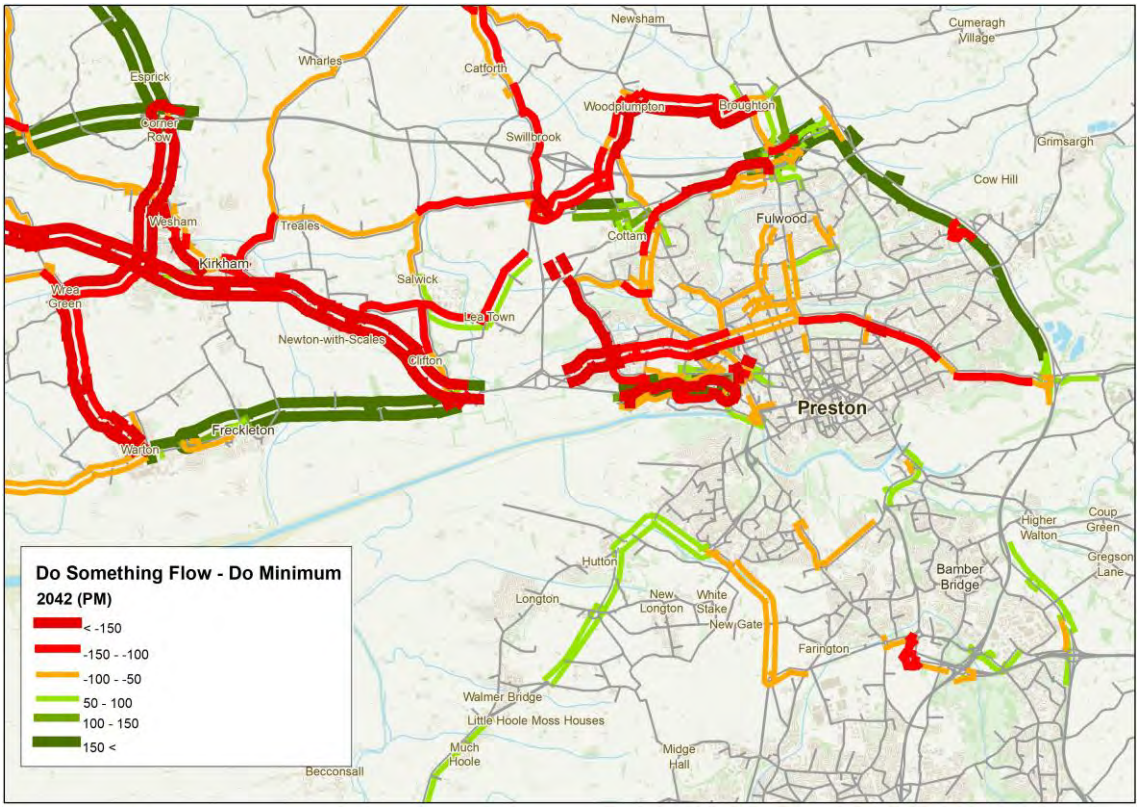

Figure 5-36: Traffic Flow Change Do Something vs Do Minimum (2042 PM)

As expected, the majority of impacts on traffic flow will occur on the road network to the north of the River Ribble. The PWD scheme will reduce the traffic on urban roads particularly on the A585 from Kirkham to M55 Junction 3 and on the A583 between M55 Junction 4 and the Warton junction. There is also noticeable flow reduction on Tom Benson Way and the A6, as the traffic shifts from M55 J1 to the new M55 J2.

Moreover, there are a number of local roads in the surrounding areas, such as Woodplumpton Road, B5269 Newsham Hall Lane and Bryning Lane (from Warton to Kirkham), which are expected to experience significant reduction in traffic during the peak hours. This can be mainly attributed to traffic from Broughton and Woodplumton, which in the absence of the scheme use the local roads to travel to the west and south directions and shift to the Broughton bypass to get onto the M55 with the implementation of the PWD.

Similar patterns can be observed between Catforth Road (flow reduction) and A585 Fleetwood Road (flow increase).

In addition with the PWD in place, traffic will increase on the strategic road network (in both directions to/from M55 J4), and also on the A584 between Warton and A583 given this is the primary means of accessing the scheme from the south. The figures also indicate that the M6 is anticipated to experience higher flows, particularly in the northbound direction. The reason for the increase is the re-routing effect of traffic from Preston internal roads, such as A5085 Blackpool Road, and those in the south of Preston, to the motorways.

Local access routes, such as the East West Link, also see an increase, as a local means of accessing the PWD, and the new M55 J2 respectively.

The flow changes around A583 Riversway are due to the differences in route choice between this road and Mariners Way, the parallel road to the south of Riversway. It has been noted that these two parallel routes have similar travel cost and therefore, the flow appear to switch between the two in different assignment iterations.

5.9 Delay Changes Due to the Scheme

Figures 5-37 to Figure 5-45 provide the change in delay between the Do Something and Do Minimum scenarios.

Only the increases and decreases in traffic delay of over 15 seconds across the simulation network are shown.

As expected the changes are more noticeable in the AM and PM peak hours. The main areas which experience delay reductions are mainly around M55 J1 and Kirkham junctions on the A583 due to the traffic shifting to the proposed scheme.

The plots also show that delay is anticipated to reduce at a number of junctions within the Preston urban area, particularly along the A6, as a result of traffic re-routing to the PWD and the strategic road network.

There will be an increase in delay on some sections of the M6. This result is consistent with the flow difference plots in the previous section, which showed an increase in flow on the motorway.

Figure 5-37: Delay Changes Do Something vs Do Minimum (2022 AM)

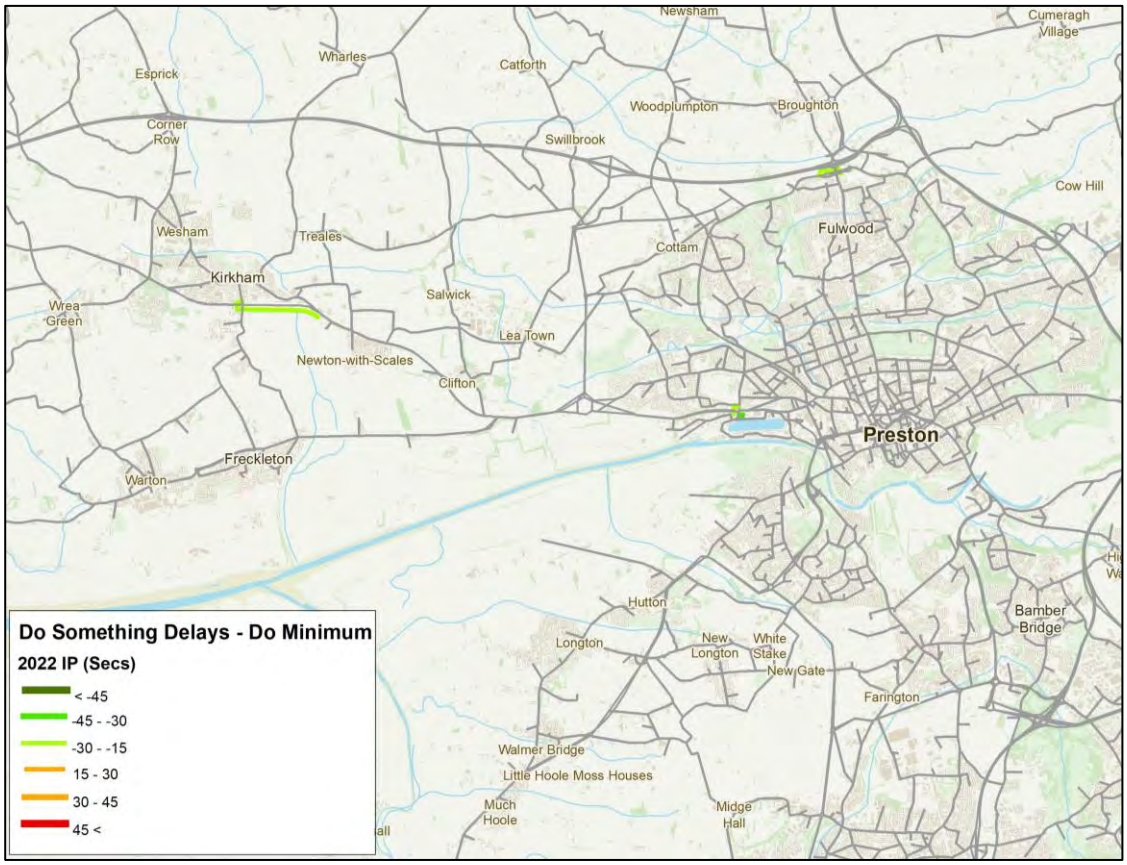

Figure 5-38: Delay Changes Do Something vs Do Minimum (2022 IP)

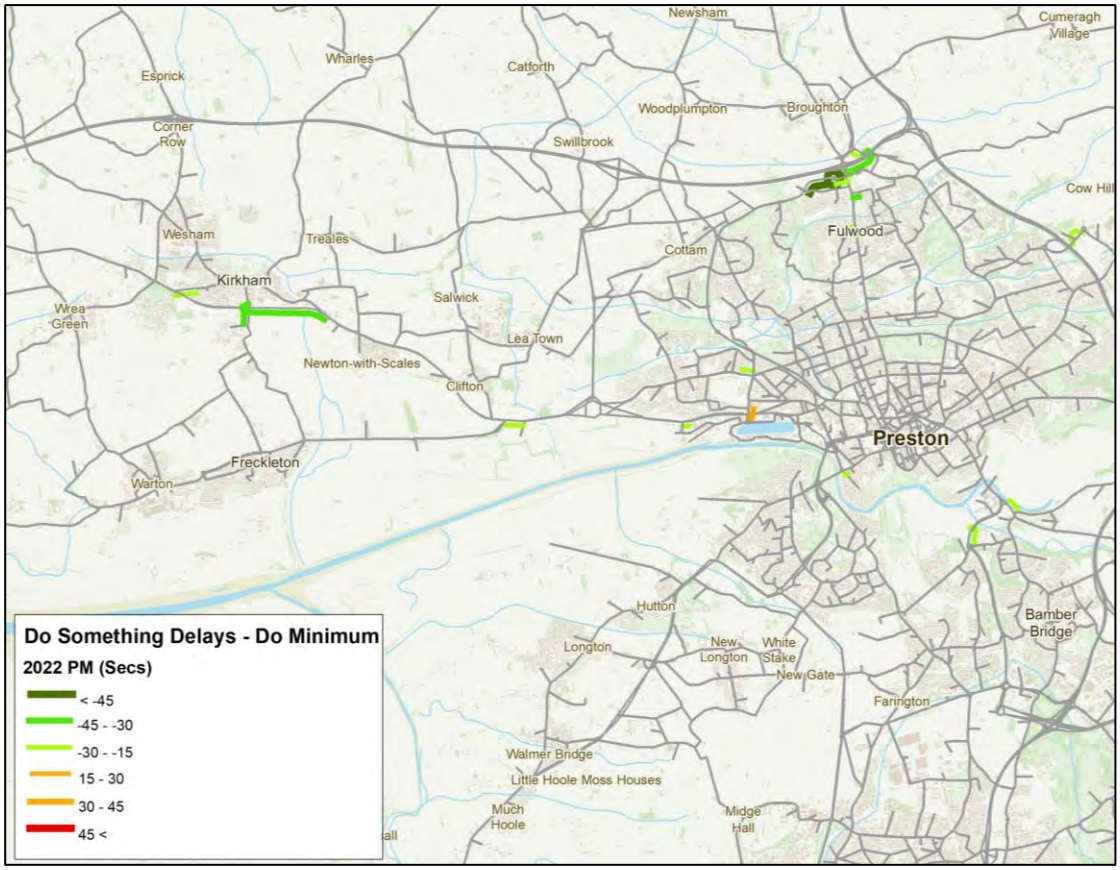

Figure 5-39: Delay Changes Do Something vs Do Minimum (2022 PM)

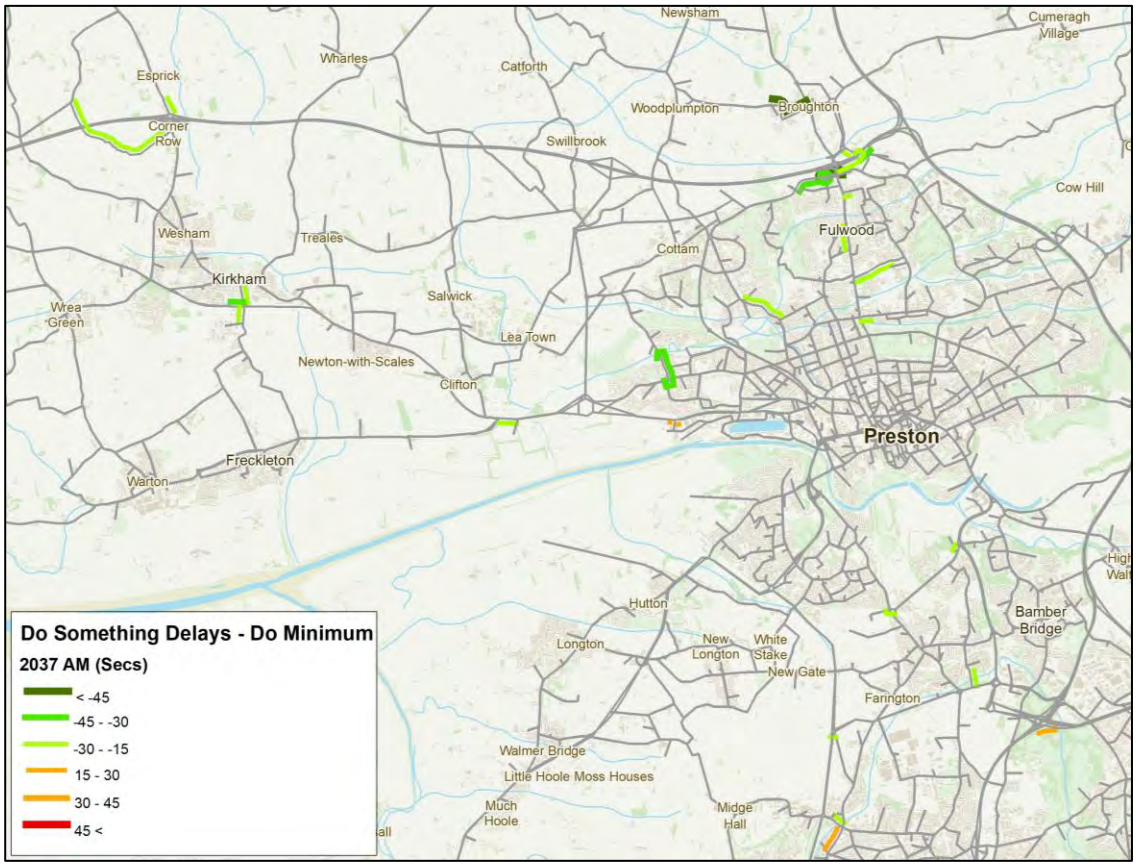

Figure 5-40: Delay Changes Do Something vs Do Minimum (2037 AM)

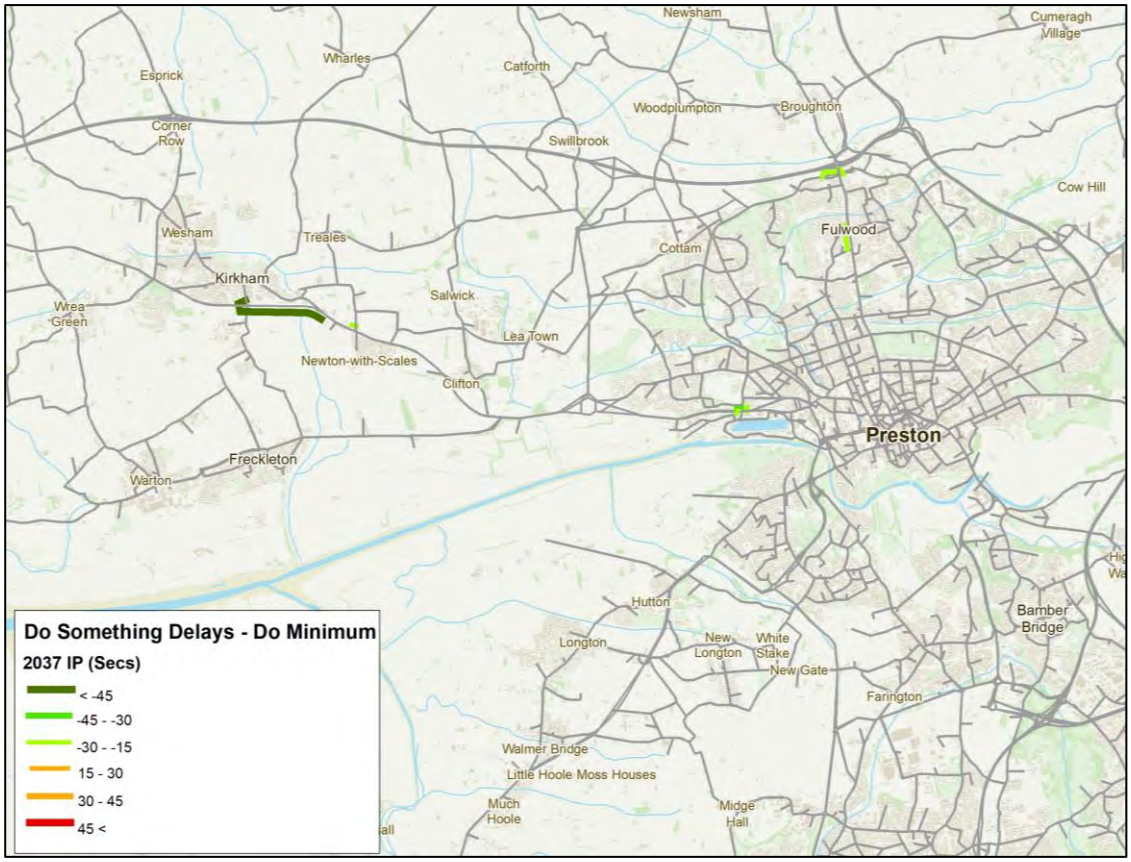

Figure 5-41: Delay Changes Do Something vs Do Minimum (2037 IP)

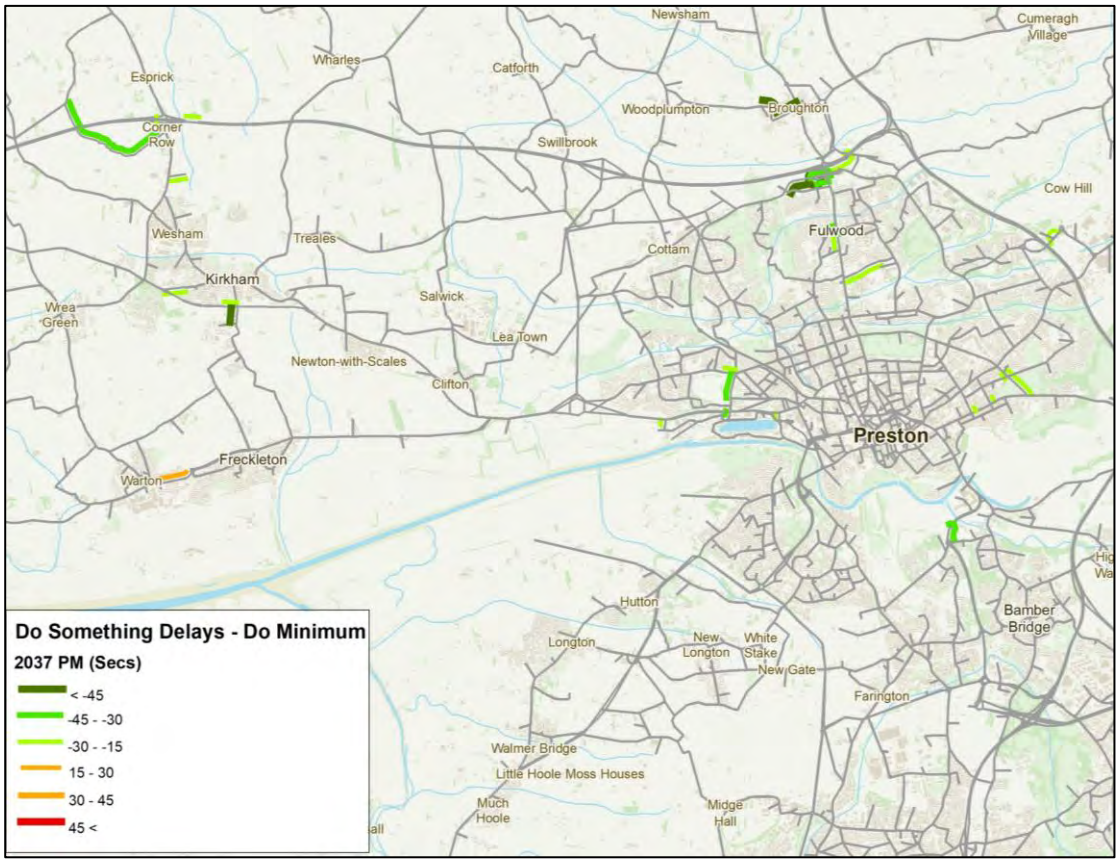

Figure 5-42: Delay Changes Do Something vs Do Minimum (2037 PM)

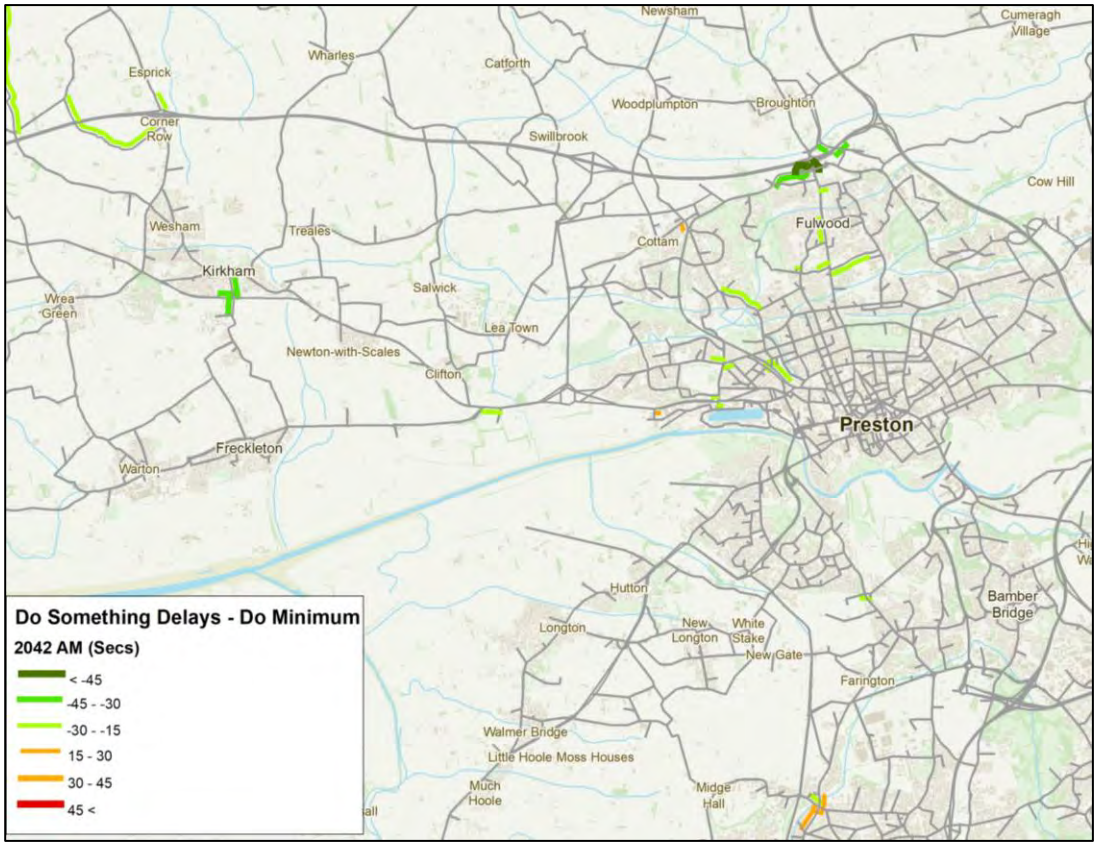

Figure 5-43: Delay Changes Do Something vs Do Minimum (2042 AM)

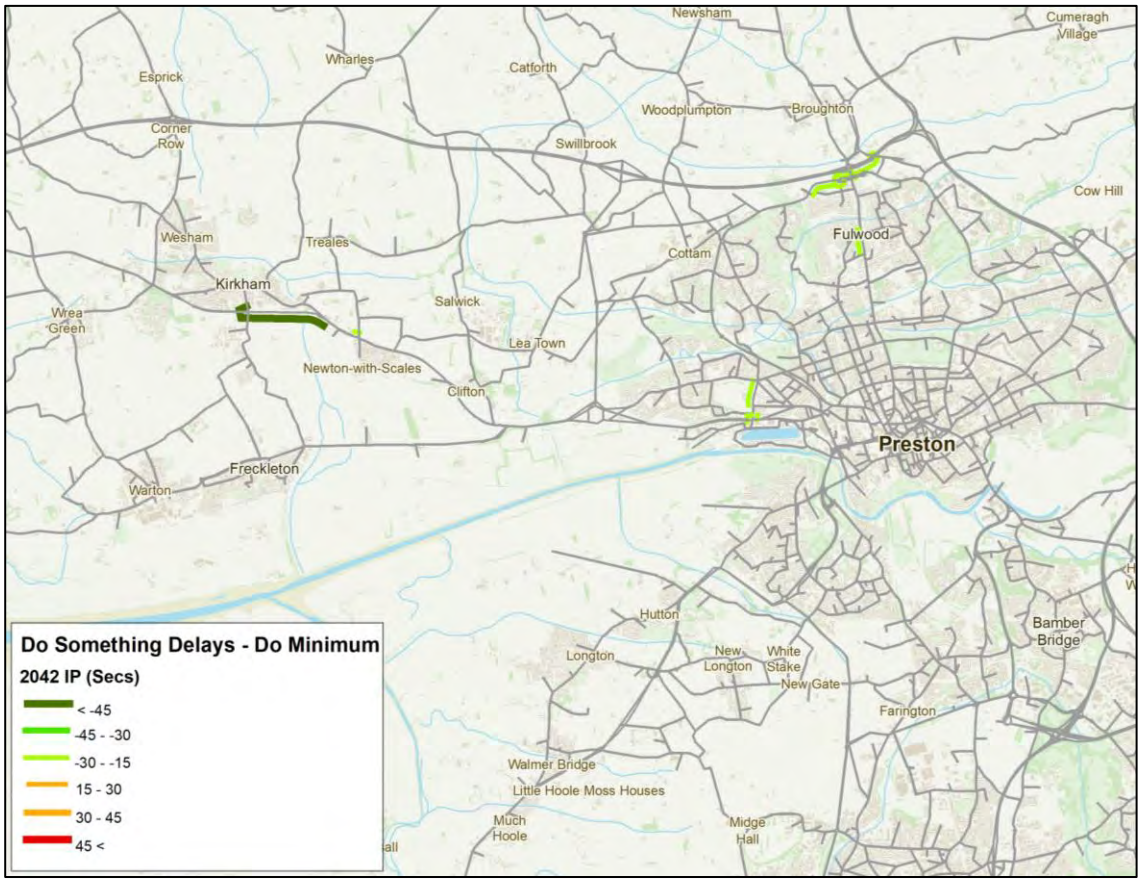

Figure 5-44: Delay Changes Do Something vs Do Minimum (2042 IP)

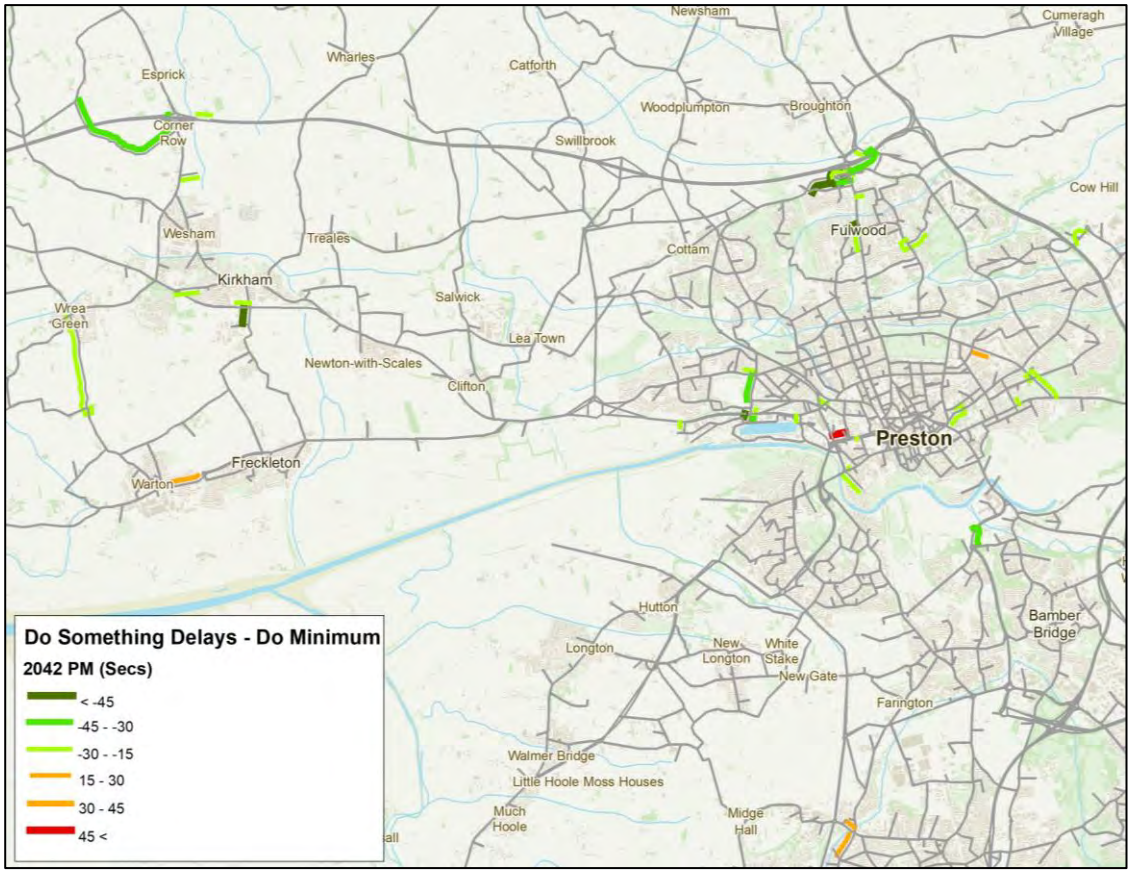

Figure 5-45: Delay Changes Do Something vs Do Minimum (2042 PM)

5.10 Preston Western Distributor Forecast Flows

The forecast flows on three different sections of the PWD have been extracted from the SATURN core scenario for each forecast year and time period. The four sections are illustrated in Figure 5-46 and described below:

- Section 1: PWD between M55 Junction 2 and the East West Link Road
- Section 2: PWD between the East West Link Road and Cottam Link Road
- Section 3: Cottam Link Road and the A583

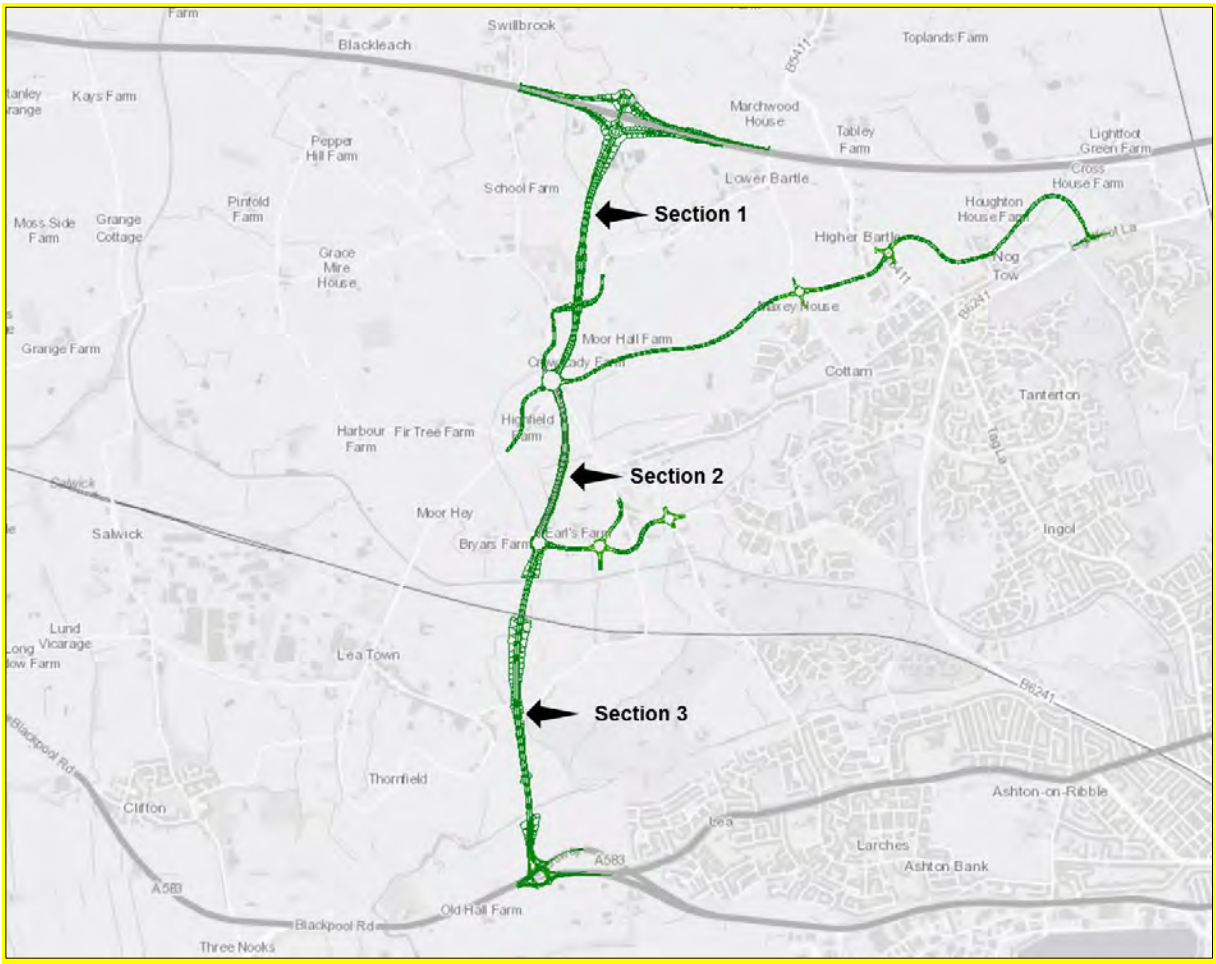

Figure 5-46: Preston Western Distributor Sections

Table 5-I presents the flow (vehicle per hour) on each of the three sections in each modelled year and time period by direction.

Table 5-I: Forecast traffic flow on the PWD (veh/hr)

Period	Section	2022			2037			2042		
		NB	SB	Two-Way	NB	SB	Two-Way	NB	SB	Two-Way
AM	1	1,529	1,722	3,251	1,946	1,978	3,924	2,036	2,048	4,084
	2	1,277	1,615	2,892	1,560	1,815	3,375	1,637	1,905	3,542
	3	1,041	1,498	2,539	1,319	1,613	2,932	1,396	1,735	3,131
IP	1	962	925	1,887	1,384	1,244	2,628	1,456	1,315	2,771
	2	890	851	1,741	1,235	1,108	2,343	1,296	1,170	2,466
	3	786	743	1,529	1,079	954	2,033	1,126	998	2,124
PM	1	1,894	1,810	3,704	2,254	2,145	4,399	2,308	2,229	4,537
	2	1,765	1,455	3,220	2,124	1,627	3,751	2,188	1,677	3,865
	3	1,690	1,052	2,742	2,064	1,235	3,299	2,122	1,263	3,385
AADT	1	14,563	14,633	29,196	19,134	18,088	37,222	19,938	18,915	38,853
	2	13,160	13,016	26,176	16,903	15,545	32,448	17,634	16,278	33,912
	3	11,726	11,039	22,765	15,181	13,096	28,277	15,809	13,746	29,555

The traffic flow on the PWD ranges from 1,000veh/hr to 1,900veh/hr per direction during the AM and PM peak hours in 2022 and increases to 1,300-2,300veh/hr in 2042. As expected, the IP average peak hour flow is not as high as the other two peak hours. The flows also show tidal flow pattern, meaning that during the AM peak hour the southbound traffic is higher than northbound; while, the opposite pattern prevails during the PM peak hour.

The table also presents Average Annual Daily Traffic (AADT), which varies from 11,000veh to over 19,000veh on average in each direction across the modelled years.

The two-way hourly flows, which are either close or above 3,000 veh/hr in the opening year and reaching 4,000veh/hr in the design year, cannot be accommodated only by 2 lanes and clearly justify the dual carriageway design of the PWD. Furthermore, DMRB (Volume 5, Section 1, Part 3) Table 2.1, shown below, provides an indication of range of traffic flows for which each carriageway standard is likely to be warranted for a new rural road. It recommends that for the opening year AADT between 11,000veh to 39,000veh, which is the case for the PWD, a Dual 2 lane all purpose road (D2AP) can be provided.

It should be noted that the above flow does not include all trips from North West Preston housing development, as the dependent developments are not considered in the core scenario. Therefore, the flows presented in this section could be potentially higher with the entire NW Preston development in place, confirming the need to have the dual carriageway design.

Table 5-J: Opening Year Economic Flow Ranges (Table 2.1, DMRB Volume 5, Section 1, Part 3)

Carriageway Standard	Opening Year AADT	
	Minimum	Maximum
S2	Up to 13,000	
WS2	6,000	21,000
D2AP	11,000	39,000
D3AP	23,000	54,000
D2M	Up to 41,000	
D3M	25,000	67,000
D4M	52,000	90,000

5.11 Journey Time Changes Due to the Scheme

Table 5-K shows the impact of the scheme on journey times along the key routes in the study area.

As expected the increase in traffic on the SRN (M55 and M6) will result in slightly longer journey times along these roads.

On the other hand, journey times along the A583 between the M55 J3 and Preston and along the A6 between the M55 J1 and central Preston will be shortened due to reduced congestion on these roads once the scheme is built.

The journey time between the M55 J3 and A59 is expected to be further reduced by 5% for southbound and 10% for northbound traffic during peak times, if the PWD scheme is used instead of the A583.

The model also shows an increase in journey time along A584 between Warton and A583. This is consistent with the traffic flow impacts above, and as the key route to/from the PWD scheme to the south. Journey times along the A6 and A5085 are reduced in both directions.

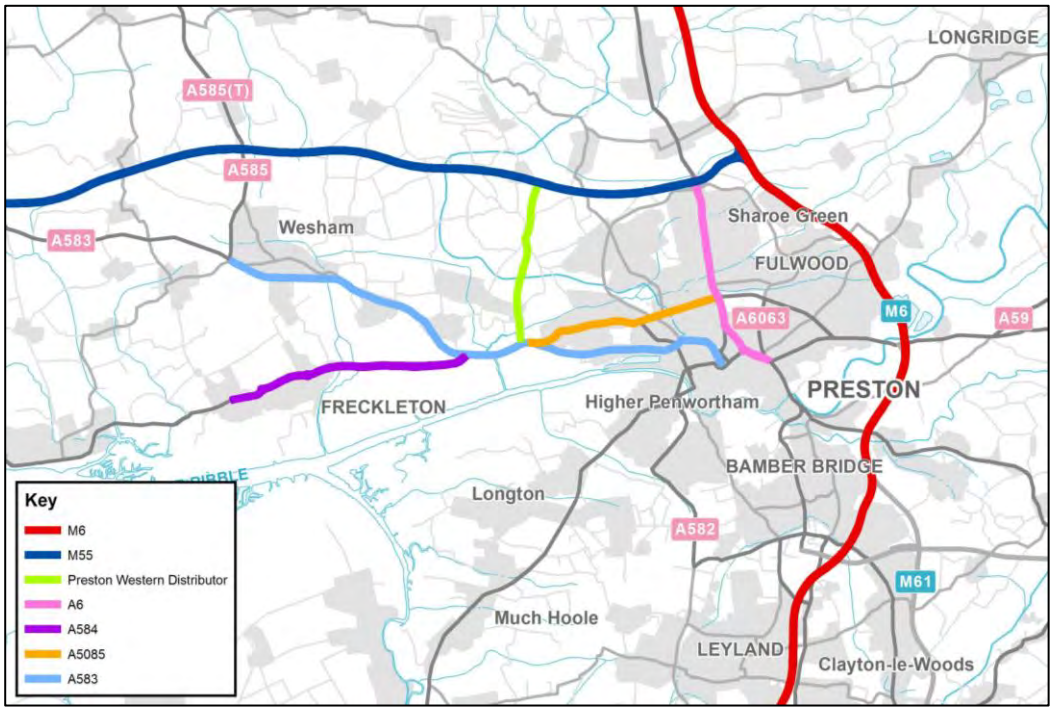

Figure 5-47: The Location of Routes in the Journey Time Assessment

Table 5-K: Journey Time Changes (in seconds) Do Something vs Do Minimum

			2022			2037			2042		
Route	Direction	Scenario	AM	IP	PM	AM	IP	PM	AM	IP	PM
M6 (J27 to J33)	Southbound	DM	1709	1693	1928	1817	1805	2123	1861	1861	2177
		DS	1713	1693	1933	1825	1805	2118	1869	1860	2176
		Diff	**3**	**0**	**4**	**8**	**0**	**-5**	**8**	**-1**	**-1**
	Northbound	DM	1893	1673	1808	2147	1797	2026	2228	1840	2090
		DS	1900	1674	1819	2155	1797	2044	2234	1842	2110
		Diff	**7**	**2**	**11**	**8**	**1**	**18**	**6**	**2**	**19**
M55 (M6 J32 to west of M55 J3)	Eastbound	DM	551	535	567	577	553	627	584	558	639
		DS	567	540	581	602	563	643	610	569	660
		Diff	**16**	**5**	**14**	**25**	**9**	**17**	**26**	**11**	**21**
	Westbound	DM	569	531	561	594	546	585	600	550	586
		DS	592	539	588	628	561	626	638	567	630
		Diff	**23**	**8**	**27**	**34**	**15**	**41**	**38**	**17**	**43**
A583 (M55 J3 to A59)	Southbound	DM	1322	1260	1490	1366	1318	1725	1378	1326	1764
		DS	1273	1243	1477	1340	1278	1611	1321	1296	1651
		Diff	**-49**	**-17**	**-13**	**-26**	**-41**	**-114**	**-57**	**-30**	**-113**
	Northbound	DM	1363	1249	1432	1510	1303	1540	1548	1320	1575
		DS	1293	1192	1371	1415	1250	1412	1408	1258	1414
		Diff	**-70**	**-57**	**-61**	**-95**	**-53**	**-129**	**-140**	**-62**	**-161**
PWD (M55 J3 to A59)	Southbound	DM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		DS	805	740	889	888	779	835	878	795	858
		Diff	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
	Northbound	DM	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
		DS	859	780	921	932	847	989	907	856	991
		Diff	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
A5085 (A583 to A6)	Eastbound	DM	562	539	585	579	547	600	586	550	606
		DS	561	549	561	573	553	565	575	555	569
		Diff	**-1**	**10**	**-24**	**-6**	**6**	**-35**	**-11**	**5**	**-36**
	Westbound	DM	606	589	587	620	600	599	630	604	605
		DS	590	583	570	597	590	580	599	592	583
		Diff	**-17**	**-6**	**-17**	**-23**	**-10**	**-20**	**-31**	**-11**	**-21**
A584 (Warton to A583)	Eastbound	DM	478	462	504	483	466	515	486	468	520
		DS	479	465	538	486	470	558	488	472	568
		Diff	**1**	**2**	**34**	**2**	**4**	**43**	**3**	**4**	**48**
	Westbound	DM	521	481	519	534	485	528	539	487	530
		DS	536	484	524	552	490	535	557	492	537
		Diff	**16**	**4**	**5**	**18**	**6**	**7**	**18**	**6**	**6**
A6 (M55 J1 to New Hall Lane)	Southbound	DM	858	812	909	906	845	971	922	856	989
		DS	845	808	903	878	835	956	887	845	972
		Diff	**-13**	**-5**	**-6**	**-28**	**-10**	**-15**	**-36**	**-11**	**-17**
	Northbound	DM	911	891	1015	988	983	1143	1010	1000	1177
		DS	897	874	992	947	949	1098	962	974	1125
		Diff	**-14**	**-17**	**-22**	**-42**	**-35**	**-45**	**-48**	**-26**	**-52**

6. Summary and Conclusion

The traffic forecasts for the PWD scheme have been developed from the validated Base Year model, based on current WebTAG guidance Unit M-4.

Three forecast years have been developed for 2022, 2037 and 2042 to best support the appraisal of the scheme, and to meet WebTAG desirability for three forecast years.

An agreed uncertainty log was used to identify all significant developments in the study area, and appropriate developments were modelled explicitly in the forecast, as they pertain to each forecast year and planning authority

Checks of housing and employment growth are presented in Section 4.5 and have been demonstrated to be in line with TEMPRO / NTEM v7.2 at the overall model level and planning authority level.

The dependent developments, i.e. North West Preston housing developments, were identified during the outline business case of the proposed scheme in line with the WebTAG guidance. Subsequently, it was found that 5 sites within the NWP development were granted planning permission. Therefore, these sites which account for approximately 1300 dwelling units were removed from the list of dependent developments and included in the core scenario as part of the FBC appraisal.

The modelled networks have considered for all proposed future highway schemes, as consulted with local authorities, and incorporated into the future forecast years; where there was enough certainty over these schemes they were included in the network.

Variable Demand Model has been undertaken and model convergence, both for SATURN assignments and DIADEM runs, have been checked. All forecast models meet and exceed requirements as set out in WebTAG Unit M3.1 and Unit M2.

Outputs from the model have shown that the modelled effects of the PWD are sensible, and that there is a significant transfer of trips from North West Preston, the A583 via Kirkham and the Preston urban area to the scheme. The strategic road network (M55 and M6) is expected to experience higher flows due to rerouting of traffic from urban roads around Preston.

Changes in delays and journey times are also logical and generally consistent with the traffic flow changes.

Future year flow and delay changes with and without the scheme have been checked and confirmed as suitable based on local knowledge of the network.

The forecast models are therefore considered suitable for appraising of the PWD scheme, with further value for money evidence supporting the scheme detailed in the Economic Assessment Report (EAR) for the PWD Scheme.

Appendix A. Uncertainty Log

Appendix B. Sector-To-Sector Demand Matrices

Appendix C. Matrix Total Changes between Pre and Post VDM

Appendix D. Pre and Post VDM Sector Analysis

Appendix E. Traffic Flow Changes