Great Yarmouth Third River Crossing

OUTLINE BUSINESS CASE

MARCH 2017

Supporting Document 8 – Forecasting Report (SATURN)

Norfolk County Council

Great Yarmouth Borough Council

NEWANGLIA Local Enterprise Partnership for Norfolk and Suffolk

Great Yarmouth Third River Crossing

Forecasting Report

April 2017

Produced By

Document Control Sheet

Project Title	Great Yarmouth Third River Crossing
Report Title	Forecasting Report
Revision	2.0
Status	Final
Control Date	05th April 2017
Document Ref	1076653-MOU-GEN-XX-TN-TP -0006

Record of Issue

Issue	Status	Author	Date	Check	Date	Authorised	Date
1 0	Draft	AK	24/03/2017	AF	27/03/2017	PS	04/04/2017
2.0	Final	AK	04/04/17	AF	05/04/17	PS	05/04/17

This Report is presented to Norfolk County Council in respect of Great Yarmouth Third River Crossing and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this Report.

Notwithstanding anything to the contrary contained in the Report, Mouchel Limited is obliged to exercise reasonable skill, care and diligence in the performance of the services required by Norfolk County Council and Mouchel Limited shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

This report has been prepared by Mouchel Limited. No individual is personally liable in connection with the preparation of this Report. By receiving this Report and acting on it, the client or any other person accepts that no individual is personally liable whether in contract, tort, for breach of statutory duty or otherwise.

Contents

Tables & Figures

1 Introduction

1.1 Introduction

Norfolk County Council (NCC) has appointed Mouchel to prepare an Outline Business Case (OBC) relating to a proposed Third River Crossing in Great Yarmouth.

To support the OBC, extensive transport modelling and appraisal work will be undertaken in order to select a preferred option, forecast the likely scheme impact and quantify its benefits.

This will include the development of a tiered modelling approach, including both a SATURN model (used for strategic analysis and to feed into the economic appraisal) and a Paramics Discovery model (used to assist in the option selection process and to accurately forecast operational performance).

1.2 Background

The Great Yarmouth Third River Crossing is proposed as a new bascule bridge between A12 Harfrey's Roundabout over the River Yare and a new three-arm junction on South Denes Road between Sutton Road and Swanston's Road. The bridge will improve access to the main section of the Great Yarmouth port area and take this traffic away from the town centre.

The new crossing will provide much needed connections between the strategic road network and the fast growing energy related Enterprise Zone. This proposal is crucial in providing linkages across the River Yare to the economic growth hub in the South Denes peninsula. The current lack of connectivity severely inhibits movement in Great Yarmouth resulting in congestion and ultimately limiting the economic potential of the Great Yarmouth Enterprise Zone, Great Yarmouth Energy Park, the South Denes Business Park and the deep water outer harbour, operated by Peel Ports Great Yarmouth.

The provision of the TRC is to achieve four operational objectives, these are as follows:

- To provide an additional crossing of the River Yare for vehicles, cyclists and pedestrians;
- To reduce overall journey times and vehicle kilometres in Great Yarmouth;
- To minimise environmental impact, compulsory purchase and demolition of residential and commercial property; and
- To achieve a balance between the needs of road and river traffic.

The updated Great Yarmouth Traffic Model (GYTM) has been developed to assist in the delivery of this project and has been calibrated to represent 2016 traffic levels. Development of the model has been referenced in the Local Model Validation Report[1] and the Demand Model Report[2]

1.3 Report Structure

This report describes the methods employed to develop the traffic forecasts required to support the Outline Business Case. The following sections of the report are included to provide a full understanding of the processing undertaken.

- Chapter 2. Forecast and Appraisal Requirements;
- Chapter 3. Overview of Forecasting Requirements;
- Chapter 4. Future Year Scenarios;
- Chapter 5. Future Year Network Configurations;
- Chapter 6. Future Year Travel Demands;
- Chapter 7. Core Scenario Outputs;
- Chapter 8. Variable Demand Model Outputs;
- Chapter 9. Sensitivity Test Outputs; and
- Chapter 10. Summary and Conclusions

[1] 1076653-MOU-GEN-XX-TN-TP-003

[2] 1076653-MOU-GEN-XX-TN-TP-004

2 Forecasting and Appraisal Requirements

2.1 Introduction

Forecasting the usage and performance of transport networks is a critical component in any transport appraisal. The principal purpose in the development of the future year traffic forecasts is to support the Norfolk County Council funding bid for the Great Yarmouth Third River Crossing scheme. This chapter describes the various requirements of the forecasting and appraisal process for the TRC scheme. These include the prediction of the future year travel demands and the assumptions relating to changes in the future year highway network.

The forecasting model has been developed in accordance with guidance provided by the DfT in the WebTAG series of documents, specifically those areas focussed on Forecasting and Uncertainty[3].

2.2 Future Year Travel Demand Scenarios

The principal requirement of the traffic model was the provision of traffic forecasts for use in economic appraisal of the TRC scheme for the Opening Year (2023), Design Year (2038) and Horizon Year (2051). Future travel demand forecasts for these years take into account the existing base year traffic demand together with the effects of future traffic growth and the additional traffic due to new development activity.

Traffic is forecast to grow mostly because people are expected to become wealthier and to live longer, because economic activity increases, and because households are forecast to become more numerous. Traffic growth is facilitated by car ownership, which is linked to wealth. Wealth enhances economic activity and also underpins new household formation. These progenitors of traffic growth are reconciled at a national level and are translated through to local changes. Local congestion levels seek to limit the impact of growth via a negative feedback process. Network improvements mitigate the levels of congestion. The remainder of the report explains how this process has been applied in respect of the Great Yarmouth Third River Crossing.

More specifically the assumptions adopted in the derivation of the future travel demands for the wider Great Yarmouth area are documented in Chapter 4.

2.3 Future Year Highway Network Configurations

The future year traffic models must take into account the effects of other highway or traffic management schemes that are likely to be in place by the scheme's Opening and Design years. Information in relation to future highway/traffic management schemes was provided by Norfolk CC. The actual highway and traffic management

[3] TAG_Unit_M4_Forecasting_and_Uncertainty_November2014.pdf

schemes that have been adopted in the future year traffic models are discussed in detail in Chapter 5.

2.4 Requirements for Scheme Appraisal

As mentioned earlier a cost-benefit assessment was required to estimate the value for money provided by the proposed scheme. The chosen tool for this part of the project was TUBA (Transport User Benefit Analysis), a computer program developed for the Department for Transport (DfT) to undertake the appraisal of highway schemes and multi-modal transport studies.

The accident benefits resulting from the introduction of a proposed highway scheme formed a significant part of the cost-benefit assessment. The TUBA software estimates the economic benefits of a scheme based on zone-to-zone travel costs and therefore it cannot take into account link based accident costs. The evaluation of the benefits due to changes in accident costs was therefore performed by COBALT software.

Improvements in journey time reliability due to the introduction of the TRC have been evaluated as part of the scheme assessment. The traffic forecasts detailed in this report contributed to the reliability assessment.

Additionally Wider Impact Transport Assessment (WITA) has also been considered. These are economic impacts in markets other than transportation that are realised through transportation improvements. WITA calculates this impact based on changes to certain demand segments.

3 Overview of Forecasting Methodology

3.1 Introduction

This chapter highlights the main features of the model structure and presents an overview of the forecasting methodology that was adopted in the preparation of the Opening, Design and Horizon Year forecasts.

3.2 Base Year Model Overview

Model base Year – A 2016 base year model was developed using updated survey data.

Software – The 2016 base year model was developed using the SATURN suite of programs.

Study Area – The study area covers the urban area of Great Yarmouth and surrounding areas of Caister, Bradwell and Gorleston. The study area is shown in **Error! Reference source not found.** below.

Figure 3-1 Great Yarmouth Modelled Area

Zoning System – A zoning system aggregates geographical areas into individual blocks and so reduces the amount of detail in the model. The zoning system designed for the Great Yarmouth model comprised 240 zones, of which

approximately 90 are internal zones, within the study area, and 150 are external zones.

In order to represent traffic patterns to an adequate level of detail, the zoning system in Great Yarmouth contained a number of smaller sized zones. Outside the study area the zoning system is much less detailed with larger zones covering wider areas, reflecting the lower level of detail required for these areas.

A detailed list of the zoning system, including the relationship between the TEMPRO sectors and the zoning system used in the traffic model is presented in Appendix A.

Modelled Time Periods – Three time periods identified from the survey data were modelled in order to replicate different trip patterns during a typical weekday. The three time periods are shown below:

- AM Peak hour (08:00 – 09:00);
- PM Peak hour (16:30 – 17:30); and
- Average Inter-Peak hour (10:00 – 15:30).

Private Vehicle Classes - Five user classes were modelled:

- Cars – employer business ;
- Cars – commute;
- Cars – other
- Light Goods Vehicles; and
- Heavy Goods Vehicles (OGV1, OGV2 and Coaches).

Modelled Highway Network – Within the study area, the modelled network included all 'A' and 'B' class roads and most minor roads. Within Great Yarmouth, residential roads that act as distributor routes or 'rat-runs' were also included in the model. The network was coded in detail to reproduce the effects of traffic queues and delays on vehicle routing patterns.

Outside the study area, a coarse network of buffer links was defined to include major 'A' roads; including the A12, A143 and A47. This ensured that long distance traffic was properly routed into and around Great Yarmouth.

Highway Matrix Development – The demand matrices for the base model were created by combining RSI/Traffic Master Origin Destination (TMOD) matrices and the original MM model uplifted matrices. First, the RSI data was expanded to form OD matrices and these were blended with TMOD data to fill any missing data. These

matrices were then combined with the uplifted matrices from the original MM model using weighting factors favouring RSI matrices if the data was sufficient.

Highway Model Calibration – The calibration of the Base Year traffic models was undertaken using a standard approach where the network was adjusted to ensure that the model realistically replicated routeing and vehicle speeds through the study area. Matrix estimation was incorporated in the model calibration process in order to obtain matrices based on the routeing patterns to which the network was calibrated.

Highway Model Validation – Network validation was undertaken to establish that the network structure was accurate and that characteristics of the network are suitably represented in the model. A number of range and logic checks were undertaken, including routeing checks. Assignment validation was then undertaken for traffic flows (links and turns) and journey times.

The development of the base year traffic model and its validation against observed traffic flows and journey times was fully documented in the Great Yarmouth Traffic Model, Local Model Validation Report (Mouchel 2017).

3.3 Forecast Model Overview

'Network Configurations' refer to combinations of different transport interventions, which in broad terms encompass changes in capacity, e.g. new infrastructure, operating conditions, and prices. Network Configurations typically include a Reference Network Configuration, referred to as the Do Minimum (DM), against which to test a scheme focused Network Configuration, referred to as the Do Something (DS).

'Scenarios' refer to the level, distribution and structure of population, households, employment, and car ownership, which affect car availability, as well as general economic variables such as the level of GDP and fuel prices. Scenarios combine growth information from Development Logs and TEMPRO and typically include:

- Core Scenario;
- Low Demand Scenario; and
- High Demand Scenario.

In addition to this a sensitivity test to gauge the impact of improvements to a key roundabout (Harfrey's roundabout) was also undertaken.

The future year modelling falls into two parts, the second dependent upon the first:

- **Unconstrained Forecast** - or 'reference growth', including pure changes in demand (assuming constant transport costs) brought about by external changes, e.g. effects due to land use, income, car ownership etc; and

- **Constrained Forecast** - changes to the above brought about by the transport system, including the result of supply side constraints.

The Forecasting Model produced production and attraction growth factors for each purpose for the scenario being tested, and applied them to the Calibrated Segmented Base matrices, yielding a set of 'Future Base' matrices which represented the change in demand for transport on the assumption of transport costs remaining fixed. The Forecast Model has been used to predict the change to these Future Base matrices, as a result of changes in generalised cost arising both from transport network configurations and from the level of demand predicted in the travel scenario.

Individuals' demand for travel varies by person-type. Changes in the distribution of such person-types between the base and forecast year has repercussions on total travel demand. There was therefore a need for an interface at the 'trip generation' stage with external 'planning' data to reflect the scenario assumptions. This was the role of the Forecast Model which combined the UK forecasts available through the TEMPRO software and local development planning data.

Given a basic demand forecast for any chosen scenario, the function of the Forecast Model is to predict the effects of a Network Configuration. This model is postulated on the basis that any changes in the transport system can be represented by changes in the components of generalised cost (journey time, distance etc) between specific zones at specific times. Changes to capacity are impacted in the model via an appropriate modification of the supply side relationship in the assignment models (Supply Model).

After each change in generalised costs, the Demand Model was rerun and the output 'loaded' into the Supply Model where changes in generalised cost were recalculated, until convergence is reached. The final estimates could then be passed to the appraisal process.

For convenience in preparing the Forecast Model, and providing early indications of scheme performance, the highway assignment element of the Forecast Model was initially used without running the Demand Model, referred to as the Fixed Demand forecasts. These forecasts provided an opportunity to evaluate changes in advance of a set of actual TAG compliant forecasts including the Demand and Supply model looping, referred to as the Variable Demand forecasts. Fixed and Variable Demand forecasts were prepared for Do Minimum and Do Something Network Configurations and are both reported in this Forecasting Report.

3.4 Forecast Model Stages

The forecasting process comprised the following main stages:

- define future year travel Scenarios;
- define future year intervention Network Configurations;

- undertake Fixed Matrix DM and DS forecasting ;
- undertake Variable Matrix DM and DS forecasting ; and
- Report of Model Outputs.

Each of these stages is described in subsequent chapters.

4 Future Year Scenarios

4.1 Introduction

This chapter presents the assumptions adopted in the derivation of the future year forecasts for the scheme's Opening and Design Years. Assumptions relating to future developments are outlined in the Development Uncertainty Log used in developing the alternative scenarios in accordance with the Department's guidance included in the WebTAG Unit M4 (November 2014).

Other assumptions relating to highway network improvements and to travel cost parameters are also discussed in this chapter.

4.2 Uncertainty Log

A robust set of assumptions relating to land use and future developments within Great Yarmouth were generated as part of the forecasting process. The land use forecasting assumptions were based on two broad key land use types, these were:

- Employment – Measured by gross floor area (m^2); and
- Housing – Measured by number of dwellings.

A detailed development log was generated to collate all developments built, proposed or planned for Great Yarmouth covering the period from 2016 through to the opening year (2023) and the design year (2038). It was assumed that the development traffic in the 2051 forecasts would be the same as those in 2038 as the ability to predict individual developments over this longer horizon was diminished. The key developments included within the development log are detailed within Table 4-2 and Table 4-3.

As part of the input to the development log all housing data was given in number of dwellings and the employment data was given by gross floor area in meters squared.

The specific details relating to each development were collated from the respective planning application, Area Action Plan or Development Order.

Each development detailed within the development log was assessed against the following scale:

Table 4-1 Classification of Development Inputs

Probability of Input	Status	Core Scenario Assumptions
Near certain: The outcome will happen or there is a high probability that it will happen.	Intent announced by proponent to regulatory agencies. Approved development proposals. Projects under construction	This should form part of the core scenario
More than likely: The outcome is likely to happen but there is some uncertainty.	Submission of planning or consent application imminent. Development application within the consent process.	This could form part of the core scenario
Reasonably foreseeable: The outcome may happen, but there is significant uncertainty	Identified within a development plan. Not directly associated with the transport strategy/scheme, but may occur if the strategy/scheme is implemented. Development conditional upon the transport strategy/scheme proceeding. Or, a committed policy goal, subject to tests (e.g. of deliverability) whose outcomes are subject to significant uncertainty	These should be excluded from the core scenario but may form part of the alternative scenarios
Hypothetical: There is considerable uncertainty whether the outcome will ever happen.	Conjecture based upon currently available information. Discussed on a conceptual basis. One of a number of possible inputs in an initial consultation process. Or, a policy aspiration	These should be excluded from the core scenario but may form part of the alternative scenarios

Tables 4-2 and 4-3 detail the uncertainty assessment for each development within the log.

4.3 Scenario Definition

Advice provided in the Department's series of TAG documents highlights the fact that studies should test a 'core' scenario and in addition alternative scenarios should also be developed to account for future uncertainty. In response to those requirements, three scenario options were developed for forecasting, as listed below:

- Low Demand Growth;
- Core (or 'Most Likely' scenario); and
- High Demand Growth.

The methodology for the calculation of the Low and High traffic growth rates is given in Section 4-7.

Each scenario option was applied to the different Network Configurations to reflect the future possibilities.

4.4 Development Assumptions

For the forecast models, future developments must be included to reflect the changes in demand in future year scenarios. The developments that have been included in the Great Yarmouth model forecasts are discussed in this section.

The developments included in the assumptions was decided based on a threshold of 25 (vehicle) arrival and departure trips for an average inter-peak hour based on TRICS data. The developments that exceed this threshold gave a broad representation of developments within the modelled area. The remainder were absorbed by background growth.

Several key additional locations for development are summarised below.

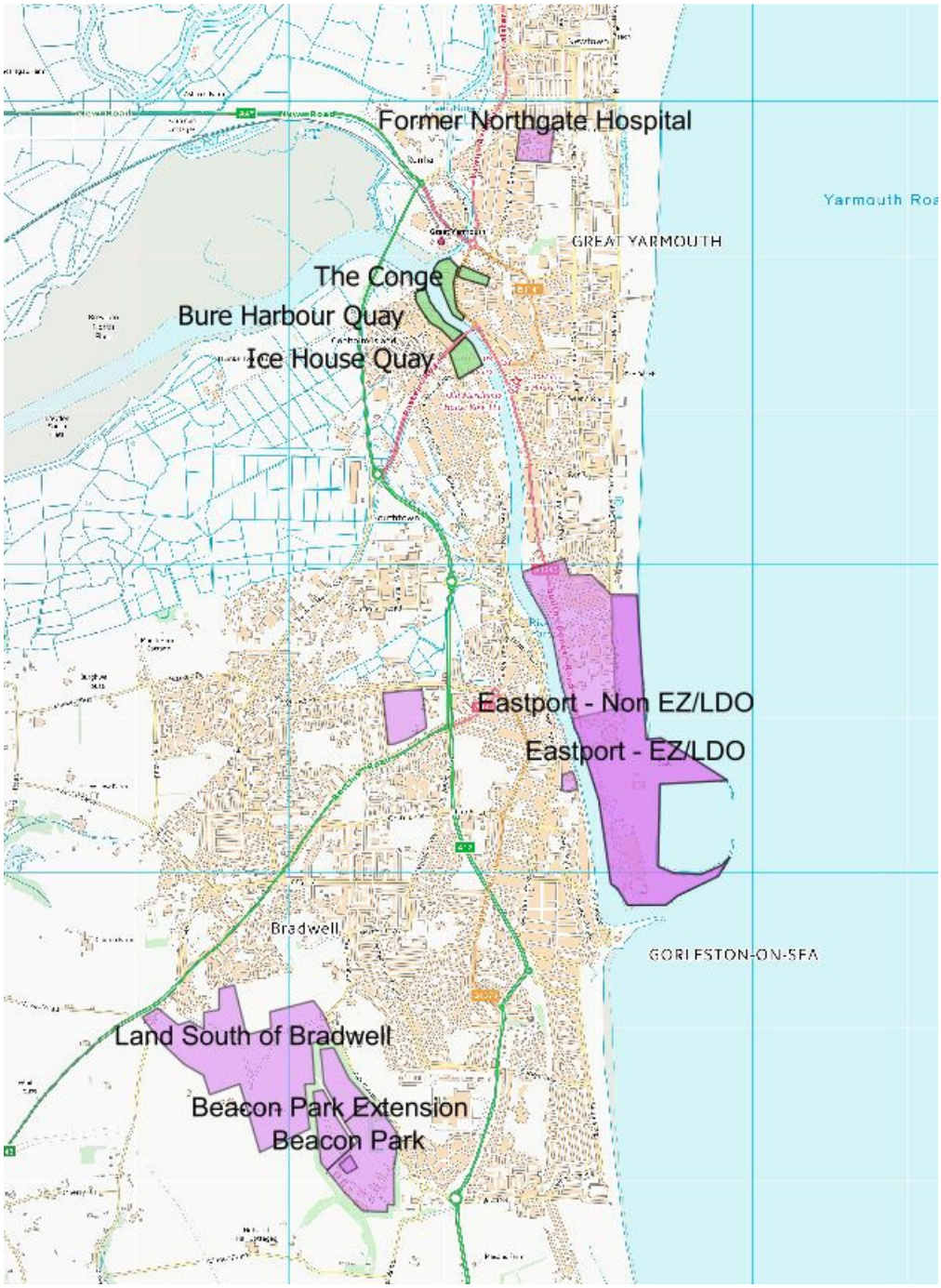
- The Eastport and South Denes Road Local Development Order covers the southern area of the Great Yarmouth peninsula and consists of only industrial and storage units. The development was included in the Core Scenario as it is assigned 'more than likely' status and is in close proximity to the new bridge scheme.
- Beacon Park is a mixed use development located on the southern outskirts of Great Yarmouth. The development is based around the new A12/ A143 link road and is a combination of offices and industrial units. The development has been gauged as 'more than likely' and so developments within the given threshold are included in the Core Scenario.
- The Waterfront Area Action Plan is a regeneration plan encompassing several areas along the River Bure near Great Yarmouth town centre including North Quay, The Conge, Ice House Quay and Bure Harbour Quay as part of Great Yarmouth's Local Development Framework. The development contains a variety of uses including residential buildings, offices, shops, restaurants and a hotel. This scheme has been quantified as 'more than likely' so developments within the given threshold are included in the Core Scenario.

Several other (mainly residential) developments are also included in the development assumptions.

The scale of these developments was provided to Mouchel in yearly summaries which have been grouped into those from 2017 to 2023 and from 2024 to 2038 to calculate trip totals for the respective future year scenarios.

The developments are identified in Figure 4.1.

Figure 4-1 Great Yarmouth Development Locations



4.5 Development Trip Generation

For the developments above, trip rates were calculated using the TRICS software package. The TRICS software package is a database of observed arrivals and departures for a variety of sites and land use types across the UK, and is used to estimate trip generation for proposed developments. All developments contained within the development log were classified into the TRICS land uses and their respective trip rates generated using the TRICS software. All housing was classified as privately owned households. The different land uses within the employment were treated separately and then combined to generate a total number of trips arriving/leaving at each site.

The individual developments that have been included in the forecasting assumptions and their trip rates for 2023 and 2038 are shown in Table 4-2 and Table 4-3, the grouping of these developments into zones for matrix calculations are shown in Table 4-4 and

Table 4-5.

Table 4-2 Individual Developments for 2023

Development	Development Type	Certainty	Size of Development	Trip Generation 2023					
				AM		IP		PM	
				Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Eastport (EZ/LDO)	B1 – Offices/ Industrial	More Than Likely	8238 m²	129	15	29	33	15	88
Eastport (EZ/LDO)	B2 – Industrial	More Than Likely	6850 m²	33	15	19	20	12	29
Eastport (EZ/LDO)	B8 – Storage	More Than Likely	63625 m²	92	51	85	90	64	98
South Denes (Non EZ/LDO)	B2 – Industrial	More Than Likely	2950 m²	14	7	8	9	5	12
South Denes (Non EZ/LDO)	B8 – Storage	More Than Likely	7160 m²	10	6	10	10	7	11
Beacon Park EZ/LDO	B2 –Industrial	More Than Likely	31760 m²	70	19	33	39	10	64
Beacon Park (15ha extension)	B1 – Offices	More Than Likely	6000 m²	82	10	15	18	10	48
Beacon Park (15ha extension)	B2 – Industrial	More Than Likely	11250 m²	25	7	12	14	4	23
Beacon Park Neighbourhood Centre	A1 – Food Superstore	Near Certain	4366 m²	152	112	255	251	233	235
Halls, Riverside Road	Residential	More Than Likely	104 dwellings	15	39	18	17	28	18
Halls, Riverside Road	B1 – Offices	More Than Likely	2600 m²	56	8	15	15	9	44
Land South of Bradwell, Site A (Phase 1)	Residential	More Than Likely	89 dwellings	12	33	15	15	25	16

Development	Development Type	Certainty	Size of Development	Trip Generation 2023					
				AM		IP		PM	
				Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Land South of Bradwell, Site A (Phase 2-6)	Residential	More Than Likely	240 dwellings	28	89	39	38	67	43
Land South of Bradwell, Site B	Residential	More Than Likely	130 dwellings	19	49	23	21	35	23
Former Claydon School Site	Residential	More Than Likely	110 dwellings	16	41	19	18	29	19
Site 25, Beacon Park	Residential	More Than Likely	287 dwellings	33	106	47	45	80	52
Former Northgate Hospital Site	Residential	More Than Likely	79 dwellings	11	29	14	13	22	14
Land off Yarmouth Road, Ormesby St Margaret	Residential	More Than Likely	189 dwellings	22	70	31	30	53	34
Land west of Caister	Residential	More Than Likely	220 dwellings	26	82	36	34	62	40
Land west of Yarmouth Road, Hemsby	Residential	More Than Likely	93 dwellings	14	35	16	15	25	16
Land sout-east of Hopton, Hopton-on-Sea	Residential	More Than Likely	200 dwellings	23	74	33	31	56	36
Former Mushroom Farm, Martham	Residential	More Than Likely	100 dwellings	15	37	17	16	27	17
Land north of Hemsby Road, Martham	Residential	More Than Likely	103 dwellings	15	39	18	17	28	18

Development	Development Type	Certainty	Size of Development	Trip Generation 2023					
				AM		IP		PM	
				Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Land south of Repps Road, Martham	Residential	More Than Likely	144 dwellings	21	54	25	23	38	25

Table 4-3 Individual Developments for 2038

Development	Development Type	Certainty	Size of Development	Trip Generation 2038					
				AM		IP		PM	
				Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Eastport (EZ/LDO)	B1 – Offices/ Industrial	More Than Likely	11988 m²	187	22	43	48	21	128
Eastport (EZ/LDO)	B2 – Industrial	More Than Likely	10600 m²	51	24	30	32	19	45
Eastport (EZ/LDO)	B8 – Storage	More Than Likely	93625 m²	135	75	125	132	94	144
South Denes (Non EZ/LDO)	B2 – Industrial	More Than Likely	2950 m²	14	7	8	9	5	12
South Denes (Non EZ/LDO)	B8 – Storage	More Than Likely	7160 m²	10	6	10	10	7	11
Beacon Park EZ/LDO	B2 –Industrial	More Than Likely	46760 m²	102	22	49	57	15	94
Beacon Park (15ha extension)	B1 – Offices	More Than Likely	21000 m²	309	28	24	25	18	129
Beacon Park (15ha extension)	B2 – Industrial	More Than Likely	26250 m²	57	16	27	32	8	53
Beacon Park Neighbourhood Centre	A1 – Food Superstore	Near Certain	4366 m²	152	112	255	251	233	235

Development	Development Type	Certainty	Size of Development	Trip Generation 2038					
				AM		IP		PM	
				Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
North Quay (Area Action Plan)	Residential	More Than Likely	370 dwellings	39	153	67	63	122	73
North Quay (Area Action Plan)	B1 – Offices	More Than Likely	6200 m²	85	11	16	19	11	50
North Quay (Area Action Plan)	A1/ A3 – Shops/ Restaurants	More Than Likely	4100 m²	85	71	169	170	142	140
North Quay (Area Action Plan)	C1 – Hotel	More Than Likely	150 beds	23	37	15	18	21	19
The Conge (Area Action Plan)	Residential	More Than Likely	90 dwellings	13	34	16	15	24	16
The Conge (Area Action Plan)	A1/ A3 – Shops/ Restaurants	More Than Likely	3600 m²	75	62	149	149	125	123
Ice House Quay (Area Action Plan)	Residential	More Than Likely	450 dwellings	30	159	69	70	129	80
Ice House Quay (Area Action Plan)	B1 – Offices	More Than Likely	7000 m²	96	12	18	21	12	56
Ice House Quay (Area Action Plan)	A1/ A3 – Shops/ Restaurants	More Than Likely	6500 m²	135	112	268	269	226	222
Bure Harbour Quay (Area Action Plan)	Residential	More Than Likely	100 dwellings	15	37	17	16	27	17
Halls, Riverside Road	Residential	More Than Likely	104 dwellings	15	39	18	17	28	18
Halls, Riverside Road	B1 – Offices	More Than Likely	2600 m²	56	8	15	15	9	44

Development	Development Type	Certainty	Size of Development	Trip Generation 2038					
				AM		IP		PM	
				Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Land South of Bradwell, Site A (Phase 1)	Residential	More Than Likely	89 dwellings	12	33	15	15	25	16
Land South of Bradwell, Site A (Phase 2-6)	Residential	More Than Likely	700 dwellings	47	248	107	109	201	125
Land South of Bradwell, Site B	Residential	More Than Likely	130 dwellings	19	49	23	21	35	23
Former Claydon School Site	Residential	More Than Likely	110 dwellings	16	41	19	18	29	19
Site 25, Beacon Park	Residential	More Than Likely	287 dwellings	33	106	47	45	80	52
Former Northgate Hospital Site	Residential	More Than Likely	79 dwellings	11	29	14	13	22	14
Land off Yarmouth Road, Ormesby St Margaret	Residential	More Than Likely	189 dwellings	22	70	31	30	53	34
Land west of Caister	Residential	More Than Likely	850 dwellings	99	315	139	133	238	154
Land west of Yarmouth Road, Hemsby	Residential	More Than Likely	93 dwellings	14	35	16	15	25	16
Land south-east of Hopton, Hopton-on-Sea	Residential	More Than Likely	200 dwellings	23	74	33	31	56	36
Former Mushroom Farm, Martham	Residential	More Than Likely	100 dwellings	15	37	17	16	27	17

Development	Development Type	Certainty	Size of Development	Trip Generation 2038					
				AM		IP		PM	
				Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Land north of Hemsby Road, Martham	Residential	More Than Likely	103 dwellings	15	39	18	17	28	18
Land south of Repps Road, Martham	Residential	More Than Likely	144 dwellings	21	54	25	23	38	25

Table 4-4 Grouped Developments for 2023 Forecast Matrices

Development Grouping	Zone Number	Size of Development	Trip Generation 2023					
			AM		IP		PM	
			Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Eastport and South Denes Road LDO	714	8238 m² B1 (offices/ light industrial), 9800 m² B2 industrial and 70785 B8 storage	278	94	151	162	103	238
Beacon Park	707	43010 m² B2 industrial, 6000 m² B1 offices and 4366 m² A1 food superstore	328	148	315	322	257	369
Halls, Riverside Road	709	104 residential dwellings and 2600 m² B1 offices	72	47	33	32	37	62
Land South of Bradwell	705	459 residential dwellings	59	171	77	73	127	82
Former Claydon School Site	708	110 dwellings	16	41	19	18	29	19
Site 25, Beacon Park	706	287 dwellings	33	106	47	45	80	52

Development Grouping	Zone Number	Size of Development	Trip Generation 2023					
			AM		IP		PM	
			Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Former Northgate Hospital Site	710	79 dwellings	11	29	14	13	22	14
Land off Yarmouth Road, Ormesby St Margaret	712	189 dwellings	22	70	31	30	53	34
Land west of Caister	713	220 dwellings	26	82	36	34	62	40
Land west of Yarmouth Road, Hemsby	20006	93 dwellings	14	35	16	15	25	16
Land south-east of Hopton, Hopton-on-Sea	55	200 dwellings	23	74	33	31	56	36
Former Mushroom Farm, Martham	20004	100 dwellings	15	37	17	16	27	17
Land north of Hemsby Road, Martham	20004	103 dwellings	15	39	18	17	28	18
Land south of Repps Road, Martham	20004	144 dwellings	21	54	25	23	38	25

Table 4-5 Grouped Developments for 2038 Forecast Matrices

Development Grouping	Zone Number	Size of Development	Trip Generation 2038					
			AM		IP		PM	
			Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Eastport and South Denes Road LDO	714	11988 m² B1 offices/ industrial, 13550 m² B2 industrial, 100785 m² B8 storage	397	134	216	231	146	340
Beacon Park	707	73010 m² B2 industrial, 21000 m² B1 offices, 4366 m² A1 food superstore	621	178	355	365	274	509
North Quay	701	370 residential dwellings, 6200 m² B1 offices, 4100 m² A1/ A3 shops/ restaurants, 150 bed hotel	232	271	267	269	296	281
The Conge	711	90 residential dwellings, 3600 m² A1/ A3 shops/ restaurants	88	96	164	164	149	139
Ice House Quay	703	450 residential dwellings, 7000 m² B1 offices, 6500 m² A1/ A3 shops/ restaurants	261	283	355	360	367	358
Bure Harbour Quay	702	100 residential dwellings	15	37	17	16	27	17
Halls, Riverside Road	709	104 residential dwellings, 2600 m² B1 offices	72	47	33	32	37	62
Land South of Bradwell	705	919 dwellings	78	330	145	144	260	163
Former Claydon School Site	708	110 dwellings	16	41	19	18	29	19
Site 25, Beacon Park	706	287 dwellings	33	106	47	45	80	52

Development Grouping	Zone Number	Size of Development	Trip Generation 2038					
			AM		IP		PM	
			Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
Former Northgate Hospital Site	710	79 dwellings	11	29	14	13	22	14
Land off Yarmouth Road, Ormesby St Margaret	712	189 dwellings	22	70	31	30	53	34
Land west of Caister	713	850 dwellings	99	315	139	133	238	154
Land west of Yarmouth Road, Hemsby	20006	93 dwellings	14	35	16	15	25	16
Land south-east of Hopton, Hopton-on-Sea	55	200 dwellings	23	74	33	31	56	36
Former Mushroom Farm, Martham	20004	100 dwellings	15	37	17	16	27	17
Land north of Hemsby Road, Martham	20004	103 dwellings	15	39	18	17	28	18
Land south of Repps Road, Martham	20004	144 dwellings	21	54	25	23	38	25

4.6 Potential Highway Improvements

The Uncertainty Log should also contain information on supply side changes which are anticipated within the study area. From research on the status of schemes within the area several committed and proposed highway improvements have been considered in the TRC model. The full set of potential schemes and their status are listed in Table 4-6. Dependent upon scheme timing and level of certainty inclusion has been referenced by modelled year in columns 6 through 8 of the table..

Table 4-6 Highway Improvements for Forecast Networks

Scheme	Location	Owner	Description	Certainty	2016	2023	2038	2051
Vauxhall Junction	*A47/ Runham Rd/ A149 Acle Rd/ A12*	*HE*	*Option 2, HE551491-ACM-HGN-VR-DR-HE-00011*	*Reasonably Foreseeable*	*No*	*No*	*No*	*No*
Great Yarmouth Station Access	*A149 Acle New Rd /Station Access*	*HE*	*Option 9, HE551491-ACM-HGN-VR-DR-HE-00014-P01.3*	*Reasonably Foreseeable*	*No*	*No*	*No*	*No*
Gapton Junction	*A12/ Pasteur Road*	*HE*	*Option 1, HE551491-ACM-HGN-GR-DR-HE-00011*	*Reasonably Foreseeable*	*No*	*No*	*No*	*No*
Harfreys Junction	*A12 / William Adamsway*	*HE*	*Option 1, HE551491-ACM-HGN-HR-DR-HE-00011*	*Hypothetical*	*No*	*No*	*No*	*No*
James Paget Hospital	*A12 Lowstoft Rd/ JP Hospital Access*	*HE*	*Option 1, HE551491-ACM-HGN-JP-DR-HE-00011*	*Hypothetical*	*No*	*No*	*No*	*No*
Fullers Hill	A149 Acle New Rd /Fullers Hill / N Quay	NCC	Fullars Hill - SK01 211116, Programmed for 2018	Near Certain	No	Yes	Yes	Yes
Bridge Rd	*A12 Lowstoft Rd/ Bridge Rd*	*HE*	*Option 1, HE551491-ACM-HGN-BR-DR-HE-00011*	*Hypothetical*	*No*	*No*	*No*	*No*
Improvements to Rail Station Forecourt and	Station Forecourt	NCC	PK6060-HP1-037	Near Certain	No	Yes	Yes	Yes

Surrounding Highways			Consultation Plan One					
Improvements to the North Quay and The Conge	North Quay and The Conge	NCC	PK6060-HP1-038 Consultation Plan Two	Near Certain	No	Yes	Yes	Yes
Great Yarmouth Trafalgar Rd Improvements	Trafalgar Rd/ Marine Parade/ Nelson Rd	NCC	PE1022-HP1-013 Phase 1 - Shared Use Facility Only	Near Certain	No	Yes	Yes	Yes
Possible congestion improvement	South Quay/Yarmouth Way	NCC		Reasonably Foreseeable	No	No	No	No
Possible congestion improvement	Southtown Road/Pasteur Road/Bridge Road	NCC		Reasonably Foreseeable	No	No	No	No
Possible congestion improvement	Town centre locations TBD	NCC		Reasonably Foreseeable	No	No	No	No

4.7 Sensitivity Tests on Growth Assumptions

In accordance with advice provided in TAG Unit M4 sensitivity tests were developed to test the uncertainty regarding future growth.

This relies on the proportion of base year demand added to the demand from the core scenario.

Unit M4 Section 4.2 provides the guidelines on how to derive the test demands as described below:

- *for 1 year after the base year, proportion p of base year demand added to the core scenario;*
- *for 36 or more years after the base year, proportion 6*p of base year demand added to the core scenario;*
- *between 1 and 36 years after the base year, the proportion of base year demand should rise from p to 6*p in proportion with the square root of the years. (So, for example, 16 years after the base year the proportion is 4*p).*

  For highway demand at the national level, the value of p is 2.5%, reflecting uncertainty around annual forecasts from the National Transport Model

(NTM), based on the macro-economic variables that influence the main drivers of travel demand.

Hence the high and low alternatives are presented below as:

- Low Growth: 1 – 2.5% * √(Future Year – Base Year); and
- High Growth: 1 + 2.5% * √(Future Year – Base Year)

The resulting growth factors that were applied to the Core scenario matrices are presented in Table 4.7.

Table 4-7 Sensitivity Tests - Growth Factors

Future Year	Percentage Adjustment Factor	Low Adjustment (% of base demand)	High Adjustment (% of base demand)
2023	6.6	0.934	1.066
2038	11.7	0.883	1.117
2051	14.8	0.852	1.148

The adjustment factors were applied across the matrices to encompass both background growth and specific development trips.

4.8 Future Cost Parameters

The formulation of the generalised cost was based on the latest values of time and operating costs provided in the TAG databook of July 2016. Tables 4-8 presents the cost parameters adopted for this study for the Base year, the opening and the design year respectively.

Generalised Cost = Time + (PPK / PPM) x Distance

Where:

PPK = Distance related cost in pence per Kilometre
PPM = Time related cost in pence per minute

Table 4-8 Generalised Cost Parameters

User Class	Time period	2016		2023		2038		2051	
		ppm	ppk	ppm	ppk	ppm	ppk	ppm	ppk
Car Work	AM Peak	47.46	12.16	52.72	11.98	70.47	11.74	89.55	11.94
	Inter Peak	46.38	12.16	51.60	11.98	69.12	11.74	87.84	11.94
	PM Peak	45.63	12.16	50.70	11.98	67.79	11.74	86.14	11.94
Car Commute	AM Peak	14.00	5.63	15.53	5.46	20.72	5.30	26.33	5.54
	Inter Peak	13.89	5.63	15.42	5.46	20.59	5.30	26.16	5.54
	PM Peak	13.70	5.63	15.23	5.46	20.38	5.30	25.90	5.54
Car Other	AM Peak	17.79	5.63	19.49	5.46	25.44	5.30	32.33	5.54
	Inter Peak	18.49	5.63	20.26	5.46	26.41	5.30	33.56	5.54
	PM Peak	19.04	5.63	20.92	5.46	27.40	5.30	34.81	5.54
LGV	AM Peak	21.34	12.68	23.82	12.78	32.10	12.88	40.79	13.16
	Inter Peak	21.34	12.68	23.82	12.78	32.10	12.88	40.79	13.16
	PM Peak	21.34	12.68	23.82	12.78	32.10	12.88	40.79	13.16
HGV	AM Peak	49.84	46.75	55.62	52.03	74.96	55.73	95.25	57.53
	Inter Peak	49.84	46.75	55.62	52.03	74.96	55.73	95.25	57.53
	PM Peak	49.84	46.75	55.62	52.03	74.96	55.73	95.25	57.53

5 Future Year Network Configurations

5.1 Introduction

This chapter of the report describes the development of the future year highway network models. These include the initial Do Minimum (or Without-Intervention case) networks and subsequent Do Something (or With-Intervention case) networks for Opening (2023), Design (2038) and Horizon Year (2051).

These future year networks were developed from the base year networks by coding in committed and proposed highway improvement schemes, based on the information obtained from NCC. Reference was made to the uncertainty log when selecting the schemes for inclusion.

In summary, the three networks considered in this report are:

1. Do Minimum (DM) – The validated 2016 base Great Yarmouth road network, plus DM schemes coded.

2. Do Something (Option 32) – The DM networks plus the Great Yarmouth Third River Crossing Option 32 scheme.

3. Do Something including improvements to Harfrey's Roundabout (Option 32 plus Harfrey's Roundabout) – The Option 32 scheme plus improvements to Harfrey's Roundabout

The following section explains this network development process.

5.2 Do Minimum Networks

The following changes have been made to the validated base networks:

- Improvements to Great Yarmouth Rail Station Forecourt and Surrounding Highways;

- Improvements to the Fuller's Hill roundabout;

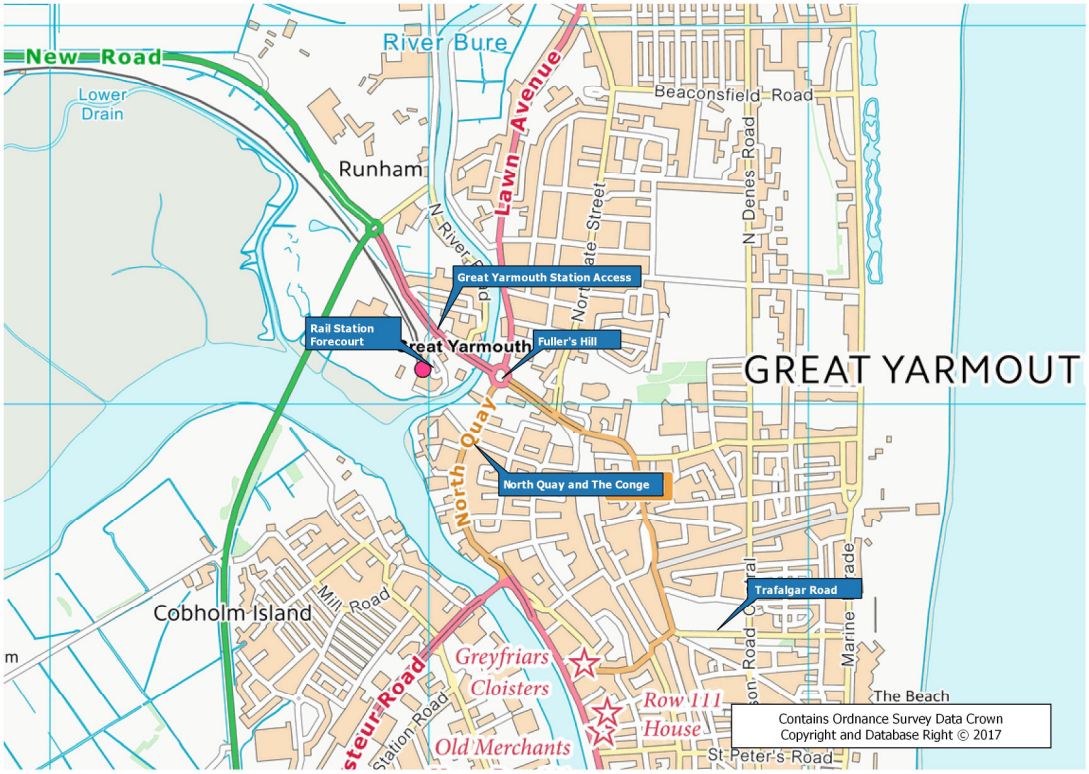
- Improvements to North Quay and The Conge; and

- Improvements to Trafalgar Road.

The wide area forecast network is shown as Figure 5.1. DM network improvements are included as Figure 5.2.

Figure 5-1 DM Network

Figure 5-2 Do Minimum Improvement Locations



All developments included will be complete by 2023 and have been shown in **Error! Reference source not found.**. 2051 assumptions are as per 2038.

5.3 Do Something Option 32 Network

The Do something network combines the Do Minimum network and the Third River Crossing improvement scheme. The wide area Do Something coding is included in Figure 5.3. The detail of Option 32 scheme, shown in Figure 5-4, is summarised below:

Option 32 comprises a four lane bridge which ties back into the local road network on the western side at a proposed new roundabout with William Adams Way/Suffolk Road. The western approach to the bridge from the new roundabout will oversail Southtown Road, which will remain open to traffic. William Adams Way will be realigned to accommodate the new roundabout and bridge approach and tie into the strategic road network at Harfrey's roundabout.

At the eastern side, the bridge will tie back into South Denes Road at a new signalised junction close to Sutton Road.

A change of direction is proposed on the one-way Sutton Rd to make it an exit from the new signal junction. A corresponding change of direction is also proposed for Swanston's Rd to the south. These proposed changes will reduce the number of conflict movements at the proposed signal junction whilst maintaining the flow of traffic in the local area for the east-west movements between South Denes Road and Admiralty Road.

Figure 5-3 Do Something Network

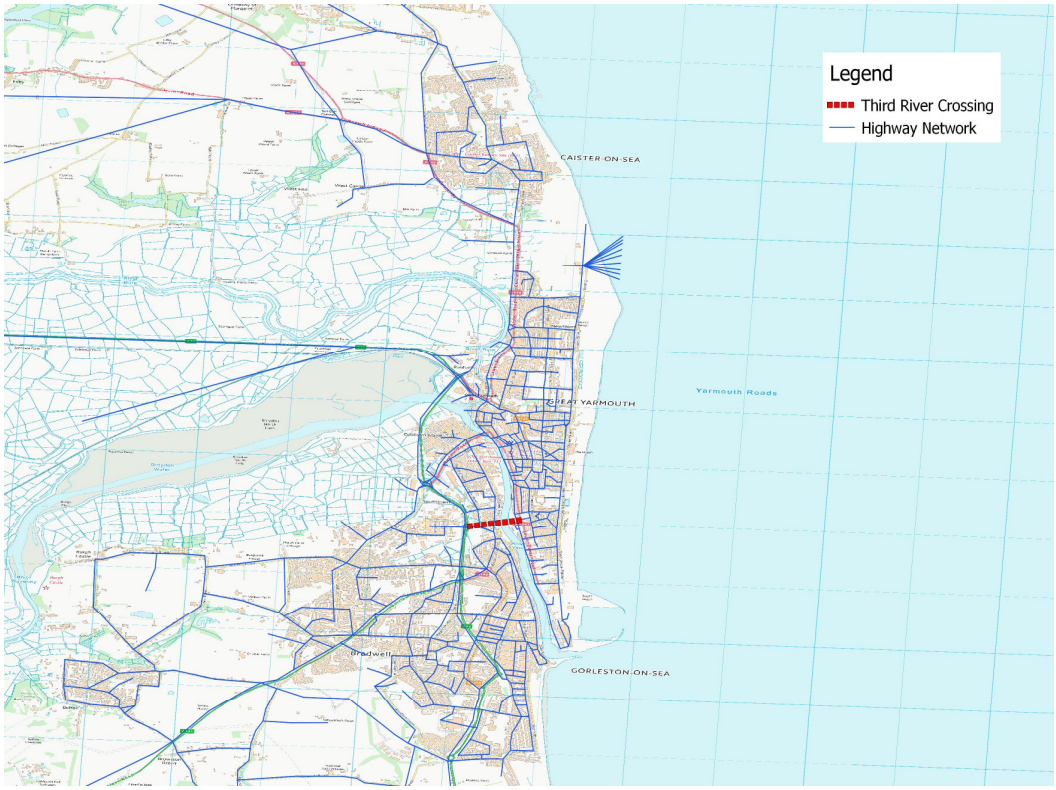
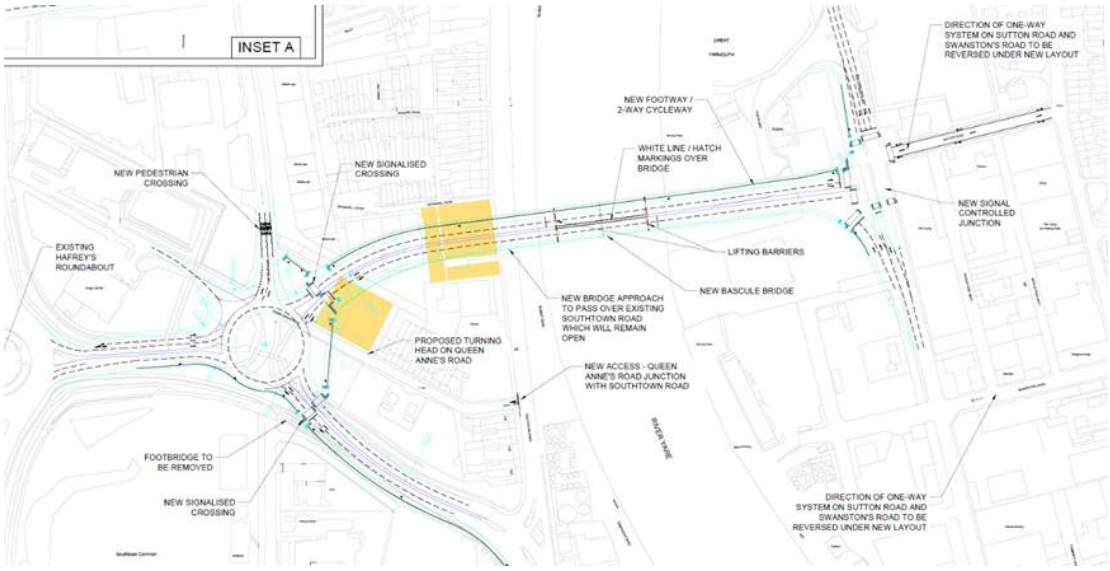


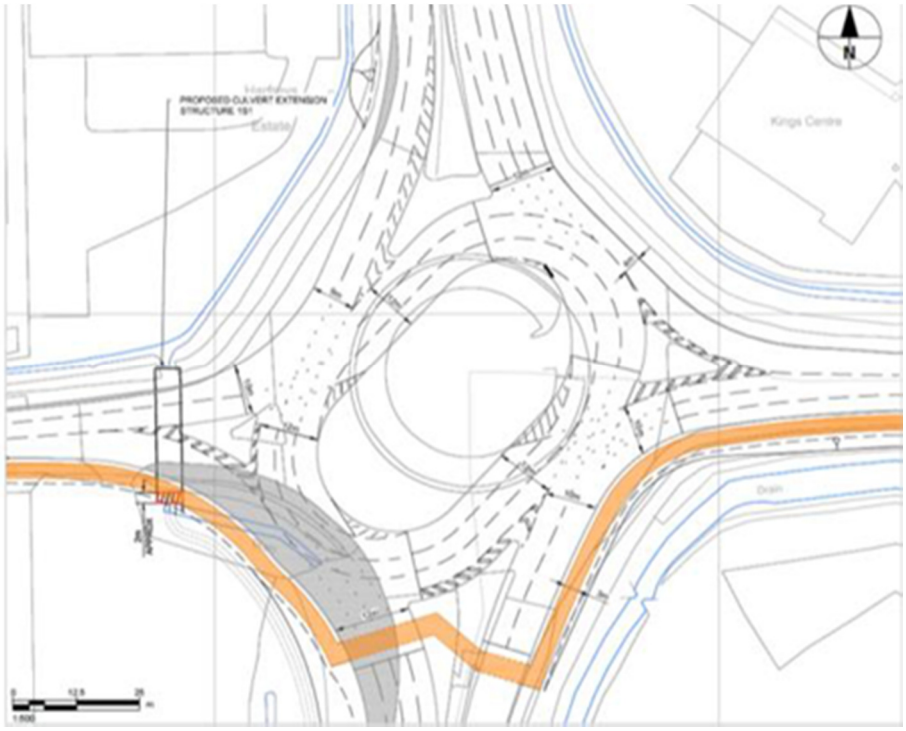
Figure 5-4 Option 32 Scheme Detail



5.4 Do Something Option 32 plus Harfrey's Roundabout

In addition to the Option 32 TRC, a further Do Something network configuration which included the Option 32 improvement and improvements to Harfrey's roundabout was modelled. Figure 5.5 covers this network configuration.

Figure 5-5 Option 32 – Indicative Harfrey's Roundabout Scheme



5.5 Network Checks

Networks were coded in line with the protocols developed as part of the base model construction. Checks were conducted on the coded networks. These included:

- Checks on the distance;
- Checks on capacity of link and turns;
- Checks on free flow speed and speed limit; and
- Select link analyses on DM and DS network (with TEMPRO growth matrices)

These checks were carried out to ensure the forecast networks were appropriate for application in the future year models.

6 Future Year Travel Demands

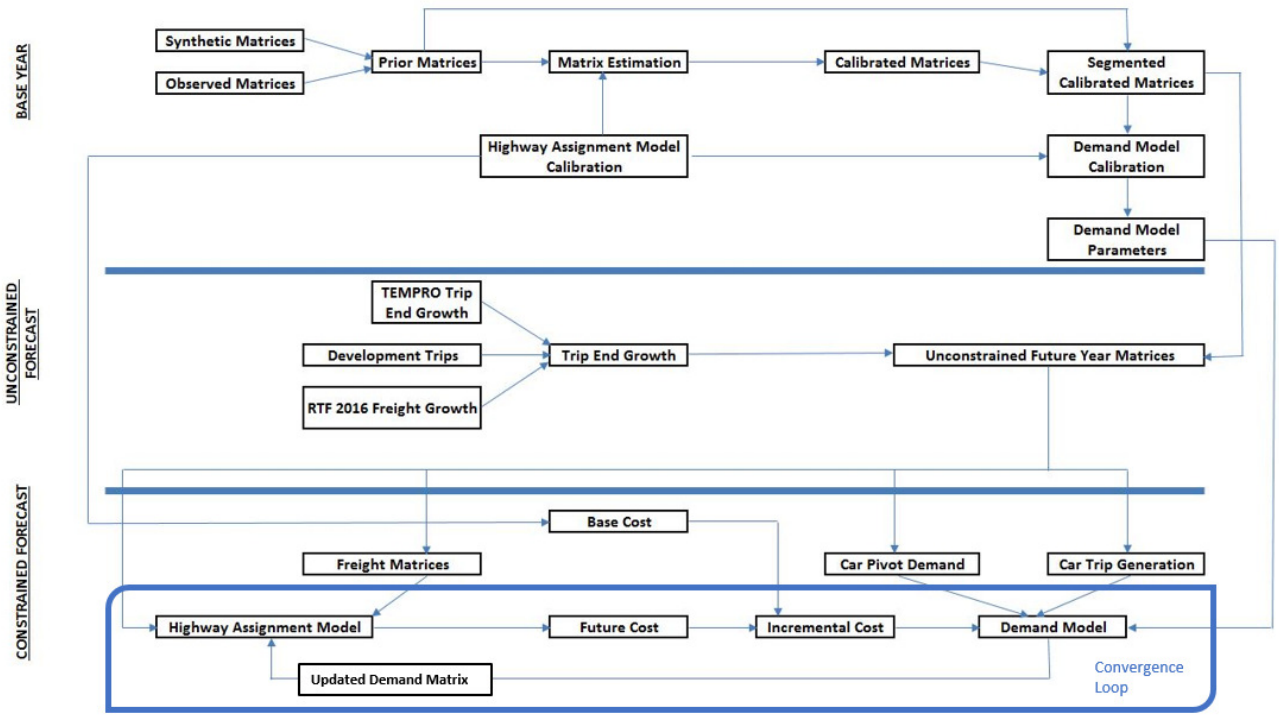
6.1 Introduction

Detailed guidance on the forecasting process using transport models and the derivation of future year travel demands using growth factors is given in TAG unit M4.

Figure 6.1 below provides a summary of the Forecasting Process and shows the Base Model Calibration (GYTM) and Forecasting Model GYVDM). The processes involved in creating the Forecast model output matrices are discussed in this section. This follows distinct stages of:

- Apply growth from TEMPRO 7;
- Build development Matrices;
- Merge development and background growth matrices;
- Control to TEMPRO 7; and
- Output the Future Calibrated Segmented Matrices.

Figure 6-1 Forecast Development Process



6.2 Matrix Segmentation

Matrix processing was undertaken at a level of traveller segmentation that allows correlation to land use to be maintained and different characteristics of travellers to be forecast. The segmentation was derived from the Prior Matrices, which are built from observed and synthetic data and include the following traveller segmentation.

Table 6-1 Modelled Journey Purposes

Trip Purpose	Segment		Modelled Approach
	Short name	Long name	
1	HBW	Home Based Work	PA
2	HBO	Home Based Other	PA
3	HBEB	Home Based Employers Business	PA
4	NHBEB	Non Home Based Employers Business	OD
5	NHBO	Non Home Based Other	OD
6	LGV	Light Goods Vehicle	OD
7	OGV	Other Goods Vehicles	OD

Table 6-2 Modelled Hours

Period	Description	Timing	Modelled Approach
1	AM Peak	0800-0859	Peak hour assignment & demand model
2	Inter Peak	1000-1529	Average hour assignment & demand model
3	PM Peak	1630-1729	Peak hour assignment & demand model

The purposes and direction are aggregated to the following Flow Groups, or User Classes, for use in the GYTM.

Table 6-3 Assignment User Classes

Class	Description	Composition
1	Commute	HBW
2	Other	HBE, HBO, NHBO
3	Employers Business	EB, NHBEB
4	LGV	LGV
5	OGV	OGV

6.3 Base Year Matrix Development

Base matrix calibration used the Flow Group aggregated matrices as the starting Prior Matrices for each of the three one hour assignment periods, indicated above. This process is documented in the Local Model Validation Report (LMVR) and includes the use of Matrix Estimation (ME). The ME process applied changes to specific cells within the Prior Matrices to produce the Calibrated Matrices. The ME

output Calibrated Matrices represented the start of the preparation of future year travel matrices.

Following the completion of the ME process the ME change factors were applied back to the fully segmented Prior Matrices to produce the 2016 Base Calibrated Segmented Matrices.

6.4 Development Matrices

The next stage in preparing the future matrices was to convert the Uncertainty Log information into the Development Matrices. The Uncertainty Log provides development information for the three peak assignment periods by Vehicle. As discussed previously there are three future years of 2023, 2038 and 2051, and three main travel Scenarios including:

- Core Scenario;
- Low Demand Growth Scenario; and
- High Demand Growth Scenario

Tables 4-3 and 4-4 provide a summary of the trips for each Scenario and Year.

The next stage was to add the zone number associated with each development and identify the different types of land use within the development. Two principle types of land were included in the Uncertainty Log of:

- E – Employment; and
- R – Residential.

The development in / out trips needed converting to full traveller segmentation so the Development Matrices could be merged with the Base Calibrated Segmented Matrices.

6.5 TEMpro Growth Factors

The second source of traffic growth was extracted from the Trip End Model Presentation Program (TEMpro) software. TEMpro provides projections of growth over time for use in local and regional transport models. Based on the outputs provided by the Department's National Trip End Model (NTEM), it presents projections of growth in planning data, car ownership, and resulting growth in trip-making by different modes under a constant cost assumption.

TEMpro includes travel by vehicles owned by households but does not include freight vehicles. Forecasts of freight traffic (available by region, road type and vehicle class) were provided by the National Transport Model (NTM).

The TEMpro 7.2 dataset was used to forecast growth at local zone level. The growth in each local traffic zone was adjusted to allow for new developments and was ultimately controlled to the TEMpro target growth total at district level.

Growth factors for cars have been applied for the periods 2016-2023, 2016-2038, and 2016-2051 for the assignment hours:

Growth factors were obtained for the four different levels of Geographic Area available in TEMpro (Region, County, Local Authority, and TEMpro Zone), forming 32 sectors which include all the traffic model zones. A breakdown of these sectors by TEMpro Geographic Area (from high to low level) is provided below:

- Regional Level: 6 sectors including the rest of the East Of England, South East, London, North East, North West, York & Humber, East Midlands, South West, West Midlands;
- Local Authority level: 13 sectors including Broadland, Norwich, South Norfolk, North Norfolk, Waveney, South Holland, Breckland, Mid Suffolk, Suffok Coastal, Ipswich, King's Lynn, Cambridge and St Edmundsbury;
- MSOA level: 13 sectors within Great Yarmouth.

Table 6.4 below shows the description of the TEMpro zones and the corresponding districts. Table 6.5 below shows the description of the districts. Growth factors extracted from TEMpro are presented in Appendix B.

6.6 Application of TEMPRO Growth

Applying TEMpro growth used a two stage process which involved firstly constraining development growth at TEMpro zone level and by purpose and time period, and then constraining to the TEMpro by District growth and by time period.

The Base Calibrated Segmented Matrices were allocated to the TEMpro zone level and the TEMPRO growth applied to provide an estimate of future year trip ends. The Development Matrices were also allocated to TEMpro zones for comparison with the matrices produced by applying TEMpro growth to the base year demand.

If the Base + Development trip ends were greater than the Base + TEMpro growth trip ends then the Base + Development trip ends were used. If the Base + Development trip ends were lower than the Base + TEMpro growth trip ends then the Base + TEMpro growth trip ends were used. The Base * TEMpro growth trip ends was mostly used as the development growth could be largely accommodated within the TEMpro growth.

These growths were then applied to the Base Calibrated Segmented Matrices and a Furness procedure was used to growth the matrix. This process controlled the overall matrix total to the Production trip end total for HB trips and an average of the Origin and Destination trip end totals for NHB purposes.

The second stage in this process was to aggregate the 2016 demand matrices to the District sector level and, now using an OD format, apply the Origin and Destination TEMpro district trip end growth by time period. This process controlled the overall matrix total to an average of the Origin and Destination trip end estimates and provided the ultimate future year growth targets. These trip ends were then applied back to the matrices created during the first stage to ensure District sector growth was controlled to TEMpro.

The headline magnitue of the matrices created within the demand build are included in Table 6.6 and Appendix C.

6.7 LGV and HGV Growth Factors

Growth factors for Light and Heavy goods vehicles were obtained from the DfT's 'Road Traffic Forecasts (RTF) 2015' document. The forecasts are produced by the ITEA division of the DfT using the National Transport Model (NTM). The NTM provides detailed growth factors at regional level. It is consistent with TEMpro 7.2.

The NTM is a multi-modal model of land-based transport in Great Britain. This provides a systematic means of comparing the national consequences of alternative national transport policies or widely-applied local transport policies, against a range of background scenarios which take into account the major factors affecting future patterns of travel. Although the NTM is essentially a passenger transport model, freight road traffic is modelled for the purpose of assessing the impact of freight vehicles on congestion.

Heavy goods vehicle traffic growth is modelled using the Great Britain Freight Model (GBFM) which takes base year data from 2004 on international and domestic freight movements for 15 different commodities. The model then grows the traffic over time by modelling the effect of changes in macroeconomic variables and also changes in generalised cost. Light goods vehicle traffic is projected by a separate time series model relating LGV kilometres in a given year to the levels of GDP and fuel price.

The growth figures are central forecasts and represent percentage changes on base year values.

Goods vehicle growth was applied at a regional level as outlined in TAG. These growth factors are presented in detail in Table 6.7 below.

Table 6-4 TEMpro Zones and Districts

Description	TEMPRO sector	District	Region
Great Yarmouth 006 (E02005543)	1	3	East of England
Great Yarmouth 005 (E02005542) 002 (E02005539)	2	3	East of England
Great Yarmouth 004 (E02005541)	3	3	East of England

Description	TEMPRO sector	District	Region
Great Yarmouth 003 (E02005540)	4	3	East of England
Great Yarmouth 007 (E02005544) 006 (E02005543)	5	3	East of England
Great Yarmouth 008 (E02005545)	6	3	East of England
Great Yarmouth 009 (E02005546)	7	3	East of England
Great Yarmouth 010 (E02005547)	8	3	East of England
Great Yarmouth 011 (E02005548) 013 (E02005550)	9	3	East of England
Great Yarmouth 013 (E02005550) 012 (E02005549)	10	3	East of England
Waveney 001 (E02006302)	11	5	East of England
Great Yarmouth 001 (E02005538)	12	3	East of England
Great Yarmouth 002 (E02005539)	13	3	East of England
Broadland	14	1	East of England
Norwich	15	8	East of England
South Norfolk	16	2	East of England
North Norfolk	17	4	East of England
Waveney	18	5	East of England
South Holland	19	11	UK
Breckland	20	6	East of England
Mid Suffolk	21	9	UK
Suffolk Coastal	22	9	UK
Ipswich	23	9	UK
King's Lynn and West Norfolk	24	7	East of England
Cambridge	25	9	UK
St Edmundsbury	26	9	UK
LON	27	10	London
Parts of SE	28	9	UK
Parts of SE	29	9	UK
SW and Parts of SE	30	9	UK
Midlands	31	11	UK
North	32	12	UK

Table 6-5 District Sectors

District	Description
1	Broadland
2	South Norfolk
3	Great Yarmouth
4	North Norfolk
5	Waveney
6	Breckland
7	King's Lynn and West Norfolk
8	Norwich
9	EAST_Other, SE, SW
10	LON
11	Midlands
12	North

Table 6-6 24 Hour Person Trips by Purpose

Total	Format	2016	2023	2038	2051
HBW	PA	22,987	23,968	25,565	27,100
HBE	PA	11,082	12,437	14,575	15,972
HBO	PA	81,416	87,613	97,698	107,447
HBB	PA	3,194	3,398	3,703	3,981
NHBO	OD	50,663	54,217	60,511	66,313
NHBEB	OD	8,190	8,545	9,151	9,822
SUM		177,532	190,178	211,203	230,635

Table 6-7 NTM 2015 LGV and HGV Growth

Region	Growth Index					
	2016 - 2023		2016 - 2038		2016 - 2051	
	LGV	HGV	LGV	HGV	LGV	HGV
NE	1.193063	1.042511	1.563358	1.138111	1.864859	1.235616
YH	1.197082	1.055795	1.566085	1.190991	1.863413	1.318322
EM	1.193552	1.044099	1.570194	1.172611	1.875755	1.297795
EAST	1.192362	1.082057	1.565935	1.266764	1.872878	1.445825
SE	1.192276	1.081954	1.565752	1.266934	1.871239	1.444456
LON	1.196427	1.06801	1.561538	1.229971	1.852835	1.385508
SW	1.192609	1.051572	1.566468	1.163316	1.872533	1.27806
WM	1.195174	1.064478	1.566302	1.210832	1.868219	1.351477
NW	1.193993	1.054671	1.562622	1.187055	1.861114	1.311848

Region	Growth Index					
	2016 - 2023		2016 - 2038		2016 - 2051	
	LGV	HGV	LGV	HGV	LGV	HGV
WALES	1.192319	1.06527	1.564265	1.216416	1.869366	1.359503

6.8 Forecast Matrix Totals

Overall assignment matrix totals are presented in Table 6-8.

Table 6-8 Assignment Matrices plus Development Matrices by Time Period – Core (PCU)

Category		2016	2023	2038	2051	% Difference		
						2016 to 2023	2016 to 2038	2016 to 2051
AM Peak								
1	Emp Bus.	868	919	1,001	1,077	6%	15%	24%
2	Commute	5,114	5,371	5,791	6,168	5%	13%	21%
3	Other	7,895	8,652	9,973	11,012	10%	26%	39%
4	LGV	2,453	2,925	3,840	4,592	19%	57%	87%
5	HGV	1,318	1,423	1,661	1,892	8%	26%	44%
Total		17,648	19,290	22,267	24,741	9%	26%	40%
Development		-	1,642	4,218	4,218			
Background		-	17,648	18,049	20,523			
Inter Peak								
1	Emp Bus.	950	1,005	1,094	1,174	6%	15%	24%
2	Commute	1,507	1,574	1,685	1,776	4%	12%	18%
3	Other	9,967	10,982	12,759	14,008	10%	28%	41%
4	LGV	1,875	2,236	2,936	3,511	19%	57%	87%
5	HGV	1,249	1,348	1,573	1,791	8%	26%	43%
Total		15,549	17,145	20,047	22,260	10%	29%	43%
Development		-	1,596	3,835	3,835			
Background		-	15,549	16,212	18,425			
PM Peak								
1	Emp Bus.	895	946	1,031	1,106	6%	15%	24%
2	Commute	4,605	4,823	5,190	5,495	5%	13%	19%
3	Other	10,082	10,992	12,595	13,802	9%	25%	37%
4	LGV	2,093	2,496	3,277	3,919	19%	57%	87%
5	HGV	745	806	942	1,074	8%	26%	44%
Total		18,420	20,063	23,035	25,396	9%	25%	38%
Development		-	1,643	4,414	4,414			
Background		-	18,420	18,621	20,982			
Daily								
1	Emp Bus.	11,447	12,110	13,188	14,160	6%	15%	24%
2	Commute	39,787	41,691	44,843	47,541	5%	13%	19%
3	Other	118,492	130,046	150,293	165,119	10%	27%	39%
4	LGV	25,922	30,911	40,586	48,535	19%	57%	87%
5	HGV	14,248	15,384	17,959	20,455	8%	26%	44%
Total		209,902	230,143	266,871	295,809	10%	27%	41%
Development			20,240	50,949	50,949			
Background			209,903	215,922	244,860			

6.9 Sensitivity Test Inputs

As described previously, variants around the core scenario have been developed as follows:

- Low Demand Growth; and
- High Demand Growth

As well as including national growth variation the same tests also included pessimistic development growth for the low test and optimistic development growth for the high growth test. Development trips are input according to the assumptions outlined in Chapter 4 where pessimistic developments are scaled back and or removed and optimistic developments are advanced. The respective TEMPRO growth target (low or high) is maintained in each case. Tables 6.9 and 6.10 present the low and high growth respectively.

Table 6-9 Low Growth & Pessimistic Development Trips (PCU)

Category		2016	2023	2038	2051	% Difference		
						2016 to 2023	2016 to 2038	2016 to 2051
AM Peak								
1	Emp Bus.	868	862	900	949	-1%	4%	9%
2	Commute	5,114	5,033	5,191	5,411	-2%	2%	6%
3	Other	7,895	8,130	9,047	9,844	3%	15%	25%
4	LGV	2,453	2,762	3,553	4,230	13%	45%	72%
5	HGV	1,318	1,336	1,507	1,697	1%	14%	29%
Total		17,648	18,123	20,197	22,131	3%	14%	25%
Development		-	1,534	3,724	3,594			
Background		-	16,589	16,473	18,537			
Inter Peak								
1	Emp Bus.	950	942	982	1033	-1%	3%	9%
2	Commute	1,507	1,474	1,508	1,553	-2%	0%	3%
3	Other	9,967	10,323	11,590	12,534	4%	16%	26%
4	LGV	1,875	2,112	2,716	3,234	13%	45%	72%
5	HGV	1,249	1,265	1,426	1,606	1%	14%	29%
Total		15,549	16,116	18,224	19,960	4%	17%	28%
Development		-	1,491	3,386	3,267			
Background		-	14,625	14,838	16,693			
PM Peak								
1	Emp Bus.	895	887	926	974	-1%	3%	9%
2	Commute	4,605	4,519	4,650	4,814	-2%	1%	5%
3	Other	10,082	10,325	11,413	12,311	2%	13%	22%

Category		2016	2023	2038	2051	% Difference		
						2016 to 2023	2016 to 2038	2016 to 2051
4	LGV	2,093	2,357	3,032	3,610	13%	45%	72%
5	HGV	745	757	855	964	2%	15%	29%
Total		18,420	18,845	20,875	22,672	2%	13%	23%
Development		-	1,535	3,898	3,761			
Background		-	17,310	16,977	18,911			
Daily								
1	Emp Bus.	11,447	11,353	11,844	12,466	-1%	3%	9%
2	Commute	39,787	39,059	40,174	41,655	-2%	1%	5%
3	Other	118,492	122,211	136,397	147,595	3%	15%	25%
4	LGV	25,922	29,193	37,548	44,707	13%	45%	72%
5	HGV	14,248	14,441	16,288	18,346	1%	14%	29%
Total		209,902	216,258	242,257	264,766	3%	15%	26%
Development			18,904	44,988	43,409			
Background			197,354	197,269	221,357			

Table 6-10 High Growth & Optimistic Development Trips (PCU)

Category		2016	2023	2038	2051	% Difference		
						2016 to 2023	2016 to 2038	2016 to 2051
AM Peak								
1	Emp Bus.	868	977	1,103	1,205	13%	27%	39%
2	Commute	5,114	5,710	6,391	6,924	12%	25%	35%
3	Other	7,895	9,174	10,898	12,180	16%	38%	54%
4	Emp Bus.	2,453	3,087	4,128	4,955	26%	68%	102%
5	Commute	1,318	1,510	1,816	2,087	15%	38%	58%
Total		17,648	20,458	24,336	27,351	16%	38%	55%
Development		-	1,750	4,712	4,842			
Background		-	18,708	19,624	22,509			
Inter Peak								
1	Emp Bus.	950	1,068	1,205	1,315	12%	27%	38%
2	Commute	1,507	1,674	1,862	1,999	11%	24%	33%
3	Other	9,967	11,641	13,928	15,482	17%	40%	55%
4	LGV	1,875	2,360	3,156	3,788	26%	68%	102%
5	HGV	1,249	1,431	1,719	1,975	15%	38%	58%
Total		15,549	18,173	21,870	24,560	17%	41%	58%
Development		-	1,701	4,284	4,403			
Background		-	16,472	17,586	20,157			
PM Peak								

Category		2016	2023	2038	2051	% Difference		
						2016 to 2023	2016 to 2038	2016 to 2051
1	Emp Bus.	895	1,005	1,135	1,239	12%	27%	38%
2	Commute	4,605	5,128	5,730	6,176	11%	24%	34%
3	Other	10,082	11,659	13,777	15,293	16%	37%	52%
4	LGV	2,093	2,634	3,523	4,229	26%	68%	102%
5	HGV	745	855	1,029	1,184	15%	38%	59%
Total		18,420	21,281	25,195	28,121	16%	37%	53%
Development		-	1,751	4,930	5,067			
Background		-	19,530	20,265	23,054			
Daily								
1	Emp Bus.	11,447	12,869	14,525	15,857	12%	27%	39%
2	Commute	39,787	44,327	49,511	53,426	11%	24%	34%
3	Other	118,492	137,882	164,186	182,644	16%	39%	54%
4	LGV	25,922	32,624	43,629	52,369	26%	68%	102%
5	HGV	14,248	16,328	19,627	22,557	15%	38%	58%
Total		209,902	244,025	291,481	326,859	16%	39%	56%
Development			21,576	56,910	58,489			
Background			222,449	234,571	268,370			

7 Core Scenario Outputs

7.1 Introduction

This section provides a summary of the model outputs used to assess the DM and DS Network Configuration performance when combined with the various travel Scenarios. It also contains details of key model statistics that are later used in the appraisal process.

7.2 Model Convergence

Convergence is the measure used to determine model stability during the assignment process. A suitably converged model can be expected to produce consistent outputs with minimal model noise.

The convergence criteria recommended in TAG are given in Table 7-1 below.

Table 7-1 TAG Convergence Criteria

Measure of Convergence	Base Model Acceptable Values
Delta and % Gap	less than 0.1% or at least stable with convergence fully documented and all other criteria met
percentage of links with flow change (P) < 1%	four consecutive iterations greater than 98%
percentage of links with cost change (P2) < 1%	four consecutive iterations greater than 98%
Percentage change in total user costs (V)	Four consecutive iterations > 0.1%

Details of the model performance are included in Appendix D.

The statistics show that all three models for each time period reached convergence within between 15 and 157 assignment iterations. These ensure that both fixed demand and variable demand forecasting outputs are consistent and sufficiently stable.

Demand / Supply convergence has been described in the Variable Demand Model Report[4]. The model was deemed converged when a %GAP of less 0.1 is achieved.

7.3 Tabular and Graphical Highway Network Summary Statistics

The following summary highway network tabular and graphical information is provided:

[4] 1076653/MOU/GEN/XX/TN/TP/0004

1. total number of assigned trips;
2. total network travelled distance as vehicle kilometres;
3. total network travelled time as vehicle hours; and
4. average network speeds.

Modelled flows and link travel times in the vicinity of the TRC scheme, comparing the DM and the DS, are also plotted against a simple network background. Plots of the AADT flow difference between the DM and DS are also provided to further indicate the impact of the scheme. Tables and plots of forecast flows for key parts of the highway network within the study area are also appended.

7.4 Scenarios Reported

The following scenarios are reported:

- Core scenario (TEMPRO V7.2)

7.5 Core Scenario

The TRC flow volumes and traffic relief across the River Screenline (see Figure 7-1) is demonstrated in Table 7.2 below.

Figure 7-1 River Screenline

Table 7-2 River Screenline Traffic Relief - Fixed Demand

Road	2016	2023 DM	2038 DM	2051 DM	2023 DS	2038 DS	2051 DS	2023 DS Harfrey	2038 DS Harfrey	2051 DS Harfrey
AADT Flows										
A12	31,798	35,213	35,845	35,616	32,292	34,422	34,577	32,023	34,310	34,634
Bridge Road	21,684	26,890	34,165	36,303	12,964	19,893	22,664	12,189	17,091	19,218
TRC	0	0	0	0	18,581	22,729	27,237	19,781	26,043	31,904
Sum	53,483	62,103	70,010	71,919	63,837	77,044	84,478	63,992	77,443	85,756
Flow Change										
		Increase from Base	Increase from DM 2023	Increase from DM 2038	Increase from DM 2023	Increase from DM 2038	Increase from DM 2051	Increase from DM 2023	Increase from DM 2038	Increase from DM 2051
A12		11%	2%	-1%	-8%	-4%	-3%	-9%	-4%	-3%
Bridge Road		24%	27%	6%	-52%	-42%	-38%	-55%	-50%	-47%
TRC										
Sum		16%	13%	3%	3%	10%	17%	3%	11%	19%

Traffic volumes increase on Bridge Road with each successive forecast year in the DM. The traffic volume on the A12 Bridge shows limited growth beyond 2023 indicating that the route will have reached capacity.

The TRC opening has the greatest impact on traffic volumes on Bridge Road. Traffic on this alignment shows growth year-on-year indicating sufficient route capacity for continued growth.

All DS scenarios show an increase in flow volume across the Bridge Screenline as traffic held within queues is released, resultant from the additional network capacity.

7.6 Network Performance

Travel time and distance are reported in Figures 7-2 and 7-3. Speeds are shown in Figure 7-4. Traffic patterns show declining speed across the modelled area into the future. Inter-Peak networks operate at a higher speed and the PM peak operates at the lowest speed. All figures are included in Table 7-2. The introduction of the TRC (DS) positively impacts the network in each case.

Figure 7-2 Travel Distance by Scenario Fixed Demand

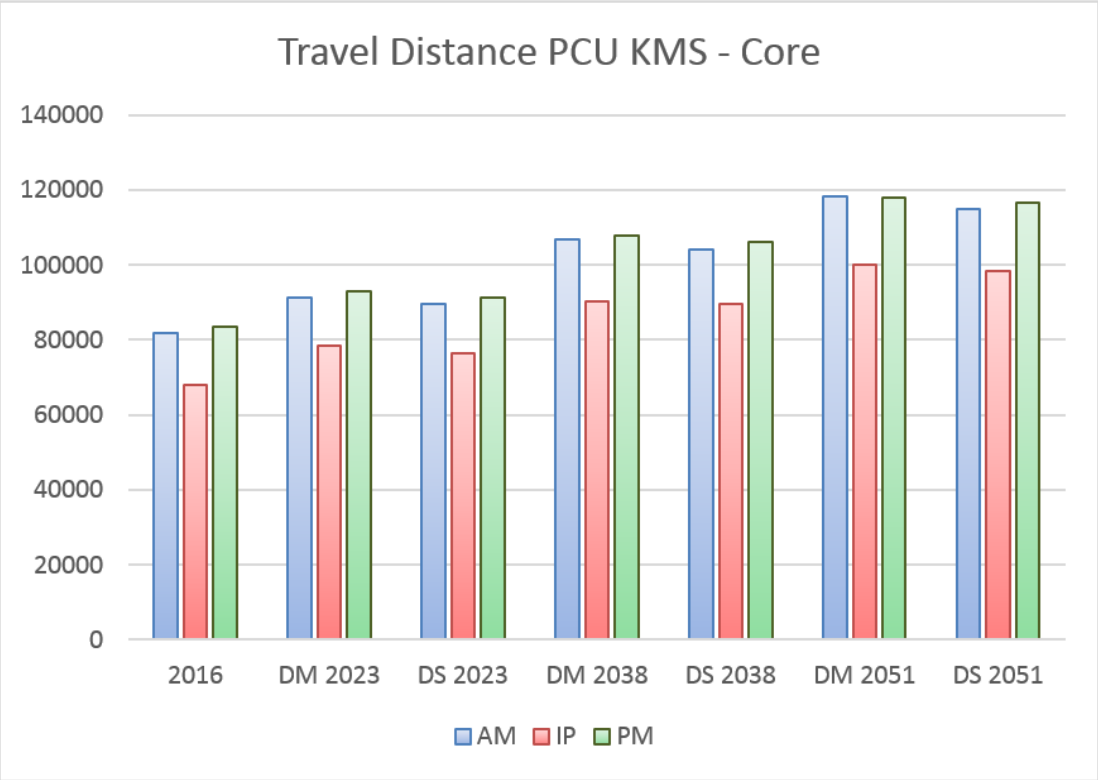


Figure 7-3 Travel Time by Scenario – Fixed Demand

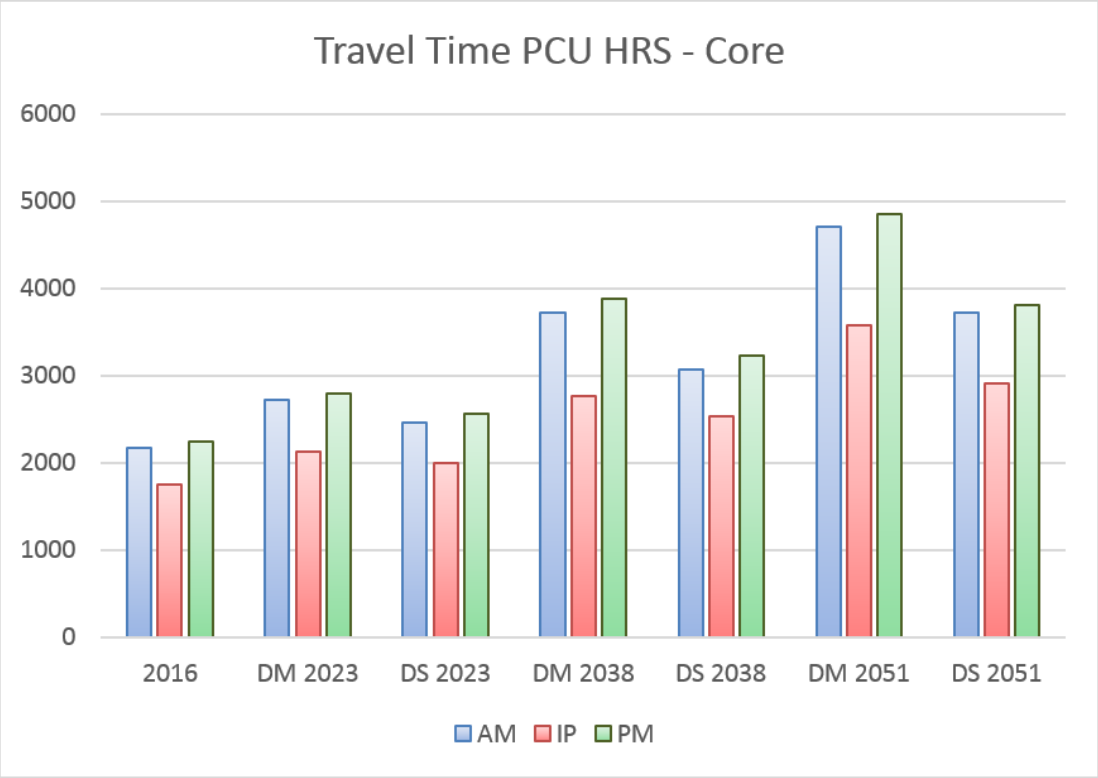


Figure 7-4 Travel Speed by Scenario- Fixed Demand

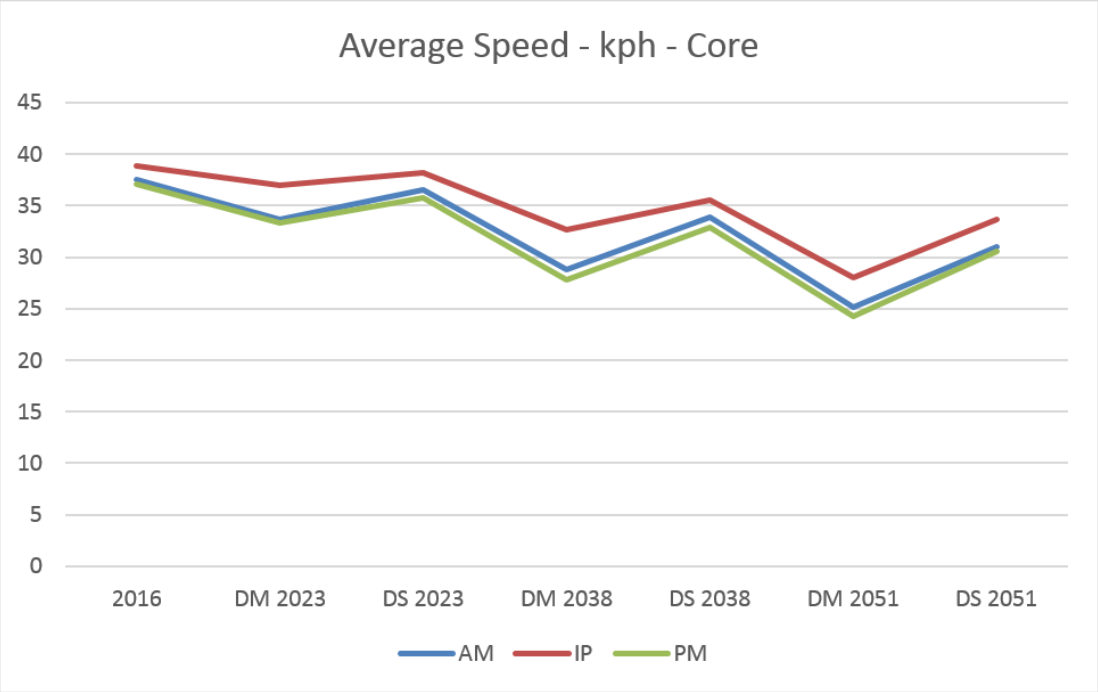


Table 7-3 Core Area Assignment – Fixed Demand

Attribute	2016	DM 2023	DS 2023	DM 2038	DS 2038	DM 2051	DS 2051
PCU KMS							
AM	81,670	91,399	89,681	106,841	103,907	118,175	115,016
IP	68,000	78,515	76,384	90,287	89,602	99,952	98,344
PM	83,392	93,051	91,280	107,610	105,971	117,793	116,510
PCU HRS							
AM	2,176	2,715	2,459	3,716	3,066	4,712	3716
IP	1,746	2,123	1,999	2,759	2,526	3,576	2,914
PM	2,250	2,793	2,559	3,874	3,222	4,847	3,807
Speed kph							
AM	38	34	37	29	34	25	31
IP	39	37	38	33	36	28	34
PM	37	33	36	28	33	24	31

7.7 Traffic Patterns

The increase in traffic flow due to fixed demand growth assignment for 2023, 2038 and 2051 are included in Appendix E. Heaviest growth occurs on the A12 corridor from the south of the town with the A1243 Bridge Road also showing heavy growth through the forecast years.

Traffic relief resulting from the TRC occurs in the areas expected, namely the northern sections of the A12, the A1243 and the A149 from the A47 into the Town Centre.

7.8 Matrix Values

The reference matrix is compressed into 10 sectors, included in Appendix F.

8 Variable Demand Model Outputs

8.1 Introduction

This section provides the results of the Variable Demand forecasting process whereby the previously unconstrained demand forecasts are modified in response to future changes in travel costs to create the constrained demand forecasts. Iterations of the demand/ supply loop continue until these converge to a stable solution.

This chapter reports the following:

- Core Scenario;

Given the large number of the forecast runs and statistics only the Core scenario results are described in detail. However overall impacts for Low and High growth alternatives and sensitivity tests are also included later in the report.

8.2 Flow Impacts

Traffic flow on the TRC and traffic relief on the other River Crossings is indicated below in Table 8-1. Significant trip growth on the TRC can be seen in comparison to the fixed demand assignment. In comparison, the other bridges show limited change. The trip growth is the result of traffic induction where cost change in the DS relative to the DM results in additional journey opportunities across the river.

Table 8-1 River Screenline Traffic Relief VDM

Road	2016	2023 DM	2038 DM	2051 DM	2023 DS	2038 DS	2051 DS
AADT Flows							
A12	31,798	34,846	35,713	35,499	32,208	34,389	34,677
Bridge Road	21,684	26,186	32,711	35,162	13,458	19,941	22,619
TRC	N/A	N/A	N/A	N/A	20,114	24,140	27,920
Sum	53,483	61,032	68,424	70,661	65,781	78,470	85,215
Flow Change							
		Increase from Base	Increase from DM 2023	Increase from DM 2038	Increase from DM 2023	Increase from DM 2038	Increase from DM 2051
A12		10%	2%	-1%	-8%	-4%	-2%
Bridge Road		21%	25%	7%	-49%	-39%	-36%
TRC		N/A	N/A	N/A	N/A	N/A	N/A
Sum		14%	12%	3%	8%	15%	21%

Appendix G includes VDM flow difference plots demonstrating the catchment area of the TRC and the flow relief afforded by the scheme.

8.3 Matrix Changes

The Variable Matrix runs involve Demand Model matrix changes in response to changes in travel cost as predicted by the highway Supply Model. As such, before any network information is considered, it is first important to understand the changes to the travel matrices output from the converged demand / supply model looping.

Appendix H provides vehicle highway matrix totals for all permutations of Scenario, Network Configuration, year and period, and for the three model User Classes of:

- Car Commute;
- Car Other;
- Car EB;

It should be noted that LGV and HGV are not subject to the demand model and are therefore not reported.

The Vehicle totals are reported for the Unconstrained (input) and Constrained (output) matrices for both DM and DS. Sectorised outputs by time period and daily are included. The locations of the sectors are given in Figure 8-1 and Table 8-2 below.

Flow changes by sector are also reported in a subsequent set of tables.

Figure 8-1 VDM Sectors

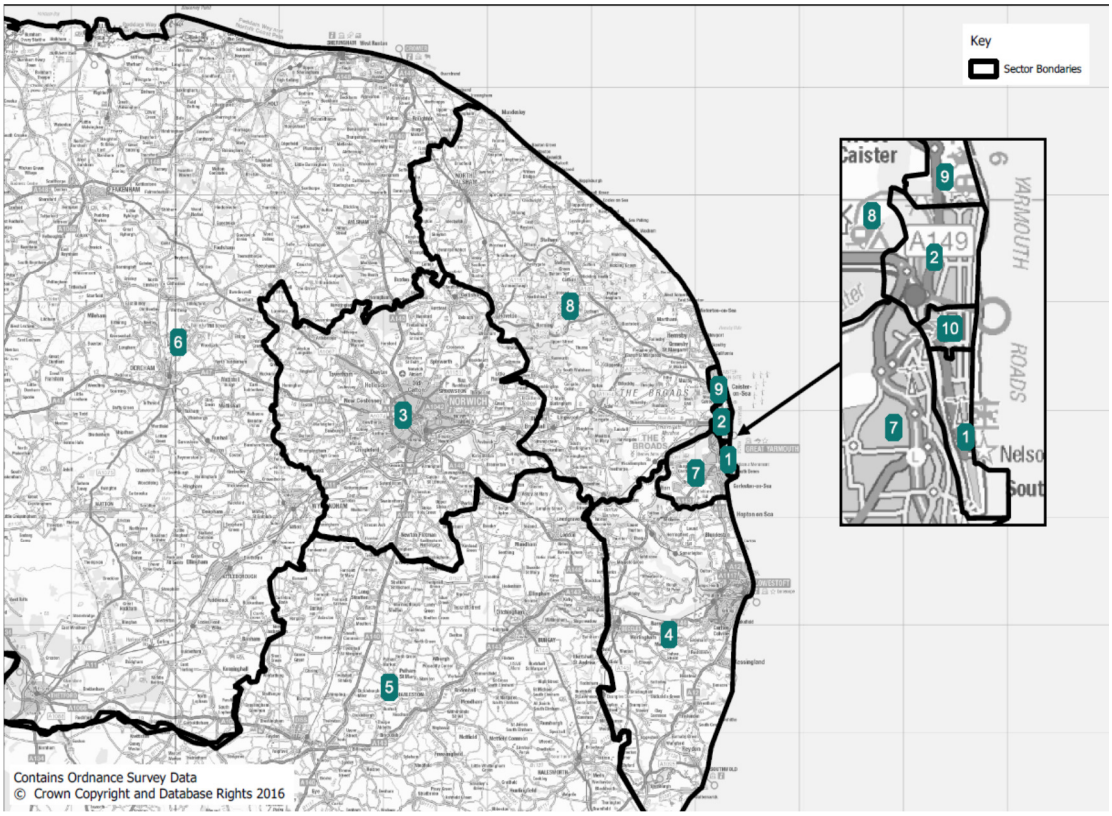


Table 8-2 VDM Sectors

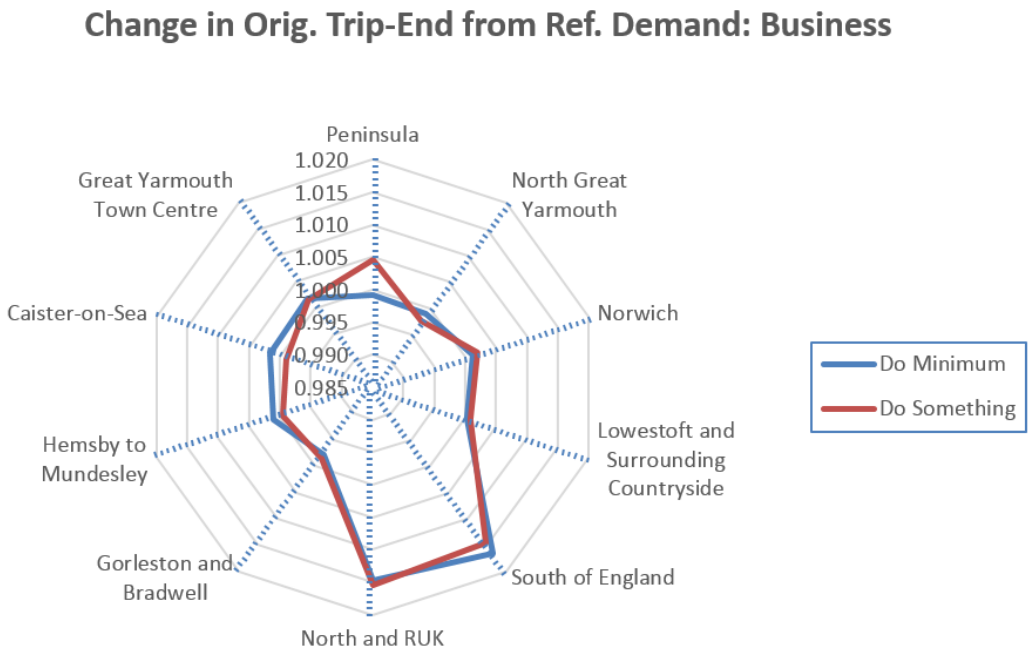
District	Description
1	Peninsula
2	North Great Yarmouth
3	Norwich
4	Lowestoft and Surrounding Countryside
5	South of England
6	North and RUK
7	Gorleston and Bradwell
8	Hemsby to Mundesley
9	Caister-on-Sea
10	Great Yarmouth Town Centre

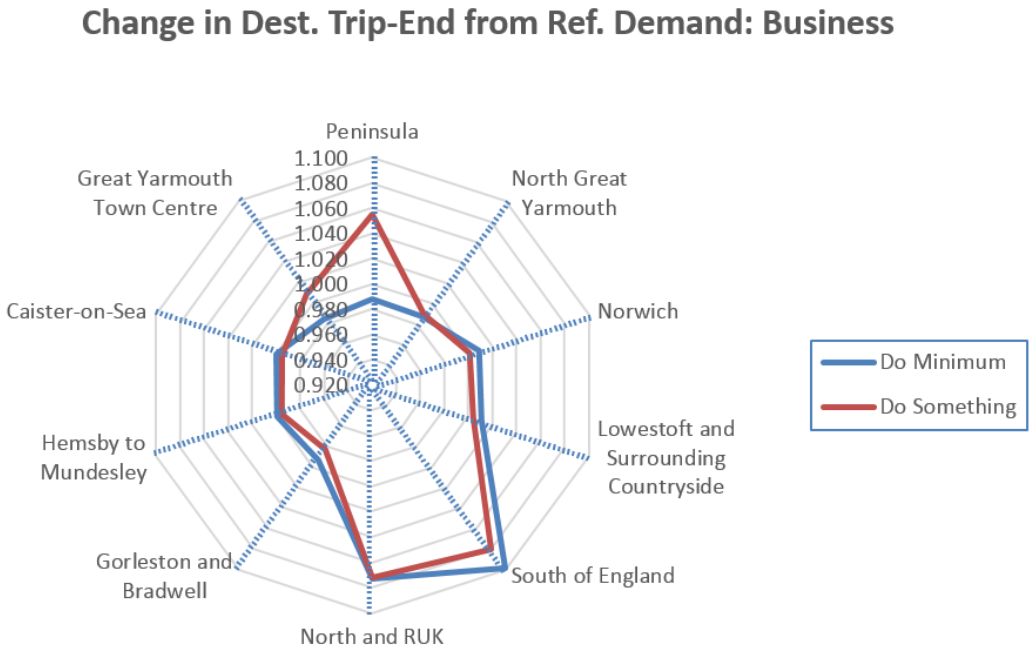
Figures 8-2, 8-3 and 8-4 below show constrained matrix change at a sector level. The diagrams demonstrate daily origins and destinations by sector in terms of trip induction or suppression from reference, for both DM and DS. Figures less than 1.00 indicate suppression for a sector and in excess of 1.00 indicates induction.

Figure 8-2 considers the 2023 models. For all car user classes, there is trip induction in the DM compared to the base in Sectors representing the wider South and North of England. In general the longer distance movements experience a slight cost reduction within the demand model pivot, leading to a modest gain in trips. This is facilitated by DM network changes relative to the change in trips. In addition, in the DS compared to the DM, there is trip induction in the Sector representing the Peninsula. “Other” trip purposes are impacted the most, correctly reflecting the relative sensitivity of this user class. Business trips are impacted the least.

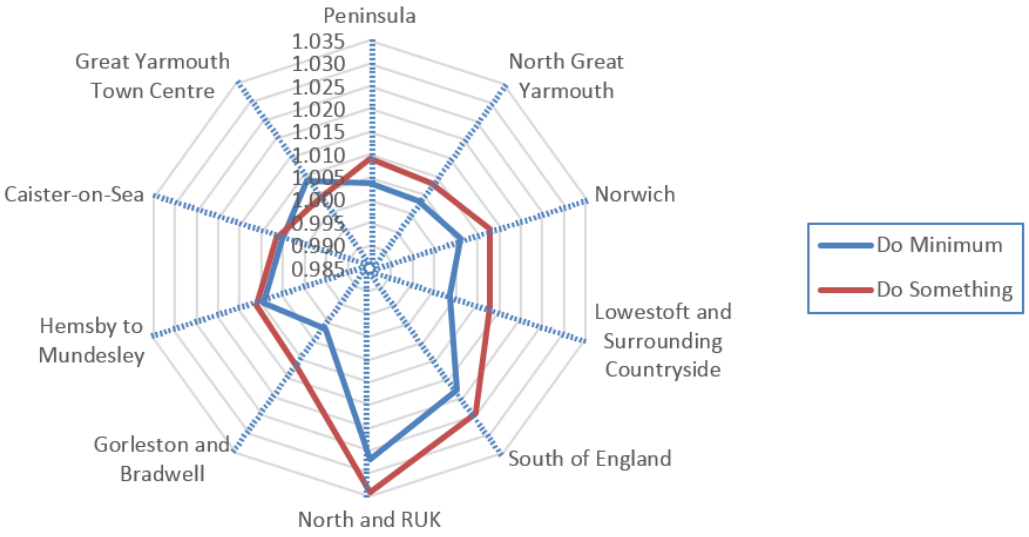
Figures 8-3 and 8-4 consider the 2038 and 2051 models respectively. Patterns of trip change between reference and VDM scenario are similar to 2023, with the level of trip induction in the DS being generally greater, reflective of the increased network provision. The raised induction levels for longer distance movement stem from the changing mix of time and distance components within generalised cost over the forecast horizon.

Figure 8-2 Constrained Matrix Changes at Sector Trip End Level – 2023

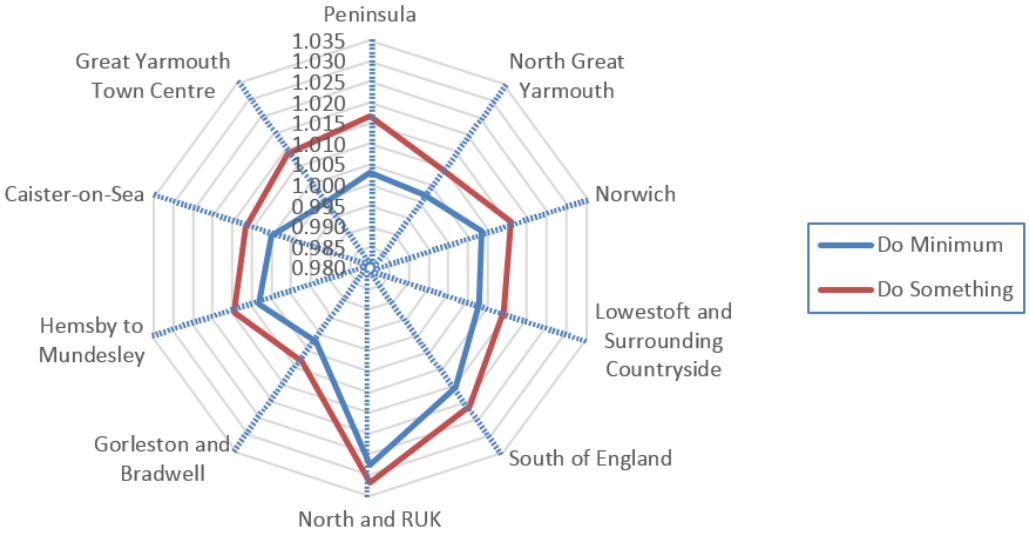




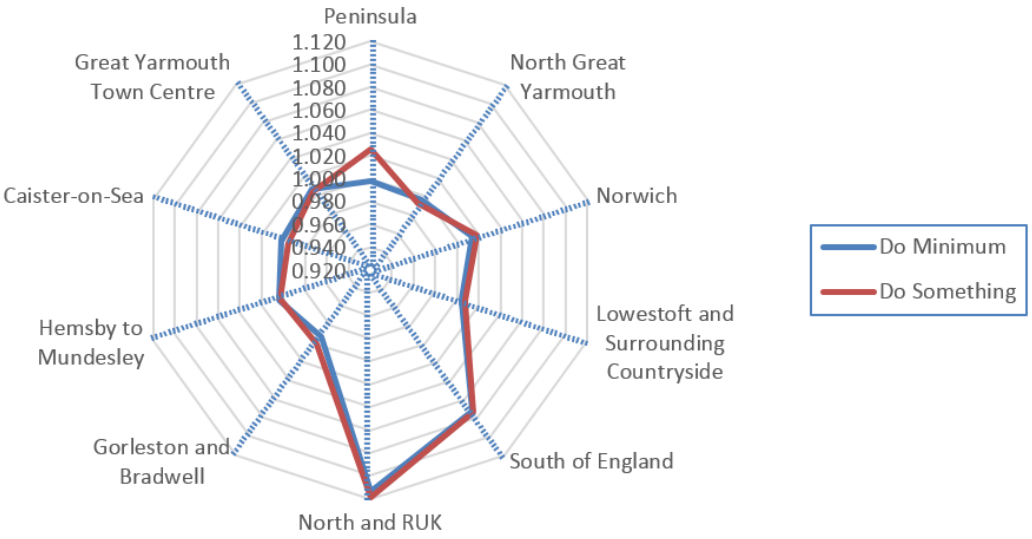
Change in Orig. Trip-End from Ref. Demand: Commute



Change in Dest. Trip-End from Ref. Demand: Commute



Change in Orig. Trip-End from Ref. Demand: Other



Change in Dest. Trip-End from Ref. Demand: Other

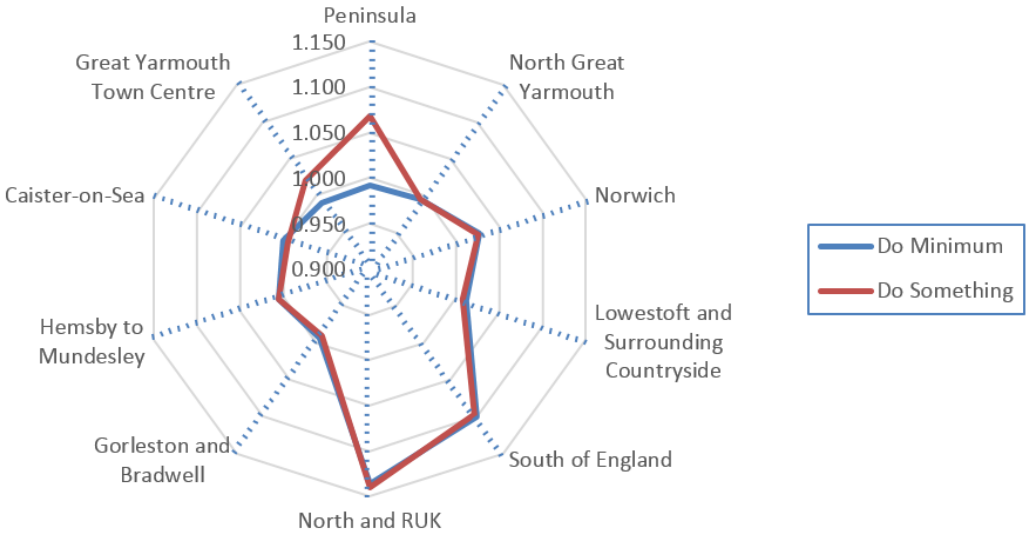
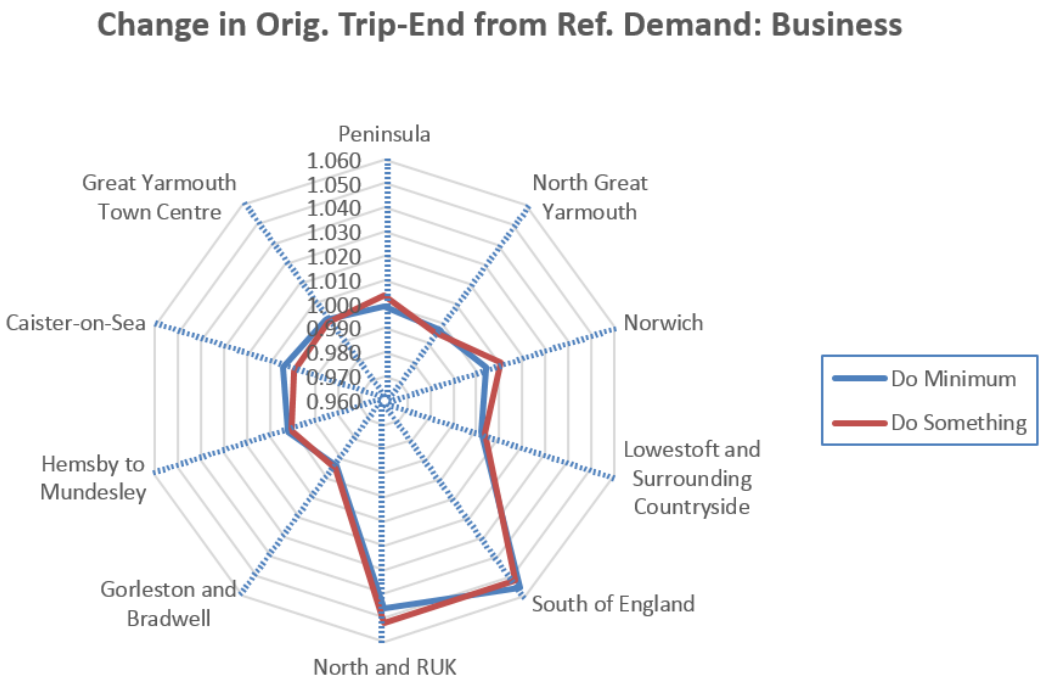
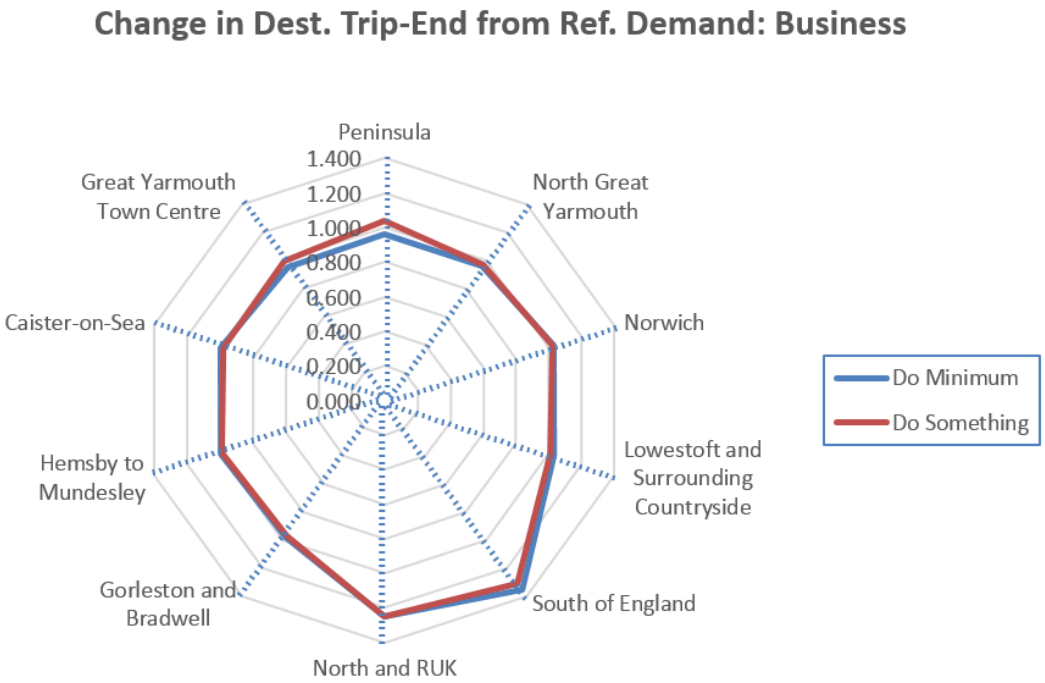
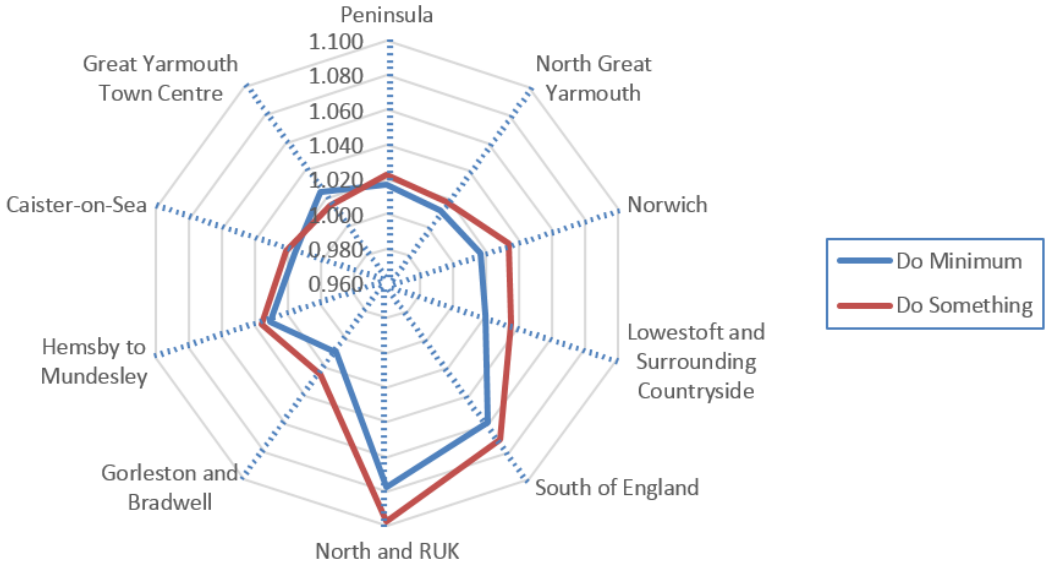


Figure 8-3 Constrained Matrix Changes at Sector Trip End Level – 2038

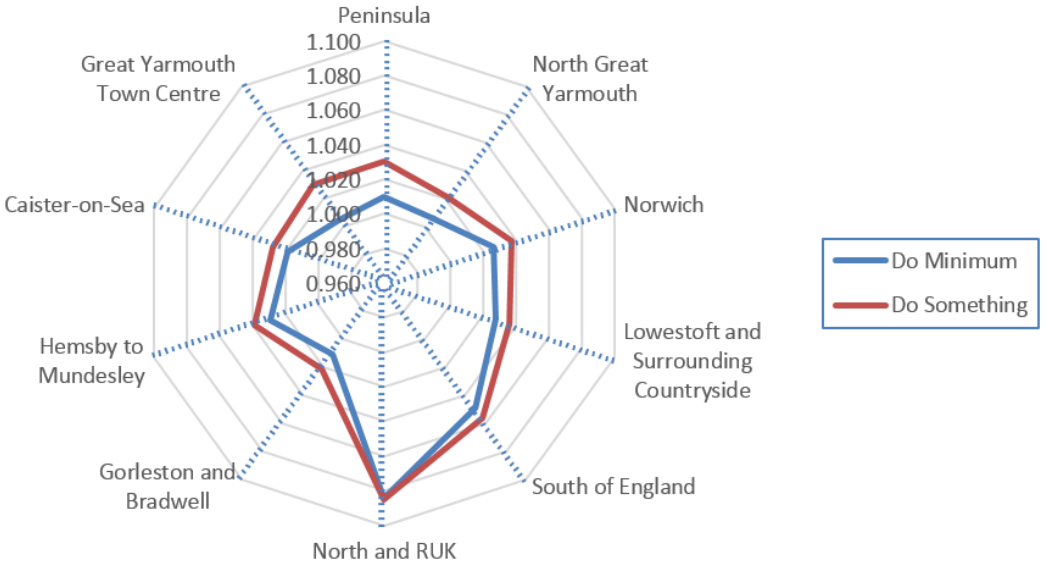




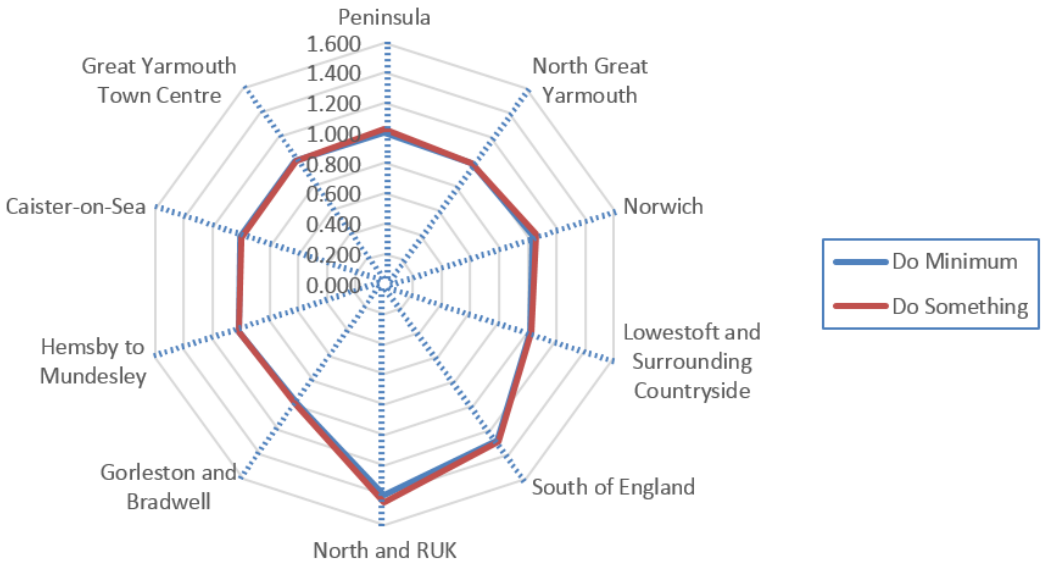
Change in Orig. Trip-End from Ref. Demand: Commute



Change in Dest. Trip-End from Ref. Demand: Commute



Change in Orig. Trip-End from Ref. Demand: Other



Change in Dest. Trip-End from Ref. Demand: Other

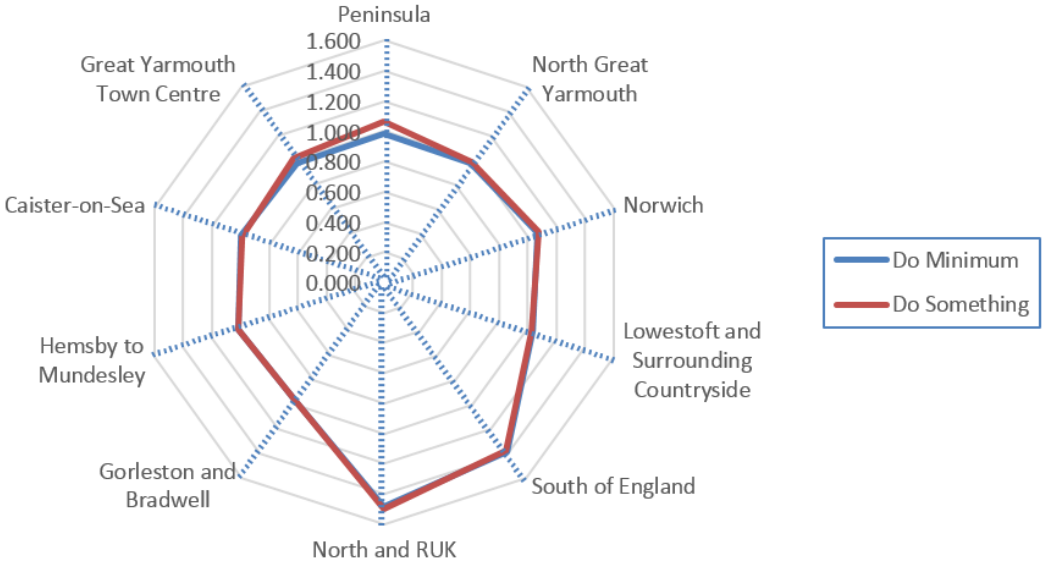
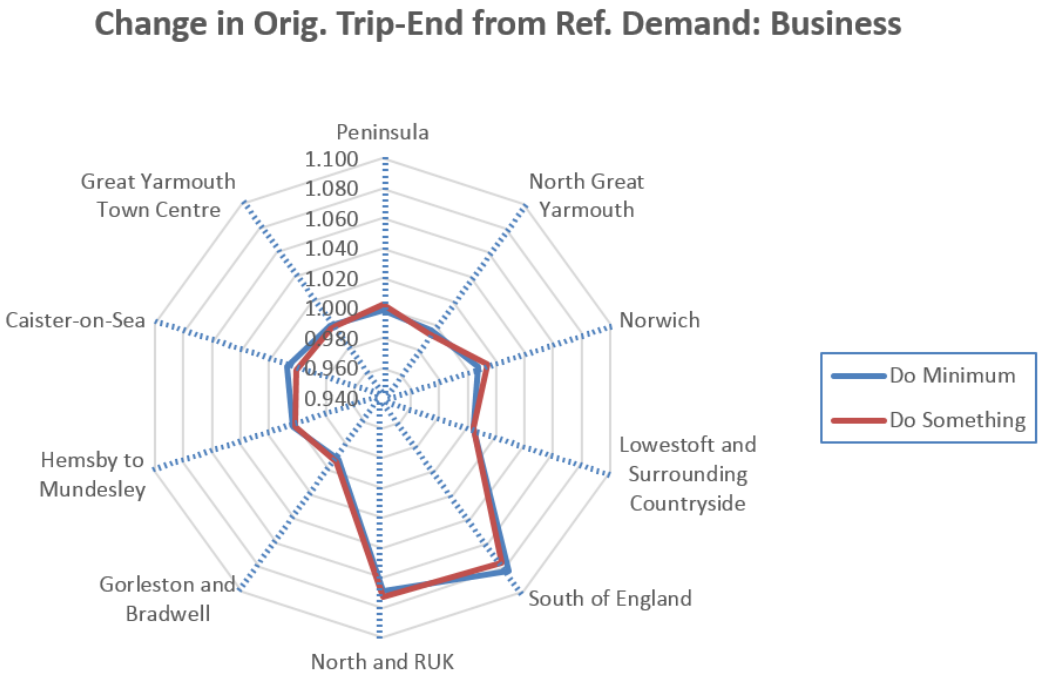
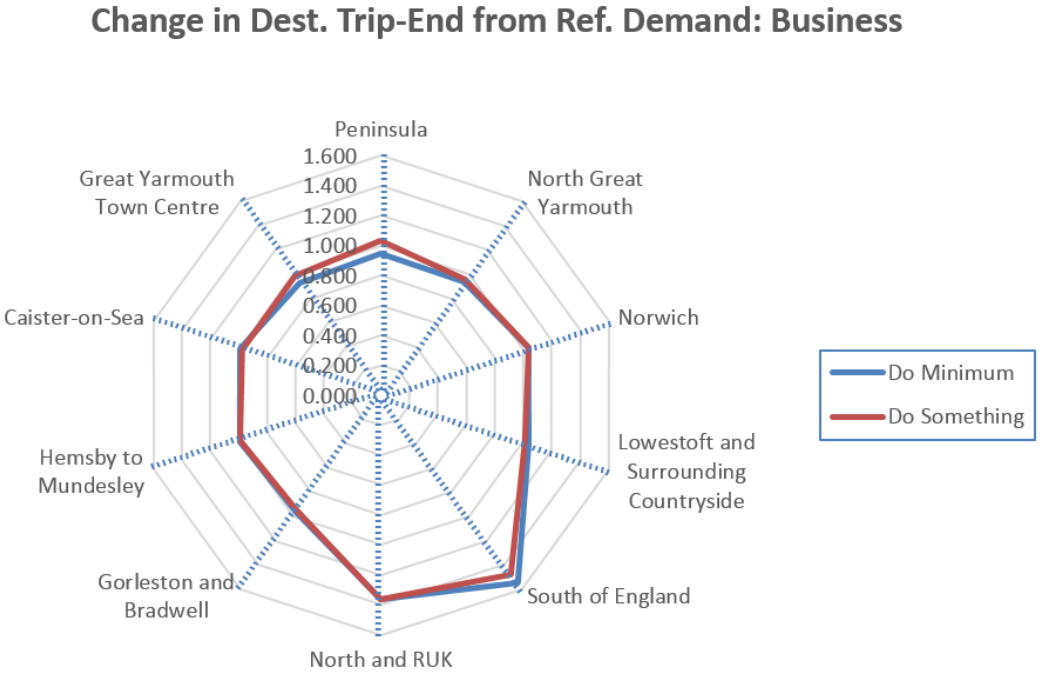
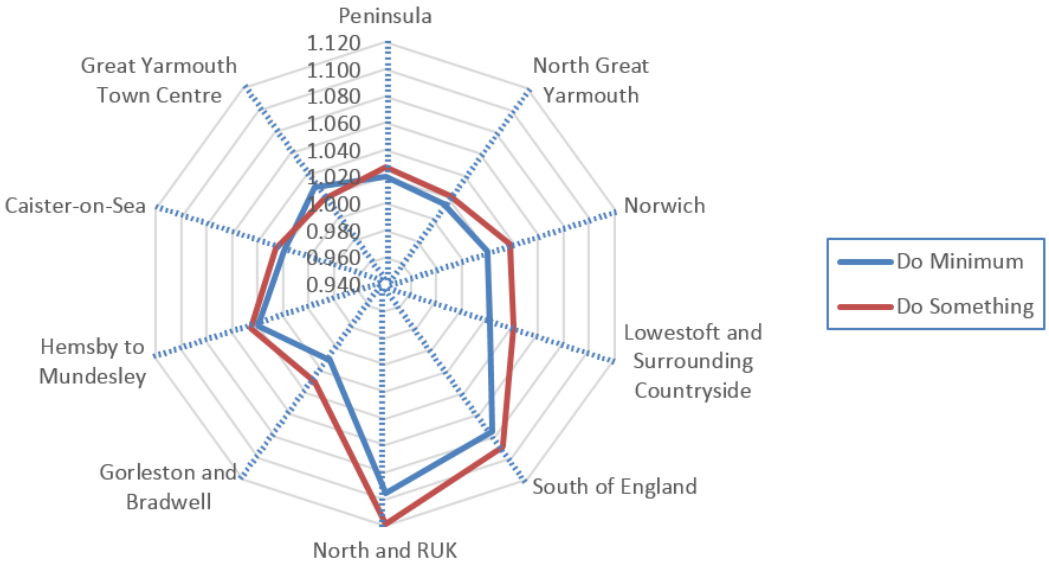


Figure 8-4 Constrained Matrix Changes at Sector Trip End Level – 2051

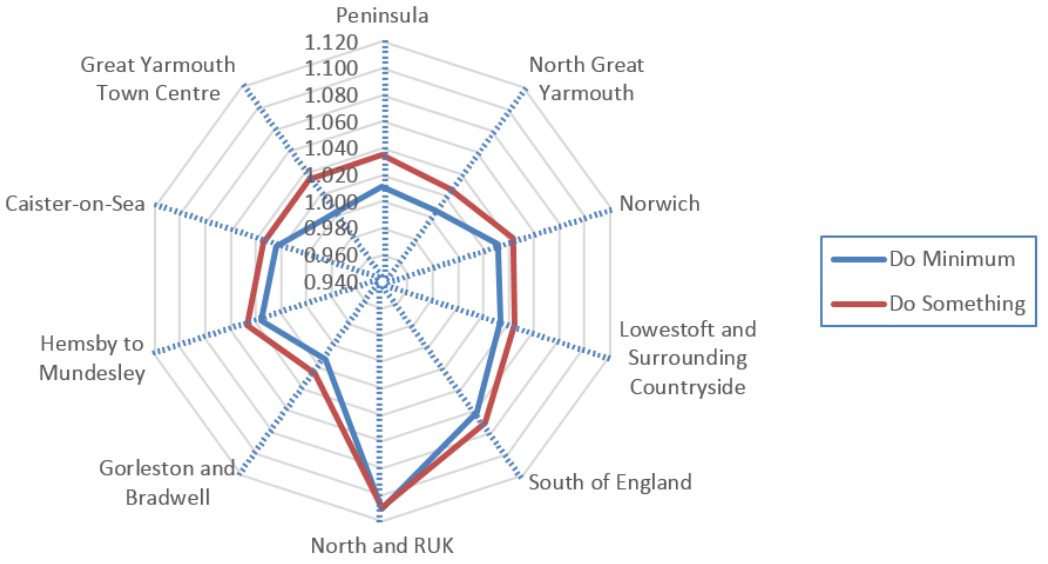


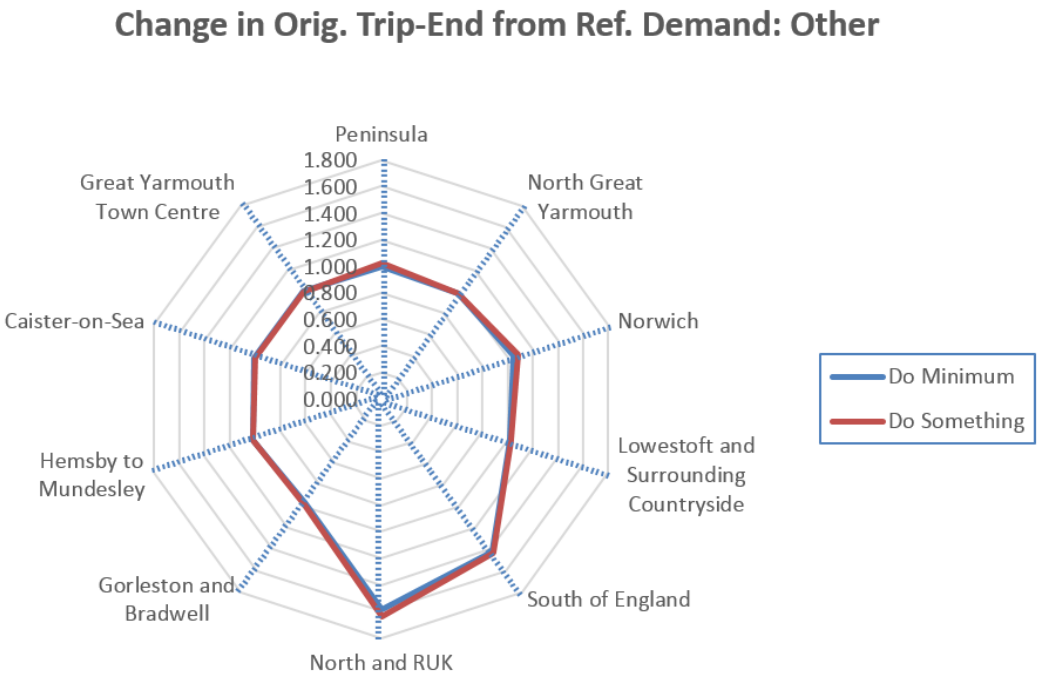


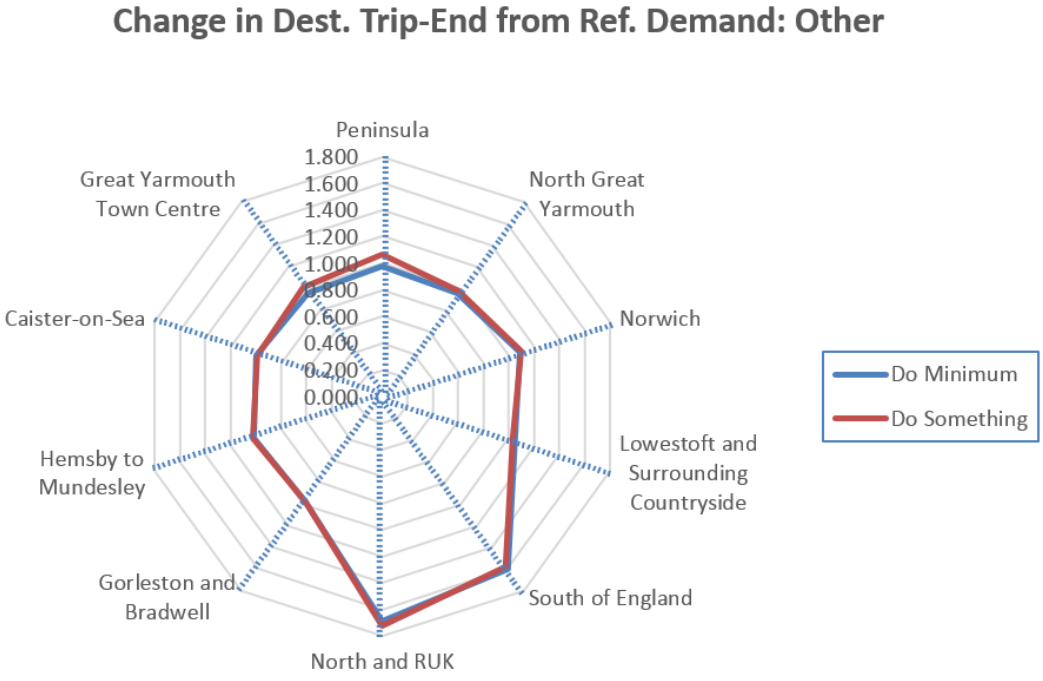
Change in Orig. Trip-End from Ref. Demand: Commute



Change in Dest. Trip-End from Ref. Demand: Commute







8.4 Network Statistics

The following table and figures indicates how the total travel distance varies between the separate forecasts, for all three time period models.

Figure 8-4 Total Travel Distance - Variable Demand

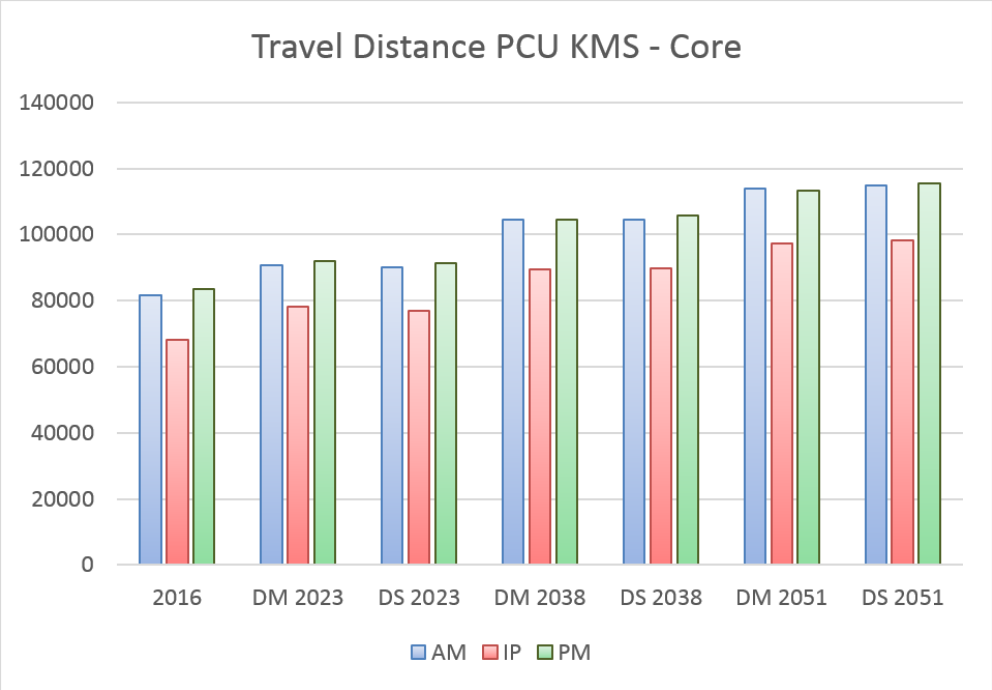


Figure 8-5 Total Travel Time - Variable Demand

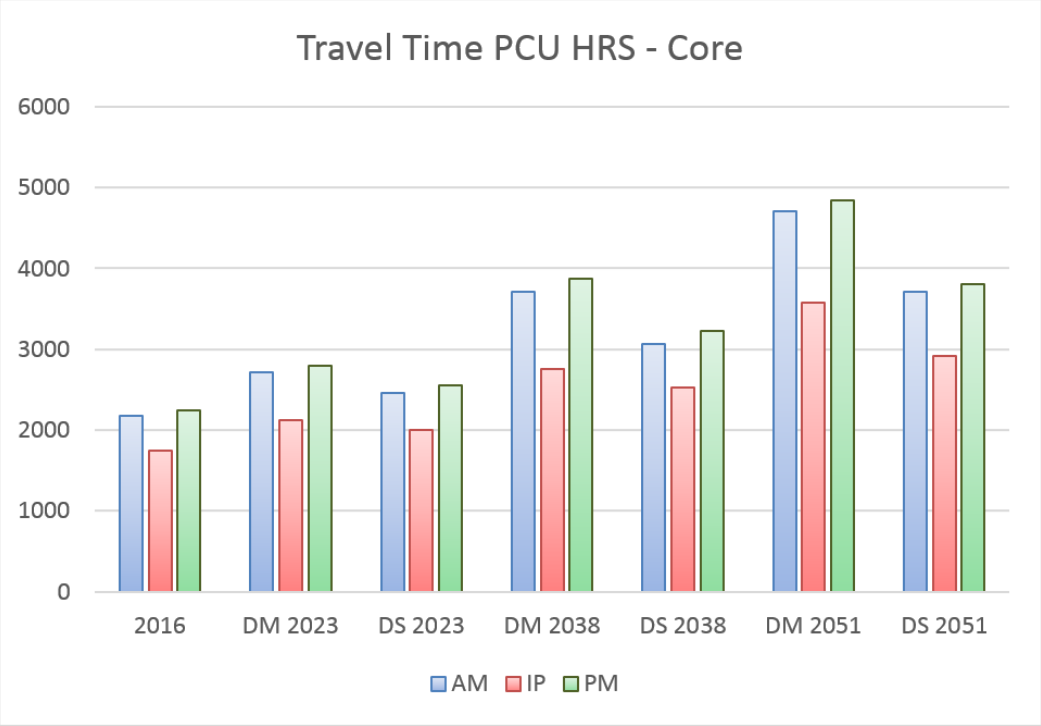


Figure 8-6 Average Speed (Core) – Variable Demand

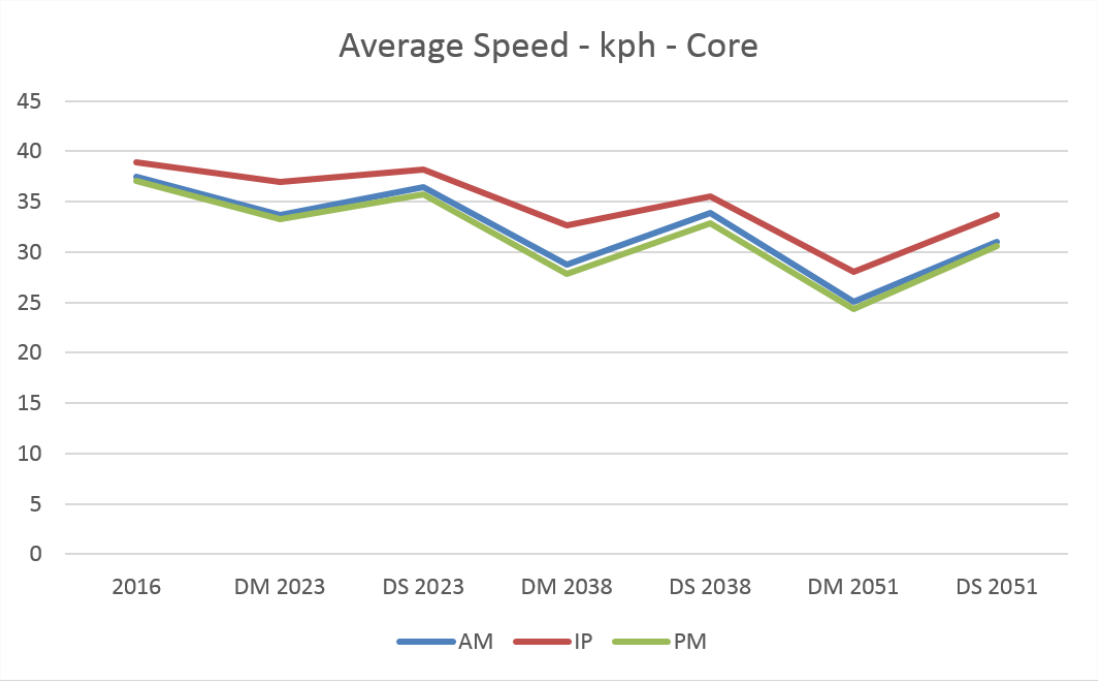


Table 8-3 Core Scenario – Variable Demand

Attribute	2016	DM 2023	DS 2023	DM 2038	DS 2038	DM 2051	DS 2051
PCU KMS							
AM	81,670	90,664	90,229	104,439	104,472	114,004	114,722
IP	68,000	78,172	76,755	89,527	89,682	97,261	98,160
PM	83,392	91,900	91,427	104,624	105,767	113,138	115,329
PCU HRS							
AM	2,176	2,627	2,481	3,381	3,076	4,058	3,656
IP	1,746	2,099	2,009	2,625	2,518	3,088	2,878
PM	2,250	2,687	2,569	3,483	3,201	4,057	3,700
Speed kph							
AM	38	35	36	31	34	28	31
IP	39	37	38	34	36	32	34
PM	37	34	36	30	33	28	31

With reference to Table 8.3 in all three time periods, there is a reduction in the total travel time in the Do Something case compared to the Do Minimum case. This indicates that with the Third River Crossing in place there will be travel time savings in all three time periods.

The Variable Demand response suggest that the TRC will help to reduce total travel time and distance in early years where route choice is greater due to available network capacity. In later years due to combined effects of traffic induction and

limited capacity the impact is primarily on time rather than distance savings. This translates through to a general speed / level of service improvement at an operational level

In comparison to the reference case forecasts the VDM distance, travel time and speed has fallen in the Do Minimum. Conversely in the Do Something distance and travel time have increased slightly reflecting the release of traffic resultant from new network configuration. In 2051 the VDM Do Something indicates a slight suppression of time and distance statistics as the network experiences capacity constraint. These differences are included in Table 8.4.

Table 8-4 Core Scenario – Change in Network Statistics VDM vs Fixed

Attribute	2016	DM 2023	DS 2023	DM 2038	DS 2038	DM 2051	DS 2051
PCU KMS							
AM	-	-0.8%	0.6%	-2.2%	0.5%	-3.5%	-0.3%
IP	-	-0.4%	0.5%	-0.8%	0.1%	-2.7%	-0.2%
PM	-	-1.2%	0.2%	-2.8%	-0.2%	-4.0%	-1.0%
PCU HRS							
AM	-	-3.2%	0.9%	-9.0%	0.3%	-13.9%	-1.6%
IP	-	-1.1%	0.5%	-4.9%	-0.3%	-13.6%	-1.2%
PM	-	-3.8%	0.4%	-10.1%	-0.7%	-16.3%	-2.8%
Speed kph							
AM	-	2.5%	-0.3%	7.4%	0.2%	12.0%	1.4%
IP	-	0.7%	0.0%	4.2%	0.4%	12.7%	1.1%
PM	-	2.7%	-0.2%	8.1%	0.5%	14.8%	1.8%

8.5 Variable Demand Commentary

Application of Variable Demand techniques to forecasting scenarios indicates that demand matrices have remained relatively constant in overall terms. Daily change suggests an increase of around 0.5% in 2023 rising to approximately 1% in 2051 for the Do Something network. Do Minimum changes are minimal. Disaggregating this indicates that some of the largest changes have occurred in the commute user class as this purpose occurs primarily in congested peaks. The associated time/distance parameters confer a greater level of sensitivity. Despite this effect, total matrix changes have not exceeded around 3.5%. The main impact of the VDM has been on movements into and out of Great Yarmouth.

9 Sensitivity Test Outputs

9.1 Introduction

Sensitivity tests for the alternative Low and High growth scenarios have been included in the analysis and are presented in this section.

As the following tests have been conducted to provide sensitivity on the impact of the core scenario they are not reported in as complete a level of detail as the Core test. Flow volumes differences are included and the relative impacts are included in a tabulation. The Economic Appraisal Report provides the TUBA evaluation of these alternative specification tests.

9.2 Total Demands

Figure 9.1 demonstrates the flow magnitude (reference matrices) employed in each of the sensitivity tests relative to the core scenario (blue). This demonstrates a significant increase and reduction in demand for the high and low scenarios, particularly for 2038 and 2051.

The magnitude of change in demand for the Core, Low and High matrices (relative to 2016) are included in Figure 9.2.

Figure 9-1 Alternative Demand Scenarios

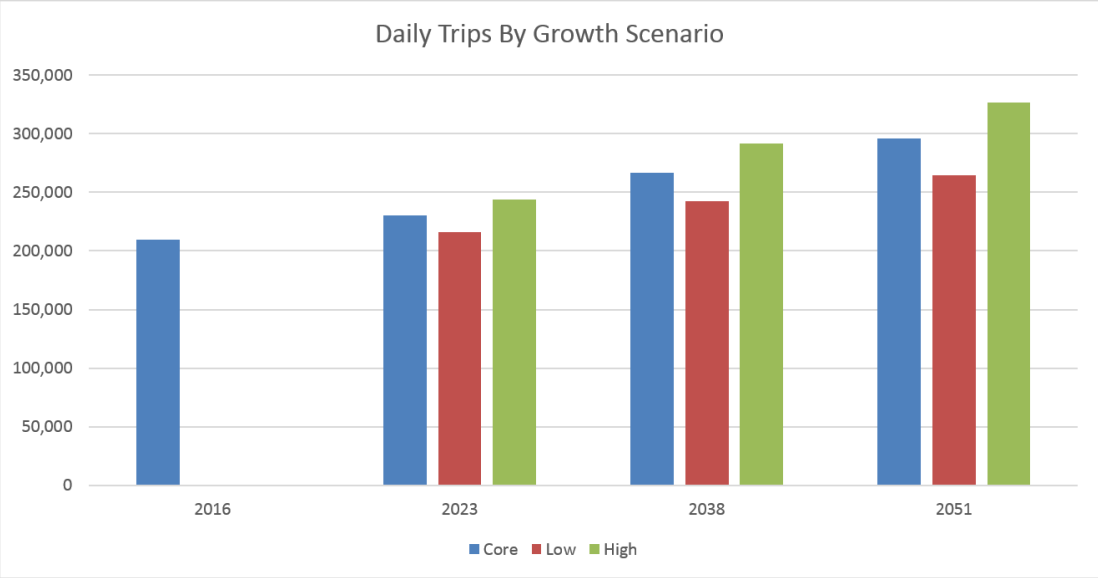
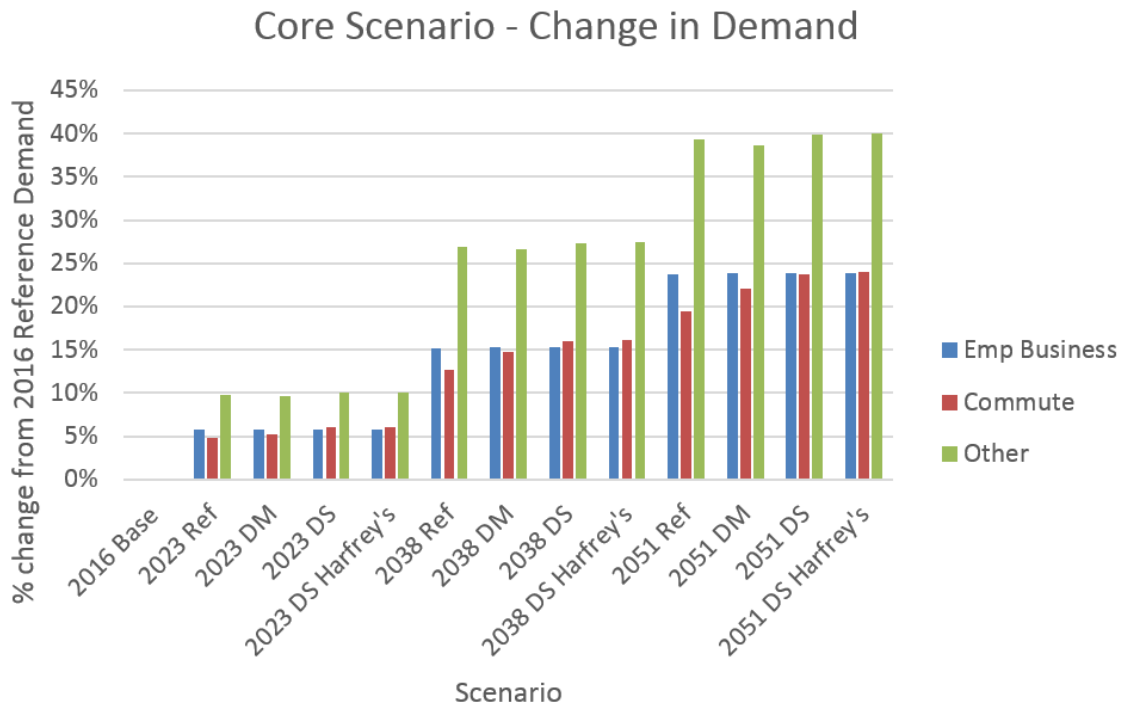
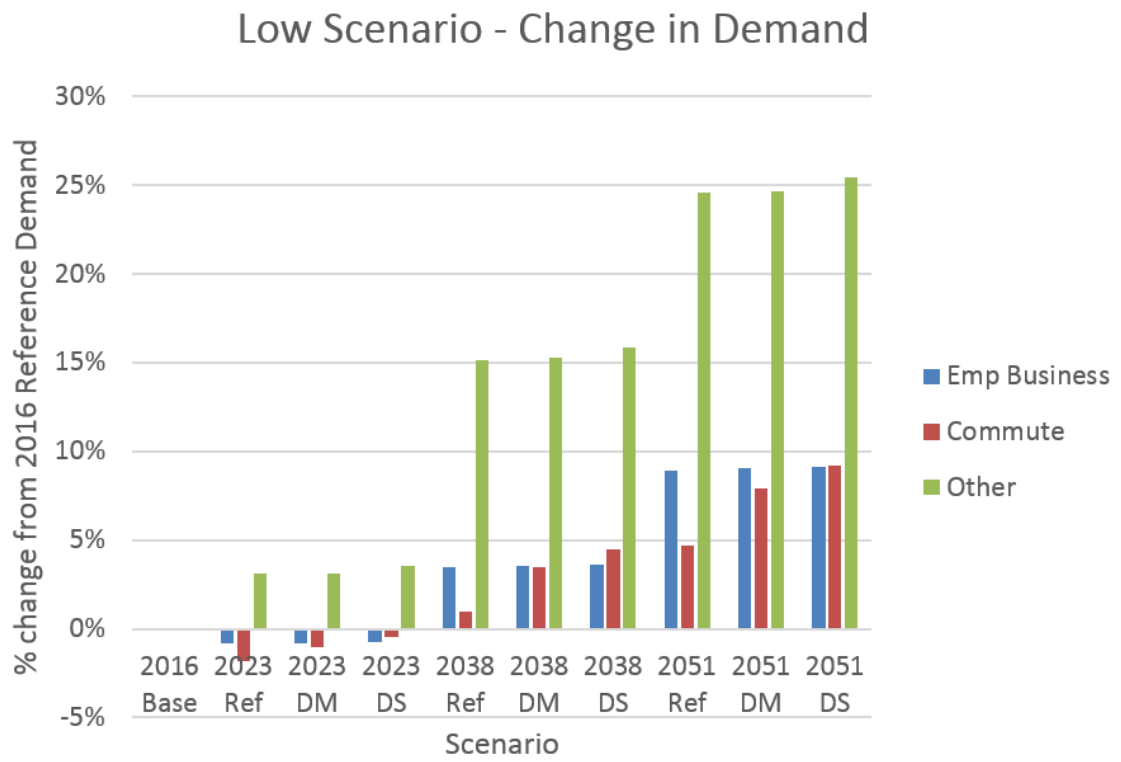
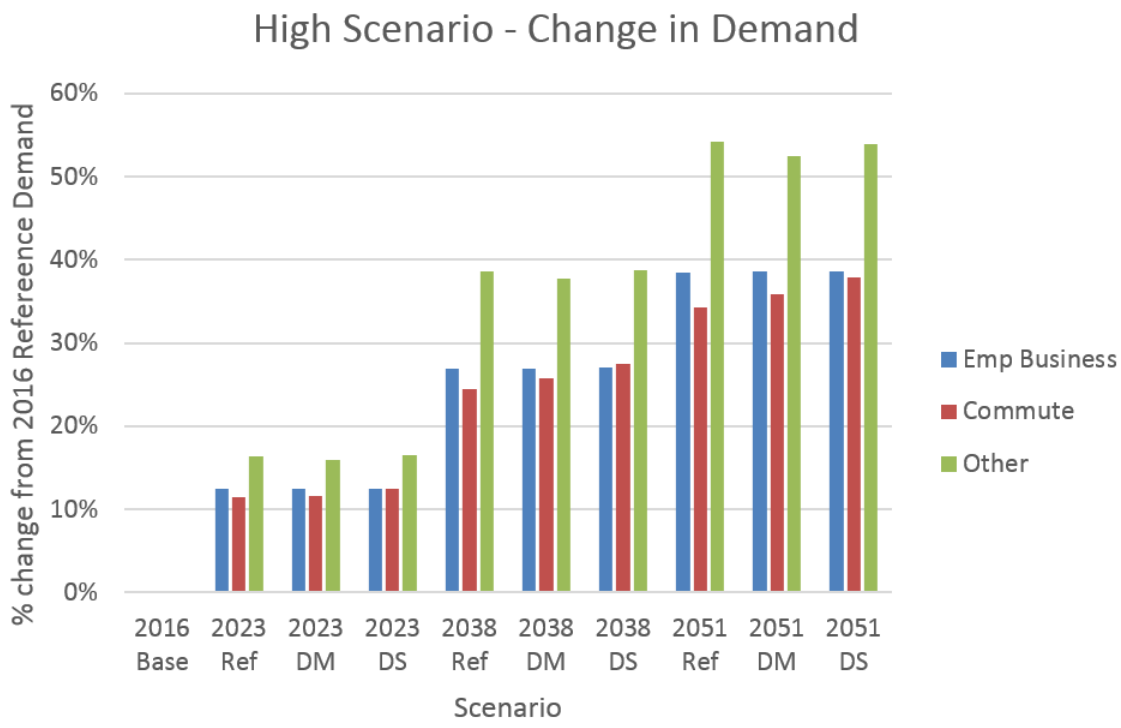


Figure 9-2 Change in Demand Relative to 2016 Reference Demands







9.3 Screenline Flow Results

Table 9.1 below shows the flow changes associated with the TRC with Harfrey's Roundabout test. In each case the flow is elevated compared to the Core test reported in the earlier chapter indicating that the sensitivity test is successful in releasing queued traffic and aiding flow progression.

Table 9-1 Harfrey's Roundabout Sensitivity Test

Road	2016	2023 DS Harfrey	2038 DS Harfrey	2051 DS Harfrey
AADT Flows				
A12	31,798	32,012	34,382	34,805
Bridge Road	21,684	12,480	17,080	19,229
TRC	N/A	21,725	27,998	33,172
Sum	53,483	66,217	79,460	87,206
Flow Change				
		Increase from DM 2023	Increase from DM 2038	Increase from DM 2051
A12		-8%	-4%	-2%
Bridge Road		-52%	-48%	-45%
TRC		N/A	N/A	N/A
Sum		8%	16%	23%

9.4 Sensitivity Test VDM Results

The impact of VDM on daily travel demand matrices is presented in Table 9-2. This demonstrates that trip induction due to the TRC scheme is significant in the Commuting and Other user classes. The business trips do not show significant trip induction due to the TRC scheme.

In the Core and High growth scenarios only, the Do Minimum “Other” trips shows some modest trip suppression in relation to the Reference Case. In each forecast year the Do Something releases the suppression. The Harfrey’s Roundabout sensitivity has been conducted for the Core Scenario only.

Table 9-2 TRC Daily VDM Results - by Scenario

Scenario	Purpose	2023				2038				2051			
		Ref	DM	DS	DS Harfrey	Ref	DM	DS	DS Harfrey	Ref	DM	DS	DS Harfrey
Core	Business	12,110	12,112	12,115	12,116	13,188	13,192	13,200	13,201	14,160	14,172	14,180	14,181
	Commute	41,691	41,892	42,189	42,221	44,843	45,656	46,176	46,231	47,541	48,561	49,235	49,316
	Other	130,046	129,855	130,385	130,398	150,293	149,979	150,901	151,037	165,119	164,320	165,712	165,905
	LGV	30,911	30,911	30,911	30,911	40,589	40,589	40,589	40,589	48,538	48,538	48,538	48,538
	HGV	15,385	15,385	15,385	15,385	17,959	17,959	17,959	17,959	20,455	20,455	20,455	20,455
Low	Business	11,353	11,356	11,358	NA	11,844	11,853	11,858	NA	12,466	12,481	12,488	NA
	Commute	39,059	39,369	39,610	NA	40,174	41,168	41,563	NA	41,655	42,946	43,444	NA
	Other	122,211	122,220	122,670	NA	136,397	136,566	137,297	NA	147,595	147,691	148,666	NA
	LGV	29,194	29,194	29,194	NA	37,549	37,549	37,549	NA	44,707	44,707	44,707	NA
	HGV	14,442	14,442	14,442	NA	16,288	16,288	16,288	NA	18,346	18,346	18,346	NA
High	Business	12,869	12,866	12,872	NA	14,525	14,531	14,541	NA	15,857	15,860	15,868	NA
	Commute	44,327	44,372	44,749	NA	49,511	50,040	50,694	NA	53,426	54,030	54,863	NA
	Other	137,882	137,442	138,059	NA	164,186	163,180	164,382	NA	182,644	180,625	182,445	NA
	LGV	32,624	32,624	32,624	NA	43,629	43,629	43,629	NA	52,371	52,371	52,371	NA
	HGV	16,328	16,328	16,328	NA	19,630	19,630	19,630	NA	22,557	22,560	22,560	NA

10 Summary and Conclusions

10.1 Summary

This report has described the methods and assumptions used in preparing the future year traffic forecasts using the 2016 Base year traffic model for Great Yarmouth, in line with the Department for Transport's guidance. A projection from a 2016 Present Year has been conducted to the opening year, 2023, design year, 2038 and horizon year, 2051.

A number of tests using different transport demand and supply assumptions were used to test the sensitivity of the model and also the plausibility of the economic assessment process that was used is assessing the benefits of the Third River Crossing scheme.

Fixed matrix tests have been conducted. This has been followed by Variable Demand tests both for Core and Sensitivity scenarios. In all cases the variable demand response has been found to be plausible and consistent with the inputs.

10.2 Conclusion

Forecasting results, with both fixed demand and variable demand, predict that the TRC will help to reduce total travel distance, reduce total travel time and increase average network speed in the study area.

As expected the Variable Demand process limits the difference in distance and time saving between the Do Minimum and the Do Something.

The results are considered appropriate to employ in a subsequent Economic Evaluation of the scheme.

Appendix A – Zonal Correspondence - TEMPRO

Model Zone - TEMPRO Correspondence

Zone	Region	Authority	Detailed Description	TEMPRO	District
1	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
2	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
3	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
4	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
5	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
7	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
8	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
9	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
10	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
11	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
12	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
13	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
16	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
19	EAST	Great Yarmouth	Great Yarmouth 004 (E02005541)	3	3
20	EAST	Great Yarmouth	Great Yarmouth 004 (E02005541)	3	3
21	EAST	Great Yarmouth	Great Yarmouth 004 (E02005541)	3	3
22	EAST	Great Yarmouth	Great Yarmouth 004 (E02005541)	3	3
23	EAST	Great Yarmouth	Great Yarmouth 004 (E02005541)	3	3
24	EAST	Great Yarmouth	Great Yarmouth 004 (E02005541)	3	3
25	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
26	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
27	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
28	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
29	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
30	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
31	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
32	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
34	EAST	Great Yarmouth	Great Yarmouth 008 (E02005545)	6	3
35	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
36	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
39	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
40	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
41	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
42	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
43	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
44	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
45	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
46	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
47	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3

Zone	Region	Authority	Detailed Description	TEMPRO	District
48	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
49	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
50	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
51	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
52	EAST	Great Yarmouth	Great Yarmouth 010 (E02005547)	8	3
53	EAST	Great Yarmouth	Great Yarmouth 010 (E02005547)	8	3
54	EAST	Great Yarmouth	Great Yarmouth 010 (E02005547)	8	3
55	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	9	3
56	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	10	3
57	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	10	3
58	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
59	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
61	EAST	Great Yarmouth	Great Yarmouth 008 (E02005545)	6	3
62	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
63	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	9	3
64	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
65	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
66	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
67	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
68	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
69	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
70	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
71	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
72	EAST	Great Yarmouth	Great Yarmouth 010 (E02005547)	8	3
73	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	9	3
74	EAST	Great Yarmouth	Great Yarmouth 008 (E02005545)	6	3
75	EAST	Great Yarmouth	Great Yarmouth 008 (E02005545)	6	3
76	EAST	Great Yarmouth	Great Yarmouth 011 (E02005548)	9	3
77	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
78	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
80	EAST	Great Yarmouth	Great Yarmouth 001 (E02005538)	12	3
81	EAST	Great Yarmouth	Great Yarmouth 001 (E02005538)	12	3
83	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
84	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
85	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
86	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
87	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
88	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
89	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
90	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
91	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
92	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
126	EAST	South Norfolk	South Norfolk	16	2

Zone	Region	Authority	Detailed Description	TEMPRO	District
127	EAST	South Norfolk	South Norfolk	16	2
131	EAST	South Norfolk	South Norfolk	16	2
132	EAST	South Norfolk	South Norfolk	16	2
133	EAST	South Norfolk	South Norfolk	16	2
134	EAST	South Norfolk	South Norfolk	16	2
135	EAST	South Norfolk	South Norfolk	16	2
136	EAST	South Norfolk	South Norfolk	16	2
137	EAST	South Norfolk	South Norfolk	16	2
138	EAST	South Norfolk	South Norfolk	16	2
139	EAST	South Norfolk	South Norfolk	16	2
140	EAST	South Norfolk	South Norfolk	16	2
141	EAST	South Norfolk	South Norfolk	16	2
142	EAST	South Norfolk	South Norfolk	16	2
143	EAST	South Norfolk	South Norfolk	16	2
144	EAST	South Norfolk	South Norfolk	16	2
145	EAST	South Norfolk	South Norfolk	16	2
146	EAST	South Norfolk	South Norfolk	16	2
147	EAST	South Norfolk	South Norfolk	16	2
148	EAST	South Norfolk	South Norfolk	16	2
149	EAST	South Norfolk	South Norfolk	16	2
150	EAST	South Norfolk	South Norfolk	16	2
152	EAST	Broadland	Broadland	14	1
153	EAST	Broadland	Broadland	14	1
154	EAST	Broadland	Broadland	14	1
157	EAST	Broadland	Broadland	14	1
158	EAST	Broadland	Broadland	14	1
159	EAST	South Norfolk	South Norfolk	16	2
160	EAST	South Norfolk	South Norfolk	16	2
161	EAST	South Norfolk	South Norfolk	16	2
162	EAST	South Norfolk	South Norfolk	16	2
163	EAST	Broadland	Broadland	14	1
164	EAST	Broadland	Broadland	14	1
167	EAST	South Norfolk	South Norfolk	16	2
168	EAST	South Norfolk	South Norfolk	16	2
169	EAST	South Norfolk	South Norfolk	16	2
170	EAST	South Norfolk	South Norfolk	16	2
171	EAST	South Norfolk	South Norfolk	16	2
172	EAST	South Norfolk	South Norfolk	16	2
173	EAST	South Norfolk	South Norfolk	16	2
174	EAST	South Norfolk	South Norfolk	16	2
175	EAST	South Norfolk	South Norfolk	16	2
176	EAST	South Norfolk	South Norfolk	16	2
177	EAST	Broadland	Broadland	14	1

Zone	Region	Authority	Detailed Description	TEMPRO	District
178	EAST	Broadland	Broadland	14	1
179	EAST	Broadland	Broadland	14	1
180	EAST	Broadland	Broadland	14	1
181	EAST	Broadland	Broadland	14	1
182	EAST	Broadland	Broadland	14	1
183	EAST	Broadland	Broadland	14	1
184	EAST	Broadland	Broadland	14	1
185	EAST	Broadland	Broadland	14	1
186	EAST	Broadland	Broadland	14	1
187	EAST	Broadland	Broadland	14	1
188	EAST	Broadland	Broadland	14	1
189	EAST	Broadland	Broadland	14	1
192	EAST	South Norfolk	South Norfolk	16	2
193	EAST	South Norfolk	South Norfolk	16	2
194	EAST	Breckland	Breckland	20	6
195	EAST	South Norfolk	South Norfolk	16	2
196	EAST	Breckland	Breckland	20	6
197	EAST	Broadland	Broadland	14	1
198	EAST	Broadland	Broadland	14	1
202	EAST	Breckland	Breckland	20	6
203	EM	South Holland	South Holland	19	11
204	EM	South Holland	South Holland	19	11
205	EM	South Holland	South Holland	19	11
206	EM	South Holland	South Holland	19	11
207	EM	South Holland	South Holland	19	11
208	EAST	North Norfolk	North Norfolk	17	4
209	EAST	North Norfolk	North Norfolk	17	4
210	EAST	South Norfolk	South Norfolk	16	2
211	EAST	South Norfolk	South Norfolk	16	2
212	WM		WM	31	11
212	EM	Leicester	Leicester	31	11
212	EM	Rutland	Rutland	31	11
212	EM	Blaby	Blaby	31	11
212	EM	Harborough	Harborough	31	11
212	EM	Hinckley and Bosworth	Hinckley and Bosworth	31	11
212	EM	Oadby and Wigston	Oadby and Wigston	31	11
212	EM	Corby	Corby	31	11
212	EM	Daventry	Daventry	31	11
212	EM	East Northamptonshire	East Northamptonshire	31	11
212	EM	Kettering	Kettering	31	11
212	EM	Northampton	Northampton	31	11

Zone	Region	Authority	Detailed Description	TEMPRO	District
212	EM	South Northamptonshire	South Northamptonshire	31	11
212	EM	Wellingborough	Wellingborough	31	11
213	LON		LON	27	10
214	EAST	Cambridge	Cambridge	25	9
215	SW		SW	30	9
215	SE	Luton	Luton	30	9
215	SE	Bracknell Forest	Bracknell Forest	30	9
215	SE	West Berkshire	West Berkshire	30	9
215	SE	Reading	Reading	30	9
215	SE	Slough	Slough	30	9
215	SE	Windsor and Maidenhead	Windsor and Maidenhead	30	9
215	SE	Wokingham	Wokingham	30	9
215	SE	Milton Keynes	Milton Keynes	30	9
215	SE	Southampton	Southampton	30	9
215	SE	Isle of Wight	Isle of Wight	30	9
215	EAST		Bedfordshire	30	9
215	SE	Aylesbury Vale	Aylesbury Vale	30	9
215	SE	Chiltern	Chiltern	30	9
215	SE	South Bucks	South Bucks	30	9
215	SE	Wycombe	Wycombe	30	9
215	EAST	East Cambridgeshire	East Cambridgeshire	30	9
215	EAST	South Cambridgeshire	South Cambridgeshire	30	9
215	EAST	Braintree	Braintree	30	9
215	EAST	Uttlesford	Uttlesford	30	9
215	SE	Basingstoke and Deane	Basingstoke and Deane	30	9
215	SE	Eastleigh	Eastleigh	30	9
215	SE	Fareham	Fareham	30	9
215	SE	Gosport	Gosport	30	9
215	SE	Hart	Hart	30	9
215	SE	New Forest	New Forest	30	9
215	SE	Rushmoor	Rushmoor	30	9
215	SE	Test Valley	Test Valley	30	9
215	SE	Winchester	Winchester	30	9
215	EAST	Dacorum	Dacorum	30	9
215	EAST	East Hertfordshire	East Hertfordshire	30	9
215	EAST	North Hertfordshire	North Hertfordshire	30	9
215	EAST	St Albans	St Albans	30	9
215	EAST	Stevenage	Stevenage	30	9
215	EAST	Three Rivers	Three Rivers	30	9

Zone	Region	Authority	Detailed Description	TEMPRO	District
215	EAST	Watford	Watford	30	9
215	EAST	Welwyn Hatfield	Welwyn Hatfield	30	9
215	EM	South Northamptonshire	South Northamptonshire	30	11
215	SE	Cherwell	Cherwell	30	9
215	SE	Oxford	Oxford	30	9
215	SE	South Oxfordshire	South Oxfordshire	30	9
215	SE	Vale of White Horse	Vale of White Horse	30	9
215	SE	West Oxfordshire	West Oxfordshire	30	9
215	EAST	Forest Heath	Forest Heath	30	9
215	SE	Elmbridge	Elmbridge	30	9
215	SE	Runnymede	Runnymede	30	9
215	SE	Spelthorne	Spelthorne	30	9
215	SE	Surrey Heath	Surrey Heath	30	9
215	SE	Woking	Woking	30	9
216	EAST	St Edmundsbury	St Edmundsbury	26	9
217	EAST	Ipswich	Ipswich	23	9
221	EAST	King's Lynn and West Norfolk	King's Lynn and West Norfolk	24	7
222	NW		NW	32	12
222	YH		YH	32	12
222	NE		NE	32	12
222	EM	Derby	Derby	32	12
222	EM	Nottingham	Nottingham	32	12
222	EM	Amber Valley	Amber Valley	32	12
222	EM	Bolsover	Bolsover	32	12
222	EM	Chesterfield	Chesterfield	32	12
222	EM	Derbyshire Dales	Derbyshire Dales	32	12
222	EM	Erewash	Erewash	32	12
222	EM	High Peak	High Peak	32	12
222	EM	North East Derbyshire	North East Derbyshire	32	12
222	EM	South Derbyshire	South Derbyshire	32	12
222	EM	Charnwood	Charnwood	32	12
222	EM	Melton	Melton	32	12
222	EM	North West Leicestershire	North West Leicestershire	32	12
222	EM	Boston	Boston	32	12
222	EM	East Lindsey	East Lindsey	32	12
222	EM	Lincoln	Lincoln	32	12
222	EM	North Kesteven	North Kesteven	32	12
222	EM	South Holland	South Holland	32	11
222	EM	South Kesteven	South Kesteven	32	12
222	EM	West Lindsey	West Lindsey	32	12

Zone	Region	Authority	Detailed Description	TEMPRO	District
222	EM	Ashfield	Ashfield	32	12
222	EM	Bassetlaw	Bassetlaw	32	12
222	EM	Broxtowe	Broxtowe	32	12
222	EM	Gedling	Gedling	32	12
222	EM	Mansfield	Mansfield	32	12
222	EM	Newark and Sherwood	Newark and Sherwood	32	12
222	EM	Rushcliffe	Rushcliffe	32	12
500	EAST	Norwich	Norwich	15	8
601	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
602	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
603	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
701	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
702	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
703	EAST	Great Yarmouth	Great Yarmouth 007 (E02005544)	5	3
704	EAST	Great Yarmouth	Great Yarmouth 001 (E02005538)	12	3
705	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	10	3
706	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	10	3
707	EAST	Great Yarmouth	Great Yarmouth 010 (E02005547)	**8**	3
708	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
709	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
710	EAST	Great Yarmouth	Great Yarmouth 004 (E02005541)	3	3
711	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
712	EAST	Great Yarmouth	Great Yarmouth 001 (E02005538)	12	3
713	EAST	Great Yarmouth	Great Yarmouth 003 (E02005540)	4	3
714	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1401	EAST	Great Yarmouth	Great Yarmouth 005 (E02005542)	2	3
1402	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1501	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1502	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1701	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1702	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1801	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1802	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
1803	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
3301	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	5	3
3302	EAST	Great Yarmouth	Great Yarmouth 009 (E02005546)	7	3
3701	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
3702	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
3703	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
3704	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
3801	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
3802	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3
3803	EAST	Great Yarmouth	Great Yarmouth 006 (E02005543)	1	3

Zone	Region	Authority	Detailed Description	TEMPRO	District
11002	EAST	Broadland	Broadland	14	1
12601	EAST	South Norfolk	South Norfolk	16	2
12602	EAST	South Norfolk	South Norfolk	16	2
12603	EAST	South Norfolk	South Norfolk	16	2
13004	EAST	South Norfolk	South Norfolk	16	2
13201	EAST	South Norfolk	South Norfolk	16	2
15101	EAST	South Norfolk	South Norfolk	16	2
15102	EAST	Broadland	Broadland	14	1
15201	EAST	Broadland	Broadland	14	1
15701	EAST	Broadland	Broadland	14	1
15901	EAST	Broadland	Broadland	14	1
15902	EAST	Broadland	Broadland	14	1
15903	EAST	South Norfolk	South Norfolk	16	2
15904	EAST	South Norfolk	South Norfolk	16	2
19001	EAST	Broadland	Broadland	14	1
19002	EAST	Broadland	Broadland	14	1
19101	EAST	South Norfolk	South Norfolk	16	2
19102	EAST	South Norfolk	South Norfolk	16	2
19901	EAST	North Norfolk	North Norfolk	17	4
19902	EAST	North Norfolk	North Norfolk	17	4
20001	EAST	Great Yarmouth	Great Yarmouth 002 (E02005539)	13	3
20002	EAST	Great Yarmouth	Great Yarmouth 001 (E02005538)	12	3
20003	EAST	Great Yarmouth	Great Yarmouth 002 (E02005539)	13	3
20004	EAST	Great Yarmouth	Great Yarmouth 002 (E02005539)	**13**	3
20005	EAST	Great Yarmouth	Great Yarmouth 001 (E02005538)	12	3
20006	EAST	Great Yarmouth	Great Yarmouth 001 (E02005538)	**12**	3
20007	EAST	Great Yarmouth	Great Yarmouth 002 (E02005539)	2	3
20008	EAST	Great Yarmouth	Great Yarmouth 012 (E02005549)	10	3
20009	EAST	Great Yarmouth	Great Yarmouth 013 (E02005550)	10	3
20010	EAST	Great Yarmouth	Great Yarmouth 012 (E02005549)	10	3
21801	EAST	Mid Suffolk	Mid Suffolk	21	9
21802	SE	Medway	Medway	29	9
21802	SE	Brighton and Hove	Brighton and Hove	29	9
21802	SE	Portsmouth	Portsmouth	29	9
21802	SE	Eastbourne	Eastbourne	29	9
21802	SE	Hastings	Hastings	29	9
21802	SE	Lewes	Lewes	29	9
21802	SE	Rother	Rother	29	9
21802	SE	Wealden	Wealden	29	9
21802	SE	East Hampshire	East Hampshire	29	9
21802	SE	Havant	Havant	29	9
21802	SE	Ashford	Ashford	29	9
21802	SE	Canterbury	Canterbury	29	9

Zone	Region	Authority	Detailed Description	TEMPRO	District
21802	SE	Dartford	Dartford	29	9
21802	SE	Dover	Dover	29	9
21802	SE	Gravesham	Gravesham	29	9
21802	SE	Maidstone	Maidstone	29	9
21802	SE	Sevenoaks	Sevenoaks	29	9
21802	SE	Shepway	Shepway	29	9
21802	SE	Swale	Swale	29	9
21802	SE	Thanet	Thanet	29	9
21802	SE	Tonbridge and Malling	Tonbridge and Malling	29	9
21802	SE	Tunbridge Wells	Tunbridge Wells	29	9
21802	SE	Guildford	Guildford	29	9
21802	SE	Mole Valley	Mole Valley	29	9
21802	SE	Reigate and Banstead	Reigate and Banstead	29	9
21802	SE	Tandridge	Tandridge	29	9
21802	SE	Waverley	Waverley	29	9
21802	SE	Adur	Adur	29	9
21802	SE	Arun	Arun	29	9
21802	SE	Chichester	Chichester	29	9
21802	SE	Crawley	Crawley	29	9
21802	SE	Horsham	Horsham	29	9
21802	SE	Mid Sussex	Mid Sussex	29	9
21802	SE	Worthing	Worthing	29	9
21803	EAST	Babergh	Babergh	28	9
21803	EAST	Tendring	Tendring	28	9
21803	EAST	Colchester	Colchester	28	9
21803	EAST	Chelmsford	Chelmsford	28	9
21803	EAST	Maldon	Maldon	28	9
21803	EAST	Brentwood	Brentwood	28	9
21803	EAST	Basildon	Basildon	28	9
21803	EAST	Rochford	Rochford	28	9
21803	EAST	Southend-on-Sea	Southend-on-Sea	28	9
21803	EAST	Castle Point	Castle Point	28	9
21803	EAST	Thurrock	Thurrock	28	9
21901	EAST	Waveney	Waveney	18	5
21902	EAST	Suffolk Coastal	Suffolk Coastal	22	9
22001	EAST	Waveney	Waveney 001 (E02006302)	11	5
22002	EAST	Waveney	Waveney 001 (E02006302)	11	5
22003	EAST	Waveney	Waveney 001 (E02006302)	11	5
22004	EAST	Waveney	Waveney	18	5
22005	EAST	Waveney	Waveney	18	5
22006	EAST	Waveney	Waveney	18	5
22007	EAST	Waveney	Waveney	18	5

Appendix B – TEMPRO 7.2 Growth

TEMPRO 7.2 Growth 2016–2023 – AM Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.1173	1.0495	1.1598	1.1136	1.1093	1.0575
2	1.0618	1.0468	1.1156	1.1007	1.0691	1.0563
3	1.0570	1.0462	1.0968	1.0962	1.0640	1.0559
4	1.0227	1.0415	1.0798	1.0882	1.0394	1.0501
5	1.0161	1.0440	1.0684	1.0901	1.0343	1.0537
6	1.0746	1.0425	1.1172	1.0966	1.0763	1.0506
7	1.0623	1.0536	1.1289	1.1325	1.0732	1.0659
8	1.0864	1.0440	1.1045	1.0873	1.0784	1.0515
9	1.0503	1.0539	1.0912	1.0936	1.0590	1.0606
10	1.0806	1.0651	1.1286	1.1201	1.0753	1.0686
11	1.0462	1.0456	1.0785	1.0783	1.0525	1.0521
12	1.0557	1.0560	1.0735	1.0736	1.0615	1.0617

TEMPRO 7.2 Growth 2016–2023 – Inter Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.0751	1.0866	1.1394	1.1436	1.0718	1.0731
2	1.0464	1.0503	1.1144	1.1157	1.0598	1.0600
3	1.0443	1.0458	1.1021	1.1026	1.0579	1.0581
4	1.0286	1.0253	1.0890	1.0892	1.0496	1.0478
5	1.0264	1.0214	1.0864	1.0852	1.0492	1.0492
6	1.0500	1.0567	1.1151	1.1167	1.0590	1.0583
7	1.0508	1.0519	1.1344	1.1343	1.0686	1.0672
8	1.0506	1.0566	1.1017	1.1053	1.0553	1.0569
9	1.0438	1.0434	1.0931	1.0925	1.0607	1.0601
10	1.0687	1.0702	1.1182	1.1205	1.0731	1.0743
11	1.0378	1.0379	1.0798	1.0799	1.0516	1.0516
12	1.0448	1.0448	1.0718	1.0718	1.0599	1.0599

TEMPRO 7.2 Growth 2016–2023 – PM Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.0507	1.1121	1.1260	1.1420	1.0625	1.1035
2	1.0436	1.0587	1.1011	1.1064	1.0564	1.0675
3	1.0450	1.0525	1.0923	1.0892	1.0557	1.0610
4	1.0382	1.0217	1.0800	1.0751	1.0498	1.0409
5	1.0393	1.0145	1.0768	1.0672	1.0517	1.0368
6	1.0406	1.0707	1.1010	1.1087	1.0530	1.0731
7	1.0521	1.0598	1.1198	1.1172	1.0668	1.0698
8	1.0440	1.0765	1.0903	1.0934	1.0524	1.0725
9	1.0490	1.0457	1.0846	1.0845	1.0599	1.0572
10	1.0645	1.0789	1.1133	1.1142	1.0684	1.0769
11	1.0408	1.0413	1.0726	1.0727	1.0502	1.0505
12	1.0491	1.0489	1.0683	1.0682	1.0585	1.0584

TEMPRO 7.2 Growth 2016–2038 – AM Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.3340	1.1310	1.4365	1.3113	1.3080	1.1523
2	1.1754	1.1219	1.3024	1.2718	1.1913	1.1467
3	1.1561	1.1170	1.2703	1.2614	1.1725	1.1431
4	1.0664	1.1097	1.2158	1.2411	1.1097	1.1348
5	1.0283	1.1107	1.1774	1.2368	1.0809	1.1378
6	1.2381	1.1173	1.3460	1.2744	1.2349	1.1403
7	1.1941	1.1292	1.3505	1.3270	1.2083	1.1590
8	1.2130	1.1160	1.2966	1.2471	1.2003	1.1388
9	1.1096	1.1220	1.2124	1.2181	1.1326	1.1404
10	1.1854	1.1370	1.2892	1.2699	1.1756	1.1496
11	1.1214	1.1193	1.1848	1.1842	1.1367	1.1352
12	1.1339	1.1348	1.1676	1.1678	1.1504	1.1510

TEMPRO 7.2 Growth 2016–2038 – Inter Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.2060	1.2437	1.3822	1.3944	1.1963	1.1984
2	1.1303	1.1420	1.3079	1.3107	1.1603	1.1595
3	1.1179	1.1241	1.2819	1.2825	1.1536	1.1508
4	1.0817	1.0732	1.2435	1.2434	1.1351	1.1298
5	1.0633	1.0488	1.2282	1.2252	1.1254	1.1242
6	1.1542	1.1783	1.3351	1.3401	1.1707	1.1692
7	1.1419	1.1545	1.3566	1.3590	1.1759	1.1722
8	1.1334	1.1464	1.2882	1.2958	1.1490	1.1528
9	1.1008	1.0992	1.2352	1.2337	1.1401	1.1392
10	1.1545	1.1602	1.2972	1.3023	1.1631	1.1643
11	1.1023	1.1027	1.1974	1.1975	1.1339	1.1339
12	1.1109	1.1107	1.1735	1.1734	1.1463	1.1463

TEMPRO 7.2 Growth 2016–2038 – PM Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.1358	1.3181	1.3489	1.3931	1.1680	1.2879
2	1.1172	1.1679	1.2754	1.2873	1.1498	1.1844
3	1.1168	1.1455	1.2532	1.2501	1.1458	1.1635
4	1.1043	1.0653	1.2217	1.2084	1.1349	1.1117
5	1.1001	1.0270	1.2030	1.1782	1.1316	1.0880
6	1.1157	1.2266	1.2987	1.3251	1.1490	1.2214
7	1.1293	1.1871	1.3154	1.3214	1.1651	1.1972
8	1.1178	1.1925	1.2535	1.2656	1.1408	1.1876
9	1.1128	1.1016	1.2067	1.2063	1.1385	1.1304
10	1.1389	1.1829	1.2746	1.2762	1.1515	1.1755
11	1.1086	1.1105	1.1781	1.1785	1.1307	1.1318
12	1.1196	1.1188	1.1619	1.1618	1.1433	1.1429

TEMPRO 7.2 Growth 2016–2051 – AM Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.5047	1.2083	1.6523	1.4655	1.4731	1.2433
2	1.2721	1.1949	1.4491	1.4048	1.2995	1.2345
3	1.2382	1.1852	1.4078	1.3900	1.2664	1.2260
4	1.1046	1.1760	1.3087	1.3569	1.1730	1.2173
5	1.0549	1.1767	1.2634	1.3514	1.1349	1.2201
6	1.3696	1.1883	1.5238	1.4139	1.3696	1.2261
7	1.3026	1.2013	1.5135	1.4743	1.3262	1.2484
8	1.3130	1.1851	1.4533	1.3754	1.3060	1.2231
9	1.1770	1.1934	1.3153	1.3260	1.2132	1.2232
10	1.2775	1.2151	1.4376	1.4003	1.2688	1.2362
11	1.1968	1.1939	1.2971	1.2960	1.2227	1.2207
12	1.2132	1.2145	1.2816	1.2821	1.2426	1.2434

TEMPRO 7.2 Growth 2016–2051 – Inter Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.3091	1.3653	1.5595	1.5779	1.3054	1.3081
2	1.2010	1.2181	1.4447	1.4490	1.2518	1.2505
3	1.1772	1.1869	1.4082	1.4088	1.2390	1.2348
4	1.1277	1.1124	1.3447	1.3436	1.2119	1.2051
5	1.1023	1.0800	1.3248	1.3205	1.1989	1.1973
6	1.2378	1.2734	1.4898	1.4981	1.2705	1.2675
7	1.2152	1.2351	1.5054	1.5088	1.2716	1.2665
8	1.1966	1.2144	1.4220	1.4314	1.2338	1.2399
9	1.1586	1.1569	1.3340	1.3315	1.2212	1.2196
10	1.2361	1.2412	1.4228	1.4312	1.2525	1.2555
11	1.1659	1.1664	1.3037	1.3038	1.2173	1.2173
12	1.1770	1.1767	1.2802	1.2801	1.2355	1.2355

TEMPRO 7.2 Growth 2016–2051 – PM Peak

District	TEMPRO 7.2 OD Car Growth					
	Commute		Other		Emp.Bus	
	O	D	O	D	O	D
1	1.2090	1.4760	1.5182	1.5856	1.2638	1.4395
2	1.1832	1.2571	1.4059	1.4246	1.2367	1.2868
3	1.1794	1.2176	1.3737	1.3714	1.2284	1.2519
4	1.1637	1.0992	1.3214	1.3002	1.2130	1.1748
5	1.1567	1.0490	1.2974	1.2608	1.2087	1.1432
6	1.1807	1.3475	1.4466	1.4866	1.2375	1.3462
7	1.1958	1.2864	1.4544	1.4666	1.2548	1.3066
8	1.1814	1.2780	1.3768	1.3968	1.2224	1.2861
9	1.1763	1.1614	1.3025	1.3012	1.2187	1.2072
10	1.2141	1.2718	1.3993	1.4049	1.2359	1.2695
11	1.1760	1.1786	1.2804	1.2810	1.2126	1.2141
12	1.1907	1.1896	1.2657	1.2655	1.2310	1.2303

Appendix C – Daily Demand Matrices

Base Year 2016 Matrices

Purpose	Format	AM period	IP Period	PM Period	OP Period	24hr Total
HB Trips						
HB Commute (PA)	from Home	6,636	2,661	1,096	2,805	**13,198**
	return Home	604	2,472	4,827	1,886	**9,789**
	Total	**7,239**	**5,133**	**5,924**	**4,691**	**22,987**
HB Education (PA)	from Home	828	1,239	731	563	**3,360**
	return Home	325	1,750	4,227	1,419	**7,722**
	Total	**1,153**	**2,989**	**4,958**	**1,982**	**11,082**
HB Other (PA)	from Home	10,849	16,874	5,193	4,567	**37,482**
	return Home	3,254	19,288	11,476	9,915	**43,934**
	Total	**14,104**	**36,162**	**16,669**	**14,482**	**81,416**
HB Business (PA)	from Home	732	496	126	300	**1,654**
	return Home	72	594	554	320	**1,541**
	Total	**804**	**1,089**	**680**	**621**	**3,194**
NHB Trips						
NHB Other (OD)	Total	5,736	21,578	13,557	9,793	**50,663**
NHB Business (OD)	Total	1,067	4,159	1,397	1,566	**8,190**

Opening Year 2023 Matrices

Purpose	Format	AM period	IP Period	PM Period	OP Period	24hr Total
HB Trips						
HB Commute (PA)	from Home	6,928	2,743	1,112	2,929	**13,712**
	return Home	629	2,588	5,071	1,969	**10,257**
	Total	**7,557**	**5,331**	**6,183**	**4,898**	**23,968**
HB Education (PA)	from Home	926	1,370	817	632	**3,745**
	return Home	346	2,026	4,725	1,594	**8,692**
	Total	**1,273**	**3,396**	**5,542**	**2,226**	**12,437**
HB Other (PA)	from Home	11,644	18,265	5,674	4,933	**40,517**
	return Home	3,488	20,781	12,116	10,711	**47,097**
	Total	**15,133**	**39,046**	**17,791**	**15,644**	**87,613**
HB Business (PA)	from Home	778	527	135	319	**1,759**
	return Home	76	633	589	341	**1,638**
	Total	**854**	**1,160**	**724**	**660**	**3,398**
NHB Trips						
NHB Other (OD)	Total	6,084	23,117	14,500	10,516	**54,217**
NHB Business (OD)	Total	1,107	4,357	1,447	1,634	**8,545**

Design Year 2038 Matrices

Purpose	Format	AM period	IP Period	PM Period	OP Period	24hr Total
HB Trips						
HB Commute (PA)	from Home	7,414	2,905	1,153	3,130	**14,603**
	return Home	655	2,752	5,451	2,104	**10,963**
	Total	**8,068**	**5,657**	**6,605**	**5,235**	**25,565**
HB Education (PA)	from Home	1,089	1,614	937	747	**4,387**
	return Home	385	2,519	5,401	1,884	**10,189**
	Total	**1,474**	**4,132**	**6,338**	**2,631**	**14,575**
HB Other (PA)	from Home	13,046	20,744	6,493	5,534	**45,816**
	return Home	3,757	22,889	13,220	12,015	**51,882**
	Total	**16,804**	**43,633**	**19,713**	**17,549**	**97,698**
HB Business (PA)	from Home	841	580	147	348	**1,916**
	return Home	79	692	644	372	**1,787**
	Total	**920**	**1,272**	**792**	**720**	**3,703**
NHB Trips						
NHB Other (OD)	Total	6,674	25,903	16,132	11,801	**60,511**
NHB Business (OD)	Total	1,194	4,669	1,538	1,750	**9,151**

2051 Matrices

Purpose	Format	AM period	IP Period	PM Period	OP Period	24hr Total
HB Trips						
HB Commute (PA)	from Home	7,891	3,070	1,234	3,319	**15,514**
	return Home	702	2,893	5,759	2,231	**11,585**
	Total	**8,594**	**5,963**	**6,993**	**5,550**	**27,100**
HB Education (PA)	from Home	1,203	1,762	1,016	819	**4,801**
	return Home	424	2,744	5,936	2,067	**11,171**
	Total	**1,627**	**4,507**	**6,952**	**2,886**	**15,972**
HB Other (PA)	from Home	14,405	22,651	7,067	6,086	**50,209**
	return Home	4,188	25,305	14,530	13,214	**57,238**
	Total	**18,593**	**47,956**	**21,597**	**19,300**	**107,447**
HB Business (PA)	from Home	902	626	158	374	**2,060**
	return Home	85	745	691	399	**1,921**
	Total	**987**	**1,371**	**849**	**774**	**3,981**
NHB Trips						
NHB Other (OD)	Total	7,306	28,396	17,678	12,933	**66,313**
NHB Business (OD)	Total	1,288	5,002	1,654	1,878	**9,822**

Appendix D – Convergence Statistics

Do Minimum Assignments

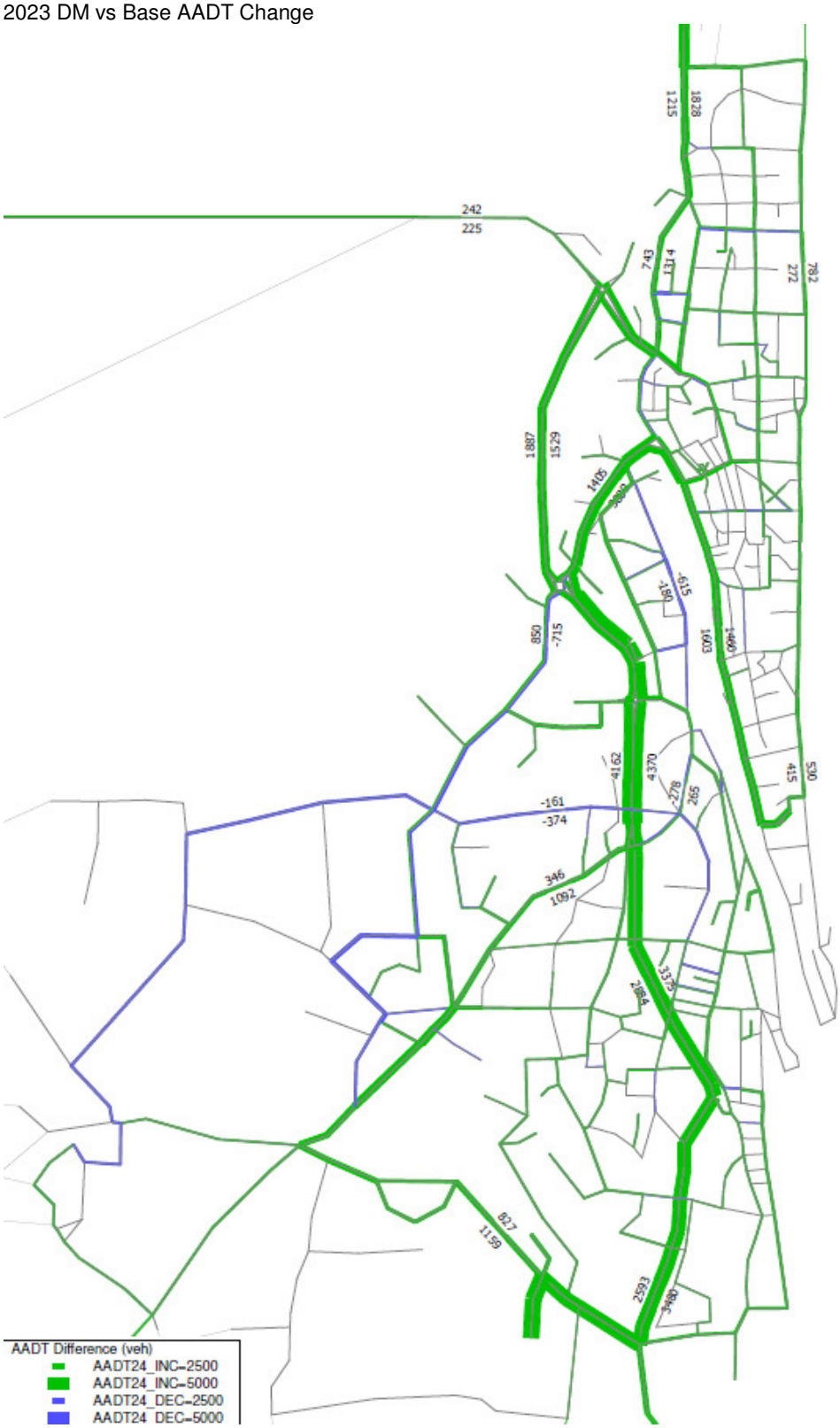
Scenario	Iteration	Percentage of links with flow change (P) < 1%	RAAD	GAP
DM AM 23	26	99.8	0.012	0.0097
	27	99.8	0.012	0.0085
	28	99.8	0.012	0.0085
	29	99.8	0.010	0.0042
DM IP 23	15	99.6	0..017	0.00047
	16	99.7	0.015	0.00039
	17	99.8	0.016	0.00027
	18	99.9	0.011	0.00024
DM PM 23	69	100.0	0.008	0.0014
	70	99.8	0.011	0.0013
	71	99.7	0.009	0.0013
	72	99.7	0.009	0.0013
DM AM 38	43	99.8	0.026	0.0085
	44	99.9	0.020	0.0073
	45	99.9	0.013	0.0072
	46	99.9	0.013	0.0077
DM IP 38	53	100.0	0.021	0.0068
	54	100.0	0.020	0.0066
	55	100.0	0.017	0.0064
	56	100.0	0.016	0.0064
DM PM 38	63	99.6	0.033	0.0063
	64	99.7	0.018	0.0091
	65	99.8	0.027	0.0081
	66	99.7	0.020	0.0092
DM AM 51	46	99.8	0.021	0.0056
	47	99.8	0.014	0.0057
	48	99.7	0.017	0.0093
	49	99.7	0.015	0.0058
DM IP 51	41	99.9	0.017	0.0097
	42	99.9	0.014	0.0099
	43	100.0	0.016	0.0094
	44	100.0	0.014	0.0090
DM PM 51	94	99.6	0.022	0.0097
	95	99.5	0.021	0.0082
	96	99.7	0.020	0.0077
	97	99.7	0.016	0.0086

Do Something Assignments

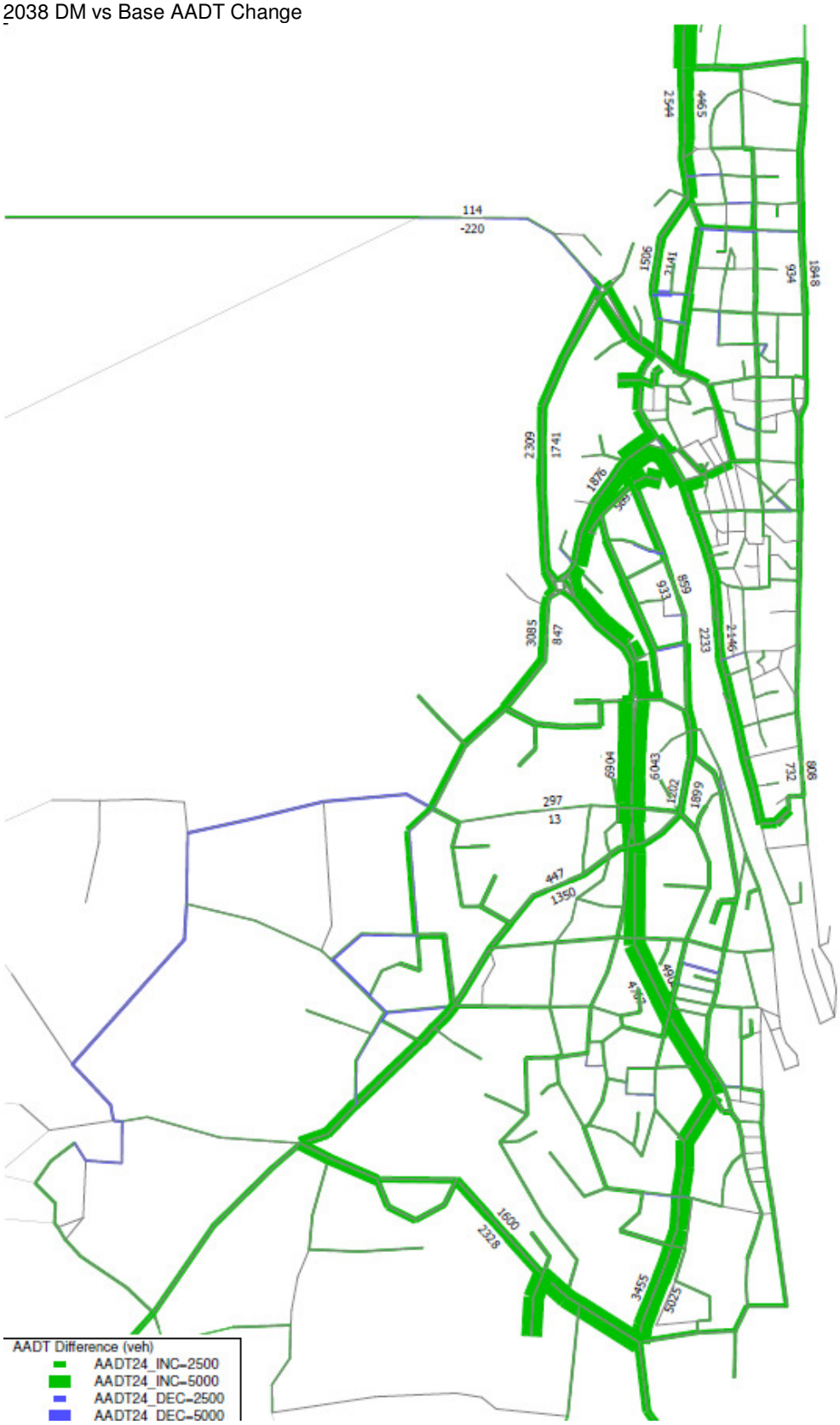
Scenario	Iteration	Percentage of links with flow change (P) < 1%	RAAD	GAP
DS AM 23	18	99.7	0.024	0.0016
	19	99.8	0.024	0.0016
	20	99.7	0.020	0.0013
	21	99.9	0.018	0.0014
DS IP 23	12	99.8	0.019	0.00029
	13	99.8	0.017	0.00022
	14	99.9	0.011	0.00022
	15	100.0	0.007	0.00017
DS PM 23	24	99.6	0.0090	0.0036
	25	99.8	0.0091	0.0049
	26	99.9	0.0074	0.0035
	27	99.8	0.0093	0.0042
DS AM 38	39	100.0	0.014	0.0065
	40	99.9	0.015	0.0070
	41	99.9	0.016	0.0097
	42	99.9	0.014	0.0062
DS IP 38	154	100.0	0.011	0.0088
	155	100.0	0.008	0.0076
	156	100.0	0.009	0.0098
	157	100.0	0.007	0.0066
DS PM 38	55	99.7	0.029	0.0057
	56	99.9	0.025	0.0099
	57	99.6	0.032	0.0060
	58	99.9	0.025	0.0090
DS AM 51	45	99.6	0.020	0.0075
	46	99.5	0.020	0.0086
	47	99.7	0.017	0.0056
	48	99.6	0.017	0.0067
DS IP 51	44	99.8	0.028	0.0090
	45	99.9	0.021	0.0097
	46	99.9	0.022	0.0079
	47	99.9	0.021	0.0074
DS PM 51	93	99.6	0.034	0.0071
	94	99.6	0.037	0.0046
	95	99.6	0.036	0.0046
	96	99.6	0.028	0.0037

Appendix E – Fixed Traffic Flows

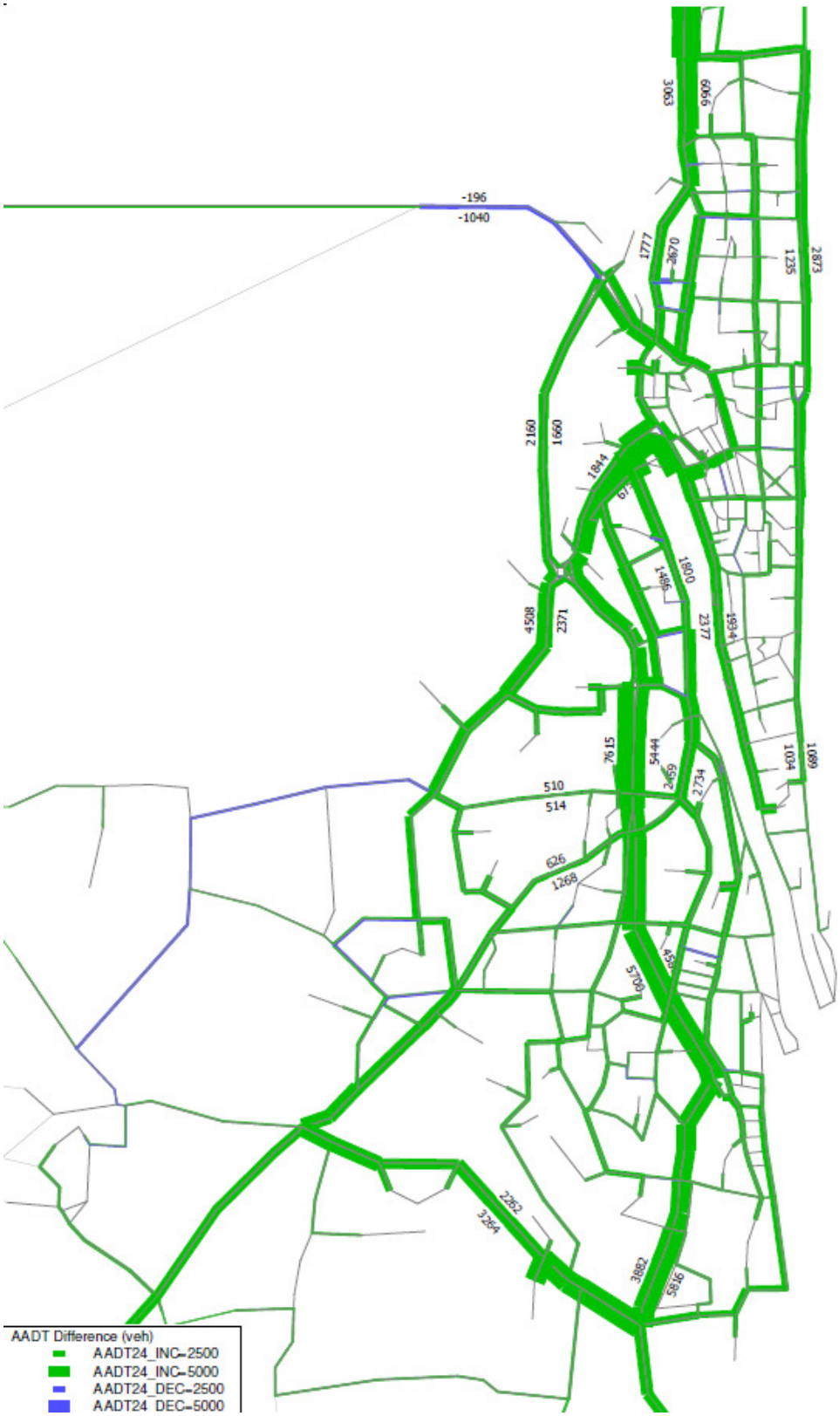
2023 DM vs Base AADT Change



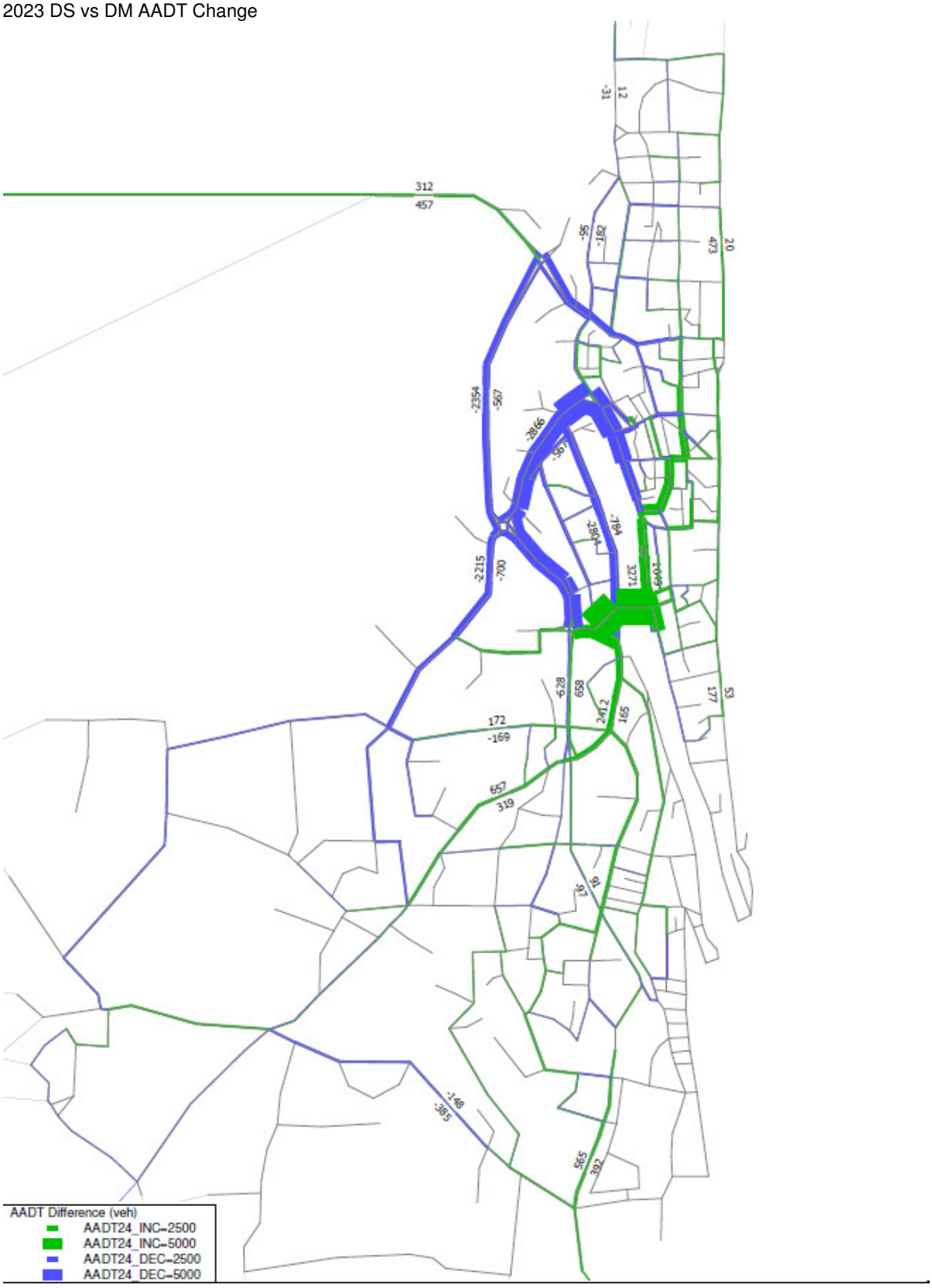
2038 DM vs Base AADT Change



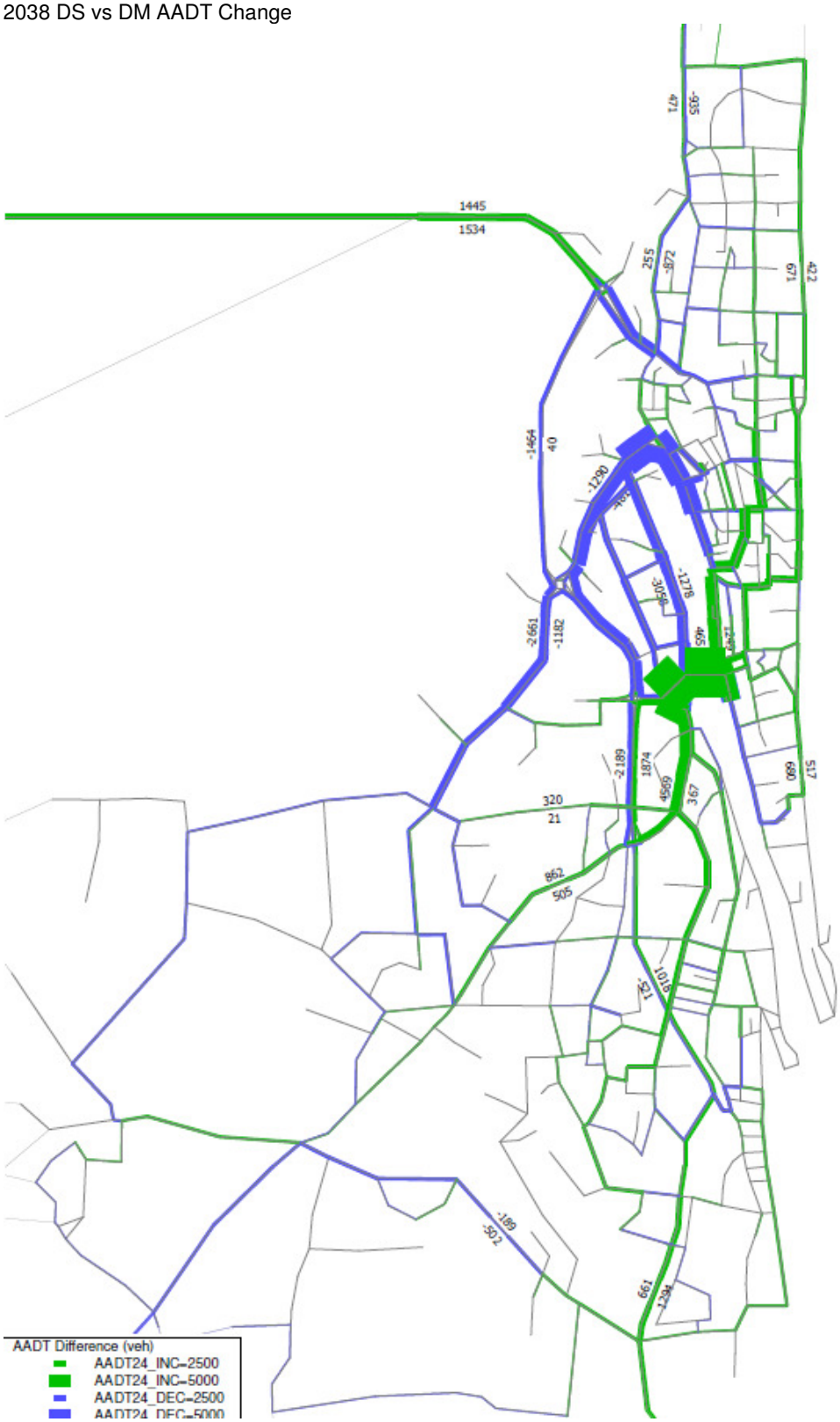
2051 DM vs Base AADT Change



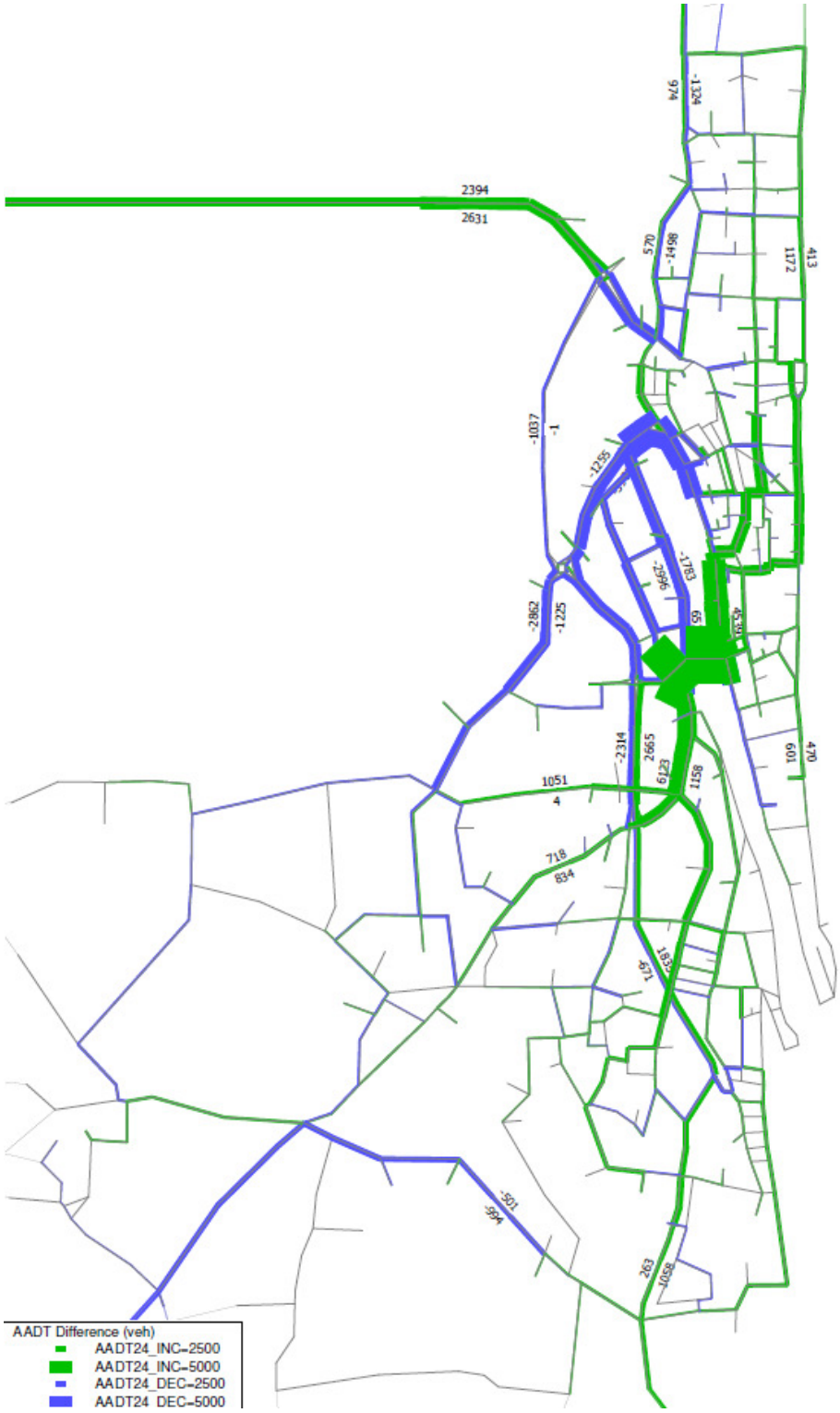
2023 DS vs DM AADT Change



2038 DS vs DM AADT Change



2051 DS vs DM AADT Change



Appendix F– Reference Matrix Compression

2023 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	5	5	0	4	2	0	16	5	4	3
2	3	17	2	5	2	6	22	5	8	9
3	1	2	0	4	0	0	22	1	1	3
4	8	9	12	3	3	14	85	6	1	17
5	2	2	0	0	0	0	5	1	0	0
6	2	2	0	5	0	0	11	1	1	1
7	12	29	4	50	14	14	197	13	4	23
8	4	16	1	10	1	1	30	2	14	14
9	5	10	3	1	0	9	11	15	16	10
10	2	9	2	2	1	3	8	4	4	1

UC2	1	2	3	4	5	6	7	8	9	10
1	18	21	9	24	1	2	54	7	30	6
2	92	33	23	29	4	12	143	21	20	21
3	33	21	1	25	0	0	149	40	19	16
4	75	71	29	19	4	27	478	20	4	43
5	6	10	0	5	0	0	30	6	1	5
6	11	23	2	14	0	0	68	14	4	4
7	143	174	144	305	44	26	1,134	47	23	175
8	72	94	98	33	13	43	147	175	84	47
9	51	62	38	12	4	19	62	53	42	45
10	13	13	7	32	3	1	32	8	4	3

UC3	1	2	3	4	5	6	7	8	9	10
1	84	87	15	3	1	1	109	18	34	58
2	73	282	12	29	6	8	272	41	117	150
3	8	10	1	20	0	0	81	10	8	16
4	19	44	30	32	5	22	555	12	5	47
5	1	7	0	2	0	0	16	4	0	1
6	2	10	1	18	0	0	43	3	1	3
7	180	263	34	352	22	29	2,876	99	46	267
8	64	135	6	27	3	4	173	20	141	97
9	66	164	15	5	2	12	154	133	260	132
10	40	151	12	14	2	4	111	30	44	27

LGV	1	2	3	4	5	6	7	8	9	10
1	21	17	6	24	2	2	37	5	13	11
2	37	55	8	21	6	4	79	21	48	22
3	8	5	0	10	0	0	28	3	13	4
4	33	30	12	13	3	138	148	9	5	35
5	4	4	0	3	0	0	20	1	1	0
6	9	6	1	56	0	0	61	1	3	2
7	57	89	40	160	13	52	643	44	33	49
8	27	49	3	24	2	3	54	10	89	29
9	15	25	14	8	1	10	14	47	85	12
10	9	31	7	6	1	2	19	15	14	6

HGV	1	2	3	4	5	6	7	8	9	10
1	0	11	1	29	0	1	18	12	19	2
2	6	0	55	4	0	13	11	15	73	0
3	9	65	0	7	0	0	18	5	0	1
4	18	2	3	65	1	62	173	4	7	4
5	0	3	0	1	0	0	23	9	1	5
6	1	1	0	23	0	0	71	0	1	0
7	51	5	22	124	74	51	25	8	5	24
8	17	4	0	21	0	0	12	6	8	0
9	11	31	3	2	0	8	2	7	0	0
10	7	0	7	1	0	6	22	1	0	0

2023 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	6	17	5	12	0	3	27	3	3	18
2	20	13	3	6	2	5	30	15	13	8
3	6	1	0	3	0	0	23	1	2	2
4	2	3	1	5	1	7	68	4	1	6
5	1	1	0	1	0	0	5	1	0	2
6	3	2	0	6	0	0	13	2	6	5
7	19	27	19	59	6	12	181	23	12	33
8	6	10	1	6	1	2	27	3	16	8
9	4	10	2	2	1	8	9	15	14	7
10	6	7	5	7	2	15	12	8	6	1

UC2	1	2	3	4	5	6	7	8	9	10
1	5	26	6	9	2	4	41	10	8	11
2	26	8	6	9	6	2	64	21	16	4
3	11	3	0	4	0	0	47	30	10	2
4	10	2	1	9	6	20	107	2	2	14
5	1	1	0	7	0	0	17	2	1	1
6	3	1	0	16	0	0	30	10	2	1
7	33	36	28	124	14	14	266	37	12	34
8	12	9	21	6	2	8	37	40	15	4
9	10	8	8	3	1	2	38	14	11	3
10	7	3	7	8	1	3	24	6	4	0

UC3	1	2	3	4	5	6	7	8	9	10
1	134	97	9	13	2	5	186	25	58	72
2	109	293	22	52	5	7	411	134	233	186
3	11	10	1	14	1	0	89	9	16	13
4	9	36	17	52	2	29	614	31	11	84
5	1	3	2	2	0	0	25	3	2	5
6	5	4	0	21	0	1	48	4	10	10
7	187	338	82	532	20	42	3,537	189	155	374
8	26	90	9	39	3	5	176	28	188	73
9	45	172	18	11	3	12	136	159	299	102
10	62	147	43	51	4	19	177	63	94	25

LGV	1	2	3	4	5	6	7	8	9	10
1	29	43	1	15	1	2	41	15	10	19
2	31	48	4	16	5	2	66	21	46	19

3	2	3	0	4	0	0	15	1	2	1
4	19	17	2	14	2	43	108	3	3	11
5	3	2	0	2	0	0	11	1	1	1
6	3	1	0	34	0	0	31	1	2	2
7	60	79	8	128	7	17	641	18	13	49
8	18	18	2	8	1	1	26	4	35	8
9	9	50	4	5	1	2	22	26	78	17
10	20	24	5	4	1	3	18	10	13	6

HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	0	1	3	23	8	4	33	6	12	7
2	15	1	6	3	3	84	7	19	82	0
3	7	6	0	8	0	0	20	0	0	8
4	18	3	7	1	5	53	186	2	1	1
5	6	6	0	3	0	0	53	1	1	5
6	2	53	0	22	0	0	37	0	0	0
7	29	4	32	146	54	28	17	8	3	13
8	16	32	0	3	1	0	9	4	3	6
9	10	39	0	1	0	0	3	2	0	0
10	18	0	3	1	6	0	14	8	0	0

2023 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	7	19	0	10	2	1	11	5	7	1
2	17	14	2	8	2	1	32	7	6	8
3	10	2	0	9	0	0	42	1	4	2
4	1	3	1	2	1	9	57	11	0	2
5	1	1	0	2	0	0	16	1	0	0
6	1	5	0	5	0	0	27	1	10	1
7	9	37	31	84	6	11	169	25	13	11
8	3	5	1	4	2	2	17	1	15	7
9	5	7	2	2	0	1	5	12	12	4
10	4	11	4	4	0	1	13	10	5	1

UC2	1	2	3	4	5	6	7	8	9	10
1	21	80	31	81	13	9	143	72	40	19
2	28	30	23	46	6	8	112	33	25	11
3	23	15	1	24	0	1	163	83	46	6
4	5	17	5	16	5	36	329	34	25	16
5	1	5	0	4	0	0	81	12	3	2
6	7	11	0	15	0	0	73	37	20	1
7	49	89	162	478	31	49	900	220	85	45
8	15	18	41	22	8	13	64	156	48	14
9	9	17	20	6	1	5	28	67	32	6
10	4	25	16	16	3	5	52	34	17	2

UC3	1	2	3	4	5	6	7	8	9	10
1	156	64	10	39	0	1	195	41	39	94
2	96	347	22	72	12	6	288	82	150	214
3	21	15	1	21	0	1	118	9	33	17
4	3	37	4	38	5	43	578	45	4	18
5	0	5	0	8	0	0	59	4	1	2
6	3	12	0	15	0	0	60	5	19	3
7	103	373	81	765	17	60	3,574	238	237	234
8	16	63	9	39	5	4	115	19	182	74
9	27	143	14	13	1	1	88	169	315	73
10	110	269	33	32	2	3	128	93	102	26

LGV	1	2	3	4	5	6	7	8	9	10
1	19	23	4	21	6	2	39	27	18	15
2	23	48	3	38	6	3	95	36	48	26

3	2	3	0	7	0	1	30	1	4	6
4	9	22	5	13	5	90	142	19	17	9
5	3	1	0	2	0	0	23	1	1	1
6	2	1	0	43	0	0	58	1	4	1
7	30	54	18	150	5	33	651	28	46	43
8	16	12	2	9	1	1	25	5	35	14
9	7	39	2	6	1	1	23	32	82	16
10	11	18	4	6	0	0	11	12	15	5

HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	0	0	10	4	0	0	22	0	1	5
2	11	0	67	2	1	3	3	3	71	0
3	0	57	0	2	0	0	13	0	1	13
4	8	2	0	15	0	12	89	1	2	1
5	2	5	0	0	0	0	20	0	0	0
6	1	8	0	10	0	0	20	0	7	5
7	22	2	17	94	12	11	14	25	3	17
8	7	5	3	5	6	0	3	4	4	0
9	4	21	0	7	0	0	2	3	0	0
10	3	0	0	6	1	0	3	0	0	0

2038 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	5	6	0	4	2	0	18	5	4	3
2	4	18	2	5	2	6	28	5	9	9
3	1	3	0	4	0	0	25	1	2	4
4	8	10	12	3	4	15	89	6	2	17
5	2	2	0	0	0	0	5	1	0	0
6	2	3	0	5	0	0	11	1	1	1
7	13	36	5	54	15	16	217	14	6	23
8	5	18	1	11	1	2	33	2	14	14
9	6	12	3	1	0	10	15	15	16	10
10	2	9	2	2	1	3	8	4	3	1

UC2	1	2	3	4	5	6	7	8	9	10
1	19	24	10	26	1	2	60	7	31	6
2	99	40	26	32	5	13	182	24	23	20
3	36	26	4	26	1	1	168	42	20	15
4	75	73	30	19	5	27	486	21	4	43
5	7	10	1	5	0	0	33	7	1	5
6	12	25	2	15	0	0	73	15	4	4
7	153	209	158	325	47	31	1,241	54	32	169
8	73	100	101	36	14	46	166	179	85	45
9	55	70	40	13	4	20	86	55	42	44
10	12	12	6	32	3	1	27	8	4	3

UC3	1	2	3	4	5	6	7	8	9	10
1	84	100	15	4	1	1	127	19	39	58
2	104	332	15	33	7	9	423	49	141	162
3	9	15	3	22	1	0	93	12	10	17
4	19	52	32	35	6	23	605	11	7	49
5	1	7	0	2	0	0	18	5	0	1
6	2	12	1	21	0	1	45	3	1	3
7	207	431	43	394	25	32	3,299	111	94	278
8	61	148	8	31	4	5	188	23	145	94
9	92	194	15	6	2	12	237	135	265	133
10	35	144	11	14	2	4	90	29	42	22

LGV	1	2	3	4	5	6	7	8	9	10
1	27	24	7	28	3	4	51	7	16	15
2	49	71	11	29	6	7	106	26	62	32

3	9	7	1	13	1	1	35	5	16	6
4	42	40	17	22	4	174	187	17	14	42
5	5	5	1	5	0	0	24	2	3	1
6	11	8	1	77	1	0	72	3	7	3
7	82	123	50	195	15	68	832	60	57	69
8	34	57	7	37	4	9	80	16	104	34
9	20	35	18	13	2	13	30	53	104	16
10	13	37	8	10	2	3	31	17	17	8

HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	1	12	3	32	0	2	23	14	21	2
2	8	1	62	9	1	14	22	17	75	0
3	11	73	0	9	1	0	22	5	2	2
4	23	7	5	71	3	71	192	7	15	5
5	2	4	0	2	0	0	26	9	2	5
6	2	1	0	27	0	0	75	1	2	0
7	58	9	26	141	83	58	35	11	8	26
8	19	5	0	25	1	1	15	6	9	1
9	12	32	4	6	1	9	4	8	0	0
10	8	0	7	2	1	7	24	2	1	0

2038 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	7	19	6	12	0	3	29	3	4	18
2	22	16	3	6	2	6	38	16	15	9
3	6	2	0	3	0	0	24	1	2	2
4	2	3	1	5	1	7	72	4	1	6
5	1	1	0	1	0	0	6	1	0	2
6	3	3	0	6	0	0	15	2	6	5
7	20	36	21	62	6	14	199	25	14	31
8	6	11	1	7	1	3	28	3	17	8
9	4	12	3	2	1	9	12	16	14	7
10	6	7	5	8	2	15	11	8	6	1

UC2	1	2	3	4	5	6	7	8	9	10
1	5	28	6	9	2	4	42	10	9	11
2	28	11	8	10	6	3	79	22	18	4
3	11	5	1	4	0	0	52	30	11	1
4	11	3	1	9	6	21	110	3	2	14
5	2	2	0	7	0	0	18	2	1	1
6	3	2	0	16	0	0	32	10	3	1
7	34	51	32	126	15	16	290	40	15	31
8	13	10	21	7	2	8	40	41	15	4
9	10	10	9	3	1	2	41	15	11	3
10	7	3	6	8	1	3	22	5	4	0

UC3	1	2	3	4	5	6	7	8	9	10
1	136	131	10	14	2	6	198	26	75	69
2	141	360	29	63	6	8	625	151	284	187
3	12	16	5	16	2	1	99	12	19	12
4	10	48	20	57	2	32	680	36	14	89
5	2	4	2	3	0	1	28	4	3	5
6	5	5	1	23	0	2	52	5	11	10
7	198	567	98	586	22	47	4,078	215	231	352
8	28	104	12	45	3	6	199	36	199	71
9	59	216	21	13	3	13	204	170	319	101
10	61	150	43	54	4	18	165	62	95	21

LGV	1	2	3	4	5	6	7	8	9	10
1	38	54	2	19	2	3	60	17	14	25
2	42	64	5	21	5	3	90	24	57	26

3	2	4	0	5	0	0	17	2	3	2
4	23	23	3	21	3	55	135	7	7	14
5	3	3	0	4	0	0	14	2	2	1
6	4	2	0	45	1	0	37	2	3	2
7	83	110	10	156	9	22	828	28	27	64
8	21	22	2	13	2	2	37	7	42	10
9	13	62	4	10	2	3	36	31	96	21
10	25	31	5	7	1	4	30	11	16	9

HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	1	2	5	25	9	5	38	7	14	7
2	17	2	8	9	4	91	18	21	85	1
3	8	8	0	9	0	0	23	0	1	8
4	22	8	8	4	8	60	206	3	4	1
5	7	6	1	5	0	1	59	1	2	5
6	3	57	0	25	0	0	41	1	2	1
7	35	10	35	161	60	32	26	11	6	16
8	18	35	0	4	1	1	12	4	4	7
9	12	41	1	2	1	1	5	3	0	1
10	19	1	4	1	6	1	16	8	1	1

2038 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	7	21	1	10	2	1	12	5	8	1
2	18	16	3	9	2	2	39	8	8	8
3	11	3	0	10	0	0	45	1	5	2
4	2	4	1	3	1	10	61	12	0	2
5	1	1	0	2	0	0	17	1	0	0
6	1	6	0	5	0	0	29	2	10	1
7	11	45	34	87	6	12	185	28	16	10
8	3	6	1	4	2	2	18	1	15	7
9	5	8	2	2	0	2	7	13	13	4
10	4	11	4	4	0	1	13	9	5	1

UC2	1	2	3	4	5	6	7	8	9	10
1	19	92	33	81	13	10	142	70	44	17
2	33	41	32	50	7	9	171	41	37	10
3	24	21	2	26	0	2	178	84	48	6
4	5	21	7	16	6	39	341	38	26	16
5	2	6	1	5	0	0	86	12	4	2
6	8	13	1	16	0	0	78	38	21	1
7	48	159	180	478	33	53	944	227	103	37
8	14	22	42	23	8	13	69	153	47	13
9	10	26	23	7	1	5	44	66	31	5
10	4	23	16	16	3	4	44	31	15	1

UC3	1	2	3	4	5	6	7	8	9	10
1	158	91	11	42	1	1	207	42	59	92
2	117	407	27	82	13	8	445	96	189	216
3	22	21	5	23	1	2	135	14	35	17
4	5	46	5	41	5	46	638	51	7	19
5	0	6	1	9	0	0	64	5	1	2
6	4	14	1	17	0	1	64	6	21	3
7	127	564	95	834	20	66	4,057	268	312	225
8	18	72	11	44	5	4	133	24	190	76
9	36	177	17	15	1	2	143	178	332	73
10	112	278	33	34	2	3	134	92	103	22

LGV	1	2	3	4	5	6	7	8	9	10
1	23	31	4	26	6	3	60	31	24	21
2	31	62	5	47	7	5	128	43	64	35

3	3	5	0	10	0	1	37	3	6	7
4	13	27	7	21	6	114	181	27	25	13
5	3	1	0	3	0	0	27	3	2	2
6	3	3	1	59	0	0	69	3	6	1
7	43	77	22	185	7	43	840	44	69	58
8	18	16	3	15	2	2	38	8	41	16
9	10	47	4	12	2	3	40	38	100	19
10	13	22	5	9	0	1	21	13	18	6

HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	0	0	10	7	0	0	24	1	3	5
2	12	0	78	7	1	3	10	5	73	0
3	1	64	0	2	0	0	17	0	2	14
4	11	5	0	15	0	14	96	1	8	3
5	3	6	0	0	0	0	23	0	1	1
6	2	9	0	11	0	0	23	0	8	5
7	24	5	21	106	15	12	17	29	8	19
8	8	6	3	5	6	0	6	4	5	2
9	4	21	0	9	0	0	5	3	0	0
10	3	0	0	7	1	0	4	0	0	0

2051 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	6	7	1	5	2	1	20	5	5	3
2	5	20	2	5	2	7	32	6	10	10
3	1	3	0	5	0	0	27	2	2	4
4	8	11	13	3	4	16	93	7	2	18
5	2	2	0	0	0	0	6	2	0	0
6	2	3	0	5	0	0	12	2	2	1
7	13	38	6	57	16	17	232	16	7	25
8	5	19	1	12	1	2	36	2	15	14
9	6	13	3	2	1	10	17	16	17	11
10	2	9	2	2	1	3	9	4	4	2

UC2	1	2	3	4	5	6	7	8	9	10
1	20	27	11	27	1	3	69	8	32	7
2	101	46	29	34	6	14	199	26	26	24
3	37	30	6	28	1	2	183	44	22	17
4	76	75	31	20	5	28	502	22	5	45
5	7	11	1	5	0	0	35	7	1	5
6	12	27	3	16	1	1	78	16	5	5
7	152	226	169	344	49	34	1,325	63	37	182
8	75	105	105	38	15	48	183	186	89	48
9	56	74	42	15	4	21	94	57	44	47
10	13	13	7	33	3	1	32	8	4	3

UC3	1	2	3	4	5	6	7	8	9	10
1	89	117	16	5	1	2	156	22	44	67
2	108	376	16	37	8	10	487	54	158	187
3	10	18	5	23	1	1	103	13	12	18
4	20	55	34	38	6	25	649	12	9	54
5	1	8	0	3	0	0	19	5	1	1
6	2	14	1	22	0	2	48	4	2	4
7	199	471	48	427	27	35	3,617	119	113	320
8	61	157	9	34	4	7	210	26	154	100
9	96	221	17	8	2	13	277	145	286	145
10	39	160	12	16	2	4	123	32	46	28

LGV	1	2	3	4	5	6	7	8	9	10
1	31	31	8	31	3	5	63	9	19	18
2	58	83	14	35	7	9	128	29	73	39

3	11	9	1	16	1	1	41	6	19	7
4	49	48	21	29	6	204	219	24	22	47
5	5	6	1	6	0	1	28	3	4	1
6	12	10	1	93	1	0	81	5	9	3
7	102	151	59	224	17	81	986	72	77	85
8	39	64	10	47	5	13	102	22	117	37
9	23	44	20	18	3	15	43	58	119	20
10	16	42	9	12	2	3	41	18	20	10

HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	1	14	4	35	1	4	28	15	23	2
2	10	1	68	13	1	15	33	18	77	1
3	12	80	0	12	1	1	25	5	3	3
4	28	11	6	77	4	79	210	9	23	7
5	3	5	0	3	0	0	29	9	2	5
6	4	1	0	31	0	0	79	1	3	0
7	64	14	30	157	92	64	46	14	11	27
8	20	5	1	29	1	1	18	6	9	1
9	14	33	5	9	1	10	7	8	0	1
10	8	0	8	3	1	7	26	3	1	0

2051 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	8	21	6	13	0	4	32	4	4	19
2	23	18	4	7	2	6	42	17	16	10
3	6	2	0	4	0	0	25	2	3	2
4	3	4	1	5	1	7	76	5	2	7
5	1	1	0	1	0	0	6	1	1	2
6	3	3	0	7	0	0	16	2	6	5
7	22	38	22	65	6	15	210	27	16	35
8	6	11	2	8	1	3	31	4	18	8
9	4	13	3	3	1	9	13	17	15	8
10	6	8	5	8	2	15	14	8	7	1

UC2	1	2	3	4	5	6	7	8	9	10
1	6	29	7	9	2	4	44	11	9	11
2	30	11	9	11	6	3	82	23	19	4
3	12	6	1	4	0	0	55	31	11	1
4	11	3	2	9	6	22	115	3	2	15
5	2	2	0	7	0	0	19	2	1	1
6	3	2	0	17	0	0	34	11	3	1
7	37	52	34	130	16	17	310	42	17	32
8	14	11	22	7	2	9	43	43	16	4
9	11	11	9	3	1	3	45	16	12	3
10	7	3	7	9	1	3	23	6	4	0

UC3	1	2	3	4	5	6	7	8	9	10
1	139	136	10	15	3	6	201	27	78	75
2	149	407	33	69	7	10	699	160	309	215
3	12	19	7	18	2	2	107	14	21	14
4	11	53	21	61	2	34	726	40	17	97
5	2	4	3	3	0	1	30	4	3	5
6	5	6	2	25	1	4	56	6	12	10
7	205	625	109	624	24	52	4,485	235	275	411
8	30	112	14	49	4	7	217	40	211	77
9	62	235	24	16	4	14	241	181	344	111
10	65	168	44	59	4	19	208	66	103	26

LGV	1	2	3	4	5	6	7	8	9	10

1	45	63	2	22	2	3	75	19	17	29
2	51	77	6	26	6	3	109	27	66	33
3	3	6	0	7	1	0	20	2	4	3
4	27	27	4	27	4	64	157	10	11	16
5	4	3	1	5	0	1	16	2	2	1
6	5	3	0	55	1	0	42	3	4	2
7	102	135	13	179	11	27	982	37	39	76
8	24	26	3	17	2	3	46	9	47	11
9	17	72	5	14	2	4	48	36	111	25
10	28	36	5	9	1	4	40	12	18	11

HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	2	3	6	27	10	7	42	8	17	8
2	19	3	10	14	5	99	30	24	89	1
3	9	10	0	10	1	1	25	0	2	9
4	25	13	10	7	11	67	225	3	7	2
5	8	7	1	7	0	1	65	1	3	5
6	4	61	1	29	1	0	44	1	3	1
7	41	16	38	175	66	36	35	13	10	18
8	20	38	1	5	2	2	14	4	4	8
9	13	42	1	4	2	1	7	3	0	1
10	19	1	5	2	7	1	19	9	2	1

2051 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	7	21	1	10	2	1	12	5	8	1
2	19	17	4	9	2	2	42	9	9	9
3	11	4	1	10	0	0	47	2	6	3
4	2	4	2	3	1	10	65	12	1	2
5	1	1	0	3	0	0	18	1	0	0
6	2	6	0	6	0	0	31	2	11	1
7	13	49	36	91	6	13	198	30	18	12
8	3	7	2	4	2	2	20	2	16	7
9	6	9	2	2	0	2	8	13	13	4
10	5	11	5	4	0	1	14	10	6	1

UC2	1	2	3	4	5	6	7	8	9	10
1	20	94	35	82	13	11	148	73	44	18
2	33	43	35	51	7	10	179	43	37	10
3	24	23	4	26	1	2	191	88	48	6
4	5	23	8	17	6	39	362	41	28	16
5	2	7	2	5	0	0	90	13	4	2
6	8	14	1	16	0	0	83	41	22	1
7	49	168	197	494	36	59	1,029	246	106	38
8	15	24	44	24	8	14	77	161	50	13
9	10	27	23	7	1	5	46	69	32	5
10	4	24	16	16	3	5	45	32	16	1

UC3	1	2	3	4	5	6	7	8	9	10
1	161	94	11	44	1	1	203	42	61	95
2	132	453	30	87	13	9	494	104	210	238
3	23	24	7	25	1	2	146	17	39	19
4	6	51	6	44	6	48	683	56	10	23
5	1	7	1	9	0	1	68	6	2	3
6	4	15	2	19	1	2	69	8	22	4
7	158	629	106	888	22	71	4,439	292	353	271
8	21	79	13	47	6	4	146	27	201	81
9	40	196	19	18	1	2	170	189	357	80
10	121	301	34	38	3	4	174	97	112	30

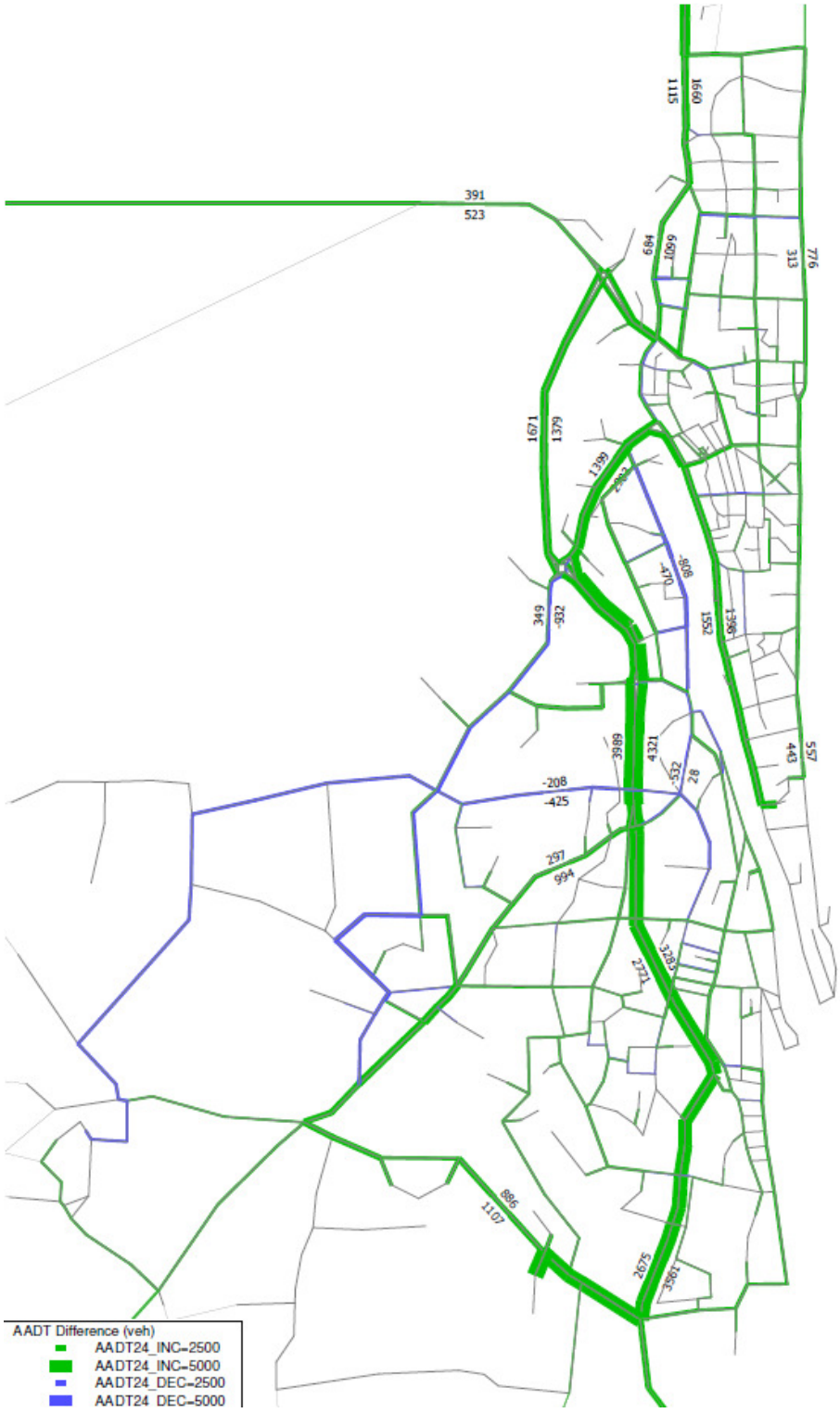
LGV	1	2	3	4	5	6	7	8	9	10
1	27	37	5	31	7	4	77	34	28	25
2	38	74	6	55	7	6	156	49	78	43

3	3	6	1	12	1	2	43	4	8	8
4	15	32	9	28	7	133	213	34	32	16
5	4	2	0	5	0	1	31	3	3	2
6	3	3	1	72	1	0	78	4	8	2
7	55	95	26	214	9	51	995	57	87	70
8	19	19	3	19	2	3	48	10	47	18
9	12	54	4	17	2	5	54	44	114	22
10	15	25	5	10	0	1	30	15	20	8

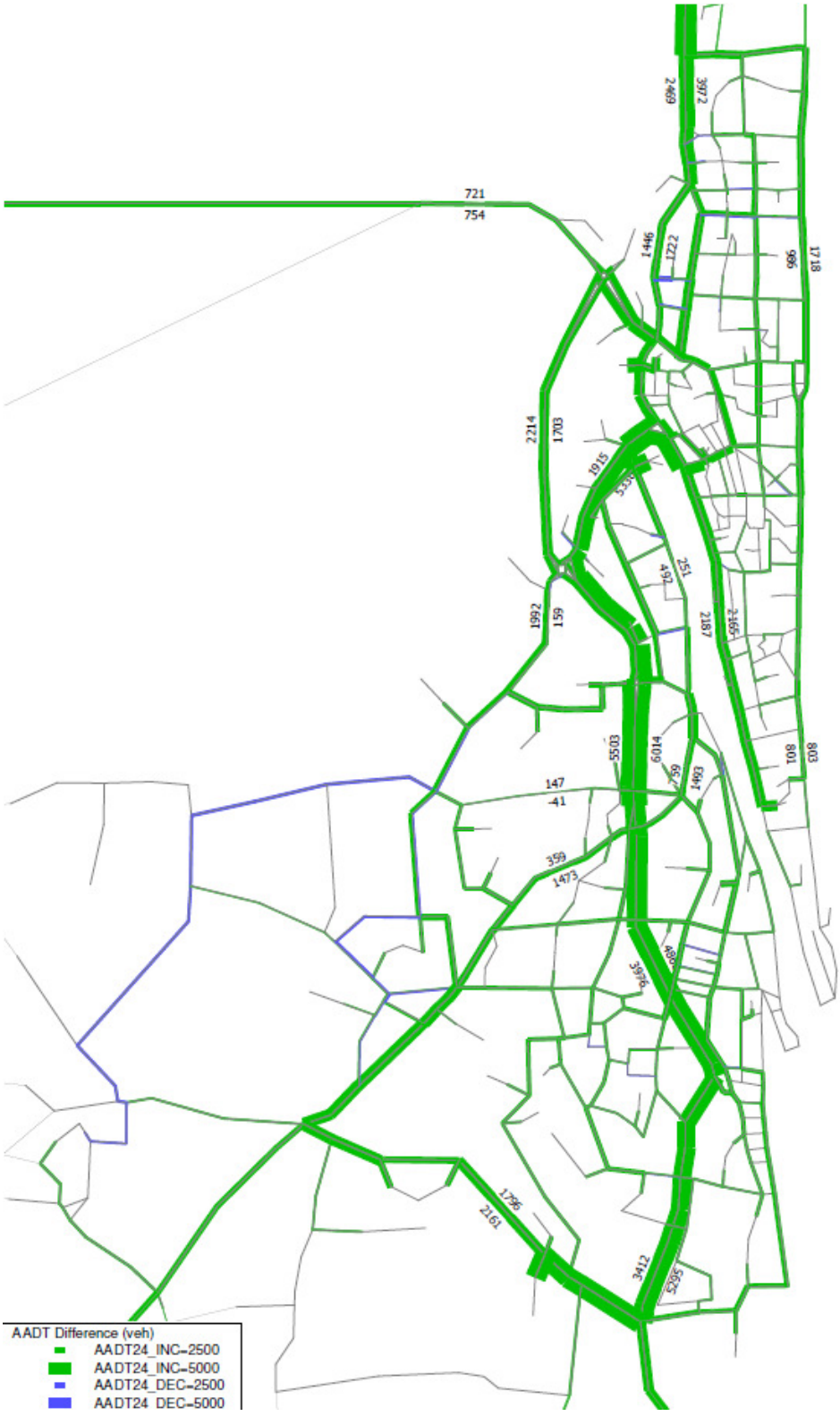
HGV	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	0	1	11	9	1	1	25	1	3	5
2	14	0	89	12	2	3	16	6	74	0
3	2	70	0	2	0	0	20	0	4	16
4	14	8	0	15	0	15	103	1	13	4
5	4	7	0	0	0	0	25	0	1	1
6	4	11	0	12	0	0	26	0	8	5
7	26	8	26	118	17	13	19	32	12	20
8	9	7	3	6	6	0	8	4	5	3
9	5	22	0	11	0	0	8	3	0	0
10	3	0	0	8	2	0	4	1	0	0

Appendix G – VDM Results

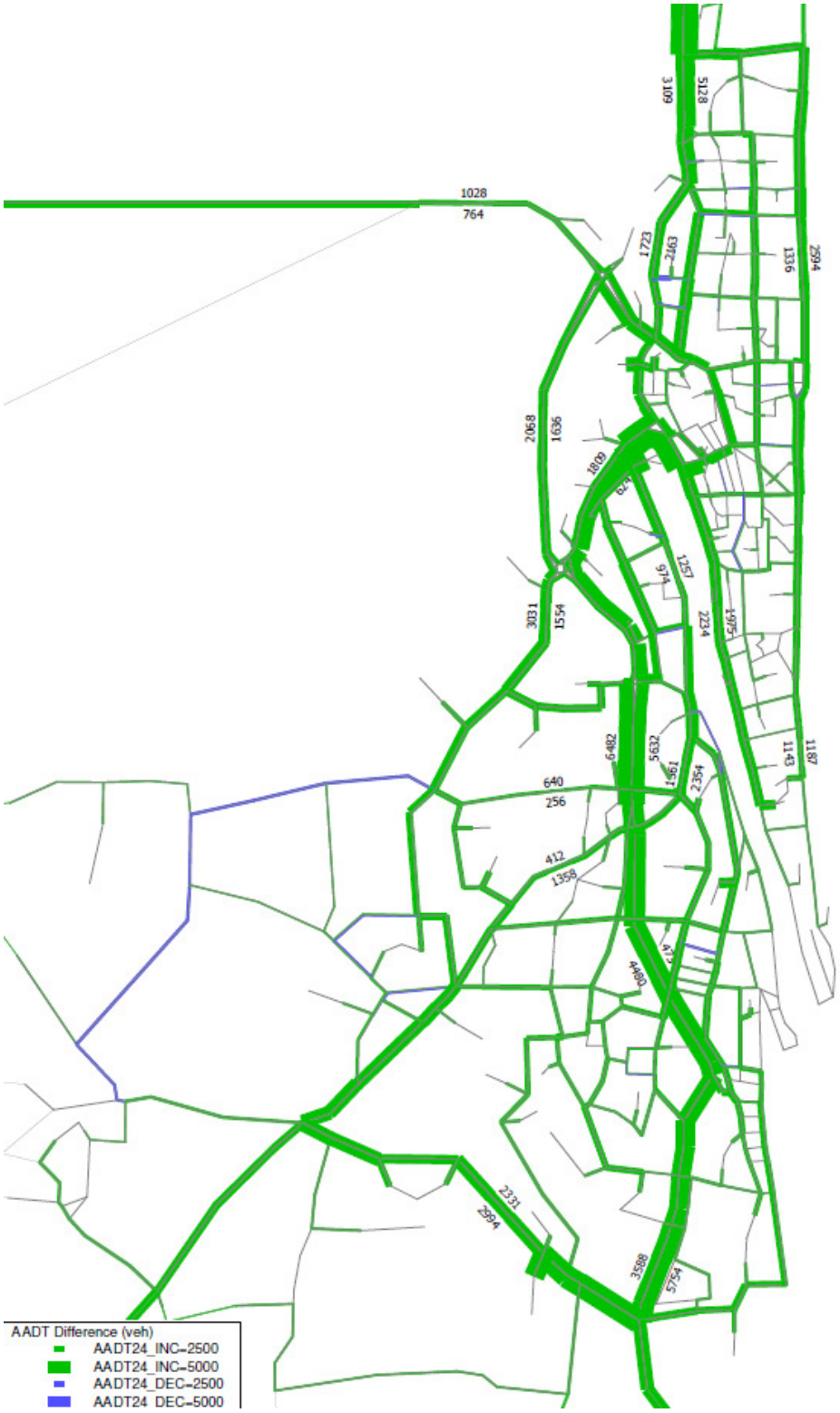
2023 DM vs BASE AADT Change



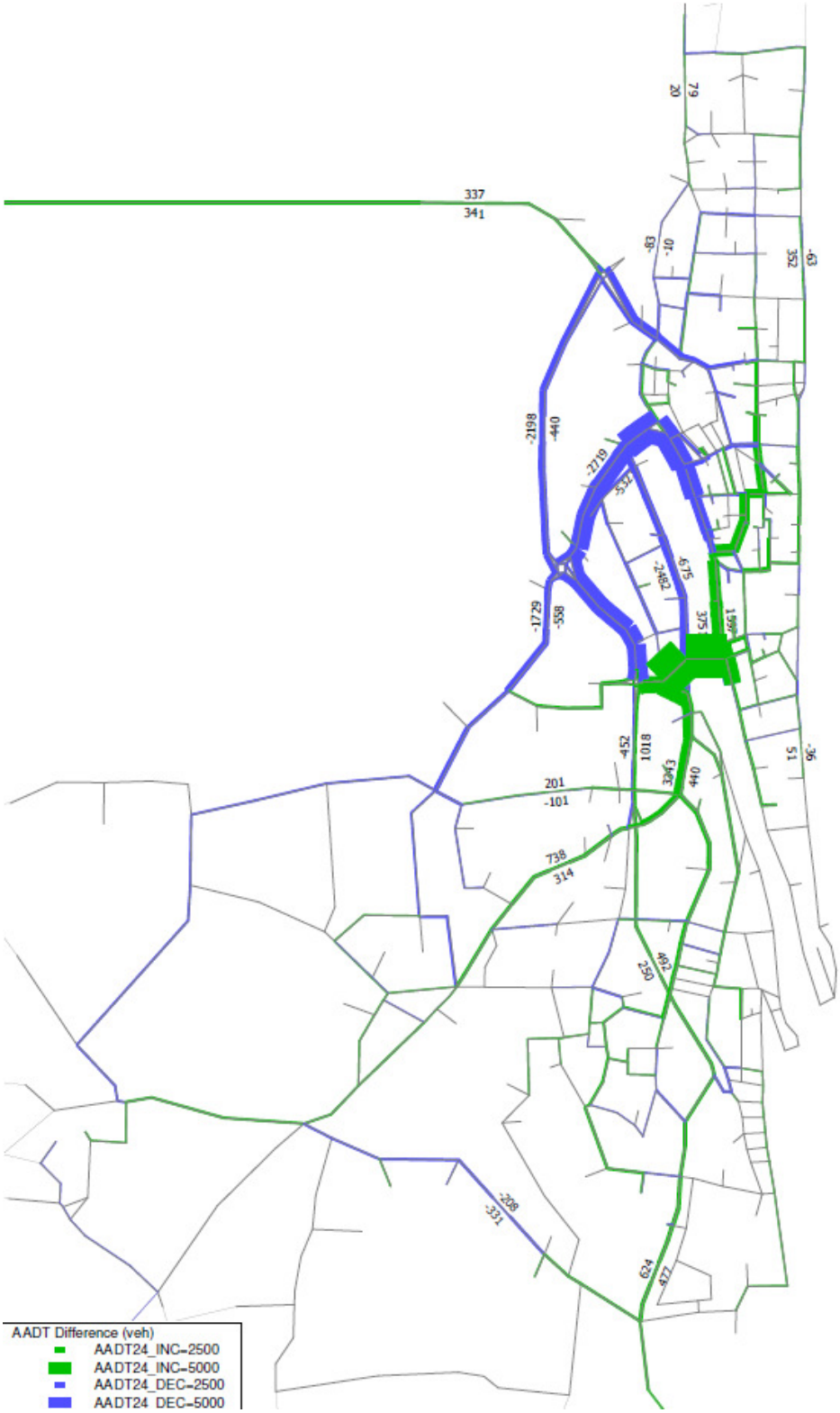
2038 DM vs BASE AADT Change



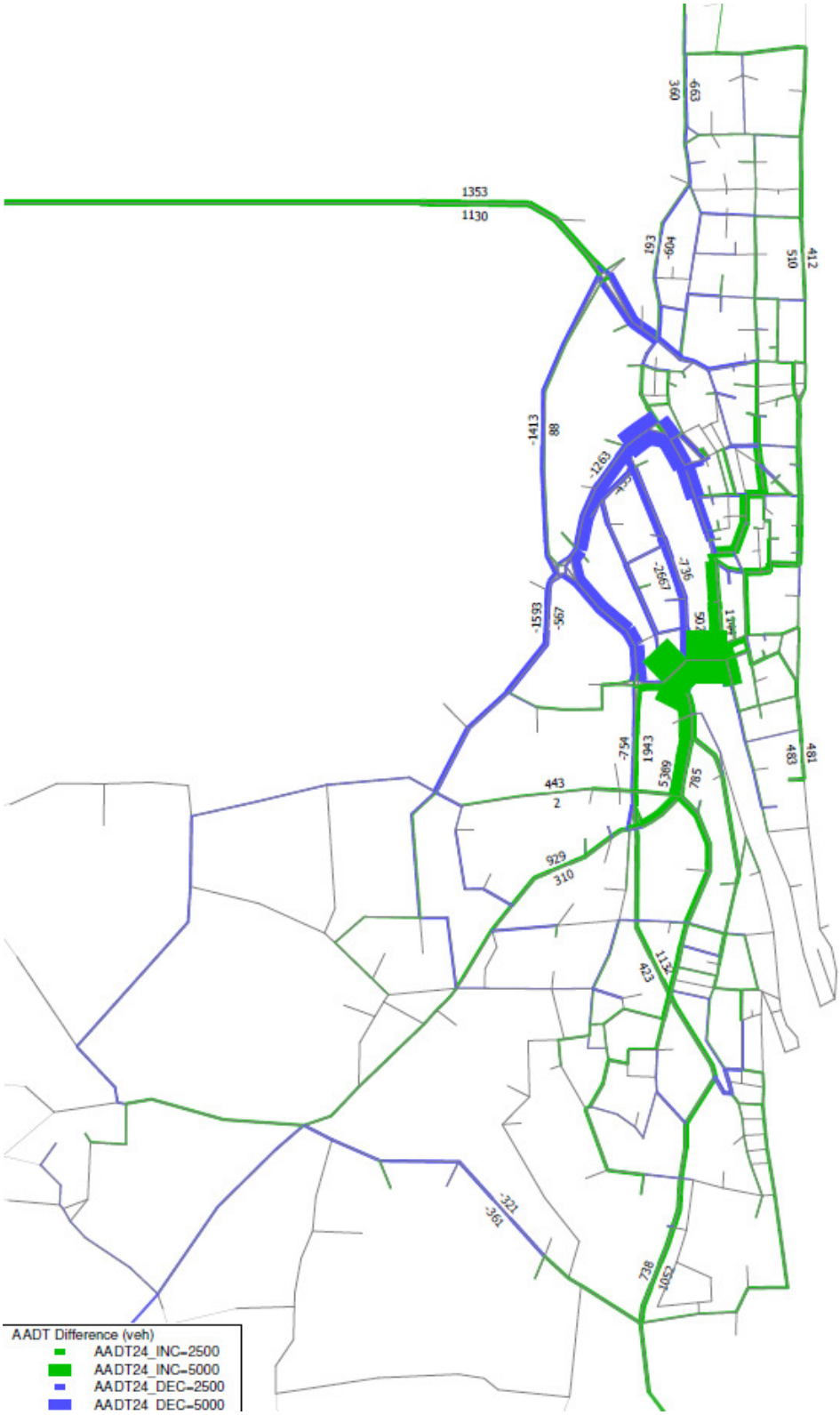
2051 DM vs BASE AADT Change



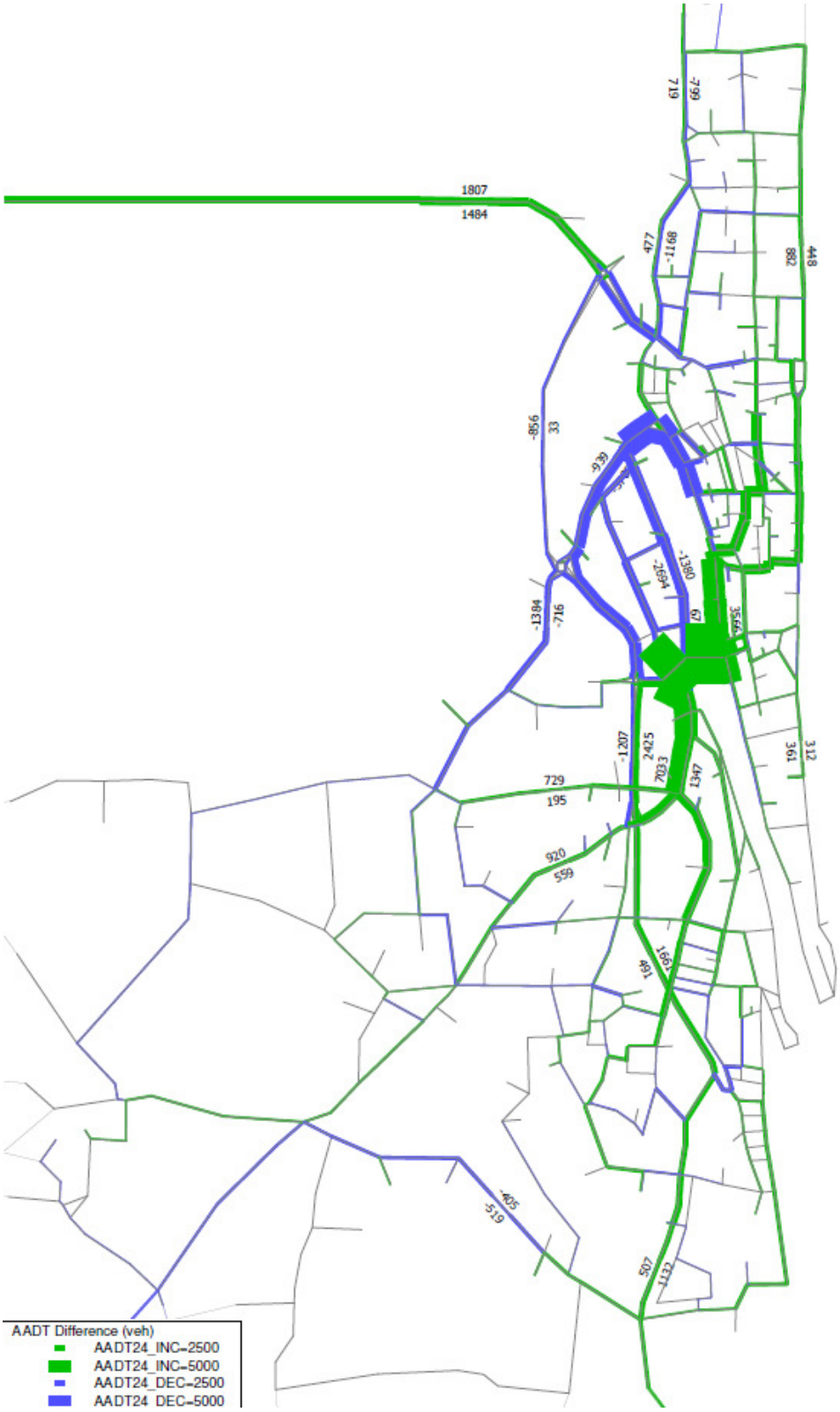
2023 DS vs DM AADT Change



2038 DS vs DM AADT Change



2051 DS vs DM AADT Change



Appendix H – VDM Matrix Sector Compression

2023 AM Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	5	5	0	4	2	0	16	5	4	3	**44**
2	3	17	2	5	2	6	22	5	8	9	**77**
3	1	2	0	4	0	0	22	1	1	3	**35**
4	8	9	12	3	3	14	85	6	1	17	**159**
5	2	2	0	0	0	0	5	1	0	0	**11**
6	2	2	0	5	0	0	11	1	1	1	**23**
7	12	29	4	50	14	14	197	13	4	23	**361**
8	4	16	1	10	1	1	30	2	14	14	**93**
9	5	10	3	1	0	9	11	15	16	10	**80**
10	2	9	2	2	1	3	8	4	4	1	**36**
Total	**44**	**102**	**24**	**84**	**23**	**48**	**406**	**54**	**53**	**81**	**919**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	18	21	9	24	1	2	54	7	30	6	**173**
2	92	33	23	29	4	12	143	21	20	21	**397**
3	33	21	1	25	0	0	149	40	19	16	**304**
4	75	71	29	19	4	27	478	20	4	43	**769**
5	6	10	0	5	0	0	30	6	1	5	**63**
6	11	23	2	14	0	0	68	14	4	4	**141**
7	143	174	144	305	44	26	1,134	47	23	175	**2,216**
8	72	94	98	33	13	43	147	175	84	47	**806**
9	51	62	38	12	4	19	62	53	42	45	**387**
10	13	13	7	32	3	1	32	8	4	3	**116**
Total	**516**	**519**	**350**	**498**	**74**	**131**	**2,297**	**392**	**230**	**365**	**5,371**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	84	87	15	3	1	1	109	18	34	58	**410**
2	73	282	12	29	6	8	272	41	117	150	**989**
3	8	10	1	20	0	0	81	10	8	16	**154**
4	19	44	30	32	5	22	555	12	5	47	**771**
5	1	7	0	2	0	0	16	4	0	1	**31**
6	2	10	1	18	0	0	43	3	1	3	**81**
7	180	263	34	352	22	29	2,876	99	46	267	**4,170**
8	64	135	6	27	3	4	173	20	141	97	**669**
9	66	164	15	5	2	12	154	133	260	132	**943**
10	40	151	12	14	2	4	111	30	44	27	**433**
Total	**538**	**1,153**	**124**	**503**	**42**	**80**	**4,390**	**369**	**656**	**798**	**8,652**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	5	5	0	4	2	0	16	5	4	3	**44**
2	3	17	2	4	2	6	21	5	8	9	**77**
3	1	2	0	4	0	0	22	1	1	3	**35**
4	7	9	12	3	4	15	86	6	1	16	**159**
5	2	2	0	0	0	0	5	1	0	0	**10**
6	2	2	0	5	0	0	10	1	1	1	**23**
7	11	28	4	52	16	14	197	13	4	21	**360**
8	4	16	1	10	1	2	29	2	14	14	**93**
9	5	10	3	1	0	10	10	15	16	10	**80**
10	2	9	2	2	1	3	8	4	3	1	**36**
Total	**43**	**100**	**24**	**85**	**26**	**51**	**404**	**54**	**53**	**79**	**918**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	19	21	9	24	1	2	54	7	30	6	**173**
2	94	34	23	28	4	12	140	22	20	21	**398**
3	34	21	1	25	0	0	146	41	20	16	**305**
4	72	69	28	19	4	27	486	19	3	42	**770**
5	6	9	0	5	0	0	31	7	1	5	**64**
6	12	24	2	15	0	0	69	15	4	5	**145**
7	137	169	141	309	45	26	1,145	46	23	172	**2,213**
8	75	96	101	32	14	44	142	178	85	48	**814**
9	53	63	39	11	4	20	59	53	42	46	**389**
10	14	13	7	31	3	1	32	8	4	3	**116**
Total	**516**	**519**	**352**	**499**	**75**	**133**	**2,304**	**396**	**232**	**363**	**5,387**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	84	88	16	3	1	1	106	18	34	59	**411**
2	74	285	13	27	6	9	261	42	118	152	**987**
3	8	10	1	21	0	0	78	10	9	16	**153**
4	18	40	29	33	6	26	553	11	5	43	**765**
5	1	7	0	2	0	0	17	5	0	1	**33**
6	2	11	1	21	0	0	45	3	1	3	**88**
7	169	249	34	360	26	32	2,878	99	44	250	**4,140**
8	64	135	6	26	4	5	165	21	143	98	**667**
9	67	164	16	5	2	14	145	135	261	133	**944**
10	40	154	12	14	2	4	108	31	44	27	**436**
Total	**528**	**1,142**	**129**	**513**	**48**	**92**	**4,356**	**376**	**659**	**781**	**8,623**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	5	5	0	4	2	0	16	5	4	3	**44**
2	3	16	2	5	2	6	21	5	8	9	**77**
3	1	2	0	4	0	0	22	1	1	3	**35**
4	9	9	12	3	4	15	83	6	1	17	**160**
5	2	2	0	0	0	0	5	1	0	0	**11**
6	2	2	0	5	0	0	10	1	1	1	**23**
7	14	29	4	50	15	14	193	13	4	24	**361**
8	4	16	1	10	1	2	30	2	14	14	**93**
9	5	10	3	1	0	10	10	15	15	10	**80**
10	2	9	2	2	1	3	8	4	3	1	**36**
Total	**47**	**101**	**24**	**84**	**25**	**51**	**399**	**54**	**53**	**82**	**921**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	16	20	9	28	1	2	59	6	29	6	**176**
2	86	34	23	30	4	12	147	22	20	20	**399**
3	31	22	1	25	0	0	152	41	20	16	**308**
4	89	70	29	19	4	27	474	20	4	45	**781**
5	7	10	0	5	0	0	31	7	1	5	**65**
6	10	24	2	15	0	0	71	15	4	4	**146**
7	166	175	145	302	44	26	1,131	47	23	185	**2,246**
8	64	96	101	34	14	44	149	178	86	46	**813**
9	46	64	39	12	4	20	63	54	43	44	**389**
10	12	13	7	33	3	1	34	8	4	3	**117**
Total	**528**	**528**	**355**	**503**	**75**	**133**	**2,312**	**399**	**233**	**373**	**5,439**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	81	84	15	4	1	1	123	18	32	56	**415**
2	71	282	12	28	6	9	272	41	117	147	**985**
3	8	10	1	21	0	0	81	10	8	16	**155**
4	27	43	30	33	6	26	541	12	5	51	**775**
5	2	7	0	2	0	0	17	5	0	1	**34**
6	2	10	1	21	0	0	47	3	1	3	**89**
7	241	261	35	351	25	33	2,822	101	44	295	**4,208**
8	63	134	6	27	4	5	170	21	142	97	**667**
9	63	163	16	5	2	14	150	135	259	131	**939**
10	38	148	12	14	2	4	117	30	43	26	**433**
Total	**596**	**1,143**	**129**	**508**	**47**	**92**	**4,338**	**374**	**652**	**823**	**8,701**

2023 Inter Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	6	17	5	12	0	3	27	3	3	18	**95**
2	20	13	3	6	2	5	30	15	13	8	**115**
3	6	1	0	3	0	0	23	1	2	2	**38**
4	2	3	1	5	1	7	68	4	1	6	**97**
5	1	1	0	1	0	0	5	1	0	2	**11**
6	3	2	0	6	0	0	13	2	6	5	**37**
7	19	27	19	59	6	12	181	23	12	33	**390**
8	6	10	1	6	1	2	27	3	16	8	**80**
9	4	10	2	2	1	8	9	15	14	7	**73**
10	6	7	5	7	2	15	12	8	6	1	**69**
Total	**72**	**92**	**37**	**106**	**12**	**51**	**395**	**75**	**74**	**91**	**1,005**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	5	26	6	9	2	4	41	10	8	11	**122**
2	26	8	6	9	6	2	64	21	16	4	**162**
3	11	3	0	4	0	0	47	30	10	2	**106**
4	10	2	1	9	6	20	107	2	2	14	**172**
5	1	1	0	7	0	0	17	2	1	1	**31**
6	3	1	0	16	0	0	30	10	2	1	**63**
7	33	36	28	124	14	14	266	37	12	34	**600**
8	12	9	21	6	2	8	37	40	15	4	**154**
9	10	8	8	3	1	2	38	14	11	3	**100**
10	7	3	7	8	1	3	24	6	4	0	**63**
Total	**120**	**97**	**78**	**195**	**31**	**54**	**671**	**172**	**82**	**75**	**1,574**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	134	97	9	13	2	5	186	25	58	72	**602**
2	109	293	22	52	5	7	411	134	233	186	**1,452**
3	11	10	1	14	1	0	89	9	16	13	**165**
4	9	36	17	52	2	29	614	31	11	84	**884**
5	1	3	2	2	0	0	25	3	2	5	**44**
6	5	4	0	21	0	1	48	4	10	10	**103**
7	187	338	82	532	20	42	3,537	189	155	374	**5,453**
8	26	90	9	39	3	5	176	28	188	73	**637**
9	45	172	18	11	3	12	136	159	299	102	**956**
10	62	147	43	51	4	19	177	63	94	25	**686**
Total	**590**	**1,189**	**204**	**787**	**40**	**120**	**5,398**	**645**	**1,067**	**942**	**10,982**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	6	17	5	12	0	3	26	3	3	19	**95**
2	20	13	3	6	2	5	29	15	13	8	**115**
3	6	1	0	3	0	0	22	1	2	2	**38**
4	2	3	1	5	1	7	68	4	1	6	**97**
5	1	1	0	1	0	0	5	1	0	2	**11**
6	3	2	0	6	0	0	13	2	6	5	**38**
7	18	26	19	60	6	12	181	23	12	32	**390**
8	6	10	1	6	1	3	26	3	17	8	**81**
9	3	10	2	2	1	9	9	15	14	7	**73**
10	6	7	5	7	2	16	12	8	6	1	**69**
Total	**71**	**91**	**37**	**107**	**13**	**55**	**392**	**75**	**73**	**90**	**1,006**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	5	26	6	9	2	4	40	11	9	11	**123**
2	27	8	7	9	6	2	63	22	16	4	**164**
3	11	3	0	3	0	0	47	31	11	2	**108**
4	10	2	1	9	6	21	109	2	1	14	**175**
5	1	1	0	7	0	0	17	2	1	1	**32**
6	3	1	0	17	0	0	31	10	3	1	**66**
7	33	36	28	127	15	15	269	37	12	34	**604**
8	13	9	21	6	2	8	37	40	15	4	**156**
9	10	8	9	3	1	2	37	15	12	4	**100**
10	7	4	7	8	1	3	24	6	4	0	**64**
Total	**121**	**98**	**79**	**199**	**32**	**55**	**675**	**175**	**83**	**75**	**1,590**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	135	98	9	12	2	6	181	25	59	72	**601**
2	110	295	23	51	5	7	398	136	234	189	**1,448**
3	12	11	1	15	1	0	89	9	18	13	**169**
4	8	35	17	53	2	34	621	31	10	81	**892**
5	1	3	2	3	0	0	27	4	3	5	**48**
6	5	4	0	25	0	1	52	5	12	11	**116**
7	178	325	81	540	21	47	3,534	183	147	360	**5,417**
8	27	91	10	38	4	6	170	30	192	75	**641**
9	45	173	20	10	4	14	129	163	299	103	**960**
10	64	148	45	51	5	21	173	65	95	25	**692**
Total	**585**	**1,183**	**209**	**799**	**44**	**138**	**5,373**	**651**	**1,069**	**933**	**10,984**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	6	17	5	13	0	3	28	3	3	17	**95**
2	20	13	3	6	2	5	29	15	13	8	**115**
3	6	1	0	3	0	0	22	1	2	2	**38**
4	3	3	1	5	1	7	67	4	1	6	**97**
5	1	1	0	1	0	0	5	1	0	2	**11**
6	3	2	0	6	0	0	13	2	6	5	**37**
7	23	27	19	58	6	12	176	23	12	34	**390**
8	6	10	1	6	1	3	26	3	16	8	**80**
9	3	10	2	2	1	9	9	15	14	7	**73**
10	6	6	5	7	2	16	12	8	6	1	**69**
Total	**76**	**90**	**36**	**107**	**13**	**55**	**387**	**74**	**73**	**92**	**1,005**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	4	24	5	11	2	4	45	9	8	10	**122**
2	25	8	7	9	6	2	64	22	17	4	**164**
3	10	3	0	4	0	0	48	31	11	2	**108**
4	12	2	1	9	6	21	106	2	2	15	**176**
5	1	2	0	7	0	0	17	2	1	1	**32**
6	3	1	0	17	0	0	32	10	3	1	**67**
7	38	37	29	124	15	15	266	38	12	35	**608**
8	11	9	21	6	2	8	38	41	15	4	**156**
9	9	9	9	3	1	2	38	15	12	3	**100**
10	7	3	7	8	1	3	24	6	4	0	**63**
Total	**121**	**97**	**79**	**198**	**32**	**55**	**678**	**176**	**83**	**76**	**1,595**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	129	94	9	16	3	6	217	24	55	69	**621**
2	106	292	22	52	5	7	403	135	232	184	**1,440**
3	11	11	1	15	1	0	90	9	17	13	**168**
4	12	36	18	52	2	35	606	31	11	91	**894**
5	2	3	2	3	0	0	26	4	3	6	**48**
6	5	4	0	25	0	1	53	5	12	11	**116**
7	235	334	83	529	21	48	3,464	187	149	393	**5,445**
8	26	90	10	39	4	6	173	29	190	73	**640**
9	42	171	20	11	4	14	131	162	298	101	**953**
10	61	146	44	53	5	20	183	63	94	24	**692**
Total	**631**	**1,180**	**208**	**795**	**44**	**138**	**5,346**	**649**	**1,061**	**964**	**11,016**

2023 PM Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	19	0	10	2	1	11	5	7	1	**63**
2	17	14	2	8	2	1	32	7	6	8	**97**
3	10	2	0	9	0	0	42	1	4	2	**71**
4	1	3	1	2	1	9	57	11	0	2	**88**
5	1	1	0	2	0	0	16	1	0	0	**22**
6	1	5	0	5	0	0	27	1	10	1	**50**
7	9	37	31	84	6	11	169	25	13	11	**396**
8	3	5	1	4	2	2	17	1	15	7	**56**
9	5	7	2	2	0	1	5	12	12	4	**51**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	20	1	10	2	1	11	5	7	1	**62**
2	17	14	3	8	2	1	31	7	6	9	**97**
3	11	2	0	9	0	0	42	1	5	3	**71**
4	1	3	1	2	1	10	56	10	0	2	**88**
5	1	1	0	3	0	0	17	1	0	0	**23**
6	1	5	0	5	0	0	27	2	10	1	**51**
7	8	35	31	84	6	11	169	25	13	11	**393**
8	3	5	1	4	2	2	16	1	15	7	**56**
9	5	7	2	2	0	2	5	12	12	4	**51**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	6	19	0	10	2	1	12	5	7	1	**64**
2	17	14	3	8	2	1	31	7	6	8	**97**
3	11	2	0	9	0	0	42	1	4	2	**71**
4	2	3	1	2	1	10	56	11	0	2	**88**
5	1	1	0	3	0	0	17	1	0	0	**22**
6	1	5	0	5	0	0	27	2	10	1	**51**
7	10	37	31	82	6	11	166	25	13	12	**393**
8	3	5	1	4	2	2	17	1	15	7	**56**
9	5	7	2	2	0	2	5	12	12	4	**51**

10	4	11	4	4	0	1	13	10	5	1	**53**
Total	**57**	**103**	**43**	**130**	**11**	**26**	**389**	**75**	**74**	**38**	**946**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	21	80	31	81	13	9	143	72	40	19	**509**
2	28	30	23	46	6	8	112	33	25	11	**322**
3	23	15	1	24	0	1	163	83	46	6	**362**
4	5	17	5	16	5	36	329	34	25	16	**489**
5	1	5	0	4	0	0	81	12	3	2	**109**
6	7	11	0	15	0	0	73	37	20	1	**163**
7	49	89	162	478	31	49	900	220	85	45	**2,107**
8	15	18	41	22	8	13	64	156	48	14	**399**
9	9	17	20	6	1	5	28	67	32	6	**190**
10	4	25	16	16	3	5	52	34	17	2	**173**
Total	**162**	**307**	**300**	**707**	**66**	**126**	**1,944**	**748**	**342**	**121**	**4,823**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	156	64	10	39	0	1	195	41	39	94	**638**
2	96	347	22	72	12	6	288	82	150	214	**1,290**
3	21	15	1	21	0	1	118	9	33	17	**237**
4	3	37	4	38	5	43	578	45	4	18	**776**
5	0	5	0	8	0	0	59	4	1	2	**79**
6	3	12	0	15	0	0	60	5	19	3	**119**
7	103	373	81	765	17	60	3,574	238	237	234	**5,683**
8	16	63	9	39	5	4	115	19	182	74	**527**
9	27	143	14	13	1	1	88	169	315	73	**845**
10	110	269	33	32	2	3	128	93	102	26	**798**
Total	**535**	**1,327**	**176**	**1,041**	**44**	**120**	**5,204**	**706**	**1,082**	**757**	**10,992**

10	4	11	5	4	0	1	13	10	5	1	**53**
Total	**58**	**102**	**43**	**130**	**12**	**28**	**386**	**74**	**74**	**38**	**946**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	21	82	32	78	13	10	138	75	41	20	**510**
2	28	31	24	45	5	8	109	34	26	11	**321**
3	24	15	1	24	0	1	160	85	48	7	**364**
4	5	16	5	16	5	38	333	32	23	15	**489**
5	1	5	0	4	0	0	82	12	4	2	**111**
6	8	11	0	15	0	0	72	38	21	1	**165**
7	47	86	159	487	32	50	909	213	82	44	**2,110**
8	15	19	42	21	8	13	62	158	49	14	**402**
9	9	17	21	5	1	5	27	68	32	6	**191**
10	4	26	17	15	3	5	51	35	17	2	**175**
Total	**163**	**308**	**302**	**711**	**67**	**131**	**1,943**	**750**	**342**	**122**	**4,838**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	157	65	11	37	0	1	187	42	40	95	**634**
2	97	351	23	67	12	7	271	83	151	217	**1,280**
3	21	16	1	21	0	1	118	9	35	18	**242**
4	3	33	4	39	5	51	583	42	4	17	**781**
5	0	5	0	9	0	0	62	4	1	2	**84**
6	4	14	0	18	0	0	63	6	23	3	**131**
7	98	359	80	771	19	62	3,562	227	218	227	**5,623**
8	17	64	10	38	6	5	111	20	186	76	**532**
9	27	144	15	12	1	1	83	172	316	74	**846**
10	113	273	35	30	2	3	124	94	103	27	**803**
Total	**537**	**1,323**	**180**	**1,042**	**47**	**131**	**5,164**	**700**	**1,076**	**757**	**10,956**

10	4	11	4	4	0	1	13	10	5	1	**53**
Total	**59**	**104**	**43**	**129**	**12**	**28**	**385**	**74**	**74**	**39**	**947**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	18	73	28	95	13	9	160	64	36	17	**514**
2	26	32	24	46	6	8	112	34	26	11	**325**
3	22	15	1	24	0	1	164	85	48	6	**366**
4	6	18	6	16	6	38	327	35	25	16	**491**
5	2	5	0	4	0	0	81	12	4	2	**111**
6	7	11	0	15	0	0	74	37	21	1	**166**
7	56	93	166	474	32	52	896	226	88	46	**2,128**
8	13	19	42	22	8	13	64	159	49	14	**405**
9	8	17	21	6	1	5	28	69	33	6	**193**
10	4	24	17	16	3	5	54	34	17	1	**174**
Total	**162**	**308**	**305**	**718**	**68**	**131**	**1,960**	**756**	**346**	**120**	**4,873**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	149	61	10	44	1	1	221	40	36	90	**652**
2	94	347	23	70	13	7	281	82	150	209	**1,275**
3	21	16	1	21	0	1	120	9	34	17	**242**
4	4	36	5	38	5	51	572	45	4	19	**779**
5	0	5	0	9	0	0	61	4	1	2	**83**
6	4	14	0	18	0	0	64	6	22	3	**132**
7	126	377	83	755	19	63	3,512	237	232	246	**5,651**
8	16	64	10	39	6	4	114	19	184	74	**531**
9	25	143	15	12	1	1	85	171	314	72	**840**
10	108	266	33	33	3	3	135	92	100	25	**798**
Total	**548**	**1,328**	**180**	**1,041**	**47**	**132**	**5,166**	**706**	**1,078**	**758**	**10,984**

2038 AM Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	5	6	0	4	2	0	18	5	4	3	**49**
2	4	18	2	5	2	6	28	5	9	9	**90**
3	1	3	0	4	0	0	25	1	2	4	**39**
4	8	10	12	3	4	15	89	6	2	17	**166**
5	2	2	0	0	0	0	5	1	0	0	**11**
6	2	3	0	5	0	0	11	1	1	1	**25**
7	13	36	5	54	15	16	217	14	6	23	**398**
8	5	18	1	11	1	2	33	2	14	14	**100**
9	6	12	3	1	0	10	15	15	16	10	**88**
10	2	9	2	2	1	3	8	4	3	1	**35**
Total	**48**	**116**	**26**	**90**	**25**	**52**	**448**	**57**	**57**	**82**	**1,001**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	19	24	10	26	1	2	60	7	31	6	**185**
2	99	40	26	32	5	13	182	24	23	20	**465**
3	36	26	4	26	1	1	168	42	20	15	**340**
4	75	73	30	19	5	27	486	21	4	43	**782**
5	7	10	1	5	0	0	33	7	1	5	**68**
6	12	25	2	15	0	0	73	15	4	4	**152**
7	153	209	158	325	47	31	1,241	54	32	169	**2,418**
8	73	100	101	36	14	46	166	179	85	45	**845**
9	55	70	40	13	4	20	86	55	42	44	**428**
10	12	12	6	32	3	1	27	8	4	3	**107**
Total	**541**	**588**	**378**	**530**	**79**	**141**	**2,522**	**411**	**246**	**354**	**5,791**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	84	100	15	4	1	1	127	19	39	58	**448**
2	104	332	15	33	7	9	423	49	141	162	**1,276**
3	9	15	3	22	1	0	93	12	10	17	**181**
4	19	52	32	35	6	23	605	11	7	49	**840**
5	1	7	0	2	0	0	18	5	0	1	**35**
6	2	12	1	21	0	1	45	3	1	3	**90**
7	207	431	43	394	25	32	3,299	111	94	278	**4,913**
8	61	148	8	31	4	5	188	23	145	94	**706**
9	92	194	15	6	2	12	237	135	265	133	**1,091**
10	35	144	11	14	2	4	90	29	42	22	**392**
Total	**615**	**1,435**	**144**	**562**	**47**	**88**	**5,126**	**397**	**743**	**816**	**9,973**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	5	6	0	4	2	1	18	5	4	3	**49**
2	5	18	2	5	3	7	26	6	9	9	**90**
3	1	2	0	5	0	0	24	1	2	3	**39**
4	7	9	13	3	5	18	89	6	1	15	**166**
5	2	2	0	0	0	0	5	2	0	0	**11**
6	2	3	0	5	0	0	11	2	2	1	**25**
7	12	32	5	57	20	18	215	14	5	19	**397**
8	5	17	1	11	2	2	31	2	15	14	**99**
9	6	11	3	1	0	13	13	16	15	10	**88**
10	2	8	2	2	1	4	7	4	3	1	**35**
Total	**46**	**110**	**27**	**93**	**34**	**62**	**438**	**57**	**57**	**76**	**1,000**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	20	26	10	25	1	2	60	8	31	6	**187**
2	105	43	28	29	5	13	173	25	24	22	**468**
3	37	27	4	28	1	1	160	46	23	15	**343**
4	69	68	31	20	5	29	508	19	4	40	**793**
5	7	10	1	5	0	0	35	8	1	4	**71**
6	13	28	2	18	0	0	76	17	5	5	**165**
7	142	197	149	337	47	29	1,284	51	30	162	**2,428**
8	80	106	111	34	15	49	155	186	87	49	**873**
9	59	72	45	11	4	23	78	55	42	46	**435**
10	13	12	6	31	3	1	26	8	4	3	**107**
Total	**544**	**590**	**387**	**538**	**82**	**148**	**2,555**	**424**	**251**	**352**	**5,870**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	85	102	16	3	2	2	120	21	40	59	**451**
2	108	342	17	30	8	11	384	52	145	168	**1,265**
3	9	15	3	24	1	0	86	15	12	16	**180**
4	15	41	33	37	10	43	595	10	6	39	**829**
5	1	8	0	3	0	0	21	8	1	1	**44**
6	3	14	1	31	0	1	56	6	2	4	**118**
7	183	379	42	416	39	42	3,308	107	81	238	**4,835**
8	61	148	10	28	7	10	166	25	151	94	**702**
9	98	195	20	6	5	21	204	143	266	133	**1,091**
10	36	148	12	14	3	4	83	31	43	23	**397**
Total	**600**	**1,393**	**155**	**593**	**74**	**135**	**5,024**	**417**	**748**	**774**	**9,913**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	5	6	0	4	2	1	18	5	4	3	**49**
2	4	18	2	5	3	7	27	6	9	9	**90**
3	1	3	0	5	0	0	24	1	2	4	**39**
4	9	9	13	3	5	18	85	6	1	17	**167**
5	2	2	0	0	0	0	5	2	0	0	**11**
6	2	3	0	5	0	0	11	2	1	1	**26**
7	16	34	5	54	19	19	208	14	5	23	**399**
8	5	17	1	11	2	2	32	2	14	14	**100**
9	6	11	3	1	0	13	13	16	15	10	**88**
10	2	8	2	2	1	4	7	4	3	1	**35**
Total	**51**	**112**	**27**	**91**	**32**	**64**	**432**	**57**	**57**	**81**	**1,004**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	17	24	9	30	1	2	67	7	30	5	**191**
2	94	43	27	32	5	13	185	25	24	20	**470**
3	33	28	4	28	1	1	174	45	23	15	**352**
4	90	73	31	19	5	28	494	20	4	45	**810**
5	8	10	1	6	0	0	35	8	1	5	**73**
6	12	28	2	18	0	0	81	17	5	5	**168**
7	180	212	159	328	47	31	1,256	55	32	180	**2,480**
8	68	105	109	37	16	48	169	187	88	46	**873**
9	51	73	44	13	4	23	85	57	43	44	**435**
10	11	12	6	33	3	1	29	8	4	2	**109**
Total	**563**	**606**	**392**	**545**	**82**	**148**	**2,575**	**429**	**253**	**367**	**5,961**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	81	96	16	5	2	2	143	20	37	56	**457**
2	101	334	16	32	8	11	406	51	142	160	**1,262**
3	9	15	3	24	1	0	93	13	11	16	**187**
4	26	47	35	36	9	44	577	11	6	51	**844**
5	2	9	0	3	0	0	22	8	1	1	**46**
6	3	14	1	32	0	1	62	5	2	4	**124**
7	276	417	46	401	37	46	3,217	112	86	301	**4,938**
8	60	146	10	31	7	10	176	24	148	92	**704**
9	91	193	20	6	5	21	216	141	263	129	**1,084**
10	34	140	12	15	3	4	93	30	40	21	**392**
Total	**683**	**1,411**	**159**	**584**	**72**	**139**	**5,004**	**415**	**737**	**832**	**10,037**

2038 Inter Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	19	6	12	0	3	29	3	4	18	**101**
2	22	16	3	6	2	6	38	16	15	9	**133**
3	6	2	0	3	0	0	24	1	2	2	**42**
4	2	3	1	5	1	7	72	4	1	6	**103**
5	1	1	0	1	0	0	6	1	0	2	**12**
6	3	3	0	6	0	0	15	2	6	5	**40**
7	20	36	21	62	6	14	199	25	14	31	**429**
8	6	11	1	7	1	3	28	3	17	8	**86**
9	4	12	3	2	1	9	12	16	14	7	**80**
10	6	7	5	8	2	15	11	8	6	1	**68**
Total	**76**	**110**	**40**	**113**	**13**	**56**	**435**	**80**	**80**	**89**	**1,094**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	5	28	6	9	2	4	42	10	9	11	**125**
2	28	11	8	10	6	3	79	22	18	4	**188**
3	11	5	1	4	0	0	52	30	11	1	**116**
4	11	3	1	9	6	21	110	3	2	14	**180**
5	2	2	0	7	0	0	18	2	1	1	**33**
6	3	2	0	16	0	0	32	10	3	1	**68**
7	34	51	32	126	15	16	290	40	15	31	**650**
8	13	10	21	7	2	8	40	41	15	4	**160**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	19	6	13	0	4	28	3	4	18	**101**
2	22	16	4	6	2	7	36	17	15	9	**133**
3	6	2	0	4	0	0	24	1	3	2	**42**
4	2	3	1	5	1	10	71	4	1	5	**104**
5	1	1	0	1	0	0	6	1	1	2	**12**
6	3	3	0	7	0	0	15	2	6	5	**42**
7	18	33	22	65	8	17	198	24	13	29	**427**
8	6	11	1	7	2	4	27	3	17	8	**86**
9	4	12	3	2	1	12	10	16	14	7	**80**
10	5	6	5	7	2	18	10	7	6	1	**68**
Total	**73**	**106**	**41**	**117**	**18**	**71**	**424**	**80**	**79**	**86**	**1,096**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	5	29	6	9	2	5	42	12	9	11	**130**
2	30	12	9	10	6	3	77	25	19	4	**194**
3	11	6	1	4	0	0	50	34	12	2	**120**
4	10	2	1	9	7	23	116	2	1	14	**187**
5	2	2	0	8	0	0	19	3	1	1	**36**
6	4	2	0	20	0	0	36	11	3	1	**77**
7	33	50	31	134	16	16	300	39	14	31	**665**
8	14	11	23	6	2	9	39	41	16	4	**165**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	6	18	5	14	0	3	30	3	3	17	**101**
2	22	16	4	6	2	7	36	16	15	8	**133**
3	6	2	0	4	0	0	24	1	2	2	**42**
4	3	3	1	5	1	10	69	4	1	6	**104**
5	1	1	0	1	0	0	6	1	0	2	**12**
6	3	3	0	7	0	0	15	2	6	5	**42**
7	23	34	22	62	8	17	190	24	14	32	**427**
8	6	11	1	7	2	4	27	3	17	8	**86**
9	4	11	3	2	1	12	10	16	14	7	**80**
10	5	6	5	7	2	18	11	7	6	1	**68**
Total	**79**	**106**	**41**	**115**	**18**	**71**	**418**	**79**	**79**	**88**	**1,094**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	4	27	6	11	2	5	46	10	8	10	**128**
2	27	12	8	10	6	3	79	24	19	4	**193**
3	10	6	1	4	0	0	53	33	12	1	**120**
4	13	3	1	9	7	23	113	3	2	15	**188**
5	2	2	0	8	0	0	19	3	1	1	**36**
6	3	2	0	20	0	0	37	11	3	1	**78**
7	39	52	33	129	16	17	294	41	15	33	**668**
8	12	11	23	7	2	9	41	42	16	4	**166**

9	10	10	9	3	1	2	41	15	11	3	**106**
10	7	3	6	8	1	3	22	5	4	0	**59**
Total	**123**	**125**	**84**	**200**	**33**	**57**	**726**	**179**	**87**	**70**	**1,685**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	136	131	10	14	2	6	198	26	75	69	**666**
2	141	360	29	63	6	8	625	151	284	187	**1,854**
3	12	16	5	16	2	1	99	12	19	12	**195**
4	10	48	20	57	2	32	680	36	14	89	**988**
5	2	4	2	3	0	1	28	4	3	5	**51**
6	5	5	1	23	0	2	52	5	11	10	**115**
7	198	567	98	586	22	47	4,078	215	231	352	**6,395**
8	28	104	12	45	3	6	199	36	199	71	**703**
9	59	216	21	13	3	13	204	170	319	101	**1,119**
10	61	150	43	54	4	18	165	62	95	21	**673**
Total	**652**	**1,599**	**241**	**874**	**46**	**135**	**6,329**	**718**	**1,249**	**916**	**12,759**

9	11	11	10	3	1	3	39	15	11	3	**107**
10	7	3	7	8	1	3	22	6	4	0	**62**
Total	**126**	**129**	**89**	**211**	**35**	**63**	**740**	**188**	**91**	**71**	**1,742**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	137	133	11	14	2	8	188	28	77	70	**668**
2	144	368	33	60	7	11	575	158	289	192	**1,836**
3	12	18	5	18	2	1	99	15	24	13	**206**
4	9	42	21	60	3	54	700	36	12	82	**1,019**
5	2	4	2	4	0	1	36	7	6	6	**68**
6	6	7	1	39	0	2	72	8	18	14	**169**
7	182	517	99	610	29	69	4,069	200	203	324	**6,303**
8	29	108	15	44	7	11	182	40	210	74	**718**
9	62	218	27	12	7	23	178	181	320	102	**1,128**
10	62	151	45	54	6	26	156	64	95	21	**682**
Total	**645**	**1,567**	**259**	**915**	**63**	**206**	**6,255**	**737**	**1,253**	**897**	**12,797**

9	10	11	9	3	1	3	41	15	12	3	**108**
10	6	3	6	9	1	3	22	6	4	0	**60**
Total	**126**	**128**	**88**	**209**	**35**	**63**	**746**	**188**	**91**	**72**	**1,745**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	130	124	10	18	3	8	230	26	71	67	**687**
2	136	361	32	62	7	11	592	155	284	185	**1,824**
3	12	18	5	18	2	1	104	14	23	13	**209**
4	13	45	22	59	3	55	674	38	13	95	**1,015**
5	2	4	2	4	0	1	35	6	6	7	**68**
6	6	7	1	40	0	2	76	8	17	14	**173**
7	249	542	104	589	28	73	3,965	209	213	364	**6,336**
8	28	106	15	46	7	10	189	39	206	72	**716**
9	56	215	26	12	7	22	187	178	316	99	**1,118**
10	60	147	43	58	6	25	167	62	93	20	**681**
Total	**694**	**1,569**	**259**	**905**	**63**	**208**	**6,219**	**735**	**1,241**	**935**	**12,827**

2038 PM Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	21	1	10	2	1	12	5	8	1	**66**
2	18	16	3	9	2	2	39	8	8	8	**112**
3	11	3	0	10	0	0	45	1	5	2	**78**
4	2	4	1	3	1	10	61	12	0	2	**95**
5	1	1	0	2	0	0	17	1	0	0	**24**
6	1	6	0	5	0	0	29	2	10	1	**54**
7	11	45	34	87	6	12	185	28	16	10	**434**
8	3	6	1	4	2	2	18	1	15	7	**60**
9	5	8	2	2	0	2	7	13	13	4	**56**
10	4	11	4	4	0	1	13	9	5	1	**52**
Total	**63**	**119**	**48**	**135**	**12**	**28**	**427**	**81**	**81**	**37**	**1,030**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	19	92	33	81	13	10	142	70	44	17	**520**
2	33	41	32	50	7	9	171	41	37	10	**430**
3	24	21	2	26	0	2	178	84	48	6	**390**
4	5	21	7	16	6	39	341	38	26	16	**515**
5	2	6	1	5	0	0	86	12	4	2	**117**
6	8	13	1	16	0	0	78	38	21	1	**175**
7	48	159	180	478	33	53	944	227	103	37	**2,263**
8	14	22	42	23	8	13	69	153	47	13	**405**
9	10	26	23	7	1	5	44	66	31	5	**217**
10	4	23	16	16	3	4	44	31	15	1	**157**
Total	**165**	**424**	**336**	**717**	**70**	**136**	**2,097**	**761**	**376**	**107**	**5,190**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	158	91	11	42	1	1	207	42	59	92	**702**
2	117	407	27	82	13	8	445	96	189	216	**1,600**
3	22	21	5	23	1	2	135	14	35	17	**275**
4	5	46	5	41	5	46	638	51	7	19	**864**
5	0	6	1	9	0	0	64	5	1	2	**89**
6	4	14	1	17	0	1	64	6	21	3	**132**
7	127	564	95	834	20	66	4,057	268	312	225	**6,570**
8	18	72	11	44	5	4	133	24	190	76	**577**
9	36	177	17	15	1	2	143	178	332	73	**972**
10	112	278	33	34	2	3	134	92	103	22	**814**
Total	**599**	**1,675**	**206**	**1,142**	**49**	**133**	**6,019**	**776**	**1,249**	**746**	**12,595**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	21	1	10	2	1	11	5	8	1	**66**
2	18	16	4	8	3	2	36	8	8	8	**111**
3	11	3	0	10	0	0	44	2	6	2	**78**
4	1	3	1	3	1	14	59	10	0	2	**95**
5	1	1	0	3	0	0	19	1	0	0	**26**
6	1	6	0	6	0	0	30	2	12	1	**59**
7	10	39	34	89	8	13	185	26	14	10	**427**
8	3	6	1	4	2	3	17	2	16	7	**60**
9	5	8	2	2	0	2	7	13	12	4	**56**
10	4	11	5	4	0	1	12	10	5	1	**52**
Total	**62**	**114**	**49**	**138**	**16**	**35**	**420**	**79**	**81**	**36**	**1,030**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	20	97	34	75	13	11	134	76	47	18	**526**
2	35	44	34	47	6	10	164	43	38	11	**432**
3	24	22	2	27	0	2	166	93	54	6	**396**
4	4	18	7	17	6	46	353	34	22	15	**521**
5	2	6	1	5	0	0	88	14	5	2	**122**
6	8	13	1	17	0	0	75	42	24	1	**180**
7	45	148	174	503	36	56	974	213	94	37	**2,280**
8	15	23	46	22	9	15	65	158	49	14	**416**
9	11	27	26	6	1	6	41	69	31	5	**223**
10	4	25	17	15	3	5	43	34	16	1	**162**
Total	**166**	**424**	**342**	**733**	**74**	**151**	**2,103**	**775**	**380**	**110**	**5,257**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	160	95	12	39	1	2	191	43	62	93	**697**
2	119	415	29	72	14	10	399	99	193	223	**1,573**
3	22	22	5	24	1	2	129	18	44	17	**283**
4	3	35	6	44	6	75	649	42	5	16	**882**
5	1	6	1	13	0	0	78	6	2	2	**109**
6	5	19	1	29	0	1	76	10	33	4	**179**
7	113	494	90	845	27	73	4,034	236	254	208	**6,374**
8	18	76	14	40	9	8	122	26	200	80	**592**
9	37	180	20	13	2	3	127	186	331	74	**973**
10	116	284	36	31	2	4	122	93	105	23	**815**
Total	**594**	**1,626**	**213**	**1,150**	**63**	**179**	**5,926**	**759**	**1,228**	**740**	**12,478**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	21	1	11	2	1	13	5	7	1	**67**
2	18	16	3	8	2	2	37	8	8	8	**111**
3	11	3	0	10	0	0	45	1	5	2	**79**
4	2	4	1	2	1	13	58	11	0	2	**95**
5	1	1	0	3	0	0	19	1	0	0	**26**
6	1	6	0	6	0	0	31	2	12	1	**59**
7	13	44	34	85	7	14	179	27	15	11	**427**
8	3	6	1	4	2	3	17	1	15	7	**60**
9	5	8	2	2	0	2	7	13	12	4	**55**
10	4	10	4	4	0	1	12	9	5	1	**52**
Total	**64**	**118**	**49**	**135**	**15**	**36**	**418**	**80**	**81**	**37**	**1,033**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	17	85	30	96	13	10	161	64	40	16	**531**
2	31	44	33	50	7	10	172	43	39	10	**438**
3	22	22	2	27	0	2	178	90	53	6	**403**
4	6	21	7	17	6	46	345	39	26	16	**529**
5	2	6	1	5	0	0	87	14	5	2	**122**
6	7	14	1	17	0	0	81	41	24	1	**184**
7	55	163	188	486	35	59	954	233	102	39	**2,314**
8	13	23	45	23	9	14	70	160	50	13	**421**
9	9	27	25	7	1	6	43	69	32	5	**225**
10	3	23	16	16	3	5	46	31	15	1	**159**
Total	**166**	**427**	**348**	**743**	**75**	**152**	**2,137**	**785**	**384**	**108**	**5,326**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	151	86	11	48	1	2	236	40	55	89	**717**
2	113	408	28	77	14	10	421	96	190	211	**1,568**
3	23	22	5	25	1	2	142	16	41	18	**294**
4	6	44	6	42	6	75	634	50	6	19	**888**
5	1	6	1	13	0	0	77	6	2	3	**109**
6	5	20	1	30	0	1	83	10	31	4	**186**
7	157	545	98	817	26	78	3,964	257	285	235	**6,462**
8	18	74	13	44	9	7	130	25	196	78	**594**
9	34	177	20	14	2	3	132	183	328	71	**965**
10	111	273	33	35	3	4	139	89	101	21	**808**
Total	**618**	**1,655**	**216**	**1,145**	**62**	**182**	**5,957**	**773**	**1,235**	**748**	**12,591**

2051 AM Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	6	7	1	5	2	1	20	5	5	3	**54**
2	5	20	2	5	2	7	32	6	10	10	**99**
3	1	3	0	5	0	0	27	2	2	4	**43**
4	8	11	13	3	4	16	93	7	2	18	**175**
5	2	2	0	0	0	0	6	2	0	0	**12**
6	2	3	0	5	0	0	12	2	2	1	**27**
7	13	38	6	57	16	17	232	16	7	25	**426**
8	5	19	1	12	1	2	36	2	15	14	**107**
9	6	13	3	2	1	10	17	16	17	11	**95**
10	2	9	2	2	1	3	9	4	4	2	**39**
Total	**48**	**125**	**28**	**96**	**27**	**56**	**484**	**61**	**62**	**89**	**1,077**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	20	27	11	27	1	3	69	8	32	7	**207**
2	101	46	29	34	6	14	199	26	26	24	**504**
3	37	30	6	28	1	2	183	44	22	17	**370**
4	76	75	31	20	5	28	502	22	5	45	**808**
5	7	11	1	5	0	0	35	7	1	5	**72**
6	12	27	3	16	1	1	78	16	5	5	**163**
7	152	226	169	344	49	34	1,325	63	37	182	**2,582**
8	75	105	105	38	15	48	183	186	89	48	**891**
9	56	74	42	15	4	21	94	57	44	47	**455**
10	13	13	7	33	3	1	32	8	4	3	**117**
Total	**548**	**632**	**404**	**562**	**85**	**151**	**2,700**	**439**	**264**	**384**	**6,168**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	89	117	16	5	1	2	156	22	44	67	**517**
2	108	376	16	37	8	10	487	54	158	187	**1,441**
3	10	18	5	23	1	1	103	13	12	18	**203**
4	20	55	34	38	6	25	649	12	9	54	**900**
5	1	8	0	3	0	0	19	5	1	1	**39**
6	2	14	1	22	0	2	48	4	2	4	**99**
7	199	471	48	427	27	35	3,617	119	113	320	**5,375**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	6	7	1	4	3	1	19	6	5	3	**54**
2	5	20	2	5	3	8	28	6	10	10	**99**
3	1	3	0	5	0	0	25	2	2	4	**42**
4	7	9	14	4	6	20	93	6	2	14	**174**
5	2	2	0	0	0	0	5	2	0	0	**12**
6	2	3	0	6	0	0	11	2	2	1	**28**
7	11	32	5	62	24	20	230	15	6	20	**425**
8	5	18	1	11	2	3	32	3	16	15	**106**
9	6	12	4	1	1	15	14	17	16	10	**96**
10	2	9	2	2	2	4	8	4	4	1	**39**
Total	**45**	**115**	**30**	**101**	**41**	**72**	**467**	**62**	**63**	**79**	**1,074**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	22	30	11	25	1	3	68	9	32	8	**208**
2	111	52	31	29	6	15	182	29	27	27	**508**
3	38	32	6	30	1	2	169	51	26	18	**373**
4	66	66	33	21	5	31	532	19	4	39	**816**
5	7	10	1	6	0	0	38	9	1	4	**77**
6	13	31	3	20	1	1	81	19	6	6	**181**
7	134	203	153	363	50	31	1,396	55	32	170	**2,587**
8	84	114	120	36	17	53	161	197	92	54	**928**
9	61	78	49	11	5	24	80	59	45	51	**463**
10	14	14	7	30	3	1	31	9	5	3	**116**
Total	**549**	**630**	**415**	**571**	**88**	**160**	**2,736**	**457**	**271**	**380**	**6,257**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	90	122	17	4	3	3	141	24	46	69	**519**
2	115	398	20	30	9	14	413	60	166	199	**1,422**
3	10	18	5	27	1	1	91	18	16	17	**203**
4	13	38	36	41	12	57	628	9	7	36	**877**
5	2	9	0	3	0	0	26	11	1	1	**54**
6	4	16	1	39	0	2	64	8	4	5	**144**
7	162	376	46	463	50	47	3,652	109	89	252	**5,246**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	5	6	1	5	3	1	20	5	4	3	**54**
2	5	20	2	5	3	8	30	6	10	10	**99**
3	1	3	0	5	0	0	26	2	2	4	**43**
4	9	10	14	3	5	20	88	6	2	17	**176**
5	2	2	0	0	0	0	5	2	0	0	**12**
6	2	4	0	6	0	0	12	2	2	1	**28**
7	15	35	6	58	22	22	221	15	6	25	**426**
8	5	18	1	11	2	3	34	3	15	14	**106**
9	6	12	4	1	1	14	15	16	16	10	**96**
10	2	9	2	2	2	4	9	4	3	1	**39**
Total	**51**	**119**	**30**	**97**	**39**	**74**	**459**	**62**	**62**	**87**	**1,079**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	18	27	10	31	1	3	77	8	31	7	**212**
2	97	50	30	33	6	15	201	28	27	24	**511**
3	34	31	6	30	1	2	185	50	26	17	**381**
4	91	74	33	21	5	30	513	21	5	46	**837**
5	8	11	1	6	0	0	38	9	1	5	**80**
6	12	30	3	20	1	1	86	19	6	5	**183**
7	179	227	168	351	49	34	1,355	62	36	196	**2,657**
8	70	111	117	40	17	52	182	197	93	49	**928**
9	52	78	48	14	5	24	90	60	46	47	**463**
10	12	13	7	34	3	1	34	8	4	3	**119**
Total	**572**	**653**	**422**	**580**	**88**	**161**	**2,762**	**463**	**274**	**398**	**6,373**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	85	112	17	6	3	3	173	23	41	64	**527**
2	105	381	19	34	9	14	454	57	160	185	**1,417**
3	10	18	5	26	1	1	100	16	15	17	**209**
4	25	47	38	39	12	56	606	11	8	52	**893**
5	2	10	0	3	0	0	26	10	1	2	**55**
6	4	16	1	39	0	2	72	7	3	5	**151**
7	264	443	52	440	48	55	3,515	117	100	340	**5,375**

8	61	157	9	34	4	7	210	26	154	100	**764**
9	96	221	17	8	2	13	277	145	286	145	**1,212**
10	39	160	12	16	2	4	123	32	46	28	**462**
Total	**625**	**1,596**	**159**	**613**	**52**	**97**	**5,690**	**432**	**824**	**924**	**11,012**

8	62	156	13	30	10	17	172	31	166	100	**755**
9	103	223	25	7	8	27	215	159	293	145	**1,206**
10	41	170	14	15	4	5	106	36	48	30	**469**
Total	**601**	**1,528**	**177**	**660**	**98**	**173**	**5,507**	**464**	**834**	**854**	**10,895**

8	60	153	12	33	10	16	188	29	161	96	**758**
9	94	218	24	8	8	27	239	156	286	139	**1,199**
10	38	156	13	16	4	5	124	33	45	27	**461**
Total	**687**	**1,554**	**182**	**645**	**95**	**178**	**5,497**	**460**	**821**	**927**	**11,046**

2051 Inter Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	8	21	6	13	0	4	32	4	4	19	**110**
2	23	18	4	7	2	6	42	17	16	10	**144**
3	6	2	0	4	0	0	25	2	3	2	**45**
4	3	4	1	5	1	7	76	5	2	7	**110**
5	1	1	0	1	0	0	6	1	1	2	**12**
6	3	3	0	7	0	0	16	2	6	5	**44**
7	22	38	22	65	6	15	210	27	16	35	**457**
8	6	11	2	8	1	3	31	4	18	8	**92**
9	4	13	3	3	1	9	13	17	15	8	**86**
10	6	8	5	8	2	15	14	8	7	1	**74**
Total	**83**	**119**	**43**	**120**	**14**	**60**	**465**	**86**	**87**	**97**	**1,174**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	6	29	7	9	2	4	44	11	9	11	**132**
2	30	11	9	11	6	3	82	23	19	4	**197**
3	12	6	1	4	0	0	55	31	11	1	**123**
4	11	3	2	9	6	22	115	3	2	15	**187**
5	2	2	0	7	0	0	19	2	1	1	**35**
6	3	2	0	17	0	0	34	11	3	1	**72**
7	37	52	34	130	16	17	310	42	17	32	**686**
8	14	11	22	7	2	9	43	43	16	4	**169**
9	11	11	9	3	1	3	45	16	12	3	**113**
10	7	3	7	9	1	3	23	6	4	0	**62**
Total	**132**	**130**	**90**	**207**	**35**	**61**	**769**	**188**	**94**	**72**	**1,776**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	139	136	10	15	3	6	201	27	78	75	**690**
2	149	407	33	69	7	10	699	160	309	215	**2,057**
3	12	19	7	18	2	2	107	14	21	14	**216**
4	11	53	21	61	2	34	726	40	17	97	**1,062**
5	2	4	3	3	0	1	30	4	3	5	**55**
6	5	6	2	25	1	4	56	6	12	10	**126**
7	205	625	109	624	24	52	4,485	235	275	411	**7,045**
8	30	112	14	49	4	7	217	40	211	77	**761**
9	62	235	24	16	4	14	241	181	344	111	**1,231**
10	65	168	44	59	4	19	208	66	103	26	**764**
Total	**680**	**1,763**	**267**	**937**	**51**	**147**	**6,972**	**775**	**1,375**	**1,040**	**14,008**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	8	21	6	13	0	5	30	4	4	19	**110**
2	23	18	4	6	3	9	37	18	16	10	**143**
3	6	3	0	4	0	0	25	2	3	2	**45**
4	2	3	1	5	2	12	74	4	1	5	**111**
5	1	1	0	1	0	0	6	1	1	2	**13**
6	3	3	0	8	0	0	15	3	7	5	**45**
7	19	32	22	71	10	19	212	24	14	30	**455**
8	6	11	2	7	2	5	28	4	18	8	**93**
9	4	12	3	2	1	14	11	17	14	8	**87**
10	5	7	5	7	3	20	12	8	6	1	**74**
Total	**78**	**111**	**45**	**126**	**23**	**84**	**449**	**85**	**85**	**91**	**1,177**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	6	31	7	9	2	5	44	13	10	12	**139**
2	33	13	10	10	6	3	79	27	20	4	**204**
3	12	6	1	4	0	0	52	36	13	2	**128**
4	10	2	2	10	7	25	124	3	2	13	**198**
5	2	2	0	9	0	0	21	3	1	1	**39**
6	4	2	0	21	0	0	38	12	4	1	**84**
7	35	49	33	142	18	17	327	40	15	32	**707**
8	15	12	25	6	2	9	39	44	17	4	**176**
9	12	12	11	3	1	3	40	16	12	4	**114**
10	8	4	8	8	1	3	23	6	4	0	**65**
Total	**136**	**135**	**96**	**222**	**38**	**68**	**786**	**201**	**99**	**73**	**1,853**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	142	141	11	15	3	10	183	30	82	77	**692**
2	154	424	39	61	7	14	611	172	319	225	**2,028**
3	13	21	7	20	2	2	104	18	29	15	**232**
4	9	41	24	66	4	70	758	38	13	80	**1,103**
5	2	5	3	5	0	1	43	9	9	7	**84**
6	7	10	2	51	1	4	85	11	24	17	**210**
7	175	532	107	662	35	82	4,498	208	221	355	**6,875**
8	31	118	19	47	9	15	188	47	229	80	**782**
9	66	240	33	13	10	30	194	199	348	113	**1,246**
10	68	173	48	56	8	30	189	69	105	28	**773**
Total	**668**	**1,703**	**293**	**996**	**79**	**258**	**6,851**	**801**	**1,378**	**997**	**14,025**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	19	6	15	0	4	32	4	4	18	**110**
2	23	18	4	6	3	8	38	17	16	10	**143**
3	6	2	0	4	0	0	25	2	3	2	**45**
4	3	3	1	5	2	12	71	4	2	7	**110**
5	1	1	0	1	0	0	6	1	1	2	**13**
6	3	3	0	7	0	0	16	3	7	5	**45**
7	26	36	23	66	10	20	199	25	15	35	**455**
8	6	11	2	8	2	5	29	4	18	8	**93**
9	4	12	3	2	1	14	11	17	14	7	**86**
10	5	7	5	8	3	19	12	7	6	1	**74**
Total	**85**	**113**	**45**	**123**	**22**	**84**	**440**	**84**	**84**	**96**	**1,175**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	5	28	6	11	2	5	49	11	9	11	**137**
2	29	12	9	11	6	3	82	26	20	4	**203**
3	11	6	1	4	0	0	56	35	13	1	**129**
4	13	3	2	10	7	25	120	3	2	15	**199**
5	2	2	0	9	0	0	21	3	1	1	**39**
6	4	2	0	21	0	0	41	12	4	1	**85**
7	42	53	35	135	17	19	317	44	16	34	**712**
8	13	12	24	7	2	9	44	44	17	4	**177**
9	10	12	10	3	1	3	43	17	13	3	**116**
10	7	3	6	9	1	3	24	6	4	0	**63**
Total	**136**	**134**	**95**	**220**	**38**	**68**	**796**	**201**	**99**	**74**	**1,861**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	133	129	11	19	3	9	232	28	74	72	**710**
2	143	409	37	66	8	14	648	166	310	212	**2,013**
3	13	21	7	20	2	2	113	17	28	15	**238**
4	15	48	24	64	4	69	722	42	15	101	**1,104**
5	2	5	3	5	0	1	42	8	8	9	**85**
6	7	10	2	51	1	4	94	11	22	16	**217**
7	256	589	117	633	34	91	4,340	225	246	421	**6,951**
8	30	114	18	50	9	15	202	45	222	76	**781**
9	59	233	32	14	10	29	213	195	341	108	**1,234**
10	63	164	45	62	8	28	208	66	100	25	**770**
Total	**721**	**1,723**	**296**	**984**	**78**	**262**	**6,813**	**801**	**1,368**	**1,056**	**14,103**

2051 PM Peak

Reference Demand

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	21	1	10	2	1	12	5	8	1	**68**
2	19	17	4	9	2	2	42	9	9	9	**121**
3	11	4	1	10	0	0	47	2	6	3	**84**
4	2	4	2	3	1	10	65	12	1	2	**101**
5	1	1	0	3	0	0	18	1	0	0	**25**
6	2	6	0	6	0	0	31	2	11	1	**58**
7	13	49	36	91	6	13	198	30	18	12	**467**
8	3	7	2	4	2	2	20	2	16	7	**65**
9	6	9	2	2	0	2	8	13	13	4	**60**
10	5	11	5	4	0	1	14	10	6	1	**57**
Total	**69**	**130**	**52**	**142**	**13**	**31**	**455**	**86**	**87**	**41**	**1,106**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	20	94	35	82	13	11	148	73	44	18	**538**
2	33	43	35	51	7	10	179	43	37	10	**449**
3	24	23	4	26	1	2	191	88	48	6	**414**
4	5	23	8	17	6	39	362	41	28	16	**545**
5	2	7	2	5	0	0	90	13	4	2	**124**
6	8	14	1	16	0	0	83	41	22	1	**186**
7	49	168	197	494	36	59	1,029	246	106	38	**2,422**
8	15	24	44	24	8	14	77	161	50	13	**430**
9	10	27	23	7	1	5	46	69	32	5	**225**
10	4	24	16	16	3	5	45	32	16	1	**162**
Total	**170**	**446**	**364**	**739**	**75**	**145**	**2,249**	**807**	**387**	**111**	**5,495**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	161	94	11	44	1	1	203	42	61	95	**713**
2	132	453	30	87	13	9	494	104	210	238	**1,771**
3	23	24	7	25	1	2	146	17	39	19	**304**
4	6	51	6	44	6	48	683	56	10	23	**933**
5	1	7	1	9	0	1	68	6	2	3	**97**
6	4	15	2	19	1	2	69	8	22	4	**144**
7	158	629	106	888	22	71	4,439	292	353	271	**7,228**
8	21	79	13	47	6	4	146	27	201	81	**625**
9	40	196	19	18	1	2	170	189	357	80	**1,073**
10	121	301	34	38	3	4	174	97	112	30	**914**
Total	**668**	**1,848**	**229**	**1,218**	**54**	**145**	**6,591**	**838**	**1,367**	**844**	**13,802**

VDM Demand DM

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	21	1	10	2	1	11	5	8	1	**67**
2	20	18	4	8	3	3	37	9	9	9	**120**
3	11	4	1	11	0	0	46	2	7	3	**85**
4	1	3	2	3	1	16	62	11	1	2	**102**
5	1	1	0	3	0	0	21	2	1	0	**30**
6	2	7	0	7	0	0	32	3	13	1	**66**
7	11	40	36	93	10	14	199	26	15	11	**456**
8	4	7	2	4	2	4	18	2	16	7	**66**
9	6	9	3	2	0	2	7	14	13	5	**60**
10	5	12	5	4	0	1	13	10	6	1	**56**
Total	**67**	**122**	**54**	**145**	**19**	**41**	**445**	**85**	**88**	**40**	**1,107**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	21	104	37	72	13	12	134	83	49	20	**544**
2	37	49	37	45	7	12	165	47	40	11	**450**
3	24	25	4	28	1	2	172	101	58	6	**422**
4	4	18	8	18	7	50	380	33	21	14	**554**
5	2	6	2	5	0	0	93	16	5	2	**130**
6	8	15	1	18	0	0	78	45	26	1	**192**
7	44	150	185	530	39	62	1,084	219	91	38	**2,441**
8	16	26	51	22	10	16	68	169	52	15	**446**
9	11	28	29	6	1	7	40	73	32	6	**233**
10	4	27	17	14	3	5	43	36	17	2	**168**
Total	**172**	**447**	**370**	**758**	**80**	**167**	**2,257**	**822**	**391**	**115**	**5,578**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	166	100	12	38	1	3	177	43	66	98	**705**
2	138	471	33	68	15	13	414	108	218	252	**1,731**
3	23	27	7	26	1	2	136	23	52	20	**317**
4	4	34	7	48	7	94	703	42	7	16	**963**
5	1	7	1	16	0	1	90	8	3	2	**131**
6	6	24	2	39	1	2	86	14	41	5	**220**
7	130	516	96	899	34	81	4,441	237	259	237	**6,930**
8	21	85	17	41	11	10	125	32	217	89	**648**
9	43	203	25	15	3	4	138	203	360	83	**1,077**
10	126	312	37	30	2	5	150	99	114	32	**909**
Total	**658**	**1,779**	**238**	**1,220**	**76**	**215**	**6,461**	**810**	**1,337**	**836**	**13,630**

VDM Demand DS

Ref EB	1	2	3	4	5	6	7	8	9	10	Total
1	7	21	1	11	2	1	13	5	8	1	**68**
2	19	17	4	9	3	3	39	9	9	9	**120**
3	11	4	1	11	0	0	48	2	6	3	**86**
4	2	4	2	3	1	15	60	12	1	2	**102**
5	1	1	0	3	0	0	20	2	1	0	**29**
6	2	7	0	7	0	0	33	3	13	1	**66**
7	15	46	36	89	9	15	190	28	16	12	**457**
8	3	7	2	4	2	4	18	2	16	7	**65**
9	6	8	3	2	0	2	8	13	13	4	**60**
10	5	11	5	4	0	1	14	10	6	1	**56**
Total	**71**	**128**	**53**	**142**	**18**	**41**	**443**	**85**	**87**	**41**	**1,109**

Ref Com	1	2	3	4	5	6	7	8	9	10	Total
1	18	88	31	97	14	10	167	68	40	17	**550**
2	32	47	36	50	7	12	179	46	39	10	**458**
3	22	25	4	28	1	2	188	98	56	6	**430**
4	6	22	8	18	7	49	370	41	26	16	**563**
5	2	7	2	5	0	0	92	16	5	2	**131**
6	8	15	1	17	0	0	85	45	25	1	**198**
7	57	171	202	507	38	65	1,051	247	103	41	**2,482**
8	14	26	49	24	10	16	76	170	53	14	**452**
9	9	28	28	7	1	7	44	73	33	5	**235**
10	4	24	15	16	3	5	48	32	16	1	**164**
Total	**172**	**452**	**377**	**770**	**81**	**166**	**2,299**	**836**	**397**	**113**	**5,662**

Ref Oth	1	2	3	4	5	6	7	8	9	10	Total
1	155	89	11	49	1	2	229	39	57	92	**723**
2	128	456	30	78	15	13	455	103	211	233	**1,721**
3	24	26	7	27	1	2	153	21	48	19	**330**
4	8	46	7	45	7	92	681	52	9	22	**969**
5	1	8	1	15	0	1	89	8	3	3	**130**
6	6	25	2	39	1	2	96	13	39	5	**228**
7	194	597	107	862	32	89	4,323	268	304	281	**7,056**
8	20	82	16	46	11	10	138	30	212	84	**650**
9	39	197	24	16	3	4	151	198	354	78	**1,065**
10	119	293	33	38	3	5	177	92	108	29	**897**
Total	**694**	**1,818**	**239**	**1,215**	**75**	**219**	**6,492**	**824**	**1,344**	**848**	**13,769**

DM VDM versus REFERENCE. Volume Change by Sector

2023 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.0	0.0	0.1	0.0	-0.1	0.0	0.0	0.0
2	0.0	0.1	0.0	-0.1	0.1	0.2	-0.6	0.1	0.1	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	0.0	0.1	0.0
4	-0.2	-0.4	0.1	0.1	0.4	0.6	0.5	-0.2	0.0	-0.9
5	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
6	0.0	0.1	0.0	0.1	0.0	0.0	-0.3	0.1	0.0	0.0
7	-0.6	-1.2	0.0	1.2	1.5	0.6	-0.3	-0.1	-0.1	-1.3
8	0.0	0.0	0.0	-0.1	0.1	0.2	-0.8	0.1	0.2	0.1
9	0.0	-0.2	0.1	0.0	0.0	0.9	-0.5	0.1	-0.1	-0.2
10	0.0	-0.1	0.0	0.0	0.2	0.2	-0.2	0.0	0.0	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	0.3	0.5	0.1	-0.4	0.0	0.0	-0.6	0.1	0.1	0.2
2	2.4	0.9	0.6	-1.1	0.0	0.3	-3.2	0.5	0.2	0.6
3	0.9	0.1	0.0	0.3	0.0	0.0	-2.9	1.3	0.9	0.2
4	-2.9	-1.8	-0.4	0.4	0.0	0.2	7.3	-0.8	-0.2	-1.4
5	0.0	-0.4	0.0	-0.1	0.0	0.0	0.8	0.5	0.0	-0.3
6	0.3	0.8	0.0	0.7	0.0	0.0	1.2	0.7	0.3	0.1
7	-5.7	-4.4	-2.7	4.1	0.2	-0.3	11.6	-1.1	-0.6	-4.0
8	2.9	2.2	2.9	-0.6	0.5	1.1	-4.8	2.2	0.8	1.7
9	1.6	0.8	1.3	-0.8	0.1	0.6	-2.6	0.3	0.0	1.1
10	0.4	0.4	0.1	-0.8	0.0	0.0	-0.5	0.2	0.1	0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	0.3	0.8	0.8	-0.1	0.2	0.2	-2.6	0.5	0.3	0.8
2	1.1	3.0	0.7	-1.3	-0.1	0.8	-11.0	1.0	1.2	2.0
3	0.1	0.0	0.0	0.4	0.0	0.0	-2.7	0.7	0.6	-0.1
4	-1.9	-3.5	-0.2	1.0	1.0	4.5	-1.5	-0.7	-0.4	-3.9
5	0.0	0.0	0.0	0.1	0.0	0.0	0.8	0.8	0.0	0.0
6	0.3	0.2	0.0	2.5	0.0	0.0	2.5	0.6	0.1	0.2
7	-11.7	-14.2	0.1	8.2	3.3	2.6	2.0	-0.5	-2.6	-17.2
8	0.3	0.4	0.5	-1.1	0.7	1.1	-8.2	0.8	2.3	0.8
9	1.5	-0.2	1.4	-0.2	0.7	2.5	-9.5	2.7	1.0	0.9
10	0.7	2.5	0.7	0.1	0.2	0.4	-3.5	0.9	0.7	0.4

2023 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.1	0.1	0.0	0.1	-0.4	0.1	0.0	0.1
2	0.0	0.0	0.1	-0.1	0.1	0.4	-0.9	0.2	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.0
4	-0.1	-0.1	0.0	0.1	0.1	0.7	-0.1	0.0	0.0	-0.3
5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
6	0.0	0.0	0.0	0.1	0.0	0.0	-0.2	0.1	0.2	0.1
7	-0.9	-0.9	0.1	1.4	0.6	0.5	0.3	-0.4	-0.3	-1.0
8	0.0	0.1	0.0	0.0	0.2	0.3	-0.6	0.0	0.1	0.0
9	0.0	-0.1	0.1	-0.1	0.1	0.9	-0.4	0.0	-0.2	-0.1
10	-0.2	-0.1	0.0	-0.2	0.2	1.2	-0.4	-0.1	-0.1	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	0.1	0.5	0.2	-0.1	0.0	0.3	-0.5	0.4	0.1	0.3
2	0.6	0.2	0.2	-0.2	-0.1	0.1	-0.3	0.8	0.3	0.1
3	0.2	0.1	0.0	0.0	0.0	0.0	-0.6	1.0	0.4	0.1
4	-0.3	0.0	0.0	0.1	0.2	0.5	2.1	-0.1	-0.1	-0.3
5	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.1	0.1	0.0
6	0.2	0.0	0.0	1.0	0.0	0.0	1.1	0.3	0.2	0.1
7	-0.8	-0.3	-0.2	2.7	0.4	0.2	3.1	-0.5	-0.3	-0.4
8	0.5	0.3	0.6	-0.2	0.1	0.2	-0.8	0.4	0.2	0.2
9	0.2	0.1	0.3	-0.1	0.0	0.1	-0.8	0.1	0.0	0.1
10	0.1	0.1	0.3	0.0	0.0	0.1	-0.2	0.2	0.1	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	0.6	0.6	0.4	0.0	-0.1	0.8	-5.0	0.5	0.7	0.5
2	0.6	2.5	1.0	-1.1	0.0	0.7	-13.6	2.6	1.3	2.3
3	0.4	0.4	0.0	0.3	0.0	0.0	-0.2	0.6	1.3	0.6
4	-0.5	-1.6	0.2	1.4	0.2	5.1	7.1	-0.3	-0.7	-2.9
5	0.0	0.1	0.0	0.3	0.0	0.0	2.0	0.6	0.6	0.4
6	0.5	0.4	0.0	3.8	0.0	0.0	4.7	0.7	1.7	1.5
7	-8.6	-12.6	-0.3	8.5	1.6	5.2	-2.6	-5.3	-7.7	-14.0
8	0.4	1.4	0.7	-0.3	0.8	1.1	-5.9	1.1	3.5	1.5
9	0.6	0.7	1.6	-0.5	0.7	2.5	-7.0	3.6	0.8	0.8
10	1.3	1.7	1.8	-0.1	0.5	2.7	-4.6	1.7	0.6	0.3

2023 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	0.0	0.1	0.0	-0.2	0.0	0.1	-0.3	0.0	0.0	0.0
2	0.3	0.2	0.1	-0.3	0.3	0.2	-1.4	0.2	0.1	0.1
3	0.2	0.0	0.0	0.1	0.0	0.0	-0.3	0.0	0.1	0.1
4	-0.1	-0.2	0.0	0.1	0.1	1.0	-0.4	-0.5	0.0	0.0
5	0.0	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.0	0.0
6	0.0	0.2	0.0	0.2	0.0	0.0	0.2	0.1	0.6	0.0
7	-0.3	-1.4	-0.2	0.7	0.5	0.2	0.0	-0.7	-0.6	-0.3
8	0.1	0.0	0.0	-0.1	0.1	0.3	-0.5	0.0	0.1	0.1
9	0.0	0.0	0.1	-0.1	0.0	0.1	-0.2	0.2	-0.1	0.0
10	0.0	0.1	0.2	-0.1	0.0	0.0	-0.3	0.2	0.0	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	0.4	2.0	1.0	-3.1	0.0	0.4	-5.1	3.0	1.4	0.6
2	0.7	0.7	0.4	-1.4	-0.2	0.2	-3.0	0.7	0.3	0.3
3	0.4	0.4	0.0	-0.2	0.0	0.0	-2.9	2.5	1.8	0.2
4	-0.2	-1.1	0.0	0.3	0.1	2.1	4.1	-1.9	-2.0	-0.5
5	0.0	-0.1	0.0	0.1	0.0	0.0	0.6	0.6	0.3	-0.1
6	0.1	0.3	0.0	0.1	0.0	0.0	-0.5	1.0	0.8	0.0
7	-1.5	-2.8	-2.3	9.4	0.8	1.1	9.3	-7.0	-3.3	-0.3
8	0.5	0.4	1.2	-0.5	0.5	0.6	-2.3	1.7	0.5	0.5
9	0.2	0.2	0.9	-0.3	0.0	0.4	-1.0	0.8	0.0	0.2
10	0.1	0.8	0.6	-0.6	-0.1	0.3	-0.8	1.2	0.3	0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	1.0	1.1	0.7	-1.7	0.0	0.2	-8.0	0.9	1.0	0.8
2	1.0	3.8	0.9	-4.6	0.3	0.5	-17.1	0.9	1.1	3.4
3	0.7	0.5	0.0	0.1	0.0	0.0	0.0	0.6	2.1	0.5
4	-0.3	-3.7	0.1	1.0	0.2	7.5	5.1	-3.3	-0.4	-1.4
5	0.0	0.1	0.0	1.1	0.0	0.0	3.1	0.3	0.1	-0.1
6	0.4	1.9	0.0	2.8	0.0	0.0	3.4	0.8	3.2	0.4
7	-4.9	-14.4	-1.3	5.8	1.8	1.8	-12.3	-10.7	-18.8	-6.6
8	0.3	1.3	0.7	-1.5	0.8	1.0	-4.1	0.7	3.8	2.0
9	0.4	0.9	1.0	-1.0	0.2	0.1	-5.1	2.8	0.6	0.6
10	2.6	3.7	1.9	-1.6	-0.1	0.2	-4.8	1.5	0.9	0.5

2038 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.0	-0.1	0.2	0.2	-0.3	0.0	0.0	0.0
2	0.0	0.1	0.1	-0.3	0.4	0.8	-1.9	0.3	0.2	0.1
3	0.0	-0.1	0.0	0.3	0.0	0.0	-0.9	0.2	0.2	-0.1
4	-0.6	-1.2	0.6	0.2	1.2	2.5	0.3	-0.5	0.0	-2.5
5	-0.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
6	-0.1	0.3	0.0	0.5	0.0	0.0	-0.6	0.3	0.1	0.0
7	-1.4	-3.7	-0.2	2.9	5.5	2.4	-2.1	-0.5	-0.5	-3.3
8	0.0	-0.2	0.1	-0.3	0.5	0.7	-2.4	0.2	0.6	0.1
9	0.0	-0.6	0.4	-0.1	0.1	3.0	-1.7	0.3	-0.4	-0.6
10	0.0	-0.3	0.0	-0.1	0.5	0.6	-0.6	0.1	-0.1	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	0.7	1.5	-0.3	-1.0	-0.1	0.1	-0.5	0.3	0.2	0.3
2	6.1	3.0	1.4	-3.0	-0.1	0.6	-9.2	1.5	0.7	1.6
3	0.8	0.9	0.0	1.6	0.0	0.0	-8.1	4.4	3.0	0.1
4	-5.5	-4.0	1.1	0.7	0.1	1.8	22.0	-1.8	-0.4	-3.1
5	0.1	-0.6	0.0	0.4	0.0	0.0	2.6	1.5	0.2	-0.5
6	0.7	2.9	0.0	2.6	0.0	0.0	3.3	2.2	1.1	0.3
7	-11.4	-11.8	-8.9	11.7	0.7	-1.2	42.7	-3.1	-2.2	-6.9
8	6.6	6.1	10.4	-1.3	1.6	3.4	-11.4	6.8	2.3	3.9
9	3.7	2.4	5.1	-1.9	0.3	2.3	-8.2	0.8	0.0	2.3
10	0.8	0.8	0.1	-1.7	-0.1	0.0	-0.7	0.5	0.2	0.2

UC3	1	2	3	4	5	6	7	8	9	10
1	0.6	2.3	0.9	-0.3	0.8	0.6	-6.6	1.8	1.1	1.2
2	4.1	10.2	2.1	-3.8	0.4	2.5	-39.4	3.4	4.1	5.7
3	-0.1	0.0	0.0	2.2	0.0	0.0	-7.2	2.7	2.4	-1.0
4	-4.2	-10.4	1.1	2.1	4.1	19.4	-10.0	-1.6	-1.1	-10.2
5	0.1	0.9	0.0	0.4	0.0	0.0	3.7	3.2	0.2	0.2
6	1.0	1.3	0.0	10.8	0.0	0.0	11.1	2.4	0.8	0.7
7	-24.4	-52.3	-0.4	22.6	13.8	9.8	8.8	-4.0	-12.1	-39.6
8	0.4	0.2	2.0	-2.2	3.4	5.2	-22.1	2.5	6.4	0.2
9	5.6	1.0	4.6	-0.5	3.0	9.1	-32.4	8.0	1.8	0.1
10	1.1	4.3	1.2	0.1	1.2	0.6	-7.1	2.3	1.2	0.5

2038 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.1	0.4	0.0	0.5	-1.0	0.2	0.0	-0.1
2	-0.1	0.1	0.3	-0.2	0.6	1.5	-2.8	0.5	-0.1	-0.1
3	0.0	0.1	0.0	0.2	0.0	0.0	-0.3	0.2	0.3	0.0
4	-0.3	-0.4	0.0	0.1	0.3	2.9	-1.1	-0.1	-0.1	-0.8
5	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1	0.0
6	0.0	0.1	0.0	0.4	0.0	0.0	-0.4	0.3	0.7	0.0
7	-1.8	-3.2	0.7	3.4	2.4	3.0	-1.1	-1.2	-1.2	-2.3
8	0.1	0.0	0.2	0.0	0.6	1.1	-1.9	0.1	0.3	0.0
9	-0.2	-0.4	0.3	-0.2	0.3	3.1	-1.5	0.0	-0.6	-0.4
10	-0.6	-0.4	-0.3	-0.4	0.7	3.3	-1.0	-0.6	-0.4	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	0.2	1.6	0.3	-0.2	0.0	0.7	-0.1	1.1	0.4	0.6
2	1.7	0.8	0.7	-0.4	-0.3	0.4	-1.2	2.4	0.9	0.2
3	0.1	0.3	0.0	0.1	0.0	0.0	-1.5	3.4	1.6	0.1
4	-0.6	-0.2	0.0	0.3	0.7	2.3	6.0	-0.2	-0.3	-0.5
5	0.1	0.0	0.0	1.3	0.0	0.0	1.3	0.4	0.2	0.0
6	0.4	0.2	0.0	3.3	0.0	0.0	3.4	1.0	0.5	0.1
7	-1.0	-1.1	-0.2	7.5	1.2	0.7	10.0	-0.8	-1.0	-0.1
8	1.2	1.0	2.2	-0.4	0.2	0.5	-1.7	0.8	0.6	0.4
9	0.5	0.5	1.2	-0.3	0.2	0.4	-2.4	0.4	0.1	0.2
10	0.3	0.2	0.7	0.0	0.1	0.4	0.1	0.4	0.2	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	0.9	2.5	0.9	0.4	0.1	2.5	-10.3	1.5	2.5	0.6
2	2.8	8.2	3.7	-3.5	0.4	2.8	-50.0	7.4	5.1	4.8
3	0.7	1.3	0.0	1.5	0.0	0.0	-0.2	2.6	4.9	0.7
4	-0.9	-5.9	1.6	3.3	0.8	21.6	19.5	-0.3	-1.9	-7.3
5	0.2	0.6	0.0	1.2	0.0	0.0	7.8	2.7	2.9	1.7
6	1.3	2.2	0.0	16.1	0.0	0.0	19.4	3.0	6.8	4.6
7	-16.5	-49.4	1.1	23.8	6.3	22.1	-8.6	-14.6	-28.1	-27.8
8	1.2	3.6	2.8	-0.5	3.4	4.9	-17.0	3.9	10.0	2.3
9	2.5	2.6	5.7	-1.5	3.3	10.0	-25.3	11.0	0.5	0.9
10	1.3	1.7	2.9	0.1	2.1	7.7	-9.3	2.3	0.6	0.4

2038 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	0.0	0.1	0.0	-0.3	-0.1	0.2	-0.6	0.1	0.0	0.0
2	0.4	0.2	0.4	-0.6	0.9	0.6	-3.2	0.3	0.1	0.1
3	-0.2	0.1	0.0	0.6	0.0	0.0	-1.0	0.3	0.7	0.0
4	-0.4	-0.8	0.1	0.1	0.3	3.9	-2.0	-1.1	-0.1	-0.1
5	0.0	0.0	0.0	0.5	0.0	0.0	2.0	0.2	0.1	0.0
6	0.1	0.6	0.0	1.0	0.0	0.0	0.6	0.5	1.9	0.0
7	-1.3	-5.3	0.1	1.5	2.0	0.8	-0.3	-2.1	-1.9	-0.8
8	0.1	0.0	0.1	-0.3	0.4	1.0	-1.4	0.1	0.3	0.1
9	-0.1	0.1	0.2	-0.1	0.0	0.4	-0.6	0.4	-0.3	0.0
10	0.0	0.1	0.2	-0.3	0.0	0.0	-0.6	0.2	0.0	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	0.8	5.8	1.1	-5.5	0.1	0.8	-8.1	6.4	3.4	1.2
2	2.1	3.0	1.7	-3.0	-0.3	1.0	-7.0	2.2	1.5	0.8
3	-0.4	1.2	0.0	1.0	0.0	0.0	-11.9	8.8	6.6	-0.1
4	-0.4	-3.0	0.1	0.6	0.6	7.2	11.8	-4.8	-4.8	-1.0
5	-0.1	-0.4	0.0	0.3	0.0	0.0	2.1	2.0	0.9	-0.2
6	0.1	0.8	0.0	0.9	0.0	0.0	-2.9	3.1	2.9	0.0
7	-2.7	-10.8	-6.2	24.8	2.1	2.9	30.3	-14.0	-9.0	0.0
8	0.7	1.4	4.3	-1.2	1.4	1.6	-4.6	4.9	1.4	1.1
9	0.6	1.1	3.5	-0.6	0.2	1.2	-3.1	2.4	0.0	0.3
10	0.2	1.8	0.9	-1.2	-0.2	0.7	-1.0	2.6	0.7	0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	1.9	3.5	1.2	-2.7	0.1	0.7	-15.7	0.9	3.2	1.2
2	2.3	8.2	2.4	-10.5	1.2	2.4	-45.8	2.9	3.9	6.3
3	-0.3	1.4	0.0	1.1	0.0	0.0	-6.0	3.4	8.2	-0.1
4	-1.1	-10.8	0.4	2.3	0.9	29.8	11.2	-9.5	-1.1	-3.8
5	0.1	0.2	0.0	4.3	0.0	0.0	13.2	1.5	0.5	-0.2
6	0.9	5.2	0.0	12.2	0.0	0.0	11.7	3.8	12.5	0.8
7	-14.3	-69.8	-5.7	10.7	7.3	7.3	-23.5	-32.1	-57.9	-17.3
8	0.2	3.9	2.5	-3.8	3.3	3.7	-11.2	2.4	9.8	4.8
9	1.5	3.5	3.9	-2.0	1.0	0.9	-16.2	8.1	-0.7	1.2
10	3.6	5.9	2.6	-3.6	-0.1	0.8	-11.3	1.7	1.0	0.6

2051 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	0.1	0.0	0.0	-0.2	0.4	0.4	-0.7	0.1	0.0	0.0
2	0.1	0.2	0.2	-0.5	0.8	1.4	-3.4	0.5	0.3	0.2
3	0.0	-0.1	0.0	0.4	0.0	0.0	-1.4	0.3	0.4	-0.2
4	-1.0	-2.1	1.2	0.3	1.9	4.0	0.2	-1.0	-0.1	-4.0
5	-0.2	-0.2	0.0	0.1	0.0	0.0	0.0	0.2	0.0	-0.1
6	-0.1	0.5	0.0	0.8	0.0	0.0	-0.9	0.4	0.2	0.0
7	-2.0	-5.9	-0.4	4.7	8.6	3.3	-2.1	-1.0	-0.9	-5.3
8	0.1	-0.4	0.2	-0.6	1.0	1.2	-3.9	0.3	1.0	0.0
9	-0.1	-0.9	0.6	-0.2	0.4	4.4	-3.1	0.6	-0.3	-0.9
10	0.0	-0.4	0.0	-0.2	0.9	0.9	-1.2	0.1	-0.2	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	1.3	2.9	-0.4	-2.6	-0.2	0.1	-1.3	0.5	0.2	0.7
2	10.0	6.0	2.5	-5.4	-0.3	0.9	-17.5	2.5	1.3	3.5
3	1.6	2.1	0.0	2.5	0.0	0.0	-14.7	6.6	4.6	0.3
4	-10.6	-8.4	2.0	0.9	0.1	3.2	30.0	-2.9	-0.8	-6.2
5	-0.1	-1.0	0.0	0.6	0.0	0.0	3.6	2.1	0.3	-0.7
6	1.0	4.3	0.0	3.9	0.0	0.0	3.2	3.1	1.6	0.5
7	-18.2	-22.6	-16.5	18.4	0.9	-3.0	71.2	-7.6	-4.8	-12.4
8	9.6	9.4	15.6	-2.6	2.2	5.0	-22.0	10.9	3.8	6.0
9	5.1	3.9	7.6	-3.2	0.5	3.1	-14.5	1.6	0.4	3.9
10	1.5	1.6	0.2	-3.7	-0.2	0.0	-1.3	0.8	0.3	0.3

UC3	1	2	3	4	5	6	7	8	9	10
1	1.7	5.0	1.4	-0.8	1.3	1.1	-15.2	2.7	1.9	2.8
2	7.2	21.7	3.6	-7.0	0.9	4.3	-74.6	5.4	7.7	11.9
3	0.1	0.4	0.0	3.7	0.0	0.0	-12.3	4.5	4.2	-1.3
4	-6.7	-17.2	2.2	3.2	6.7	31.9	-20.9	-2.5	-2.0	-17.9
5	0.1	1.5	0.0	0.7	0.0	0.0	6.6	5.5	0.6	0.3
6	1.6	2.7	0.0	17.5	0.0	0.0	16.3	4.2	1.8	1.4
7	-37.4	-94.8	-1.8	36.1	23.2	12.9	34.2	-10.0	-24.0	-68.2
8	0.3	-0.5	3.5	-4.4	6.1	10.2	-38.6	4.1	11.4	-0.5
9	6.5	2.8	7.2	-1.5	5.7	14.5	-61.4	13.5	6.3	0.2
10	2.4	9.9	1.7	-0.9	2.3	0.8	-16.7	3.9	2.5	1.6

2051 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	0.0	0.1	0.2	0.2	0.1	1.1	-1.8	0.3	-0.1	0.0
2	-0.1	0.1	0.4	-0.4	1.0	2.5	-4.5	0.8	-0.1	0.0
3	-0.1	0.1	0.0	0.4	0.0	0.0	-0.8	0.3	0.5	0.0
4	-0.6	-0.8	0.0	0.2	0.6	4.8	-1.4	-0.3	-0.2	-1.4
5	0.0	-0.1	0.0	0.1	0.0	0.0	0.3	0.2	0.1	-0.1
6	0.0	0.1	0.0	0.8	0.0	0.0	-0.7	0.4	1.1	0.0
7	-3.4	-6.0	0.3	6.1	4.2	4.3	1.1	-2.3	-2.2	-4.6
8	0.1	0.0	0.3	-0.2	1.1	1.9	-3.2	0.2	0.4	-0.1
9	-0.2	-0.6	0.4	-0.4	0.6	4.7	-2.6	0.1	-0.8	-0.4
10	-0.7	-0.5	-0.4	-0.8	1.2	4.8	-2.0	-0.7	-0.5	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	0.4	2.7	0.4	-0.6	0.0	0.9	-0.6	1.7	0.6	1.0
2	3.0	1.4	1.1	-0.9	-0.5	0.5	-2.8	3.7	1.6	0.4
3	0.2	0.6	0.0	0.1	0.0	0.0	-3.2	5.0	2.3	0.2
4	-1.3	-0.3	-0.1	0.4	1.1	3.7	9.1	-0.4	-0.4	-1.4
k5	0.1	-0.1	0.0	1.8	0.0	0.0	1.7	0.6	0.3	0.0
6	0.6	0.3	0.0	4.8	0.0	0.0	3.7	1.5	0.8	0.2
7	-2.1	-2.6	-1.0	11.3	1.7	0.4	17.0	-2.2	-1.9	-0.3
8	1.8	1.5	3.4	-0.8	0.4	0.8	-3.6	1.5	0.9	0.5
9	0.8	0.8	1.7	-0.5	0.3	0.7	-4.5	0.7	0.2	0.4
10	0.5	0.4	1.0	-0.4	0.1	0.5	-0.1	0.7	0.4	0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	2.8	5.2	1.2	0.0	0.1	3.7	-18.5	2.2	3.9	1.9
2	5.9	17.2	5.8	-7.2	0.7	4.9	-88.2	11.2	9.8	10.3
3	0.9	2.2	0.0	2.6	0.0	0.0	-2.8	4.5	8.0	0.8
4	-1.9	-11.4	2.7	5.5	1.4	35.5	31.2	-1.9	-3.6	-16.4
5	0.2	1.0	0.0	2.0	0.0	0.0	12.9	4.6	5.2	2.6
6	2.0	3.8	0.0	26.4	0.0	0.0	28.4	5.3	11.5	7.0
7	-29.7	-92.9	-1.7	37.5	10.6	30.6	12.7	-27.5	-54.5	-55.3
8	1.7	5.5	4.9	-2.1	5.8	8.7	-29.6	6.6	17.0	2.7
9	3.7	5.1	9.3	-2.9	5.9	16.6	-47.5	18.1	3.7	2.1
10	2.2	4.7	3.8	-2.9	3.5	11.2	-19.5	2.7	1.7	1.2

2051 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	0.1	0.2	0.1	-0.6	-0.1	0.3	-0.9	0.1	0.0	0.0
2	0.7	0.4	0.6	-1.2	1.5	1.0	-5.4	0.6	0.3	0.3
3	-0.2	0.3	0.0	1.0	0.0	0.0	-1.5	0.5	1.1	0.0
4	-0.6	-1.1	0.1	0.2	0.5	5.8	-2.7	-1.1	-0.1	-0.2
5	0.0	0.1	0.0	0.8	0.0	0.0	3.0	0.3	0.1	0.0
6	0.2	1.1	0.0	1.6	0.0	0.0	1.0	0.9	2.7	0.1
7	-2.4	-8.7	0.2	2.1	3.4	1.1	1.2	-3.5	-3.2	-1.4
8	0.2	0.1	0.3	-0.4	0.6	1.5	-2.3	0.2	0.5	0.2
9	-0.1	0.1	0.4	-0.1	0.1	0.7	-1.1	0.6	-0.4	0.0
10	0.2	0.3	0.3	-0.5	0.0	0.1	-1.3	0.3	0.0	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	1.3	9.7	1.9	-10.7	-0.3	1.2	-13.9	9.5	5.0	2.3
2	3.5	5.3	2.9	-6.1	-0.5	1.5	-13.4	3.6	2.6	1.4
3	-0.3	2.0	0.0	1.8	0.0	0.0	-18.7	13.2	9.3	0.0
4	-0.8	-4.7	0.1	0.9	0.8	10.6	18.7	-7.4	-7.2	-1.9
5	-0.1	-0.6	0.0	0.4	0.0	0.0	3.0	2.8	1.2	-0.3
6	0.1	1.1	0.0	1.5	0.0	0.0	-5.4	4.7	3.9	0.0
7	-4.8	-18.5	-12.0	35.8	3.0	3.5	54.4	-27.0	-15.1	-0.5
8	1.2	2.1	6.5	-1.9	2.1	2.4	-9.1	8.1	2.3	1.8
9	0.9	1.8	5.1	-0.9	0.3	1.8	-5.6	3.9	0.2	0.6
10	0.4	2.9	1.2	-2.2	-0.3	0.8	-2.1	3.7	1.2	0.2

UC3	1	2	3	4	5	6	7	8	9	10
1	5.3	6.3	1.5	-5.7	0.1	1.1	-25.3	0.9	4.2	3.2
2	5.4	18.2	3.3	-18.8	1.8	4.1	-79.8	4.1	7.5	14.0
3	-0.1	2.7	0.0	1.5	0.0	0.0	-9.5	5.8	12.6	0.4
4	-2.1	-16.6	0.7	3.6	1.4	46.7	19.8	-14.5	-2.5	-6.3
5	0.1	0.6	0.0	6.9	0.0	0.0	22.0	2.7	1.4	-0.2
6	1.5	8.8	0.0	20.2	0.0	0.0	17.6	6.7	19.2	1.6
7	-28.4	-112.8	-10.1	11.8	12.1	9.4	2.4	-54.3	-93.4	-34.4
8	0.4	6.2	4.2	-6.7	5.5	6.0	-21.0	4.2	16.3	8.0
9	2.4	7.1	6.5	-3.6	1.9	2.0	-31.7	14.2	2.3	3.0
10	5.5	11.1	2.7	-7.5	-0.2	1.3	-24.0	1.7	2.4	1.9

DS VDM versus REFERENCE

2023 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.1	-0.1	0.0	0.2	0.1	0.0	0.2	0.0	-0.1	-0.1
2	0.0	0.0	0.0	0.0	0.1	0.2	-0.2	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
4	1.1	-0.2	0.1	0.0	0.3	0.7	-1.8	-0.1	0.0	0.3
5	0.2	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
6	0.0	0.1	0.0	0.1	0.0	0.0	-0.1	0.1	0.0	0.0
7	2.4	-0.4	0.0	-0.3	1.0	0.8	-4.1	0.0	-0.1	1.4
8	0.0	-0.1	0.0	0.0	0.1	0.2	-0.4	0.0	0.1	0.0
9	0.0	-0.2	0.1	0.0	0.0	0.8	-0.3	0.1	-0.2	-0.2
10	-0.1	-0.1	0.0	0.1	0.1	0.2	-0.1	0.0	-0.1	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.4	-0.7	-0.3	4.0	0.1	-0.1	4.8	-0.5	-1.3	-0.7
2	-5.6	1.3	0.8	0.4	0.1	0.4	4.2	0.8	0.5	-0.6
3	-2.4	0.7	0.0	0.6	0.0	0.0	3.2	1.4	0.9	0.1
4	14.3	-0.3	-0.1	0.0	0.0	0.4	-4.1	-0.3	-0.1	1.7
5	0.7	-0.1	0.0	0.4	0.0	0.0	0.7	0.4	0.0	0.0
6	-0.8	0.9	0.0	0.9	0.0	0.0	3.4	0.6	0.3	0.0
7	23.2	1.7	0.6	-2.6	-0.3	0.1	-2.8	0.2	0.4	9.2
8	-7.7	2.6	3.0	0.8	0.7	1.1	2.7	3.1	1.5	-0.5
9	-5.1	1.9	1.7	0.1	0.2	0.8	1.0	1.1	0.7	-0.8
10	-1.6	0.1	0.0	1.1	0.0	0.0	1.5	0.0	-0.1	-0.2

UC3	1	2	3	4	5	6	7	8	9	10
1	-3.0	-2.7	0.4	1.1	0.2	0.1	13.7	-0.3	-1.9	-2.5
2	-2.5	0.0	0.5	-0.1	0.0	0.7	-0.7	0.5	0.3	-2.5
3	0.1	0.1	0.0	0.5	0.0	0.0	0.0	0.3	0.3	0.1
4	7.9	-1.2	0.7	0.4	0.9	5.0	-13.9	-0.2	-0.2	4.3
5	0.3	0.3	0.0	0.1	0.0	0.0	0.7	0.7	0.0	0.2
6	0.2	0.0	0.0	2.8	0.0	0.0	4.0	0.5	0.1	0.1
7	60.1	-1.6	0.9	-0.6	2.6	3.6	-53.8	1.1	-2.1	28.2
8	-0.7	-0.9	0.4	-0.1	0.7	0.9	-3.4	0.4	0.9	-0.4
9	-2.0	-1.0	1.2	0.1	0.7	2.3	-4.4	1.8	-0.8	-1.3
10	-1.8	-3.0	0.2	0.5	0.3	0.3	5.5	0.0	-1.1	-1.1

2023 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.9	-0.2	1.5	0.0	0.1	1.3	-0.3	-0.1	-1.0
2	0.1	-0.1	0.1	0.0	0.1	0.4	-0.7	0.1	-0.1	-0.1
3	0.1	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0
4	0.8	-0.1	0.0	0.0	0.1	0.7	-1.9	0.0	0.0	0.4
5	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
6	0.1	0.0	0.0	0.1	0.0	0.0	-0.1	0.1	0.2	0.0
7	3.7	-0.3	0.0	-0.6	0.4	0.6	-5.1	-0.3	-0.2	1.4
8	0.0	0.0	0.0	0.0	0.2	0.3	-0.5	0.0	0.0	0.0
9	-0.1	-0.2	0.1	-0.1	0.1	0.8	-0.4	0.0	-0.2	-0.2
10	-0.3	-0.2	-0.1	0.1	0.2	1.0	-0.1	-0.2	-0.2	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-0.7	-1.3	-0.5	1.6	0.2	0.1	3.6	-1.0	-0.7	-0.7
2	-1.3	0.3	0.2	0.0	0.0	0.1	0.7	1.0	0.6	0.0
3	-0.7	0.1	0.0	0.0	0.0	0.0	0.5	1.0	0.5	0.0
4	2.0	0.0	0.0	0.0	0.2	0.7	-0.2	0.0	0.0	0.7
5	0.1	0.0	0.0	0.5	0.0	0.0	0.4	0.2	0.1	0.0
6	0.0	0.0	0.0	1.1	0.0	0.0	1.6	0.3	0.1	0.0
7	4.6	0.7	0.4	-0.6	0.2	0.4	-0.5	1.0	0.2	1.0
8	-1.2	0.4	0.7	0.0	0.1	0.2	0.7	0.7	0.4	0.0
9	-0.9	0.3	0.4	0.0	0.1	0.1	-0.2	0.3	0.2	0.0
10	-0.6	-0.1	-0.1	0.2	0.0	0.0	0.4	0.0	0.0	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	-5.5	-3.2	0.1	3.6	0.6	0.6	30.1	-0.7	-3.3	-3.1
2	-2.6	-0.7	0.7	0.0	0.1	0.5	-8.0	0.8	-0.5	-2.7
3	0.2	0.2	0.0	0.5	0.0	0.0	0.6	0.4	1.1	0.3
4	3.5	-0.5	0.4	0.3	0.2	5.6	-7.8	0.3	-0.3	7.6
5	0.3	0.1	0.0	0.3	0.0	0.0	1.3	0.6	0.6	0.9
6	0.3	0.4	0.0	4.2	0.0	0.0	5.3	0.6	1.5	1.1
7	48.7	-3.6	0.8	-2.4	1.1	6.1	-72.1	-1.3	-5.4	19.6
8	-0.2	0.3	0.5	0.3	0.7	1.0	-2.7	0.7	1.5	0.5
9	-2.3	-0.7	1.4	-0.2	0.7	2.3	-4.8	2.2	-0.9	-1.1
10	-1.6	-1.1	0.7	2.3	0.6	2.0	5.3	0.4	-0.8	-1.0

2023 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.1	0.0	0.5	0.2	0.0	0.9	-0.1	-0.1	0.0
2	0.1	0.1	0.1	-0.1	0.2	0.2	-0.9	0.1	0.0	0.0
3	0.1	0.0	0.0	0.1	0.0	0.0	-0.1	0.0	0.1	0.0
4	0.4	0.0	0.0	0.0	0.1	1.0	-1.4	-0.2	0.0	0.1
5	0.1	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.0
6	0.0	0.2	0.0	0.3	0.0	0.0	0.4	0.1	0.5	0.0
7	1.4	0.2	0.1	-1.2	0.3	0.4	-3.3	-0.2	-0.2	0.4
8	0.0	0.0	0.0	-0.1	0.1	0.3	-0.3	0.0	0.0	0.0
9	0.0	0.0	0.1	0.0	0.0	0.1	-0.2	0.1	-0.1	-0.1
10	-0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.4	-6.4	-2.6	14.1	0.4	-0.7	16.8	-7.8	-4.5	-2.5
2	-1.3	1.2	0.7	-0.2	0.0	0.3	0.7	1.0	0.7	-0.1
3	-1.4	0.6	0.0	0.0	0.0	0.0	0.5	2.5	2.1	0.0
4	0.9	0.3	0.1	0.0	0.3	2.3	-2.2	0.6	0.0	0.4
5	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	0.8	0.3	0.0
6	-0.5	0.4	0.0	0.2	0.0	0.0	0.9	1.0	1.0	0.0
7	7.4	4.1	4.5	-3.4	0.5	2.7	-3.8	5.7	2.2	1.3
8	-1.5	0.7	1.3	0.1	0.5	0.5	0.2	2.8	1.1	0.0
9	-0.8	0.4	1.0	0.0	0.1	0.4	0.2	1.5	0.6	-0.2
10	-0.4	-0.6	0.3	0.2	0.0	0.0	2.2	-0.1	-0.3	-0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	-7.0	-3.0	0.1	5.7	0.1	0.1	26.1	-1.2	-2.8	-3.7
2	-2.7	0.0	0.3	-1.4	0.4	0.4	-6.9	0.0	0.2	-5.0
3	0.4	0.5	0.0	0.5	0.0	0.0	1.7	0.4	1.5	0.0
4	1.1	-0.5	0.2	0.1	0.2	7.7	-5.5	-0.4	0.0	0.5
5	0.1	0.1	0.0	1.0	0.0	0.0	2.5	0.3	0.1	0.1
6	0.3	1.7	0.0	3.1	0.0	0.0	4.6	0.6	2.8	0.3
7	23.3	4.1	1.6	-9.6	1.3	3.3	-62.1	-0.7	-5.6	12.1
8	-0.1	0.5	0.5	-0.1	0.8	0.9	-1.1	0.4	1.9	-0.1
9	-1.2	-0.2	0.8	-0.4	0.2	0.1	-3.4	1.5	-1.0	-1.4
10	-2.0	-2.9	0.5	1.2	0.1	0.2	6.2	-0.6	-1.6	-1.0

2038 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.1	-0.2	0.0	0.1	0.3	0.1	0.1	0.0	-0.1	-0.1
2	0.0	-0.1	0.1	-0.1	0.4	0.8	-1.2	0.2	0.0	-0.1
3	0.0	0.0	0.0	0.2	0.0	0.0	-0.2	0.1	0.1	0.0
4	1.1	-0.6	0.7	0.0	1.0	2.9	-3.4	-0.2	-0.1	-0.3
5	0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	0.0
6	0.0	0.4	0.0	0.4	0.0	0.0	-0.2	0.2	0.1	0.0
7	2.5	-1.6	0.1	-0.1	4.3	3.7	-8.6	-0.1	-0.3	0.6
8	0.0	-0.4	0.1	-0.1	0.5	0.6	-1.2	0.1	0.2	-0.2
9	-0.1	-0.6	0.3	-0.1	0.1	2.9	-1.2	0.2	-0.5	-0.6
10	-0.1	-0.4	0.0	0.0	0.5	0.5	-0.4	0.0	-0.2	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.2	-0.5	-0.6	4.0	0.1	-0.1	6.4	-0.3	-1.0	-0.4
2	-5.1	2.5	0.8	0.1	0.1	0.6	3.5	1.5	1.0	-0.2
3	-2.7	1.1	0.0	1.9	0.0	0.0	5.2	3.5	2.5	-0.1
4	15.2	0.4	1.0	0.2	-0.1	1.2	7.9	-0.6	-0.1	2.2
5	1.1	0.0	0.0	0.7	0.0	0.0	2.6	1.3	0.2	0.0
6	-0.4	2.7	0.0	2.7	0.0	0.0	8.0	1.9	1.0	0.1
7	27.1	2.8	1.1	2.9	-0.1	0.5	15.5	0.2	-0.3	11.8
8	-5.5	5.4	7.8	1.7	2.0	2.8	2.9	7.9	3.2	0.4
9	-4.6	3.5	4.2	-0.2	0.5	2.1	-1.4	2.1	0.8	-0.4
10	-1.0	0.3	-0.1	1.1	0.0	0.0	1.5	0.3	0.0	-0.2

UC3	1	2	3	4	5	6	7	8	9	10
1	-3.0	-4.2	1.2	1.2	0.9	0.5	15.8	0.9	-2.0	-2.2
2	-3.2	2.0	1.6	-1.1	0.6	2.4	-17.6	2.2	1.2	-2.0
3	0.1	0.3	0.0	2.0	0.0	0.0	-0.1	1.6	1.6	-0.2
4	7.0	-4.5	2.7	1.1	3.8	20.1	-27.7	-0.4	-0.5	2.2
5	0.6	1.7	0.0	0.3	0.0	0.0	4.0	3.0	0.2	0.5
6	1.0	1.3	0.0	11.2	0.0	0.0	17.0	2.1	0.7	0.7
7	68.3	-14.6	3.4	7.0	12.4	14.1	-82.6	0.4	-7.5	23.9
8	-0.5	-1.6	1.6	-0.1	3.1	4.8	-12.2	1.6	3.4	-1.6
9	-1.4	-1.3	4.2	-0.2	2.9	8.8	-20.6	6.2	-1.9	-3.7
10	-1.1	-3.5	0.3	0.5	1.2	0.4	2.6	1.1	-1.2	-0.9

2038 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.3	-1.1	-0.2	1.7	0.1	0.4	0.8	-0.2	-0.2	-1.0
2	-0.2	-0.1	0.2	-0.2	0.6	1.4	-2.2	0.3	-0.2	-0.2
3	0.0	0.0	0.0	0.2	0.0	0.0	-0.1	0.1	0.2	0.0
4	0.6	-0.3	0.0	0.1	0.3	3.0	-3.5	0.0	-0.1	0.0
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
6	0.0	0.1	0.0	0.5	0.0	0.0	-0.1	0.2	0.5	0.0
7	3.2	-1.7	0.8	0.3	2.1	3.2	-8.7	-0.7	-0.9	0.8
8	0.0	-0.1	0.1	0.0	0.6	1.0	-1.4	0.1	0.0	-0.1
9	-0.2	-0.6	0.2	-0.2	0.3	3.0	-1.3	-0.1	-0.7	-0.4
10	-0.7	-0.5	-0.4	-0.1	0.7	3.0	-0.6	-0.7	-0.5	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-0.6	-1.1	-0.5	1.7	0.3	0.5	4.1	-0.6	-0.6	-0.4
2	-1.0	0.7	0.4	0.1	0.1	0.4	0.7	2.1	1.1	0.0
3	-0.8	0.3	0.0	0.1	0.0	0.0	1.2	2.5	1.2	0.0
4	2.1	0.0	0.0	0.2	0.7	2.1	2.5	0.0	-0.1	0.8
5	0.1	0.1	0.0	1.3	0.0	0.0	1.4	0.4	0.2	0.0
6	0.2	0.2	0.0	3.2	0.0	0.0	5.0	0.9	0.5	0.1
7	5.0	1.0	1.0	2.5	0.8	1.4	3.9	1.3	-0.1	1.4
8	-0.8	0.9	1.7	0.1	0.3	0.4	1.0	1.2	0.7	0.1
9	-0.7	0.6	0.9	-0.1	0.2	0.4	-0.5	0.6	0.3	0.0
10	-0.4	0.0	-0.1	0.3	0.1	0.1	0.7	0.1	0.0	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	-5.8	-6.8	0.4	4.3	0.8	2.2	31.9	-0.1	-4.1	-2.5
2	-4.7	1.0	2.6	-1.4	0.5	2.4	-33.0	3.9	0.8	-2.2
3	0.5	1.2	0.0	1.8	0.0	0.0	4.4	1.8	4.2	0.4
4	3.7	-2.8	1.9	1.7	0.7	22.5	-6.7	1.1	-1.1	5.9
5	0.6	0.8	0.0	1.2	0.0	0.0	7.2	2.5	2.8	2.4
6	1.3	2.2	0.0	17.0	0.0	0.0	24.0	2.7	6.2	4.1
7	50.9	-24.6	5.5	3.1	5.5	25.4	-113.0	-5.6	-18.4	12.1
8	0.2	1.4	2.3	1.0	3.2	4.6	-9.4	2.8	6.0	0.6
9	-2.8	-0.7	5.2	-0.9	3.3	9.6	-17.1	8.1	-3.1	-1.9
10	-1.7	-2.6	0.9	3.2	2.2	6.4	2.0	0.1	-1.6	-1.0

2038 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.2	0.0	0.5	0.2	0.1	0.9	-0.2	-0.1	0.0
2	0.0	0.0	0.2	-0.3	0.8	0.5	-2.1	0.1	0.0	0.0
3	-0.1	0.1	0.0	0.6	0.0	0.0	0.3	0.1	0.3	0.0
4	0.3	-0.2	0.1	0.0	0.3	3.6	-3.4	-0.3	0.0	0.0
5	0.1	0.1	0.0	0.4	0.0	0.0	1.6	0.2	0.0	0.0
6	0.1	0.6	0.0	1.0	0.0	0.0	1.5	0.5	1.5	0.1
7	1.6	-1.2	0.3	-2.1	1.3	1.5	-6.2	-0.9	-1.1	0.2
8	0.0	-0.1	0.1	-0.2	0.3	0.9	-0.8	0.0	-0.1	0.0
9	-0.1	-0.1	0.2	-0.1	0.0	0.4	-0.5	0.2	-0.4	-0.1
10	-0.1	-0.1	0.0	0.1	0.0	0.0	-0.1	-0.2	-0.1	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.1	-6.9	-3.0	15.2	0.8	-0.5	18.3	-5.7	-4.0	-1.7
2	-1.5	2.7	1.1	0.1	0.0	1.0	1.2	2.3	1.8	0.2
3	-1.8	1.0	0.0	1.1	0.0	0.0	0.4	6.4	5.2	0.0
4	1.0	0.1	0.3	0.2	0.7	7.0	3.8	1.0	-0.6	0.5
5	0.1	0.2	0.0	0.2	0.0	0.0	1.4	2.1	0.8	0.0
6	-0.4	0.9	0.0	0.6	0.0	0.0	2.7	2.5	2.6	0.0
7	7.6	3.5	7.6	8.0	1.8	5.5	10.0	5.8	-0.5	1.6
8	-1.2	1.5	3.4	0.2	1.4	1.4	0.5	6.3	2.2	0.4
9	-0.7	1.3	2.9	-0.1	0.2	1.1	-0.7	3.2	0.7	-0.1
10	-0.2	-0.4	0.0	0.5	0.0	0.1	2.5	0.0	-0.1	-0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	-7.0	-5.5	0.3	6.0	0.2	0.4	29.0	-2.0	-4.0	-3.1
2	-4.4	1.1	0.7	-4.9	1.5	2.0	-23.5	0.4	0.9	-5.4
3	0.7	1.5	0.0	2.0	0.0	0.0	6.7	2.0	5.6	0.2
4	1.5	-2.3	0.6	0.7	0.6	29.4	-4.0	-1.6	-0.3	0.0
5	0.2	0.6	0.0	3.9	0.0	0.0	12.6	1.4	0.5	0.4
6	0.9	6.4	0.0	12.8	0.0	0.0	18.6	3.1	10.8	1.0
7	30.1	-19.0	2.9	-17.6	6.2	12.2	-93.4	-11.0	-27.2	9.5
8	-0.2	2.4	2.0	-0.1	3.1	3.4	-3.1	1.6	6.6	1.9
9	-1.5	0.5	3.1	-1.0	1.0	0.8	-10.8	5.4	-3.6	-1.7
10	-1.5	-5.5	-0.1	1.1	0.4	0.6	5.3	-2.4	-2.8	-1.0

2051 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.1	-0.3	0.0	0.0	0.6	0.3	-0.1	0.0	-0.2	-0.1
2	-0.1	-0.1	0.2	-0.3	0.7	1.4	-2.2	0.3	0.0	-0.1
3	0.0	0.0	0.0	0.3	0.0	0.0	-0.7	0.2	0.2	-0.1
4	1.0	-1.1	1.1	0.0	1.6	4.2	-4.6	-0.4	-0.1	-1.0
5	0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.2	0.0	0.0
6	0.0	0.5	0.0	0.6	0.0	0.0	-0.4	0.3	0.1	0.0
7	2.2	-2.6	0.1	0.4	6.9	5.3	-11.2	-0.4	-0.6	0.1
8	-0.1	-0.6	0.1	-0.4	0.9	1.1	-2.2	0.2	0.4	-0.4
9	-0.3	-0.9	0.5	-0.1	0.3	4.3	-2.2	0.4	-0.6	-1.0
10	-0.1	-0.5	0.0	0.0	0.9	0.9	-0.9	0.0	-0.3	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.2	-0.1	-0.8	3.4	0.1	-0.1	7.6	-0.3	-1.3	-0.5
2	-4.0	4.1	1.4	-1.0	0.1	0.8	1.9	1.9	1.2	0.1
3	-2.9	1.1	0.0	2.6	0.0	0.0	1.7	5.4	3.9	-0.7
4	14.6	-1.2	1.4	0.3	0.0	2.1	11.6	-1.2	-0.2	1.7
5	1.2	-0.2	0.0	0.9	0.0	0.0	3.4	1.9	0.3	-0.1
6	-0.3	3.6	0.0	3.7	0.0	0.0	9.0	2.8	1.5	0.1
7	27.6	2.0	-1.7	6.8	0.0	-0.1	30.1	-1.4	-1.4	13.9
8	-4.8	6.6	11.8	1.5	2.8	4.2	-0.7	11.4	4.6	0.5
9	-4.4	4.3	6.2	-0.9	0.7	2.9	-4.3	2.9	1.1	-0.2
10	-0.8	0.6	-0.1	0.7	0.0	0.0	2.0	0.4	0.0	-0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	-3.4	-5.1	1.8	1.4	1.5	1.0	17.1	1.3	-2.2	-2.7
2	-3.0	5.1	2.7	-2.9	1.4	4.1	-33.6	3.0	2.0	-2.3
3	0.0	0.2	0.0	3.2	0.0	0.0	-3.3	3.0	3.1	-0.9
4	5.4	-8.4	3.6	1.4	6.2	31.3	-43.0	-0.9	-0.9	-1.5
5	0.7	2.5	0.0	0.6	0.0	0.0	6.6	5.0	0.5	0.7
6	1.5	2.3	0.0	17.4	0.0	0.0	24.5	3.7	1.6	1.2
7	65.3	-28.4	4.2	12.6	21.0	20.4	-101.9	-1.9	-12.4	20.2
8	-1.3	-4.2	2.9	-1.1	5.7	9.3	-22.5	2.8	6.7	-4.0
9	-1.9	-2.6	6.7	-0.7	5.5	13.9	-37.7	10.5	-0.1	-6.4
10	-1.3	-4.0	0.6	0.2	2.2	0.7	1.4	1.6	-1.4	-1.1

2051 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.4	-1.2	-0.2	1.9	0.2	0.8	0.4	-0.2	-0.3	-1.0
2	-0.4	-0.2	0.3	-0.2	0.9	2.2	-3.3	0.3	-0.4	-0.3
3	0.0	0.1	0.0	0.3	0.0	0.0	-0.2	0.2	0.3	0.0
4	0.6	-0.4	0.0	0.1	0.5	4.5	-4.5	0.0	-0.2	-0.1
5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
6	0.0	0.1	0.0	0.7	0.0	0.0	-0.2	0.3	0.7	0.1
7	3.4	-2.5	1.2	0.8	3.5	5.3	-11.7	-1.1	-1.4	0.5
8	0.0	-0.2	0.2	0.0	1.0	1.7	-2.2	0.1	0.0	-0.2
9	-0.4	-0.8	0.4	-0.3	0.6	4.5	-2.1	-0.1	-1.0	-0.6
10	-0.9	-0.7	-0.5	-0.2	1.2	4.3	-1.3	-0.9	-0.7	-0.2

UC2	1	2	3	4	5	6	7	8	9	10
1	-0.7	-0.6	-0.6	1.8	0.3	0.7	4.6	-0.3	-0.6	-0.2
2	-0.6	1.0	0.7	0.0	0.0	0.5	0.4	2.9	1.5	0.1
3	-0.9	0.4	0.0	0.1	0.0	0.0	0.9	3.8	1.9	0.0
4	2.1	0.0	0.0	0.4	1.0	3.0	4.8	0.0	-0.2	0.7
5	0.2	0.1	0.0	1.8	0.0	0.0	1.9	0.6	0.3	0.0
6	0.3	0.3	0.0	4.4	0.0	0.0	6.4	1.3	0.7	0.1
7	5.6	1.2	1.1	4.9	1.2	1.7	7.5	1.2	-0.4	1.7
8	-0.6	1.2	2.6	0.0	0.4	0.7	0.6	1.8	1.1	0.1
9	-0.7	0.8	1.4	-0.2	0.3	0.6	-1.3	0.9	0.4	0.1
10	-0.3	0.0	-0.1	0.3	0.1	0.2	0.9	0.1	0.1	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	-5.8	-6.7	0.5	4.6	1.0	3.2	30.2	0.1	-4.3	-2.9
2	-5.3	2.6	4.0	-2.8	1.0	4.2	-50.8	5.1	0.7	-2.6
3	0.7	1.9	0.0	2.7	0.0	0.0	6.1	3.1	6.8	0.5
4	3.8	-4.5	2.9	2.8	1.3	34.9	-3.9	1.4	-1.8	4.9
5	0.8	1.4	0.0	2.0	0.0	0.0	12.2	4.2	5.0	3.8
6	2.0	3.8	0.0	26.3	0.0	0.0	37.3	4.7	10.4	6.3
7	50.7	-35.2	8.3	8.3	9.3	39.6	-145.1	-10.1	-29.8	10.3
8	0.1	1.7	4.0	1.3	5.5	8.0	-15.5	4.7	10.6	-0.5
9	-3.0	-1.5	8.4	-1.5	5.7	15.7	-28.5	13.3	-2.8	-3.0
10	-2.4	-3.8	1.0	3.0	3.6	9.4	-0.6	-0.8	-2.5	-1.2

2051 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.2	0.0	0.4	0.2	0.2	0.8	-0.3	-0.2	0.0
2	0.2	0.1	0.3	-0.5	1.3	0.9	-3.2	0.0	-0.1	0.0
3	-0.1	0.1	0.0	0.9	0.0	0.0	0.1	0.2	0.5	0.0
4	0.2	-0.4	0.1	0.0	0.4	5.3	-4.5	-0.6	-0.1	0.0
5	0.1	0.2	0.0	0.6	0.0	0.0	2.5	0.3	0.1	0.0
6	0.2	1.0	0.0	1.5	0.0	0.0	2.1	0.7	2.3	0.1
7	1.9	-2.5	0.4	-2.6	2.3	2.1	-7.9	-1.7	-2.0	0.1
8	0.0	-0.1	0.2	-0.3	0.6	1.4	-1.4	0.1	0.0	0.0
9	-0.2	-0.1	0.4	-0.1	0.1	0.7	-0.9	0.4	-0.5	-0.1
10	0.0	-0.1	0.0	0.0	0.0	0.1	-0.3	-0.3	-0.2	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-1.9	-6.0	-3.4	14.8	0.7	-0.4	19.2	-5.3	-3.8	-1.3
2	-1.0	3.8	0.9	-1.0	-0.1	1.3	0.2	2.7	2.1	0.4
3	-2.1	1.4	0.0	1.6	0.0	0.0	-2.8	9.8	7.6	0.0
4	0.9	-0.6	0.4	0.4	1.0	9.7	8.4	-0.3	-2.0	0.3
5	0.1	0.1	0.0	0.3	0.0	0.0	2.0	3.0	1.2	0.0
6	-0.4	1.3	0.0	1.0	0.0	0.0	1.9	3.8	3.6	0.0
7	8.0	2.6	5.8	13.5	2.3	6.6	21.6	1.2	-3.3	2.1
8	-1.2	1.8	5.3	-0.1	2.0	2.1	-1.2	9.0	3.1	0.6
9	-0.7	1.5	4.4	-0.2	0.3	1.7	-1.8	4.5	0.9	0.0
10	-0.1	-0.3	-0.4	0.3	0.0	0.2	2.8	0.0	0.0	-0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	-6.4	-5.4	0.2	5.0	0.3	0.7	25.8	-3.2	-4.8	-3.0
2	-4.6	3.6	0.7	-9.4	2.1	3.2	-39.3	-1.1	0.4	-5.1
3	0.9	2.4	0.0	2.7	0.0	0.0	7.5	3.6	9.1	0.3
4	1.9	-4.9	0.8	1.0	1.1	44.5	-1.9	-4.8	-1.0	-0.7
5	0.5	1.1	0.0	6.2	0.0	0.0	20.7	2.6	1.2	0.6
6	1.6	9.9	0.0	19.9	0.0	0.0	27.3	5.5	17.0	1.7
7	35.8	-32.2	0.9	-25.6	10.2	17.6	-116.1	-23.7	-49.1	10.2
8	-0.3	3.4	3.4	-1.3	5.1	5.6	-7.3	2.8	11.1	2.8
9	-1.5	0.9	5.3	-1.8	1.9	1.8	-19.0	9.6	-3.1	-1.9
10	-2.0	-7.9	-1.0	-0.2	0.4	0.9	3.8	-5.1	-4.2	-1.1

DS with Harfrey's roundabout Improvement VDM versus REFERENCE

2023 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.1	-0.1	0.0	0.2	0.1	0.0	0.2	0.0	-0.1	-0.1
2	0.0	0.0	0.0	0.0	0.1	0.2	-0.2	0.0	0.0	-0.1
3	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
4	1.2	-0.1	0.2	0.0	0.3	0.9	-2.2	0.0	0.0	0.6
5	0.2	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
6	0.0	0.1	0.0	0.1	0.0	0.0	-0.1	0.1	0.0	0.0
7	2.6	-0.2	0.0	-0.5	0.8	0.9	-4.3	0.0	-0.1	1.7
8	0.0	-0.1	0.0	-0.1	0.1	0.2	-0.4	0.0	0.1	0.0
9	0.0	-0.2	0.1	0.0	0.0	0.8	-0.3	0.1	-0.2	-0.2
10	-0.1	-0.1	0.0	0.1	0.1	0.2	0.0	0.0	-0.1	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.5	-0.8	-0.3	4.5	0.2	-0.1	5.0	-0.5	-1.3	-0.7
2	-6.4	1.2	0.6	0.7	0.1	0.3	5.4	0.8	0.5	-0.7
3	-2.8	0.8	0.0	0.6	0.0	0.0	3.2	1.5	0.9	0.1
4	17.4	0.0	0.1	-0.1	-0.1	0.3	-5.5	-0.3	0.0	2.2
5	0.9	-0.1	0.0	0.4	0.0	0.0	0.7	0.4	0.0	0.0
6	-0.8	0.9	0.0	0.8	0.0	0.0	3.4	0.7	0.3	0.0
7	24.2	2.8	0.7	-3.2	-0.4	0.1	-1.8	0.3	0.5	10.2
8	-8.7	2.5	3.2	0.9	0.8	1.2	3.3	3.1	1.5	-0.6
9	-5.7	1.9	1.8	0.3	0.2	0.9	1.3	1.1	0.7	-1.0
10	-1.8	0.0	0.0	1.4	0.1	0.0	1.7	0.0	-0.1	-0.2

UC3	1	2	3	4	5	6	7	8	9	10
1	-3.0	-3.0	0.3	1.2	0.2	0.1	14.1	-0.3	-2.0	-2.6
2	-2.8	-0.5	0.5	0.2	0.1	0.6	0.1	0.4	0.1	-2.8
3	0.0	0.2	0.0	0.4	0.0	0.0	-0.1	0.3	0.3	0.2
4	9.4	-0.4	0.8	0.3	0.8	5.0	-14.2	0.0	-0.1	6.2
5	0.3	0.3	0.0	0.1	0.0	0.0	0.7	0.7	0.0	0.2
6	0.2	0.0	0.0	2.7	0.0	0.0	4.0	0.5	0.1	0.1
7	65.1	1.3	0.9	-1.1	2.5	3.7	-58.9	1.4	-2.0	32.0
8	-0.7	-0.9	0.4	0.0	0.7	0.9	-3.6	0.4	0.9	-0.3
9	-2.2	-1.1	1.2	0.1	0.7	2.3	-4.3	1.8	-1.0	-1.4
10	-1.9	-3.1	0.1	0.5	0.3	0.3	6.1	0.0	-1.2	-1.1

2023 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.8	-0.3	1.8	0.0	0.1	0.9	-0.3	-0.1	-0.9
2	0.1	-0.1	0.1	-0.1	0.1	0.4	-0.8	0.1	-0.1	-0.1
3	0.1	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.1	0.0
4	0.8	-0.1	0.0	0.0	0.1	0.7	-1.8	0.0	0.0	0.3
5	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
6	0.1	0.0	0.0	0.1	0.0	0.0	-0.2	0.1	0.2	0.1
7	3.7	-0.2	0.1	-0.7	0.4	0.6	-5.4	-0.2	-0.1	1.4
8	0.0	0.0	0.0	-0.1	0.2	0.3	-0.5	0.0	0.1	0.0
9	-0.1	-0.2	0.1	-0.1	0.1	0.8	-0.4	0.0	-0.2	-0.2
10	-0.3	-0.2	-0.1	0.2	0.2	1.0	0.0	-0.2	-0.2	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-0.7	-1.5	-0.6	1.8	0.2	0.1	3.3	-1.2	-0.8	-0.7
2	-1.5	0.3	0.3	0.0	0.0	0.1	0.7	0.9	0.6	0.0
3	-0.8	0.1	0.0	0.0	0.0	0.0	0.4	1.0	0.5	0.0
4	2.3	0.0	0.0	0.0	0.2	0.6	-0.7	0.0	0.0	0.8
5	0.1	0.0	0.0	0.5	0.0	0.0	0.4	0.2	0.1	0.0
6	0.0	0.0	0.0	1.0	0.0	0.0	1.6	0.3	0.2	0.0
7	4.5	0.7	0.4	-1.2	0.1	0.5	-0.5	1.0	0.2	1.0
8	-1.4	0.4	0.7	0.0	0.1	0.2	0.8	0.7	0.4	0.0
9	-0.9	0.3	0.4	0.0	0.1	0.1	-0.2	0.3	0.2	-0.1
10	-0.6	-0.1	-0.2	0.2	0.0	0.0	0.4	0.0	-0.1	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	-5.4	-3.4	0.1	3.8	0.6	0.5	30.9	-0.8	-3.5	-3.1
2	-2.8	-0.7	0.7	-0.5	0.0	0.5	-8.4	0.8	-0.5	-2.9
3	0.1	0.3	0.0	0.4	0.0	0.0	0.3	0.4	1.1	0.3
4	3.7	-0.6	0.4	0.3	0.2	5.4	-8.0	0.0	-0.4	7.2
5	0.4	0.1	0.0	0.3	0.0	0.0	1.2	0.6	0.6	0.9
6	0.3	0.4	0.0	4.0	0.0	0.0	5.1	0.6	1.6	1.1
7	49.3	-3.2	0.7	-3.5	1.0	6.0	-83.1	-1.1	-5.5	19.8
8	-0.3	0.3	0.5	-0.1	0.7	1.0	-2.9	0.7	1.5	0.5
9	-2.4	-0.8	1.4	-0.3	0.7	2.4	-5.2	2.2	-1.0	-1.2
10	-1.6	-1.2	0.7	2.9	0.6	1.9	5.4	0.3	-0.9	-1.0

2023 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.1	0.0	0.7	0.2	0.0	1.0	-0.1	-0.1	-0.1
2	0.1	0.1	0.1	-0.1	0.2	0.2	-0.9	0.1	0.0	0.0
3	0.2	0.0	0.0	0.1	0.0	0.0	-0.3	0.0	0.1	0.0
4	0.5	0.1	0.0	0.0	0.1	0.9	-1.5	-0.2	0.0	0.1
5	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0
6	0.0	0.2	0.0	0.3	0.0	0.0	0.3	0.1	0.4	0.0
7	1.6	0.3	0.0	-1.8	0.3	0.4	-3.2	-0.2	-0.1	0.5
8	0.0	0.0	0.0	-0.1	0.1	0.3	-0.3	0.0	0.0	0.0
9	0.0	0.0	0.1	0.0	0.0	0.1	-0.2	0.1	-0.1	-0.1
10	-0.1	-0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.6	-7.3	-3.0	17.7	0.7	-0.8	19.0	-8.8	-5.0	-2.7
2	-1.5	1.2	0.7	0.0	-0.1	0.3	1.2	1.0	0.7	-0.1
3	-1.6	0.6	0.0	0.0	0.0	0.0	0.3	2.7	2.3	0.0
4	1.1	0.6	0.1	-0.1	0.3	2.2	-2.6	1.2	0.6	0.5
5	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	0.8	0.3	0.1
6	-0.5	0.5	0.0	0.2	0.0	0.0	0.8	1.0	1.1	0.0
7	8.0	5.2	4.9	-5.7	0.5	2.9	-3.6	7.3	2.9	1.4
8	-1.7	0.7	1.4	0.0	0.5	0.6	0.5	2.8	1.2	-0.1
9	-0.9	0.4	1.1	0.0	0.1	0.4	0.3	1.5	0.6	-0.2
10	-0.4	-0.8	0.3	0.3	0.0	0.0	2.4	-0.2	-0.3	-0.2

UC3	1	2	3	4	5	6	7	8	9	10
1	-8.0	-3.5	-0.1	9.3	0.1	0.0	31.6	-1.7	-3.4	-4.2
2	-2.9	0.2	0.3	-1.4	0.5	0.4	-6.2	-0.1	0.1	-5.0
3	0.4	0.5	0.0	0.4	0.0	0.0	1.6	0.4	1.5	0.1
4	1.5	1.4	0.2	-0.1	0.2	7.6	-3.9	0.6	0.1	1.3
5	0.1	0.2	0.0	0.9	0.0	0.0	2.5	0.3	0.1	0.3
6	0.3	1.7	0.0	3.0	0.0	0.0	4.3	0.7	2.8	0.3
7	26.1	8.1	2.1	-14.8	1.2	3.4	-59.3	0.1	-2.8	13.8
8	0.0	0.5	0.5	-0.2	0.8	0.9	-1.0	0.4	1.9	0.0
9	-1.3	-0.2	0.8	-0.4	0.2	0.1	-3.5	1.5	-1.0	-1.4
10	-1.9	-3.0	0.6	2.1	0.2	0.2	6.9	-0.6	-1.7	-1.1

2038 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.3	0.0	0.1	0.3	0.1	0.2	0.0	-0.1	-0.1
2	-0.1	-0.2	0.1	-0.1	0.4	0.8	-1.1	0.2	0.0	-0.1
3	0.0	0.0	0.0	0.1	0.0	0.0	-0.2	0.1	0.1	0.0
4	1.3	-0.5	0.7	0.0	0.9	2.9	-3.7	-0.2	0.0	-0.1
5	0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	0.0
6	0.0	0.4	0.0	0.4	0.0	0.0	-0.1	0.2	0.1	0.0
7	2.7	-1.5	0.1	-0.3	4.2	3.7	-8.8	-0.1	-0.3	0.9
8	0.0	-0.4	0.1	-0.1	0.5	0.6	-1.2	0.1	0.2	-0.2
9	-0.2	-0.6	0.3	0.0	0.1	2.9	-1.1	0.2	-0.5	-0.6
10	-0.1	-0.4	0.0	0.1	0.5	0.6	-0.4	0.0	-0.2	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.5	-0.9	-0.5	5.0	0.1	-0.1	7.0	-0.3	-1.2	-0.5
2	-7.1	2.3	1.0	0.8	0.2	0.7	5.9	1.4	1.0	-0.5
3	-3.0	1.5	0.0	1.9	0.0	0.0	5.8	3.4	2.5	0.0
4	19.3	0.5	0.9	0.0	-0.1	1.2	5.5	-0.4	0.0	2.9
5	1.3	0.0	0.0	0.7	0.0	0.0	2.6	1.3	0.2	0.1
6	-0.5	2.6	0.0	2.6	0.0	0.0	8.3	1.9	1.0	0.1
7	29.0	4.0	0.8	1.1	-0.2	0.5	15.3	0.5	0.1	12.6
8	-6.7	5.0	7.9	2.0	2.0	2.7	4.0	7.9	3.3	0.1
9	-5.4	3.1	4.2	0.1	0.5	2.1	-0.4	2.2	0.8	-0.8
10	-1.2	0.2	0.0	1.7	0.1	0.0	1.5	0.3	0.0	-0.2

UC3	1	2	3	4	5	6	7	8	9	10
1	-3.3	-5.1	1.4	1.5	0.9	0.5	18.6	0.7	-2.5	-2.6
2	-5.0	0.6	1.9	0.1	0.8	2.5	-13.2	1.9	0.5	-3.4
3	0.1	0.4	0.0	1.9	0.0	0.0	0.1	1.4	1.4	0.0
4	8.7	-3.6	2.5	0.8	3.7	20.1	-29.7	-0.3	-0.4	3.9
5	0.6	1.9	0.0	0.3	0.0	0.0	4.0	2.9	0.2	0.5
6	1.0	1.3	0.0	11.2	0.0	0.0	16.9	2.1	0.7	0.8
7	76.6	-11.4	3.3	5.4	12.3	14.0	-90.8	0.8	-6.8	27.4
8	-0.7	-2.4	1.6	0.4	3.1	4.7	-10.9	1.4	2.7	-2.1
9	-2.2	-2.0	4.2	0.0	2.9	8.7	-18.0	5.8	-2.7	-4.5
10	-1.3	-3.9	0.5	0.7	1.3	0.5	3.3	1.0	-1.4	-1.0

2038 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.3	-1.2	-0.2	2.2	0.1	0.4	0.7	-0.3	-0.2	-1.0
2	-0.4	-0.2	0.2	-0.1	0.6	1.5	-1.9	0.2	-0.3	-0.3
3	0.1	0.1	0.0	0.2	0.0	0.0	-0.2	0.1	0.2	0.0
4	0.7	-0.3	0.0	0.0	0.3	3.0	-3.7	0.0	-0.1	0.1
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
6	0.0	0.1	0.0	0.5	0.0	0.0	-0.1	0.2	0.4	0.1
7	3.5	-1.5	0.8	0.0	2.1	3.2	-9.4	-0.6	-0.8	1.0
8	0.0	-0.1	0.1	0.0	0.6	1.0	-1.1	0.1	-0.1	-0.1
9	-0.3	-0.6	0.2	-0.2	0.3	2.9	-1.1	-0.2	-0.7	-0.5
10	-0.7	-0.6	-0.3	0.0	0.8	3.2	-0.7	-0.7	-0.5	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-0.7	-1.4	-0.6	2.2	0.3	0.5	4.2	-0.7	-0.7	-0.5
2	-1.5	0.6	0.5	0.2	0.1	0.4	1.6	2.1	1.1	0.0
3	-0.9	0.3	0.0	0.1	0.0	0.0	1.2	2.5	1.2	0.0
4	2.6	0.1	0.0	0.1	0.6	2.1	1.9	0.0	0.0	1.1
5	0.2	0.1	0.0	1.2	0.0	0.0	1.3	0.4	0.2	0.1
6	0.2	0.2	0.0	3.2	0.0	0.0	5.1	0.9	0.5	0.1
7	5.2	1.4	1.0	1.6	0.7	1.4	3.7	1.6	0.1	1.4
8	-1.0	0.9	1.7	0.1	0.3	0.4	1.4	1.2	0.8	0.1
9	-0.8	0.6	0.9	0.0	0.2	0.4	-0.3	0.6	0.3	0.0
10	-0.4	-0.1	0.0	0.4	0.1	0.2	0.7	0.1	0.0	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	-6.4	-8.5	0.5	5.1	0.9	2.2	35.8	-0.2	-4.8	-2.8
2	-6.5	-0.3	3.1	0.0	0.7	2.6	-25.4	3.7	-0.5	-3.7
3	0.6	1.4	0.0	1.7	0.0	0.0	4.2	1.7	4.0	0.6
4	4.3	-1.6	1.8	1.3	0.7	22.6	-9.2	1.6	-0.7	7.9
5	0.6	0.9	0.0	1.2	0.0	0.0	7.0	2.5	2.8	2.5
6	1.3	2.3	0.0	17.0	0.0	0.0	23.9	2.6	6.1	4.2
7	54.9	-19.4	5.4	0.2	5.3	25.2	-126.8	-3.8	-15.9	13.5
8	0.0	1.2	2.2	1.8	3.2	4.5	-7.2	2.5	5.0	0.2
9	-3.4	-1.3	5.1	-0.5	3.2	9.4	-14.1	7.3	-4.2	-2.4
10	-2.2	-2.8	1.9	4.4	2.3	6.9	1.8	0.3	-2.1	-1.2

2038 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.3	-0.3	0.0	0.7	0.2	0.1	1.1	-0.2	-0.2	0.0
2	-0.1	0.0	0.2	-0.3	0.9	0.5	-1.9	0.0	-0.1	-0.1
3	0.0	0.1	0.0	0.5	0.0	0.0	0.1	0.1	0.3	0.0
4	0.4	-0.1	0.1	-0.1	0.3	3.5	-3.4	-0.3	0.0	0.1
5	0.1	0.1	0.0	0.4	0.0	0.0	1.5	0.2	0.0	0.0
6	0.1	0.6	0.0	1.0	0.0	0.0	1.4	0.4	1.5	0.1
7	1.9	-1.1	0.4	-2.6	1.3	1.5	-6.2	-0.9	-1.0	0.3
8	0.0	-0.1	0.1	-0.2	0.3	0.9	-0.8	0.0	-0.1	0.0
9	-0.2	-0.1	0.2	-0.1	0.0	0.4	-0.5	0.2	-0.4	-0.1
10	-0.1	-0.1	0.0	0.1	0.0	0.0	0.0	-0.2	-0.1	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.3	-8.9	-3.3	19.6	1.1	-0.6	20.8	-6.8	-4.7	-2.0
2	-2.1	2.5	1.4	0.4	0.1	1.0	2.5	2.2	1.6	0.0
3	-1.9	1.1	0.0	0.9	0.0	0.0	0.6	6.4	5.2	0.0
4	1.2	0.8	0.3	0.0	0.7	6.9	2.4	1.8	0.0	0.7
5	0.2	0.2	0.0	0.2	0.0	0.0	1.3	2.1	0.9	0.1
6	-0.4	1.0	0.0	0.7	0.0	0.0	2.6	2.5	2.6	0.0
7	8.5	6.1	8.4	4.7	1.7	5.9	9.8	7.8	0.7	1.5
8	-1.4	1.4	3.3	0.2	1.4	1.4	1.0	6.3	2.3	0.3
9	-0.9	1.2	2.9	0.1	0.2	1.1	-0.2	3.2	0.7	-0.1
10	-0.2	-0.7	0.1	0.6	0.0	0.1	2.8	-0.1	-0.2	-0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	-8.6	-7.6	0.1	10.3	0.2	0.4	36.2	-2.7	-5.0	-4.0
2	-5.5	0.3	1.0	-4.0	1.7	1.9	-20.0	-0.3	0.0	-6.7
3	0.8	1.6	0.0	1.7	0.0	0.0	6.6	1.9	5.5	0.4
4	2.0	0.3	0.6	0.2	0.6	29.0	-3.6	-0.4	-0.1	1.0
5	0.3	0.7	0.0	3.7	0.0	0.0	12.4	1.4	0.5	0.5
6	1.0	6.4	0.0	12.8	0.0	0.0	18.2	3.0	10.7	1.0
7	34.8	-10.4	3.8	-23.7	5.9	12.3	-91.4	-9.6	-23.5	10.4
8	-0.2	2.1	1.9	0.3	3.0	3.4	-2.5	1.4	5.9	1.6
9	-1.8	-0.1	3.0	-0.7	1.0	0.7	-9.6	4.9	-4.2	-1.9
10	-2.2	-6.3	0.1	2.0	0.4	0.6	5.8	-2.8	-3.4	-1.1

2051 AM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.2	-0.4	0.0	0.1	0.6	0.3	0.0	0.0	-0.2	-0.2
2	-0.1	-0.3	0.1	-0.1	0.7	1.4	-1.9	0.2	0.0	-0.2
3	0.0	0.0	0.0	0.3	0.0	0.0	-0.5	0.2	0.2	-0.1
4	1.3	-0.9	1.0	0.0	1.6	4.2	-4.9	-0.4	-0.1	-0.6
5	0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.2	0.0	0.0
6	0.0	0.5	0.0	0.7	0.0	0.0	-0.3	0.3	0.1	0.0
7	2.5	-2.4	0.1	0.0	6.7	5.5	-11.5	-0.3	-0.5	0.3
8	-0.1	-0.7	0.1	-0.2	0.9	1.1	-2.1	0.2	0.4	-0.5
9	-0.3	-1.0	0.5	-0.1	0.3	4.3	-2.0	0.4	-0.6	-1.0
10	-0.1	-0.6	0.0	0.1	0.9	0.9	-0.7	0.0	-0.3	-0.1

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.6	-0.5	-0.8	5.2	0.1	-0.2	8.9	-0.4	-1.6	-0.6
2	-6.1	3.7	1.1	0.3	0.2	0.8	5.7	1.7	1.1	-0.2
3	-3.6	1.0	0.0	2.7	0.0	0.0	3.5	5.4	3.9	-0.8
4	19.6	-0.3	1.3	0.0	-0.1	2.0	8.7	-1.0	-0.2	2.9
5	1.4	-0.1	0.0	0.9	0.0	0.0	3.4	1.8	0.3	0.0
6	-0.6	3.5	0.0	3.8	0.0	0.0	9.5	2.8	1.5	0.0
7	30.3	3.9	-0.9	3.9	-0.2	0.2	29.4	-0.9	-1.0	15.4
8	-6.4	6.1	11.8	2.0	2.8	4.1	1.1	11.6	4.7	0.1
9	-5.5	4.0	6.3	-0.4	0.7	2.9	-3.1	3.0	1.1	-0.6
10	-1.1	0.5	-0.2	1.6	0.1	0.0	2.3	0.3	0.0	-0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	-3.8	-6.7	1.7	1.9	1.5	0.9	22.5	1.2	-2.8	-3.4
2	-5.1	2.8	2.6	-0.6	1.7	4.1	-24.6	2.6	0.9	-4.2
3	-0.1	0.2	0.0	3.2	0.0	0.0	-2.2	2.8	3.0	-1.0
4	7.3	-6.8	3.5	1.1	6.1	31.2	-44.6	-0.7	-0.7	0.6
5	0.8	2.6	0.0	0.6	0.0	0.0	6.5	4.9	0.5	0.8
6	1.4	2.2	0.0	17.5	0.0	0.0	24.9	3.6	1.6	1.2
7	74.7	-23.6	4.4	10.3	20.7	20.6	-107.3	-1.5	-11.5	24.2
8	-1.6	-4.7	2.8	-0.2	5.6	9.2	-20.2	2.6	6.2	-4.9
9	-3.2	-3.7	6.6	-0.3	5.5	13.8	-33.1	10.1	-0.9	-7.8
10	-1.7	-5.4	0.6	0.9	2.3	0.8	2.9	1.4	-1.7	-1.3

2051 IP

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.4	-1.5	-0.3	2.5	0.2	0.8	0.6	-0.2	-0.3	-1.2
2	-0.6	-0.3	0.3	-0.1	0.9	2.2	-3.0	0.3	-0.4	-0.4
3	0.0	0.1	0.0	0.3	0.0	0.0	-0.2	0.1	0.3	0.0
4	0.7	-0.4	0.0	0.0	0.5	4.5	-4.9	0.0	-0.1	0.0
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
6	0.0	0.1	0.0	0.7	0.0	0.0	-0.2	0.3	0.7	0.1
7	3.6	-2.4	1.2	0.5	3.4	5.3	-12.0	-1.0	-1.4	0.6
8	0.0	-0.2	0.2	0.0	1.0	1.7	-2.1	0.1	0.0	-0.3
9	-0.4	-0.8	0.4	-0.3	0.6	4.5	-2.0	-0.2	-1.0	-0.7
10	-0.9	-0.8	-0.5	0.0	1.2	4.2	-1.2	-1.0	-0.7	-0.2

UC2	1	2	3	4	5	6	7	8	9	10
1	-0.8	-1.1	-0.7	2.4	0.3	0.6	5.0	-0.5	-0.7	-0.3
2	-1.2	0.9	0.6	0.2	0.1	0.5	1.4	2.8	1.4	0.1
3	-1.1	0.4	0.0	0.1	0.0	0.0	1.2	3.8	1.8	0.0
4	2.8	0.1	0.0	0.3	0.9	3.1	3.8	0.0	-0.1	1.1
5	0.2	0.1	0.0	1.7	0.0	0.0	1.9	0.6	0.3	0.1
6	0.3	0.3	0.0	4.4	0.0	0.0	6.6	1.3	0.7	0.1
7	6.0	1.5	1.2	3.6	1.1	1.8	7.3	1.4	-0.3	1.8
8	-0.9	1.2	2.6	0.1	0.4	0.7	1.0	1.8	1.1	0.1
9	-0.9	0.7	1.4	-0.1	0.3	0.6	-1.0	0.9	0.4	0.1
10	-0.4	0.0	-0.2	0.4	0.1	0.2	0.9	0.0	0.0	0.0

UC3	1	2	3	4	5	6	7	8	9	10
1	-6.5	-9.1	0.4	5.9	1.2	2.9	36.5	-0.1	-5.4	-3.4
2	-7.7	0.1	3.9	-0.8	1.1	4.2	-42.6	4.5	-1.0	-4.7
3	0.6	1.8	0.0	2.7	0.0	0.0	6.3	3.0	6.7	0.3
4	4.7	-2.8	3.0	2.2	1.2	35.1	-8.0	2.0	-1.4	7.8
5	0.8	1.5	0.0	1.9	0.0	0.0	11.9	4.2	5.0	3.9
6	2.0	3.8	0.0	26.4	0.0	0.0	37.4	4.6	10.3	6.2
7	56.2	-29.8	8.4	4.2	9.0	39.4	-150.4	-8.9	-27.0	11.3
8	-0.1	1.3	3.9	2.0	5.5	8.0	-14.1	4.5	9.9	-1.6
9	-3.7	-2.5	8.3	-1.2	5.7	15.6	-25.8	12.8	-3.7	-4.0
10	-3.9	-5.2	0.6	5.0	3.6	9.1	-0.5	-1.7	-3.6	-1.4

2051 PM

UC1	1	2	3	4	5	6	7	8	9	10
1	-0.3	-0.4	0.0	0.7	0.3	0.2	1.0	-0.4	-0.3	-0.1
2	-0.1	0.1	0.2	-0.4	1.3	0.8	-2.7	-0.1	-0.2	-0.1
3	-0.1	0.1	0.0	0.8	0.0	0.0	0.2	0.2	0.5	0.0
4	0.4	-0.3	0.1	-0.1	0.4	5.2	-4.7	-0.6	-0.1	0.1
5	0.1	0.2	0.0	0.6	0.0	0.0	2.4	0.3	0.1	0.0
6	0.2	1.0	0.0	1.5	0.0	0.0	2.2	0.7	2.3	0.1
7	2.2	-2.4	0.5	-3.2	2.3	2.1	-7.6	-1.8	-1.9	0.2
8	0.0	-0.1	0.2	-0.3	0.5	1.4	-1.3	0.1	0.0	0.0
9	-0.3	-0.1	0.3	-0.1	0.1	0.7	-0.8	0.3	-0.6	-0.1
10	0.0	-0.2	-0.1	0.1	0.0	0.1	-0.1	-0.4	-0.3	0.0

UC2	1	2	3	4	5	6	7	8	9	10
1	-2.2	-8.4	-4.1	20.2	1.0	-0.7	23.1	-7.0	-4.9	-1.7
2	-1.7	3.5	0.8	0.0	0.0	1.2	2.3	2.5	1.9	0.3
3	-2.5	1.3	0.0	1.4	0.0	0.0	-1.5	9.8	7.6	0.0
4	1.3	0.5	0.5	0.1	1.0	9.7	5.7	0.9	-1.2	0.6
5	0.2	0.3	0.0	0.2	0.0	0.0	1.9	3.0	1.2	0.0
6	-0.5	1.2	0.0	1.0	0.0	0.0	2.5	3.8	3.6	0.0
7	9.3	5.7	6.8	9.2	2.1	6.9	21.5	3.4	-2.1	2.1
8	-1.6	1.7	5.3	0.1	2.0	2.1	-0.5	9.2	3.2	0.4
9	-0.9	1.4	4.4	0.0	0.3	1.7	-1.3	4.6	0.9	-0.1
10	-0.2	-0.6	-0.6	0.6	0.0	0.1	3.3	-0.3	-0.1	-0.1

UC3	1	2	3	4	5	6	7	8	9	10
1	-8.1	-8.1	-0.3	10.3	0.3	0.6	35.0	-4.5	-6.4	-4.1
2	-6.6	1.4	0.5	-7.0	2.4	3.1	-32.0	-1.7	-0.9	-7.3
3	0.8	2.4	0.0	2.5	0.0	0.0	8.8	3.5	9.0	0.3
4	2.7	-1.6	0.9	0.5	1.1	44.3	-3.2	-3.2	-0.6	0.8
5	0.6	1.2	0.0	6.0	0.0	0.0	20.6	2.5	1.2	0.7
6	1.6	9.9	0.0	19.9	0.0	0.0	27.5	5.5	16.9	1.7
7	41.8	-23.5	1.9	-32.5	9.8	17.9	-108.6	-22.2	-45.2	11.1
8	-0.5	3.0	3.3	-0.6	5.0	5.5	-6.3	2.7	10.4	2.4
9	-2.0	-0.2	5.1	-1.3	1.8	1.7	-16.7	9.0	-3.9	-2.3
10	-4.5	-10.8	-1.8	1.3	0.6	0.8	5.0	-6.4	-5.4	-1.4