

**A66 Northern Trans-Pennine Project
TR010062**

**3.8 Combined Modelling and Appraisal
Report
Appendix D - Stage 3 Transport
Forecast Package**

APFP Regulations 5(2)(q)

Planning Act 2008

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Infrastructure Planning

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**The Infrastructure Planning
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**3.8 COMBINED MODELLING AND APPRAISAL REPORT –
APPENDIX D TRANSPORT FORECAST PACKAGE**

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1 Introduction

1.1 Project Overview

1.1.1 Highways England are currently undertaking the A66 Northern Trans-Pennine Route study. The study is looking at options to upgrade the A66 corridor between the M6 at Penrith and the A1(M) at Scotch Corner. The study is at Highways England Project Control Framework (PCF) Stage 3 – Preliminary Design within the ‘Development Phase’. The scope of the project is to dual the six sections of single carriageways along the A66 including improvements to the M6 J40 and A1(M) Scotch Corner junctions at each end of the route.

1.1.2 The Transport Model Package contains the analytic material created during the production of the base year transport model which will be used to underpin the Project’s business case, design and operational and environmental assessments.

1.1.3 The A66 transport model (A66TM) was developed based on the North Regional Transport Model (NRTM) in PCF Stage 1, and further refined in PCF Stage 2. At PCF Stage 3, the opportunity has been taken to update the base year model from 2015 to 2019 with traffic counts collected from various sources and update the forecasts taking into account the most up to date available information.

1.2 Purpose of This Report

1.2.1 This Transport Model Forecasting Package describes the traffic forecasts using the Stage 3 A66 Transport Model to assess the Preferred Route option for the A66 corridor, covering model assumptions and forecast results.

1.2.2 The purpose of this report is to describe the A66TM Stage 3 traffic forecast modelling and set out the assumption on which the forecasts are based for the future year with and without the selected scheme scenarios.

1.3 Report Layout

1.3.1 The remaining sections of the report are set out as follows:

- Chapter 2 – Describing the Project and Objectives
- Chapter 3 – Summary of the Base Year Model
- Chapter 4 – Summary of the Previous Work
- Chapter 5 – Uncertainty Log, Forecast Years and Assumptions
- Chapter 6 – Reference Demand and Supply
- Chapter 7 – Equilibrium Demand Forecasts
- Chapter 8 – Assignment Results
- Chapter 9 – Sensitivity Tests
- Chapter 10 – Summary

1.3.2 The report is accompanied by the following appendices containing supporting information:

-
- Appendix A – Development Uncertainty Log
 - Appendix B – Sectorised VDM Impact
 - Appendix C – Core Scenario Design Year Forecast Flows
 - Appendix D – Core Scenario Forecast Flow Difference Plots by Period
 - Appendix E – Core Scenario Forecast Delay
 - Appendix F – Core Scenario Journey Time Profiles
 - Appendix G – Sensitivity Test Assignment Convergence
 - Appendix H – Sensitivity Test Network Statistics
 - Appendix I – Sensitivity Test A66 Flow Tables
 - Appendix J – Sensitivity Test Journey Times

2 Project Outline and Objectives

2.1 Background

- 2.1.1 The Northern Trans-Pennine Routes (NTPR) Strategic Study was one of six strategic studies announced as part of the Department for Transport's (DfT's) first Roads Investment Strategy (RIS) in December 2014, and in March 2016 a Stage 0 initial report was published providing an evidence base of travel patterns and behaviour on the A66/A685 and A69 corridors.
- 2.1.2 The A66 is a key national and regional strategic route, linking the east and west of northern England across the Pennines, and is the best available option for traffic travelling between the south east of England and the west of Scotland. However, there is no complete dual carriageway along the A66 between the M6 junction 40 at Penrith and the A1(M) at Scotch Corner. The only existing east-west road of dual carriageway or motorway standard north of the M62 is the M8 in Scotland. This is a significant barrier to the movement of freight and the utilisation of the A66 route, which represents a major constraint to economic growth in the north of England. The strategic context of the route in northern England is shown in Figure 2-1.



Figure 2-1: A66 Strategic Context

- 2.1.3 Along the 50 mile stretch between the M6 at Penrith and the A1(M) at Scotch Corner, the A66 has been upgraded from single carriageway to dual carriageway in a number of stages since the 1970s. The most recent section to be dualled was the Temple Sowerby Bypass which opened to traffic in 2007. However, there are six remaining single carriageway sections, and an at-grade junction making the route slow, accident-prone and unreliable.
- 2.1.4 The Northern Powerhouse Independent Economic Review¹ identified the critical importance of improving connectivity across the North and the Northern Trans-Pennine Routes Study identified the A66 as the priority for investment. Upgrading the route is a UK National priority which forms a key part of the 'levelling-up' and Northern Powerhouse agendas, enabling better connectivity between North and South and increasing economic performance in the North.
- 2.1.5 The study area for PCF Stage 1 is illustrated in Figure 2-2 and stretches approximately 49.5 miles along the A66 between the M6 at Penrith and

¹ SQW Ltd The Northern Powerhouse Independent Economic Review Report 24 June 2016

the A1 at Scotch Corner. At Stage 1, the study looked specifically at upgrading the single carriageway sections along this route. There are currently six remaining sections that are single carriageway (approximately 28 miles).

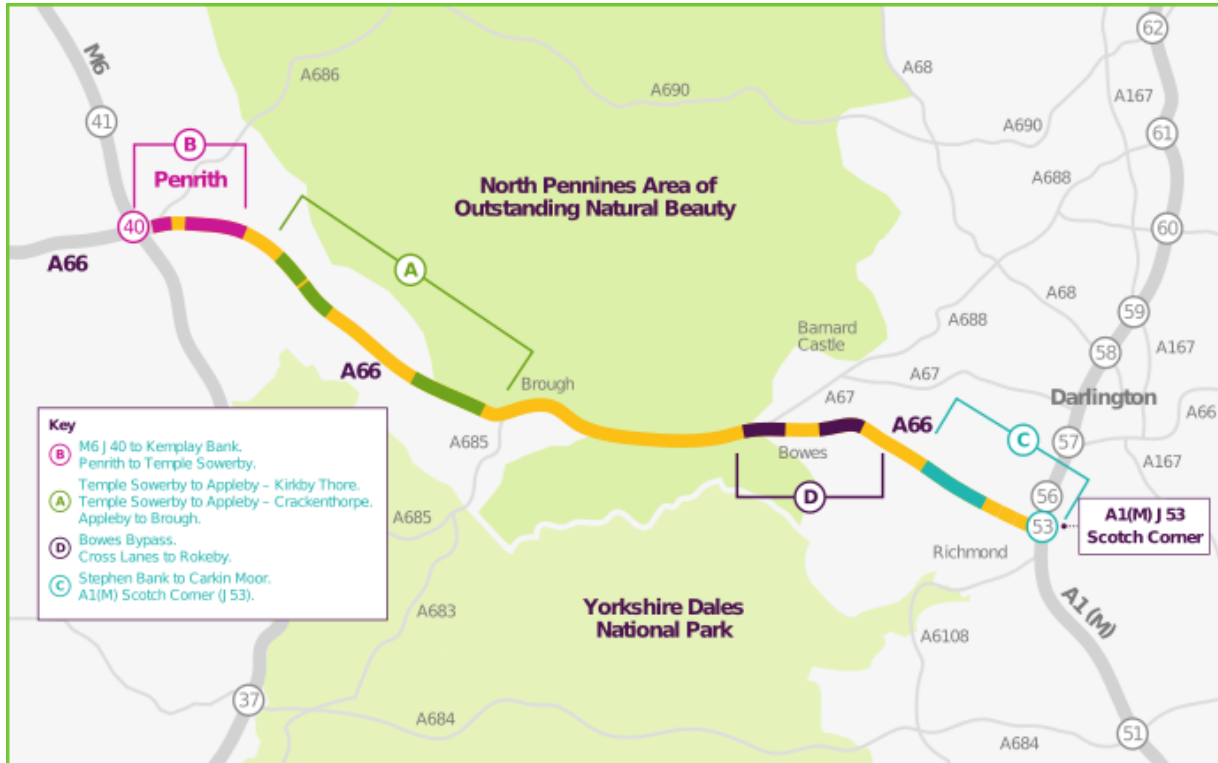


Figure 2-2: Stage 3 A66 Northern Trans-Pennine Scheme

- 2.1.6 During PCF Stages 1 and 2, using an enhanced version of the North Regional Transport Model (NRTM), traffic forecasting and economic appraisal was undertaken to determine the preferred route.
- 2.1.7 The PCF Stage 1 A66 Transport Model (A66TM) was developed to assess options along the A66 corridor and to inform the option identification process. The NRTM was used as a starting point, with key elements of the model structure retained and the networks, representation of demand, and validation all refined in the area of interest. At PCF Stage 2, the A66TM was further refined to improve assessment of the Project.
- 2.1.8 Project-specific data was collected to enhance the model, including a traffic survey programme along the A66 corridor between Penrith and A1(M) Scotch Corner during November and early December 2017. In addition to this additional traffic count data was received from Cumbria County Council.
- 2.1.9 At PCF Stage 3, the opportunity has been taken to update the base year model from 2015 to 2019 with data and traffic counts collected from various sources.

2.2 Project Objectives

2.2.1 The strategic objective of the study is to investigate the potential to create a new improved strategic corridor linking the A1(M) with the M6 by upgrading the A66 corridor and making other improvements along its length. Further aims and objectives are to improve strategic, regional and national connectivity, particularly for HGVs, considering a more attractive alternative route to the M62 for some east-west crossing movements, improving journey time reliability on the A66 and promoting economic growth.

2.2.2 Table 2-1 summarises the project objectives for the study.

Table 2-1 Project Objectives

Option	Description
Economic Growth	Support the economic growth objectives of the Northern Powerhouse agenda
	Improve national connectivity including freight
	Improve access for tourism
	Improve access for local services and jobs
Transport	Improve road safety
	Improve journey time reliability for road users
	Improve and promote the A66 as a strategic connection for all traffic
	Improve the resilience of the route to the impact of events such as incidents, roadworks and severe weather events
	Seek to improve NMU provision along the route
Community	Reduce the impact of the route on severance for local communities
Environment	Minimise adverse impacts on the environment and where possible optimise environmental improvement opportunities

3 Base Year Model

3.1 The A66 Transport Model

3.1.1 The A66 Transport Model (A66TM) is based on the Highways England's North Regional Transport Model (NRTM).

3.1.2 The RTM models have been developed for several purposes including the following:

- Assessing programme level strategies across the regions.
- Individual scheme appraisal at the early stages of scheme development, for example PCF Stage 0.
- To provide a starting point for the development of detailed scheme specific models, where networks, volumetric counts and availability of travel demand data can reduce the traffic modelling programme.

3.2 Geographical Coverage

3.2.1 The modelling undertaken during Stage 0 provided a good understanding of the potential demand and reassignment impacts of an improved A66. Initial modelling of the full dualling of the A66 using the NRTM, provided an indication of the extent of reassignment and hence a basis for determining the geographical coverage of the network and the differing levels of network detail required.

3.2.2 The geographical extent of the network is based on the NRTM. At Stage 1, there was a need to refine the level of detail included in the network, with increased network definition along the A66 corridor where needed and reduced definition in areas remote from the Project.

3.2.3 The network inherited from NRTM includes area of simulation network, where detailed junction modelling is included, and buffer network, where the network representation is link based.

3.2.4 The extent of both the simulation area and buffer area were both retained from NRTM, however at Stage 1 the simulation area was further subdivided to include fully modelled, intermediate and external areas containing different levels of simulation coding. This reflected the need to enhance the network detail included in the NRTM, which as a strategic model does not include the appropriate level of network density or simulation coding required.

3.2.5 In Stage 3 the model's geographical extent included the same area as the PCF Stage 1 and 2 A66TM model, however the Transport Reliability Area (TRA) had been extended further north and south at either end of the A66 along the M6 and A1(M). This had been revised taking into account impacts from the Project identified within PCF Stage 2 forecasting. The TRA is shown in Figure 3-1.

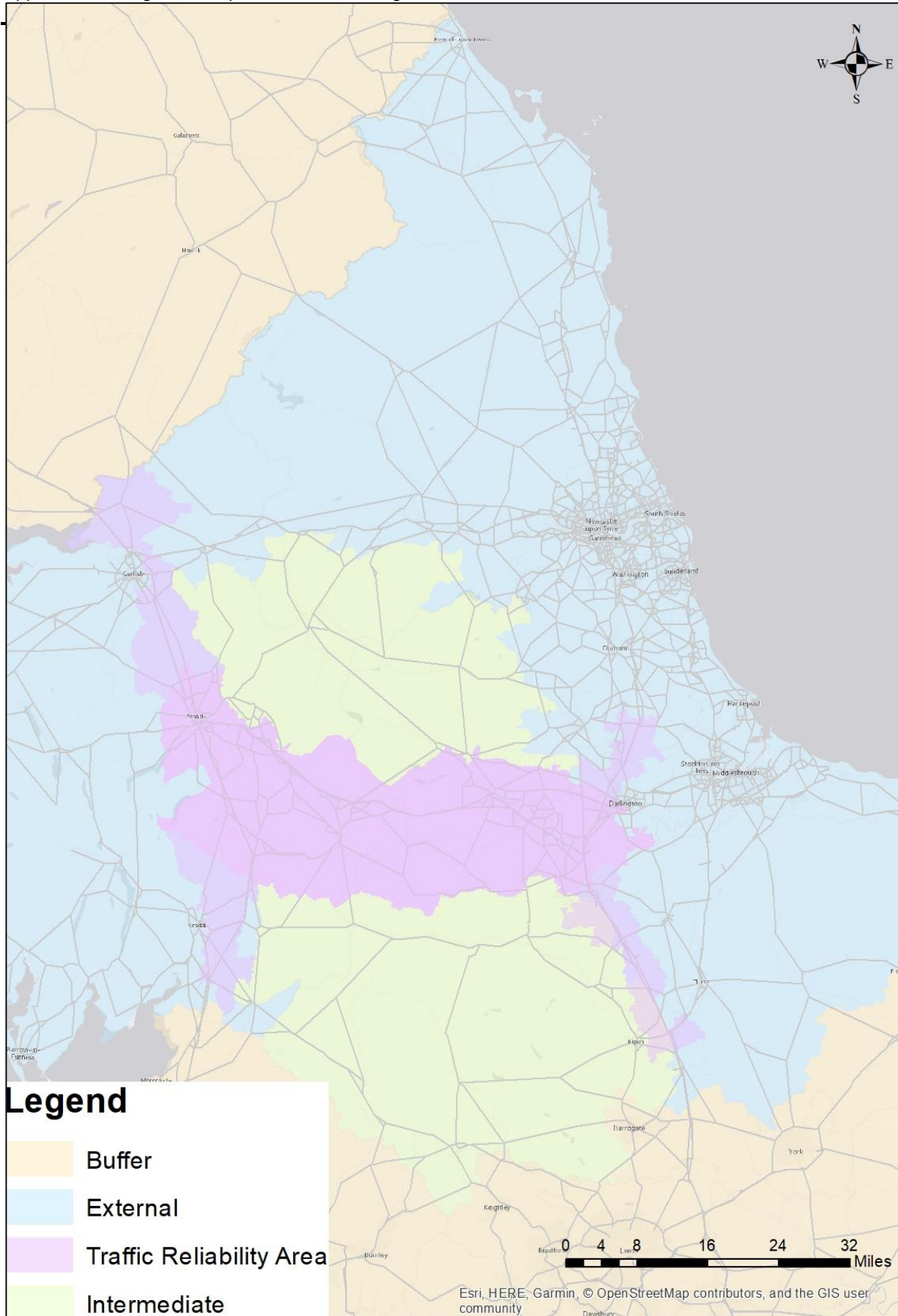


Figure 3-1 Stage 3 A66TM Modelled Area

3.3 Time Periods and Demand Segmentation

- 3.3.1 The time periods modelled represent an AM peak period hour (08:00-09:00), an average hour in the inter-peak (10:00-16:00), an average PM peak period hour (16:00-18:00) and an average hour in the off-peak (19:00-07:00).
- 3.3.2 The base year model represents an average March weekday in 2019. Vehicle class definitions are from the COBA manual, with OGV1 (Other Goods Vehicles 1) and OGV2 (Other goods Vehicles 2) combined together and referred to as HGVs, and the car user class split into Car Commute, Car Employers Business and Car Other trips to allow for variations in the perceived costs of travel between different journey purposes. LGVs have all been assumed to be employer's business trips, and other goods vehicles (OGV1 and OGV2) along with Passenger Service Vehicles (PSV) have been combined with HGVs. As the number of PSVs picked up in the manual counts were so low it was assumed they would have a negligible effect combined with the HGV movements.
- 3.3.3 The highway assignment model user classes are as follows:
- User class 1 – Car, Employers Business
 - User class 2 – Car, Commute
 - User class 3 – Car, Other
 - User class 4 – Light Goods Vehicles
 - User class 5 – Heavy Goods Vehicles
- 3.3.4 The demand model also includes the following rail purposes:
- Rail – Commuting
 - Rail – Other
 - Rail – Employers Business
 - (Goods vehicles are excluded from the demand model)

3.4 Modelling Software

- 3.4.1 Model composition and software is based on the NRTM and keeps the same structure of a highway SATURN supply model and a variable demand model system which uses a combination of the Department for Transport (DfT) Dynamic Integrated Assignment and DEMand Modelling (DIADEM) Variable Demand Modelling software and a bespoke graphical user interface (GUI) known as the Highways England Integrated Demand Interface (HEIDI).
- 3.4.2 SATURN operates as a static equilibrium highway assignment model which incorporates both simulation and assignment loops. The highway assignment model uses SATURN software version 11.4.07H.
- 3.4.3 DIADEM software is designed to enable practitioners to easily set up variable demand models. DIADEM provides a user-friendly method for setting up a multi-stage transport demand model and finding equilibrium between demand and supply, using the SATURN package as the supply model. The variable demand model uses the bespoke version of the software version developed specifically for Highways England.

3.4.4 HEIDI is a bespoke programme developed to assemble trip end data and to organise and implement forecast model runs. HEIDI invokes a DIADEM run which in turn invokes SATURN. HEIDI version 6.2h has been used for the A66 forecast model runs.

3.5 Stage 3 Updates

3.5.1 The following updates were undertaken to the demand data within PCF Stage 3:

- During PCF Stage 3, the matrices have been updated from a base year of 2015 to a base year of 2019 and further refined to reflect further zone disaggregation.
- The LGV matrix has been developed using 2019 Teletrac Navman data. The following steps were applied to the original TeletracNavman source data to create the initial LGV assignment matrices:
- The HGV matrices have been updated. Prior freight matrices based in 2018 were provided by TfN based on data supplied by MDS Transmodal, provided in the A66TM zone system. These have been calibrated to observed 2019 data

3.5.1 The majority of the A66 model network remains unchanged from PCF Stage 2, however, several updates were required to develop the PCF Stage 3 model. These include:

- additional coding to include RIS1 National Highways and local highway schemes built since 2015
- additional coding in Penrith to better reflect route choice and improve the accuracy of traffic flows
- additional coding north of Kirkby Thore
- additional coding east of Scotch Corner between Middleton Tyas, Scorton and Croft-on-Tees to capture local traffic which could route via the Scotch Corner junction
- additional coding and updated zone loadings to improve convergence in Durham, Middlesbrough and Carnforth.

3.5.2 The model has been calibrated and validated to 2019 count and journey time data.

3.6 Highway Assignment Technique and Generalised Costs Assignment Procedures

3.6.1 The assignment procedure adopted for the highway model is based on an equilibrium assignment with multiple demand segments for an average hour in AM peak, interpeak and PM peak time periods.

3.6.2 The assignment technique uses Wardrop equilibrium assignment, achieved through the use of Franke-Wolfe user equilibrium algorithm in SATURN.

3.6.3 The assignment methodology includes the following:

- Path-based algorithm;
- Blocking back; and

- Each time period is modelled as a standalone model, no interaction with the previous time period (that is, no PASSQ from the previous time period).

Assignment Units

- 3.6.4 The assignment works across the multiple user classes with traffic flow measured in passenger car units (PCU) as defined below:
- Car and LGV = 1 PCU/vehicle; and
 - HGV = 2.5 PCU/vehicle
- 3.6.5 This is consistent with the NRTM.

Generalised Costs

- 3.6.6 The generalised costs within the assignment model are essential as they affect traffic routing on the road network. They are applied in the following form:

$$\text{Generalised Cost} = \text{Time} + \text{PPK/PPM} * \text{Distance} + \text{Toll}$$

Where PPM is Pence per Minute, and PPK is Pence per Kilometer.

- 3.6.7 The user class HGV in the model is a mix of:
- Other Goods Vehicles 1 (OGV1), including goods vehicles over 3.5 tonnes with two or three axles, and
 - Other Goods Vehicles 2 (OGV2), including all rigid vehicles with four or more axles and all articulated vehicles.
- 3.6.8 Consistent with the NRTM model a split of 40:60 (OGV1:OGV2) was assumed for the calculation of generalised costs (also includes HGV operator multiplier of 2.0)
- 3.6.9 An Excel workbook was provided by Highways England with source data which reflects the May 2021 v1.15 release of the TAG Databook. The opportunity was given to update the base model using the November 2021 v1.17 release but the decision was taken to keep the 2019 values from v1.15 of the TAG databook. This aligns with the methodology used in the NRTM development.
- 3.6.10 Table 3-1 and Table 3-2 show the PPM and PPK generalised cost parameters used, which are all in 2010 prices.

Table 3-1 Value of Time Costs 2019 Parameters – PPM

Element	User Class	AM Peak	Inter Peak	PM Peak
Car	Employers Business	30.92	31.68	31.36
	Commute	20.73	21.07	20.81
	Other	14.31	15.24	14.98
LGV		22.41	22.41	22.41
HGV		44.63	44.63	44.63

Table 3-2 Vehicle Operating Cost 2019 Parameters – PPK

Element	User Class	AM Peak	Inter Peak	PM Peak
Car	Employers Business	12.55	12.55	12.55
	Commute	6.14	6.14	6.14
	Other	6.14	6.14	6.14
LGV		13.75	13.75	13.75
HGV		42.15	42.15	42.15

3.6.11 Tolls have been coded for the Tyne Tunnel along the A19, East of Newcastle. These are summarised in

3.6.12 Table 3-3.

Table 3-3 Tyne Tunnel Tolls

Car - Business	Car – Commute	Car – Other	LGV	HGV
£1.22	£1.45	£1.45	£1.25	£2.44

3.6.13 These values are based on a 2019 toll price for cars and LGV's of £1.70 per vehicle and for HGV's £3.40, which were then converted into 2010 prices using the GDP deflator provided in the latest TAG Databook.

3.6.14 The costs used for the assignment are based on 2010 perceived prices (i.e. without taxation) and therefore, the toll charge for User Class 1 (employers' business) is lower than the cost for both commuting or other user class categories (UC2 and UC3). Additionally, toll charges for LGVs have been calculated using a weighted average of personal and freight trips based on Table A1.3.4 in the latest TAG Databook, giving a default proportional split of 12% for LGV personal and 88% for LGV freight.

3.6.15 It is noted that in 2019, all users of the Tyne Tunnel had the option to pre-pay toll fees at a discount of 10% to the advertised cash price. This has not been assessed in detail for the purpose of calculating assignment toll charges and is considered to have negligible impact on the assessment of the A66 Project.

3.7 Validation Results

3.7.1 The model validation process is summarised below as follows:

- Trip matrix validation;
- Link flow validation;
- Journey time validation; and
- Route choice validation.

3.7.2 The A66TM prior car matrices were created using the 2015 A66TM prior matrices which were then growthed using TEMPRO. The orginal 2015 A66TM prior matrices were developed using NRTM prior matrices. These were developed using model phone data (MPOD) with short distance trips being infilled synthetically and applying regional adjustment factors to a achieve satisfactory starting position. A summary of the matrix development process is shon in Figure 3-2.

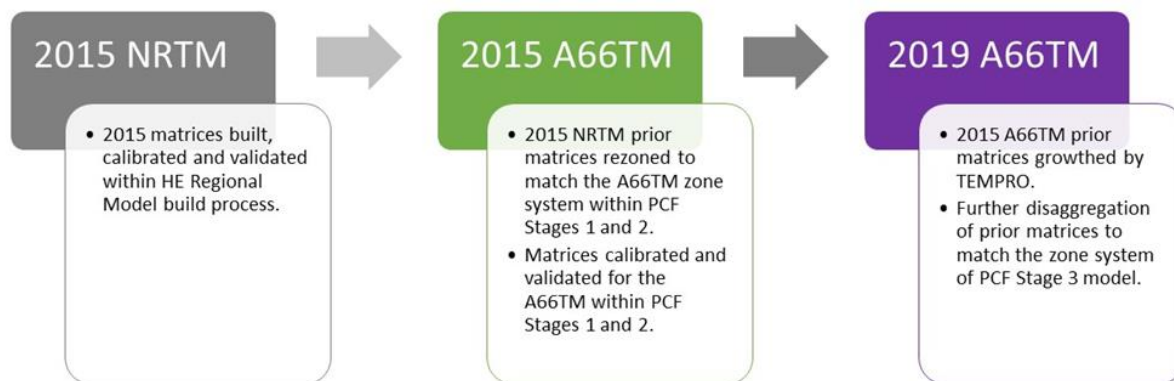


Figure 3-2: Matrix Development Process

- 3.7.3 LGV matrices were developed using 2019 TeletracNavman data. The main strengths of the Teletrac Navman dataset is that it provides LGV trip data at OD level, at a detailed spatial and temporal resolution. This allows the day-to-day variation in trip patterns to be observed.
- 3.7.4 Freight matrices were based on 2018 prior freight matrices provided by TfN. This was considered more desirable compared with the original NRTM freight matrices which were based on the DfT’s Base Year Freight Matrices (BYFM), which provide road freight vehicle movements for a base year of 2006.
- 3.7.5 The steps undertaken to develop the car, LGV and HGV matrices are described in detail within the Transport Model Package²
- 3.7.6 Matrix estimation was applied to refine the trip estimates across the various screen line and ad-hoc count site locations. A final blended assignment was undertaken to ensure the changes due to matrix estimation were limited for long distance car trips which were considered to be the more robust element of the prior matrices. The blend consisted of a fully unconstrained and a constrained matrix estimation run as follows:
- Fully unconstrained matrix estimation for all OD pairs across all vehicle types (30%); and
 - Constrained matrix estimation for cars with OD pairs frozen for skim distances greater than 20km. LGVs and HGVs remain unconstrained (70%).
- 3.7.7 The matrix validation results post matrix estimation are presented in Table 3-4, which shows the number (No.) and the percentage (%) of screen line sites meeting the validation criteria.

Table 3-4 Prior Matrix Validation (All Vehicles)

Performance Measure	AM Peak		Inter-Peak		PM Peak	
	No.	%	No.	%	No.	%
All screenlines (18) or cordons within 5% of observed flows	17	94%	17	94%	18	100%

² A66 Northern Trans-Pennine Stage 3 Transport Model Package. Document Ref: HE565627-AMY-GEN-S00-RP-TR-000010

Performance Measure	AM Peak		Inter-Peak		PM Peak	
	No.	%	No.	%	No.	%
All screenlines (18) or cordons within 10% of observed flows	17	94%	18	100%	18	100%
All screenlines (18) or cordons within GEH <4	17	94%	18	100%	18	100%
All screenlines (18) and cordons with GEH <7.5	18	100%	18	100%	18	100%

3.7.8 The calibrated link flow validation results are provided in Table 3-5.

Table 3-5 Link Flow Validation Summary – Calibrated Matrices (All Vehicles)

Performance Measure	AM Peak	Inter-Peak	PM Peak
All Links (494)			
- within GEH of 5.0	84%	89%	87%
- within GEH of 7.5	95%	97%	95%
- pass cal/val guidance link criterion	85%	85%	85%
By Calibration/Validation			
Calibration Counts (341)			
- within GEH of 5.0	89%	93%	91%
- within GEH of 7.5	96%	98%	96%
- pass cal/val guidance link criterion	85%	85%	85%
Validation Counts (153)			
- within GEH of 5.0	71%	81%	78%
- within GEH of 7.5	91%	93%	91%
- pass cal/val guidance link criterion	85%	85%	85%
By Road Type			
SRN link Counts (230)			
- within GEH of 5.0	84%	92%	88%
- within GEH of 7.5	96%	96%	95%
- pass cal/val guidance link criterion	85%	85%	85%
Non-SRN link Counts (264)			
- within GEH of 5.0	83%	87%	86%
- within GEH of 7.5	94%	97%	94%
- pass cal/val guidance link criterion	85%	85%	85%

3.7.9 The journey time results are presented in Table 3-6 which shows the number (No.) and the percentage (%) of routes meeting the validation criteria.

Table 3-6 Journey Time Validation Summary

Route Class	No. of Routes	AM Peak		Inter Peak		PM Peak	
		No.	%	No.	%	No.	%
SRN	14	14	100%	14	100%	14	100%
Non-SRN	20	20	100%	20	100%	20	100%
Total	34	34	100%	34	100%	34	100%

3.7.10 In summary, the validation results demonstrate that the model performs well against TAG criteria.

3.8 Variable Demand Modelling (VDM)

3.8.1 TAG Unit M2 provides guidance on the need for variable demand modelling and the modelled approach was undertaken in accordance with this guidance. Given the scale of Recommended Preferred Route scheme, the estimated cost of options and evidence from PCF Stage 0 that variable demand modelling had an impact on benefits, there is a need to include the impacts of variable demand.

3.8.2 The variable demand modelling system developed for the A66TM is largely unchanged from that developed for the NRTM. Changes are limited to updating it and recalibrating it to reflect the enhanced A66TM networks and zonings systems and recalibrated demand. The reasoning behind the specification of the structure of the VDM are contained in the NRTM model development report and remain valid for the A66TM.

3.8.3 The key characteristics of the VDM are as follows:

- Incremental pivot point approach
- Pivot point between base and test
- Home Based Production / Attraction

3.8.4 Non-Home-Based Origin / Destination

- Goods Fixed
- Special Generators Fixed

3.8.5 The VDM model applies to the entire modelled area (simulation and buffer area) and predicts the key traveller responses of:

- Mode Choice (between Car Available Car Users and Rail);
- Destination Choice (a change of origin and/or destination); and
- Macro Time of Day Choice (MTOD) (a change of time period in which travel is made).

3.8.6 Public Transport supply and demand is represented as inter-urban rail travel only, it being considered the main competitor to car when the RTM's were developed. This assumption and its representation in the model have been retained for the A66TM. Further details are provided in Chapter 7.

3.8.7 A land use transport interaction model has not been used after taking into consideration the location of the Project, surrounding development,

current network conditions and the likely impacts with the Project in place.

- 3.8.8 The base model development and performance is described in more detail in the Stage 3 Transport Model Package Report.

4 Previous Work

4.1 Overview

- 4.1.1 The A66 Northern Trans-Pennine Project was one of six strategic studies announced as part of the DfT Road Investment Strategy: Investment Plan, December 2014.
- 4.1.2 The A66 is identified as a key national and regional strategic road link for east-west journeys in the north of England, carrying high levels of freight traffic, as well as being considered as an important route for tourism.
- 4.1.3 The previous modelling work is summarised below with more detail in the following sections:
- Stage 0: Strategy, shaping and prioritisation – Development of the NTRAM spreadsheet-based model and use of the NRTM to assess option on the A66 and A69, recommending that options on the A66 corridor be further progressed.
 - Stage 1: Option identification – Use of the and enhanced version of the NRTM to assess two options along the A66 corridor, both involving dualling the A6 corridor single carriageway sections. The outcomes from the appraisal were presented into the interim Outline Business Case at the end of Stage 1.
 - Stage 2: Option Selection – Use of the NRTM to select a preferred option. The outcomes from the appraisal were presented in the Outline Business Case at the end of Stage 2.

4.2 Stage 0 Forecasting

- 4.2.1 The NTPR Strategic Study commenced in September 2015. Throughout the study a Stakeholder Reference Group was engaged in the various stages of technical work. In March 2016, the Stage 1 Report was published providing a robust evidence base of travel patterns and behaviour in the A66/A685 and A69 corridors. The evidence was used to develop intervention specific objectives and establish a case for strategic intervention on each corridor.
- 4.2.2 Based on the need for intervention, a long list of potential interventions was developed to improve connectivity on the Trans-Pennine Routes. Through a sifting process a short list of options was produced to meet the agreed study specific objectives.
- 4.2.3 More detailed assessment and appraisal of interventions was undertaken including environmental assessments and wider economic impacts. Indicative order of magnitude Project costs were produced for the interventions.
- 4.2.4 The feasibility work undertaken by the study indicated that the initial strategic and economic cases were positive enough for interventions to be taken forward to the next stage of assessment.

- 4.2.5 As part of the Northern Trans-Pennine Routes Strategic Study the Northern Trans Pennine Routes Assessment Model (NTRAM) was developed. The NTRAM is a spreadsheet-based regression model using link-based speed flow relationships & generalised costs (CH2MHill – Traffic Modelling Methodology July 2016) and was used to model the A69, A66 and A685 for different levels of flow and HGV usage3.
- 4.2.6 Once the North Regional Transport Model (NRTM) became available an updated Stage 0 assessment was undertaken. This assessment used the NRTM in its existing form and also used existing future year traffic forecasts. The results of this work are presented in the A66 Northern Trans Pennine Route Forecasting Report – Stage 0 (October 2017).
- 4.2.7 The outcome from the study was a recommendation to take the options on the A66 corridor between the M6 Junction 40 at Penrith and the A1(M) at Scotch Corner forward to PCF Stage 1 – Option Identification.

4.3 Stage 1 Forecasting

- 4.3.1 The Stage 1 A66 Transport Model (A66TM) was developed to assess options along the A66 corridor and to inform the option identification process. The NRTM was used as a starting point, with key elements of the model structure retained and the networks, representation of demand, and validation all refined in the area of interest. Model network and zone detail along the A66 corridor was enhanced to better reflect traffic movements and interaction in the Project location.
- 4.3.2 The outcome of the Stage 1 was the modelling and appraisal of the following two options identified to take forward into Stage 2:
- Option 1 – Shortest Route; and
 - Option 2 – Longest Route.
- 4.3.3 Both options involved dualling of the A66 from M6 Junction 40 to the A1(M) at Scotch Corner, with grade separation of the A66/A6 Kemplay Bank junction. The Project appraisal results are shown below in Table 4-1. Seasonal Modelling, and a high super high growth scenario sensitivity tests were carried out using Option 1.

Table 4-1 Stage 1 Project Appraisal Results

Description	Metric	Core Scenario		Seasonal Model	High Growth Scenario	Super High Growth Scenario
		Option 1	Option 2			
Excluding Wider Impacts (Level 1 Benefits)	TUBA Benefits	£807.00	£738.28	£750.36	£910.13	£960.38
	Accident Benefits	£20.73	£23.76	£20.73	£20.73	£20.73
	Environmental Benefits (GHG and Noise)	-£120.00	-£117.80	-£120.00	-£120.00	-£120.00
	Present value of Benefits (PVB)	£707.73	£644.24	£651.09	£810.86	£861.11

Description	Metric	Core Scenario		Seasonal Model	High Growth Scenario	Super High Growth Scenario
		Option 1	Option 2			
	Present value of Cost (PVC)	£393.49	£418.66	£393.49	£393.49	£393.49
	Initial Benefit-Cost Ratio (BCR)	1.80	1.54	1.65	2.06	2.19
Including Wider Impacts (Level 2 Benefits)	Wider Impacts	£101.00	£94.00	N/A	N/A	N/A
	Present value of Benefits (PVB)	£808.73	£738.24	N/A	N/A	N/A
	Adjusted Benefit-Cost Ratio (BCR)	2.06	1.76	N/A	N/A	N/A

4.4 Stage 2 Forecasting

- 4.4.1 The A66 Transport Model has been updated at PCF Stage 2 to forecast the impacts of the Recommended Preferred Route along the A66 corridor between the A1 (M) Scotch Corner and M6 J40 as part of the A66 North Trans-Pennine Project. The A66 Transport Model is a network based Variable Demand Model using the SATURN assignment and DIADEM demand model software. There is detailed representation of the model network and zone system along the A66 corridor. The Stage 2 A66 Transport Model is an updated version of the Stage 1 model which was original derived from the Northern Regional Transport Model used for the Stage 0 assessment.
- 4.4.2 In terms of forecasting assumptions, the following updates were made at Stage 2:
- Preparation of a revised uncertainty log using the latest information on developments and schemes along and in the near vicinity of the A66 corridor, and updated core scenario network infrastructure and demand assumption.
 - Revised forecast years taking account of the most up to date Project construction programme.
 - More detailed forecast networks including variation in road characteristic, speed restrictions and side roads.
 - Representation of the Stage 2 Preferred Route Project in the DS network.
 - Updated generalised cost parameters, reflecting the May 2019 TAG data book.
- 4.4.3 The stage 2 results are summarised in Table 4-2.

Table 4-2 Stage 2 Benefits

Description	Metric	Core Scenario
	Transport User Benefits (Travel Time, VOC and User Charge Savings)	673.47
	Construction Impacts	-12.23
	Accidents	28.70
	Wider Public Finances (Indirect Tax Revenue)	80.29
	Noise	-4.36
	Air Quality	-1.08
	Greenhouse gases	-141.28
	Present Value of Benefits (PVB)	623.51
	Present value of Cost (PVC)	477.49
	Initial Benefit-Cost Ratio (BCR)	1.31
	Journey Time Reliability Benefits	179.35
	Wider Economic Benefits	63.00
	Present value of Benefits (PVB)	865.86
	Adjusted Benefit-Cost Ratio (BCR)	1.81

- Note: 2010 prices and discounted to 2010 in £m.

4.4.4 The Stage 2 model forecast results appear sensible and provide a logical representation of the future year Project impacts. The changes made to the transport model at Stage2, and the changes to the Project being tested in the form of the Preferred Route, would not be expected to generate a significantly different set of forecast to Stage 1, and this is reflected in the Stage 2 results.

5 Forecast Years and Assumptions

5.1 Introduction

5.1.1 TAG Unit M4 – Forecasting and Uncertainty provides guidance for forecasting the impact of transport projects including option testing and appraisal. In transport scheme appraisal, modelling is used to establish the difference between two forecasts, without scheme and with scheme scenarios. In order to do this an understanding of errors and associated uncertainty and what impact this may have on the analysis is required.

5.1.2 This section of the report describes the following aspects:

- Model forecast years – which will be used to forecast economic benefits.
- Uncertainty log and core scenario – input assumptions of developments and infrastructure schemes, and selection for the core scenario.

5.2 Forecast Years

5.2.1 The following forecast traffic model years have been defined based on information provided for Project construction and data availability for predicting future demand:

- 2029 – Project opening year
- 2044 – Project design year, 15 years post opening
- 2051 – additional model year

5.2.2 For economic appraisal TAG Unit M4 recommends that the final forecast years is as far into the future as possible. 2051 was chosen as this is the current horizon year to which DfT currently provide trip end forecasts.

5.3 Uncertainty Log

5.3.1 An uncertainty log is required for transport model forecasting. The purpose of an uncertainty log is to record the central forecasting assumptions that underpin the core scenario, as well as uncertainty around those central assumptions. The uncertainty log should summarise all known uncertainties in the modelling and forecasting, listing each source of uncertainty together with the following information:

- The core scenario assumptions, describing development and infrastructure assumptions for the Central Case.
- The likelihood that the scheme or development will go ahead.
- The range of assumptions around each input or parameter.

5.3.2 The initial data collection concentrated on interrogation of the planning portals to obtain submitted planning applications in all nearby Local Authority Districts for all live applications, applications approved in the last three years and potential developments up to local plan horizon years, or 2035 in the case of the TfN list of developments. Any built schemes along the A66 corridor since the 2019 were identified and also

included. Table 5-1 shows the information sources used to collect the uncertainty log data.

Table 5-1 Information Sources for Developments

Local Authority	Sources
Cumbria County Council	Strategic Economic Plan, Cumbria LEP Infrastructure Plan. Additional input from Eden District Council Local Plan, Carlisle District Local Plan, Allerdale District Local Plan, Copeland Borough Council Local Plan, Barrow in Furness Draft Local Plan
North Yorkshire County Council	Online planning portals, submitted planning applications, live and approved in the last three years. Additional input from Richmondshire District Council
Durham County Council	County Durham Plan – preferred options document, SHLAA
Darlington Borough Council	Darlington Employment Land Review, LDF Core Strategy, SHLAA
Hartlepool Council	Hartlepool Employment Land Review
Stockton Borough Council	Stockton Local Plan
Redcar and Cleveland Borough Council	South Tees Regeneration Masterplan
Middlesbrough Council	Middlesbrough Local Plan
Tees Valley Combined Authority	Strategic Infrastructure Plan
South Lakeland District Council	South Lakeland Local Plan
Gateshead Borough Council	Core Strategy and Urban Core Plan, Making Spaces for Growing Places
North Tyneside Council	North Tyneside Local Plan
Sunderland City Council	Sunderland Local Plan
Newcastle City Council	Core Strategy and Urban Core Plan, Newcastle Employment Land Review, SHLAA, Benwell Scotswood Area Action Plan
Transport for the North (TfN)	Draft Strategic Transport Plan, TfN Development Log

5.3.3 Updates were then applied using the latest information from the following sources:

- Local Development Plans and Planning portals,
- Council and Highways England websites, and
- TfN development and infrastructure interventions Logs.

5.3.4 To ensure accuracy the uncertainty log was issued to Cumbria County Council (incorporating feedback from the district councils within Cumbria), Durham County Council, North Yorkshire County Council, Richmondshire District Council and Tees Valley Combined Authority (representing the councils within the Tees Valley) for their review and to

update with any additional strategic sites not yet included. Responses were received from all and updates incorporated as appropriate.

- 5.3.5 All development data was entered with details provided of the data source, development location, planning reference, size, planning status and predicted trip generation where available.
- 5.3.6 An estimation of the number of jobs at each development type was required so that development sites could be filtered by size when identifying sites for inclusion in the core scenario and for the subsequent calculation of trip generation during the demand modelling process. Information collected on employment sites recorded in the uncertainty log generally covered development type and development size, (based on floor space size), but not necessarily the number of jobs. Therefore, a consistent approach was applied across all employment sites based on the site area and employment type categories (shown in Table 5-2).

Table 5-2 Different Development Types from UK Planning Portal

Development Type	Description
A1	Shops
A2	Financial and Professions Services
A3	Restaurants and Cafes
A4	Drinking Establishments
A5	Hot Food Takeaways
B1	Business
B2	General Industrial
B8	Storage and Distribution
C1	Hotels
C2	Residential Institutions
C3	Dwelling houses
D1	Non-residential institutions
D2	Assembly and leisure

- 5.3.7 For each employment site job numbers were derived by taking the gross external area and converting to gross internal area, and then net floor area using factors developed from TRICs³ (Trip Rate Information Computer System) data. The net floor area per employment type was then used to calculate the total number of jobs of that type using data from the “Homes & Communities Agency – Employment Density Guide – 3rd Edition – November 2015”.
- 5.3.8 For developments within the Core Area (see 5.4.4 below), Transport Assessments were found and their trip generation data recorded to incorporate more accurate trip data.

³ <http://www.trics.org/system.html>

5.4 Core Scenario

- 5.4.1 The complete uncertainty log contains all the sites identified in the data collection process regardless of certainty level, geographical location or size. In selecting development sites for inclusion in the core scenario, filters were applied as follows:
- Level of Certainty – Filter applied in line with TAG (Near Certain or Reasonably Foreseeable).
 - Geographical Location – Filters were applied to sites geographically to select those within the core boundary, noting that for development sites remote from the Project there would be little difference in traffic impact if these schemes were explicitly represented in the model or included as part of the overall TEMPRO growth.
 - Size of Development – Similarly filters were applied based on the size of individual development and whether it was ‘big enough’, noting that for developments that did not generate much traffic there would be little difference in traffic impact if these schemes were explicitly represented in the model or included as part of the overall TEMPRO growth.
- 5.4.2 In summary only those developments that were considered ‘near certain’ or ‘more than likely’, within the core area and considered ‘big enough’ were included in the future year modelling.
- 5.4.3 Table 5-3 shows how the likelihood classification of future inputs for infrastructure schemes and developments was determined.

Table 5-3 Classification of Future Inputs⁴

Probability of the Input	Status	Core Scenario Assumption
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 (for example 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

⁴ TAG Unit M4 Forecasting and Uncertainty – Appendix A – Table A2

Probability of the Input	Status	Core Scenario Assumption
<p>Hypothetical: There is considerable uncertainty whether the outcome will ever happen.</p>	<p>Conjecture based upon currently available information. Discussed on a conceptual basis. One of several possible inputs in an initial consultation process. Or a policy aspiration</p>	<p>These should be excluded from the core scenario but may form part of the alternative scenario</p>

- 5.4.4 For selection of core scenario developments, a boundary was drawn up based on a combination of development density, Local Authority Districts and geographical proximity to the A66. The Core and Wider area can be described as:
- Core area – the A66 corridor largely including the south-west part of County Durham comprising Barnard Castle and the Borough of Darlington, Richmondshire District Council and the Eden District of Cumbria.
 - Wider area – area outside of the core area (largely including Cumbria, County Durham, Northumberland and Local Authorities in Tyne & Wear and the Tees Valley).
- 5.4.5 Size criteria for developments based on number of households for residential developments or jobs for employment developments were established. In developing the criteria, consideration was given to the level of trip generation that might impact on the A66 corridor traffic, given that background trip end growth is contained within NTEM, which is used to account for traffic growth from smaller developments.
- 5.4.6 The size criteria for the inclusion of developments in the core scenario was based on the following thresholds:
- Core area:
- over 200 jobs for employment sites
 - over 100 dwellings for residential sites
- Wider area:
- over 500 jobs for employment sites
 - over 250 dwellings for residential sites

Developments

- 5.4.7 Figure 5-1 shows both the core scenario developments and other developments included in the uncertainty log, the core boundary. Those that are included within the Core Scenario are both large enough to be considered (see 5.4.6) and are likely enough to come forward (see 5.4.1). Figure 5-2 and Figure 5-3 show all core area employment and residential developments.

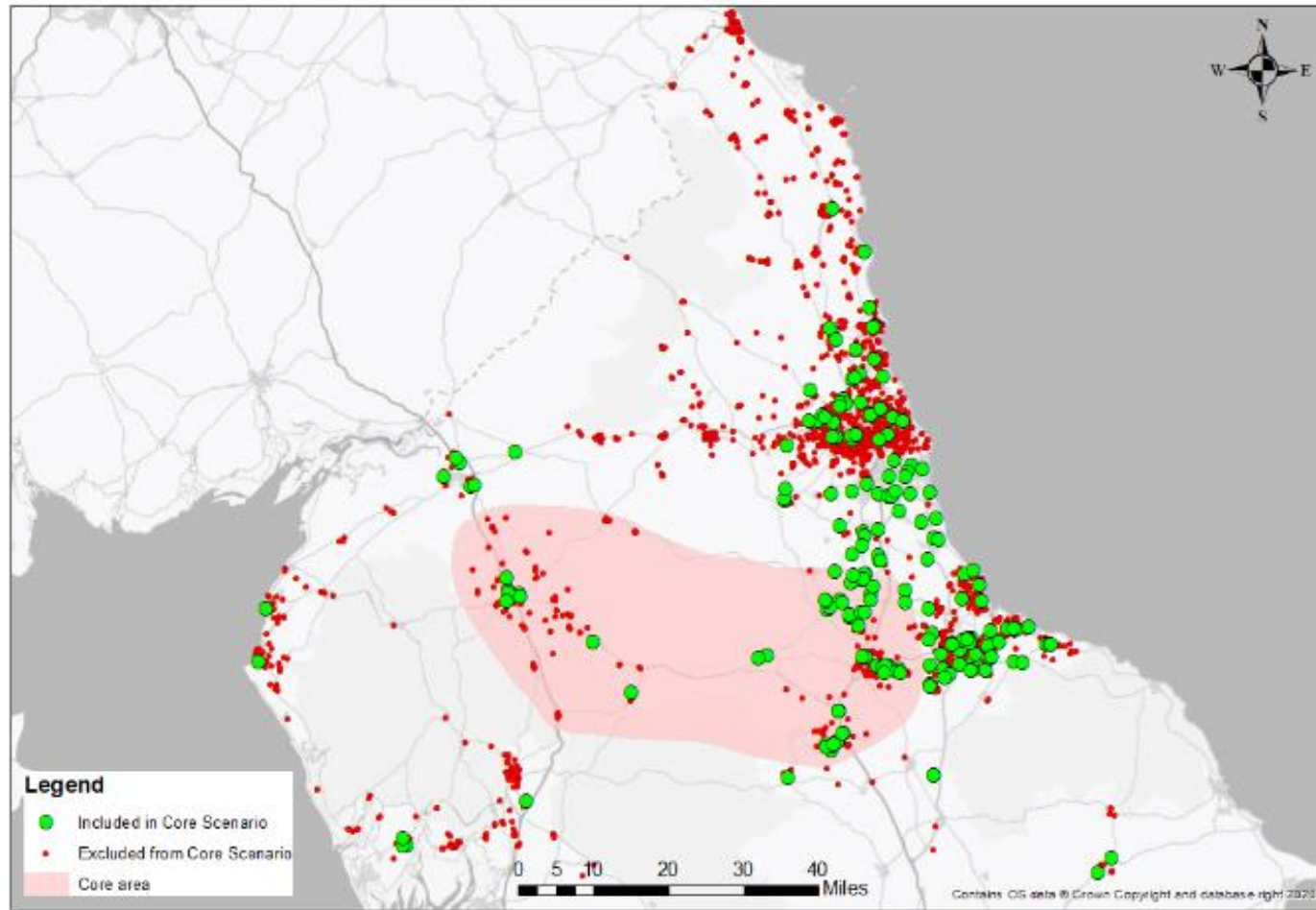


Figure 5-1: All Uncertainty Log Developments

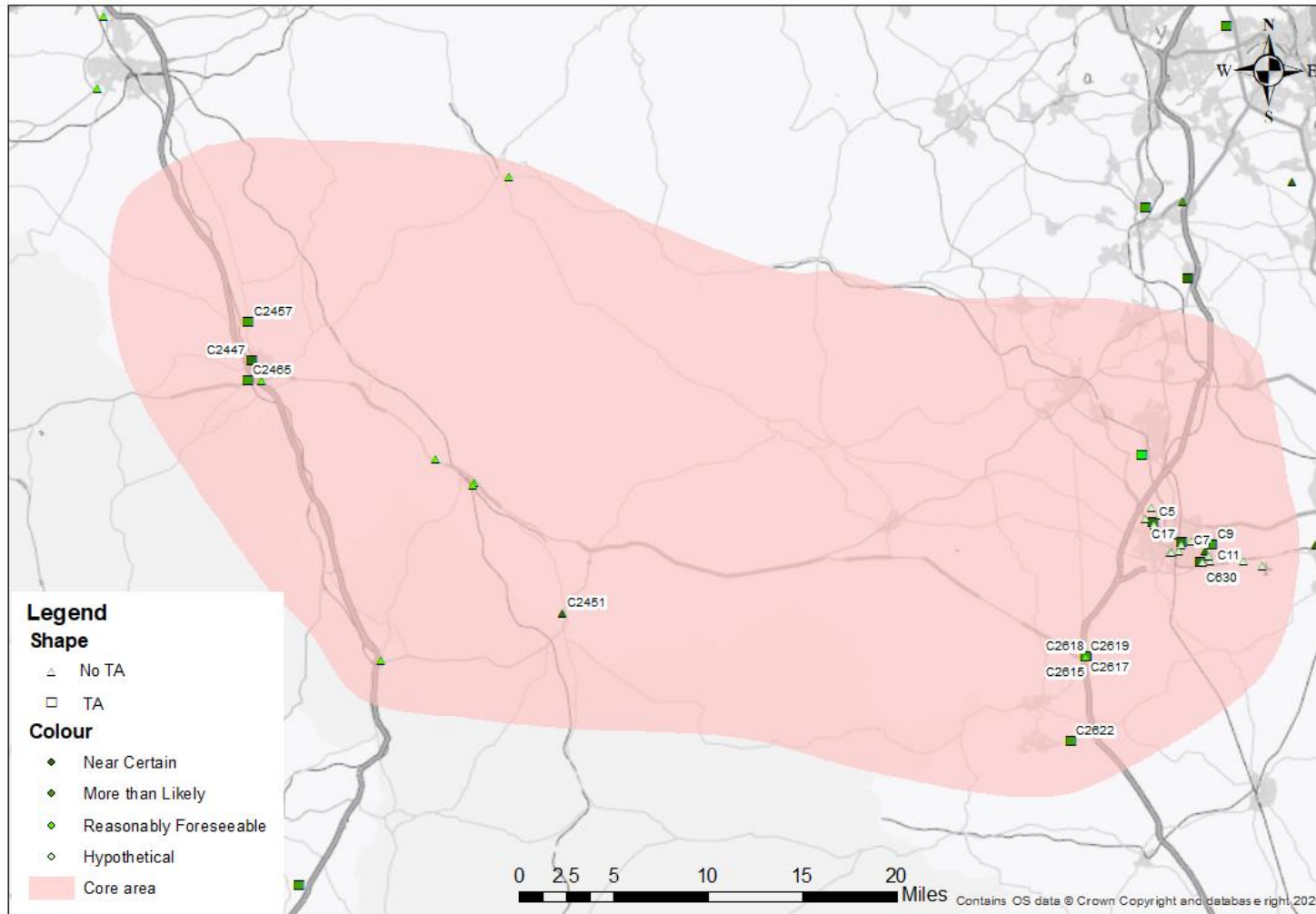


Figure 5-2: Core Area Employment Developments

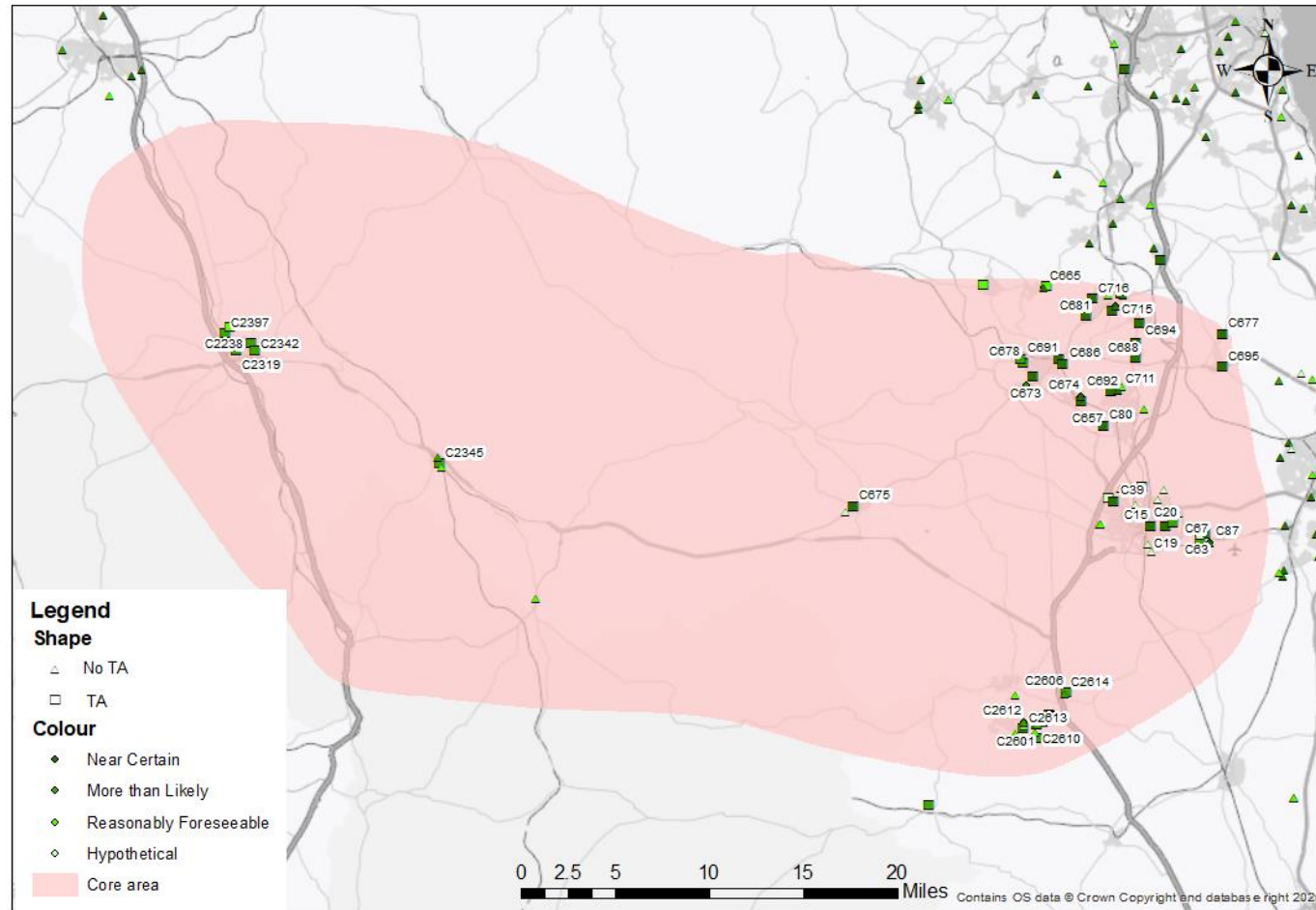


Figure 5-3: Core Area Residential Developments

- 5.4.8 The full list of all development sites in the uncertainty log is shown in **Appendix A – Development Uncertainty Log**.
- 5.4.9 The following sites are of particular interest in terms of their size and location in the A66 corridor area, all of which are included in the core scenario:
- A66 route:
 - C2615 – Scotch Corner Designer Outlet – 23,258m² GFA.
 - C2618 – Scotch Corner Garden Centre – 10,761m² GFA.
 - C2238 – Residential Development at Carleton Fields, Carleton Heights, Penrith – 505 houses.
 - North Penrith:
 - C2397 – Residential Development at Raiselands Farm, Penrith – 299 houses.
 - C2457– Eden 41 Business Park – 420 estimated jobs.
 - County Durham:
 - C716 – Residential Development Whitworth Park – 726 houses.
 - C686 – Land South of Douglas Crescent houses – 500 houses.
 - Catterick Garrison:
 - C69 – DIO Catterick Service Family Accommodation (Breckenbrough Lane) – 155 houses.
 - C2631 – Residential Development at Catterick Garrison – 160 houses.
 - Darlington:
 - C630 – Employment development at Ingenium Parc – 1,536 estimated jobs.
 - C39 – West Park Garden Village – 1,200 houses.
 - C175 – Lingfield Point – 1140 estimated jobs.
- 5.4.10 The uncertainty log identifies a large area of residential development at Carleton, Penrith, and significant development anticipated in Darlington, as this is identified in the core scenario it indicates that it is not dependent on the A66 Project.

6 Reference Forecast Demand and Supply

6.1 National Trip End Model

6.1.1 The DfT NTEM (National Trip End Model) provides growth figures for trip origin and destination (or production/attraction⁵). The forecasts consider population, employment, housing, car ownership and trip rates.

6.1.2 Growth in demand is expressed by the number of trip ends providing an estimate of the total number of trips to or from a zone, split by trip purpose, mode and time period. Spatially they are disaggregated across an NTEM zoning system, covering the whole of Great Britain. NTEM zones for England and Wales are consistent with Middle Super Output Area (MSOAs), whilst for Scotland, NTEM zones are an aggregation of Data Zones (DZs).

6.1.3 NTEM v7.2 has been used for the Stage 3 model forecasting to calculate growth factors for both car and rail uses.

6.1.4 Table 6-1 to Table 6-6 show NTEM growth for the forecast model years by the following trip purposes:

- Home-based work (HBW)
- Home-based employer's business (HBEB)
- Home-based other (HBO)
- All Purposes

6.1.5 The tables show increases by Production (P) and Attraction (A).

Table 6-1: 2019 – 2029 NTEM v7.2 Car Trip Growth

Region	HBW		HBEB		HBO		All Purposes	
	P	A	P	A	P	A	P	A
North East	6.9%	6.9%	8.2%	8.2%	8.8%	8.8%	8.0%	8.0%
North West	6.2%	6.2%	7.1%	7.1%	8.5%	8.5%	7.5%	7.5%
Other Regions	5.8%	5.8%	6.9%	6.9%	10.9%	10.9%	8.8%	8.8%
All Regions	5.9%	5.9%	7.0%	7.0%	10.6%	10.6%	8.6%	8.6%

Table 6-2: 2019 – 2044 NTEM v7.2 Car Trip Growth

Region	HBW		HBEB		HBO		All Purposes	
	P	A	P	A	P	A	P	A
North East	17.0%	17.0%	20.3%	20.3%	21.5%	21.5%	19.6%	19.6%
North West	15.2%	15.2%	17.6%	17.6%	20.6%	20.6%	18.3%	18.3%
Other Regions	14.1%	14.1%	16.9%	16.9%	24.3%	24.3%	20.0%	20.0%
All Regions	14.4%	14.4%	17.1%	17.1%	23.8%	23.8%	19.8%	19.8%

⁵ Home-based trip ends are split by production (home) and attraction (the reason for travel). Across a suitably large geographical area, it is usually best to scale the attractions to match the productions, as the productions are based on the most relevant and reliable data (resident population) and the fit of production trip ends to planning assumptions is usually better.

Table 6-3: 2019 – 2051 NTEM v7.2 Car Trip Growth

Region	HBW		HBEB		HBO		All Purposes	
	P	A	P	A	P	A	P	A
North East	21.7%	21.7%	26.2%	26.2%	28.3%	28.3%	25.6%	25.6%
North West	19.6%	19.6%	22.9%	22.9%	26.9%	26.9%	23.7%	23.7%
Other Regions	18.2%	18.2%	22.0%	22.0%	30.1%	30.1%	25.1%	25.1%
All Regions	18.5%	18.5%	22.3%	22.3%	29.6%	29.6%	24.9%	24.9%

Table 6-4: 2019 – 2029 NTEM v7.2 Rail Trip Growth

Region	HBW		HBEB		HBO		All Purposes	
	P	A	P	A	P	A	P	A
North East	-0.9%	-0.9%	-2.6%	-2.6%	-4.4%	-4.4%	-2.2%	-2.2%
North West	-0.3%	-0.3%	-1.5%	-1.5%	-2.6%	-2.6%	-1.1%	-1.1%
Other Regions	3.1%	3.1%	3.0%	3.0%	4.3%	4.3%	3.6%	3.6%
All Regions	2.9%	2.9%	2.5%	2.5%	3.5%	3.5%	3.1%	3.1%

Table 6-5: 2019 – 2044 NTEM v7.2 Rail Trip Growth

Region	HBW		HBEB		HBO		All Purposes	
	P	A	P	A	P	A	P	A
North East	-1.1%	-1.1%	-3.1%	-3.1%	-6.1%	-6.1%	-2.6%	-2.6%
North West	-0.1%	-0.1%	-1.1%	-1.1%	-2.3%	-2.3%	-0.4%	-0.4%
Other Regions	6.4%	6.4%	7.1%	7.1%	9.6%	9.6%	7.7%	7.7%
All Regions	6.0%	6.0%	6.1%	6.1%	8.2%	8.2%	6.9%	6.9%

Table 6-6: 2019 – 2051 NTEM v7.2 Rail Trip Growth

Region	HBW		HBEB		HBO		All Purposes	
	P	A	P	A	P	A	P	A
North East	-1.1%	-1.1%	-2.6%	-2.6%	-5.7%	-5.7%	-2.1%	-2.1%
North West	0.1%	0.1%	-0.2%	-0.2%	-1.6%	-1.6%	0.3%	0.3%
Other Regions	7.6%	7.6%	9.1%	9.1%	10.9%	10.9%	9.0%	9.0%
All Regions	7.0%	7.0%	8.0%	8.0%	9.4%	9.4%	8.1%	8.1%

6.2 Goods Vehicles

6.2.1 Freight growth factors for goods vehicles are based on Road Traffic Forecasts (RTF) 2018 Scenario 1 which uses central projections of GDP, fuel price, and population. RTF data is provided on a five yearly basis from 2015 to 2050. Factors for the modelled years were calculated by interpolating the RTF data.

6.2.2 LGV and HGV growth from the RTF data used for forecasting are provided in Table 6-7 and Table 6-8.

Table 6-7: RTF Growth vs 2019 - LGVs

Region	2029	2044	2051
North East	12%	34%	42%
North West	11%	33%	41%
Yorkshire and Humber	15%	37%	45%
East Midlands	13%	35%	43%
Eastern England	11%	33%	41%
South East	12%	34%	42%
London	11%	33%	40%
South West	13%	36%	44%
West Midlands	12%	34%	42%
Wales	11%	34%	41%
All Regions	12%	34%	42%

Table 6-8: RTF Growth vs 2019 - HGVs

Region	2029	2044	2051
North East	-1%	3%	5%
North West	4%	13%	17%
Yorkshire and Humber	1%	4%	5%
East Midlands	-1%	2%	3%
Eastern England	0%	3%	5%
South East	4%	14%	19%
London	0%	2%	3%
South West	0%	5%	7%
West Midlands	0%	5%	7%
Wales	0%	3%	5%
All Regions	1%	7%	9%

6.2.3 Growth for Scotland was assumed the same as that for England and Wales in line with the assumption made with the development of RTM2.

6.3 Ports and Airports

Ports

6.3.1 The following ports fall within the model simulation area:

- Sunderland
- Teesside
- Tyneside

- 6.3.2 Minor ports also exist on the Cumbria coast, but are not considered significant for freight traffic due to their relatively low demand (DfT Port freight annual statistics).
- 6.3.3 For ports, the same DfT Road Traffic forecasts described for goods vehicles were used, which follows the approach taken in the NRTM for LGV and HGV port traffic. HGV growth from historic cargo trends using information within the DfT UK major ports data set was not used based on comments in the NRTM Forecasting Report implying limitations in the representation of Base model HGV port demand and also limitations in using forecasts based on historic trends rather than future economic conditions as incorporated in the DfT RTF18 forecasts.

Airports

- 6.3.4 TAG Unit M4 indicates that the NTEM dataset includes all trip end productions for surface access trips to airports but does not include surface travel for airline passengers.
- 6.3.5 The following two airports exist in the model simulation area:
- Newcastle Airport; and
 - Durham Tees Valley Airport.
- 6.3.6 Newcastle is an international airport and modelled as an individual zone, whereas Durham Tees Valley is small scale operation which is included as part of another zone and therefore not modelled in detail.
- 6.3.7 For Newcastle airport the same approach taken in the A66 Transport Model at Stage 1 and 2, and the NRTM before that, has been applied by adding in airport passenger surface access trips to the demand matrices based on data from the DfT National Air Passenger Allocation Model (NAPALM).
- 6.3.8 Newcastle airport passenger growth factors from 2019 to each forecast model year are shown in Table 6-9.

Table 6-9: Newcastle Airport Passenger Growth Factors

Year	Growth Factor
2029	1.22
2044	1.57
2051	1.76

- 6.3.9 The airline passenger demand includes demand in the Car Employers Business and Car Other segments and uses corresponding demand model values of time in the forecasts.

6.4 Development Trips

- 6.4.1 Trips for developments selected to be explicitly represented in the model forecast demand have been included as follows:
- Trip generation – establish the number of trips produced or attracted to development sites based on quantum of households or jobs;

- Trip distribution – distribute the development trips across the model zone system, based on existing distributions within the model; and
- Constraining to Balancing Areas – controlling overall trip growth so that the development and background trips comply with NTEM growth forecasts. The NTEM control is applied using designated balancing areas.

Trip Generation

- 6.4.2 With the Uncertainty log providing numbers of dwellings and jobs per site, trip ends were established for each development as follows:
- Car – trip rates taken from NTEM v7.2, establishing trip rates per dwelling or job for each model demand segment.
 - Goods vehicles – the proportion of goods vehicles per car trip end were calculated using the TRICS 7.6.2 database, selecting a comprehensive set of sites across England, Wales and Scotland to derive different proportions for the development types used in the uncertainty log. Proportions were calculated by comparing TRICS goods trips rates against the TRICS car trip rates.
- 6.4.3 With using the TRICS database for goods trips, very few, if any, sites existed with matching geographical and employment profiles as our developments. Therefore, data from the whole of England, Wales and Scotland was used to give a good sample of representative sites.
- 6.4.4 Employment sites from the uncertainty log were classified into the different TRICS employment type categories, with sites of a mixed nature being allocated across more than one employment type. Using TRICS data in this way provides a suitable representation of goods vehicle development trips in the absence of NTEM goods vehicle trip rates.
- 6.4.5 Rather than apply the goods trip rates directly to the uncertainty log developments, the proportion of goods trips to car trips was calculated and subsequently applied to the NTEM car trip rates. The proportion system was used due to the discrepancy in NTEM car trip rates to that of TRICS. Forecasting the goods trips as a proportion of car trips ensures the relative trip rates per land use type are respected whilst also retaining a proportionate ratio of trips between cars and goods vehicles.
- 6.4.6 Car trip rates used are summarised below in Table 6-10 for Local Authorities situated in the Core model area.

Table 6-10: Car vehicle trip rates from NTEM

Local Authority	HBEB		HBW		HBO		NHBEB		NHBO	
	Prod	Attr	Prod	Attr	Prod	Attr	Orig	Dest	Orig	Dest
<i>24-hour trip rates per job</i>										
Cleveland	0.00	0.05	0.00	0.35	0.00	0.54	0.07	0.07	0.23	0.23
Durham	0.00	0.05	0.00	0.35	0.00	0.51	0.07	0.07	0.23	0.22

Local Authority	HBEB		HBW		HBO		NHBEB		NHBO	
	Prod	Attr	Prod	Attr	Prod	Attr	Orig	Dest	Orig	Dest
Cumbria	0.00	0.05	0.00	0.34	0.00	0.53	0.07	0.07	0.22	0.23
North Yorkshire	0.00	0.05	0.00	0.34	0.00	0.52	0.07	0.07	0.23	0.22
<i>24-hour trip rates per dwelling</i>										
Cleveland	0.05	0.00	0.33	0.00	0.60	0.09	0.00	0.00	0.00	0.00
Durham	0.05	0.00	0.36	0.00	0.62	0.09	0.00	0.00	0.00	0.00
Cumbria	0.06	0.00	0.38	0.00	0.68	0.09	0.00	0.00	0.00	0.00
North Yorkshire	0.06	0.00	0.40	0.00	0.71	0.10	0.00	0.00	0.00	0.00

6.4.7 The proportion of goods vehicles forecast per development type are shown below in Table 6-11 at a 24 hour level.

Table 6-11: Goods vehicle trip rate proportions calculated from TRICS

Local Authority	LGV	HGV
Office	5%	1%
Business Park	5%	1%
Industrial Unit	5%	1%
Industrial Estate	6%	1%
Warehousing	13%	9%
Hotels	23%	8%
Residential	40%	3%

6.4.8 In addition to trip rates being developed and applied, an extensive data collection exercise was undertaken to collate the Transport Assessments (TA) developed for each of the developments listed in the uncertainty log. Where available, forecast trip levels were generally only provided for the peak hours. Therefore, where TAs were available, NTEM trip rates for the respective developments were scaled to align with those forecast by the detailed assessments. The trips forecast for each development considered can be found in Table 11-2 in **Appendix A – Development Uncertainty Log**.

Trip Distribution

- 6.4.9 To distribute the generated trips, developments were assigned to model zones primarily based on their location. Where a site area covered multiple zones, a single zone was chosen based on land usage composition being most like the development. The distribution from these assigned zones was then used to distribute the trips using a SATURN based approach taking distribution proportions from the base matrix.
- 6.4.10 The Eden 41 Business Park and Scotch Corner Designer Outlet were deemed too large and close to the Project to load onto an existing zone, and without the supporting existing network connectivity. Two new zones were therefore created specifically for these developments. The trip distributions for these new zones were sourced from multiple nearby zones providing distribution compositions considered similar in land usage to the respective developments.
- 6.4.11 For the Scotch Corner Retail Park, trip distribution is based on multiple donor zones selected nearby to the site covering a mix of rural and urban locations, including Darlington town centre, to reflect the different trip patterns that would be expected at the site.

Balancing Areas

- 6.4.12 Balancing areas were used to control background growth to a level which results in an overall growth, including the development trips, in line with NTEM. Balancing areas are collections of zones, in this case representing grouped District areas, where the demand will be constrained to an overall growth level for each forecast year.
- 6.4.13 The balancing areas used are shown in Figure 6-1. The 'External Model Areas' balancing area represents areas where there are no explicitly modelled developments.

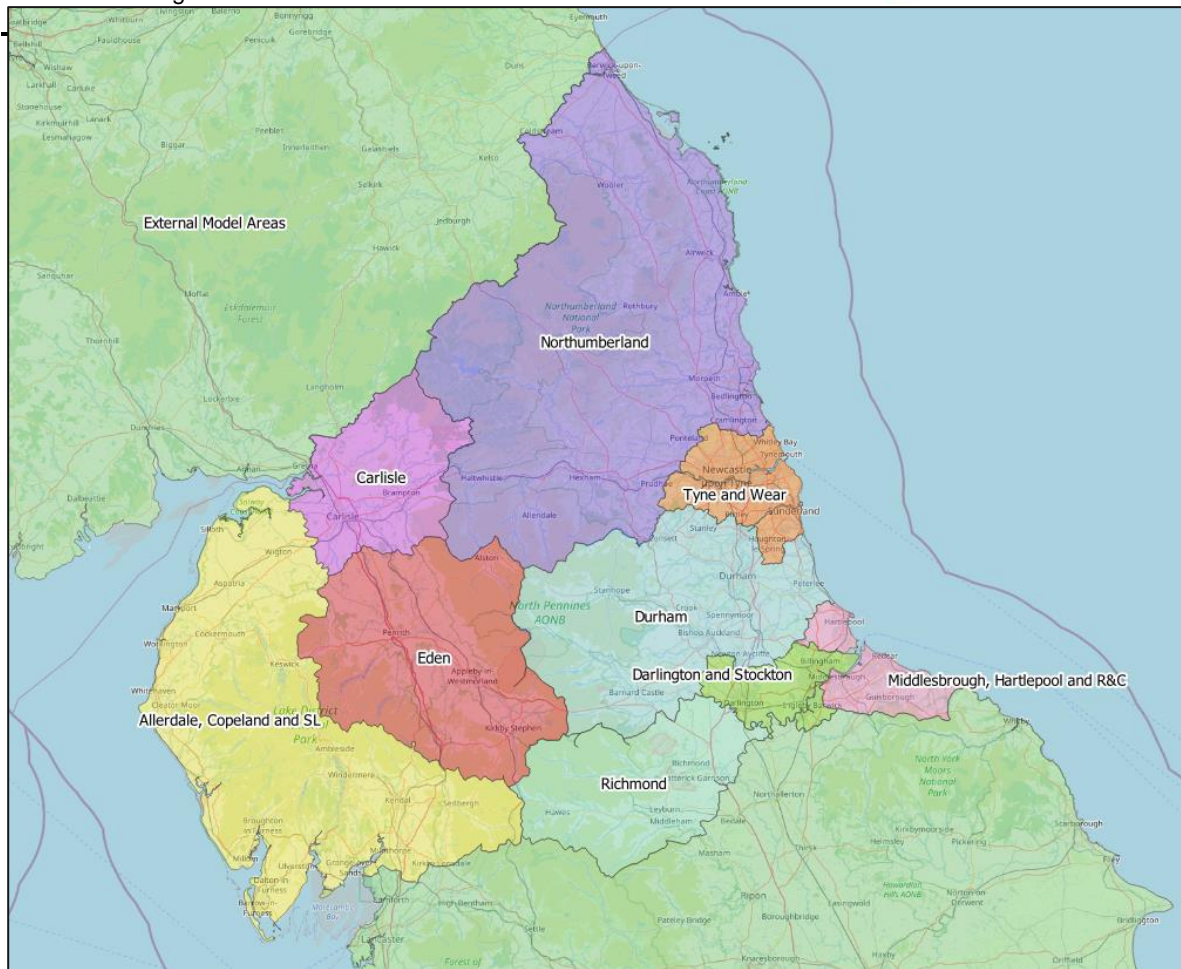


Figure 6-1: Balancing Areas

6.4.14 The balancing areas were used in HEIDI as part of its standard approach to forecast demand development process.

6.5 Combined Reference Forecast Demand

6.5.1 The reference forecast refers to the forecast demand growth factors being applied to the base demand but without taking account of changes in cost which are later included through VDM. These matrix totals are presented for Employer’s Business (EB), Commute, Other, LGV and HGV user classes in Table 6-12, Table 6-13 and Table 6-14 below.

Table 6-12: Highway Reference Forecast Demand - AM Peak (pcu/hr)

Vehicle type/ purpose	2019 Base	2029 Ref	Growth %	2044 Ref	Growth %	2051 Ref	Growth %
EB	579,018	618,377	6.80%	675,028	16.58%	703,389	21.48%
Commute	3,302,016	3,500,883	6.02%	3,785,833	14.65%	3,924,863	18.86%
Other	1,646,480	1,815,335	10.26%	2,029,278	23.25%	2,125,006	29.06%
LGV	751,106	842,229	12.13%	1,009,005	34.34%	1,065,760	41.89%
HGV	284,138	283,591	-0.19%	294,772	3.74%	300,131	5.63%
Total	6,562,758	7,060,415	7.58%	7,793,917	18.76%	8,119,149	23.72%

Table 6-13: Highway Reference Forecast Demand - IP Peak (pcu/hr)

Vehicle type/ purpose	2019 Base	2029 Ref	Growth %	2044 Ref	Growth %	2051 Ref	Growth %
EB	508,367	542,564	6.73%	591,676	16.39%	616,210	21.21%
Commute	1,300,580	1,379,132	6.04%	1,491,595	14.69%	1,546,497	18.91%
Other	2,918,620	3,219,595	10.31%	3,599,782	23.34%	3,769,546	29.16%
LGV	561,879	630,230	12.16%	755,024	34.37%	797,483	41.93%
HGV	267,153	266,621	-0.20%	277,128	3.73%	282,166	5.62%
Total	5,556,599	6,038,142	8.67%	6,715,204	20.85%	7,011,902	26.19%

Table 6-14: Highway Reference Forecast Demand - PM Peak (pcu/hr)

Vehicle type/ purpose	2019 Base	2029 Ref	Growth %	2044 Ref	Growth %	2051 Ref	Growth %
EB	605,848	646,883	6.77%	705,853	16.51%	735,365	21.38%
Commute	2,716,123	2,880,057	6.04%	3,114,865	14.68%	3,229,375	18.90%
Other	3,225,905	3,561,127	10.39%	3,984,065	23.50%	4,172,809	29.35%
LGV	546,359	612,634	12.13%	733,940	34.33%	775,217	41.89%
HGV	199,293	198,917	-0.19%	206,783	3.76%	210,551	5.65%
Total	7,293,528	7,899,617	8.31%	8,745,506	19.91%	9,123,317	25.09%

6.5.2 Input and output model growth by vehicle type/ purpose for each forecast year is shown below in Table 6-15, comparing trip growth from NTEM or RTF (input trip growth) and the trip growth from the SATURN reference matrices (output trip growth), across the full model. The table shows the growth in the reference case matrices align with that in the respective forecast at a national level.

Table 6-15: Input and Model Vehicle Trip Growth

Vehicle type/ purpose	2029		2044		2051	
	NTEM/ RTF	Model	NTEM/ RTF	Model	NTEM/ RTF	Model
Car – EB	6%	7%	15%	16%	20%	21%
Car – Commute	5%	6%	14%	15%	18%	19%
Car – Other	9%	10%	22%	23%	28%	29%
LGV	12%	12%	34%	34%	42%	42%
HGV	1%	0%	7%	4%	9%	6%

6.6 Dependent Development

6.6.1 Dependent development refers to new development that is dependent on the provision of a transport scheme and for which, with the new development but in the absence of the transport scheme, the existing transport network would not provide a reasonable level of service to existing and/or new users. This has the implication that the development would not be delivered in the absence of the transport scheme.

6.6.2 Based on the information listed in uncertainty log no dependant supply or land use developments were identified. Accordingly, dependency testing has not been undertaken.

6.7 Forecast Networks

Do Minimum Network

6.7.1 The Do Minimum (DM) forecast networks reflect the base 2019 year but with the addition of the following core scenario schemes from the uncertainty log, included in all forecast years.

Table 6-16: Schemes included in Forecast Models

	Scheme name	Description	Opening year
		RIS1 Highways England Schemes	
1	A19/A1058 Coast Road	Upgrade to fully grade separated three level interchange serving the A19 and A1058 Coast Road	2019 (April)
2	A19 Testos	Full grade separated junction with flyover for the A19	2021
3	A1 Northumberland	Alnwick to Ellingham and Morpeth to Felton dualling	2024
4	A1 Northumberland Mousen Bends	Dualling of 3-mile section between Belford and Adderstone incorporating the Mousen Bends	2028
5	A1 Scotswood	Widening within the existing highway boundary to three lanes between junctions	2022/23
6	A1 Birtley to Coal House	Improving 4 miles of the A1 by widening of the carriageway between junctions 65 (Birtley) and 67 (Coal House)	2024/25
7	A19 Norton Wynyard	Widening of the A19 between Norton and Wynyard in both directions from two to three lanes	2022
8	A19 Downhill Lane	Construction of a new bridge to the south of the existing A1290 bridge across the A19	2022
9	A69 Junction Upgrades	Grade separate Bridge End and Styford Roundabout at Hexham and Corbridge to make route between Newcastle and Hexham fully grade separated.	2022 (Hexham)
10	A19 Elwick Closures	Safety improvements on the A19. Gaps closed that previously allowed right turns at Elwick North, Elwick South and Dalton Piercy on the A19	2019 October
		Local Highway Schemes	
11	A167 Sunderland Bridge	A167/B6300 Sunderland Bridge Improvement. T-junction replaced with roundabout	2020
12	Carlisle Southern Link Road	New road connecting Junction 42 M6 with the A595 to the West. Route will include new junctions linking existing radial routes into Carlisle and the Garden Village	2024
13	Cumbria – Brigham Broughton	Upgrade to replace staggered junction at Broughton Brigham on A66 with a four-arm roundabout	2026
14	Northallerton Link Road	New link road and overbridge to join two new developments at Northallerton	2022

	Scheme name	Description	Opening year
15	Wallsend Road, Howdon	New signals at Wallsend Road/Howdon A19 junction	2020
16	Whitehouse Farm North Tyneside	Circulatory carriageway widening on the A188/A189 roundabout and new signalised crossing points	2022
17	South Tees Improvements	Improvements to South Tees site access points, Trunk Road, Dockside Road, Cargo Fleet Roundabout, Southern Cross Improvements Stainton Way/Dixons Bank, Stainton Way Western Extension, A19 Mandale Interchange and Mandale Roundabout, Longlands to Ladgate Lane, Eston Road Signals	2029 onwards

6.7.2 The location of the schemes are shown in the figure below.



Figure 6-2: Committed Highway Schemes

Do Something Network

6.7.3 The Do Something (DS) network reflects the DS forecast network but with the addition of the A66 Northern Trans-Pennine Route Project Route which is divided into 9 sections, as shown in Table 6-17.

Table 6-17: A66 Corridor NTPP Assumptions

Scheme Number	A66 Corridor Location	Description
01	M6 Junction 40 Penrith	Three-lane circulatory and signalised flared four lane junction approaches
02	M6 Junction 40 to Kemplay Bank	Introduction of an Underpass at the Kemplay Bank Junction. Section between junction 40 and east of Kemplay reduced to 50mph
03	Penrith to Temple Sowerby (Center Parcs)	Online dualling between Penrith and Temple Sowerby.
04/05	Temple Sowerby to Appleby	Blue Option - Primarily offline dualling around Kirkby Thore and Crackenthorpe.
06	Appleby to Brough (Warcop)	Black-Blue-Black – A mix of both online and offline dualling between Appleby and Brough
07	Bowes Bypass	Online dualling with a new Bridge on the Bowes Bypass
08	Cross Lanes to Rokeby	Mostly online dualling between Boldron and Greta Bridge. Cross Lanes junction west of Moorhouse Lane and Rokeby junction west of Rokeby Park.
09	Stephen Bank to Carkin Moor (Layton)	A mix of online and offline dualling between Smallways and Forcett Lane. Westbound merge provided at Browson Bank
11	A1(M) Junction 53 Scotch Corner	Minor upgrades to junction

6.7.4 Table 6-18 below shows the two-way average route length between Scotch Corner and M6 J40 for the DM and DS networks.

Table 6-18: A66 Corridor NTPP Assumptions

Scenario	A66 Corridor distance (km)
Do Minimum	79.8
Do Something	80.2

6.7.5 The M6 J40 and Kemplay Bank junctions sit at the Penrith end of the A66 corridor, and the Scotch Corner junction at the A1(M) end.

6.7.6 The proposed design at Junction 40 shown in Figure 6-3 includes the following features:

- A 3-lane circulatory carriageway with spiral markings on roundabout
- Widening on all 5 approach arms to provide additional lanes and controlled under their own signal phase –this provides a better alignment on approaches; preserves the operation and use of the
- current depot and emergency services accesses; maintains the active travel route on the western side of the junction by accommodating

controlled toucan crossings facilities; and reduces the land take and environmental impact at the junction.



Figure 6-3: M6 Junction 40 scheme design

6.7.7 The proposal includes for conversion of the existing at grade roundabout at Kemplay junction shown in Figure 6-4 into a grade separated interchange with the A66 being placed in an underpass beneath the existing junction, removing between 35 to 50% of the traffic that would otherwise flow through the roundabout. Kemplay Bank will remain signalised with provision for pedestrians to cross through the centre of the junction. The design provides for:

- single lane approaches on the A66 offslips; and
- flared approaches on the remaining arms (A6 north and south) and the A689.



Figure 6-4: A6 / A66 Kemplay Bank scheme design

6.7.8 The proposal at Scotch Corner, shown in Figure 6-5, shows a minor improvement to the Middleton Tyas Arm, and a whitelining exercise to provide three circulatory carriageway lanes on the circulatory carriageway on the northern A1(M) overbridge. This junction was recently upgraded as part of the A1 between Leeming Bar and Barton scheme which was completed in August 2018.

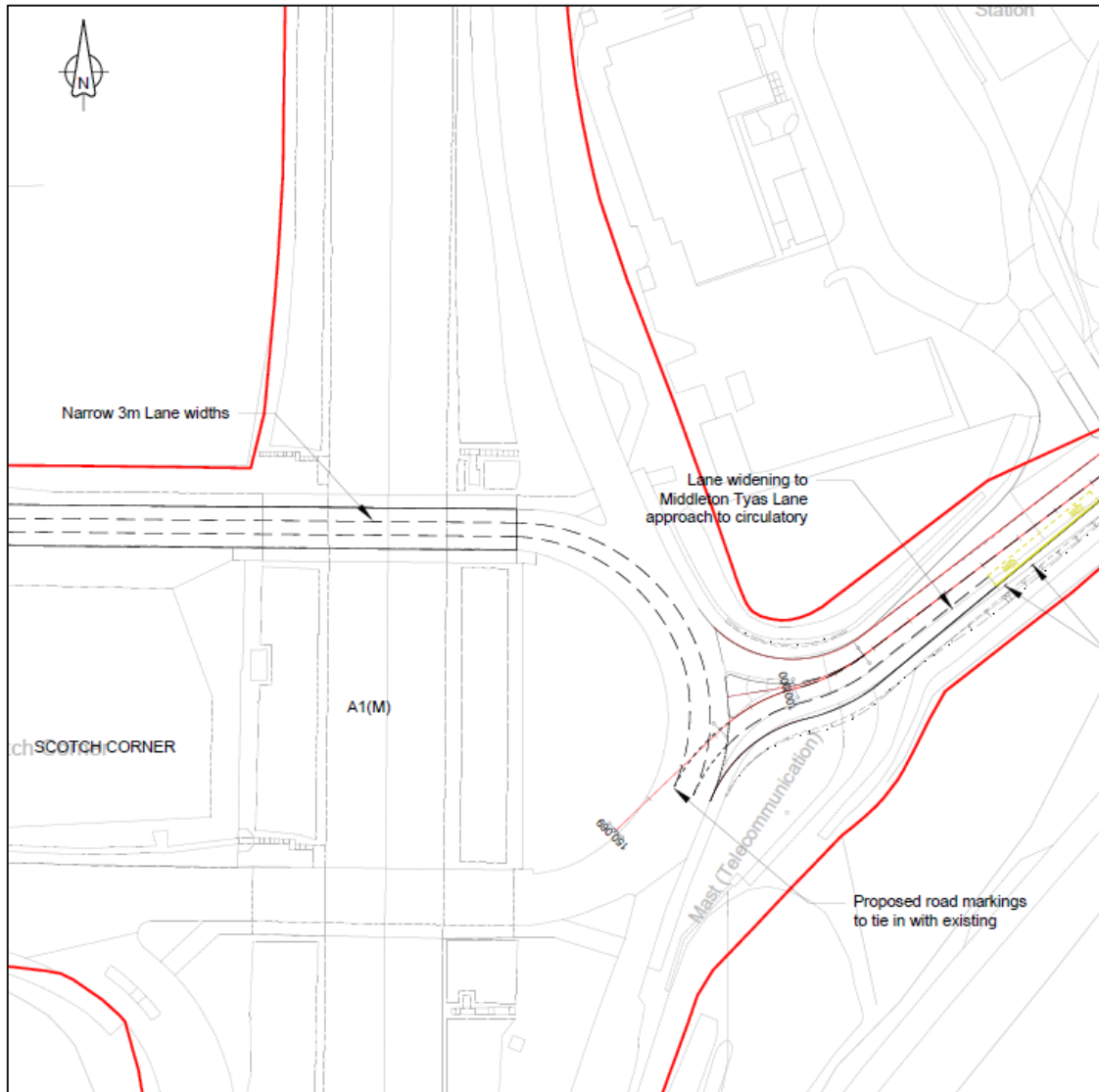


Figure 6-5: A1(M) Jnc 53 Scotch Corner scheme design

7 Equilibrium Forecast Demand

7.1 Reference Forecast Travel Costs

7.1.1 The VDM is an incremental pivot-point model which runs in DIADEM software. The pivot point from which all model forecasts are consistently prepared is from the base scenario. The base scenario has:

- Travel demand identical to the calibrated base year
- Public transport (rail) supply identical to the calibrated base year
- Highway supply identical to the calibrated base year

7.1.2 The VDM model applies to the simulation and buffer area and predicts the responses of:

- Mode choice
- Destination choice
- Macro time of day choice

7.1.3 VDM does not predict change in travel behaviour for:

- Heavy Goods vehicles
- Light Goods vehicles
- Passenger surface access to Newcastle Airport

7.1.4 Only Car available rail travel demand is included. Non-Car available demand that is captive to public transport has been excluded.

7.2 VDM Generalised Costs

7.2.1 The methodology for using generalised costs in the forecast models align with the NRTM development methodology. The growth between 2019 and future year generalised costs in the v1.17 November Databook has been applied to the 2019 v1.15 Databook values to calculate forecast VoT and VoC parameters for the forecast years 2029, 2044 and 2051.

Table 7-1: Value of Time Costs 2029 Parameters – PPM

Element	User Class	AM Peak	Inter Peak	PM Peak
	Employers Business	34.34	35.19	34.84
	Commute	23.03	23.41	23.11
	Other	15.89	16.93	16.64
		24.89	24.89	24.89
		49.78	49.78	49.78

Table 7-2: Vehicle Operating Cost 2029 Parameters – PPK

Element	User Class	AM Peak	Inter Peak	PM Peak
	Employers Business	10.97	10.97	10.97
	Commute	5.28	5.28	5.28
	Other	5.28	5.28	5.28
		13.20	13.20	13.20

Element	User Class	AM Peak	Inter Peak	PM Peak
		41.27	41.27	41.27

Table 7-3: Value of Time Costs 2044 Parameters – PPM

Element	User Class	AM Peak	Inter Peak	PM Peak
Car	Employers Business	42.34	43.39	42.95
	Commute	28.39	28.86	28.49
	Other	19.59	20.87	20.51
LGV		30.68	30.68	30.68
HGV		61.37	61.37	61.37

Table 7-4: Vehicle Operating Cost 2044 Parameters – PPK

Element	User Class	AM Peak	Inter Peak	PM Peak
	Employers Business	8.59	8.59	8.59
	Commute	4.01	4.01	4.01
	Other	4.01	4.01	4.01
		11.56	11.56	11.56
		38.81	38.81	38.81

Table 7-5: Value of Time Costs 2051 Parameters – PPM

Element	User Class	AM Peak	Inter Peak	PM Peak
	Employers Business	46.34	47.48	47.01
	Commute	31.08	31.58	31.18
	Other	21.21	22.84	22.45
		33.58	33.58	33.58
		67.16	67.16	67.16

Table 7-6: Vehicle Operating Cost 2051 Parameters – PPK

Element	User Class	AM Peak	Inter Peak	PM Peak
	Employers Business	8.31	8.31	8.31
	Commute	3.86	3.86	3.86
	Other	3.86	3.86	3.86
		11.13	11.13	11.13
		39.22	39.22	39.22

7.3 VDM Convergence Statistics

7.3.1 VDM convergence data for the DM and DS model runs are provided below in Table 7-7. The following convergence criteria are set, which have been carried across from Stage 2 and are consistent with NRTM:

- Global GAP – 0.1%
- Sub-Area GAP – 0.2%

Table 7-7: VDM convergence data

Scenario	Year	No. of Loops	Global GAP	Sub-Area GAP
	2029	4	0.03%	0.10%
	2044	5	0.01%	0.12%
	2051	6	0.01%	0.19%
	2029	4	0.02%	0.09%
	2044	5	0.02%	0.13%
	2051	6	0.01%	0.20%

7.3.2 The results show that the demand model converges across all scenarios within a satisfactory number of DIADEM loops. Reasonable run times were experienced across all runs.

7.4 Impacts of VDM

7.4.1 The forecast travel demand for all movements is shown in the tables below, showing change in demand through assumed trip growth and VDM response for the following scenarios:

- Base;
- Reference Forecast (pre-VDM) – future year trip growth only (pre-VDM);
- DM (post-VDM)– reference demand with VDM impact based on DM supply changes
- DS (post-VDM) – reference demand with VDM impact based on DS supply changes

7.4.2 The changes summarise impacts by mode, time periods and purpose.

7.4.3 Table 7-8 provides a summary of forecast travel demand over 24 hours by mode for Car and PT (Rail).

Table 7-8: VDM Forecast Travel Demand by Mode

Mode	Year	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
	2029	76,664,726	83,068,932 (8.4%)	83,149,215 (0.1%)	83,149,236 (0.1%)
	2044		91,543,778 (19.4%)	91,741,219 (0.2%)	91,741,241 (0.2%)
	2051		95,471,427 (24.5%)	95,692,371 (0.2%)	95,692,398 (0.2%)
	2029	2,485,470	2,625,220 (5.6%)	2,521,978 (-3.9%)	2,521,952 (-3.9%)
	2044		2,814,507 (13.2%)	2,563,380 (-8.9%)	2,563,352 (-8.9%)
	2051		2,898,727 (16.6%)	2,617,584 (-9.7%)	2,617,551 (-9.7%)

7.4.4 These results by mode over 24 hours show that the growth in demand from base to reference forecast satisfactorily reflects the NTEM growth applied (as shown in Table 6-1 to Table 6-6). The scale of VDM impact in the DM versus the reference forecast shows absolute car demand increase of a similar scale to rail demand decrease, reflecting the mode shift in the future years as the balance between highway and rail travel cost changes

7.4.5 Table 7-9 shows the Car forecast travel demand by model time period.

Table 7-9: Forecast car demand by model time period

Year	Time Period	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
	AM	15,406,734	16,540,895 (7.4%)	16,553,547 (0.1%)	16,553,439 (0.1%)
	IP	28,389,318	30,873,474 (8.8%)	30,906,456 (0.1%)	30,906,924 (0.1%)
	PM	17,626,446	19,079,993 (8.2%)	19,092,863 (0.1%)	19,092,840 (0.1%)
	OP	15,242,228	16,574,570 (8.7%)	16,596,349 (0.1%)	16,596,033 (0.1%)
	AM	15,406,734	18,089,367 (17.4%)	18,116,220 (0.1%)	18,116,123 (0.1%)
	IP	28,389,318	34,127,026 (20.2%)	34,206,511 (0.2%)	34,207,169 (0.2%)
	PM	17,626,446	21,009,270 (19.2%)	21,040,098 (0.1%)	21,039,973 (0.1%)
	OP	15,242,228	18,318,115 (20.2%)	18,378,390 (0.3%)	18,377,976 (0.3%)
	AM	15,406,734	18,822,766 (22.2%)	18,853,909 (0.2%)	18,853,806 (0.2%)
	IP	28,389,318	35,623,806 (25.5%)	35,710,461 (0.2%)	35,711,211 (0.2%)
	PM	17,626,446	21,905,183 (24.3%)	21,936,383 (0.1%)	21,936,314 (0.1%)
	OP	15,242,228	19,119,672 (25.4%)	19,191,618 (0.4%)	19,191,068 (0.4%)

7.4.6 Across the time periods the VDM response from reference forecast to DM is slightly larger in the IP and OP, reflecting time period impacts and the small shift in Car demand from AM and PM to the less busy time periods. In the DS the demand totals are very similar to the DM as would be expected across a model of this size where demand represents the whole of mainland UK.

7.4.7 Table 7-10 shows the car forecast travel demand by trip purpose. Home and Non-home-based purposes are combined for the Business and Other purposes.

Table 7-10: Forecast car demand by trip purpose

Year	Time Period	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
	Business	7,964,169	8,501,585 (6.7%)	8,511,353 (0.1%)	8,511,363 (0.1%)
	Commute	28,451,102	30,167,155 (6.0%)	30,218,123 (0.2%)	30,218,130 (0.2%)
	Other	40,249,455	44,400,192 (10.3%)	44,419,739 (0.0%)	44,419,744 (0.0%)
	Business	7,964,169	9,273,926 (16.4%)	9,297,957 (0.3%)	9,297,969 (0.3%)
	Commute	28,451,102	32,625,713 (14.7%)	32,753,954 (0.4%)	32,753,959 (0.4%)
	Other	40,249,455	49,644,139 (23.3%)	49,689,308 (0.1%)	49,689,313 (0.1%)
	Business	7,964,169	9,659,947 (21.3%)	9,685,493 (0.3%)	9,685,506 (0.3%)
	Commute	28,451,102	33,825,513 (18.9%)	33,969,931 (0.4%)	33,969,938 (0.4%)
	Other	40,249,455	51,985,968 (29.2%)	52,036,947 (0.1%)	52,036,953 (0.1%)

7.4.8 The scale of demand growth from base to reference forecast scenario satisfactorily reflects the NTEM growth proportions presented earlier in Table 6-1 to Table 6-3.

7.4.9 Appendix B contains tables of sectorised demand showing the Reference Case demand and the absolute and proportional change to the Do Minimum and Do Something. The appendix contains tables for all modelled years and journey purposes at a 24-hour level. The tables show that between the Reference Case and the Do Minimum Growth in demand in all years relative to the Base year for all car movements, apart from the intra sector movements, and movements between nearby sectors. This is indicative of a general re-distribution of trips with destination choice in the VDM. A general increase in longer distance movements can also be seen, which is also indicative of a general re-distribution of trips with destination choice in the VDM.

7.4.10 The appendix also contains a comparison of the Do Minimum and the Do Something. The Project can be seen to be increasing trips across the Pennines, for example between sectors in the west such as Eden and Carlisle and sectors in the east such as Durham and Darlington, Stockton and Hartlepool, generally at the expense of intra sector trips. This is the expected result of a Project that improves trans Pennine connectivity.

8 Assignment Results

8.1 Highway Assignment Model Convergence

8.1.1 TAG Unit M3.1 provides guidance on assignment model convergence and stability, which is set out below in Table 8-1, and has been used as the acceptability convergence criteria for the model.

Table 8-1: Convergence Criteria – TAG Unit M3.1

Measure	Criteria
Convergence Gap	Adopt TAG criteria 0.1%
Percentage of links with flow change (P)<1%	Adopt TAG criteria – 4 iterations >98%
Percentage of links with cost change (P2)<1%	Adopt TAG criteria – 4 iterations >98%

8.1.2 Highway assignment model convergence for each forecast scenario is presented in tables Table 8-2 to Table 8-7. Convergence has been assessed for the final four loops of the following scenarios:

- DM 2029 (Table 8-2)
- DM 2044 (Table 8-3)
- DM 2051 (Table 8-4)
- DS 2029 (Table 8-5)
- DS 2044 (Table 8-6)
- DS 2051 (Table 8-7)

Table 8-2: DM Convergence Statistics (2029)

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
18	98.7	0.000	18	98.6	0.000	35	98.5	0.001
19	98.6	0.001	19	98.8	0.000	36	99.1	0.001
20	98.7	0.000	20	98.5	0.000	37	98.8	0.001
21	99.0	0.000	21	99.2	0.000	38	99.1	0.001

Table 8-3: DM Convergence Statistics (2044)

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
29	98.7	0.001	25	98.7	0.000	28	98.8	0.002
30	98.6	0.001	26	98.8	0.000	29	98.8	0.001
31	98.8	0.001	27	98.9	0.000	30	98.9	0.001
32	98.5	0.001	28	98.9	0.000	31	98.6	0.001

Table 8-4: DM Convergence Statistics (2051)

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
42	98.8	0.001	27	98.7	0.000	35	98.8	0.002
43	98.8	0.001	28	98.8	0.000	36	98.7	0.002
44	99	0.001	29	99	0.000	37	98.8	0.002
45	99.1	0.001	30	99.0	0.000	38	98.7	0.002

Table 8-5: DS Convergence Statistics (2029)

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
19	98.5	0.000	18	98.8	0.000	29	98.6	0.001
20	98.8	0.000	19	98.5	0.000	30	98.9	0.001
21	98.8	0.001	20	99.1	0.000	31	98.8	0.002
22	98.7	0.000	21	98.9	0.000	32	98.7	0.001

Table 8-6: DS Convergence Statistics (2044)

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
31	98.9	0.001	21	98.8	0.000	28	98.6	0.002
32	98.9	0.001	22	98.9	0.000	29	98.7	0.002
33	99.2	0.001	23	99.1	0.000	30	98.6	0.002
34	98.9	0.001	24	98.5	0.000	31	98.8	0.001

Table 8-7: DS Convergence Statistics (2051)

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
46	98.8	0.001	26	98.6	0.001	34	98.6	0.003
47	99	0.001	27	98.8	0.000	35	98.7	0.002
48	98.6	0.001	28	98.7	0.001	36	98.8	0.002
49	99.1	0.001	29	99.0	0.000	37	98.7	0.002

8.1.3 The assignment convergence statistics provided in Table 8-2 to Table 8-7 show that all models converge within a reasonable number of iterations, such that the rate of improvement of the convergence statistics is uniform and does not slow significantly or bottom out as the stopping criterion are approached.

8.2 Forecast Network Performance

8.2.1 The network performance statistics are based on assigned traffic in the SATURN assignment model.

8.2.2 The tables below show the network statistic PM scenario values and differences between scenarios as follows:

- Table 8-8 – Network Statistics, Values – 2029
- Table 8-9 – Network Statistics, Differences – 2029
- Table 8-10 – Network Statistics, Values – 2044
- Table 8-11 – Network Statistics, Differences – 2044
- Table 8-12 – Network Statistics, Values – 2051
- Table 8-13 – Network Statistics, Differences – 2051.

8.2.3 Values in the tables represent the following:

- Time – Total Travel Time, pcu hours (000)
- Distance – Total Distance Travelled, pcu kms (000)
- Speed – Total Average Speed, kph
- Trips – Total Trip, (pcu/hr)

Table 8-8: Network Statistics – Values 2029

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	1,845	128,636	70	1,657,070
	IP	1,291	93,093	72	1,248,207
	PM	1,768	123,303	70	1,671,213
DM Post VDM	AM	1,948	135,917	70	1,723,445
	IP	1,361	98,234	72	1,297,441
	PM	1,872	130,646	70	1,739,898
DS Post VDM	AM	1,948	135,952	70	1,723,432
	IP	1,361	98,286	72	1,297,536
	PM	1,872	130,701	70	1,739,929

Table 8-9: Network Statistics – comparisons between scenarios 2029

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	144 (8%)	8,408 (7%)	-1 (-1%)	111,250 (7%)
	IP	102 (9%)	6,152 (7%)	-1 (-1%)	86,810 (7%)
	PM	139 (9%)	8,221 (7%)	-1 (-1%)	115,554 (7%)
DM Post VDM vs Reference	AM	103 (6%)	7,281 (6%)	0 (0%)	66,374 (4%)
	IP	70 (5%)	5,141 (6%)	0 (0%)	49,235 (4%)
	PM	104 (6%)	7,343 (6%)	0 (0%)	68,686 (4%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	35 (0%)	0 (0%)	-13 (0%)
	IP	0 (0%)	52 (0%)	0 (0%)	94 (0%)
	PM	0 (0%)	55 (0%)	0 (0%)	31 (0%)

Table 8-10: Network Statistics – Values 2044

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
	AM	2,070	141,981	69	1,830,005

Scenario	Time Period	Time	Distance	Speed	Trips
Reference Forecast	IP	1,449	102,845	71	1,382,029
	PM	1,982	135,927	69	1,845,210
DM Post VDM	AM	2,348	161,311	69	2,004,630
	IP	1,641	116,577	71	1,513,876
	PM	2,263	155,486	69	2,026,913
DS Post VDM	AM	2,348	161,357	69	2,004,627
	IP	1,641	116,653	71	1,513,999
	PM	2,264	155,555	69	2,026,906

Table 8-11: Network Statistics – comparisons between scenarios 2044

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	369 (22%)	21,752 (18%)	-2 (-3%)	284,184 (18%)
	IP	260 (22%)	15,903 (18%)	-2 (-3%)	220,632 (19%)
	PM	353 (22%)	20,846 (18%)	-2 (-3%)	289,551 (19%)
DM Post VDM vs Reference	AM	279 (13%)	19,331 (14%)	0 (0%)	174,625 (10%)
	IP	192 (13%)	13,733 (13%)	0 (0%)	131,848 (10%)
	PM	281 (14%)	19,559 (14%)	0 (0%)	181,703 (10%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	46 (0%)	0 (0%)	-3 (0%)
	IP	0 (0%)	76 (0%)	0 (0%)	123 (0%)
	PM	0 (0%)	69 (0%)	0 (0%)	-7 (0%)

Table 8-12: Network Statistics – Values 2051

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	2,168	147,994	68	1,908,303
	IP	1,519	107,282	71	1,443,365
	PM	2,078	141,764	68	1,926,326
DM Post VDM	AM	2,490	170,241	68	2,108,685
	IP	1,742	123,151	71	1,595,396
	PM	2,403	164,265	68	2,134,907
DS Post VDM	AM	2,490	170,290	68	2,108,687
	IP	1,742	123,232	71	1,595,534
	PM	2,403	164,342	68	2,134,951

Table 8-13: Network Statistics – comparisons between scenarios 2051

Scenario	Time Period	Time	Distance	Speed	Trips
	AM	467 (27%)	27,765 (23%)	-2 (-3%)	362,482 (23%)
	IP	330 (28%)	20,341 (23%)	-3 (-3%)	281,968 (24%)
	PM	449 (28%)	26,682 (23%)	-2 (-3%)	370,667 (24%)
	AM	322 (15%)	22,247 (15%)	0 (0%)	200,382 (11%)
	IP	223 (15%)	15,868 (15%)	0 (0%)	152,031 (11%)

Scenario	Time Period	Time	Distance	Speed	Trips
	PM	325 (16%)	22,501 (16%)	0 (0%)	208,582 (11%)
	AM	0 (0%)	50 (0%)	0 (0%)	3 (0%)
	IP	0 (0%)	82 (0%)	0 (0%)	138 (0%)
	PM	0 (0%)	78 (0%)	0 (0%)	43 (0%)

8.2.4 The network performance statistics show that the main changes occur between the base and reference forecast, as a result of the assigned trip growth, and then to a lesser extent between reference forecast and DM as a result of the VDM response to change in costs. The differences between the DM and DS are minor in comparison, as would be expected considering the only model input change is the A66 Project network. This pattern is consistent across the time periods and years. Overall these results appear reasonable and generally consistent with those results achieved within Stage 2.

8.3 Forecast Traffic Flows

8.3.1 Forecast traffic flows for each forecast year are shown below for the A66 corridor, and mainline M6 either side of J40 and likewise for A1(M) Scotch Corner:

- Table 8-14 - 12-Hour Traffic Flows (vehicles, two-way) – 2029;
- Table 8-15 - 12-Hour Traffic Flows (vehicles, two-way) – 2044; and
- Table 8-16 - 12-Hour Traffic Flows (vehicles, two-way) – 2051.

8.3.2 A map showing the link locations where traffic flows have been extracted from the model is provided in Figure 8-1.

8.3.3 Detailed traffic flow diagrams showing AADT for the DM, DS and change from DS vs. DM for the Design Year, 2044 can be found in **Appendix C – Core Scenario Design Year Forecast Flows.**

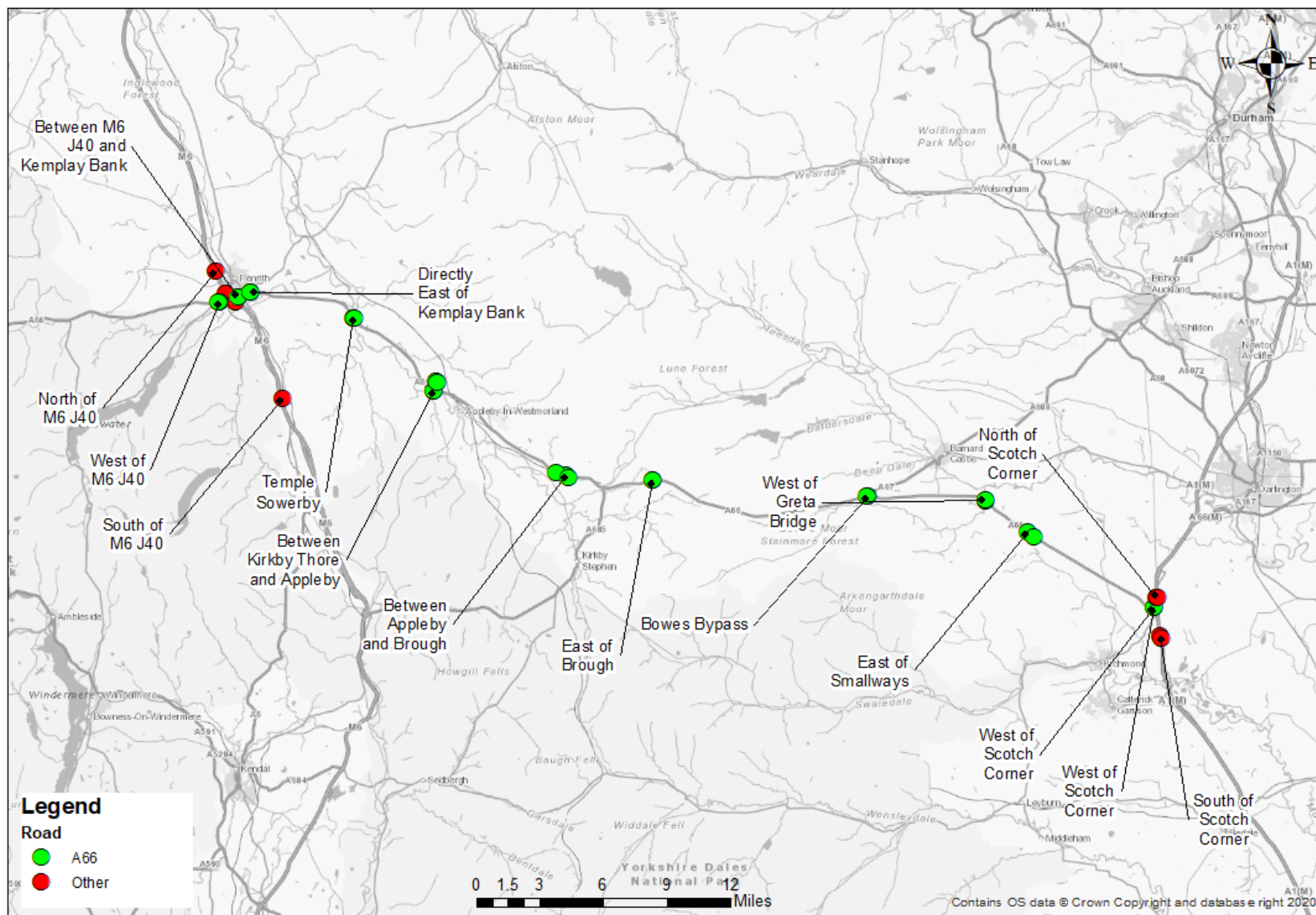


Figure 8-1:A66 Traffic Flow Locations

Table 8-14: 12-Hour Traffic Flows (vehicles, two-way) - 2029

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
	West of M6 J40	16,584	17,687	18,644	19,307	1,103 (7%)	957 (5%)	663 (4%)
	Between M6 J40 and Kemplay Bank	25,699	27,502	29,319	33,508	1,802 (7%)	1,818 (7%)	4,189 (14%)
	Directly East of Kemplay Bank	17,598	19,073	19,968	25,354	1,476 (8%)	894 (5%)	5,386 (27%)
	Temple Sowerby	14,459	15,589	16,459	22,590	1,130 (8%)	870 (6%)	6,131 (37%)
	Between Kirkby Thore and Appleby	15,629	16,767	17,693	20,889	1,138 (7%)	927 (6%)	3,196 (18%)
	Between Appleby and Brough	13,038	13,790	14,660	20,280	752 (6%)	871 (6%)	5,620 (38%)
	East of Brough	14,793	16,020	17,227	22,555	1,227 (8%)	1,207 (8%)	5,328 (31%)
	Bowes Bypass	12,701	14,119	15,075	20,697	1,418 (11%)	955 (7%)	5,623 (37%)
	West of Greta Bridge	15,422	17,004	18,094	24,111	1,582 (10%)	1,089 (6%)	6,018 (33%)
	East of Smallways	15,196	16,769	17,798	24,408	1,573 (10%)	1,029 (6%)	6,609 (37%)
	West of Scotch Corner	15,652	17,595	18,597	25,145	1,943 (12%)	1,002 (6%)	6,548 (35%)
	North of Scotch Corner	49,043	56,097	61,094	62,968	7,054 (14%)	4,998 (9%)	1,873 (3%)
	South of Scotch Corner	51,079	56,245	61,312	64,156	5,165 (10%)	5,068 (9%)	2,844 (5%)
	North of M6 J40	42,658	46,550	51,330	52,597	3,891 (9%)	4,781 (10%)	1,267 (2%)
	South of M6 J40	31,472	33,993	37,037	35,465	2,521 (8%)	3,043 (9%)	-1,572 (-4%)

Table 8-15: 12-Hour Traffic Flows (vehicles, two-way) - 2044

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
	West of M6 J40	16,584	19,499	21,972	23,001	2,915 (18%)	2,473 (13%)	1,030 (5%)
	Between M6 J40 and Kemplay Bank	25,699	29,610	33,367	38,319	3,911 (15%)	3,757 (13%)	4,952 (15%)
	Directly East of Kemplay Bank	17,598	20,973	22,903	29,910	3,375 (19%)	1,931 (9%)	7,007 (31%)
	Temple Sowerby	14,459	17,030	18,866	26,748	2,571 (18%)	1,836 (11%)	7,882 (42%)
	Between Kirkby Thore and Appleby	15,629	18,254	20,181	24,854	2,625 (17%)	1,927 (11%)	4,674 (23%)
	Between Appleby and Brough	13,038	15,105	16,979	24,164	2,067 (16%)	1,874 (12%)	7,185 (42%)
	East of Brough	14,793	17,945	20,958	27,822	3,152 (21%)	3,012 (17%)	6,865 (33%)
	Bowes Bypass	12,701	16,050	18,301	25,385	3,349 (26%)	2,251 (14%)	7,085 (39%)
	West of Greta Bridge	15,422	19,058	21,404	29,474	3,636 (24%)	2,346 (12%)	8,070 (38%)
	East of Smallways	15,196	18,752	20,553	29,776	3,556 (23%)	1,801 (10%)	9,223 (45%)
	West of Scotch Corner	15,652	19,814	22,014	30,252	4,162 (27%)	2,200 (11%)	8,239 (37%)
	North of Scotch Corner	49,043	62,382	73,079	75,069	13,338 (27%)	10,697 (17%)	1,991 (3%)
	South of Scotch Corner	51,079	62,531	73,604	76,407	11,451 (22%)	11,074 (18%)	2,803 (4%)
	North of M6 J40	42,658	52,165	62,613	64,520	9,507 (22%)	10,448 (20%)	1,906 (3%)
	South of M6 J40	31,472	38,474	46,266	45,006	7,001 (22%)	7,792 (20%)	-1,260 (-3%)

Table 8-16: 12-Hour Traffic Flows (vehicles, two-way) - 2051

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
	West of M6 J40	16,584	20,558	23,190	24,336	3,974 (24%)	2,631 (13%)	1,147 (5%)
	Between M6 J40 and Kemplay Bank	25,699	30,574	34,343	39,891	4,875 (19%)	3,768 (12%)	5,548 (16%)
	Directly East of Kemplay Bank	17,598	21,850	23,678	31,477	4,252 (24%)	1,828 (8%)	7,799 (33%)
	Temple Sowerby	14,459	17,652	19,431	28,108	3,193 (22%)	1,779 (10%)	8,677 (45%)
	Between Kirkby Thore and Appleby	15,629	18,918	20,839	26,160	3,289 (21%)	1,921 (10%)	5,321 (26%)
	Between Appleby and Brough	13,038	15,664	17,555	25,484	2,626 (20%)	1,891 (12%)	7,929 (45%)
	East of Brough	14,793	18,785	22,033	29,479	3,992 (27%)	3,248 (17%)	7,446 (34%)
	Bowes Bypass	12,701	16,822	19,218	26,902	4,120 (32%)	2,397 (14%)	7,684 (40%)
	West of Greta Bridge	15,422	19,812	22,386	31,246	4,390 (28%)	2,573 (13%)	8,861 (40%)
	East of Smallways	15,196	19,427	21,168	31,448	4,231 (28%)	1,741 (9%)	10,280 (49%)
	West of Scotch Corner	15,652	20,689	22,917	31,862	5,037 (32%)	2,229 (11%)	8,945 (39%)
	North of Scotch Corner	49,043	64,829	76,113	78,143	15,785 (32%)	11,284 (17%)	2,030 (3%)
	South of Scotch Corner	51,079	65,227	77,019	80,131	14,148 (28%)	11,792 (18%)	3,111 (4%)
	North of M6 J40	42,658	54,623	66,191	68,139	11,965 (28%)	11,568 (21%)	1,949 (3%)
	South of M6 J40	31,472	40,690	49,541	48,138	9,218 (29%)	8,850 (22%)	-1,403 (-3%)

8.3.4 The traffic flows above show the following:

- Traffic flows show similar patterns compared with Stage 2 results
- Reference Forecast growth is generally similar to NTEM background growth on the West side of the A66 corridor, but less so on the east side where it is slightly higher. Reference forecast growth along the A66 corridor is as follows:
 - 6% - 12% (2029)
 - 15% - 27% (2044)
 - 19% - 32% (2051)
- The impact of VDM on traffic flows on the A66 in the DM are significant with an increase in traffic compared to the reference forecast of;
 - 5% - 8% (2029)
 - 9% - 13% (2044)
 - 9% - 17% (2051)
- This reflects the response to change in costs between base and future years, and the resulting impact of an increase in longer car journeys which use the A66 and other strategic roads.
- The DS vs. DM results show traffic flows increase by at least 30%-40% at most locations along the A66 with the Project in place due to re-routing and VDM response. Traffic growth on the A66 corridor due to the Project ranges between;
 - 14% - 38% (2029)
 - 15% - 45% (2044)
 - 16% - 49% (2051)
- The lowest percentage increases are associated with the section of A66 between M6 junction 40 and Kemplay Bank close to Penrith, where the base traffic flows are highest, with most other locations much closer to the higher end of the range between 30%-40%.

8.3.5 The following tables show traffic flows by vehicle types along the A66 corridor

- Table 8-17 – Vehicle Flows by Vehicle Type (Two-way) – 2029
- Table 8-18 – Vehicle Flows by Vehicle Type (Two-way) – 2044
- Table 8-19 – Vehicle Flows by Vehicle Type (Two-way) – 2051

8.3.6 Lights represent cars and LGVs; and Heavies HGVs.

Table 8-17: Vehicle Flows by Vehicle Type (two-way) 2029

Road	Location	Scenario	AM (veh/hr)		IP (veh/hr)		PM (veh/hr)	
			Lights	Heavies	Lights	Heavies	Lights	Heavies
A66	East of M6 J40	Base	1,926 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,197 (84%)	421 (16%)	2,000 (83%)	407 (17%)	2,396 (87%)	361 (13%)
		DS	2,514 (85%)	438 (15%)	2,313 (84%)	425 (16%)	2,837 (88%)	386 (12%)
A66	East of Brough	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,134 (81%)	267 (19%)	1,238 (81%)	283 (19%)	1,275 (82%)	278 (18%)
		DS	1,489 (84%)	290 (16%)	1,656 (85%)	299 (15%)	1,864 (86%)	300 (14%)
A66	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,261 (82%)	273 (18%)	1,254 (80%)	321 (20%)	1,464 (83%)	308 (17%)
		DS	1,708 (85%)	297 (15%)	1,762 (84%)	337 (16%)	2,206 (87%)	331 (13%)

Table 8-18: Vehicle Flows by Vehicle Type (two-way) 2044

Road	Location	Scenario	AM (veh/hr)		IP (veh/hr)		PM (veh/hr)	
			Lights	Heavies	Lights	Heavies	Lights	Heavies
A66	East of M6 J40	Base	1,926 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,524 (85%)	442 (15%)	2,331 (85%)	425 (15%)	2,740 (88%)	375 (12%)
		DS	2,925 (86%)	458 (14%)	2,699 (86%)	441 (14%)	3,263 (89%)	393 (11%)
A66	East of Brough	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,416 (83%)	280 (17%)	1,547 (84%)	297 (16%)	1,618 (85%)	291 (15%)
		DS	1,882 (86%)	304 (14%)	2,107 (87%)	312 (13%)	2,349 (88%)	309 (12%)
A66	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,512 (84%)	290 (16%)	1,539 (82%)	338 (18%)	1,780 (85%)	304 (15%)
		DS	2,115 (87%)	315 (13%)	2,222 (86%)	354 (14%)	2,584 (88%)	337 (12%)

Table 8-19: Vehicle Flows by Vehicle Type (two-way) 2051

Road	Location	Scenario	AM (veh/hr)		IP (veh/hr)		PM (veh/hr)	
			Lights	Heavies	Lights	Heavies	Lights	Heavies
A66	East of M6 J40	Base	1,926 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,596 (85%)	452 (15%)	2,407 (85%)	433 (15%)	2,831 (88%)	372 (12%)
		DS	3,098 (87%)	464 (13%)	2,794 (86%)	442 (14%)	3,436 (89%)	403 (11%)
A66	East of Brough	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,499 (84%)	286 (16%)	1,636 (84%)	303 (16%)	1,705 (85%)	297 (15%)
		DS	2,027 (87%)	310 (13%)	2,235 (88%)	319 (12%)	2,498 (89%)	316 (11%)
A66	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,597 (85%)	290 (15%)	1,612 (82%)	343 (18%)	1,851 (86%)	307 (14%)
		DS	2,271 (88%)	322 (12%)	2,352 (87%)	362 (13%)	2,695 (89%)	345 (11%)

- 8.3.7 The tables for light and heavy vehicles show the following:
- A high proportion of Heavies along the A66 at Bowes Bypass and West of Scotch Corner (approx.20-25%).
 - A reduction in the proportion of Heavies in the future as RTF HGV growth is not forecast to be as significant as Car NTEM growth and RTF LGV growth. (Refer to Section 6.2 for RTF HGV & LGV growth).
 - A higher proportion of light vehicles in the DS compared to the DM due to assignment re-routing and HGV demand being fixed.
- 8.3.8 Difference plots showing the flow difference between the DM and the DS by time period and year for all vehicles are shown in **Appendix C – Core Scenario Forecast Flow Difference Plots by Period.**
- 8.3.9 Overall, the outputs above indicate a similar level of flow and differences across future year scenarios compared with the Stage 2 results.

8.4 Forecast Traffic Delay

8.4.1 Forecast traffic delays have been assessed on approaches to major junctions along the A66 including;

- M6 Junction 40
- Kemplay Bank
- Scotch Corner

8.4.2 Delay information in this section relates to the base, DM 2044 and DS 2044 scenarios for AM, IP and PM peak periods. Whilst the delay information from the SATURN A66 traffic model provides an indication of operational performance, each junction has been assessed separately within VISSIM (microsimulation modelling software) which is considered more appropriate when focussing on a much smaller and localised area. Full information on these operational forecast models can be found separately within the **3.7 Transport Assessment Chapter 8.2 Major junction performance**.

Junction 40

8.4.3 The following figure and tables show the junction approaches and forecast delays on the M6 junction 40;

- Figure 8-2 – M6 Junction 40 approaches
- Table 8-20 – M6 Junction 40 AM Delays
- Table 8-21 – M6 Junction 40 IP Delays
- Table 8-22 – M6 Junction 40 PM Delays



Figure 8-2: Junction 40 approaches

Table 8-20: Delay (s) Junction 40 – AM

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A592	30	71	21	41 (139%)	-50 (-70%)
A66 East	18	20	21	2 (13%)	1 (5%)
M6 South	38	67	23	30 (79%)	-45 (-67%)
A66 West	24	58	22	34 (141%)	-36 (-62%)
M6 North	17	30	32	13 (76%)	2 (7%)

Table 8-21: Delay (s) Junction 40 - IP

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A592	24	62	14	38 (157%)	-48 (-77%)
A66 East	14	18	12	4 (31%)	-6 (-32%)
M6 South	42	96	26	54 (130%)	-69 (-72%)
A66 West	22	45	23	24 (109%)	-22 (-49%)
M6 North	15	19	31	3 (22%)	12 (66%)

Table 8-22: Delay (s) Junction 40 PM

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A592	28	106	15	78 (279%)	-91 (-86%)
A66 East	14	20	14	5 (37%)	-6 (-31%)
M6 South	47	133	27	86 (183%)	-106 (-80%)
A66 West	22	82	24	60 (271%)	-57 (-70%)
M6 North	16	19	43	4 (24%)	24 (125%)

8.4.4 Forecast delays at M6 Junction 40 are close to one minute for the design year DM scenario, particularly on the A592 and M6 South junction approaches where delays are in the region of two minutes during the PM peak period. Whilst the percentage change in delay between the base and DM is high on these approaches, the DS scenario reveals a reduction of 70-80% in delay from the DM. Delays on the A66 East and M6 North remain relatively low across the base, DM and Do-something scenarios and are generally within 30 seconds. All forecast delays are comfortably within a minute on all approaches in all time periods for the DS scenario.

Kemplay Bank

8.4.5 The following figure and tables show the junction approaches and forecast delays on Kemplay Bank;

- Figure 8-3 – Kemplay Bank approaches
- Table 8-23 – Kemplay Bank AM Delays
- Table 8-24 - Kemplay Bank IP Delays
- Table 8-25 - Kemplay Bank PM Delays



Figure 8-3: Kemplay Bank junction approaches

Table 8-23: Delay (s) Kemplay Bank - AM

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	61	97	29	36 (58%)	-68 (-70%)
A66 East	21	26	18	5 (23%)	-8 (-32%)
A6 South (Kemplay Bank)	20	20	21	0 (0%)	1 (6%)
A66 West	14	22	41	8 (57%)	19 (85%)
A6 North (Bridge Lane)	18	26	26	8 (42%)	0 (1%)

Table 8-24: Delay (s) Kemplay Bank - IP

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	44	60	29	16 (37%)	-31 (-51%)
A66 East	20	45	21	24 (118%)	-23 (-52%)
A6 South (Kemplay Bank)	24	31	31	8 (33%)	0 (-1%)

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A66 West	11	14	16	4 (36%)	2 (13%)
A6 North (Bridge Lane)	18	25	26	7 (42%)	1 (2%)

Table 8-25: Delay (s) Kemplay Bank - PM

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	59	89	34	31 (53%)	-56 (-62%)
A66 East	21	63	22	42 (201%)	-40 (-64%)
A6 South (Kemplay Bank)	25	42	39	17 (68%)	-4 (-9%)
A66 West	11	15	17	4 (38%)	2 (12%)
A6 North (Bridge Lane)	19	28	28	9 (49%)	0 (0%)

8.4.6 Forecast delays at Kemplay Bank are generally within one minute on all approaches across AM, IP and PM periods during the design year. The highest delay is seen on the A686 (Carleton Avenue) which exceeds one minute in the DM scenario but this reduces to approximately 30 seconds across all time periods in the DS. The DS scenario shows a generous reduction in delay on the A686(Carleton Avenue) and A66 East compared with the DM. During the AM peak there is a small increase in delay between the DM and DS scenarios on the A66 West approach.

Scotch Corner

8.4.7 The following figure and tables show the junction approaches and forecast delays on Scotch Corner;

- Figure 8-4 – Scotch Corner approaches
- Table 8-26 – Scotch Corner AM Delays
- Table 8-27 - Scotch Corner IP Delays
- Table 8-28: Delay (s) PM Scotch Corner- Scotch Corner PM Delays

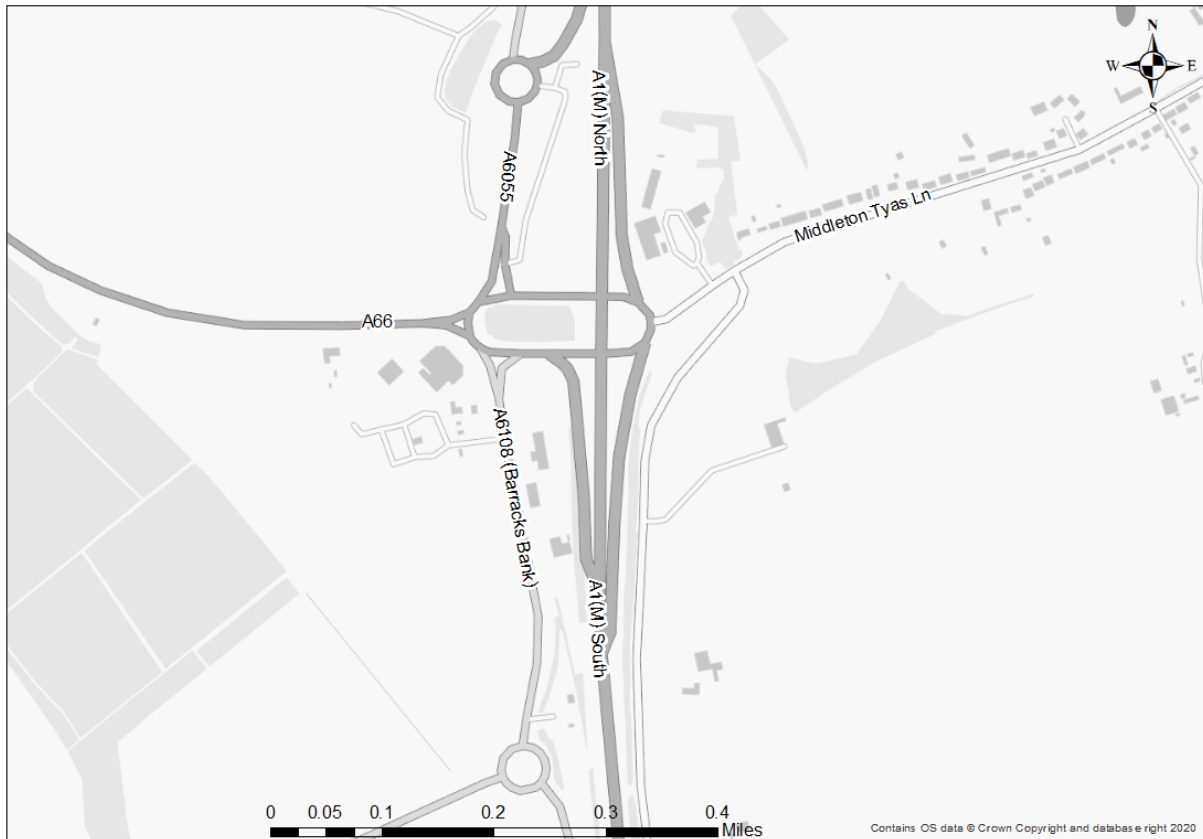


Figure 8-4: Scotch Corner junction approaches

Table 8-26: Delay (s) Scotch Corner - AM

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A1(M) North	15	17	18	2 (10%)	1 (6%)
Middleton Tyas Ln	7	10	11	2 (32%)	1 (14%)
A1(M) South	21	22	23	1 (6%)	1 (5%)
A6108 (Barracks Bank)	19	21	20	1 (7%)	0 (0%)
A66	12	13	15	1 (7%)	1 (11%)
A6055	6	6	6	0 (4%)	0 (7%)

Table 8-27: Delay (s) Scotch Corner - IP

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A1(M) North	18	21	24	3 (17%)	3 (12%)
Middleton Tyas Ln	7	10	11	3 (38%)	1 (14%)
A1(M) South	14	15	16	1 (6%)	1 (5%)

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A6108 (Barracks Bank)	15	16	16	1 (9%)	0 (0%)
A66	14	15	17	1 (8%)	2 (13%)
A6055	6	6	6	0 (5%)	0 (7%)

Table 8-28: Delay (s) PM Scotch Corner

Time Period	Base 2019	DM 2044	DS 2044	DM vs. Base	DS vs. DM
A1(M) North	19	24	26	5 (26%)	2 (8%)
Middleton Tyas Ln	8	13	14	5 (71%)	1 (8%)
A1(M) South	14	15	17	1 (7%)	2 (11%)
A6108 (Barracks Bank)	16	19	20	4 (23%)	0 (2%)
A66	14	16	18	1 (9%)	3 (18%)
A6055	6	6	7	1 (10%)	1 (13%)

8.4.8 Forecast delays at Scotch are low across all scenarios and time periods with only small increases between the DM vs. Base and DS vs. DM. All delays remain within 30 seconds for the design year DS scenario.

8.4.9 Forecast delays at these locations for all other modelled years are contained in **Appendix D – Core Scenario Forecast Delay**

8.5 Forecast Journey Times

8.5.1 Journey times for the A66 corridor between Scotch Corner and M6 Junction 40 are shown below:

- Table 8-29 – A66 Corridor Journey times (mm:ss) – 2029
- Table 8-30 – A66 Corridor Journey times (mm:ss) – 2044
- Table 8-31 – A66 Corridor Journey times (mm:ss) – 2051

8.5.2 The routes capture delay through the Kemplay Bank junction and stop line delay on the approaches to the M6 J40 and Scotch Corner.

Table 8-29: A66 Corridor Journey Times (mm:ss) - 2029

Time Period	Direction	Base 2019	2029 DM	2029 DS	DM vs. Base	DS vs. DM
	A66 - Eastbound	53:20	54:36	44:47	01:16 (2%)	-09:49 (-18%)
	A66 - Westbound	54:11	55:25	45:04	01:14 (2%)	-10:21 (-19%)
	A66 - Eastbound	54:11	55:36	45:04	01:25 (3%)	-10:32 (-19%)
	A66 - Westbound	54:05	55:46	44:56	01:41 (3%)	-10:50 (-19%)
	A66 - Eastbound	54:49	56:22	45:12	01:33 (3%)	-11:10 (-20%)
	A66 - Westbound	54:26	56:04	45:20	01:38 (3%)	-10:44 (-19%)
	A66 - Eastbound	49:25	49:32	44:07	00:07 (0%)	-05:25 (-11%)
	A66 - Westbound	49:24	49:39	44:10	00:15 (0%)	-05:29 (-11%)

Table 8-30: A66 Corridor Journey Times (mm:ss) - 2044

Time Period	Direction	Base 2019	2044 DM	2044 DS	DM vs. Base	DS vs. DM
	A66 - Eastbound	53:20	56:34	45:11	03:13 (6%)	-11:23 (-20%)
	A66 - Westbound	54:11	57:29	45:26	03:17 (6%)	-12:02 (-21%)
	A66 - Eastbound	54:11	57:54	45:27	03:43 (7%)	-12:27 (-22%)
	A66 - Westbound	54:05	58:21	45:29	04:15 (8%)	-12:51 (-22%)
	A66 - Eastbound	54:49	58:58	45:45	04:09 (8%)	-13:13 (-22%)
	A66 - Westbound	54:26	58:49	45:55	04:23 (8%)	-12:54 (-22%)
	A66 - Eastbound	49:25	49:43	44:09	00:18 (1%)	-05:34 (-11%)
	A66 - Westbound	49:24	49:55	44:11	00:31 (1%)	-05:44 (-11%)

Table 8-31: A66 Corridor Journey Times (mm:ss) - 2051

Time Period	Direction	Base 2019	2051 DM	2051 DS	DM vs. Base	DS vs. DM
	A66 - Eastbound	53:20	57:07	45:20	03:46 (7%)	-11:46 (-21%)
	A66 - Westbound	54:11	58:22	45:39	04:11 (8%)	-12:43 (-22%)
	A66 - Eastbound	54:11	58:39	45:36	04:28 (8%)	-13:03 (-22%)
	A66 - Westbound	54:05	59:17	45:41	05:11 (10%)	-13:35 (-23%)
	A66 - Eastbound	54:49	59:55	45:56	05:06 (9%)	-13:58 (-23%)
	A66 - Westbound	54:26	59:55	46:10	05:30 (10%)	-13:45 (-23%)
	A66 - Eastbound	49:25	49:48	44:10	00:23 (1%)	-05:38 (-11%)
	A66 - Westbound	49:24	50:01	44:12	00:37 (1%)	-05:49 (-12%)

8.5.3 These results show the following:

- Journey time increases between the base and DM, with travel times increasing in the future years during AM/IP/PM as follows:
 - One to two minutes (2029)
 - Three to five minutes (2044)
 - Four to six minutes (2051)
- A journey time decrease between the DM and DS scenarios, with time saving increasing in the later forecast years. Time savings for AM/IP/PM are as follows:
 - 10 – 11 minutes (2029)
 - 11 – 13 minutes (2044)
 - 12 – 14 minutes (2051)

8.5.4 The travel times and scale of time saving with the Project in place is very similar to Stage 2 where journey time savings were in the order of 10 – 15 minutes.

9 Sensitivity Tests

9.1 Introduction

Demand Assumptions

9.1.1 The Core Scenario is based on the most unbiased and realistic set of assumptions that will form the central case, defined in TAG Unit M4 Forecasting and Uncertainty as follows:

- NTEM growth in demand, at a suitable spatial area.
- Sources of local uncertainty that are more likely to occur than not.
- Appropriate modelling assumptions.

9.1.2 In addition to the core scenario, TAG requires that additional sensitivity tests be undertaken. Specifically, high and low growth scenarios are defined to assess whether the Project is still effective in reducing congestion in high demand scenarios and is still economically viable in low demand scenarios.

9.1.3 For highway demand at the national level within a 36 year horizon, the demand that is added to the core for the high scenario and removed from the core from the low scenario is described by the following⁶:

$$P = 15y^{1/2}$$

Where:

P = Proportion of base year demand

Y = Number of years from the base year

9.1.4 The high scenario adds a proportion of the base demand to that of the core scenario. For highway demand, the proportion is 2.5% multiplied by the square root of the number of years from the base year. Rail demand is adjusted in the same manner, using a proportion of 2.0% multiplied by the square root of the number of years from the base year. The Low scenario removes demand from the Core scenario by the same proportions of that added in the High for both highway and rail demand.

9.1.5 In addition to raising / lowering the core scenario, the level of certainty considered for developments from the uncertainty log is also adjusted. For the High scenario, developments which are “Reasonably Foreseeable” are modelled in addition to those already considered in the core scenario. For the low scenario, only developments which are considered “Near Certain” have been modelled.

9.1.6 Table 9-1 shows the base and reference forecast highway demand matrix totals.

⁶ See TAG Unit M4 Forecasting and Uncertainty Paragraph 4.2.2

Table 9-1: Sensitivity Test Reference Forecast Highway Demand Totals (24 hour, vehicles)

Year	Core	Low	Low % change from core	High	High % change from core
2029	83,068,932	77,008,105	-7%	89,129,812	7%
2044	91,543,778	81,960,689	-10%	101,126,869	10%
2051	95,471,427	84,629,399	-11%	106,313,456	11%

Network Assumptions

9.1.7 No supply side adjustments have been applied for the High or Low growth scenarios.

9.2 Equilibrium Forecast Demand

VDM Convergence Statistics

9.2.1 VDM convergence and run time data for the sensitivity test scenarios are shown below in Table 9-2 and Table 9-3 for the Low and High growth scenarios respectively.

Table 9-2: VDM Convergence and Run Time Data – Low Growth Scenario

Scenario	Year	No. of Loops	Global GAP	Sub-Area GAP
DM	2029	4	0.03%	0.10%
	2044	4	0.06%	0.16%
	2051	5	0.02%	0.13%
DS	2029	4	0.03%	0.12%
	2044	4	0.06%	0.20%
	2051	5	0.02%	0.12%

Table 9-3: VDM Convergence and Run Time Data – High Growth Scenario

Scenario	Year	No. of Loops	Global GAP	Sub-Area GAP
DM	2029	4	0.03%	0.12%
	2044	6	0.01%	0.18%
	2051	15	0.01%	0.35%
DS	2029	4	0.03%	0.11%
	2044	6	0.01%	0.17%
	2051	15	0.01%	0.36%

9.2.2 The results show that the demand model converges satisfactorily in the majority of cases, failing to convergence on a sub-area level only in 2051 for the High scenario. It is believed this is due to the volume of growth on the network causing significant congestion within the model.

Impacts of VDM

9.2.3 The forecast travel demand for all movements is presented below, showing change in demand through assumed trip growth and VDM response.

9.2.4 The tables below summarise the demand impacts by mode, time period and purpose for the two sensitivity tests.

- Table 9-4 – demand by mode – low growth scenario.
- Table 9-5 – demand by time period – low growth scenario.
- Table 9-6 – demand by purpose – low growth scenario.
- Table 9-7 – demand by mode – high growth scenario.
- Table 9-8 – demand by time period – high growth scenario.
- Table 9-9 – demand by purpose – high growth scenario.

Low Growth Demand Summaries

Table 9-4: VDM Forecast Travel Demand by Mode – Low Growth Scenario

Mode	Year	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS (DS vs. Ref %)
Car (vehicles)	2029	76,664,726	77,008,105 (0.4%)	77,083,497 (0.1%)	77,083,516 (0.1%)
	2044		81,960,689 (6.9%)	82,138,690 (0.2%)	82,138,711 (0.2%)
	2051		84,629,399 (10.4%)	84,827,476 (0.2%)	84,827,499 (0.2%)
PT Rail (passengers)	2029	2,485,470	2,468,026 (-0.7%)	2,371,040 (-3.9%)	2,371,018 (-3.9%)
	2044		2,565,960 (3.2%)	2,339,345 (-8.8%)	2,339,319 (-8.8%)
	2051		2,617,528 (5.3%)	2,365,188 (-9.6%)	2,365,160 (-9.6%)

Table 9-5: Table 9-9: VDM Forecast Car Travel Demand by Time Period – Low Growth Scenario

Year	Time Period	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS (DS vs. Ref %)
2029	AM	15,406,734	15,322,886 (-0.5%)	15,335,776 (0.1%)	15,335,711 (0.1%)
	IP	28,389,318	28,629,101 (0.8%)	28,660,852 (0.1%)	28,661,184 (0.1%)
	PM	17,626,446	17,686,552 (0.3%)	17,700,795 (0.1%)	17,700,784 (0.1%)
	OP	15,242,228	15,369,566 (0.8%)	15,386,074 (0.1%)	15,385,836 (0.1%)
2044	AM	15,406,734	16,163,525 (4.9%)	16,189,919 (0.2%)	16,189,856 (0.2%)
	IP	28,389,318	30,578,362 (7.7%)	30,652,145 (0.2%)	30,652,647 (0.2%)
	PM	17,626,446	18,805,965 (6.7%)	18,838,051 (0.2%)	18,838,003 (0.2%)
	OP	15,242,228	16,412,837 (7.7%)	16,458,575 (0.3%)	16,458,205 (0.3%)
2051	AM	15,406,734	16,643,925 (8.0%)	16,674,308 (0.2%)	16,674,281 (0.2%)
	IP	28,389,318	31,608,950 (11.3%)	31,690,067 (0.3%)	31,690,563 (0.3%)
	PM	17,626,446	19,412,428 (10.1%)	19,444,923 (0.2%)	19,444,893 (0.2%)
	OP	15,242,228	16,964,096 (11.3%)	17,018,178 (0.3%)	17,017,761 (0.3%)

Table 9-6: VDM Forecast Car Travel Demand by Purpose – Low Growth Scenario

Year	Time Period	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
2029	Business	7,964,169	7,871,962 (-1.2%)	7,881,163 (0.1%)	7,881,172 (0.1%)
	Commute	28,451,102	27,917,898 (-1.9%)	27,965,677 (0.2%)	27,965,683 (0.2%)
	Other	40,249,455	41,218,245 (2.4%)	41,236,657 (0.0%)	41,236,660 (0.0%)
2044	Business	7,964,169	8,278,405 (3.9%)	8,300,232 (0.3%)	8,300,242 (0.3%)
	Commute	28,451,102	29,069,325 (2.2%)	29,184,451 (0.4%)	29,184,456 (0.4%)
	Other	40,249,455	44,612,958 (10.8%)	44,654,007 (0.1%)	44,654,012 (0.1%)
2051	Business	7,964,169	8,533,644 (7.2%)	8,556,769 (0.3%)	8,556,780 (0.3%)
	Commute	28,451,102	29,801,919 (4.7%)	29,930,712 (0.4%)	29,930,718 (0.4%)
	Other	40,249,455	46,293,836 (15.0%)	46,339,995 (0.1%)	46,340,000 (0.1%)

High Growth Demand Summaries

Table 9-7: VDM Forecast Travel Demand by Mode – High Growth Scenario

Mode	Year	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
Car (vehicles)	2029	76,664,726	89,129,812 (16.3%)	89,214,947 (0.1%)	89,214,970 (0.1%)
	2044		101,126,869 (31.9%)	101,342,767 (0.2%)	101,342,795 (0.2%)
	2051		106,313,456 (38.7%)	106,556,937 (0.2%)	106,556,966 (0.2%)
PT Rail (passengers)	2029	2,485,470	2,782,415 (11.9%)	2,521,978 (-9.4%)	2,521,952 (-9.4%)
	2044		3,063,054 (23.2%)	2,563,380 (-16.3%)	2,563,352 (-16.3%)
	2051		3,179,926 (27.9%)	2,617,584 (-17.7%)	2,617,551 (-17.7%)

Table 9-8: VDM Forecast Car Travel Demand by Time Period – High Growth Scenario

Year	Time Period	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
2029	AM	15,406,734	17,758,905 (15.3%)	17,771,036 (0.1%)	17,770,970 (0.1%)
	IP	28,389,318	33,117,846 (16.7%)	33,152,053 (0.1%)	33,152,532 (0.1%)

Year	Time Period	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
	PM	17,626,446	20,473,486 (16.2%)	20,484,274 (0.1%)	20,484,210 (0.1%)
	OP	15,242,228	17,779,575 (16.6%)	17,807,584 (0.2%)	17,807,257 (0.2%)
2044	AM	15,406,734	20,015,209 (29.2%)	20,041,839 (0.1%)	20,041,782 (0.1%)
	IP	28,389,318	37,675,691 (32.7%)	37,759,355 (0.2%)	37,760,037 (0.2%)
	PM	17,626,446	23,212,576 (31.7%)	23,241,190 (0.1%)	23,241,152 (0.1%)
	OP	15,242,228	20,223,393 (32.7%)	20,300,383 (0.4%)	20,299,824 (0.4%)
2051	AM	15,406,734	21,001,607 (36.3%)	21,032,838 (0.1%)	21,032,760 (0.1%)
	IP	28,389,318	39,638,662 (39.6%)	39,730,608 (0.2%)	39,731,430 (0.2%)
	PM	17,626,446	24,397,939 (38.4%)	24,424,873 (0.1%)	24,424,808 (0.1%)
	OP	15,242,228	21,275,248 (39.6%)	21,368,618 (0.4%)	21,367,968 (0.4%)

Table 9-9: VDM Forecast Car Travel Demand by Purpose – High Growth Scenario

Year	Time Period	Base	Reference (Ref vs. Base %)	DM (DM vs. Ref %)	DS(DS vs. Ref %)
2029	Business	7,964,169	9,131,208 (14.7%)	9,141,535 (0.1%)	9,141,546 (0.1%)
	Commute	28,451,102	32,416,412 (13.9%)	32,470,546 (0.2%)	32,470,553 (0.2%)
	Other	40,249,455	47,582,191 (18.2%)	47,602,866 (0.0%)	47,602,871 (0.0%)
2044	Business	7,964,169	10,269,447 (28.9%)	10,295,559 (0.3%)	10,295,572 (0.3%)
	Commute	28,451,102	36,182,101 (27.2%)	36,322,817 (0.4%)	36,322,825 (0.4%)
	Other	40,249,455	54,675,321 (35.8%)	54,724,391 (0.1%)	54,724,398 (0.1%)
2051	Business	7,964,169	10,786,250 (35.4%)	10,814,173 (0.3%)	10,814,188 (0.3%)
	Commute	28,451,102	37,849,106 (33.0%)	38,008,929 (0.4%)	38,008,936 (0.4%)
	Other	40,249,455	57,678,100 (43.3%)	57,733,834 (0.1%)	57,733,842 (0.1%)

9.2.5 The results show that the Low growth scenario and High growth scenario demand increase between the base and reference forecast are consistent with the growth factors applied. Rail growth stays the same

as the core scenario. The low growth scenario shows a more significant transfer of trips from rail to car which seems logical.

- 9.2.6 By time period, the relative change in trips for the low growth scenario and high growth scenario between the base and reference forecast is the same across time periods, correctly reflecting the approach taken. The VDM responses in the IP and OP are more significant compared to the AM and PM which follows a similar pattern to the core scenario results presented earlier in this report. With the Project in place, the impact on demand is very similar to the core scenario.
- 9.2.7 The VDM demand impacts by trip purpose and the change between the DM and DS are comparable to the core scenario.

9.3 Assignment Results

Highway Assignment Model Convergence

- 9.3.1 The assignment convergence statistics for each forecasting scenario are presented in **Appendix F – Sensitivity Test Assignment Convergence**, showing the final four iterations/ loops. The results show that convergence is satisfactorily achieved across all scenarios.

Forecast Network Performance

- 9.3.2 The forecast network performance for each scenario is shown in **Appendix G – Sensitivity Test Network Statistics**, showing the network statistics comparing Base, Reference Forecast (Per VDM), DM Post VDM and DS scenarios. These results are based on assigned traffic in the SATURN model.
- 9.3.3 The pattern of changes in the network statistics are similar to the core scenario results, presented earlier in this report, apart from the change from base to reference forecast which varies depending on low growth scenario or high growth scenario demand assumptions. The low growth scenario future year fixed speeds are very similar to the base, which is reflected in the results showing network speeds.

Forecast Traffic Flows

- 9.3.4 Base year 2015 and 2044 forecast traffic flows along the A66 corridor and mainline M6 either side of J40 and likewise for the A1(M) Scotch Corner, for each sensitivity test, are shown in Table 9-10 and Table 9-11 respectively.
- 9.3.5 Flows for the other forecast years are shown in **Appendix H – Sensitivity Test A66 Flow Tables**.
- 9.3.6 A map showing the locations monitored is presented earlier in the report as Figure 8-1.
- 9.3.7 The results show that traffic flows along the A66 corridor are less in the low growth scenario and more in the high growth scenario. The relative traffic flow change between the DM and DS are comparable with the core scenario results (presented earlier in this report).

9.3.8 The Bowes bypass site represents a mid-point along the A66 corridor. In the low growth scenarios, traffic flows increase by 16% between the 2019 Base and 2044 Reference Case. A further 16% increase is shown between the 2044 Reference Case and DM Post VDM. With the Project in place, traffic flows increase a further 39% from the DM Post VDM to DS Post VDM model. In the high growth scenario, the equivalent growth is 37%, 11% and 39% respectively.

Table 9-10: 12-Hour Traffic Flows (vehicles, two-way) – 2044 – Low Growth Scenario

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
	West of M6 J40	16,584	17,439	19,958	20,746	855 (5%)	2,519 (14%)	787 (4%)
	Between M6 J40 and Kemplay Bank	25,699	27,190	31,045	35,534	1,490 (6%)	3,855 (14%)	4,489 (14%)
	Directly East of Kemplay Bank	17,598	19,062	21,253	27,746	1,464 (8%)	2,190 (11%)	6,493 (31%)
	Temple Sowerby	14,459	15,743	17,702	24,932	1,285 (9%)	1,958 (12%)	7,231 (41%)
	Between Kirkby Thore and Appleby	15,629	16,665	18,814	23,140	1,036 (7%)	2,149 (13%)	4,326 (23%)
	Between Appleby and Brough	13,038	13,839	15,828	22,483	801 (6%)	1,989 (14%)	6,655 (42%)
	East of Brough	14,793	16,447	19,460	26,014	1,654 (11%)	3,013 (18%)	6,554 (34%)
	Bowes Bypass	12,701	14,746	17,083	23,779	2,045 (16%)	2,337 (16%)	6,696 (39%)
	West of Greta Bridge	15,422	17,507	20,053	27,469	2,085 (14%)	2,546 (15%)	7,416 (37%)
	East of Smallways	15,196	17,308	19,692	27,849	2,111 (14%)	2,384 (14%)	8,158 (41%)
	West of Scotch Corner	15,652	18,238	20,676	28,521	2,587 (17%)	2,438 (13%)	7,844 (38%)
	North of Scotch Corner	49,043	56,558	68,329	70,435	7,514 (15%)	11,772 (21%)	2,105 (3%)
	South of Scotch Corner	51,079	56,574	67,988	71,178	5,495 (11%)	11,414 (20%)	3,190 (5%)
	North of M6 J40	42,658	46,784	57,179	58,753	4,126 (10%)	10,396 (22%)	1,574 (3%)
	South of M6 J40	31,472	33,812	41,261	39,532	2,340 (7%)	7,449 (22%)	-1,730 (-4%)

Table 9-11: 12-Hour Traffic Flows (vehicles, two-way) – 2044 – High Growth Scenario

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
A66	West of M6 J40	16,584	21,685	23,693	25,056	5,101 (31%)	2,008 (9%)	1,363 (6%)
A66	Between M6 J40 and Kemplay Bank	25,699	31,918	34,944	40,789	6,219 (24%)	3,026 (9%)	5,845 (17%)
A66	Directly East of Kemplay Bank	17,598	22,874	24,228	32,083	5,276 (30%)	1,354 (6%)	7,855 (32%)
A66	Temple Sowerby	14,459	18,271	19,572	28,436	3,813 (26%)	1,300 (7%)	8,864 (45%)
A66	Between Kirkby Thore and Appleby	15,629	19,711	21,194	26,476	4,082 (26%)	1,483 (8%)	5,282 (25%)
A66	Between Appleby and Brough	13,038	16,277	17,746	25,738	3,239 (25%)	1,469 (9%)	7,992 (45%)
A66	East of Brough	14,793	19,580	22,257	29,429	4,787 (32%)	2,677 (14%)	7,172 (32%)
A66	Bowes Bypass	12,701	17,416	19,326	26,889	4,715 (37%)	1,910 (11%)	7,563 (39%)
A66	West of Greta Bridge	15,422	20,545	22,650	31,375	5,123 (33%)	2,105 (10%)	8,724 (39%)
A66	East of Smallways	15,196	19,836	21,153	31,462	4,640 (31%)	1,316 (7%)	10,310 (49%)
A66	West of Scotch Corner	15,652	21,354	22,940	31,780	5,703 (36%)	1,586 (7%)	8,840 (39%)
A1(M)	North of Scotch Corner	49,043	67,678	76,845	78,758	18,634 (38%)	9,167 (14%)	1,913 (2%)
A1(M)	South of Scotch Corner	51,079	68,443	78,566	81,307	17,363 (34%)	10,123 (15%)	2,742 (3%)
M6	North of M6 J40	42,658	57,695	68,101	69,938	15,037 (35%)	10,406 (18%)	1,837 (3%)
M6	South of M6 J40	31,472	43,203	51,177	50,020	11,731 (37%)	7,973 (18%)	-1,156 (-2%)

9.3.10 Traffic flows by vehicle type along the A66 corridor are shown below in Table 9-12 and Table 9-13 respectively.

Table 9-12: Vehicle Flows by Vehicle Type (Two-way) – 2044 – Low Growth Scenario

Road	Location	Scenario	AM (veh/ hr)		IP (veh/ hr)		PM (veh/ hr)	
	West of M6 J40	Base	1,926 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,346 (86%)	392 (14%)	2,181 (85%)	381 (15%)	2,591 (89%)	335 (11%)
		DS	2,676 (87%)	403 (13%)	2,522 (87%)	393 (13%)	3,086 (90%)	358 (10%)
	Bowes Bypass	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,316 (84%)	249 (16%)	1,451 (84%)	267 (16%)	1,514 (85%)	258 (15%)
		DS	1,741 (87%)	268 (13%)	1,998 (88%)	279 (12%)	2,208 (89%)	279 (11%)
	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,421 (85%)	255 (15%)	1,464 (83%)	302 (17%)	1,685 (86%)	285 (14%)
		DS	1,971 (88%)	277 (12%)	2,107 (87%)	315 (13%)	2,508 (89%)	304 (11%)

Table 9-13: Vehicle Flows by Vehicle Type (Two-way) – 2044 – High Growth Scenario

Road	Location	Scenario	AM (veh/ hr)		IP (veh/ hr)		PM (veh/ hr)	
	West of M6 J40	Base	1,926 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,642 (84%)	486 (16%)	2,429 (84%)	468 (16%)	2,813 (87%)	403 (13%)
		DS	3,119 (86%)	502 (14%)	2,846 (86%)	483 (14%)	3,461 (89%)	442 (11%)
	Bowes Bypass	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,498 (83%)	311 (17%)	1,632 (83%)	330 (17%)	1,689 (84%)	323 (16%)
		DS	1,995 (86%)	333 (14%)	2,223 (87%)	343 (13%)	2,436 (88%)	344 (12%)
	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,608 (84%)	298 (16%)	1,597 (81%)	364 (19%)	1,803 (85%)	329 (15%)
		DS	2,246 (87%)	345 (13%)	2,322 (86%)	389 (14%)	2,649 (88%)	367 (12%)

9.3.11 The Light and Heavy vehicle proportions shown are similar to the Core Scenario proportions.

Forecast Journey Times

9.3.12 Journey times on the A66 corridor between Scotch Corner and M6 J40 are shown in Table 9-14 and Table 9-15. Results for other years are presented in **Appendix J – Sensitivity Test Journey Time Tables**.

Table 9-14: A66 Corridor Journey times (mm:ss) – 2044 – Low Growth Scenario

Time Period	Direction	Base 2019	DM	DS	DM vs. Base	DS vs. DM
	A66 - Eastbound	53:20	55:08	44:56	01:47 (3%)	-10:12 (-18%)
	A66 - Westbound	54:11	55:56	45:12	01:45 (3%)	-10:45 (-19%)
	A66 - Eastbound	54:11	56:28	45:19	02:17 (4%)	-11:09 (-20%)
	A66 - Westbound	54:05	56:46	45:11	02:40 (5%)	-11:35 (-20%)
	A66 - Eastbound	54:49	57:24	45:28	02:35 (5%)	-11:56 (-21%)
	A66 - Westbound	54:26	56:54	45:37	02:29 (5%)	-11:17 (-20%)
	A66 - Eastbound	49:25	49:33	44:08	00:09 (0%)	-05:25 (-11%)
	A66 - Westbound	49:24	49:45	44:10	00:20 (1%)	-05:34 (-11%)

Table 9-15: A66 Corridor Journey times (mm:ss) – 2044 – High Growth Scenario

Time Period	Direction	Base 2019	DM	DS	DM vs. Base	DS vs. DM
	A66 - Eastbound	53:20	57:35	45:22	04:15 (8%)	-12:13 (-21%)
	A66 - Westbound	54:11	59:27	45:46	05:16 (10%)	-13:41 (-23%)
	A66 - Eastbound	54:11	59:26	45:42	05:15 (10%)	-13:44 (-23%)
	A66 - Westbound	54:05	01:00:09	45:45	06:04 (11%)	-14:24 (-24%)
	A66 - Eastbound	54:49	01:00:39	45:55	05:50 (11%)	-14:44 (-24%)
	A66 - Westbound	54:26	01:01:11	46:19	06:45 (12%)	-14:51 (-24%)
	A66 - Eastbound	49:25	49:53	44:10	00:28 (1%)	-05:43 (-11%)
	A66 - Westbound	49:24	50:06	44:12	00:41 (1%)	-05:54 (-12%)

9.3.13 The DM and DS journey times for the Low Growth Scenario and High Growth Scenario logically sit either side of the Core Scenario forecasts, with slightly less of a time saving in the Low Growth Scenario and slightly more in the High Growth Scenario, with time savings of 10-12 minutes and 12-15 minutes for the Low Growth Scenario and High Growth Scenario, respectively.

9.3.14 Journey time difference tables across all years are shown in **Appendix I – Sensitivity Test Journey Times**

10 Summary

10.1 Approach

10.1.1 The A66 Transport Model has been updated at PCF Stage 3 to forecast the impacts of the Preferred Route along the A66 corridor between the A1 (M) Scotch Corner and M6 J40 as part of the A66 Trans Pennine project. The A66 model is a network based variable Demand Model using SATURN assignment and DIADEM demand model software. There is detailed representation of the model network and zone system along the A66 corridor and local network. The Stage 3 A66 Transport Model is an updated version of the Stage 2 model which was original derived from the Northern Regional Transport Model used for the Stage 0 assessment.

10.1.2 The future model years are 2029 (Project opening year), 2044 (design year) and 2051 (final model year) all pivoting off the 2019 base model year for VDM.

10.1.3 The A66 Transport Model revalidation and updates made at Stage 3 are described in the Transport Model Package report:

- **HE565627-AMY-GEN-S00-RP-TR-000010**

10.1.4 In terms of forecasting assumptions, the following have been updated at Stage 3:

- Preparation of a revised Uncertainty Log using the latest information on developments and schemes along and in the near vicinity of the A66 corridor, and updated Core Scenario network infrastructure and demand assumptions;
- Revised forecast years taking account of the most up to date Project construction programme;
- More detailed forecast networks including variation in road characteristic and speed restrictions, side roads and additional network detail particularly in Penrith;
- Representation of the Stage 3 Preferred Route Project in the DS network; and
- Updated generalised cost parameters, reflecting the latest TAG data book (v1.15 and v1.17).

10.1.5 The following forecasting assumptions have been retained from the Stage 2 modelling:

- Background growth assumptions using NTEM version 7.2, and goods vehicle growth based on RTF 2018 is unchanged from the methodology used at Stage 2; and
- Enhanced network and zone detail added to the A66 corridor area at Stage 3 to improve the representation inherited from the NRTM, including enhanced definition in Penrith.

10.1.6 Low Growth Scenario and High Growth Scenario sensitivity tests have been run following the approach detailed in TAG Unit M4-1.

10.2 Results

- 10.2.1 The model results are presented in Chapters 7 and 8 for the demand and highway assignment impacts and are summarised below:
- 10.2.2 Demand summary impacts:
- Demand model convergence is achieved within the set criteria for all model runs across scenarios and future years.
 - Overall, the demand summary results are reasonable. The demand summary tables presented show that the impacts with the Project in place are generally quite subtle, which makes sense considering the Project and movements which would be expected to benefit in the context of modelled demand set covering the whole of mainland UK.
 - The DS demand summaries shows highest percentage increase between sectors representing long distance movements between Scotland and Yorkshire, and East and West of the Pennines, which seems logical.
- 10.2.3 Highway assignment impacts concerning model convergence and network statistics have been examined.
- Model convergence criteria satisfactorily achieved across all model scenarios and years.
 - There is generally an intuitive pattern of network statistics, in terms of total network travel time and distance changes, change in average speed and total assigned trips. Changes between the DM and DS statistics are relatively minor, as would be expected.
- 10.2.4 Highway assignment impacts in terms of change in DM and DS flows and travel times:
- The trends in flow differences across the scenarios is similar in all three forecast years, with highest change occurring on the A66 where the Project is located, and smaller changes elsewhere.
 - The flow difference plots clearly show a pattern of long-distance strategic trips travelling from South East to North West of the model simulation area, re-routing to use the A66 corridor.
 - The forecast journey time results predict travel time savings of 11-13 minutes in the design year with the Project in place; with increased travel time savings in 2051 as would be expected.
- 10.2.5 The Low Growth Scenario and High Growth Scenario sensitivity test results show the impact on the forecasts when the assumptions are changed to reflect upper and lower traffic growth estimates. The results show that to a certain extent the VDM responds to adjust the demand a little closer to the Core Scenario. Overall the impact on traffic flow patterns and delays is moderate, and the scale of change in terms of Project travel time saving along the A66 corridor in 2044 is plus or minus 1-2 minutes for the Low Growth Scenario and High Growth Scenario, respectively.
- 10.2.6 In summary, the model forecast results presented appear reasonable and provide a logical representation of the future year Project impacts.

11 Abbreviations

11.1.1 The table below sets out the abbreviations for terms used in this document.

Table 11-1: Abbreviations

Term	Definition
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekly Traffic
ADMS	Advanced Dispersion Modelling System
AEP	Annual Exceedance Probability
AGI	Above Ground Installation
AGS	Amenity Green Space
AHA	Agricultural Holdings Act
AHLV	Area of High Landscape Value
ALARP	As low as reasonably practicable
ALC	Agricultural Land Classification
AM	Ante meridiem (morning)
AMAA	Ancient Monuments and Archaeological Areas Act 1979
ANPR	Automatic Number Plate Recognition
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
APIS	Air Pollution Information System
AQ	Air Quality
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
ARN	Affected Road Network
ASNW	Ancient Semi Natural Woodland
ASR	Annual Status Report
ATI	Ancient Tree Inventory
AW	Ancient Woodland
BAP	Biodiversity Action Plan
BBS	Breeding Bird Survey
BCT	Bat Conservation Trust
BEIS	Department for Business, Energy & Industrial Strategy
Bgl	Below ground level
BGS	British Geological Survey
BMCL	Bat Mitigation Class License
BMV	Best and Most Versatile
BNL	Basic Noise Level
BoQ	Bill of Quantities
BoCC	Birds of Conservation Concern
BPM	Best Practicable Means
BS	British Standards

Term	Definition
BSI	British Standards Institute
BTO	British Trust for Ornithology
CAA	Civil Aviation Authority
CBC	Common Bird Census
CCC	Cumbria County Council
CCTV	Closed Circuit Television
CDE	Construction, Demolition and Excavation
CDM	Construction Design and Management
CEDA	Centre for Environmental Data Analysis
CEH	Centre for Ecology and Hydrology
CEnv	Chartered Environmentalist
CIEEM	Chartered Institute of Ecology and Environmental Management
CiFA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CIWEM	Chartered Institution of Water and Environmental Management
CKD	Combined Kerb and Drainage
CKDU	Combined Kerb and Drainage Units
CL:AIRE	Contaminated Land: Applications in Real Environments
CMLI	Chartered Members of the Landscape Institute
CMRA	Coal Mining Risk Assessment
CO ₂	Carbon Dioxide, commonly closely related to the global climate change phenomenon
ComMA	Combined Modelling and Appraisal
COPA	Control of Pollution Act 1974
CRoW	Countryside and Rights of Ways Act 2000
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
dB	Decibels
DBA	Desk Based Assessment
DCC	Durham County Council
DCMS	Department for Culture, Media and Sport
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do Minimum
DMRB	Design Manual for Roads and Bridges
DS	Do Something
DTM	Digital Terrain Model
DWP	Diffuse Water Pollution
EAR	Environmental Assessment Report
EC	European Commission
ECoW	Ecological Clerk of Work

Term	Definition
EDC	Eden District Council
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EMF	Electric and Magnetic Fields
EMP	Environmental Management Plan
EMS	Environmental Management System
END	Environmental Noise Directive
EPDs	Environmental Product Declarations
EPS	European Protected Species
EQR	Ecological Quality Ratio
EQS	Environmental Quality Standard
ERIC	Environmental Records Information Centre
ERS	Expose Riverine Sediment
ES	Environmental Statement
EU	European Union
EZI	Ecological Zone of Influence
FBT	Farm Business Tenancy
FRA	Flood Risk Assessment
FRAP	Flood Risk Activities Permit
FRGS	Fellowship of the Royal Geographical Society
GA	General Arrangement
GAC	Generic Assessment Criteria
GCN	Great crested newt
GCSE	General Certificate of Secondary Education
GHG	Greenhouse Gas
GI	Ground Investigation
GIR	Ground Investigation Report
GIS	Geographical Information Systems
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GPP	Guidance for Pollution Prevention
ha	Hectares
HADDMS	Highways Agency Drainage Data Management System
HAPMS	Highways England Pavement Management System
HAWRAT	Highways Agency Water Risk Assessment Tool
HDV	Heavy Duty Vehicle
HEDBA	Historic Environment Desk Based Assessment
HEMP	Handover Environmental Management Plan
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HLC	Historic Landscape Characterisation
HLT	Historic Landscape Type

Term	Definition
HM	Her Majesty's
HP	High Pressure
HPGM	High Pressure Gas Main
HPI	Habitats of Principal Importance
HRA	Habitats Regulation Assessment
HRA	Hot Rolled Asphalt
HS	Health & Safety
HSE	Health and Safety Executive
HSI	Habitat Suitability Index
HS2	High Speed Rail
HE GDMS	Highways Agency Geotechnical Data Management System
IAN	Interim Advice Note
IAQM	Institute of Air Quality Management
ICE	Institute of Chartered Engineers
ICG	Internal Condition Grade
ICM	Integrated Catchment Modelling
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEMA	Institute of Environmental Management and Assessment
ILM	Incremental Launching Method
IMD	Indices of Multiple Deprivation
IUCN	International Union for the Conservation of Nature
JNCC	Joint Nature Conservation Committee
JSNA	Joint Strategic Needs Assessment
Kg	Kilogram
kgCO _{2e}	Kilogram of carbon dioxide equivalent
Km	Kilometre
KPI	Key Performance Indicators
kTCO _{2e}	Kilo-tonne of carbon dioxide equivalent
KV	Kilovolt
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LCA	Landscape Character Area
LCT	Landscape Character Type
LED	Light Emitting Diode
LFRMS	Local Flood Risk Management Strategy
LiDAR	Light Detection and Ranging
LLCA	Local Landscape Character Area
LLFA	Lead Local Flood Authority
LMP	Landscape Mitigation Masterplan
LNR	Local Nature Reserve
LNS	Low Noise Surface
LOAEL	Lowest Observed Adverse Effect Level

Term	Definition
LoD	Limits of Deviation
LP	Low Pressure
LPA	Local Planning Authority
LRM	Local Relief Model
LSOA	Lower-layer Super Output Area
LTP	Local Transport Plan
LTTE6	The Long-Term Trends for projecting annual mean NO ₂ and NO _x concentrations at the roadside, including the impact of Euro 6 and Euro VI emissions standards
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MA	Master of Arts
MAD	Major Accidents and Disasters
MAGIC	Multi Agency Geographic Information for the Countryside
MCHW	Manual of Contract Documents for Highway Works
MCIEEM	Member of CIEEM
MCIWEM	Member of CIWEM
MHCLG	Ministry of Housing, Communities and Local Government
MICE	Member of Institute of Chartered Engineers
MIOA	Member of the Institute of Acoustics
MMP	Material Management Plan
MoD	Ministry of Defence
MP	Medium Pressure
MRSS	Maintenance and Repair Strategy Statement
MSP	Maintenance Service Provider
Mt	Million Tonnes
MW	Megawatt
N/A	Not Applicable
NBN	National Biodiversity Network
NCA	National Character Area
NHL	National Heritage List
NIA	Noise Important Area
NIR	Noise Insulation Regulations 1975
NMR	National Monument Record
NMP	National Mapping Programme
NNR	National Nature Reserve
NO	Nitrogen Oxide
NO ₂	Nitrogen Dioxide
NOEL	No Observed Effect Level
NO _x	Oxides of Nitrogen
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NPS NN	National Policy Statement for National Networks

Term	Definition
NRMM	Non-Road Mobile Machinery
NRPB	National Radiological Protection Board
NSIP	Nationally Significant Infrastructure Project
NTCC	National Traffic Control Centre
NTS	Non-Technical Summary
NVC	National Vegetation Classification
NVMP	Noise and Vibration Management Plan
NVQ	National Vocational Qualification
NYCC	North Yorkshire County Council
OD	Ordnance Datum
ONS	Office for National Statistics
OS	Ordnance Survey
PAWS	Plantations on Ancient Woodland Sites
PCBs	Polychlorinated Biphenyls
PCF	Project Control Framework
PCM	Pollution Climate Mapping
PDR	Project Design Report
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
PIEMA	Practitioner in IEMA
PINS	Planning Inspectorate
PM	Post meridian (afternoon)
PM	Particulate Matter
PM10	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM2.5	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
PMA	Private Means of Access
PNL	Prevailing Noise Levels
PPE	Personal Protective Equipment
PPG	Planning Practice Guidance
PPGs	Pollution Prevention Guidelines
PPV	Peak Particle Velocity
PRA	Preliminary Risk Assessment
PRoW	Public Right of Way
PSSR	Preliminary Sources Study Report
PSV	Polished Stone Values
PSYM	Predictive System for Multimetrics
PWM	Precautionary Working Method
PWMS	Precautionary Working Method Statement
R&D	Research and Development
RAMS	Risk Assessments and Method Statements
RBMP	River Basin Management Plan
RDC	Richmondshire District Council

Term	Definition
REAC	Register of Environmental Actions and Commitments
RHS	River Habitat Survey
RIGS	Regionally Important Geological Site
RIS	Road Investment Strategy
RNL	Relevant Noise Level
RPA	Root Protection Area
RPE	Respiratory Protective Equipment
RSE	Road Safety Engineers
RWSC	Routine and Winter Service Code
SAC	Special Area of Conservation
SEE	Suitably experienced ecologist
SFAR	Strategic Flood Risk Assessment
SGAR	Stage Gate Assessment Review
SLR	Single Lens Reflex
SM	Scheduled Monument
SMS	Soil Management Strategy
SRN	Strategic Road Network
SNCI	Site of Nature Conservation Importance
SNRHW	Stable Non-Reactive Hazardous Waste
SOAEL	Significant Observed Adverse Effect Level
SoCC	Statement of Community Consultation
SoCG	Statement of Common Ground
SOP	Standard Operating Procedure
SPA	Special Protection Area
SPD	Supplementary Planning Documents
SPHN	Statutory Plant Health Notice
SPI	Species of Principal Importance
SPZ	Source Protection Zone
SRG	Stakeholder Reference Group
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
SWMP	Site Waste Management Plan
t	tonnes
TA	Transport Assessment
TAG	Transport and Analysis Guidance
TCPO	The Town and Country Planning (Development Management Procedure) (England) Order 2015
TM	Traffic Management
TMP	Traffic Management Plan
TMU	Traffic Monitoring Unit
TPO	Tree Protection Order
TRA	Traffic Reliability Area

Term	Definition
TSCS	Thin Surface Course System
TTMP	Traffic and Transport Management Plan
TVCB	Temporary Vertical Concrete Barrier
UK	United Kingdom
UV	Ultraviolet
UXO	Unexploded Ordnance
VES	Visual Effects Schedules
VLR	Variable Lighting Regime
VOL	Volatile Organic Compound
VRS	Vehicle Restraint System
WCA	Wildlife and Countryside Act 1981
WCC	Woodland Carbon Code
WCH	Walking, Cycling and Horse Riding / Walkers, Cyclists and Horse Riders
WCHAR	Walking, Cycling and Horse Riding Assessment and Review
WFD	Water Framework Directive
WHO	World Health Organisation
WRAP	Waste and Resources Action Programme
WSI	Written Scheme of Investigation
Zol	Zone of Influence
ZTV	Zone of Theoretical Visibility
ZVI	Zone of Visual Influence

A Development Uncertainty Log

A.1 All Developments - Uncertainty Log

ArupID	Author	SiteNm	X	Y	Dev	Land Use	NetArea	TotDwell	2029	2039	2044	2051	Uncertainty	Big Enough	Core Wide	TA
1	Teesvalley	Heighington Lane North	426464	522445	Emp	B2/B8	26970	0	26970	26970	26970	26970	Reasonably Foreseeable	1	C	1
2	Teesvalley	Faverdale Reserve Site	427318	518008	Emp	B2/B8	36000	0	7200	14400	14400	14400	Hypothetical	1	C	0
3	Teesvalley	Morton Palms (Alderman Best Way)	432282	513463	Emp	B1	50400	0	18144	28224	30240	30240	Hypothetical	1	C	0
4	Teesvalley	Faverdale East Business Park (St Modwens)	428060	517347	Emp	B2/B8	100000	0	25000	35000	35000	35000	Hypothetical	1	C	0
5	Teesvalley	Faverdale Industrial Area (Argon)	427448	516721	Emp	B2/B8	6305	0	6305	6305	6305	6305	Near Certain	1	C	1
6	Teesvalley	Faverdale Industrial Area (Remainder)	427486	516576	Emp	B2/B8	25968	0	6856	8569	8569	8569	Hypothetical	1	C	0
7	Teesvalley	Yarm Road Industrial Area	431902	514355	Emp	B2/B8	59295	0	59295	59295	59295	59295	Near Certain	1	C	0
8	Teesvalley	Yarm Road South Extension	431639	513329	Emp	B2/B8	132192	0	43623	43623	43623	43623	Hypothetical	1	C	0
9	Teesvalley	Yarm Road North (Dean and Chapter)	432417	514839	Emp	B2/B8	127000	0	25400	50800	50800	50800	Near Certain	1	C	1
11	Teesvalley	Yarm Road North (Dean and Chapter)	432417	514839	Emp	A3	2500	0	2500	2500	2500	2500	More than Likely	1	C	1
12	Teesvalley	McMullen Road West	430662	515204	Emp	B2/B8	40600	0	36540	40600	40600	40600	Hypothetical	1	C	0
14	Teesvalley	Central Park (vacant land only)	429810	514838	Emp	B1	28000	0	22736	28000	28000	28000	Hypothetical	1	C	0
15	Teesvalley	Central Park	429816	514727	Res	C3	0	359	359	359	359	359	Near Certain	1	C	1
16	Teesvalley	Central Park South (Business Startup Center)	429596	514358	Emp	B1	3199	0	3199	3199	3199	3199	Hypothetical	1	C	0
17	Teesvalley	Central Park (Local Centre)	429880	515075	Emp	A1	1700	0	1700	1700	1700	1700	Near Certain	1	C	1
18	Teesvalley	Durham Tees Valley Airport	436740	513100	Emp	B2/B8	101250	0	94365	101250	101250	101250	Hypothetical	1	C	0
19	Teesvalley	Lingfield Point Phase 1	431131	514771	Res	C3House	0	273	273	273	273	273	Near Certain	1	C	1
20	Teesvalley	Lingfield Point (ex Phase 1)	431715	515017	Res	C3	0	331	268	331	331	331	More than Likely	1	C	1
21	Teesvalley	Lingfield Point	431715	515017	Emp	B1	13666	0	9566	13666	13666	13666	More than Likely	1	C	1
22	Teesvalley	Lingfield Point	431715	515017	Emp	A1	2700	0	2700	2700	2700	2700	More than Likely	1	C	1
25	Teesvalley	Geneva Lane/Geneva Bakery	429565	513278	Res	C3	0	216	216	216	216	216	Hypothetical	1	C	0
26	Teesvalley	Former Corus site, Whessoe Road	428545	516693	Res	C3	0	250	220	250	250	250	Hypothetical	1	C	0
33	Teesvalley	North West Urban Fringe (West Park Garden Village)	426240	517131	Res	C3	0	1200	516	1116	1176	1176	Hypothetical	1	C	1
34	Teesvalley	Eastern Urban Fringe, Great Burdon	432223	515914	Res	C3	0	1250	200	700	750	750	Hypothetical	1	C	0
35	Teesvalley	Hopetown Park	428603	515861	Res	C3	0	110	110	110	110	110	Hypothetical	1	C	0
37	Teesvalley	Feethams / Beaumont Street	428866	514271	Emp	B1	3000	0	3000	3000	3000	3000	Hypothetical	1	C	0
39	Teesvalley	West Park	426690	516860	Res	C3House	0	213	202	213	213	213	Near Certain	1	C	1
41	Teesvalley	Feethams East (former bus depot)	429045	514255	Emp	A4	3135	0	3135	3135	3135	3135	Hypothetical	1	C	0
42	Teesvalley	Feethams East (former bus depot)	429045	514255	Emp	D2Cinema	3526	0	3526	3526	3526	3526	Hypothetical	1	C	0
60	Teesvalley	Albert Road Retail Park	429125	515676	Emp	A1	1737	0	1737	1737	1737	1737	Hypothetical	1	C	0
61	Teesvalley	Albert Road Retail Park	429125	515676	Emp	A1Food	2177	0	2177	2177	2177	2177	Hypothetical	1	C	0
62	Teesvalley	Land to the South of Burtree Lane	428603	518037	Res	C3	0	380	267	380	380	380	Hypothetical	1	C	0
63	Teesvalley	Land off Sadberge Road, Middleton St George, Darlington	434469	514151	Res	C3House	0	234	0	0	0	0	Near Certain	1	C	1
64	Teesvalley	Elm Tree Farm	430480	517084	Res	C3	0	150	0	0	0	0	Hypothetical	1	C	0
67	Teesvalley	High Stell/Gendon Gardens, Middleton St. George	434106	513628	Res	C3	0	198	0	0	0	0	More than Likely	1	C	1
68	Teesvalley	Land north of Coniscliffe Road (Southern Coniscliffe Park)	425472	514970	Res	C3	0	535	0	0	0	0	Reasonably Foreseeable	1	C	0
80	Teesvalley	School Aycliffe West	425840	523342	Res	C3House	0	101	101	101	101	101	Near Certain	1	C	1
81	Teesvalley	Land at Berrymead Farm / Land North of White Horse Pub	429102	518165	Res	C3	0	370	0	0	0	0	Reasonably Foreseeable	1	C	1
82	Teesvalley	Land South of Neasham Road	429920	512631	Res	C3	0	700	0	0	0	0	Hypothetical	1	C	0
85	Teesvalley	Maxgate Farm, Station Road, Midditon st George	434020	514041	Res	C3	0	260	0	260	260	260	Hypothetical	1	C	0
87	Teesvalley	Land Off Yarm Road South of Railway Line, MSG (High Scrogg Farm)	434928	513365	Res	C3	0	330	0	330	330	330	Near Certain	1	C	0
89	Teesvalley	Middleton St George, New School	435105	513465	Emp	B2/B8	40938	0	8188	0	0	0	Hypothetical	1	C	0
90	Teesvalley	Land at Coniscliffe Grange South, Staindrop Road	425576	514991	Res	C3	0	985	0	788	985	985	Reasonably Foreseeable	1	C	0
92	Teesvalley	John Fowler Way, West Park	426793	517085	Emp	A1Food	1820	0	1820	1820	1820	1820	Hypothetical	1	C	0
93	Teesvalley	Land to the South of Woodlands Hospital (Dunelm)	432140	513889	Emp	A1	3670	0	3670	3670	3670	3670	Hypothetical	1	C	0
105	Teesvalley	Skerningham Masterplan	430940	517925	Res	C3	0	4500	1260	2160	2790	3240	Hypothetical	1	C	0
106	Teesvalley	Greater Faverdale Masterplan (Burtree Garden Village)	427317	518006	Res	C3	0	2000	0	0	0	0	Hypothetical	1	C	0
130	Teesvalley	South of Maritime Avenue	451665	532266	Res	C3	0	400	0	160	200	200	Near Certain	1	W	0
135	Teesvalley	Mayfair	452182	528728	Res	C3House	0	261	261	261	261	261	Near Certain	1	W	0
142	Teesvalley	Upper Warren	448481	534644	Res	C3House	0	500	475	500	500	500	Near Certain	1	W	0
147	Teesvalley	Britmag	450399	535359	Res	C3House	0	479	456	479	479	479	Near Certain	1	W	0
158	Teesvalley	South West Extension (Claxton)	448020	529184	Res	C3	0	1260	882	1260	1260	1260	Near Certain	1	W	0
168	Teesvalley	High Tunstall	447783	532560	Res	C3	0	1200	768	1200	1200	1200	Hypothetical	1	W	0

ArupID	Author	SiteNm	X	Y	Dev	Land Use	NetArea	TotDwell	2029	2039	2044	2051	Uncertainty	Big Enough	Core Wide	TA
173	Teesvalley	Wynyard Park North	442766	527920	Res	C3House	0	400	368	400	400	400	Hypothetical	1	W	0
206	Teesvalley	Acklam Gardens (Central Whinney Banks)	447657	518272	Res	C3House	0	304	294	304	304	304	Near Certain	1	W	0
208	Teesvalley	Police HQ, Ladgate Lane	450467	515759	Emp	B1	11621	0	0	0	0	0	Hypothetical	1	W	0
209	Teesvalley	Ladgate Woods (Police HQ site)	450367	515736	Res	C3House	0	467	432	467	467	467	Near Certain	1	W	0
212	Teesvalley	Grey Towers Village	453221	513881	Res	C3House	0	453	373	453	453	453	Near Certain	1	W	0
219	Teesvalley	Brackenhoe East	451047	517402	Res	C3House	0	350	331	350	350	350	Near Certain	1	W	0
228	Teesvalley	Snow centre	450319	520890	Emp	D2	13802	0	13802	13802	13802	13802	Near Certain	1	W	0
234	Teesvalley	Middlehaven - office	449685	520985	Emp	B1	68000	0	14960	47600	51000	51000	Hypothetical	1	W	0
235	Teesvalley	Middlehaven - retail	449685	520985	Emp	A1	3150	0	3150	3150	3150	3150	Hypothetical	1	W	0
237	Teesvalley	Gresham	449000	519665	Res	C3House	0	273	0	0	0	0	Hypothetical	1	W	0
238	Teesvalley	Gresham	449000	519665	Res	C3Flat	0	450	450	450	450	450	Hypothetical	1	W	0
242	Teesvalley	Stainsby (Stainsby Hall Farm/Stainsby Hill Farm)	447189	515892	Res	C3House	0	850	631	850	850	850	Hypothetical	1	W	0
243	Teesvalley	Stainsby (Brookfield Woods/Brookland Park)	447448	515195	Res	C3House	0	299	299	299	299	299	Near Certain	1	W	0
244	Teesvalley	Hemlington Grange (Elderwood Park phases 1-4 and Ashwood Park phase 1)	450251	513982	Res	C3House	0	655	641	655	655	655	Near Certain	1	W	0
245	Teesvalley	Hemlington Grange (outline consent)	449876	514007	Res	C3House	0	575	368	575	575	575	More than Likely	1	W	0
249	Teesvalley	Newham Hall Farm	451650	513626	Res	C3House	0	1100	425	1049	1100	1100	Hypothetical	1	W	0
262	Teesvalley	Tees AMP	448078	520288	Emp	B2/B8	23865	0	23865	23865	23865	23865	Near Certain	1	W	0
268	Teesvalley	Cargo Fleet West	450960	520323	Emp	A1	3500	0	3500	3500	3500	3500	Hypothetical	1	W	0
275	Teesvalley	University Building One - Southfield Road	449429	519706	Emp	D1College	5800	0	5800	5800	5800	5800	Hypothetical	1	W	0
298	Teesvalley	Centre North East	449553	520458	Res	C3Flat	0	300	0	0	0	0	Near Certain	1	W	0
304	Teesvalley	1-29 Station Street	449381	520703	Emp	B2/B8	9159	0	0	0	0	0	Old Use	1	W	0
305	Teesvalley	1-29 Station Street	449381	520703	Res	C3Flat	0	337	337	337	337	337	Near Certain	1	W	0
306	Teesvalley	Centre Square	449754	520238	Emp	B1	19466	0	19466	19466	19466	19466	Near Certain	1	W	1
310	Teesvalley	Stainton Vale Farm	447226	514715	Res	C3House	0	740	355	740	740	740	Hypothetical	1	W	0
313	Teesvalley	Grove Hill (excluding Bishopton Road)	449742	518009	Res	C3House	0	270	258	270	270	270	Hypothetical	1	W	0
322	Teesvalley	Cornell Quarter, Woodlands Road	449727	519761	Res	C3Flat	0	300	300	300	300	300	Near Certain	1	W	0
328	Teesvalley	BoHo X office	449524	520932	Emp	B1	8611	0	8611	8611	8611	8611	Reasonably Foreseeable	1	W	0
331	Teesvalley	Denmark Street Car Park	449045	520430	Emp	D1College	5629	0	5629	5629	5629	5629	Near Certain	1	W	0
336	Teesvalley	Low Grange Farm	454176	520448	Res	C3	0	1250	338	713	750	750	Near Certain	1	W	0
339	Teesvalley	Church Hill, Skelton (A+B)	466065	519475	Res	C3	0	267	267	267	267	267	Near Certain	1	W	0
340	Teesvalley	Greenfield Extension South of Marske	462476	523068	Res	C3House	0	1000	500	960	1000	1000	More than Likely	1	W	0
342	Teesvalley	Kirkleatham Business Park	459045	522617	Emp	B1	25000	0	17000	20000	20000	20000	Hypothetical	1	W	0
343	Teesvalley	Kirkleatham Business Park	459045	522617	Emp	B2/B8	24000	0	0	0	0	0	Near Certain	1	W	0
346	Teesvalley	Skelton Industrial Estate Extension (Housing part)	466929	519593	Res	C3	0	400	288	400	400	400	Near Certain	1	W	0
351	Teesvalley	Skelton Industrial Estate Extension	467169	519602	Emp	A1	3482	0	3482	3482	3482	3482	Near Certain	1	W	0
373	Teesvalley	High Farm, Teesville	453520	519345	Res	C3House	0	294	294	294	294	294	Near Certain	1	W	0
374	Teesvalley	The Closes, Redcar. Havelock Park	459830	522790	Res	C3	0	342	342	342	342	342	Near Certain	1	W	0
376	Teesvalley	Mannion Park, Grangetown	456000	520000	Emp	B1	11500	0	0	0	0	0	More than Likely	1	W	0
380	Teesvalley	Longbank Farm, Ormesby	454065	516537	Res	C3	0	320	288	320	320	320	More than Likely	1	W	0
385	Teesvalley	Galley Hill Farm, Guisborough	459168	515710	Res	C3House	0	326	326	326	326	326	Near Certain	1	W	0
390	Teesvalley	Land at North East of Wilton International Site	457893	522872	Emp	B2/B8	87181	0	87181	87181	87181	87181	Near Certain	1	W	1
409	Teesvalley	West of Kirkleatham Lane	459227	522954	Res	C3House	0	550	308	528	550	550	More than Likely	1	W	0
412	Teesvalley	Cleveland Gate, Guisborough (Employment)	461131	515535	Emp	A1Food	5730	0	5730	5730	5730	5730	Near Certain	1	W	0
420	Teesvalley	Kilton Lane, Brotton	469290	519350	Res	C3	0	270	167	270	270	270	Hypothetical	1	W	0
427	Teesvalley	Land north of Woodcock Wood and West of Flatts Lane	454392	516937	Res	C3House	0	400	384	400	400	400	More than Likely	1	W	0
445	Teesvalley	Former Visqueen Site	443586	517297	Res	C3	0	450	450	450	450	450	Near Certain	1	W	0
457	Teesvalley	Allens West	441320	514887	Emp	B2/B8	38500	0	19712	77	0	0	Old Use	1	W	0
459	Teesvalley	Allens West	441320	514887	Res	C3House	0	845	412	843	845	845	Near Certain	1	W	0
466	Teesvalley	The Rings	444037	514155	Res	C3	0	480	480	480	480	480	Near Certain	1	W	0
469	Teesvalley	Little Maltby Farm, Low Lane	445444	513005	Res	C3House	0	1155	1155	1155	1155	1155	Near Certain	1	W	0
483	Teesvalley	Summerville Farm	441674	521995	Res	C3House	0	340	340	340	340	340	Near Certain	1	W	0
484	Teesvalley	Pipe Mill (Corus), Portrack Lane	446014	519595	Emp	B2/B8	22500	0	0	0	0	0	Old Use	1	W	0
485	Teesvalley	Pipe Mill (Corus), Portrack Lane	446012	519804	Emp	B1	11613	0	11613	11613	11613	11613	Near Certain	1	W	0

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486	Teesvalley	Corus Pipe Mill	446014	519595	Res	C3	0	322	322	322	322	322	Near Certain	1	W	0
495	Teesvalley	Morley Carr Farm	441242	510995	Res	C3	0	350	350	350	350	350	Near Certain	1	W	0
498	Teesvalley	Tall Trees	441127	510502	Res	C3House	0	288	288	288	288	288	Near Certain	1	W	0
518	Teesvalley	Victoria Park (Estate)	444698	519524	Res	C3Flat	0	254	0	0	0	0	Old Use	1	W	0
521	Teesvalley	Queens Park North	444581	520249	Res	C3House	0	400	320	400	400	400	Old Use	1	W	0
525	Teesvalley	Land off Grangefield Road (Thompsons Scrap Yard/Millfield)	443730	519156	Res	C3House	0	600	386	600	600	600	Reasonably Foreseeable	1	W	0
529	Teesvalley	Tees Marshalling Yard	446291	519192	Res	C3	0	1100	0	0	0	0	Reasonably Foreseeable	1	W	0
541	Teesvalley	Tithebarn Land	440995	520646	Res	C3House	0	340	0	0	0	0	Near Certain	1	W	0
543	Teesvalley	Land at Wynyard Village (Wynyard Village Western Extension)Phase F	440808	527194	Res	C3House	0	279	0	0	0	0	More than Likely	1	W	0
550	Teesvalley	Wynyard Park	443733	527380	Res	C3House	0	400	0	0	0	0	Reasonably Foreseeable	1	W	0
554	Teesvalley	Land West Of Yarm Lea	440792	510847	Res	C3House	0	495	0	0	0	0	Reasonably Foreseeable	1	W	0
614	Teesvalley	Mount Leven Farm, Leven Bank Farm, Yarm	444266	512241	Res	C3House	0	332	226	332	332	332	Near Certain	1	W	0
625	Teesvalley	Hardwick Redevelopment	441894	521448	Res	C3	0	635	635	635	635	635	Hypothetical	1	W	0
630	Teesvalley	Ingenium Parc	431480	513392	Emp	B2/B8	100000	0	83000	100000	100000	100000	Near Certain	1	C	1
631	Teesvalley	South Industrial Zone	454239	522313	Emp	B2/B8	174000	0	174000	174000	174000	174000	More than Likely	1	W	1
632	Teesvalley	Lackenby	455341	521552	Emp	B2/B8	93000	0	93000	93000	93000	93000	Reasonably Foreseeable	1	W	1
633	Teesvalley	Dorman Point	454715	521428	Emp	B2/B8	140000	0	140000	140000	140000	140000	Reasonably Foreseeable	1	W	1
634	Teesvalley	The Foundry	456224	525186	Emp	B2/B8	464000	0	464000	464000	464000	464000	Reasonably Foreseeable	1	W	1
635	Teesvalley	Steel House	457747	524265	Emp	B1	15794	0	15794	15794	15794	15794	Reasonably Foreseeable	1	W	1
636	Teesvalley	Long Acres	457543	524644	Emp	B2/B8	186000	0	186000	186000	186000	186000	Reasonably Foreseeable	1	W	1
637	Durham	INTEGRA61	430430	537494	Emp	B2	170859	3781	139763	170944	170944	170944	Near Certain	1	W	1
642	Durham	Aykley Heads	426775	543543	Emp	B1a	12260	6000	6130	12260	12260	12260	More than Likely	1	W	1
646	Durham	Jade Park	439290	545775	Emp	B2/B8	14458	Unknown	0	0	0	0	Near Certain	1	W	0
647	Durham	Former LG Phillips site	429989	544063	Emp	B2/B8	21073	Unknown	0	0	0	0	More than Likely	1	W	0
651	Durham	Black & Decker (Durham Gate)	427481	534508	Res	C3	507	507	289	289	289	289	Near Certain	1	C	0
653	Durham	Bracks Farm	421945	529083	Res	C3	300	300	201	201	201	201	Near Certain	1	C	1
654	Durham	British Oxygen Co Vigo Lane	427565	553797	Res	C3	233	233	157	157	157	157	Near Certain	1	C	1
656	Durham	Copelaw	429274	524849	Res	C3	600	600	410	770	1400	1400	Reasonably Foreseeable	1	C	0
657	Durham	Dale Farm Land at Dale Road	423856	525404	Res	C3	340	340	125	275	340	340	Near Certain	1	C	1
658	Durham	Electrolux	426558	533164	Res	C3	425	425	240	425	425	425	Near Certain	1	C	1
661	Durham	Former Cape Asbestos Works Durham Road (The Grange)	430194	538614	Res	C3	360	360	74	74	74	74	Near Certain	1	W	0
662	Durham	Former Cemex Site	419252	526777	Res	C3	100	100	99	99	99	99	More than Likely	1	C	0
665	Durham	Former Riding Carpets Site	420735	535193	Res	C3	213	213	58	58	58	58	Near Certain	1	C	0
666	Durham	Former Tudhoe Grange Upper School, St Charles Road	426227	534575	Res	C3	110	110	110	110	110	110	Reasonably Foreseeable	1	C	0
667	Durham	Genesis Site Berry Edge South	410025	550481	Res	C3	482	482	330	421	421	421	Near Certain	1	W	0
668	Durham	High Riggs (land adj Darlington Road)	406242	517233	Res	C3	107	107	49	49	49	49	Near Certain	1	C	1
669	Durham	High West Road	415495	535356	Res	C3	250	250	155	250	250	250	Reasonably Foreseeable	1	C	1
670	Durham	Integra 61 Land South Of Bowburn & West Of The A688	430652	537491	Res	C3	270	270	270	270	270	270	Near Certain	1	W	1
671	Durham	Lambton Park	430164	551743	Res	C3	400	400	282	400	400	400	Near Certain	1	W	0
672	Durham	LAND AT AND TO WEST OF K HARTWALL LTD BUTCHERS RACE GREEN LANE	427275	534601	Res	C3	108	108	57	57	57	57	Near Certain	1	C	1
673	Durham	Land at Former Catkin Way	419749	527554	Res	C3	101	101	101	101	101	101	Near Certain	1	C	1
674	Durham	Land at Spout Lane	423941	525850	Res	C3	278	278	98	98	98	98	Near Certain	1	C	0
675	Durham	Land At The East Of Deerbolt HMYOI And North Of Bowes Road	404430	516445	Res	C3	162	162	149	149	149	149	Near Certain	1	C	1
677	Durham	Land At The Former Sedgefield Community Hospital Salters Lane	435973	531141	Res	C3	100	100	100	100	100	100	Near Certain	1	C	1
678	Durham	Land At The North Of Woodhouses Farm And South Of Etherley Moor Wigda	418956	528709	Res	C3	234	234	234	234	234	234	More than Likely	1	C	1
679	Durham	Land at Woodham College	427432	526759	Res	C3	100	100	100	100	100	100	Reasonably Foreseeable	1	C	0
681	Durham	Land North of Durham Road	424324	532717	Res	C3	300	300	270	300	300	300	Near Certain	1	C	1
682	Durham	Land north of West Chilton Terrace	428582	530391	Res	C3	135	135	135	135	135	135	Near Certain	1	C	1
684	Durham	Land rear of Newfield Terrace Newfield Farm	424535	552447	Res	C3	274	274	28	28	28	28	Near Certain	1	W	0
685	Durham	Land South Of A182SeahamCounty Durham	442527	546569	Res	C3	1500	1500	480	840	1500	1500	Near Certain	1	W	0
686	Durham	Land South of Douglas Crescent	422350	528613	Res	C3	500	500	378	500	500	500	Near Certain	1	C	1
687	Durham	Land to East of Ash Drive	420969	535326	Res	C3	200	200	135	200	200	200	Reasonably Foreseeable	1	C	1
688	Durham	Land To The East Of Clare Lodge And Durham Road	428579	529119	Res	C3	194	194	115	115	115	115	Near Certain	1	C	1

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691	Durham	Land To The North Of Etherley Moor	418752	529091	Res	C3	150	150	150	150	150	150	More than Likely	1	C	1
692	Durham	Land To The North Of Middridge Road	426481	526245	Res	C3	256	256	87	87	87	87	Near Certain	1	C	1
693	Durham	Land To The South East Of Stewart Drive	440623	537891	Res	C3	250	250	175	250	250	250	Near Certain	1	W	0
694	Durham	Land To The South Of 100 To 106 Dean Road	428904	532059	Res	C3	161	161	161	161	161	161	Near Certain	1	C	1
695	Durham	Land To The South Of Eden Drive	435962	528365	Res	C3	277	277	212	212	212	212	Near Certain	1	C	1
696	Durham	Land to the South of Fenwick Way (Berry Edge Central)	410037	550842	Res	C3	319	319	101	101	101	101	Near Certain	1	W	0
698	Durham	Land To The South Of Wallnook Lane And East Of Recreation Ground	421932	544911	Res	C3	400	400	210	348	348	348	Near Certain	1	W	0
700	Durham	Land West of Browney Lane	424639	538947	Res	C3	292	292	111	111	111	111	Near Certain	1	W	0
701	Durham	Laurel Drive	412541	551245	Res	C3	290	290	155	290	290	290	Reasonably Foreseeable	1	W	0
702	Durham	Low Hills	441928	542297	Res	C3	900	900	210	390	900	900	Near Certain	1	W	0
703	Durham	Middles Farm	420119	551687	Res	C3	296	296	113	113	113	113	Near Certain	1	W	0
704	Durham	Milburngate House	427242	542792	Res	C3	303	303	303	303	303	303	More than Likely	1	W	0
705	Durham	Mount Oswald	426613	540690	Res	C3	291	291	147	147	147	147	Near Certain	1	W	0
706	Durham	North East Industrial Estate	442972	541983	Res	C3	390	390	150	330	390	390	More than Likely	1	W	0
708	Durham	Seaham Colliery	441017	549806	Res	C3	335	335	160	335	335	335	Reasonably Foreseeable	1	C	0
709	Durham	Sherburn Road	429806	542235	Res	C3	420	420	200	420	420	420	Reasonably Foreseeable	1	W	0
710	Durham	Shotley Bridge Hospital	410271	552981	Res	C3	280	280	73	73	73	73	Near Certain	1	W	0
711	Durham	Site O - Cobblers Hall	427110	526437	Res	C3	175	175	25	25	25	25	Near Certain	1	C	0
712	Durham	Sniperley Park	425851	544159	Res	C3	1700	1700	740	1700	1700	1700	Reasonably Foreseeable	1	W	0
715	Durham	Thorn Lighting	426827	533563	Res	C3	403	403	150	150	150	150	Near Certain	1	C	0
716	Durham	Whitworth Park (All Phases)	424806	534203	Res	C3	726	726	259	259	259	259	Near Certain	1	C	1
717	Durham	Land To The West Of Startforth Park	403812	516063	Res	C3	210	210	0	0	0	0	Hypothetical	1	C	0
808	Northumberland	Ellington (land at), Ellington	428156	591699	Res	C3	14	392	335	385	385	385	Near Certain	1	W	0
928	Northumberland	Land at South West Newsham, Blyth	430072	578905	Res	C3	13	275	205	300	300	300	Reasonably Foreseeable	1	W	0
929	Northumberland	Land at South West Sector (Bellway), Cramlington	424630	576359	Res	C3	78	1600	700	767	767	767	Near Certain	1	W	0
937	Northumberland	Land at West Blyth (accessed from Chase Farm), Blyth	429235	580682	Res	C3	22	726	254	254	254	254	Near Certain	1	W	0
945	Northumberland	Land east of Allerburn Lea, Alnwick	419958	613244	Res	C3	13	270	120	220	270	270	Reasonably Foreseeable	1	W	0
961	Northumberland	Land East Of Wansbeck General Hospital, Ashington	429404	587757	Res	C3	28	600	460	600	600	600	Near Certain	1	W	0
977	Northumberland	Land north of Scotland Gate, Choppington	425593	584598	Res	C3	15	327	150	327	327	327	Reasonably Foreseeable	1	W	0
980	Northumberland	Land North of Station Road (Bellway), Cramlington	426021	577419	Res	C3	16	481	302	302	302	302	Near Certain	1	W	0
997	Northumberland	Land S of Dandsfield Square, Amble	427202	603686	Res	C3	10	272	272	272	272	272	Near Certain	1	W	0
1035	Northumberland	Land to the East, Featherstone Grove, Bedlington	425218	582756	Res	C3	4	500	500	500	500	500	Near Certain	1	W	0
1103	Northumberland	New Hartley Area 1, Land to the East of Seaburn Avenue, New Hartley	431087	576943	Res	C3	9	285	285	285	285	285	Near Certain	1	W	0
1137	Northumberland	Police HQ, Smallburn, Ponteland	415429	574035	Res	C3	14	253	253	253	253	253	Near Certain	1	W	0
1145	Northumberland	Prudhoe Hospital Site, Prudhoe	410552	562196	Res	C3	29	404	400	400	400	400	Near Certain	1	W	0
1163	Northumberland	Seaton Vale, Land at Summerhouse Lane, Ashington	429030	587479	Res	C3	23	704	265	265	265	265	Near Certain	1	W	0
1178	Northumberland	South West Sector Application Site (Barratt), Cramlington	424987	576607	Res	C3	22	715	150	362	362	362	Near Certain	1	W	0
1180	Northumberland	South-East of Coquet High School, Amble	426098	603389	Res	C3	22	500	150	450	500	500	Reasonably Foreseeable	1	W	0
1190	Northumberland	St Georges Hospital, Morpeth	420307	586813	Res	C3	20	375	292	292	292	292	Near Certain	1	W	0
1196	Northumberland	St. George's Hospital (land north), Morpeth	419780	587295	Res	C3	42	875	270	570	720	870	Near Certain	1	W	0
1199	Northumberland	Stobhill (land at), Morpeth	421124	584779	Res	C3	17	438	317	317	317	317	Near Certain	1	W	0
1222	Northumberland	Vald Birn UK Ltd, C403 South View to Unity Terrace, Cambois	430231	584744	Res	C3	8	323	150	323	323	323	Reasonably Foreseeable	1	W	0
1247	Northumberland	Windy Edge, Alnwick	420158	613006	Res	C3	13	270	200	270	270	270	Near Certain	1	W	0
1350	Tyne and Wear	BAE Systems	426738	556027	Res	C3	11	300	300	300	300	300	Reasonably Foreseeable	1	W	0
1353	Tyne and Wear	Bedewell Industrial Estate and Disused Playing Fields	432136	564464	Res	C3	10	335	292	292	292	292	More than Likely	1	W	0
1383	Tyne and Wear	Dunston Hill	422641	560676	Res	C3	18	352	352	352	352	352	Reasonably Foreseeable	1	W	0
1393	Tyne and Wear	Exemplar Neighbourhood	426012	562869	Res	C3	41	1000	500	1000	1000	1000	Reasonably Foreseeable	1	W	0
1451	Tyne and Wear	Land at Chuter Ede Education Centre (excluding Brydon Court)	435899	562960	Res	C3	8	280	200	280	280	280	Reasonably Foreseeable	1	W	0
1463	Tyne and Wear	Land at Holborn	435831	566544	Res	C3	5	365	365	365	365	365	Reasonably Foreseeable	1	W	0
1491	Tyne and Wear	Land to North of Town End Farm	434513	559884	Res	C3	22	400	325	400	400	400	Reasonably Foreseeable	1	W	0
1506	Tyne and Wear	MetroGreen - Dunston W	422503	562606	Res	C3	20	480	240	480	480	480	Reasonably Foreseeable	1	W	0
1510	Tyne and Wear	MetroGreen - South	421884	562405	Res	C3	19	289	40	289	289	289	Reasonably Foreseeable	1	W	0
1527	Tyne and Wear	Pipewellgate	425119	563530	Res	C3	1	270	270	270	270	270	Reasonably Foreseeable	1	W	0

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1535	Tyne and Wear	Ryton	415362	563641	Res	C3	32	550	550	550	550	550	Reasonably Foreseeable	1	W	0
1545	Tyne and Wear	Site of former Siemens and Narec Clothier Laboratories	430421	563532	Res	C3	10	334	334	334	334	334	More than Likely	1	W	0
1551	Tyne and Wear	South Shields Community School - Brinkburn Campus	437513	566018	Res	C3	8	272	272	272	272	272	Reasonably Foreseeable	1	W	0
1588	Tyne and Wear	Eastgate House, Manors Central Business Park Argyle Street	425380	564372	Res	C3	0	75	303	303	303	303	Reasonably Foreseeable	1	W	0
1658	Tyne and Wear	Cement works and scrap yard, Pottery Lane East	424589	563513	Res	C3	0	283	120	220	270	283	More than Likely	1	W	0
1659	Tyne and Wear	Cuthbert House, Pilgrim Street	425209	564119	Res	C3	0	321	321	321	321	321	More than Likely	1	W	0
1664	Tyne and Wear	St James Metro Station	424385	564459	Res	C3	0	328	328	328	328	328	Reasonably Foreseeable	1	W	0
1671	Tyne and Wear	Newburn Riverside	417924	564252	Res	C3	30	1000	475	875	875	875	Reasonably Foreseeable	1	W	0
1673	Tyne and Wear	Former Redewood School, Etal Lane	420500	567198	Res	C3	7	253	120	220	253	253	More than Likely	1	W	0
1687	Tyne and Wear	Scotswood Development Area (Phase 1)	420936	563890	Res	C3	12	362	120	220	270	320	More than Likely	1	W	0
1690	Tyne and Wear	Scotswood Development Area Phase 2, Scotswood	420352	564020	Res	C3	30	1368	1205	1358	1358	1358	More than Likely	1	W	0
1706	Tyne and Wear	2 Saint James Boulevard, Newcastle	424279	564341	Res	C3	0	230	350	350	350	350	More than Likely	1	W	0
1708	Tyne and Wear	Newcastle Technopole, Kings Manor	425330	564431	Res	C3	0	162	535	535	535	535	More than Likely	1	W	0
1728	Tyne and Wear	Calder Industrial Materials, Skinnerburn Road	424187	563144	Res	C3	5	700	450	700	700	700	Reasonably Foreseeable	1	W	0
1738	Tyne and Wear	Lower Callerton SLR	417143	567336	Res	C3	30	900	360	760	760	760	More than Likely	1	W	0
1743	Tyne and Wear	Hazlerigg SLR	422755	572174	Res	C3	20	455	375	375	375	375	More than Likely	1	W	0
1748	Tyne and Wear	NGP Cell C	423202	571205	Res	C3	11	393	120	220	270	320	More than Likely	1	W	0
1749	Tyne and Wear	Newcastle Great Park Cell A	421879	571326	Res	C3	36	1200	660	1060	1060	1060	More than Likely	1	W	0
1750	Tyne and Wear	Newcastle Great Park Cell D	421833	570547	Res	C3	27	600	384	384	384	384	More than Likely	1	W	0
1755	Tyne and Wear	Throckley North SLR Phases 3-5	415130	567424	Res	C3	16	412	385	412	412	412	More than Likely	1	W	0
1760	Tyne and Wear	Upper Callerton SLR	419500	568888	Res	C3	46	1200	625	1085	1085	1085	Reasonably Foreseeable	1	W	0
1762	Tyne and Wear	NGP West SLR	421173	570570	Res	C3	38	1000	560	960	960	960	Reasonably Foreseeable	1	W	0
1763	Tyne and Wear	Middle Callerton West	418031	568624	Res	C3	26	513	493	493	493	493	More than Likely	1	W	0
1773	Tyne and Wear	Middle Callerton East	418642	568171	Res	C3	17	600	460	570	570	570	More than Likely	1	W	0
1814	Tyne and Wear	North Tyne Industrial Estate, Whitley Road, Benton	429262	569626	Res	C3	22	495	80	480	495	495	Reasonably Foreseeable	1	W	0
1857	Tyne and Wear	West Chirton South, Norham Road, North Shields	433218	568302	Res	C3	29	399	399	399	399	399	More than Likely	1	W	0
1862	Tyne and Wear	Whitehouse Farm, West Moor	426405	571288	Res	C3	32	427	369	369	369	369	More than Likely	1	W	0
1863	Tyne and Wear	Station Road West, Wallsend (inc East Benton Farm)	428708	568765	Res	C3	31	593	588	588	588	588	More than Likely	1	W	0
1864	Tyne and Wear	Station Road East, Wallsend	428474	568765	Res	C3	29	650	488	488	488	488	More than Likely	1	W	0
1867	Tyne and Wear	Smith's Dock, North Shields	435464	567500	Res	C3	11	701	588	701	701	701	More than Likely	1	W	0
1868	Tyne and Wear	Scaffold Hill Farm, Holystone	430609	569997	Res	C3	23	460	288	288	288	288	More than Likely	1	W	0
1914	Tyne and Wear	Killingworth Moor (strategic site)	429518	570788	Res	C3	192	2000	1710	2000	2000	2000	Reasonably Foreseeable	1	W	0
1915	Tyne and Wear	Murton (strategic site)	432760	570883	Res	C3	243	3300	2283	3000	3000	3000	Reasonably Foreseeable	1	W	0
1971	Tyne and Wear	Balliol East, Benton Road, Longbenton	426988	570027	Res	C3	23	583	281	583	583	583	Reasonably Foreseeable	1	W	0
1979	Tyne and Wear	Tynemouth Golf Course, Tynemouth	435825	569693	Res	C3	36	806	0	320	400	480	Reasonably Foreseeable	1	W	0
2004	Tyne and Wear	Baltic Business Quarter	426105	563533	Emp	A1 - Retail, B	76800	NULL	51200	76800	76800	76800	Reasonably Foreseeable	1	W	0
2006	Tyne and Wear	Bede Industrial Estate	434755	564781	Emp	B1 - Business	18100	0	12000	16100	16100	16100	Reasonably Foreseeable	1	W	0
2007	Tyne and Wear	Boldon Business Park	434071	561372	Emp	B1 - Business	265400	31595	75828	157975	189570	221165	Reasonably Foreseeable	1	W	0
2013	Tyne and Wear	Former Hawthorne Leslie Shipyard, Hebburn	431340	564884	Emp	B2 - General	37000	0	12000	25000	30000	35000	Reasonably Foreseeable	1	W	0
2015	Tyne and Wear	Gateshead Quays	425650	563738	Emp	A1 - Retail, A	61400	NULL	61400	61400	61400	61400	Reasonably Foreseeable	1	W	0
2016	Tyne and Wear	Green Business Park, Hebburn / Jarrow Staithes	431340	564884	Emp	B2 - General	63000	7500	18000	37500	45000	52500	Reasonably Foreseeable	1	W	0
2020	Tyne and Wear	Jackson Street	425591	563045	Emp	A1 - Retail, A	3400	NULL	3400	3400	3400	3400	Reasonably Foreseeable	1	W	0
2024	Tyne and Wear	Land bounded by Chaytor Street, Ellison Place, the Metro Line and Berkley V	433022	565611	Emp	B2 - General	140000	16667	40002	83337	100004	116671	Reasonably Foreseeable	1	W	0
2026	Tyne and Wear	Land east of Luke's Lane, Monkton Fell	431521	562663	Emp	B1 - Business	11300	0	9300	9300	9300	9300	Reasonably Foreseeable	1	W	0
2037	Tyne and Wear	Monkton Business Park	431521	562663	Emp	B1 - Business	38000	1000	12000	25000	30000	35000	Reasonably Foreseeable	1	W	0
2038	Tyne and Wear	Old Town Hall Area	425478	563387	Emp	A1 - Retail, A	7600	NULL	7600	7600	7600	7600	Reasonably Foreseeable	1	W	0
2040	Tyne and Wear	Port of Tyne	434407	565563	Emp	B1 - Business	153100	18226	43740	91126	109352	127578	Reasonably Foreseeable	1	W	0
2047	Tyne and Wear	Simonside Industrial Estate	434953	564256	Emp	B1 - Business	18700	0	12000	16700	16700	16700	Reasonably Foreseeable	1	W	0
2050	Tyne and Wear	Wardley Colliery	430503	562010	Emp	B2 - General	364200	43357	104058	216787	260144	303501	Reasonably Foreseeable	1	W	0
2058	Tyne and Wear	Shiremoor West	430567	571127	Emp	B1 - Business	11200	0	9335	9335	9335	9335	Reasonably Foreseeable	1	W	0
2059	Tyne and Wear	A19 Corridor Killingworth Moor	430047	570986	Emp	B1 - Business	170000	0	141665	141665	141665	141665	Reasonably Foreseeable	1	W	0
2064	Tyne and Wear	Balliol Business Park East	426909	570022	Emp	B1 - Business	252900	0	210750	210750	210750	210750	Reasonably Foreseeable	1	W	0
2065	Tyne and Wear	Gosforth Business Park	426081	569842	Emp	B1 - Business	102600	0	85500	85500	85500	85500	Reasonably Foreseeable	1	W	0

ArupID	Author	SiteNm	X	Y	Dev	Land Use	NetArea	TotDwell	2029	2039	2044	2051	Uncertainty	Big Enough	Core Wide	TA
2066	Tyne and Wear	Weetslade East A	426135	572377	Emp	B1 - Business	14000	0	11665	11665	11665	11665	Reasonably Foreseeable	1	W	0
2068	Tyne and Wear	Whitehill Point	434415	566488	Emp	B1 - Business	11300	0	9415	9415	9415	9415	Reasonably Foreseeable	1	W	0
2070	Tyne and Wear	Esso	434048	566816	Emp	B1 - Business	208500	0	173750	173750	173750	173750	Reasonably Foreseeable	1	W	0
2071	Tyne and Wear	Weetslade	425770	571869	Emp	B1 - Business	318600	0	265500	265500	265500	265500	Reasonably Foreseeable	1	W	0
2080	Tyne and Wear	Swan Hunters	430278	565949	Emp	B1 - Business	11300	0	9415	9415	9415	9415	Reasonably Foreseeable	1	W	0
2081	Tyne and Wear	Thermal Syndicate	429736	565646	Emp	B1 - Business	20400	0	17000	17000	17000	17000	Reasonably Foreseeable	1	W	0
2082	Tyne and Wear	Hadrian Road South	431087	566426	Emp	B1 - Business	11500	0	9585	9585	9585	9585	Reasonably Foreseeable	1	W	0
2111	Tyne and Wear	Chapelgarth Site	437082	551888	Res	C3	750	750	563	750	750	750	Near Certain	1	W	0
2128	Tyne and Wear	Former Groves Site, Woodbine Terrace, Pallion	437149	558004	Res	C3	720	720	390	720	720	720	More than Likely	1	W	0
2129	Tyne and Wear	Former Lambton Cokeworks Site (Elba Park)	432091	551337	Res	C3	359	359	359	359	359	359	Near Certain	1	W	0
2133	Tyne and Wear	Heritage Green - Rear of Bee Hive Pub, Coaley Lane	432936	551187	Res	C3	277	277	288	288	288	288	Near Certain	1	W	0
2136	Tyne and Wear	High Ford Estate, Flodden Road	436519	556678	Res	C3	285	285	285	285	285	285	Near Certain	1	W	0
2145	Tyne and Wear	Land at North Road	434606	548134	Res	C3	300	300	300	300	300	300	Near Certain	1	W	0
2148	Tyne and Wear	Land north of Burdon Lane	439668	556967	Res	C3	955	955	395	785	785	785	Reasonably Foreseeable	1	W	0
2155	Tyne and Wear	Phases 2-6, Chester Road	435769	555458	Res	C3	500	500	238	418	418	418	Near Certain	1	W	0
2156	Tyne and Wear	Philadelphia Complex	433660	552393	Res	C3	500	500	309	459	459	459	More than Likely	1	W	0
2161	Tyne and Wear	Ryhope and Cherry Knowle Hospital	439668	556967	Res	C3	800	800	533	773	773	773	Near Certain	1	W	0
2166	Tyne and Wear	Stadium Village, Sheepfolds North	439668	556967	Res	C3	265	265	70	265	265	265	Hypothetical	1	W	0
2172	Tyne and Wear	Teal Farm North	432426	555603	Res	C3	566	566	566	566	566	566	Near Certain	1	W	0
2179	Tyne and Wear	Willow Farm land to south, Ryhope (North)	441111	552143	Res	C3	450	450	335	450	450	450	More than Likely	1	W	0
2180	Tyne and Wear	International Advanced Manufacturing Park	433633	559032	Emp	B1 - Business	0	0	391875	391875	391875	391875	More than Likely	1	W	1
2183	Richmondshire	Duchess of Kent Barracks	419054	497678	Res	C3	6	122	122	122	122	122	Reasonably Foreseeable	1	C	0
2186	Richmondshire	Former Colburn Pipeworks site (Phase 2)	420650	498040	Res	C3	6	201	171	171	171	171	Near Certain	1	C	1
2189	Richmondshire	Harley Hill	419957	497195	Res	C3	50	1085	120	420	570	720	Reasonably Foreseeable	1	C	0
2200	Richmondshire	Land W of Scotton Road	418311	497098	Res	C3	7	126	120	126	126	126	Reasonably Foreseeable	1	C	0
2208	Richmondshire	Windfall Allowance Sites 3 & Under	418326	500334	Res	C3	9	195	194	194	194	194	Reasonably Foreseeable	1	C	0
2217	Ryedale	Agri-Business Park and Business Technology Park, Eden House Road, Malton	480011	473790	Emp	mixed use	3750	3750	3750	3750	3750	3750	Near Certain	1	C	1
2221	Ryedale	Malton Enterprise park	477227	470517	Emp	B1,B2,B8	5109	5109	5109	5109	5109	5109	Near Certain	1	C	1
2225	Cumbria	Station Road, Appleby	368815	520860	Res	C3	0	101	101	101	101	101	More than Likely	1	C	0
2238	Cumbria	Carleton Heights, Penrith	352961	530449	Res	C3	18	560	560	560	560	560	More than Likely	1	C	1
2239	Cumbria	Croftlands East	328786	476254	Res	C3	16	330	180	330	330	330	More than Likely	1	W	0
2319	Cumbria	Land at Southend Road/Castle Hill Road, Penrith	351617	529814	Res	C3	5	161	120	161	161	161	More than Likely	1	C	1
2326	Cumbria	Land Behind Cross Croft, Appleby	369215	519848	Res	C3	5	115	115	115	115	115	Reasonably Foreseeable	1	C	0
2342	Cumbria	Land off Carleton Road, Penrith	353267	529748	Res	C3	8	149	149	149	149	149	More than Likely	1	C	1
2345	Cumbria	Land off Cross Croft/Back Lane, Appleby	369007	520122	Res	C3	5	142	142	142	142	142	More than Likely	1	C	1
2371	Cumbria	Land to west of Faraday Road, Kirby Stephen	377300	508591	Res	C3	5	128	120	128	128	128	Reasonably Foreseeable	1	C	0
2384	Cumbria	Nook Farm (Croftlands West)	328153	476293	Res	C3	16	330	230	330	330	330	Near Certain	1	W	0
2397	Cumbria	Raiselands, Penrith	350723	531226	Res	C3	8	229	229	229	229	229	More than Likely	1	C	1
2400	Cumbria	Salkeld Road/ Fairhill, Penrith	351093	531838	Res	C3	11	250	162	250	250	250	Reasonably Foreseeable	1	C	1
2443	Cumbria	Brough Main Street	366289	522193	EMP	NULL	15000	0	12000	13000	13000	13000	Reasonably Foreseeable	1	C	0
2444	Cumbria	Cross Croft Industrial estate	369594	520099	EMP	NULL	25600	0	12000	23600	23600	23600	Reasonably Foreseeable	1	C	0
2445	Cumbria	East of Burton Road	352657	489835	EMP	B1 - Business	65200	7762	12420	38812	46574	54336	Reasonably Foreseeable	1	W	0
2447	Cumbria	Gilwilly Industrial Estate Extension	350624	530574	EMP	B1 - Business	119100	14179	34026	70889	85068	99247	Near certain	1	C	1
2451	Cumbria	Kirkby Stephen Business Park	377113	509078	EMP	NULL	33300	0	12000	25000	30000	31300	Near certain	1	C	0
2452	Cumbria	Land Adjacent to Bridge End Business Park	349449	481616	EMP	B1 - Business	80488	9582	22998	47912	57494	67076	Reasonably Foreseeable	1	W	0
2453	Cumbria	Land adjacent to Croppers Paper Mill	350830	495961	EMP	B1 - Business	12000	0	10000	10000	10000	10000	Reasonably Foreseeable	1	W	0
2455	Cumbria	Land adjacent to Mainline Business Park	351565	481635	EMP	B2 - General	80700	9607	23058	48037	57644	67251	Reasonably Foreseeable	1	W	0
2456	Cumbria	Land at Elmsfield Park	351908	480068	EMP	B2 - General	30400	0	12000	25000	28400	28400	Reasonably Foreseeable	1	W	0
2457	Cumbria	Land at junction of A6 and B5035 (Eden 41)	350337	533776	EMP	B1 - Business	77000	9167	22002	45837	55004	64171	More than Likely	1	C	1
2458	Cumbria	Land at Lightburn Road	328004	477898	EMP	A1 - Retail, B	32500	3779	9072	18899	22678	26457	Near certain	1	W	1
2459	Cumbria	Land at Milnthorpe Road	351981	478748	EMP	B1 - Business	25800	0	12000	23800	23800	23800	Reasonably Foreseeable	1	W	0
2460	Cumbria	Land North of Gatebeck Lane, A Gatebeck	354614	485834	EMP	B2 - General	31300	0	12000	25000	29300	29300	More than Likely	1	W	1
2461	Cumbria	Land North of Meadowbank Business Park	352244	494882	EMP	B1 - Business	51500	6131	14712	30651	36782	42913	Reasonably Foreseeable	1	W	0

ArupID	Author	SiteNm	X	Y	Dev	Land Use	NetArea	TotDwell	2029	2039	2044	2051	Uncertainty	Big Enough	Core Wide	TA
2462	Cumbria	Land on Sandside Road and Quarry Lane, Storth	348082	481017	EMP	NULL	30108	0	12000	25000	28108	28108	Reasonably Foreseeable	1	W	0
2465	Cumbria	Land Southwest of Mile Lane	350262	528809	EMP	B1 - Business	39000	2000	12000	25000	30000	35000	More than Likely	1	C	1
2468	Cumbria	Old Tebay Depot	361598	504966	EMP	NULL	14200	0	12000	12200	12200	12200	Reasonably Foreseeable	1	C	0
2469	Cumbria	Scroggs Wood	350962	490566	EMP	B1 - Business	112000	13333	31998	66663	79996	93329	Reasonably Foreseeable	1	W	0
2471	Cumbria	Skelgillside Workshops	372516	546248	EMP	NULL	13100	0	11100	11100	11100	11100	Reasonably Foreseeable	1	C	0
2472	Cumbria	Skirsgill	351466	528869	EMP	NULL	32900	0	12000	25000	30000	30900	Reasonably Foreseeable	1	C	0
2474	Cumbria	The Old Creamery	369521	519971	EMP	NULL	19800	0	12000	17800	17800	17800	Reasonably Foreseeable	1	C	0
2479	Cumbria	Former Corus Steel Works	298769	527179	R	c3	324	0	324	324	324	324	Near Certain	1	W	0
2487	Cumbria	Land at Oldside, Wokington	299487	529839	NR	B2	10	0	41440	41440	41440	41440	Reasonably Foreseeable	1	W	0
2488	Cumbria	Land North of Branthwaite Road, Lillyhall	302580	525558	NR	B2	18	0	70040	70040	70040	70040	Reasonably Foreseeable	1	W	0
2490	Cumbria	Land north of the Port of Wokington	299304	530030	NR	B2	9	0	37360	37360	37360	37360	Reasonably Foreseeable	1	W	0
2491	Cumbria	Land off Hallwood Road, Lillyhall	301441	525129	NR	B8	10	0	47850	47850	47850	47850	Reasonably Foreseeable	1	W	0
2492	Cumbria	Land off Joesph Noble Road, Lillyhall	302638	525273	NR	B2	2	0	9520	9520	9520	9520	Reasonably Foreseeable	1	W	0
2493	Cumbria	Land off Jubilee Road, Lillyhall	301718	525536	NR	B8	10	0	49600	49600	49600	49600	Reasonably Foreseeable	1	W	0
2499	Cumbria	Whitecroft, Maryport	303045	535300	R	c3	300	300	265	265	265	265	Reasonably Foreseeable	1	W	0
2525	Cumbria	Land at Edgehill Park (part former Marchon Car Park), Whitehaven	297089	515672	Residential	C3	335	335	335	335	335	335	More than Likely	1	W	0
2537	Cumbria	North of former Marchon Site, Whitehaven	296576	516096	Residential	C3	532	532	532	532	532	532	Reasonably Foreseeable	1	W	0
2544	Cumbria	Red Lonning and Harras Moor Stage 3, Whitehaven	298254	517948	Residential	C3	370	370	370	370	370	370	Reasonably Foreseeable	1	W	0
2556	Cumbria	Brunthill	338013	559841	Emp	B1	370000	370000	370000	370000	370000	370000	Reasonably Foreseeable	1	W	0
2558	Cumbria	Kingmoor Park Harker Estate	339012	560812	Res	c3	311	311	311	311	311	311	Reasonably Foreseeable	1	W	0
2562	Cumbria	Land at Newhouse Farm, south-east of Orton Road	336868	555483	Res	c3	539	539	539	539	539	539	More than Likely	1	W	0
2563	Cumbria	Land between Carleton Road and Cumwhinton Road	342750	553339	Res	c3	400	400	400	400	400	400	Near certain	1	W	0
2565	Cumbria	Land north of Carleton Clinic, east of Cumwhinton Drive	343587	553778	Res	c3	347	347	347	347	347	347	Near certain	1	W	0
2568	Cumbria	Land off Windsor Way	340300	558476	Res	c3	415	415	415	415	415	415	Near certain	1	W	0
2570	Cumbria	Land south of Carlisle Road	352335	560724	Res	c3	260	260	260	260	260	260	Near certain	1	W	0
2571	Cumbria	Land to the south east of junction 44	339556	559604	Res	c3	290	290	290	290	290	290	Near certain	1	W	0
2574	Cumbria	South West Morton	337496	553701	Emp	B1	80000	80000	80000	80000	80000	80000	Reasonably Foreseeable	1	W	0
2575	Cumbria	St Cuthbert's Garden Village	340889	551554	Res	c3	10325	10325	3500	8500	10325	10325	Reasonably Foreseeable	1	W	0
2587	Hambleton	NM5A & D - North Northallerton Area, West of Northallerton - Middlesbrou	442091	491502	Res	c3	472	472	460	472	472	472	More than Likely	1	W	0
2588	Hambleton	NM5C - North Northallerton Area, East of Stokesley Road, Northallerton	442091	491502	Res	c3	645	645	235	645	645	645	Reasonably Foreseeable	1	W	0
2596	Hambleton	TM2A - South West Thirsk Area, West of Topcliffe Road, Sowerby	442091	491502	Res	c3	489	489	300	489	489	489	Near Certain	1	W	0
2598	Hambleton	Winton Road, Northallerton	442091	491502	Res	c3	435	435	35	435	435	435	Reasonably Foreseeable	1	W	0
2599	Richmondshire	Breckenbrough - Catterick SFA	420044	496662	Res	C3	170	170	170	170	170	170	More than Likely	1	C	1
2600	Richmondshire	Brough St Giles, Catterick	421340	498519	Res	C3	289	289	289	289	289	289	More than Likely	1	C	1
2601	Richmondshire	Chartermark Way, Colburn	420154	497807	Res	C3	0	0	0	0	0	0	More than Likely	1	C	0
2602	Richmondshire	Colburndale Phase 2	420539	498125	Res	C3	250	250	250	250	250	250	More than Likely	1	C	1
2604	Richmondshire	Cookson Way, Brough With St Giles	421181	498693	Res	C3	145	145	145	145	145	145	More than Likely	1	C	1
2605	Richmondshire	Cookson Way, Brough with St Giles - Site 128	421340	498519	Res	C3	289	289	289	289	289	289	More than Likely	1	C	1
2606	Richmondshire	Gatherley Road	422590	500555	Res	C3	250	250	250	250	250	250	More than Likely	1	C	1
2610	Richmondshire	Land At Arras Lines And Sour Beck	420047	497846	Res	C3	130	130	130	130	130	130	Near Certain	1	C	1
2611	Richmondshire	Land At Hill Top Farm, Leyburn	410819	490948	Res	C3	127	127	127	127	127	127	More than Likely	1	C	1
2612	Richmondshire	Land to North west of Brewery House, Byng Road, Catterick Garrison	418978	498014	Res	C3	125	125	125	125	125	125	More than Likely	1	C	0
2613	Richmondshire	Le Cateau - Catterick SFA	418937	497441	Res	C3	170	170	150	170	170	170	More than Likely	1	C	1
2614	Richmondshire	North of Caxton Close	422497	500452	Res	C3	124	124	124	124	124	124	More than Likely	1	C	0
2615	Richmondshire	Scotch Corner - Designer Outlet Centre	421690	505299	Emp	A1	23258	23258	23258	23258	23258	23258	More than Likely	1	C	1
2616	Richmondshire	Scotch Corner Designer Village Outlet - Phase 3 - Pre-App details Awaited	421690	505299	Emp	A1	5000	5000	5000	5000	5000	5000	Reasonably Foreseeable	1	C	0
2617	Richmondshire	Scotch Corner Interchange - Triangular area of land Adjacent VOSA weighbr	421690	505299	Emp	B2	0	0	0	0	0	0	More than Likely	1	C	1
2618	Richmondshire	Scotch Corner Phase 2 - Proposed Garden Centre	421690	505299	Emp	A1	10761	10761	10761	10761	10761	10761	More than Likely	1	C	1
2619	Richmondshire	Scotch Corner Services - Redevelopment incl Drive Thru	421690	505299	Emp	A1	5000	5000	5000	5000	5000	5000	More than Likely	1	C	1
2622	Richmondshire	Woodlands Ave, Colburn - Drive Thru Coffee Shop and Class A Units	420421	498151	Emp	A1	5000	5000	5000	5000	5000	5000	More than Likely	1	C	1

A.2 Development Trip Generation

Table 11-2: Development Trip Generation

ID	Area	Site Name	Land Use	Net Area GFA m ²	Total Units	O AM	D AM	O PM	D PM	O IP	D IP
5	Tees Valley	Faverdale Industrial Area (Argon)	B2/B8	6305	0	10	25	29	6	13	12
7	Tees Valley	Yarm Road Industrial Area	B2/B8	59295	0	40	171	152	61	96	91
9	Tees Valley	Yarm Road North (Dean and Chapter)	B2/B8	12700 0	0	222	741	725	329	365	347
11	Tees Valley	Yarm Road North (Dean and Chapter)	A3	2500	0	19	22	17	27	15	15
15	Tees Valley	Central Park	C3	0	359	136	36	80	136	58	62
17	Tees Valley	Central Park (Local Centre)	A1	1700	0	87	623	517	104	241	229
19	Tees Valley	Lingfield Point Phase 1	C3	0	273	608	166	388	660	271	293
20	Tees Valley	Lingfield Point (ex Phase 1)	C3	0	331	135	36	86	147	60	65
21	Tees Valley	Lingfield Point	B1	13666	0	103	927	770	144	352	334
22	Tees Valley	Lingfield Point	A1	2700	0	0	0	10	29	7	7
39	Tees Valley	West Park	C3	0	213	524	192	287	482	221	238
63	Tees Valley	Land off Sadberge Road, Middleton St George, Darlington	C3	0	234	148	35	48	141	55	60

ID	Area	Site Name	Land Use	Net Area GFA m ²	Total Units	O AM	D AM	O PM	D PM	O IP	D IP
67	Tees Valley	High Stell/Gendon Gardens, Middleton St.George	C3	0	198	110	55	55	102	48	52
80	Tees Valley	School Aycliffe West	C3	0	101	58	9	23	44	20	22
87	Tees Valley	Land Off Yarm Road South of Railway Line, MSG (High Scrogg Farm)	C3	0	330	43	6	16	42	20	21
630	Tees Valley	Ingenium Parc	B2/B8	100000	0	265	459	433	208	247	235
651	Durham	Black & Decker (Durham Gate)	C3	507	507	70	9	25	68	32	34
653	Durham	Bracks Farm	C3	300	300	123	47	71	116	53	57
654	Durham	British Oxygen Co Vigo Lane	C3	233	233	87	33	42	76	35	38
657	Durham	Dale Farm Land at Dale Road	C3	340	340	199	35	67	118	62	67
658	Durham	Electrolux	C3	425	425	212	105	140	198	97	104
662	Durham	Former Cemex Site	C3	100	100	14	2	5	13	6	7
665	Durham	Former Riding Carpets Site	C3	213	213	29	4	11	29	13	14
668	Durham	High Riggs (land adj Darlington Road)	C3	107	107	54	20	37	53	24	26
672	Durham	Land at and to west of k hartwall ltd butchers race green lane industrial estate	C3	108	108	80	18	29	62	28	30

ID	Area	Site Name	Land Use	Net Area GFA m ²	Total Units	O AM	D AM	O PM	D PM	O IP	D IP
673	Durham	Land at Former Catkin Way	C3	101	101	65	23	26	47	24	26
674	Durham	Land at Spout Lane	C3	278	278	38	5	14	37	18	19
675	Durham	Land At The East Of Deerbolt HMYOI And North Of Bowes Road	C3	162	162	67	24	32	51	26	28
677	Durham	Land At The Former Sedgefield Community Hospital Salters Lane	C3	100	100	40	15	22	35	17	18
678	Durham	Land At The North Of Woodhouses Farm And South Of Etherley Moor Wigdan Walls Road	C3	234	234	152	55	60	101	55	59
681	Durham	Land North of Durham Road	C3	300	300	201	45	72	156	70	76
682	Durham	Land north of West Chilton Terrace	C3	135	135	131	242	204	105	101	109
686	Durham	Land South of Douglas Crescent	C3	500	500	272	84	152	262	114	123
688	Durham	Land To The East Of Clare Lodge And Durham Road	C3	194	194	89	23	40	76	34	36
691	Durham	Land To The North Of Etherley Moor	C3	150	150	96	35	38	64	35	37
692	Durham	Land To The North Of Middridge Road	C3	256	256	113	43	63	107	48	52
694	Durham	Land To The South Of 100 To 106 Dean Road	C3	161	161	72	27	40	68	31	33

ID	Area	Site Name	Land Use	Net Area GFA m ²	Total Units	O AM	D AM	O PM	D PM	O IP	D IP
695	Durham	Land To The South Of Eden Drive	C3	277	277	114	42	61	105	48	51
711	Durham	Site O - Cobblers Hall	C3	175	175	24	3	9	23	11	12
715	Durham	Thorn Lighting	C3	403	403	56	7	20	54	25	27
716	Durham	Whitworth Park (All Phases)	C3	726	726	344	75	219	219	127	137
2186	Richmond shire	Former Colburn Pipeworks site (Phase 2)	C3	6	201	225	262	304	272	158	170
2217	Ryedale	Agri-Business Park and Business Technology Park, Eden House Road, Malton	Mixed use	3750	3750	158	227	285	169	152	144
2221	Ryedale	Malton Enterprise park	Mixed use	5109	5109	22	87	62	13	33	32
2225	Cumbria	Station Road, Appleby	C3	100	100	36	5	13	34	16	18
2238	Cumbria	Carleton Heights, Penrith	C3	18	560	39	116	111	53	48	51
2319	Cumbria	Land at Southend Road/Castle Hill Road, Penrith	C3	5	161	149	225	421	392	179	191
2342	Cumbria	Land off Carleton Road, Penrith	C3	8	149	65	19	36	59	27	29
2345	Cumbria	Land off Cross Croft/Back Lane, Appleby	C3	5	142	63	24	35	59	27	29
2397	Cumbria	Raiselands, Penrith	C3	8	229	108	35	55	101	45	48
2447	Cumbria	Gilwilly Industrial Estate Extension	Mixed use	11910 0	14179	0	6	4	5	3	3

ID	Area	Site Name	Land Use	Net Area GFA m ²	Total Units	O AM	D AM	O PM	D PM	O IP	D IP
2451	Cumbria	Kirkby Stephen Business Park	Mixed use	33300	0	31	136	123	50	77	74
2457	Cumbria	Land at junction of A6 and B5035 (Eden 41)	Mixed use	77000	9167	64	81	80	20	45	43
2465	Cumbria	Land Southwest of Mile Lane	Mixed use	39000	2000	8	48	43	6	19	18
2599	Richmond shire	Breckenbrough – Catterick SFA	C3	170	170	58	20	33	53	25	26
2600	Richmond shire	Brough St Giles, Catterick	C3	289	289	86	37	31	78	35	37
2601	Richmond shire	Chartermark Way, Colburn	C3	0	0	0	0	0	0	0	0
2602	Richmond shire	Colburndale Phase 2	C3	250	250	225	262	304	272	158	170
2604	Richmond shire	Cookson Way, Brough with St Giles	C3	145	145	54	23	20	49	22	23
2605	Richmond shire	Cookson Way, Brough with St Giles - Site 128	C3	289	289	86	37	31	78	35	37
2606	Richmond shire	Gatherley Road	C3	250	250	143	43	48	125	53	57
2610	Richmond shire	Land At Arras Lines and Sour Beck	C3	130	130	52	17	0	0	10	11
2611	Richmond shire	Land At Hill Top Farm, Leyburn	C3	127	127	54	18	20	45	20	22
2612	Richmond shire	Land to North west of Brewery House, Byng Road, Catterick Garrison	C3	125	125	19	3	7	19	9	10
2613	Richmond shire	Le Cateau – Catterick SFA	C3	170	170	64	22	36	58	27	29

ID	Area	Site Name	Land Use	Net Area GFA m ²	Total Units	O AM	D AM	O PM	D PM	O IP	D IP
2614	Richmond shire	North of Caxton Close	C3	124	124	19	3	7	19	9	9
2615	Richmond shire	Scotch Corner - Designer Outlet Centre	A1	23258	23258	12	21	268	459	138	131
2617	Richmond shire	Scotch Corner Interchange – Triangular area of land Adjacent VOSA weighbridge	B2	0	0	0	0	0	0	0	0
2618	Richmond shire	Scotch Corner Phase 2 - Proposed Garden Centre	A1	10761	10761	1	52	295	193	98	93
2619	Richmond shire	Scotch Corner Services – Redevelopment incl Drive Thru	A1	5000	5000	49	49	51	49	36	34
2622	Richmond shire	Woodlands Ave, Colburn – Drive Thru Coffee Shop and Class A Units	A1	5000	5000	18	21	30	29	18	17

B Sectored VDM Impact

Reference Case - 2029 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11628	1277	906	1078	69	88	17	133	34	24	86	77	3490	308	21255
2	1265	8555	1114	1417	96	140	18	90	31	29	25	33	1231	511	14577
3	941	1142	2066	511	183	127	31	272	114	89	119	66	2518	766	8947
4	1100	1446	469	7796	633	663	19	179	33	12	26	23	1182	1613	15216
5	70	93	190	690	15266	8894	436	1386	328	171	171	109	1249	2171	31245
6	88	145	129	681	9143	49304	3623	6088	2198	1072	309	473	3831	694	79980
7	19	18	33	19	489	3336	11712	2800	688	382	147	173	900	69	22807
8	172	101	313	189	1392	5967	2761	16240	3907	1628	704	339	3974	184	38092
9	30	46	103	32	304	1914	629	3378	14473	5296	476	897	3678	98	31394
10	23	26	86	12	173	1121	399	1464	3088	13232	278	1347	3390	32	29114
11	110	28	136	25	153	514	173	636	493	330	1824	388	1616	70	6497
12	78	31	63	22	111	477	186	333	1100	1912	382	3201	7818	46	17982
13	7178	1533	3428	1740	1543	4910	1179	3161	3899	3938	2383	8792	7427433	8742	7481897
14	327	706	1304	2153	3732	1173	102	309	170	73	134	87	9111	683000	702582
Total	23250	15168	10342	16386	33295	80648	23305	38711	32618	30226	7263	18430	7473621	698322	8501585

DM - 2029 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11168	1332	944	1171	73	96	19	161	38	26	90	84	3730	326	21300
2	1347	8142	1173	1496	103	133	19	97	33	30	27	36	1327	538	14546
3	977	1179	1841	534	193	136	33	283	119	93	122	69	2646	791	9014
4	1203	1521	497	7243	674	726	21	194	61	13	28	23	1307	1693	15207
5	76	101	199	729	14778	9024	312	1481	337	191	183	119	1332	2266	31369
6	98	162	140	733	9326	47313	3623	6394	2447	1198	384	324	4238	778	79783
7	20	20	36	21	363	3398	11249	2806	739	433	167	194	995	78	22740
8	186	110	333	206	1489	6140	2702	13346	3976	1763	742	609	4306	200	38110
9	34	30	110	38	329	2098	673	3432	13682	5199	481	973	4074	107	31341
10	24	27	91	13	197	1237	448	1600	4938	14307	298	1632	3947	37	29058
11	117	30	142	27	163	533	134	633	478	343	1647	397	1711	74	6526
12	83	34	66	24	121	314	199	390	1134	1932	386	4733	8160	49	18069
13	7608	1687	3686	1936	1686	3402	1296	3600	4232	4290	2363	9307	7432244	9333	7491114
14	371	737	1383	2261	3963	1311	116	340	189	81	144	96	9991	681990	703176
Total	23533	15152	10643	16494	33864	80126	23096	38998	32505	30123	7466	18819	7482030	698505	8511353

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-460	75	38	93	3	8	1	9	4	2	3	7	240	19	45
2	81	-414	39	79	8	13	2	7	4	2	2	3	96	27	-31
3	36	37	-223	22	7	9	2	11	3	4	4	3	128	23	67
4	102	75	27	-533	39	63	2	13	6	1	2	2	123	83	-9
5	6	8	8	39	-488	130	36	94	29	20	14	10	103	93	124
6	9	17	11	74	383	-1991	0	306	249	127	73	49	407	84	-198
7	2	2	3	2	74	43	-463	6	71	31	21	18	93	9	-66
8	14	9	20	17	97	173	-39	-893	68	138	38	30	332	17	19
9	4	3	7	3	23	183	47	74	-792	-96	6	73	396	9	-53
10	2	2	3	1	22	136	49	136	-130	-743	20	83	337	3	-56
11	6	2	6	2	10	42	11	19	-14	16	-177	9	93	4	29
12	7	2	3	2	10	38	13	34	34	40	4	-447	343	3	86
13	430	134	239	217	144	492	117	439	333	332	180	316	4811	814	9216
14	44	30	81	108	232	138	14	31	19	8	10	9	880	-1010	594
Total	283	-16	301	108	569	-522	-209	287	-113	-103	203	389	8408	183	9768

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.96	1.06	1.04	1.09	1.08	1.09	1.09	1.06	1.07	1.07	1.04	1.09	1.04	1.06	1.00
2	1.06	0.95	1.03	1.06	1.08	1.11	1.09	1.07	1.07	1.07	1.06	1.08	1.08	1.03	1.00
3	1.04	1.03	0.89	1.04	1.04	1.07	1.06	1.04	1.05	1.04	1.03	1.04	1.05	1.03	1.01
4	1.09	1.05	1.06	0.93	1.06	1.10	1.09	1.09	1.11	1.09	1.09	1.11	1.11	1.03	1.00
5	1.09	1.08	1.04	1.06	0.97	1.01	1.12	1.07	1.09	1.11	1.08	1.09	1.08	1.04	1.00
6	1.11	1.12	1.09	1.11	1.04	0.96	1.00	1.05	1.11	1.12	1.13	1.10	1.11	1.12	1.00
7	1.10	1.11	1.09	1.10	1.13	1.01	0.96	1.00	1.10	1.13	1.14	1.11	1.11	1.14	1.00
8	1.08	1.09	1.06	1.09	1.07	1.03	0.98	0.94	1.02	1.08	1.05	1.09	1.08	1.09	1.00
9	1.08	1.07	1.06	1.10	1.08	1.10	1.07	1.02	0.93	0.98	1.01	1.08	1.11	1.09	1.00
10	1.07	1.07	1.06	1.09	1.12	1.12	1.12	1.09	0.97	0.93	1.07	1.06	1.10	1.10	1.00
11	1.06	1.06	1.04	1.07	1.06	1.08	1.06	1.03	0.97	1.03	0.90	1.02	1.06	1.03	1.00
12	1.09	1.07	1.04	1.09	1.09	1.08	1.07	1.06	1.03	1.02	1.01	0.91	1.04	1.07	1.00
13	1.06	1.09	1.08	1.12	1.09	1.10	1.10	1.09	1.09	1.08	1.08	1.06	1.00	1.09	1.00
14	1.08	1.04	1.06	1.05	1.06	1.12	1.13	1.10	1.11	1.11	1.08	1.11	1.10	1.00	1.00
Total	1.01	1.00	1.03	1.01	1.02	0.99	0.99	1.01	1.00	1.00	1.03	1.02	1.00	1.00	1.00

Reference Case - 2029 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	87639	2321	2198	702	20	31	7	67	14	17	20	40	6434	27	99536
2	2321	91836	2471	5180	42	49	9	42	19	11	5	17	137	238	102394
3	2198	2471	23171	6339	509	113	40	336	47	29	21	14	335	106	35727
4	702	5180	6339	66347	965	138	10	51	8	10	2	2	115	1260	81129
5	20	42	509	965	109865	47709	949	2783	229	80	37	35	138	2336	165718
6	31	49	113	138	47709	397112	33070	22493	2083	725	124	146	410	71	504275
7	7	9	40	10	949	33070	114787	24131	1911	402	52	63	102	6	175539
8	67	42	336	51	2783	22493	24131	160260	23705	2896	1639	663	360	17	239442
9	14	19	47	8	229	2083	1911	23705	127591	39937	4721	3888	337	12	204504
10	17	11	29	10	80	725	402	2896	39937	151034	454	7076	413	2	203086
11	20	5	21	2	37	124	52	1639	4721	454	15091	2409	543	3	25120
12	40	17	14	2	35	146	63	663	3888	7076	2409	43243	8085	8	65688
13	6434	137	335	115	158	410	102	360	337	413	543	8085	25707808	602	25725858
14	27	238	106	1260	2336	71	6	17	12	2	3	8	602	2534448	2539137
Total	99536	102394	35727	81129	165718	504275	175539	239442	204504	203086	25120	65688	25725858	2539137	30167155

DM - 2029 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	86621	2575	2371	848	25	40	8	77	17	20	21	50	6898	32	99603
2	2575	90725	2585	5870	50	63	11	50	22	13	5	20	187	260	102436
3	2371	2585	21701	7379	541	130	45	359	53	31	23	13	385	116	35734
4	848	5870	7379	64235	1055	164	12	62	10	12	3	3	190	1349	81151
5	25	50	541	1055	107651	49058	1199	3063	281	102	43	43	195	2471	165778
6	40	63	130	164	49058	392873	34290	23648	2381	858	141	171	504	89	504410
7	8	11	45	12	1199	34290	112748	24420	2101	461	58	71	123	8	175556
8	77	50	359	62	3063	23648	24420	157212	24402	3233	1759	738	430	21	239473
9	17	22	53	10	281	2381	2101	24402	125232	40523	4926	4209	400	14	204575
10	20	13	31	12	102	858	461	3233	40523	149544	495	7384	485	2	203165
11	21	5	23	3	43	141	58	1759	4926	495	14479	2549	619	4	25125
12	50	20	15	3	43	171	71	738	4209	7384	2549	41724	8729	10	65718
13	6898	187	385	190	195	504	123	430	400	485	619	8729	25754861	747	25774713
14	32	260	116	1349	2471	89	8	21	14	2	4	10	747	2535562	2540686
Total	99603	102436	35734	81151	165778	504410	175556	239473	204575	203165	25125	65718	25774713	2540686	30218123

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1018	255	173	146	5	9	2	10	3	3	2	10	463	5	66
2	255	-1111	115	690	9	14	2	8	3	2	1	3	31	22	42
3	173	115	-1470	1040	31	17	6	23	5	2	3	2	50	10	7
4	146	690	1040	-2112	91	26	2	10	2	2	0	1	35	88	22
5	5	9	31	91	-2214	1349	250	280	52	23	6	8	37	135	61
6	9	14	17	26	1349	-4239	1220	1155	298	133	18	25	94	18	135
7	2	2	6	2	250	1220	-2039	289	190	58	6	9	21	2	17
8	10	8	23	10	280	1155	289	-3048	698	337	120	76	70	3	31
9	3	3	5	2	52	298	190	698	-2359	588	205	321	63	3	71
10	3	2	2	2	23	133	58	337	588	-1490	41	308	72	0	79
11	2	1	3	0	6	18	6	120	205	41	-612	140	77	1	5
12	10	3	2	1	8	25	9	76	321	308	140	-1519	644	2	29
13	463	31	50	35	37	94	21	70	63	72	77	644	47053	146	48854
14	5	22	10	88	135	18	2	3	3	0	1	2	146	1114	1549
Total	66	42	7	22	61	135	17	31	71	79	5	29	48854	1549	50968

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.99	1.11	1.08	1.21	1.23	1.27	1.23	1.15	1.18	1.19	1.10	1.23	1.07	1.18	1.00
2	1.11	0.99	1.05	1.13	1.21	1.28	1.24	1.20	1.18	1.16	1.20	1.18	1.20	1.09	1.00
3	1.08	1.05	0.94	1.16	1.06	1.15	1.15	1.07	1.12	1.07	1.13	1.12	1.15	1.09	1.00
4	1.21	1.13	1.16	0.97	1.09	1.19	1.21	1.20	1.23	1.24	1.22	1.23	1.30	1.07	1.00
5	1.23	1.21	1.06	1.09	0.98	1.03	1.26	1.10	1.22	1.29	1.16	1.24	1.23	1.06	1.00
6	1.27	1.28	1.15	1.19	1.03	0.99	1.04	1.05	1.14	1.18	1.14	1.17	1.23	1.26	1.00
7	1.23	1.24	1.15	1.21	1.26	1.04	0.98	1.01	1.10	1.15	1.11	1.14	1.20	1.29	1.00
8	1.15	1.20	1.07	1.20	1.10	1.05	1.01	0.98	1.03	1.12	1.07	1.11	1.19	1.20	1.00
9	1.18	1.18	1.12	1.23	1.22	1.14	1.10	1.03	0.98	1.01	1.04	1.08	1.19	1.22	1.00
10	1.19	1.16	1.07	1.24	1.29	1.18	1.15	1.12	1.01	0.99	1.09	1.04	1.17	1.24	1.00
11	1.10	1.20	1.13	1.22	1.16	1.14	1.11	1.07	1.04	1.09	0.96	1.06	1.14	1.21	1.00
12	1.25	1.18	1.12	1.25	1.24	1.17	1.14	1.11	1.08	1.04	1.06	0.96	1.08	1.21	1.00
13	1.07	1.20	1.15	1.30	1.23	1.23	1.20	1.19	1.19	1.17	1.14	1.08	1.00	1.24	1.00
14	1.18	1.09	1.09	1.07	1.06	1.26	1.29	1.20	1.22	1.24	1.21	1.21	1.24	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Reference Case - 2029 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	86927	1327	1683	441	43	39	13	93	34	14	43	42	4092	66	94884
2	1298	69603	1724	2886	42	75	13	38	42	17	20	23	109	172	76085
3	1643	1724	28929	2906	235	89	25	252	105	42	84	40	334	131	36558
4	323	3027	2979	71842	624	173	16	38	33	9	10	10	30	1434	80769
5	43	39	222	584	118324	42513	473	2013	131	30	72	34	306	3433	168257
6	62	76	90	193	40995	430336	37868	17440	1638	420	130	211	866	328	530872
7	13	14	29	17	461	37493	103234	20861	1124	191	40	88	199	32	163799
8	102	60	253	48	2023	18425	21601	137087	16296	1623	1186	406	437	78	199647
9	34	36	103	35	109	1799	1138	16048	128844	38368	2893	2639	909	47	192807
10	16	16	47	10	33	437	216	1643	39634	149760	204	6632	314	27	199209
11	31	20	86	8	34	108	32	1162	2797	233	20787	1631	246	22	27259
12	43	22	40	11	39	211	89	362	2991	8083	1362	67231	14888	25	95416
13	3086	124	441	71	370	1004	237	349	308	379	326	13667	38968868	608	38992238
14	39	136	120	1690	4737	178	29	33	38	28	23	24	138	3333119	3542391
Total	95884	76223	36750	80741	168127	532901	165005	197662	194254	199223	27186	92699	38991995	3541542	44400192

DM - 2029 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	85643	1352	1933	366	60	80	17	119	42	18	34	36	4787	83	95034
2	1324	68610	1922	3313	37	103	17	74	31	21	23	31	144	205	76101
3	1901	1912	27349	3730	283	118	31	298	127	31	98	48	423	178	36749
4	663	3460	3864	69703	729	222	21	30	44	12	13	14	70	1632	80500
5	61	34	271	682	113832	44343	639	2323	170	70	93	72	417	3771	168818
6	83	106	120	247	42823	423360	39316	19082	2027	337	160	269	1139	445	529935
7	20	18	37	21	622	39177	100334	21316	1321	237	49	109	263	42	163586
8	128	77	300	62	2327	19964	21984	133878	17170	1933	1349	480	396	98	200367
9	43	44	130	46	142	1947	1323	16910	123447	39210	3137	3029	1098	39	192566
10	20	20	36	12	74	339	267	1983	40483	147611	242	7140	643	33	199148
11	61	24	101	10	70	134	61	1323	3012	276	20062	1813	311	26	27286
12	38	27	47	14	78	267	109	426	3383	8630	1307	64669	16603	31	95852
13	3939	162	338	97	499	1323	308	708	640	481	407	13427	38982772	768	39010110
14	30	161	143	1893	3080	243	37	68	73	36	28	30	212	3333633	3543686
Total	96219	76227	37053	80397	168698	531843	164685	198560	193991	199143	27224	93189	39009502	3543007	44419739

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1282	225	270	124	17	21	4	24	8	4	8	14	693	17	150
2	226	-995	199	428	16	30	4	16	9	4	4	6	36	33	15
3	258	189	-1381	824	31	29	6	46	22	9	13	8	89	27	191
4	142	434	883	-2139	103	49	3	12	11	3	3	3	20	198	-269
5	17	13	48	97	-2471	1830	166	311	39	20	21	18	111	338	561
6	23	31	30	34	1828	-7176	1648	1642	369	117	30	38	293	117	-937
7	3	3	8	3	161	1684	-2880	433	197	46	8	21	64	10	-213
8	26	16	47	14	304	1339	383	-3208	874	328	163	75	140	20	719
9	8	8	24	11	33	348	183	862	-3397	841	242	390	188	12	-242
10	4	4	10	3	21	122	31	340	830	-2130	38	308	131	8	-60
11	10	4	16	2	16	23	10	161	213	41	-723	184	63	3	27
12	13	3	8	3	19	36	19	64	392	347	146	-2362	1717	6	436
13	873	38	117	26	129	319	71	139	132	103	81	1760	13904	160	17872
14	11	23	23	204	343	63	9	13	14	8	3	6	33	314	1293
Total	335	4	304	-345	571	-1058	-319	898	-263	-80	38	490	17507	1466	19547

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.99	1.17	1.16	1.28	1.40	1.36	1.30	1.23	1.24	1.23	1.18	1.34	1.17	1.26	1.00
2	1.17	0.99	1.12	1.15	1.38	1.40	1.34	1.27	1.22	1.23	1.21	1.24	1.33	1.19	1.00
3	1.16	1.11	0.93	1.28	1.22	1.32	1.26	1.18	1.21	1.20	1.17	1.20	1.27	1.18	1.01
4	1.27	1.14	1.30	0.97	1.17	1.28	1.29	1.31	1.33	1.33	1.29	1.33	1.40	1.14	1.00
5	1.40	1.39	1.22	1.17	0.98	1.04	1.33	1.13	1.30	1.39	1.28	1.34	1.36	1.10	1.00
6	1.37	1.40	1.33	1.28	1.04	0.98	1.04	1.09	1.22	1.28	1.23	1.28	1.34	1.36	1.00
7	1.31	1.33	1.27	1.29	1.33	1.04	0.97	1.02	1.18	1.24	1.20	1.23	1.32	1.31	1.00
8	1.23	1.27	1.19	1.28	1.13	1.08	1.02	0.98	1.03	1.20	1.14	1.18	1.31	1.26	1.00
9	1.23	1.22	1.23	1.31	1.30	1.22	1.16	1.03	0.97	1.02	1.08	1.13	1.21	1.26	1.00
10	1.23	1.22	1.21	1.31	1.39	1.28	1.24	1.21	1.02	0.99	1.19	1.08	1.26	1.28	1.00
11	1.19	1.20	1.18	1.27	1.30	1.23	1.19	1.14	1.08	1.17	0.97	1.11	1.26	1.21	1.00
12	1.33	1.24	1.20	1.30	1.32	1.26	1.22	1.18	1.13	1.07	1.11	0.96	1.12	1.25	1.00
13	1.17	1.31	1.27	1.37	1.33	1.32	1.30	1.29	1.26	1.27	1.23	1.13	1.00	1.26	1.00
14	1.28	1.19	1.19	1.12	1.07	1.36	1.31	1.28	1.23	1.28	1.20	1.23	1.34	1.00	1.00
Total	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00

Reference Case - 2044 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	12379	1338	953	1147	74	96	19	163	39	26	91	81	5838	329	22612
2	1335	9074	1179	1512	103	154	19	97	56	31	26	35	1312	546	15479
3	993	1209	2204	543	199	139	34	293	123	97	125	69	2711	825	9568
4	1173	1544	300	8325	689	731	21	196	61	13	27	24	1284	1745	16335
5	75	100	204	746	16810	9843	504	1527	364	189	182	116	1369	2385	34412
6	97	159	141	749	10096	34898	6226	6740	2447	1198	545	514	4286	780	88875
7	20	20	36	21	338	3929	12951	3081	762	423	156	189	998	76	25200
8	186	109	338	206	1531	6608	3054	17962	4337	1813	752	603	4389	204	42091
9	54	30	112	58	337	2136	698	3751	16108	5839	511	966	4070	109	34799
10	24	28	94	13	194	1251	441	1629	3604	16888	298	1660	3955	58	32138
11	117	29	143	26	163	553	186	682	530	353	1916	406	1715	75	6894
12	81	33	66	23	118	516	200	598	1181	2047	400	5432	8308	49	19051
13	7699	1637	3671	1874	1686	5462	1301	5681	4311	4356	2533	9345	8091075	9671	8150323
14	571	753	1397	2320	4081	1308	113	341	189	81	143	93	10100	754659	776149
Total	24810	16102	11035	17564	36619	89625	25765	42745	36130	33353	7705	19533	8141429	771512	9273926

DM - 2044 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11273	1533	1051	1365	88	118	23	189	69	30	99	99	6426	382	22743
2	1546	8070	1927	1683	120	188	22	114	65	35	30	41	1545	618	15404
3	1090	1296	1686	574	218	163	39	324	138	106	134	76	3006	899	9748
4	1426	1712	545	6976	782	890	25	233	74	15	32	29	1566	1989	16295
5	91	116	226	840	15718	10121	602	1728	422	226	210	134	1585	2652	34671
6	123	199	172	944	11158	49972	6080	7399	3049	1483	731	629	5281	1016	88235
7	26	24	45	26	691	3869	11901	3133	949	549	214	237	1245	100	25009
8	225	133	395	249	1762	6901	2921	15811	4539	2126	856	731	5222	248	42119
9	64	59	130	70	388	2560	824	3982	14150	5512	529	1168	5090	132	34659
10	29	32	107	15	235	1552	559	1959	5262	14927	356	1920	4927	71	31951
11	133	33	158	30	183	637	211	733	497	394	1504	430	1943	85	6973
12	100	38	73	27	134	593	230	679	1266	2153	411	4398	9121	57	19280
13	8737	1986	4279	2351	1980	6557	1582	6726	5125	5180	2967	10605	8103481	11682	8173237
14	693	832	1621	2626	4620	1650	144	416	233	99	171	115	12217	752194	777632
Total	25557	16064	11813	17776	38078	87771	25165	43425	35837	32836	8245	20611	8162655	772124	9297957

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1106	195	98	218	14	22	4	24	10	4	9	18	568	53	131
2	211	-1004	148	170	17	33	3	16	10	5	4	6	233	72	-75
3	94	87	-518	31	19	24	6	29	14	10	9	6	293	74	180
4	250	169	45	-1350	93	159	4	37	14	2	5	5	281	244	-41
5	17	17	23	94	-1092	278	99	201	59	36	28	18	216	267	259
6	26	40	31	195	1063	-4927	-146	659	602	283	186	115	993	236	-639
7	6	5	8	5	153	-60	-1050	52	187	126	58	48	248	23	-191
8	39	23	57	43	231	293	-132	-2151	202	313	104	128	833	44	28
9	10	9	18	13	51	424	125	231	-1958	-327	18	202	1021	23	-140
10	4	4	14	2	42	301	118	329	-342	-1961	59	260	972	12	-187
11	17	4	15	4	19	84	26	51	-32	40	-412	24	229	10	79
12	18	5	7	4	16	77	31	81	85	107	11	-1034	814	8	229
13	1038	328	608	477	294	1095	281	1045	814	824	434	1259	12405	2011	22914
14	122	80	224	306	539	342	31	75	45	18	27	22	2117	-2465	1483
Total	747	-38	778	212	1460	-1854	-600	681	-293	-517	540	1078	21227	612	24031

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.91	1.15	1.10	1.19	1.20	1.23	1.22	1.15	1.17	1.16	1.09	1.22	1.10	1.16	1.01
2	1.16	0.89	1.13	1.11	1.17	1.22	1.18	1.17	1.17	1.15	1.15	1.18	1.18	1.13	1.00
3	1.09	1.07	0.77	1.06	1.09	1.18	1.17	1.10	1.11	1.10	1.07	1.09	1.11	1.09	1.02
4	1.21	1.11	1.09	0.84	1.14	1.22	1.19	1.19	1.23	1.18	1.19	1.22	1.22	1.14	1.00
5	1.22	1.17	1.11	1.13	0.94	1.03	1.20	1.13	1.16	1.19	1.15	1.15	1.16	1.11	1.01
6	1.27	1.25	1.22	1.26	1.11	0.91	0.98	1.10	1.25	1.24	1.34	1.22	1.23	1.30	0.99
7	1.28	1.23	1.24	1.23	1.28	0.99	0.92	1.02	1.24	1.30	1.37	1.26	1.25	1.31	0.99
8	1.21	1.21	1.17	1.21	1.15	1.04	0.96	0.88	1.05	1.17	1.14	1.21	1.19	1.22	1.00
9	1.19	1.18	1.16	1.22	1.15	1.20	1.18	1.06	0.88	0.94	1.04	1.21	1.25	1.21	1.00
10	1.18	1.16	1.15	1.18	1.21	1.24	1.27	1.20	0.94	0.88	1.20	1.16	1.25	1.21	0.99
11	1.14	1.14	1.10	1.15	1.12	1.15	1.14	1.08	0.94	1.11	0.78	1.06	1.13	1.13	1.01
12	1.23	1.15	1.10	1.17	1.14	1.15	1.15	1.13	1.07	1.03	0.81	1.10	1.10	1.16	1.01
13	1.13	1.20	1.17	1.25	1.17	1.20	1.22	1.18	1.19	1.19	1.17	1.13	1.00	1.21	1.00
14	1.21	1.11	1.16	1.13	1.13	1.26	1.27	1.22	1.24	1.23	1.19	1.24	1.21	1.00	1.00
Total	1.03	1.00	1.07	1.01	1.04	0.98	0.98	1.02	0.99	0.98	1.07	1.06	1.00	1.00	1.00

Reference Case - 2044 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	91904	2437	2245	754	22	34	7	72	16	19	22	41	7146	30	104750
2	2437	96286	2535	5464	45	52	9	44	20	11	5	17	173	254	107353
3	2245	2535	24487	6802	530	126	44	360	52	32	21	14	360	116	37724
4	754	5464	6802	70439	1037	150	11	55	9	11	2	3	122	1360	86219
5	22	45	530	1037	118756	51963	1028	2995	253	88	39	37	176	2518	179488
6	34	52	126	150	51963	440268	36334	24376	2298	803	137	157	442	88	557228
7	7	9	44	11	1028	36334	125776	26329	2102	444	53	65	111	7	192320
8	72	44	360	55	2995	24376	26329	174550	25974	3206	1736	699	392	21	260808
9	16	20	52	9	253	2298	2102	25974	140211	43880	5033	4131	365	13	224357
10	19	11	32	11	88	803	444	3206	43880	165588	494	7541	445	2	222563
11	22	5	21	2	39	137	53	1736	5033	494	15485	2494	589	3	26113
12	41	17	14	3	37	157	65	699	4131	7541	2494	44628	8699	9	68537
13	7146	173	360	122	176	442	111	392	365	445	589	8699	27761924	665	27781610
14	30	254	116	1360	2518	88	7	21	13	2	3	9	665	2771556	2776642
Total	104750	107353	37724	86219	179488	557228	192320	260808	224357	222563	26113	68537	27781610	2776642	32625713

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	89409	3086	2712	1099	34	56	11	98	22	27	26	68	8192	44	104884
2	3086	93841	2878	6772	61	80	14	63	29	16	7	25	251	312	107433
3	2712	2878	21439	8667	608	167	57	423	66	38	28	18	493	146	37739
4	1099	6772	8667	66323	1251	215	15	79	14	16	3	4	205	1601	86263
5	34	61	608	1251	113566	55418	1434	3553	335	124	48	51	249	2861	179593
6	56	80	167	215	55418	431983	38248	26650	2862	1036	172	201	653	133	557476
7	11	14	57	15	1434	38248	121921	27215	2550	564	66	83	160	11	192348
8	98	63	423	79	3553	26650	27215	167577	27840	3901	2024	864	559	29	260875
9	22	29	66	14	335	2862	2550	27840	134809	45004	5523	4913	520	20	224508
10	27	16	38	16	124	1036	564	3901	45004	162340	606	8417	635	3	222727
11	26	7	28	3	48	172	86	2024	5523	606	14006	2827	779	5	26212
12	68	25	18	4	51	201	83	864	4913	8417	2827	40864	10249	13	68597
13	8192	251	493	205	249	653	160	559	520	635	779	10249	27881275	1032	27905251
14	44	312	146	1601	2861	133	11	29	20	3	5	13	1032	2773928	2780139
Total	104884	107433	37739	86263	179593	557476	192348	260875	224508	222727	26121	68597	27905251	2780139	32753954

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-2495	649	467	345	12	21	4	26	7	8	5	26	1045	14	135
2	649	-2445	342	1308	16	28	4	18	8	4	2	7	78	58	80
3	467	342	-3047	1865	77	41	13	62	15	6	7	4	133	30	14
4	345	1308	1865	-4116	214	64	4	24	4	5	1	1	82	241	44
5	12	16	77	214	-5190	3455	406	559	82	36	9	13	73	343	105
6	21	28	41	64	3455	-8682	1914	2274	564	234	34	45	211	45	248
7	4	4	13	4	406	1914	-3855	886	448	120	13	17	49	4	28
8	26	18	62	24	559	2274	886	-6973	1866	695	288	165	167	9	67
9	7	8	15	4	82	564	448	1866	-5401	1124	490	782	155	6	151
10	8	4	6	5	36	234	120	695	1124	-3248	112	875	190	1	163
11	5	2	7	1	9	34	13	288	490	112	-1479	333	191	2	7
12	26	7	4	1	13	45	17	165	782	875	333	-3764	1550	4	60
13	1045	78	133	82	73	211	49	167	155	190	191	1550	119351	367	123641
14	14	58	30	241	343	45	4	9	6	1	2	4	367	2372	3497
Total	135	80	14	44	105	248	28	67	151	163	7	60	123641	3497	128241

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.97	1.27	1.21	1.46	1.57	1.62	1.52	1.36	1.42	1.44	1.22	1.64	1.15	1.47	1.00
2	1.27	0.97	1.13	1.24	1.36	1.53	1.44	1.41	1.42	1.39	1.44	1.41	1.45	1.23	1.00
3	1.21	1.13	0.88	1.27	1.15	1.32	1.30	1.17	1.29	1.19	1.32	1.30	1.37	1.26	1.00
4	1.46	1.24	1.27	0.94	1.21	1.43	1.38	1.43	1.48	1.51	1.49	1.53	1.67	1.18	1.00
5	1.57	1.36	1.15	1.21	0.96	1.07	1.39	1.19	1.32	1.41	1.23	1.36	1.41	1.14	1.00
6	1.62	1.53	1.32	1.43	1.07	0.98	1.05	1.09	1.25	1.29	1.25	1.28	1.48	1.52	1.00
7	1.52	1.44	1.30	1.38	1.39	1.05	0.97	1.03	1.21	1.27	1.25	1.27	1.44	1.57	1.00
8	1.36	1.41	1.17	1.43	1.19	1.09	1.03	0.96	1.07	1.22	1.17	1.24	1.43	1.43	1.00
9	1.42	1.42	1.29	1.48	1.32	1.25	1.21	1.07	0.96	1.03	1.10	1.19	1.43	1.46	1.00
10	1.44	1.39	1.19	1.51	1.41	1.29	1.27	1.22	1.03	0.98	1.23	1.12	1.43	1.54	1.00
11	1.22	1.44	1.32	1.49	1.23	1.25	1.25	1.17	1.10	1.23	0.90	1.13	1.32	1.47	1.00
12	1.64	1.41	1.30	1.53	1.36	1.28	1.27	1.24	1.19	1.12	1.13	0.92	1.18	1.43	1.00
13	1.15	1.45	1.37	1.67	1.41	1.48	1.44	1.43	1.43	1.43	1.32	1.18	1.00	1.55	1.00
14	1.47	1.23	1.26	1.18	1.14	1.52	1.57	1.43	1.46	1.54	1.47	1.43	1.55	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Reference Case - 2044 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	93737	1413	1793	490	47	66	13	104	37	16	51	43	4430	71	102315
2	1380	74263	1850	3116	45	83	14	63	45	18	22	27	118	179	81223
3	1748	1854	31169	3172	252	99	27	273	113	43	91	42	361	162	39408
4	574	3267	3238	77664	690	189	18	42	36	10	11	11	34	1332	87356
5	47	42	239	648	131536	47412	523	2227	146	56	79	59	347	3907	187271
6	69	84	101	214	45636	485231	42207	19320	1854	468	147	235	988	377	596931
7	17	15	32	18	510	41773	114739	23138	1246	211	44	97	224	36	182101
8	113	67	277	54	2234	20396	23956	152084	18171	1808	1296	444	512	87	221499
9	38	39	115	39	121	1787	1262	17876	144068	42511	3139	2890	1005	53	214943
10	18	17	51	10	59	486	238	1823	43888	165267	222	7188	565	30	219862
11	58	22	93	9	59	124	56	1270	3047	256	22222	1766	274	23	29278
12	47	23	42	12	64	233	98	393	3263	8735	1474	72134	16051	28	102598
13	5497	135	477	79	417	1141	266	614	564	415	360	14759	43649766	673	43675163
14	42	143	127	1826	5354	210	32	60	64	32	25	26	175	3396075	3904191
Total	103385	81385	39605	87352	187023	599229	183453	219289	216542	219849	29182	99724	43674871	3903252	49644139

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	90497	2027	2515	833	97	132	27	176	60	26	75	84	6296	121	102966
2	1992	71832	2374	4158	83	158	25	107	71	29	33	43	214	268	81388
3	2440	2353	27958	4924	390	186	46	403	175	69	131	63	602	239	39980
4	966	4365	5124	72045	973	320	29	72	63	17	18	20	106	2136	86253
5	98	79	371	909	125390	52531	881	2971	225	97	120	98	608	4856	189235
6	141	161	191	359	51029	466906	45264	23027	2730	727	220	375	1753	700	593583
7	32	27	56	30	861	44805	108298	24528	1780	324	66	150	402	64	181423
8	190	112	411	88	2988	23821	25158	144149	20597	2599	1730	637	883	143	223506
9	62	62	183	66	190	2606	1771	20323	135658	44325	3781	3974	1499	88	214589
10	29	28	78	18	101	759	365	2659	43886	158971	336	8783	934	53	218998
11	86	33	135	14	92	187	81	1698	3606	372	20394	2253	464	35	29449
12	87	37	63	20	103	362	147	556	4839	10349	1859	65747	20652	45	104367
13	7836	239	791	145	717	1963	459	1031	920	705	590	19528	43680314	1086	43716324
14	75	211	192	2412	6308	396	56	100	104	54	37	43	317	3396943	3907247
Total	104531	81565	40442	86021	189321	595133	182607	221801	216212	218664	29391	101798	43715044	3906777	49689308

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-3240	614	721	344	50	66	13	72	23	10	23	39	1866	50	651
2	613	-2430	524	1042	38	75	11	43	26	11	11	16	96	89	165
3	692	499	-3211	1752	138	87	19	130	62	23	40	21	241	78	572
4	391	1098	1886	-5620	283	131	11	30	27	7	7	9	52	584	-1104
5	50	37	132	261	-6146	5119	356	745	80	40	41	38	262	949	1964
6	71	77	90	144	5393	-18324	3057	3707	875	260	74	139	763	323	-3348
7	15	12	24	11	351	3032	-6440	1391	533	113	22	53	177	28	-678
8	77	45	135	35	753	3425	1202	-7936	2426	791	435	193	370	56	2007
9	24	22	68	27	69	819	509	2447	-8410	1814	642	1084	494	36	-354
10	12	10	27	7	43	273	126	835	1998	-6296	113	1596	369	22	-864
11	28	11	42	5	33	64	25	428	559	116	-1828	486	189	13	171
12	41	14	20	8	39	129	49	163	1075	1613	385	-6387	4601	17	1768
13	2339	104	314	66	300	822	193	417	356	290	230	4769	30548	413	41161
14	33	68	65	586	954	186	23	40	40	23	13	17	141	868	3056
Total	1146	181	838	-1331	2298	-4096	-846	2512	-329	-1185	209	2074	40173	3525	45169

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.97	1.43	1.40	1.70	2.06	2.01	1.86	1.69	1.63	1.63	1.45	1.87	1.42	1.71	1.01
2	1.44	0.97	1.28	1.33	1.85	1.91	1.78	1.68	1.57	1.58	1.53	1.62	1.82	1.49	1.00
3	1.40	1.27	0.90	1.55	1.55	1.87	1.72	1.48	1.55	1.51	1.43	1.50	1.67	1.48	1.01
4	1.68	1.34	1.58	0.93	1.41	1.69	1.62	1.71	1.74	1.74	1.66	1.77	1.95	1.38	0.99
5	2.06	1.87	1.55	1.40	0.95	1.11	1.68	1.33	1.55	1.72	1.52	1.65	1.75	1.24	1.01
6	2.02	1.92	1.90	1.67	1.12	0.96	1.07	1.19	1.47	1.53	1.50	1.59	1.77	1.86	0.99
7	1.86	1.80	1.75	1.62	1.69	1.07	0.94	1.06	1.43	1.53	1.50	1.55	1.79	1.77	1.00
8	1.68	1.67	1.49	1.64	1.34	1.17	1.05	0.95	1.13	1.44	1.34	1.44	1.72	1.65	1.01
9	1.64	1.57	1.59	1.69	1.57	1.46	1.40	1.14	0.94	1.04	1.20	1.38	1.49	1.68	1.00
10	1.66	1.58	1.53	1.71	1.73	1.56	1.53	1.46	1.05	0.96	1.51	1.22	1.65	1.74	1.00
11	1.49	1.49	1.46	1.61	1.55	1.51	1.45	1.34	1.18	1.45	0.92	1.28	1.69	1.55	1.01
12	1.87	1.59	1.48	1.66	1.61	1.55	1.50	1.41	1.33	1.18	1.26	0.91	1.29	1.63	1.02
13	1.43	1.77	1.66	1.83	1.72	1.72	1.72	1.68	1.63	1.70	1.64	1.32	1.00	1.61	1.00
14	1.79	1.48	1.51	1.52	1.18	1.89	1.73	1.67	1.62	1.71	1.50	1.64	1.81	1.00	1.00
Total	1.01	1.00	1.02	0.98	1.01	0.99	1.00	1.01	1.00	0.99	1.01	1.02	1.00	1.00	1.00

Reference Case - 2051 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	12893	1396	994	1199	76	101	20	172	61	27	94	83	6112	343	23575
2	1385	9473	1232	1584	107	162	20	101	58	32	27	36	1366	565	16148
3	1033	1263	2303	569	208	146	35	309	129	101	130	72	2838	861	9999
4	1226	1616	523	8711	720	768	22	206	63	13	28	23	1347	1820	17088
5	78	104	213	783	17596	10319	527	1598	381	198	189	120	1432	2496	36034
6	101	167	148	788	10550	57543	6513	7048	2566	1257	566	535	4505	820	93106
7	21	20	38	22	562	6199	13523	3209	799	442	161	196	1044	80	26316
8	195	114	354	217	1601	6912	3183	18766	4534	1896	781	626	4596	213	43989
9	56	52	118	60	353	2243	731	3917	16842	6117	530	1004	4262	114	36401
10	23	29	98	14	203	1314	461	1705	5873	17669	310	1724	4139	61	33625
11	122	30	149	28	170	571	192	706	549	367	1983	420	1781	78	7146
12	84	34	69	24	123	537	207	620	1226	2124	414	5599	8614	51	19725
13	8004	1726	3832	1963	1760	5725	1359	5926	4503	4550	2626	9665	8425106	10110	8486854
14	591	780	1452	2422	4265	1367	118	355	197	84	148	96	10551	787513	809940
Total	25819	16805	11523	18384	38294	93906	26911	44638	37781	34878	7989	20201	8477692	805126	9659947

DM - 2051 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11628	1630	1108	1452	93	126	24	200	73	31	105	104	6748	404	23726
2	1632	8324	1400	1776	127	199	24	120	69	37	32	43	1631	648	16061
3	1146	1339	1713	603	230	174	42	343	145	112	140	79	3171	948	10207
4	1516	1804	574	7159	825	948	26	248	79	16	34	31	1668	2106	17036
5	97	122	240	890	16388	10620	634	1819	445	237	219	139	1666	2801	36318
6	132	212	185	1014	11803	51912	6318	7753	3244	1572	777	664	5630	1095	92309
7	28	26	48	28	734	6101	12394	3265	1011	584	228	251	1326	106	26089
8	240	141	422	266	1864	7215	3031	16325	4761	2242	902	775	5547	264	43995
9	68	62	138	75	409	2717	875	4178	14625	5715	552	1240	5436	140	36231
10	30	34	114	16	248	1647	594	2076	5462	15422	379	2034	5265	75	33397
11	141	35	166	32	190	662	220	765	511	412	1520	450	2041	90	7236
12	105	40	76	28	140	621	242	710	1321	2248	429	4440	9522	60	19982
13	9173	2104	4520	2508	2077	6930	1672	7090	5419	5482	3117	11076	8437712	12351	8511231
14	731	871	1710	2776	4864	1752	152	440	246	104	179	120	12906	784822	811673
Total	26668	16764	12416	18624	39992	91624	26208	45333	37411	34215	8611	21445	8500271	805910	9685493

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1267	233	114	253	16	25	5	28	11	5	10	21	636	61	151
2	248	-1149	168	192	19	38	4	19	11	5	4	7	266	83	-87
3	111	96	-588	34	22	29	6	34	16	11	10	7	333	87	208
4	290	189	50	-1552	105	181	4	42	16	3	6	6	321	286	-53
5	19	19	27	107	-1208	301	107	221	64	39	30	19	235	305	285
6	31	45	37	226	1253	-5631	-195	705	678	315	211	128	1125	275	-797
7	7	5	10	5	173	-99	-1169	57	213	142	67	55	282	27	-227
8	45	27	68	49	262	304	-152	-2442	227	346	121	148	951	51	6
9	12	10	20	14	56	473	144	261	-2217	-402	22	236	1174	26	-170
10	5	5	16	3	46	334	133	371	-411	-2247	69	310	1126	13	-228
11	20	5	17	5	20	91	29	59	-37	45	-463	30	260	11	90
12	21	6	8	4	17	84	34	90	95	124	15	-1158	908	9	257
13	1169	378	688	545	317	1204	313	1164	915	932	491	1411	12606	2241	24377
14	140	91	259	354	598	385	34	84	49	20	31	24	2355	-2690	1734
Total	849	-41	894	240	1697	-2281	-703	694	-369	-662	622	1244	22579	785	25546

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.90	1.17	1.11	1.21	1.22	1.25	1.24	1.16	1.19	1.18	1.11	1.25	1.10	1.18	1.01
2	1.18	0.88	1.14	1.12	1.18	1.23	1.19	1.18	1.19	1.16	1.16	1.19	1.19	1.15	0.99
3	1.11	1.08	0.74	1.06	1.11	1.20	1.18	1.11	1.12	1.11	1.08	1.10	1.12	1.10	1.02
4	1.24	1.12	1.10	0.82	1.15	1.24	1.20	1.21	1.25	1.19	1.21	1.24	1.24	1.16	1.00
5	1.24	1.18	1.13	1.14	0.93	1.03	1.20	1.14	1.17	1.20	1.16	1.15	1.16	1.12	1.01
6	1.30	1.27	1.25	1.29	1.12	0.90	0.97	1.10	1.26	1.25	1.37	1.24	1.25	1.34	0.99
7	1.31	1.25	1.26	1.24	1.31	0.98	0.91	1.02	1.27	1.32	1.42	1.28	1.27	1.33	0.99
8	1.23	1.24	1.19	1.23	1.16	1.04	0.95	0.87	1.05	1.18	1.15	1.24	1.21	1.24	1.00
9	1.21	1.19	1.17	1.24	1.16	1.21	1.20	1.07	0.87	0.93	1.04	1.23	1.28	1.23	1.00
10	1.20	1.17	1.16	1.19	1.22	1.25	1.29	1.22	0.93	0.87	1.22	1.18	1.27	1.22	0.99
11	1.16	1.15	1.12	1.16	1.12	1.16	1.15	1.08	0.93	1.12	0.77	1.07	1.15	1.14	1.01
12	1.25	1.16	1.11	1.18	1.14	1.16	1.16	1.15	1.08	1.06	1.04	0.79	1.11	1.17	1.01
13	1.15	1.22	1.18	1.28	1.18	1.21	1.23	1.20	1.20	1.20	1.19	1.15	1.00	1.22	1.00
14	1.24	1.12	1.18	1.15	1.14	1.28	1.29	1.24	1.25	1.24	1.21	1.25	1.22	1.00	1.00
Total	1.03	1.00	1.08	1.01	1.04	0.98	0.97	1.02	0.99	0.98	1.08	1.06	1.00	1.00	1.00

Reference Case - 2051 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	95103	2519	2309	787	23	36	8	75	16	20	22	43	7494	31	108486
2	2519	99790	2599	5682	47	54	10	46	21	12	5	18	181	262	111245
3	2309	2599	25480	7097	550	132	45	376	54	33	22	14	374	120	39206
4	787	5682	7097	73274	1080	157	11	38	10	11	2	3	127	1405	89704
5	23	47	550	1080	123239	54034	1066	3111	264	92	41	39	184	2613	186378
6	36	54	132	157	54034	459918	37829	25325	2395	836	144	163	438	95	581576
7	8	10	45	11	1066	37829	130664	27333	2187	462	54	67	115	7	199858
8	75	46	376	58	3111	25325	27333	181279	26976	3337	1797	721	407	22	270863
9	16	21	54	10	264	2395	2187	26976	143815	45745	5202	4264	379	14	233340
10	20	12	33	11	92	836	462	3337	45745	172190	513	7797	462	2	231510
11	22	5	22	2	41	144	54	1797	5202	513	15934	2565	610	3	26914
12	43	18	14	3	39	163	67	721	4264	7797	2565	45790	9027	10	70520
13	7494	181	374	127	184	438	115	407	379	462	610	9027	28769826	694	28790337
14	31	262	120	1405	2613	95	7	22	14	2	3	10	694	2880298	2885577
Total	108486	111245	39206	89704	186378	581576	199858	270863	233340	231510	26914	70520	28790337	2885577	33825513

DM - 2051 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	92286	3265	2846	1178	36	59	12	104	24	29	28	73	8642	48	108630
2	3265	97090	2978	7096	64	83	14	66	30	16	7	25	268	326	111330
3	2846	2978	22072	9162	639	178	59	449	70	39	30	19	526	155	39222
4	1178	7096	9162	68735	1313	228	15	84	14	17	4	4	221	1679	89752
5	36	64	639	1313	117566	57823	1500	3714	346	128	49	52	259	2997	186486
6	59	83	178	228	57823	450721	39810	27670	2971	1071	179	207	682	146	581829
7	12	14	59	15	1500	39810	126612	28285	2661	588	68	83	167	12	199888
8	104	66	449	84	3714	27670	28285	173868	28978	4065	2117	901	589	32	270922
9	24	30	70	14	346	2971	2661	28978	140218	46760	5727	5135	550	21	233504
10	29	16	39	17	128	1071	588	4065	46760	168866	637	8803	676	4	231698
11	28	7	30	4	49	179	68	2117	5727	637	14297	2948	824	5	26920
12	73	25	19	4	52	207	85	901	5135	8803	2948	41584	10733	14	70583
13	8642	268	526	221	259	682	167	589	550	676	824	10733	28904409	1095	28929641
14	48	326	155	1679	2997	146	12	32	21	4	5	14	1095	2882992	2889525
Total	108630	111330	39222	89752	186486	581829	199888	270922	233504	231698	26920	70583	28929641	2889525	33969931

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-2816	746	537	392	14	23	4	29	7	9	5	30	1148	16	144
2	746	-2700	379	1415	17	30	4	20	9	5	2	8	87	64	86
3	537	379	-3408	2065	89	46	14	73	16	6	8	5	152	35	16
4	392	1415	2065	-4538	234	71	4	26	5	6	1	1	94	274	49
5	14	17	89	234	-5673	3789	434	603	83	36	9	13	75	385	108
6	23	30	46	71	3789	-9197	1981	2345	576	235	35	44	224	51	253
7	4	4	14	4	434	1981	-4052	953	474	126	14	18	52	4	30
8	29	20	73	26	603	2345	953	-7411	2001	728	321	179	183	10	59
9	7	9	16	5	83	576	474	2001	-5596	1015	525	870	171	7	164
10	9	5	6	6	36	235	126	728	1015	-3324	124	1007	214	1	188
11	5	2	8	1	9	35	14	321	525	124	-1637	383	215	2	7
12	30	8	5	1	13	44	18	179	870	1007	383	-4206	1706	4	63
13	1148	87	152	94	75	224	52	183	171	214	215	1706	134582	401	139304
14	16	64	35	274	385	51	4	10	7	1	2	4	401	2694	3949
Total	144	86	16	49	108	253	30	59	164	188	7	63	139304	3949	144415

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.97	1.30	1.23	1.50	1.61	1.64	1.53	1.39	1.45	1.47	1.24	1.70	1.15	1.52	1.00
2	1.30	0.97	1.15	1.25	1.37	1.55	1.43	1.43	1.43	1.40	1.47	1.42	1.48	1.24	1.00
3	1.23	1.15	0.87	1.29	1.16	1.35	1.31	1.19	1.31	1.19	1.36	1.32	1.41	1.29	1.00
4	1.50	1.25	1.29	0.94	1.22	1.45	1.38	1.45	1.49	1.52	1.53	1.53	1.74	1.19	1.00
5	1.61	1.37	1.16	1.22	0.95	1.07	1.41	1.19	1.31	1.40	1.21	1.35	1.41	1.15	1.00
6	1.64	1.55	1.35	1.45	1.07	0.98	1.05	1.09	1.24	1.28	1.24	1.27	1.49	1.54	1.00
7	1.53	1.43	1.31	1.38	1.41	1.05	0.97	1.03	1.22	1.27	1.25	1.27	1.45	1.58	1.00
8	1.39	1.43	1.19	1.45	1.19	1.09	1.03	0.96	1.07	1.22	1.18	1.25	1.45	1.45	1.00
9	1.45	1.43	1.31	1.49	1.31	1.24	1.22	1.07	0.96	1.02	1.10	1.20	1.45	1.48	1.00
10	1.47	1.40	1.19	1.52	1.40	1.28	1.27	1.22	1.02	0.98	1.24	1.13	1.46	1.56	1.00
11	1.24	1.47	1.36	1.53	1.21	1.24	1.25	1.18	1.10	1.24	0.90	1.15	1.35	1.49	1.00
12	1.70	1.42	1.32	1.55	1.35	1.27	1.27	1.25	1.20	1.13	1.15	0.91	1.19	1.43	1.00
13	1.15	1.48	1.41	1.74	1.41	1.49	1.45	1.45	1.45	1.46	1.35	1.19	1.00	1.58	1.00
14	1.52	1.24	1.29	1.19	1.15	1.54	1.58	1.45	1.48	1.56	1.49	1.43	1.58	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Reference Case - 2051 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	97953	1463	1867	316	49	69	16	110	39	16	54	46	4650	75	106927
2	1426	77396	1916	3258	47	87	15	67	47	19	22	27	123	185	84636
3	1819	1923	32552	3321	264	105	28	288	118	47	96	44	378	168	41153
4	604	3429	3388	81174	727	199	19	44	38	10	12	12	57	1621	91333
5	50	44	252	686	138549	49979	552	2355	154	59	83	62	368	4130	197322
6	73	89	107	224	48082	514223	44512	20434	1963	493	155	246	1051	402	632054
7	18	16	34	19	533	44046	120535	24382	1311	221	46	101	237	38	191539
8	118	70	290	56	2361	21540	25217	159979	19064	1896	1350	459	539	91	233029
9	40	41	120	41	128	1893	1328	18804	151592	44993	3257	3010	1058	55	226360
10	19	18	53	11	62	513	251	1920	46476	173934	233	7482	592	32	231595
11	61	23	97	9	62	131	58	1324	3162	266	23023	1822	287	24	30349
12	48	24	44	13	67	245	102	411	3408	9102	1540	74560	16673	29	106268
13	5753	141	496	83	441	1211	281	648	595	433	376	15288	45728290	702	45754740
14	44	147	132	1895	5636	227	34	63	67	33	26	27	184	4050149	4058664
Total	108026	84828	41346	91304	197009	634470	192946	230827	228035	231526	30274	103187	45754487	4057702	51985968

DM - 2051 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	94254	2185	2700	919	107	147	30	194	66	28	82	91	6819	133	107756
2	2142	74672	2502	4442	90	173	26	116	76	31	35	45	232	286	84870
3	2619	2483	28897	5322	427	209	51	442	190	73	142	67	638	259	41842
4	1063	4687	5545	74588	1053	349	31	78	68	18	20	22	116	2307	89944
5	109	86	408	985	131698	55922	963	3206	242	104	126	104	660	5238	199850
6	157	177	215	388	54390	493001	47866	24546	2939	777	238	401	1924	781	627800
7	35	29	62	32	941	47345	113334	25979	1918	347	70	161	440	70	190762
8	207	121	448	94	3226	25325	26602	151072	21807	2779	1849	678	964	156	235327
9	68	67	198	71	204	2803	1907	21561	142257	46872	3987	4272	1626	96	225989
10	32	30	83	19	110	814	393	2863	48608	166688	365	9381	1021	57	230464
11	94	34	146	15	97	203	85	1814	3787	400	20979	2388	508	38	30589
12	95	40	67	22	110	389	157	597	4659	11005	1992	67388	21939	48	108505
13	8469	258	858	157	775	2144	501	1124	1005	771	645	20764	45762439	1159	45801070
14	82	224	207	2580	6751	448	61	109	112	58	40	46	341	4051120	4062180
Total	109427	85095	42335	89635	199980	629272	192007	233700	227734	229953	30570	105808	45799685	4061747	52036947

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-3699	720	833	403	58	78	15	84	27	11	28	45	2169	59	830
2	716	-2724	586	1184	43	86	12	50	29	12	13	18	109	101	234
3	801	560	-3655	2001	163	104	22	153	71	26	46	24	280	91	688
4	459	1258	2156	-6586	326	150	12	34	30	8	8	10	59	686	-1389
5	59	41	156	300	-6851	5943	411	851	88	45	44	42	292	1108	2528
6	83	88	108	164	6308	-21222	3355	4112	976	284	82	155	873	378	-4255
7	17	13	28	12	406	3299	-7201	1597	607	126	24	60	203	32	-777
8	89	51	158	39	865	3785	1385	-8907	2744	883	499	219	425	64	2298
9	28	25	78	30	76	910	579	2757	-9335	1879	731	1262	568	40	-371
10	13	11	30	8	48	300	143	943	2132	-7245	133	1899	429	25	-1131
11	33	12	49	6	35	71	28	490	625	133	-2044	566	221	14	241
12	47	15	23	9	43	143	55	186	1251	1902	451	-7173	5266	19	2237
13	2716	117	362	74	334	934	220	477	411	336	269	5476	34148	456	46330
14	38	77	75	685	1115	221	27	46	44	25	14	19	158	971	3516
Total	1401	266	989	-1669	2971	-5198	-939	2872	-300	-1574	297	2621	45198	4045	50979

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.96	1.49	1.45	1.78	2.18	2.12	1.93	1.76	1.68	1.70	1.51	1.97	1.47	1.79	1.01
2	1.30	0.96	1.31	1.36	1.91	1.98	1.82	1.74	1.61	1.62	1.57	1.66	1.89	1.54	1.00
3	1.44	1.29	0.89	1.60	1.62	1.99	1.79	1.53	1.60	1.55	1.48	1.54	1.74	1.54	1.02
4	1.76	1.37	1.64	0.92	1.45	1.75	1.65	1.76	1.80	1.78	1.72	1.83	2.04	1.42	0.98
5	2.18	1.94	1.62	1.44	0.95	1.12	1.74	1.36	1.57	1.75	1.53	1.67	1.79	1.27	1.01
6	2.14	1.99	2.01	1.73	1.13	0.96	1.08	1.20	1.50	1.58	1.53	1.63	1.83	1.94	0.99
7	1.94	1.85	1.82	1.65	1.76	1.07	0.94	1.07	1.46	1.57	1.54	1.59	1.86	1.84	1.00
8	1.76	1.73	1.55	1.69	1.37	1.18	1.05	0.94	1.14	1.47	1.37	1.48	1.79	1.71	1.01
9	1.70	1.61	1.65	1.74	1.60	1.48	1.44	1.15	0.94	1.04	1.22	1.42	1.54	1.73	1.00
10	1.72	1.62	1.58	1.76	1.77	1.58	1.57	1.49	1.05	0.96	1.57	1.25	1.72	1.79	1.00
11	1.55	1.53	1.51	1.67	1.57	1.54	1.48	1.37	1.20	1.50	0.91	1.31	1.77	1.59	1.01
12	1.96	1.63	1.52	1.72	1.63	1.58	1.54	1.45	1.37	1.21	1.29	0.90	1.32	1.68	1.02
13	1.47	1.83	1.73	1.90	1.76	1.77	1.78	1.74	1.69	1.77	1.71	1.36	1.00	1.65	1.00
14	1.88	1.52	1.57	1.36	1.20	1.97	1.79	1.73	1.66	1.76	1.54	1.69	1.86	1.00	1.00
Total	1.01	1.00	1.02	0.98	1.02	0.99	1.00	1.01	1.00	0.99	1.01	1.03	1.00	1.00	1.00

Reference Case - 2029 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11628	1277	906	1078	69	88	17	153	54	24	86	77	5490	308	21255
2	1265	8555	1114	1417	96	140	18	90	51	29	25	33	1231	511	14577
3	941	1142	2066	511	185	127	31	272	114	89	119	66	2518	766	8947
4	1100	1446	469	7796	635	663	19	179	55	12	26	23	1182	1613	15216
5	70	93	190	690	15266	8894	456	1386	328	171	171	109	1249	2171	31245
6	88	145	129	681	9143	49304	5623	6088	2198	1072	509	475	3831	694	79980
7	19	18	33	19	489	5356	11712	2800	688	382	147	175	900	69	22807
8	172	101	313	189	1392	5967	2761	16240	3907	1628	704	559	3974	184	38092
9	50	46	103	52	304	1914	629	3378	14473	5296	476	897	3678	98	31394
10	23	26	86	12	175	1121	399	1464	5088	15252	278	1547	3590	52	29114
11	110	28	136	25	153	514	173	636	493	330	1824	388	1616	70	6497
12	78	31	63	22	111	477	186	555	1100	1912	382	5201	7818	46	17982
13	7178	1593	3428	1740	1543	4910	1179	5161	3899	3958	2383	8792	7427433	8742	7481897
14	527	706	1304	2153	3732	1173	102	309	170	73	134	87	9111	683000	702582
Total	23250	15168	10342	16386	33295	80648	23305	38711	32618	30226	7263	18430	7473621	698322	8501585

D5 - 2029 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11153	1346	942	1167	75	99	20	164	62	27	91	89	5734	325	21294
2	1337	8092	1170	1487	104	155	20	106	65	35	32	43	1361	534	14541
3	962	1164	1808	529	191	137	36	303	137	106	138	80	2695	782	9068
4	1198	1512	495	7208	672	725	21	201	70	14	34	30	1340	1686	15207
5	76	100	198	728	14778	9024	512	1481	357	191	185	118	1350	2266	31364
6	101	162	141	756	9528	47310	5623	6393	2445	1197	583	523	4233	779	79775
7	22	22	40	21	563	5398	11244	2806	758	432	167	193	994	78	22739
8	188	122	364	213	1488	6136	2700	15321	3967	1762	741	610	4298	204	38115
9	57	58	127	66	329	2095	674	3448	13664	5194	479	971	4068	114	31344
10	26	32	105	15	197	1256	448	1598	4954	14497	297	1631	3943	61	29059
11	119	36	164	32	162	550	182	651	474	343	1639	395	1706	81	6534
12	90	39	78	28	120	513	199	589	1131	1949	385	4748	8148	54	18072
13	7618	1730	3807	2011	1683	5393	1294	5590	4228	4284	2561	9295	7431863	9736	7491094
14	570	732	1396	2255	3963	1311	116	351	203	87	163	107	10192	681711	703156
Total	23516	15148	10835	16517	33854	80104	23089	39002	32515	30120	7494	18832	7481925	698411	8511363

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-474	70	36	89	5	11	3	11	7	3	5	11	244	18	39
2	71	-463	56	70	7	15	3	16	14	7	7	9	130	23	-37
3	21	22	-258	18	5	10	5	31	23	17	19	14	178	16	121
4	98	66	25	-588	37	63	2	22	16	3	8	8	158	74	-9
5	6	7	8	38	-489	130	56	94	29	20	14	10	101	96	119
6	12	17	13	75	385	-1994	0	305	247	126	74	48	402	85	-205
7	3	3	7	2	74	42	-467	6	70	50	20	18	94	9	-68
8	16	21	51	24	96	170	-61	-919	59	134	37	51	324	21	23
9	7	12	24	14	25	181	46	70	-809	-101	4	73	390	16	-50
10	3	6	19	3	22	135	49	134	-134	-755	19	84	353	9	-55
11	9	8	28	7	9	37	9	15	-19	13	-185	7	89	11	37
12	12	8	14	7	9	36	13	34	31	38	3	-453	330	8	90
13	440	177	379	272	141	483	115	430	330	326	178	503	4429	994	9197
14	42	26	91	101	231	138	14	42	33	14	29	20	1082	-1289	575
Total	266	-20	493	132	559	-545	-216	291	-103	-106	231	403	8304	90	9778

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.96	1.05	1.04	1.08	1.08	1.12	1.13	1.07	1.14	1.13	1.05	1.15	1.04	1.06	1.00
2	1.06	0.95	1.05	1.05	1.08	1.10	1.17	1.18	1.26	1.24	1.28	1.27	1.11	1.04	1.00
3	1.02	1.02	0.88	1.03	1.03	1.08	1.17	1.11	1.21	1.19	1.16	1.21	1.07	1.02	1.01
4	1.09	1.05	1.05	0.92	1.06	1.09	1.09	1.12	1.28	1.25	1.31	1.34	1.13	1.05	1.00
5	1.09	1.08	1.04	1.06	0.97	1.01	1.12	1.07	1.09	1.11	1.08	1.09	1.08	1.04	1.00
6	1.14	1.12	1.10	1.11	1.04	0.96	1.00	1.05	1.11	1.12	1.15	1.10	1.10	1.12	1.00
7	1.17	1.19	1.21	1.10	1.15	1.01	0.96	1.00	1.10	1.13	1.14	1.10	1.10	1.14	1.00
8	1.09	1.21	1.16	1.13	1.07	1.03	0.98	0.94	1.02	1.08	1.05	1.09	1.08	1.11	1.00
9	1.14	1.25	1.23	1.26	1.08	1.09	1.07	1.02	0.94	0.98	1.01	1.08	1.11	1.17	1.00
10	1.14	1.23	1.22	1.26	1.12	1.12	1.12	1.09	0.97	0.95	1.07	1.05	1.10	1.17	1.00
11	1.08	1.28	1.20	1.28	1.06	1.07	1.05	1.02	0.96	1.04	0.90	1.02	1.06	1.15	1.01
12	1.15	1.25	1.23	1.31	1.08	1.08	1.07	1.06	1.03	1.02	1.01	0.91	1.04	1.18	1.01
13	1.06	1.11	1.11	1.16	1.09	1.10	1.10	1.08	1.08	1.08	1.07	1.06	1.00	1.11	1.00
14	1.08	1.04	1.07	1.05	1.06	1.12	1.14	1.13	1.20	1.19	1.22	1.23	1.12	1.00	1.00
Total	1.01	1.00	1.05	1.01	1.02	0.99	0.99	1.01	1.00	1.00	1.03	1.02	1.00	1.00	1.00

Reference Case - 2029 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	87639	2321	2198	702	20	31	7	67	14	17	20	40	6434	27	99536
2	2321	91836	2471	5180	42	49	9	42	19	11	5	17	157	238	102394
3	2198	2471	23171	6339	509	113	40	336	47	29	21	14	335	106	35727
4	702	5180	6339	66347	965	138	10	51	8	10	2	2	115	1260	81129
5	20	42	509	965	109865	47709	949	2783	229	80	37	35	158	2336	165718
6	31	49	113	138	47709	397112	33070	22493	2083	725	124	146	410	71	504275
7	7	9	40	10	949	33070	114787	24131	1911	402	52	63	102	6	175539
8	67	42	336	51	2783	22493	24131	160260	23705	2896	1639	663	360	17	239442
9	14	19	47	8	229	2083	1911	23705	127591	39937	4721	3888	337	12	204504
10	17	11	29	10	80	725	402	2896	39937	151034	454	7076	413	2	203086
11	20	5	21	2	37	124	52	1639	4721	454	15091	2409	543	3	25120
12	40	17	14	2	35	146	63	663	3888	7076	2409	43243	8085	8	65688
13	6434	157	335	115	158	410	102	360	337	413	543	8085	25707808	602	25725858
14	27	238	106	1260	2336	71	6	17	12	2	3	8	602	2534448	2539137
Total	99536	102394	35727	81129	165718	504275	175539	239442	204504	203086	25120	65688	25725858	2539137	30167155

DS - 2029 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	86617	2575	2353	848	25	44	10	79	20	23	22	58	6898	32	99603
2	2575	90668	2583	5869	50	64	14	63	34	19	8	29	200	260	102437
3	2353	2583	21644	7346	540	133	54	401	76	46	31	22	394	115	35737
4	848	5869	7346	64238	1059	165	12	71	15	19	4	5	155	1347	81152
5	25	50	540	1059	107640	49064	1200	3065	281	102	43	43	194	2471	165778
6	44	64	133	165	49064	392855	34292	23650	2379	857	141	170	504	89	504408
7	10	14	54	12	1200	34292	112732	24421	2099	460	57	71	123	8	175555
8	79	63	401	71	3065	23650	24421	157089	24419	3232	1775	755	432	21	239473
9	20	34	76	15	281	2379	2099	24419	125215	40513	4906	4199	401	16	204574
10	23	19	46	19	102	857	460	3232	40513	149531	493	7381	483	3	203165
11	22	8	31	4	43	141	57	1775	4906	493	14474	2549	619	4	25125
12	58	29	22	5	43	170	71	755	4199	7381	2549	41701	8722	13	65718
13	6898	200	394	155	194	504	123	432	401	483	619	8722	25754806	788	25774718
14	32	260	115	1347	2471	89	8	21	16	3	4	13	788	2535517	2540686
Total	99603	102437	35737	81152	165778	504408	175555	239473	204574	203165	25125	65718	25774718	2540686	30218130

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1022	255	155	146	5	13	3	12	6	6	3	18	464	5	67
2	255	-1169	113	689	9	15	5	21	15	8	4	13	43	22	42
3	155	113	-1526	1007	30	20	15	66	29	17	10	8	59	9	10
4	146	689	1007	-2109	95	27	2	19	7	9	2	2	40	87	23
5	5	9	30	95	-2225	1355	251	282	52	23	6	8	36	135	60
6	13	15	20	27	1355	-4257	1222	1157	296	132	17	24	94	18	133
7	3	5	15	2	251	1222	-2055	291	188	58	5	9	21	2	16
8	12	21	66	19	282	1157	291	-3171	715	336	136	92	71	4	31
9	6	15	29	7	52	296	188	715	-2376	576	184	311	63	4	70
10	6	8	17	9	23	132	58	336	576	-1502	39	305	72	1	79
11	3	4	10	2	6	17	5	136	184	39	-617	140	76	1	5
12	18	13	8	2	8	24	9	92	311	305	140	-1542	637	4	30
13	464	43	59	40	36	94	21	71	63	72	76	637	46998	186	48860
14	5	22	9	87	135	18	2	4	4	1	1	4	186	1069	1549
Total	67	42	10	23	60	133	16	31	70	79	5	30	48860	1549	50975

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.99	1.11	1.07	1.21	1.23	1.40	1.46	1.18	1.41	1.37	1.13	1.45	1.07	1.18	1.00
2	1.11	0.99	1.05	1.13	1.21	1.30	1.59	1.51	1.80	1.76	1.83	1.77	1.27	1.09	1.00
3	1.07	1.05	0.93	1.16	1.06	1.17	1.37	1.20	1.61	1.57	1.50	1.60	1.18	1.08	1.00
4	1.21	1.13	1.16	0.97	1.10	1.19	1.21	1.38	1.77	1.92	1.92	1.95	1.35	1.07	1.00
5	1.23	1.21	1.06	1.10	0.98	1.03	1.26	1.10	1.22	1.29	1.15	1.24	1.23	1.06	1.00
6	1.40	1.30	1.17	1.19	1.03	0.99	1.04	1.05	1.14	1.18	1.14	1.17	1.23	1.26	1.00
7	1.46	1.39	1.37	1.21	1.26	1.04	0.98	1.01	1.10	1.14	1.10	1.14	1.20	1.29	1.00
8	1.18	1.51	1.20	1.38	1.10	1.05	1.01	0.98	1.03	1.12	1.08	1.14	1.20	1.25	1.00
9	1.41	1.80	1.61	1.77	1.22	1.14	1.10	1.03	0.98	1.01	1.04	1.08	1.19	1.39	1.00
10	1.37	1.76	1.57	1.92	1.29	1.18	1.14	1.12	1.01	0.99	1.08	1.04	1.17	1.52	1.00
11	1.13	1.83	1.50	1.92	1.15	1.14	1.10	1.08	1.04	1.08	0.96	1.06	1.14	1.47	1.00
12	1.45	1.77	1.60	1.95	1.24	1.17	1.14	1.14	1.08	1.04	1.06	0.96	1.08	1.50	1.00
13	1.07	1.27	1.18	1.35	1.23	1.23	1.20	1.20	1.19	1.17	1.14	1.08	1.00	1.31	1.00
14	1.18	1.09	1.08	1.07	1.06	1.26	1.29	1.25	1.39	1.52	1.47	1.50	1.31	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Reference Case - 2029 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	86927	1327	1683	441	43	39	13	93	34	14	43	42	4092	66	94884
2	1298	69605	1724	2886	42	75	13	38	42	17	20	25	109	172	76085
3	1643	1724	28929	2906	235	89	25	252	105	42	84	40	334	151	36558
4	323	3027	2979	71842	624	173	16	38	33	9	10	10	30	1434	80769
5	43	39	222	584	118324	42513	473	2013	131	50	72	34	306	3433	168257
6	62	76	90	193	40995	430336	37868	17440	1638	420	130	211	866	328	530872
7	13	14	29	17	461	37493	103234	20861	1124	191	40	88	199	32	163799
8	102	60	253	48	2023	18425	21601	137087	16296	1625	1186	406	437	78	199647
9	34	36	105	35	109	1799	1138	16048	128844	38368	2895	2639	909	47	192807
10	16	16	47	10	33	437	216	1643	39634	149760	204	6632	514	27	199209
11	51	20	86	8	34	108	32	1162	2797	235	20787	1631	246	22	27259
12	43	22	40	11	39	211	89	362	2991	8083	1362	67231	14888	25	95416
13	3086	124	441	71	370	1004	237	549	308	379	326	13667	38968868	608	38992238
14	39	136	120	1690	4737	178	29	33	38	28	23	24	158	3335119	3542391
Total	95884	76223	36750	80741	168127	532901	165005	197662	194254	199223	27186	92699	38991995	3541542	44400192

D5 - 2029 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	85993	1549	1955	364	60	88	21	126	49	21	36	64	4794	83	95025
2	1520	68477	1923	3309	37	107	22	99	78	32	38	46	175	204	76088
3	1889	1908	27493	3703	285	124	44	354	188	78	129	72	443	177	36888
4	664	3437	3843	69624	732	224	21	38	65	19	21	22	78	1629	80456
5	60	34	271	684	115845	44346	640	2325	170	70	93	72	415	3771	168816
6	93	108	127	248	42826	423338	39515	19082	2025	336	159	269	1158	445	529930
7	24	24	34	21	622	39177	100321	21310	1319	237	48	109	264	42	163573
8	135	103	365	70	2329	19965	21977	133752	17160	1951	1383	487	397	102	200373
9	30	68	197	67	142	1944	1321	16906	123355	39184	3120	3023	1096	70	192542
10	24	30	87	19	74	359	267	1983	40462	147369	241	7137	643	42	199137
11	65	38	139	16	69	133	61	1332	2983	273	20009	1805	311	34	27288
12	68	41	73	23	77	266	109	431	3376	8623	1503	64626	16392	40	95850
13	3969	196	394	110	497	1324	309	709	643	482	406	15418	38982389	834	39010080
14	30	161	142	1889	5080	243	38	71	86	43	37	39	230	3335388	3543695
Total	96205	76213	37263	80349	168695	531836	164666	198558	193957	199121	27244	93187	39009388	3543063	44419744

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1333	222	270	123	17	29	8	31	15	7	11	23	702	17	141
2	221	-1127	199	423	16	32	9	40	36	15	18	21	66	32	2
3	246	184	-1436	797	51	35	20	102	83	33	45	32	109	26	330
4	140	430	864	-2218	108	50	3	20	32	9	10	11	29	196	-314
5	17	13	49	100	-2478	1832	167	312	39	20	20	18	109	339	559
6	32	33	37	35	1831	-7198	1647	1642	367	116	29	57	292	118	-941
7	9	10	25	5	161	1684	-3913	449	195	46	8	20	65	10	-226
8	33	42	112	22	305	1540	376	-3335	863	326	197	81	140	24	726
9	16	32	91	32	33	345	183	858	-3489	816	224	384	187	23	-265
10	8	14	40	10	21	122	31	339	828	-2191	37	305	131	15	-71
11	14	18	53	8	16	24	9	190	186	39	-778	174	64	12	29
12	25	19	34	11	19	35	19	70	385	342	141	-2605	1705	15	434
13	883	72	153	39	127	320	72	159	135	103	81	1751	13721	226	17842
14	11	25	22	200	343	65	9	18	28	15	14	15	71	469	1304
Total	320	-11	513	-393	568	-1065	-339	896	-297	-101	58	488	17392	1521	19551

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.98	1.17	1.16	1.28	1.39	1.49	1.57	1.32	1.46	1.48	1.24	1.54	1.17	1.25	1.00
2	1.17	0.98	1.12	1.15	1.38	1.42	1.70	1.69	1.86	1.85	1.88	1.86	1.61	1.19	1.00
3	1.15	1.11	0.95	1.27	1.22	1.39	1.81	1.40	1.79	1.84	1.54	1.80	1.33	1.17	1.01
4	1.27	1.14	1.29	0.97	1.17	1.29	1.30	1.51	1.95	2.04	2.01	2.08	1.58	1.14	1.00
5	1.39	1.39	1.22	1.17	0.98	1.04	1.35	1.16	1.30	1.39	1.28	1.34	1.36	1.10	1.00
6	1.51	1.43	1.41	1.29	1.04	0.98	1.04	1.09	1.22	1.28	1.22	1.27	1.34	1.36	1.00
7	1.57	1.73	1.85	1.29	1.35	1.04	0.97	1.02	1.17	1.24	1.20	1.23	1.33	1.32	1.00
8	1.32	1.70	1.44	1.45	1.15	1.08	1.02	0.98	1.05	1.20	1.17	1.20	1.31	1.31	1.00
9	1.47	1.90	1.87	1.90	1.30	1.22	1.16	1.05	0.97	1.02	1.08	1.15	1.21	1.30	1.00
10	1.47	1.87	1.86	2.02	1.39	1.28	1.24	1.21	1.02	0.99	1.18	1.08	1.25	1.35	1.00
11	1.27	1.87	1.62	2.02	1.29	1.22	1.18	1.16	1.07	1.16	0.96	1.11	1.26	1.38	1.00
12	1.57	1.88	1.86	2.04	1.32	1.26	1.21	1.19	1.13	1.07	1.10	0.96	1.11	1.60	1.00
13	1.17	1.38	1.35	1.55	1.34	1.32	1.30	1.29	1.27	1.27	1.25	1.13	1.00	1.37	1.00
14	1.28	1.18	1.18	1.12	1.07	1.37	1.31	1.33	1.48	1.53	1.60	1.61	1.45	1.00	1.00
Total	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00

Reference Case - 2044 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	12379	1338	953	1147	74	96	19	163	99	26	91	81	9898	329	22612
2	1335	9074	1179	1512	103	154	19	97	56	31	26	35	1312	546	15479
3	995	1209	2204	543	199	139	34	295	123	97	125	69	2711	825	9568
4	1175	1544	500	8325	689	731	21	196	61	13	27	24	1284	1745	16335
5	75	100	204	746	16810	9843	504	1527	364	189	182	116	1369	2385	34412
6	97	159	141	749	10096	54898	6226	6740	2447	1198	545	514	4286	780	88875
7	20	20	36	21	538	5929	12951	3081	762	423	156	189	998	76	25200
8	186	109	338	206	1531	6608	3054	17962	4337	1813	752	603	4389	204	42091
9	54	50	112	58	337	2136	698	3751	16108	5839	511	966	4070	109	34799
10	24	28	94	13	194	1251	441	1629	5604	16888	298	1660	3955	58	32138
11	117	29	143	26	163	553	186	682	530	353	1916	406	1715	75	6894
12	81	33	66	23	118	516	200	598	1181	2047	400	5432	8308	49	19051
13	7699	1657	3671	1874	1686	5462	1301	5681	4311	4356	2533	9345	8091075	9671	8150323
14	571	753	1397	2320	4081	1308	113	341	189	81	143	93	10100	754659	776149
Total	24810	16102	11035	17564	36619	89625	25765	42745	36130	33353	7705	19533	8141429	771512	9273926

DS - 2044 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11253	1524	1053	1358	88	122	25	192	73	32	101	105	6432	380	22737
2	1532	8004	1324	1669	119	188	24	127	79	42	37	50	1591	612	15399
3	1072	1275	1652	568	215	164	44	352	161	124	153	90	3071	886	9828
4	1418	1699	540	6932	781	890	25	243	89	18	40	36	1610	1976	16297
5	92	116	225	841	15717	10121	603	1728	422	225	209	133	1581	2653	34666
6	127	200	174	947	11160	49971	6080	7400	3043	1480	729	627	5269	1017	88226
7	28	27	51	26	691	5865	11899	3132	947	548	213	236	1243	100	25007
8	228	151	440	259	1761	6897	2918	15783	4525	2120	854	732	5204	254	42127
9	68	70	154	83	388	2555	822	3977	14130	5507	525	1164	5077	143	34664
10	31	38	127	18	235	1549	558	1956	5255	14918	354	1918	4919	76	31951
11	136	42	187	37	181	629	209	728	490	389	1496	428	1936	95	6983
12	107	46	88	33	134	590	229	678	1259	2150	410	4391	9105	63	19284
13	8754	2045	4456	2427	1974	6535	1577	6702	5113	5170	2963	10584	8102975	11922	8173196
14	690	827	1633	2617	4619	1651	144	432	255	107	197	130	12466	751838	777606
Total	25535	16063	12105	17816	38064	87728	25158	43430	35841	32830	8282	20625	8162478	772013	9297969

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1126	186	100	211	14	26	6	27	15	6	10	24	574	51	125
2	196	-1070	145	157	16	34	6	30	23	12	11	15	279	66	-80
3	76	66	-552	25	16	26	11	57	38	27	29	20	360	62	260
4	243	156	41	-1394	92	159	4	47	28	5	13	12	326	230	-38
5	17	16	22	95	-1092	279	99	201	98	36	27	17	213	268	253
6	31	40	34	198	1065	-4927	-146	660	597	283	184	113	983	237	-649
7	8	7	15	5	152	-64	-1052	52	185	125	57	48	245	23	-193
8	42	41	103	53	230	289	-135	-2179	188	307	102	130	816	50	36
9	15	20	42	26	50	419	124	226	-1978	-332	14	198	1007	34	-135
10	6	10	34	5	41	297	117	326	-349	-1970	57	258	963	17	-187
11	19	13	44	11	18	77	23	47	-40	36	-421	22	221	20	89
12	25	13	22	10	16	75	30	80	78	104	10	-1041	797	14	232
13	1054	387	786	553	288	1073	276	1021	802	814	430	1238	11900	2250	22873
14	119	74	237	297	538	343	31	91	66	27	54	37	2365	-2821	1457
Total	725	-39	1070	252	1446	-1897	-607	685	-289	-523	577	1092	21049	501	24043

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.91	1.14	1.11	1.18	1.20	1.27	1.31	1.16	1.25	1.24	1.11	1.30	1.10	1.16	1.01
2	1.15	0.88	1.12	1.10	1.16	1.22	1.30	1.31	1.41	1.38	1.42	1.43	1.21	1.12	0.99
3	1.08	1.05	0.75	1.05	1.08	1.19	1.32	1.19	1.31	1.28	1.23	1.29	1.13	1.07	1.03
4	1.21	1.10	1.08	0.83	1.13	1.22	1.19	1.24	1.47	1.38	1.47	1.52	1.25	1.13	1.00
5	1.22	1.16	1.11	1.13	0.94	1.03	1.20	1.13	1.16	1.19	1.15	1.15	1.16	1.11	1.01
6	1.32	1.25	1.24	1.26	1.11	0.91	0.98	1.10	1.24	1.24	1.34	1.22	1.23	1.30	0.99
7	1.38	1.36	1.42	1.23	1.28	0.99	0.92	1.02	1.24	1.29	1.37	1.25	1.25	1.31	0.99
8	1.22	1.38	1.30	1.26	1.15	1.04	0.96	0.88	1.04	1.17	1.14	1.22	1.19	1.25	1.00
9	1.27	1.41	1.37	1.44	1.15	1.20	1.18	1.06	0.88	0.94	1.03	1.20	1.25	1.31	1.00
10	1.26	1.37	1.36	1.39	1.21	1.24	1.27	1.20	0.94	0.88	1.19	1.16	1.24	1.30	0.99
11	1.17	1.43	1.31	1.41	1.11	1.14	1.13	1.07	0.92	1.10	0.78	1.05	1.13	1.26	1.01
12	1.31	1.39	1.33	1.45	1.13	1.14	1.15	1.13	1.07	1.05	1.03	0.81	1.10	1.29	1.01
13	1.14	1.23	1.21	1.30	1.17	1.20	1.21	1.18	1.19	1.19	1.17	1.13	1.00	1.23	1.00
14	1.21	1.10	1.17	1.13	1.13	1.26	1.27	1.27	1.35	1.33	1.37	1.40	1.23	1.00	1.00
Total	1.03	1.00	1.10	1.01	1.04	0.98	0.98	1.02	0.99	0.98	1.07	1.06	1.00	1.00	1.00

Reference Case - 2044 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	91904	2437	2243	754	22	34	7	72	16	19	22	41	7146	30	104750
2	2437	96286	2533	5464	43	32	9	44	20	11	5	17	173	254	107353
3	2243	2533	24487	6802	530	126	44	360	32	32	21	14	360	116	37724
4	754	5464	6802	70439	1037	190	11	55	9	11	2	3	122	1360	86219
5	22	43	530	1037	118756	51963	1028	2995	253	88	39	37	176	2318	179488
6	34	52	126	150	51963	440268	36334	24376	2298	803	137	157	442	88	557228
7	7	9	44	11	1028	36334	125776	26329	2102	444	53	65	111	7	192320
8	72	44	360	55	2995	24376	26329	174550	29974	3206	1736	699	392	21	260808
9	16	20	52	9	253	2298	2102	25974	140211	43880	5033	4131	365	13	224357
10	19	11	32	11	88	803	444	3206	43880	165588	494	7541	445	2	222563
11	22	5	21	2	39	137	53	1736	5033	494	15485	2494	589	3	26113
12	41	17	14	3	37	157	65	699	4131	7541	2494	44628	8699	9	68537
13	7146	173	360	122	176	442	111	392	365	445	589	8699	27761924	665	27781610
14	30	254	116	1360	2518	88	7	21	13	2	3	9	665	2771556	2776642
Total	104750	107353	37724	86219	179488	557228	192320	260808	224357	222563	26113	68537	27781610	2776642	32625713

D5 - 2044 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	89390	3086	2701	1097	34	61	14	101	27	31	27	80	8192	44	104885
2	3086	93750	2878	6772	62	82	18	83	47	25	11	39	270	312	107433
3	2701	2878	21363	8596	603	171	70	480	100	58	39	27	508	144	37742
4	1097	6772	8596	66342	1260	217	15	93	21	26	6	6	213	1999	86264
5	34	62	603	1260	113550	55425	1435	3556	335	124	48	50	248	2862	179593
6	61	82	171	217	55425	431576	38240	26656	2857	1033	171	200	632	133	557475
7	14	18	70	15	1435	38240	121915	27213	2546	563	65	83	159	11	192348
8	101	83	480	93	3556	26656	27213	167411	27857	3896	2054	885	559	31	260875
9	27	47	100	21	335	2857	2546	27857	134844	44978	5464	4889	519	23	224507
10	31	25	58	26	124	1033	563	3896	44978	162342	600	8411	634	4	222726
11	27	11	39	6	48	171	65	2054	5464	600	14020	2830	778	6	26121
12	80	39	27	6	50	200	83	885	4889	8411	2830	40845	10234	17	68597
13	8192	270	508	213	248	632	159	559	519	634	778	10234	27881198	1090	27905254
14	44	312	144	1599	2862	133	11	31	23	4	6	17	1090	2773863	2780138
Total	104885	107433	37742	86264	179593	557475	192348	260875	224507	222726	26121	68597	27905254	2780138	32753959

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-2515	649	456	343	12	27	6	29	11	13	6	39	1046	14	135
2	649	-2536	343	1308	17	30	9	38	26	14	6	22	97	58	80
3	456	343	-3122	1793	73	45	26	120	48	26	18	13	148	28	17
4	343	1308	1793	-4097	224	66	4	38	12	16	4	4	91	239	45
5	12	17	75	224	-5205	3461	406	561	81	36	9	13	71	344	105
6	27	30	45	66	3461	-8692	1906	2281	559	231	34	43	209	46	247
7	6	9	26	4	406	1906	-3861	885	444	119	13	17	48	4	28
8	29	38	120	38	561	2281	885	-7139	1883	690	318	187	167	10	67
9	11	26	48	12	81	559	444	1883	-3367	1098	431	758	154	10	150
10	13	14	26	16	36	231	119	690	1098	-3245	106	869	189	2	163
11	6	6	18	4	9	34	13	318	431	106	-1465	336	190	3	8
12	39	22	13	4	13	43	17	187	758	869	336	-3784	1535	8	60
13	1046	97	148	91	71	209	48	167	154	189	190	1535	119274	425	123644
14	14	58	28	239	344	46	4	10	10	2	3	8	425	2306	3496
Total	135	80	17	45	105	247	28	67	150	163	8	60	123644	3496	128246

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.97	1.27	1.20	1.45	1.57	1.78	1.82	1.41	1.72	1.68	1.26	1.93	1.15	1.47	1.00
2	1.27	0.97	1.14	1.24	1.37	1.57	1.94	1.86	2.29	2.22	2.37	2.24	1.56	1.23	1.00
3	1.20	1.14	0.87	1.26	1.14	1.36	1.60	1.33	1.93	1.82	1.84	1.94	1.41	1.24	1.00
4	1.45	1.24	1.26	0.84	1.22	1.44	1.40	1.69	2.32	2.47	2.53	2.52	1.74	1.18	1.00
5	1.57	1.37	1.14	1.22	0.96	1.07	1.40	1.19	1.32	1.40	1.23	1.35	1.41	1.14	1.00
6	1.78	1.57	1.36	1.44	1.07	0.98	1.05	1.09	1.24	1.29	1.24	1.28	1.47	1.52	1.00
7	1.82	1.94	1.60	1.40	1.40	1.05	0.97	1.03	1.21	1.27	1.24	1.26	1.43	1.57	1.00
8	1.41	1.86	1.33	1.69	1.19	1.09	1.03	0.96	1.07	1.22	1.18	1.27	1.42	1.50	1.00
9	1.72	2.29	1.93	2.32	1.32	1.24	1.21	1.07	0.96	1.03	1.09	1.18	1.42	1.73	1.00
10	1.68	2.22	1.82	2.47	1.40	1.29	1.27	1.22	1.03	0.98	1.22	1.12	1.42	1.95	1.00
11	1.26	2.37	1.84	2.52	1.23	1.24	1.24	1.18	1.09	1.22	0.91	1.13	1.32	1.86	1.00
12	1.93	2.24	1.94	2.52	1.35	1.28	1.26	1.27	1.18	1.12	1.13	0.92	1.18	1.82	1.00
13	1.15	1.56	1.41	1.74	1.41	1.47	1.43	1.42	1.42	1.42	1.32	1.18	1.00	1.64	1.00
14	1.47	1.23	1.24	1.18	1.14	1.52	1.57	1.50	1.73	1.95	1.86	1.82	1.64	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Reference Case - 2044 - UCS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	93737	1413	1793	490	47	66	15	104	37	16	51	45	4430	71	102315
2	1380	74263	1850	3116	43	83	14	63	45	18	22	27	118	179	81223
3	1748	1834	31169	3172	252	99	27	273	113	43	91	42	361	162	39408
4	374	3267	3238	77664	690	189	18	42	36	10	11	11	54	1552	87356
5	47	42	239	648	131536	47412	525	2227	146	56	79	59	347	3907	187271
6	69	84	101	214	45636	485231	42207	19320	1834	468	147	235	988	377	596931
7	17	15	32	18	510	41773	114739	23138	1246	211	44	97	224	36	182101
8	113	67	277	54	2234	20396	23956	152084	18171	1808	1296	444	512	87	221499
9	38	39	113	39	121	1787	1262	17876	144068	42511	3139	2890	1005	53	214943
10	18	17	51	10	59	486	238	1823	43888	165267	222	7188	565	30	219862
11	58	22	93	9	59	124	56	1270	3047	256	22222	1766	274	23	29278
12	47	23	42	12	64	233	98	393	3263	8735	1474	72134	16031	28	102598
13	5497	135	477	79	417	1141	266	614	564	415	360	14759	43649766	673	43675163
14	42	143	127	1826	5354	210	32	60	64	32	25	26	175	3896075	3904191
Total	103385	81385	39605	87352	187023	599229	183453	219289	216542	219849	29182	99724	43674871	3903252	49644139

D5 - 2044 - UCS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	90404	2019	2532	830	97	143	33	187	72	31	79	99	6306	121	102955
2	1983	71607	2379	4149	83	162	33	150	114	46	55	68	267	267	81364
3	2435	2351	27903	4871	389	198	71	493	272	111	177	101	637	236	40246
4	962	4358	5078	71908	979	323	29	86	99	28	31	33	120	2129	86164
5	99	79	371	915	125982	52537	882	2974	225	97	119	97	605	4857	189237
6	155	166	205	362	51032	466880	45250	23031	2723	725	219	373	1749	702	593551
7	39	37	87	30	862	44774	108282	24518	1776	323	65	150	403	64	181409
8	202	158	517	104	2990	23821	25146	143954	20570	2593	1785	645	881	150	223516
9	75	102	293	103	189	2597	1767	20310	135538	44275	3736	3956	1495	108	214544
10	36	45	127	29	101	756	364	2634	45841	158926	332	8776	933	66	218985
11	92	55	192	24	91	185	80	1750	3541	367	20329	2239	462	48	29455
12	104	60	104	34	102	359	146	564	4319	10340	1852	65689	20628	59	104361
13	7852	297	853	166	713	1958	461	1029	923	706	589	19509	43680028	1185	43716267
14	75	210	189	2404	6308	397	56	105	127	66	52	57	345	3896868	3907259
Total	104511	81541	40831	85930	189319	595073	182599	221806	216140	218634	29419	101792	43714859	3906859	49689313

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-3333	606	739	340	50	79	19	82	35	15	28	54	1876	50	640
2	603	-2656	529	1033	38	79	19	86	69	28	34	41	150	87	141
3	687	497	-3266	1699	138	99	44	220	159	66	86	59	276	74	838
4	388	1090	1841	-5756	289	134	11	44	63	18	20	22	66	577	-1192
5	51	37	132	267	-6154	5125	357	747	79	40	40	38	258	950	1967
6	86	82	104	148	5396	-18371	3043	3711	888	257	72	137	761	325	-3380
7	22	22	54	12	352	3002	-6457	1380	530	112	21	52	179	28	-692
8	89	91	241	50	755	3425	1189	-8130	2400	785	489	202	368	63	2017
9	36	63	178	64	68	810	505	2434	-8530	1764	597	1066	490	55	-399
10	18	27	77	19	43	270	125	831	1953	-6341	110	1588	368	35	-877
11	34	33	99	15	32	62	24	480	495	111	-1893	473	188	25	177
12	58	37	61	22	38	126	48	171	1055	1604	378	-6446	4577	32	1762
13	2355	162	376	87	296	818	194	415	359	290	229	4749	30262	512	41104
14	33	67	62	578	954	187	24	46	63	35	27	31	170	793	3068
Total	1126	157	1226	-1421	2296	-4155	-854	2517	-402	-1215	237	2068	39987	3607	45174

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.96	1.43	1.41	1.69	2.07	2.21	2.28	1.79	1.94	1.99	1.54	2.21	1.42	1.70	1.01
2	1.44	0.96	1.29	1.33	1.85	1.96	2.39	2.36	2.53	2.52	2.55	2.57	2.27	1.49	1.00
3	1.39	1.27	0.90	1.54	1.55	1.99	2.64	1.81	2.41	2.45	1.94	2.39	1.76	1.46	1.02
4	1.67	1.33	1.57	0.93	1.42	1.71	1.64	2.06	2.75	2.83	2.76	2.95	2.22	1.37	0.99
5	2.08	1.87	1.53	1.41	0.95	1.11	1.68	1.34	1.55	1.72	1.51	1.64	1.74	1.24	1.01
6	2.24	1.98	2.03	1.69	1.12	0.96	1.07	1.19	1.47	1.55	1.49	1.58	1.77	1.86	0.99
7	2.27	2.44	2.69	1.64	1.69	1.07	0.94	1.06	1.42	1.53	1.49	1.54	1.80	1.78	1.00
8	1.78	2.36	1.87	1.93	1.34	1.17	1.05	0.95	1.13	1.43	1.38	1.45	1.72	1.73	1.01
9	1.96	2.59	2.54	2.63	1.57	1.45	1.40	1.14	0.94	1.04	1.19	1.37	1.49	2.05	1.00
10	2.00	2.57	2.51	2.81	1.73	1.56	1.53	1.46	1.04	0.96	1.49	1.22	1.65	2.16	1.00
11	1.59	2.50	2.07	2.75	1.54	1.50	1.43	1.38	1.16	1.43	0.91	1.27	1.68	2.11	1.01
12	2.24	2.56	2.46	2.81	1.60	1.54	1.49	1.43	1.32	1.18	1.26	0.91	1.29	2.16	1.02
13	1.43	2.20	1.79	2.10	1.71	1.72	1.73	1.67	1.64	1.70	1.64	1.32	1.00	1.76	1.00
14	1.78	1.47	1.49	1.32	1.18	1.89	1.73	1.76	1.98	2.10	2.07	2.17	1.97	1.00	1.00
Total	1.01	1.00	1.03	0.98	1.01	0.99	1.00	1.01	1.00	0.99	1.01	1.02	1.00	1.00	1.00

Reference Case - 2051 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	12895	1396	994	1199	76	101	20	172	61	27	94	83	6112	343	23575
2	1385	9473	1232	1584	107	162	20	101	58	32	27	36	1366	565	16148
3	1035	1263	2303	569	208	146	35	309	129	101	130	72	2838	861	9999
4	1226	1616	523	8711	720	768	22	206	63	13	28	25	1347	1820	17088
5	78	104	213	783	17596	10319	527	1998	381	198	189	120	1432	2496	36034
6	101	167	148	788	10550	57543	6513	7048	2566	1257	566	533	4505	820	93106
7	21	20	38	22	562	6199	13523	3209	799	442	161	196	1044	80	26316
8	195	114	354	217	1601	6912	3183	18766	4534	1896	781	626	4596	213	43989
9	56	52	118	60	353	2243	731	3917	16842	6117	530	1004	4262	114	36401
10	25	29	98	14	203	1314	461	1705	5873	17669	310	1724	4139	61	33625
11	122	30	149	28	170	571	192	706	549	367	1983	420	1781	78	7146
12	84	34	69	24	123	537	207	620	1226	2124	414	5599	8614	51	19725
13	8004	1726	3832	1963	1760	5725	1359	5926	4503	4550	2626	9665	8425106	10110	8486854
14	591	780	1452	2422	4265	1367	118	355	197	84	148	96	10551	787513	809940
Total	25819	16805	11523	18384	38294	93906	26911	44638	37781	34878	7989	20201	8477692	805126	9659947

DS - 2051 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11605	1619	1113	1444	93	130	26	203	78	34	107	111	6755	403	23719
2	1617	8252	1399	1761	125	200	26	135	83	45	39	53	1681	641	16056
3	1127	1337	1679	596	227	176	47	374	171	131	162	94	3243	933	10297
4	1508	1790	567	7114	825	949	26	258	95	19	43	39	1716	2091	17039
5	97	122	239	891	16386	10621	634	1819	444	237	218	139	1662	2802	36312
6	136	213	187	1018	11806	51907	6318	7757	3238	1570	774	661	5615	1096	92299
7	30	28	55	28	735	6098	12349	3265	1009	583	227	250	1323	107	26087
8	244	161	473	278	1862	7208	3028	16293	4746	2237	899	776	5526	271	44003
9	73	75	165	89	409	2712	873	4173	14601	5710	547	1236	5420	152	36235
10	32	40	136	19	248	1645	594	2074	5458	15408	376	2032	5254	81	33398
11	144	44	199	40	189	654	217	759	502	407	1511	447	2033	100	7247
12	113	48	93	35	139	618	241	710	1314	2245	427	4433	9503	67	19987
13	9192	2169	4719	2592	2070	6905	1667	7064	5404	5471	3111	11051	8437157	12612	8511184
14	728	864	1718	2766	4863	1753	152	457	268	113	207	136	13172	784446	811644
Total	26645	16763	12742	18672	39978	91576	26199	45341	37412	34211	8648	21459	8500059	805801	9685506

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-1291	223	118	245	17	30	7	31	16	7	12	28	643	60	144
2	232	-1222	167	177	18	38	6	34	25	13	12	17	316	76	-92
3	92	74	-624	27	19	30	12	65	42	30	32	22	405	72	297
4	281	174	44	-1598	105	182	4	53	31	5	14	14	369	271	-50
5	19	18	26	109	-1210	302	108	221	63	39	29	18	231	306	278
6	35	46	39	230	1256	-5636	-195	709	673	313	208	126	1111	277	-807
7	9	8	18	5	173	-101	-1174	56	211	141	66	54	279	27	-229
8	49	47	119	61	261	297	-155	-2473	211	341	118	150	930	57	14
9	17	23	47	29	55	468	142	256	-2240	-407	17	232	1158	38	-166
10	7	11	38	6	45	331	132	369	-415	-2260	66	309	1115	19	-226
11	23	14	50	12	19	83	26	53	-47	40	-472	28	252	22	101
12	29	14	24	11	16	81	33	90	89	121	13	-1166	889	16	261
13	1188	443	888	629	311	1180	308	1138	900	921	486	1386	12051	2502	24329
14	137	84	267	344	597	387	34	101	72	29	58	40	2621	-3067	1704
Total	826	-42	1219	287	1684	-2329	-712	703	-369	-667	659	1258	22367	675	25559

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.90	1.16	1.12	1.20	1.22	1.29	1.33	1.18	1.27	1.26	1.13	1.33	1.11	1.17	1.01
2	1.17	0.87	1.14	1.11	1.17	1.23	1.31	1.33	1.44	1.39	1.44	1.46	1.23	1.13	0.99
3	1.09	1.06	0.73	1.05	1.09	1.21	1.34	1.21	1.33	1.30	1.25	1.31	1.14	1.08	1.03
4	1.23	1.11	1.08	0.82	1.15	1.24	1.20	1.26	1.49	1.40	1.50	1.55	1.27	1.15	1.00
5	1.25	1.18	1.12	1.14	0.93	1.03	1.20	1.14	1.17	1.20	1.15	1.15	1.16	1.12	1.01
6	1.35	1.27	1.27	1.29	1.12	0.90	0.97	1.10	1.26	1.25	1.37	1.24	1.25	1.34	0.99
7	1.42	1.39	1.46	1.25	1.31	0.98	0.91	1.02	1.26	1.32	1.41	1.28	1.27	1.34	0.99
8	1.25	1.41	1.34	1.28	1.16	1.04	0.95	0.87	1.05	1.18	1.15	1.24	1.20	1.27	1.00
9	1.29	1.43	1.40	1.48	1.16	1.21	1.19	1.07	0.87	0.93	1.03	1.23	1.27	1.34	1.00
10	1.28	1.39	1.39	1.41	1.22	1.25	1.29	1.22	0.93	0.87	1.21	1.18	1.27	1.32	0.99
11	1.19	1.46	1.33	1.44	1.11	1.14	1.14	1.07	0.91	1.11	0.76	1.07	1.14	1.28	1.01
12	1.34	1.41	1.35	1.48	1.13	1.15	1.16	1.15	1.07	1.06	1.03	0.79	1.10	1.31	1.01
13	1.15	1.26	1.23	1.32	1.18	1.21	1.23	1.19	1.20	1.20	1.19	1.14	1.00	1.25	1.00
14	1.23	1.11	1.18	1.14	1.14	1.28	1.29	1.28	1.36	1.34	1.39	1.42	1.25	1.00	1.00
Total	1.03	1.00	1.11	1.02	1.04	0.98	0.97	1.02	0.99	0.98	1.08	1.06	1.00	1.00	1.00

Reference Case - 2051 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	95103	2519	2309	787	23	36	8	75	16	20	22	43	7494	31	108486
2	2519	99790	2599	5682	47	54	10	46	21	12	5	18	181	262	111245
3	2309	2599	25480	7097	550	132	45	376	54	33	22	14	374	120	39206
4	787	5682	7097	73274	1080	157	11	58	10	11	2	3	127	1405	89704
5	23	47	550	1080	123239	54034	1066	3111	264	92	41	39	184	2613	186378
6	36	54	132	157	54034	459918	37829	25325	2395	836	144	163	438	95	581576
7	8	10	45	11	1066	37829	130664	27333	2187	462	54	67	115	7	199858
8	75	46	376	58	3111	25325	27333	181279	26976	3337	1797	721	407	22	270863
9	16	21	54	10	264	2395	2187	26976	143815	45743	5202	4264	379	14	233340
10	20	12	33	11	92	836	462	3337	43745	172190	513	7797	462	2	231510
11	22	5	22	2	41	144	54	1797	5202	513	15934	2565	610	3	26914
12	43	18	14	3	39	163	67	721	4264	7797	2565	45790	9027	10	70520
13	7494	181	374	127	184	458	115	407	379	462	610	9027	28769826	694	28790337
14	31	262	120	1405	2613	95	7	22	14	2	3	10	694	2880298	2885577
Total	108486	111245	39206	89704	186378	581576	199858	270863	233340	231510	26914	70520	28790337	2885577	33825513

DS - 2051 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	92255	3265	2841	1176	36	65	14	107	29	33	29	86	8645	47	108630
2	3265	96984	2983	7096	64	86	19	88	50	27	12	42	289	326	111330
3	2841	2983	22015	9046	636	183	73	513	107	61	42	29	544	152	39226
4	1176	7096	9046	68789	1326	231	16	100	23	28	6	7	230	1678	89754
5	36	64	636	1326	117542	57834	1501	3716	346	128	49	52	238	2998	186486
6	65	86	183	231	57834	450694	39809	27680	2966	1070	177	206	680	146	581828
7	14	19	73	16	1501	39809	126595	28286	2656	586	67	85	167	12	199888
8	107	88	513	100	3716	27680	28286	173663	29006	4065	2152	925	589	33	270922
9	29	50	107	23	346	2966	2656	29006	140206	46779	5655	5109	548	25	233504
10	33	27	61	28	128	1070	586	4065	46779	168813	630	8798	675	5	231698
11	29	12	42	6	49	177	67	2152	5655	630	14320	2951	823	6	26920
12	86	42	29	7	52	206	85	925	5109	8798	2951	41564	10714	18	70584
13	8645	289	544	230	258	680	167	589	548	675	823	10714	28904325	1158	28929645
14	47	326	152	1678	2998	146	12	33	25	5	6	18	1158	2882920	2889523
Total	108630	111330	39226	89754	186486	581828	199888	270922	233504	231698	26920	70584	28929645	2889523	33969938

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-2848	745	532	390	14	29	6	33	12	14	7	43	1151	16	145
2	745	-2806	385	1415	18	32	9	42	29	15	7	24	109	64	86
3	532	385	-3465	1949	86	51	28	136	53	28	20	14	170	32	19
4	390	1415	1949	-4486	246	74	4	42	13	17	4	4	103	273	50
5	14	18	86	246	-5697	3800	435	605	83	36	8	13	74	385	108
6	29	32	51	74	3800	-9224	1981	2355	570	234	34	43	222	52	252
7	6	9	28	4	435	1981	-4069	954	470	123	13	18	52	4	30
8	33	42	136	42	605	2355	954	-7616	2029	728	355	203	182	12	60
9	12	29	53	13	83	570	470	2029	-3608	1034	454	844	170	11	163
10	14	15	28	17	36	234	123	728	1034	-3377	117	1001	213	2	188
11	7	7	20	4	8	34	13	355	454	117	-1614	386	213	3	7
12	43	24	14	4	13	43	18	203	844	1001	386	-4226	1687	8	63
13	1151	109	170	103	74	222	52	182	170	213	213	1687	134498	464	139308
14	16	64	32	273	385	52	4	12	11	2	3	8	464	2622	3946
Total	145	86	19	50	108	252	30	60	163	188	7	63	139308	3946	144426

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.97	1.30	1.23	1.50	1.62	1.80	1.83	1.44	1.75	1.71	1.29	2.02	1.15	1.51	1.00
2	1.30	0.97	1.15	1.25	1.37	1.59	1.96	1.91	2.35	2.28	2.46	2.31	1.60	1.24	1.00
3	1.23	1.15	0.86	1.27	1.16	1.38	1.62	1.36	1.99	1.87	1.91	2.01	1.45	1.26	1.00
4	1.50	1.25	1.27	0.94	1.23	1.47	1.40	1.74	2.38	2.53	2.63	2.61	1.81	1.19	1.00
5	1.62	1.37	1.16	1.23	0.95	1.07	1.41	1.19	1.31	1.40	1.21	1.34	1.40	1.15	1.00
6	1.80	1.59	1.38	1.47	1.07	0.98	1.05	1.09	1.24	1.28	1.23	1.27	1.48	1.55	1.00
7	1.83	1.96	1.62	1.40	1.41	1.05	0.97	1.03	1.21	1.27	1.24	1.26	1.45	1.59	1.00
8	1.44	1.91	1.36	1.74	1.19	1.09	1.03	0.96	1.08	1.22	1.20	1.28	1.45	1.52	1.00
9	1.75	2.35	1.99	2.38	1.31	1.24	1.21	1.08	0.96	1.02	1.09	1.20	1.45	1.75	1.00
10	1.71	2.28	1.87	2.53	1.40	1.28	1.27	1.22	1.02	0.98	1.23	1.13	1.46	1.99	1.00
11	1.29	2.46	1.91	2.63	1.21	1.23	1.24	1.20	1.09	1.23	0.90	1.15	1.35	1.90	1.00
12	2.02	2.31	2.01	2.61	1.34	1.27	1.26	1.28	1.20	1.13	1.15	0.91	1.19	1.84	1.00
13	1.15	1.60	1.45	1.81	1.40	1.48	1.45	1.45	1.46	1.46	1.35	1.19	1.00	1.67	1.00
14	1.51	1.24	1.26	1.19	1.15	1.55	1.59	1.52	1.75	1.99	1.90	1.84	1.67	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Reference Case - 2051 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	97953	1465	1867	316	49	69	16	110	39	16	54	46	4630	75	106927
2	1426	77396	1916	3258	47	87	15	67	47	19	22	27	123	185	84636
3	1819	1925	32552	3321	264	105	28	288	118	47	96	44	378	168	41153
4	604	3429	3388	81174	727	199	19	44	38	10	12	12	57	1621	91333
5	50	44	252	686	138549	49979	552	2355	154	59	83	62	368	4130	197322
6	73	89	107	224	48082	514223	44512	20434	1963	493	155	246	1051	402	632054
7	18	16	34	19	535	44046	120535	24382	1311	221	46	101	237	38	191539
8	118	70	290	56	2361	21540	25217	159979	19064	1896	1350	459	539	91	233029
9	40	41	120	41	128	1893	1328	18804	151592	44993	3257	3010	1058	55	226360
10	19	18	53	11	62	513	251	1920	46476	173934	233	7482	592	32	231595
11	61	23	97	9	62	131	58	1324	3162	266	23023	1822	287	24	30349
12	48	24	44	13	67	245	102	411	3408	9102	1540	74560	16673	29	106268
13	5753	141	486	83	441	1211	281	648	595	435	376	15288	45728290	702	45754740
14	44	147	132	1895	5636	227	34	63	67	33	26	27	184	4050149	4058664
Total	108026	84828	41346	91304	197009	634470	192946	230827	228035	231526	30274	103187	45754487	4057702	51985968

D5 - 2051 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	94141	2175	2728	916	108	162	37	206	79	34	87	109	6831	133	107746
2	2132	74416	2511	4431	91	178	36	165	124	50	60	73	292	284	84843
3	2621	2487	28857	5242	426	223	78	543	299	121	194	109	698	254	42151
4	1059	4676	5467	74458	1060	353	31	94	108	30	34	37	133	2300	89841
5	110	86	408	994	131673	55935	964	3208	241	104	126	103	656	5238	199847
6	173	183	230	393	54409	492940	47857	24546	2932	776	236	399	1918	782	627773
7	43	40	96	32	943	47326	113296	25967	1913	347	69	160	441	70	190743
8	221	173	567	112	3227	25319	26587	150850	21782	2776	1910	687	961	164	235336
9	82	111	321	113	204	2795	1901	21550	142084	46856	3930	4252	1619	118	225938
10	39	49	139	32	110	812	393	2861	48594	166595	361	9373	1019	72	230450
11	100	59	210	26	97	200	84	1873	3707	393	20912	2374	507	52	30594
12	114	65	112	37	109	386	156	605	4636	10998	1983	67322	21908	64	108497
13	8489	325	929	181	770	2138	502	1121	1008	772	644	20738	45762119	1268	45801003
14	82	223	203	2571	6752	449	61	115	137	72	55	61	373	4051039	4062192
Total	109406	85068	42777	89539	199979	629218	191984	233704	227645	229924	30599	105799	45799473	4061838	52036953

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-3812	710	860	400	59	93	22	96	40	18	32	62	2181	58	819
2	705	-2980	596	1173	43	91	21	98	77	31	37	46	170	99	207
3	802	562	-3695	1921	162	117	50	255	180	74	98	66	320	86	998
4	455	1248	2079	-6715	334	154	12	50	70	20	22	23	76	679	-1492
5	60	42	156	308	-6873	5956	412	853	87	45	43	41	287	1108	2525
6	100	94	123	169	6327	-21283	3345	4112	968	282	80	153	867	380	-4282
7	25	24	62	13	407	3280	-7239	1585	602	125	24	59	204	32	-797
8	103	103	277	56	866	3779	1371	-9129	2718	880	560	229	422	72	2307
9	42	70	201	72	76	902	574	2747	-9508	1863	673	1242	562	62	-422
10	20	31	86	21	48	299	142	941	2119	-7338	128	1893	427	40	-1145
11	39	37	112	17	35	69	26	549	545	127	-2112	552	219	28	245
12	66	41	69	25	42	141	54	194	1228	1896	442	-7239	5234	36	2229
13	2736	184	433	98	329	928	221	474	413	337	267	5450	33828	566	46263
14	38	76	71	676	1116	222	27	52	70	39	29	34	189	890	3529
Total	1380	240	1431	-1765	2970	-5253	-962	2877	-389	-1602	325	2612	44987	4136	50986

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	0.96	1.48	1.46	1.78	2.20	2.34	2.38	1.87	2.02	2.07	1.60	2.35	1.47	1.78	1.01
2	1.49	0.96	1.31	1.36	1.92	2.04	2.48	2.47	2.63	2.61	2.65	2.68	2.38	1.54	1.00
3	1.44	1.29	0.89	1.58	1.62	2.11	2.77	1.89	2.52	2.56	2.02	2.50	1.85	1.51	1.02
4	1.73	1.36	1.61	0.92	1.46	1.77	1.67	2.14	2.86	2.94	2.88	3.09	2.33	1.42	0.98
5	2.20	1.94	1.62	1.45	0.95	1.12	1.75	1.36	1.57	1.75	1.52	1.67	1.78	1.27	1.01
6	2.36	2.06	2.15	1.75	1.13	0.96	1.08	1.20	1.49	1.57	1.52	1.62	1.83	1.94	0.99
7	2.38	2.34	2.83	1.67	1.76	1.07	0.94	1.07	1.46	1.57	1.52	1.58	1.86	1.84	1.00
8	1.87	2.48	1.96	2.01	1.37	1.18	1.05	0.94	1.14	1.46	1.41	1.50	1.78	1.79	1.01
9	2.04	2.70	2.67	2.76	1.59	1.48	1.43	1.15	0.94	1.04	1.21	1.41	1.53	2.13	1.00
10	2.09	2.68	2.63	2.95	1.77	1.58	1.57	1.49	1.05	0.96	1.55	1.25	1.72	2.24	1.00
11	1.63	2.62	2.16	2.91	1.55	1.53	1.46	1.41	1.17	1.48	0.91	1.30	1.76	2.20	1.01
12	2.36	2.68	2.58	2.95	1.63	1.57	1.53	1.47	1.36	1.21	1.29	0.90	1.31	2.24	1.02
13	1.48	2.30	1.87	2.19	1.75	1.77	1.79	1.73	1.69	1.78	1.71	1.36	1.00	1.81	1.00
14	1.87	1.52	1.54	1.36	1.20	1.98	1.79	1.82	2.03	2.16	2.14	2.24	2.03	1.00	1.00
Total	1.01	1.00	1.03	0.98	1.02	0.99	1.00	1.01	1.00	0.99	1.01	1.03	1.00	1.00	1.00

DM - 2029 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11168	1332	944	1171	75	96	19	161	58	26	90	84	5730	326	21300
2	1347	8142	1173	1496	105	155	19	97	55	30	27	36	1327	538	14546
3	977	1179	1841	534	193	136	33	283	119	93	122	69	2646	791	9014
4	1203	1521	497	7243	674	726	21	194	61	13	28	25	1307	1695	15207
5	76	101	199	729	14778	9024	512	1481	357	191	185	119	1352	2266	31369
6	98	162	140	755	9526	47313	5623	6394	2447	1198	584	524	4238	778	79783
7	20	20	36	21	563	5398	11249	2806	759	433	167	194	995	78	22740
8	186	110	333	206	1489	6140	2702	15346	3976	1765	742	609	4306	200	38110
9	54	90	110	58	329	2098	675	3452	13682	5199	481	973	4074	107	31341
10	24	27	91	13	197	1257	448	1600	4958	14507	298	1632	3947	57	29058
11	117	30	142	27	163	555	184	655	478	345	1647	397	1711	74	6526
12	85	34	66	24	121	514	199	590	1134	1952	386	4755	8160	49	18069
13	7608	1687	3686	1956	1686	5402	1296	5600	4232	4290	2563	9307	7432244	9555	7491114
14	571	737	1383	2261	3965	1311	116	340	189	81	144	96	9991	681990	703176
Total	23533	15152	10643	16494	33864	80126	23096	38998	32505	30123	7466	18819	7482030	698505	8511353

DS - 2029 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11153	1346	942	1167	75	99	20	164	62	27	91	89	5734	325	21294
2	1337	8092	1170	1487	104	155	20	106	65	35	32	43	1361	534	14541
3	962	1164	1808	529	191	137	36	303	137	106	138	80	2695	782	9068
4	1198	1512	495	7208	672	725	21	201	70	14	34	30	1340	1686	15207
5	76	100	198	728	14778	9024	512	1481	357	191	185	118	1350	2266	31364
6	101	162	141	756	9528	47310	5623	6393	2445	1197	583	523	4233	779	79775
7	22	22	40	21	563	5398	11244	2806	758	432	167	193	994	78	22739
8	188	122	364	213	1488	6136	2700	15321	3967	1762	741	610	4298	204	38115
9	57	98	127	66	329	2095	674	3448	13664	5194	479	971	4068	114	31344
10	26	32	105	15	197	1256	448	1598	4954	14497	297	1631	3943	61	29059
11	119	36	164	32	162	550	182	651	474	343	1639	395	1706	81	6534
12	90	39	78	28	120	513	199	589	1131	1949	385	4748	8148	54	18072
13	7618	1730	3807	2011	1683	5393	1294	5590	4228	4284	2561	9295	7431863	9736	7491094
14	570	732	1396	2255	3963	1311	116	351	203	87	163	107	10192	681711	703156
Total	23516	15148	10835	16517	33854	80104	23089	39002	32515	30120	7494	18832	7481925	698411	8511363

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-14	-6	-2	-4	0	3	1	2	4	2	1	4	4	-1	-6
2	-10	-90	-3	-9	-1	0	1	10	10	5	5	7	33	-4	-6
3	-15	-16	-32	-5	-2	1	3	20	18	13	15	11	49	-8	54
4	-5	-9	-2	-35	-1	-1	0	6	10	2	6	5	33	-9	0
5	0	0	-1	0	-1	0	0	0	0	0	0	0	-2	0	-5
6	3	0	1	1	2	-3	-1	-1	-2	-1	-1	-1	-5	0	-7
7	1	1	4	0	0	-1	-4	-1	-1	0	0	0	-1	0	-2
8	2	12	31	7	-1	-3	-2	-24	-9	-4	-1	1	-8	4	4
9	3	8	17	8	0	-3	-1	-4	-17	-5	-2	-2	-6	7	4
10	1	4	14	2	0	-1	-1	-2	-4	-10	-1	-1	-4	4	1
11	2	6	22	5	-1	-5	-2	-4	-4	-3	-8	-2	-6	7	8
12	5	6	12	5	0	-1	-1	0	-3	-2	-1	-6	-13	5	4
13	10	43	121	55	-3	-9	-2	-9	-3	-5	-2	-13	-382	180	-19
14	-2	-4	11	-7	-1	0	0	11	14	6	19	11	201	-279	-20
Total	-17	-4	192	23	-9	-23	-7	4	10	-3	28	13	-105	-93	10

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	1.00	1.00	1.00	1.00	1.03	1.06	1.01	1.06	1.06	1.01	1.05	1.00	1.00	1.00
2	0.99	0.99	1.00	0.99	0.99	1.00	1.07	1.10	1.18	1.16	1.20	1.18	1.03	0.99	1.00
3	0.98	0.99	0.98	0.99	0.99	1.01	1.10	1.07	1.15	1.14	1.12	1.16	1.02	0.99	1.01
4	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.03	1.16	1.15	1.20	1.21	1.03	0.99	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.03	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.06	1.07	1.11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.01	1.11	1.09	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00
9	1.06	1.17	1.16	1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.07	1.00
10	1.06	1.15	1.15	1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.06	1.00
11	1.02	1.21	1.15	1.19	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.00	1.09	1.00
12	1.06	1.18	1.18	1.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00
13	1.00	1.03	1.03	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00
14	1.00	0.99	1.01	1.00	1.00	1.00	1.00	1.03	1.08	1.07	1.13	1.11	1.02	1.00	1.00
Total	1.00	1.00	1.02	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2029 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	86621	2575	2371	848	25	40	8	77	17	20	21	50	6898	32	99603
2	2575	90725	2583	5870	50	63	11	50	22	13	5	20	187	260	102436
3	2371	2583	21701	7379	541	130	45	359	53	31	23	15	385	116	35734
4	848	5870	7379	64235	1055	164	12	62	10	12	3	3	150	1349	81151
5	25	50	541	1055	107651	49058	1199	3063	281	102	43	43	195	2471	165778
6	40	63	130	164	49058	392873	34290	23648	2381	858	141	171	504	89	504410
7	8	11	45	12	1199	34290	112748	24420	2101	461	58	71	123	8	175556
8	77	50	359	62	3063	23648	24420	157212	24402	3233	1759	738	430	21	239473
9	17	22	53	10	281	2381	2101	24402	125232	40525	4926	4209	400	14	204575
10	20	13	31	12	102	858	461	3233	40525	149544	495	7384	485	2	203165
11	21	5	23	3	43	141	58	1759	4926	495	14479	2549	619	4	25125
12	50	20	15	3	43	171	71	738	4209	7384	2549	41724	8729	10	65718
13	6898	187	385	150	195	504	123	430	400	485	619	8729	25754861	747	25774713
14	32	260	116	1349	2471	89	8	21	14	2	4	10	747	2535562	2540686
Total	99603	102436	35734	81151	165778	504410	175556	239473	204575	203165	25125	65718	25774713	2540686	30218123

DS - 2029 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	86617	2575	2353	848	25	44	10	79	20	23	22	58	6898	32	99603
2	2575	90668	2583	5869	50	64	14	63	34	19	8	29	200	260	102437
3	2353	2583	21644	7346	540	133	54	401	76	46	31	22	394	115	35737
4	848	5869	7346	64238	1059	165	12	71	15	19	4	5	155	1347	81152
5	25	50	540	1059	107640	49064	1200	3065	281	102	43	43	194	2471	165778
6	44	64	133	165	49064	392855	34292	23650	2379	857	141	170	504	89	504408
7	10	14	54	12	1200	34292	112732	24421	2099	480	57	71	123	8	175555
8	79	63	401	71	3065	23650	24421	157089	24419	3232	1775	755	432	21	239473
9	20	34	76	15	281	2379	2099	24419	125215	40513	4906	4199	401	16	204574
10	23	19	46	19	102	857	460	3232	40513	149531	493	7381	485	3	203165
11	22	8	31	4	43	141	57	1775	4906	493	14474	2549	619	4	25125
12	58	29	22	5	43	170	71	755	4199	7381	2549	41701	8722	13	65718
13	6898	200	394	155	194	504	123	432	401	485	619	8722	25754806	788	25774718
14	32	260	115	1347	2471	89	8	21	16	3	4	13	788	2535517	2540686
Total	99603	102437	35737	81152	165778	504408	175555	239473	204574	203165	25125	65718	25774718	2540686	30218130

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-3	0	-18	-1	0	4	2	2	3	3	1	8	1	0	0
2	0	-57	-2	-1	0	1	3	13	12	6	3	10	12	0	0
3	-18	-2	-57	-33	-1	3	9	42	23	14	8	7	9	-1	2
4	-1	-1	-33	3	4	1	0	9	5	7	2	2	5	-1	1
5	0	0	-1	4	-11	6	1	2	0	0	0	0	0	0	0
6	4	1	3	1	6	-18	2	2	-2	-1	-1	-1	0	0	-2
7	2	3	9	0	1	2	-16	2	-2	0	0	0	0	0	0
8	2	13	42	9	2	2	2	-123	17	-1	16	16	1	1	0
9	3	12	23	5	0	-2	-2	17	-17	-12	-20	-10	0	2	0
10	3	6	14	7	0	-1	0	-1	-12	-13	-2	-3	0	1	0
11	1	3	8	2	0	-1	0	16	-20	-2	-5	0	-1	1	0
12	8	10	7	2	0	-1	0	16	-10	-3	0	-23	-7	2	0
13	1	12	9	5	0	0	0	1	0	0	-1	-7	-55	40	6
14	0	0	-1	-1	0	0	0	1	2	1	1	2	40	-45	0
Total	0	0	2	1	0	-2	0	0	0	0	0	0	6	0	7

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	1.00	0.99	1.00	1.00	1.10	1.18	1.03	1.19	1.15	1.03	1.16	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.02	1.28	1.26	1.53	1.51	1.53	1.51	1.07	1.00	1.00
3	0.99	1.00	1.00	1.00	1.00	1.02	1.20	1.12	1.44	1.46	1.33	1.43	1.02	0.99	1.00
4	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.15	1.44	1.55	1.58	1.55	1.04	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.10	1.02	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.18	1.28	1.20	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.03	1.26	1.12	1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.02	1.00	1.04	1.00
9	1.19	1.53	1.44	1.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.00
10	1.15	1.51	1.46	1.55	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.23	1.00
11	1.03	1.53	1.33	1.58	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.22	1.00
12	1.16	1.51	1.43	1.55	1.00	1.00	1.00	1.02	1.00	1.00	1.00	1.00	1.00	1.24	1.00
13	1.00	1.07	1.02	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	1.00
14	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.04	1.14	1.23	1.22	1.24	1.05	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2029 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	85645	1552	1955	566	60	80	17	119	42	18	54	56	4787	83	95034
2	1524	68610	1922	3313	57	105	17	74	51	21	25	31	144	203	76101
3	1901	1912	27549	3730	285	118	31	298	127	51	98	48	423	178	36749
4	665	3460	3864	69703	729	222	21	50	44	12	13	14	70	1632	80500
5	61	54	271	682	115852	44343	639	2323	170	70	93	72	417	3771	168818
6	85	106	120	247	42823	423360	39516	19082	2027	537	160	269	1159	443	529935
7	20	18	37	21	622	39177	100354	21316	1321	237	49	109	263	42	163586
8	128	77	300	62	2327	19964	21984	133878	17170	1953	1349	480	596	98	200367
9	43	44	130	46	142	1947	1323	16910	125447	39210	3137	3029	1098	59	192566
10	20	20	56	12	74	559	267	1983	40483	147611	242	7140	645	35	199148
11	61	24	101	10	70	134	61	1323	3012	276	20062	1815	311	26	27286
12	58	27	47	14	78	267	109	426	3383	8630	1507	64669	16605	31	95852
13	5959	162	558	97	499	1323	308	708	640	481	407	15427	38982772	768	39010110
14	50	161	143	1893	5080	243	37	68	73	36	28	30	212	3335633	3543686
Total	96219	76227	37053	80397	168698	531843	164685	198560	193991	199143	27224	93189	39009502	3543007	44419739

DS - 2029 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	85593	1548	1955	564	60	88	21	126	49	21	56	64	4794	83	95025
2	1520	68477	1923	3309	57	107	22	99	78	32	38	46	175	204	76088
3	1889	1908	27493	3703	285	124	44	354	188	78	129	72	443	177	36888
4	664	3457	3843	69624	732	224	21	58	65	19	21	22	78	1629	80456
5	60	54	271	684	115845	44346	640	2325	170	70	93	72	415	3771	168816
6	93	108	127	248	42826	423338	39515	19082	2025	536	159	269	1158	443	529930
7	24	24	54	21	622	39177	100321	21310	1319	237	48	109	264	42	163573
8	135	103	365	70	2329	19965	21977	133752	17160	1951	1383	487	597	102	200373
9	50	68	197	67	142	1944	1321	16906	125355	39184	3120	3023	1096	70	192542
10	24	30	87	19	74	559	267	1983	40462	147569	241	7137	645	42	199137
11	65	38	139	16	69	133	61	1352	2983	273	20009	1805	311	34	27288
12	68	41	73	23	77	266	109	431	3376	8625	1503	64626	16592	40	95850
13	5969	196	594	110	497	1324	309	709	643	482	406	15418	38982589	834	39010080
14	50	161	142	1889	5080	243	38	71	86	43	37	39	230	3335588	3543695
Total	96205	76213	37263	80349	168695	531836	164666	198558	193957	199121	27244	93187	39009388	3543063	44419744

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-51	-3	1	-1	0	8	4	7	7	3	3	8	7	0	-9
2	-4	-133	1	-4	0	2	5	25	27	11	14	15	31	-1	-13
3	-12	-4	-55	-27	0	6	14	56	61	27	31	24	20	-1	139
4	-1	-4	-21	-78	3	1	0	8	21	7	7	8	9	-3	-44
5	0	0	0	3	-7	3	0	1	0	0	0	0	-2	0	-2
6	9	2	7	1	3	-22	-1	0	-2	0	-1	-1	0	1	-4
7	4	5	17	0	0	0	-32	-5	-2	0	0	0	1	0	-13
8	7	26	65	8	1	1	-7	-126	-11	-1	34	6	0	4	7
9	8	24	67	21	0	-3	-2	-4	-93	-25	-18	-7	-2	11	-23
10	4	10	31	7	0	0	-1	-21	-42	-1	-3	0	7	-11	-11
11	4	14	37	6	0	-1	-1	29	-29	-2	-53	-9	-1	8	2
12	10	14	26	8	0	-1	0	5	-8	-5	-4	-43	-13	9	-2
13	10	34	36	13	-2	0	1	0	3	1	-1	-9	-183	66	-30
14	0	0	-1	-4	0	0	0	3	13	7	9	9	18	-46	9
Total	-15	-15	209	-48	-3	-7	-20	-2	-34	-21	20	-2	-115	56	4

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	1.00	1.00	1.00	1.00	1.10	1.21	1.06	1.17	1.18	1.05	1.15	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.02	1.26	1.33	1.52	1.50	1.55	1.49	1.21	1.00	1.00
3	0.99	1.00	1.00	0.99	1.00	1.05	1.44	1.19	1.48	1.53	1.31	1.50	1.05	0.99	1.00
4	1.00	1.00	0.99	1.00	1.00	1.01	1.01	1.15	1.47	1.54	1.56	1.13	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.10	1.02	1.06	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.20	1.28	1.45	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00
8	1.06	1.34	1.22	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.01	1.00	1.04	1.00
9	1.18	1.55	1.52	1.45	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.19	1.00
10	1.18	1.73	1.54	1.55	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.21	1.00
11	1.06	1.56	1.37	1.59	1.00	0.99	0.99	1.02	0.99	0.99	1.00	0.99	1.00	1.31	1.00
12	1.17	1.51	1.55	1.57	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.28	1.00
13	1.00	1.21	1.06	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.00
14	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.04	1.18	1.20	1.32	1.28	1.08	1.00	1.00
Total	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2044 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11273	1533	1051	1365	88	118	23	189	69	30	99	99	6426	382	22743
2	1546	8070	1327	1683	120	188	22	114	65	35	30	41	1545	618	15404
3	1090	1296	1686	574	218	163	39	324	138	106	134	76	3006	899	9748
4	1426	1712	545	6976	782	890	25	233	74	15	32	29	1566	1989	16295
5	91	116	226	840	15718	10121	602	1728	422	226	210	134	1585	2652	34671
6	123	199	172	944	11158	49972	6080	7399	3049	1483	731	629	5281	1016	88235
7	26	24	45	26	691	5869	11901	3133	949	549	214	237	1245	100	25009
8	225	133	395	249	1762	6901	2921	15811	4539	2126	856	731	5222	248	42119
9	64	59	130	70	388	2560	824	3982	14150	5512	529	1168	5090	132	34659
10	29	32	107	15	235	1552	559	1959	5262	14927	356	1920	4927	71	31951
11	133	33	158	30	183	637	211	733	497	394	1504	430	1943	85	6973
12	100	38	73	27	134	593	230	679	1266	2153	411	4398	9121	57	19280
13	8737	1986	4279	2351	1980	6557	1582	6726	5125	5180	2967	10605	8103481	11682	8173237
14	693	832	1621	2626	4620	1650	144	416	233	99	171	115	12217	752194	777632
Total	25557	16064	11813	17776	38078	87771	25165	43425	35837	32836	8245	20611	8162655	772124	9297957

D5 - 2044 - UC1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11253	1524	1053	1358	88	122	25	192	73	32	101	105	6432	380	22737
2	1532	8004	1324	1669	119	188	24	127	79	42	37	50	1591	612	15399
3	1072	1275	1652	568	215	164	44	352	161	124	153	90	3071	886	9828
4	1418	1699	540	6932	781	890	25	243	89	18	40	36	1610	1976	16297
5	92	116	225	841	15717	10121	603	1728	422	225	209	133	1581	2653	34666
6	127	200	174	947	11160	49971	6080	7400	3043	1480	729	627	5269	1017	88226
7	28	27	51	26	691	5865	11899	3132	947	548	213	236	1243	100	25007
8	228	151	440	259	1761	6897	2918	15783	4525	2120	854	732	5204	254	42127
9	68	70	154	83	388	2555	822	3977	14130	5507	525	1164	5077	143	34664
10	31	38	127	18	235	1549	558	1956	5255	14918	354	1918	4919	76	31951
11	136	42	187	37	181	629	209	728	490	389	1496	428	1936	95	6983
12	107	46	88	33	134	590	229	678	1259	2150	410	4391	9105	63	19284
13	8754	2045	4456	2427	1974	6535	1577	6702	5113	5170	2963	10584	8102975	11922	8173196
14	690	827	1633	2617	4619	1651	144	432	255	107	197	130	12466	751838	777606
Total	25535	16063	12105	17816	38064	87728	25158	43430	35841	32830	8282	20625	8162478	772013	9297969

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-20	-9	2	-7	0	4	2	3	5	2	2	6	7	-1	-6
2	-14	-66	-3	-13	-1	0	2	14	13	7	7	9	46	-6	-5
3	-18	-21	-34	-6	-3	1	5	28	24	18	20	14	65	-12	80
4	-8	-13	-4	-44	-1	0	0	9	14	3	8	7	44	-14	2
5	0	-1	-1	1	-1	0	0	0	-1	0	-1	0	-4	0	-6
6	4	1	2	3	2	0	0	1	-5	-2	-2	-2	-12	1	-10
7	2	2	7	0	0	-5	-2	0	-2	-1	-1	-1	-2	0	-2
8	3	18	43	10	-1	-5	-3	-28	-14	-6	-2	1	-18	6	8
9	4	11	24	13	0	-5	-1	-6	-20	-6	-4	-4	-13	11	4
10	2	6	20	3	0	-4	-1	-3	-6	-9	-2	-2	-8	5	0
11	3	8	29	7	-1	-7	-3	-5	-8	-5	-8	-2	-8	10	10
12	7	8	15	6	0	-2	-1	-1	-6	-3	-1	-7	-17	6	4
13	16	59	177	76	-6	-22	-5	-23	-12	-10	-4	-21	-505	239	-42
14	-3	-6	13	-9	-1	1	0	16	21	8	26	15	248	-356	-26
Total	-22	-1	292	40	-14	-43	-7	5	4	-5	37	14	-177	-111	12

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	0.99	1.00	1.00	1.00	1.03	1.07	1.01	1.07	1.07	1.02	1.06	1.00	1.00	1.00
2	0.99	0.99	1.00	0.99	0.99	1.00	1.09	1.12	1.20	1.19	1.24	1.22	1.03	0.99	1.00
3	0.98	0.98	0.98	0.99	0.99	1.01	1.13	1.09	1.17	1.17	1.15	1.18	1.02	0.99	1.01
4	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.04	1.19	1.17	1.24	1.24	1.03	0.99	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.04	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.08	1.10	1.15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.01	1.13	1.11	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00
9	1.07	1.19	1.19	1.18	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.08	1.00
10	1.07	1.18	1.18	1.18	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.07	1.00
11	1.02	1.25	1.19	1.23	0.99	0.99	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.11	1.00
12	1.07	1.21	1.21	1.24	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.11	1.00
13	1.00	1.03	1.04	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00
14	1.00	0.99	1.01	1.00	1.00	1.00	1.00	1.04	1.09	1.08	1.15	1.13	1.02	1.00	1.00
Total	1.00	1.00	1.02	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2044 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	89409	3086	2712	1099	34	56	11	98	22	27	26	68	8192	44	104884
2	3086	93841	2878	6772	61	80	14	63	29	16	7	25	251	312	107433
3	2712	2878	21439	8667	608	167	57	423	66	38	28	18	493	146	37739
4	1099	6772	8667	66323	1251	215	15	79	14	16	3	4	205	1601	86263
5	34	61	608	1251	113366	55418	1434	3553	335	124	48	51	249	2861	179593
6	56	80	167	215	55418	431585	38248	26650	2862	1036	172	201	653	133	557476
7	11	14	57	15	1434	38248	121921	27215	2550	564	66	83	160	11	192348
8	98	63	423	79	3553	26650	27215	167577	27840	3901	2024	864	559	29	260875
9	22	29	66	14	335	2862	2550	27840	134809	45004	5523	4913	520	20	224508
10	27	16	38	16	124	1036	564	3901	45004	162340	606	8417	635	3	222727
11	26	7	28	3	48	172	66	2024	5523	606	14006	2827	779	5	26121
12	68	25	18	4	51	201	83	864	4913	8417	2827	40864	10249	13	68597
13	8192	251	493	205	249	653	160	559	520	635	779	10249	27881275	1032	27905251
14	44	312	146	1601	2861	133	11	29	20	3	5	13	1032	2773928	2780139
Total	104884	107433	37739	86263	179593	557476	192348	260875	224508	222727	26121	68597	27905251	2780139	32753954

DS - 2044 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	89390	3086	2701	1097	34	61	14	101	27	31	27	80	8192	44	104885
2	3086	93790	2878	6772	62	82	18	83	47	25	11	39	270	312	107433
3	2701	2878	21365	8596	605	171	70	480	100	58	39	27	508	144	37742
4	1097	6772	8596	66342	1260	217	15	93	21	26	6	6	213	1599	86264
5	34	62	605	1260	113550	55425	1435	3556	335	124	48	50	248	2862	179593
6	61	82	171	217	55425	431576	38240	26656	2857	1033	171	200	652	133	557475
7	14	18	70	15	1435	38240	121915	27213	2546	563	65	83	159	11	192348
8	101	83	480	93	3556	26656	27213	167411	27857	3896	2054	885	559	31	260875
9	27	47	100	21	335	2857	2546	27857	134844	44978	5464	4889	519	23	224507
10	31	25	58	26	124	1033	563	3896	44978	162342	600	8411	634	4	222726
11	27	11	39	6	48	171	65	2054	5464	600	14020	2830	778	6	26121
12	80	39	27	6	50	200	83	885	4889	8411	2830	40845	10234	17	68597
13	8192	270	508	213	248	652	159	559	519	634	778	10234	27881198	1090	27905254
14	44	312	144	1599	2862	133	11	31	23	4	6	17	1090	2773863	2780138
Total	104885	107433	37742	86264	179593	557475	192348	260875	224507	222726	26121	68597	27905254	2780138	32753959

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-20	0	-11	-2	0	6	2	3	5	4	1	12	1	0	1
2	0	-91	0	0	0	2	5	20	18	9	4	15	19	0	0
3	-11	0	-74	-72	-2	4	13	58	33	20	11	9	15	-2	3
4	-2	0	-72	19	9	2	0	15	8	10	2	3	8	-2	1
5	0	0	-2	9	-15	7	1	2	0	0	0	0	-1	0	0
6	6	2	4	2	7	-10	-8	6	-5	-3	-1	-1	-1	0	-1
7	2	5	13	0	1	-8	-6	-1	-4	-1	-1	0	0	0	0
8	3	20	58	15	2	6	-1	-167	17	-5	30	21	0	1	0
9	5	18	33	8	0	-5	-4	17	35	-26	-59	-24	-1	3	-1
10	4	9	20	10	0	-3	-1	-5	-26	2	-6	-6	-1	1	0
11	1	4	11	2	0	-1	-1	30	-59	-6	14	3	-1	1	0
12	12	15	9	3	0	-1	0	21	-24	-6	3	-19	-15	4	0
13	1	19	15	8	-1	-1	0	0	-1	-1	-1	-15	-77	58	3
14	0	0	-2	-2	0	0	0	1	3	1	1	4	58	-66	-1
Total	1	0	3	1	0	-1	0	0	-1	0	0	0	3	-1	5

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	1.00	1.00	1.00	1.00	1.10	1.19	1.03	1.21	1.17	1.04	1.18	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.03	1.35	1.32	1.62	1.60	1.64	1.59	1.07	1.00	1.00
3	1.00	1.00	1.00	0.99	1.00	1.03	1.23	1.14	1.50	1.54	1.39	1.49	1.03	0.98	1.00
4	1.00	1.00	0.99	1.00	1.01	1.01	1.01	1.19	1.57	1.64	1.69	1.65	1.04	1.00	1.00
5	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.10	1.03	1.03	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00
7	1.19	1.35	1.23	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00
8	1.03	1.32	1.14	1.19	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.02	1.00	1.05	1.00
9	1.21	1.62	1.50	1.57	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.18	1.00
10	1.17	1.60	1.54	1.64	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.26	1.00
11	1.04	1.64	1.39	1.69	1.00	0.99	0.99	1.01	0.99	0.99	1.00	1.00	1.00	1.26	1.00
12	1.18	1.59	1.49	1.65	1.00	0.99	1.00	1.02	1.00	1.00	1.00	1.00	1.00	1.27	1.00
13	1.00	1.07	1.03	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.06	1.00
14	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.05	1.18	1.26	1.26	1.27	1.06	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2044 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	90497	2027	2515	833	97	132	27	176	60	26	75	84	6296	121	102966
2	1992	71832	2374	4158	83	158	25	107	71	29	33	43	214	268	81388
3	2440	2353	27958	4924	390	186	46	403	175	69	131	63	602	239	39980
4	966	4365	5124	72045	973	320	29	72	63	17	18	20	106	2136	86253
5	98	79	371	909	125390	52531	881	2971	225	97	120	98	608	4856	189235
6	141	161	191	359	51029	466906	45264	23027	2730	727	220	375	1753	700	593583
7	32	27	56	30	861	44805	108298	24528	1780	324	66	150	402	64	181423
8	190	112	411	88	2988	23821	25158	144149	20597	2599	1730	637	883	143	223506
9	62	62	183	66	190	2606	1771	20323	135658	44325	3781	3974	1499	88	214589
10	29	28	78	18	101	759	365	2659	45886	158971	336	8783	934	53	218998
11	86	33	135	14	92	187	81	1698	3606	372	20394	2253	464	35	29449
12	87	37	63	20	103	362	147	556	4339	10349	1859	65747	20652	45	104367
13	7836	239	791	145	717	1963	459	1031	920	705	590	19528	43680314	1086	43716324
14	75	211	192	2412	6308	396	56	100	104	54	37	43	317	3896943	3907247
Total	104531	81565	40442	86021	189321	595133	182607	221801	216212	218664	29391	101798	43715044	3906777	49689308

DS - 2044 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	90404	2019	2532	830	97	145	33	187	72	31	79	99	6306	121	102955
2	1983	71607	2379	4149	83	162	33	150	114	46	55	68	267	267	81364
3	2435	2351	27903	4871	389	198	71	493	272	111	177	101	637	236	40246
4	962	4358	5078	71908	979	323	29	86	99	28	31	33	120	2129	86164
5	99	79	371	915	125382	52537	882	2974	225	97	119	97	605	4857	189237
6	155	166	205	362	51032	466860	45250	23051	2723	725	219	373	1749	702	593551
7	39	37	87	30	862	44774	108282	24518	1776	323	65	150	403	64	181409
8	202	158	517	104	2990	23821	25146	143954	20570	2593	1785	645	881	150	223516
9	75	102	293	103	189	2597	1767	20310	135538	44275	3736	3956	1495	108	214544
10	36	43	127	29	101	756	364	2654	45841	158926	332	8776	933	66	218985
11	92	53	192	24	91	183	80	1750	3541	367	20329	2239	462	48	29455
12	104	60	104	34	102	359	146	564	4319	10340	1852	65689	20628	59	104361
13	7832	297	833	166	713	1958	461	1029	923	706	589	19509	43680028	1185	43716267
14	75	210	189	2404	6308	397	56	103	127	66	52	57	345	3896868	3907259
Total	104511	81541	40831	85930	189319	595073	182599	221806	216140	218634	29419	101792	43714859	3906859	49689313

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-93	-8	17	-3	1	13	6	11	12	5	4	15	10	0	-11
2	-9	-226	5	-9	0	4	8	43	43	17	22	25	53	-1	-24
3	-5	-2	-55	-53	-1	12	25	90	97	42	46	38	35	-3	266
4	-4	-8	-45	-136	5	3	0	15	36	11	12	13	15	-6	-89
5	1	0	0	6	-8	5	1	2	0	0	0	0	-4	1	3
6	15	5	14	4	3	-46	-14	4	-7	-2	-1	-2	-4	1	-32
7	7	10	30	0	1	-31	-16	-10	-4	-1	-1	-1	1	0	-14
8	12	46	106	16	2	-1	-12	-195	-27	-6	55	9	-2	7	9
9	12	40	110	37	0	-9	-4	-13	-120	-50	-45	-18	-5	19	-45
10	6	17	50	12	0	-3	-1	-4	-45	-45	-4	-7	-1	13	-13
11	6	22	57	10	-1	-2	-1	52	-65	-5	-65	-13	-1	13	6
12	17	23	41	14	-1	-3	-1	8	-20	-9	-7	-59	-24	14	-6
13	16	58	62	21	-4	-4	1	-2	3	1	-1	-20	-286	99	-56
14	0	-1	-3	-8	1	1	0	5	23	12	14	14	29	-75	12
Total	-19	-24	388	-91	-2	-59	-8	5	-73	-30	29	-6	-185	82	6

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	1.00	1.01	1.00	1.01	1.10	1.23	1.06	1.19	1.21	1.06	1.18	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.03	1.34	1.40	1.61	1.59	1.67	1.59	1.25	1.00	1.00
3	1.00	1.00	1.00	0.99	1.00	1.06	1.33	1.22	1.56	1.62	1.35	1.60	1.06	0.99	1.01
4	1.00	1.00	0.99	1.00	1.01	1.01	1.01	1.20	1.38	1.63	1.66	1.67	1.14	1.00	1.00
5	1.01	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
6	1.10	1.03	1.07	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00
7	1.22	1.35	1.33	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00
8	1.06	1.41	1.26	1.18	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.01	1.00	1.05	1.00
9	1.20	1.63	1.60	1.56	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.22	1.00
10	1.21	1.62	1.64	1.65	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.24	1.00
11	1.07	1.68	1.42	1.71	0.99	0.99	0.99	1.03	0.98	0.99	1.00	0.99	1.00	1.36	1.00
12	1.20	1.61	1.65	1.69	0.99	0.99	0.99	1.01	1.00	1.00	1.00	1.00	1.00	1.32	1.00
13	1.00	1.24	1.08	1.15	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.00
14	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.05	1.22	1.23	1.38	1.32	1.09	1.00	1.00
Total	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2051 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11628	1630	1108	1452	93	126	24	200	73	31	105	104	6748	404	23726
2	1632	8324	1400	1776	127	199	24	120	69	37	32	43	1631	648	16061
3	1146	1339	1713	603	230	174	42	343	143	112	140	79	3171	948	10207
4	1516	1804	574	7159	823	948	26	248	79	16	34	31	1668	2106	17036
5	97	122	240	890	16388	10620	634	1819	445	237	219	139	1666	2801	36318
6	132	212	183	1014	11803	51912	6318	7753	3244	1572	777	664	3630	1093	92309
7	28	26	48	28	734	6101	12334	3265	1011	584	228	251	1326	106	26089
8	240	141	422	266	1864	7215	3031	16323	4761	2242	902	773	3547	264	43995
9	68	62	138	75	409	2717	875	4178	14623	3715	352	1240	3436	140	36231
10	30	34	114	16	248	1647	594	2076	3462	15422	379	2034	3263	73	33397
11	141	35	166	32	190	662	220	763	511	412	1520	450	2041	90	7236
12	105	40	76	28	140	621	242	710	1321	2348	429	4440	9522	60	19982
13	9173	2104	4520	2508	2077	6930	1672	7090	3419	3482	3117	11076	8437712	12351	8511231
14	731	871	1710	2776	4864	1732	132	440	246	104	179	120	12906	784822	811673
Total	26668	16764	12416	18624	39992	91624	26208	45333	37411	34215	8611	21445	8500271	805910	9685493

DS - 2051 - UCI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	11603	1619	1113	1444	93	130	26	203	78	34	107	111	6735	403	23719
2	1617	8232	1399	1761	125	200	26	135	83	43	39	53	1681	641	16056
3	1127	1337	1679	596	227	176	47	374	171	131	162	94	3243	933	10297
4	1308	1790	567	7114	823	949	26	258	95	19	43	39	1716	2091	17039
5	97	122	239	891	16386	10621	634	1819	444	237	218	139	1662	2802	36312
6	136	213	187	1018	11806	51907	6318	7757	3238	1570	774	661	3615	1096	92299
7	30	28	53	28	735	6098	12349	3263	1009	583	227	250	1323	107	26087
8	244	161	473	278	1862	7208	3028	16293	4746	2237	899	776	3526	271	44003
9	73	75	163	89	409	2712	873	4173	14601	3710	347	1236	3420	152	36235
10	32	40	136	19	248	1643	594	2074	3438	13408	376	2032	3234	81	33398
11	144	44	199	40	189	634	217	759	502	407	1511	447	2033	100	7247
12	113	48	93	35	139	618	241	710	1314	2243	427	4433	9503	67	19987
13	9192	2169	4719	2592	2070	6905	1667	7064	3404	3471	3111	11051	8437137	12612	8511184
14	728	864	1718	2766	4863	1733	132	437	268	113	207	136	13172	784446	811644
Total	26645	16763	12742	18672	39978	91576	26199	45341	37412	34211	8648	21459	8500059	805801	9685506

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-24	-11	3	-8	0	4	2	3	5	2	2	7	7	-2	-7
2	-16	-72	-2	-13	-1	0	2	13	14	7	8	10	30	-7	-5
3	-19	-22	-36	-7	-3	2	6	31	26	19	22	13	72	-13	90
4	-9	-13	-6	-46	0	1	0	11	16	3	8	8	48	-13	3
5	0	-1	-1	2	-2	1	0	0	-1	0	-1	0	-4	1	-6
6	3	1	3	3	3	-4	0	4	-6	-2	-3	-2	-13	2	-10
7	2	3	8	0	1	-3	-5	-1	-2	-1	-1	-1	-3	0	-2
8	4	20	31	12	-1	-7	-3	-31	-16	-5	-3	2	-21	7	8
9	3	13	27	14	0	-5	-1	-5	-24	-5	-5	-4	-16	12	5
10	2	6	22	3	0	-2	-1	-2	-4	-14	-2	-2	-10	6	1
11	3	9	32	8	-1	-8	-3	-6	-10	-5	-9	-2	-8	11	11
12	8	9	17	7	0	-3	-1	0	-7	-3	-2	-7	-20	7	4
13	19	63	199	84	-7	-23	-5	-26	-13	-11	-5	-23	-336	261	-47
14	-3	-6	8	-10	-1	1	0	17	23	9	28	16	265	-376	-30
Total	-23	-1	326	48	-14	-48	-9	9	0	-4	37	14	-212	-109	13

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	0.99	1.00	0.99	1.00	1.03	1.07	1.02	1.07	1.07	1.02	1.07	1.00	1.00	1.00
2	0.99	0.99	1.00	0.99	0.99	1.00	1.10	1.13	1.21	1.20	1.23	1.22	1.03	0.99	1.00
3	0.98	0.98	0.98	0.99	0.99	1.01	1.13	1.09	1.18	1.17	1.16	1.19	1.02	0.98	1.01
4	0.99	0.99	0.99	0.99	1.00	1.00	1.00	1.04	1.20	1.18	1.24	1.23	1.03	0.99	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.04	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.08	1.11	1.16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.01	1.14	1.12	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.00
9	1.07	1.20	1.19	1.19	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.09	1.00
10	1.07	1.19	1.19	1.18	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.08	1.00
11	1.02	1.27	1.20	1.24	0.99	0.99	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.12	1.00
12	1.07	1.22	1.22	1.25	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.12	1.00
13	1.00	1.03	1.04	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.00
14	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.04	1.09	1.08	1.16	1.13	1.02	1.00	1.00
Total	1.00	1.00	1.03	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2051 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	92286	3265	2846	1178	36	59	12	104	24	29	28	73	8642	48	108630
2	3265	97090	2978	7096	64	83	14	66	30	16	7	25	268	326	111330
3	2846	2978	22072	9162	639	178	59	449	70	39	30	19	526	155	39222
4	1178	7096	9162	68735	1313	228	15	84	14	17	4	4	221	1679	89752
5	36	64	639	1313	117966	57823	1500	3714	346	128	49	52	259	2997	186486
6	59	83	178	228	57823	450721	39810	27670	2971	1071	179	207	682	146	581829
7	12	14	59	15	1500	39810	126612	28285	2661	588	68	85	167	12	199888
8	104	66	449	84	3714	27670	28285	173868	28978	4065	2117	901	589	32	270922
9	24	30	70	14	346	2971	2661	28978	140218	46760	5727	5135	550	21	233504
10	29	16	39	17	128	1071	588	4065	46760	168866	637	8803	676	4	231698
11	28	7	30	4	49	179	68	2117	5727	637	14297	2948	824	5	26920
12	73	25	19	4	52	207	85	901	5135	8803	2948	41584	10733	14	70583
13	8642	268	526	221	259	682	167	589	550	676	824	10733	28904409	1095	28929641
14	48	326	155	1679	2997	146	12	32	21	4	5	14	1095	2882992	2889525
Total	108630	111330	39222	89752	186486	581829	199888	270922	233504	231698	26920	70583	28929641	2889525	33969931

D5 - 2051 - UC2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	92255	3265	2841	1176	36	65	14	107	29	33	29	86	8645	47	108630
2	3265	96984	2983	7096	64	86	19	88	50	27	12	42	289	326	111330
3	2841	2983	22015	9046	636	183	73	513	107	61	42	29	544	152	39226
4	1176	7096	9046	68789	1326	231	16	100	23	28	6	7	230	1678	89754
5	36	64	636	1326	117542	57834	1501	3716	346	128	49	52	258	2998	186486
6	65	86	183	231	57834	450694	39809	27680	2966	1070	177	206	680	146	581828
7	14	19	73	16	1501	39809	126595	28286	2656	586	67	85	167	12	199888
8	107	88	513	100	3716	27680	28286	173663	29006	4065	2152	925	589	33	270922
9	29	50	107	23	346	2966	2656	29006	140206	46779	5655	5109	548	25	233504
10	33	27	61	28	128	1070	586	4065	46779	168813	630	8798	675	5	231698
11	29	12	42	6	49	177	67	2152	5655	630	14320	2951	823	6	26920
12	86	42	29	7	52	206	85	925	5109	8798	2951	41564	10714	18	70584
13	8645	289	544	230	258	680	167	589	548	675	823	10714	28904325	1158	28929645
14	47	326	152	1678	2998	146	12	33	25	5	6	18	1158	2882920	2889523
Total	108630	111330	39226	89754	186486	581828	199888	270922	233504	231698	26920	70584	28929645	2889523	33969938

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-32	0	-5	-2	0	6	2	3	5	5	1	14	3	0	1
2	0	-106	5	0	0	2	5	22	20	10	5	16	22	0	0
3	-5	5	-57	-116	-3	4	14	63	37	22	12	10	18	-3	3
4	-2	0	-116	54	13	3	0	16	9	11	3	3	9	-1	1
5	0	0	-3	13	-24	12	2	2	0	0	0	0	-1	0	0
6	6	2	4	3	12	-27	-1	10	-5	-2	-1	-1	-2	0	-1
7	2	5	14	0	2	-1	-17	1	-5	-1	-1	0	-1	0	0
8	3	22	63	16	2	10	1	-205	28	0	35	24	-1	2	1
9	5	20	37	9	0	-5	-5	28	-12	19	-72	-26	-2	4	0
10	5	10	22	11	0	-2	-1	0	19	-53	-7	-5	-1	1	0
11	1	5	12	3	0	-1	-1	35	-72	-7	23	3	-1	1	0
12	14	16	10	3	0	-1	0	24	-26	-5	3	-21	-19	4	0
13	3	22	18	9	-1	-2	-1	-1	-2	-1	-1	-19	-84	63	4
14	0	0	-3	-1	0	0	0	2	4	1	1	4	63	-72	-2
Total	1	0	3	1	0	-1	0	0	0	0	0	0	4	-2	7

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	1.00	1.00	1.00	1.00	1.10	1.20	1.03	1.21	1.17	1.04	1.19	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.01	1.03	1.37	1.33	1.64	1.63	1.67	1.63	1.08	1.00	1.00
3	1.00	1.00	1.00	0.99	1.00	1.03	1.24	1.14	1.52	1.57	1.41	1.52	1.03	0.98	1.00
4	1.00	1.00	0.99	1.00	1.01	1.01	1.01	1.19	1.60	1.67	1.72	1.68	1.04	1.00	1.00
5	1.00	1.01	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.10	1.03	1.03	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00
7	1.20	1.37	1.24	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00
8	1.03	1.33	1.14	1.19	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.03	1.00	1.05	1.00
9	1.21	1.64	1.52	1.60	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.19	1.00
10	1.17	1.63	1.57	1.67	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.27	1.00
11	1.04	1.67	1.41	1.72	1.00	0.99	0.99	1.02	0.99	0.99	1.00	1.00	1.00	1.27	1.00
12	1.19	1.63	1.52	1.68	1.00	0.99	1.00	1.03	0.99	1.00	1.00	1.00	1.00	1.28	1.00
13	1.00	1.08	1.03	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.06	1.00
14	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.05	1.19	1.27	1.27	1.28	1.06	1.00	1.00
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

DM - 2051 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	94234	2185	2700	919	107	147	30	194	66	28	82	91	6819	133	107756
2	2142	74672	2502	4442	90	173	26	116	76	31	35	43	232	286	84870
3	2619	2485	28897	5322	427	209	51	442	190	73	142	67	638	259	41842
4	1063	4687	5545	74588	1053	349	31	78	68	18	20	22	116	2307	89944
5	109	86	408	985	131698	55922	963	3206	242	104	126	104	660	5238	199850
6	157	177	215	388	54390	493001	47866	24546	2939	777	238	401	1924	781	627800
7	35	29	62	32	941	47345	113334	25979	1918	347	70	161	440	70	190762
8	207	121	448	94	3226	25325	26602	151072	21807	2779	1849	678	964	156	235327
9	68	67	198	71	204	2803	1907	21561	142257	46872	3987	4272	1626	96	225989
10	32	30	83	19	110	814	393	2863	48608	166688	365	9381	1021	57	230464
11	94	34	146	15	97	203	85	1814	3787	400	20979	2388	508	38	30589
12	95	40	67	22	110	389	157	597	4659	11005	1992	67388	21939	48	108505
13	8469	258	858	157	775	2144	501	1124	1005	771	645	20764	45762439	1159	45801070
14	82	224	207	2580	6751	448	61	109	112	58	40	46	341	4051120	4062180
Total	109427	85095	42335	89635	199980	629272	192007	233700	227734	229953	30570	105808	45799685	4061747	52036947

DS - 2051 - UC3

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	94141	2175	2728	916	108	162	37	206	79	34	87	109	6831	133	107746
2	2132	74416	2511	4431	91	178	36	165	124	50	60	73	292	284	84843
3	2621	2487	28857	5242	426	223	78	543	299	121	194	109	698	254	42151
4	1059	4676	5467	74438	1060	353	31	94	108	30	34	37	133	2300	89841
5	110	86	408	994	131675	55935	964	3208	241	104	126	103	656	5238	199847
6	173	183	230	393	54409	492940	47857	24546	2932	776	236	399	1918	782	627773
7	43	40	96	32	943	47326	113296	25967	1913	347	69	160	441	70	190743
8	221	173	567	112	3227	25319	26587	150850	21782	2776	1910	687	961	164	235336
9	82	111	321	113	204	2795	1901	21550	142084	46856	3930	4252	1619	118	225938
10	39	49	139	32	110	812	393	2861	48594	166393	361	9375	1019	72	230450
11	100	59	210	26	97	200	84	1873	3707	393	20912	2374	507	52	30594
12	114	65	112	37	109	386	156	603	4636	10998	1983	67322	21908	64	108497
13	8489	325	929	181	770	2138	502	1121	1008	772	644	20738	45762119	1268	45801003
14	82	223	203	2571	6752	449	61	115	137	72	55	61	373	4051039	4062192
Total	109406	85068	42777	89539	199979	629218	191984	233704	227645	229924	30599	105799	45799473	4061838	52036953

Difference

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	-113	-10	28	-3	1	15	7	12	13	6	5	17	12	-1	-10
2	-11	-256	10	-11	0	5	10	48	48	19	24	28	61	-1	-27
3	1	1	-40	-80	-1	13	28	102	109	48	52	42	40	-5	310
4	-4	-10	-78	-129	8	4	0	16	40	12	14	15	16	-7	-103
5	1	0	0	8	-23	13	1	2	0	0	-1	0	-4	1	-3
6	17	6	15	5	18	-61	-10	0	-7	-1	-2	-2	-6	2	-27
7	8	11	34	0	1	-18	-38	-12	-5	-1	-1	-1	1	0	-19
8	13	52	120	18	1	-6	-14	-222	-26	-3	62	10	-3	8	10
9	14	45	123	42	0	-8	-5	-10	-173	-16	-57	-20	-6	22	-51
10	7	19	56	13	0	-2	-1	-2	-13	-93	-5	-6	-1	14	-14
11	6	25	63	11	-1	-2	-1	39	-80	-6	-67	-14	-2	14	5
12	19	25	46	16	-1	-3	-1	9	-23	-6	-9	-66	-31	16	-8
13	20	66	71	24	-5	-6	1	-3	3	1	-2	-26	-320	109	-67
14	0	-1	-4	-9	1	1	0	6	25	13	15	15	31	-81	12
Total	-21	-26	442	-96	-1	-55	-23	4	-89	-28	29	-9	-212	91	7

Growth Factor

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
1	1.00	1.00	1.01	1.00	1.01	1.10	1.23	1.06	1.20	1.22	1.06	1.19	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.03	1.36	1.42	1.63	1.61	1.69	1.61	1.26	0.99	1.00
3	1.00	1.00	1.00	0.98	1.00	1.06	1.55	1.23	1.57	1.63	1.36	1.63	1.06	0.98	1.01
4	1.00	1.00	0.99	1.00	1.01	1.01	1.01	1.21	1.59	1.65	1.68	1.69	1.14	1.00	1.00
5	1.01	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
6	1.11	1.03	1.07	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00
7	1.23	1.37	1.55	1.01	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00
8	1.06	1.43	1.27	1.19	1.00	1.00	1.00	1.00	1.00	1.00	1.03	1.01	1.00	1.05	1.00
9	1.20	1.67	1.62	1.59	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.23	1.00
10	1.21	1.65	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.25	1.00
11	1.07	1.72	1.43	1.75	0.99	0.99	0.99	1.03	0.98	0.98	1.00	0.99	1.00	1.38	1.00
12	1.20	1.64	1.69	1.72	0.99	0.99	0.99	1.01	1.00	1.00	1.00	1.00	1.00	1.33	1.00
13	1.00	1.26	1.08	1.15	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.00
14	1.00	0.99	0.98	1.00	1.00	1.00	1.00	1.06	1.23	1.23	1.39	1.33	1.09	1.00	1.00
Total	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

C Core Scenario Forecast Flows – Design Year



Figure 11-1: M6 Junction 40 and Kemplay Bank: Forecast Year DM Flows



Figure 11-2: M6 Junction 40 and Kemplay Bank: Forecast Year DS Flows

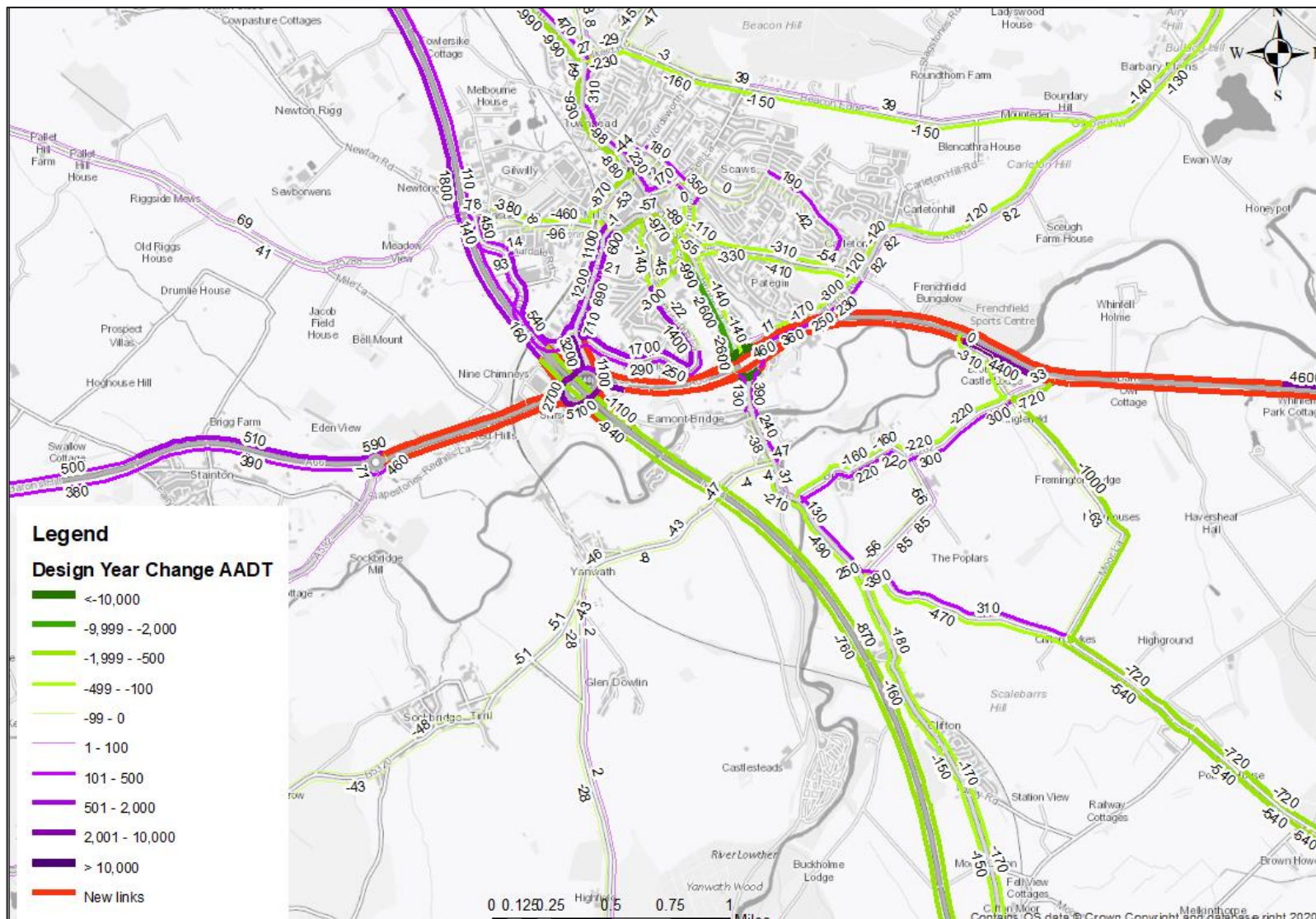


Figure 11-3: M6 Junction 40 and Kemplay Bank: Forecast Year DS Flow (Changes from DM)

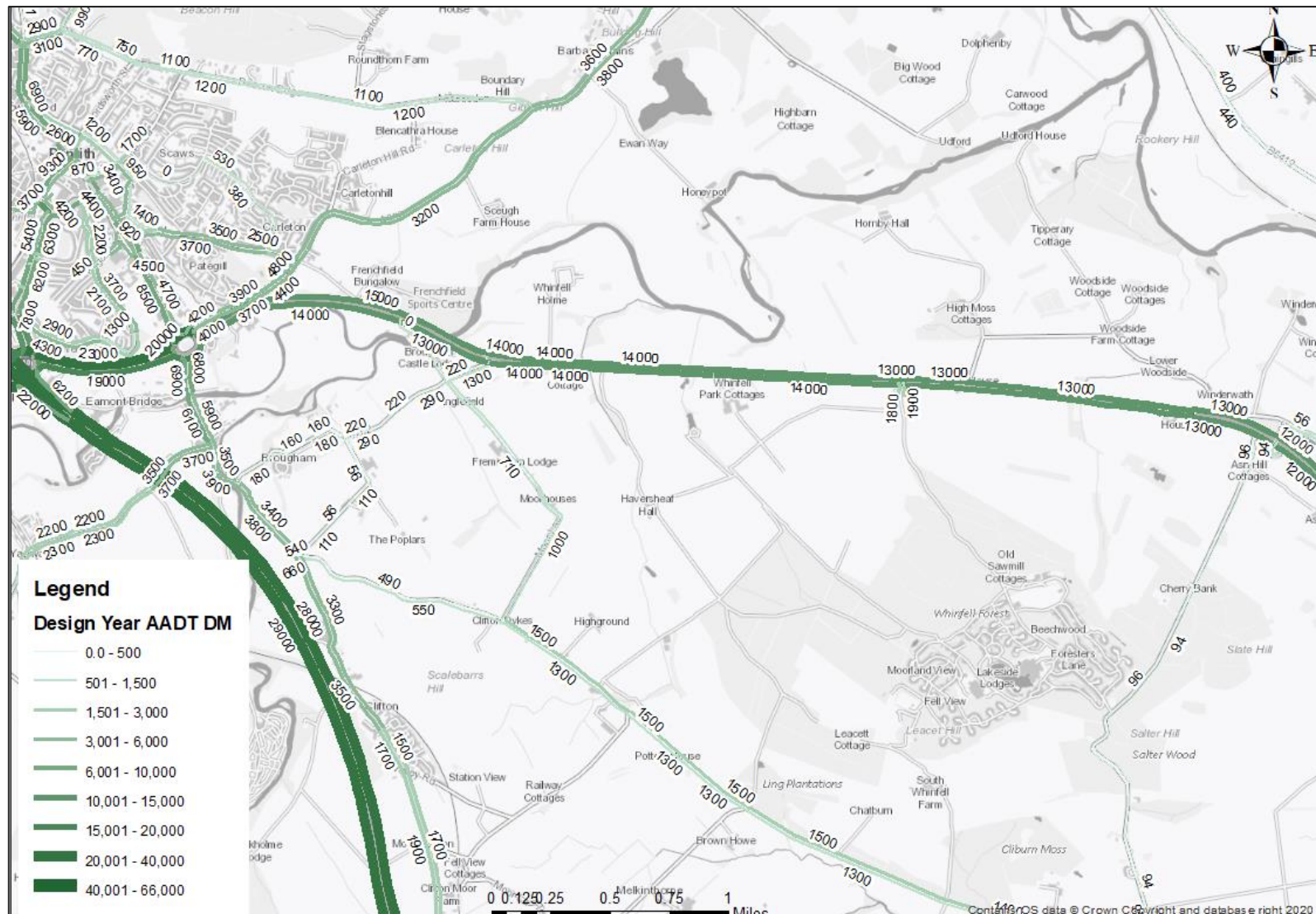


Figure 11-4: Penrith to Temple Sowerby: Forecast Year DM Flows



Figure 11-5: Penrith to Temple Sowerby: Forecast Year DS Flows

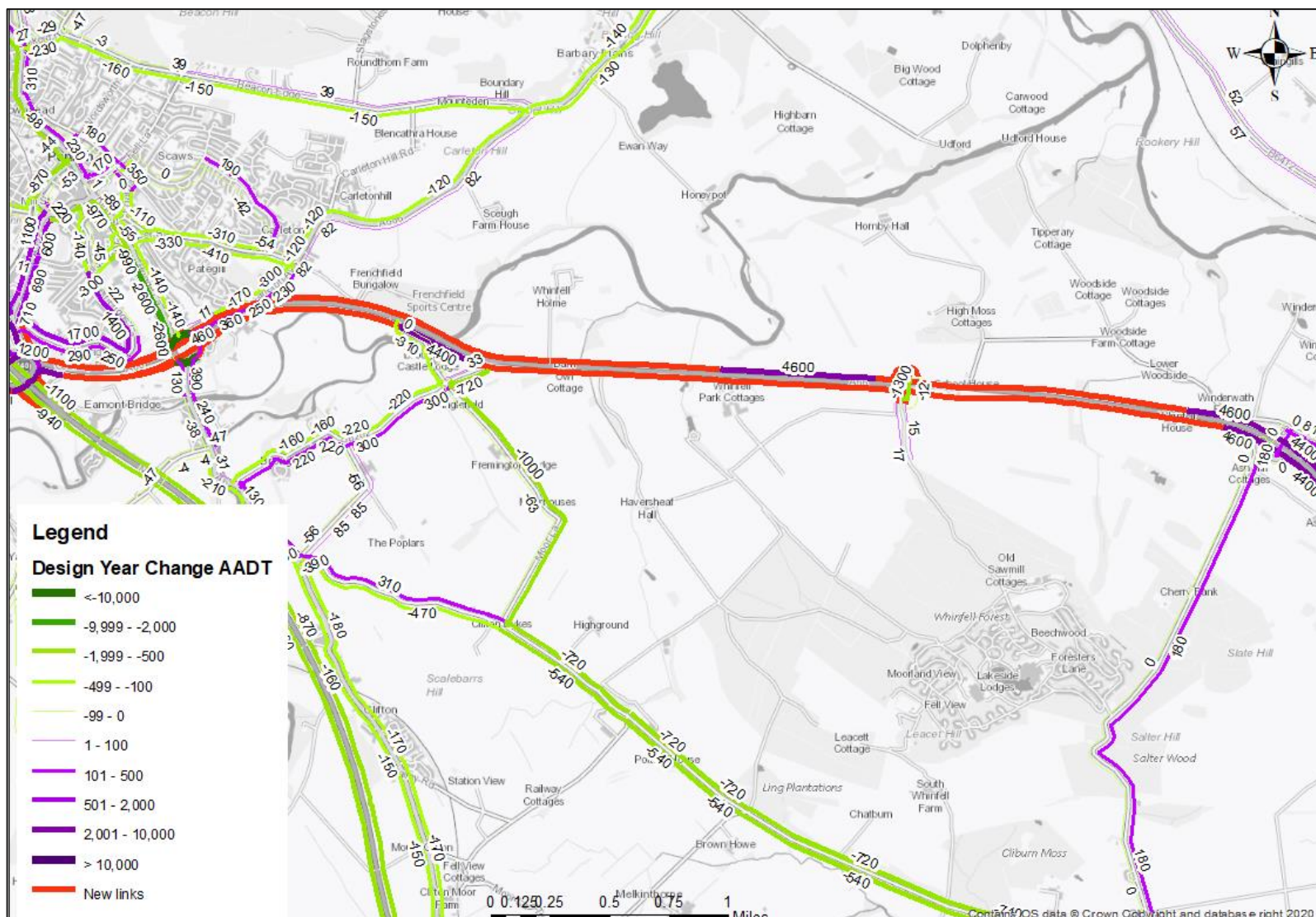


Figure 11-6: Penrith to Temple Sowerby: Forecast Year DS Flow (Changes from DM)

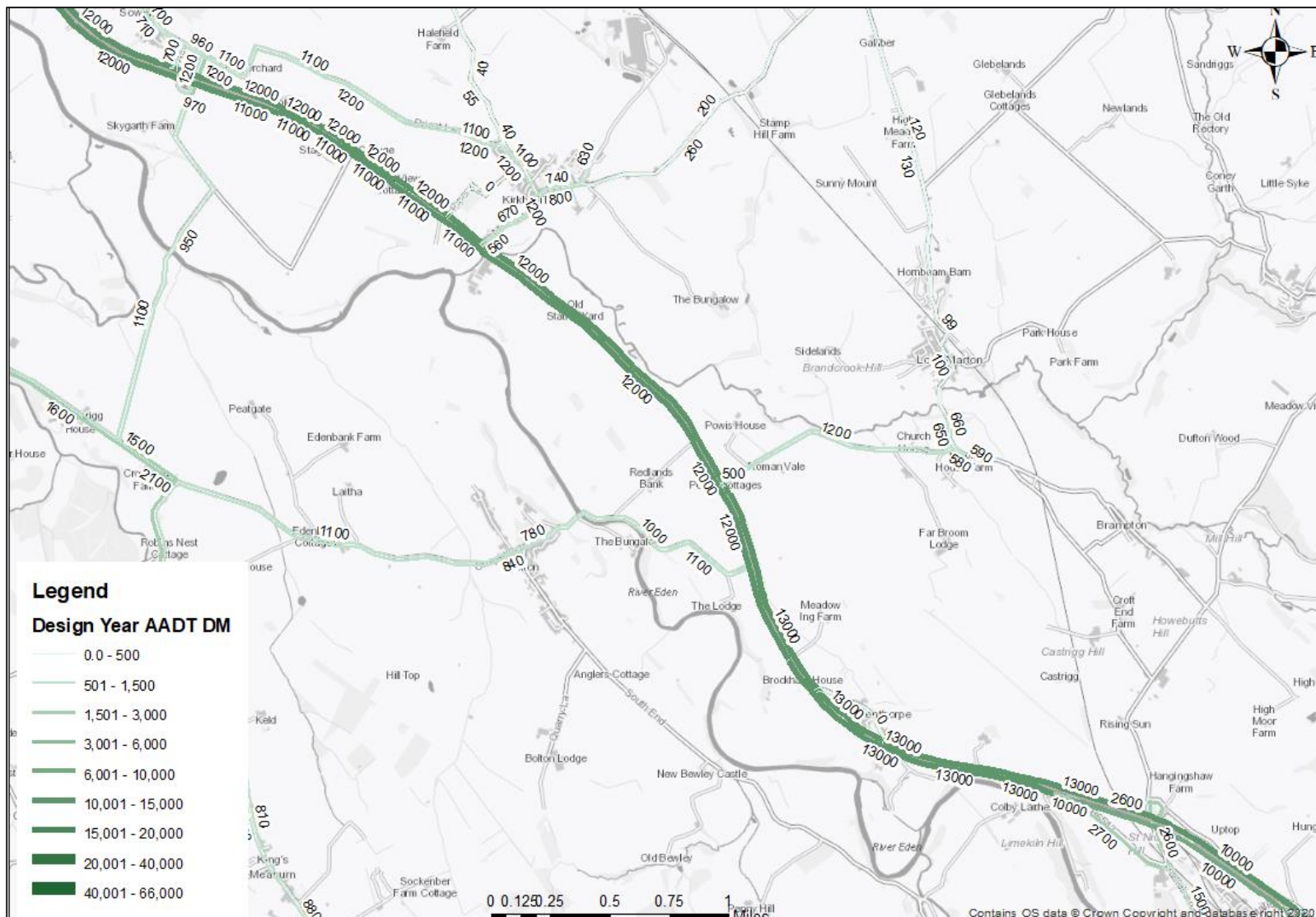


Figure 11-7: Temple Sowerby to Appleby: Forecast Year DM Flows

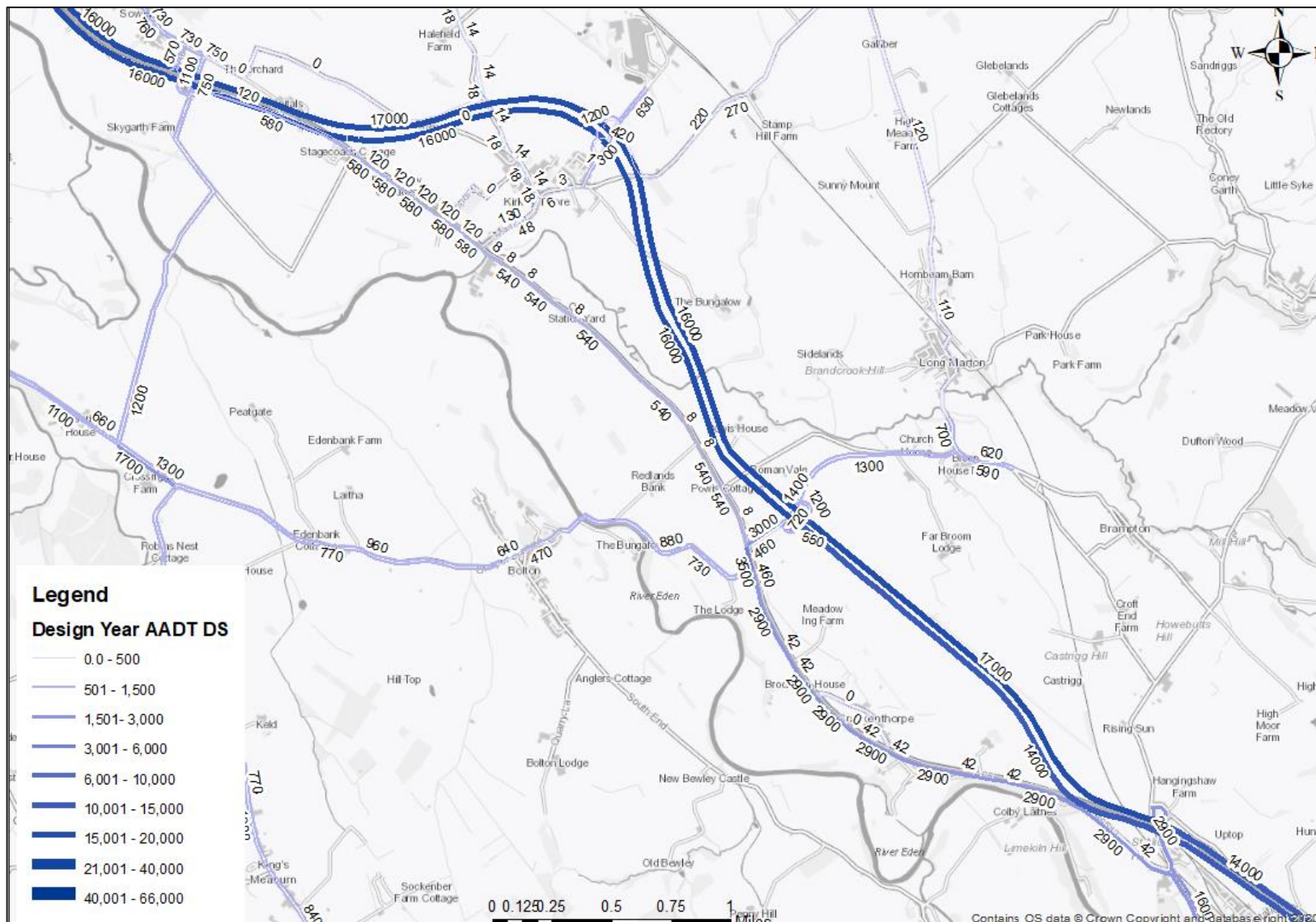


Figure 11-8: Temple Sowerby to Appleby BLUE ROUTE Forecast Year DS Flow

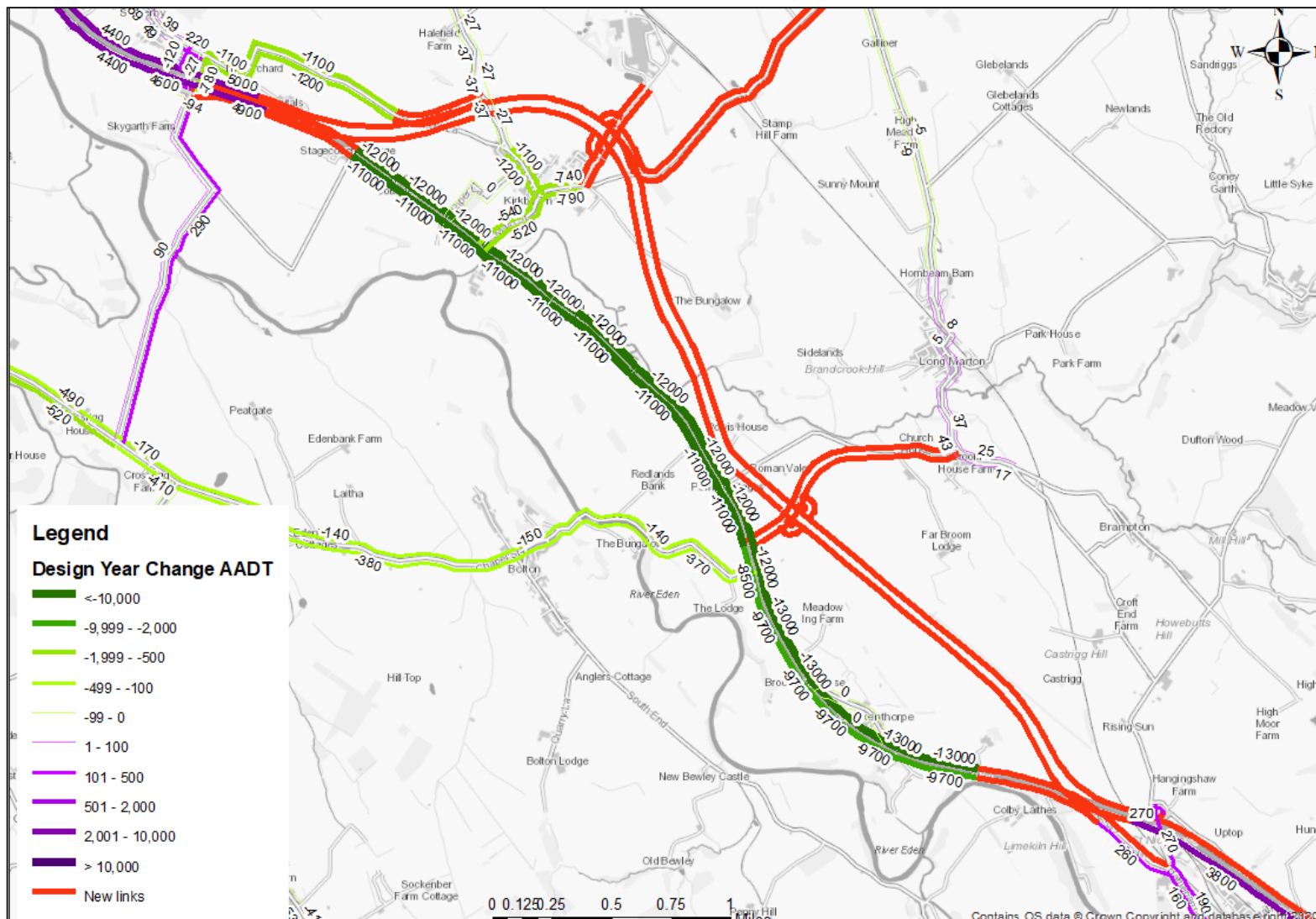


Figure 11-9: Temple Sowerby to Appleby BLUE ROUTE Forecast Year DS Flow (Changes from DM)

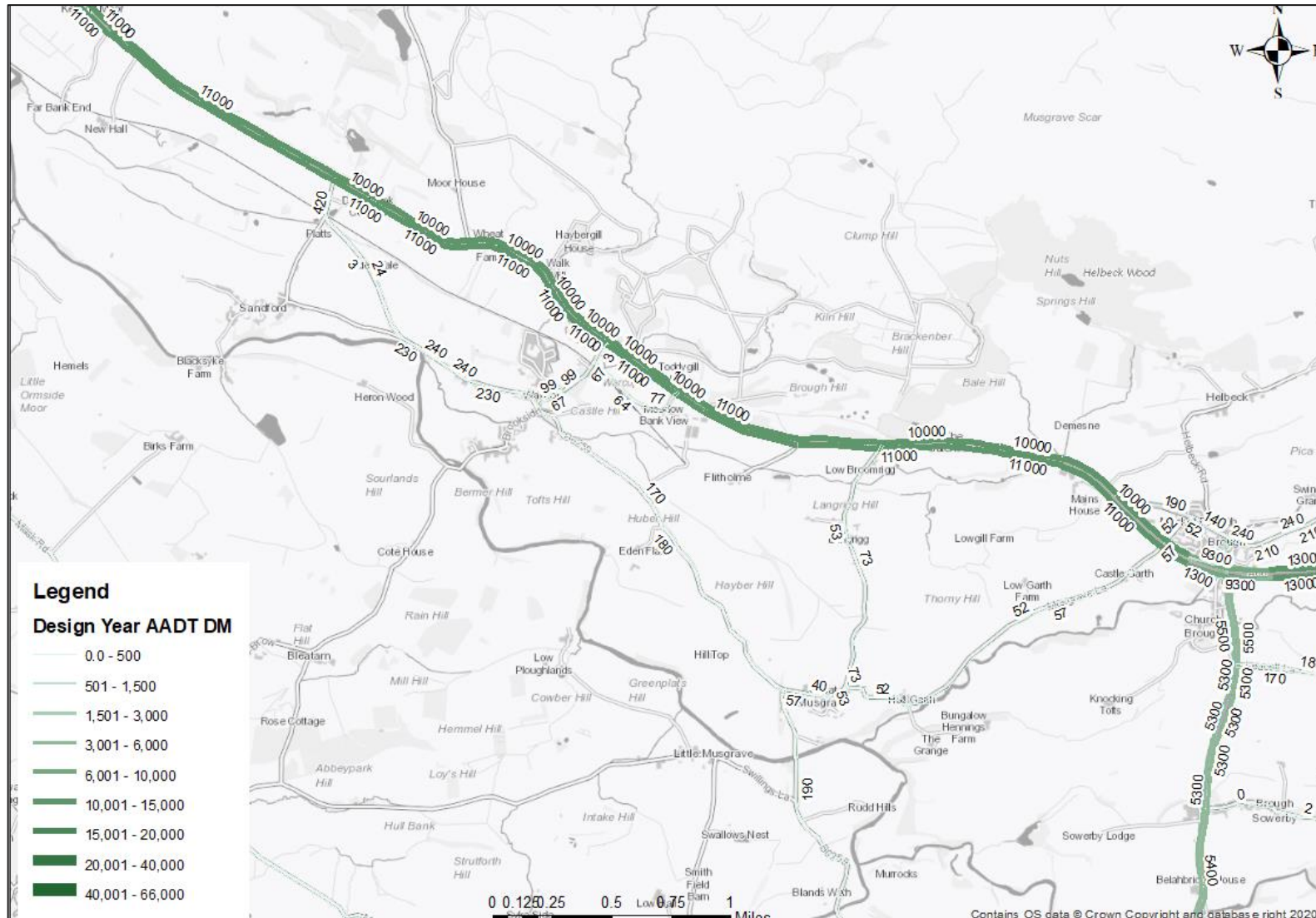


Figure 11-10: Appleby to Brough: Forecast Year DM Flows

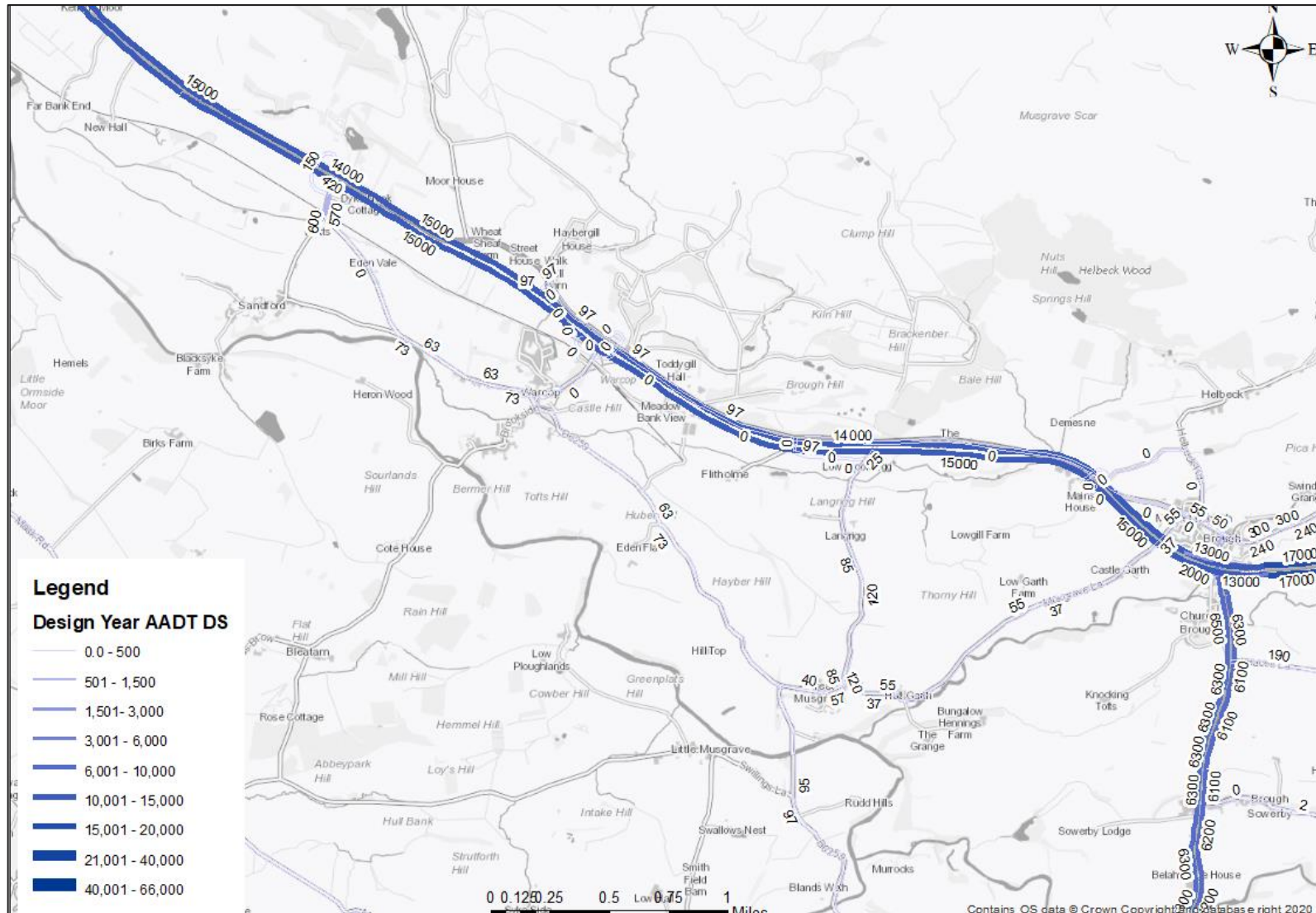


Figure 11-11: Appleby to Brough **BLACK-BLUE-BLACK ROUTE**: Forecast Year DS Flow

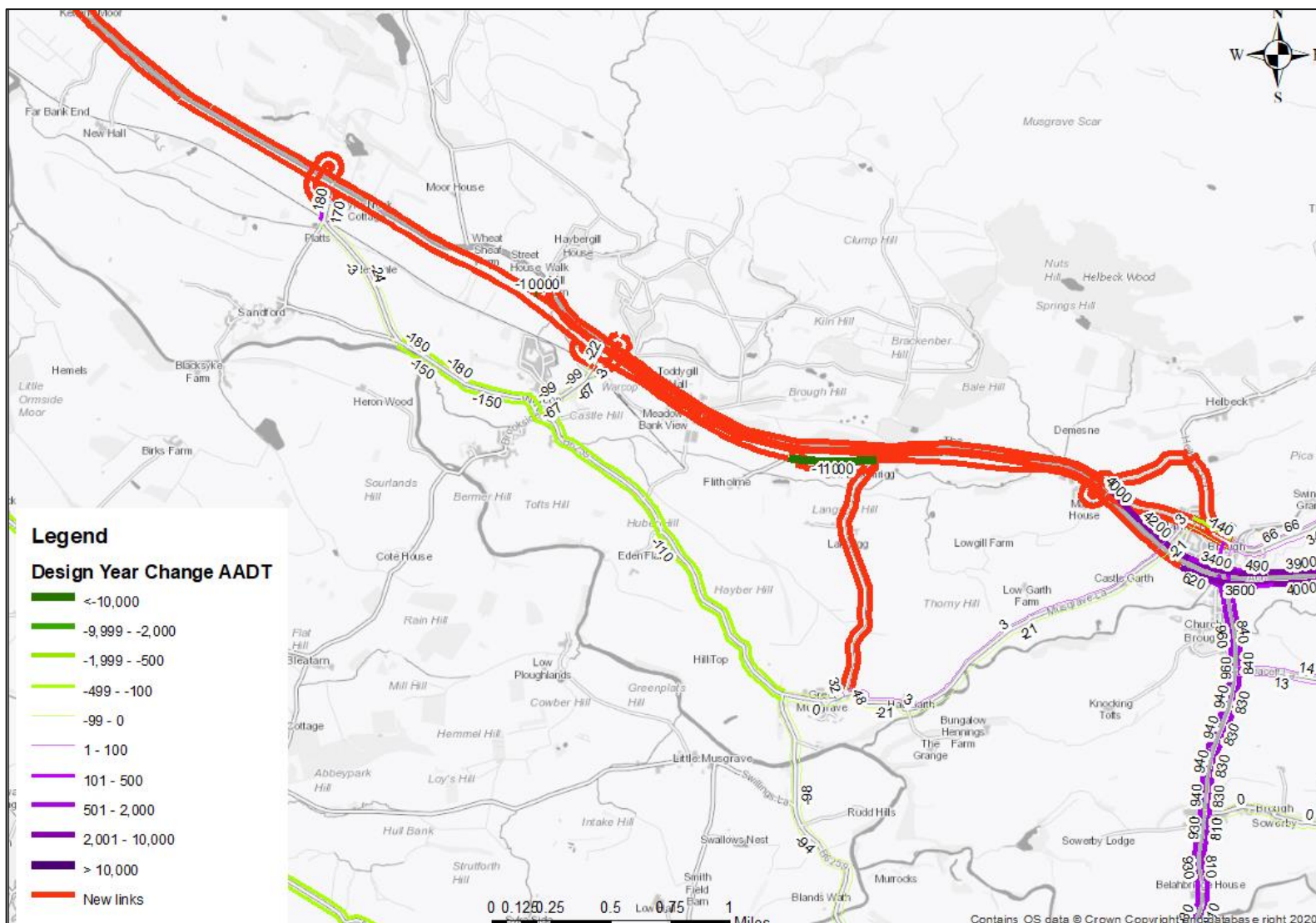


Figure 11-12: Appleby to Brough **BLACK-BLUE-BLACK ROUTE**: Forecast Year DS Flow (Changes from DM)

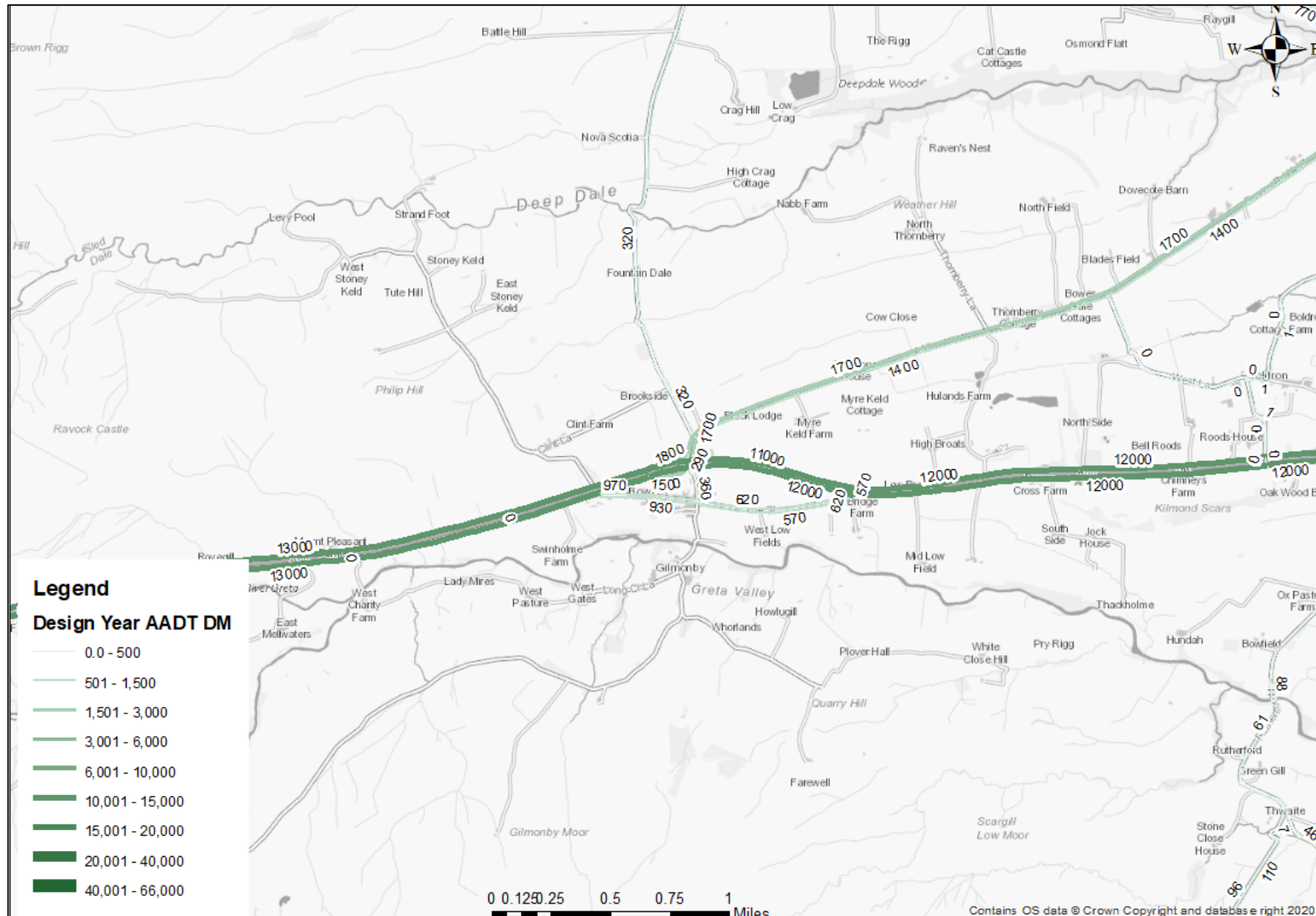


Figure 11-13: Bowes Bypass: Forecast Year DM Flows

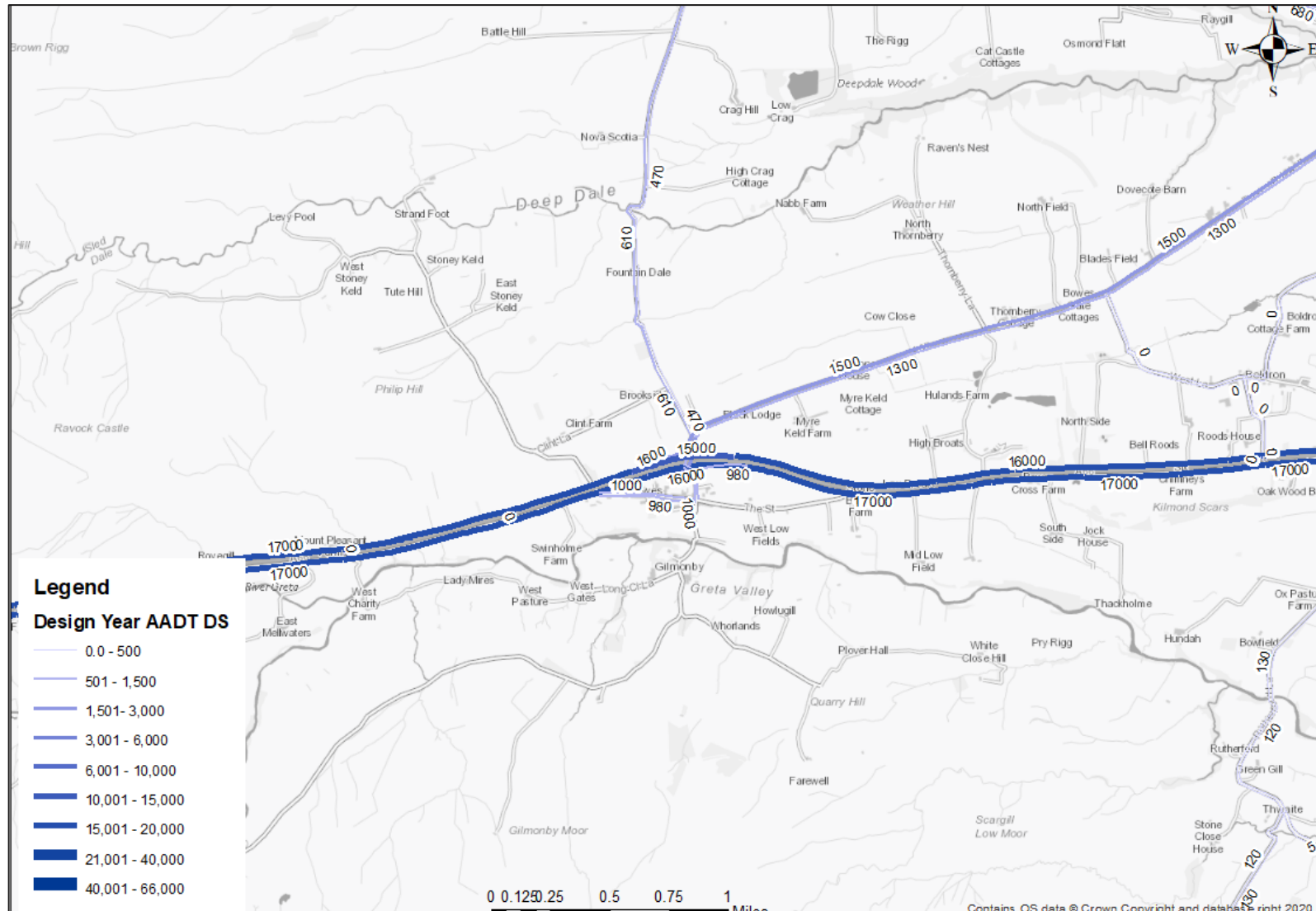


Figure 11-14: Bowes Bypass: Forecast Year DS Flow

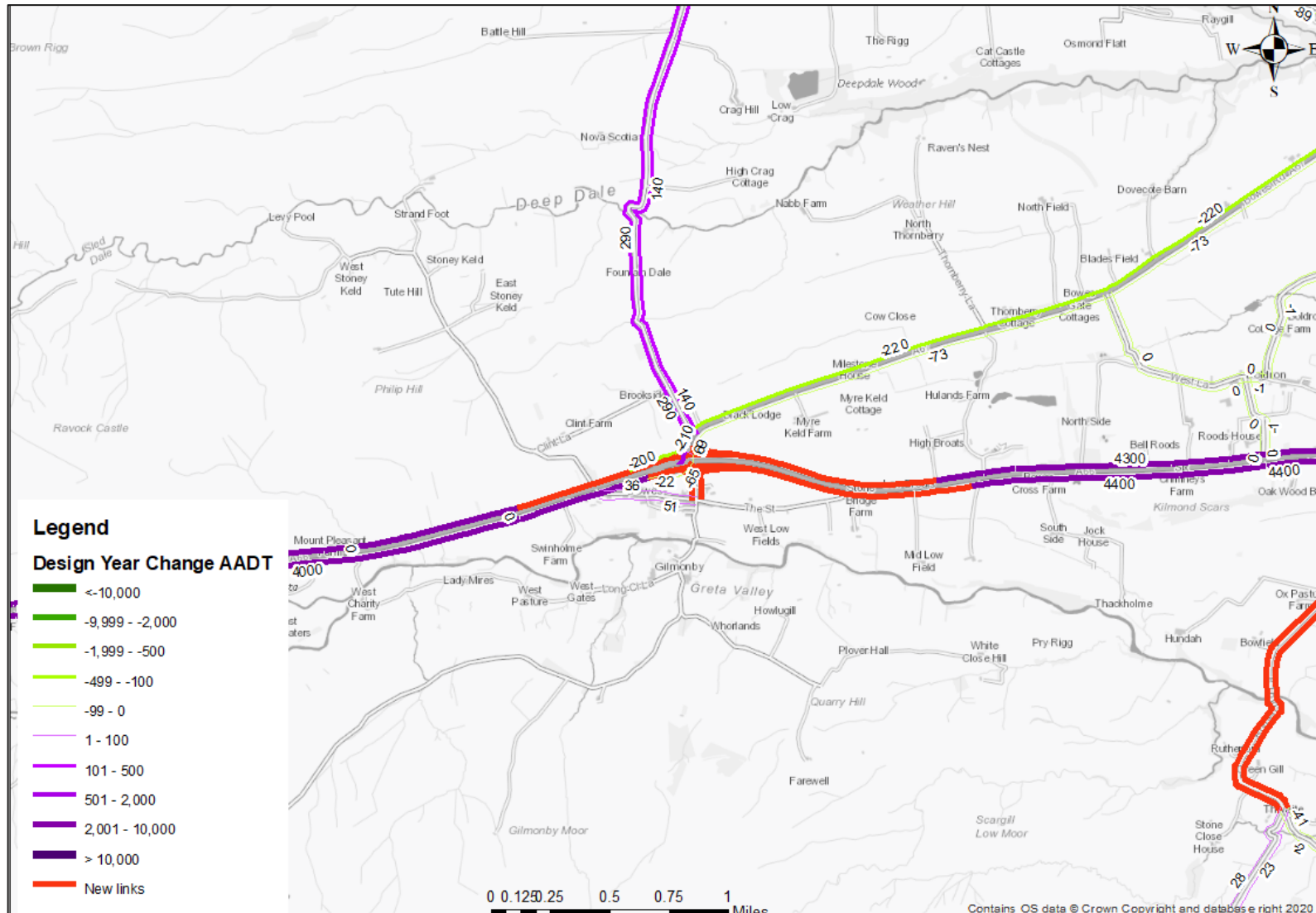


Figure 11-15: Bowes Bypass: Forecast Year DS Flow (Changes from DM)

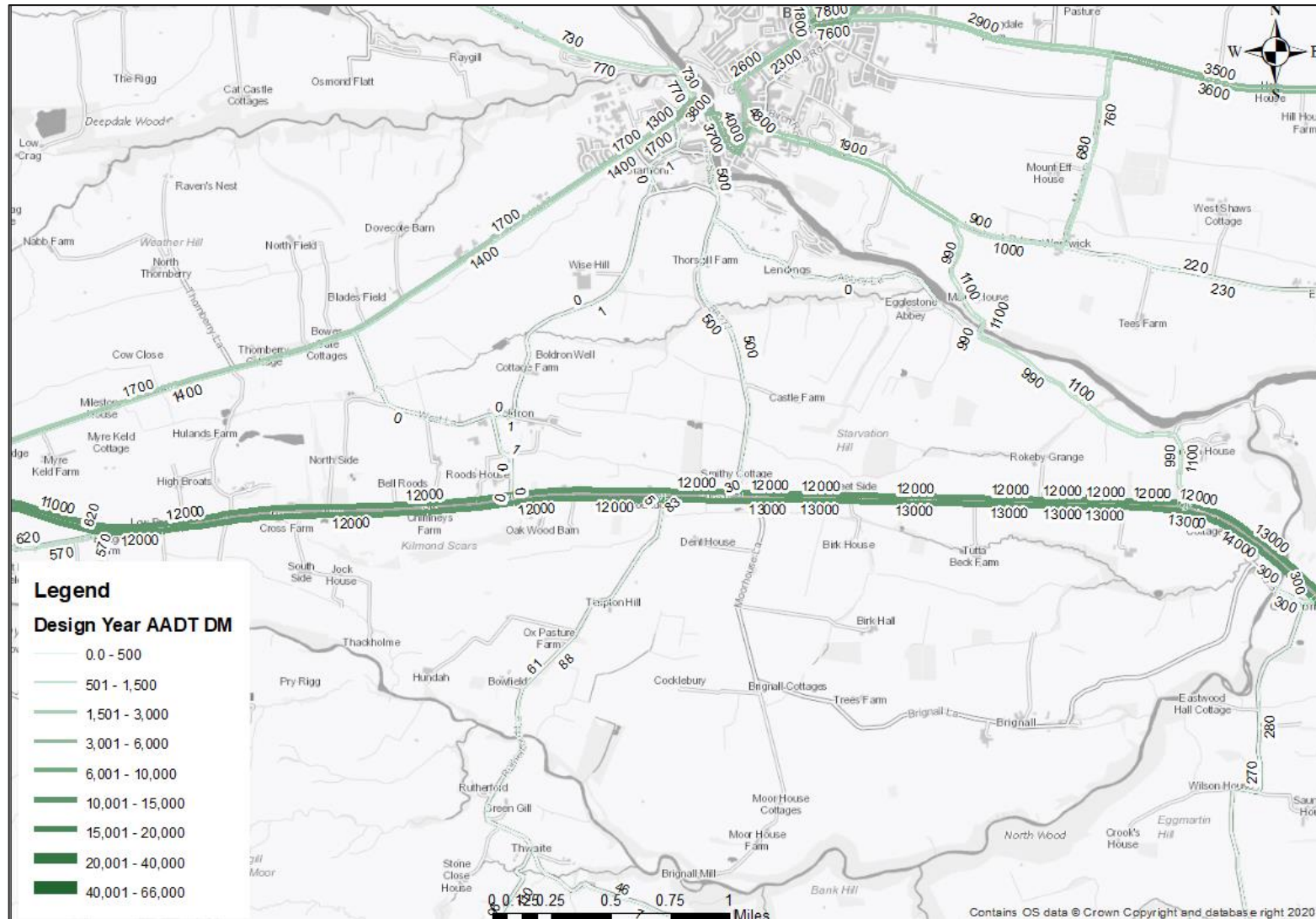


Figure 11-16: Cross Lanes to Rokeby: Forecast Year DM Flows



Figure 11-17: Cross Lanes to Rokeby: **BLACK ROUTE** Forecast Year DS Flow

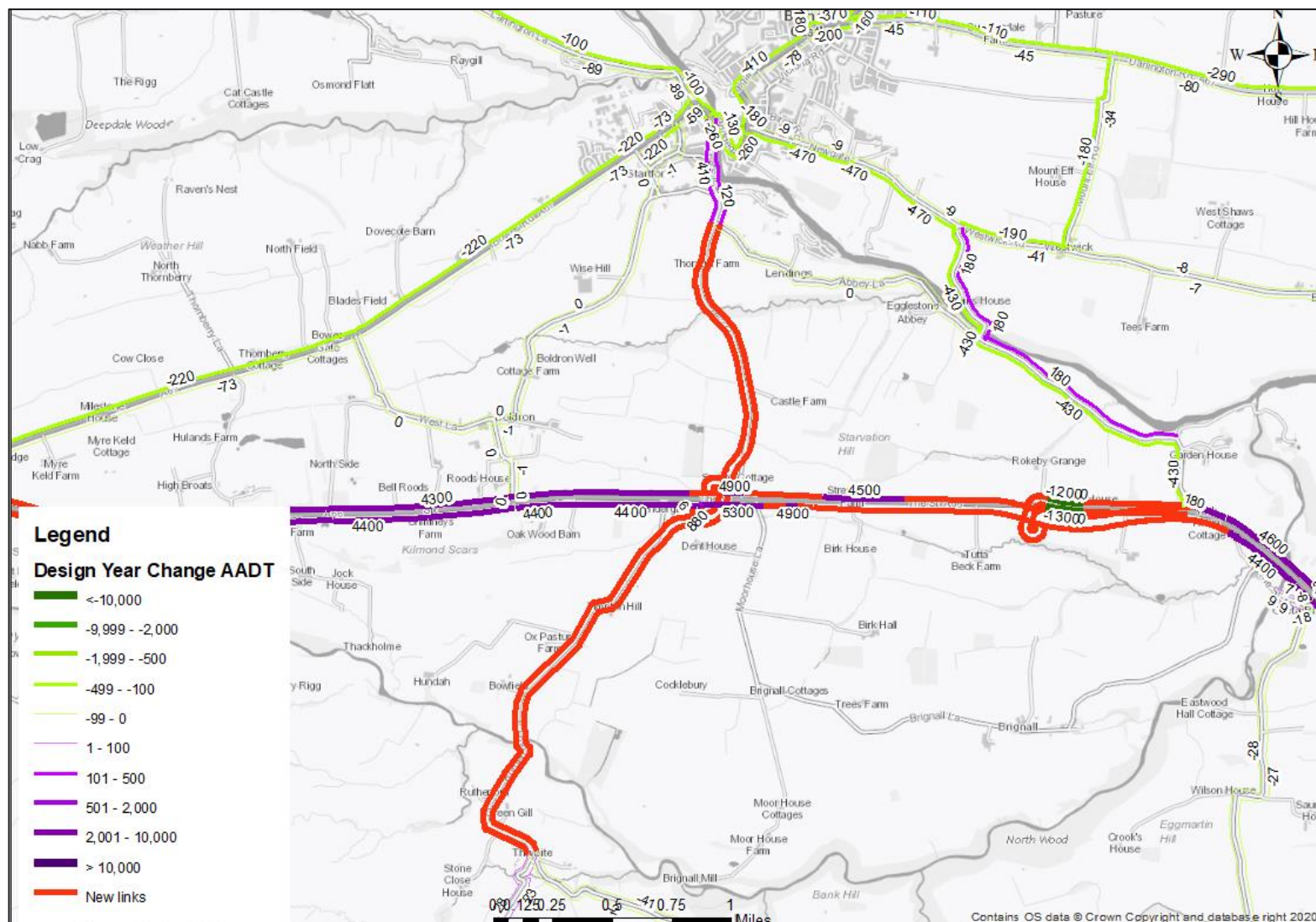


Figure 11-18: Cross Lanes to Rokeby: **BLACK ROUTE** Forecast Year DS Flow (Changes from DM)

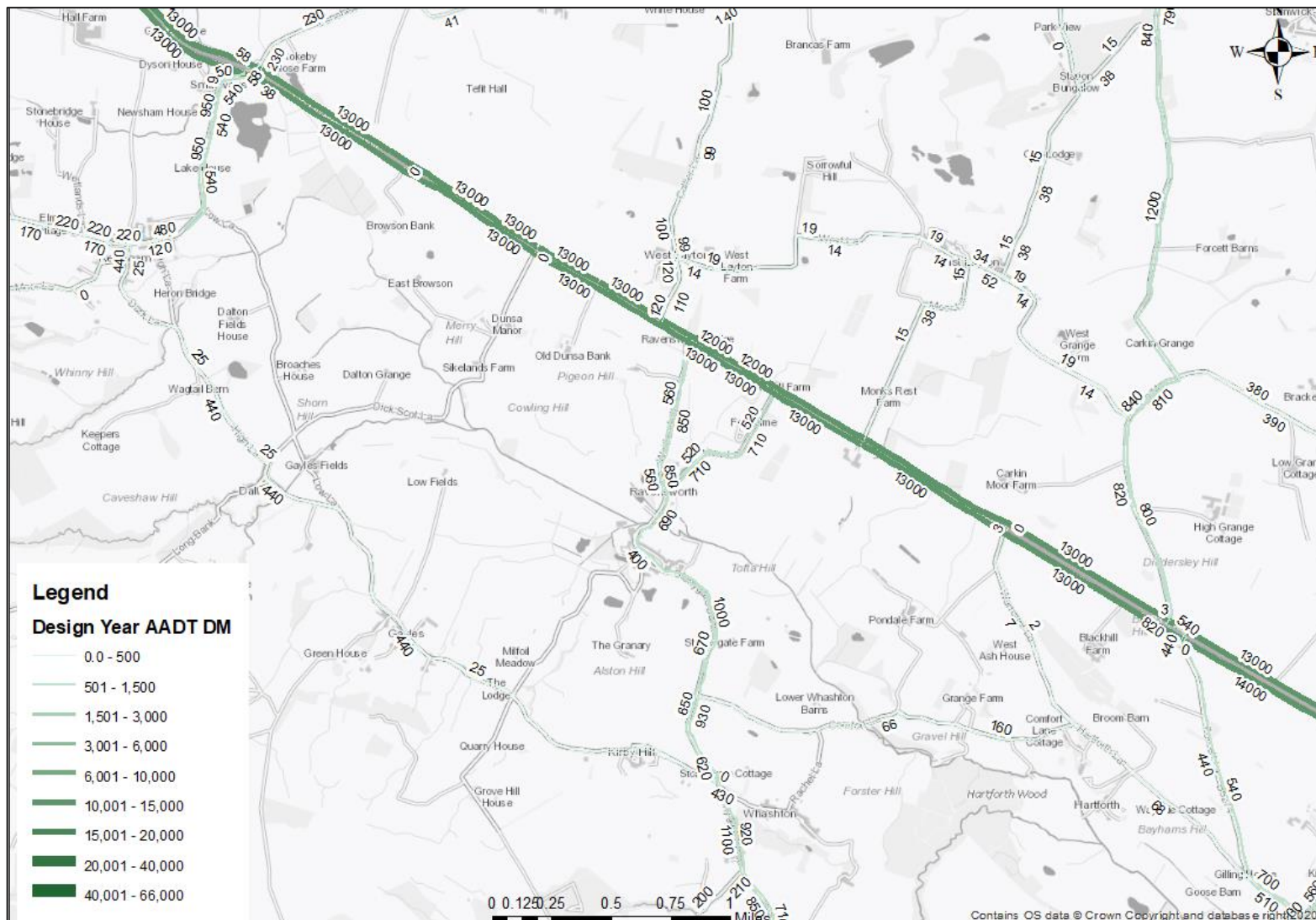


Figure 11-19: Stephen Bank to Carkin Moor: Forecast Year DM Flows

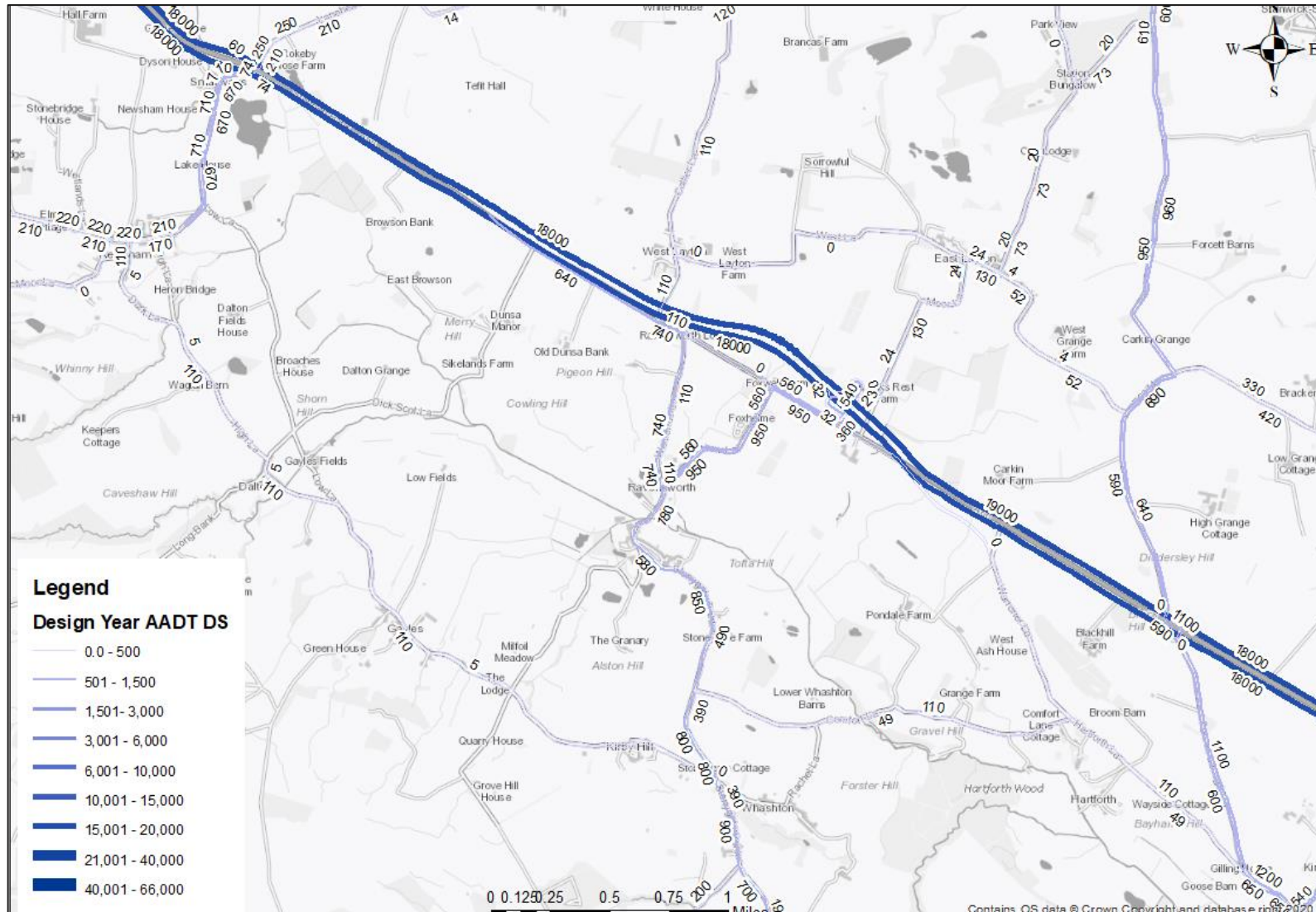


Figure 11-20: Stephen Bank to Carkin Moor: Forecast Year DS Flow

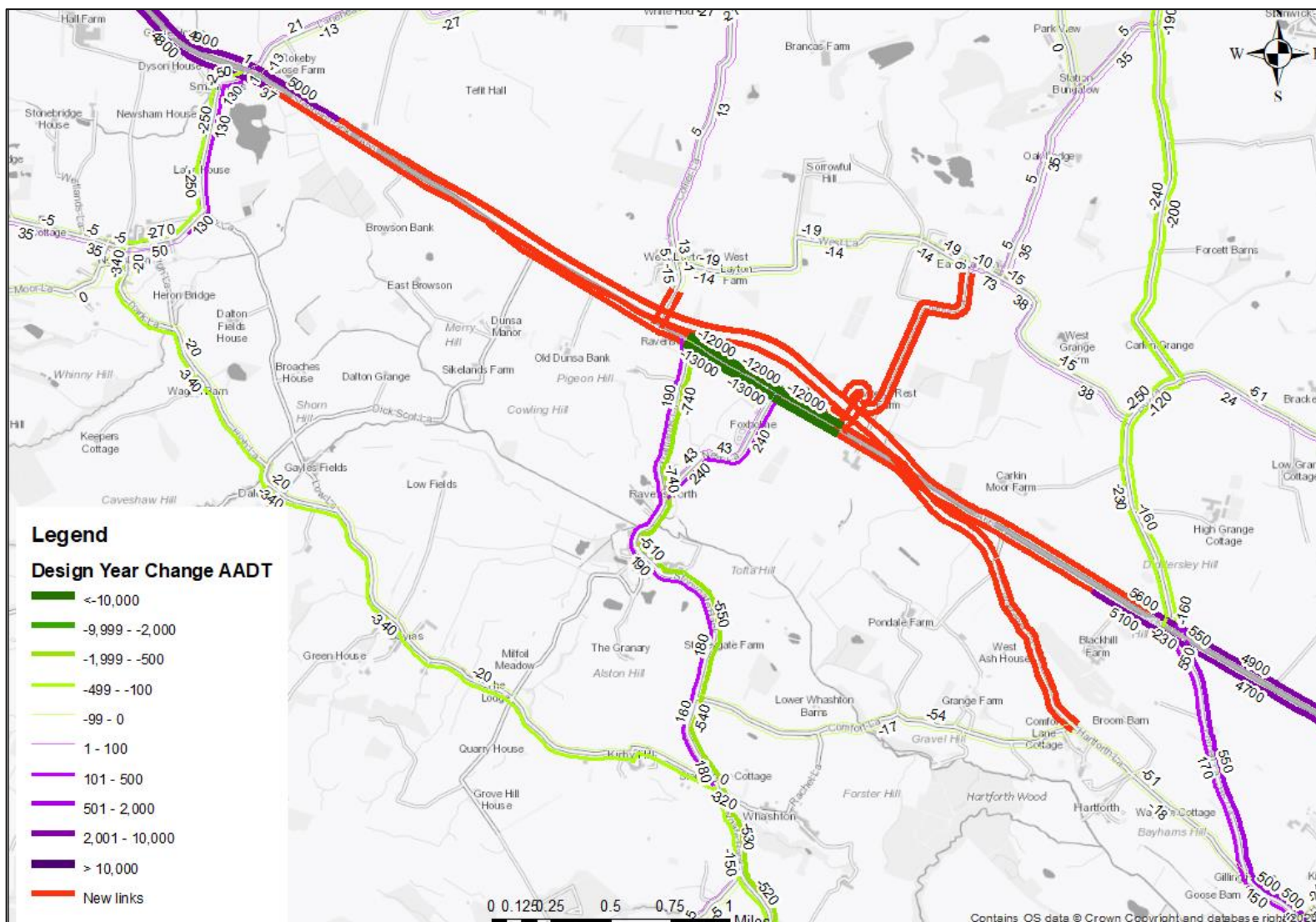


Figure 11-21: Stephen Bank to Carkin Moor: Forecast Year DS Flow (Changes from DM)

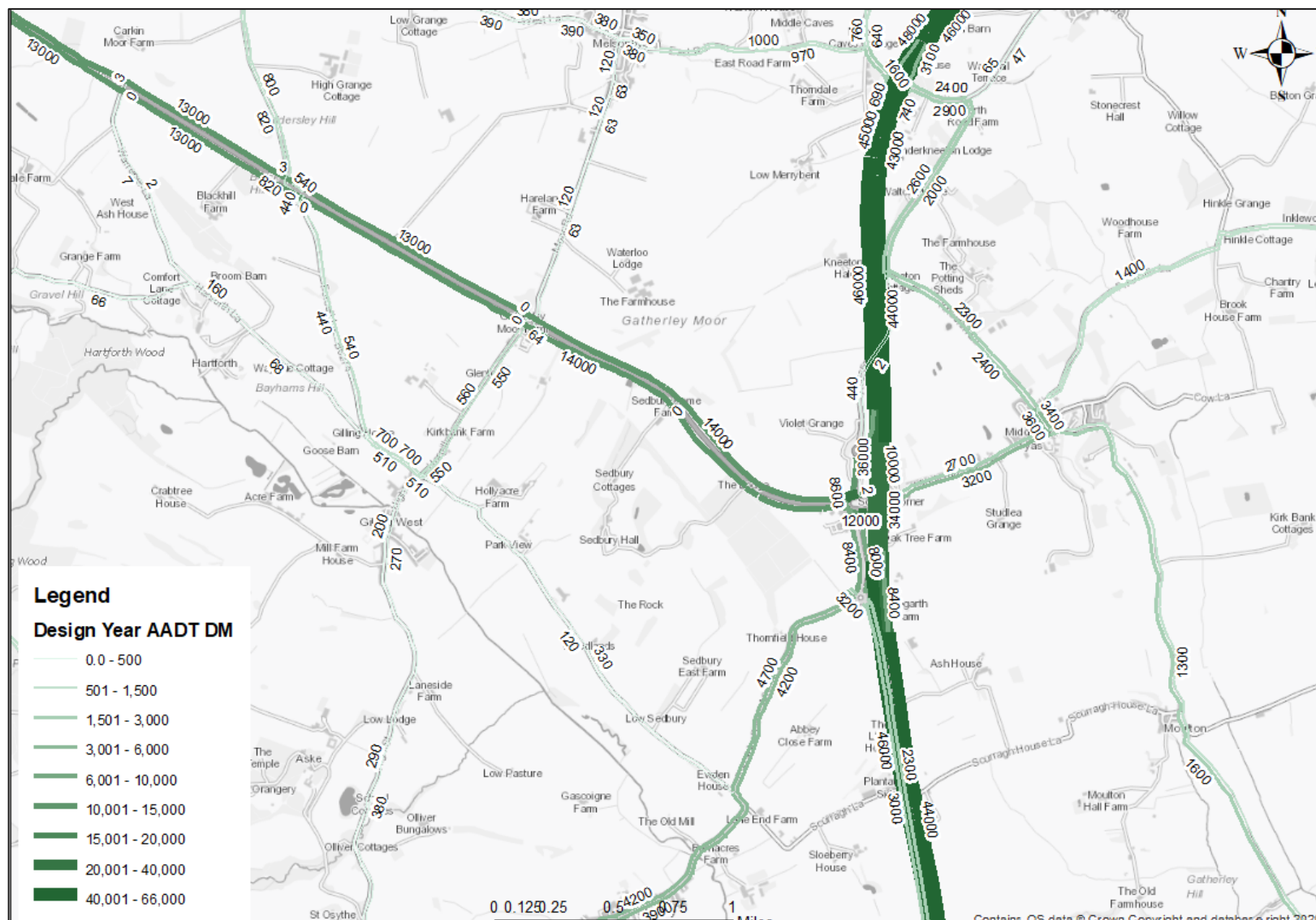


Figure 11-22: A1(M) Scotch Corner: Forecast Year DM Flows



Figure 11-23: A1(M) Scotch Corner - Forecast Year DS Flow

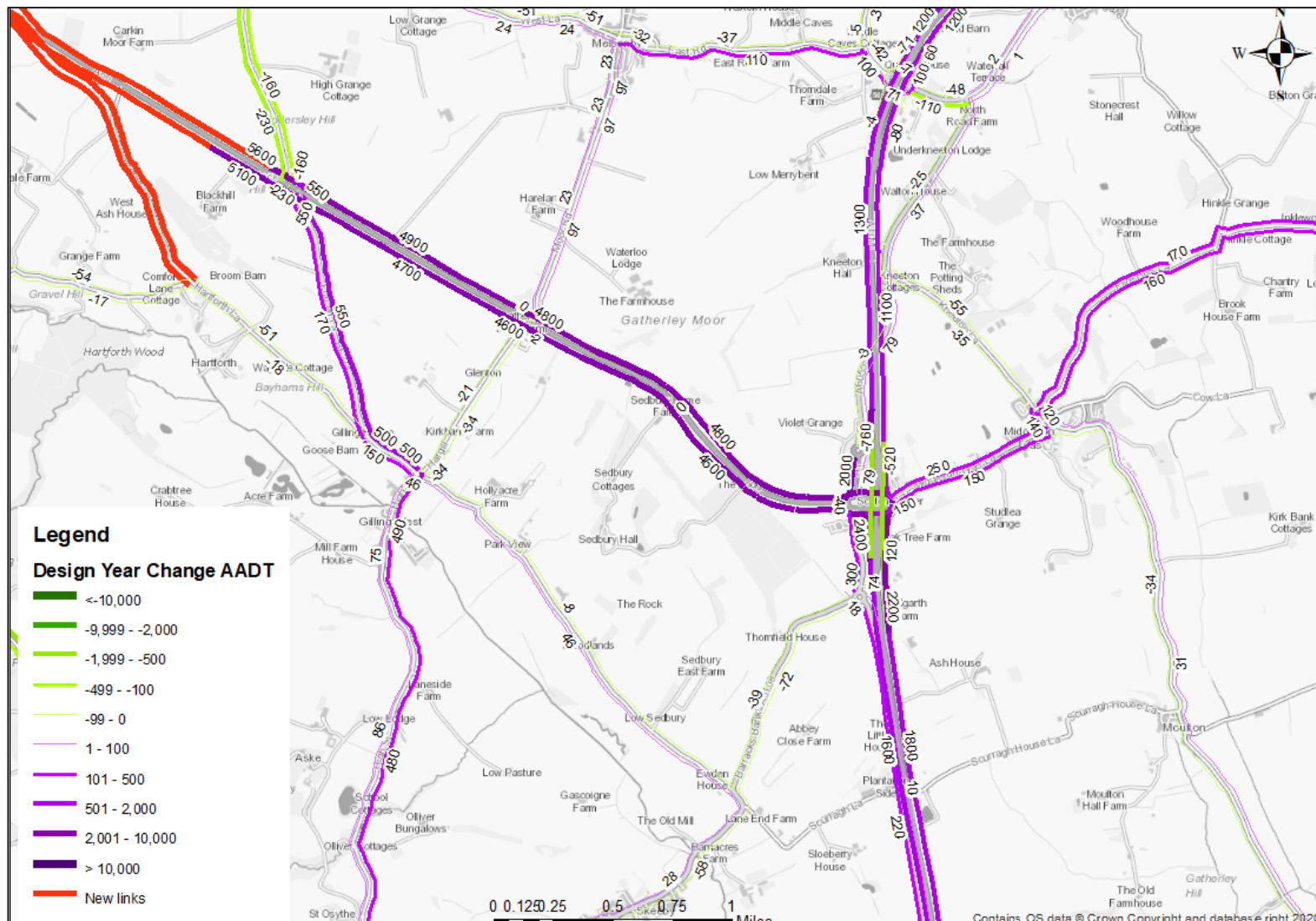
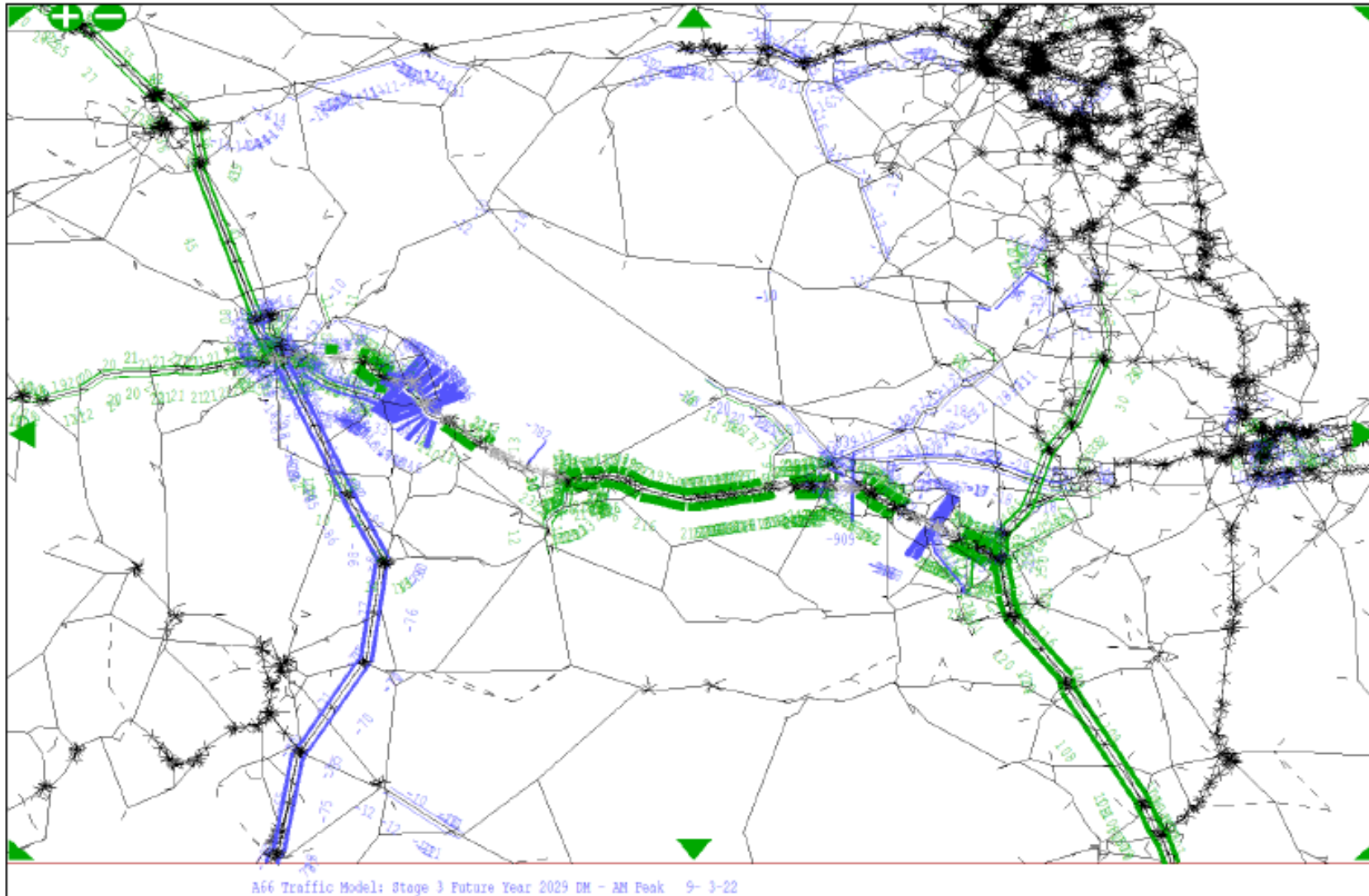


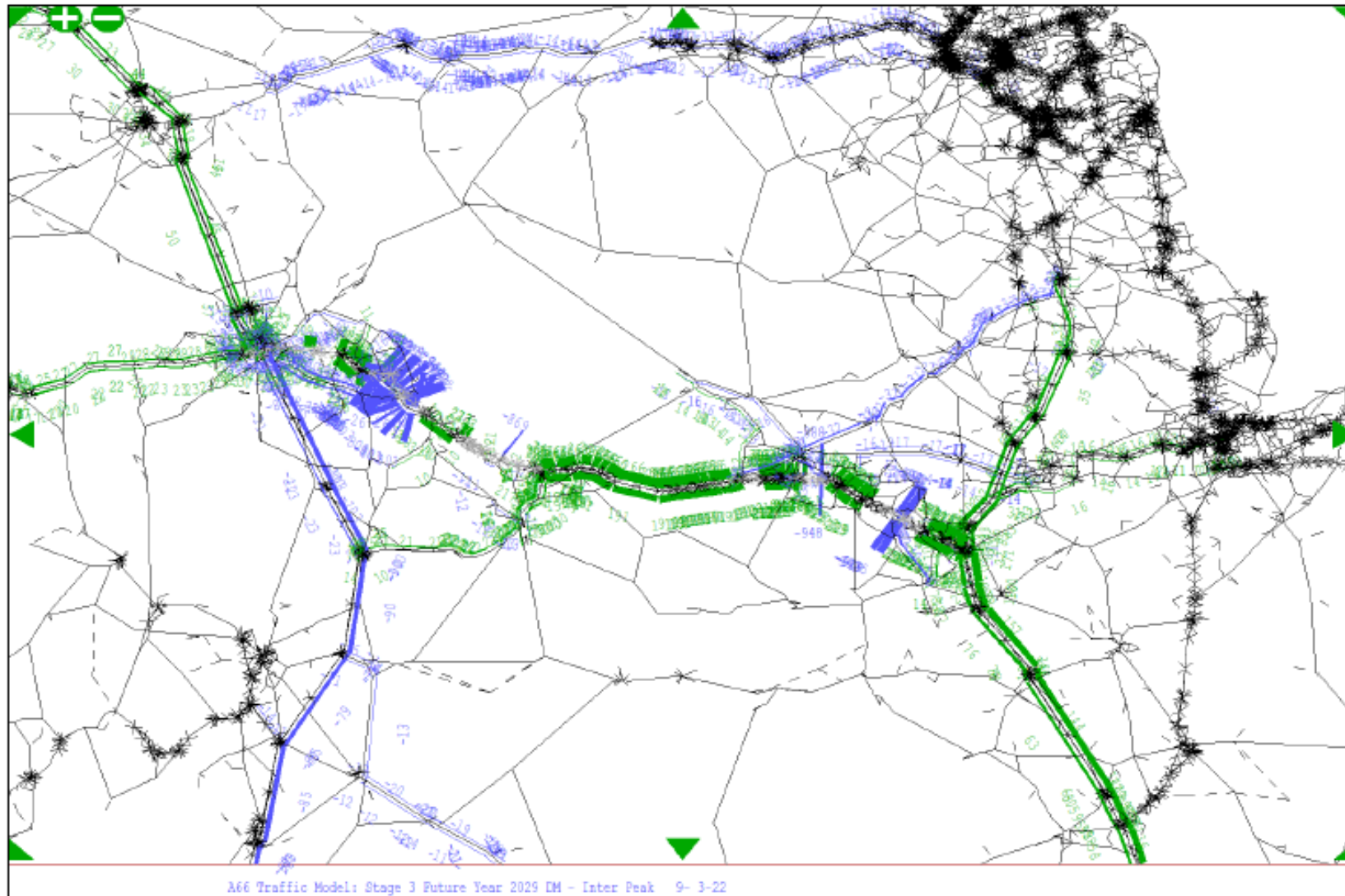
Figure 11-24: A1(M) Scotch Corner - Forecast Year DS Flow (Changes from DM)

D Core Scenario Flow Difference Plots by Period

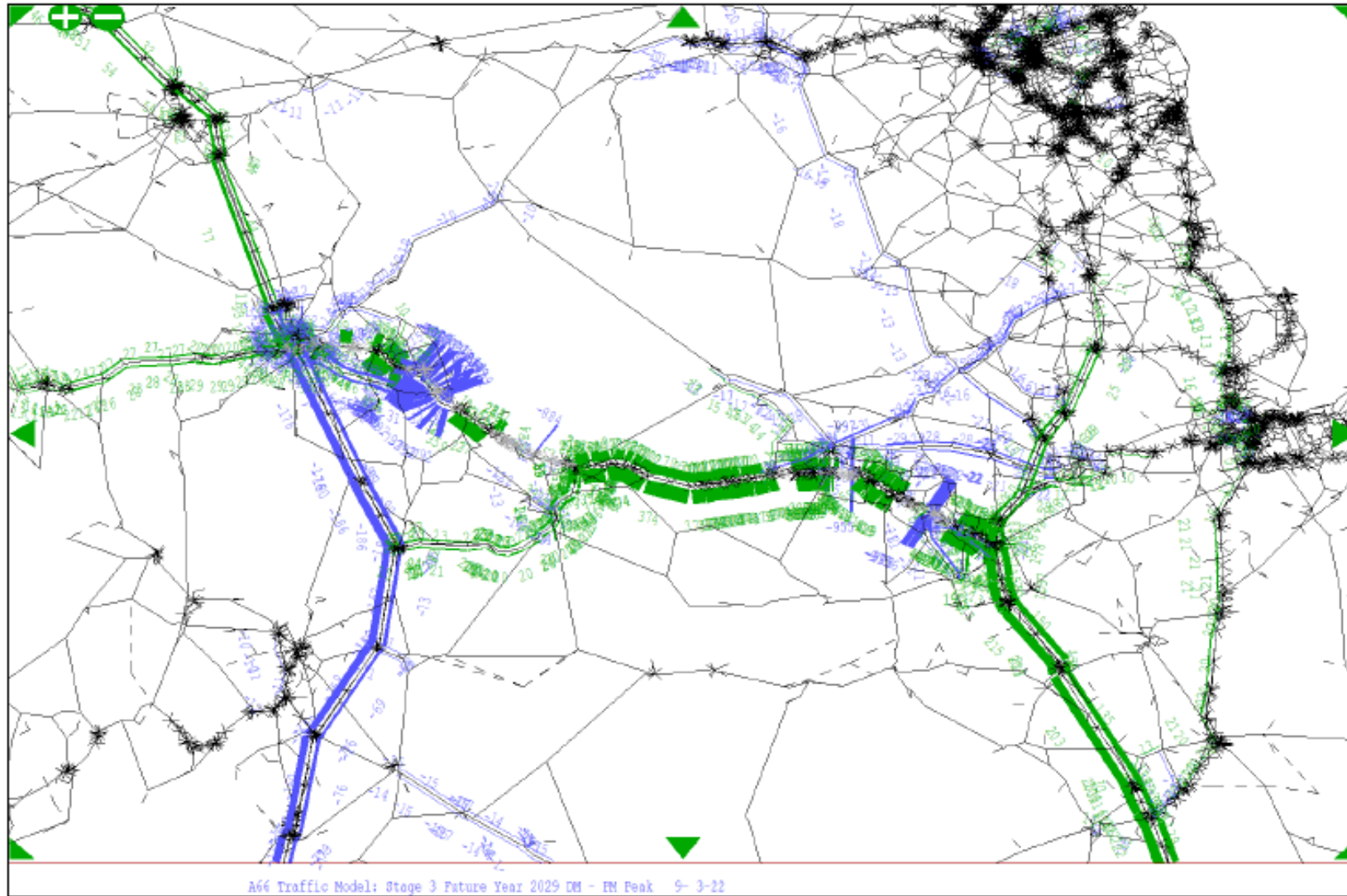
AM 2029 Flow Difference (PCUs) DS vs. DM



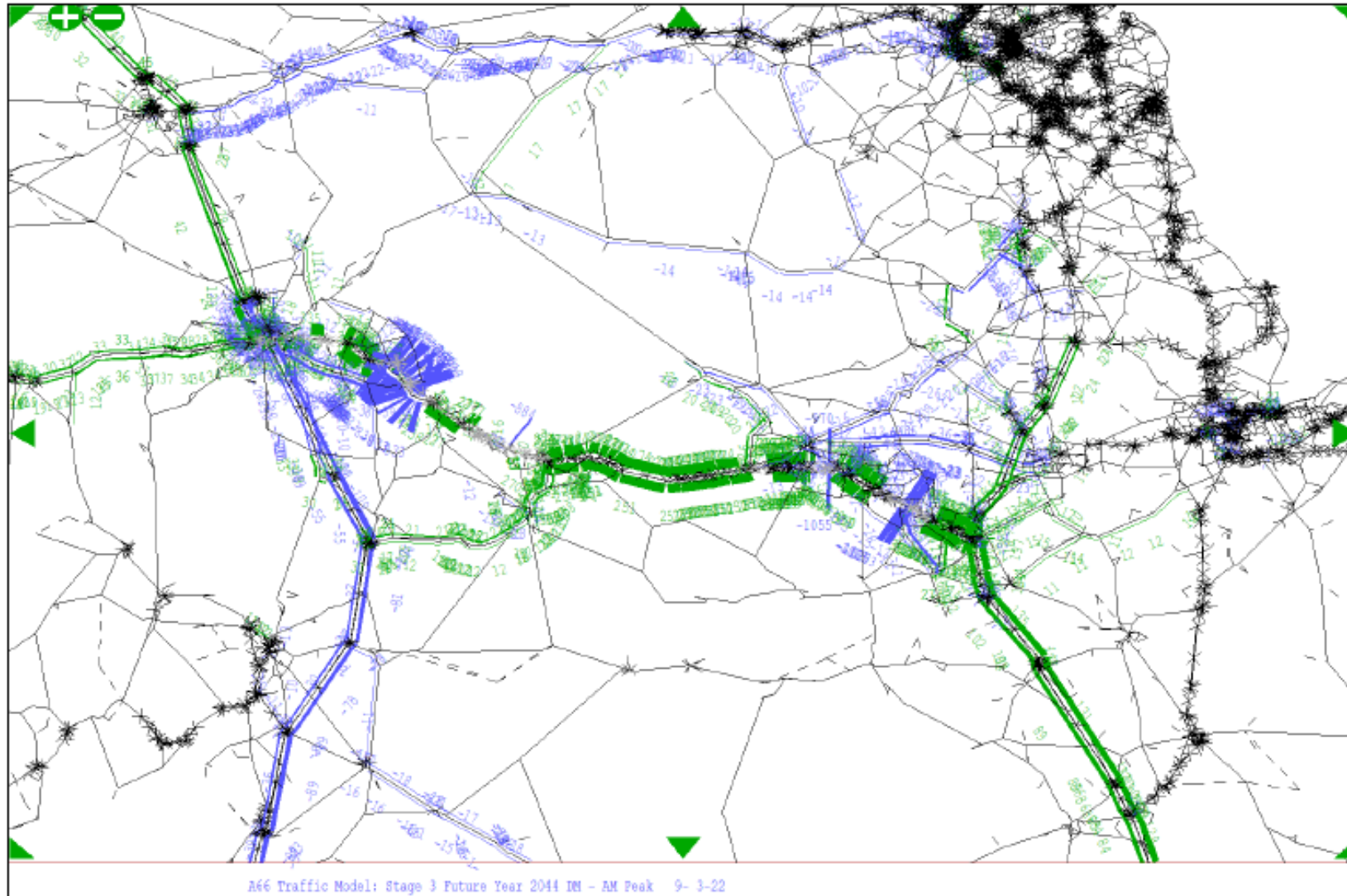
IP 2029 Flow Difference (PCUs) DS vs. DM



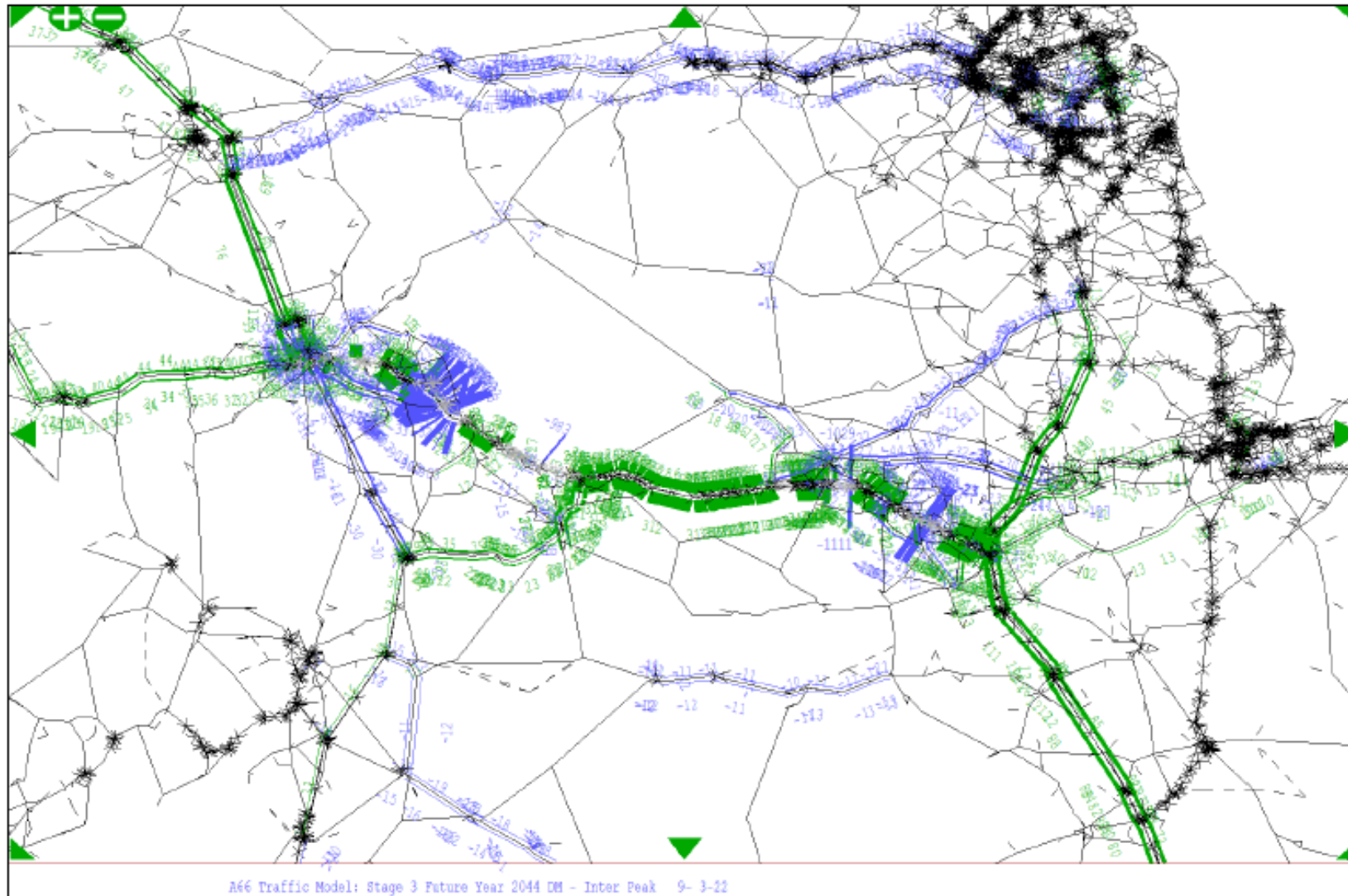
PM 2029 Flow Difference (PCUs) DS vs. DM



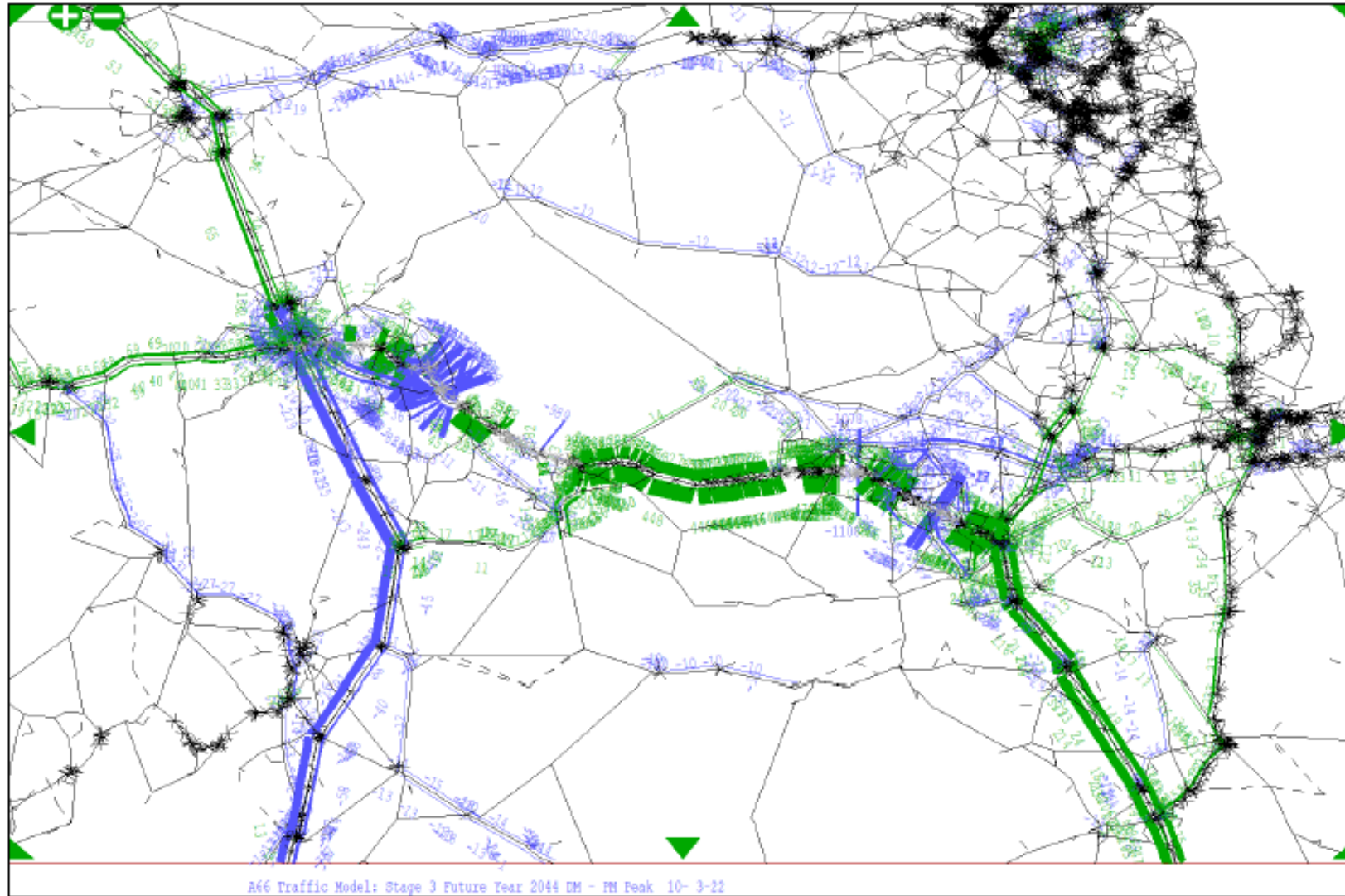
AM 2044 Flow Difference (PCUs) DS vs. DM



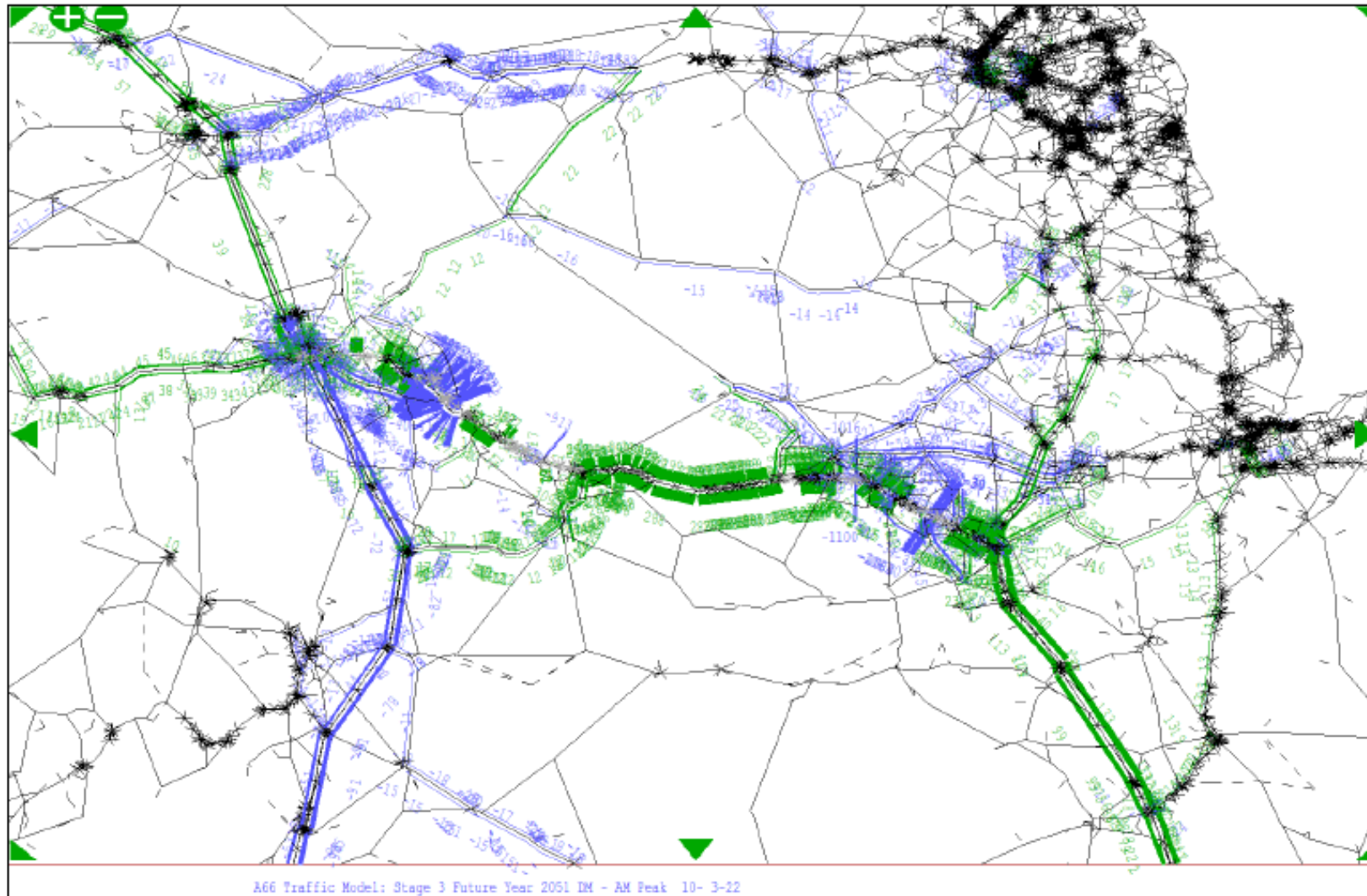
IP 2044 Flow Difference (PCUs) DS vs. DM



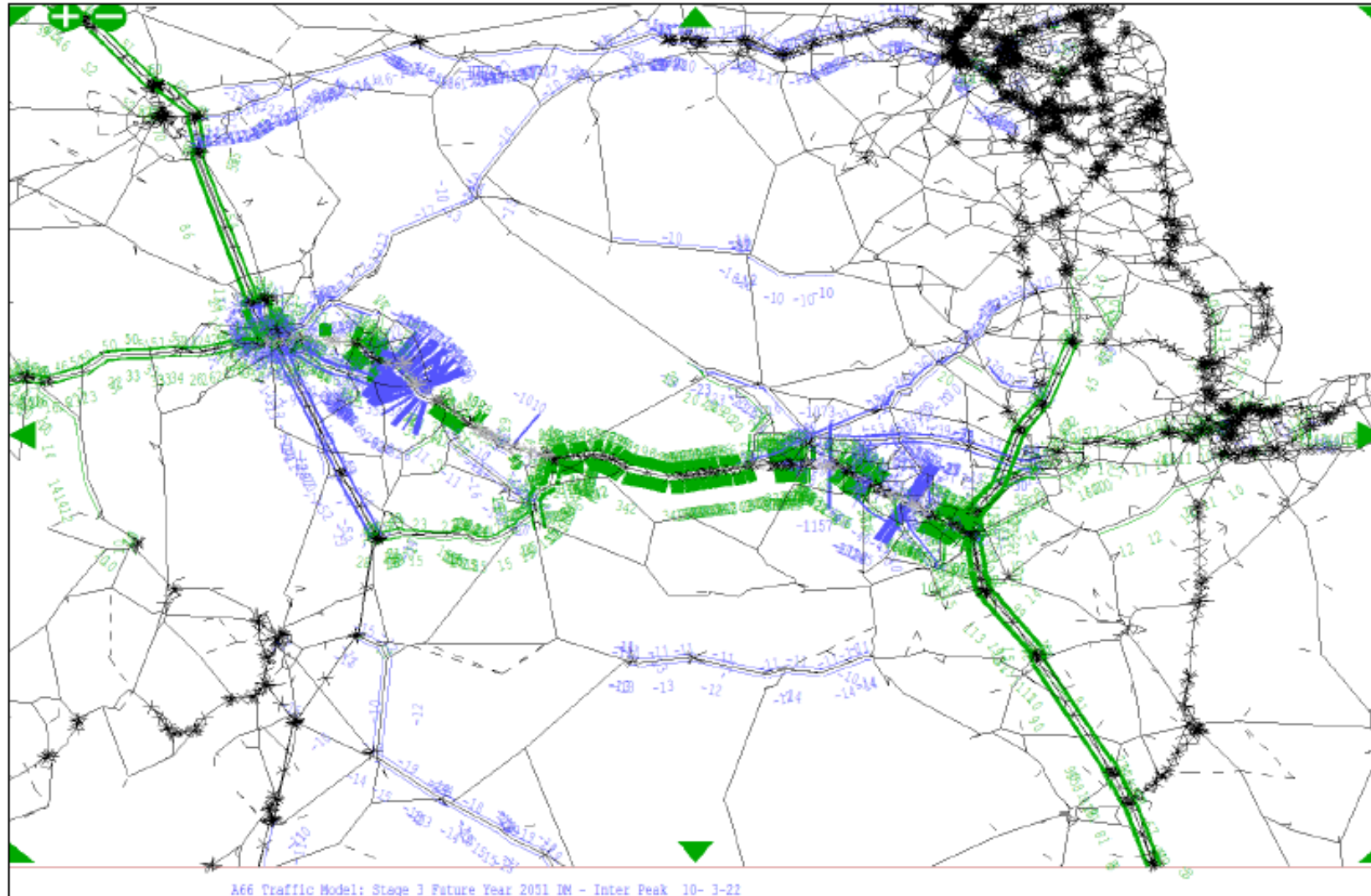
PM 2044 Flow Difference (PCUs) DS vs. DM



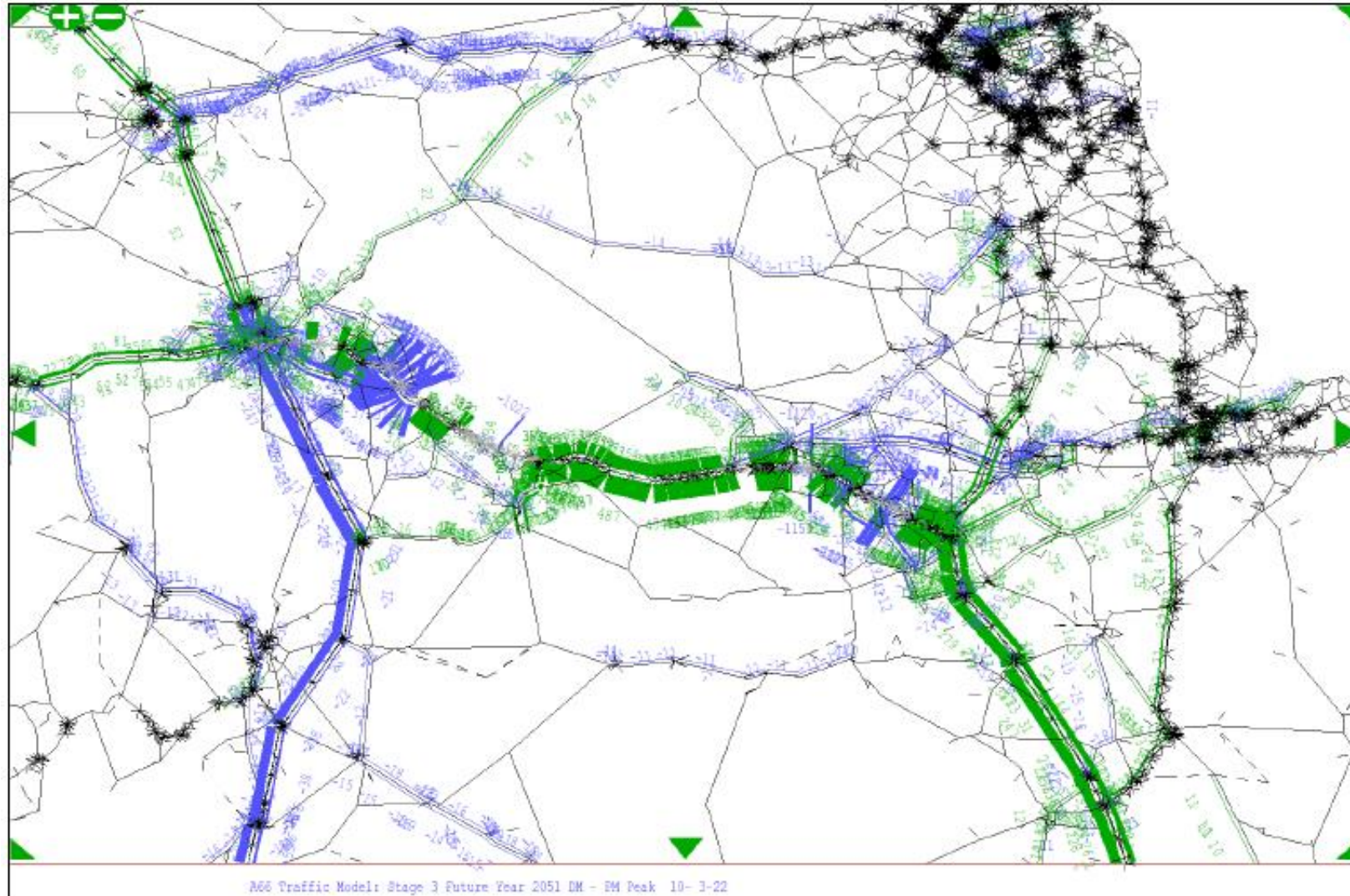
AM 2051 Flow Difference (PCUs) DS vs. DM



IP 2051 Flow Difference (PCUs) DS vs. DM



PM 2051 Flow Difference (PCUs) DS vs. DM



E Core Scenario Forecast Delay

Junction 40 Forecast Delays (s) – 2029



AM	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A592	30	43	20	13 (45%)	-23 (-53%)
A66 East	18	19	19	1 (5%)	1 (4%)
M6 South	38	41	22	3 (9%)	-19 (-47%)
A66 West	24	40	22	16 (65%)	-18 (-45%)
M6 North	17	23	25	6 (34%)	2 (8%)

IP	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A592	24	40	14	15 (64%)	-26 (-65%)
A66 East	14	17	12	3 (24%)	-6 (-33%)
M6 South	42	54	28	12 (30%)	-28 (-52%)
A66 West	22	32	22	11 (48%)	-10 (-31%)
M6 North	15	17	27	2 (12%)	10 (57%)

PM	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A592	28	87	15	59 (210%)	-72 (-83%)
A66 East	14	18	13	4 (26%)	-6 (-31%)
M6 South	47	77	28	30 (64%)	-51 (-66%)
A66 West	22	36	23	14 (64%)	-14 (-37%)
M6 North	16	18	29	2 (14%)	11 (61%)

Junction 40 Forecast Delays (s) - 2051



AM	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A592	30	77	21	48 (180%)	-56 (-72%)
A66 East	18	20	22	3 (18%)	2 (9%)
M6 South	38	78	23	40 (107%)	-55 (-71%)
A66 West	24	72	23	48 (200%)	-50 (-69%)
M6 North	17	34	38	17 (100%)	3 (10%)

IP	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A592	24	71	15	47 (193%)	-56 (-79%)
A66 East	14	19	13	5 (33%)	-6 (-32%)
M6 South	42	113	27	71 (170%)	-86 (-76%)
A66 West	22	58	24	35 (159%)	-33 (-58%)
M6 North	15	19	35	4 (25%)	15 (80%)

PM	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A592	28	113	16	85 (303%)	-97 (-86%)
A66 East	14	20	14	6 (40%)	-6 (-31%)
M6 South	47	147	27	100 (214%)	-120 (-81%)
A66 West	22	123	25	101 (457%)	-98 (-80%)
M6 North	18	20	63	4 (28%)	43 (212%)

Kemplay Bank Forecast Delays (s) - 2029



AM	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	61	77	27	16 (25%)	-50 (-65%)
A66 East	21	22	17	1 (6%)	-5 (-22%)
A6 South (Kemplay Bank)	20	21	21	1 (6%)	0 (0%)
A66 West	14	18	30	4 (27%)	12 (67%)
A6 North (Bridge Lane)	18	26	26	8 (41%)	0 (1%)

IP	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	44	49	28	5 (12%)	-21 (-43%)
A66 East	20	29	21	9 (43%)	-9 (-29%)
A6 South (Kemplay Bank)	24	30	30	6 (27%)	0 (0%)
A66 West	11	13	16	2 (23%)	2 (19%)
A6 North (Bridge Lane)	18	25	25	7 (41%)	0 (2%)

PM	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	59	72	30	14 (23%)	-42 (-58%)
A66 East	21	33	21	12 (59%)	-12 (-36%)
A6 South (Kemplay Bank)	25	36	35	11 (42%)	0 (-1%)
A66 West	11	14	17	3 (26%)	4 (25%)
A6 North (Bridge Lane)	19	27	27	8 (44%)	0 (1%)

Kemplay Bank Forecast Delays (s) - 2051



AM	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	61	119	30	58 (94%)	-89 (-74%)
A66 East	21	29	18	9 (41%)	-12 (-40%)
A6 South (Kemplay Bank)	20	20	21	0 (0%)	1 (6%)
A66 West	14	24	50	9 (66%)	27 (113%)
A6 North (Bridge Lane)	18	26	27	8 (42%)	1 (3%)

IP	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	44	67	30	23 (52%)	-36 (-54%)
A66 East	20	55	22	34 (168%)	-33 (-60%)
A6 South (Kemplay Bank)	24	33	32	9 (39%)	0 (-1%)
A66 West	11	15	16	4 (40%)	1 (6%)
A6 North (Bridge Lane)	18	25	26	8 (43%)	0 (2%)

PM	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A686 (Carleton Avenue)	59	108	36	49 (84%)	-72 (-67%)
A66 East	21	85	23	64 (306%)	-62 (-73%)
A6 South (Kemplay Bank)	25	49	41	24 (97%)	-9 (-18%)
A66 West	11	16	18	5 (41%)	3 (18%)
A6 North (Bridge Lane)	19	29	28	10 (55%)	-1 (-2%)

Scotch Corner Forecast Delays (s) – 2029



AM	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A1(M) North	15	16	17	1 (6%)	1 (4%)
Middleton Tyas Ln	7	8	9	1 (11%)	1 (7%)
A1(M) South	21	21	22	1 (2%)	1 (4%)
A6108 (Barracks Bank)	19	20	20	1 (4%)	0 (0%)
A66	12	13	14	0 (3%)	1 (7%)
A6055	6	6	6	0 (2%)	0 (3%)

IP	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A1(M) North	18	20	21	2 (10%)	1 (6%)
Middleton Tyas Ln	7	8	9	1 (16%)	1 (9%)
A1(M) South	14	15	15	0 (3%)	0 (3%)
A6108 (Barracks Bank)	15	16	16	1 (7%)	0 (0%)
A66	14	15	16	0 (3%)	2 (10%)
A6055	6	6	6	0 (3%)	0 (4%)

PM	Base 2019	DM 2029	DS 2029	DM vs. Base	DS vs. DM
A1(M) North	19	22	24	3 (17%)	2 (10%)
Middleton Tyas Ln	8	10	11	2 (30%)	1 (12%)
A1(M) South	14	15	16	1 (4%)	1 (9%)
A6108 (Barracks Bank)	16	18	18	3 (17%)	0 (0%)
A66	14	15	17	1 (4%)	2 (13%)
A6055	6	6	6	0 (4%)	1 (9%)

Scotch Corner Forecast Delays (s) – 2051

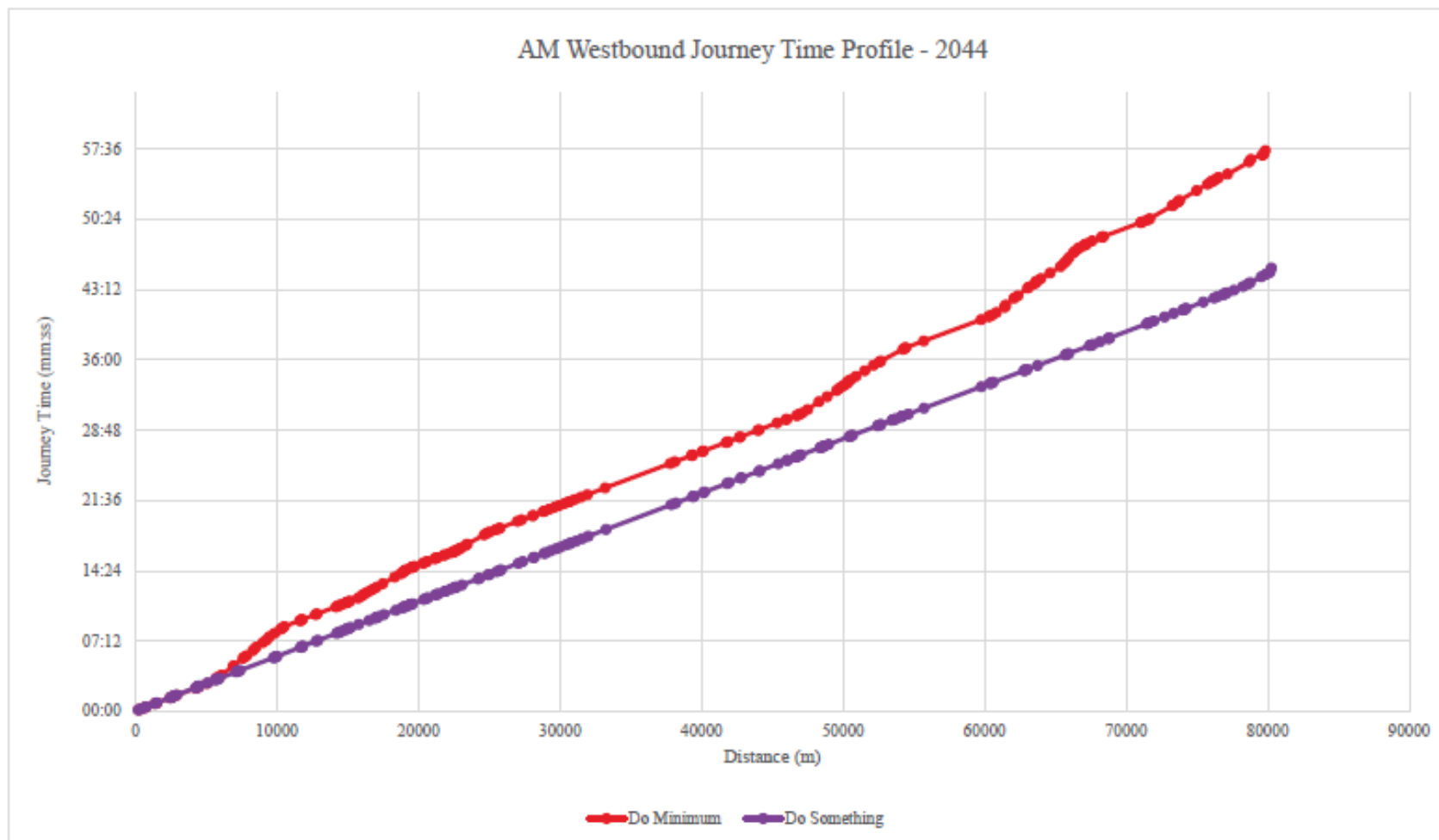


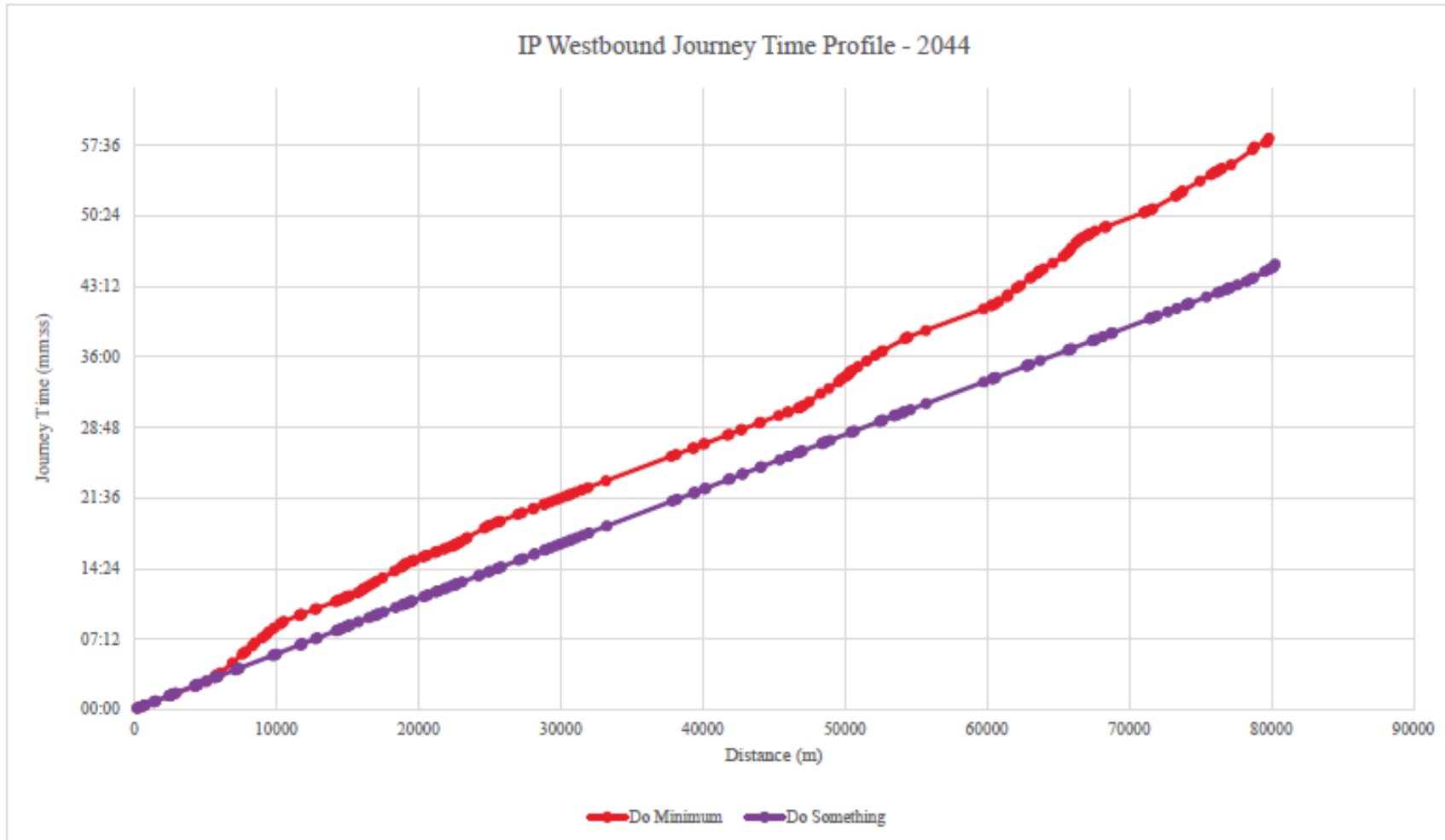
AM	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A1(M) North	15	17	18	2 (11%)	1 (7%)
Middleton Tyas Ln	7	10	12	3 (41%)	2 (16%)
A1(M) South	21	22	24	1 (7%)	1 (6%)
A6108 (Barracks Bank)	19	21	21	2 (8%)	0 (0%)
A66	12	13	15	1 (8%)	2 (13%)
A6055	6	6	6	0 (5%)	0 (8%)

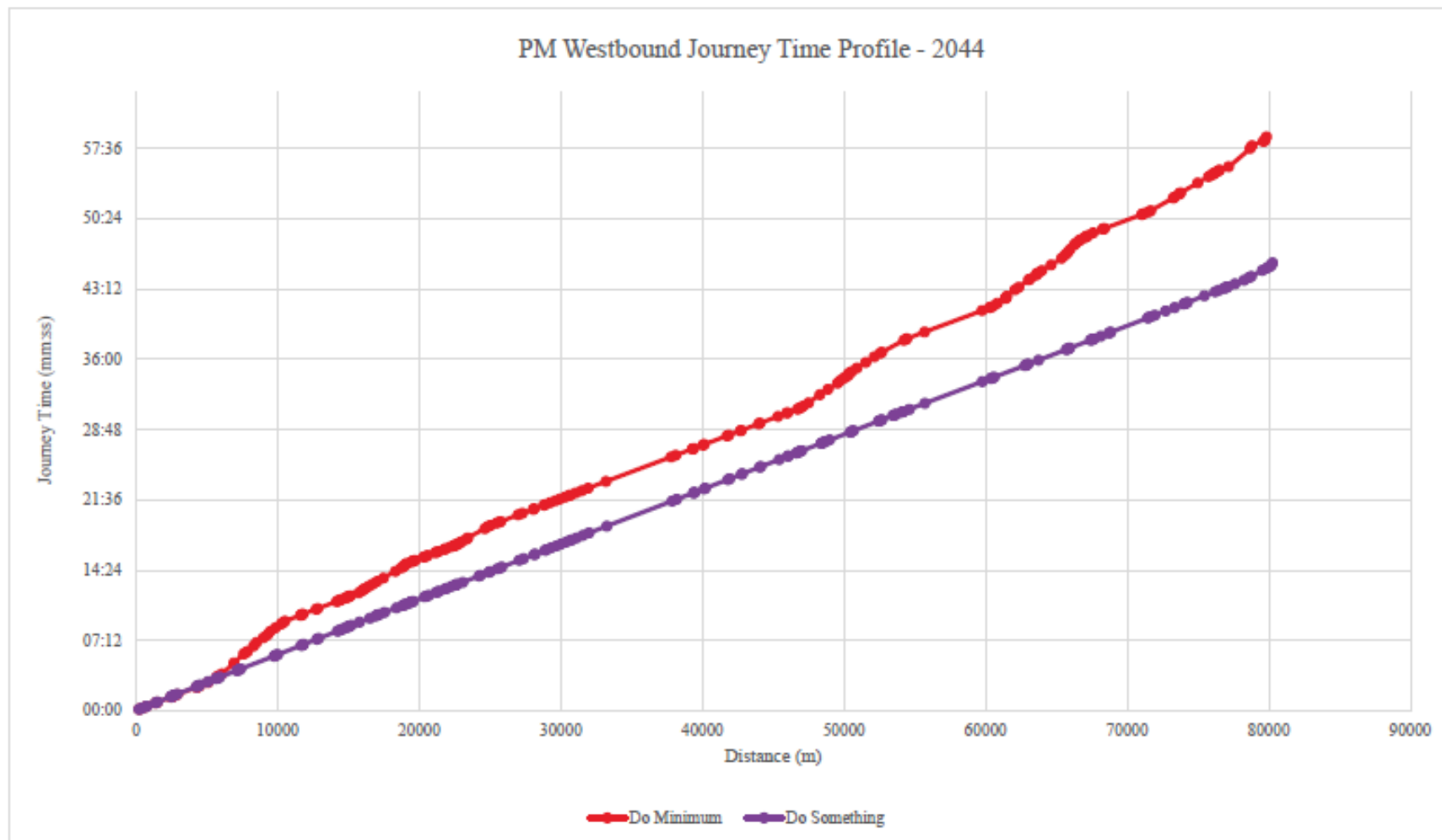
IP	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A1(M) North	18	21	25	3 (18%)	3 (16%)
Middleton Tyas Ln	7	11	12	3 (48%)	2 (15%)
A1(M) South	14	15	16	1 (7%)	1 (5%)
A6108 (Barracks Bank)	15	16	16	2 (10%)	0 (0%)
A66	14	16	18	1 (9%)	2 (15%)
A6055	6	6	6	0 (6%)	0 (8%)

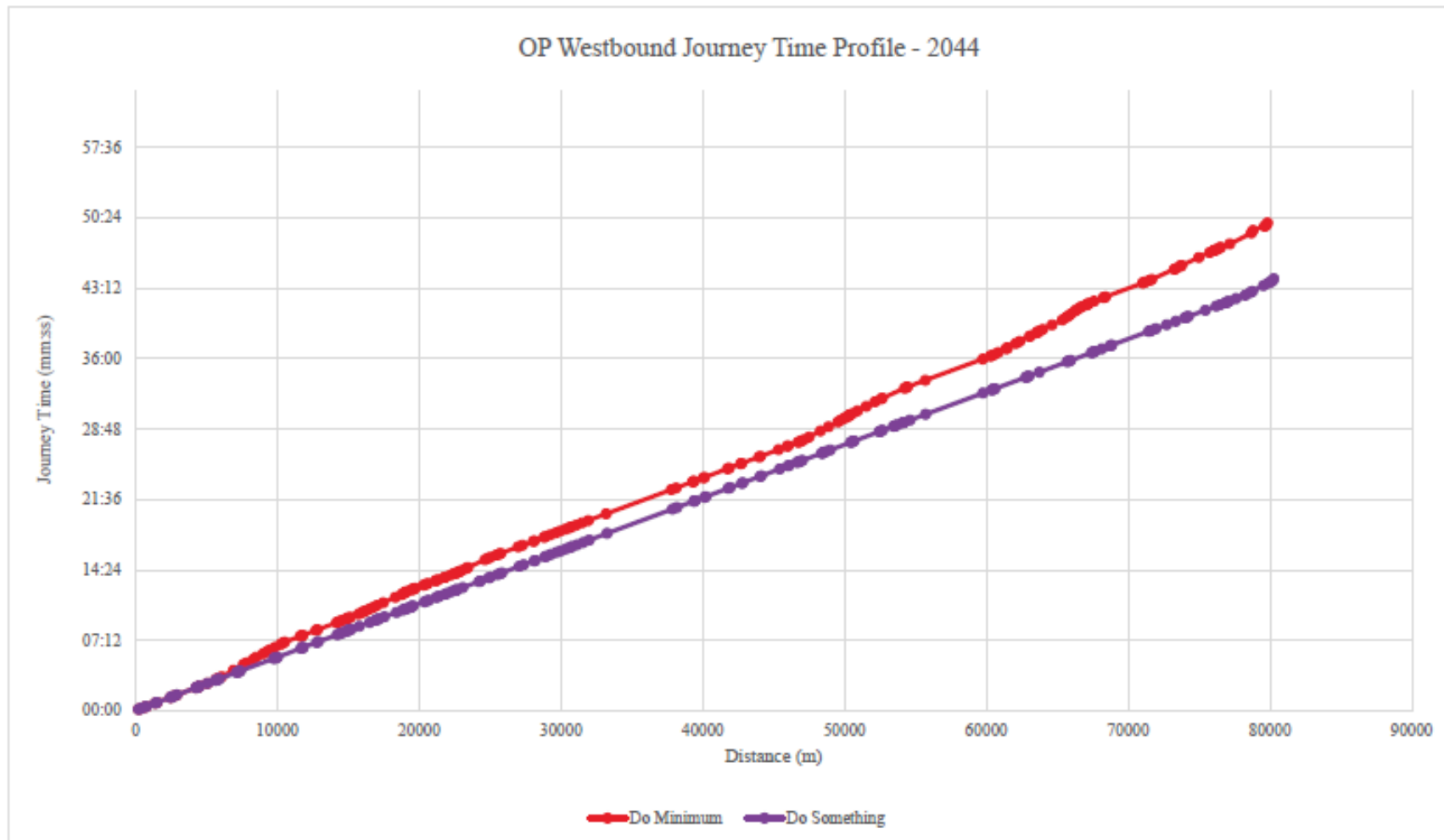
PM	Base 2019	DM 2051	DS 2051	DM vs. Base	DS vs. DM
A1(M) North	19	24	26	5 (27%)	2 (10%)
Middleton Tyas Ln	8	14	15	7 (88%)	1 (7%)
A1(M) South	14	16	18	1 (8%)	2 (12%)
A6108 (Barracks Bank)	16	20	20	4 (28%)	0 (1%)
A66	14	16	19	1 (10%)	3 (19%)
A6055	6	6	7	1 (13%)	1 (13%)

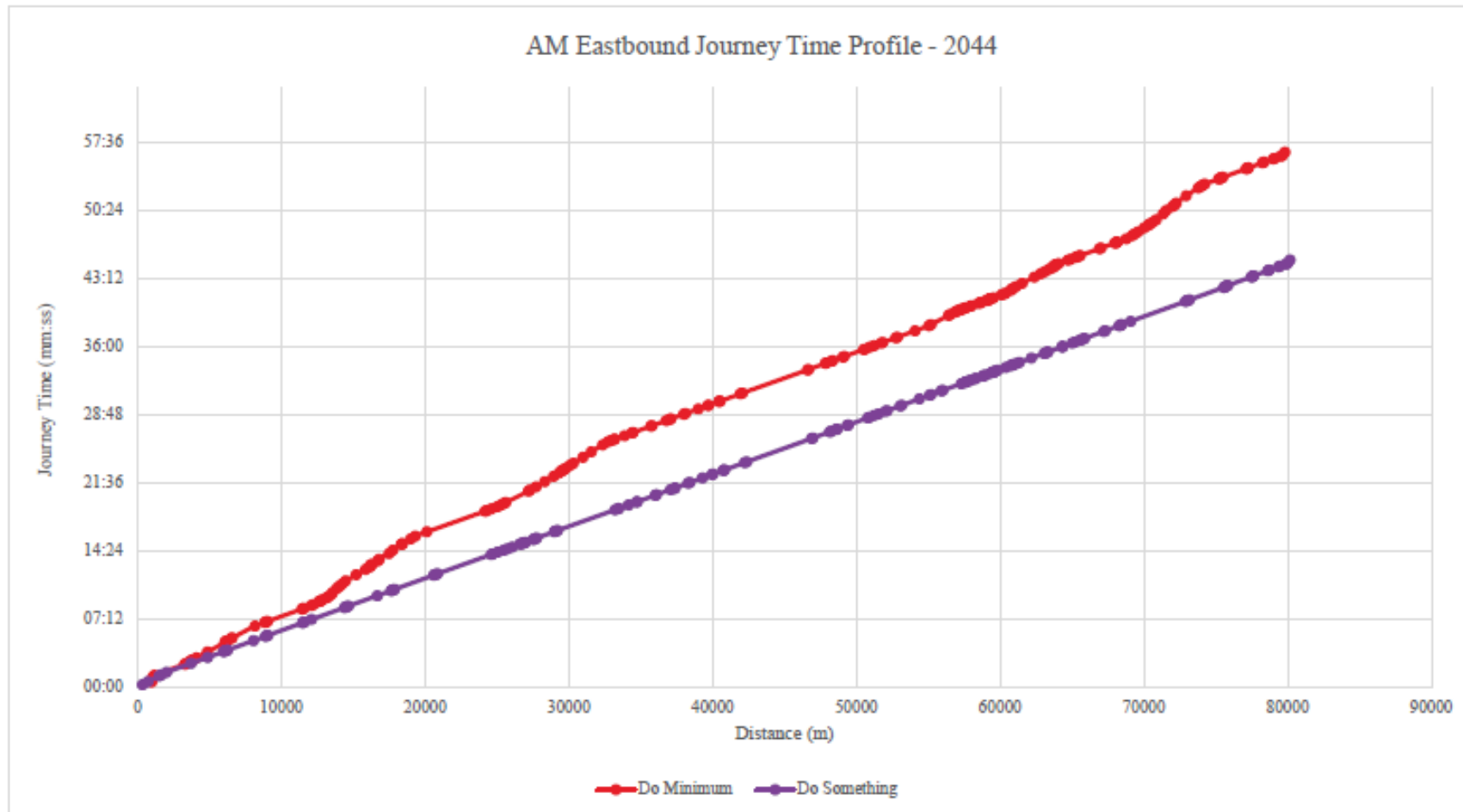
F Core Scenario Journey Time Profiles

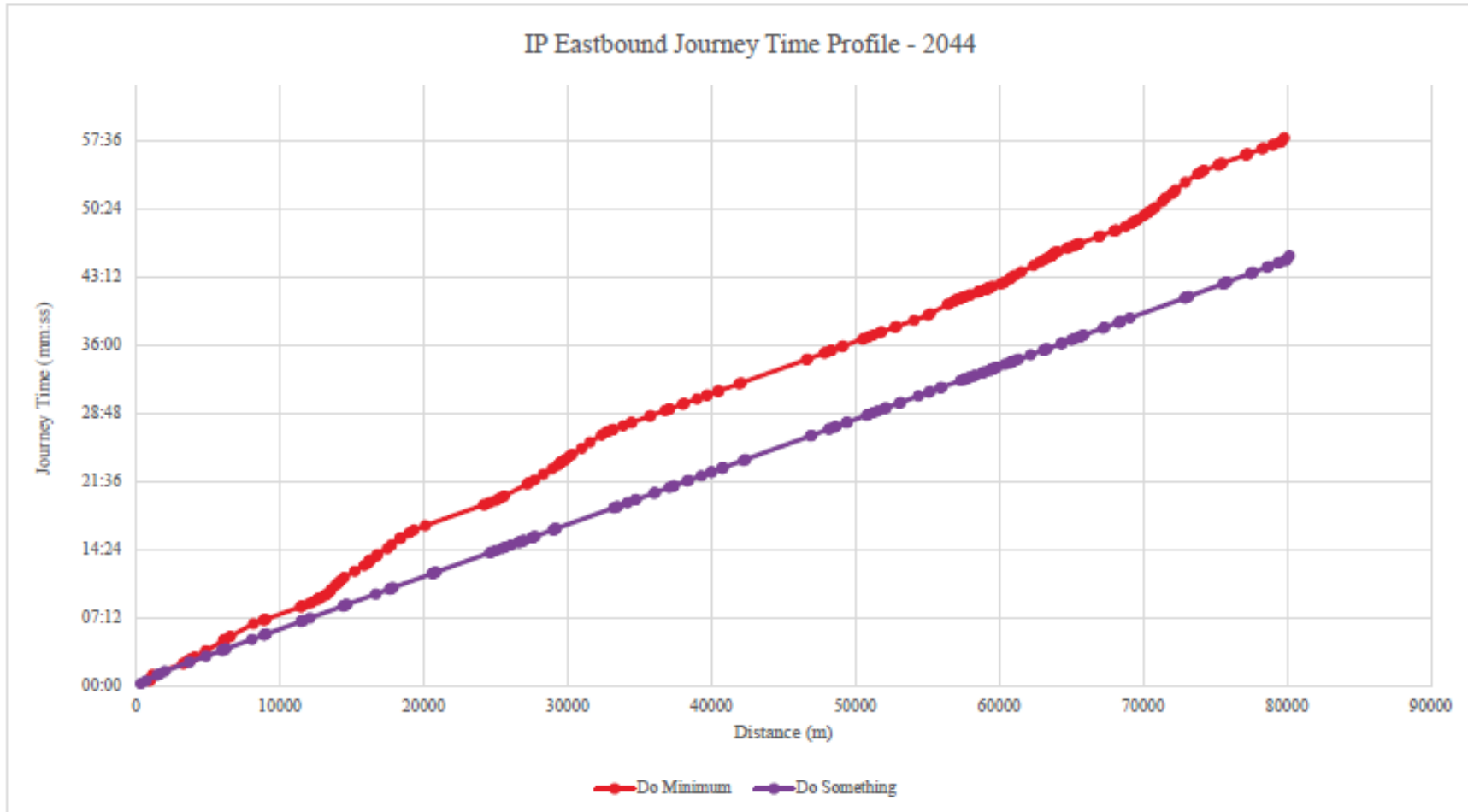


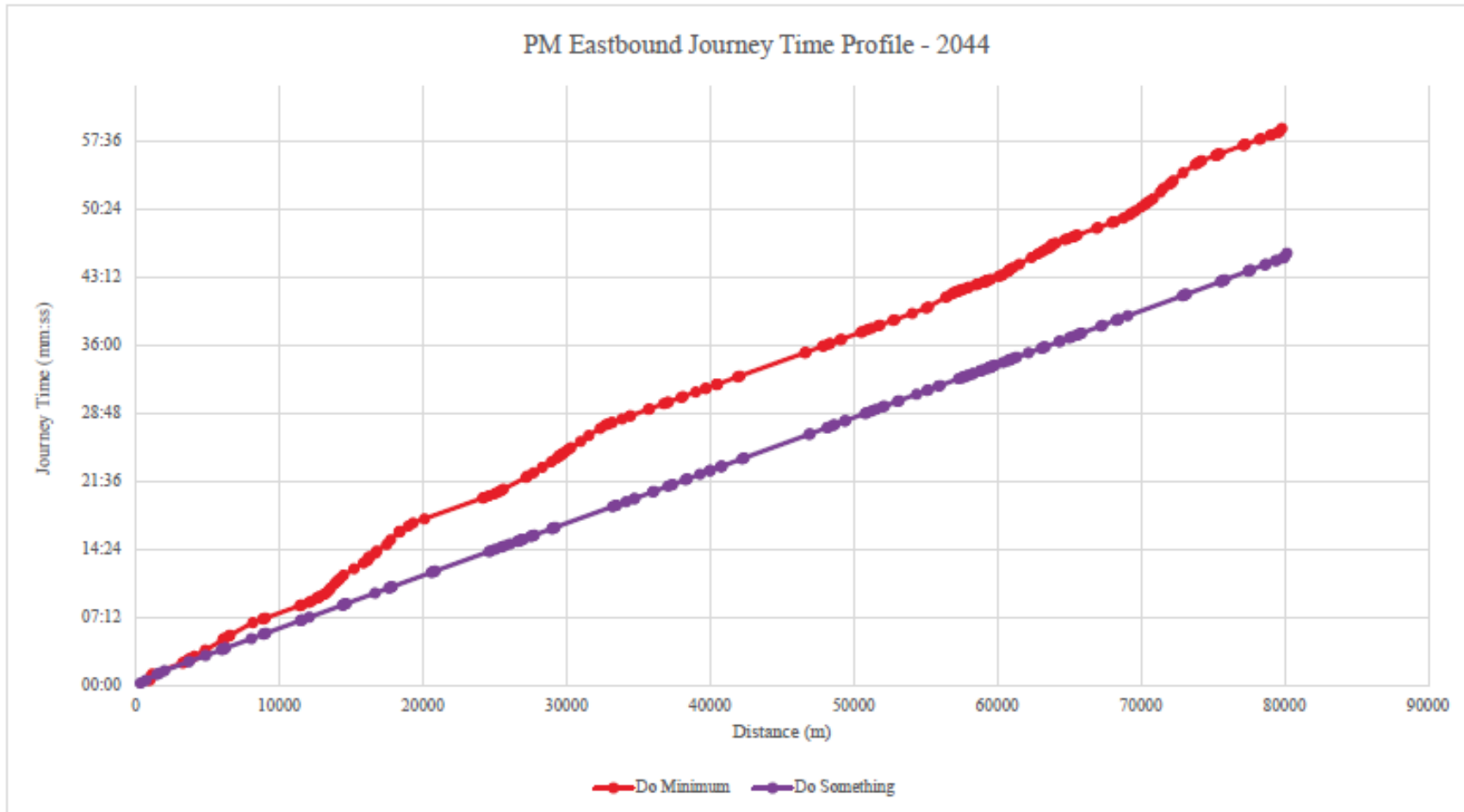


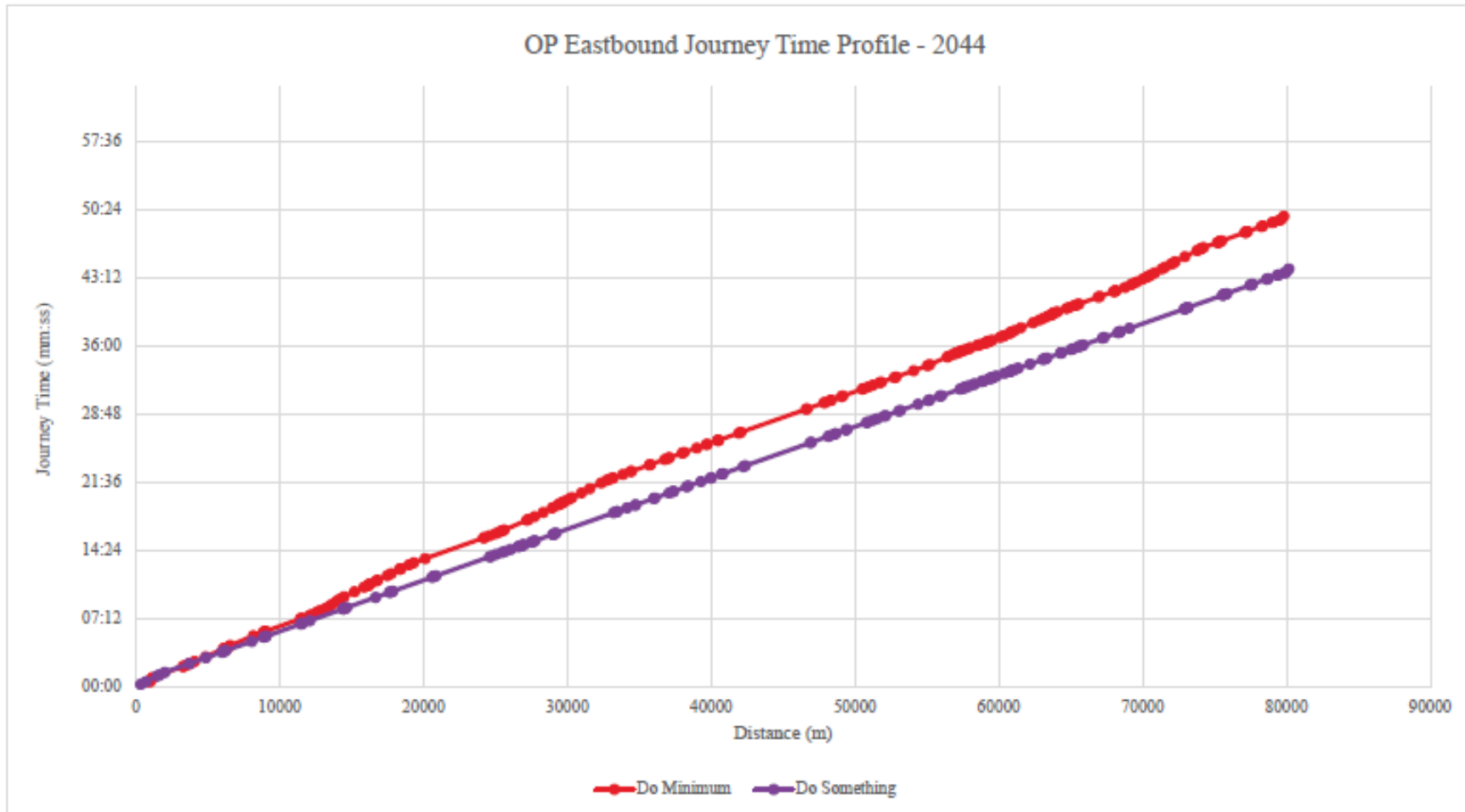












G Sensitivity Test Assignment Convergence

Low Scenario Convergence Statistics

Do Minimum 2029

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
22	98.8	0.000	19	99.3	0.001	25	98.8	0.002
23	99.3	0.000	20	98.6	0.000	26	98.8	0.001
24	98.8	0.000	21	99.7	0.000	27	98.8	0.002
25	98.8	0.000	22	99.2	0.000	28	98.8	0.001

Do Minimum 2044

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
22	98.7	0.000	19	98.8	0.000	28	98.9	0.001
23	99.1	0.000	20	98.9	0.001	29	98.9	0.001
24	99.4	0.000	21	99	0.000	30	98.7	0.001
25	98.7	0.000	22	98.6	0.000	31	99.0	0.001

Do Minimum 2051

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
23	98.6	0.001	19	98.7	0.000	27	98.6	0.002
24	99	0.001	20	98.9	0.001	28	98.7	0.001
25	98.7	0.000	21	99	0.000	29	99	0.001
26	98.9	0.000	22	98.8	0.000	30	99.0	0.002

Do Something 2029

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
20	98.9	0.000	18	99.1	0.000	23	98.6	0.001
21	98.8	0.000	19	98.6	0.000	24	98.7	0.001
22	98.7	0.000	20	99.3	0.000	25	98.8	0.001
23	99.0	0.000	21	98.9	0.000	26	98.7	0.001

Do Something 2044

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
26	99.6	0.000	18	98.6	0.001	30	98.6	0.001
27	99.2	0.000	19	99	0.000	31	99.1	0.001
28	98.8	0.000	20	98.5	0.000	32	99	0.001
29	99.4	0.000	21	98.6	0.001	33	98.7	0.001

Do Something 2051

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
25	98.9	0.000	17	98.7	0.001	31	98.7	0.002
26	99.2	0.001	18	98.6	0.000	32	98.5	0.001
27	98.6	0.000	19	98.7	0.000	33	98.8	0.001
28	99.1	0.000	20	98.8	0.001	34	98.7	0.001

High Scenario Convergence Statistics

Do Minimum 2029

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
26	98.8	0.001	19	98.6	0.000	32	98.8	0.001
27	98.6	0.000	20	99	0.000	33	99	0.001
28	99	0.000	21	98.9	0.000	34	98.9	0.002
29	99.1	0.000	22	99.1	0.000	35	98.7	0.001

Do Minimum 2044

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
38	98.6	0.001	28	98.7	0.001	41	98.7	0.002
39	98.7	0.001	29	99	0.001	42	98.5	0.002
40	98.7	0.001	30	99	0.001	43	98.9	0.002
41	98.7	0.001	31	98.7	0.001	44	98.7	0.002

Do Minimum 2051

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
37	98.6	0.001	39	99.1	0.001	46	98.7	0.002
38	98.6	0.002	40	98.9	0.000	47	99	0.001
39	98.6	0.001	41	99.2	0.000	48	98.8	0.003
40	98.7	0.002	42	99.4	0.001	49	98.8	0.001

Do Something 2029

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
26	99.2	0.000	18	98.6	0.000	26	98.6	0.002
27	99.2	0.000	19	98.5	0.000	27	98.5	0.002
28	98.7	0.000	20	98.8	0.000	28	98.8	0.001
29	99.4	0.000	21	98.8	0.000	29	99.0	0.001

Do Something 2044

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
44	98.5	0.001	27	98.7	0.000	40	98.8	0.002
45	98.7	0.001	28	98.7	0.000	41	98.8	0.002
46	98.9	0.001	29	99	0.001	42	99.1	0.001
47	98.5	0.001	30	99.0	0.001	43	98.8	0.002

Do Something 2051

AM Peak			Inter Peak			PM Peak		
Loop	% Flow	% GAP	Loop	% Flow	% GAP	Loop	% Flow	% GAP
42	99.3	0.001	31	98.8	0.001	47	98.9	0.001
43	98.9	0.002	32	98.8	0.001	48	99.1	0.001
44	98.7	0.001	33	98.8	0.001	49	99	0.002
45	99.2	0.001	34	98.7	0.002	50	98.6	0.002

H Sensitivity Test Network Statistics

Forecast Network Performance – Network Statistics High & Low

Values in the tables represent the following:

- Time – Total Travel Time, pcu hours (000)
- Distance – Total Distance Travelled, pcu kms (000)
- Speed – Total Average Speed, kph
- Trips – Total Trip, (pcu/hr)

Network Statistics – 2029 Values (Low)

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	1,707	119,130	70	1,534,862
	IP	1,194	86,222	72	1,156,390
	PM	1,636	114,199	70	1,548,242
DM Post VDM	AM	1,803	125,921	70	1,596,815
	IP	1,260	91,029	72	1,202,244
	PM	1,733	121,073	70	1,612,817
DS Post VDM	AM	1,803	125,951	70	1,596,816
	IP	1,260	91,076	72	1,202,314
	PM	1,733	121,124	70	1,612,850

Network Statistics – 2029 Differences (Low)

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	5 (0%)	-1,099 (-1%)	-1 (-1%)	-10,959 (-1%)
	IP	6 (0%)	-719 (-1%)	-1 (-1%)	-5,007 (0%)
	PM	6 (0%)	-883 (-1%)	-1 (-1%)	-7,417 (0%)
DM Post VDM vs Reference	AM	96 (6%)	6,791 (6%)	0 (0%)	61,953 (4%)
	IP	66 (6%)	4,807 (6%)	0 (0%)	45,853 (4%)
	PM	98 (6%)	6,874 (6%)	0 (0%)	64,575 (4%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	30 (0%)	0 (0%)	1 (0%)
	IP	0 (0%)	47 (0%)	0 (0%)	70 (0%)
	PM	0 (0%)	51 (0%)	0 (0%)	33 (0%)

Network Statistics – 2029 Values (High)

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	1,983	138,145	70	1,779,278
	IP	1,387	99,962	72	1,340,023
	PM	1,902	132,406	70	1,794,198
DM Post VDM	AM	2,093	145,900	70	1,849,931
	IP	1,462	105,428	72	1,392,619
	PM	2,011	140,200	70	1,866,707
DS Post VDM	AM	2,093	145,938	70	1,849,940
	IP	1,462	105,486	72	1,392,710
	PM	2,012	140,259	70	1,866,749

Network Statistics – 2029 Differences (High)

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	282 (17%)	17,917 (15%)	-1 (-2%)	233,457 (15%)
	IP	198 (17%)	13,021 (15%)	-1 (-1%)	178,627 (15%)
	PM	272 (17%)	17,325 (15%)	-1 (-1%)	238,539 (15%)
DM Post VDM vs Reference	AM	110 (6%)	7,755 (6%)	0 (0%)	70,653 (4%)
	IP	75 (5%)	5,466 (5%)	0 (0%)	52,595 (4%)
	PM	110 (6%)	7,794 (6%)	0 (0%)	72,508 (4%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	38 (0%)	0 (0%)	9 (0%)
	IP	0 (0%)	58 (0%)	0 (0%)	91 (0%)
	PM	0 (0%)	59 (0%)	0 (0%)	42 (0%)

Network Statistics – 2044 Values (Low)

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	1,847	126,931	69	1,636,777
	IP	1,294	91,974	71	1,236,854
	PM	1,768	121,513	69	1,650,753
DM Post VDM	AM	2,095	144,169	69	1,792,493
	IP	1,466	104,276	71	1,354,543
	PM	2,020	139,029	69	1,813,846
DS Post VDM	AM	2,095	144,211	69	1,792,502
	IP	1,466	104,340	71	1,354,645
	PM	2,020	139,093	69	1,813,872

Network Statistics – 2044 Differences (Low)

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	146 (9%)	6,703 (6%)	-2 (-3%)	90,956 (6%)
	IP	105 (9%)	5,032 (6%)	-2 (-3%)	75,457 (6%)
	PM	138 (8%)	6,432 (6%)	-2 (-3%)	95,094 (6%)
DM Post VDM vs Reference	AM	249 (13%)	17,238 (14%)	0 (0%)	155,716 (10%)
	IP	172 (13%)	12,303 (13%)	0 (0%)	117,689 (10%)
	PM	252 (14%)	17,516 (14%)	0 (0%)	163,093 (10%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	41 (0%)	0 (0%)	10 (0%)
	IP	0 (0%)	64 (0%)	0 (0%)	101 (0%)
	PM	0 (0%)	65 (0%)	0 (0%)	26 (0%)

Network Statistics – 2044 Values (High)

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	2,295	157,033	68	2,023,232
	IP	1,605	113,713	71	1,527,203
	PM	2,199	150,350	68	2,039,668

DM Post VDM	AM	2,601	178,342	69	2,215,703
	IP	1,816	128,787	71	1,672,395
	PM	2,506	171,834	69	2,238,807
DS Post VDM	AM	2,601	178,394	69	2,215,727
	IP	1,816	128,870	71	1,672,523
	PM	2,506	171,913	69	2,238,836

Network Statistics – 2044 Differences (High)

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	593 (35%)	36,804 (31%)	-2 (-3%)	477,411 (31%)
	IP	416 (35%)	26,772 (31%)	-2 (-3%)	365,807 (31%)
	PM	570 (35%)	35,268 (31%)	-2 (-3%)	484,009 (31%)
DM Post VDM vs Reference	AM	306 (13%)	21,309 (14%)	0 (0%)	192,471 (10%)
	IP	211 (13%)	15,074 (13%)	0 (0%)	145,192 (10%)
	PM	307 (14%)	21,484 (14%)	0 (0%)	199,138 (10%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	52 (0%)	0 (0%)	24 (0%)
	IP	0 (0%)	83 (0%)	0 (0%)	127 (0%)
	PM	0 (0%)	79 (0%)	0 (0%)	30 (0%)

Network Statistics – 2051 Values (Low)

Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	1,914	130,962	68	1,689,690
	IP	1,342	94,981	71	1,279,119
	PM	1,833	125,444	68	1,706,322
DM Post VDM	AM	2,199	150,683	69	1,867,315
	IP	1,541	109,133	71	1,414,312
	PM	2,123	145,484	69	1,892,400
DS Post VDM	AM	2,199	150,728	69	1,867,342
	IP	1,541	109,205	71	1,414,411
	PM	2,124	145,554	69	1,892,461

Network Statistics – 2051 Differences (Low)

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	213 (13%)	10,733 (9%)	-2 (-3%)	143,869 (9%)
	IP	154 (13%)	8,039 (9%)	-2 (-3%)	117,722 (10%)
	PM	204 (13%)	10,362 (9%)	-2 (-3%)	150,663 (10%)
DM Post VDM vs Reference	AM	286 (15%)	19,721 (15%)	0 (0%)	177,625 (11%)
	IP	199 (15%)	14,152 (15%)	0 (0%)	135,194 (11%)
	PM	290 (16%)	20,040 (16%)	0 (0%)	186,078 (11%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	44 (0%)	0 (0%)	27 (0%)
	IP	0 (0%)	71 (0%)	0 (0%)	98 (0%)
	PM	0 (0%)	70 (0%)	0 (0%)	61 (0%)

Network Statistics – 2051 Values (High)

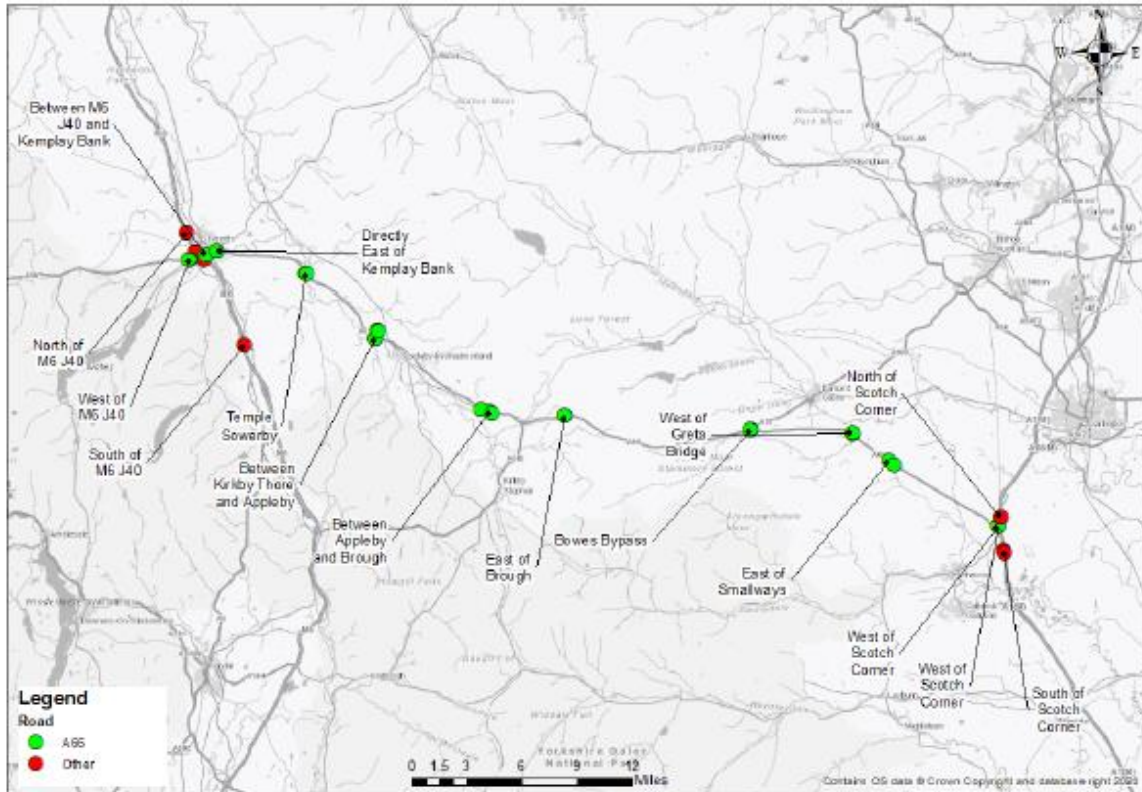
Scenario	Time Period	Time	Distance	Speed	Trips
Base 2019	AM	1,701	120,229	71	1,545,821
	IP	1,189	86,941	73	1,161,397
	PM	1,629	115,082	71	1,555,659
Reference Forecast	AM	2,424	165,032	68	2,126,915
	IP	1,697	119,582	71	1,607,611
	PM	2,326	158,092	68	2,146,329
DM Post VDM	AM	2,780	189,745	68	2,349,505
	IP	1,943	137,116	71	1,776,252
	PM	2,682	182,973	68	2,376,035
DS Post VDM	AM	2,780	189,802	68	2,349,529
	IP	1,943	137,208	71	1,776,380
	PM	2,682	183,058	68	2,376,080

Network Statistics – 2051 Differences (High)

Scenario	Time Period	Time	Distance	Speed	Trips
Reference vs. Base	AM	723 (42%)	44,803 (37%)	-3 (-4%)	581,094 (38%)
	IP	508 (43%)	32,640 (38%)	-3 (-4%)	446,214 (38%)
	PM	696 (43%)	43,011 (37%)	-3 (-4%)	590,670 (38%)
DM Post VDM vs Reference	AM	356 (15%)	24,713 (15%)	0 (0%)	222,591 (10%)
	IP	246 (15%)	17,534 (15%)	0 (0%)	168,641 (10%)
	PM	356 (15%)	24,881 (16%)	0 (0%)	229,706 (11%)
DS Post VDM vs DM Post VDM	AM	0 (0%)	58 (0%)	0 (0%)	24 (0%)
	IP	0 (0%)	92 (0%)	0 (0%)	128 (0%)
	PM	0 (0%)	85 (0%)	0 (0%)	45 (0%)

I Sensitivity Test A66 Flow Tables

Forecast Sensitivity Test Traffic Flows – 2029 & 2051



Low Scenario 12-Hour Traffic Flows (vehicles, two-way) - 2029

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
A66	West of M6 J40	16,584	16,378	17,411	17,963	-206 (-1%)	1,034 (6%)	552 (3%)
A66	Between M6 J40 and Kemplay Bank	25,699	25,773	27,658	31,015	73 (0%)	1,885 (7%)	3,357 (12%)
A66	Directly East of Kemplay Bank	17,598	17,852	18,846	23,602	254 (1%)	994 (6%)	4,756 (25%)
A66	Temple Sowerby	14,459	14,738	15,606	21,051	280 (2%)	868 (6%)	5,445 (35%)
A66	Between Kirkby Thore and Appleby	15,629	15,733	16,703	19,448	104 (1%)	970 (6%)	2,745 (16%)
A66	Between Appleby and Brough	13,038	12,996	13,854	18,854	-42 (0%)	859 (7%)	5,000 (36%)
A66	East of Brough	14,793	15,077	16,331	21,066	284 (2%)	1,253 (8%)	4,736 (29%)
A66	Bowes Bypass	12,701	13,220	14,198	19,272	519 (4%)	978 (7%)	5,074 (36%)
A66	West of Greta Bridge	15,422	15,902	17,034	22,431	480 (3%)	1,132 (7%)	5,397 (32%)
A66	East of Smallways	15,196	15,729	16,813	22,743	533 (4%)	1,084 (7%)	5,930 (35%)
A66	West of Scotch Corner	15,652	16,520	17,578	23,472	868 (6%)	1,058 (6%)	5,894 (34%)
A1(M)	North of Scotch Corner	49,043	52,183	57,532	59,343	3,140 (6%)	5,349 (10%)	1,810 (3%)
A1(M)	South of Scotch Corner	51,079	52,371	57,540	60,124	1,291 (3%)	5,169 (10%)	2,584 (4%)
M6	North of M6 J40	42,658	43,172	47,919	49,049	514 (1%)	4,747 (11%)	1,130 (2%)
M6	South of M6 J40	31,472	31,225	34,286	32,848	-248 (-1%)	3,061 (10%)	-1,438 (-4%)

Low Scenario 12-Hour Traffic Flows (vehicles, two-way) - 2051

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
A66	West of M6 J40	16,584	18,012	20,937	21,823	1,428 (9%)	2,925 (16%)	886 (4%)
A66	Between M6 J40 and Kemplay Bank	25,699	27,889	32,081	37,033	2,190 (9%)	4,192 (15%)	4,953 (15%)
A66	Directly East of Kemplay Bank	17,598	19,847	22,074	29,152	2,049 (12%)	2,427 (12%)	7,079 (32%)
A66	Temple Sowerby	14,459	16,228	18,388	26,244	1,769 (12%)	2,160 (13%)	7,856 (43%)
A66	Between Kirkby Thore and Appleby	15,629	17,171	19,542	24,371	1,542 (10%)	2,371 (14%)	4,829 (25%)
A66	Between Appleby and Brough	13,038	14,261	16,486	23,709	1,223 (9%)	2,225 (16%)	7,223 (44%)
A66	East of Brough	14,793	17,046	20,478	27,558	2,253 (15%)	3,433 (20%)	7,079 (35%)
A66	Bowes Bypass	12,701	15,300	18,020	25,191	2,598 (20%)	2,720 (18%)	7,171 (40%)
A66	West of Greta Bridge	15,422	18,142	20,955	29,047	2,720 (18%)	2,813 (16%)	8,092 (39%)
A66	East of Smallways	15,196	17,916	20,409	29,435	2,720 (18%)	2,493 (14%)	9,026 (44%)
A66	West of Scotch Corner	15,652	18,881	21,645	29,991	3,229 (21%)	2,765 (15%)	8,346 (39%)
A1(M)	North of Scotch Corner	49,043	58,449	71,294	73,362	9,406 (19%)	12,845 (22%)	2,068 (3%)
A1(M)	South of Scotch Corner	51,079	58,539	71,151	74,370	7,459 (15%)	12,613 (22%)	3,219 (5%)
M6	North of M6 J40	42,658	48,479	60,096	61,761	5,821 (14%)	11,618 (24%)	1,664 (3%)
M6	South of M6 J40	31,472	35,192	43,659	41,871	3,720 (12%)	8,466 (24%)	-1,788 (-4%)

High Scenario 12-Hour Traffic Flows (vehicles, two-way) - 2029

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
A66	West of M6 J40	16,584	19,027	19,905	20,658	2,443 (15%)	878 (5%)	753 (4%)
A66	Between M6 J40 and Kemplay Bank	25,699	29,341	30,957	35,724	3,642 (14%)	1,616 (6%)	4,767 (15%)
A66	Directly East of Kemplay Bank	17,598	20,440	21,163	27,093	2,842 (16%)	723 (4%)	5,931 (28%)
A66	Temple Sowerby	14,459	16,522	17,181	24,053	2,063 (14%)	659 (4%)	6,872 (40%)
A66	Between Kirkby Thore and Appleby	15,629	17,919	18,661	22,243	2,290 (15%)	742 (4%)	3,582 (19%)
A66	Between Appleby and Brough	13,038	14,726	15,352	21,619	1,688 (13%)	626 (4%)	6,267 (41%)
A66	East of Brough	14,793	17,030	18,117	23,943	2,237 (15%)	1,088 (6%)	5,826 (32%)
A66	Bowes Bypass	12,701	15,060	15,895	22,042	2,358 (19%)	835 (6%)	6,147 (39%)
A66	West of Greta Bridge	15,422	18,141	19,074	25,695	2,718 (18%)	934 (5%)	6,620 (35%)
A66	East of Smallways	15,196	17,846	18,693	25,995	2,650 (17%)	847 (5%)	7,302 (39%)
A66	West of Scotch Corner	15,652	18,703	19,546	26,728	3,052 (19%)	843 (5%)	7,182 (37%)
A1(M)	North of Scotch Corner	49,043	59,830	64,353	66,351	10787 (22%)	4,523 (8%)	1,998 (3%)
A1(M)	South of Scotch Corner	51,079	60,211	64,897	67,950	9,132 (18%)	4,685 (8%)	3,053 (5%)
M6	North of M6 J40	42,658	49,881	54,547	56,097	7,223 (17%)	4,666 (9%)	1,550 (3%)
M6	South of M6 J40	31,472	36,608	39,665	38,187	5,135 (16%)	3,058 (8%)	-1478 (-4%)

High Scenario 12-Hour Traffic Flows (vehicles, two-way) - 2051

Road	Location	Base 2019	Reference	DM Post VDM	DS Post VDM	DM Ref vs. Base	DM Post VDM vs. Ref	DS Post VDM vs. DM Post VDM
A66	West of M6 J40	16,584	22,923	24,793	26,646	6,340 (38%)	1,870 (8%)	1,853 (7%)
A66	Between M6 J40 and Kemplay Bank	25,699	32,898	35,745	42,802	7,199 (28%)	2,847 (9%)	7,057 (20%)
A66	Directly East of Kemplay Bank	17,598	23,880	24,957	33,833	6,263 (36%)	1,096 (5%)	8,877 (36%)
A66	Temple Sowerby	14,460	18,918	20,175	29,938	4,460 (31%)	1,256 (7%)	9,763 (48%)
A66	Between Kirkby Thore and Appleby	15,629	20,469	21,935	27,887	4,840 (31%)	1,465 (7%)	5,952 (27%)
A66	Between Appleby and Brough	13,038	16,901	18,448	27,161	3,863 (30%)	1,547 (9%)	8,713 (47%)
A66	East of Brough	14,793	20,561	23,368	31,103	5,768 (39%)	2,807 (14%)	7,735 (33%)
A66	Bowes Bypass	12,701	18,341	20,221	28,322	5,640 (44%)	1,880 (10%)	8,100 (40%)
A66	West of Greta Bridge	15,422	21,575	23,699	33,096	6,153 (40%)	2,124 (10%)	9,397 (40%)
A66	East of Smallways	15,196	20,496	21,724	33,090	5,300 (35%)	1,228 (6%)	11366 (52%)
A66	West of Scotch Corner	15,652	22,339	23,721	33,179	6,687 (43%)	1,382 (6%)	9,459 (40%)
A1(M)	North of Scotch Corner	49,043	70,597	79,615	81,576	21553 (44%)	9,018 (13%)	1,961 (2%)
A1(M)	South of Scotch Corner	51,079	71,709	82,397	84,999	20630 (40%)	10687 (15%)	2,603 (3%)
M6	North of M6 J40	42,658	60,823	72,403	74,139	18165 (43%)	11580 (19%)	1,736 (2%)
M6	South of M6 J40	31,472	45,934	55,058	54,154	14461 (46%)	9,124 (20%)	-904 (-2%)

Low Scenario Vehicle Flows by Vehicle Type (two-way) - 2029

Road	Location	Scenario	AM (veh/ hr)		IP (veh/ hr)		PM (veh/ hr)	
			Lights	Heavies	Lights	Heavies	Lights	Heavies
A66	East of M6 J40	Base	1,928 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,079 (84%)	388 (16%)	1,890 (83%)	376 (17%)	2,280 (87%)	334 (13%)
		DS	2,335 (85%)	403 (15%)	2,130 (84%)	391 (16%)	2,650 (88%)	355 (12%)
A66	East of Brough	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,078 (81%)	247 (19%)	1,178 (82%)	261 (18%)	1,225 (83%)	256 (17%)
		DS	1,382 (84%)	267 (16%)	1,554 (85%)	275 (15%)	1,751 (86%)	276 (14%)
A66	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,200 (83%)	251 (17%)	1,182 (80%)	296 (20%)	1,413 (83%)	284 (17%)
		DS	1,576 (85%)	273 (15%)	1,654 (84%)	310 (16%)	2,077 (87%)	305 (13%)

High Scenario Vehicle Flows by Vehicle Type (two-way) - 2029

Road	Location	Scenario	AM (veh/ hr)		IP (veh/ hr)		PM (veh/ hr)	
			Lights	Heavies	Lights	Heavies	Lights	Heavies
A66	East of M6 J40	Base	1,928 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,317 (84%)	448 (16%)	2,115 (83%)	436 (17%)	2,501 (87%)	388 (13%)
		DS	2,666 (85%)	473 (15%)	2,469 (84%)	458 (16%)	3,009 (88%)	416 (12%)
A66	East of Brough	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,186 (81%)	286 (19%)	1,295 (81%)	305 (19%)	1,335 (82%)	299 (18%)
		DS	1,574 (83%)	313 (17%)	1,755 (84%)	322 (16%)	1,971 (86%)	324 (14%)
A66	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,323 (82%)	294 (18%)	1,310 (79%)	346 (21%)	1,525 (82%)	332 (18%)
		DS	1,816 (85%)	323 (15%)	1,871 (84%)	363 (16%)	2,324 (87%)	357 (13%)

Low Scenario Vehicle Flows by Vehicle Type (two-way) - 2051

Road	Location	Scenario	AM (veh/ hr)		IP (veh/ hr)		PM (veh/ hr)	
			Lights	Heavies	Lights	Heavies	Lights	Heavies
A66	East of M6 J40	Base	1,928 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,447 (86%)	394 (14%)	2,261 (86%)	383 (14%)	2,681 (89%)	338 (11%)
		DS	2,802 (87%)	406 (13%)	2,662 (87%)	392 (13%)	3,197 (90%)	357 (10%)
A66	East of Brough	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,397 (85%)	251 (15%)	1,538 (85%)	269 (15%)	1,603 (86%)	260 (14%)
		DS	1,861 (87%)	272 (13%)	2,132 (88%)	278 (12%)	2,354 (89%)	279 (11%)
A66	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,497 (85%)	260 (15%)	1,547 (84%)	305 (16%)	1,767 (86%)	285 (14%)
		DS	2,090 (88%)	282 (12%)	2,244 (88%)	315 (12%)	2,617 (90%)	305 (10%)

High Scenario Vehicle Flows by Vehicle Type (two-way) - 2051

Road	Location	Scenario	AM (veh/ hr)		IP (veh/ hr)		PM (veh/ hr)	
			Lights	Heavies	Lights	Heavies	Lights	Heavies
A66	East of M6 J40	Base	1,928 (82%)	415 (18%)	1,702 (81%)	407 (19%)	2,010 (85%)	363 (15%)
		DM	2,697 (85%)	492 (15%)	2,510 (84%)	471 (16%)	2,862 (88%)	401 (12%)
		DS	3,233 (86%)	513 (14%)	3,019 (86%)	497 (14%)	3,647 (89%)	453 (11%)
A66	East of Brough	Base	939 (78%)	264 (22%)	1,019 (78%)	281 (22%)	1,073 (80%)	276 (20%)
		DM	1,581 (83%)	320 (17%)	1,721 (83%)	341 (17%)	1,776 (84%)	332 (16%)
		DS	2,078 (86%)	344 (14%)	2,364 (87%)	354 (13%)	2,608 (88%)	356 (12%)
A66	West of Scotch Corner	Base	1,026 (79%)	269 (21%)	1,008 (76%)	319 (24%)	1,180 (79%)	305 (21%)
		DM	1,699 (86%)	286 (14%)	1,679 (83%)	354 (17%)	1,845 (85%)	333 (15%)
		DS	2,333 (87%)	358 (13%)	2,433 (86%)	402 (14%)	2,786 (88%)	369 (12%)

J Sensitivity Test Journey Times

Low Scenario Journey Times (mm:ss)

2029

Time Period	Direction	Base 2019	Do-Minimum (DM)	Do-Something (DS)	DM vs. Base	DS vs. DM
AM	A66 - Eastbound	53:20	53:50	44:39	00:30 (1%)	-09:12 (-17%)
	A66 - Westbound	54:11	54:37	44:55	00:26 (1%)	-09:42 (-18%)
IP	A66 - Eastbound	54:11	54:48	44:55	00:35 (1%)	-09:52 (-18%)
	A66 - Westbound	54:05	54:51	44:48	00:45 (1%)	-10:02 (-18%)
PM	A66 - Eastbound	54:49	55:23	45:01	00:34 (1%)	-10:22 (-19%)
	A66 - Westbound	54:28	55:14	45:08	00:49 (1%)	-10:08 (-18%)
OP	A66 - Eastbound	49:25	49:27	44:07	00:02 (0%)	-05:20 (-11%)
	A66 - Westbound	49:24	49:34	44:09	00:10 (0%)	-05:25 (-11%)

2044

Time Period	Direction	Base 2015	Do-Minimum (DM)	Do-Something (DS)	DM vs. Base	DS vs. DM
AM	A66 - Eastbound	53:20	55:08	44:56	01:47 (3%)	-10:12 (-18%)
	A66 - Westbound	54:11	55:56	45:12	01:45 (3%)	-10:45 (-19%)
IP	A66 - Eastbound	54:11	56:28	45:19	02:17 (4%)	-11:09 (-20%)
	A66 - Westbound	54:05	56:46	45:11	02:40 (5%)	-11:35 (-20%)
PM	A66 - Eastbound	54:49	57:24	45:28	02:35 (5%)	-11:56 (-21%)
	A66 - Westbound	54:28	56:54	45:37	02:29 (5%)	-11:17 (-20%)
OP	A66 - Eastbound	49:25	49:33	44:08	00:09 (0%)	-05:25 (-11%)
	A66 - Westbound	49:24	49:45	44:10	00:20 (1%)	-05:34 (-11%)

2051

Time Period	Direction	Base 2019	Do-Minimum (DM)	Do-Something (DS)	DM vs. Base	DS vs. DM
AM	A66 - Eastbound	53:20	55:39	45:02	02:18 (4%)	-10:37 (-19%)
	A66 - Westbound	54:11	56:30	45:20	02:19 (4%)	-11:10 (-20%)
IP	A66 - Eastbound	54:11	57:08	45:27	02:57 (5%)	-11:41 (-20%)
	A66 - Westbound	54:05	57:25	45:20	03:20 (6%)	-12:05 (-21%)
PM	A66 - Eastbound	54:49	58:01	45:36	03:12 (6%)	-12:24 (-21%)
	A66 - Westbound	54:28	57:44	45:50	03:19 (6%)	-11:54 (-21%)
OP	A66 - Eastbound	49:25	49:37	44:08	00:12 (0%)	-05:28 (-11%)
	A66 - Westbound	49:24	49:49	44:11	00:25 (1%)	-05:38 (-11%)

High Scenario Journey Times (mm:ss)

2029

Time Period	Direction	Base 2019	Do-Minimum (DM)	Do-Something (DS)	DM vs. Base	DS vs. DM
AM	A66 - Eastbound	53:20	55:25	44:55	02:05 (4%)	-10:30 (-19%)
	A66 - Westbound	54:11	56:16	45:13	02:05 (4%)	-11:03 (-20%)
IP	A66 - Eastbound	54:11	56:30	45:15	02:19 (4%)	-11:15 (-20%)
	A66 - Westbound	54:05	56:43	45:05	02:38 (5%)	-11:38 (-21%)
PM	A66 - Eastbound	54:49	57:28	45:23	02:39 (5%)	-12:05 (-21%)
	A66 - Westbound	54:26	57:05	45:32	02:40 (5%)	-11:33 (-20%)
OP	A66 - Eastbound	49:25	49:37	44:08	00:13 (0%)	-05:30 (-11%)
	A66 - Westbound	49:24	49:43	44:10	00:19 (1%)	-05:33 (-11%)

2044

Time Period	Direction	Base 2015	Do-Minimum (DM)	Do-Something (DS)	DM vs. Base	DS vs. DM
AM	A66 - Eastbound	53:20	57:35	45:22	04:15 (8%)	-12:13 (-21%)
	A66 - Westbound	54:11	59:27	45:46	05:16 (10%)	-13:41 (-23%)
IP	A66 - Eastbound	54:11	59:26	45:42	05:15 (10%)	-13:44 (-23%)
	A66 - Westbound	54:05	00:09	45:45	06:04 (11%)	-14:24 (-24%)
PM	A66 - Eastbound	54:49	00:39	45:55	05:50 (11%)	-14:44 (-24%)
	A66 - Westbound	54:26	01:11	46:19	06:45 (12%)	-14:51 (-24%)
OP	A66 - Eastbound	49:25	49:53	44:10	00:28 (1%)	-05:43 (-11%)
	A66 - Westbound	49:24	50:06	44:12	00:41 (1%)	-05:54 (-12%)

2051

Time Period	Direction	Base 2019	Do-Minimum (DM)	Do-Something (DS)	DM vs. Base	DS vs. DM
AM	A66 - Eastbound	53:20	58:19	45:25	04:59 (9%)	-12:54 (-22%)
	A66 - Westbound	54:11	00:58	46:03	06:47 (13%)	-14:55 (-24%)
IP	A66 - Eastbound	54:11	00:25	45:58	06:14 (12%)	-14:27 (-24%)
	A66 - Westbound	54:05	01:36	45:57	07:31 (14%)	-15:39 (-25%)
PM	A66 - Eastbound	54:49	02:02	46:11	07:13 (13%)	-15:50 (-26%)
	A66 - Westbound	54:26	02:40	46:37	08:14 (15%)	-16:03 (-26%)
OP	A66 - Eastbound	49:25	50:00	44:11	00:36 (1%)	-05:49 (-12%)
	A66 - Westbound	49:24	50:14	44:13	00:49 (2%)	-06:00 (-12%)