total Distance (m)	3825968	3955309	4788985	4892487	4791040	4893834	4790574	4892652	3672791	3723620	4625682	4820388	4628266	4826667	4623045	4815567
Total Vehicles	3007	3186	3590	3660	3592	3663	3591	3662	2959	2936	3563	3665	3566	3674	3564	3665
Total Delay (s)	454107	727554	115980	124133	125319	130171	130686	130655	270814	380313	106601	110707	121037	131267	113159	114011
Average Time (s) / Vehicle	228	303	113	115	116	117	117	117	167	207	109	111	113	116	111	111
Average Time (s) / Mile	288	392	137	139	140	141	142	141	217	262	135	135	140	142	138	136
Average Distance (m) / Vehicle	1272	1242	1334	1337	1334	1336	1334	1336	1241	1268	1298	1315	1298	1314	1297	1314
Average Speed (mph)	13	9	26	26	26	26	25	26	17	14	27	27	26	25	26	26
Average Speed (kph)	20	15	42	42	41	41	41	41	27	22	43	43	41	41	42	42
Average Delay / Vehicle	151	228	32	34	35	36	36	36	92	130	30	30	34	36	32	31
Max Latent Demand Total (Vehicles)	0	221	0	0	0	0	0	0	0	199	0	0	0	0	0	0
Max Latent Demand Pilsworth Road EB (Vehicles)	0	101	0	0	0	0	0	0	0	189	0	0	0	0	0	0
Max Latent Demand Pilsworth Road WB (Vehicles)	0	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Network statistics are extracted from the peak hours whereas the latent demand is not purely from the peak hour, it also includes the cool-down period traffic which are not able to enter the network at the end of simulation.
 - AM Peak Hour: 08:00 – 09:00
 - PM Peak Hour: 17:00 – 18:00



2039 Overall Network Performance Statistics

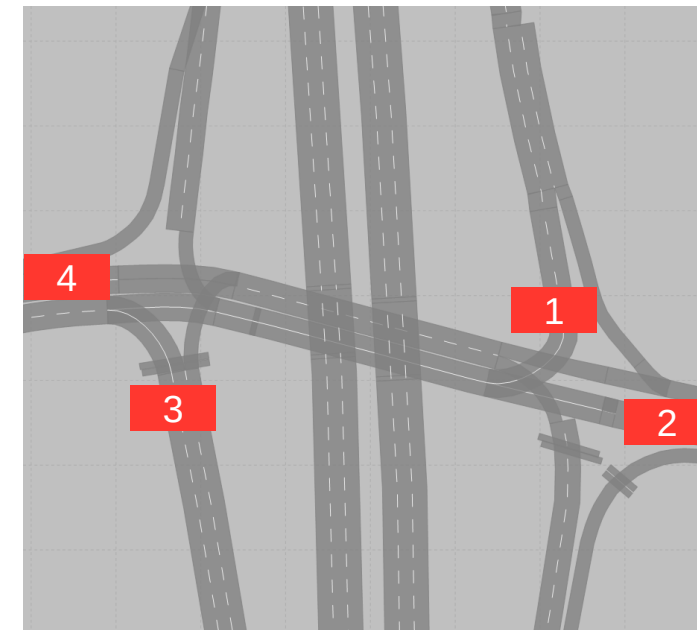
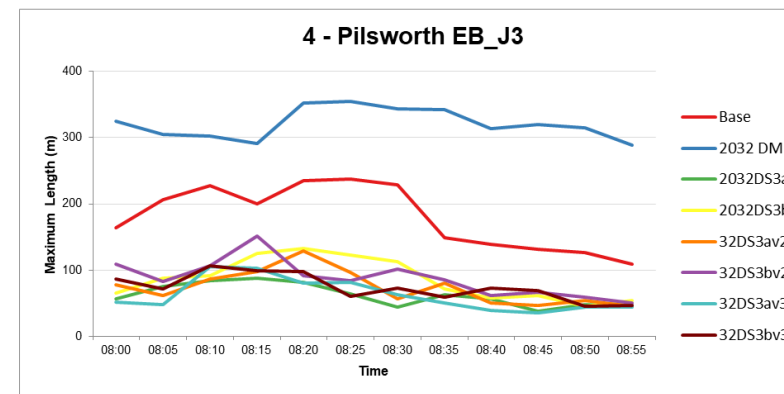
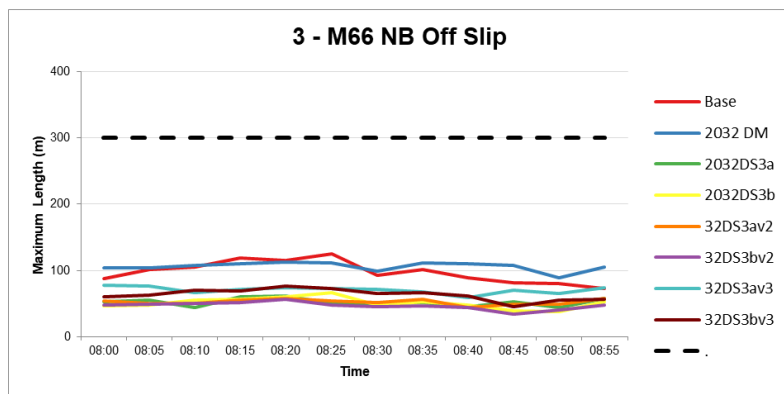
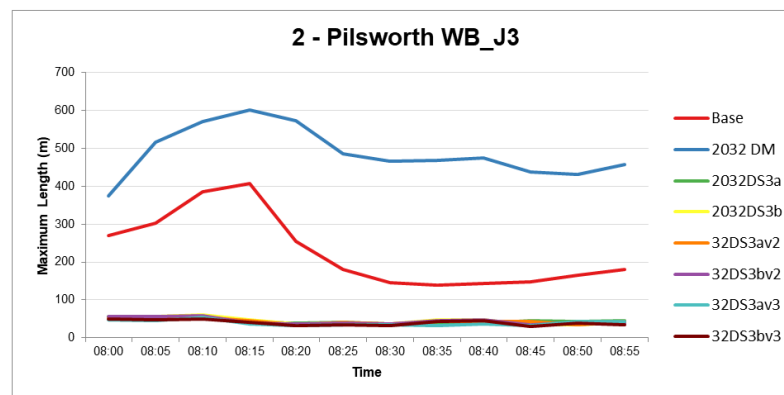
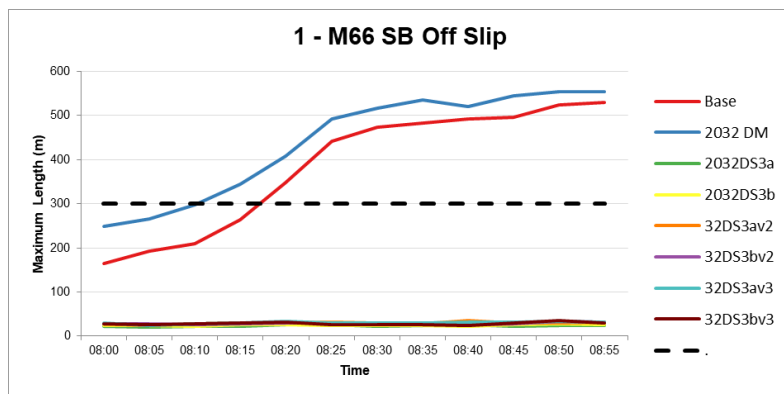
Network Parameters	AM								PM							
	2022 Base	2039 DM	2039 DS3b	2039 DS3- Policy On	2039 DS3b - v2	2039 DS3- Policy On - v2	2039 DS3b - v3	2039 DS3- Policy On - v3	2022 Base	2039 DM	2039 DS3b	2039 DS3- Policy On	2039 DS3b - v2	2039 DS3- Policy On - v2	2039 DS3b - v3	2039 DS3- Policy On - v3
Total Time Taken (s)	684876	965878	544421	398298	532932	407419	571373	410264	494106	633230	446689	374267	462497	387214	450403	377646
Total Distance (m)	3825968	4013268	5466024	4807372	5464701	4810534	5464649	4807007	3672791	3738491	5212432	4536276	5214629	4540804	5209835	4537976
Total Vehicles	3007	3238	4084	3557	4087	3563	4092	3560	2959	2954	3961	3486	3966	3487	3964	3487
Total Delay (s)	454107	724997	211074	108014	199565	116999	237992	119944	270814	406729	130389	99087	146149	112013	134243	102428
Average Time (s) / Vehicle	228	298	133	112	130	114	140	115	167	214	113	107	117	111	114	108
Average Time (s) / Mile	288	387	160	133	157	136	168	137	217	273	138	133	143	137	139	134
Average Distance (m) / Vehicle	1272	1240	1338	1352	1337	1350	1335	1350	1241	1266	1316	1301	1315	1302	1314	1302
Average Speed (mph)	13	9	23	27	23	26	22	26	17	13	26	27	25	26	26	27
Average Speed (kph)	20	15	36	43	37	43	35	42	27	21	42	44	41	42	42	43
Average Delay / Vehicle	151	224	52	30	49	33	58	34	92	138	33	28	37	32	34	29
Max Latent Demand Total (Vehicles)	0	364	0	0	0	0	0	0	0	255	0	0	0	0	0	0
Max Latent Demand Pilsworth Road EB (Vehicles)	0	205	0	0	0	0	0	0	0	249	0	0	0	0	0	0
Max Latent Demand Pilsworth Road WB (Vehicles)	0	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- Network statistics are extracted from the peak hours whereas the latent demand is not purely from the peak hour, it also includes the cool-down period traffic which are not able to enter the network at the end of simulation.
 - AM Peak Hour: 08:00 – 09:00
 - PM Peak Hour: 17:00 – 18:00



M66 J3 – 2032 AM Queue Length (m)

Approach Arm	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3
1 - M66 SB Off Slip	529	555	27	28	35	34	34	35
2 - Pilsworth WB_J3	407	601	55	60	54	58	54	50
3 - M66 NB Off Slip	125	113	61	66	58	57	78	76
4 - Pilsworth EB_J3	238	355	87	132	129	152	105	106
Total	1299	1623	230	286	277	301	270	267



How are Queue Results recorded?

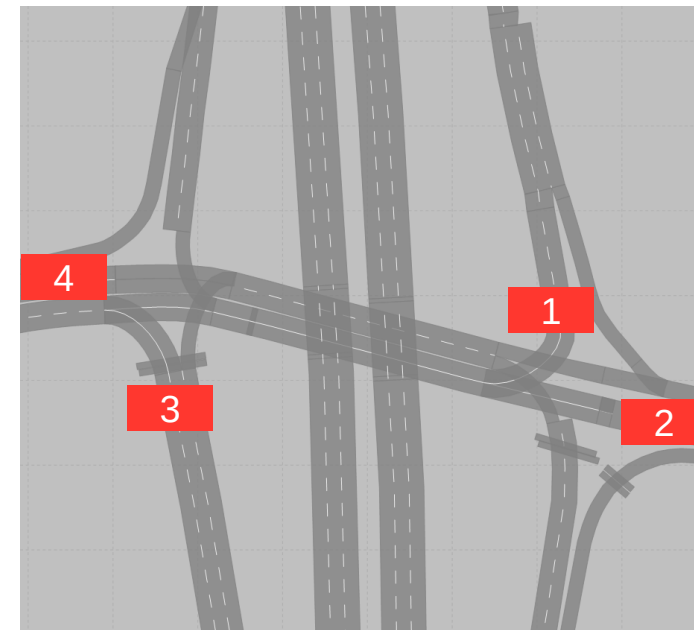
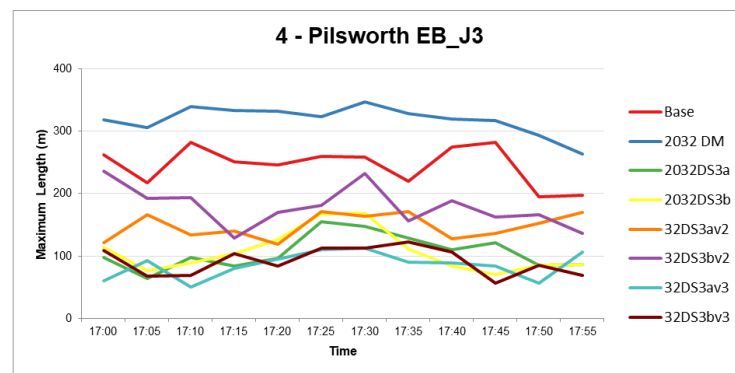
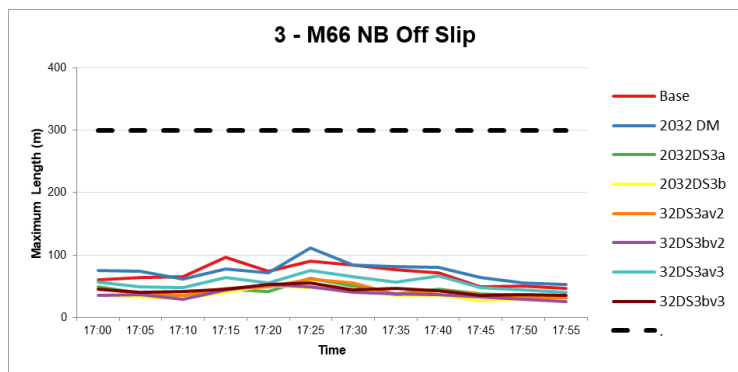
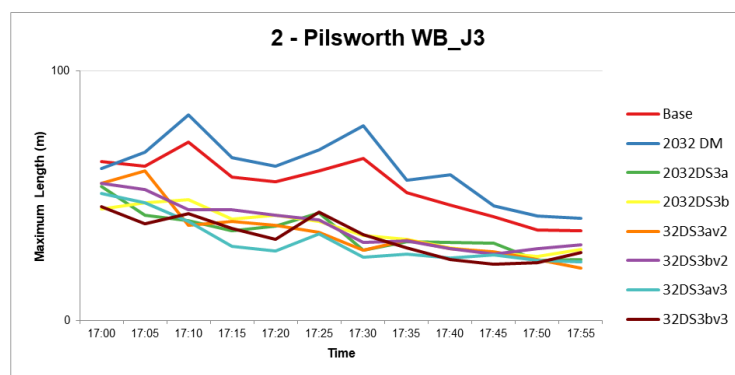
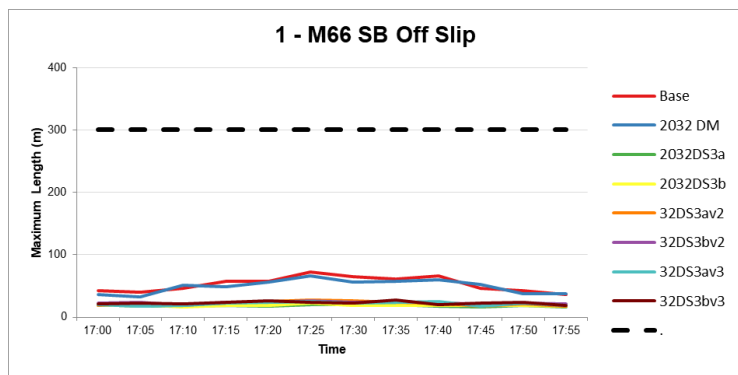
Queue lengths are reported as the Maximum average for each Queue counter.

This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



M66 J3 – 2032 PM Queue Length (m)

Approach Arm	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3
1 - M66 SB Off Slip	73	66	20	22	28	26	24	27
2 - Pilsworth WB_J3	72	82	54	48	60	55	51	46
3 - M66 NB Off Slip	97	111	62	52	61	53	75	55
4 - Pilsworth EB_J3	283	347	155	169	171	237	113	122
Total	524	606	291	292	320	371	264	251



How are Queue Results recorded?

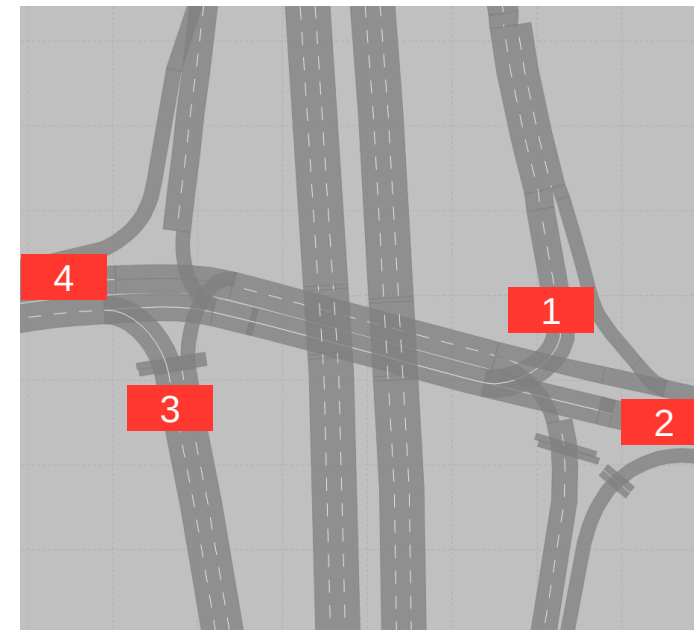
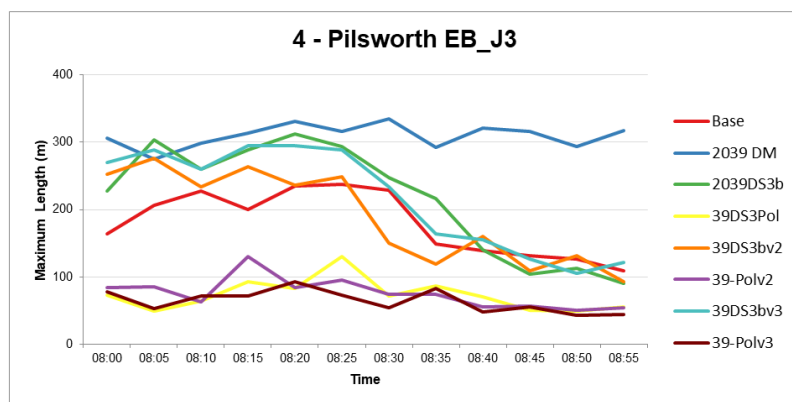
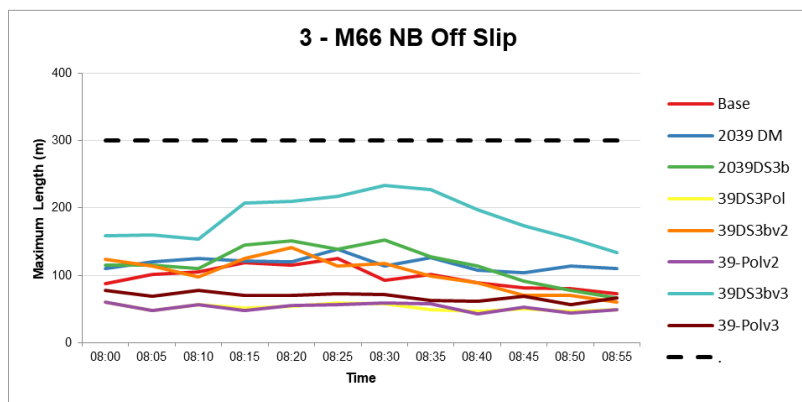
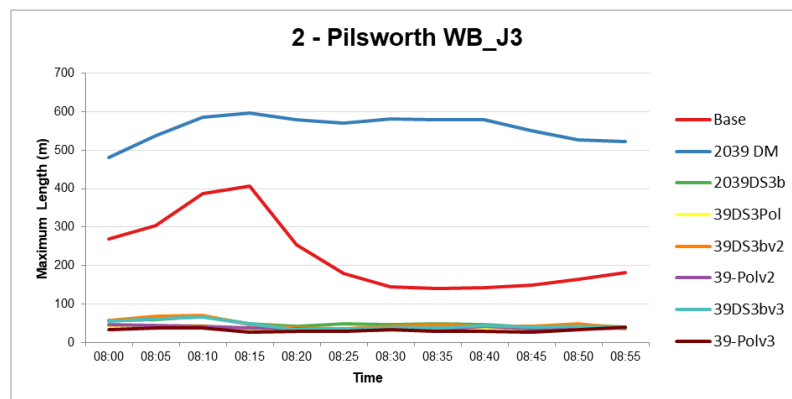
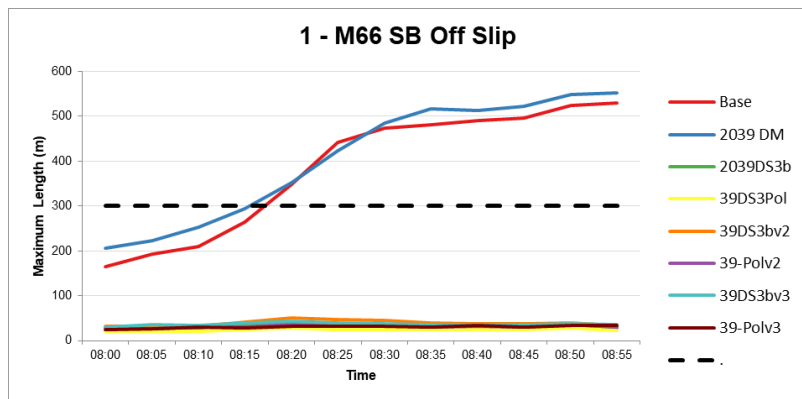
Queue lengths are reported as the Maximum average for each Queue counter.

This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



M66 J3 – 2039 AM Queue Length (m)

Approach Arm	2022 Base	2039 DM	2039 DS3b	2039 DS3-Policy On	2039 DS3b - v2	2039 DS3-Policy On - v2	2039 DS3b - v3	2039 DS3-Policy On - v3
1 - M66 SB Off Slip	529	553	41	29	50	36	43	34
2 - Pilsworth WB_J3	407	597	69	43	70	47	65	40
3 - M66 NB Off Slip	125	139	152	60	141	61	233	78
4 - Pilsworth EB_J3	238	335	312	130	276	130	295	93
Total	1299	1624	574	262	537	274	637	245



How are Queue Results recorded?

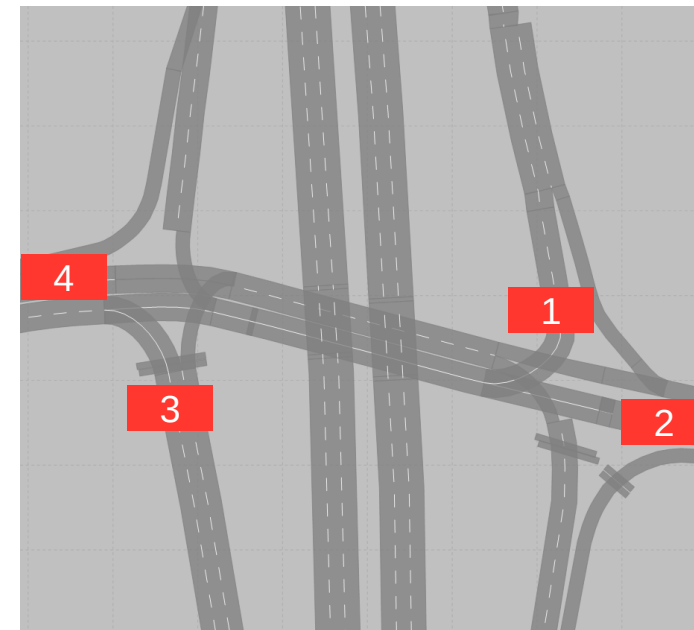
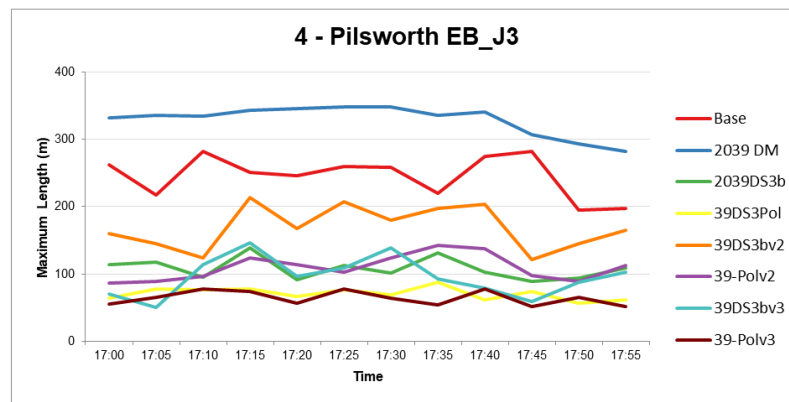
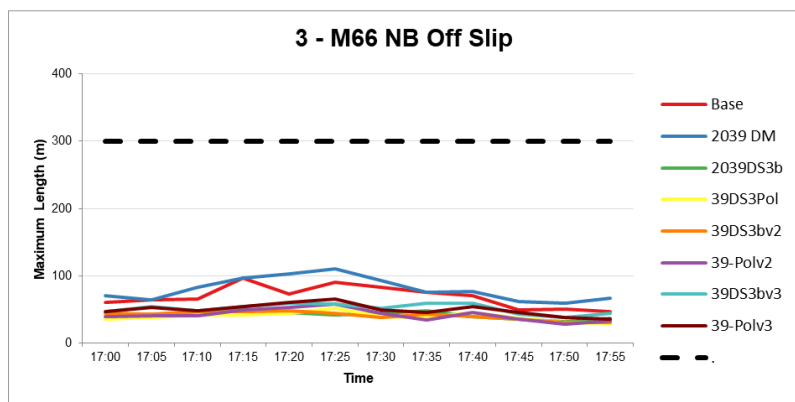
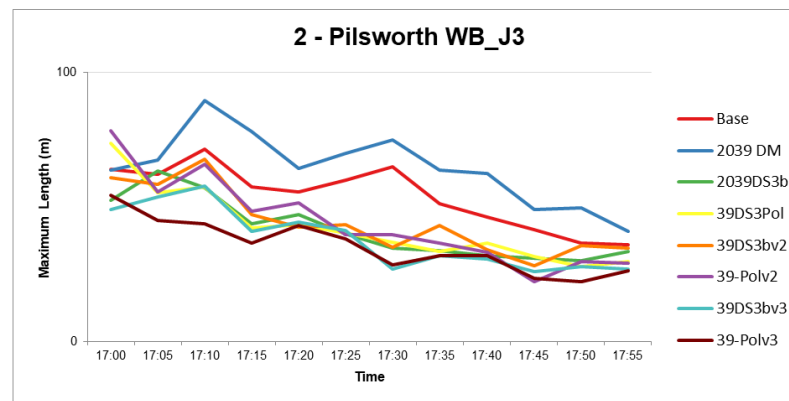
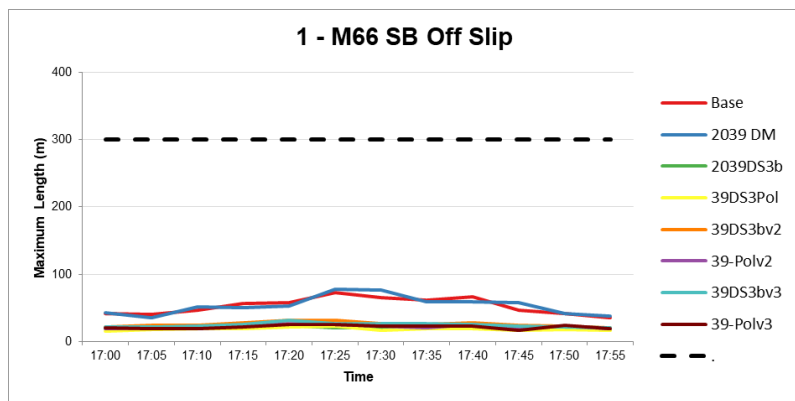
Queue lengths are reported as the Maximum average for each Queue counter.

This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



M66 J3 – 2039 PM Queue Length (m)

Approach Arm	2022 Base	2039 DM	2039 DS3b	2039 DS3-Policy On	2039 DS3b - v2	2039 DS3-Policy On - v2	2039 DS3b - v3	2039 DS3-Policy On - v3
1 - M66 SB Off Slip	73	78	25	22	32	26	31	25
2 - Pilsworth WB_J3	72	90	63	74	68	78	58	54
3 - M66 NB Off Slip	97	111	51	52	48	59	59	66
4 - Pilsworth EB_J3	283	348	138	87	213	143	147	78
Total	524	627	278	236	360	305	295	223



How are Queue Results recorded?

Queue lengths are reported as the Maximum average for each Queue counter.

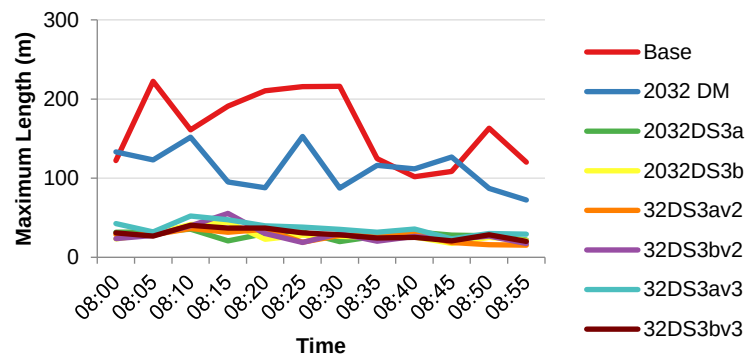
This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



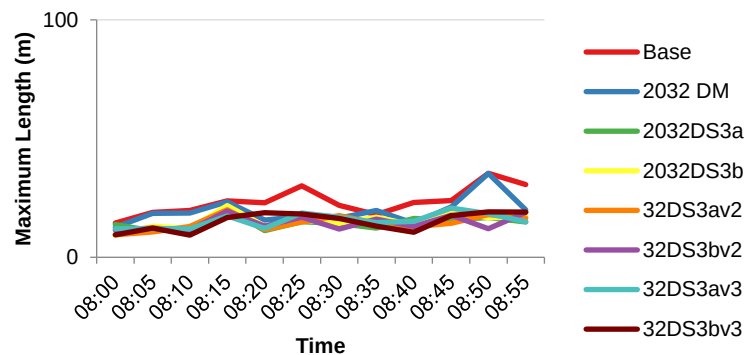
ASDA– 2032 AM Queue Length (m)

Approach Arm	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3
17 - ASDA East Approach	222	153	36	44	36	55	52	40
18 - ASDA South Approach	35	35	21	22	20	19	21	19
19 - ASDA West Approach	231	350	49	54	56	49	60	35
20 - ASDA North Approach	16	24	20	20	21	24	24	21
Total	505	563	125	140	133	148	157	115

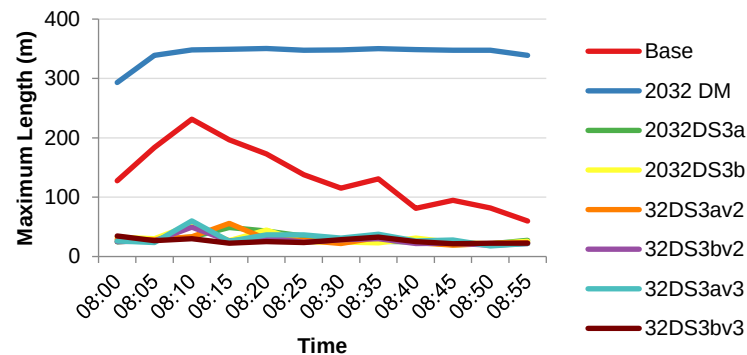
17 - ASDA East Approach



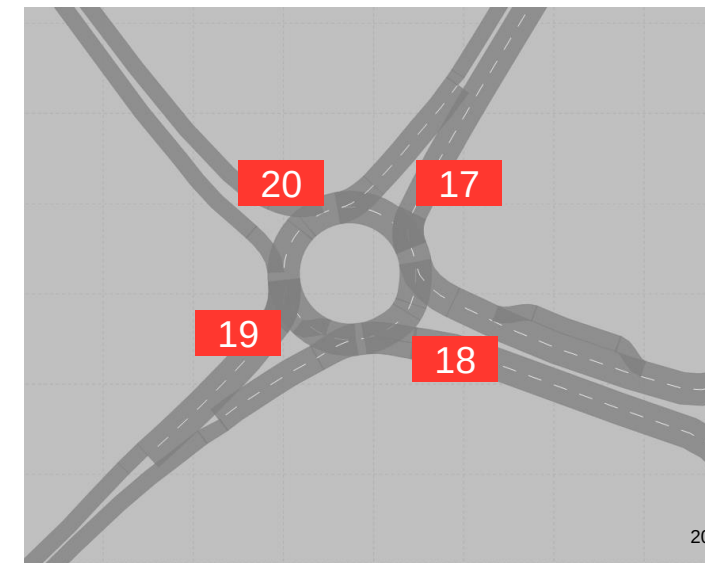
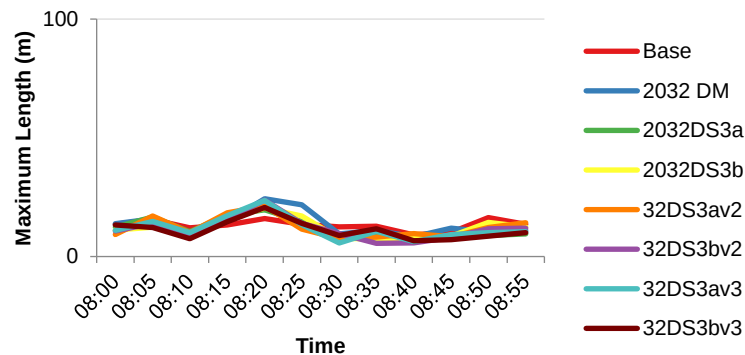
18 - ASDA South Approach



19 - ASDA West Approach



20 - ASDA North Approach



How are Queue Results recorded?

Queue lengths are reported as the Maximum average for each Queue counter.

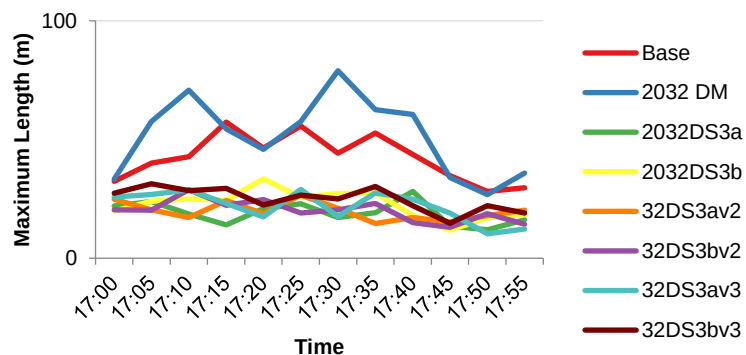
This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



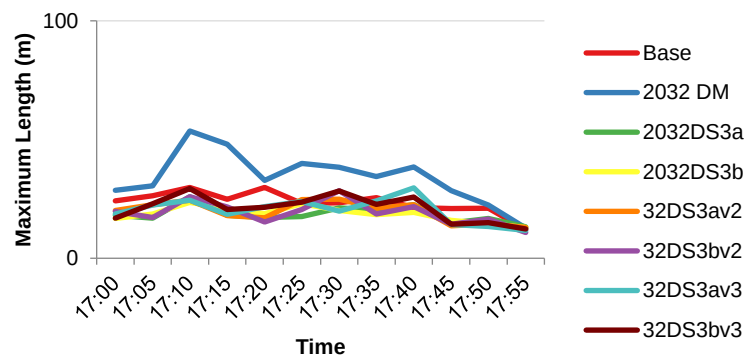
ASDA– 2032 PM Queue Length (m)

Approach Arm	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3
17 - ASDA East Approach	57	79	28	33	27	29	29	31
18 - ASDA South Approach	30	54	26	24	25	28	30	29
19 - ASDA West Approach	341	350	24	26	24	33	26	24
20 - ASDA North Approach	92	97	37	38	35	48	35	37
Total	520	580	115	121	110	138	119	122

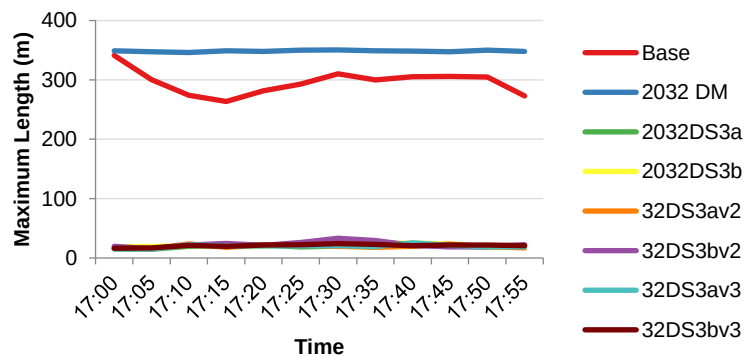
17 - ASDA East Approach



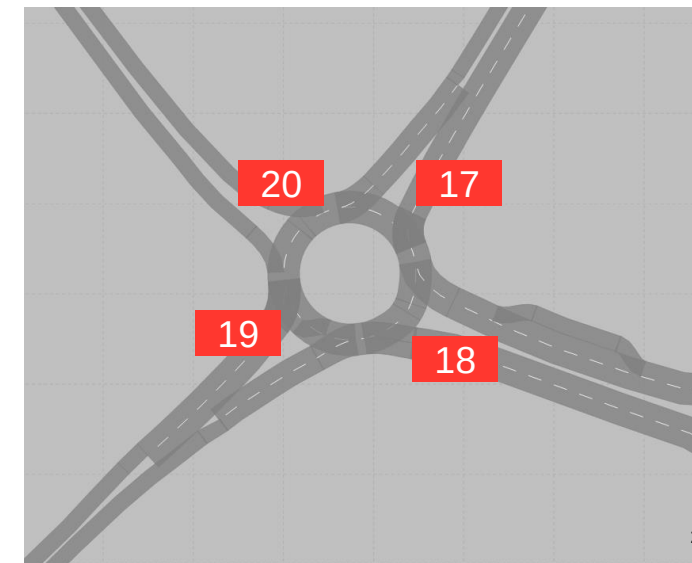
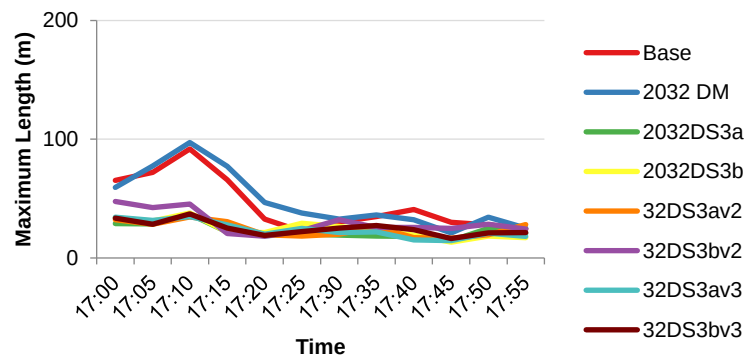
18 - ASDA South Approach



19 - ASDA West Approach



20 - ASDA North Approach



How are Queue Results recorded?

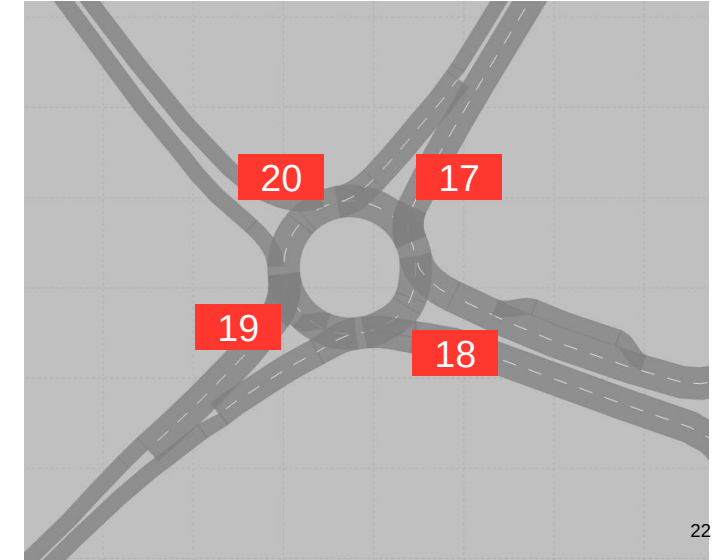
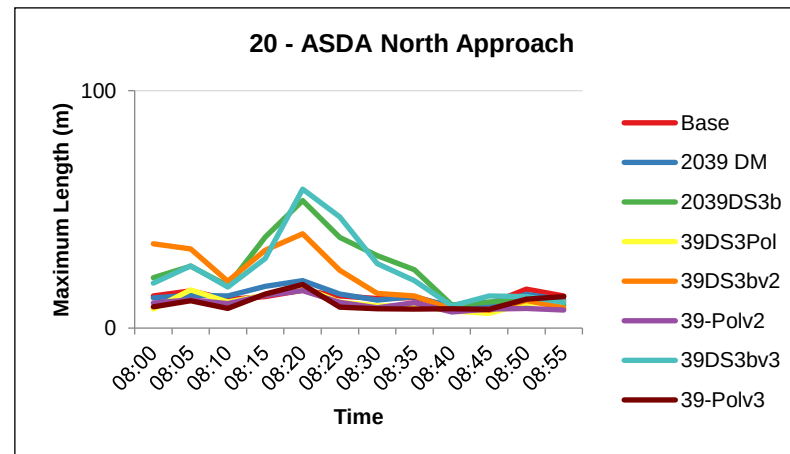
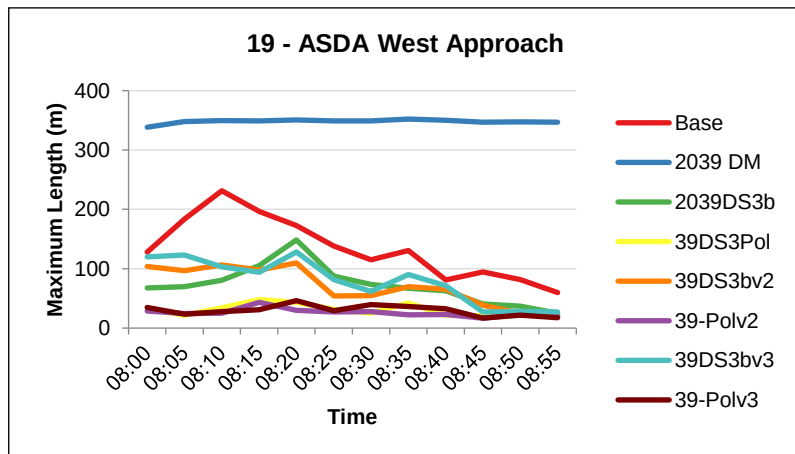
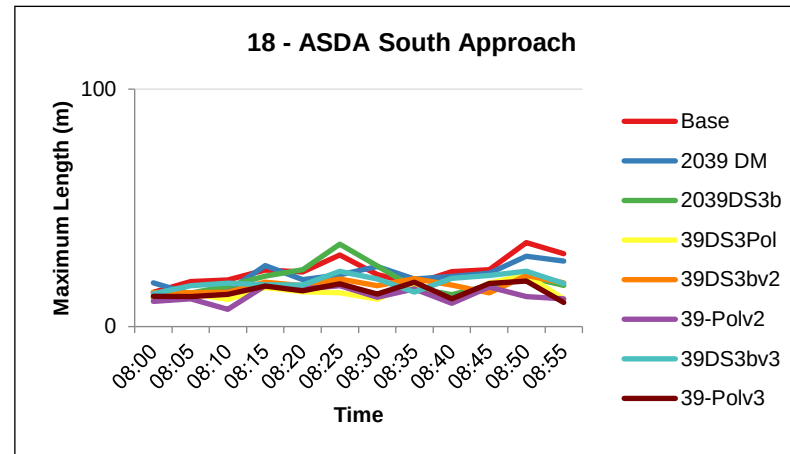
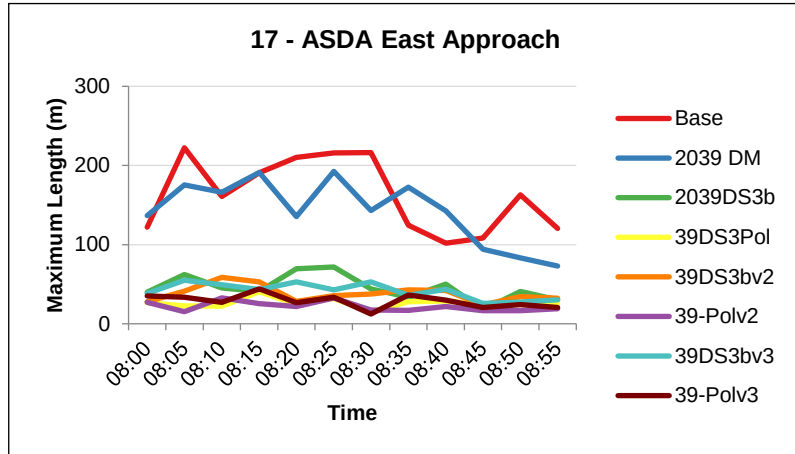
Queue lengths are reported as the Maximum average for each Queue counter.

This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



ASDA– 2039 AM Queue Length (m)

Approach Arm	2022 Base	2039 DM	2039 DS3b	2039 DS3-Policy On	2039 DS3b - v2	2039 DS3-Policy On - v2	2039 DS3b - v3	2039 DS3-Policy On - v3
17 - ASDA East Approach	222	193	72	40	59	33	55	44
18 - ASDA South Approach	35	30	35	22	22	17	23	19
19 - ASDA West Approach	231	352	149	48	110	43	128	46
20 - ASDA North Approach	16	20	54	17	40	16	59	18
Total	505	594	309	127	230	109	265	128



How are Queue Results recorded?

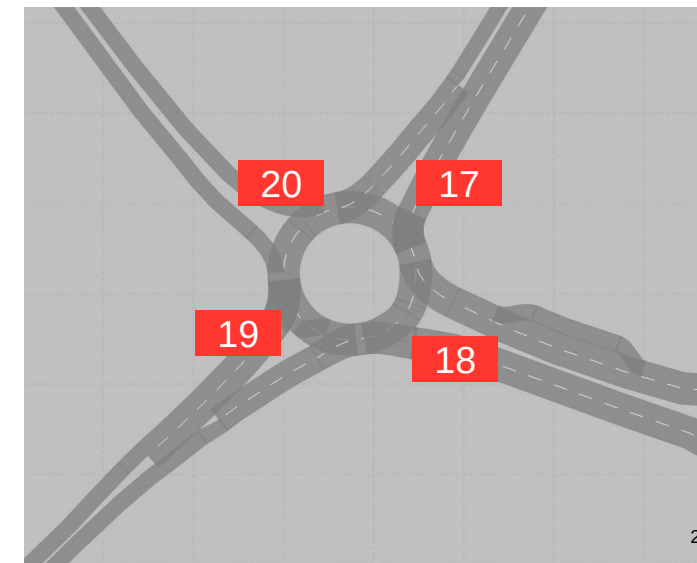
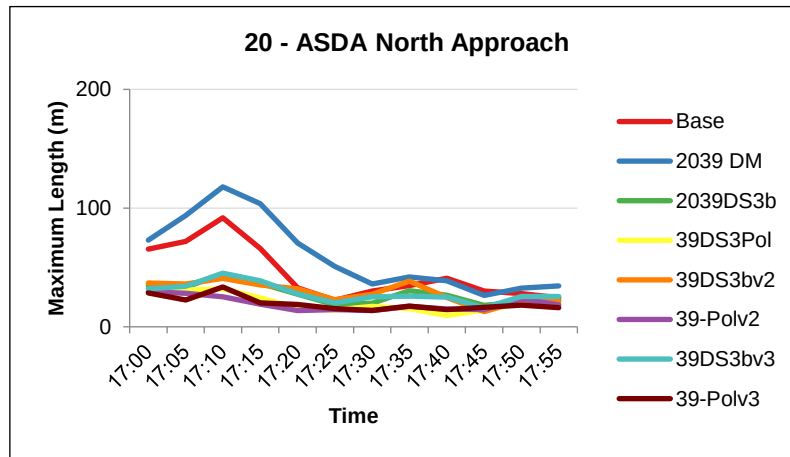
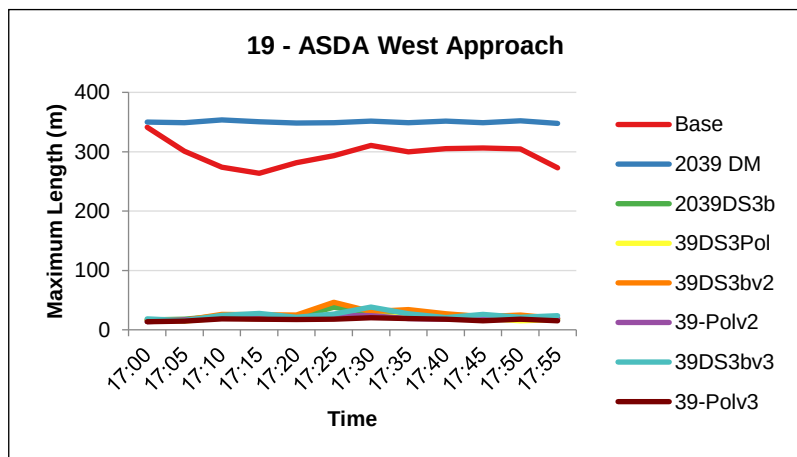
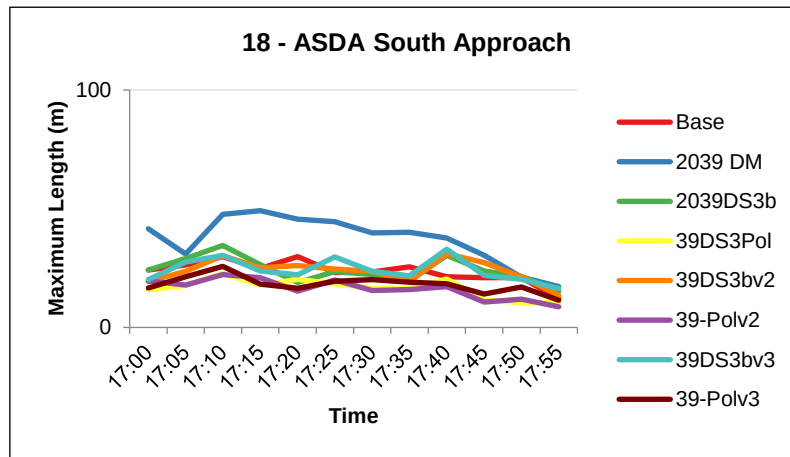
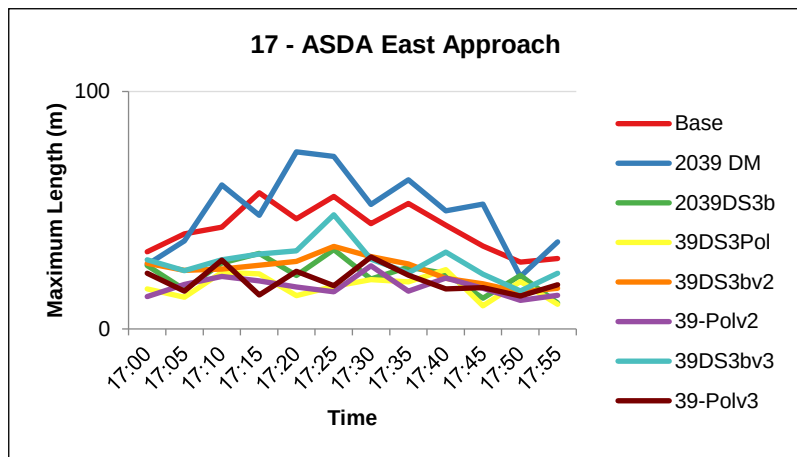
Queue lengths are reported as the Maximum average for each Queue counter.

This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



ASDA– 2039 PM Queue Length (m)

Approach Arm	2022 Base	2039 DM	2039 DS3b	2039 DS3-Policy On	2039 DS3b - v2	2039 DS3-Policy On - v2	2039 DS3b - v3	2039 DS3-Policy On - v3
17 - ASDA East Approach	57	75	33	25	35	27	48	30
18 - ASDA South Approach	30	49	35	23	31	22	33	26
19 - ASDA West Approach	341	354	38	24	46	25	38	20
20 - ASDA North Approach	92	118	44	32	41	29	45	34
Total	520	595	150	104	153	103	165	110



How are Queue Results recorded?

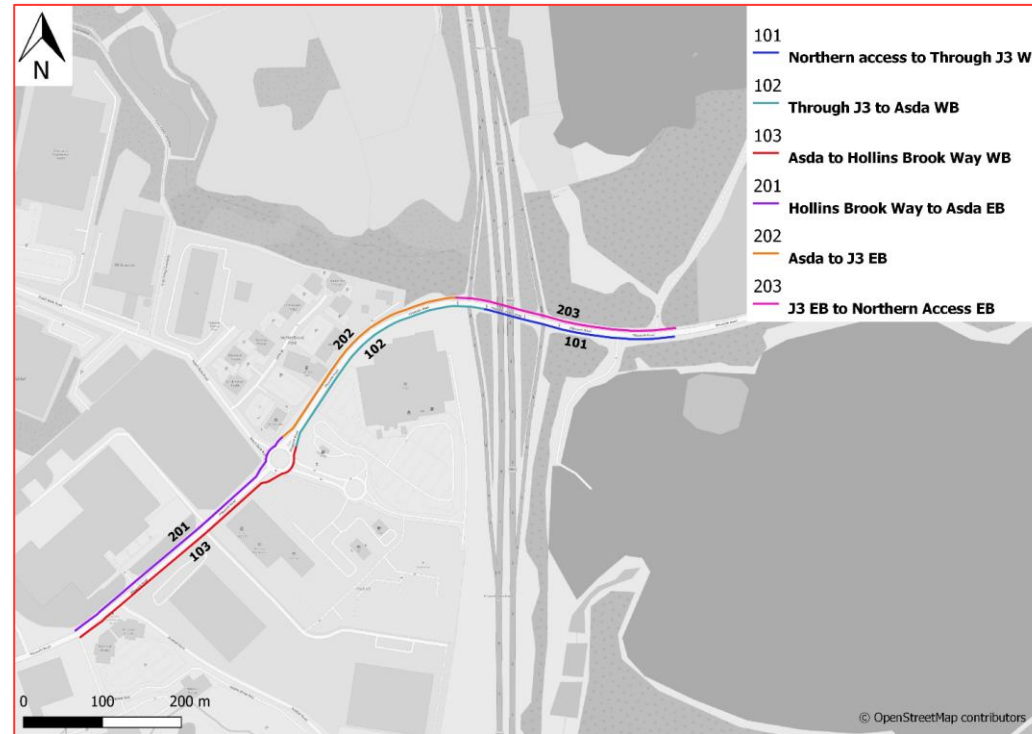
Queue lengths are reported as the Maximum average for each Queue counter.

This takes the maximum queue across each 5 minute segment within each run and then an average is taken from the 10 runs which is reported in the table and illustrated in the graphs.



2032 Journey Time Results (seconds)

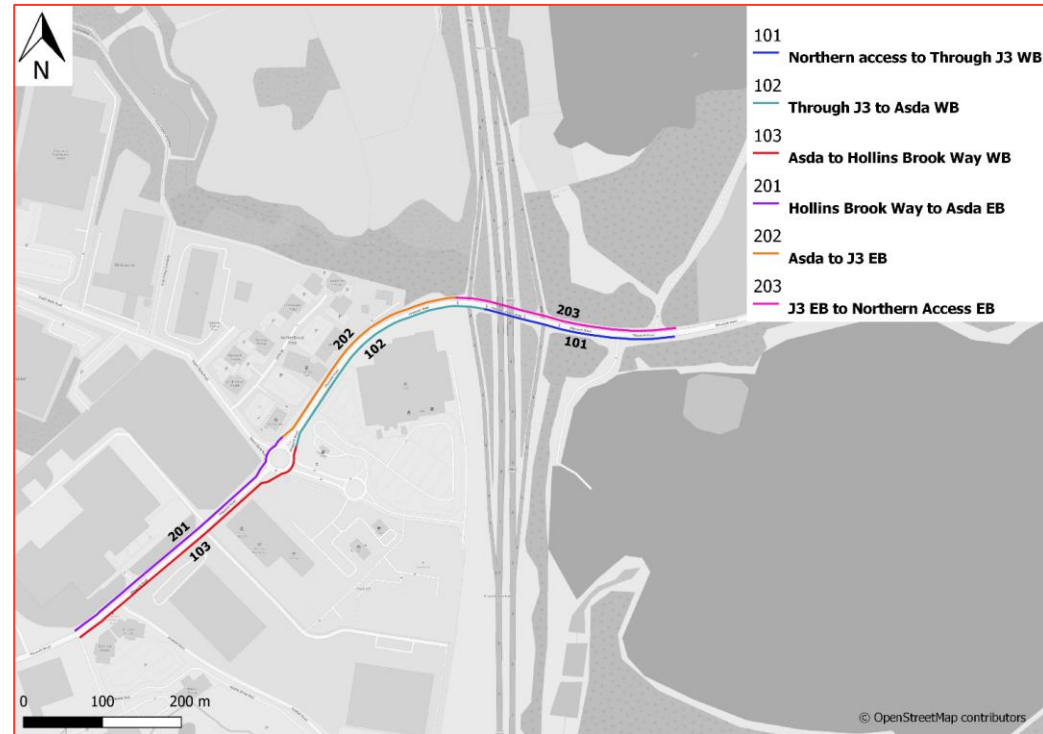
Segment / Route	AM								PM							
	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3	2022 Base	2032 DM	2032 DS3a	2032 DS3b	2032 DS3a - v2	2032 DS3b - v2	2032 DS3a - v3	2032 DS3b - v3
101 - Northern Access to Through J3 WB	106	115	41	40	45	43	38	36	50	50	37	36	42	42	33	32
102 - Through J3 to Asda WB	54	48	37	37	38	38	38	38	42	43	35	35	36	36	35	35
103 - Asda to Hoolins Book Way WB	32	32	34	35	34	35	35	35	32	34	32	32	32	32	32	32
104 - Westbound Full Route	192	195	112	112	117	116	111	109	124	126	103	103	109	110	100	99
201 - Hoolins Brook Way to Asda EB	55	144	36	37	36	37	37	36	136	202	34	34	34	34	34	34
202 - Asda to J3 EB	79	121	51	53	55	55	49	49	73	89	51	52	59	62	48	47
203 - J3 EB to Northern Access EB	41	39	31	31	31	31	33	33	31	31	30	30	31	31	31	31
204 - Eastbound Full Route	176	304	118	121	122	123	118	117	239	322	115	116	123	127	113	112





2039 Journey Time Results (seconds)

Segment / Route	AM								PM							
	2022 Base	2039 DM	2039 DS3b	2039 DS3- Policy On	2039 DS3b - v2	2039 DS3- Policy On - v2	2039 DS3b - v3	2039 DS3- Policy On - v3	2022 Base	2039 DM	2039 DS3b	2039 DS3- Policy On	2039 DS3b - v2	2039 DS3- Policy On - v2	2039 DS3b - v3	2039 DS3- Policy On - v3
101 - Northern Access to Through J3 WB	106	118	44	39	44	44	45	35	50	53	36	37	41	41	33	32
102 - Through J3 to Asda WB	54	51	41	37	40	38	40	38	42	43	35	34	37	35	36	35
103 - Asda to Hoolins Book Way WB	32	33	35	34	35	34	35	34	32	34	33	32	33	32	33	32
104 - Westbound Full Route	192	202	120	109	119	115	120	107	124	130	104	103	110	108	102	99
201 - Hoolins Brook Way to Asda EB	55	148	43	35	42	35	43	36	136	226	35	33	35	33	35	33
202 - Asda to J3 EB	79	117	69	50	64	53	66	47	73	96	50	48	57	55	47	45
203 - J3 EB to Northern Access EB	41	39	32	30	32	30	33	32	31	32	31	30	31	30	31	31
204 - Eastbound Full Route	176	305	144	116	138	119	141	114	239	354	116	111	123	118	114	108





Summary

Network Performance Statistics

- Results indicated that all DS scenarios (DS3a, DS3b, DS3 – Policy On) across both peaks have benefits against the DM. All DS scenarios have no latent demand compared to DM scenario which have latent demand in both peaks. Reduction in total delay and increase in speed can be seen in all DS scenarios.
- Similar delay and speed are observed with various stage arrangement at M66 J3.

Queues

- PF2.2 scheme perform better than DM scenarios across both peaks with less total queue .
- With PF2.2 scheme, there is no latent demand in DS scenario compared to DM.
- Scenario 2039 DS3b AM has the highest demand. The model observed to occasionally have queues on Pilsworth Road eastbound tailback to ASDA roundabout. This is due to the scenario having the highest eastbound traffic demand on Pilsworth Road and the highest demand on the northbound off-slip.
- Overall queue length total in DS scenairos is better than the Base and DM scenarios.

Journey Time

- The westbound and eastbound traffic sees a reduction in journey time across all DS scenarios when compared to DM as a result of the PF2.2 scheme.
- Minimal impact on journey time observed with various stage arrangements undertaken at M66 J3.
- All DS scenarios perform better then the Base scenario.

Latent Demand

- Latent Demand can only be seen in DM scenario across both peaks.

wsp