M3 Junction 9 Improvement

Scheme Number: TR010055

7.13 Transport Assessment Report (Rev 1) Tracked

APFP Regulations 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 7

6 June ~~November~~ 2022~~3~~

Infrastructure Planning

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

M3 Junction 9 Improvement
Development Consent Order 202[X]

7.13 TRANSPORT ASSESSMENT REPORT

Regulation Number:	Regulation 5(2)q
Planning Inspectorate Scheme Reference:	TR010055
Application Document Reference:	7.13
BIM Document Reference:	HE 551511-VFK-GEN-X_XXXX_XX-RP-TR-0007
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Version	Date	Status of Version
Rev 0	November 2022	Application Submission
Rev 1	6 June 2023	Deadline 1 Submission

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Glossary

AADT: Annual Average Daily Traffic

ATC: Automatic Traffic Count

BCR: Benefit Cost Ratio

Buffer: Buffer network is a simplified version of the simulation network for locations away from area of interest

COBALT: Cost Benefit Analysis Light Touch (Accident Software)

Convergence: The seek for network stability (Wardrop's First Principle of Traffic Equilibrium or User Equilibrium)

CTM: Construction Traffic Management

DCO: Development Consent Order

Delta statistic or % gap: The difference between the costs along the chosen routes and those along the minimum cost routes, summed across the whole network, and expressed as a percentage of the minimum costs, usually known as 'Delta' or the '%GAP

DM: Do-Minimum

DMRB: Design Manual for Roads and Bridges

DS: Do-Something

EIA: Environmental Impact Assessment

ES: Environmental Statement

GEH: Geoffrey E. Havers statistic formula

HGV: Heavy Goods Vehicle

LGV: Light Goods Vehicle

Link Flow: Number of PCU/hr

Matrix estimation: Refine estimates of movements which have been synthesised

MCC: Manual Classified Count

MCTC: Manual Classified Turning Count

ME: Matrix Estimation

NPV: Net Present Value

NTEM: National Trip End Model

OD: Origin / Destination

OGV: Ordinary Goods Vehicle

PCF: Project Control Framework

PCU: Passenger Car Unit

PPK: Pence per Kilometre

PPM: Pence per Minute

PVB: Present Value of Benefits

PVC: Present Value of Costs
RTF: Road Traffic Forecasts
SATURN: Strategic Transport Modelling software
SERTM: South East Regional Transport Model
TAG: Transport Analysis Guidance
TEE: Transport Economic Efficiency
TUBA: Transport User Benefits Appraisal software
UL: Uncertainty Log
VDM: Variable Demand Model
VISSIM: Micro-Simulation Transport Modelling software
VOC: Vehicle Operating Costs
WITA: Wider Impacts in Transport Appraisal software

Executive summary

Purpose

The M3 Junction 9 Improvement project (the Scheme) is a Nationally Significant Infrastructure Project (NSIP). The Scheme therefore requires an application for a Development Consent Order (DCO) to be submitted to the Planning Inspectorate, acting on behalf of the Secretary of State (SoS).

This Transport Assessment Report forms part of Volume 7 of the application for a DCO authorising National Highways (the Applicant) to construct and operate the Scheme. The Transport Assessment is intended to provide a description of the existing transport features, an outline of relevant policy context, a summary of the transport modelling work undertaken and a description of traffic impacts and benefits arising from the Scheme. The purpose of these works has been to:

- Measure the impacts of the Scheme on the highway network
- Provide traffic flow inputs to the design of the Scheme
- Provide traffic flow inputs to the Environmental Statement (ES)
- Assess cycling and walking provision

The M3 Junction 9 is a key transport interchange connecting South Hampshire (facilitating an intensive freight-generating industry) and the wider sub-region, with London via the M3 and with the Midlands and the North of England via the A34 (which also links to the principal east-west A303 and M4 corridors). The M3 is also a key strategic route for freight traffic accessing the Port of Southampton. In addition, Junction 9 is one of the access points to the City of Winchester from the M3 motorway. As a result, the Scheme would have an impact not only on the Strategic Road Network (SRN), but also to some extent on the local traffic to and from Winchester.

Background

The Scheme was developed in the Applicant's Project Control Framework (PCF) and this report provides an overview of the development and assessment of PCF Stage 3 (Preliminary Design).

After the statutory consultation in 2019, a design review of the Scheme was undertaken addressing key issues that were raised during this consultation. Two further design solutions to those proposed at the 2019 statutory consultation were assessed against a set of multi-disciplinary criteria including economic impacts and value for money. After completion of the PCF Stage 3a, further design work was undertaken in PCF Stage 3b. A statutory consultation was undertaken as part of Stage 3b and the Applicant has subsequently further developed the Scheme and the DCO application documents following statutory consultation.

Policy

The following policies and strategies have been reviewed in relation to the Scheme in the **Case for the Scheme (Document Reference 7.1)**:

- National Networks National Policy Statement (2014)
- National Planning Policy Framework (2021)
- Road Investment Strategy 2 (2020)
- Winchester Local Plan 2013 and Winchester District Local Plan, Emerging, 2018-2038
- South Downs Local Plan (adopted July 2019)
- Hampshire Local Transport Plan 3 (2011)
- Winchester Movement Strategy (2021)

Current issues

At M3 Junction 9 the northbound and southbound movements between the M3, south of the Junction, and the A34 to the north, are particularly significant. There are very high flows from the A34/A33 to and from the M3 southbound and there are also queues on the M3 northbound off-slip that regularly back onto the mainline carriageway, resulting in delays for both M3 northbound through traffic and traffic seeking to leave the motorway. Such issues are particularly prevalent during peak periods. Observed data indicates that AM and PM peak period journey times are more than 2 minutes (+20%) longer than the interpeak period on routes via M3 Junction 9 indicating congestion.

There have been accidents on the circulatory area involving rear end shunts where drivers may have failed to anticipate slowing traffic. Although these are not shown up as clusters within the accident data, they appear to be related to congestion on the A34 and M3 north bound and the M3 Junction 9 roundabout.

Traffic model development

The Scheme assessment has adopted the existing (2015) M3M27 SMI model , which was based on the Applicant's South East Regional Traffic Model (SERTM) (2015).

As part of the M3 Junction 9 Improvement programme, the M3M27 SMI model underwent several further enhancements for the purpose of the assessment. This model is referred to as the M3 Junction 9 Model. Calibration and validation focussed on the area of Winchester to strengthen the model and make it suitable for the analysis of impacts of the Scheme. The enhanced model is referred to as the M3 Junction 9 Model.

In PCF Stage 2 (Options Selection) an operational assessment model was developed using PTV-VISSIM micro-simulation software (version 11). Referred to as the operational model, this was used to test the updated Scheme in Preliminary Design.

The forecasting process followed the guidance set out in TAG Unit M4 related to forecasting and uncertainty. Further details of the forecasting method can be found in **Chapter 4** of the **ComMA (Document Reference 7.10)**. The forecast demand matrices for the operational model were prepared using growth rates derived from the M3 Junction 9 Model. As part of the forecasting appraisal, low and high growth sensitivity tests were developed using TAG methodology.

Future 'without-Scheme' results

From analysis of the results of the M3 Junction 9 Model, the Do-Minimum ('without Scheme') network shows a significant number of roads with proximity to Junction 9 predicted to be close to or exceeding theoretical capacity.

Analysis of the operational model in the Do-Minimum ('without Scheme') in 2047 shows that there are predicted to be significant delays above free-flow journey time at Junction 9. The model predicts delays on the Easton Lane approach at Junction 9 of the M3 (from Winchester city centre) of 165 seconds in the AM peak and 90 seconds in the PM peak. On the A34 approach to Junction 9 there was a predicted delay of 30 to 40 seconds in the AM and PM peaks with a predicted average queue length of 870m (maximum queue length of 2,000m) in the PM peak.

The Scheme

The improvements proposed as part of the Scheme both maintain existing connectivity on the road network, whilst providing enhanced capacity, simplified routing and improved facilities for walking, cycling and horse-riding routes and landscaping enhancements. The Scheme would provide new free flow links between the M3 and A34, as well as a dedicated new A33 alignment.

The removal of A34 traffic on the M3 Junction 9 gyratory with the Scheme in place reduces congestion at this location and increases the attractiveness of A272/A31 Spitfire Link as an access route to the M3 and Winchester City; attracting traffic that would otherwise be diverting onto other routes in the local network.

The flows on a number of local roads within Winchester City are predicted to decrease. One reason is that, in the Do-Minimum scenario, traffic diverts through Winchester to avoid the delays at Junction 9. The introduction of the Scheme reduces the incentive to avoid the Junction with a predicted reduction in traffic flows across the city.

The operational model showed the proposed improvements are predicted to reduce queuing and delay at Junction 9. Most significantly at the A33 (old A34 approach), where average queuing in the Do-Minimum 2047 forecast is over 0.8 kilometres, which is removed with the introduction of the Scheme.

Safety

Out of the 80 collisions, in the 5 years from 2015-2019, there were 106 casualties, 87 casualties were involved in slight collisions, 15 in serious collisions and 4 casualties involved in a fatal collision.

The fatal collision was located on the M3 northbound diverge to the off-slip at Junction 9 where there are a cluster of collisions.

The recorded collisions on the M3 have several factors, including shunt collisions where drivers have not anticipated slowing traffic, loss of control, poor driving conditions leading to aquaplaning, and lane change manoeuvres.

The impact of the Scheme on accidents over a 60-year period was assessed using DfT COBALT1 software. This shows a reduction of 537 accidents with the Scheme in place compared to without. This includes a reduction in 696 slight casualties, 59 serious, and 9 fatal casualties.

Sustainable transport

There are direct bus services linking Winchester with surrounding villages and between Eastleigh and Winchester. However, no bus services in the study area directly use the M3 Junction 9. There are presently no changes to the bus network as a result of the Scheme although there may be future scope for them to change following completion of the Scheme.

There is a rail line running between Southampton, Eastleigh and Winchester into Basingstoke and London which can provide public transport connectivity for people travelling along the M3 Corridor. There are no changes to the rail network as a result of the Scheme.

Walking, cycling and horse-riding

Counts of cyclists and pedestrians were undertaken to understand current movements. In September 2016, Tracsis carried out cycle and pedestrian count surveys at the M3 Junction 9 roundabout. Counts were carried out for 24 hours on Thursday 8 and Saturday 10 September 2016.

Across both days, 256 movements were observed across all sites. Cyclists and pedestrians may conflict with each other throughout the extent of the facilities especially on the approaches to subways where paths from different directions merge together.

[1] COBALT (Cost and Benefit to Accidents – Light Touch) https://www.gov.uk/government/publications/tag-unit-a4-1-social-impact-appraisal

The Scheme provides opportunities for upgraded footway, cycleway and horse-riding and vulnerable use facilities. These elements are incorporated within the Scheme design.

Construction

The construction phase of the Scheme is estimated to commence in late 2024, with operation anticipated to commence in winter 2027. The construction phase would be programmed and sequenced to reduce disruption to the local surroundings and the environment, residents, business, and road users as far as practicable.

Traffic modelling was undertaken to assess CTM impacts.

Overall journey times and network congestion were forecast to increase, relative to the Do-Minimum, because of the reduction in capacity.

The M3 mainline 40mph and 50mph contraflow speeds in Phase 2 demonstrated relatively limited difference on overall network performance where the operation of the gyratory was the constraining factor on overall network.

In Phase 3b, northbound traffic blocked back from the M3 diverge to the northbound off-slip where four lanes of northbound traffic are reduced to two lanes under the southern gyratory bridge, which creates queues and slow- moving traffic. This indicated that the northbound route going through the underpass is slower than the Phase 3a equivalent route using the gyratory. The removal of the gyratory signal-control in Phase 3b had a generally positive impact on journey times, particularly to/from Easton Lane. However, congestion was still evident on the M3 northbound.

1 Introduction

1.1 Purpose of the document

1.1.1 The M3 Junction 9 Improvement Scheme (the Scheme) is a Nationally Significant Infrastructure Project (NSIP). The Scheme therefore requires an application for a Development Consent Order (DCO) to be submitted to the Planning Inspectorate, acting on behalf of the Secretary of State (SoS).

1.1.2 This Transport Assessment Report forms part of Volume 7 of the application for a DCO authorising National Highways (the Applicant) to construct and operate the Scheme. The purpose of this report is to provide a description of the existing transport features, an outline of relevant policy context, a summary of the transport modelling work undertaken and the impact of the Scheme on the strategic and local network, road safety and sustainable modes of transport. The purpose of these works has been to:

- Measure the impacts of the Scheme on the highway network
- Provide traffic flow inputs to the design of the Scheme
- Provide traffic flow inputs to the Environmental Statement (ES)
- Assess cycling and walking provision

1.1.3 Traffic models have been prepared for the Scheme. The Scheme's traffic modelling consists of both a micro-simulation and a strategic transport model to assess the impacts at a local and wider network level. The strategic model is more detailed around the areas of the Scheme just outside Winchester to Eastleigh as this was considered to be the area of influence of the Scheme.

1.1.4 Full details of the transport planning work to support the DCO are set out in the **Combined Modelling and Appraisal (ComMA) Report (Document Reference 7.10)**.

1.2 The Applicant

1.2.1 National Highways is the Applicant and the strategic highways company as defined in the Infrastructure Act 2015, and is charged with operating, maintaining and improving England's motorways and major A-roads on behalf of the Department for Transport (DfT).

1.2.2 The Applicant's Road network totals over 4,300 miles (6,920 kilometres). Whilst this represents only 2% of all roads in England by length, these roads carry a third of all traffic by milage and two-thirds of all heavy goods traffic.

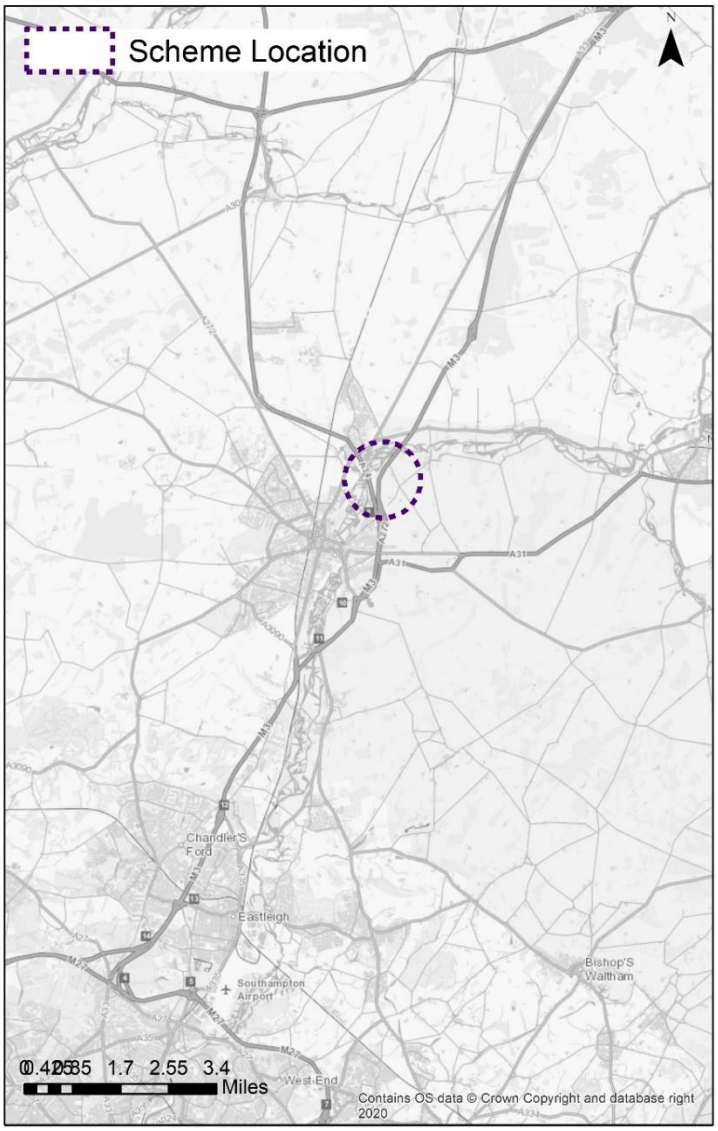
1.2.3 In summer 2021, Highways England rebranded to National Highways, therefore all references to the Applicant prior to summer 2021 will be to Highways England and all references post summer 2021 will be to National Highways.

1.3 Scheme overview

1.3.1 The M3 Junction 9 is a key transport interchange connecting South Hampshire (facilitating an intensive freight-generating industry) and the wider sub-region, with London via the M3 and with the Midlands and the North of England via the A34 (which also links to the principal east-west A303 and M4 corridors). The M3 is also a key strategic route for freight traffic accessing the Port of Southampton. In addition, Junction 9 is one of the access points to the City of Winchester from the M3 motorway. As a result, the Scheme would have an impact not only on the Strategic Road Network (SRN), but also to some extent on the local traffic to and from Winchester.

1.3.2 The Scheme (location shown in **Figure 1-1**) would maintain existing connectivity on the road network, whilst providing enhanced capacity, simplifying routes and improving facilities for walkers, cyclists and horse-riders.

Figure 1-1: Scheme location



1.4 Scheme background

Scheme description

1.4.1 The improvements proposed as part of the Scheme both maintain existing connectivity on the road network, whilst providing enhanced capacity, simplified routing and improved facilities for walking, cycling and horse-riding routes and landscaping enhancements. The Scheme would provide new free flow links between the M3 and A34, as well as a dedicated new A33 alignment. The Scheme elements are as follows:

- Widening of the M3 from a dual two-lane motorway (two-lane motorway with hard shoulders) to a four-lane motorway (with hard shoulders) between the proposed M3 Junction 9 gyratory north and south slip roads.
- A new smaller grade separated gyratory roundabout arrangement within the footprint of the existing roundabout, incorporating new connections over the M3 with improved walking, cycling and horse-riding routes.
- Connector roads from and to the new gyratory roundabout.
- Improved slip roads to/from the M3.
- New structures (in the form of gyratory bridges, underpasses, retaining walls, subway and a new cycle and footbridge over the River Itchen).
- A new surface water runoff system with associated drainage and infiltration features.
- New signage and gantries.
- Utility diversions.
- New lighting (subways, underpasses and gantries).
- Modifications to topography through cuttings and false cuttings as well as re-profiling of existing landform.
- New walking, cycling and horse-riding provision.
- Creation of new areas of chalk grassland, woodland, scrub planting and species rich grassland.

1.4.1 The Application Boundary covers an area of approximately 109 hectares (ha). This includes the proposed land required for gantries, signage, temporary construction compound areas, areas for environmental mitigation, areas for drainage requirements (some of which would be temporary) and traffic management.

1.4.2 The Scheme includes a package of environmental mitigation and enhancement measures to reduce the impacts from the Scheme to the environment where possible. Consideration has also been given to the enhancement of the South Downs National Park where reasonably practicable.

1.4.3 Bridleways, footpaths and cycleways have been designed to allow all gradients to be less than 1:20 to comply with Department for Transport's (DfT) inclusive mobility impaired users. The walking, cycling and horse-riding routes are designed for cyclists, and therefore as all horizontal radii are suited for cyclists, they are also considered acceptable for mobility impaired users. The range of opportunities and barriers to all forms of users have been given due consideration in the design of the Scheme.

1.4.4 A number of new structures are required to be both constructed and demolished to facilitate the Scheme. Some of the main structures are as follows:

- The existing bridges at the M3 Junction 9 gyratory roundabout are proposed to be demolished and replaced by the two new bridge structures carrying the new gyratory
- A new underpass is proposed to carry the A34 southbound under the new A33 link road and the existing M3. The A34 northbound underpass would carry the new A34 northbound over the new A33 link
- The existing subways (Winnall Subway East and Winnall Subway West) located under the existing gyratory are proposed to be demolished to facilitate the construction of the reconfigured roundabout. New subways are proposed along the proposed walking, cycling and horse-riding route
- A new footbridge over the River Itchen is proposed between the existing Itchen Bridge, (which carries the A34 northbound carriageway), and the existing Kings Worthy Bridge which will carry the A33 north and southbound carriageways and the A34 southbound carriageway, respectively.

1.4.5 The walking, cycling and horse-riding facilities around and within the Scheme are to be upgraded. This includes an improvement to the National Cycle Network (NCN) Route 23. An additional footpath, cyclepath and bridleway is proposed on the eastern side of the Scheme to link Easton Lane with Long Walk. Such a route would provide a circular leisure path for those using the South Downs National Park with a link to the other paths around Long Walk with their links to local villages. A new combined footpath and cyclepath for the western side of the Scheme is proposed to link the A33 / B3047 Junction to Winnall Industrial Estate situated on Easton Lane.

1.4.6 A detailed description of the Scheme is provided in **Chapter 1 (Introduction)** and **Chapter 2 (The Scheme and its Surroundings)** of the **Environmental Statement (ES) (Document Reference 6.1)**.

Evolution of the Scheme design

1.4.7 The Scheme was developed in the Applicant's Project Control Framework (PCF) and this report provides an overview of the development and assessment of PCF Stage 3 (Preliminary Design).

1.4.8 After the statutory consultation in 2019, a decision review was undertaken of the Scheme presented at the consultation (PCF Stage 3 Design Fix 2), addressing key issues that were raised during this consultation. Two further design solutions to those proposed at the 2019 statutory consultation were assessed against a set of multi-disciplinary criteria including economic impacts and value for money. This information allowed the Applicant to make an informed decision and conclude a preferred design solution to take forward.

1.4.9 The preferred solution at Stage 3a incorporated the following revisions to the consultation design:

- Removal of the A33 merge/ diverge from the A34, Junction 9 link to the A33 now provided through the Stage 3 Design Fix 2 M3 northbound on-slip with new roundabout north of A34 underpass and contraflow arrangement up to the roundabout.

- Dumbbell gyratory arrangement proposed at consultation design revised to oval shaped 2 lane gyratory accompanied with a provision of flares and free flowing turns to increase capacity.

1.4.10 The reporting of the forecasts and assessment of the proposed Stage 3a design solution was delivered by in 2020.

1.4.11 After completion of the PCF Stage 3a the work was developed further in PCF Stage 3b. Further value engineering of the Stage 3a design at Stage 3b proposed a reduction from 3 to 2 lanes on the southern section of the M3 overpass. In addition, amendments were proposed to reduce the M3 northbound off-slip Junction approach from 3 lanes to 2.

1.4.12 Reporting of the modelling and forecasting methodology for the assessment of the preferred option are described in the **ComMA (Document Reference: 7.10)** and summarised in this report.

1.4.13 The Applicant undertook a further round of statutory consultation between 27 May and 8 July 2021 in accordance with section 42, section 47 and section 48 of the Planning Act 2008. An overview of the consultation is provided in the **Consultation Report (Document Reference 5.1)**.

1.4.14 The Applicant undertook reviews of all responses received through the 2021 statutory consultation process to determine if comments have influenced the evolution of the Scheme. In summary, feedback informed the development of the Scheme in the following ways:

- Development of design

- Approach to assessment methodologies and commitment to mitigation and enhancement measures in the Environmental Impact Assessment (EIA)

1.4.15 Comments received from South Downs National Park Authority and Natural England were considered to result in the need to revisit the design of the earthwork profile along the eastern flank of the Scheme parallel to the M3 and north-east of the gyratory, as well as the approach to planting of woodland across the River Itchen Valley.

1.4.16 The Scheme redesign sought to address the comments raised by South Downs National Park Authority through the 2021 consultation process though the creation of chalk grassland, the plant scrub/woodland on the slopes of the proposed earthworks, the promotion of large open skies and distant panoramic views, the promotion of good access opportunities to areas of created chalk downland and the maintaining of open rolling chalk downland landscape with woodland on steep slopes.

1.4.17 A summary of the relevant responses receive to the 2021 statutory consultation and the Applicant's detailed comments on these are contained in the **Consultation Report (Document Reference 5.1)**.

1.4.18 Following a ministerial statement on 12 January 2022, the roll out of all lane running (ALR) schemes not yet constructed was paused. As the M3 Junction 9 to Junction 14 Scheme tied into the Scheme on the south facing slips of the gyratory roundabout, some minor design development was undertaken.

1.4.19 The design changes do not result in any change to the Application Boundary. The Applicant provided a Scheme update in September 2022 to provide further information about the minor design amendments and proposed timescales following the ALR pause. The Applicant also used the Scheme update to notify stakeholders about the design changes following the responses received from the 2021 statutory consultation.

1.4.20 The update was disseminated to stakeholders through various methods, including public information events, an online information portal and stakeholder briefings.

1.4.21 During the period of the Scheme update, engagement with prescribed bodies, relevant local authorities and landowners, as detailed in **Chapter 14** of the **Consultation Report (Document Reference 5.1)** was ongoing.

1.5 Scheme objectives

1.5.1 The Scheme objectives are:

- To reduce delays at M3 Junction 9 on all links M3, A33 and A34.
- Smooth the flow of traffic by improving journey time reliability and reducing delays (time lost per vehicle per mile) at M3 Junction 9 and the exit and entry roads for the A33 and A34.
- Improve the safety for all road users and reduce the annual collision frequency and severity ratio on the M3 Junction 9.
- Support economic growth and ensure the junction can accommodate additional traffic.
- Improvements for walkers and cyclists, including connecting the National Cycle Network Route 23 which is severed by the current Junction layout.

1.6 Document structure

1.6.1 The Transport Assessment structure is as follows:

- Policy context
- Existing highway conditions overview
- Traffic model development
- Forecast year Do Minimum scenario traffic model summary
- Overview of the Scheme
- Forecast year ‘with Scheme’ scenario traffic model summary
- Safety overview
- Sustainable transport overview
- Construction impacts

2 Policy context

2.1 Overview

2.1.1 To support the preparation of the Scheme traffic model and economic appraisal, National and Local Planning Policy have been reviewed to inform the approach. An assessment of the Scheme's compliance with relevant policies is provided in the **Case for the Scheme (Document Reference 7.1)** and the **National Policy Statement for National Networks Accordance Table (Document Reference 7.2)**.

2.2 National policy

National Networks National Policy Statement

2.2.1 The National Networks National Policy Statement (NN NPS) sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.

2.2.2 The Government's vision and strategic objectives for the national networks are that they will deliver national networks that meet the country's long term needs; supporting a prosperous and competitive economy and improving overall quality of life, as part of a wider transport system. This means:

- Networks with the capacity and connectivity and resilience to support national and local economic activity and facilitate growth and create jobs
- Networks which support and improve journey quality, reliability and safety
- Networks which support the delivery of environmental goals and the move to a low carbon economy
- Networks which join up our communities and link effectively to each other

2.2.3 The general principles of assessment in considering any proposed development, and in particular, when weighing its adverse impacts against its benefits which have to be considered include:

- its potential benefits including; the facilitation of economic development, including job creation, housing and environmental improvement, and any long-term or wider benefits.

- its potential adverse impacts including; any longer-term and cumulative adverse impacts, as well as any measures to avoid, reduce or compensate for any adverse impacts.

National Planning Policy Framework

2.2.4 The National Planning Policy Framework (NPPF) (2021) sets out the Government's planning policies for England and how these should be applied strategically in the development plan system and in the management of development.

2.2.5 The overall strategic aims of the NPPF and NPS are consistent. Paragraph 5 of the NPPF makes clear that it does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the PA 2008 and relevant national policy statements for major infrastructure, as well as any other matters that are relevant to that project (which may include the National Planning Policy Framework).

2.2.6 The NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development. In this regard there are three interdependent overarching objectives; economic, social, and environmental which need to be pursued in mutually supportive ways with the aim of securing net gains across each. Accordingly, the NPPF states a '*presumption in favour of sustainable development*' (NPPF Paragraph 10).

2.3 National strategy

Road Investment Strategy 2

2.3.1 In April 2020, the second Road Investment Strategy (RIS2) was published by the Department for Transport (DfT). The RIS2 sets out the road investment strategy, including the list of schemes that are to be developed by the Applicant in the period 2020-2025.

2.3.2 The Applicant, as the strategic highways company and appointed by the SoS must, in exercising its functions and complying with its legal duties and other obligations, act in a manner which it considers best calculated to, among others:

- Minimise the environmental impacts of operating, maintaining, and improving its network and seek to protect and enhance the quality of the surrounding environment

- Conform to the principles of sustainable development

2.3.3 RIS2 introduces the schemes in the south and west of England committed for Road Programme 2. RIS2 includes the *'M3 Junction 9 – upgrade to the Junction to allow free movement from the A34 to the M3.'*

2.4 Local policy

2.4.1 At the local level, every local planning authority (LPA) has an adopted development plan for the area, which sets out the planning policies and proposals for land use in their area. It is these policies that planning applications for development in the area are determined in accordance with, provided they are not of a scale to qualify as an NSIP. The adopted development plan should align with the NPPF. In addition to the adopted development plan, emerging draft policy may be a material consideration in decision-making.

2.4.2 The Scheme has considered the following local policy documents:

- Winchester Local Plan 2013 and Winchester District Local Plan, Emerging, 2018-2038
- South Downs Local Plan (adopted July 2019)
- Hampshire Local Transport Plan 3 (2011) and Emerging Local Transport Plan 4
- Winchester City Movement Strategy, Winchester City Council, 2021

2.4.3 The Winchester Local Plan (2013) states the need for 12,500 new dwellings and 20 hectares of employment land. The Draft Eastleigh Local Plan concluded that there was a need for 10,140 new dwellings within Eastleigh district to meet the housing need.

2.4.4 The South Downs National Park Local Plan was adopted in 2019 and considers a range of factors relating to the special qualities of the National Park, setting out policies relating to landscape character, biodiversity and cultural heritage of the National Park, Neighbourhood Plans, local housing and economic needs and the impact of climate change.

2.4.5 The Hampshire Local Transport Plan 3 states that '*The most severe congestion is generally experienced on the motorway network, in particular the M27 and M3 in south Hampshire*'. The junction of the A34(T) and M3 at Winnall (Winchester), which acts as a gateway to the South Hampshire sub-region, presents particular difficulties. Capacity problems at this key intersection present significant difficulties for local traffic wishing to join the strategic network from employment areas. A key goal in the strategy is to *'Over the longer-term, work with the Highways Agency to explore scope for affordable and environmentally acceptable solutions to address congestion'.*

2.4.6 The City of Winchester Movement Strategy has been developed in partnership by Hampshire County Council and Winchester City Council. It is a joint policy document that sets out an agreed vision and long-term priorities for travel and transport improvements in Winchester over the next 20-30 years. It also covers, at a high level, plans for how these priorities might be met, including indicative timescales and costings. The M3 is mentioned in the strategy and it meets with the Strategy by maintaining a functioning route for through journeys to avoid impact on city centre and accommodates wider growth, maintaining function of the strategic network.

3 Existing highway conditions

3.1 Overview

3.1.1 The M3 Junction 9 is located to the east of the City of Winchester which is the county town of Hampshire. Based on the 2011 Census, the Winchester District including Alresford and Bishop's Waltham has a population of 116,800.

3.1.2 M3 Junction 9 is located adjacent to the settlement of Winnall (to the east of Winchester). The surrounding area is urban to the west and northwest of the junction and primarily rural in all other directions with the South Downs National Park located to the east and north of the junction.

3.1.3 The land immediately to the west of the junction is predominantly commercial/industrial with Wykeham Trade Park and a National Highways maintenance depot located to the north-west of the junction. Developments to the south-west include Sun Valley Business Park, Tesco Extra Superstore, Winnall Industrial Estate and Scylla Industrial Estate.

3.1.4 The land to the east is generally greenfield primarily forming part of the SDNP, with the River Itchen and its associated floodplain to the north of the Scheme. The River Itchen Special Area of Conservation and Site of Special Scientific Interest also extend to the north-east and south-west of the existing junction.

3.1.5 M3 Junction 9 is a key strategic route interchange which connects South Hampshire and the ports of Southampton and Portsmouth with the wider sub region. It also connects the region to London and the north-west via the M3, and the Midlands and the North via the A34. The A34 also provides a connection to the principal east-west corridor of the A303. The junction acts as a bottleneck on the local and strategic highways network and causes significant delay, especially during peak hours.

Highway alignment and junction arrangement

3.1.6 The existing Junction forms a grade-separated, partially signal controlled roundabout arrangement between:

- M3 (which forms the principal route between Southampton and London)
- A34 (which forms the principal route between Winchester and Oxford; this also links with the A33 to Basingstoke)
- A272 Spitfire Link (non-signalised link, this forms the principal route between Winchester and Petersfield, this route also links to the A31)
- Easton Lane (which provides the local access route between Winchester and the Strategic Road Network via M3 Junction 9)

3.1.7 The northbound carriageway of the M3 approaching Junction 9 from the south is formed of a standard dual 3 lane motorway with hard shoulder. The Junction 9 northbound diverge is a DMRB10 (Design Manual for Roads and Bridges) TD22/06 Layout of Grade Separated Junctions Type 'D' Lane Drop with Parallel diverge. Diverge lanes from the motorway are marked for the A34, with two lanes proceeding northbound through the junction for the M3 as a standard dual 2 lane motorway. A northbound slip road from Junction 9 joins the M3 mainline north of the junction via a TD22/06 Type 'A' Taper merge.

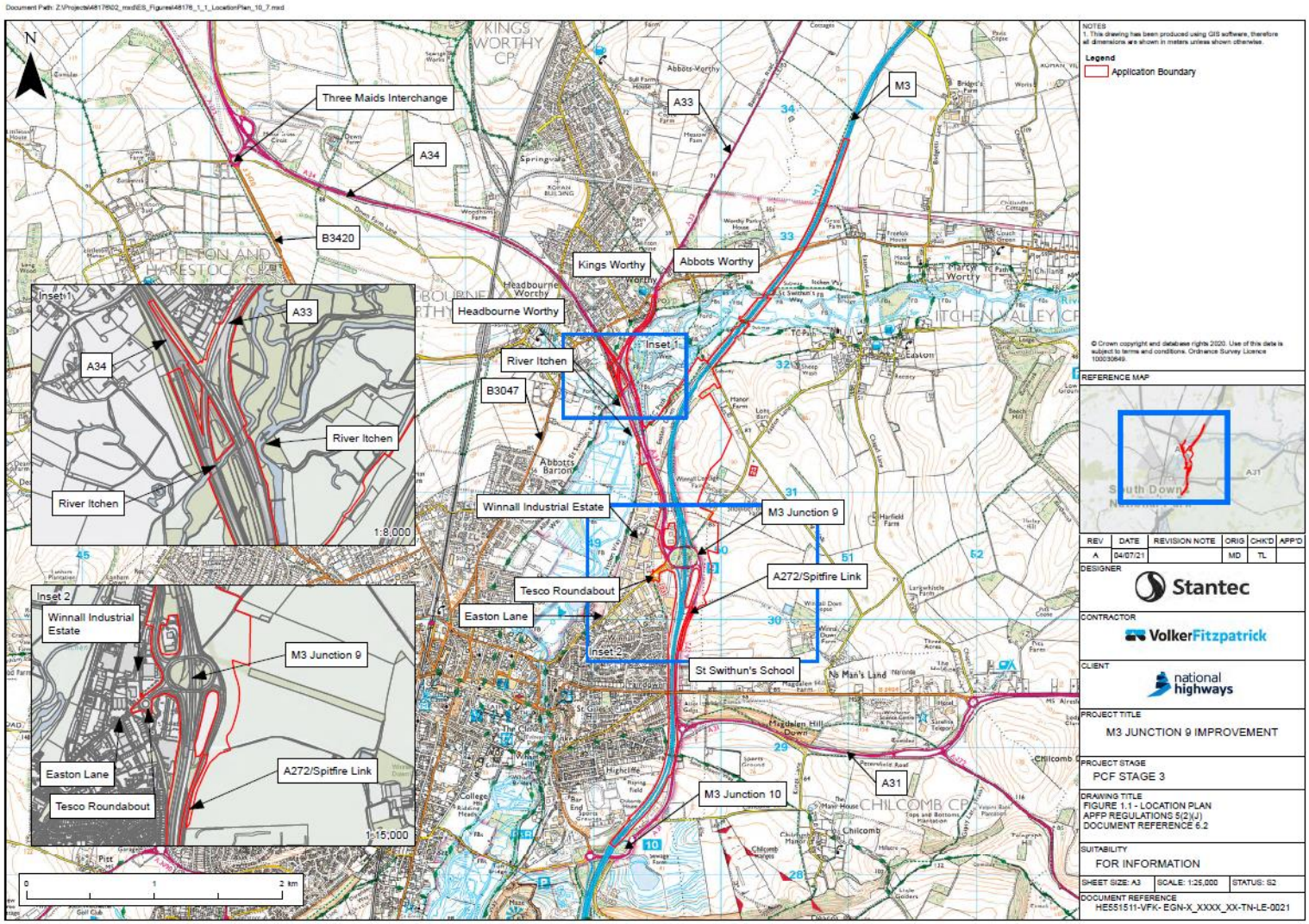
3.1.8 North of the Junction the southbound carriageway of the M3 forms part of the standard dual 2 lane motorway. A TD22/06 Type 'A' Taper diverge provides access to the Junction 9 roundabout via the southbound off-slip road. The M3 continues through the junction as a standard dual 2 lane motorway with hard shoulder. South of the junction a TD22/06 Type 'F' Lane Gain with Ghost Island Merge is provided after which the junction the M3 becomes a standard dual 3 lane motorway with hard shoulder.

3.1.9 The A34 is a dual 2 lane all-purpose road. Approximately 1km north of the M3 Junction 9 the 2-lane northbound carriageway bifurcates. The nearside lane continues north-west as the A34, widening to two lanes just beyond the bifurcation. The offside lane continues to the north to become the A33. The existing A34 / A33 arrangement creates a bottleneck for the A34 traffic by effectively narrowing the A34 from two lanes to one prior to the diverge, before returning to two lanes after the diverge.

3.1.10 In the southbound direction the A33 southbound carriageway merges with the southbound A34 with a TD22/06 Type 'C' ghost island merge. Beyond the merge the A34 is 2 lanes until just before the M3 Junction 9 roundabout where it widens to three lanes on the approach to the Junction 9 traffic signals. On the A34 southbound approach to Junction 9 there is also an access to and egress from the National Highways maintenance depot.

3.1.11 **Figure 3-1** illustrates the Scheme application boundary.

Figure 3-1: Application boundary of the M3 Junction 9



3.2 Current transport and traffic issues

3.2.1 The northbound and southbound movements between the M3 to the south of the M3 Junction 9 and the A34 to the north, are particularly significant. Queues on the northbound diverge (off-slip) of the M3 regularly back onto the mainline carriageway, resulting in delays and safety concerns for both M3 northbound through traffic and traffic seeking to leave the motorway. Such issues are particularly prevalent during peak periods. There are further potential safety concerns on the A34 southbound due to significant queuing which also results in rat running traffic through the residential suburbs of Winchester.

3.2.2 To overcome queuing on the M3 Junction 9 northbound diverge (off-slip), additional traffic signal green time has been allocated at the Junction 9 signalised roundabout in a recent pinch point project, which has resulted in the development of lengthy queues on the A272 Spitfire Link and Easton Lane during the morning and evening peak periods respectively.

3.2.3 As the primary congestion and safety issues are associated with traffic travelling between the M3 south of Junction 9 and the A34, there is no identified need to provide free flowing links between the M3 north of Junction 9 and the A34. Traffic would continue to use Junction 9 for this movement with the Scheme in place.

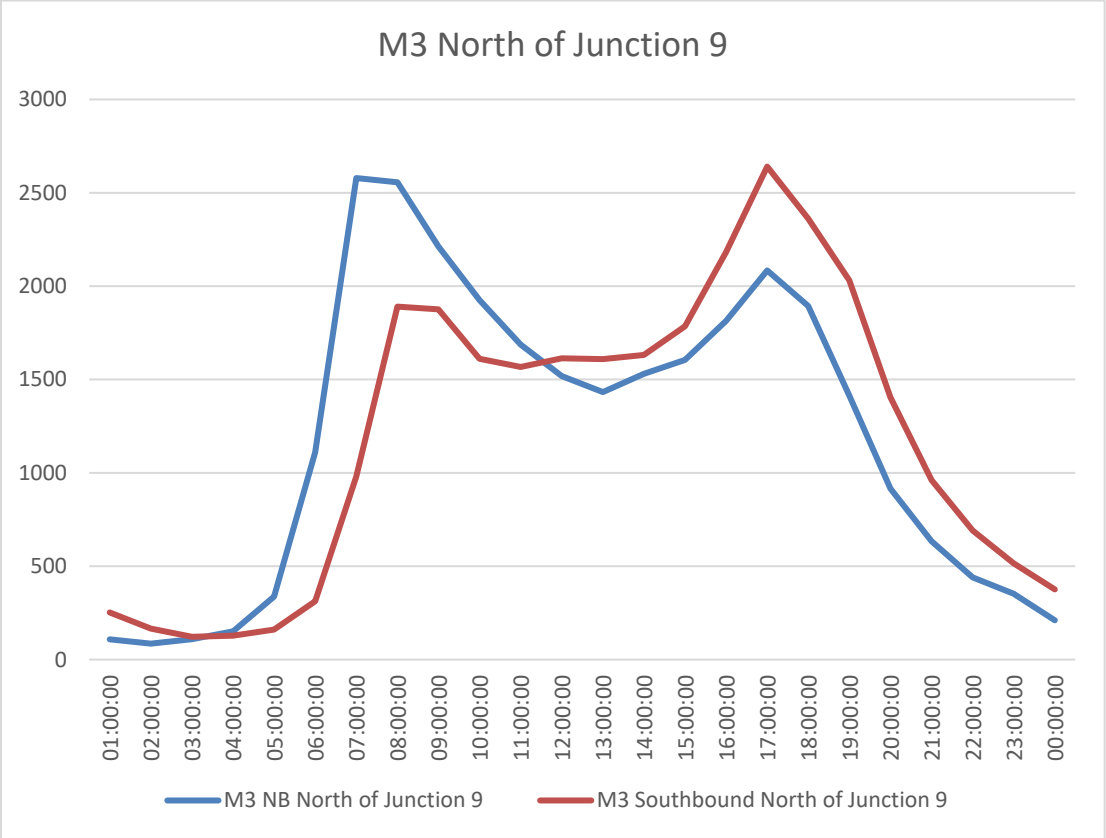
3.3 Current traffic flows

3.3.1 Data collected by the Applicant[2] indicates that the annual average daily traffic flows along the A34 in 2019 (pre-COVID-19) were around 32,900 vehicles in the northbound direction and 30,800 vehicles in the southbound direction, of which 26,000 were from the A34 and 4,800 from the A33. The annual average daily traffic (AADT) flow along the M3 (north of Junction 9) was approximately 30,000 vehicles in each direction. The Junction 9 slip roads have around 26,600 vehicles on the northbound off-slip and 25,300 on the southbound on-slip.

3.3.2 The data indicates very high flows from the A34/A33 to and from the M3 southbound.

[2] National Highways network traffic flow data

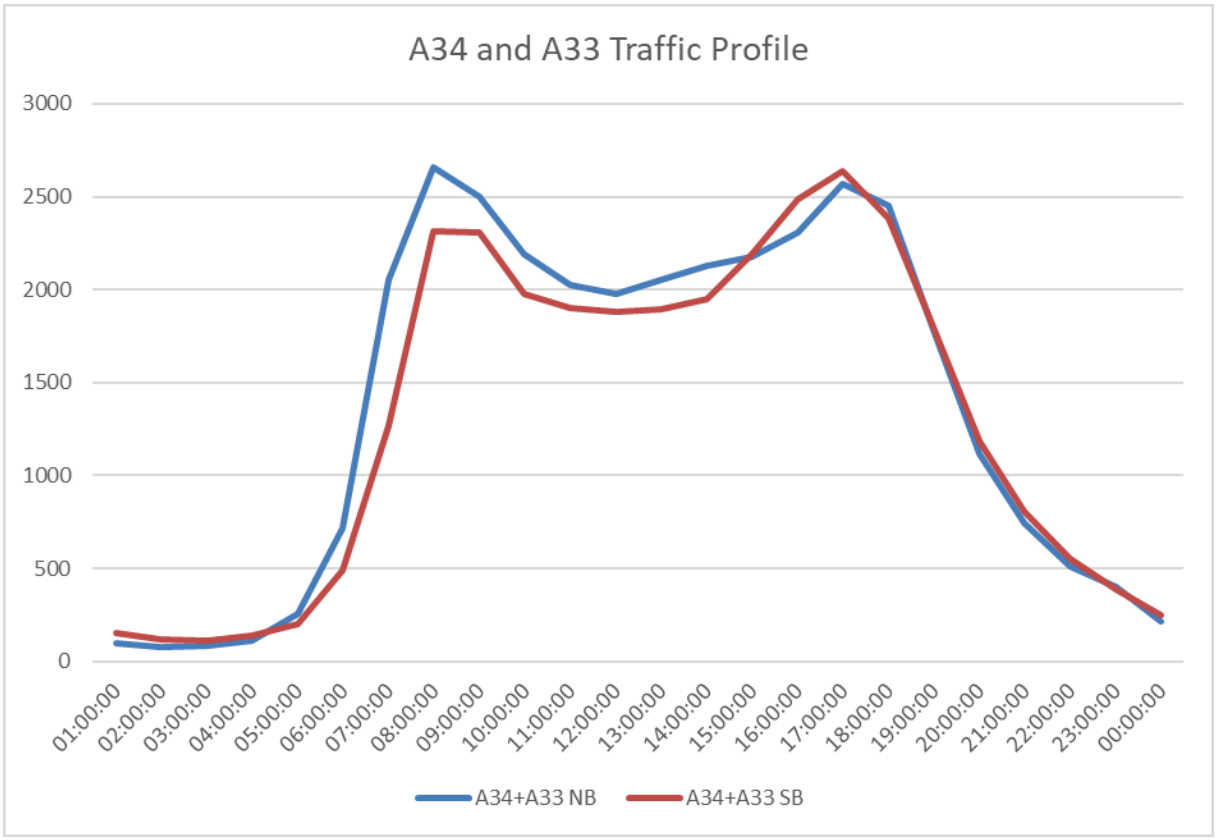
Figure 3-2: Daily flow profile of the M3 Junction 9



3.3.3 **Figure 3-2** shows that there are clear morning and evening peaks in both the northbound and southbound directions (traffic flows from WebTRIS in February 2020). There is a higher peak in the AM for the northbound traffic (which could be associated with people travelling to London) between 7am to 9am. In the southbound direction, the peak is an hour later. The PM peak is more pronounced in the southbound direction at approximately 5pm to 6pm.

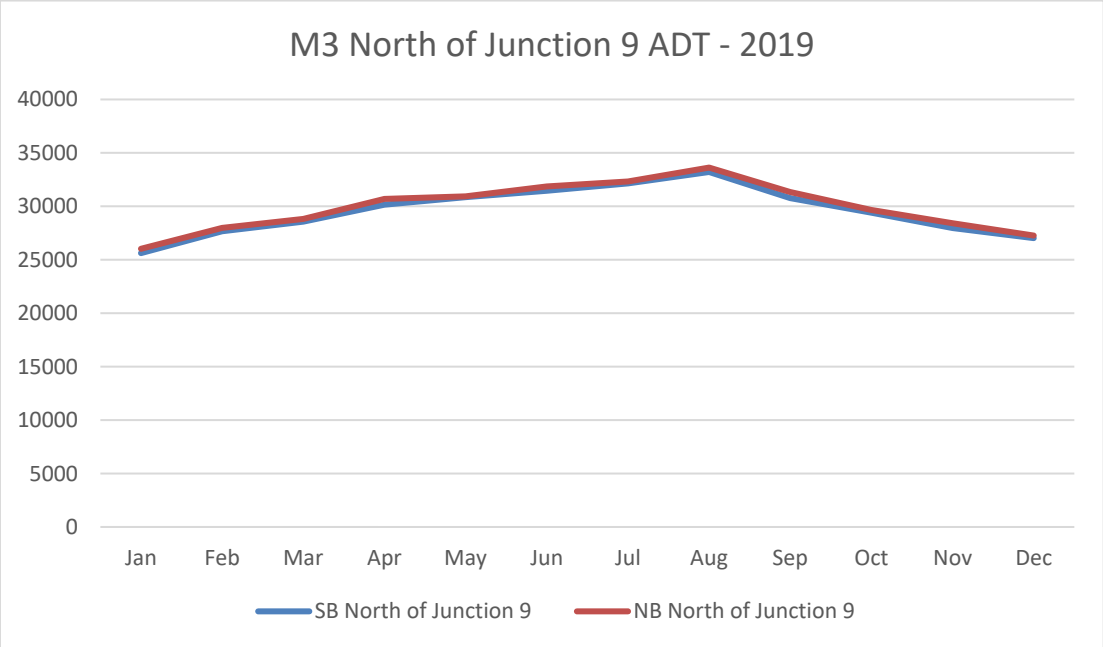
3.3.4 The profile for the A34 and A33 combined average daily traffic for February 2020 (**Figure 3-3**) shows that the northbound direction has higher traffic flow at peak times and has generally more traffic throughout the day. For both the AM and PM peaks the northbound and southbound direction happen in the between 8am and 9am and 5pm to 6pm.

Figure 3-3: A34 daily traffic flow profile



3.3.5 **Figure 3-4** shows the Average Daily Traffic (ADT) for the year of 2019 on the M3 just north of Junction 9 from WebTRIS. The flows across the year indicate that there is a stable flow along the M3. There is a steady rise in flow into the summer months with a peak in August and then a fall in flow between August and September. The northbound and southbound direction have very similar ADT.

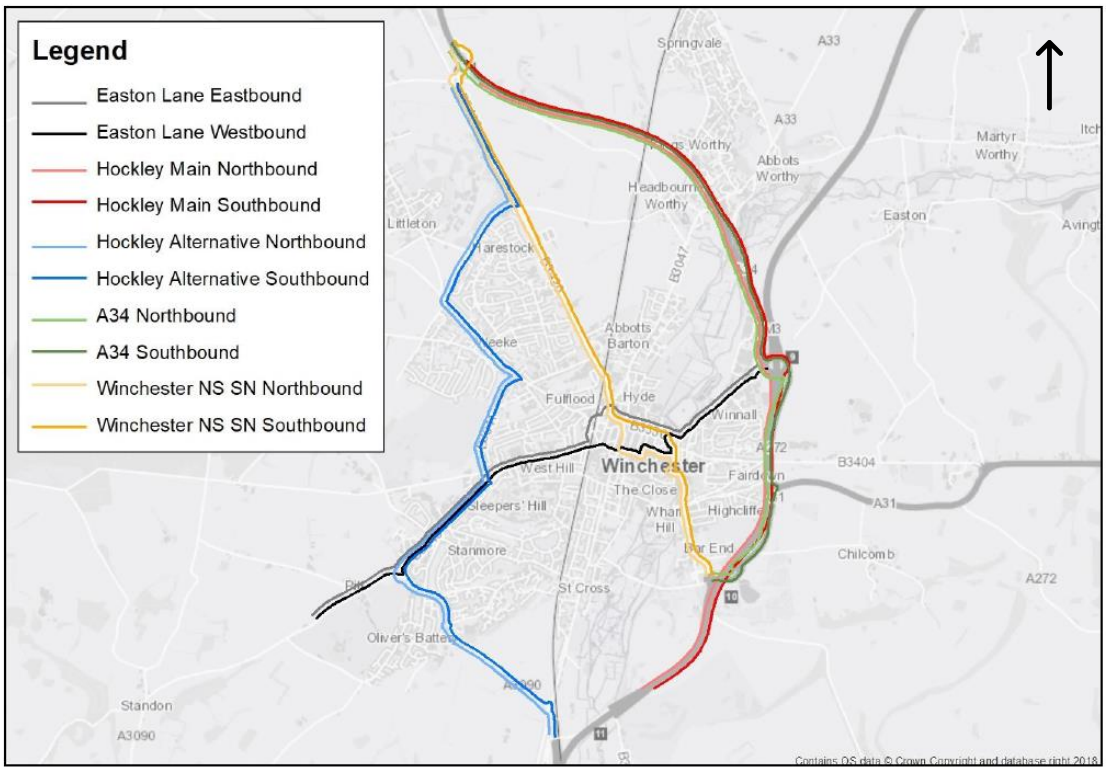
Figure 3-4: Monthly flow profile M3 north of Junction 9



3.4 Observed journey times

3.4.1 The observed journey time data sections are shown in **Figure 3-5**.

Figure 3-5: Observed journey time routes



3.4.2 Observed journey times based on 2015 Traffic Master data are shown in **Table 3-1**. This shows on most sections the AM and PM peak periods journey times take longer than the interpeak period indicating congestion during these periods. Some of the largest differences between occur on the Hockley Alternative in the Northbound direction and Easton Lane in the Eastbound direction. Hockley Main Southbound in the PM peak is also over 2 minutes slower than the AM and IP periods. The A34 northbound is over 2 minutes slower in the AM peak compared to the IP and the A34 southbound is 1.5 minutes slower in the PM peak compared to the IP.

Table 3-1: 2016 Observed journey time data (2015 Traffic Master Data) -source: PCF Stage 2 (Options Selection) Transport Data Package

Route name	Direction	Route description	AM mean (min)	IP mean (min)	PM mean (min)
A34	NB	M3 J10 <> A34/A272 via Spitfire Link	10:54	08:24	09:18
A34	SB	A34/A272 <> M3 J10 via Spitfire Link	07:36	07:12	08:48
Easton Lane	EB	South Winchester Golf Club to Easton Lane Roundabout	16:18	14:18	14:42
Easton Lane	WB	Easton Lane Roundabout to South Winchester Golf Club	13:48	14:30	15:18
Hockley Alternative	NB	M3 J11 to A34 A272 through west Winchester	16:42	12:48	14:00
Hockley Alternative	SB	A34 A272 to M3 J11 through west Winchester	15:24	14:06	14:54
Hockley Main	NB	M3 J11 to A34 A272 on M3 and A34	06:30	06:18	06:12
Hockley Main	SB	A34 A272 to M3 J11 on A34 and M3	07:06	07:00	09:18
Winchester NS SN Route	NB	M3 J10 to A34 A272 through city centre	14:36	14:00	14:18
Winchester NS SN Route	SB	A34 A272 to M3 J10 through city centre	12:36	11:54	13:12

Key: NB-northbound, SB-southbound, EB-eastbound, WB-westbound

4 Traffic model development

4.1 Introduction

4.1.1 The modelling assessment comprises a strategic model complemented with a local operational model.

4.1.2 The strategic model used is a derivation of the Applicant's South East Regional Transport Model (SERTM), including updates for this stage. This model is referred to as the M3 Junction 9 Model.

M3 Junction 9 PCF Stage 1 and Stage 2 traffic forecasts

4.1.3 The PCF Stage 1 (Options Identification) made use of a strategic traffic model developed by Hampshire County Council, called the Solent Regional Traffic Model (SRTM) referred to as the "Solent Model" throughout this report. This was the only model for this area available at the time.

4.1.4 The Solent Model is a multi-modal model, with the highway assignment component developed in SATURN software and a bespoke variable demand model component. The model used in the assessment had a base year of 2009. The outputs of this work are provided in the Applicant's PCF Stage 1 (Options Identification) documentation for this Scheme. This model was used for early option sifting and superseded with a newer version updated for the purposes of PCF Stage 2 (Options Selection).

4.1.5 The model used in PCF Stage 1 (Options Identification) (the Solent model) was subsequently enhanced by Hampshire County Council. The key enhancement was to update the base year to 2015 and subsequently calibrate and validate the model. This model formed the basis of the PCF Stage 2 (Options Selection) assessment of the options and provided traffic growth estimates for input into a more detailed operational assessment of the junction tested in a micro-simulation model.

4.1.6 The enhanced Solent model provided a tool sufficient for use in PCF Stage 2 (Options Selection), and its use was proportionate to inform option testing. The PCF Stage 2 (Options Selection) identified a preferred scheme, known as Option 14, which formed the basis of the PCF Stage 3 (Preliminary Design) design.

Overview of the Strategic Model

4.1.7 PCF Stage 3 (Preliminary Design) required a full assessment of the preferred scheme and required a robust and up-to-date modelling tool. The Applicant identified limitations of the Solent model associated with its coverage and the details of its validation. To support the full Scheme assessment in PCF Stage 3 (Preliminary Design) a new modelling tool was therefore required.

4.1.8 In parallel to the Scheme, the Applicant developed the M3M27 SMI Model, which was based on SERTM (which was developed to assist in the assessment of schemes in the Road Investment Strategy (RIS1)). The Applicant judged the M3M27 SMI Model to be fit for modelling SRN schemes and requested that this model should be adopted and enhanced further for use in the M3 Junction 9 Improvement Scheme assessment.

4.2 Strategic model development

4.2.1 As part of the M3 Junction 9 Improvement programme, the M3 M27 SMI model underwent a number of further enhancements for the purpose of the assessment. Calibration and validation focussed on the area of Winchester to strengthen the model and make it suitable for the analysis of impacts of the Scheme. These enhancements included:

- Improvements to the local network detail
- Additional calibration of the traffic model in Winchester, including the amendments to the trip matrix in the local area
- Updated calibration of the Variable Demand Model (VDM)

4.2.2 The enhanced model is referred to as the M3 Junction 9 Model throughout this report.

4.2.3 There are two primary modelling components to the M3 Junction 9 Model as follows:

- Highway Assignment Model (HAM). The HAM was used to predict traffic flows, speeds, delays, routes, and travel costs on the highway network. SATURN was identified as the most appropriate tool for building the Regional Transport Models by the Applicant. SATURN operates as a static equilibrium highway assignment model which incorporates both simulation and assignment loops. It can deal with local, large conurbation, regional or even national models thus making it appropriate for the modelling of traffic in the South East of England. SATURN Software Version 11.4.06D was used for the M3 Junction 9 Model.
- Variable Demand Model (VDM). The VDM was used to predict the future changes in demand for private vehicle travel with and without the Scheme. For consistency with the Regional Traffic Models (RTMs), it was agreed that DfT's DIADEM3 (Dynamic Integrated Assignment and Demand Modelling) software v7.0 (64bit) was used.

[3] https://www.gov.uk/government/publications/diadem-software

4.2.4 The SERTM model is representative of an average hour model within the following time periods:

- AM peak (07:00 to 10:00)
- Inter-peak (10:00 to 16:00)
- PM peak (16:00 to 19:00)

4.2.5 The SERTM model was developed for the following user classes:

- User Class 1 – Car business
- User Class 2 – Car commuting
- User Class 3 – Car other
- User Class 4 – Light goods vehicles (LGVs)
- User Class 5 – Heavy goods vehicles (HGVs)

4.2.6 The M3M27 SMI model was developed from SERTM, and consequently the M3 Junction 9 Model which was developed from it, retain these key features of the SERTM model.

4.3 Calibration and validation

4.3.1 As the scope of the strategic model and subsequent application was to underpin the appraisal of a Road Improvement Scheme (RIS), validation criteria were required to align with Transport Analysis Guidance (TAG).

4.3.2 Two sets of validation criteria were used to define individual link flow criteria dependant on the screen line definition.

- “Core” screenlines defined with the standard TAG criteria
- “Non-Core” screenlines defined with a bespoke link flow passing criteria

4.3.3 The variance in the “Core” (TAG criteria) and bespoke “Non-Core” is summarised in **Table 4-1** and **Table 4-2**.

Table 4-1: 'Core' calibration and validation criteria (standard TAG criteria)

Element	Criteria	Acceptability guideline	Vehicle type
Screenline flows			
Total	Within 5%	All or nearly all screenlines	All vehicle class separately
Individual link flows			
Roads with flows >2700	+/- 400 veh/hr	>85% of cases	Car and Total Flow
Roads between 2700 & 700	+/- 15%	>85% of cases	Car and Total Flow
Roads < 700	**+/- 100 veh/hr**	>85% of cases	Car and Total Flow
GEH <5		>85% of cases	Car and Total Flow

Table 4-2: 'Non-core' calibration and validation criteria (adjusted TAG criteria used in Stage 3a)

Element	Criteria	Acceptability guideline	Vehicle type
Screenline flows			
Total	Within 5%	All or nearly all screenlines	All vehicle class separately
Individual link flows			
Roads with flows >2700	+/- 400 veh/hr	>85% of cases	Car and Total Flow
Roads between 2700 & 2000	+/- 15%	>85% of cases	Car and Total Flow
Roads < 2000	**+/- 300 veh/hr**	>85% of cases	Car and Total Flow
GEH <5		>85% of cases	Car and Total Flow

4.3.4 **Table 4-3** and **Table 4-4** show the proportion of links which meet the TAG highway assignment criteria in each modelled time period for the key screenlines, as well as the overall model area for Stage 3a (using the bespoke criteria) and Stage 3b (using the standard TAG criteria) respectively. The Scheme stages (Stage 3a and 3b) are described in **Section 1.3**.

Table 4-3: % Core screenlines meeting Stage 3a criteria (adjusted TAG criteria)

Screenline	Direction	Total count sites	AM peak	Inter-peak	PM peak
Winchester	Inbound	11	100%	100%	91%
Winchester	Outbound	11	91%	91%	91%
Winchester NS	Eastbound	5	100%	100%	100%
Winchester NS	Westbound	6	83%	100%	100%
Winchester WE	Northbound	5	100%	80%	80%
Winchester WE	Southbound	5	100%	100%	100%
All screenline links			83.7%	87.5%	82.8%

Table 4-4: % Core screenlines meeting Stage 3b criteria (standard TAG criteria)

Screenline	Direction	Total count sites	AM peak	Inter-peak	PM peak
Winchester	Inbound	11	91%	100%	100%
Winchester	Outbound	11	100%	82%	100%
Winchester NS	Eastbound	5	100%	100%	100%
Winchester NS	Westbound	6	83%	100%	100%
Winchester WE	Northbound	5	100%	80%	80%
Winchester WE	Southbound	5	100%	100%	100%
All screenline links			70.1%	73.7%	68.7%

4.3.5 The journey time validation compared the modelled journey times with observed data derived from TrafficMaster. The journey time routes prepared for comparison (of modelled vs observed) are the same as those reported in the Stage 3a Model Package and as illustrated in **Figure 4-1** and **Figure 4-2**.

Figure 4-1: M3 Junction 9 model local journey time routes (Source: PCF Stage 3 (Preliminary Design) Transport Data Package, Highways England, 2020)

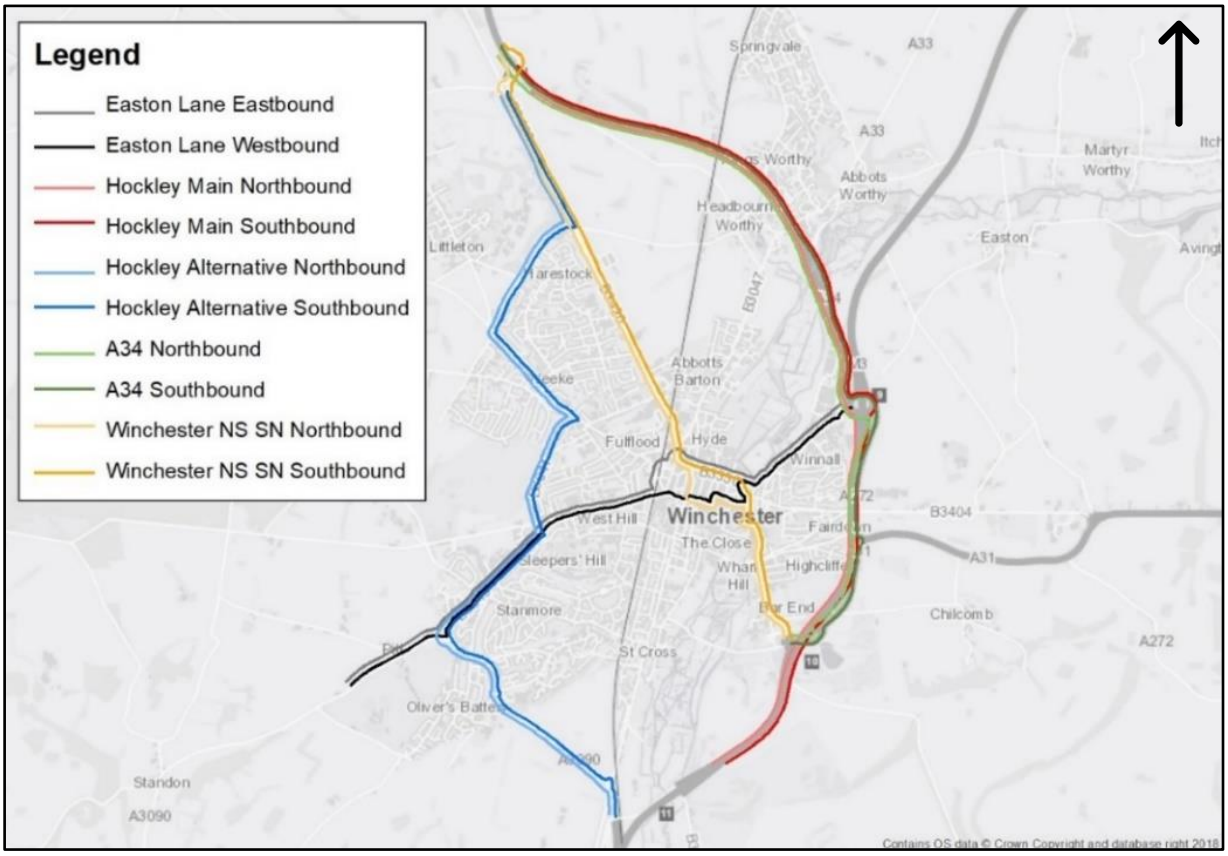


Figure 4-2: M3 Junction 9 model strategic journey time routes (Source: PCF Stage 3 (Preliminary Design) Transport Model Package, Highways England, 2020)

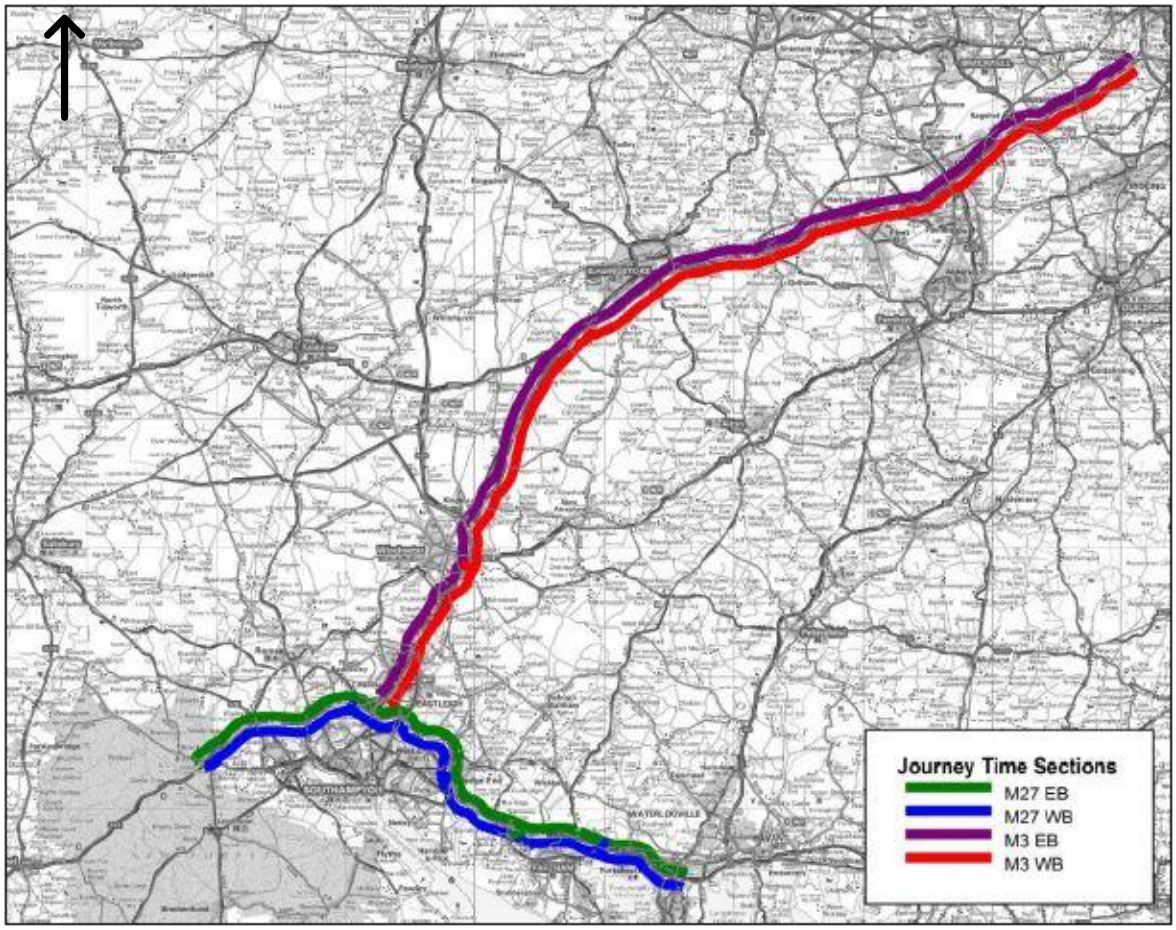


Table 4-5: Journey time validation results (minutes)

Route ID	Route description	AM peak			Inter peak			PM peak		
		Obs.	Mod.	% Diff	Obs.	Mod.	% Diff	Obs.	Mod.	% Diff
A34 (NB)	M3 J10 <> A34/A272 via Spitfire Link	10:54	09:54	-9%	08:24	07:54	-6%	09:18	08:36	-8%
A34 (SB)	A34/A272 <> M3 J10 via Spitfire Link	07:36	07:30	-1%	07:12	07:18	1%	08:48	07:30	-15%
Easton Lane (EB)	South Winchester Golf Club <> Easton Lane Roundabout	16:18	14:54	-9%	14:18	14:24	1%	14:42	13:24	-9%
Easton Lane (WB)	South Winchester Golf Club <> Easton Lane Roundabout	13:48	14:24	4%	14:30	12:06	-17%	15:18	13:30	-12%
Hockley Alternative (NB)	M3 J11 <> A34 A272 through west Winchester	16:42	14:12	-15%	12:48	13:06	2%	14:00	13:48	-1%
Hockley Alternative (SB)	M3 J11 <> A34 A272 through west Winchester	15:24	14:00	-9%	14:06	13:06	-7%	14:54	14:18	-4%
Hockley Main (NB)	M3 J11 <> A34 / A272	06:30	07:30	15%	06:18	06:12	-2%	06:12	06:30	5%
Hockley Main (SB)	M3 J11 <> A34 / A272	07:06	07:24	4%	07:00	06:48	-3%	09:18	08:00	-14%
M27 (EB)	J1 <> J12	27:42	29:42	7%	25:00	26:00	4%	25:30	29:54	17%
M27 (WB)	J12 <> J1	27:42	29:42	7%	25:12	25:54	3%	25:42	31:54	24%
M3 (EB)	J14 <> M25	53:48	58:24	9%	50:36	52:18	3%	49:48	52:36	6%

Route ID	Route description	AM peak			Inter peak			PM peak		
		Obs.	Mod.	% Diff	Obs.	Mod.	% Diff	Obs.	Mod.	% Diff
M3 (WB)	M25 <> J14	51:30	55:36	8%	51:54	54:18	5%	56:24	60:36	7%
Winchester N<>S (NB)	M3 J10 <> A34 A272 through the town centre	14:36	13:30	-8%	14:00	12:54	-8%	14:18	14:24	1%
Winchester N<>S (SB)	M3 J10 <> A34 A272 through the town centre	12:36	12:00	-5%	11:54	12:42	7%	13:12	12:00	-9%

Key: NB-northbound, SB-southbound, EB-eastbound, WB-westbound

4.3.6 **Table 4-5** shows that the journey time validation compares well with that reported in Stage 3a. Differences between modelled and observed data are less than or equal to 15% for all routes in the AM peak and most routes in the inter and PM peak modelled hours.

4.3.7 Further information on the calibration and validation can be found in **Chapter 4** of the **ComMA (Document Reference: 7.10)**.

4.4 Overview of the operational model

4.4.1 In PCF Stage 2 (Options Selection) an operational assessment model was developed using PTV-VISSIM software version 11. Referred to as the operational model, this was used to test the updated Scheme in Preliminary Design. This section sets out the results of the PCF Stage 3b (Preliminary Design) assessment using the operational model.

4.4.2 The following amendments were made to the Do-Something scenario in the operational model for the PCF Stage 3b (Preliminary Design):

- M3 northbound off-slip approach reduced from 3 lanes to 2
- Junction 9 circulatory reduced from 3 lanes to 2
- A33 exit from circulatory reduced from 2 lanes to 1
- M3 southbound off-slip dedicated left lane filter altered to give way arrangement instead of merge

4.4.3 The extent of the operational model is illustrated in **Figure 4-3**.

Figure 4-3: Operational model extent (Source: PCF Stage 3 (Preliminary Design) Transport Forecasting Report, Highways England, 2020)

4.4.4 The base year of the operational model is 2017. The travel demand matrices covering the movements within the operational model network were developed from Automatic Number Plate Recognition (ANPR) data, along with turning counts at key junctions.

4.4.5 The model was prepared for both the AM peak hour (07:15 – 08:15) and PM peak hour (16:00 – 17:00) and the demand matrices are divided into 15-minute intervals.

4.4.6 Further information, including data collection and calibration \ validation, can be found in **Chapter 3** of the **ComMA (Document Reference: 7.10)**.

5 Forecast year Do-Minimum scenario traffic model summary

5.1 Introduction

5.1.1 This section describes the development of the traffic forecasts within the model to assess the Scheme. Traffic forecasts for this study were developed in accordance with TAG (Transport Analysis Guidance).

5.1.2 The forecasting process followed the guidance set out in TAG Unit M4 related to forecasting and uncertainty. This section provides a summary overview of the process and defines the forecast scenarios. Further details of the forecasting method can be found within **Chapter 4** of the **ComMA (Document Reference 7.10)**.

5.2 Methodology

5.2.1 TAG Unit M-4 recommends the production of an Uncertainty Log to summarise the local planning assumptions in relation to the nature, likelihood, timing, size, and other details of the future developments. The Uncertainty Log was based on information provided by Hampshire County Council who maintain a log of planned developments in their area.

5.2.2 The following Local Authorities were consulted: Eastleigh Borough Council, Fareham Borough Council, Gosport Borough Council, Havant Borough Council, New Forest District Council, Portsmouth City Council, Winchester City Council, Test Valley Borough Council, and Southampton City Council. The status of all schemes (development schemes and network supply schemes) was classified according to the TAG classification.

Table 5-1: Classification status of future developments

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 should form part of the Core scenario.
Reasonably Foreseeable: The outcome may happen, but there is significant uncertainty.	Identified within a development plan. Not directly associated with the transport strategy/scheme but may occur if the strategy/scheme is implemented; development conditional upon the transport strategy/scheme proceeding; or, a committed policy goal, subject to tests (e.g. of deliverability) whose outcomes are subject to significant uncertainty.	These should be excluded from the Core scenario but may form part of the Alternative scenarios.
Hypothetical: There is considerable uncertainty whether the outcome will ever happen.	Conjecture based upon currently available information; discussed on a conceptual basis; one of a number of possible inputs in an initial consultation process; or a policy aspiration.	These should be excluded from the Core scenario but may form part of the Alternative scenarios.

5.2.3 The criteria used to select the developments included in each forecast scenario are presented in **Table 5-2**. In line with guidance, only those development sites which can be categorised as ‘Near Certain’ or ‘More than Likely’ were included in the Core Scenario, which represents the most likely outcome and forms the basis for the Scheme appraisal. The Core and Optimistic Scenarios were constrained to growth assumptions from NTEM at the borough level.

Table 5-2: Classification criteria of future developments

Scenario	Supply	Demand
Core	Near Certain, and More than Likely schemes	Near Certain, and More than Likely developments
High	Near Certain, and More than Likely	Near Certain and More than Likely developments
Optimistic	Near Certain, More than Likely, and Reasonably Foreseeable schemes	Near Certain, More than Likely, and Reasonably Foreseeable developments
Low	Near Certain, and More than Likely schemes	Near Certain, and More than Likely developments

Developments

5.2.4 In line with TAG Unit M-4, future developments in the vicinity of the Scheme should be modelled explicitly rather than as part of growth factors extracted from NTEM[4]. For each development the modelling process involved estimating the trip generation and trip distribution of the development when fully completed for each time period.

5.2.5 Each development was assigned a model zone (or zones) and the trip distribution used the model zone system. This provides a development trip matrix which is then added to the forecast matrix derived from applying TEMPro[5] growth to the base year matrix.

5.2.6 The locations of developments included in the Uncertainty Log (this is appended to the **COmMA (Document Reference 7.10)** are shown in **Figure 5-1**. Assumptions were made for those developments for which either sufficient data was not provided, or they were at a very initial stage.

5.2.7 **Table 5-3** summarises development totals from the Uncertainty Log, for each Local Authority.

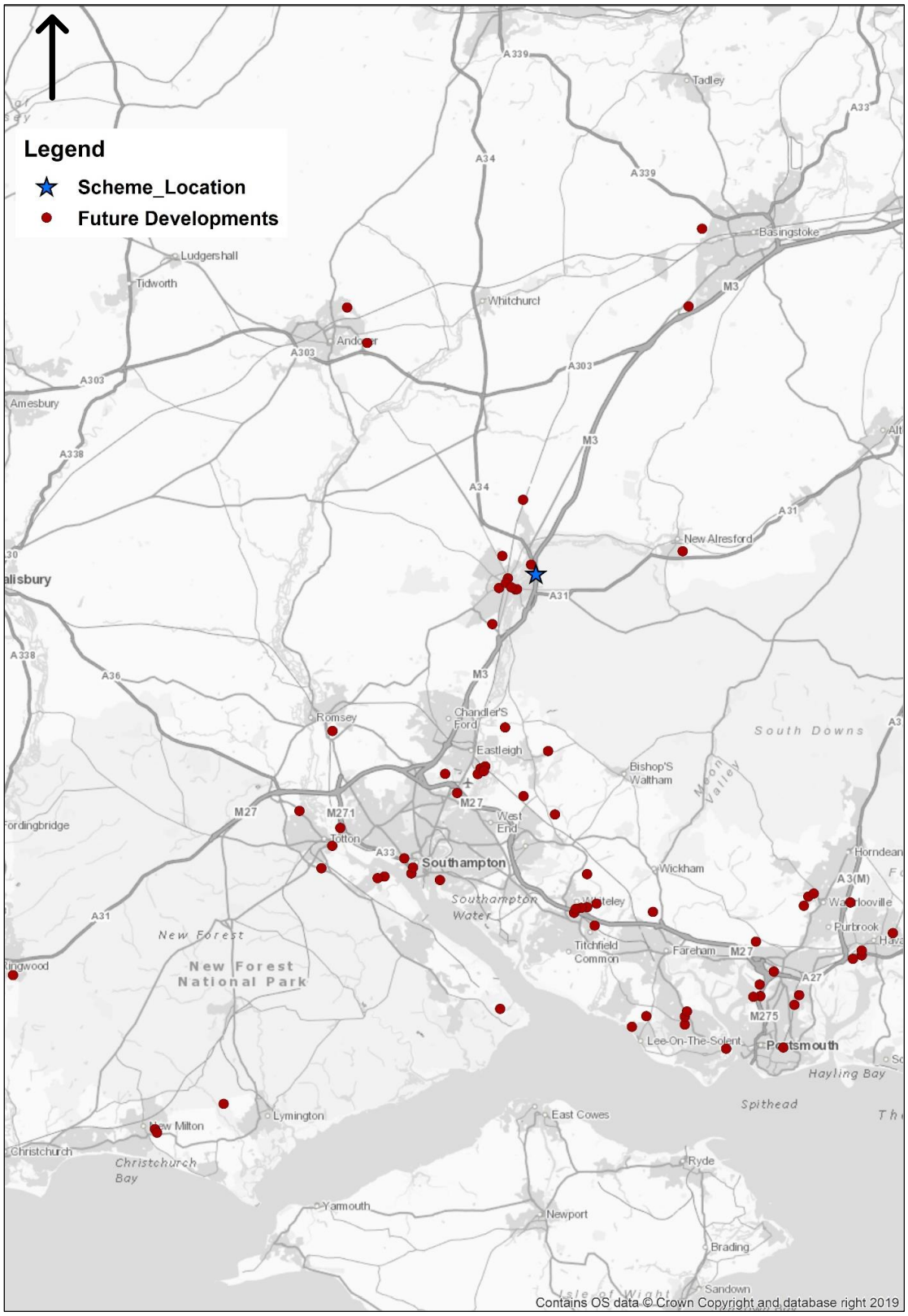
[4] National Trip End Model (NTEM) - data.gov.uk

[5] Trip End Model Presentation Program (TEMPro) download - GOV.UK (www.gov.uk)

Table 5-3: Uncertainty log development summary

Local Authority	Dwellings			Jobs		
	2027	2042	2047	2027	2042	2047
Basingstoke and Deane Borough Council	3,172	5,460	5,460	1,443	1,443	1,443
Test Valley Borough Council	5,159	5,906	5,906	4,905	6,363	6,363
Winchester City Council	5,339	8,854	8,854	6,259	11,110	11,110
Eastleigh Borough Council	4,735	8,358	8,358	6,132	12,614	12,713
Southampton City Council	1,799	1,799	1,799	7,541	9,002	9,002
Fareham Borough Council	1,147	6,000	6,000	6,409	6,409	6,409
Gosport Borough Council	1,079	1,198	1,198	5,034	5,610	5,610
Havant Borough Council	-	-	-	5,994	5,994	5,994
New Forest District Council	40	400	400	5,475	12,105	12,105
Portsmouth City Council	657	2,376	2,376	8,744	9,248	9,248

Figure 5-1: Location of developments



5.3 Forecast scenarios

5.3.1 To demonstrate the long-term benefits of the Scheme, three forecast years were modelled:

- 2027: assumed to be the opening year of the Scheme at the time of the development of the forecasts
- 2042: assumed to be the design year 15 years after the assumed opening year
- 2047: a horizon year for modelling that is three years on from that in the Stage 3a assessment

5.3.2 Three further sensitivity tests, referred to as the Low, High, and Optimistic growth scenarios were also run as part of this study. The High and Low growth scenarios were prepared in accordance with TAG Unit M4 to reflect uncertainties in travel demand forecasts. The Optimistic scenario was prepared to assess the impact of additional development and related demand.

5.3.3 Following the completion of the Uncertainty Log for housing and commercial developments, the highway schemes to be included in the 2027, 2042 and 2047 Do-Minimum (DM) networks were determined. These are summarised in **Table 5-4**, which specifies whether the scheme was included in the core\high\low scenarios or the optimistic scenario (see **Section 5.6**).

Table 5-4: Forecast highway schemes

Scheme	2027 Core, High and Low	2042 & 2047 Core, High and Low	2047 Optimistic
A31 Ringwood Widening	✓	✓	✓
M271 Redbridge	✓	✓	✓
M3 Junction 2-4a	✓	✓	✓
A27 Arundel Bypass		✓	✓
M4 Junctions 3-12	✓	✓	✓
A27 Segensworth Dualling	✓	✓	✓
Stubbington Bypass	✓	✓	✓
M27 Junction 9 and Parkway South Roundabout	✓	✓	✓
Whitehill and Bordon Relief Road	✓	✓	✓
M27 Junction 4-11 J4 S3	✓	✓	✓
A3024 Eastern Corridor improvements	✓	✓	✓
A3024 / Kingfisher Grange Access	✓	✓	✓
M27 J8	✓	✓	✓
Botley Bypass			✓
M27 Junction 10 Welborne			✓

5.4 Methodology

Car growth

5.4.1 The car trip ends for the base year and each forecast year, for AM, Inter and PM Peak periods for each origin and destination NTEM zone (consistent with the OD-based structure of the demand model) were extracted from TEMPro 7.2. These were then mapped to the M3 Junction 9 Model zones, to provide standard growth in car trips based on housing and employment assumptions included in NTEM 7.2.

5.4.2 Following this, based on the housing and commercial developments listed in **Section 5.2**, new local assumptions about the location and quantum of housing and commercial developments were prepared and mapped to the relevant NTEM zones. With regards to residential developments, the number of additional households to be used in forecasting was taken from the number of houses expected to be delivered in the relevant NTEM zones. With regards to the commercial developments, floor space was converted into the number of jobs, based on the job density assumptions derived from Government's 'Employment Densities Guide: 3rd Edition'.

5.4.3 Based on these assumptions, the number of new households and jobs defined for the relevant NTEM zones were entered into the Alternative Planning Assumptions (APA) tool in TEMPro to derive alternative trip ends for each relevant NTEM zone. These alternative trip end forecasts were then mapped to the M3 Junction 9 Model zones in the same way as the standard, background TEMPro 7.2 growth forecasts.

5.4.4 The forecasts were subsequently constrained to TEMPro 7.2 trip end projections. This process retained the trip end projections associated with the new developments in the zones where the developments are located. In the remaining model zones, it reduced the background NTEM growth to meet the overall TEMPro trip end projections over the local authorities for which the detailed development assumptions were specified. In the areas outside of these authorities, the original TEMPro 7.2 trip end assumptions were used without any further adjustment.

5.4.5 The adjusted trip end forecasts were used to calculate growth factors between the base year and each forecast year and for each origin and destination. These factors were then applied to the base year matrix through furnessing (balancing between origins and destinations) to produce forecast year reference case travel demand matrices.

Rail growth

5.4.6 To facilitate the operation of the variable demand procedure, the M3 Junction 9 Model requires forecast rail demand and supply (time and fare) inputs. These were based on the M3M27 SMI model (which in turn were derived from SERTM) by interpolating and extrapolating M3M27 SMI data for available years.

LGV and HGV growth

5.4.7 LGV and HGV growth was derived from Road Traffic Forecasts (RTF) 2018, published by the DfT. The RTF growth forecast are published for five-year intervals for each region and road type. For the purposes of this study, average regional growth factors for the South East reference case scenario were used. LGV\HGV growth factors for the M3 Junction 9 Model forecast years of 2027, 2042 and 2047 were determined via linear interpolation across the forecasted years published in RTF. Growth factors were obtained as the ratio of vehicle kilometres travelled, in the respective forecast years, to the vehicle kilometres travelled in the base year of 2015.

Forecast matrices

5.4.8 The reference case matrix totals for the Core scenarios for all modelled time periods and forecast years are presented in **Table 5-5**.

Table 5-5: Growth rates – core scenario

Period / Year	Matrix Totals (PCUs/Hr)					
	Car Business	Car Commuting	Car Other	LGV	HGV	Total
AM						
2027	11%	8%	13%	19%	4%	**11%**
2042	20%	17%	27%	43%	15%	**24%**
2047	24%	21%	32%	49%	18%	**28%**
IP						
2027	10%	7%	13%	19%	4%	**12%**
2042	19%	15%	28%	43%	15%	**26%**
2047	23%	18%	32%	49%	18%	**30%**
PM						
2027	10%	7%	12%	19%	5%	**10%**
2042	19%	16%	25%	43%	15%	**22%**
2047	23%	19%	29%	49%	18%	**26%**

VDM process and results

5.4.9 The VDM was prepared using DIADEM software v7.0. DIADEM software is designed to enable practitioners to set up (using user-friendly methods) a multi-stage transport demand model and find equilibrium between demand and supply, using the SATURN package as the supply model. The process iterates between demand calculations and highway assignments until a converged solution is reached.

5.4.10 DIADEM is consistent with TAG with respect to model form, model hierarchy and incremental nature of the model. The approach makes use of cost changes from incremental differences between base and test scenarios operated using a pivot point approach.

5.4.11 The Do-Minimum converged in less than 19 iterations to a GAP value of 0.2% or less for both the full model and the subset area. The reference case and post-VDM matrix totals were compared to understand the impact of VDM on highway trips. The comparison of pre and post VDM results indicated that there was induced traffic for all demand segments as a result of VDM. The 2047 VDM

impact is shown in **Table 5-6**. The comparisons for all other scenarios, years, and time periods are provided in the **ComMA (Document Reference 7.10)**.

Table 5-6: 2047 VDM demand impact – 2047 Do-Minimum forecast

Time period	User class	Reference			Post-VDM			Difference		
		Inter zonal	Intra zonal	Total	Inter zonal	Intra zonal	Total	Inter zonal	Intra zonal	Total
AM	Car business	573,581	356,662	216,919	573,639	356,748	216,891	58	86	-28
	Car commuting	2,476,765	1,059,696	1,417,069	2,476,769	1,059,684	1,417,085	4	-12	16
	Car other	2,600,758	1,214,508	1,386,250	2,600,824	1,214,701	1,386,123	66	193	-127
	Total	5,651,104	2,630,866	3,020,238	5,651,232	2,631,133	3,020,099	128	267	-139
IP	Car business	497,477	307,019	190,458	497,511	307,098	190,413	34	79	-45
	Car commuting	839,126	495,888	343,238	839,145	495,922	343,223	19	34	-15
	Car other	3,707,920	1,593,155	2,114,765	3,707,980	1,593,436	2,114,544	60	281	-221
	Total	5,044,523	2,396,062	2,648,461	5,044,636	2,396,456	2,648,180	113	394	-281
PM	Car business	600,611	377,625	222,986	600,636	377,681	222,955	25	56	-31
	Car commuting	2,278,448	1,094,177	1,184,271	2,278,458	1,094,208	1,184,250	10	31	-21
	Car other	3,664,075	1,646,672	2,017,403	3,664,122	1,646,808	2,017,314	47	136	-89
	Total	6,543,134	3,118,474	3,424,660	6,543,216	3,118,697	3,424,519	82	223	-141

5.5 Operational model forecasts

5.5.1 The forecast demand matrices were prepared using growth rates derived from the M3 Junction 9 Model. To obtain strategic traffic forecasts from the M3 Junction 9 Model, the highway assignment model was cordoned in a manner consistent with the coverage of the operational model network. The cordoned demand for each scenario was prepared based on this network for each user class and forecast year, as well as the base year. This ensured that zonal demand from M3 Junction 9 Model was compatible with the operational model zone structure.

5.5.2 Since the M3 Junction 9 Model has a base year of 2015 and the operational model has a base year of 2017, adjustment was necessary to reflect the proportion of growth that would have taken place between these two years. This was undertaken by generating an estimate of 2017 demand through linear interpolation between the 2015 base demand, 2047 Do-Minimum and Do-Something forecast demand (**Table 5-7**).

Table 5-7: Operational model years

M3 Junction 9 model	Operational model
2015	-
-	2017
2047	2047

5.6 Sensitivity testing

5.6.1 As part of the forecasting appraisal, low and high growth sensitivity tests were developed using TAG methodology, in which a proportion of the base model is subtracted (low growth) or added (high growth) to prepare alternatives to the forecast core scenario. The calculations are based on the proportion of the base year demand to be added or subtracted in proportion to the square root of the number of years between the base and future year scenario.

5.6.2 In addition to the low and high growth scenarios, a further ‘optimistic’ growth scenario was also prepared. This scenario included developments and schemes classified as ‘Reasonably Foreseeable’ within the Uncertainty Log for the year 2047 only. Developments classified as ‘Reasonably Foreseeable’ are listed in the Uncertainty Log (**Appendix A** in the **ComMA (Document Reference 7.10)** Highway schemes included within the optimistic scenario are listed in **Table 5-4**.

5.7 Do-Minimum summary

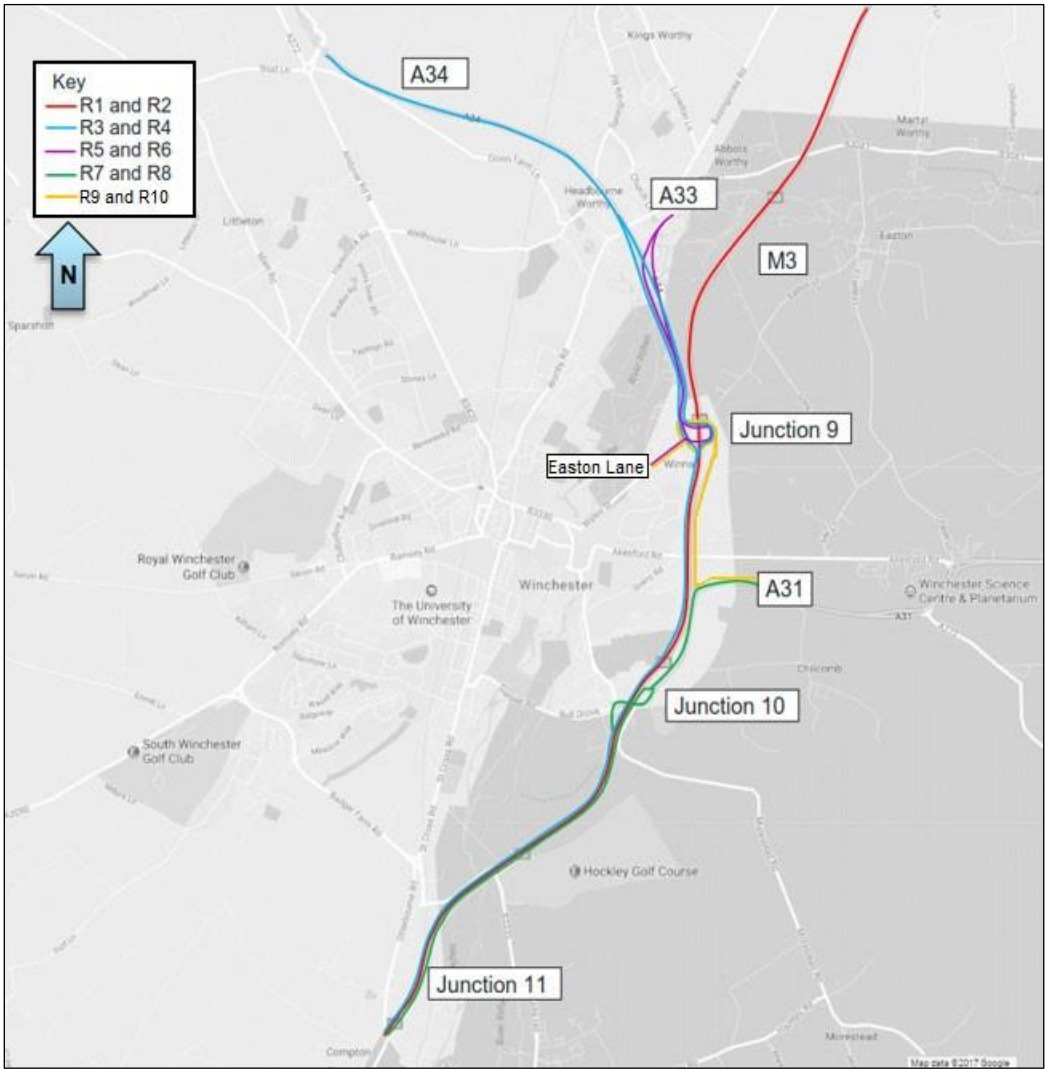
5.7.1 The M3 Junction 9 Model highway assignment analysis is summarised in the **ComMA (Document Reference 7.10)**. The assessment included analysis of network and model convergence statistics, traffic flows, journey times, and volume to capacity ratios in the modelled peak hours.

5.7.2 Analysis of the strategic model Volume to Capacity Ratios (V/Cs) in the Do-Minimum showed a significant number of links close to Junction 9 predicted to be above 75% which means these are close to theoretical capacity. Including the Easton Lane eastbound arm which was greater than 85% approaching Junction 9 (in the AM and PM peak). Furthermore, the A34 arm southbound at Junction 9 was over 75% in the AM and PM peak, and the M3 Junction 9 northbound off-slip was over 75% in the PM peak period. The operational model assessment included analysis of journey times, relative delay heatmaps, and analysis of queues and delays. **Figure 5-2** shows the journey time route sections used for the operational model analysis of the journey times, which are also described in **Table 5-8**.

Table 5-8: Operational model journey time assessment routes

JT number	Description
R1	M3 south to M3 north
R2	M3 north to M3 south
R3	M3 south to A34
R4	A34 to M3 south
R5	A33 to Easton Lane
R6	Easton Lane to A33
R7	A31 to M3 south via J10
R8	M3 south to A31 via J10
R9	A31 to Easton Lane
R10	Easton Lane to A31

Figure 5-2: Operational model journey time route sections (Source: PCF Stage 2 (Options Selection) Local Model Validation Report, Highways England, 2017)



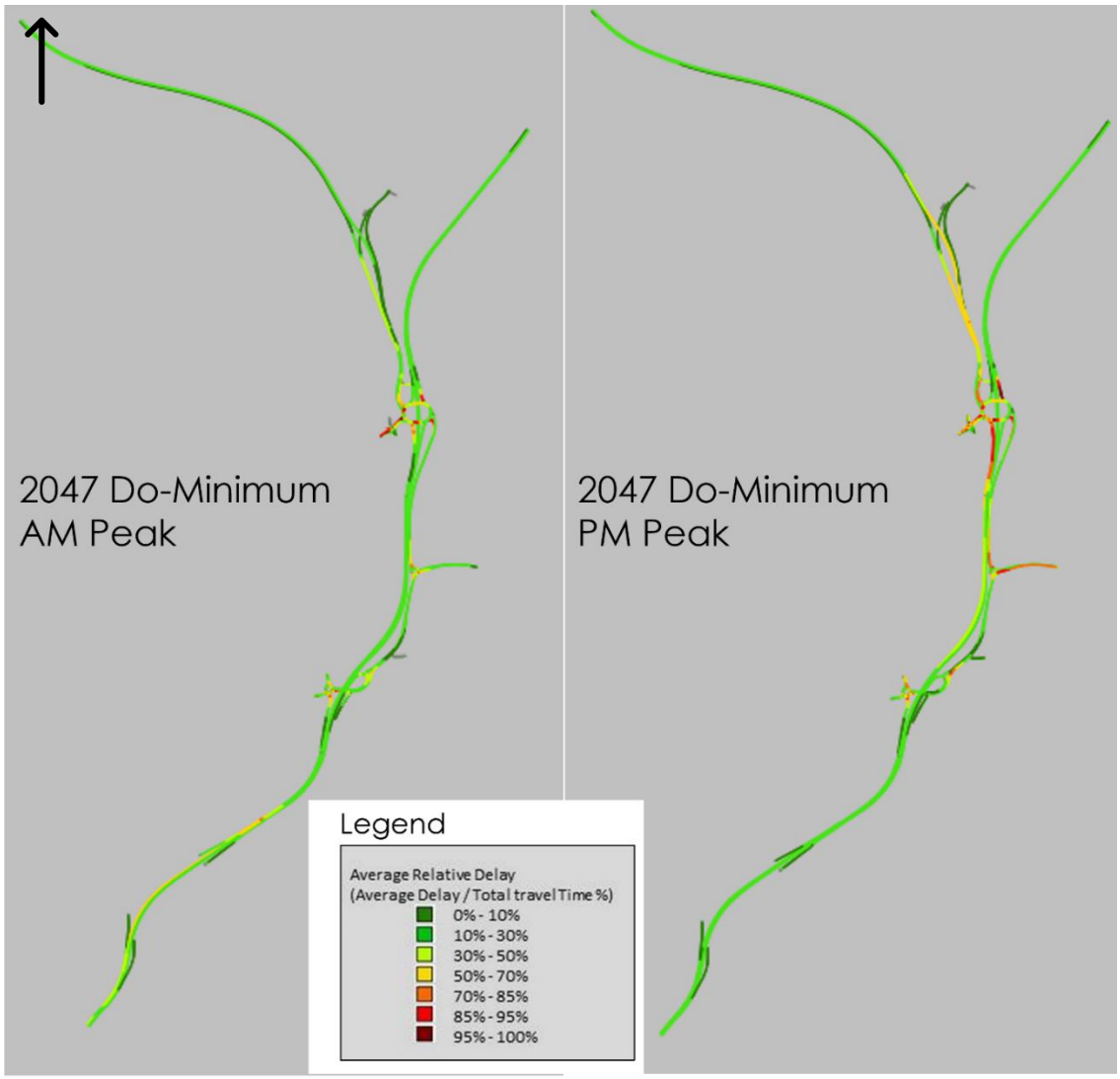
5.7.3 In the AM Peak Easton Lane to the A33 had a predicted journey time increase of over 3 minutes (120% of total travel time) between the 2017 base and the 2047 Do-Minimum. Easton Lane to the A31 had a predicted increase in journey time from 2017 to 2047 of over 2 minutes (50% of total travel time).

5.7.4 In the PM peak Easton Lane to A33 had a predicted journey time increase of almost 1 minute (circa 33% of travel total time) between the 2017 base and 2047 Do-Minimum. The M3 South to the A34 had a predicted journey time increase of circa 2 minutes (20% of total travel time).

5.7.5 **Figure 5-3** shows the operational model average relative delay for the Do-Minimum, this shows significant relative delays on the A34 southbound approaching Junction 9 of the M3 and the M3 Junction 9 northbound off-slip. On some of the links approaching key junctions at Junction 9 in both the AM and PM

peak the delay is more than 95% of total travel time. Easton Lane eastbound also shows significant relative delays.

Figure 5-3: 2047 Do-Minimum average delay as a proportion of free flow time



5.7.6 Modelled junction flows, delays, and queues were extracted from the operational model to provide an indication of network performance at the M3 Junction 9 gyratory and adjacent junctions (Easton Lane Tesco roundabout and A31/A272 roundabout).

5.7.7 Queue lengths are output by VISSIM in metres. Two metrics are provided for queues: the average queue length in metres, which is the average of the queue on each arm based on every model time step and the Max Queue in metres, which is the average of the maximum queue observed on each arm across the 10 model runs in the hourly period. Showing the max queue provides an indication of a worst-case scenario of queuing within the Peak hours.

5.7.8 The Do-Minimum scenario results are presented in **Table 5-9**.

5.7.9 Analysis of the operational model in the Do-Minimum ('without-Scheme') in 2047 showed that there are significant predicted delays above free-flow journey time at Junction 9. The model predicted delays on the Easton Lane approach (from Winchester city centre) of almost 3 minutes in the AM peak and 1.5 minutes in the PM peak. On the A34 approach to Junction 9 there was a predicted delay of around 0.5 minutes in the AM and PM peaks with a predicted average queue length of 870m (maximum queue length of 2,000m) in the PM peak.

Table 5-9: 2047 Do-Minimum junction results

Junction	Approach	Do-Minimum - AM				Do-Minimum - PM			
		Flow	Delay (s)	Avg Queue (m)	Max Q (m)	Flow	Delay (s)	Avg Queue (m)	Max Q (m)
M3 Junction 9	A272	391	100	30	177	405	138	76	402
	M3 southbound off-slip	263	88	21	81	356	170	87	192
	A34	2,699	28	75	593	2,697	37	870	2,099
	Easton Lane	603	165	150	184	1,230	91	107	181
	M3 northbound off-slip	2,320	19	30	196	1,972	54	695	2,594

5.7.10 Further details of the Do-Minimum outputs can be found in the **ComMA** (**Document Reference 7.10**).

6 The Scheme

6.1 Scheme description

6.1.1 The improvements proposed as part of the Scheme both maintain existing connectivity on the road network, whilst providing enhanced capacity, simplified routing and improved facilities for walking, cycling and horse-riding routes and landscaping enhancements. The Scheme would provide new free flow links between the M3 and A34, as well as a dedicated new A33 alignment. The Scheme elements are as follows:

- Widening of the M3 from a dual two-lane motorway (two-lane motorway with hard shoulders) to a four-lane motorway (with hard shoulders) between the proposed M3 Junction 9 gyratory north and south slip roads.
- A new smaller grade separated gyratory roundabout arrangement within the footprint of the existing roundabout, incorporating new connections over the M3 with improved walking, cycling and horse-riding routes.
- Connector roads from and to the new gyratory roundabout.
- Improved slip roads to/from the M3.
- New structures (in the form of gyratory bridges, underpasses, retaining walls, subway and a new cycle and footbridge over the River Itchen).
- A new surface water runoff system with associated drainage and infiltration features.
- New signage and gantries.
- Utility diversions.
- New lighting (subways, underpasses and gantries).
- Modifications to topography through cuttings and false cuttings as well as re-profiling of existing landform.
- New walking, cycling and horse-riding provision.
- Creation of new areas of chalk grassland, woodland, scrub planting and species rich grassland.

6.1.2 The Application Boundary covers an area of approximately 109 hectares (ha). This includes the proposed land required for gantries, signage, temporary construction compound areas, areas for environmental mitigation, areas for drainage requirements (some of which would be temporary) and traffic management.

6.1.3 The Scheme includes a package of environmental mitigation and enhancement measures to reduce the impacts from the Scheme to the environment where possible. Consideration was also given to the enhancement of the South Downs National Park where reasonably practicable.

6.1.4 Bridleways, footpaths, and cycleways have been designed to allow all gradients to be less than 1:20 to comply with Department for Transport's (DfT) inclusive mobility impaired users. The walking, cycling and horse-riding routes are designed for cyclists, and therefore as all horizontal radii are suited for cyclists, they are also considered acceptable for mobility impaired users. The range of opportunities and barriers to all forms of users have been given due consideration in the design of the Scheme.

6.1.5 A number of new structures are required to be both constructed and demolished to facilitate the Scheme. Some of the main structures are as follows:

- The existing bridges at the M3 Junction 9 gyratory roundabout are proposed to be demolished and replaced by the two new bridge structures carrying the new gyratory
- A new underpass is proposed to carry the A34 southbound under the new A33 link road and the existing M3. The A34 northbound underpass would carry the new A34 northbound over the new A33 link
- The existing subways (Winnall Subway East and Winnall Subway West) located under the existing gyratory are proposed to be demolished to facilitate the construction of the reconfigured roundabout. New subways are proposed along the proposed walking, cycling and horse-riding route
- A new footbridge over the River Itchen is proposed between the existing Itchen Bridge, (which carries the A34 northbound carriageway), and the existing Kings Worthy Bridge which will carry the A33 north and southbound carriageways and the A34 southbound carriageway, respectively.

6.1.6 The walking, cycling and horse-riding facilities around and within the Scheme are to be upgraded. This includes an improvement to the National Cycle Network (NCN) Route 23. An additional footpath, cyclepath and bridleway is proposed on the eastern side of the Scheme to link Easton Lane with Long Walk. Such a route would provide a circular leisure path for those using the South Downs National Park with a link to the other paths around Long Walk with their links to local villages. A new combined footpath and cyclepath for the western side of the Scheme is proposed to link the A33 / B3047 Junction to Winnall Industrial Estate situated on Easton Lane.

6.1.7 A detailed description of the Scheme is provided in **Chapter 1 (Introduction)** and **Chapter 2 (The Scheme and its Surroundings)** of the **Environmental Statement (ES) (Document Reference 6.1)**.

7 Forecast year Do-Something scenario Scheme traffic model summary

7.1 Approach

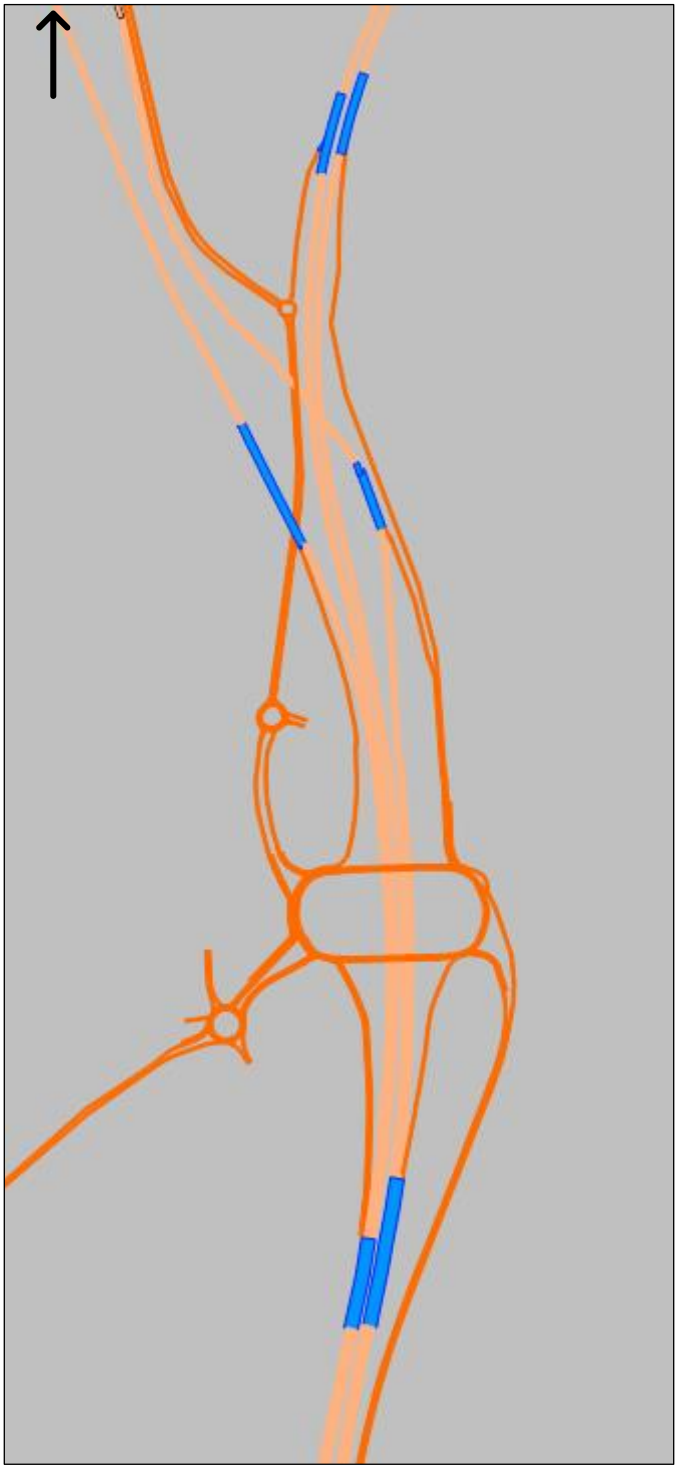
7.1.1 The reference demand matrices are the same as those used in the Do-Minimum. These were then used in VDM with the Scheme network to forecast travel demand. The process used to do this is explained in detail in the **ComMA (Document Reference 7.10)** and summarised below.

7.2 Do-Something infrastructure

7.2.1 This comprises the Do-Minimum network with the addition of the Scheme detailed in **Chapter 6** which was incorporated into the strategic and operational models.

7.2.2 The Scheme coded into the operational model is presented in **Figure 7-1**,. The light orange represents the mainline carriageways e.g. M3, A34, the dark orange represents the road network around the junction and the blue represents the merge diverge. The same Scheme representation was also coded into the strategic M3 Junction 9 Model.

Figure 7-1: Scheme coding for the operational model (Source: Interim PCF Stage 3a Economic Assessment Technical Note, Highways England, 2020)



7.3 Summary of the Do-Something scenario

7.3.1 The Do-Something model analysis is provided in Chapter 4 of the **ComMA (Document Reference 7.10)**. This includes M3 Junction 9 Model and operational model analysis of predicted Scheme impacts which is summarised below.

7.3.2 The 2027 and 2042 forecast Do-Something VDM scenarios converged in less than 20 iterations to a GAP value of 0.2% or less for both the full model and the subset area. The 2047 forecast Do-Something VDM scenario was terminated at 20 iterations and a GAP value of 0.24% achieved for the full model and 0.14% for the subset area. The Do-Something VDM matrix totals for 2047 are shown in **Table 7-1**. The comparisons for all other scenarios, years, and time periods are provided in the **ComMA (Document Reference: 7.10)**.

Table 7-1: 2047 VDM demand impact – 2047 Do-Something forecast

Time period	User class	Reference			Post-VDM			Difference		
		Inter zonal	Intra zonal	Grand total	Inter zonal	Intra zonal	Grand total	Inter zonal	Intra zonal	Grand total
AM	Car business	573,581	356,662	216,919	573,639	356,748	216,891	58	86	-28
	Car commuting	2,476,765	1,059,696	1,417,069	2,476,774	1,059,689	1,417,085	9	-7	16
	Car other	2,600,758	1,214,508	1,386,250	2,600,824	1,214,700	1,386,124	66	192	-126
	Total	5,651,104	2,630,866	3,020,238	5,651,237	2,631,137	3,020,100	133	271	-138
IP	Car business	497,477	307,019	190,458	497,512	307,099	190,413	35	80	-45
	Car commuting	839,126	495,888	343,238	839,146	495,923	343,223	20	35	-15
	Car other	3,707,920	1,593,155	2,114,765	3,707,980	1,593,439	2,114,541	60	284	-224
	Total	5,044,523	2,396,062	2,648,461	5,044,638	2,396,461	2,648,177	115	399	-284
PM	Car business	600,611	377,625	222,986	600,635	377,681	222,954	24	56	-32
	Car commuting	2,278,448	1,094,177	1,184,271	2,278,466	1,094,216	1,184,250	18	39	-21
	Car other	3,664,075	1,646,672	2,017,403	3,664,122	1,646,811	2,017,311	47	139	-92
	Total	6,543,134	3,118,474	3,424,660	6,543,223	3,118,708	3,424,515	89	234	-145

Strategic model traffic flows

7.3.3 The difference in flows for the Winchester road network (**Figure 7-2**) is presented in **Figure 7-3** to **Figure 7-11**. These are also presented in larger format in **Appendix A**. There are increases in flow in all time periods (up to 870 vehicles in the PM period in 2047) due to the provision of direct slip roads between the M3 and A34.

7.3.4 The Scheme is predicted to increase the traffic flow on Easton Lane in all periods in all years. The diversion of A34 traffic from M3 Junction 9 increases the attractiveness of the A272 Spitfire Link as an access route to the M3 and Winchester City.

7.3.5 The flows on several local roads within Winchester City are predicted to decrease. One reason is that, in the Do-Minimum scenario, traffic diverts through Winchester to avoid the delays at Junction 9. The introduction of the Scheme reduces the incentive to avoid the junction with a predicted reduction in traffic flows across the city.

Figure 7-2: Winchester road network

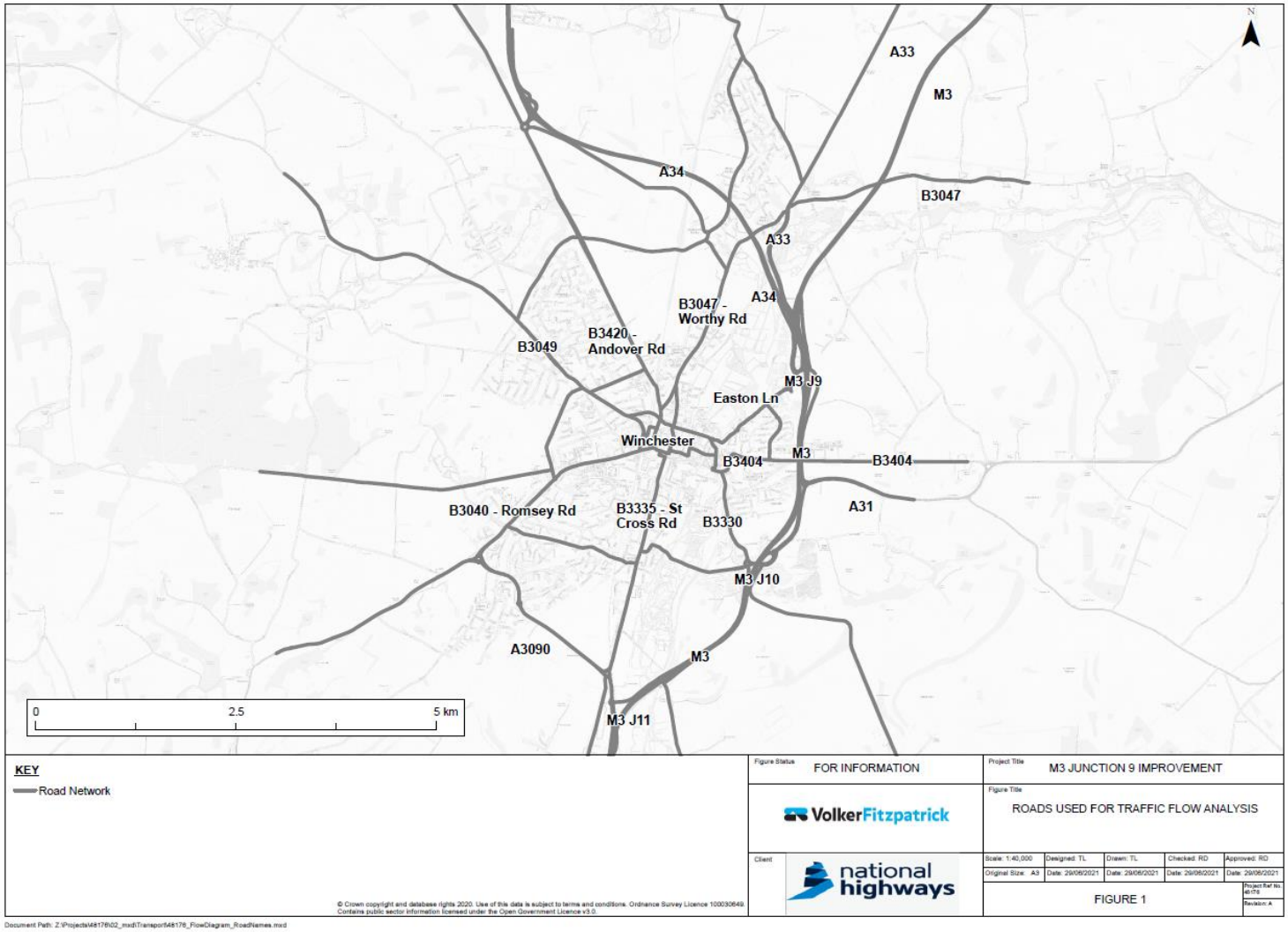
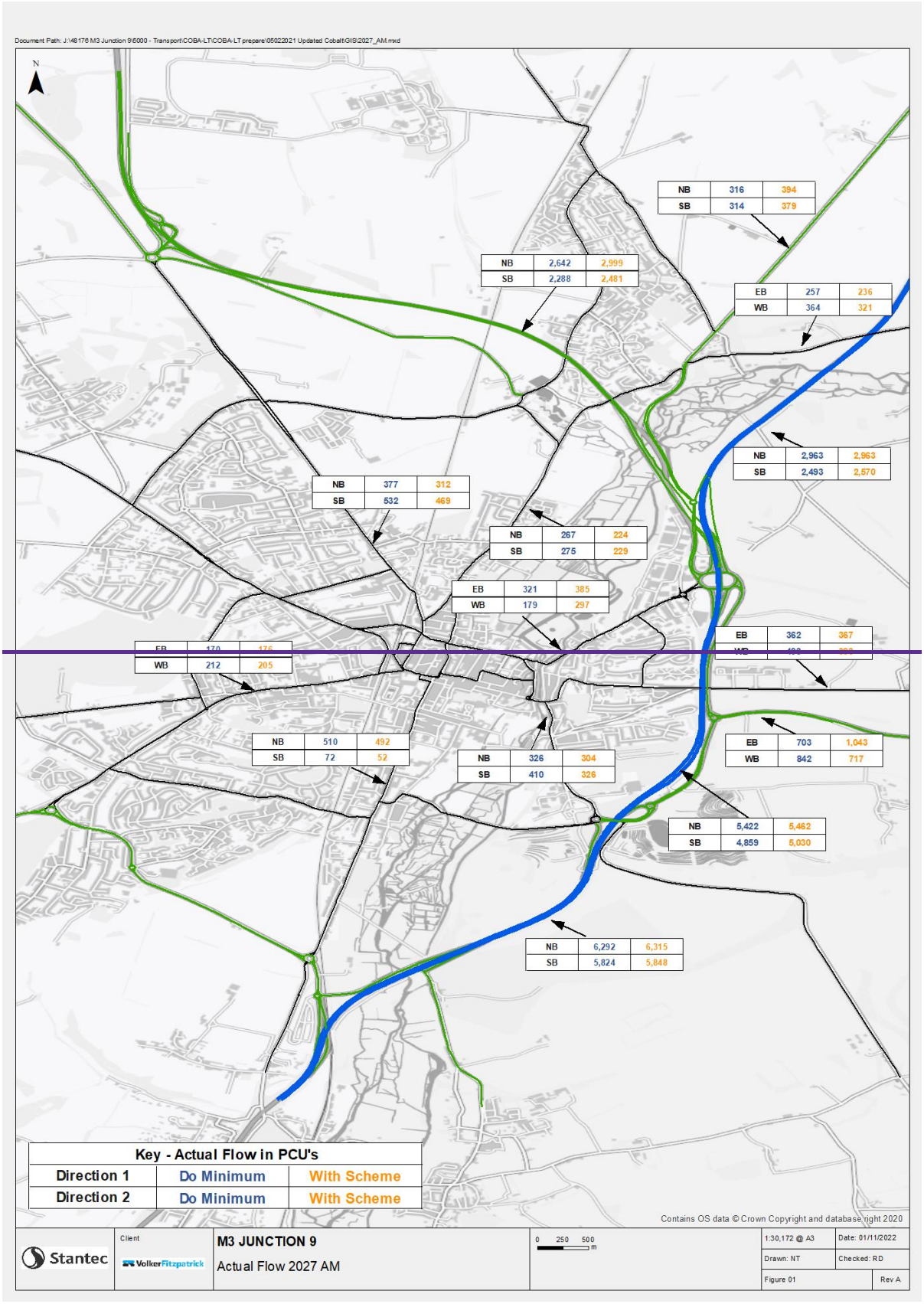


Figure 7-3: Core scenario flows, 2027 AM peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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SB 2,288 2,481
EB 257 236
WB 364 321
NB 2,963 2,963
SB 2,493 2,570
NB 377 312
SB 532 469
NB 267 224
SB 275 229
EB 321 385
WB 179 297
EB 362 367
WB 212 205
NB 510 492
SB 72 52
NB 326 304
SB 410 326
EB 703 1,043
WB 842 717
NB 5,422 5,462
SB 4,859 5,030
NB 6,292 6,315
SB 5,824 5,848
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
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Stantec
Client
VolkerFitzpatrick
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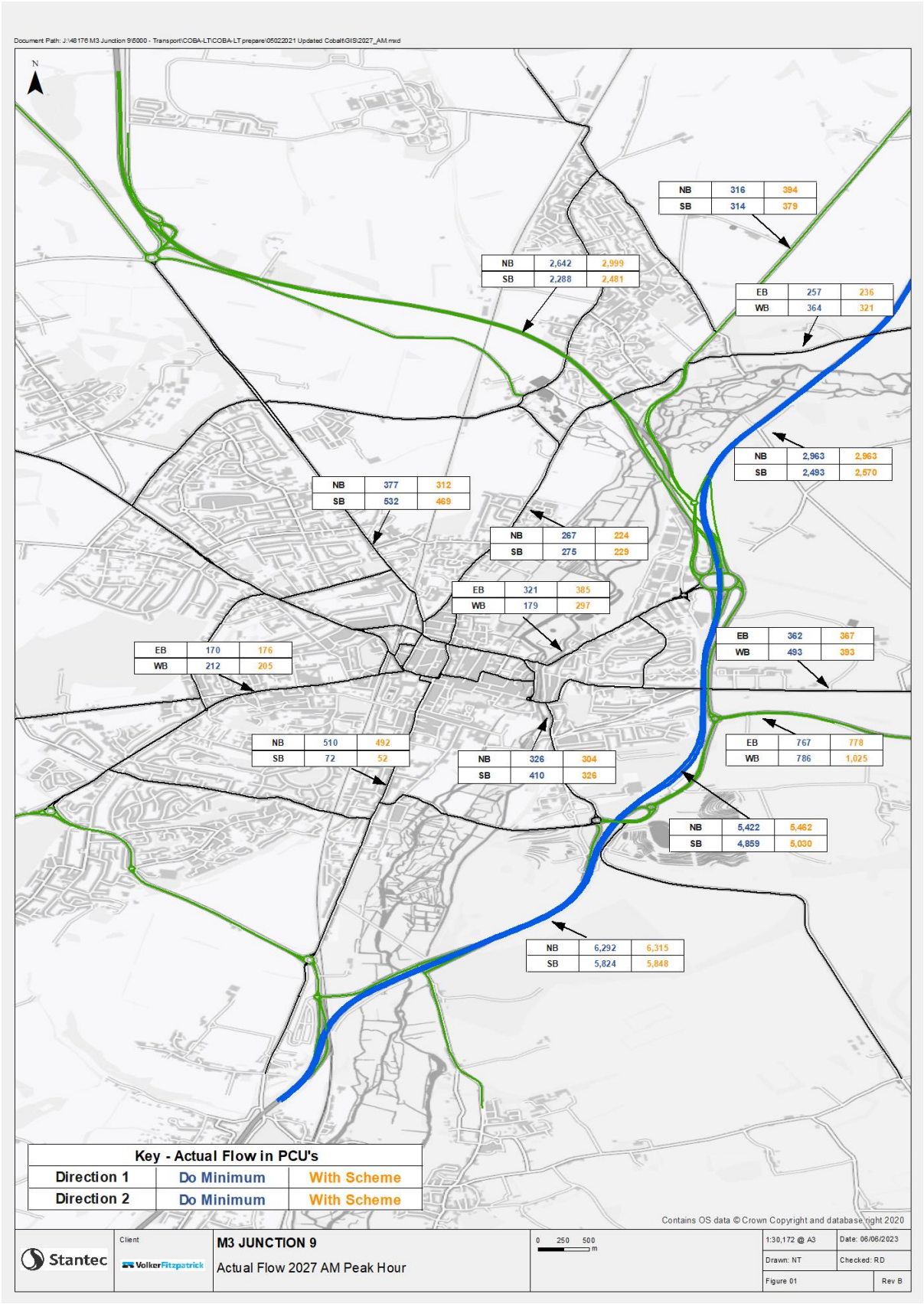
Figure 01
Rev A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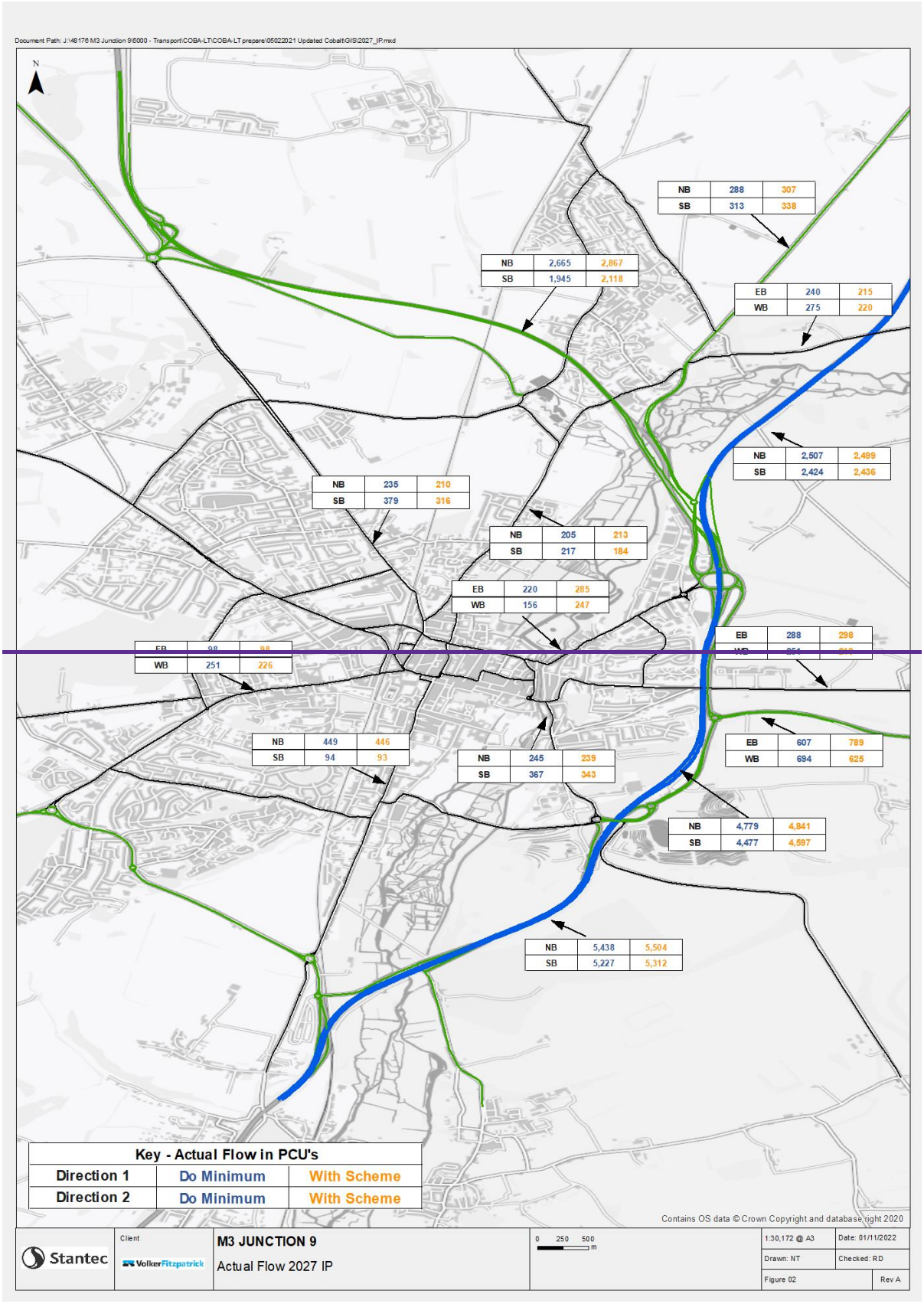
SB 314 379
NB 2,642 2,999
SB 2,288 2,481
EB 257 236
WB 364 321
NB 2,963 2,963
SB 2,493 2,570
NB 377 312
SB 532 469
NB 267 224
SB 275 229
EB 321 385
WB 179 297
EB 362 367
WB 493 393
EB 170 176
WB 212 205
NB 510 492
SB 72 52
NB 326 304
SB 410 326
EB 767 778
WB 786 1,025
NB 5,422 5,462
SB 4,859 5,030
NB 6,292 6,315
SB 5,824 5,848
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2027 AM Peak Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 01
Rev B

Figure 7-4: Core scenario flows, 2027 inter peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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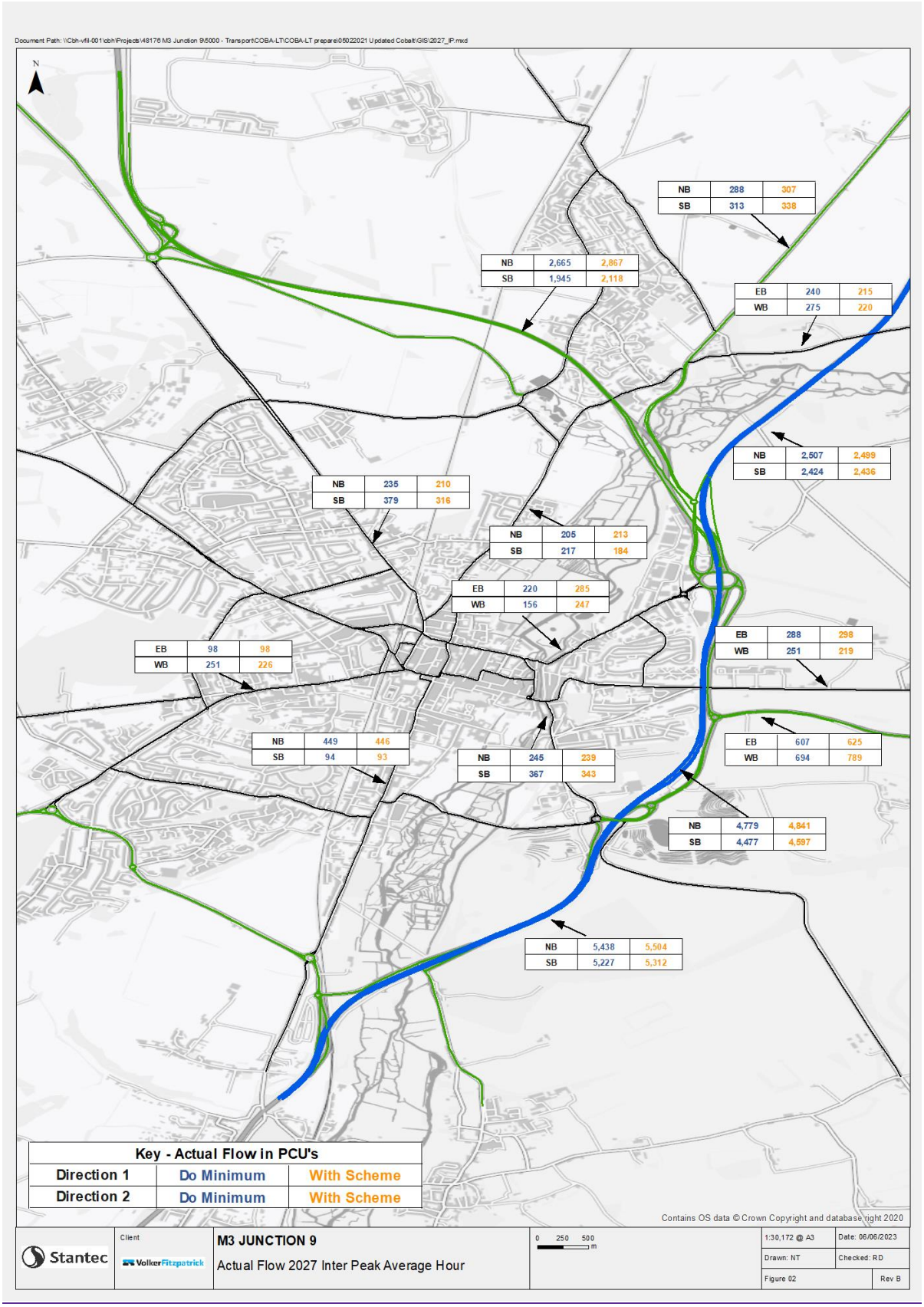
WB 275 220
NB 2,507 2,499
SB 2,424 2,436
NB 235 210
SB 379 316
NB 205 213
SB 217 184
EB 220 285
WB 156 247
EB 288 298
WB 251 226
NB 449 446
SB 94 93
NB 245 239
SB 367 343
EB 607 789
WB 694 625
NB 4,779 4,841
SB 4,477 4,597
NB 5,438 5,504
SB 5,227 5,312
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2027 IP
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 02
Rev A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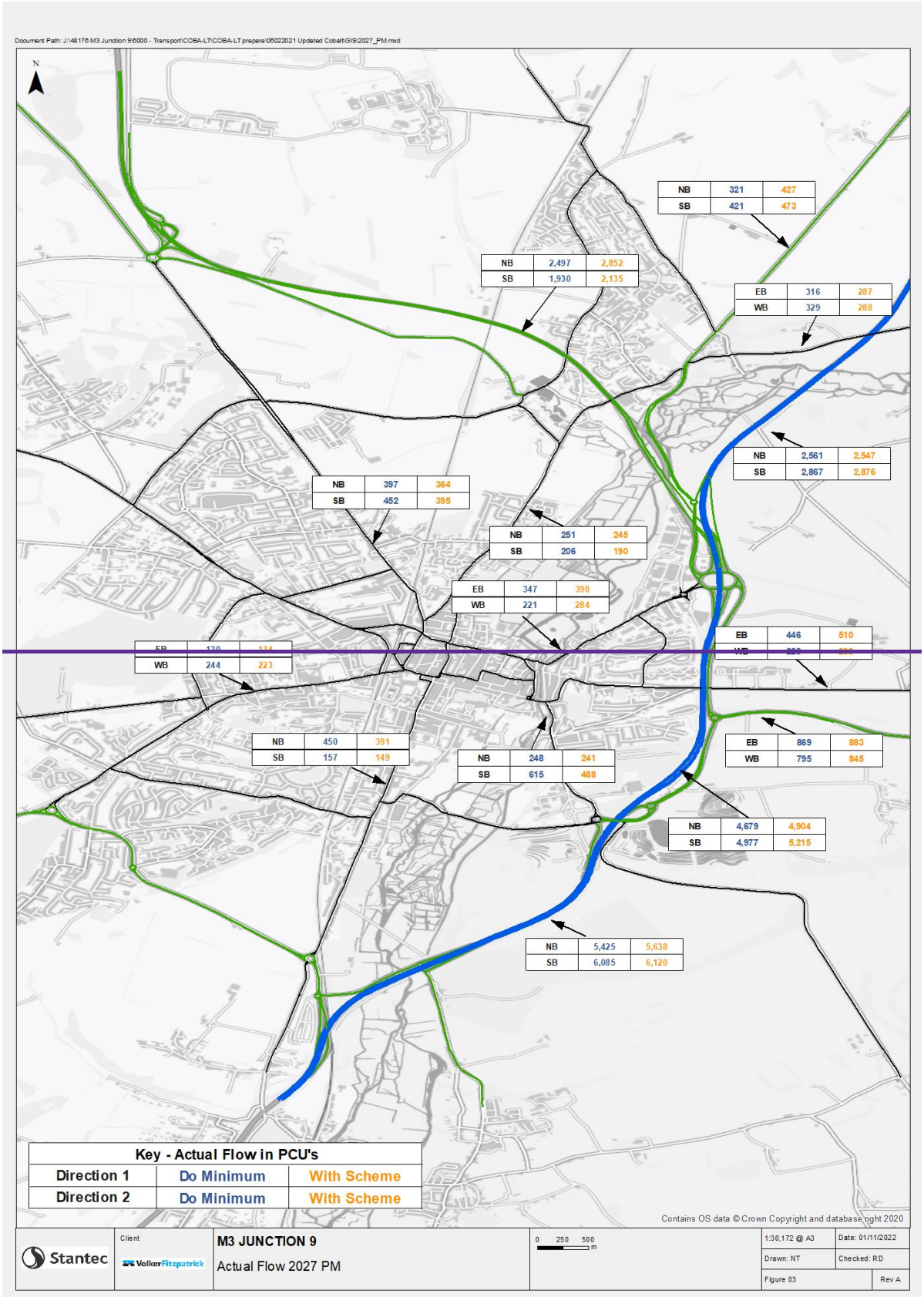
WB 275 220
NB 2,507 2,499
SB 2,424 2,436
NB 235 210
SB 379 316
NB 205 213
SB 217 184
EB 220 285
WB 156 247
EB 98 98
WB 251 226
EB 288 298
WB 251 219
NB 449 446
SB 94 93
NB 245 239
SB 367 343
EB 607 625
WB 694 789
NB 4,779 4,841
SB 4,477 4,597
NB 5,438 5,504
SB 5,227 5,312
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2027 Inter Peak Average Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 02
Rev B

Figure 7-5: Core scenario flows, 2027 PM peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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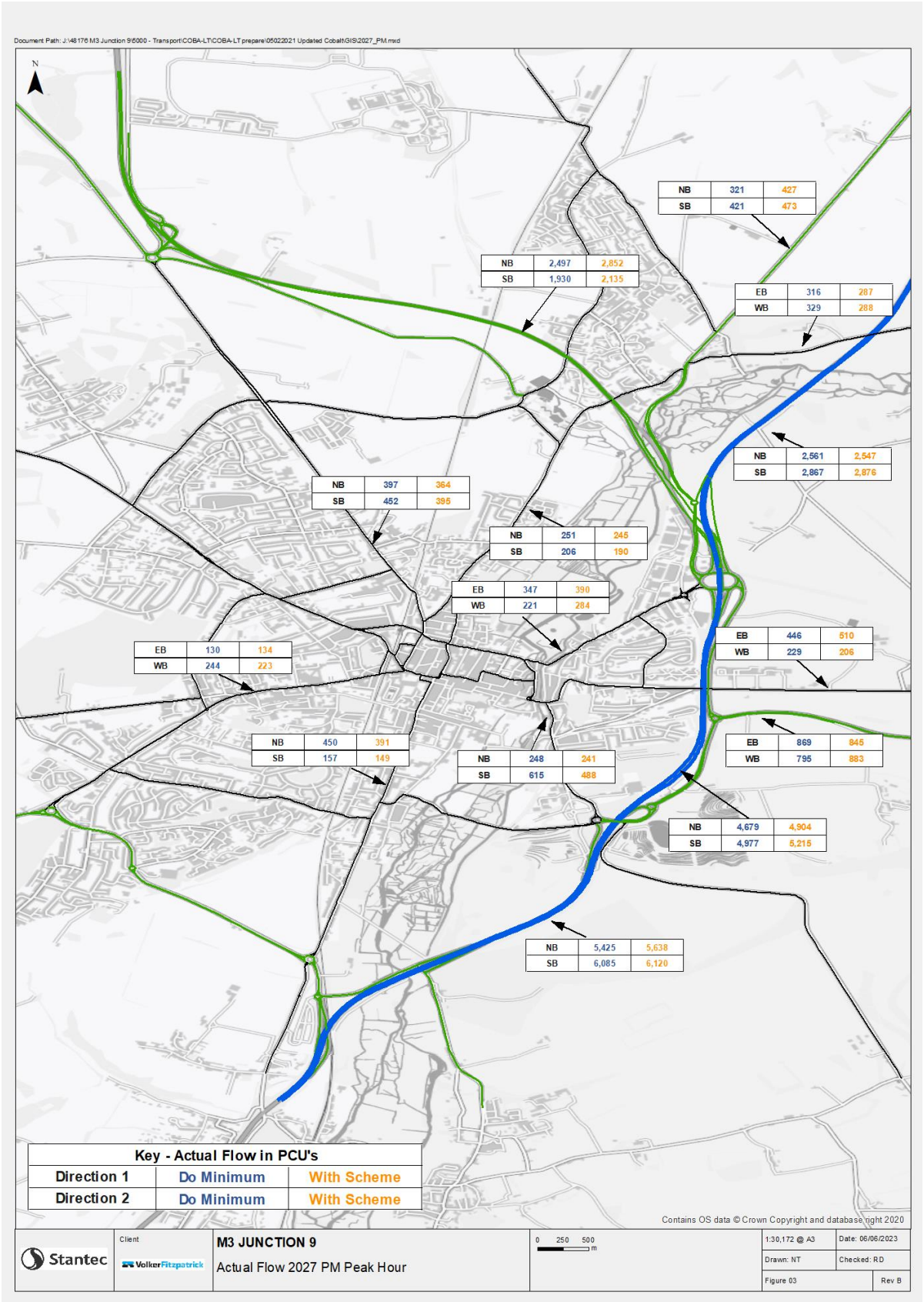
SB 1,930 2,135
EB 316 287
WB 329 288
NB 2,561 2,547
SB 2,867 2,876
NB 397 364
SB 452 395
NB 251 245
SB 206 190
EB 347 390
WB 221 284
EB 446 510
WB 244 223
NB 450 391
SB 157 149
NB 248 241
SB 615 488
EB 869 883
WB 795 845
NB 4,679 4,904
SB 4,977 5,215
NB 5,425 5,638
SB 6,085 6,120
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2027 PM
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 03
Rev A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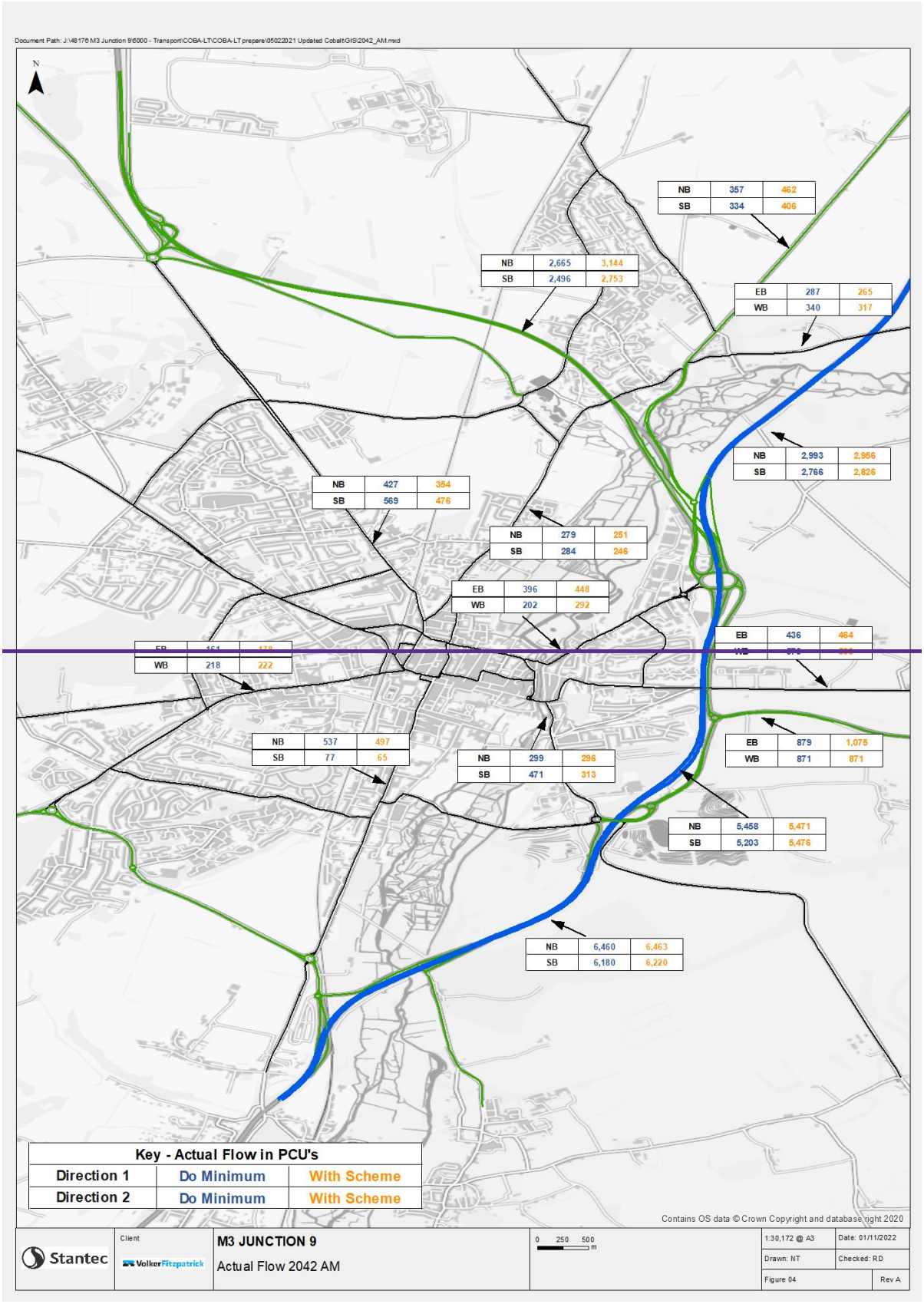
EB 316 287
WB 329 288
NB 2,561 2,547
SB 2,867 2,876
NB 397 364
SB 452 395
NB 251 245
SB 206 190
EB 347 390
WB 221 284
EB 130 134
WB 244 223
EB 446 510
WB 229 206
NB 450 391
SB 157 149
NB 248 241
SB 615 488
EB 869 845
WB 795 883
NB 4,679 4,904
SB 4,977 5,215
NB 5,425 5,638
SB 6,085 6,120
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2027 PM Peak Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 03
Rev B

Figure 7-6: Core scenario flows, 2042 AM peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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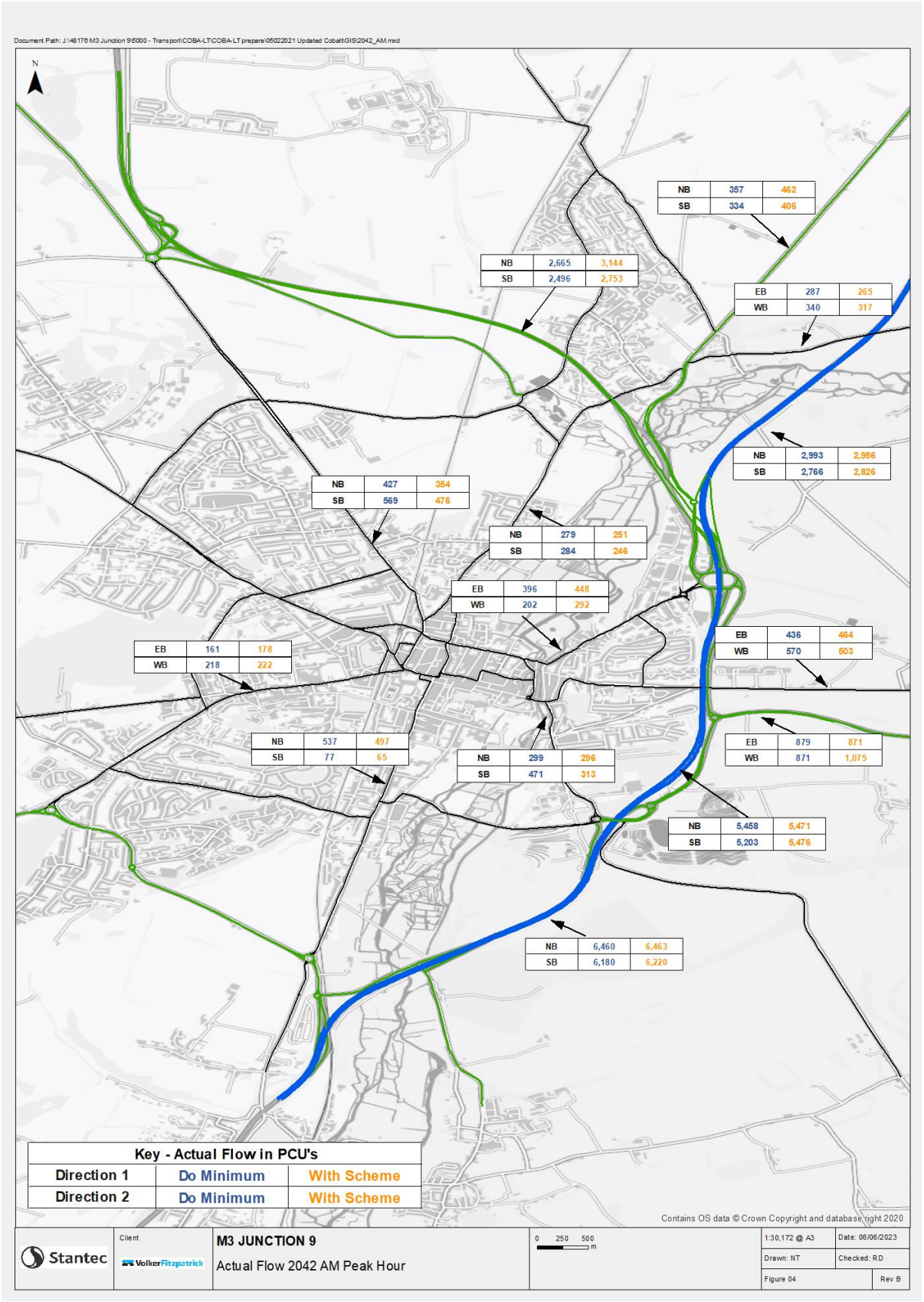
NB 2,665 3,144
SB 2,496 2,753
EB 287 265
WB 340 317
NB 2,993 2,956
SB 2,766 2,826
NB 427 354
SB 569 476
NB 279 251
SB 284 246
EB 396 448
WB 202 292
EB 436 464
WB 218 222
NB 537 497
SB 77 65
NB 299 296
SB 471 313
EB 879 1,075
WB 871 871
NB 5,458 5,471
SB 5,203 5,476
NB 6,460 6,463
SB 6,180 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2042 AM
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 04
Rev A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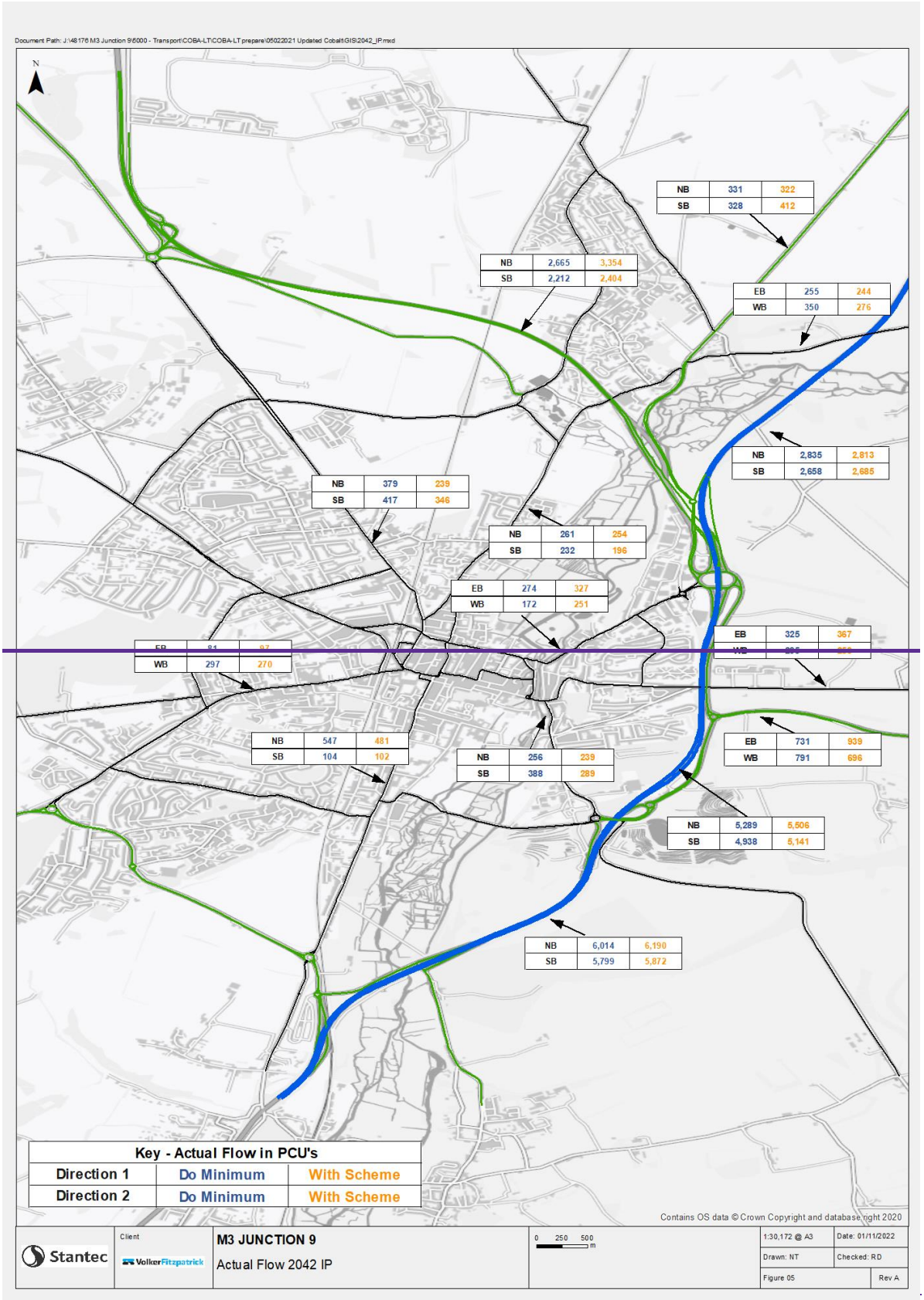
NB 2,665 3,144
SB 2,496 2,753
EB 287 265
WB 340 317
NB 2,993 2,956
SB 2,766 2,826
NB 427 354
SB 569 476
NB 279 251
SB 284 246
EB 396 448
WB 202 292
EB 436 464
WB 570 503
EB 161 178
WB 218 222
NB 537 497
SB 77 65
NB 299 296
SB 471 313
EB 879 871
WB 871 1,075
NB 5,458 5,471
SB 5,203 5,476
NB 6,460 6,463
SB 6,180 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2042 AM Peak Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 04
Rev B

Figure 7-7: Core scenario flows, 2042 inter peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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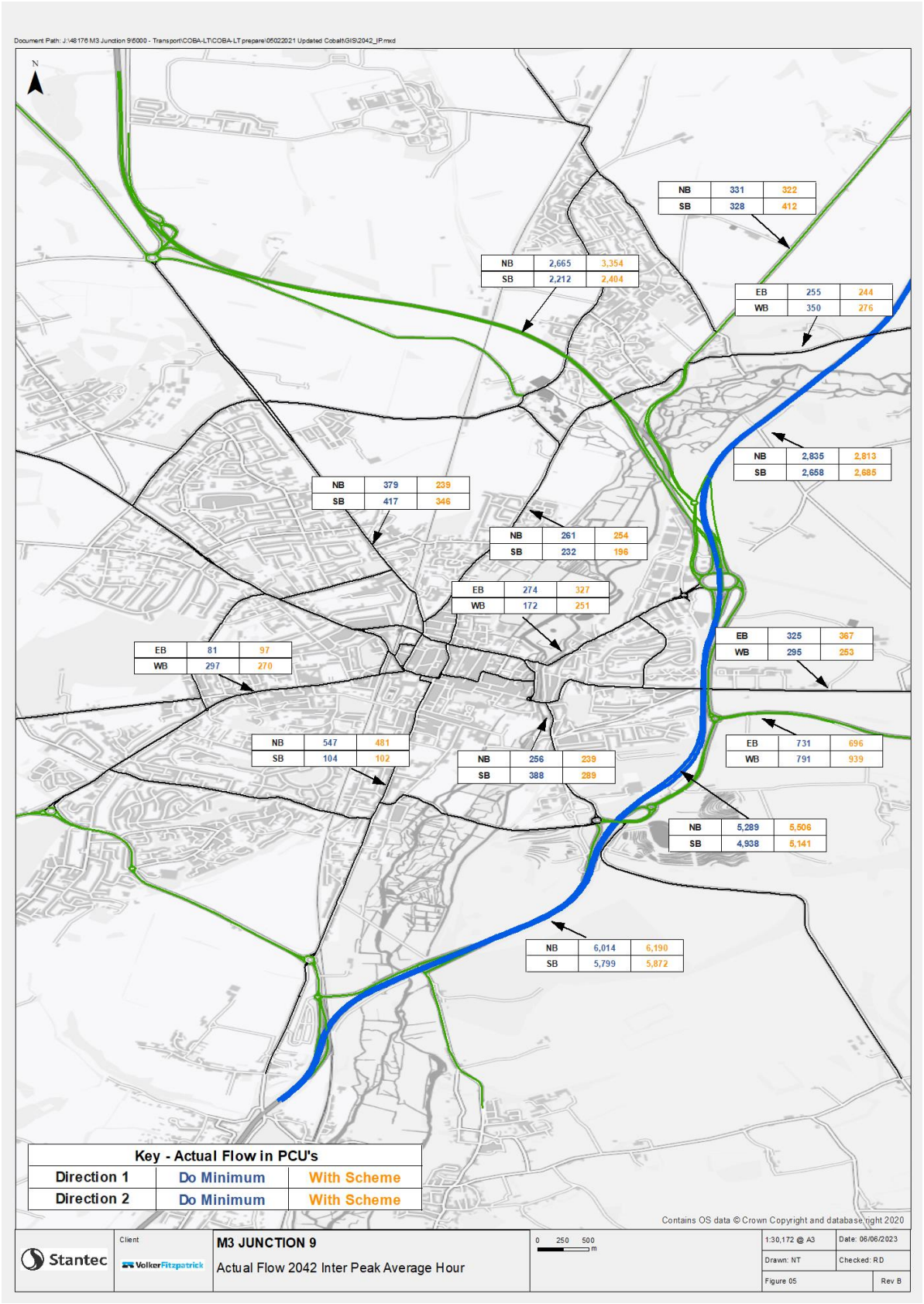
NB 2,665 3,354
SB 2,212 2,404
EB 255 244
WB 350 276
NB 2,835 2,813
SB 2,658 2,685
NB 379 239
SB 417 346
NB 261 254
SB 232 196
EB 274 327
WB 172 251
EB 84 97
WB 297 270
EB 325 367
NB 547 481
SB 104 102
NB 256 239
SB 388 289
EB 731 939
WB 791 696
NB 5,289 5,506
SB 4,938 5,141
NB 6,014 6,190
SB 5,799 5,872
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2042 IP
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 05
Rev A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EB 255 244
WB 350 276
NB 2,835 2,813
SB 2,658 2,685
NB 379 239
SB 417 346
NB 261 254
SB 232 196
EB 274 327
WB 172 251
EB 325 367
WB 295 253
EB 81 97
WB 297 270
NB 547 481
SB 104 102
NB 256 239
SB 388 289
EB 731 696
WB 791 939
NB 5,289 5,506
SB 4,938 5,141
NB 6,014 6,190
SB 5,799 5,872
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
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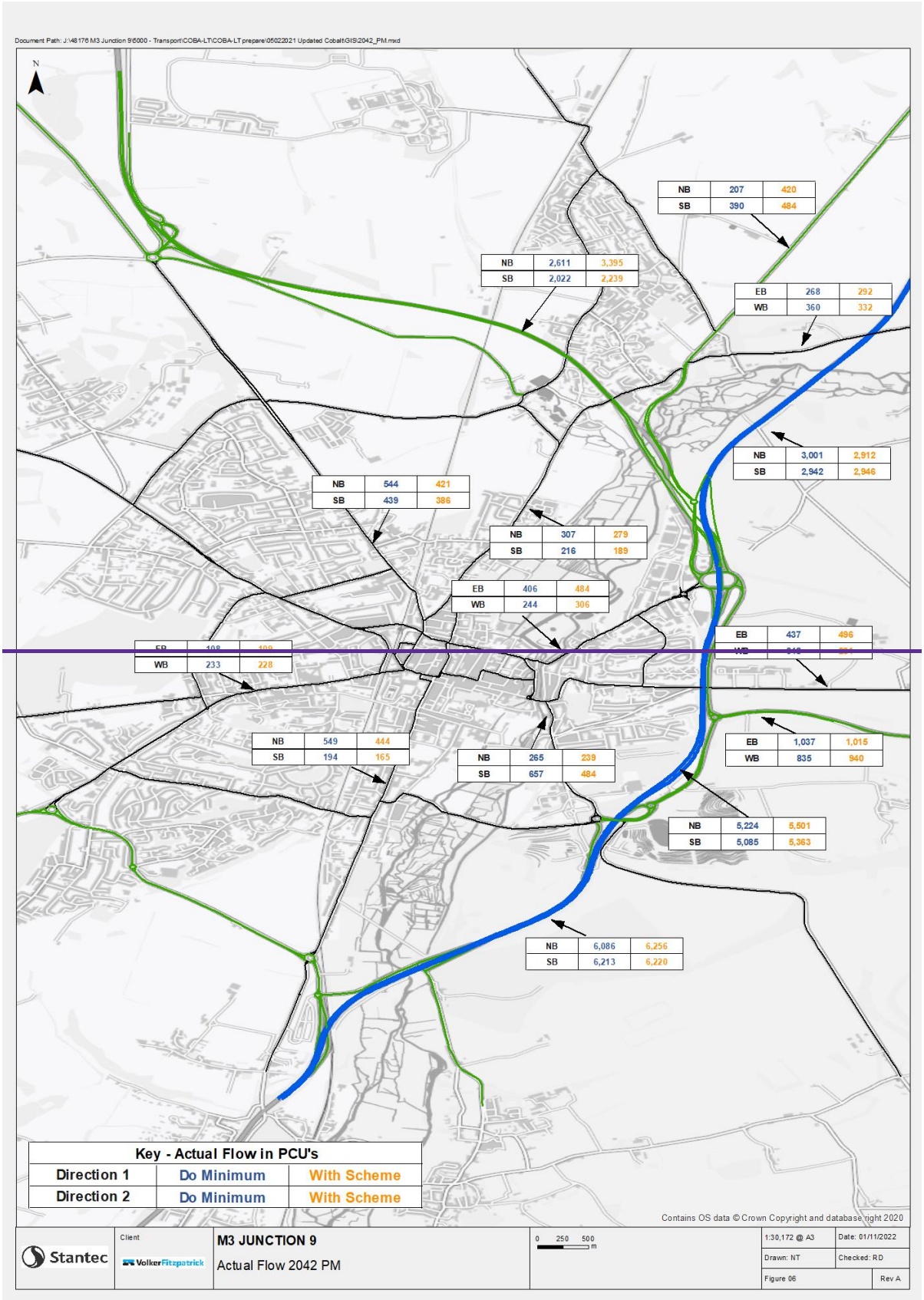
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2042 Inter Peak Average Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 05
Rev B

Figure 7-8: Core scenario flows, 2042 PM peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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SB 390 484
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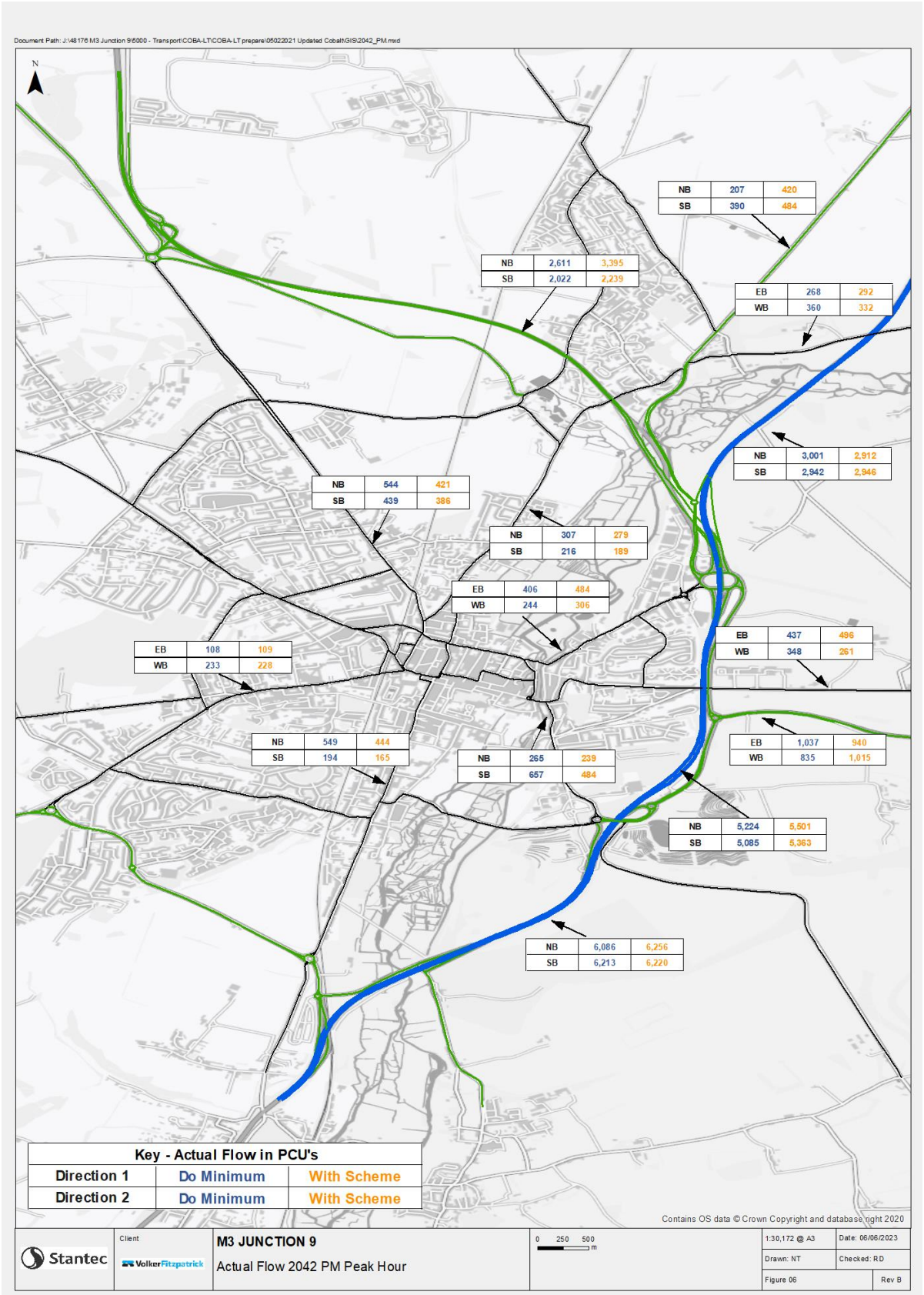
SB 2,022 2,239
EB 268 292
WB 360 332
NB 3,001 2,912
SB 2,942 2,946
NB 544 421
SB 439 386
NB 307 279
SB 216 189
EB 406 484
WB 244 306
EB 437 496
WB 233 228
NB 549 444
SB 194 165
NB 265 239
SB 657 484
EB 1,037 1,015
WB 835 940
NB 5,224 5,501
SB 5,085 5,363
NB 6,086 6,256
SB 6,213 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2042 PM
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 06
Rev A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SB 2,022 2,239
EB 268 292
WB 360 332
NB 3,001 2,912
SB 2,942 2,946
NB 544 421
SB 439 386
NB 307 279
SB 216 189
EB 406 484
WB 244 306
EB 108 109
WB 233 228
EB 437 496
WB 348 261
NB 549 444
SB 194 165
NB 265 239
SB 657 484
EB 1,037 940
WB 835 1,015
NB 5,224 5,501
SB 5,085 5,363
NB 6,086 6,256
SB 6,213 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
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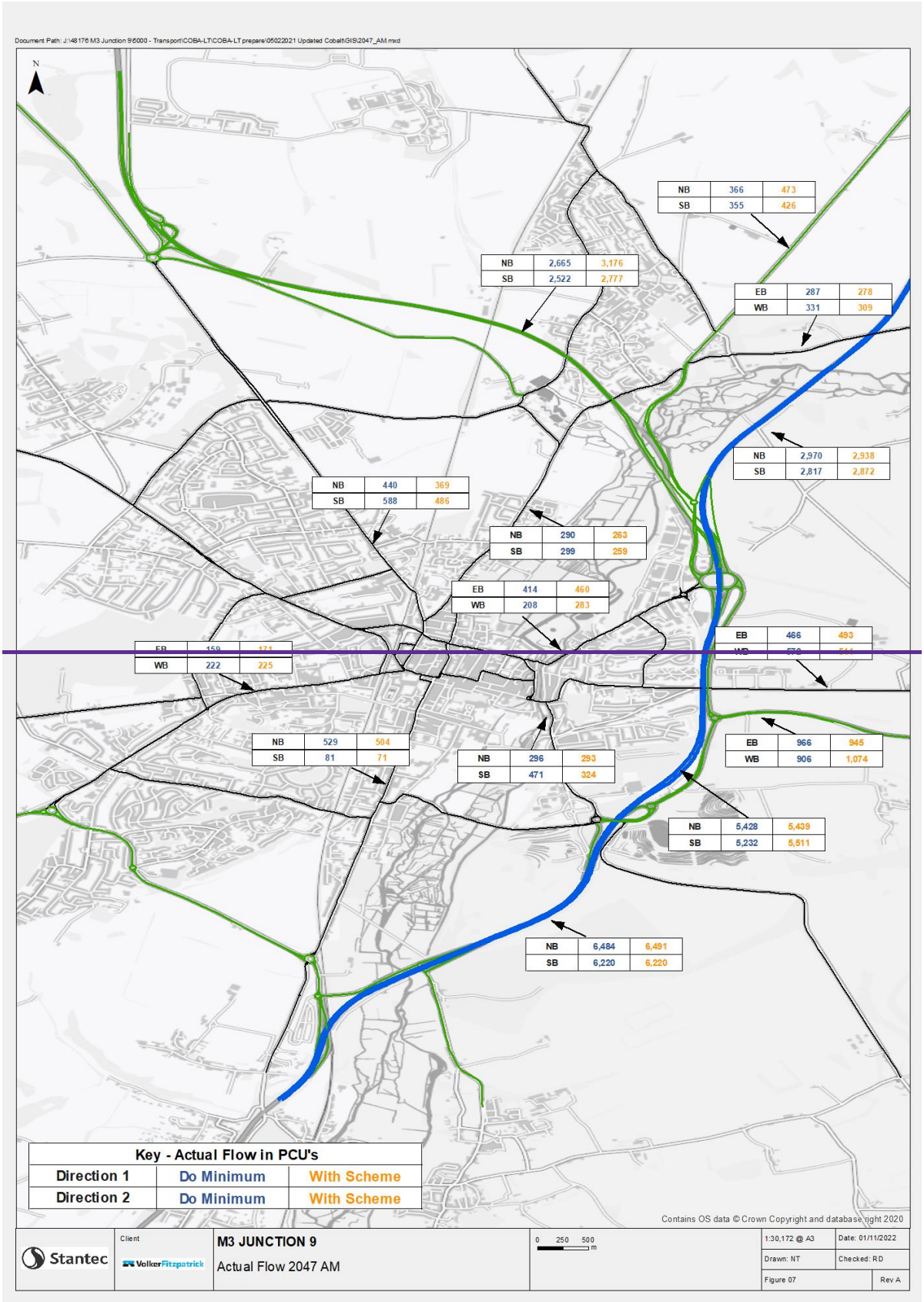
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2042 PM Peak Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 06
Rev B

Figure 7-9: Core scenario flows, 2047 AM peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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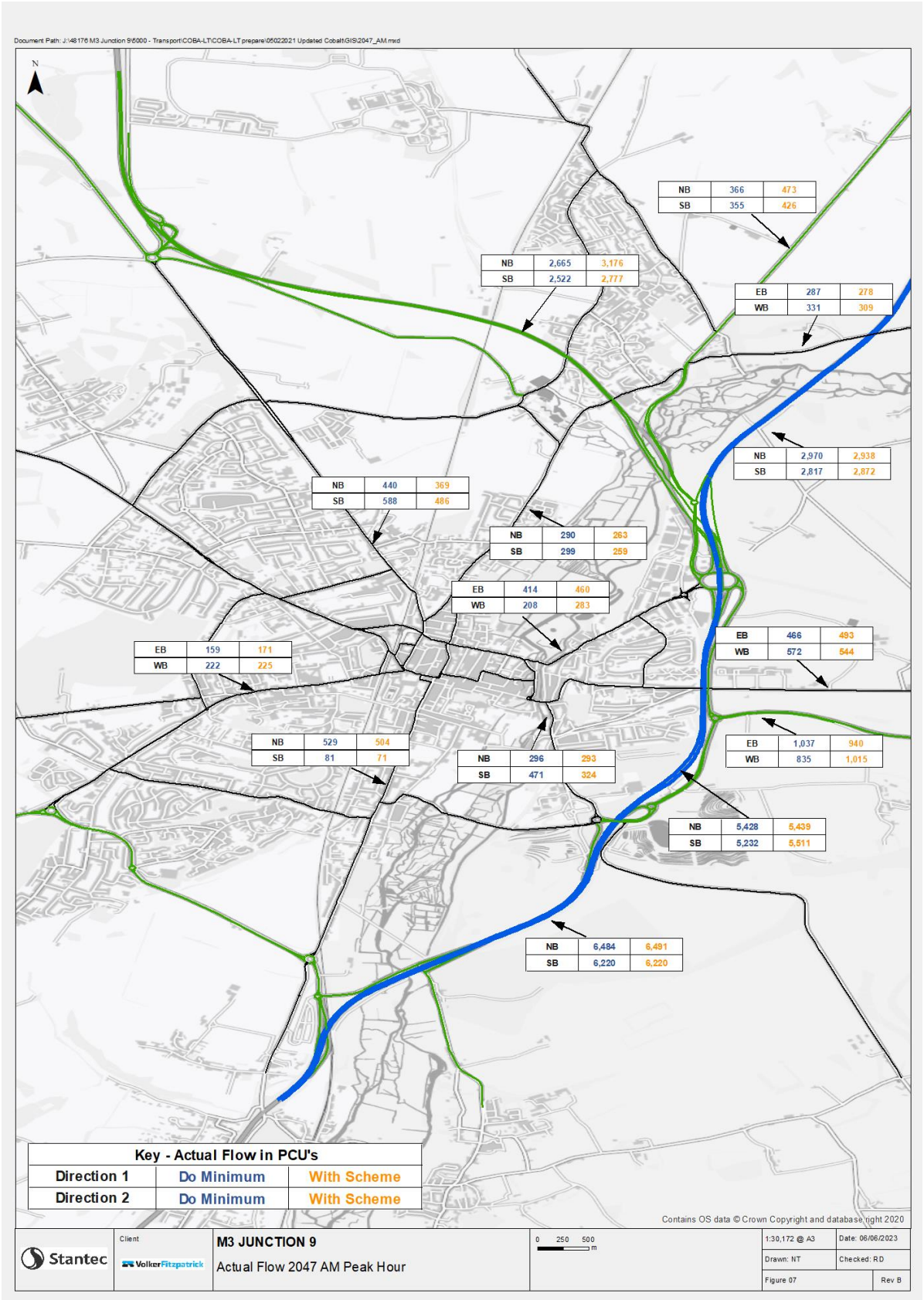
EB 287 278
WB 331 309
NB 2,970 2,938
SB 2,817 2,872
NB 440 369
SB 588 486
NB 290 263
SB 299 259
EB 414 460
WB 208 283
EB 466 493
WB 222 225
NB 529 504
SB 81 71
NB 296 293
SB 471 324
EB 966 945
WB 906 1,074
NB 5,428 5,439
SB 5,232 5,511
NB 6,484 6,491
SB 6,220 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2047 AM
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 07
Rev A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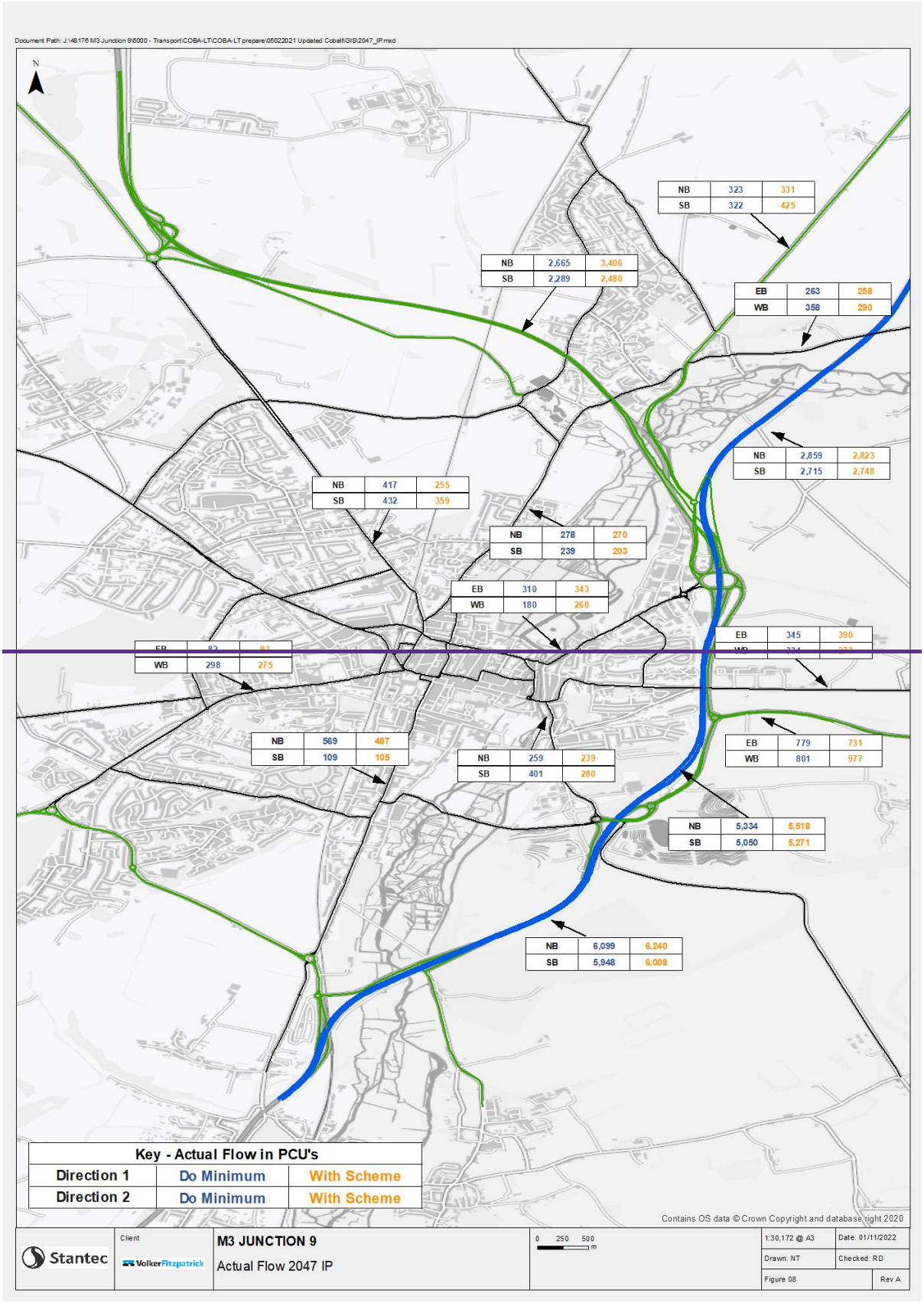
EB 287 278
WB 331 309
NB 2,970 2,938
SB 2,817 2,872
NB 440 369
SB 588 486
NB 290 263
SB 299 259
EB 414 460
WB 208 283
EB 466 493
WB 572 544
EB 159 171
WB 222 225
NB 529 504
SB 81 71
NB 296 293
SB 471 324
EB 1,037 940
WB 835 1,015
NB 5,428 5,439
SB 5,232 5,511
NB 6,484 6,491
SB 6,220 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2047 AM Peak Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 07
Rev B

Figure 7-10: Core scenario flows, 2047 inter peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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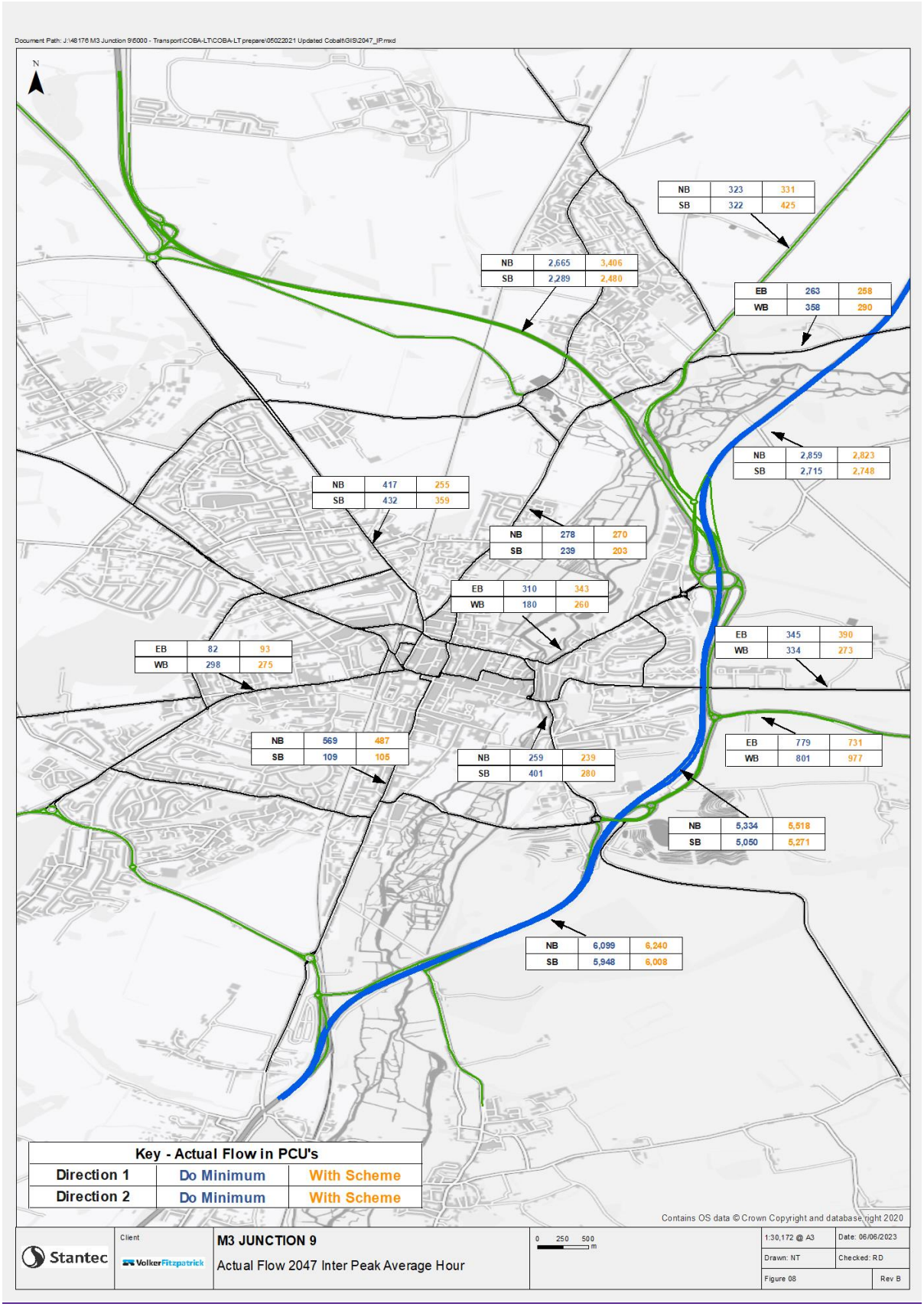
SB 432 359
NB 278 270
SB 239 203
EB 310 343
WB 180 260
EB 345 390
WB 298 275
NB 569 487
SB 109 105
NB 259 239
SB 401 280
EB 779 731
WB 801 977
NB 5,334 5,518
SB 5,050 5,271
NB 6,099 6,240
SB 5,948 6,008
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2047 IP
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 08
Rev A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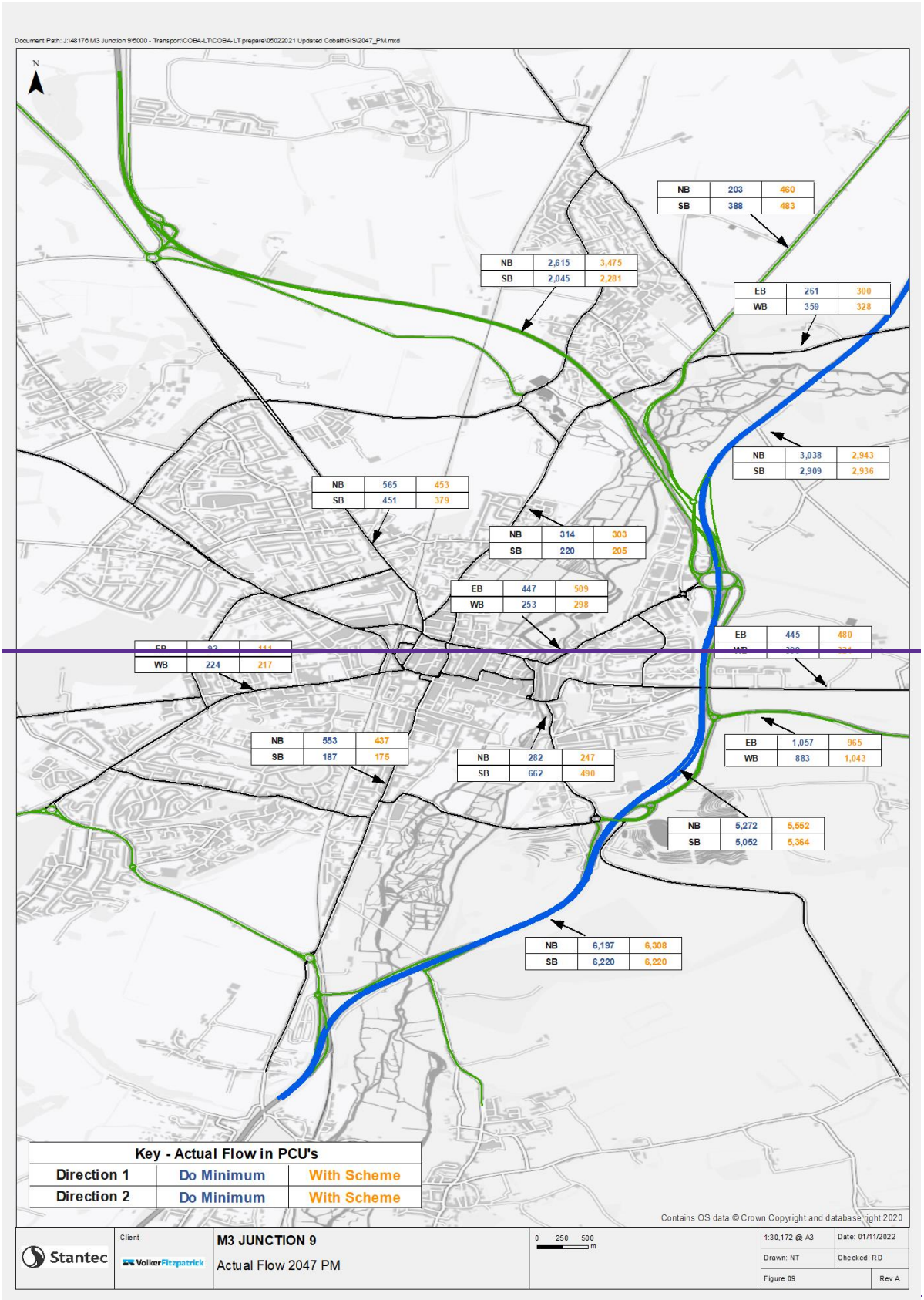
NB 2,665 3,406
SB 2,289 2,480
EB 263 258
WB 358 290
NB 2,859 2,823
SB 2,715 2,748
NB 417 255
SB 432 359
NB 278 270
SB 239 203
EB 310 343
WB 180 260
EB 345 390
WB 334 273
EB 82 93
WB 298 275
NB 569 487
SB 109 105
NB 259 239
SB 401 280
EB 779 731
WB 801 977
NB 5,334 5,518
SB 5,050 5,271
NB 6,099 6,240
SB 5,948 6,008
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2047 Inter Peak Average Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 08
Rev B

Figure 7-11: Core scenario flows, 2047 PM peak, Do-Minimum and Do-Something scenarios (NB-northbound, SB-southbound, EB-eastbound, WB-westbound)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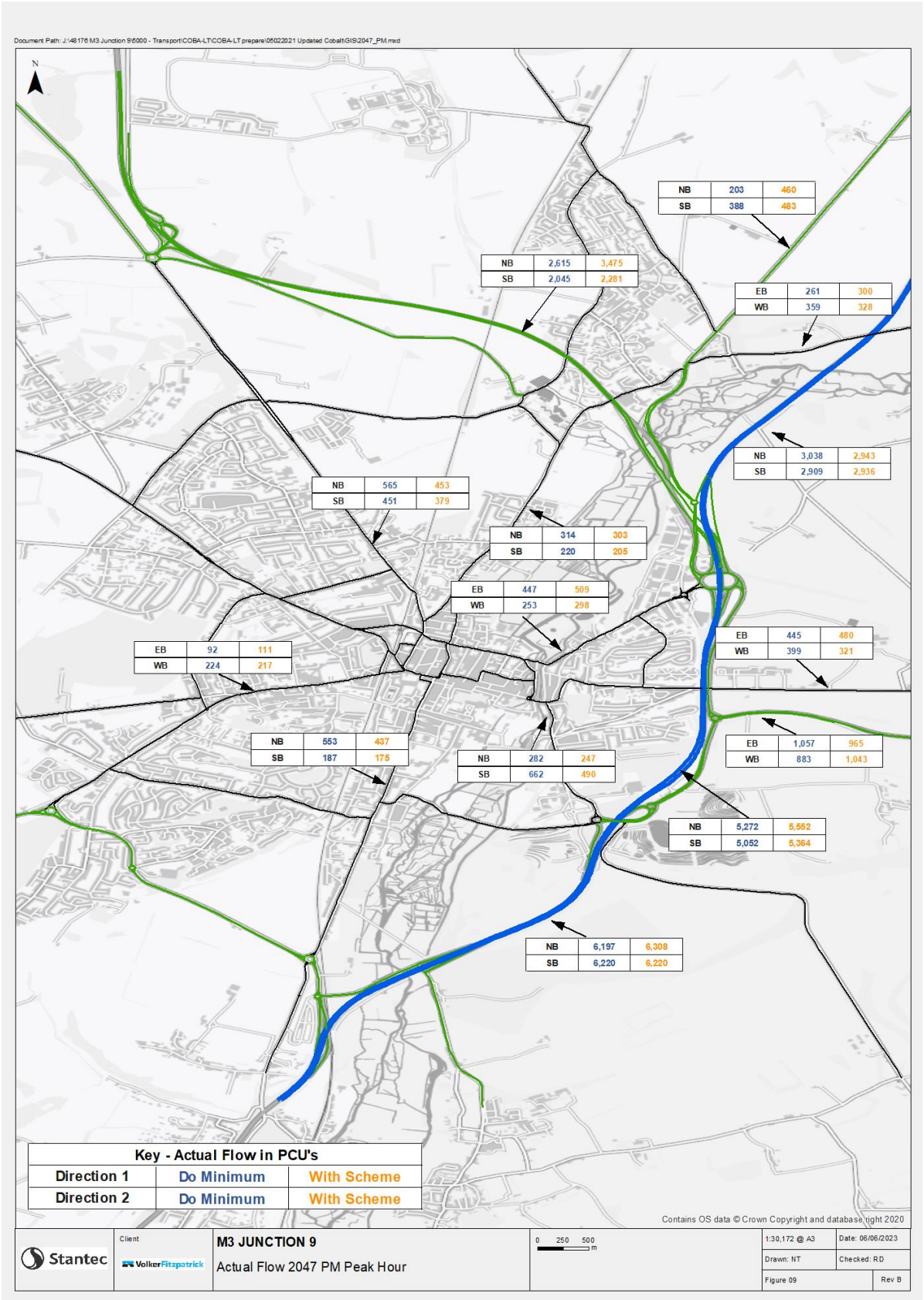
NB 2,615 3,475
SB 2,045 2,281
EB 261 300
WB 359 328
NB 3,038 2,943
SB 2,909 2,936
NB 565 453
SB 451 379
NB 314 303
SB 220 205
EB 447 509
WB 253 298
EB 445 480
WB 224 217
NB 553 437
SB 187 175
NB 282 247
SB 662 490
EB 1,057 965
WB 883 1,043
NB 5,272 5,552
SB 5,052 5,364
NB 6,197 6,308
SB 6,220 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2047 PM
0 250 500 m
1:30,172 @ A3
Date: 01/11/2022
Drawn: NT
Checked: RD
Figure 09
Rev A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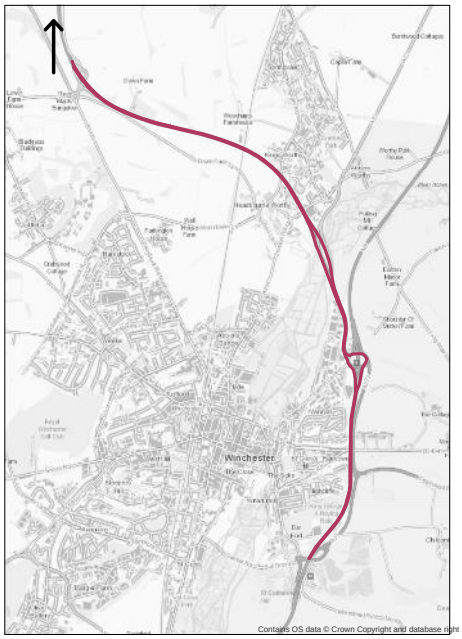
NB 2,615 3,475
SB 2,045 2,281
EB 261 300
WB 359 328
NB 3,038 2,943
SB 2,909 2,936
NB 565 453
SB 451 379
NB 314 303
SB 220 205
EB 447 509
WB 253 298
EB 92 111
WB 224 217
EB 445 480
WB 399 321
NB 553 437
SB 187 175
NB 282 247
SB 662 490
EB 1,057 965
WB 883 1,043
NB 5,272 5,552
SB 5,052 5,364
NB 6,197 6,308
SB 6,220 6,220
Key - Actual Flow in PCU's
Direction 1 Do Minimum With Scheme
Direction 2 Do Minimum With Scheme
Contains OS data © Crown Copyright and database right 2020
Stantec
Client
VolkerFitzpatrick
M3 JUNCTION 9
Actual Flow 2047 PM Peak Hour
0 250 500 m
1:30,172 @ A3
Date: 06/06/2023
Drawn: NT
Checked: RD
Figure 09
Rev B

Strategic model journey times

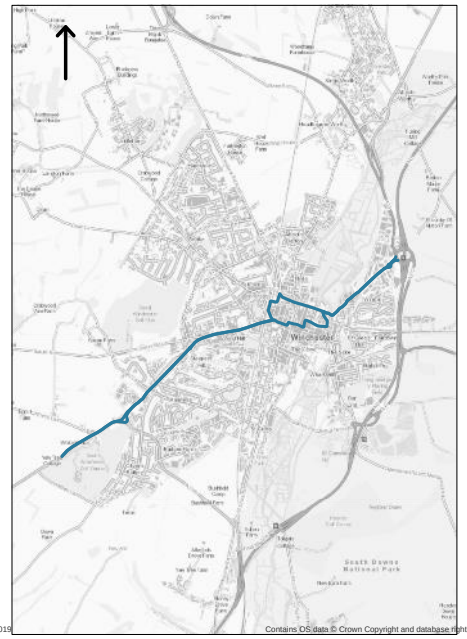
7.3.6 An analysis of journey times on various routes through the Scheme was also undertaken. The points between the potential combinations of routes were analysed and are illustrated in **Figure 7-12**. Tables in this section present the difference in journey time between the Do-Minimum and Do-Something scenarios for 2027, 2042 and 2047 for each of these routes.

Figure 7-12: Journey time routes (Source: PCF Stage 3 (Preliminary Design) Transport Forecasting Package Report, Highways England, 2020)

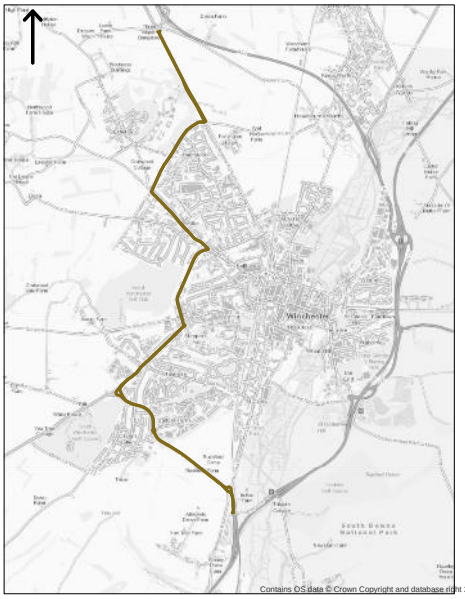
▼ *A34 Route*



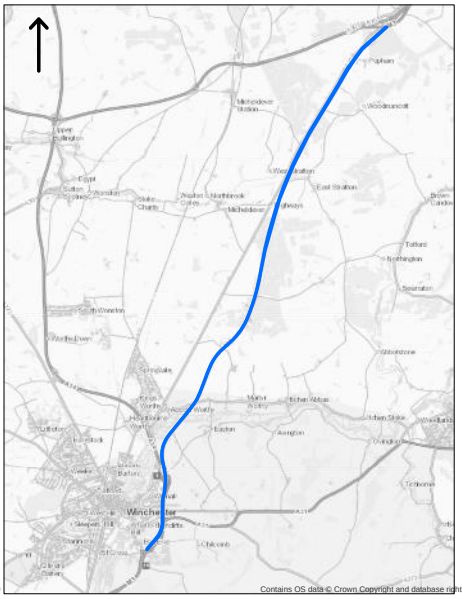
▼ *Easton Lane Route*



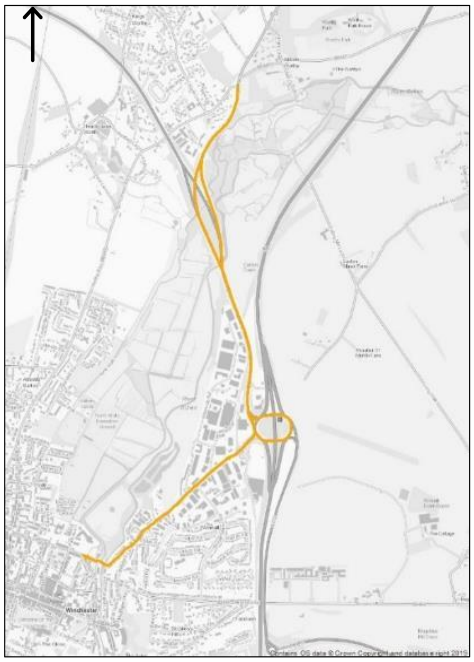
▼ Hockley Alternative Route



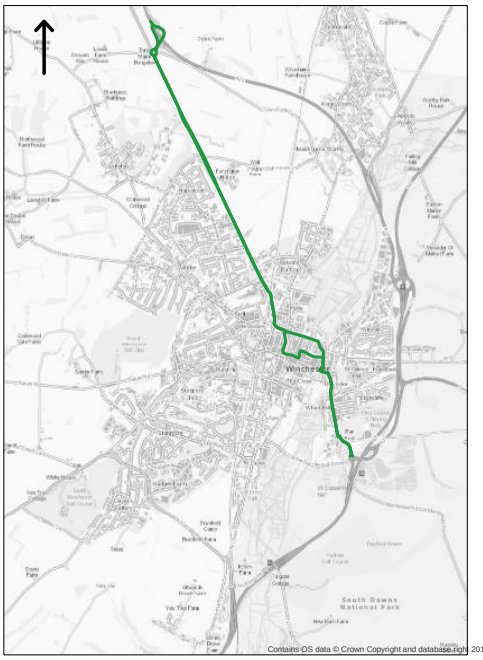
▼ M3 Route



▼ A33 Route



▼ Winchester NS SN Route



▼ A31/A272 Route

7.3.7 Several analysed routes demonstrate predicted journey time improvements with the introduction of the Scheme.

7.3.8 The A34 route northbound between M3 Junction 10 and A34/A272 junction is predicted to have journey time savings in excess of two minutes in 2027, in excess of three minutes in 2042, and in excess of four minutes in 2047 in the PM peak period and around one minute for the AM Peak. The equivalent southbound journey time savings are approximately one minute in 2027, 2042 and 2047. The Scheme provides a direct connection between the M3 and A34, hence the journey time improvements.

7.3.9 The eastbound Easton Lane route is predicted to have journey time savings in 2027, 2042 and 2047 across all time periods resulting from the alleviation of congestion at the Easton Lane approach to Junction 9. The highest predicted impact is in 2047 in the PM peak with a journey time saving more than four minutes. The westbound Easton Lane route also demonstrates journey time savings across each forecast year, although much smaller than the equivalent eastbound direction.

7.3.10 The Hockley Alternative route demonstrates minor predicted journey time savings in all forecast years, where the Scheme reduces traffic flows on this route.

7.3.11 As mainline M3 congestion increases in the Do Minimum AM and PM peaks, the Scheme is predicted to provide northbound journey time benefits for the mainline M3 in all three forecast years.

7.3.12 The remaining route through Winchester (Route Winchester NS SN) is also predicted to have minor journey time savings in 2027 in the AM and PM peak, with greater journey time savings in all time periods in 2042 and 2047.

7.3.13 Journey times in both directions of the A33 route are predicted to reduce across all years and time periods, with the largest reductions in 2047 of two and half minutes in the AM Peak. The southbound direction follows a similar pattern, with journey time savings between one and two minutes.

7.3.14 In 2027, journey time savings for the A31/A272 route (Route A31 in the tables). are predicted to be between one and four minutes in all time periods, with the AM Peak showing the largest journey time savings. In 2042 and 2047 AM and PM peaks, the westbound direction demonstrates a journey time reduction of four to five minutes. The inter-peak travel time saving is predicted to be around two minutes. These journey time benefits are predominantly as a result of the reduction of conflicting traffic at the A272 approach to the Scheme.

Table 7-2: 2027 Journey time DS-DM comparison

Route	Do-Minimum			Do-Something			Difference			% Difference		
	AM	IP	PM	AM	IP	PM	AM	IP	PM	AM	IP	PM
A34 Route												
From M3 Junction 10 to A34/A272 (northbound)	08:45	07:34	08:35	07:43	06:02	06:07	-01:02	-01:32	-02:28	-12%	-20%	-29%
From A34/A272 to M3 Junction 10 (southbound)	08:12	07:22	08:40	06:55	06:06	07:07	-01:17	-01:16	-01:34	-16%	-17%	-18%
Route Easton Lane												
From South Winchester Golf Club to Easton Lane Roundabout (eastbound)	16:27	14:53	14:52	14:26	14:06	13:30	-02:01	-00:46	-01:22	-12%	-5%	-9%
From Easton Lane Roundabout to South Winchester Golf Club (westbound)	16:17	12:39	14:54	16:14	12:41	14:19	-00:03	00:02	-00:35	0%	0%	-4%
Route Hockley Alternative												
From Hockley Link Roundabout to A34/A272 via west Winchester (northbound)	14:47	13:31	14:26	14:37	13:29	14:13	-00:10	-00:02	-00:13	-1%	0%	-2%
From A34/A272 to Hockley Link Roundabout via west Winchester (southbound)	15:15	13:37	15:10	14:54	13:25	14:40	-00:22	-00:12	-00:30	-2%	-1%	-3%
Route M3												
From M3 Junction 10 to M3 Junction 8 (northbound)	13:09	12:08	12:12	11:43	12:11	10:48	-01:26	00:03	-01:23	-11%	0%	-11%
From M3 Junction 8 to M3 Junction 10 (southbound)	12:04	11:50	12:35	12:04	11:52	12:26	00:00	00:02	-00:09	0%	0%	-1%
Route Winchester NS SN												
From Bar End Road Roundabout to A34/A272 (northbound)	14:07	13:13	15:43	13:36	13:11	15:19	-00:31	-00:03	-00:25	-4%	0%	-3%
From A34/A272 to Bar End Road Roundabout (southbound)	12:45	12:58	12:27	12:09	12:40	11:41	-00:36	-00:18	-00:47	-5%	-2%	-6%
Route A33												
From Easton Lane to A33 in Kings Worthy (northbound)	06:31	05:22	05:25	04:57	04:43	04:54	-01:34	-00:39	-00:32	-24%	-12%	-10%
From A33 in Kings Worthy to Easton Lane (southbound)	06:31	06:13	06:39	05:28	05:16	05:27	-01:03	-00:57	-01:12	-16%	-15%	-18%
Route A31												
From A31 Percy Hobbs Roundabout to Union St/N Walls Junction (westbound)	11:15	07:01	08:02	07:08	06:19	06:34	-04:07	-00:42	-01:28	-37%	-10%	-18%
From Union St/N Walls Junction to A31 Percy Hobbs Roundabout (eastbound)	08:45	07:09	07:42	05:51	05:40	05:53	-02:54	-01:28	-01:48	-33%	-21%	-23%

Table 7-3: 2042 journey time DS-DM comparison

Route	Do-Minimum			Do-Something			Difference			% Difference		
	AM	Inter	PM	AM	Inter	PM	AM	Inter	PM	AM	Inter	PM
A34 Route												
From M3 Junction 10 to A34/A272 (northbound)	10:00	10:28	11:33	08:35	07:22	07:47	-01:25	-03:06	-03:47	-14%	-30%	-33%
From A34/A272 to M3 Junction 10 (southbound)	09:21	08:16	09:24	08:08	06:47	07:56	-01:13	-01:29	-01:28	-13%	-18%	-16%
Route Easton Lane												
From South Winchester Golf Club to Easton Lane Roundabout (eastbound)	18:11	15:54	16:50	15:08	14:29	14:24	-03:04	-01:25	-02:26	-17%	-9%	-14%
From Easton Lane Roundabout to South Winchester Golf Club (westbound)	18:04	13:41	16:56	17:55	13:18	15:53	-00:09	-00:23	-01:03	-1%	-3%	-6%
Route Hockley Alternative												
From Hockley Link Roundabout to A34/A272 via west Winchester (northbound)	15:41	14:14	15:32	14:49	13:52	14:52	-00:52	-00:22	-00:41	-6%	-3%	-4%
From A34/A272 to Hockley Link Roundabout via west Winchester (southbound)	16:37	14:21	16:03	15:59	13:55	15:29	-00:38	-00:26	-00:34	-4%	-3%	-4%
Route M3												
From M3 Junction 10 to M3 Junction 8 (northbound)	13:43	12:41	13:00	12:11	12:43	11:26	-01:32	00:03	-01:35	-11%	0%	-12%
From M3 Junction 8 to M3 Junction 10 (southbound)	12:38	12:18	12:46	12:27	12:13	12:34	-00:11	-00:05	-00:13	-1%	-1%	-2%
Route Winchester NS SN												
From Bar End Road Roundabout to A34/A272 (northbound)	14:33	13:58	17:42	13:53	13:27	16:18	-00:40	-00:31	-01:24	-5%	-4%	-8%
From A34/A272 to Bar End Road Roundabout (southbound)	13:33	13:14	12:50	12:42	12:43	11:58	-00:51	-00:30	-00:52	-6%	-4%	-7%
Route A33												
From Easton Lane to A33 in Kings Worthy (northbound)	07:19	06:35	06:33	05:07	04:47	05:02	-02:13	-01:48	-01:31	-30%	-27%	-23%
From A33 in Kings Worthy to Easton Lane (southbound)	07:08	06:26	06:55	05:35	05:20	05:31	-01:33	-01:06	-01:24	-22%	-17%	-20%
Route A31												
From A31 Percy Hobbs Roundabout to Union St/N Walls Junction (westbound)	12:33	08:27	11:15	07:39	06:39	07:05	-04:54	-01:48	-04:10	-39%	-21%	-37%
From Union St/N Walls Junction to A31 Percy Hobbs Roundabout (eastbound)	09:28	07:45	08:50	06:04	05:46	06:05	-03:25	-01:59	-02:46	-36%	-26%	-31%

Table 7-4: 2047 journey time DS-DM comparison

Route	Do-Minimum			Do-Something			Difference			% Difference		
	AM	Inter	PM	AM	Inter	PM	AM	Inter	PM	AM	Inter	PM
A34 Route												
From M3 Junction 10 to A34/A272 (northbound)	10:09	11:02	12:31	08:46	07:43	08:11	-01:24	-03:19	-04:20	-14%	-30%	-35%
From A34/A272 to M3 Junction 10 (southbound)	09:40	08:35	09:33	08:30	07:01	08:10	-01:10	-01:34	-01:23	-12%	-18%	-14%
Route Easton Lane												
From South Winchester Golf Club to Easton Lane Roundabout (eastbound)	18:44	16:28	18:51	16:11	14:43	14:41	-02:33	-01:45	-04:10	-14%	-11%	-22%
From Easton Lane Roundabout to South Winchester Golf Club (westbound)	18:46	14:22	17:47	18:33	13:44	16:32	-00:13	-00:38	-01:14	-1%	-4%	-7%
Route Hockley Alternative												
From Hockley Link Roundabout to A34/A272 via west Winchester (northbound)	15:47	14:33	17:00	15:40	14:03	14:59	-00:07	-00:30	-02:01	-1%	-3%	-12%
From A34/A272 to Hockley Link Roundabout via west Winchester (southbound)	17:05	14:47	16:34	16:24	14:12	15:53	-00:41	-00:35	-00:41	-4%	-4%	-4%
Route M3												
From M3 Junction 10 to M3 Junction 8 (northbound)	13:45	12:45	13:10	12:13	12:46	11:34	-01:32	00:01	-01:36	-11%	0%	-12%
From M3 Junction 8 to M3 Junction 10 (southbound)	12:43	12:27	12:42	12:31	12:19	12:33	-00:12	-00:08	-00:09	-2%	-1%	-1%
Route Winchester NS SN												
From Bar End Road Roundabout to A34/A272 (northbound)	14:55	14:23	18:46	14:05	13:39	16:48	-00:49	-00:43	-01:58	-5%	-5%	-10%
From A34/A272 to Bar End Road Roundabout (southbound)	13:55	13:29	13:05	13:11	12:52	12:08	-00:44	-00:37	-00:58	-5%	-5%	-7%
Route A33												
From Easton Lane to A33 in Kings Worthy (northbound)	07:40	06:53	07:01	05:09	04:48	05:07	-02:30	-02:05	-01:54	-33%	-30%	-27%
From A33 in Kings Worthy to Easton Lane (southbound)	07:22	06:30	07:19	05:38	05:22	05:31	-01:44	-01:08	-01:48	-23%	-17%	-25%
Route A31												
From A31 Percy Hobbs Roundabout to Union St/N Walls Junction (westbound)	12:53	08:55	11:48	07:53	06:47	07:17	-05:01	-02:08	-04:31	-39%	-24%	-38%
From Union St/N Walls Junction to A31 Percy Hobbs Roundabout (eastbound)	09:57	08:00	09:21	06:09	05:48	06:10	-03:48	-02:12	-03:11	-38%	-27%	-34%

Strategic model volume to capacity ratios

7.3.15 **Figure 7-13** and **Figure 7-14** present Volume to Capacity Ratio (V/C) plots for key links around the Scheme for the 2042 DS scenario and for the AM and PM peak periods, respectively. The green colour represents a V/C of less than 75%, orange a V/C between 75% and 85% and red a V/C of over 85%. Comparison of the Do-Minimum and Do-Something plots indicates a predicted reduction in V/C at M3 Junction 9 in all peak periods with the Scheme in place.

7.3.16 While the V/C values are generally below 85%, the key areas of pressure are predicted to be on the A34 in the northbound direction and on the M3 south of Junction 9 in both directions. These figures are also presented in larger format in **Appendix B**.

Figure 7-13: Volume to capacity ratio, 2042 Do-Something and Do-Minimum AM peak

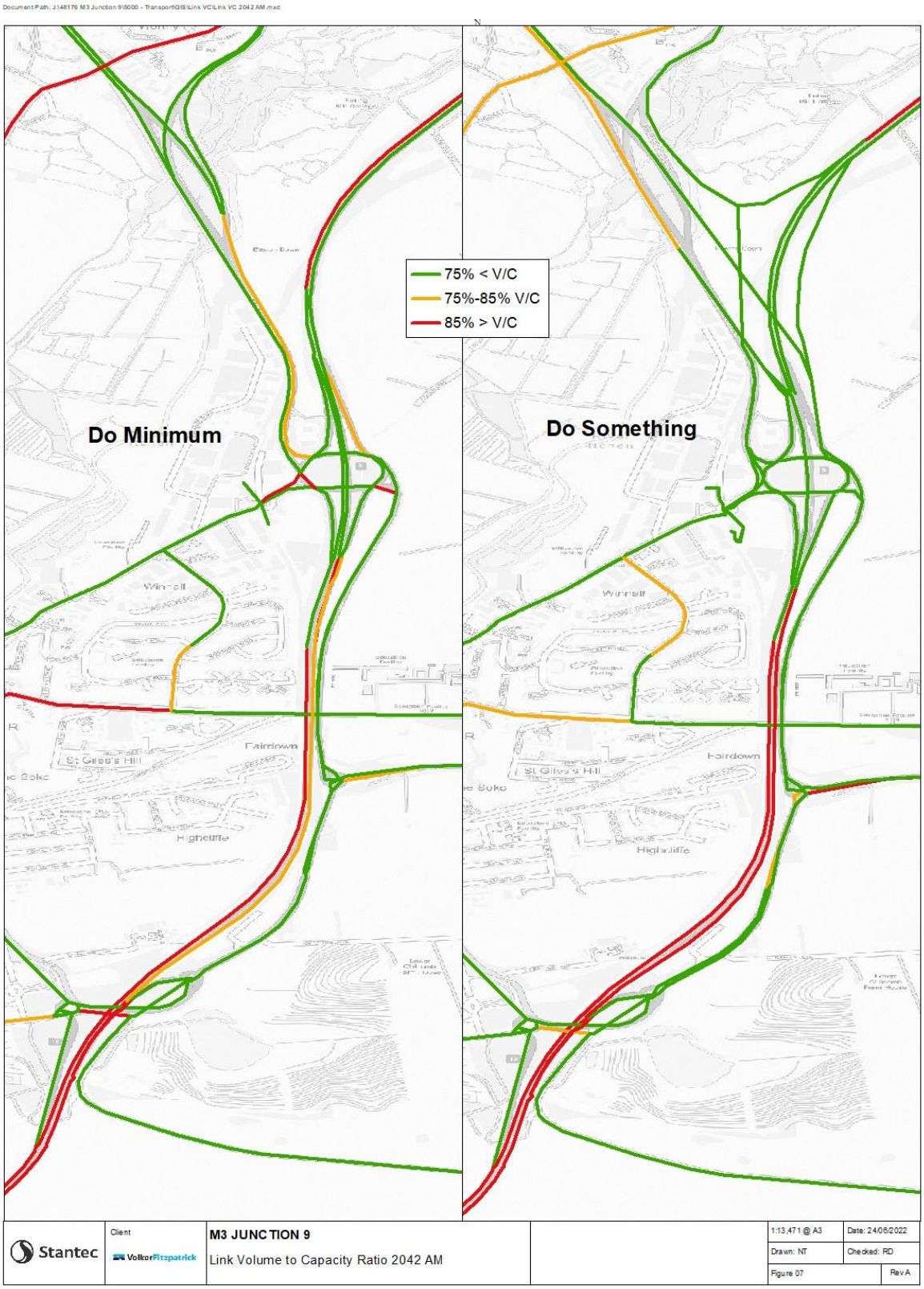
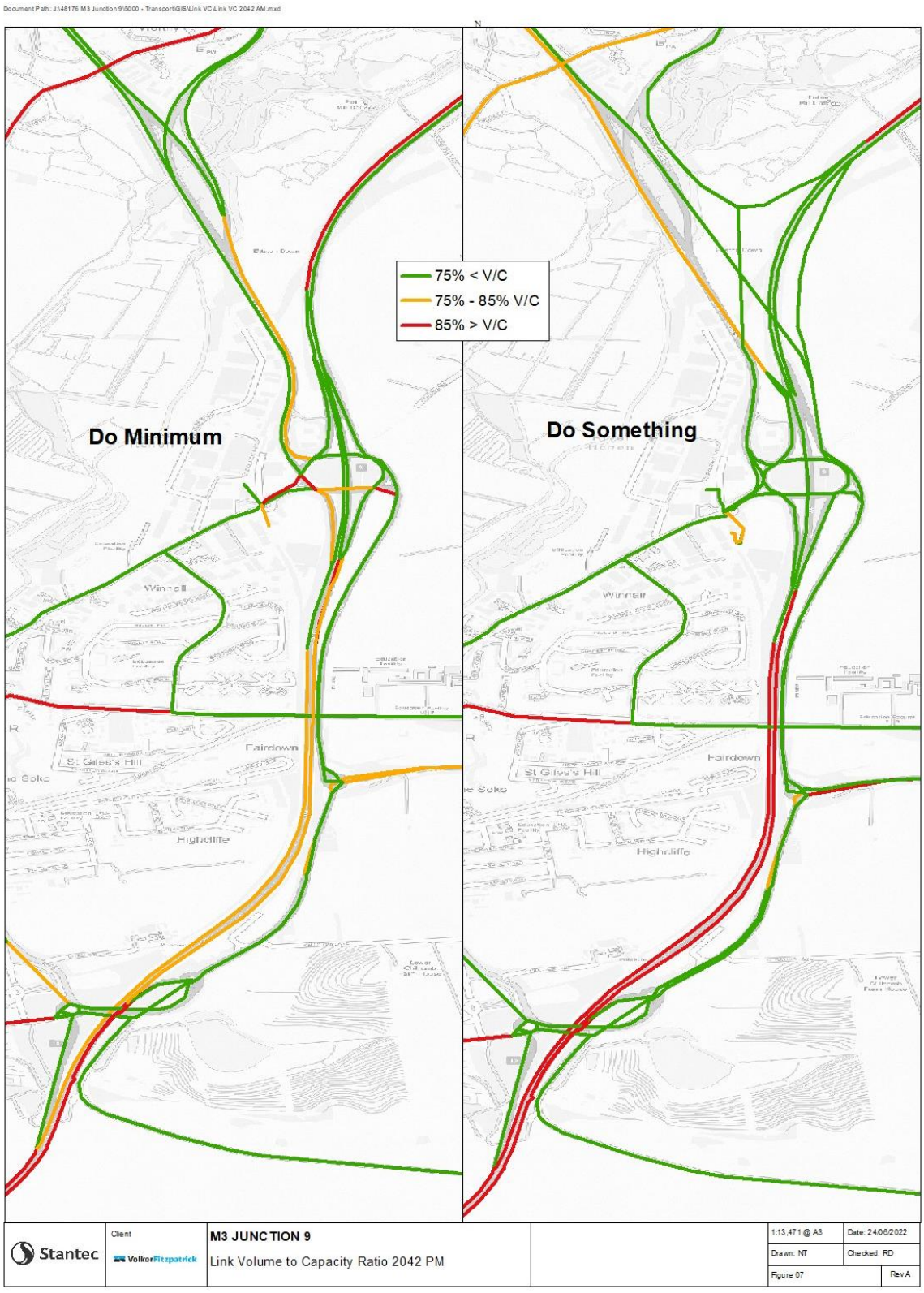


Figure 7-14: Volume to capacity ratio, 2042 Do-Something and Do-Minimum PM peak



Operational assessment

7.3.17 **Table 7-5** and **Table 7-6** present the 2017 Base, 2047 Do-Minimum (DM) and 2047 Do-Something (DS) journey time results for the routes presented in **Section 5.7**.

Table 7-5: AM peak journey times

Route	Description	2017	2047		
		Base	DM	DS	Difference (DS-DM)
R1	M3S to M3N	06:37	08:00	09:09	01:09
R2	M3N to M3S	06:31	05:58	06:02	00:04
R3	M3S to A34	09:04	10:22	10:45	00:23
R4	A34 to M3S	09:07	08:23	07:44	-00:39
R5	A33 to Easton Lane	03:38	03:43	04:35	00:52
R6	Easton Lane to A33	03:03	06:49	03:07	-03:42
R7	A31 to M3S	04:14	03:57	03:53	-00:04
R8	M3S to A31	05:29	06:10	07:35	01:25
R9	A31 to Easton Lane	03:42	03:46	03:05	-00:41
R10	Easton Lane to A31	04:45	07:09	03:19	-03:50

Table 7-6: PM peak journey times

Route	Description	2017	2047		
		Base	DM	DS	Difference (DS-DM)
R1	M3S to M3N	05:35	06:13	06:16	00:04
R2	M3N to M3S	06:49	06:13	06:38	00:25
R3	M3S to A34	09:10	11:02	08:26	-02:35
R4	A34 to M3S	10:55	10:50	08:20	-02:31
R5	A33 to Easton Lane	05:05	05:03	04:22	-00:41
R6	Easton Lane to A33	02:57	03:56	03:21	-00:35
R7	A31 to M3S	04:25	05:25	04:12	-01:13
R8	M3S to A31	04:17	04:23	04:35	00:12
R9	A31 to Easton Lane	04:33	06:35	02:54	-03:41
R10	Easton Lane to A31	05:03	06:05	03:38	-02:28

7.3.18 The majority of routes show a predicted decrease in journey time with the Scheme in place. The largest reductions are between the A31 and Easton Lane where southbound (Route 10) journey times reduce by almost 4 minutes in the AM peak and northbound (Route 9) journey times reduce by around 3.5 minutes in the PM peak., This is due to the significant congestion within the Do-Minimum being alleviated with the introduction of the Scheme.

7.3.19 Where journey time increases are noted on the M3, further investigation of the journey time segments indicated that predicted increases on this route were around M3 Junction 10. To the north of this, journey times are forecast to improve. The heatmaps provided below illustrate the additional delay in the AM Peak, principally caused by the increased demand in traffic associated with the Do-Something scenario at the M3 Junction 10 northbound merge. The same pattern is noted in the PM Peak at the M3 Junction 10 southbound merge.

7.3.20 **Figure 7-15** and **Figure 7-16** show relative delay heatmaps that visualise the delay as the percentage of the free flow journey time for the Do-Minimum and Do-Something model scenarios.

Figure 7-15: 2047 Do-Minimum delay heatmaps

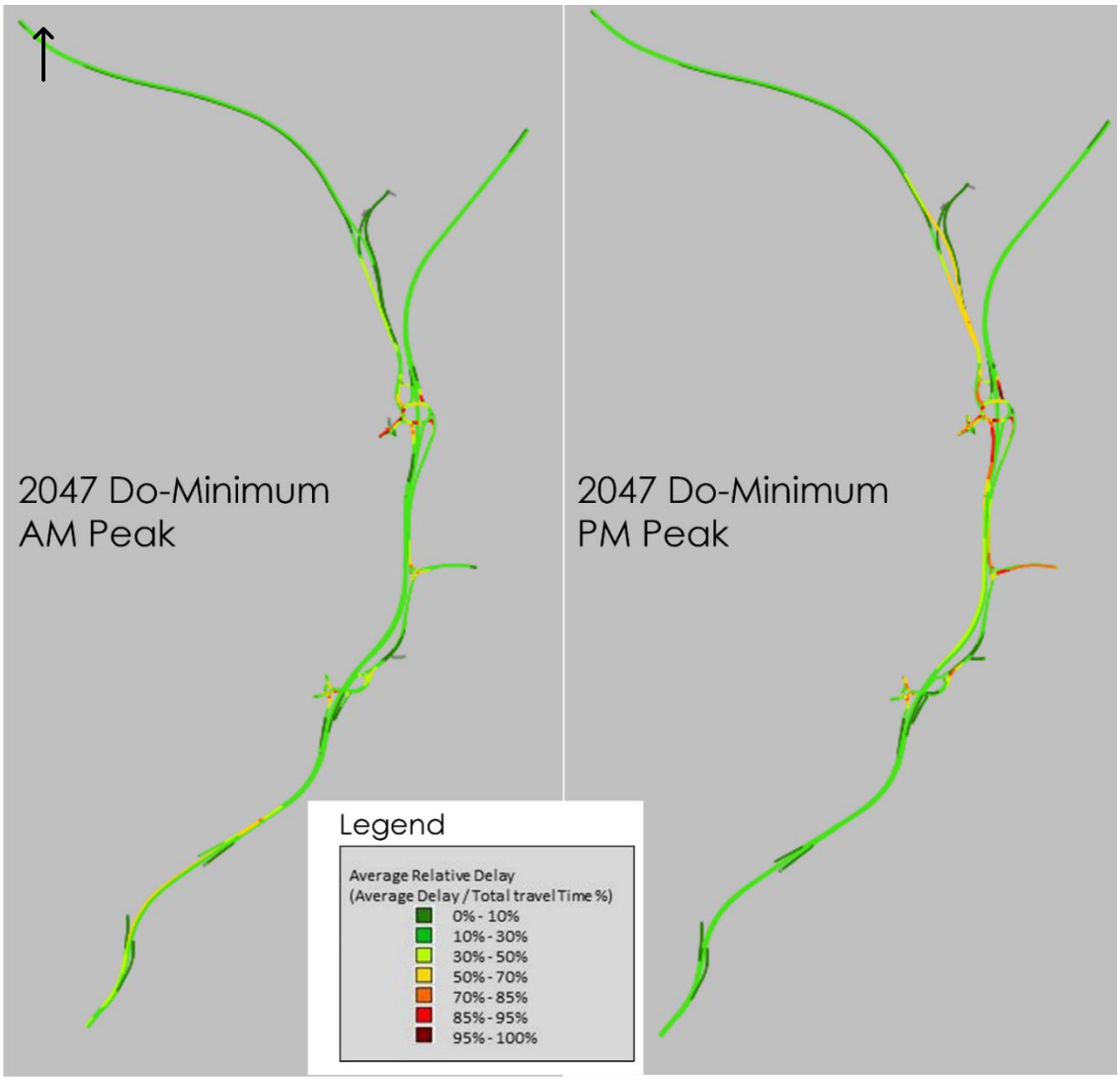
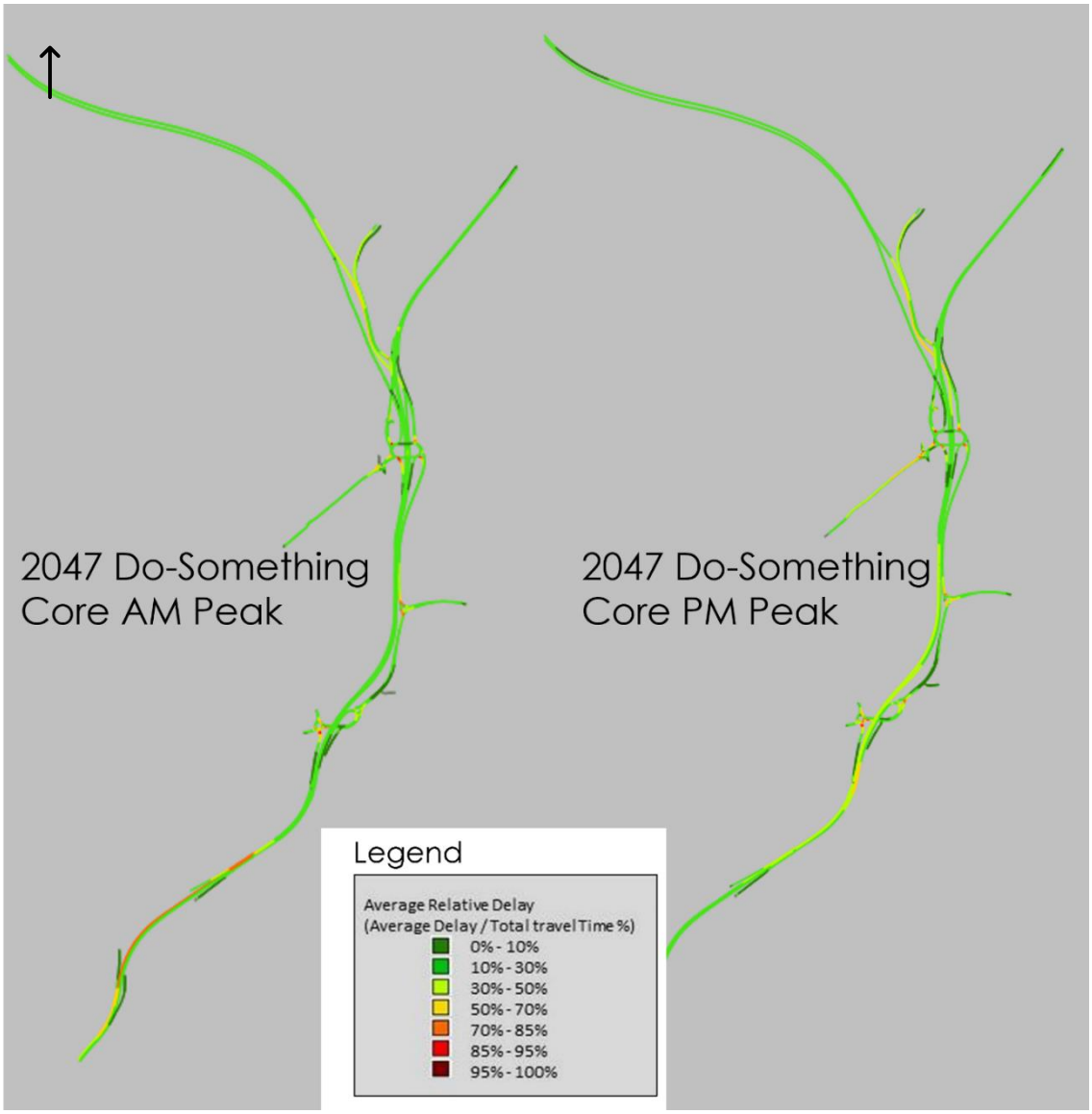


Figure 7-16: 2047 Do-Something delay heatmaps



7.3.21 Inspection of the relative delay heatmaps above indicates a reduction in congestion in the Do-Something relative to the Do-Minimum at M3 Junction 9, reflecting the increase in capacity associated with the Scheme.

7.3.22 The Do-Something scenario (with Scheme) Junction results are presented in **Table 7-7** and **Table 7-8** compared to the Do-Minimum.

Table 7-7: 2047 Do-Minimum and Do-Something Junction Results AM

Junction	Approach	Do-Minimum - AM				Do-Something - AM			
		Flow	Delay (s)	Avg queue (m)	Max Q (m)	Flow	Delay (s)	Avg queue (m)	Max Q (m)
M3 Junction 9	A272	391	100	30	177	690	27	13	145
	M3 southbound off-slip / A34	263	88	21	81	1,368	11	7	77
	A33 (old A34)	2,699	28	75	593	399	29	9	91
	Easton Lane	603	165	150	184	1,057	11	15	146
	M3 northbound off-slip	2,320	19	30	196	703	21	14	89

Table 7-8: 2047 Do-Minimum and Do-Something Junction results PM

Junction	Approach	Do-Minimum - PM				Do-Something - PM			
		Flow	Delay (s)	Avg queue (m)	Max Q (m)	Flow	Delay (s)	Avg queue (m)	Max Q (m)
M3 Junction 9	A272	405	138	76	402	611	24	8	87
	M3 southbound off-slip / A34	356	170	87	192	1,097	16	10	76
	A33 (old A34)	2,697	37	870	2,099	358	27	7	75
	Easton Lane	1,230	91	107	181	1,471	17	25	126
	M3 northbound off-slip	1,972	54	695	2,594	451	7	3	32

7.3.23 From the results above, the Scheme is predicted to reduce queuing and delay at Junction 9. Most significantly at the A33 (old A34 approach), where average queuing in the Do-Minimum 2047 forecast is over 0.8 kilometres, which is removed with the introduction of the Scheme.

Optimistic scenario

7.3.24 In order to provide further detail of congestion and journey time impacts resulting from the optimistic forecasts, the strategic model flows from the optimistic scenario were extracted and input to the operational model.

7.3.25 **Table 7-9** and **Table 7-10** present journey time outputs from the operational assessment model for the Do-Something optimistic scenario against the Do-Something core scenario for the AM and PM peak, respectively.

Table 7-9: 2047 AM optimistic scenario journey time comparison

Route	Description	Core	Optimistic	Diff
R1	M3S to M3N	09:09	09:17	00:08
R2	M3N to M3S	06:02	06:02	00:00
R3	M3S to A34	10:45	10:46	00:00
R4	A34 to M3S	07:44	07:08	-00:36
R5	A33 to Easton Lane	04:35	04:33	-00:02
R6	Easton Lane to A33	03:07	03:04	-00:03
R7	A31 to M3S	03:53	03:51	-00:02
R8	M3S to A31	07:35	07:38	00:02
R9	A31 to Easton Lane	03:05	03:05	-00:00
R10	Easton Lane to A31	03:19	03:14	-00:06

Table 7-10: 2047 PM optimistic scenario journey time comparison

Route	Description	Core	Optimistic	Diff
R1	M3S to M3N	06:16	06:35	00:19
R2	M3N to M3S	06:38	06:34	-00:04
R3	M3S to A34	08:26	08:48	00:22
R4	A34 to M3S	08:20	08:39	00:19
R5	A33 to Easton Lane	04:22	04:26	00:04
R6	Easton Lane to A33	03:21	03:24	00:04
R7	A31 to M3S	04:12	04:09	-00:03
R8	M3S to A31	04:35	04:48	00:13
R9	A31 to Easton Lane	02:54	02:56	00:02
R10	Easton Lane to A31	03:38	03:39	00:01

7.3.26 Comparing the Do-Something core scenario against the Do-Something optimistic scenario indicates minor increases in delay as a result of the optimistic scenario's higher level of travel demand. However, there are no significant increases in journey times.

7.3.27 Although route R4 within the PM peak exhibits increases in journey time in comparison to the core scenario, the increase in journey time falls below the journey time of the Do-Minimum scenario. Therefore, the optimistic scenario forecasts are predicted to meet the Scheme objectives of reducing congestion.

7.3.28 **Figure 7-17** and **Figure 7-18** illustrate the relative delay heatmaps that visualise the delay as the percentage of the free flow journey time for the Core and Optimistic scenarios for the AM peak and PM peak, respectively. From the heatmaps, there is little variation between the Do-Something Core and Do-Something Optimistic scenarios in either time period.

Figure 7-17: 2047 optimistic scenario Do-Something heatmap – AM peak

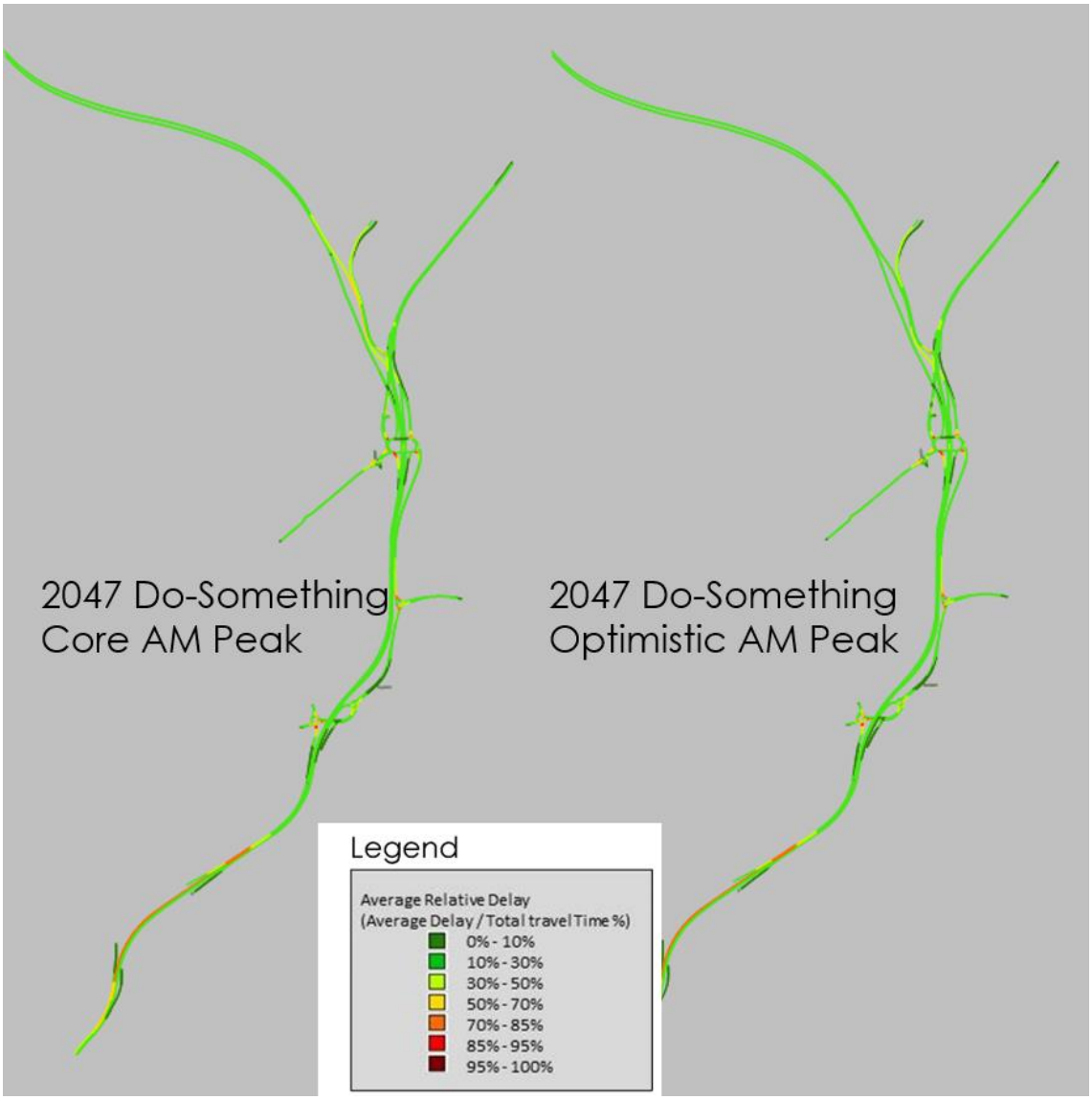
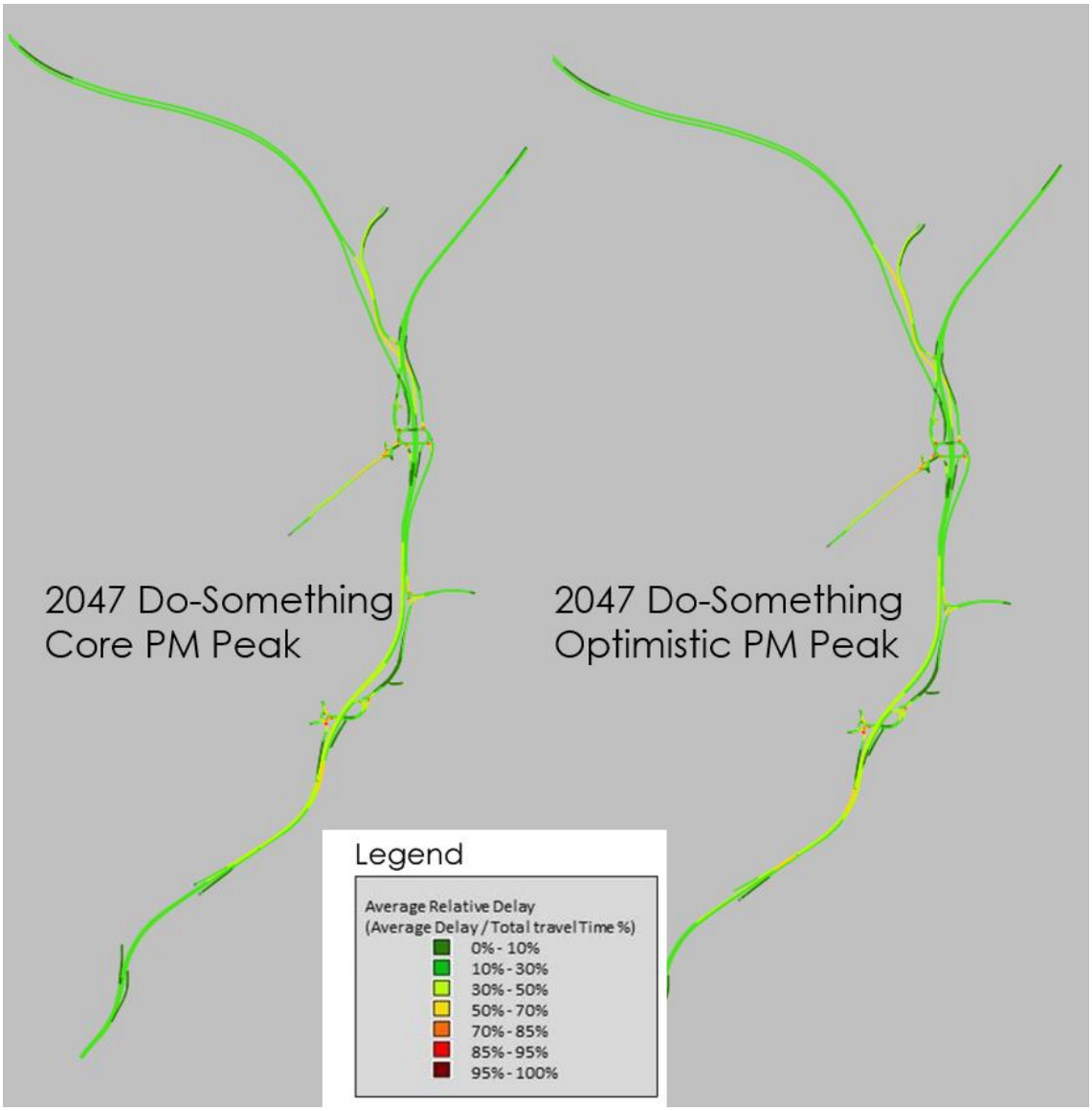


Figure 7-18: 2047 optimistic scenario Do-Something heatmap – PM peak



7.4 Economic appraisal

7.4.1 Economic Appraisal of the Scheme was carried out using standard procedures and economic parameters as defined by TAG Unit A1. **Chapter 5** of the **ComMA (Document Reference 7.10)** provides a description of the processes and results including the Scheme costs and benefits.

7.5 Journey time reliability

7.5.1 A qualitative assessment of journey time reliability was undertaken for Stage 3b.

7.5.2 Recurring congestion at approaches to Junction 9 is evident in the base year and Do-Minimum forecast year scenarios and can be deemed to reflect unpredictable variation in journey time delays due to sensitivities caused by day-to-day demand variations.

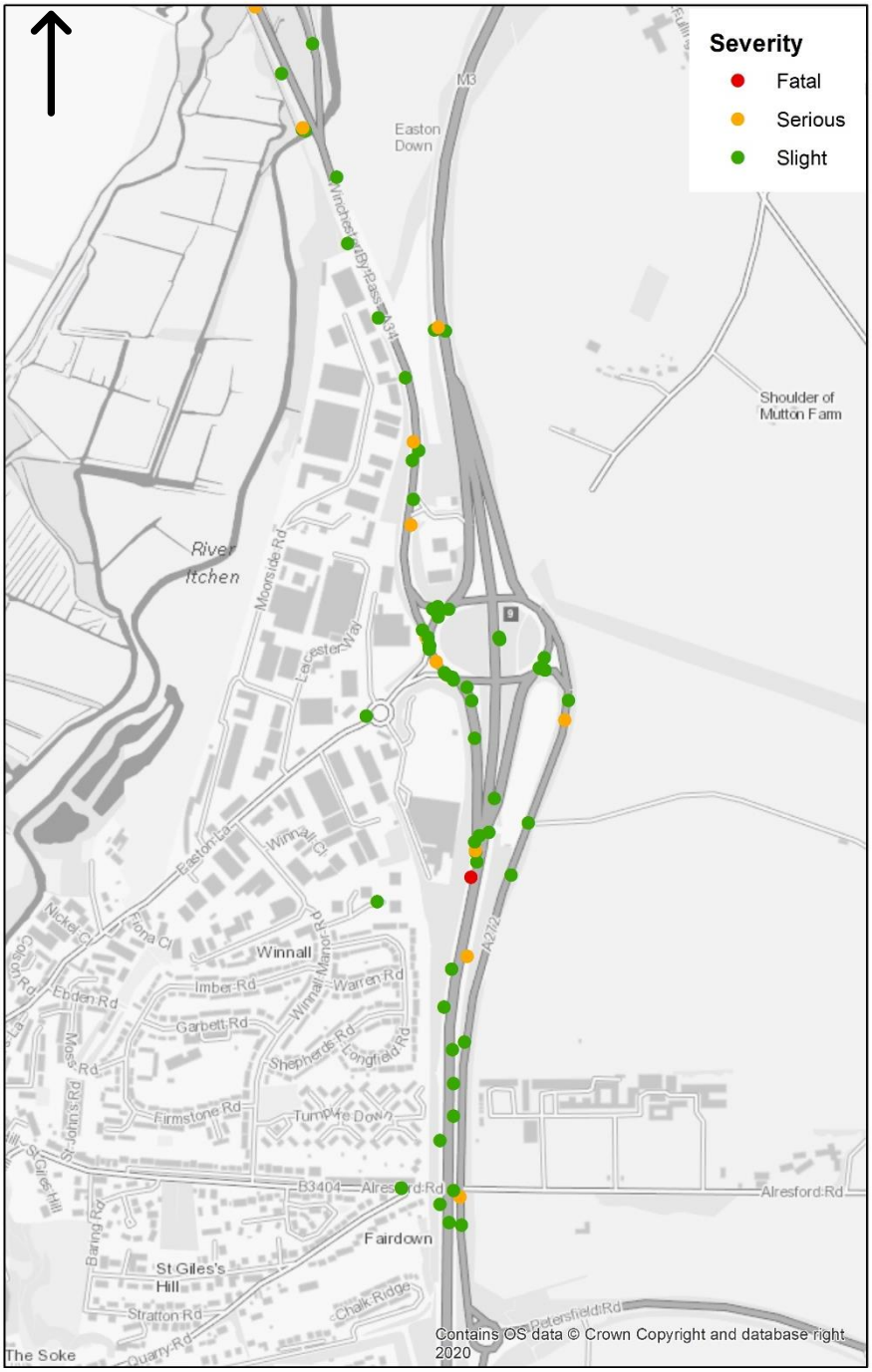
7.5.3 The Scheme is expected to improve journey time reliability where it provides additional capacity which reduces congestion and journey time delays. This is evident from the forecast journey time savings associated with the Scheme, particularly to/from the Easton Lane gyratory approach at M3 Junction 9. As these routes are shown to be more 'free flowing' with the Scheme, it can be expected that journey time reliability along these routes would improve. In addition, there is a predicted reduction in accidents, which would have a positive impact on journey time reliability.

8 Safety

8.1 Historical safety data

8.1.1 Accident data for the 5-year period between 2015 and 2019 was interrogated. The accidents within the vicinity of the A34, A33 and the M3 Junction 9 are shown in **Figure 8-1**.

Figure 8-1: Historical collision data around the M3 Junction 9 (2015-2019)



8.1.2 **Table 8-1** presents the number of collisions in each year by severity classification.

Table 8-1: Collision data by year (2015-2019)

Severity	2015	2016	2017	2018	2019	Total	Total %
Slight	18	13	14	16	6	67	84%
Serious	2	4	2	1	3	12	15%
Fatal	0	0	1	0	0	1	1%

8.1.3 Out of the 80 collisions there were 106 casualties, 87 casualties were involved in slight collisions, 15 casualties were involved in serious collisions and 4 casualties were involved in a fatal collision.

8.1.4 The fatal collision was located on the northbound diverge to the off-slip at Junction 9 where there are a cluster of collisions.

8.1.5 The recorded collisions on the M3 have several factors, including shunt collisions where drivers have not anticipated slowing traffic, loss of control, poor driving conditions leading to aquaplaning and lane change manoeuvres.

8.1.6 The recorded accidents on the A33, A272 and Easton Lane, involve a vehicle U--turning, a motorcyclist striking a kerb and losing control, a vehicle being driven erratically, and a rear end shunt.

8.1.7 The majority of collisions within the study area occurred on the M3 Junction 9 roundabout. These have been mainly on the circulatory area involving rear end shunts where drivers have failed to anticipate slowing traffic. Although these are not shown up as clusters within the data, they appear to be related to congestion on the A34 and M3 northbound and the M3 Junction 9 roundabout. Other collisions involve incidents where vehicles have overturned, and a further vehicle with an insecure load. There were a number of collisions where lane changes have resulted in collisions where they have been in the wrong lane to exit the roundabout.

8.2 Forecast accidents

8.2.1 The design has been developed based on best practice and a review of the current personal injury collisions was undertaken to identify areas which could be improved as part of the developed design and to understand the residual effect of the scheme on road safety with a view to address any specific issues

8.2.2 The impact of the Scheme on accidents over a 60-year period was assessed using DfT COBALT[6] software.

[6] COBALT (Cost and Benefit to Accidents – Light Touch) https://www.gov.uk/government/publications/tag-unit-a4-1-social-impact-appraisal

8.2.3 **Table 8-2** presents the input parameters used for the Stage 3b COBALT assessment.

Table 8-2: Stage 3b COBALT input parameters

Parameter	Value
Assessment Mode	Separate Links; Separate Junctions; Combined Links and Junctions
Version	COBALT v2.3
Parameters	TAG data book version 1.18 (May 2022)
Base Year	2015
Years 1, 2 and 3	2027, 2042 and 2047
First Year	2027
Horizon Year	2086
Current Year	2022 (defines the year from which discount rates are determined)
Observed Accident Data	2015 to 2019

8.2.4 Observed accident data for a 5-year period (2015-2019) was obtained by analysing the STATS19[7] (Road Safety Data) accident data published from the DfT.

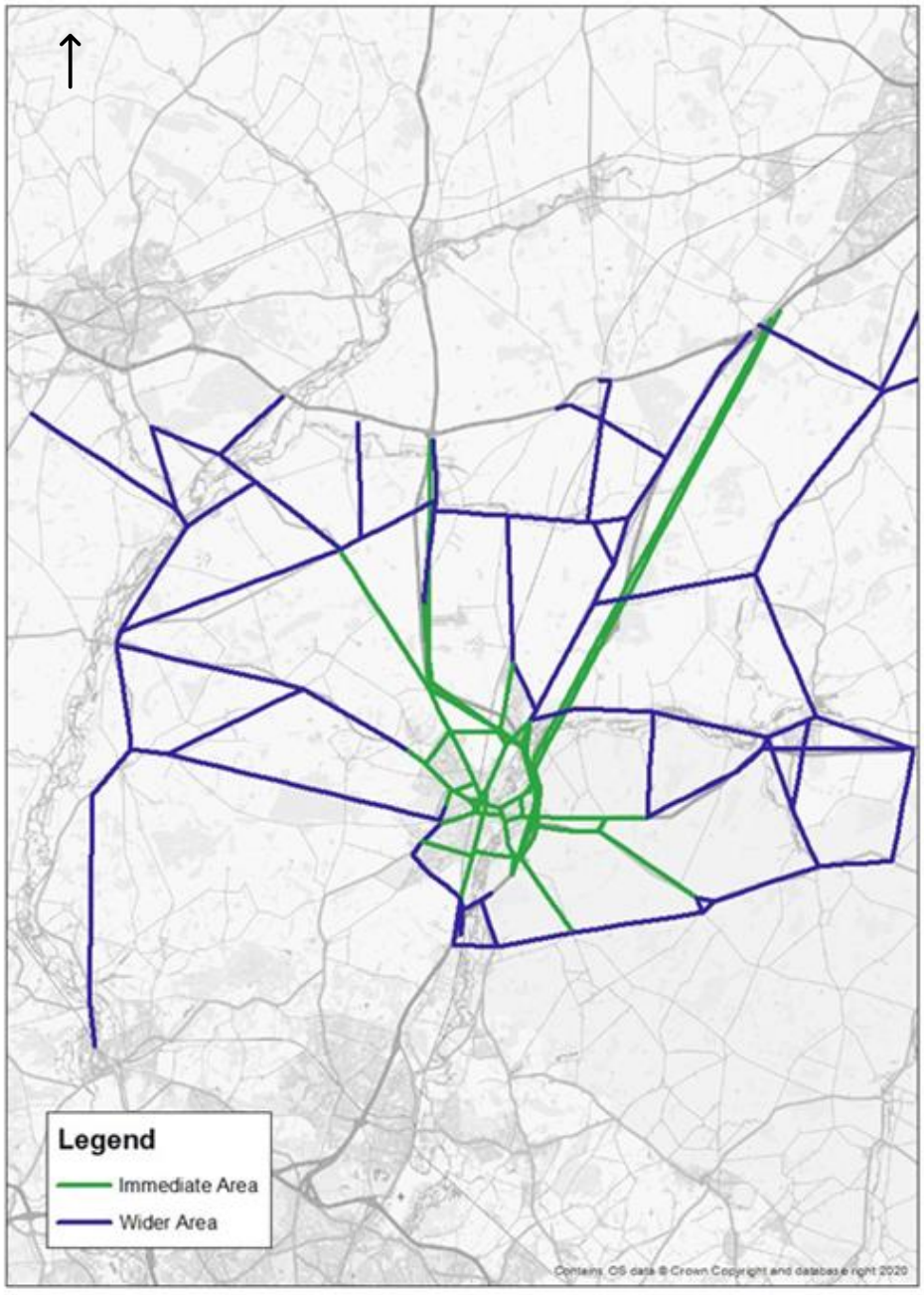
8.2.5 For links and/or junctions with no observed accident data, default accident rates were applied with the assumption that over a longer period some accidents would occur rather than absolute zero.

8.2.6 **Figure 8-2** illustrates the highway network coverage included in the accident assessment, which was defined as follows:

- Immediate area of influence (illustrated in Green), which was assessed in terms of separate link and junction impacts
- Wider impacts area (illustrated in Blue), which was determined based on links with a 10% change in traffic flow between the Do-Minimum and Do-Something scenarios, which was assessed with combined link and junction impacts

[7] https://data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data

Figure 8-2: Stage 3b COBALT assessment area



Note: This has been assessed using the SATURN Highway Network which is not georeferenced to the actual road network in this figure.

8.2.7 AADT flow, speed, and link length data were extracted from the M3 Junction 9 Model.

8.2.8 Further information on the accident appraisal can be found in **Chapter 5** of the **ComMA (Document Reference 7.10)**.

Accident results

8.2.9 The results of the COBALT assessment are provided in **Table 8-3**Table 8-3.

Table 8-3: Accident impacts (60-year appraisal period)

Area of influence	Reduction in number of accidents	Casualties reduction - fatal	Casualties reduction - serious	Casualties reduction - slight
Immediate area of influence - links only	417	10	54	600
Immediate area of influence - junctions only	-75	-3	-27	-122
Wider area of influence	195	2	32	218
Total	537	9	59	696

* present value in £M, discounted to 2010, in 2010 prices

8.2.10 The accident assessment indicated an overall reduction in predicted accidents and casualties. This shows a reduction of 537 accidents with the Scheme in place compared to without. This included a predicted reduction in 696 slight casualties, 59 serious, and 9 fatal casualties.

9 Sustainable transport

9.1 Baseline

Bus

9.1.1 There are direct bus services linking Winchester with surrounding villages and between Eastleigh and Winchester. However, no bus services in the study area directly use M3 Junction 9.

Rail

9.1.2 There is a rail line running between Southampton, Eastleigh and Winchester into Basingstoke and London which can provide public transport connectivity for people travelling along the M3 Corridor.

9.1.3 Winchester Train Station is located the closest to the M3 Junction 9 and runs South Western Railway Services to Portsmouth Harbour (approx. 1hr), Southampton Central (approx. 30 mins) and London Waterloo (approx. 1hr 10 mins). Trains also stop at intermediate stations including Woking, Basingstoke, Eastleigh, Farnborough, and Fareham. Trains between Eastleigh and Winchester take 10 minutes, with two trains per hour. Trains between Basingstoke and Winchester take just over 20 minutes, with one train per hour.

Walking, cycling and horse-riding

9.1.4 Counts of cyclists and pedestrians have been undertaken to understand current movements.

9.1.5 In September 2016, Tracsis carried out cycle and pedestrian count surveys at the M3 Junction 9 roundabout. Counts were carried out for 24 hours on Thursday 8 and Saturday 10 September 2016. Data was collected at each of the sites on the type of user (pedestrian, cyclist, or equestrian) with totals aggregated every fifteen minutes.

9.1.6 Across both days, 256 movements were observed across all sites, 67% were cyclists and 33% were pedestrians, with no horse-riders recorded. Thursday was the busiest day with 170 movements split between 64% cyclists and 36% pedestrians. Saturday was quieter with 86 movements split between 74% cyclists and 26% pedestrians.

9.1.7 Around the roundabout on the Thursday, there were clear peaks for pedestrians and cyclists between 08:00-09:00, 12:00-13:00, 14:00-16:00, and 17:00-18:00, broadly in line with the peak commuting, lunchtime trips, and school times.

9.1.8 On the Saturday the numbers of pedestrians and cyclists were more evenly spread throughout the day, peaking at around 11:00hrs.

9.1.9 Under the existing layout, one footpath and cycle path crosses the carriageway at grade at the M3 Junction 9 roundabout. With a minimal inter-green time between phases, there is not sufficient inter-green time for pedestrians and cyclists to complete the full crossing from the inside of the roundabout to the eastern side of the A34 in one movement. Due to a lack of maintenance of the central refuge and it not being designed for pedestrian and cyclist use, it could be difficult for pedestrians and cyclists to identify this facility, and thus may create a conflict point between pedestrians, cyclists and motorised traffic, particularly since the refuge does not feature vehicle containment barriers or tactile paving.

9.1.10 Conflicts between cyclists and general traffic exist on the circulatory carriageway at each entry and exit point, although alternative facilities for cyclists are available. The availability of alternative facilities is reflected in the collision data; there have been no reported accidents involving cyclists in the Scheme area, or in the immediate surrounding area, within the five-year study of collision data obtained between 2011 to 2016.

9.1.11 Cyclists and pedestrians may conflict with each other throughout the extent of the facilities especially on the approaches to subways where paths from different directions merge together.

9.2 The Scheme

Bus

9.2.1 There are no changes to the bus network as a result of the Scheme.

Rail

9.2.2 There are no changes to the rail network as a result of the Scheme.

Walking, cycling and horse-riding

9.2.3 The Scheme provides opportunities for upgraded walking, cycling, horse-riding and vulnerable user facilities. The elements incorporated within the Scheme design are detailed below.

9.2.4 The significant beneficial effects identified related to improvements delivered by the Scheme. It includes elements that either help ensure continued access for pedestrians, cyclists and horse-riders or bring improvements in terms of current accessibility/severance.

9.2.5 The pedestrian, cyclist, and horse-riding facilities around and within the Scheme are to be upgraded and would retain the provision of National Cycle Network (NCN) Route 23. On both sides of the gyratory (east and west), the existing walking and cycling route which links both parts of Easton Lane, would descend to a subway route provided beneath the gyratory roundabout. Existing provision for horse-riders would be improved with a widened 3m route (with 4m wide underpasses), which includes mounting blocks provided either side of the

eastern subway to enable rider dismounting for leading horses through to continue the route to the existing bridleway extent (which currently ceases within the existing roundabout). Future provision for horse-riders is allowed for (beyond the existing cessation point within the roundabout) by providing a wider bridge over the M3 for a 3m width route, and space for future mounting block provision either side of the western subway which would be sufficient to lead horses through.

9.2.6 A new 3m wide combined footway and cycleway for the western side of the Scheme is proposed to link the A33 / B3047 Junction to Winnall Industrial Estate situated on Easton Lane. The route runs parallel to the west of the A33 with the route to be constructed within the existing verge. A signalised (unlit) Toucan crossing is proposed adjacent to the proposed National Highways depot roundabout, to provide a link to this route through the north-western side of the gyratory roundabout. The route then transitions to utilise the existing A34 northbound and A33 carriageways which are to be abandoned as part of the Scheme. The existing informal link to the existing Public Right of Way (PRoW) would also be upgraded from its connection to the A33. For the first River Itchen crossing (i.e. most northern), the route follows the existing A33 and is accommodated on the existing bridge deck abandoned carriageway.

9.2.7 For the second river crossing (i.e. most southern), the Scheme includes a new cycle/footbridge to be constructed across the River Itchen, with the route extending south along the east of the new A34 alignment, crossing under the A34 in a subway which would then traverse around new attenuation basins, then progressing to the existing depot junction and towards NCN 23 via a new subway under the northern arm of the gyratory roundabout. The new cycle/footbridge would be approximately 3.5m wide.

9.2.8 Four proposed subways would be required to accommodate existing and improved provision of routes in the area. The two new subways at the gyratory roundabout would cater for existing users of NCN Route 23, one additional subway would link with the western walking and cycling route, with a subway under the A34 northbound catering for the pedestrian/cyclist users of the new route.

9.2.9 An additional 3m wide bridleway (with unbound surfacing) is proposed on the eastern side of the Scheme to link Easton Lane with Long Walk for walkers, cyclists, and horse-riders. Such a route would provide a circular leisure path for those using the SDNP with a link to the other paths around Long Walk with their links to local villages. The bridleway has been designed to a gradient of no more than 1:20.

10 Construction

10.1 Overview

10.1.1 The construction phase of the Scheme is estimated to commence in late 2024, with operation anticipated to commence in winter 2027. The construction phase would be programmed and sequenced to reduce disruption to the local surroundings and the environment, residents, business, and road users as far as practicable.

10.1.2 It is currently envisaged that the construction phase would be split into four main phases. Each phase would be undertaken with traffic management to establish space for the works to be carried out. Landscaping would be carried out continuously through the construction phases where the relevant section of works has been completed.

10.1.3 Further details are provided in **Chapter 2 (The Scheme and its Surroundings)** of the **ES (Document Reference 6.1)**.

10.2 Construction traffic management modelling

10.2.1 Traffic modelling was undertaken to assess Construction Traffic Management (CTM) impacts and provide data for the M3 Junction 9 economic appraisal and environmental noise/air quality impact assessment. Further information on the CTM traffic modelling assessment can be found in **Chapter 4** of the **ComMA (Document Reference: 7.10)**.

10.2.2 CTM impacts were assessed following a hierarchical approach, where operational (micro-simulation) traffic modelling was first used to consider impacts, followed by strategic traffic modelling if necessary, and then variable demand modelling if applicable.

10.2.3 Impact analysis of the CTM operations was assessed using the M3 Junction 9 operational model.

10.2.4 The 2027 Do-Minimum forecast scenario was used for the Do-Minimum and all assessed CTM phases.

10.3 Construction traffic management phases

10.3.1 The Construction Traffic Management (CTM) phasing details for the M3 Junction 9 Scheme are reported in the Outline **Traffic Management Plan (Document Reference 7.8)** and these are summarised in **Table 10-1**. It should be noted that within the Outline **Traffic Management Plan** there is a Phase 0 included which relates to vegetation clearance, ecological mitigation, compound establishment and other preparatory works. This phase will also include the initial set up of the temporary traffic management (realignment of existing M3 running lanes) in order to facilitate construction.

Table 10-1: Construction traffic management phases

Phase	Summary specification
1a	No change to network with exception of lane narrowing and speed restrictions on the M3 mainline with limited traffic impacts and not included in assessment.
1b	Revised M3 southbound off-ramp. Gyratory and A34 approach reduced to 2 lanes. 3 lanes retained on M3 northbound off-slip and Easton Lane approaches. Signal- control in operation on all gyratory approaches including the A272, which is not signal-controlled in the current arrangement. Modification to southbound M3 on-ramp, with slight impact on general traffic arrangement.
2	M3 northbound and southbound mainline displaced with contraflow operation with 40mph or 50mph operation. Gyratory and A34 and M3 northbound off-slip approaches reduced to 2 lanes. 3 lanes retained on Easton Lane approach. Signal-control in operation on all gyratory approaches. M3 northbound on-ramp from gyratory closed with diversion, which was not modelled as this extends outside the M3 Junction 9 operational model noting the associated traffic flow is relatively slight.
3a	Revised gyratory setup to cross over new bridges. Gyratory and all approaches with 2 lanes. Signal-control in operation on all approaches including A272. New access for A33/A34 to M3 northbound and temporary diverted southbound route to Junction 9 gyratory including reduced speed limit. M3 northbound on-ramp from gyratory closed.
3b	Revised gyratory setup to cross over new bridges. Gyratory and all approaches with 2 lanes except A33 which has 1 lane. Signal-control in operation on all approaches except the A272. New access for A33/A34 to M3 northbound. Revised lane allocation on A272 gyratory approach. New northbound link from M3 to A33/A34. New southbound link from A33/A34 to M3 and gyratory. A variation of Option 3b was also tested with signal-control removed from the gyratory replaced by give-ways on all approaches. This test was undertaken following analysis of the Phase 3b impacts which indicated that it may be possible to remove the signal-control and maintain good operational performance. The scenario without gyratory signal-control was used in the economic analysis where this was considered to be the arrangement most likely to be taken forward.

10.3.2 Adjustments were made to the signal-control timings to optimise network performance in each CTM phase. TRANSYT models were prepared for each CTM phase which were used to determine signal stage times and junction offset

times for optimum network performance which were applied in the operational model.

10.4 Construction traffic management assessment

10.4.1 The traffic modelling revealed the following key CTM impacts:

- Overall journey times and network congestion were forecast to increase, relative to the Do-Minimum, because of the reduction in capacity, particularly on the M3 Junction 9 gyratory approaches.
- The M3 mainline 40mph and 50mph contraflow speeds in Phase 2 demonstrated relatively limited difference on overall network performance where the operation of the gyratory was the constraining factor on overall network.
- In Phase 3b, northbound traffic blocked back from the M3 diverge to the northbound off-slip where four lanes of northbound traffic are reduced to two lanes under the southern gyratory bridge, which creates queues and slow-moving traffic. This indicated that the northbound route going through the underpass is slower than the Phase 3a equivalent route using the gyratory.
- The removal of the gyratory signal-control in Phase 3b had a generally positive impact on journey times, particularly to/from Easton Lane. However, congestion was still evident on the M3 northbound.

10.4.2 Specific phases of the CTM suggested the possibility of re-routing impacts beyond the scope of the operational model, in particular the closure of the M3 Junction 9 northbound on-slip. To assess potential wider impacts of not allowing access onto the M3 north on-slip from Junction 9, a strategic traffic model run of the Phase 3a layout was undertaken based on the 2027 Do-Minimum scenario. The strategic model was run using fixed traffic demand and did not include variable demand model responses such as destination choice or mode choice, however, these would be expected to be slight given the temporary nature of the CTM.

10.4.3 The outputs of this strategic model test were compared against the Do-Minimum scenario to highlight the Annual Average Daily Traffic (AADT) variance. Based on the 1,000 AADT environmental assessment scoping criteria it was considered that the forecast impacts of the CTM arrangements on wider re-routing were relatively slight with the M3 northbound off-slip closure being the most significant cause of localised re-routing. Therefore, applying a proportionate approach it was deemed that no further CTM phasing impacts required to be assessed in the strategic model and, hence, the VDM.

10.4.4 Further information on the CTM traffic modelling assessment findings can be found in Appendix E of the **ComMA (Document Reference: 7.10)**.

Appendix A Flow diagrams

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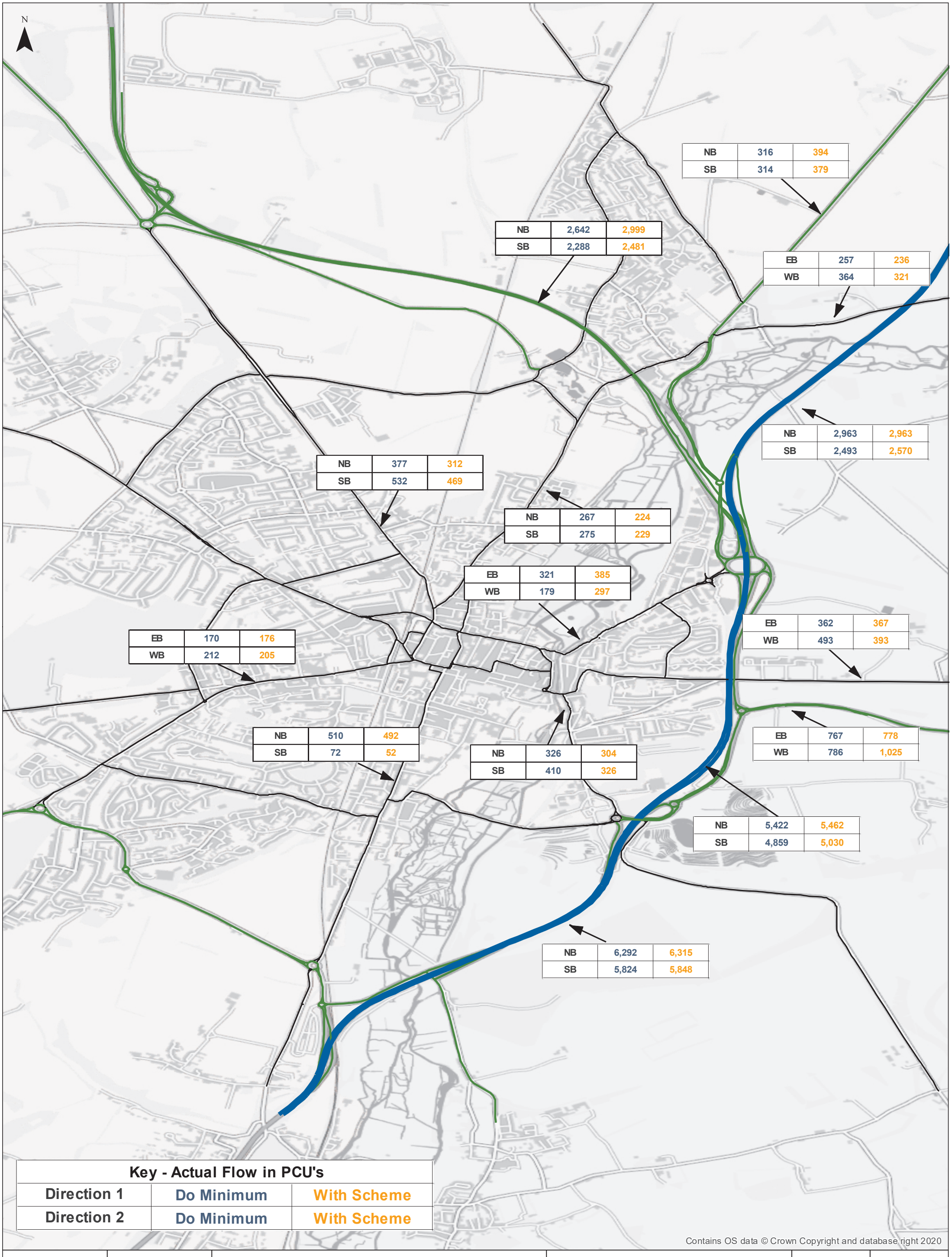

Stantec

Client: VolkerFitzpatrick

M3 JUNCTION 9

Actual Flow 2027 AM Peak Hour

0 250 500 m

1:30,172 @ A3 | Date: 06/06/2023

Drawn: NT | Checked: RD

Figure 01 | Rev B

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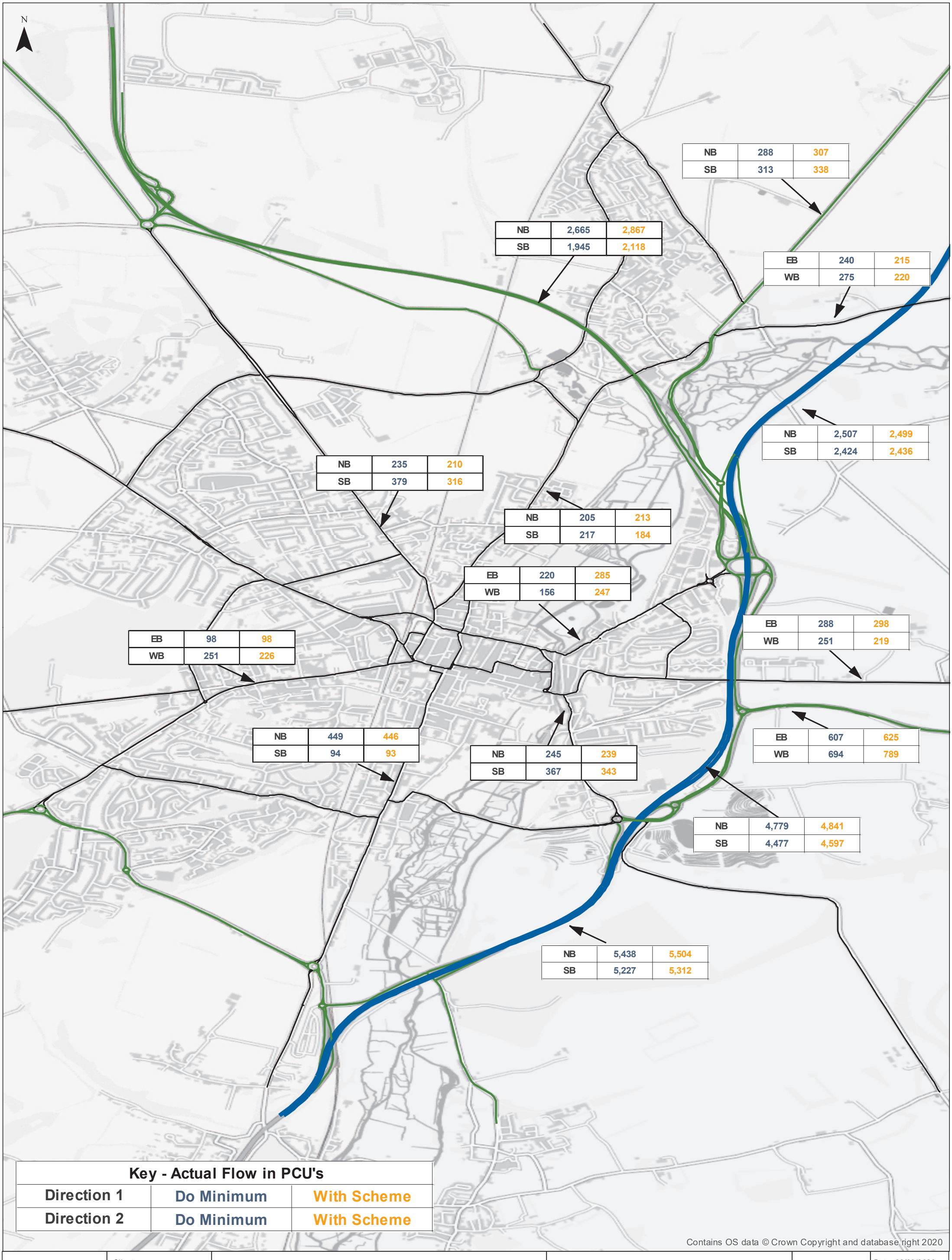

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Client: VolkerFitzpatrick

M3 JUNCTION 9

Actual Flow 2027 Inter Peak Average Hour

0 250 500 m

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Figure 02 | Rev B

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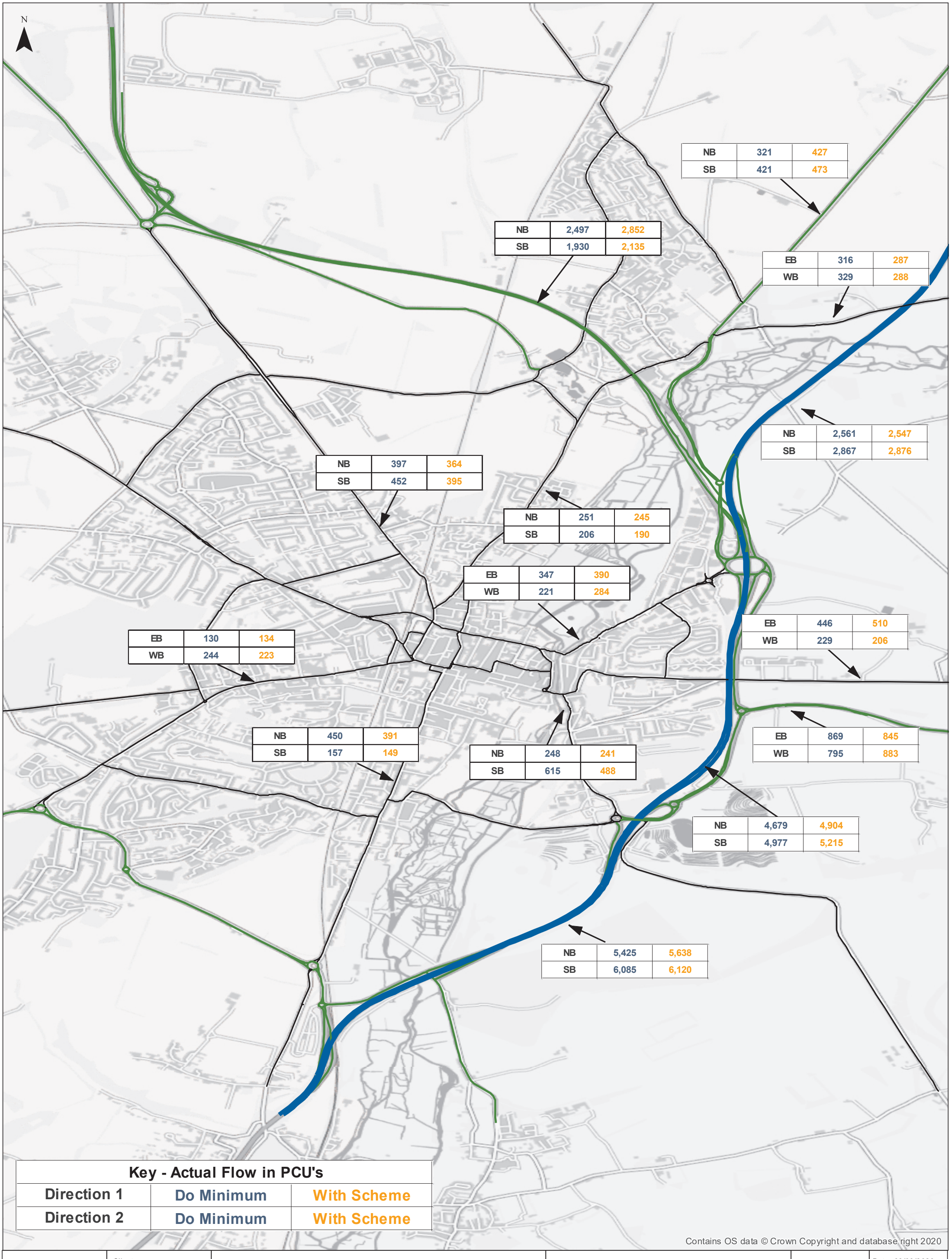

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Client: VolkerFitzpatrick

M3 JUNCTION 9

Actual Flow 2027 PM Peak Hour

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Drawn: NT | Checked: RD

Figure 03 | Rev B

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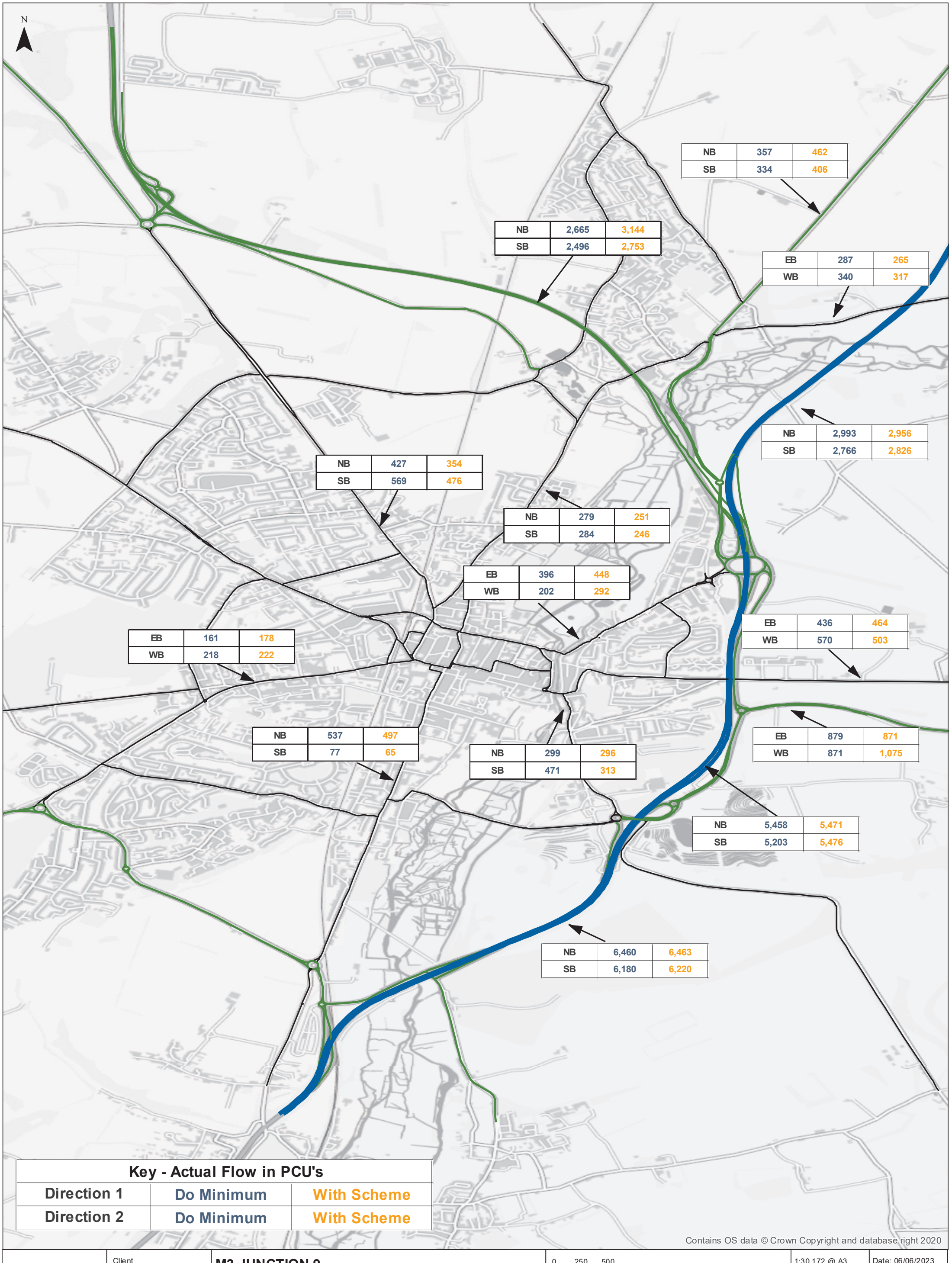

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M3 JUNCTION 9

Actual Flow 2042 AM Peak Hour

0 250 500 m

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Drawn: NT | Checked: RD

Figure 04 | Rev B

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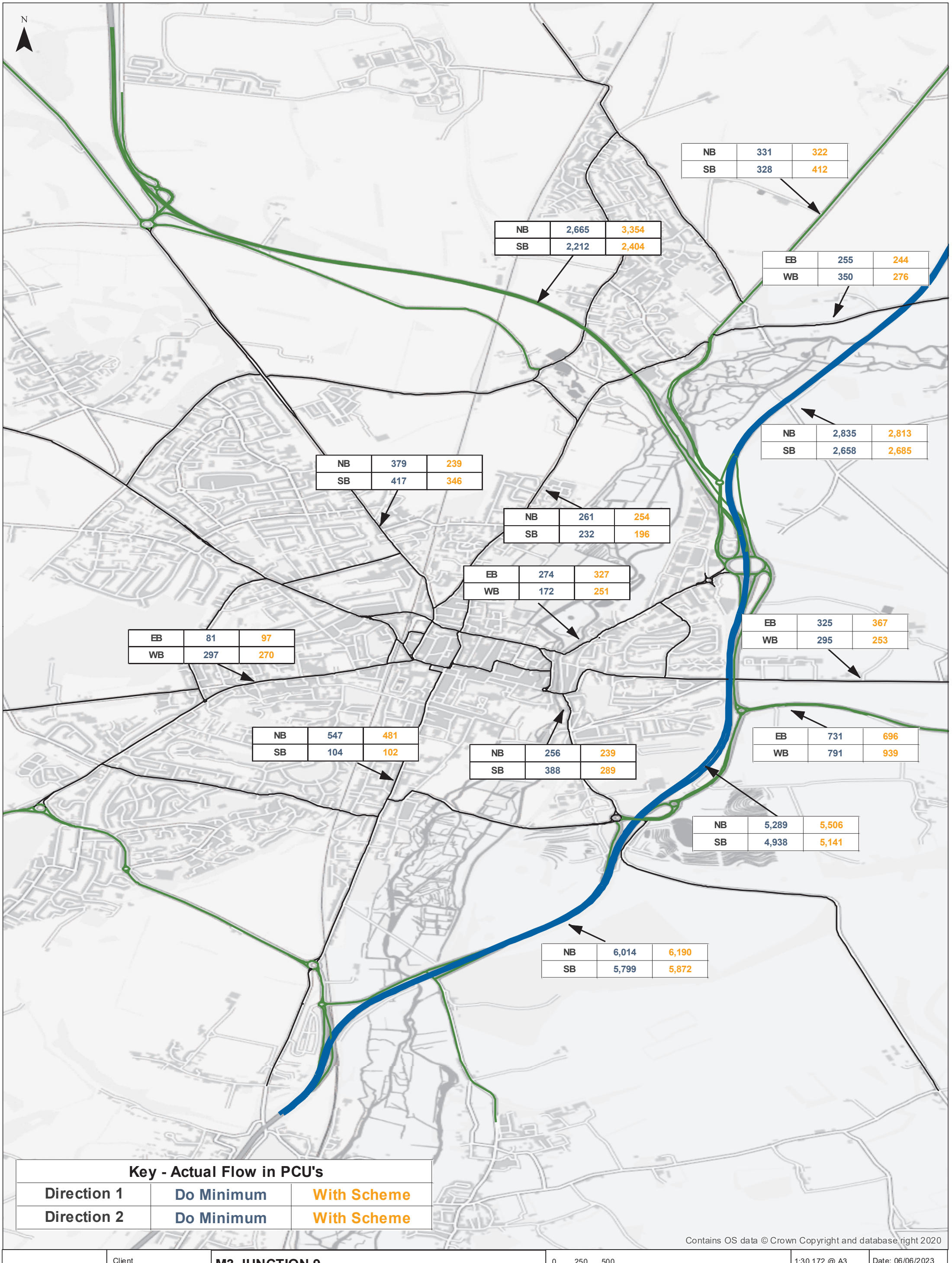

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M3 JUNCTION 9

Actual Flow 2042 Inter Peak Average Hour

0 250 500 m

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Figure 05 | Rev B

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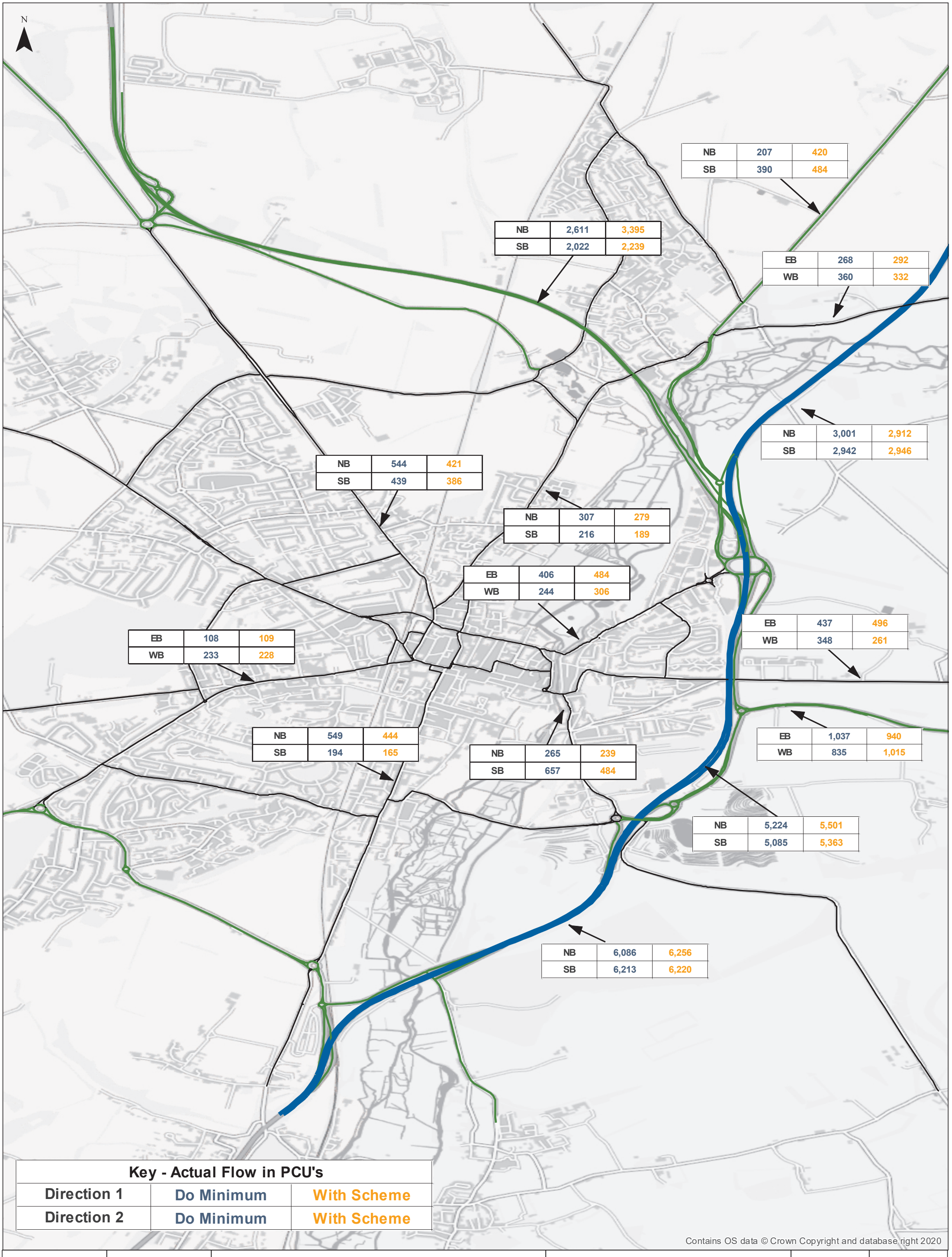

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M3 JUNCTION 9

Actual Flow 2042 PM Peak Hour

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Figure 06 | Rev B

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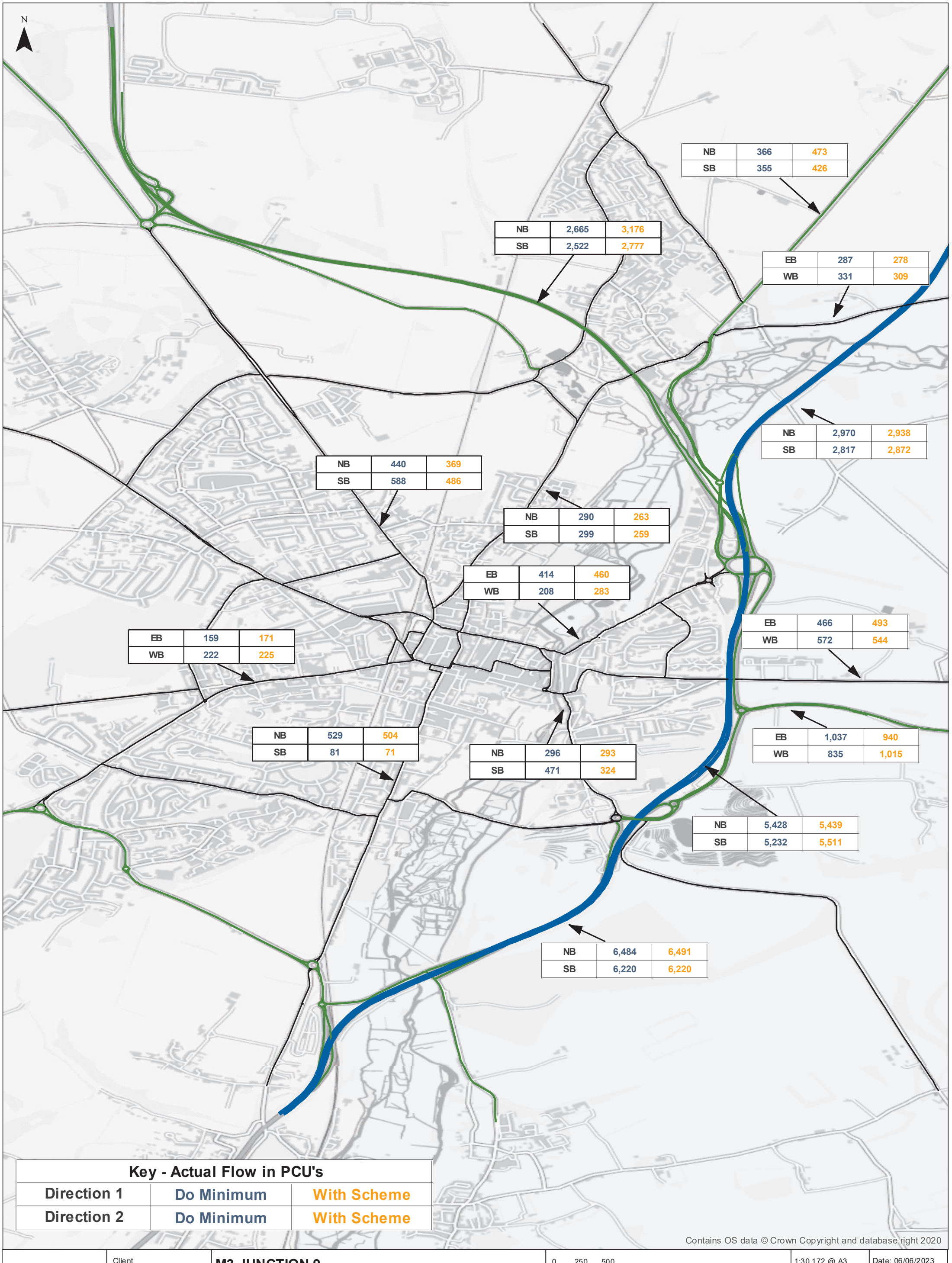

Stantec	Client: VolkerFitzpatrick	**M3 JUNCTION 9** Actual Flow 2047 AM Peak Hour	0 250 500 m	1:30,172 @ A3 · Date: 06/06/2023 Drawn: NT · Checked: RD Figure 07 · Rev B

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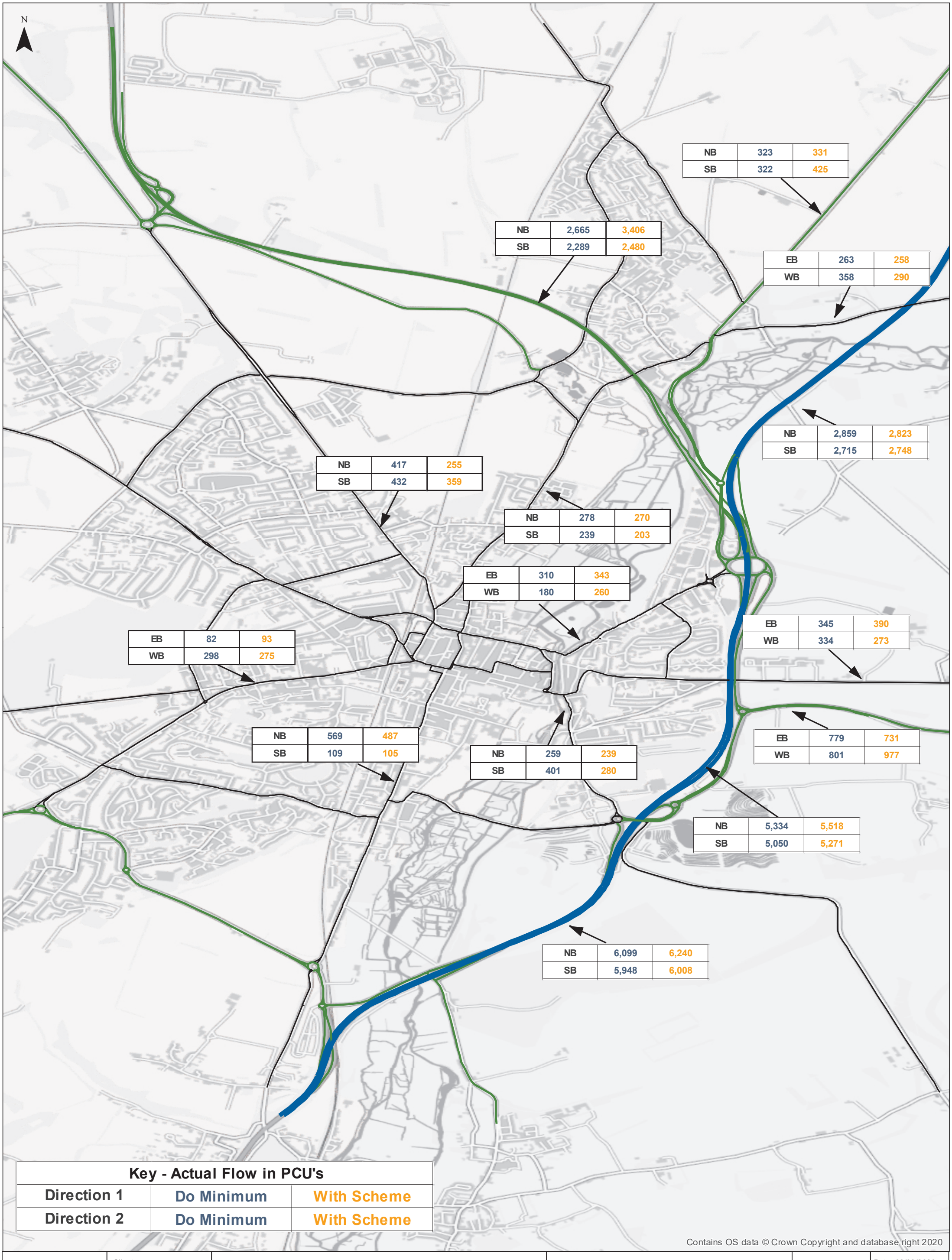

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M3 JUNCTION 9

Actual Flow 2047 Inter Peak Average Hour

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Drawn: NT | Checked: RD

Figure 08 | Rev B

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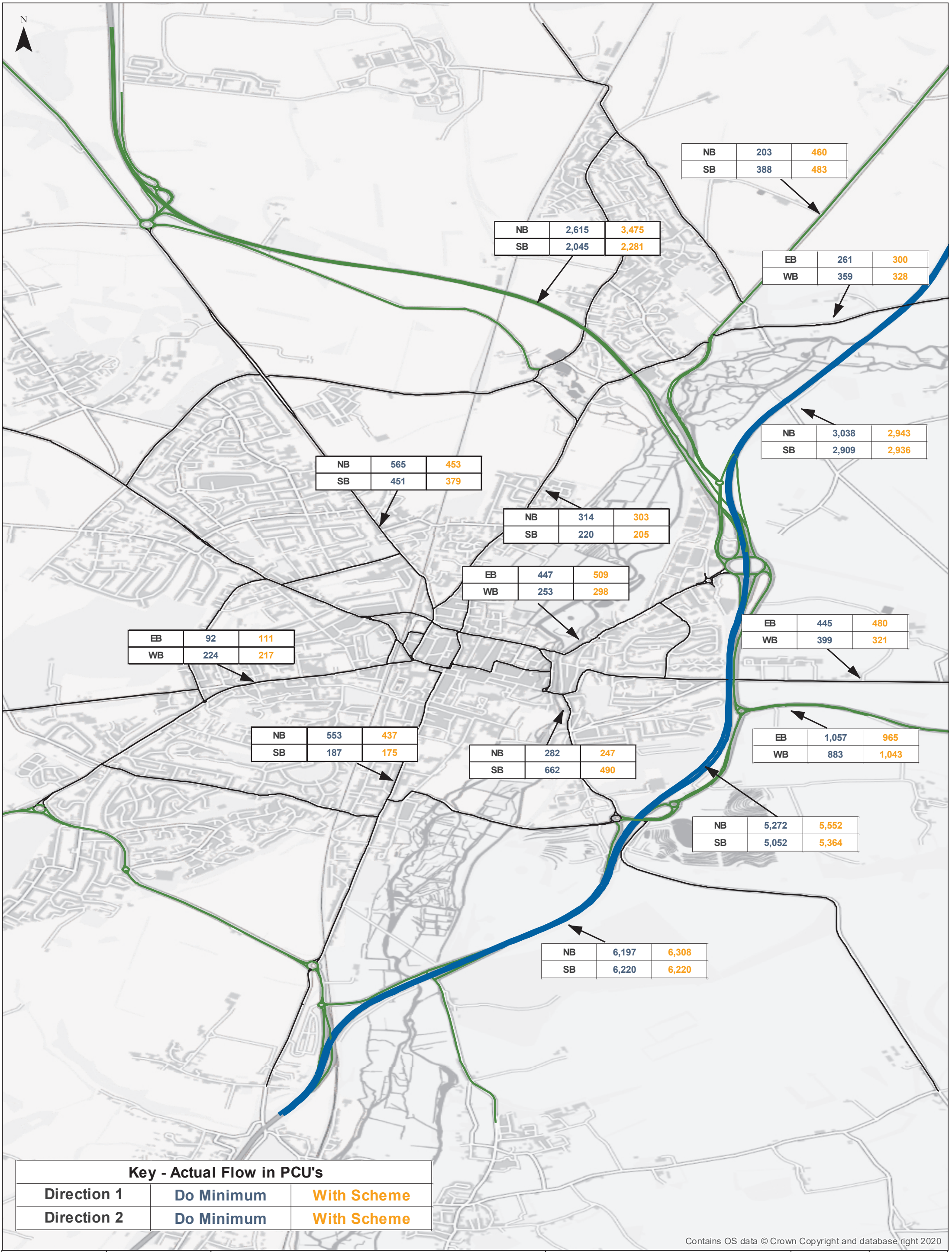

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M3 JUNCTION 9

Actual Flow 2047 PM Peak Hour

0 250 500 m

1:30,172 @ A3 | Date: 06/06/2023

Drawn: NT | Checked: RD

Figure 09 | Rev B

Appendix B Volume capacity ratio diagrams

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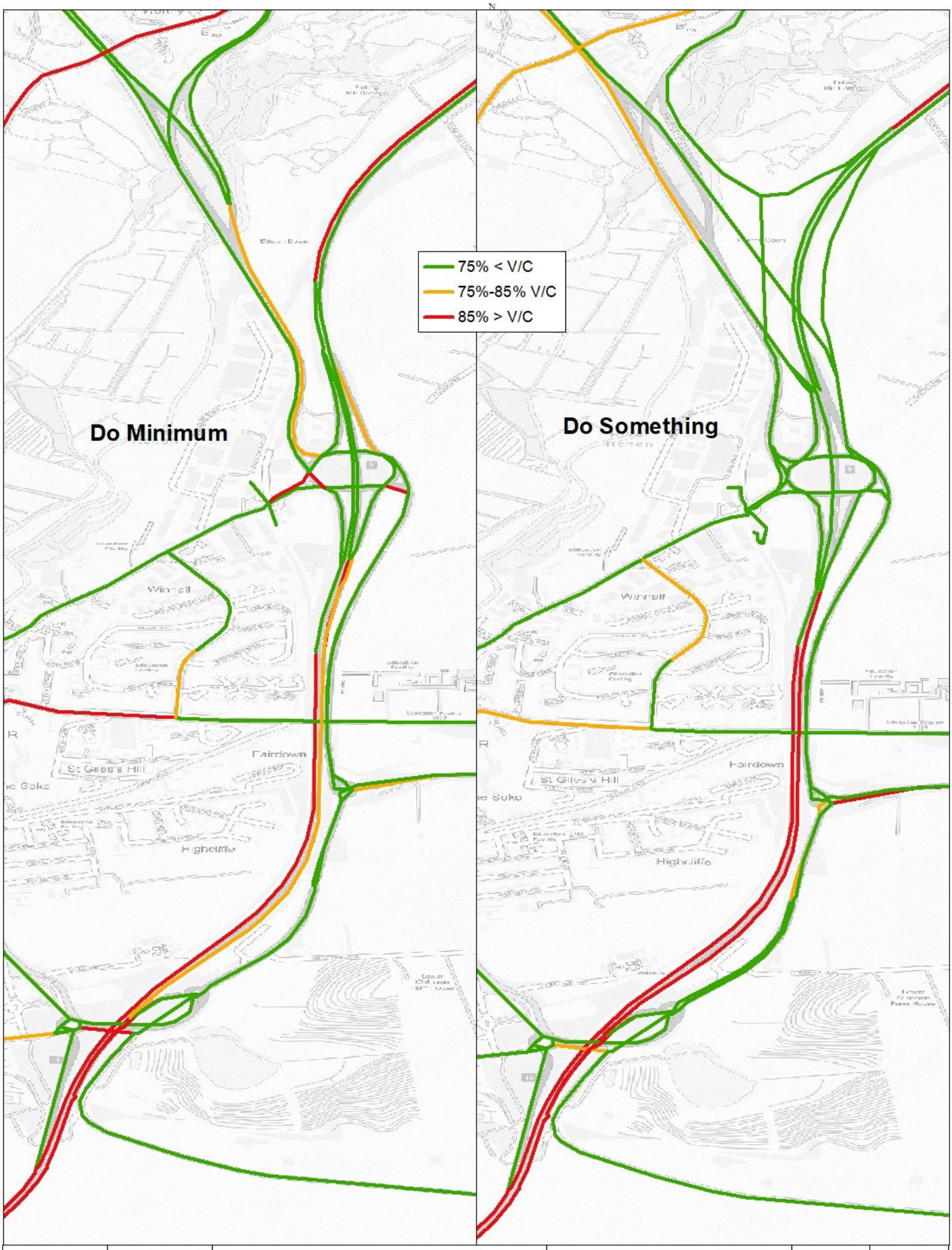
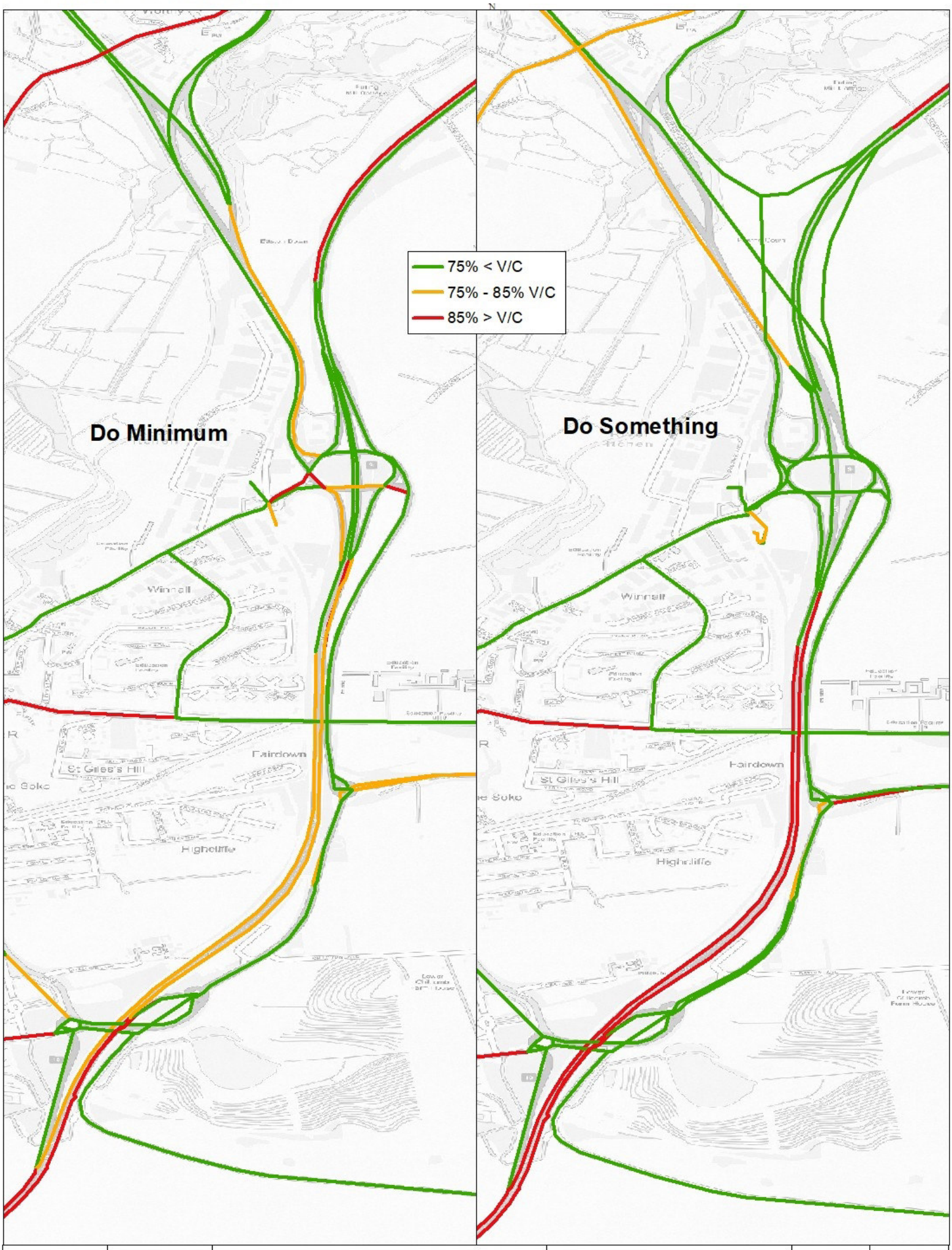


Stantec	Client: VolkerFitzpatrick	**M3 JUNCTION 9** Link Volume to Capacity Ratio 2042 AM		1:13,471 @ A3	Date: 24/06/2022
				Drawn: NT	Checked: RD
				Figure 07	Rev A

Document Path: J:\48176 M3 Junction 9\5000 - Transport\GIS\Link VC\Link VC 2042 AM.mxd



Stantec	Client: VolkerFitzpatrick	**M3 JUNCTION 9** Link Volume to Capacity Ratio 2042 PM		1:13,471 @ A3	Date: 24/06/2022
				Drawn: NT	Checked: RD
				Figure 07	Rev A