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Document
Technote

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1 Introduction

Mott MacDonald was commissioned by Transport for Wales to undertake an early indicative exercise to prepare inputs for and then analyse the outputs from variable demand model runs of the South East Wales Transport Model (SEWTM) that include assumptions about future development in Monmouthshire for the Strategic Transport Assessment (STA). The model has been run using a methodology and assumptions agreed with Transport for Wales and considered suitable. A hybrid method has been employed using the updated 2022 base year networks, matrices, and population/jobs assumptions, with the 2015 demand model system. High-level results are provided in this report.

1.1 Modelled Scenario

The Do-Minimum (DM) scenario in terms of networks, matrices and population/jobs assumptions is the updated 2022 base year and the Do-Something (DS) includes the same highway and public transport networks with the only difference being assumptions regarding the demand for transport, i.e., the STA housing assumptions. No changes were made to the fixed LGV and HGV matrices.

The STA scenario to be modelled was based on information provided by Transport for Wales in April 2024, as summarised below in Table 1-1. As can be seen from the table, a total of 2,273 additional dwellings were assumed in Monmouthshire. It should be noted that the settlements in this table refer to a different set of locations compared to the sector system described elsewhere in this report, though some locations share names.

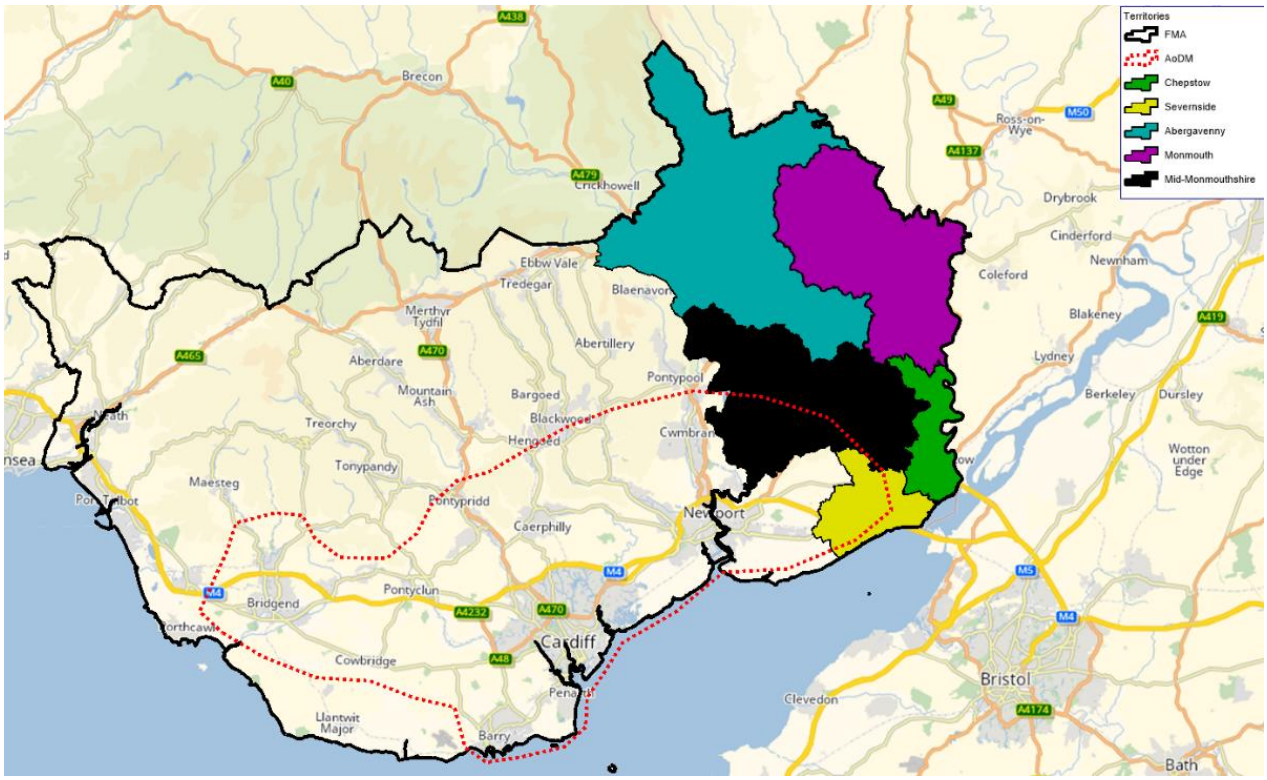
Table 1-1: STA Housing Development Sites

Candidate Site Ref	Site Name	Settlement	Units (Dwellings)
CS0165	Mounton Road (Strategic Site)	Chepstow	145
CS0213	Land East of A465 (Strategic Site)	Abergavenny	500
CS0094	Land at Penlanlas	Abergavenny	100
CS0270	Leasbrook -Land North of Dixton (Strategic Site)	Monmouth	270
CS0189	Land at Tudor Rd , Wyseham	Monmouth	50
CS0277	Land at Drewen Farm	Monmouth	110
CS0076	Land West of Rockfield Rd	Monmouth	60
CS0087	The Showground Caldicot (Strategic Site)	Severnside	350

Candidate Site Ref	Site Name	Settlement	Units (Dwellings)
CS0251	Bradbury Farm Crick (Strategic Site)	Severnside	385
CS0183	Land South of Monmouth Rd	Raglan	55
CS0037	Land west of Trem y Ysgol	Penperlleni	42
CS0009	Former MoD, Caerwent	Severnside	40
C0113	Land at Castle Oaks	Usk	40
CS0077	Land at Pierecefield	St Arvans	16
CS00214	Land at Churchfields	Devauden	20
CS0027	Land at Llanellen Court	Llanellen	30
CS00232	Land at Redd Landes	Shirenewton	25
CS00241	Land at Little Mill	Little Mill	15
CS0016	Land at Little Mill	Little Mill	20

For this application Monmouthshire has been split into 5 sectors which have been used to aggregate outputs, as shown below in Figure 1.1.

Figure 1.1: Monmouthshire in SEWTM



The change in population and number of dwellings by sector in the STA scenario compared to the DM can be seen below in Table 1-2.

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Table 1-2: Population and Dwelling Change by Sector

Sector	2022 Total Dwellings	STA Dwellings	Dwelling Change	Dwelling Change (%)	2022 Total Population	STA Population	Population Change	Population Change (%)
Chepstow	6632	6792	160	2.41%	15071	15502	431	2.86%
Abergavenny	12859	13542	683	5.31%	28399	29764	1365	4.81%
Monmouth	7291	7781	490	6.72%	16906	18004	1098	6.49%
Severnside	9402	10178	776	8.25%	22172	24106	1934	8.72%
Mid Monmouthshire	4629	4791	162	3.50%	11059	11444	385	3.48%

1.2 Application of Demand Model Growth

It should be noted that the process by which growth is applied to the calibrated base matrices has been altered for this application. Usually a percentage growth rate is calculated in the demand model and applied multiplicatively to the calibrated base matrices. However, in situations where the demand model estimates of trip making do not match closely with the calibrated base matrices, unexpectedly large or small changes can occur in the final output matrices. In an earlier model run for this application such a situation occurred, resulting in an unusually high car trip rate occurring for the new developments.

To get round this issue, the model run reported in this technical note takes the absolute growth in trips from the demand model rather than the percentage growth. This results in a more reasonable highway trip rate for the new developments (i.e. aligns with number of trips per dwelling in NTEM 8). The total trip rate for public transport also aligns well with the figures in NTEM 8. It should be noted that NTEM 8 tends to overstate the actual bus trip rates in South East Wales (likewise the survey data which the SEWTM demand model has been calibrated to).

More detailed information regarding the methodology is provided in Appendix A.

2 Forecast Change in Travel Demand

Table 2-1 provides a summary of the forecast change in demand across SEWTM between the 2022 (DM) and 2022 (DS) scenarios, presented in terms of person trips (and therefore accounting for car occupancy), there is a forecast increase in model-wide travel demand of around 0.3%, with the greatest change in volume, by assignment hour, in the AM and PM peaks, as would be expected. The table includes changes in demand by car, bus and rail modes combined. The car occupancy factors which are an input to this table are also presented below in Table 2-2.

Table 2-1: Summary of Model-wide Travel Demand (Person Trips) by Assignment Hour

Time Period	Do Minimum (DM)	Do Something (DS)	Difference (DS-DM)	% difference
AM	325,612	326,547	935	0.3%
IP	264,304	264,926	622	0.2%
PM	332,636	333,640	1,004	0.3%
OP	63,192	63,348	156	0.2%

Table 2-2: Car Occupancy, Derived from the TAG Databook

Time Period	Car Business	Car Commute	Car Other
AM	1.20	1.17	1.68
IP	1.19	1.15	1.65
PM	1.17	1.16	1.71
OP	1.18	1.18	1.66

2.1.1 Change in Travel Demand at a Local Sector Level

2.1.1.1 Change in Highway Demand at a Sector Level

To better understand the forecast change in demand locally, the sectorised change has been summarised below (Table 2-3 and Table 2-4) in terms of car demand (vehicle trips) at an all-day level. A positive value is an increase in demand in the Do-Something. The number of new car trips per dwelling is in line with the number of trips per dwelling in NTEM 8.

As expected, given it has the greatest increase in dwellings, the largest demand increase is forecast for Severnside, followed by Abergavenny which has the second largest change in dwellings. The most significant changes are observed in intra-sectoral movements in Monmouthshire, though there are also reasonable levels of change between Monmouthshire and other locations, particularly to/from the adjacent Local Authority of Newport, where there are significant employment and population levels. Of the Monmouthshire sectors the smallest change is in Mid-Monmouthshire, where there is only a small change in population. Given only changes in population (and not employment) have been modelled, the new trips between Monmouthshire and other sectors tend to have a home end in the Local Authority itself. Small reductions in travel between external sectors reflect a redistribution of trips arising from redistribution of trips to/from the Monmouthshire, and corresponding changes in highway network costs.

Table 2-3: Sectorised Car Demand Change, All-Day, Vehicles

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	37	10	-1	2	10	87	26	59	61
Newport	5	57	4	4	27	57	45	207	45
Rest of Wales	-11	-11	134	0	30	222	81	184	57
Rest of England	0	1	-3	0	81	42	104	211	26
Chepstow	10	30	33	82	204	6	19	125	22
Abergavenny	87	57	222	40	6	707	37	10	34
Monmouth	26	45	81	102	20	37	626	16	17
Severnside	57	207	178	203	124	10	15	837	28
Mid Monmouthshire	61	46	56	25	22	33	16	28	61

Table 2-4: Sectorised Car Demand Change (%), All-Day, Vehicles

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0.0%	0.1%	0.0%	0.2%	2.6%	2.6%	6.6%	9.3%	1.3%
Newport	0.0%	0.0%	0.0%	0.0%	1.3%	2.9%	5.2%	3.0%	1.2%
Rest of Wales	-0.1%	0.0%	0.0%	0.0%	3.1%	1.7%	8.1%	12.7%	2.7%

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Rest of England	0.0%	0.0%	0.0%	0.0%	1.9%	1.7%	1.3%	5.4%	1.9%
Chepstow	2.7%	1.6%	3.6%	2.2%	1.9%	2.5%	3.3%	3.9%	1.7%
Abergavenny	2.5%	3.6%	1.6%	2.0%	2.4%	2.6%	2.4%	3.9%	1.8%
Monmouth	4.7%	4.4%	5.3%	1.2%	3.2%	2.1%	4.7%	6.9%	2.0%
Severnside	7.7%	3.1%	11.8%	6.7%	3.8%	4.3%	6.1%	6.8%	3.4%
Mid Monmouthshire	1.3%	1.4%	3.1%	2.5%	1.6%	1.9%	2.4%	3.5%	1.4%

Table 2-5 to Table 2-8 contain sectorised car demand change by peak hour.

Table 2-5: Sectorised Car Demand Change, AM, Vehicles

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	4	0	-3	0	0	1	0	0	2
Newport	1	2	-5	1	0	0	0	3	1
Rest of Wales	-1	-1	12	0	0	2	0	1	0
Rest of England	0	0	0	0	0	0	1	1	0
Chepstow	2	6	7	16	17	0	1	6	2
Abergavenny	16	12	45	9	1	55	3	1	4
Monmouth	6	11	20	23	3	5	49	2	2
Severnside	13	41	43	42	16	1	2	69	3
Mid Monmouthshire	9	8	11	5	2	2	1	2	5

Table 2-6: Sectorised Car Demand Change, IP, Vehicles

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	2	1	1	0	0	4	1	3	4
Newport	1	5	1	0	1	2	2	10	2
Rest of Wales	0	0	8	0	1	10	3	7	3
Rest of England	0	0	0	0	4	2	4	9	1
Chepstow	0	1	1	4	14	0	1	8	1
Abergavenny	5	3	11	2	0	50	2	0	2
Monmouth	1	2	3	5	1	2	44	1	1
Severnside	3	11	7	10	8	0	1	56	2
Mid Monmouthshire	4	3	3	1	1	2	1	2	4

Table 2-7: Sectorised Car Demand Change, PM, Vehicles

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	5	2	1	0	2	13	5	11	8
Newport	0	8	2	0	5	10	8	35	7

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Rest of Wales	-3	-4	18	0	6	37	15	35	10
Rest of England	0	0	-1	0	13	8	19	37	4
Chepstow	0	1	1	3	19	1	3	15	2
Abergavenny	4	2	9	1	1	64	4	1	3
Monmouth	1	2	2	3	1	3	56	2	1
Severnside	2	9	5	6	8	1	2	76	2
Mid Monmouthshire	3	2	2	1	2	4	2	3	6

Table 2-8: Sectorised Car Demand Change, OP, Vehicles

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	2	1	1	1
Newport	0	0	0	0	1	1	1	4	1
Rest of Wales	0	0	1	0	1	5	2	4	1
Rest of England	0	0	0	0	2	1	2	4	1
Chepstow	0	0	0	1	3	0	0	2	0
Abergavenny	1	1	3	1	0	11	1	0	1
Monmouth	0	1	1	1	0	1	9	0	0
Severnside	1	3	2	3	2	0	0	13	0
Mid Monmouthshire	1	1	1	0	0	1	0	0	1

2.1.1.2 Change in Public Transport Demand at a Sector Level

The sectorised change in Public Transport (PT) demand (bus and rail) has been summarised below in terms of person trips at an all-day level (Table 2-9 and Table 2-10). A positive value represents an increase in demand for travel by PT. It should be noted that changes in PT trips are larger than might be expected in percentage terms, though the overall PT trip rates align well with the figures for Monmouthshire in NTEM 8. This is because NTEM 8 (and the survey data which the demand model has been calibrated to) tends to overstate the bus trip rate in South East Wales whereas the base matrices are reflective of the actual PT mode share in the region. It should be noted however that the motorised mode share of new trips for PT is less than 10%.

The biggest changes in absolute terms occur in Severnside, where the population increase is most significant, and also where the public transport provision is greatest within Monmouthshire, reflecting a greater opportunity for travel by PT.

Table 2-9: Sectorised PT Demand Change, All-Day, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	4	2	2	1	1	16	1	5	6
Newport	2	7	3	0	2	8	5	37	2
Rest of Wales	2	2	18	0	2	17	2	23	1
Rest of England	1	0	0	0	3	16	7	28	1

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Chepstow	1	2	2	3	16	0	5	24	4
Abergavenny	17	9	19	17	0	102	4	0	4
Monmouth	1	7	3	10	5	4	3	1	2
Severnside	6	42	25	29	27	0	1	189	1
Mid Monmouthshire	7	3	1	1	4	4	2	1	1

Table 2-10: Sectorised PT Demand Change (%), All-Day, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0.1%	0.2%	0.2%	0.4%	9.7%	31.8%	17.3%	32.2%	12.9%
Newport	0.3%	0.1%	0.1%	0.0%	2.2%	22.8%	23.4%	14.2%	4.0%
Rest of Wales	0.2%	0.1%	0.0%	0.0%	1.2%	6.7%	9.8%	15.5%	0.5%
Rest of England	0.3%	0.0%	0.0%	0.0%	1.6%	4.5%	9.3%	13.6%	1.4%
Chepstow	11.8%	3.1%	1.4%	1.9%	10.4%	20.9%	28.9%	27.4%	23.4%
Abergavenny	23.3%	19.6%	5.3%	6.1%	16.3%	42.2%	49.9%	94.4%	11.1%
Monmouth	18.6%	36.9%	16.4%	16.2%	33.9%	50.7%	7.3%	47.4%	25.7%
Severnside	58.6%	28.7%	18.4%	13.2%	36.8%	148.9%	46.0%	64.4%	34.7%
Mid Monmouthshire	18.9%	6.4%	0.6%	1.6%	28.3%	13.3%	27.5%	35.7%	13.0%

Table 2-11 to Table 2-14 contain sectorised total PT demand by peak hour.

Table 2-11: Sectorised PT Demand Change, AM, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	1	0	1	0	0	0	0	0	0
Newport	0	1	1	0	0	0	0	1	0
Rest of Wales	0	0	3	0	0	0	0	0	0
Rest of England	0	0	0	0	0	0	0	0	0
Chepstow	0	0	1	1	1	0	0	1	0
Abergavenny	3	2	4	4	0	10	0	0	0
Monmouth	0	1	1	1	1	0	0	0	0
Severnside	1	10	7	8	5	0	0	24	0
Mid Monmouthshire	1	1	0	0	0	0	0	0	0

Table 2-12: Sectorised PT Demand Change, IP, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	1	0	0	1
Newport	0	0	0	0	0	0	0	2	0
Rest of Wales	0	0	1	0	0	1	0	1	0
Rest of England	0	0	0	0	0	1	1	1	0

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Chepstow	0	0	0	0	1	0	0	2	0
Abergavenny	1	0	1	1	0	8	0	0	0
Monmouth	0	0	0	1	0	0	0	0	0
Severnside	0	2	1	1	2	0	0	12	0
Mid Monmouthshire	1	0	0	0	0	0	0	0	0

Table 2-13: Sectorised PT Demand Change, PM, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	3	0	1	1
Newport	0	0	0	0	0	2	1	6	0
Rest of Wales	0	0	2	0	0	3	0	5	0
Rest of England	0	0	0	0	1	3	1	6	0
Chepstow	0	0	0	0	1	0	1	3	0
Abergavenny	1	0	1	1	0	8	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	0	1	1	1	1	0	0	13	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-14: Sectorised PT Demand Change, OP, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	0	0	0	0
Newport	0	0	0	0	0	0	0	1	0
Rest of Wales	0	0	0	0	0	0	0	0	0
Rest of England	0	0	0	0	0	0	0	1	0
Chepstow	0	0	0	0	0	0	0	0	0
Abergavenny	0	0	0	0	0	1	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	0	0	0	0	0	0	0	2	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-15 to Table 2-19 contain all day and peak hour demand changes for bus.

Table 2-15: Sectorised Bus Demand Change, All-Day, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	4	1	1	0	0	8	1	3	6
Newport	1	7	2	0	1	2	5	24	2
Rest of Wales	1	1	11	0	0	5	2	3	1

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Rest of England	0	0	0	0	1	6	7	2	0
Chepstow	1	2	1	1	16	0	5	22	4
Abergavenny	9	2	7	7	0	102	4	0	4
Monmouth	1	7	3	10	5	4	3	1	2
Severnside	3	29	4	2	25	0	1	187	1
Mid Monmouthshire	7	3	1	1	4	4	2	1	1

Table 2-16: Sectorised Bus Demand Change, AM, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	0	0	0	0
Newport	0	1	0	0	0	0	0	0	0
Rest of Wales	0	0	2	0	0	0	0	0	0
Rest of England	0	0	0	0	0	0	0	0	0
Chepstow	0	0	0	0	1	0	0	1	0
Abergavenny	1	0	1	1	0	10	0	0	0
Monmouth	0	1	1	1	1	0	0	0	0
Severnside	1	6	1	0	5	0	0	24	0
Mid Monmouthshire	1	1	0	0	0	0	0	0	0

Table 2-17: Sectorised Bus Demand Change, IP, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	1	0	0	0	0	1	0	0	1
Newport	0	0	0	0	0	0	0	2	0
Rest of Wales	0	0	1	0	0	0	0	0	0
Rest of England	0	0	0	0	0	0	1	0	0
Chepstow	0	0	0	0	1	0	0	2	0
Abergavenny	1	0	0	1	0	8	0	0	0
Monmouth	0	0	0	1	0	0	0	0	0
Severnside	0	1	0	0	1	0	0	12	0
Mid Monmouthshire	1	0	0	0	0	0	0	0	0

Table 2-18: Sectorised Bus Demand Change, PM, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	1	0	0	1
Newport	0	0	0	0	0	0	1	3	0
Rest of Wales	0	0	1	0	0	1	0	1	0
Rest of England	0	0	0	0	0	1	1	0	0

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Chepstow	0	0	0	0	1	0	1	3	0
Abergavenny	0	0	0	0	0	8	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	0	1	0	0	1	0	0	13	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-19: Sectorised Bus Demand Change, OP, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	0	0	0	0
Newport	0	0	0	0	0	0	0	0	0
Rest of Wales	0	0	0	0	0	0	0	0	0
Rest of England	0	0	0	0	0	0	0	0	0
Chepstow	0	0	0	0	0	0	0	0	0
Abergavenny	0	0	0	0	0	1	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	0	0	0	0	0	0	0	2	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-15 to Table 2-19 contain all day and peak hour demand changes for rail.

Table 2-20: Sectorised Rail Demand Change, All-Day, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	1	1	1	1	0	8	0	3	0
Newport	1	0	1	0	1	6	0	13	0
Rest of Wales	1	1	7	0	1	12	0	20	0
Rest of England	1	0	0	0	2	10	0	26	0
Chepstow	0	1	1	2	0	0	0	2	0
Abergavenny	8	7	12	10	0	0	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	3	13	21	27	2	0	0	2	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-21: Sectorised Rail Demand Change, AM, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	0	0	0	0
Newport	0	0	0	0	0	0	0	0	0
Rest of Wales	0	0	1	0	0	0	0	0	0

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Rest of England	0	0	0	0	0	0	0	0	0
Chepstow	0	0	0	1	0	0	0	0	0
Abergavenny	2	2	3	3	0	0	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	1	4	6	7	0	0	0	0	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-22: Sectorised Rail Demand Change, IP, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	0	0	0	0
Newport	0	0	0	0	0	0	0	0	0
Rest of Wales	0	0	0	0	0	0	0	0	0
Rest of England	0	0	0	0	0	0	0	1	0
Chepstow	0	0	0	0	0	0	0	0	0
Abergavenny	0	0	0	0	0	0	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	0	0	0	1	0	0	0	0	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-23: Sectorised Rail Demand Change, PM, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	2	0	1	0
Newport	0	0	0	0	0	1	0	3	0
Rest of Wales	0	0	1	0	0	2	0	4	0
Rest of England	0	0	0	0	0	2	0	6	0
Chepstow	0	0	0	0	0	0	0	0	0
Abergavenny	0	0	0	0	0	0	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	0	0	0	1	0	0	0	0	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

Table 2-24: Sectorised Rail Demand Change, OP, Person Trips

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Torfaen	0	0	0	0	0	0	0	0	0
Newport	0	0	0	0	0	0	0	0	0
Rest of Wales	0	0	0	0	0	0	0	0	0
Rest of England	0	0	0	0	0	0	0	0	0

	Torfaen	Newport	Rest of Wales	Rest of England	Chepstow	Abergavenny	Monmouth	Severnside	Mid Monmouthshire
Chepstow	0	0	0	0	0	0	0	0	0
Abergavenny	0	0	0	0	0	0	0	0	0
Monmouth	0	0	0	0	0	0	0	0	0
Severnside	0	0	0	0	0	0	0	0	0
Mid Monmouthshire	0	0	0	0	0	0	0	0	0

2.1.2 Forecast Traffic Flow Differences

The following figures illustrate the highway traffic demand flow differences forecast by SEWTM by time period (in vehicle units). Red indicates an increase in traffic flow in the DS compared to the DM and the width of the line is relative to the scale of the difference. To reduce the visual effects of convergence noise, only increases in demand are shown.

The most significant increases in traffic flow in the AM peak occur in the South of Monmouthshire, particularly in the Chepstow and Severnside areas, where there is a significant population increase in a small area, and where access to the M4 and M48 for longer distance trips is facilitated. However, the most significant change occurs westbound on the A48 towards M4 Junction 24 and Newport, which is reflective of the lack of opportunity to join the M4 in this direction in parts of Monmouthshire. It can be observed that significant levels of new traffic emanate from the Caldicot area, where there is a concentration of new development. There is also a significant increase in flow on the Abergavenny-Cwmbran and Abergavenny-Merthyr corridors, this reflects that the second largest population increase by sector occurs in Abergavenny. An increase in flow on the Monmouth-Reglan-Newport corridor can also be observed. Whilst the change in population in mid-Monmouthshire is small, there are reasonable levels of flow change, largely due to the road network facilitating an increase in trips between adjacent sectors.

Figure 2.1: DS-DM Highway Demand Flow Difference – AM

The traffic flow changes in the inter-peak are less significant in absolute terms, reflecting that commute patterns to key employment centres are less dominant in this time period. In this period, the most significant change is a pattern of increased trips on the A48 and the A4042.

Figure 2.2: DS-DM Highway Demand Flow Difference – IP

In the PM peak, the patterns observed in the AM peak are again replicated, albeit with tidality in the opposite direction. The most significant increases are again in the Chepstow and Severnside areas, with corresponding increases in flow on the Abergavenny-Merthyr, Abergavenny-Cwmbran and Monmouth-Raglan-Newport corridors.

Figure 2.3: DS-DM Highway Demand Flow Difference – PM

2.1.3 Vehicle Kilometres Travelled

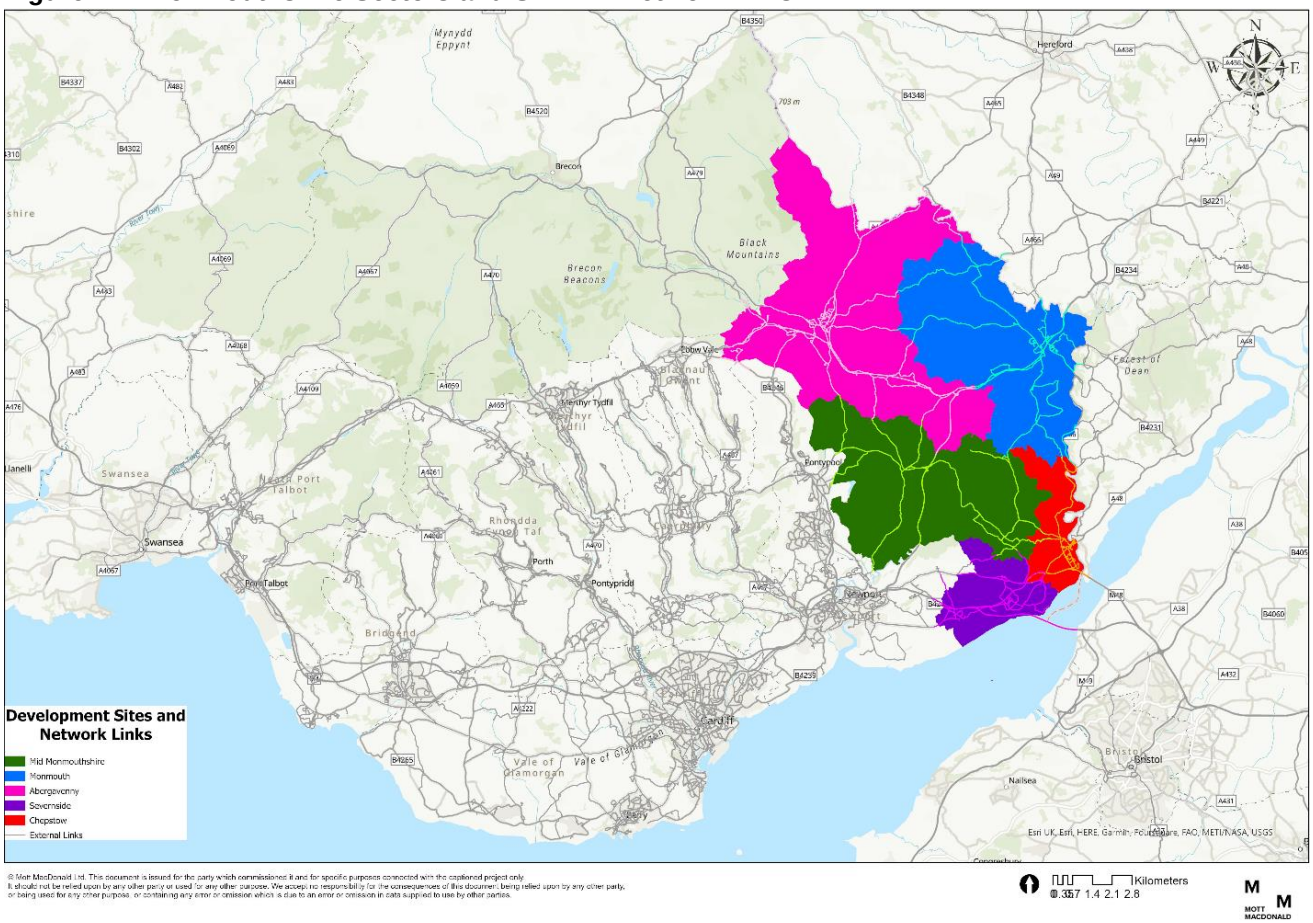
The following tables indicate the changes in vehicle kilometres travelled forecast by SEWTM by car, LGV and HGV combined (with LGV and HGV changes resulting only from changes in route. **Figure 2.4** illustrates the areas and road links to which the forecast change in vehicle kilometres travelled have been allocated. The road links illustrated are those modelled within SEWTM.

The scale of the increase varies by area and is the product of both an increase in demand for travel and the roads used by trips from the proposed development areas. The most significant absolute changes occur in Severnside and Abergavenny, where the greatest changes in population occur. The smallest absolute changes occur in Monmouth and mid-Monmouthshire, where the population changes are smallest.

Table 2-25: DS-DM vehicle km travel difference by time-period

Sector	AM	IP	PM
Abergavenny	703	282	577
Chepstow	687	328	524
Monmouth	283	115	242
Mid Monmouthshire	284	118	235
Severnside	907	450	975

Figure 2.4: Monmouthshire Sectors and SEWTM Network links



In percentage terms, the largest changes in vehicle km still occur within Severnside, even though there is already a significant concentration of vehicle-kms in the DM due to the presence of the motorways. The smallest percentage change occurs in Abergavenny despite the large absolute increase in vehicle-km. This is because the area is large and already carries significant traffic on the road network.

Table 2-26: DS-DM vehicle km travel difference (in %) by time-period

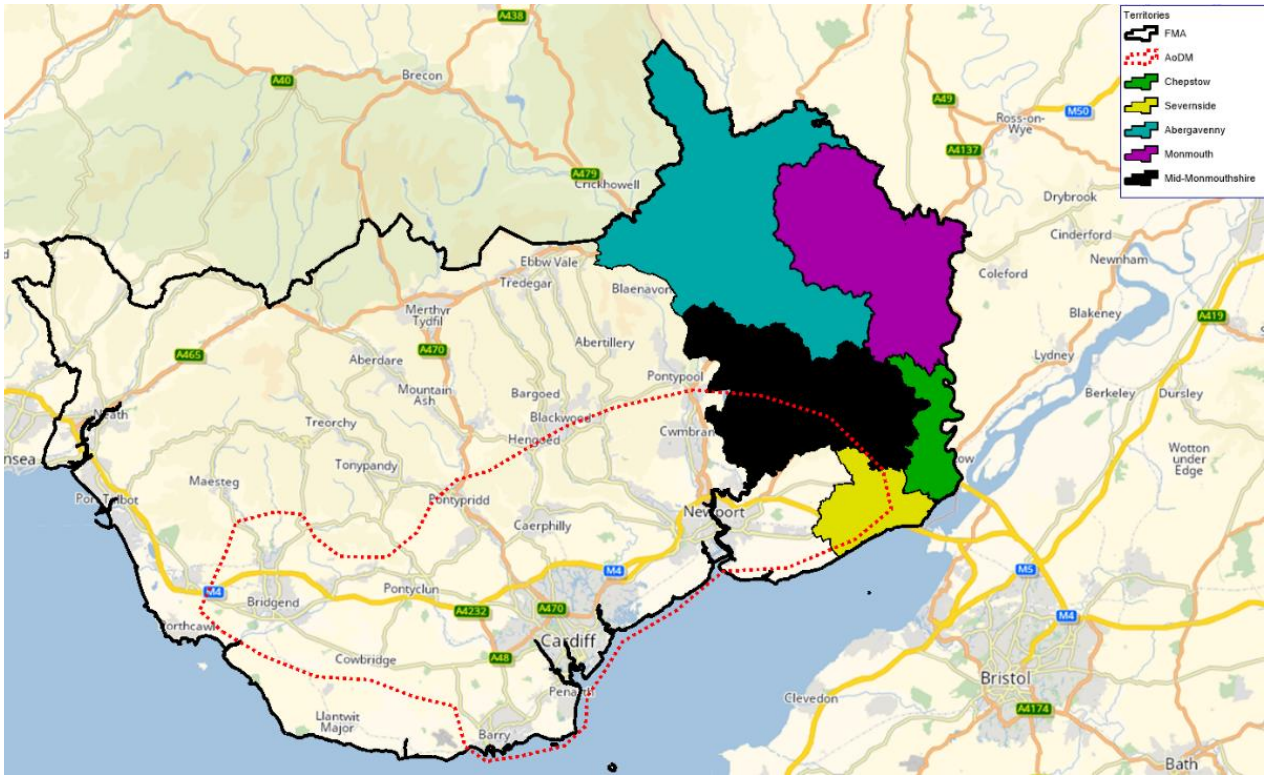
Sector	AM	IP	PM
Abergavenny	1.5%	0.8%	1.3%
Chepstow	2.5%	1.5%	1.8%
Monmouth	2.0%	1.0%	1.8%
Mid Monmouthshire	2.3%	1.2%	1.9%
Severnside	2.7%	1.7%	2.6%

A. Methodology

A.1 Background

Figure A.1 indicates the location of Monmouthshire in the context of the South East Wales Traffic Model's Fully Modelled Area (FMA) and Area of Detailed Modelling (AoDM). Within the FMA, the majority of Monmouthshire falls within the "Rest of the Fully Modelled Area." This is the area over which the modelled impacts of interventions are considered quite likely. It is characterised by representation of all trip movements, somewhat larger zones and less network detail than for the AoDM, and speed/flow curve modelling. Monmouthshire is on the edge of the FMA, to the north and east zones are larger and to the south and west more detailed.

Figure A.1: Monmouthshire in SEWTM



A.2 Variable Demand Methodology

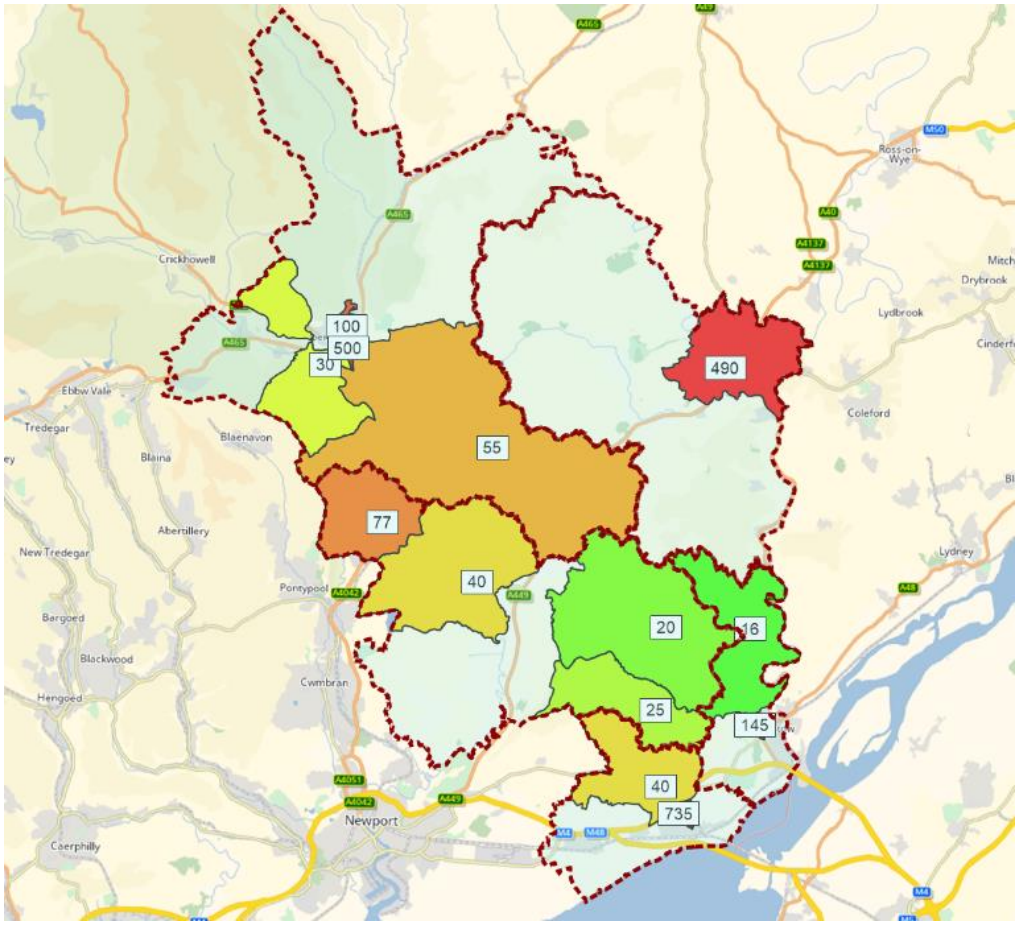
It was agreed with TfW that runs of the South East Wales Transport Model (SEWTM) would be for a base year of 2022 and that these would comprise variable demand model runs.

It should be noted that no attempt has been made to verify the validation of the highway model locally for this exercise, i.e., no checks made to compare the modelled traffic flows and observed traffic counts in or in the vicinity of Monmouthshire.

A.3 Allocation of Development Sites

The figure below illustrates the location of the zones used to allocate the additional housing. The numbers shown are the additional dwellings allocated to the zone, and the colours are reflective of the scale of change with small changes shown in green and large changes shown in red.

Figure A.2: Location of Development Sites



These additional dwellings were allocated to relevant zones in SEWTM. A series of factors was derived to apply to relevant zones in the model to increase the population in each of the areas to account for the additional housing. The demographic characteristics of each zone were kept the same, i.e., the split between the number of people in different age groups, full time / part time worker splits, household type (persons per household) etc. It should be noted that it was agreed with TfW that only additional residential development was to be assumed for each of the sites listed above.

Once the updated demographics had been calculated, these were input to the demand model. A variable demand model run was then undertaken, and results checked for sensibility and consistency with the 2022 base year model.