Report
June 2025

Traffic Filters Temporary Road Charging Scheme – Modelling and Income Forecasting Report

Oxfordshire County Council
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1 Introduction

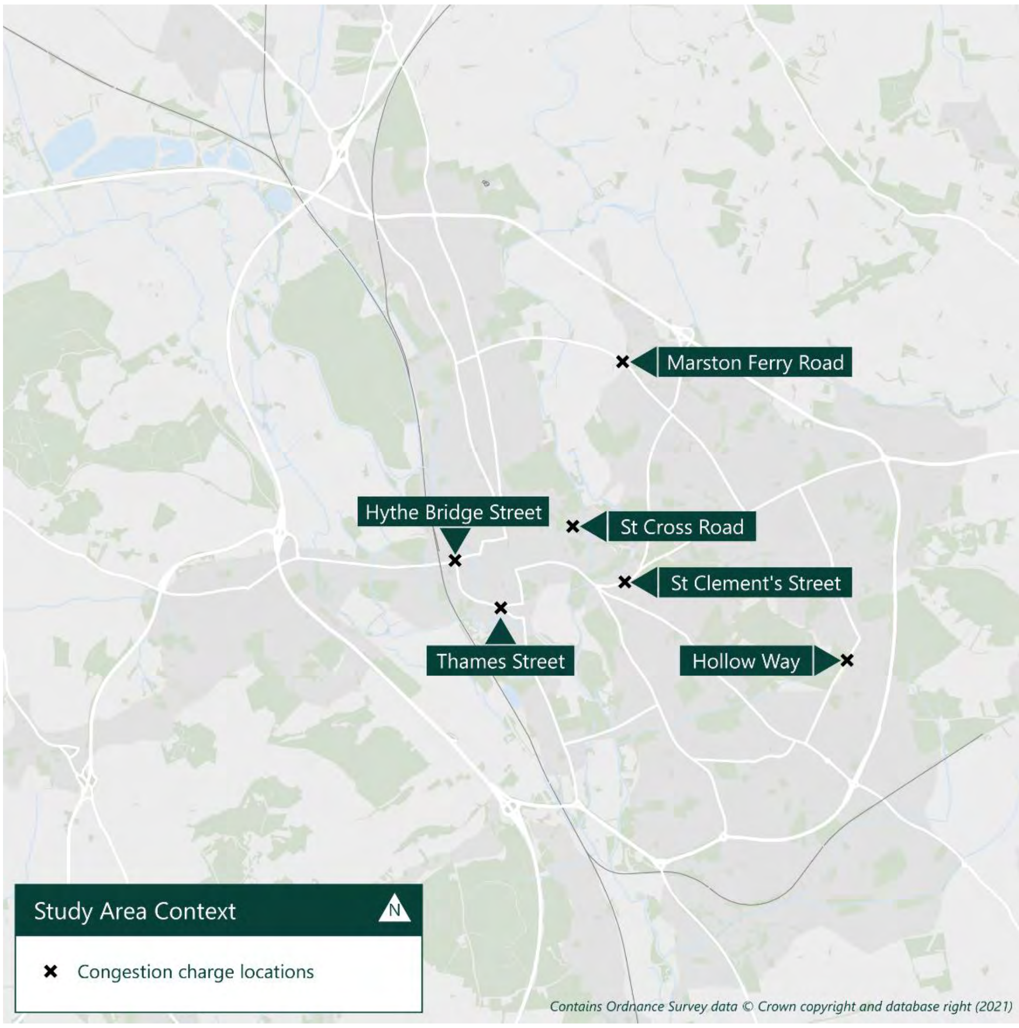
Purpose of report

1.1 This report provides details of the transport modelling, and the income forecasting carried out for a temporary road user charging scheme proposed by Oxfordshire County Council (OCC), which, subject to approval and based on current plans at the time of writing, would likely be operational from October 2025 and until the re-opening of Botley Road, following which the Traffic Filters ETRO would start.

1.2 The transport modelling forecasts the potential impacts of a proposed daily charge (£5 / £3), applicable to cars only (all other vehicle types would not incur a charge), for crossing any of the planned congestion charge locations, as listed below and shown in Figure 1-1. The congestion charge locations are the same as the Traffic Filters locations approved in November 2022.

- Thames Street
- Hythe Bridge Street
- St Cross Road
- St Clement's Street
- Marston Ferry Road
- Hollow Way

Figure 1-1: Congestion charge locations



1.3 The modelling also takes account of proposed filter exemptions and permits including resident day passes, following the same specification as in the Traffic Filters[1] scheme, but with additional permits for selected city centre residents and businesses.

1.4 The report sets out the approach to produce forecasts for a 2025 Do Minimum (with Botley Road closed and without road user charging scheme) and a Do Something (with Botley Road remaining closed and a road user charging scheme in place) scenario, including key assumptions adopted, and details the estimated impacts of introducing the charge.

1.5 The report also describes the income forecasting modelling undertaken using the transport model outputs and other inputs from traffic data collection.

Scheme definition

1.6 When the charge scheme is operating, drivers of private cars will need to pay a £5 / £3 per day charge to drive through any of the six congestion charge locations without a permit. Paying the daily charge allows unlimited access through all six congestion charge

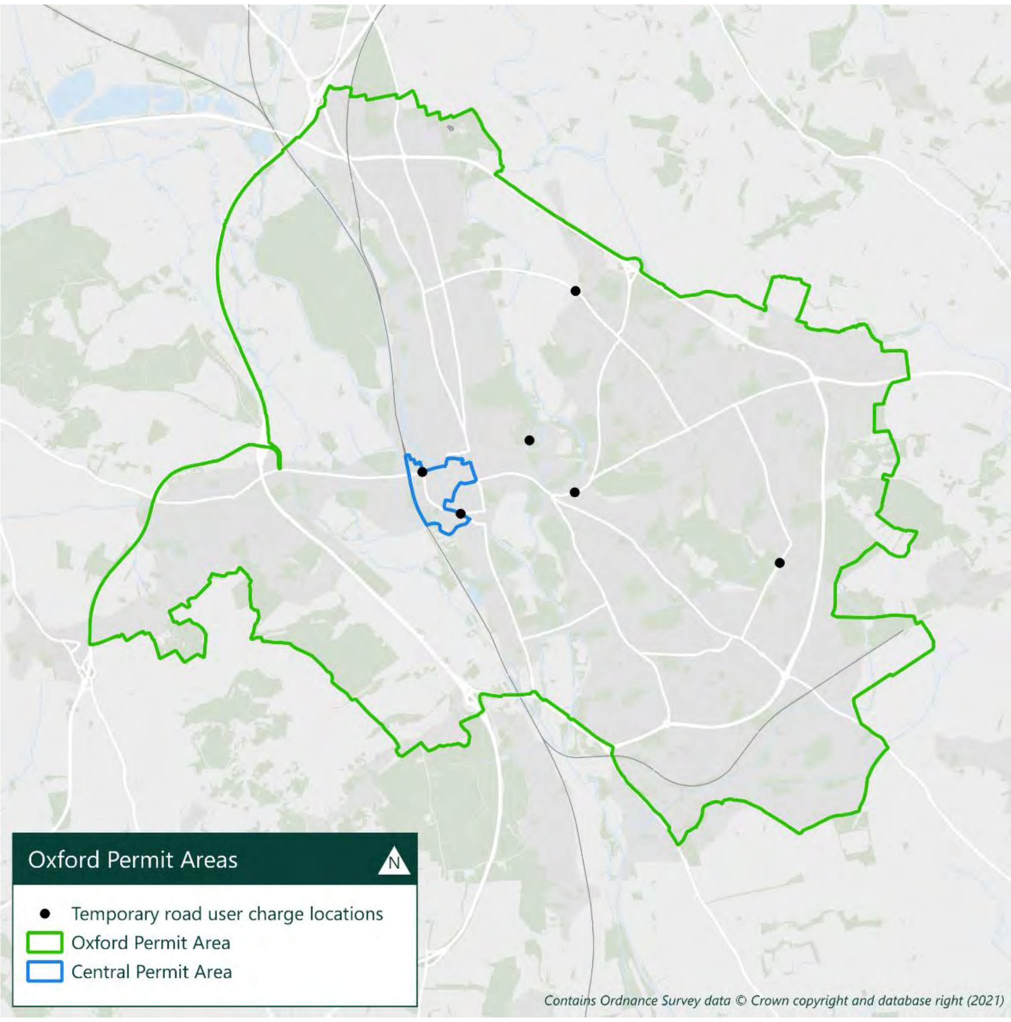
[1] https://www.oxfordshire.gov.uk/transport-and-travel/connecting-oxfordshire/oxford-traffic-filters

locations until the end of the day. As with the Traffic Filters (TF) scheme, buses, coaches, mopeds and motorbikes, vans and HGVs will be exempt from the charge.

1.7 The charge locations would operate 7 days a week from 7am to 7pm, except Marston Ferry Road and Hollow Way, which will operate Monday to Saturday 7am to 9am and 3pm to 6pm.

1.8 As for traffic filters, permits for private cars will be available for groups including residents in the Oxford and Oxfordshire permit areas, blue badge holders, taxis and PHV, emergency service vehicles, community-based health and care workers, and others. In addition, permits will be available for certain residents and businesses in a new "Central permit area", which covers the part of the city centre only accessible by passing a congestion charge location due to the Botley Road closure. Figure 1-2 shows the extent of the Oxford permit area and the new "Central permit area".

Figure 1-2: Oxford Permit Areas



1.9 Any driver of a vehicle that goes through a congestion charge location without paying the daily charge and is not exempt or using a permit, will receive a Penalty Charge Notice (PCN). The PCN charge would be £70, reduced to £35 if paid within 14 days.

The Oxfordshire Strategic Model

1.10 AtkinsRéalis has carried out the transport modelling of the scheme, using the Oxfordshire Strategic Model (OSM). OSM is a multi-modal strategic model that can be used to provide evidence to support the assessment of transport schemes and proposals. OSM has been developed in line with Department for Transport (DfT) Transport Appraisal Guidance (TAG) and has been regularly enhanced and updated since its original development in 2013. The model, and its application for this commission, is described in more detail in Chapter 2.

Modelled scenarios

1.11 For the purposes of this scheme, the relevant pre-existing scenarios are the 2025 Do Minimum (DM-1), i.e. 'without scheme', and the 2025 Traffic Filters scenario, labelled 'DM-T1' in its latest iteration.

1.12 The DM-1 scenario includes only schemes that are independent from both the traffic filters and the Zero Emissions Zone (ZEZ) schemes, while the DM-T1 scenario includes the six traffic filters and the associated exemptions, residential day permits and also public transport improvements.

1.13 The outputs from the DM-T1 modelling, particularly the comparison of demand and flow outputs between the DM-T1 (with TF) and the DM-1 scenario (without scheme), are used in this report, to compare the modelled impacts of the TF scheme with those of the road user charging scheme.

Do Minimum ('DM-BR')

1.14 The Do Minimum has been developed from modelling work and scenarios developed for the forecasting of the Traffic Filter scheme and other transport projects in Oxford.

1.15 The Do Minimum scenario developed for the modelling of the road user charging scheme ('DM-BR') has been built using the 2025 DM-1 scenario above as a starting point. This is a 'no-scheme' scenario, which is used as the counterfactual to assess the impacts of the scheme.

1.16 The only change introduced from the 2025 DM scenario has been the closure of Botley Road, at the rail overpass next to Oxford rail station.

Do Something £5 ('RUC1')

1.17 Two 'Do Something' scenarios have been developed to model the impacts of the scheme. The first one ('RUC1') represents a proposal of a £5 daily charge on non-exempt and non-permit vehicles crossing the congestion charge locations.

1.18 This scenario has been built from the DM-BR scenario described above.

Do Something £3 ('RUC2')

1.19 The second Do Something scenario ('RUC2') represents a proposal of a £3 daily charge on non-exempt and non-permit vehicles crossing the congestion charge locations.

This scenario has also been built from the DM-BR scenario described above.

Interpretation of results - caveats and limitations

1.20 The road user charging scheme, and the exemptions that form part of the scheme, will lead to a complex range of behavioural responses besides changing route, such as changing destination or mode for example. The modelling approach has been developed to best represent and forecast these responses. However, there are inherent uncertainties in any forecasting exercise.

1.21 The complex nature of scheme proposals from a modelling and 'real world' perspective, in which a variety of behavioural responses are possible, means that the modelling results should be used to support an understanding of the likely impacts of the proposals at a strategic level, but should not be seen as a precise forecast of impacts. The model itself is a strategic model – representing the whole of Oxfordshire and beyond – and is therefore more reliable in terms of its forecast impacts at a strategic level (e.g. impacts on overall car demand), and less reliable at more granular levels of detail.

Report Structure

1.22 This report is structured as follows:

- Chapter 2 sets out the forecasting approach, including the modelling assumptions, including traffic demand, highway network and public transport network;
- Chapter 3 presents the modelling results; and
- Chapter 4 presents the income forecasting results.

2 Model forecasting

Forecasting approach

Development of the Oxfordshire Strategic Model (OSM)

2.1 AtkinsRéalis has carried out the transport modelling of the scheme, using the Oxfordshire Strategic Model (OSM).

2.2 In 2013, OCC commissioned Atkins (now named AtkinsRéalis) to develop a multi-modal strategic model that can be used to provide evidence to support future assessments for funding bids and scheme prioritisation, particularly regarding transport scheme assessments that meet the Department for Transport's (DfT) Transport Appraisal Guidance (TAG). The resulting OSM was a new, strategic transport model that has been developed specifically to support business cases, local plans and other use cases.

2.3 In the summer of 2020, the model was further updated following comments from DfT on another OCC project using OSM. When built, OSM had a 2013 base year and was fully compliant with the TAG requirements. Both the Public Transport Model and the Highway Model passed the appropriate calibration/validation criteria. The model has been used for a range of other projects including previous Local Plans, thus demonstrating suitability of its use to inform the transport evidence base for this use case.

2.4 In February 2021, AtkinsRéalis undertook the local re-calibration of the highway model for Oxford City, thus creating, for the first time, a 2018 Base Year for the Variable Demand Model (VDM). Due to lack of additional information at the time, National Trip End Model (NTEM) growth was applied to all districts between 2013 and 2018, except Oxford City (where available local data showed no increase between 2013 and 2018). The same approach was used to update the public transport demand, which is also necessary to run the VDM.

2.5 At that stage, the OSM modelling system was developed to represent a 2018 base year and a 2024 forecast year, which were used for the development of the Traffic Filters scheme.

2.6 In late 2021, AtkinsRéalis was commissioned by OCC to further develop and use OSM to help assess the impacts of a number of potential improvements along the A4074 corridor between Oxford City and Berinsfield, including the provision of Park and Ride (P&R) sites (sometimes referred to as mobility hubs) at several potential locations in South Oxfordshire.

2.7 In 2024 the model was subject to a Present Year Validation using 2023 observed data, and forecast years of 2025 and 2035 were developed, taking into consideration the impact of COVID. This was done as part of the development of the model for the Oxford ZEZ study. This version of the model was the starting point for this study.

Description of the model

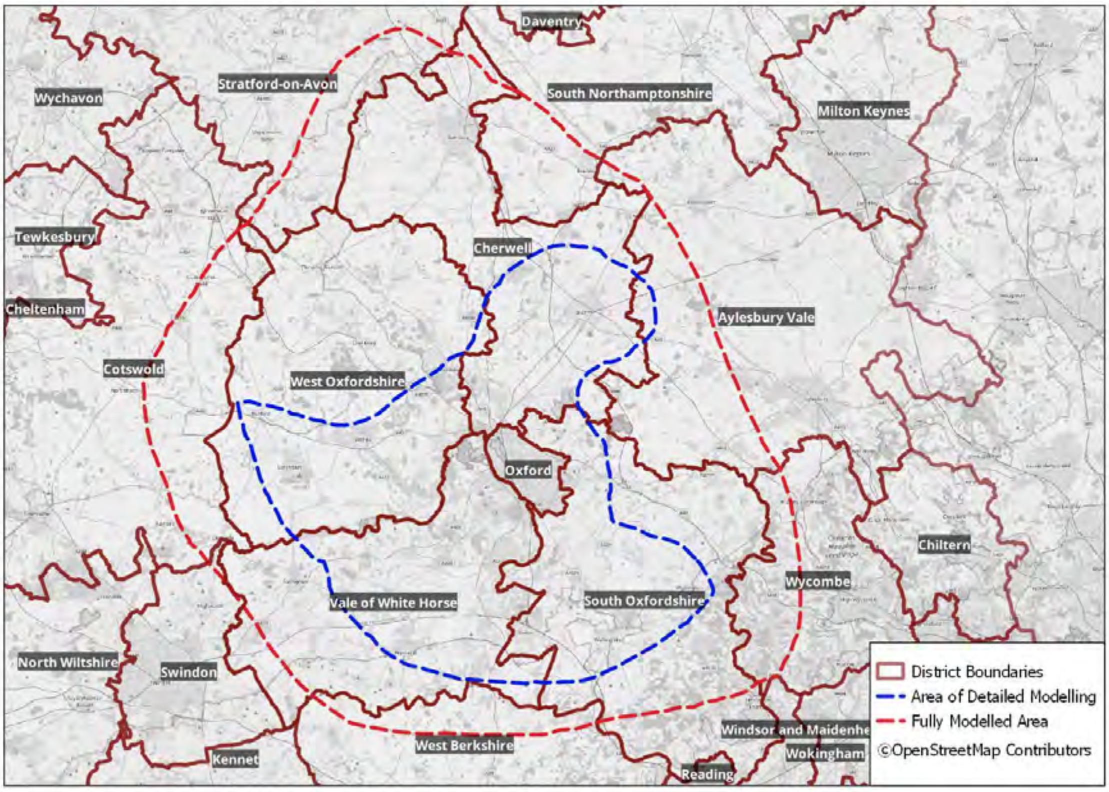
2.8 The model consists of three key elements:

- A Highway Assignment Model in SATURN representing vehicle-based movements within and across Oxfordshire for a weekday morning peak hour (08:00–09:00), an average inter-peak hour (10:00–16:00) and an evening peak hour (17:00–18:00);
- A Public Transport Assignment Model in EMME representing bus and rail-based movements across the same area and for the same time periods, month and year; and
- A multi-modal pivot incremental Variable Demand Model (VDM), coded in EMME, that estimates frequency choice, main mode choice, time period choice, destination choice, and sub-mode choice in response to changes.

2.9 The OSM covers the whole of Great Britain with different degrees of detail. The OSM covers the strategic links in Oxfordshire and has a detailed modelled area and a fully modelled area as shown in Figure 2-1. The level of detail varies as follows:

- Fully Modelled Area: the area over which proposed interventions have influence, and in which junctions are in SATURN simulation, is further subdivided as:
  - Area of Detailed Modelling – the area over which significant impacts of interventions are certain and the modelling detail in this area would be characterised by: representation of all trip movements; small zones; very detailed networks; and junction modelling (including flow metering and blocking back).
  - Rest of the Fully Modelled Area – the area over which the impacts of interventions are considered to be quite likely but relatively weak in magnitude and would be characterised by: representation of all trip movements; somewhat larger zones and less network detail than for the Area of Detailed Modelling; and speed/flow modelling (primarily link-based but possibly also including a representation of strategically important junctions).
- External Area: the area where impacts of interventions would be so small as to be reasonably assumed to be negligible and would be characterised by: a SATURN buffer network representing a large proportion of the rest of Great Britain; a partial representation of demand (trips to, from and across the Fully Modelled Area); large zones; skeletal networks and simple speed/flow relationships or fixed speed modelling.

Figure 2-1 Detailed Modelled Area



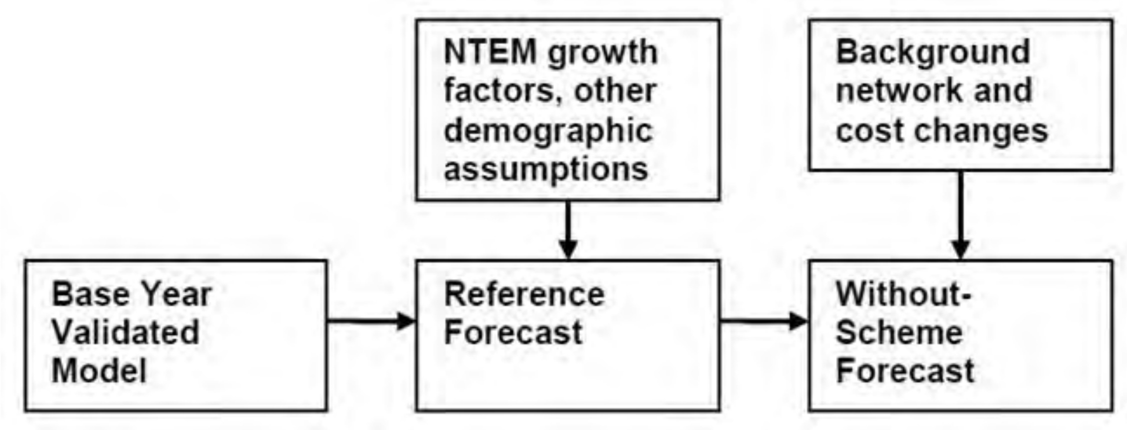
Modelling approach

2.10 The OSM forecasting methodology closely follows the current version of TAG, in particular:

- TAG Unit M1.1 – Principles of Modelling and Forecasting;
- TAG Unit A1.1 – Cost-benefit analysis;
- TAG Unit A1.3 – User and provider impacts;
- TAG Unit M2 – Variable Demand Modelling; and
- TAG Unit M4 – Forecasting and Uncertainty

2.11 The general approach is summarised in Figure 2-2 whereby the forecasting process commences with the development of the reference case by updating demand factors to the forecast year being appraised and producing a forecast based on unchanged costs from base year. The supply-side factors are then updated (i.e. network changes and different cost assumptions) and the reference case forecast is modified iteratively through the VDM until demand and cost stabilise. Once achieved, there is a sound basis for the 'Without-Intervention' (or 'Do Minimum') scenario to be tested. A similar process is undertaken to produce the Do Something forecasts by using the network interventions defined for the Do Something.

Figure 2-2 Without Scheme Forecasting Methodology

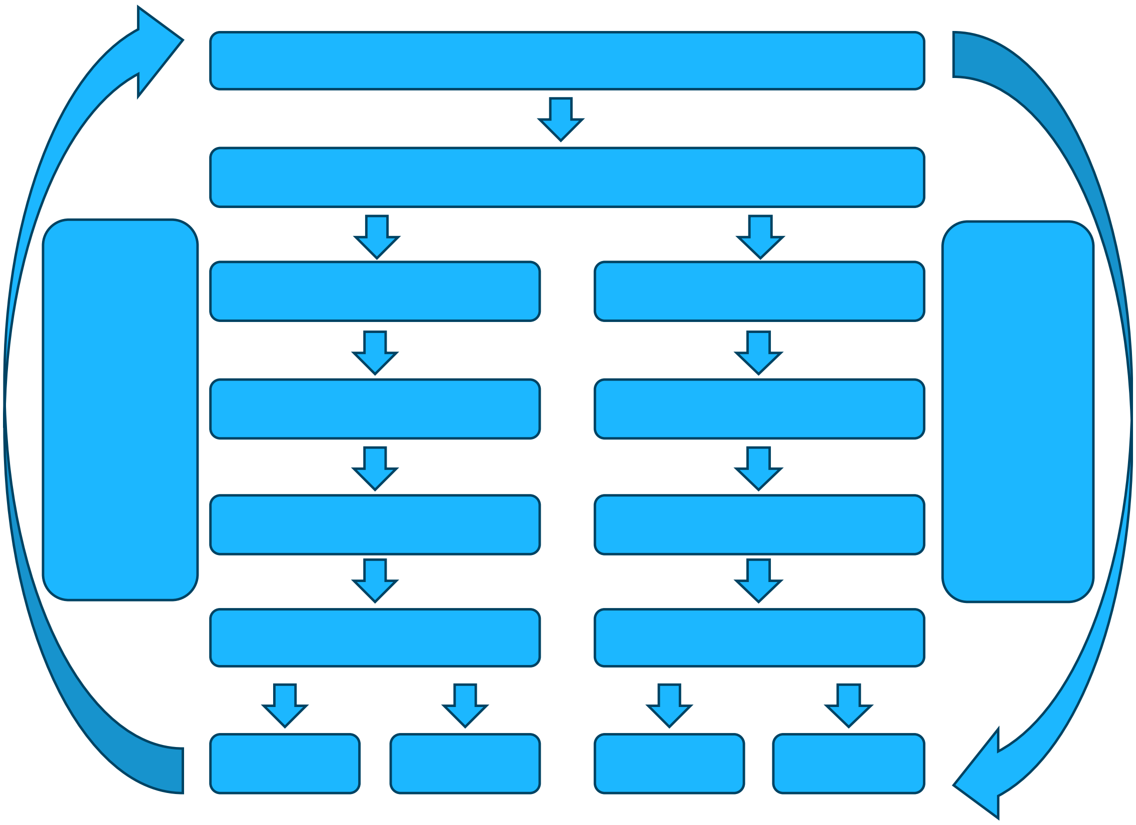


Source: TAG Unit M4 Figure 1

Description of the Variable Demand Model

2.12 The VDM has a hierarchical logit choice structure as shown in Figure 2-3. Following TAG, it has a pivot incremental demand modelling approach where the change in demand responds to changes in travel cost between the Base Year and the Forecast Year scenario. The process passes through different iterations until it converges.

Figure 2-3 Variable Demand Model Hierarchy



Transport model growth assumptions

2018 Base Year model and 2023 Present Year Validation

2.13 The model base year is 2018. However, the validity of the model has been checked through a Present Year Validation process using observed data from 2023 and comparing this to a 2023 forecast.

2018 to 2025 growth assumptions and forecasts

2.14 The 2025 forecast growth was built in two steps:

- Growth between 2018 and 2023, already accounting for COVID-related changes in travel behaviour, and
- Growth between 2023 and 2025, which is based on the NTEM, which varies by District.

2.15 The composite growth factors are an input into the VDM and assume no change in cost between 2018 and 2025. Where travel costs change from 2018 – for instance due to congestion, changes to the transport network, or any real changes in fares – then the VDM adjusts the overall growth and forecast behaviour (such as mode shares), accordingly.

2.16 The 2025 forecast year has been used as the basis for the latest development of the Traffic Filter modelling and for this temporary congestion charge scheme modelling.

2.17 **Error! Reference source not found.** summarises the growth in travel demand across the whole model (i.e. county-wide), from the 2018 BY to the 2025 FY, as estimated after the application of the VDM.

Table 2-1: Growth in Travel by Mode over a 12-hour period (2018 BY to 2025 DM)

Mode	Demand growth 2025 DM-BR vs 2018 BY
Reg car (veh.)	-7%
P&R (veh.)	-6%
Bus only (pass.)	-15%
Rail (pass.)	12%
TOTAL (persons)	**-8%**
LGV	19%
HGV	4%

2.18 The change in demand across the entire model takes account of assumed future growth across the five districts of the county. However, it also takes into account the post-pandemic flows, which were validated for the 2023 Present Year and were significantly lower than the 2018 flows.

2.19 At the county level, the overall decrease in total travel demand between 2018 and 2025 is approximately 8%. The total weekday vehicle car trips in Oxfordshire are expected to decrease by about 7%.

2.20 There is also growth assumed for goods vehicles, which is based on National Road Traffic Projections 2022, published by DfT. The growth factors between 2018 and 2024 were 1.185 for Light Goods Vehicles (i.e. an 18.5% increase) and 1.038 for Heavy Goods

Vehicles (3.8% increase). For goods vehicles, the same percentage increase was applied everywhere, so there is no difference between Oxford City and the other districts.

Highway network assumptions

2.21 The list of highway and public transport schemes considered in the model has been developed and agreed with OCC. These are summarised for each mode below, setting out what is represented in both the Do Minimum and ZEZ networks.

Highway network assumptions - Do Minimum

2.22 Some examples of key highway infrastructure schemes in and around Oxford included within both the Do Minimum and Do Something scenarios are:

- Botley Road closure
- Oxford North Development and associated infrastructure
- A44 Corridor Improvement Schemes

Highway network assumptions - Do Something

Modelling of charges

2.23 OSM is not able to directly model the impact of a daily charge on trips crossing certain locations. This is due to several reasons:

- The model does not represent a full day. Rather, it represents three separate time periods (AM, IP, PM);
- OSM models individual trips, but it does not have the ability to identify or 'track' different trips made by the same vehicle or user; and
- The model does not have the capability to model a single charge affecting a combination of locations.

2.24 For this reason, the daily charge needs to be modelled using proxy 'penalties' that affect individual trips every time they go through each Traffic Filter / Charge location. This has been carried out with the following approach:

- Estimation of the number of TF / Charge location crossings per trip, for each TF / Charge location (e.g. trips crossing the Hythe Bridge Street location make an average 1.84 crossings). This is estimated from the AM peak Do Minimum scenario. Calculation of a proxy 'per crossing' charge, as a proportion of the total daily charge (£5 or £3 respectively). The calculation is based on the reciprocal of the number of crossings, previously doubled (assumption is that all trips in one direction in the AM peak will be completed in the opposite direction within the same day).
  - E.g. If trips crossing the Hythe Bridge Street location make an average 1.84 crossings in the AM peak, the 'per crossing' charge applied at that location, in all three modelled time periods, is calculated as 1 / (2 * 1.84) = 0.27, or 27% of the daily charge of £5 (£1.36).

2.25 The model therefore applies a location-specific, 'per crossing' charge to 'do something' trips going through the TF / Charge locations, in both directions. This is the approach followed to model the potential impact of the scheme on road traffic, using the functionality available in the model. In reality, the scheme will charge drivers only once per day (the daily charge) and not per crossing.

2.26 Table 2-2 shows the modelled number of crossings per TF / Charge location, and the 'per crossing charge' derived from that.

Table 2-2: Modelled 'per crossing' charge

Location	Direction	Pass 1 TF	Pass 2 TFs	Pass 3 TFs	Avg. no. of crossings	% charge		
Hythe Bridge St	Eastbound	16%	75%	9%	1.92	1.84	26%	27%
	Westbound	29%	64%	7%	1.78		28%	
Thames St	Eastbound	46%	51%	3%	1.58	1.46	32%	34%
	Westbound	64%	34%	2%	1.37		36%	
St Cross Rd	Southbound	65%	31%	4%	1.38	1.27	36%	39%
	Northbound	81%	18%	1%	1.20		42%	
St Clement's St	Eastbound	87%	11%	2%	1.14	1.15	44%	43%
	Westbound	85%	14%	1%	1.16		43%	
Marston Ferry Rd	Westbound	89%	8%	4%	1.15	1.13	44%	44%
	Eastbound	91%	7%	2%	1.12		45%	
Hollow Way	Southbound	99%	1%	0%	1.01	1.01	50%	50%
	Northbound	99%	0%	0%	1.01		50%	

2.27 Based on the tables above, the model will apply a penalty of 27% of the daily charge (£5) to all paying trips crossing the Hythe Bridge Street filter in one direction, and 34% to trips crossing the Thames Street filter in one direction, and so on.

2.28 Both Do Something models have then been run with these penalties (proxy charges) coded in. The model forecasts the behavioural response to these penalties/charges, resulting in changes to the total volumes and re-distribution of traffic, as a proportion of non-exempt and non-permit trips will aim to re-route, change mode, destination, frequency of travel or time of travel, to avoid paying the charge.

Modelling of resident passes

2.29 The modelling also takes account of proposed exemptions and permits including resident day passes. These are:

- 100 passes per year – Oxford permit area[2]
- 25 passes per year – Oxfordshire permit area

2.30 It was assumed that the pass would be used by Oxford residents (100 day passes) on 2 weekdays during a week on average. For the modelling, 40% of weekday car tips made by residents are allowed to pass through the filters (equivalent to car trips using a 'pass' for of 2 of 5 weekdays on average). The same approach was applied, at a lower rate, for the Oxfordshire area covered by the 25 day passes.

2.31 This is the same approach as followed for the modelling of the Traffic Filters scheme.

[2] https://www.oxfordshire.gov.uk/transport-and-travel/connecting-oxfordshire/oxford-traffic-filters/how-they-will-work

Comparison vs Traffic Filters modelling

2.32 There are two differences in the modelling between the Do Something scenarios of this road user charging scheme (RUC1 and RUC2) and the Traffic Filters scenario (DM-T1).

2.33 The first one, which also applies to the Do Minimum scenarios (2025 DM-BR and 2025 DM-1, respectively), is regarding Botley Road. While the modelling of the road user charging scheme has Botley Road closed (the current status), the modelling of the TF scheme has Botley Road open (as the TF ETRO is expected to start only after the road is reopened).

2.34 The second difference is the treatment of the TF / charge locations, reflecting the differences in scheme definition. While in this case a 'per crossing' penalty is applied to non-exempt and non-permit vehicles, in the modelling of TF there is a total ban on vehicles without a permit and outside exempted groups.

Public transport and park and ride assumptions

Assumptions - Do Minimum

2.35 The representation of bus services in OSM was updated in Autumn 2023 and are included in the 2023 Present Year and all 2025 Future Year scenarios.

2.36 The 2025 network (Do Minimum and Do Something) includes the severing of all bus services at the location of Botley Road rail bridge (i.e. services inbound from the west along Botley Road terminate on Botley Road, before the bridge works, and outbound services start at the same point), and the inclusion of bus service changes between 2023 and 2025.

Assumptions - Do Something

2.37 A series of bus services are updated to improve connectivity once Traffic Filters become operational. These services are assumed to be implemented with the road charging proposals, with the services differing slightly from those assumed with traffic filters, to reflect the closure of Botley Road.

3 Do Something scenario results

Introduction

3.1 This section presents the forecasts for the Do Something scenarios (with the road user charging scheme), which are identified as RUC1 (£5 daily charge) and RUC2 (£3 daily charge), compared to the Do Minimum scenario, identified as DM-BR.

3.2 The RUC1 and RUC2 scenarios include the specific transport elements that are part of the scheme, taking account of the daily charges and the modelled exemptions described in Chapter 2.

This section also presents some outputs of the Traffic Filters modelling, undertaken prior to this commissions, to compare the impacts of both schemes. The DM and DS scenarios for the TF scheme are identified here as DM and DM-T1, respectively. Table 3-1 summarises this.

Table 3-1: Modelled scenarios with reported outputs

Scheme	Do Minimum scenario ('without scheme')	Do Something scenario 1 / £5 ('with scheme')	Do Something scenario 2 / £3 ('with scheme')
Traffic Filters	DM	DM-T1	-
Road user charging	DM-BR	RUC1	RUC2

Interpretation of results - caveats and limitations

3.3 The modelling approach has been developed to best represent and forecast the travel demand responses to the scheme. However, there are inherent uncertainties in any forecasting exercise and especially for the road user charging proposals given the complex nature of the traffic filter proposals and variety of potential behavioural responses.

3.4 The results should therefore be viewed as providing a best understanding and indication of potential impacts and effects, and not as a firm prediction of impacts.

Overall demand

3.5 Table 3-2 summarises the sectored demand (within the city, to / from the city, and combined) by mode and scenario, for the 12-hour period between 7 AM and 7 PM. The table also shows the incremental changes in demand between the DM and the DS scenarios, both in absolute numbers and in percentage format. Both the road user charge scenarios and the TF scenarios are included, to allow for comparisons between them.

3.6 The demand shown and discussed in this section refers to the trips made across the modelled network, as opposed to traffic flows along a specific model link or road.

3.7 In terms of car demand, there is little difference between the two road user charge scenarios, in terms of the changes to demand vs the DM scenario. In both cases, trips within the city reduce by around 16.5%, and trips to/from the city by 2.5-3%, with the combined reduction being around 8.5%.

3.8 These impacts to demand are of the same order of magnitude as those of the modelled Traffic Filters scheme, when compared to its own DM scenario.

3.9 Sectorised demand by mode / sector and modelled scenario, by time period (AM, IP, PM) are provided in Appendix B.

Table 3-2: Sectorised demand by mode / sector and modelled scenario – 12-hour period (7 AM - 7 PM)

Mode / sectors	DM	TF / DM-T1	DM-BR	£5 /RUC1	£3 /RUC2	DM-T1 change	£5 /RUC1 change	£3 /RUC2 change	DM-T1 change %	£5 /RUC1 change %	£3 /RUC2 change %
Car (person trips)											
Within city	95,372	79,108	95,571	79,839	79,759	*-16,264*	*-15,731*	*-15,812*	*-17.1%*	*-16.5%*	*-16.6%*
To / from city	135,812	132,020	133,674	129,778	130,051	*-3,792*	*-3,896*	*-3,623*	*-2.8%*	*-2.9%*	*-2.7%*
Combined	**231,184**	**211,128**	**229,245**	**209,617**	**209,809**	***-20,056***	***-19,628***	***-19,436***	***-8.7%***	***-8.5%***	***-8.4%***
Bus (person trips)											
Within city	43,173	45,183	43,587	45,281	45,182	*2,010*	*1,694*	*1,595*	*4.7%*	*3.9%*	*3.7%*
To / from city	25,521	25,943	24,981	25,353	25,338	*421*	*372*	*357*	*1.7%*	*1.5%*	*1.4%*
Combined	**68,694**	**71,126**	**68,568**	**70,634**	**70,520**	***2,431***	***2,066***	***1,952***	***3.5%***	***3.0%***	***2.8%***
Rail (person trips)											
Within city	-	-	-	-	-	-	-	-	-	-	-
To / from city	14,468	15,088	15,209	15,746	15,668	*620*	*538*	*459*	*4.3%*	*3.7%*	*3.2%*
Combined	**14,468**	**15,088**	**15,209**	**15,746**	**15,668**	***620***	***538***	***459***	***4.3%***	***3.7%***	***3.2%***
P&R (person trips)											
Within city	581	621	588	628	625	*39*	*41*	*38*	*6.8%*	*7.0%*	*6.5%*
To / from city	7,000	7,608	6,626	6,993	6,957	*609*	*367*	*331*	*8.7%*	*5.2%*	*4.7%*
Combined	**7,581**	**8,229**	**7,214**	**7,621**	**7,583**	***648***	***407***	***369***	***8.6%***	***5.4%***	***4.9%***

Mode / sectors	DM	TF / DM-T1	DM-BR	£5 /RUC1	£3 /RUC2	DM-T1 change	£5 /RUC1 change	£3 /RUC2 change	DM-T1 change %	£5 /RUC1 change %	£3 /RUC2 change %
Shift to walking (person trips)											
Within city	-	-	-	-	-	3,401	3,380	3,373	*N/A*	*N/A*	*N/A*
To / from city	-	-	-	-	-	605	578	578	*N/A*	*N/A*	*N/A*
Combined	**-**	**-**	**-**	**-**	**-**	**4,005**	**3,958**	**3,952**	***N/A***	***N/A***	***N/A***
Shift to cycling (person trips)											
Within city	-	-	-	-	-	9,991	10,053	10,061	*N/A*	*N/A*	*N/A*
To / from city	-	-	-	-	-	2,673	2,550	2,555	*N/A*	*N/A*	*N/A*
Combined	**-**	**-**	**-**	**-**	**-**	**12,664**	**12,603**	**12,616**	***N/A***	***N/A***	***N/A***

Traffic flows

Changes in traffic flows by area

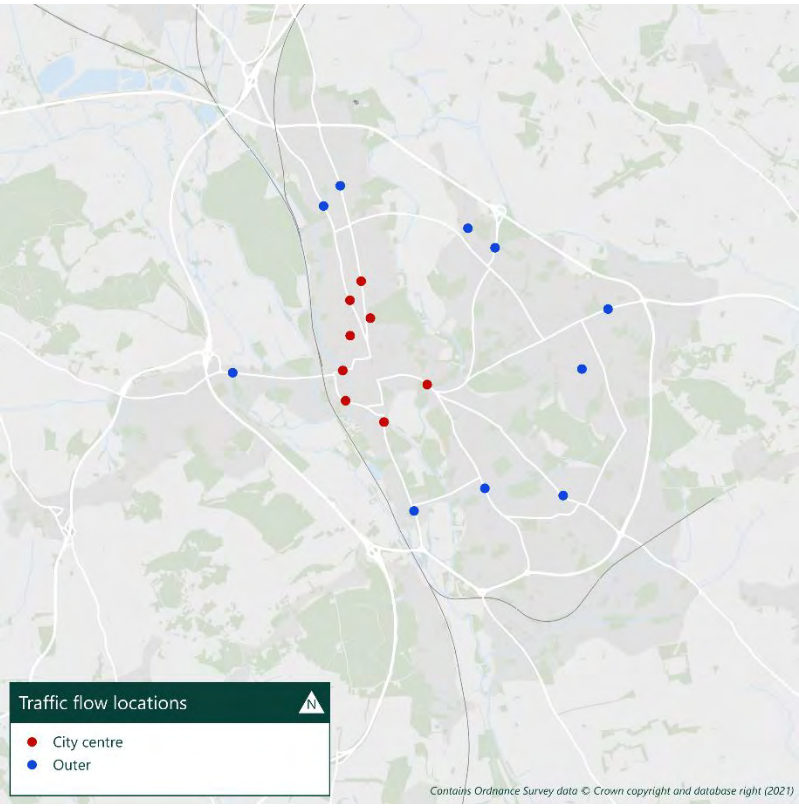
3.10 Model outputs at the link flow level have been produced, to explore the changes in traffic volumes in different areas of the city, by vehicle type and time period. This illustrates volumes of traffic at specific locations and is different from the demand figures shown in the previous section, which refer to the total trips across the modelled network.

3.11 The AM and PM peak model results show a similar pattern, with large reductions in traffic volumes in the city centre, with some increments on radial roads in the outer areas, and on the ring road. The inter-peak model shows traffic increases on Marston Ferry Road and Hollow Way, due to these locations not being active during the full 7AM – 7PM period like the other five locations (7AM – 9AM and 3PM – 6PM only). In the inter-peak traffic can re-route to Marston Ferry Road and Hollow Way, avoiding the charge, whereas this option is not possible in the AM or PM peak.

3.12 A sample of locations in the city centre (8) and outer areas of the city (10) has been selected to explore the modelled traffic flow changes as a result of the scheme. Figure 3-1 shows these locations:

- City centre sites: Folly Bridge, Magdalen Bridge, Oxpens Road, Osney Bridge, Walton Street, Woodstock Road (w/ Leckford Road), Banbury Road (w/ St Margaret's Road), and Parks Road; and
- Outer sites: approximately along the B4495 arc.

Figure 3-1: Traffic flow locations



3.13 Table 3-3 summarises the impacts of both Do Something scenarios on the traffic flows in Oxford, for the two areas listed above. It can be seen that the impact on cars is larger than in all vehicles, as the scheme only affects the former, and not LGV / HGVs, and that these impacts are larger in the city centre than in outer areas. The average forecast reduction in traffic flow at city centre and outer locations combined is around 10% across all time periods, and slightly higher when considering cars only.

3.14 The table also shows the flow changes of the modelled TF scheme, over and above its DM scenario. While the patterns of flow change are the same as in the two DS scenarios of the road user charge scheme, the magnitude of change is greater in the case of the TF scheme, with larger reductions in flow (both all vehicles and cars only) in the city centre in all time periods, and on Marston Ferry Road and Hollow Way in the AM and PM peaks.

3.15 These patterns, and the different magnitude of traffic flow changes by scenario, can be observed in the flow change maps in Figure 3-2, Figure 3-3, and Figure 3-4, for the AM peak period. Flow change maps for all scenarios and time periods are provided in Appendix A.

Table 3-3: Summary model outputs – Flow change vs DM[3]

	Traffic Filters ('DM-T1') (vs DM)			Do Something £5 ('RUC1') (vs DM-BR)			Do Something £3 ('RUC2') (vs DM-BR)		
Location	**AM Peak**	**Inter-Peak**	**PM Peak**	**AM Peak**	**Inter-Peak**	**PM Peak**	**AM Peak**	**Inter-Peak**	**PM Peak**
All vehicles (Car, LGV and HGV)									
City centre sites	-34%	-28%	-33%	-20%	-16%	-19%	-19%	-17%	-19%
Outer sites	+3%	-1%	+4%	-3%	-5%	-2%	-5%	-5%	-5%
City centre sites + Outer sites	-12%	-12%	-11%	-10%	-10%	-9%	-10%	-10%	-10%
Cars only									
City centre sites	-44%	-36%	-38%	-26%	-21%	-23%	-24%	-22%	-22%
Outer sites	+3%	-1%	+4%	-4%	-7%	-2%	-7%	-7%	-5%
City centre sites + Outer sites	-16%	-16%	-13%	-13%	-13%	-10%	-13%	-13%	-12%
Cars only									
Marston Ferry Road	-64%	24%	-65%	-55%	30%	-61%	-44%	6%	-47%
Hollow Way	-62%	25%	-63%	-65%	14%	-67%	-62%	-2%	-63%

[3] The 'City centre sites' and 'Outer sites' locations reported here are equivalent to the 'Inner Cordon Boundary' and the 'Outer Cordon Boundary' locations previously reported in transport and traffic modelling reports for the Traffic Filters scheme

Figure 3-2: Flow change – Traffic Filters - AM peak

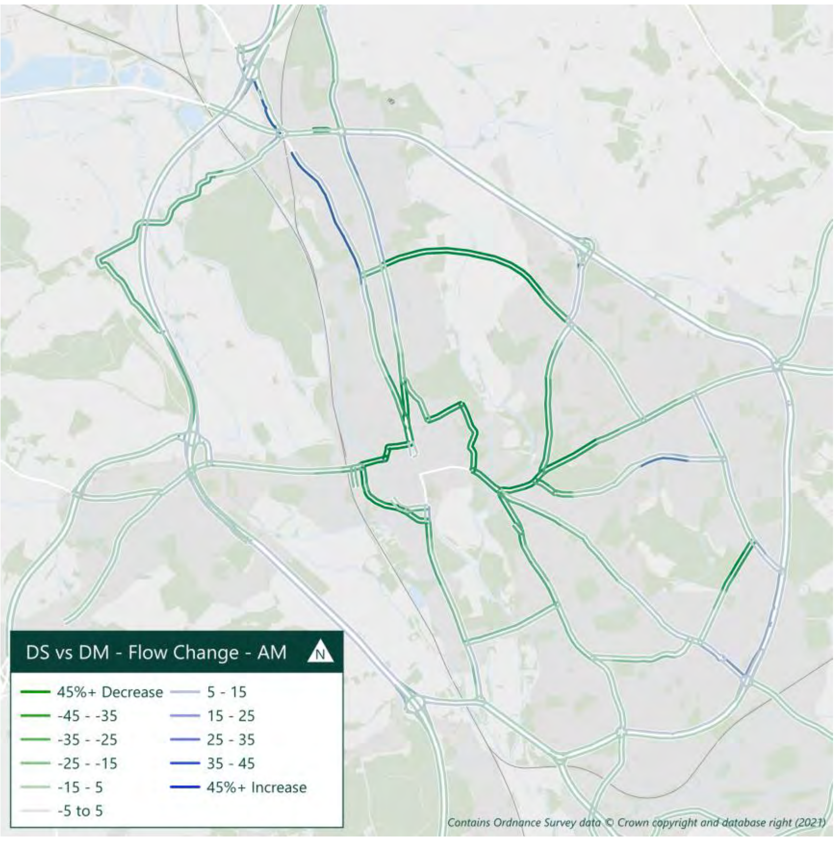


Figure 3-3: Flow change - £5 charge scheme - AM peak

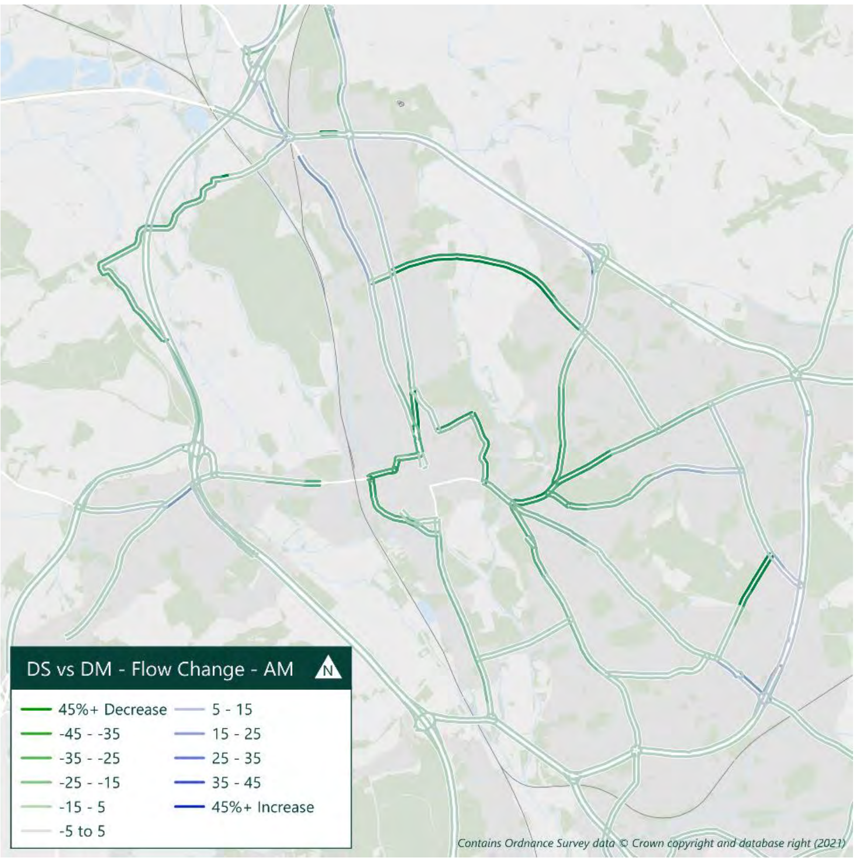
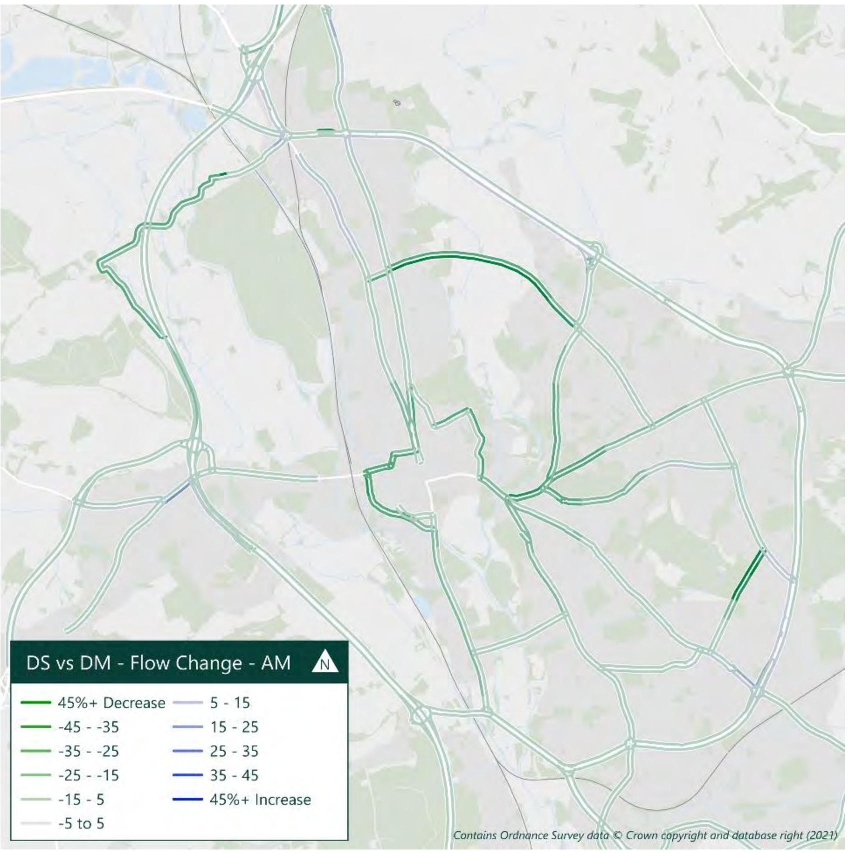


Figure 3-4: Flow change - £3 charge scheme - AM peak



Changes at Traffic Filter / Charge locations

3.2 Table 3-4 and Table 3-5 show the estimated number of paying and total trips going through each TF / Charge location, by modelled hour in each time period, for the Do Something £5 and Do Something £3 scenarios, respectively.

3.3 In terms of demand at the TF / Charge locations, the modelling suggests that, in the £5 charge scenario, around a third of vehicles crossing the locations in either direction during the AM and PM peaks would be charge-paying vehicles, with the rest assumed to be exempt or having a permit. This proportion reduces to under 25% in the IP.

3.4 The proportion of paying vehicles goes up in the £3 charge scenario, as it would be expected given the lower charge, to over 40% in the peaks and 30% in the IP. TF / Charge crossings in the £3 charge scenario are around 50% higher than in the £5 charge scenario in the peaks, and 30% in the Interpeak.

Table 3-4: Do Something £5 ('2025 RUC1') - Modelled flows through TF / Charge locations

RUC1	Direction	AM peak hour		IP average hour		PM peak hour	
		Paying	Total	Paying	Total	Paying	Total
Hythe Bridge St	Eastbound	38	96	95	164	77	176
	Westbound	54	130	58	131	68	167
Thames St	Eastbound	86	180	156	262	169	296
	Westbound	131	220	128	218	116	226

RUC1	Direction	AM peak hour		IP average hour		PM peak hour	
		Paying	Total	Paying	Total	Paying	Total
St Cross Rd	Southbound	49	142	34	109	62	156
	Northbound	124	290	31	88	72	188
St Clement's St	Eastbound	65	272	36	181	68	282
	Westbound	43	217	27	155	71	297
Marston Ferry Rd	Westbound	7	71	-	329	6	104
	Eastbound	36	136	-	363	20	135
Hollow Way	Southbound	4	102	-	308	5	109
	Northbound	1	102	-	188	1	73

Table 3-5: Do Something £3 ('2025 RUC2') - Modelled flows through TF / Charge locations

Location	Link ID	AM peak hour		IP average hour		PM peak hour	
		Paying	Total	Paying	Total	Paying	Total
Hythe Bridge St	Eastbound	41	95	84	146	77	175
	Westbound	56	136	65	137	70	162
Thames St	Eastbound	88	182	164	268	166	283
	Westbound	144	228	149	236	127	237
St Cross Rd	Southbound	76	168	57	129	95	192
	Northbound	171	338	52	108	102	215
St Clement's St	Eastbound	142	349	80	222	155	371
	Westbound	116	294	80	209	160	385
Marston Ferry Rd	Westbound	37	100	-	269	37	136
	Eastbound	71	161	-	296	80	187
Hollow Way	Southbound	22	120	-	266	22	126
	Northbound	10	104	-	162	5	78

Impacts on Other Modes

3.5 In addition to the impact on traffic levels outlined above, the modelling of the RUC scenarios suggests the following impacts on other modes:

- That the reduction in traffic would have a positive impact on bus journey times, especially in the city centre and inner radials which are served by the highest volume of buses, where services are impacted by congestion, and where the RUC proposal has the greatest impact in delivering overall traffic reduction.
- That, related to the above, there would be a positive impact on overall public transport patronage, and particularly for bus.

- The reduction in traffic would make walking & cycling more attractive and would be expected to lead to an increase in walking and cycling demand.

3.6 These findings are consistent with the modelling of the Traffic Filter scheme (albeit to a lesser degree), The positive impacts would be delivered for either RUC option, with the scale of impacts slightly higher for the RUC1 (£5) option, due to the greater change in traffic levels this would elicit.

4 Income forecasting

Income forecasting model

4.1 Steer has developed an income forecasting model, which aims to estimate the potential income for OCC from charge-paying vehicles using the scheme, as well as additional income via Penalty Charge Notice (PCN), from non-compliant vehicles.

4.2 An annual income forecast has been prepared based on an assumed scheme opening in Autumn 2025. Two scenarios have been tested, as described earlier in this note, one with a £5 daily charge and one with a £3 daily charge, applying 'per crossing' charges to modelled flows through the TF / Charge locations.

4.3 The income forecasting model uses outputs from the transport model, in particular the flows through TF/ Charge locations, as shown in the tables above. Only the flows of 'paying' trips are used.

4.4 In addition to the income from direct daily charge payments, the model also estimates the expected income from PCN, using assumptions of PCN-liable traffic as a proportion of the total traffic liable for the charge, and an average net PCN penalty charge. In both cases, the assumptions are derived from evidence provided by OCC.

Expansion factors

4.5 As these flows represent a single AM peak hour, an average IP hour and a single PM peak hour, they need to be expanded to cover a 12-hour period, from 7 AM to 7 PM (the daily hours of operation for the proposed scheme). For the sites at Marston Ferry Road and Hollow Way, which will operate only in the morning and evening peaks, only the flows from the AM and PM modelled hours have been used. AtkinsRéalis has provided expansion factors for the three time periods. These are 2.48 to convert from the AM modelled peak hour to 3-hour AM peak period, 6.00 to convert from the inter-peak modelled average hour to 6-hour inter-peak period and 2.81 to convert from the PM modelled peak hour to 3-hour PM peak period[4].

4.6 The income forecasting model estimates the revenues from the scheme on a weekly basis. To achieve this, an assumption has been made to extrapolate single day flows, as per the model outputs and the hour-to-period expansion factors above, to cover each of the weeks of the year of operation of the scheme.

4.7 Real traffic data from Automatic Traffic Count (ATC) sites operated by the OCC in Oxford has been used for this purpose. Specifically, data from April 2022 to March 2023 has been applied to reflect the seasonal traffic effects. The base year for the OSM is 2023, with model outputs representing a typical weekday in March. This period was chosen as it

[4] These expansion factors have been calculated based on observed traffic count data.

reflects the most recent year unaffected by the Botley Road closure and for which data availability and coverage was better.

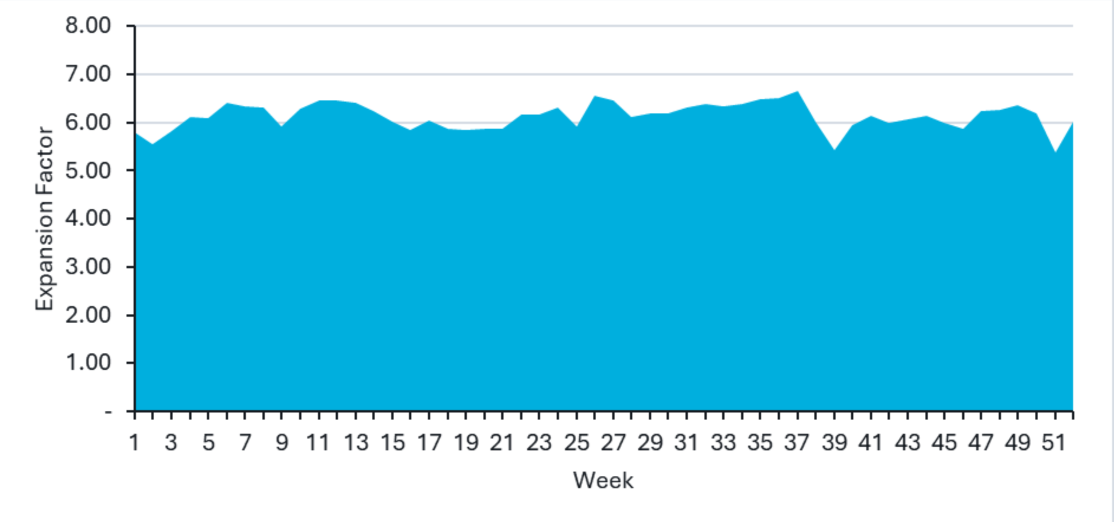
4.8 The aim is not to capture current traffic volumes, but rather to understand the relationship between traffic levels on a 'normal' March weekday and those observed in each week of the year. This provides the basis for deriving weekly adjustment factors.

4.9 The following six 'inner ring' ATC sites were used to establish the expansion factors:

- 00000501 – A420 Magdalen Bridge
- 00000502 – A4144 Folly Bridge
- 00000503 – A420 Osney Bridge
- 00000504 – Kingston Rd South of Leckford Rd
- 00000505 – A4144 Woodstock Rd South of Leckford Rd
- 00000506 – A4165 Banbury Rd North of Norham Rd

4.10 A profile of the expansion factors can be seen in Figure 4-1, where week 1 corresponds to the first week in April. This profile reflects underlying seasonal patterns, capturing how traffic levels vary throughout the year.

Figure 4-1: Weekly expansion factors



4.11 For the purposes of income forecasting, a prudent 'retiming' adjustment of 5% has been used to account for behavioural changes where some drivers alter their travel times to avoid charges (i.e. 5% of affected drivers will change their time of travel to before 7 AM and after 7 PM, outside the enforcement hours, meaning they would no longer contribute to income generation). Incorporating this assumption into the income forecasting model reduces the forecast estimate of chargeable trips, leading to more conservative and realistic income projections[5].

4.12 The traffic model accounts for potential changes to the time of travel between time periods (AM, IP, PM), and therefore it can model drivers changing their travel times to use Marston Ferry Road or Hollow Way in the IP, instead of during the hours of operation of these charging locations (7-9 AM and 3-6 PM). However, it does not account for the

[5] The 5% reduction in chargeable trips has been applied to the modelled flows.

potential adjustment of travel behaviour consisting of displacing the journeys outside the 7 AM to 7 PM period, hence this 'retiming' adjustment.

Income forecasts

Calculation of income by location

4.13 The revenue calculations for the traffic filter scheme uses 12-hour traffic flow data for each location and direction (i.e. inbound and outbound) and multiplies these by the modelled charge per crossing applicable at each TF location as seen in Table 4-1.

Table 4-1: Modelled charge per TF crossing

Modelled charge per TF crossing	Direction	RUC1, 2025 (£)	RUC2, 2025 (£)
Hythe Bridge St	Eastbound	1.36	0.81
	Westbound	1.36	0.81
Thames St	Eastbound	1.71	1.03
	Westbound	1.71	1.03
St Cross Rd	Southbound	1.97	1.18
	Northbound	1.97	1.18
St Clement's St	Eastbound	2.17	1.30
	Westbound	2.17	1.30
Marston Ferry Rd	Westbound	2.21	1.33
	Eastbound	2.21	1.33
Hollow Way	Southbound	2.48	1.49
	Northbound	2.48	1.49

4.14 This is then multiplied by a weekly expansion factor to calculate the revenue per week. Each factor is mapped to the corresponding week in the traffic filter scheme to ensure alignment with the correct time period. This yields a weekly revenue estimate per location.

4.15 Following this, income is aggregated across all TF / charge crossing locations and directions to produce a total weekly income figure. This methodology is run for both scenarios (£5 and £3 charge).

PCN Income

4.16 For the calculation of the PCN income, three assumptions have been made, informed by evidence provided by OCC:

- The proportion of traffic liable for the charge that would be expected to receive a PCN;
- The average net PCN revenue that OCC would receive, based on the amount that liable drivers would be charged (accounting for reductions for prompt payment); and
- The proportion of PCN traffic that is not charged during an initial warning notice period.

4.17 The proportion of traffic expected to receive a PCN has been estimated as 4% of the total traffic liable for the road user charge. A slight decay rate has also been included in the model, to reflect the assumption that non-compliance rates will reduce slightly over time (i.e. over the c. 1 year the temporary scheme is expected to operate).

4.18 The average net PCN amount has been estimated at £30.79. Data from OCC shows that the average income per PCN for the Pilot Zero Emissions Zone currently in operation is £26.39, and the nominal full PCN rate is £60. As this road user charge scheme will have a nominal PCN rate of £70, the average net PCN amount has been calculated as an uplift of the ZEZ amount.

4.19 The scheme will be implemented with a warning notice period, during which the first contravention by a vehicle receives a warning notice instead of a PCN. This means that no PCN income will be generated for these first-time contraventions. For income forecasting purposes, it has been assumed that this warning notice period lasts for six weeks and that the proportion of PCN traffic that is incurring into a first-time contravention starts at 100% in the first week and reduces to 50% by the last week of warning notice period.

4.20 The effect of this assumption is a reduction of the expected PCN income during the warning notice period.

4.21 The calculation of the PCN income has followed the same approach as the calculation of the charge income described in the previous section. The absence of a modelled value of unique vehicles crossing the TF / Charge locations each day or week requires using a ‘per crossing’ approach to calculate the PCN income forecasts.

4.22 For the PCN, the charge per crossing has been calculated using the modelled charge per crossing and an *‘PCN charge / road charge’* factor (i.e. £30.79 / £5). This has been applied to the estimated PCN traffic, calculated as a proportion of the charge-paying traffic using the 4% (and decay rate) mentioned earlier, and discounting the PCN traffic expected to not be charged during the warning notice period

4.23 The same PCN income has been used for both charge scenarios. Applying the same ‘proportion of traffic expected to receive a PCN’ assumption to the traffic flows of the £3 charge scenario would have produced a higher value of expected PCN traffic and therefore a higher PCN income in the £3 scenario than in the £5 scenario. This would not have been realistic, as it is unlikely that a lower charge would result in a higher number of PCN vehicles, and it was decided to keep the PCN income calculated with the £5 scenario traffic, for the £3 scenario.

Annual income forecasts

4.24 The scheme, based on the transport modelling and the assumptions summarised above, is forecast to generate an annual revenue of £5.02m under the £5 charge scenario, and of £4.57m under the £3 charge scenario. The small (10%) difference in total revenue between the schemes, despite the 40% lower charge in the second scenario, is due to the differences in number of paying trips, with significantly higher volumes in the £3 charge scenario, as described in the modelling section of this note. The split of charge and PCN revenue is shown on Table 4-2.

Table 4-2: Total annual scheme revenue

	Charges	PCN	Total
£5 charge scenario	£4.17m	£0.85m	**£5.02m**
£3 charge scenario	£3.71m	£0.85m	**£4.57m**

4.25 Figure 4-2 and Figure 4-3 show the weekly revenue profile of the scheme, including the charge payments and the forecast PCN income, for the £5 charge and the £3 charge scenarios, respectively. Given that the charges are constant throughout the year, the different levels of revenue for different weeks are due to different traffic expansion factors, reflecting the fluctuations of traffic volumes in inner areas of the city throughout the year.

Figure 4-2: Weekly revenue profile - Do Something £5

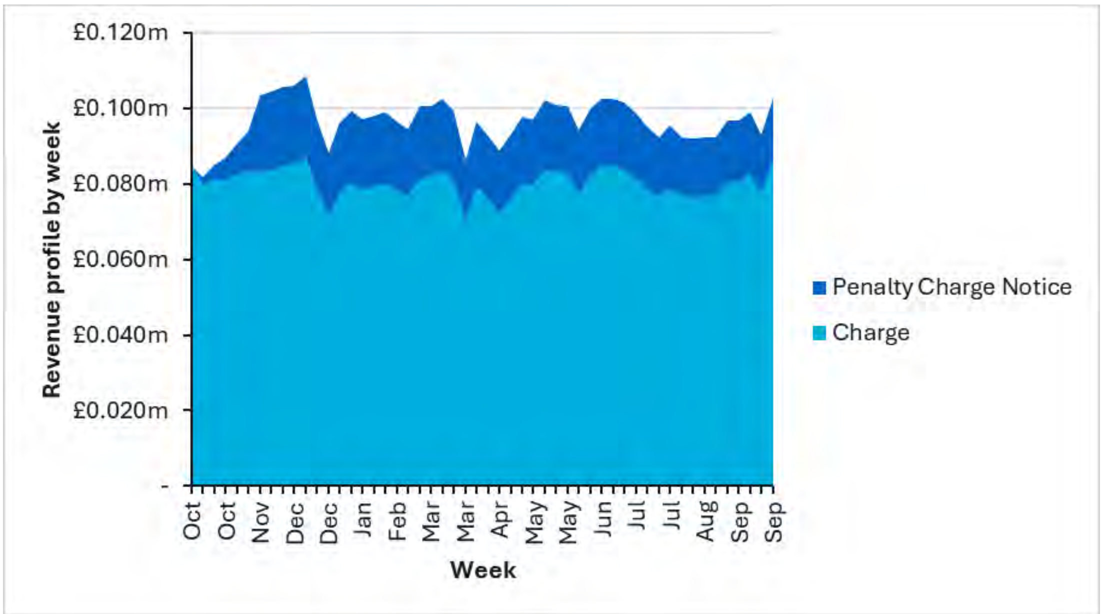
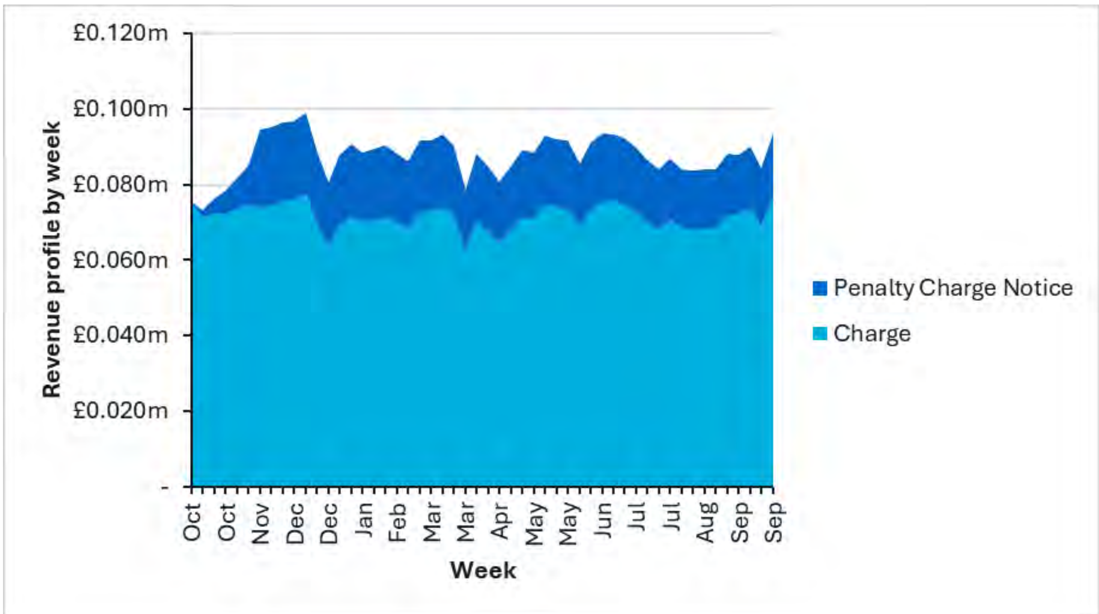


Figure 4-3: Weekly revenue profile - Do Something £3



A Flow change maps

Do Something £5 ('2025 RUC1') vs Do Minimum ('2025 DM BR')

Figure 4-4: Flow change - 2025 RUC1 vs 2025 DM BR - AM peak

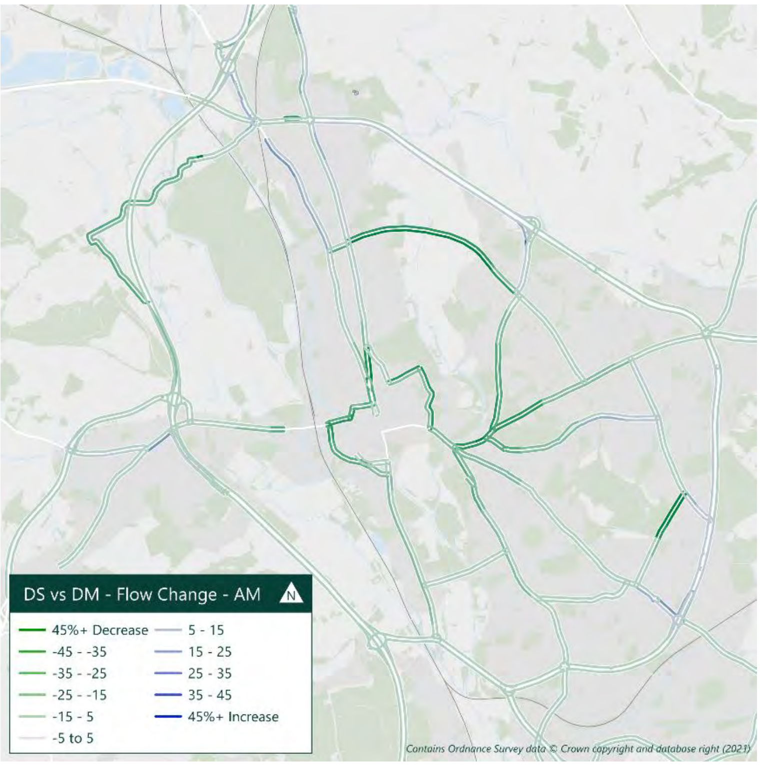


Figure 4-5: Flow change - 2025 RUC1 vs 2025 DM BR - Interpeak

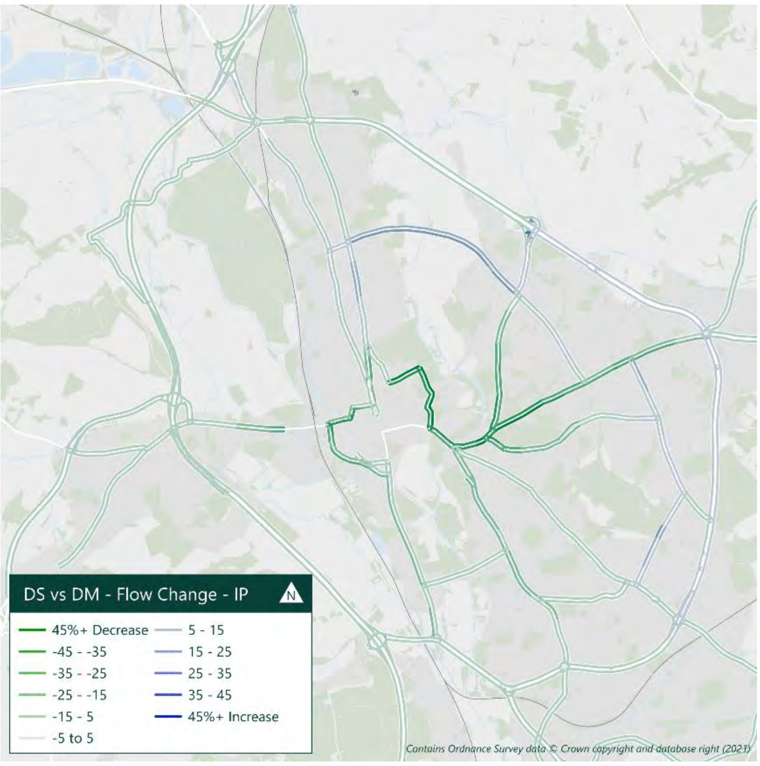
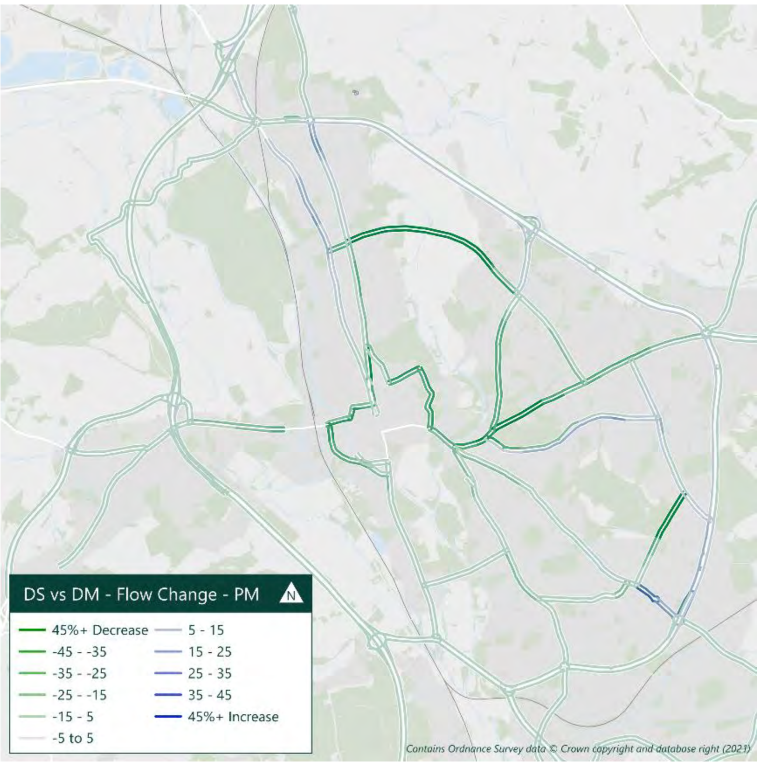


Figure 4-6: Flow change - 2025 RUC1 vs 2025 DM BR - PM peak



Do Something £3 ('2025 RUC2') vs Do Minimum ('2025 DM BR')

Figure 4-7: Flow change - 2025 RUC2 vs 2025 DM BR - AM peak

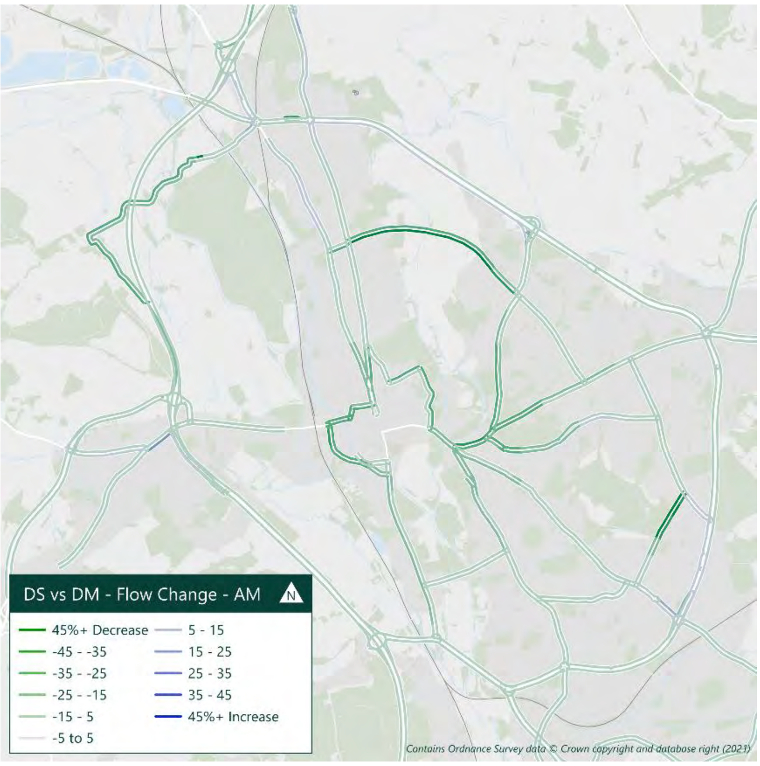


Figure 4-8: Flow change - 2025 RUC2 vs 2025 DM BR - Interpeak

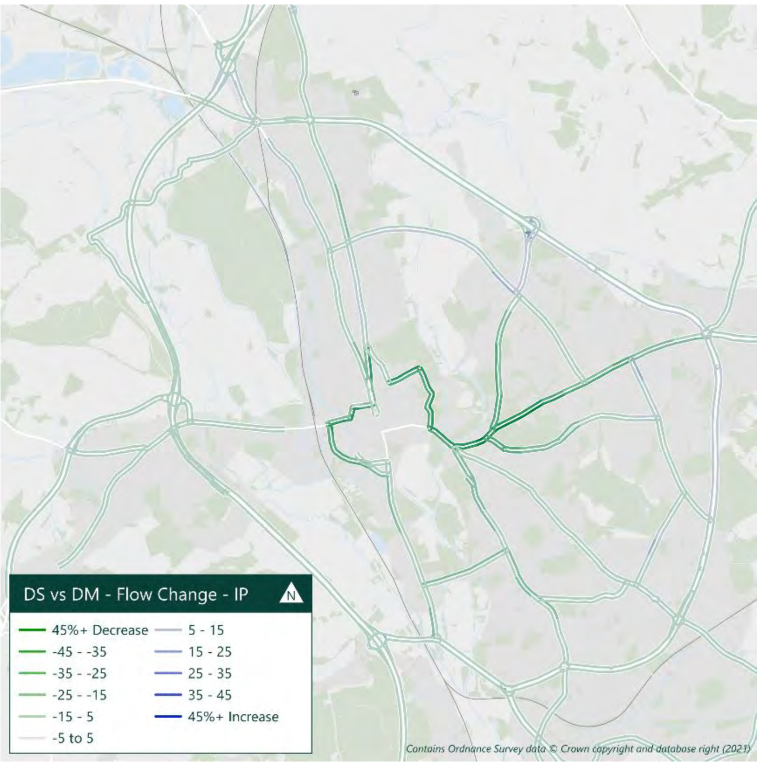
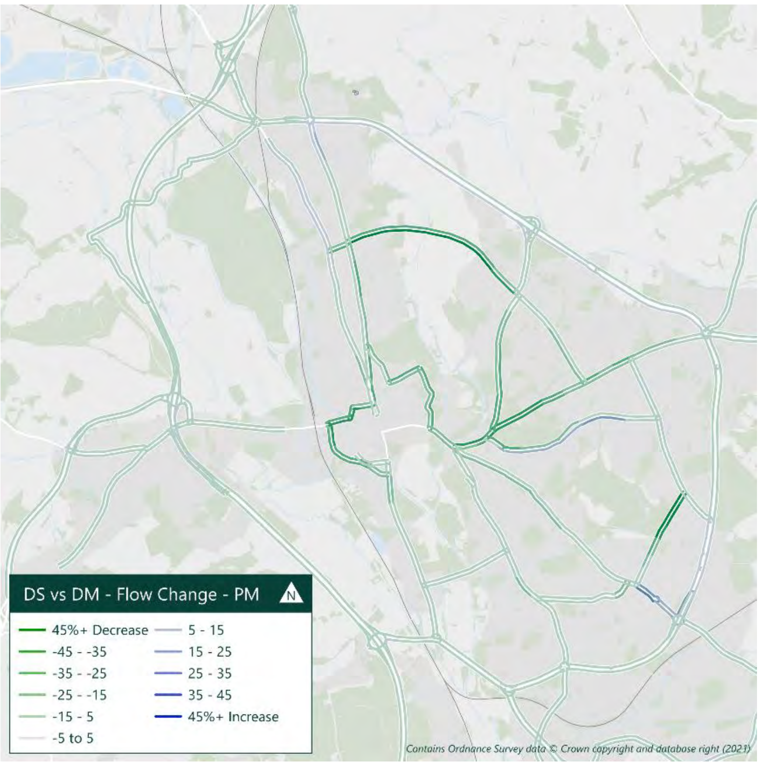


Figure 4-9: Flow change - 2025 RUC2 vs 2025 DM BR - PM peak



Traffic Filters 2025 ('2025 DM-T1') vs Do Minimum ('2025 DM')

Figure 4-10: Flow change - 2025 DM-T1 vs 2025 DM - AM peak

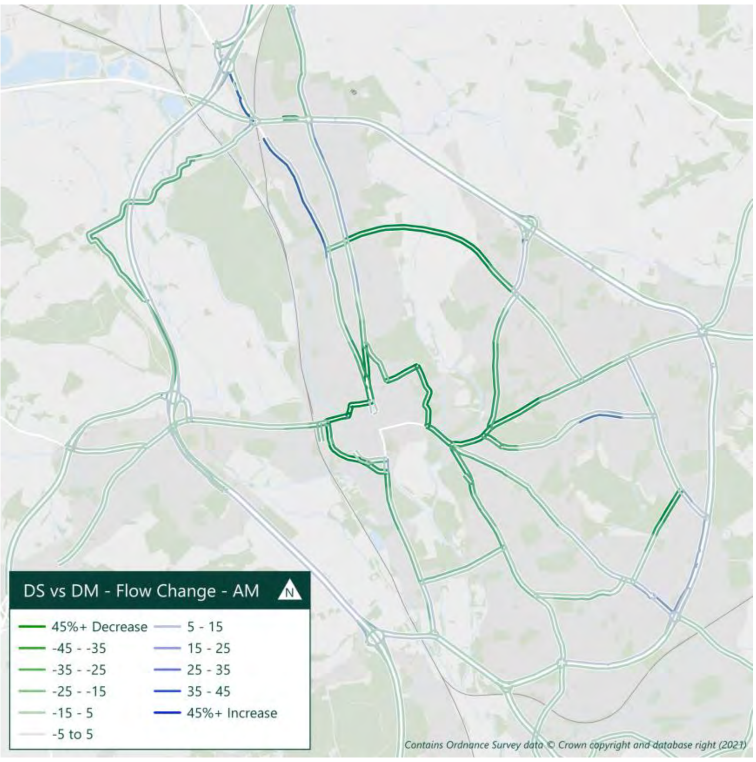


Figure 4-11: Flow change - 2025 DM-T1 vs 2025 DM - Interpeak

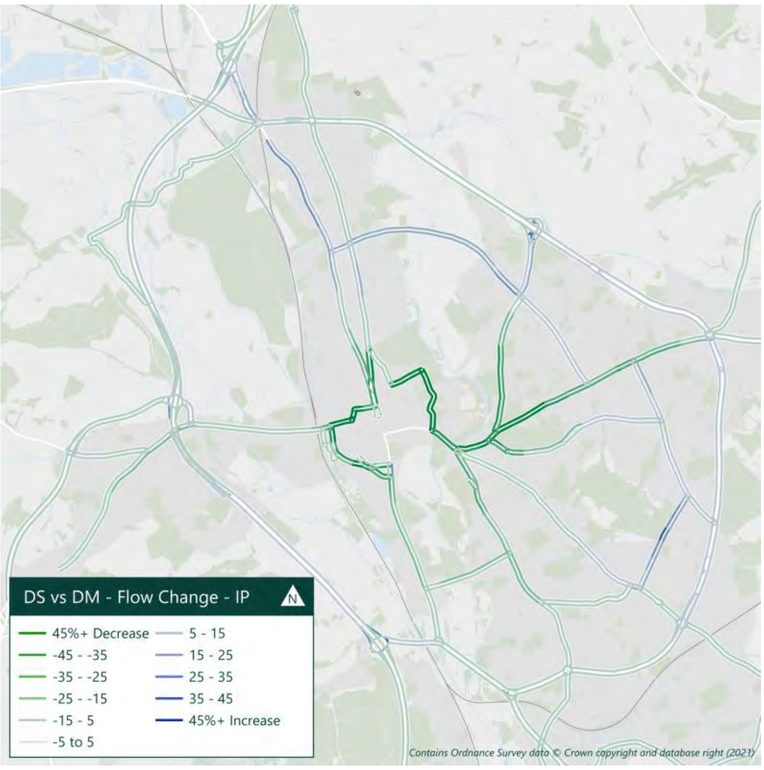
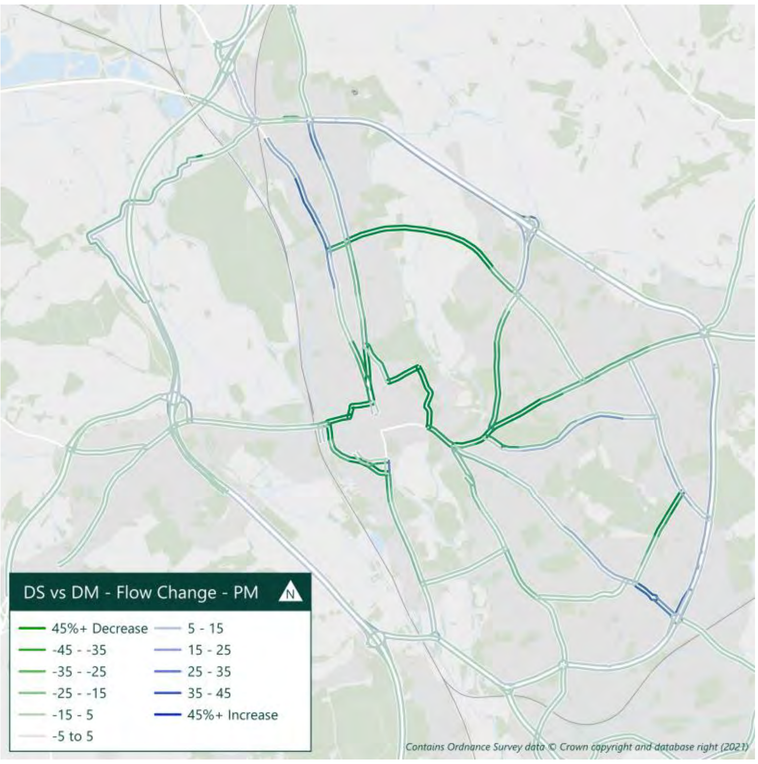


Figure 4-12: Flow change - 2025 DM-T1 vs 2025 DM - PM peak



B Sectorised demand outputs

Table 4-3: Sectorised demand by mode / sector and modelled scenario – AM peak period

Mode / sectors	DM	DM-T1	DM-BR	RUC1	RUC2	DM-T1 change	RUC1 change	RUC2 change	DM-T1 change %	RUC1 change %	RUC2 change %
Car (person trips)											
Within city	23,369	18,967	23,327	19,202	19,438	*-4,402*	*-4,125*	*-3,889*	*-18.84%*	*-17.68%*	*-16.67%*
To / from city	31,319	30,221	30,928	30,026	30,184	*-1,098*	*-901*	*-744*	*-3.50%*	*-2.91%*	*-2.40%*
Combined	**54,690**	**49,189**	**54,255**	**49,229**	**49,620**	***-5,501***	***-5,026***	***-4,635***	***-10.06%***	***-9.26%***	***-8.54%***
Bus (person trips)											
Within city	10,885	11,396	10,986	11,407	11,374	*511*	*422*	*388*	*4.69%*	*3.84%*	*3.53%*
To / from city	7,577	7,698	7,406	7,511	7,500	*120*	*105*	*94*	*1.58%*	*1.41%*	*1.27%*
Combined	**18,463**	**19,093**	**18,392**	**18,919**	**18,874**	***631***	***526***	***482***	***3.42%***	***2.86%***	***2.62%***
Rail (person trips)											
Within city	-	-	-	-	-	-	-	-	-	-	-
To / from city	4,108	4,314	4,325	4,494	4,459	*206*	*169*	*134*	*5.01%*	*3.91%*	*3.09%*
Combined	**4,108**	**4,314**	**4,325**	**4,494**	**4,459**	***206***	***169***	***134***	***5.01%***	***3.91%***	***3.09%***
P&R (person trips)											
Within city	259	275	261	276	273	*17*	*15*	*13*	*6.54%*	*5.88%*	*4.80%*
To / from city	2,457	2,659	2,260	2,354	2,337	*202*	*95*	*77*	*8.24%*	*4.18%*	*3.43%*
Combined	**2,715**	**2,934**	**2,520**	**2,630**	**2,610**	***219***	***110***	***90***	***8.08%***	***4.36%***	***3.57%***

Mode / sectors	DM	DM-T1	DM-BR	RUC1	RUC2	DM-T1 change	RUC1 change	RUC2 change	DM-T1 change %	RUC1 change %	RUC2 change %
Shift to walking (person trips)											
Within city	-	-	-	-	-	*858*	*851*	*849*	*NA*	*NA*	*NA*
To / from city	-	-	-	-	-	*113*	*110*	*111*	*NA*	*NA*	*NA*
Combined	**-**	**-**	**-**	**-**	**-**	***971***	***961***	***960***	***NA***	***NA***	***NA***
Shift to cycling (person trips)											
Within city	-	-	-	-	-	*2,444*	*2,459*	*2,482*	*NA*	*NA*	*NA*
To / from city	-	-	-	-	-	*503*	*489*	*491*	*NA*	*NA*	*NA*
Combined	**-**	**-**	**-**	**-**	**-**	***2,947***	***2,948***	***2,973***	***NA***	***NA***	***NA***

Table 4-4: Sectorised demand by mode / sector and modelled scenario – Interpeak

Mode / sectors	DM	DM-T1	DM-BR	RUC1	RUC2	DM-T1 change	RUC1 change	RUC2 change	DM-T1 change %	RUC1 change %	RUC2 change %
Car (person trips)											
Within city	46,077	38,765	46,233	38,944	38,444	*-7,312*	*-7,289*	*-7,789*	*-15.87%*	*-15.77%*	*-16.85%*
To / from city	66,027	64,407	64,792	62,891	62,897	*-1,620*	*-1,901*	*-1,895*	*-2.45%*	*-2.93%*	*-2.93%*
Combined	**112,104**	**103,173**	**111,025**	**101,835**	**101,341**	***-8,932***	***-9,191***	***-9,685***	***-7.97%***	***-8.28%***	***-8.72%***
Bus (person trips)											
Within city	20,487	21,358	20,666	21,414	21,393	*871*	*748*	*727*	*4.25%*	*3.62%*	*3.52%*
To / from city	10,855	11,038	10,622	10,775	10,774	*183*	*153*	*152*	*1.68%*	*1.44%*	*1.43%*
Combined	**31,342**	**32,397**	**31,288**	**32,189**	**32,167**	***1,054***	***901***	***879***	***3.36%***	***2.88%***	***2.81%***
Rail (person trips)											
Within city	-	-	-	-	-	-	-	-	-	-	-
To / from city	4,978	5,132	5,236	5,370	5,357	*155*	*135*	*122*	*3.11%*	*2.58%*	*2.32%*
Combined	**4,978**	**5,132**	**5,236**	**5,370**	**5,357**	***155***	***135***	***122***	***3.11%***	***2.58%***	***2.32%***
P&R (person trips)											
Within city	143	154	144	157	158	*11*	*12*	*13*	*7.60%*	*8.56%*	*9.28%*
To / from city	2,221	2,389	2,170	2,292	2,294	*169*	*122*	*124*	*7.60%*	*5.63%*	*5.73%*
Combined	**2,363**	**2,543**	**2,314**	**2,449**	**2,452**	***180***	***135***	***138***	***7.60%***	***5.81%***	***5.95%***

Mode / sectors	DM	DM-T1	DM-BR	RUC1	RUC2	DM-T1 change	RUC1 change	RUC2 change	DM-T1 change %	RUC1 change %	RUC2 change %
Shift to walking (person trips)											
Within city	-	-	-	-	-	*1,641*	*1,633*	*1,630*	*NA*	*NA*	*NA*
To / from city	-	-	-	-	-	*319*	*302*	*302*	*NA*	*NA*	*NA*
Combined	**-**	**-**	**-**	**-**	**-**	***1,959***	***1,935***	***1,932***	***NA***	***NA***	***NA***
Shift to cycling (person trips)											
Within city	-	-	-	-	-	*4,851*	*4,870*	*4,836*	*NA*	*NA*	*NA*
To / from city	-	-	-	-	-	*1,423*	*1,347*	*1,349*	*NA*	*NA*	*NA*
Combined	**-**	**-**	**-**	**-**	**-**	***6,274***	***6,218***	***6,185***	***NA***	***NA***	***NA***

Table 4-5: Sectorised demand by mode / sector and modelled scenario – PM peak period

Mode / sectors	DM	DM-T1	DM-BR	RUC1	RUC2	DM-T1 change	RUC1 change	RUC2 change	DM-T1 change %	RUC1 change %	RUC2 change %
Car (person trips)											
Within city	25,924	21,376	26,010	21,692	21,877	*-4,549*	*-4,318*	*-4,133*	*-17.55%*	*-16.60%*	*-15.89%*
To / from city	38,466	37,391	37,954	36,860	36,971	*-1,075*	*-1,094*	*-983*	*-2.79%*	*-2.88%*	*-2.59%*
Combined	**64,390**	**58,767**	**63,964**	**58,553**	**58,848**	***-5,623***	***-5,411***	***-5,116***	***-8.73%***	***-8.46%***	***-8.00%***
Bus (person trips)											
Within city	11,801	12,429	11,936	12,460	12,416	*628*	*524*	*480*	*5.32%*	*4.39%*	*4.02%*
To / from city	7,088	7,207	6,953	7,067	7,064	*119*	*114*	*111*	*1.67%*	*1.64%*	*1.60%*
Combined	**18,889**	**19,636**	**18,888**	**19,527**	**19,480**	***747***	***639***	***592***	***3.95%***	***3.38%***	***3.13%***
Rail (person trips)											
Within city	-	-	-	-	-	-	-	-	-	-	-
To / from city	5,382	5,642	5,648	5,882	5,851	*259*	*234*	*204*	*4.82%*	*4.14%*	*3.60%*
Combined	**5,382**	**5,642**	**5,648**	**5,882**	**5,851**	***259***	***234***	***204***	***4.82%***	***4.14%***	***3.60%***
P&R (person trips)											
Within city	180	192	182	195	194	*12*	*13*	*12*	*6.47%*	*7.04%*	*6.48%*
To / from city	2,323	2,560	2,197	2,347	2,326	*238*	*150*	*129*	*10.23%*	*6.82%*	*5.88%*
Combined	**2,503**	**2,752**	**2,379**	**2,542**	**2,520**	***249***	***163***	***141***	***9.96%***	***6.84%***	***5.93%***

Mode / sectors	DM	DM-T1	DM-BR	RUC1	RUC2	DM-T1 change	RUC1 change	RUC2 change	DM-T1 change %	RUC1 change %	RUC2 change %
Shift to walking (person trips)											
Within city	-	-	-	-	-	902	896	894	*NA*	*NA*	*NA*
To / from city	-	-	-	-	-	173	165	166	*NA*	*NA*	*NA*
Combined	**-**	**-**	**-**	**-**	**-**	**1,075**	**1,062**	**1,059**	***NA***	***NA***	***NA***
Shift to cycling (person trips)											
Within city	-	-	-	-	-	2,696	2,723	2,743	*NA*	*NA*	*NA*
To / from city	-	-	-	-	-	747	714	715	*NA*	*NA*	*NA*
Combined	**-**	**-**	**-**	**-**	**-**	**3,443**	**3,437**	**3,458**	***NA***	***NA***	***NA***