

TRANS-PENNINE TUNNEL STUDY PLUS

WSP IMPROVEMENTS TO DF7 – TECHNICAL NOTE

SEPTEMBER 2018

Project:	Trans-Pennine Tunnel Study Plus
Subject:	WSP Improvements to TPS RTM DF7
Author:	
Reviewed:	

1. INTRODUCTION

To prepare for the assessment of the Trans-Pennine Tunnel Studies Plus (TPTS+) proposed packages, WSP requested access and subsequently was issued with the latest version, Design Freeze 7 (DF7), of the Trans-Pennine South Regional Transport Model (TPS RTM) Base year models by Atkins.

This note considers the current convergence status of the TPS RTM Df7 base year models and the improvements that can be made to the models by improving number of junction coding issues that WSP identified up on receiving and analysing the TPS RTM DF7 models against the TPS RTM model DF2 that WSP is currently using for the Transport for the North Strategic Development Corridor studies. It however does not necessarily capture all the coding changes that could lead to improvement in model performance.

This note therefore sets out the changes that have been applied to the TPS RTM base year model DF7 and comparison in terms of convergence and flow and journey time calibration and validation between the improved base year models against the DF7 version of the TPS RTM models that were provided.

It is proposed that the TPTS+ project team will use the improved models for the forecasting process to produce required assessments for the purpose of the TPTS+ studies. It is recommended that Highways England (HE) also consider adopting these changes to the TPS RTM models for future use.

2. MODEL IMPROVEMENTS

2.1 TPS RTM Models DF7 Status

The latest version DF7 of the TPS RTM models were issued to WSP in September 2018 for the purpose of the assessment of the TPTS+. Initial interrogation of the TPS RTM DF7 base year model shows that whilst number of changes have been made since the DF2 version, number of coding errors/issues still remain in the latest version of the TPS RTM models.

Table 1 and Figures 1 to 3 below provide a high level summary of the convergence statistics and flow/journey time validation that was extracted from the TPS RTM DF7 models.

Table 1 Model Convergence – TPS RTM DF7

Period	AM Peak	Inter-Peak	PM Peak
Number of Iteration	61	56	77
%Link with flow difference <1%	98.0	99.1	98.2
Convergence Gap (%)	0.0068	0.0058	0.0087

Figure 1 Overall Statistics – TPS RTM DF7: AM Peak

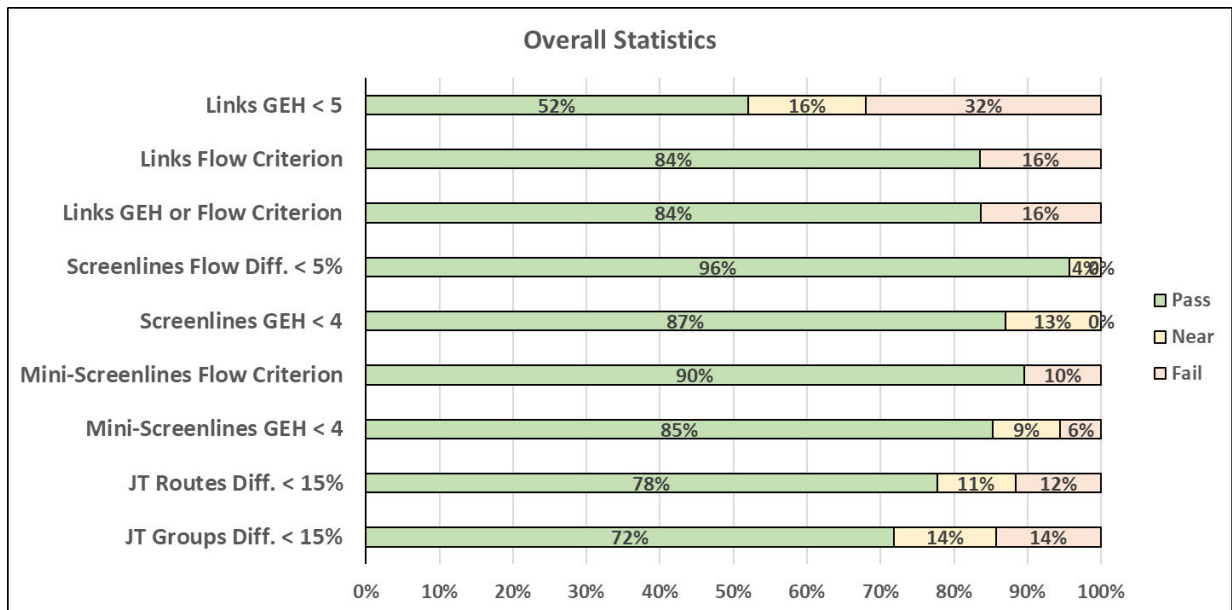


Figure 2 Overall Statistics – TPS RTM DF7: Inter-Peak

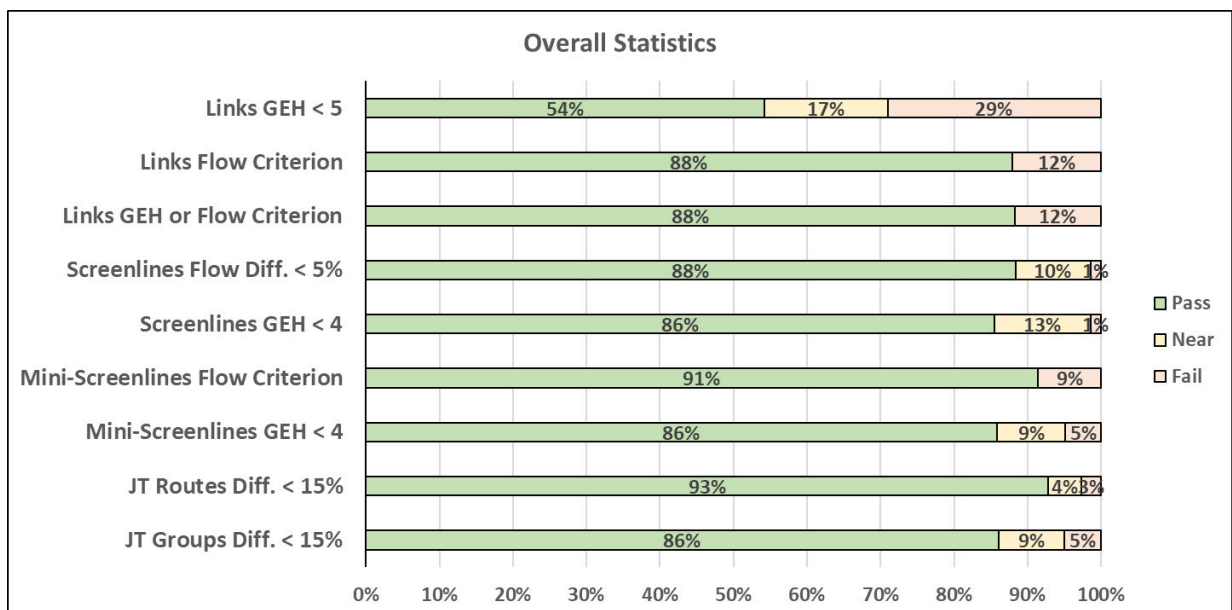
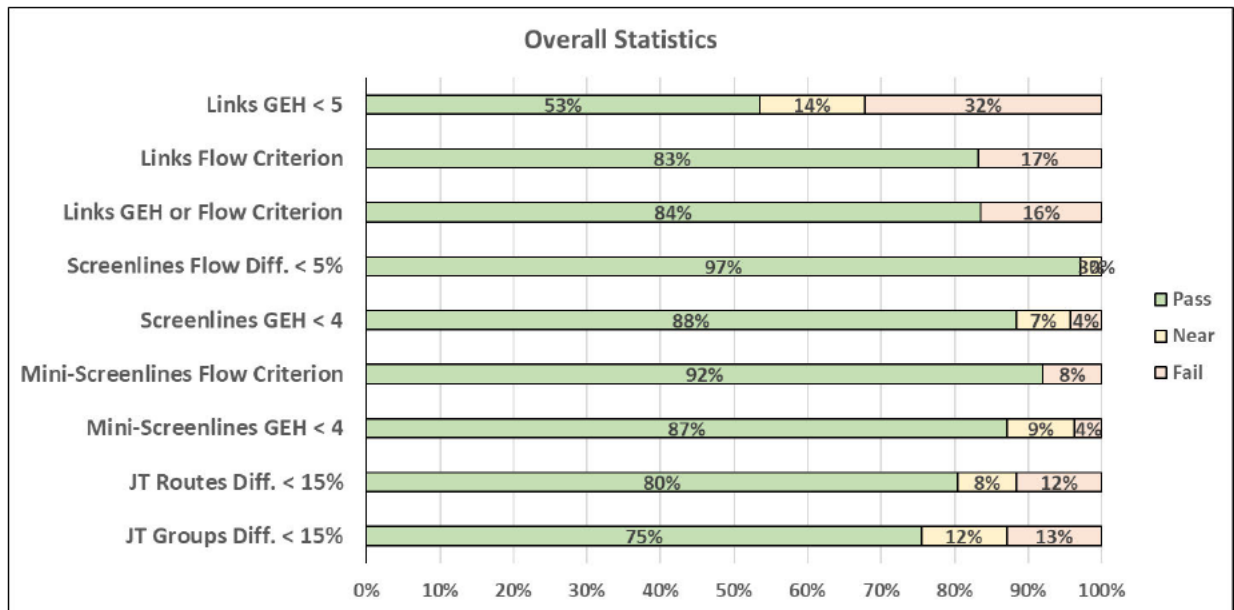


Figure 3 Overall Statistics – TPS RTM DF7: PM Peak



2.2 Improvements Made

WSP have identified eight improvements/corrections to the simulation network coding that can be made to the TPS RTM for the purpose of the TPTS+ project, as illustrated in Figure 4 and also provided in Table 2 below.

Figure 4 Location of Junction Improvements

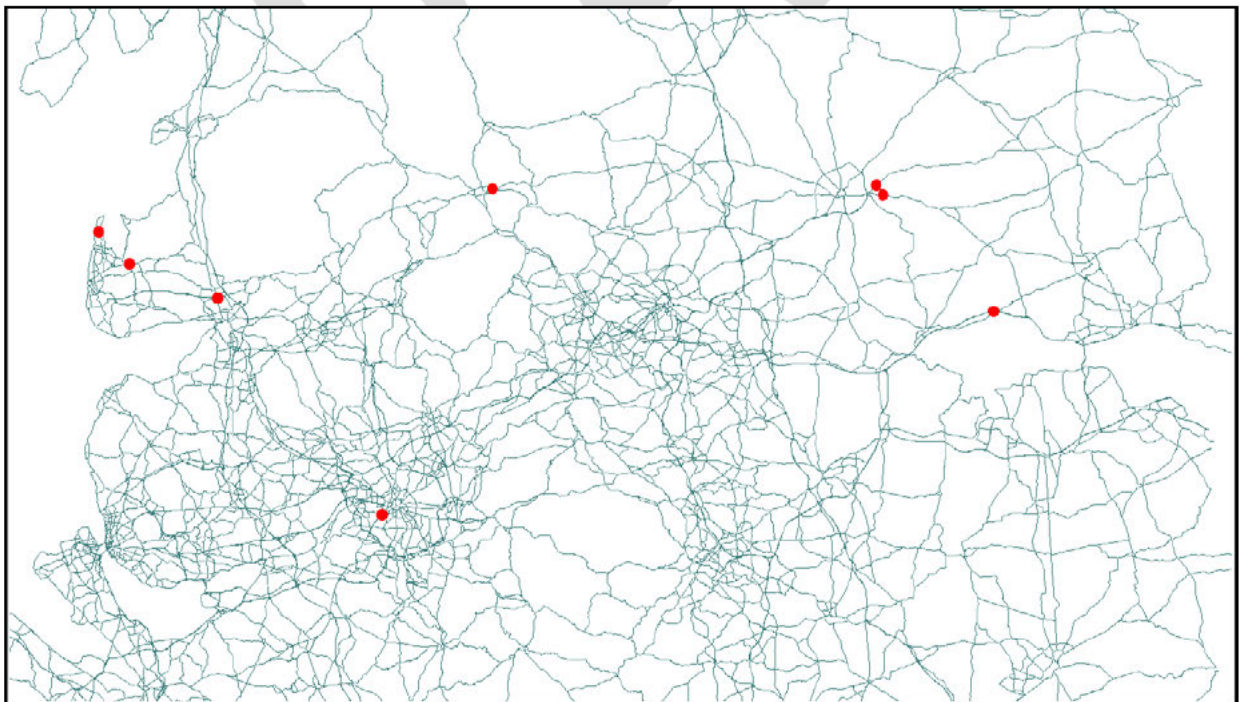
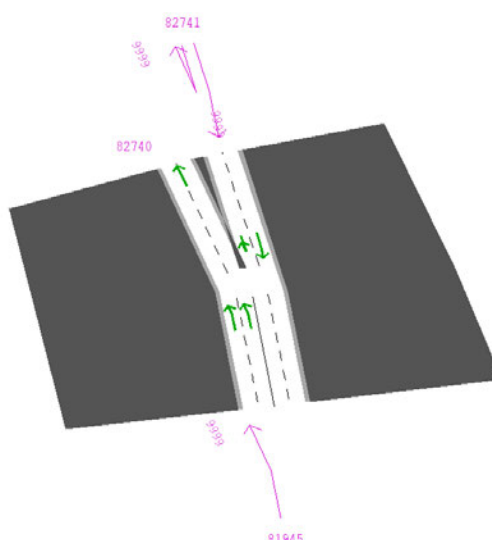
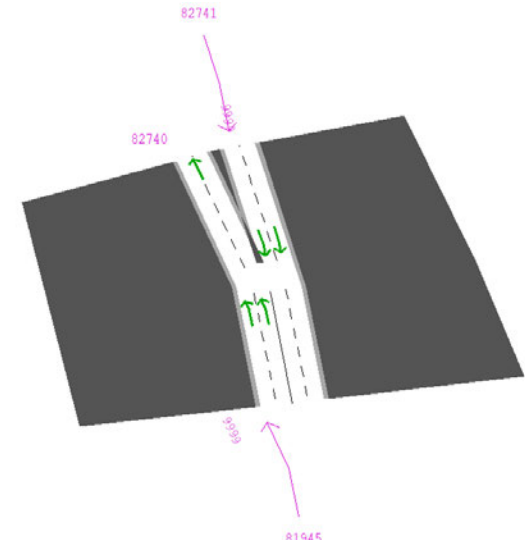


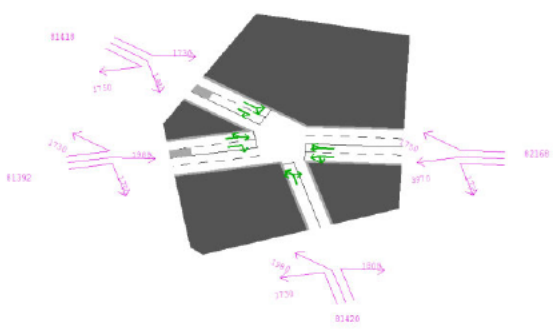
Table 2 Model Convergence – TPS RTM DF7

No	Location	Node(s)	Description	Amendments made
1	A6 junction with B6241 north of Preston	82748	Incorrect U-turn coded, resulting traffic from M55 routing to A6 and head back on to M55	Removed U-turn allocation from 82741
2	A585 Garstang New Road/Lodge Lane	88066	Incorrect turn allocation conflicting with signal phasing and staging causing significant delays	Amended arms 81418 and 82168 to allow for correct turn allocations
3	A585 junction with B5409 in Cleveleys	83215	Give-way coded on the mainline from node 82503	Removed Give-way marker
4	M62 eastbound mainline approach to J38	72723	Incorrect number of lanes coming from node 70282	Coded correct number of lane
5	A1079 junction with Long lane east of York	78375	Only Turn 1 coded, preventing traffic travelling on A1079 eastbound	Included other turn movements as per reality
6	A166 junction with Long lane east of York	78379	Only Turn 1 coded, prevent traffic travelling on A166 eastbound	Included other turn movements as per reality
7	A59 junction with A6131 outside Skipton	71746	Give-way coded on major arm from node 70737	Removed Give-way marker
8	A56 junction with A5081 outside Manchester	86677	Hamburger roundabout with right-turn missing from node 80965	Allow right turn

Detailed images of the coding errors and amendments made is provided in Table 3 below.

Table 3 Detailed Images of Coding Errors and Amendments

No	DF7 Coding	WSP's Amendments
1		

No	DF7 Coding	WSP's Amendments
2	 Diagram showing a complex intersection with multiple approaches. Green arrows indicate traffic flow. Labels include 81418, 81392, 81400, 81408, 81410, 81412, 81414, 81416, 81418, 81420, 81422, 81424, 81426, 81428, 81430, 81432, 81434, 81436, 81438, 81440, 81442, 81444, 81446, 81448, 81450, 81452, 81454, 81456, 81458, 81460, 81462, 81464, 81466, 81468, 81470, 81472, 81474, 81476, 81478, 81480, 81482, 81484, 81486, 81488, 81490, 81492, 81494, 81496, 81498, 81500, 81502, 81504, 81506, 81508, 81510, 81512, 81514, 81516, 81518, 81520, 81522, 81524, 81526, 81528, 81530, 81532, 81534, 81536, 81538, 81540, 81542, 81544, 81546, 81548, 81550, 81552, 81554, 81556, 81558, 81560, 81562, 81564, 81566, 81568, 81570, 81572, 81574, 81576, 81578, 81580, 81582, 81584, 81586, 81588, 81590, 81592, 81594, 81596, 81598, 81600, 81602, 81604, 81606, 81608, 81610, 81612, 81614, 81616, 81618, 81620, 81622, 81624, 81626, 81628, 81630, 81632, 81634, 81636, 81638, 81640, 81642, 81644, 81646, 81648, 81650, 81652, 81654, 81656, 81658, 81660, 81662, 81664, 81666, 81668, 81670, 81672, 81674, 81676, 81678, 81680, 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84542, 84544, 84546, 84548, 84550, 84552, 84554, 84556, 84558, 84560, 84562, 84564, 84566, 84568, 84570, 84572, 84574, 84576, 84578, 84580, 84582, 84584, 84586, 84588, 84590, 84592, 84594, 84596, 84598, 84600, 84602, 84604, 84606, 84608, 84610, 84612, 84614, 84616, 84618, 84620, 84622, 84624, 84626, 84628, 84630, 84632, 84634, 84636, 84638, 84640, 84642, 84644, 84646, 84648, 84650, 84652, 84654, 84656, 84658, 84660, 84662, 84664, 84666, 84668, 84670, 84672, 84674, 84676, 84678, 84680, 84682, 84684, 84686, 84688, 84690, 84692, 84694, 84696, 84698, 84700, 84702, 84704, 84706, 84708, 84710, 84712, 84714, 84716, 84718, 84720, 84722, 84724, 84726, 84728, 84730, 84732, 84734, 84736, 84738, 84740, 84742, 84744, 84746, 84748, 84750, 84752, 84754, 84756, 84758, 84760, 84762, 84764, 84766, 84768, 84770, 84772, 84774, 84776, 84778, 84780, 84782, 84784, 84786, 84788, 84790, 84792, 84794, 84796, 84798, 84800, 84802, 84804, 84806, 84808, 84810, 84812, 84814, 84816, 84818, 84820, 84822, 84824, 84826, 84828, 84830, 84832, 84834, 84836, 84838, 84840, 84842, 84844, 84846, 84848, 84850, 84852, 84854, 84856, 84858, 84860	

No	DF7 Coding	WSP's Amendments
6		
7		
8		

2.3 Assignment Impacts with WSP Amendments

The revised assignments were carried out with the 8 amendments applied to the TPS RTM base models. Figures 5 to 7 below provide an overall picture of the flow difference (at AADT level) between the revised assignments and the original DF7 model assignments.

Figure 5 AADT Flow Difference – Overview: WSP vs. DF7

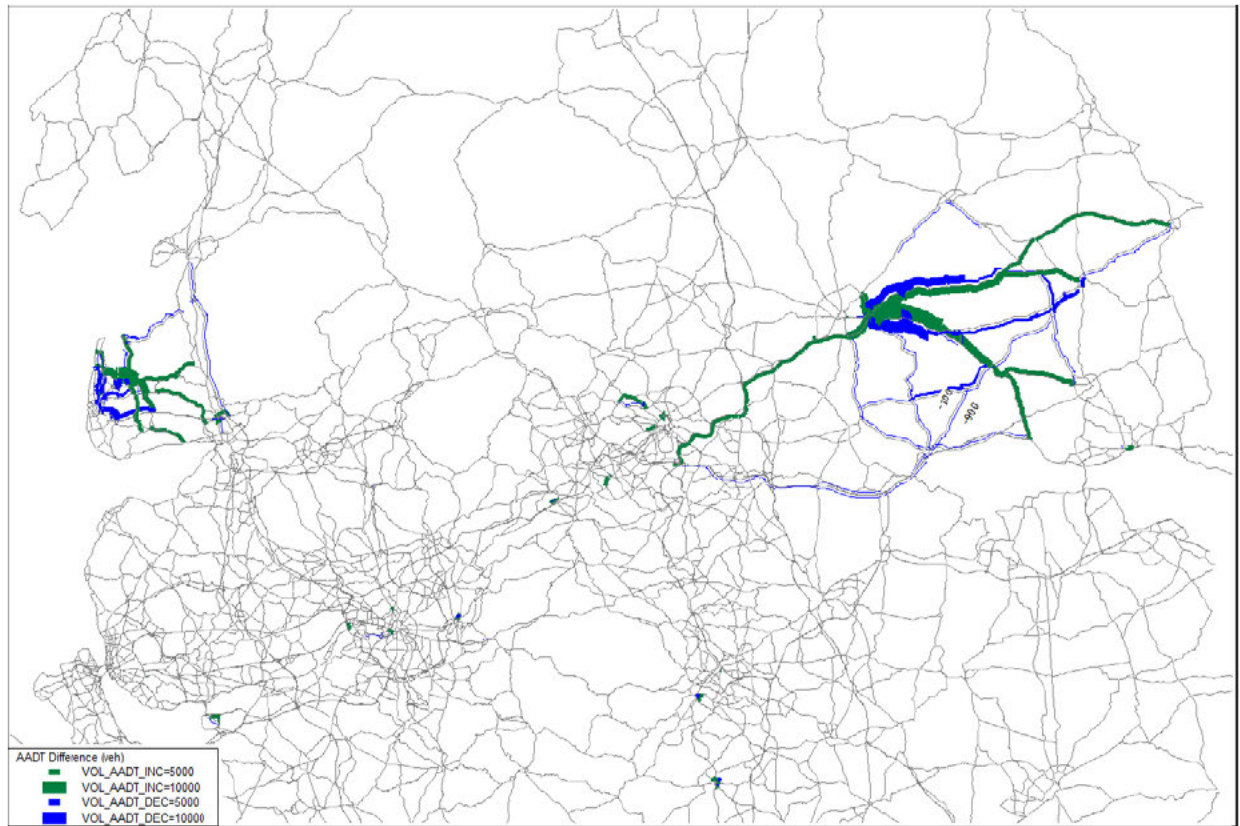


Figure 6 AADT Flow Difference – A1079 and A166 in York: WSP vs. DF7

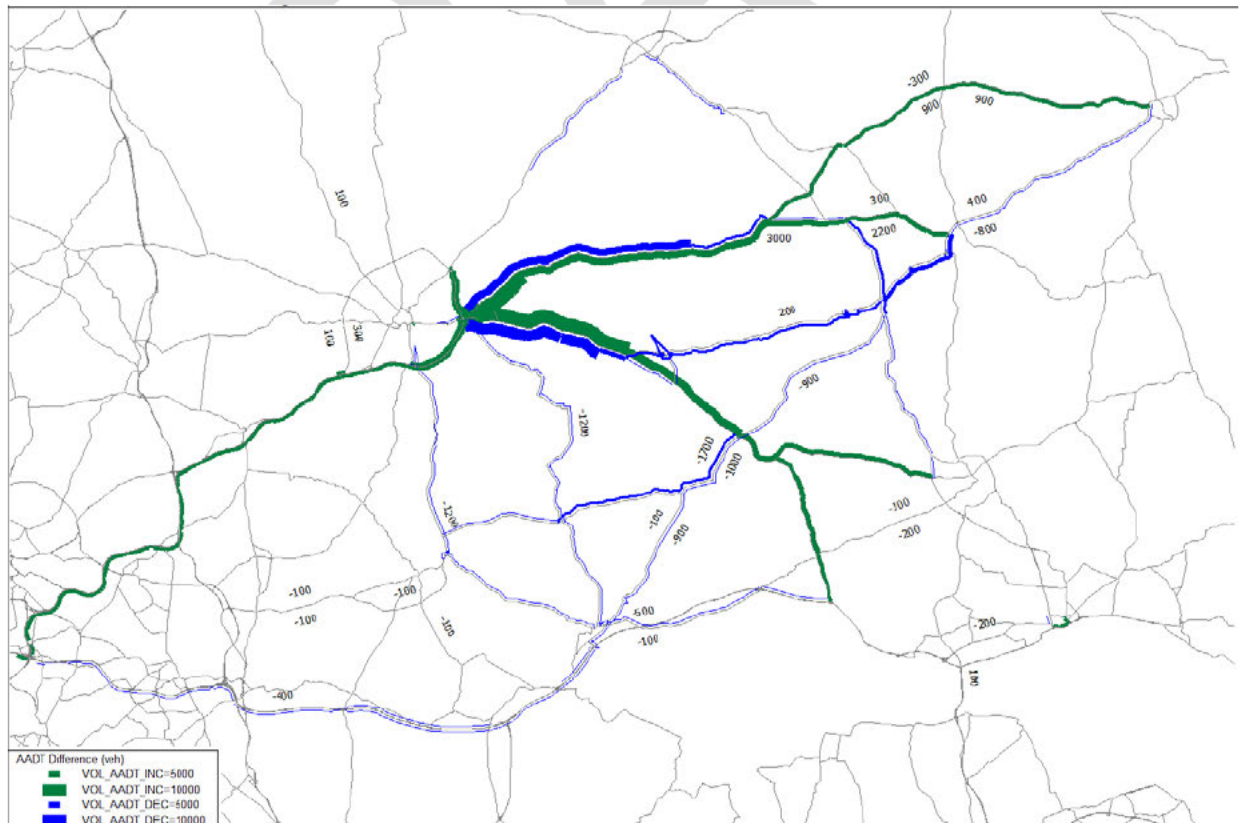
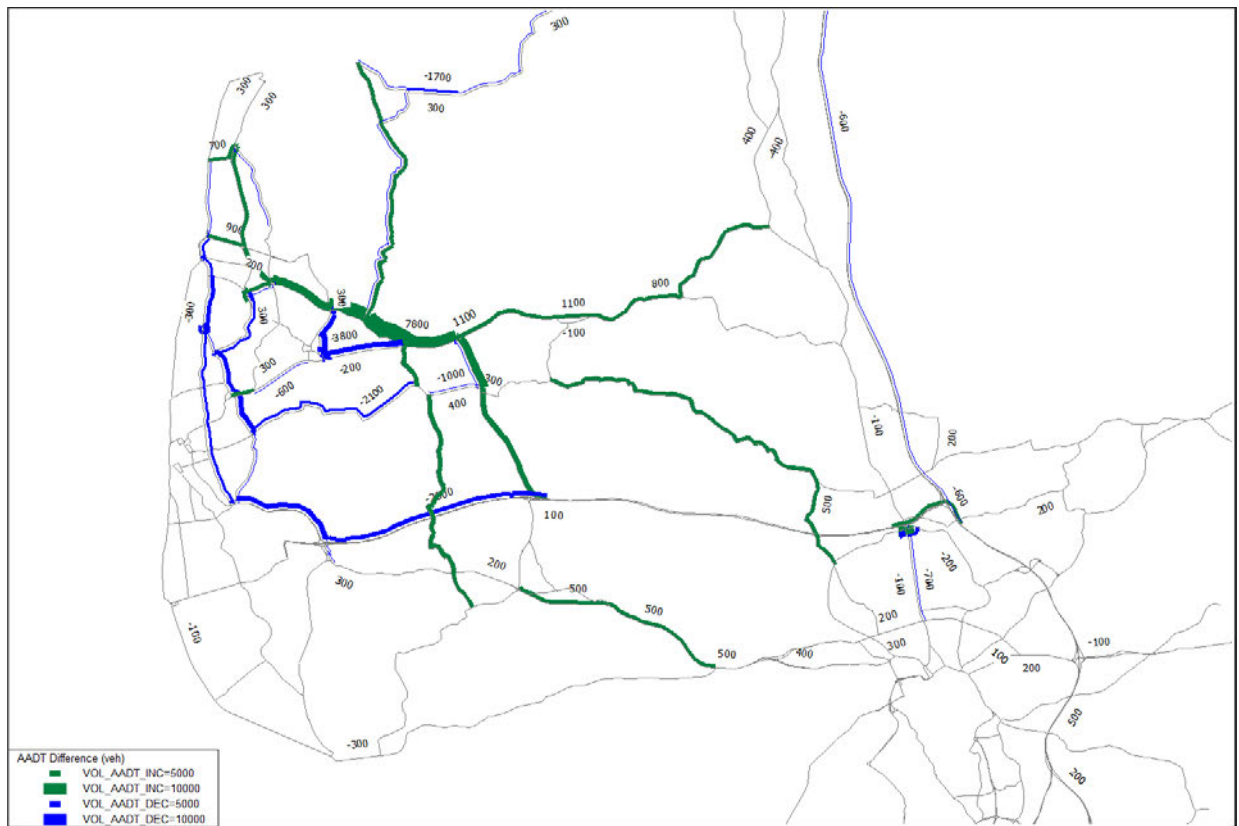


Figure 7 AADT Flow Difference – Preston and Fleetwood: WSP vs. DF7



As expected, the assignments with the WSP's revised coding produce significant difference compared to the DF7 assignments, particularly in York (A1079/A166 amendments), Preston (A6 amendment) and Fleetwood (A585 amendment) areas where the correction of network coding appear to result in significant traffic rerouting on the network.

Table 4 below provides a summary of the TPS RTM base year assignments with the WSP's coding amendments implemented.

Table 4 Model Convergence – TPS RTM with WSP's Amendments

Period	AM Peak	Inter-Peak	PM Peak
Number of Iteration	37	53	64
%Link with flow difference <1%	98.0	99.0	98.2
Convergence Gap (%)	0.0120	0.0043	0.0094

The assignments with WSP's coding amendments implemented results in reduction in model runtime by 5%-39%.

Figures 8 to 10 provide summary a high level statistics of the flow and journey validation for the base year assignments with WSP's coding amendments applied.

Figure 8 Overall Statistics – TPS RTM with WSP's Amendments: AM Peak

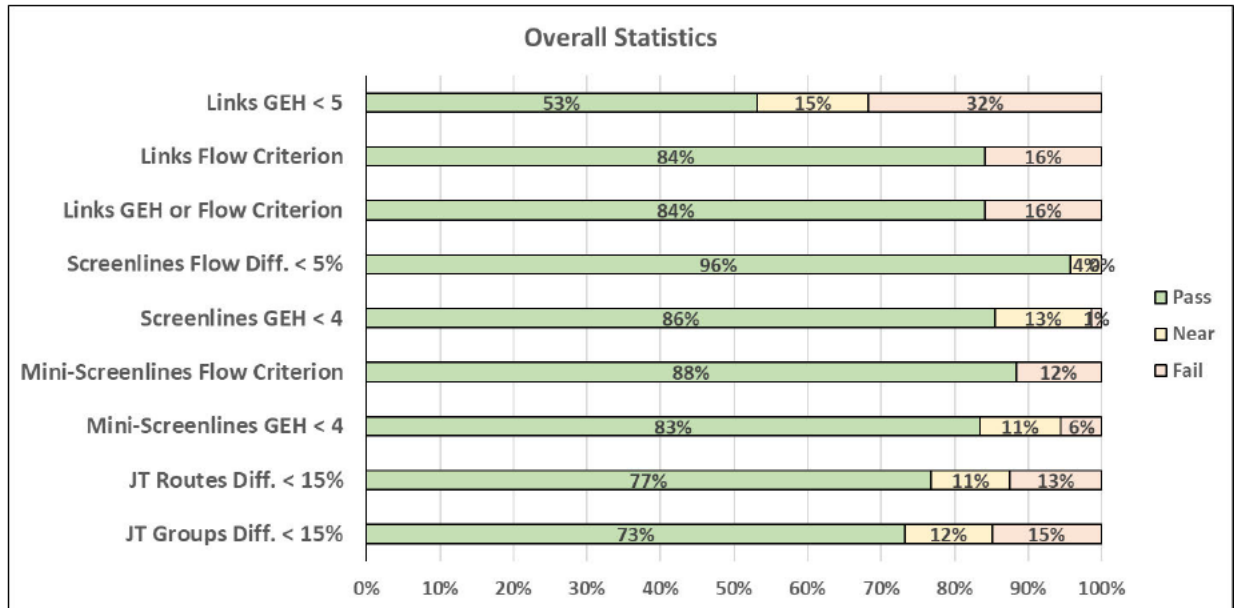


Figure 9 Overall Statistics – TPS RTM with WSP's Amendments: Inter-Peak

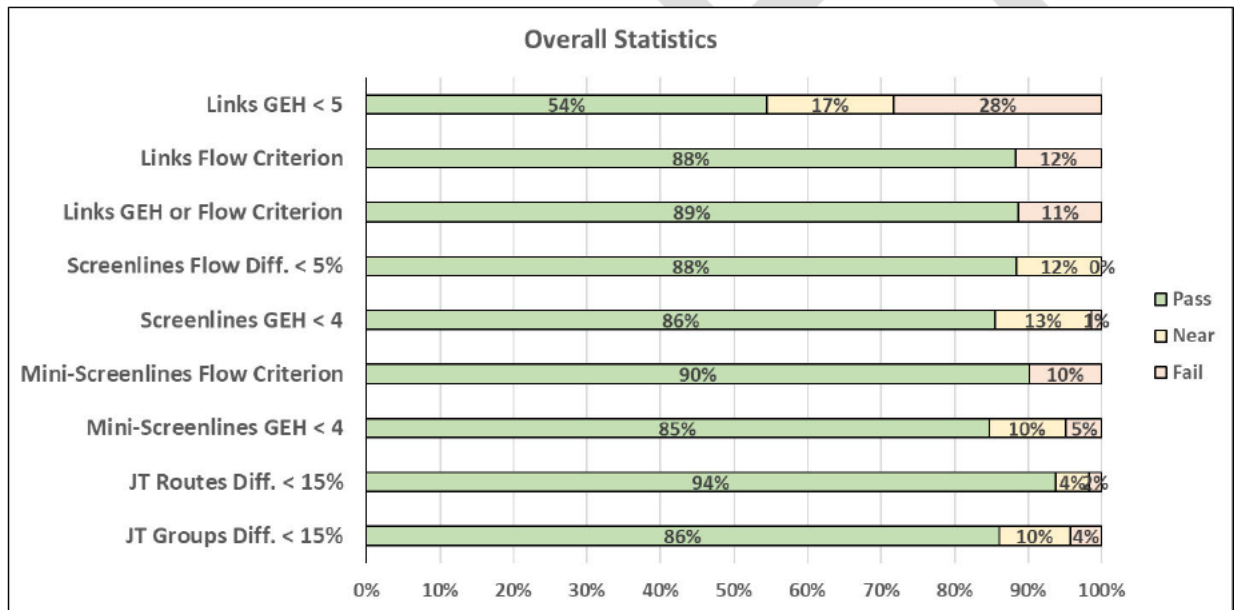
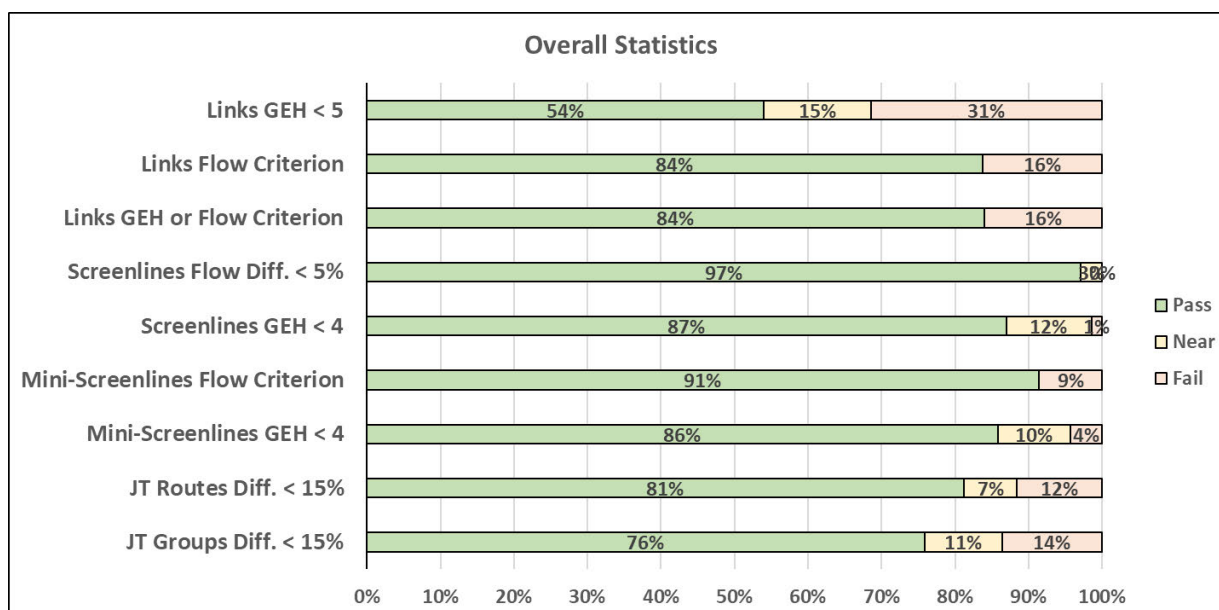


Figure 10 Overall Statistics – TPS RTM with WSP’s Amendments: PM Peak



With the WSP’s coding amendments applied, the revised models perform slightly better at overall level compared to the DF7 model assignments, as below:

- Number of link with GEH<5 has improved slightly;
- Number of link that meet the flow criterion are either similar or has improved slightly; and
- Journey time route and groups with difference of less than 15% are either similar or have improved across three model periods.

A high level check on the number of links with observed count include in to the model calibration/validation shows that there are a slight shift between ‘PASS’ and ‘FAIL’ category between the DF7 base models and the WSP’s coding amendment models, as provided in Table 5 below.

Table 5 TPS RTM with WSP’s Amendments

TPS RTM DF7	WSP’s Changes	AM Peak	Inter-Peak	PM Peak
From ‘PASS’	To ‘PASS’	1,284	1,368	1,291
From ‘PASS’	To ‘FAIL’	11	3	5
From ‘FAIL’	To ‘PASS’	19	9	10
From ‘FAIL’	To ‘FAIL’	292	226	300
Total Counts		1,606	1,606	1,606

With the improvements made to number of selected junctions, the revised models with WSP’s changes resulted in slight improvements in the flow validation, with more number of links switching from ‘FAIL’ to ‘PASS’ category compared to number of links switching from ‘PASS’ to ‘FAIL’ category.

Detailed analysis of the difference in the assignment results between the WSP’s coding improvements and the DF7 is provided in the section below.

2.4 Detailed Analysis

A1079 Junction Improvements East of York

AM Peak Period (Total vehicles)

			TPS RTM DF7					WSP's Revised Models						
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
59 Channel 1 West	A1079	Westbound	858	1,409	64.2%	16.4	0	FAIL	858	803	-6.4%	1.9	1	PASS
59 Channel 2 East	A1079	Eastbound	641	0	-100.0%	35.8	0	FAIL	641	566	-11.8%	3.1	1	PASS
A1079 Kexby	A1079	Eastbound	548	10	-98.3%	32.2	0	FAIL	548	566	3.2%	0.7	1	PASS
A1079 Kexby	A1079	Westbound	916	1,409	53.8%	14.5	0	FAIL	916	770	-16.0%	5.0	1	PASS

Inter-Peak Period (Total vehicles)

			TPS RTM DF7					WSP's Revised Models						
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
59 Channel 1 West	A1079	Westbound	558	1,075	92.6%	18.1	0	FAIL	558	523	-6.3%	1.5	1	PASS
59 Channel 2 East	A1079	Eastbound	586	0	-100.0%	34.2	0	FAIL	586	644	9.9%	2.3	1	PASS
A1079 Kexby	A1079	Eastbound	558	25	-95.5%	31.2	0	FAIL	558	644	15.5%	3.5	1	PASS
A1079 Kexby	A1079	Westbound	536	1,075	100.5%	19.0	0	FAIL	536	523	-2.4%	0.6	1	PASS

PM Peak Period (Total vehicles)

			TPS RTM DF7					WSP's Revised Models						
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
59 Channel 1 West	A1079	Westbound	601	1,216	102.4%	20.4	0	FAIL	601	727	21.0%	4.9	1	PASS
59 Channel 2 East	A1079	Eastbound	931	0	-100.0%	43.2	0	FAIL	931	886	-4.8%	1.5	1	PASS
A1079 Kexby	A1079	Eastbound	951	49	-94.9%	40.4	0	FAIL	951	886	-6.8%	2.1	1	PASS
A1079 Kexby	A1079	Westbound	590	1,216	106.2%	20.8	0	FAIL	590	627	6.3%	1.5	1	PASS

As can be seen from the table that the four sites which failed the flow/GEH criteria in the TPS RTM DF7 assignments have now passed with the revised models. The very low and high modelled flows in the DF7 due to the banned turn coded have now been addressed and the WSP revised models show more plausible flows on the A1079.

A166 Junction Improvements East of York

AM Peak Period (Total vehicles)

AM Peak Period (Total vehicles)			TPS RTM DF7						WSP's Revised Models					
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
5 Channel 1 Southwest	A166	South-Westbound	332	0	-100.0%	25.8	0	FAIL	332	843	153.8%	21.1	0	FAIL
5 Channel 2 Northeast	A166	North-Eastbound	554	1,063	91.8%	17.9	0	FAIL	554	762	37.6%	8.1	1	PASS
A166 Bridlington Road Stamford Bridge	A166	Eastbound	278	774	178.4%	21.6	0	FAIL	278	453	63.0%	9.2	1	PASS
A166 Bridlington Road Stamford Bridge	A166	Westbound	403	62	-84.6%	22.4	0	FAIL	403	378	-6.3%	1.3	1	PASS

Inter-Peak Period (Total vehicles)

Inter-Peak Period (Total vehicles)			TPS RTM DF7						WSP's Revised Models					
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
5 Channel 1 Southwest	A166	South-Westbound	378	0	-100.0%	27.5	0	FAIL	378	642	70.0%	11.7	1	PASS
5 Channel 2 Northeast	A166	North-Eastbound	364	1,031	183.2%	25.2	0	FAIL	364	656	80.2%	12.9	1	PASS
A166 Bridlington Road Stamford Bridge	A166	Eastbound	263	797	203.1%	23.2	0	FAIL	263	415	57.9%	8.3	1	PASS
A166 Bridlington Road Stamford Bridge	A166	Westbound	261	19	-92.7%	20.4	1	PASS	261	291	11.3%	1.8	1	PASS

PM Peak Period (Total vehicles)

PM Peak Period (Total vehicles)			TPS RTM DF7						WSP's Revised Models					
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
5 Channel 1 Southwest	A166	South-Westbound	524	0	-100.0%	32.4	0	FAIL	524	623	18.8%	4.1	1	PASS
5 Channel 2 Northeast	A166	North-Eastbound	345	1,403	306.6%	35.8	0	FAIL	345	958	177.7%	24.0	0	FAIL
A166 Bridlington Road Stamford Bridge	A166	Eastbound	365	1,073	194.0%	26.4	0	FAIL	365	555	51.9%	8.8	1	PASS
A166 Bridlington Road Stamford Bridge	A166	Westbound	280	17	-93.8%	21.5	1	PASS	280	220	-21.6%	3.8	1	PASS

As can be seen from the table, similar to the A1079, the four sites which failed the flow/GEH criteria in the TPS RTM DF7 assignments have now passed with the revised models. The very low and high modelled flows in the DF7 due to the banned turn coded have now been addressed and the WSP revised models show more plausible flows on the A166.

Please note that whilst the WSP revised models improve flow validation on both A1179 and A1066, further work could be done to produce better flow validation for this area. However, it is not in the scope of WSP at this stage.

A585 Junction Improvements

AM Peak Period (Total vehicles)

Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
A585 Garstang New Rd	A585	Eastbound	1,023	568	-44.5%	16.1	0	FAIL	1,023	1,097	7.2%	2.3	1	PASS
A585 Garstang New Rd	A585	Westbound	728	767	5.4%	1.4	1	PASS	728	715	-1.7%	0.5	1	PASS
TMU Site 7090/1 on A585 northbound between B5412 near	A585	Northbound	614	758	23.4%	5.5	0	FAIL	614	688	12.1%	2.9	1	PASS
TMU Site 7090/2 on A585 southbound between B5409 and E	A585	Southbound	561	748	33.3%	7.3	0	FAIL	561	807	43.7%	9.4	0	FAIL

Inter-Peak Period (Total vehicles)

Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
A585 Garstang New Rd	A585	Eastbound	868	494	-43.1%	14.4	0	FAIL	868	819	-5.6%	1.7	1	PASS
A585 Garstang New Rd	A585	Westbound	838	864	3.1%	0.9	1	PASS	838	861	2.7%	0.8	1	PASS
TMU Site 7090/1 on A585 northbound between B5412 near	A585	Northbound	589	902	53.1%	11.4	0	FAIL	589	906	53.9%	11.6	0	FAIL
TMU Site 7090/2 on A585 southbound between B5409 and E	A585	Southbound	599	708	18.2%	4.3	0	PASS	599	762	27.2%	6.2	0	FAIL

PM Peak Period (Total vehicles)

Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
A585 Garstang New Rd	A585	Eastbound	923	506	-45.1%	15.6	0	FAIL	923	1,058	14.6%	4.3	1	PASS
A585 Garstang New Rd	A585	Westbound	1,053	1,053	-0.1%	0.0	1	PASS	1,053	1,095	4.0%	1.3	1	PASS
TMU Site 7090/1 on A585 northbound between B5412 near	A585	Northbound	670	1,007	50.3%	11.6	0	FAIL	670	1,154	72.3%	16.0	0	FAIL
TMU Site 7090/2 on A585 southbound between B5409 and E	A585	Southbound	644	866	34.5%	8.1	0	FAIL	644	939	45.9%	10.5	0	FAIL

As can be seen from the tables above, the WSP's coding amendment on the A585 has resulted in more traffic travelling eastbound using the A585 as opposed to M55 in the DF7 models. that consequently resulted in improvements in flow validation the A585 Garstang new road eastbound.



M55 Impacts because of A585 Improvements

AM Peak Period (Total vehicles)

AM Peak Period (Total vehicles)			TPS RTM DF7						WSP's Revised Models					
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
MIDAS site at M55/5248K, 024/7/217/311 on M55 J1 eastbou	M55	Eastbound	1,089	773	-29.0%	10.4	0	FAIL	1,089	837	-23.2%	8.1	0	FAIL
MIDAS site at M55/5248A, 024/7/217/312 on M55 eastbound	M55	Eastbound	1,808	1,758	-2.8%	1.2	1	PASS	1,808	1,770	-2.1%	0.9	1	PASS
MIDAS site at M55/5256L, 024/7/216/251 on link road from M	M55	Northbound	2,665	2,291	-14.0%	7.5	1	PASS	2,665	2,296	-13.8%	7.4	1	PASS
MIDAS site at M55/5259M, 024/7/217/211 on link road from M	M55	Southbound	584	383	-34.3%	9.1	0	FAIL	584	381	-34.7%	9.2	0	FAIL
TMU site 9066/1 on M55 eastbound between J4 and J3	M55	Eastbound	1,485	1,578	6.3%	2.4	1	PASS	1,485	1,333	-10.2%	4.0	1	PASS
TMU site 9067/1 on M55 westbound between J3 and J4	M55	Westbound	1,659	1,658	-0.1%	0.0	1	PASS	1,659	1,688	1.8%	0.7	1	PASS
MIDAS site at M55/5229A, 024/7/217/331 on M55 eastbound	M55	Eastbound	2,501	2,425	-3.0%	1.5	1	PASS	2,501	2,378	-4.9%	2.5	1	PASS
TMU Site 9010/1 on link M55 westbound between J1 and J3	M55	Westbound	2,495	2,311	-7.4%	3.7	1	PASS	2,495	2,324	-6.8%	3.5	1	PASS

Inter-Peak Period (Total vehicles)

Inter-Peak Period (Total vehicles)			TPS RTM DF7						WSP's Revised Models					
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
MIDAS site at M55/5248K, 024/7/217/311 on M55 J1 eastbou	M55	Eastbound	792	858	8.3%	2.3	1	PASS	792	850	7.3%	2.0	1	PASS
MIDAS site at M55/5248A, 024/7/217/312 on M55 eastbound	M55	Eastbound	1,406	1,219	-13.3%	5.2	1	PASS	1,406	1,220	-13.2%	5.1	1	PASS
MIDAS site at M55/5256L, 024/7/216/251 on link road from M	M55	Northbound	1,765	1,676	-5.0%	2.1	1	PASS	1,765	1,639	-7.1%	3.0	1	PASS
MIDAS site at M55/5259M, 024/7/217/211 on link road from M	M55	Southbound	378	287	-24.3%	5.0	1	PASS	378	286	-24.3%	5.0	1	PASS
TMU site 9066/1 on M55 eastbound between J4 and J3	M55	Eastbound	1,186	1,228	3.5%	1.2	1	PASS	1,186	1,120	-5.5%	1.9	1	PASS
TMU site 9067/1 on M55 westbound between J3 and J4	M55	Westbound	1,172	1,142	-2.6%	0.9	1	PASS	1,172	1,144	-2.4%	0.8	1	PASS
MIDAS site at M55/5229A, 024/7/217/331 on M55 eastbound	M55	Eastbound	1,848	1,856	0.4%	0.2	1	PASS	1,848	1,896	2.6%	1.1	1	PASS
TMU Site 9010/1 on link M55 westbound between J1 and J3	M55	Westbound	1,759	1,723	-2.0%	0.9	1	PASS	1,759	1,725	-2.0%	0.8	1	PASS

PM Peak Period (Total vehicles)

PM Peak Period (Total vehicles)			TPS RTM DF7						WSP's Revised Models					
Road Name	Road Type	Direction	Obs	Mod	% Diff	GEH	FLOW	Pass	Obs	Mod	% Diff	GEH	FLOW	Pass
MIDAS site at M55/5248K, 024/7/217/311 on M55 J1 eastbound	M55	Eastbound	1,120	882	-21.3%	7.5	0	FAIL	1,120	938	-16.3%	5.7	0	FAIL
MIDAS site at M55/5248A, 024/7/217/312 on M55 eastbound	M55	Eastbound	2,009	1,747	-13.1%	6.1	1	PASS	2,009	1,750	-12.9%	6.0	1	PASS
MIDAS site at M55/5256L, 024/7/216/251 on link road from M55	M55	Northbound	2,607	2,422	-7.1%	3.7	1	PASS	2,607	2,424	-7.0%	3.6	1	PASS
MIDAS site at M55/5259M, 024/7/217/211 on link road from M55	M55	Southbound	489	370	-24.3%	5.7	0	FAIL	489	373	-23.7%	5.6	0	FAIL
TMU site 9066/1 on M55 eastbound between J4 and J3	M55	Eastbound	1,605	1,751	9.1%	3.6	1	PASS	1,605	1,505	-6.2%	2.5	1	PASS
TMU site 9067/1 on M55 westbound between J3 and J4	M55	Westbound	1,585	1,602	1.1%	0.4	1	PASS	1,585	1,569	-1.0%	0.4	1	PASS
MIDAS site at M55/5229A, 024/7/217/331 on M55 eastbound	M55	Eastbound	2,468	2,388	-3.2%	1.6	1	PASS	2,468	2,355	-4.6%	2.3	1	PASS
TMU Site 9010/1 on link M55 westbound between J1 and J3	M55	Westbound	2,515	2,346	-6.7%	3.4	1	PASS	2,515	2,356	-6.3%	3.2	1	PASS

With the WSP's coding amendments, the flow validation on M55 generally similar to the DF7 model outputs, with some slight improvements in some section whilst slight worse in other sections. This is expected as a result of the traffic rerouting on A585.

3. SUMMARY

Upon receiving and analysing of the latest TPS RTM DF7 models, and by comparing with the DF2 version of the TPS RTM models WSP is currently using for the TfN SDC studies, number of coding errors were found, particularly on A1079 and A166 to the east of York; and A585 and A6 in Fleetwood and Preston areas.

The revised coding has been applied the TPS RTM models and revised assignment show generally improvements in terms of flow validation for the three areas where the coding changes resulted in significant flow difference compared to the DF7 models.

It is therefore recommended that the revised base year models with WSP's coding amendments to be used as the baseline for the forecasting process of the TPTS+ studies. It is also recommended that the coding changes to be fed back to HE to update the TPS RTM models for the future use.