A6 to Manchester Airport Relief Road

Draft Complementary and Mitigation Measures

June 2012

STOCKPORT METROPOLITAN BOROUGH COUNCIL

MANCHESTER CITY COUNCIL

Cheshire East Council

A6 to Airport Relief Road

Complementary and Mitigation Measures

June 2012

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Contents

Section Page

Appendices

1. Introduction

Scheme Overview

1.1 The A6 to Manchester Airport Relief Road will **improve surface access to Manchester Airport** and provide **better connectivity along the south Manchester corridor**, to assist Greater Manchester and Cheshire East in meeting their aspirations for economic growth. It directly supports the Government's objective to **provide major transport infrastructure that will deliver economic growth**, a fact acknowledged by the announcement on **prioritisation for funding in the Chancellor's Autumn Statement in November 2011**. The Scheme will provide **congestion relief** to local communities and generate **wider benefits to business** through improved journey time reliability on the local and strategic highway network.

1.2 **The Scheme is an integral component of the wider SEMMMS strategy**, which has delivered benefits to local communities across south-east Manchester through a range of public transport and sustainable transport measures over the past ten years. It is widely recognised that the A6 to Manchester Airport Relief Road is critical to delivering the long-term objectives of the SEMMMS strategy, and to meet national objectives for growth, employment and connectivity.

Consultation with Partner Authorities

1.3 The Scheme is supported and promoted by three local authorities: Cheshire East Unitary Authority (CEC), Manchester City Council (MCC) and Stockport Metropolitan Borough Council (SMBC). Further support and funding is provided by Manchester Airport Group (MAG), the Association of Greater Manchester Authorities (AMGA), and Transport for Greater Manchester (TfGM). All partners and supporters are committed to the efficient delivery of the Scheme to ensure the North West economy can thrive in the future.

Scheme Description

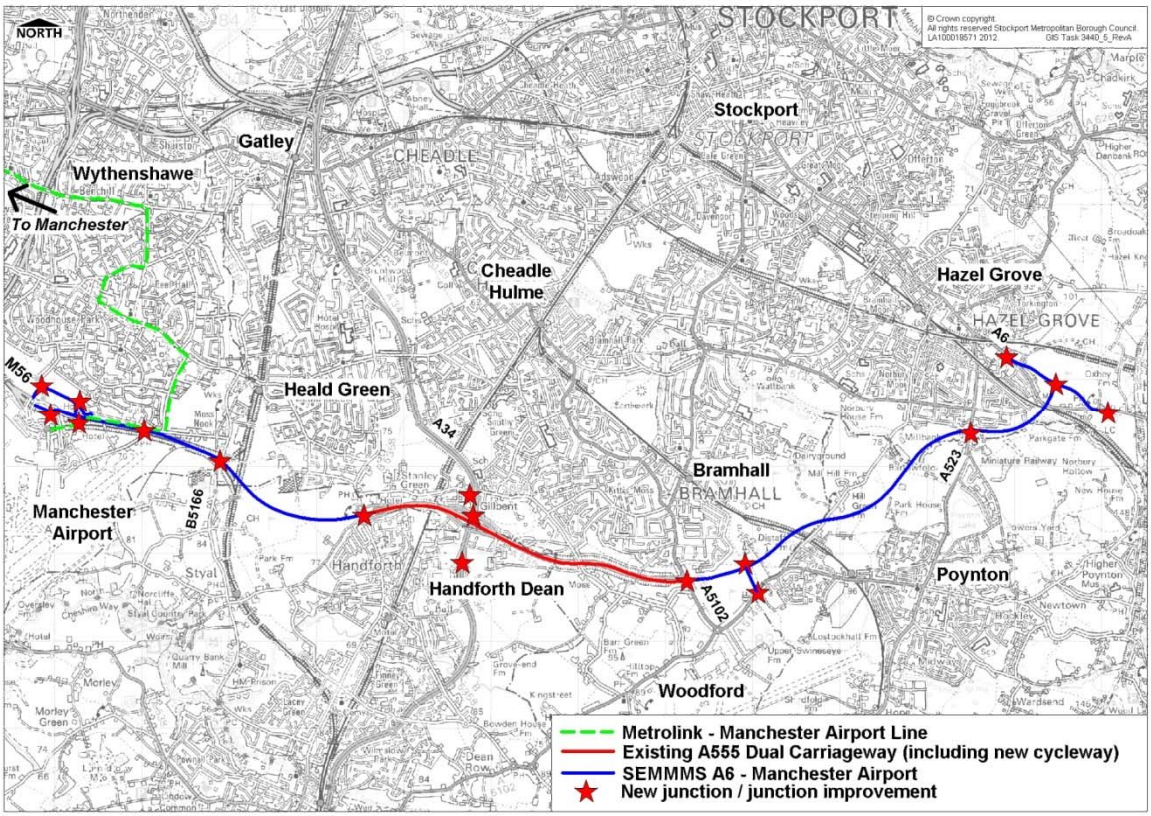
1.4 The proposed A6 to Manchester Airport Relief Road scheme includes a new 2-lane dual carriageway connecting the A6 to Manchester Airport. The Scheme bypasses Bramhall, Cheadle Hulme, Hazel Grove, Handforth, Poynton and Wythenshawe District Centres and Gatley and Heald Green Local Centres. The location of the Scheme is shown in **Figure 1.1** overleaf.

1.5 The Scheme improves access to / from Manchester Airport and its employment areas as well as Hazel Grove, Newby Road, Bramhall Moor Lane, Poynton and Stanley Green employment areas. Access to a number of regeneration areas is also improved by the Scheme, including Stockport Town Centre and Wythenshawe. The junction providing access to the A5149 Chester Road also provides the entry point to the proposed Poynton Relief Road.

1.6 The Scheme will provide a high quality route for freight vehicles to access the strategic road network (i.e. M56) and Manchester Airport from the south east Manchester and Cheshire East / Derbyshire area, and as an alternative route to using existing residential streets.

1.7 The new road is approximately 10 kilometres long, of predominantly dual 2-lane carriageway standard and will include ten new and seven improved junctions. It also incorporates a further 4 kilometres of existing A555 dual carriageway to the south of Bramhall. There are four rail crossings in the new sections, one of which is over the West Coast Main Line. A pedestrian and cycle route is proposed for the whole length of the scheme, including retrofitting it to the 4 kilometre existing section of A555.

Figure 1.1 - Location of the A6 to Manchester Airport Relief Road Scheme



Purpose of Report

1.8 The purpose of this report is to identify and develop a package of measures that will ameliorate the impact of the Scheme on local communities, where there are predicted to be increases in traffic flow and junction delay, and to seek opportunities to reallocate existing road space in favour of sustainable modes of transport, where there are predicted to be reductions in traffic flow.

1.9 Together, the complementary and mitigation measures will help secure substantial environmental, safety and social benefits, along with improvements in the form of urban regeneration and public realm.

1.10 The complementary and mitigation measures will be introduced to coincide with completion of the A6 to Manchester Airport Relief Road. These schemes will be site specific, route-based or area-based and will include:

- The provision of new cycleways and footpaths to link the existing network to the new, segregated cycleway forming part of the core scheme;
- Enhancement of existing networks for cyclists, pedestrians and equestrians;
- Priority schemes for public transport;
- Public realm improvements;
- Modest traffic management proposals, such as traffic calming on residential routes; and
- Junction remodelling to optimise the operational capability of existing junctions.

1.11 Together this minor works package is considered to be an essential element of the major scheme, as it will maximise opportunities to secure both the scheme objectives and those of the wider SEMMMS strategy.

Value for Money

1.12 Value for money has always been critical to transport investment decisions and has become increasingly so over recent times and will continue to be so into the foreseeable future. It is essential therefore that any mitigation package and opportunities for complementary measures are evidenced-based and supported by a systematic and structured approach to problem identification, option development and impact assessment.

1.13 The process needs to be transparent and accessible to stakeholders with a direct link between the impact of the Scheme and measures being promoted. Alternative delivery/ funding mechanisms will therefore be required for local schemes where a causal link cannot be established, and value for money in the context of Relief Road scheme objectives cannot be demonstrated.

Relief Road Design Freeze 5 (DF5)

1.14 This Report is based on Relief Road Design Freeze 5 (DF5), which is reproduced in **Appendix A**, and associated traffic modelling work used to inform the supporting major scheme business case, and focuses on those impacts (positive and negative) resulting from full completion of the Scheme.

2. Relief Road DF5 Traffic Model

Overview

2.1 A robust approach to scheme assessment has been undertaken, using a variable demand modelling framework originally developed for the Greater Manchester Transport Innovation Fund (GMTIF) work, but updated specifically for the A6 to Manchester Airport Relief Road scheme. The modelling suite was developed jointly by the Transport for Greater Manchester, Highways Forecasting and Analytical Services (TfGM, HFAS) and MVA Consultancy. Additional modelling input and a formal reviewing role was provided by Atkins.

2.2 The model captures origin-destination trip and cost data across the extent of the UK, with detailed simulation modelling across Greater Manchester, Cheshire and the surrounding environs.

2.3 Models were created to represent three time periods:

- Morning peak (0700-1000);
- Inter-peak average hour (1000-1600); and
- Evening peak hour (1600-1900).

2.4 The model developed for GMTIF work had a base year of 2007. The A6 to Manchester Airport Relief Road model has been updated with a base year of 2009. The model was calibrated and validated in accordance with DfT criteria using observed traffic count and journey time data collected in neutral months throughout 2009. Full details of the data used to develop, calibrate and validate the base year transport model are presented in the ***Data Collection and Traffic Surveys Report [CD X.XX]***.

2.5 All modelled time periods pass the calibration and validation criteria and are deemed to provide a good representation of observed traffic conditions across the study area. Full details of the calibration and validation methodology and outputs are provided in the ***Assignment Model Validation Report [CD X.XX]***. Full details of the demand model are provided in the ***Demand Model Report [CD X.XX]***.

2.6 Model forecasts were prepared for two future years: 2017 and 2032. The transport network and public transport services have been updated to reflect schemes under construction and committed transport options anticipated to be in place by 2017 and 2032 respectively.

2.7 Future year forecast models were produced for the following core scenarios:

- A Do-Minimum (DM), which contains all committed developments and committed transport schemes (highway and public transport) across the study area to 2032; and
- A Do-Something (DS), which includes all committed developments and schemes from the DM, plus the Relief Road DF5 scheme.

2.8 The demand model was run for the DM and DS scenarios, to enable any variation in traffic due to the Scheme (induced traffic) to be reflected in the appraisal.

2.9 Further details of the development of the future year forecast models, and the impact of the Scheme relative to the DM, are presented in the ***Model Forecasting Report [CD X.XX]***.

Relief Road Highway Model Network

2.10 The Relief Road highway model represents all roads of traffic carrying significance within the area through which the proposed scheme will run - Stockport, South Manchester, the north of Cheshire East and High Peak area of Derbyshire - and the remainder of Greater Manchester, including all motorways, A roads, B roads and C class roads. The network outside the county is represented in much less detail, and becomes increasingly less dense with increasing distance from the county boundary.

2.11 SATURN offers two levels of network detail, both types of which are used in the Relief Road highway model;

- **Simulation network**, which represents the operation of junctions in detail where capacity restraint is based on gap acceptance and the impact of traffic signal timings applied to the interaction between different movements at junctions; and
- **Buffer network**, which represents the network in terms of its links, rather than as a series of junctions, and capacity restraint is based on flow-delay curves specified individually for each link.

2.12 The entire network within Greater Manchester and the northern part of Cheshire East is coded in full SATURN simulation format. The coding of the simulation network was checked and updated as necessary, based on information from a number of sources, including digital maps and aerial photographs. Site visits were undertaken to examine lane usage and the operation of junctions in each of the modelled time periods. Furthermore, saturation flows at key junctions in the study area were checked and updated as. Signal staging/ phasing, green-times, inter-greens and signal offsets were updated where necessary using information obtained from the TfGM for all signalised junctions in the core study area.

2.13 The information required for buffer network coding includes the following attributes for each link:

- link length;
- speed at capacity;
- speed in free-flow conditions;
- flow at capacity; and
- a measure of the steepness of the flow-delay curve (often referred to as the power function of the curve).

2.14 Link flow-delay relationships for the buffer links are based on COBA speed-flow curves.

2.15 Buses are represented in the model as fixed loads, with routes defined as chains of nodes in the simulation and buffer networks.

Relief Road Highway Model Trip Matrices

2.16 The Relief Road highway model trip matrices contain representations of all vehicle trips with an origin or destination inside the study area and the remainder of Greater Manchester, and all external-to-external trips that cross the county boundary. The matrices do not, however, represent intra-zonal trips that take place entirely within the same zone.

2.17 Separate matrices are maintained for car, Light Goods Vehicle (LGV) and Other Goods Vehicle (OGV) trips, for the morning peak hour (0800-0900), the evening peak hour (1700-1800) and an average inter-peak hour for the period 1000-1530.

2.18 For cars, matrices are available for 12 journey purposes. For assignment purposes, however, the matrices are aggregated to form 5 'user classes', comprising:

- Commuting cars (home-to-work plus work-to-home car trips);
- Employer's business cars (home-based plus non-home-based employer's business car trips);
- Other cars (all other car trips);
- LGVS (all purpose LGV trips); and
- OGVS (all purpose OGV trips).

Area of Influence

2.19 The Scheme will provide strategic connectivity to Manchester Airport and along the south Manchester corridor. In light of this, the project modelling team set out to identify an 'Area of Influence' (AOI) for the Scheme, within which to focus attention on aspects such as network coding and density, inclusion of significant developments as individual zones, and compliance to DfT criteria (including base assignment validation).

2.20 The Relief Road AOI was initially identified using a base year network with the Scheme added. The defined AOI was later confirmed using interim forecasts for 2030.

2.21 Two sets of criteria were examined to identify the AOI:

- GEH criteria based on the traffic flow changes between the without- and with- scheme situations; the purpose of this approach was to apply quantification that related to DfT criteria for validation, where a key threshold is a GEH value of 5.0; and
- Absolute flow differences between without- and with scheme scenarios; changes were analysed in steps of 50 pcus from 100 to 250 pcus).

2.22 The formula defining GEH is given by:

$$GEH = \sqrt{\frac{(F_1 - F_2)^2}{(F_1 + F_2)/2}}$$

Where:

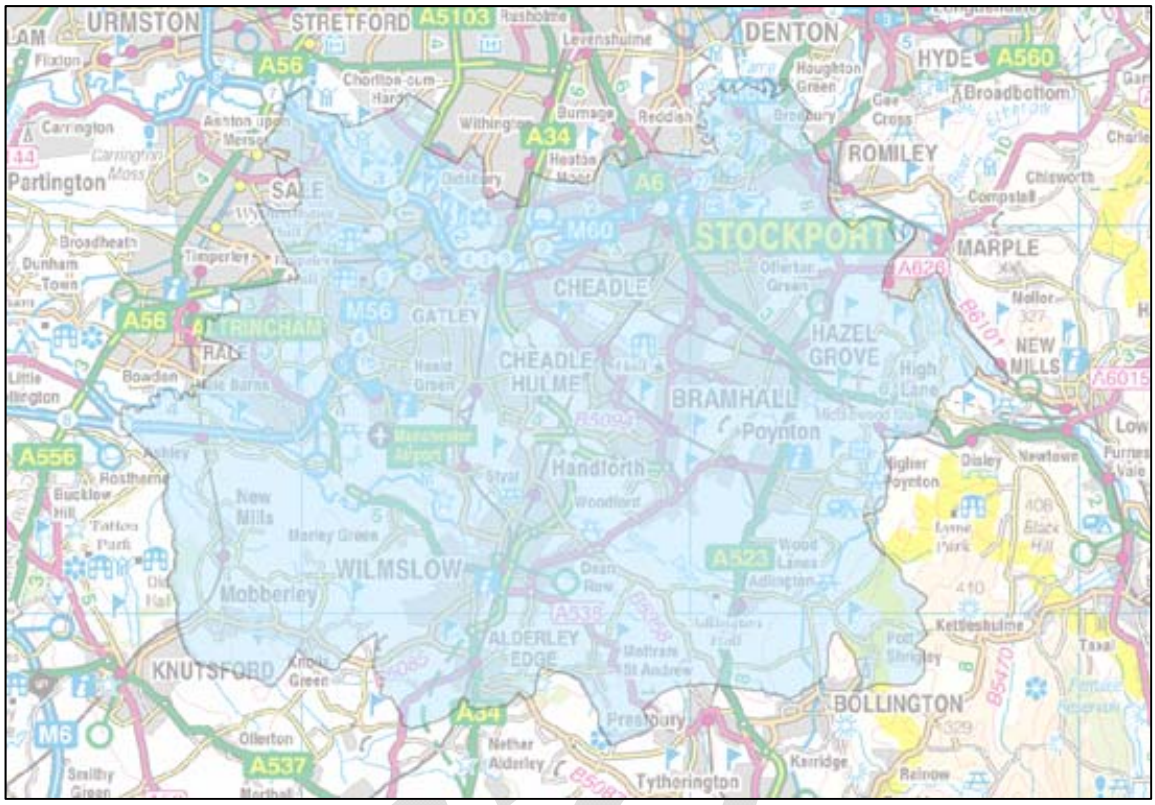
F_1 is the Do Something flow

F_2 is the Do Minimum flow

2.23 The results of the analyses undertaken were presented to the DfT and following discussion, the project modelling team decided to adopt an AOI based on changes of +/- 250 pcus. The area in which flow changes of this level were identified was converted into a boundary relating to SATURN zone boundaries.

2.24 The Relief Road highway network within the AOI is shown in **Figure 2.1** below.

Figure 2.1 – Relief Road Highway Network within Area of Influence



Impact of Relief Road Based on Design Freeze 5

2.25 **Figures 2.2 and 2.3** present the predicted changes[1] in traffic flow resulting from full completion of the Scheme (DF5) under 2032 future year conditions for the morning and evening peak hours.

2.26 In addition to 'actual' flow differences the GEH statistic has been used to assess the impact of the Scheme and by doing so overcome the problem of simple percentage flow comparisons when traffic volumes across the network cover a wide range and this is presented in **Figures B.1 and B.2 in Appendix B**. The GEH statistic has some similarity in structure to the chi-square statistic, and because it is non-linear, a single impact threshold[2] based on GEH can be used over a wide range of traffic volumes (from lightly trafficked country lanes/ residential roads to heavily trafficked motorway/ principal routes).

2.27 In terms of the operational impact of the Scheme, **Figures B.3 to B.6** in **Appendix B** presents a summary of the level of congestion across the highway network with and without the Scheme expressed through plots of the maximum volume to capacity ratio[3] for any movement at a junction approaches. **Figures 2.4 and 2.5** present the impact of the Scheme in terms of change in average junction delay (per pcu).

[1] Representing differences (+/-) in actual flow of more than 50 pcus/hr
[2] GEH of more than 5.0
[3] V/C ratios greater than 0.85

Figure 2.2 - 2032 Morning Peak Relief Road DF5 (Actual Flows): Do-Something minus Do-Minimum

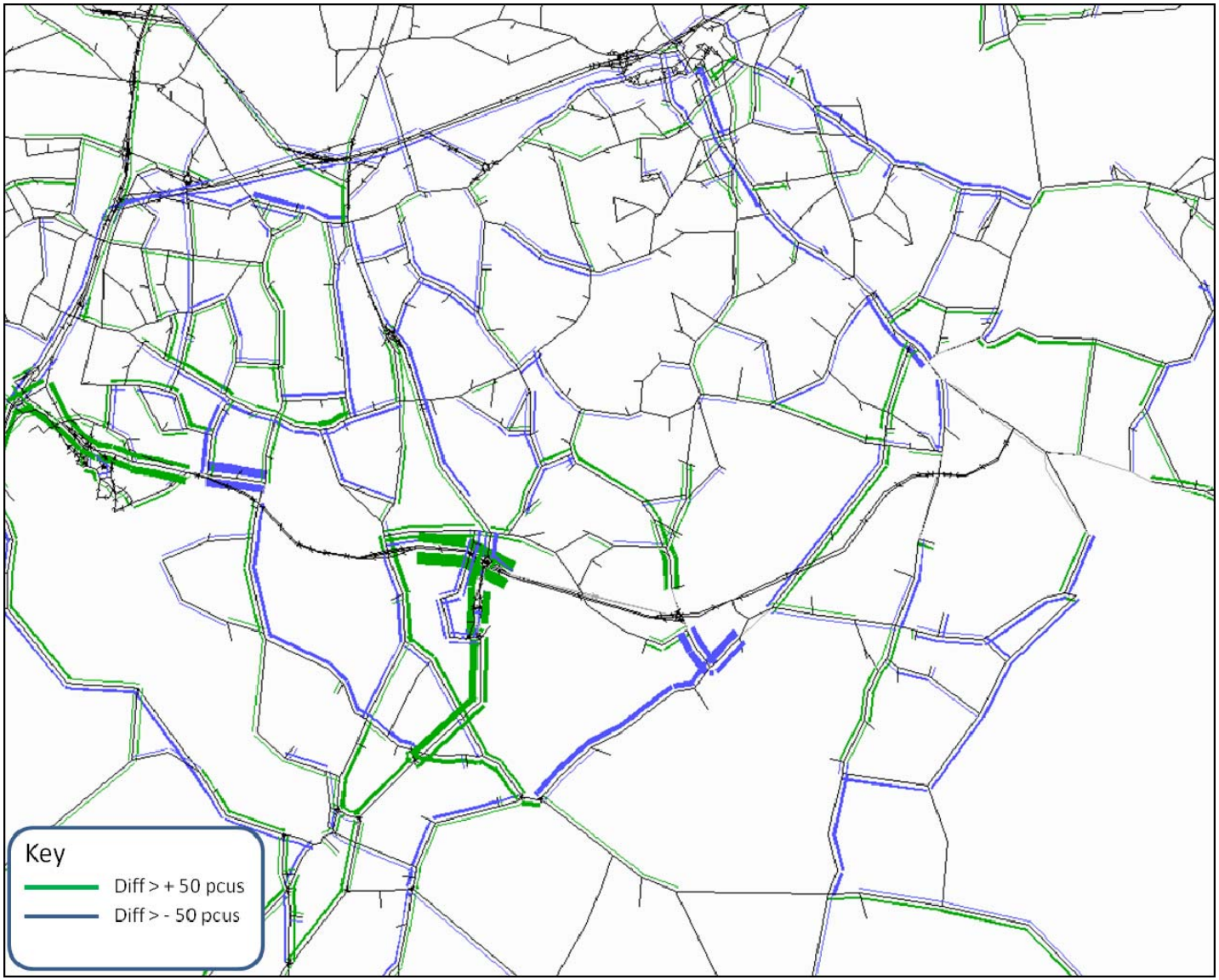


Figure 2.3 - 2032 Evening Peak Relief Road DF5 (Actual Flows): Do-Something minus Do-Minimum

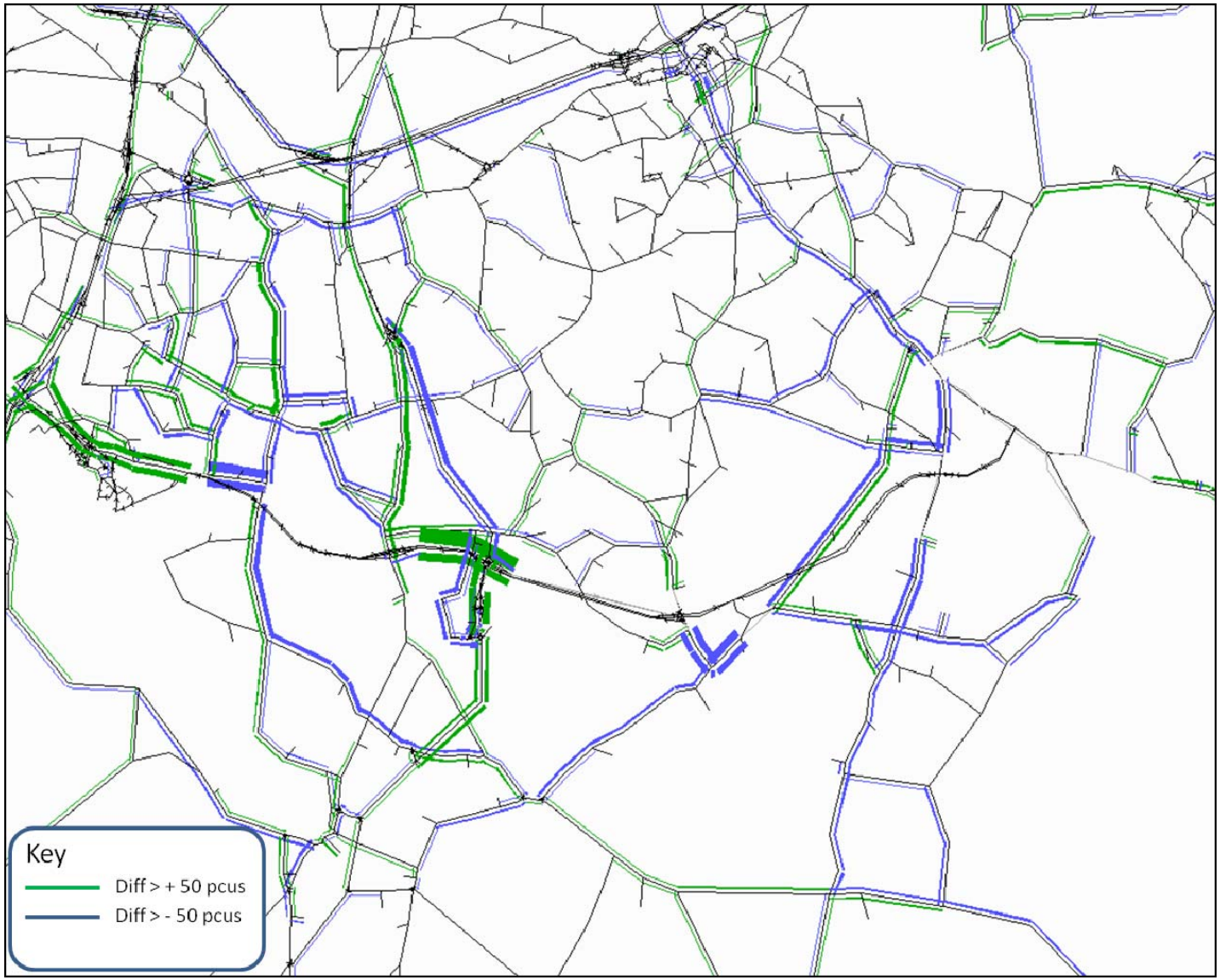


Figure 2.4 - 2032 Morning Peak Relief Road DF5 (Change in Average Junction Delay per PCU): Do-Something minus Do-Minimum

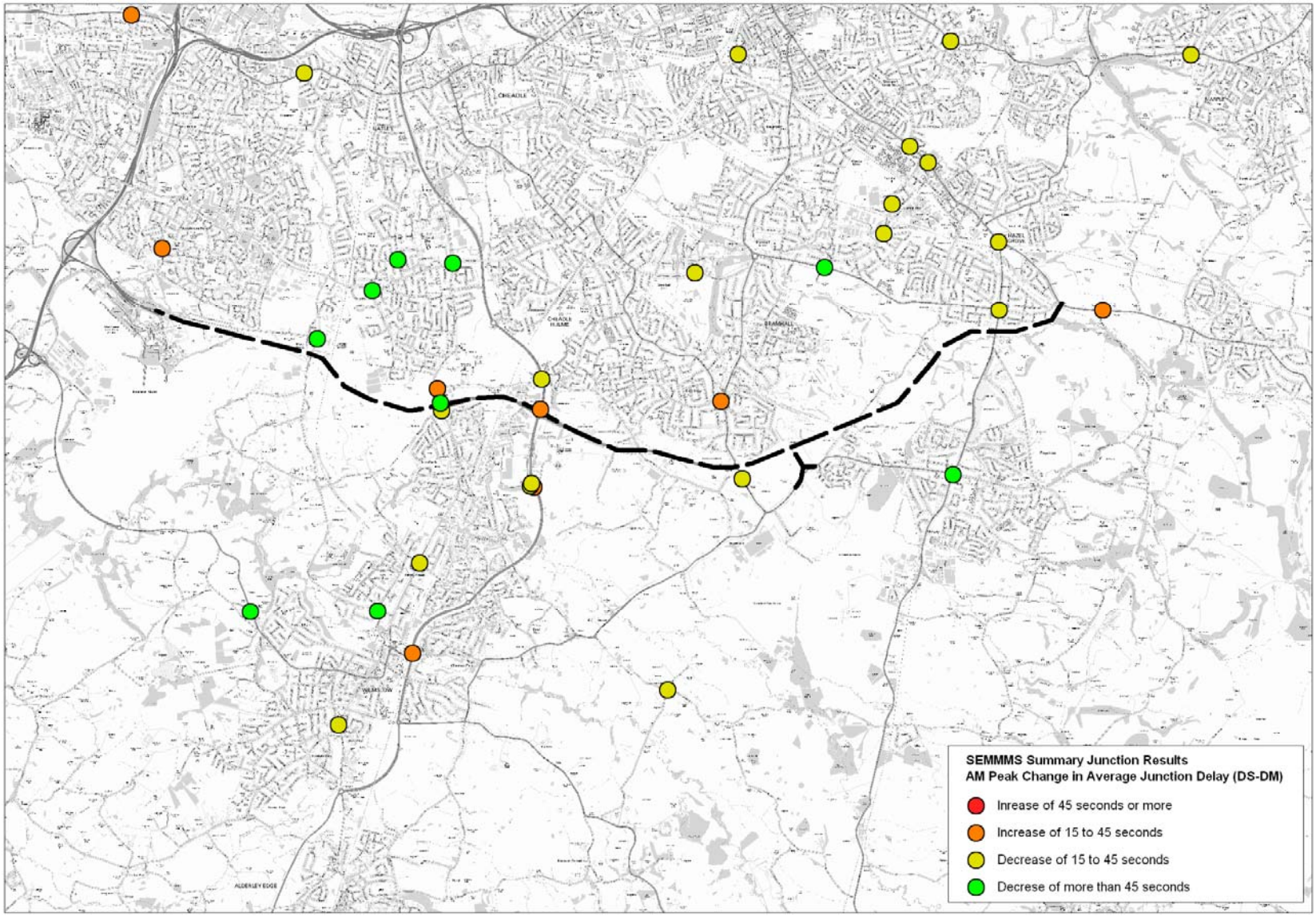
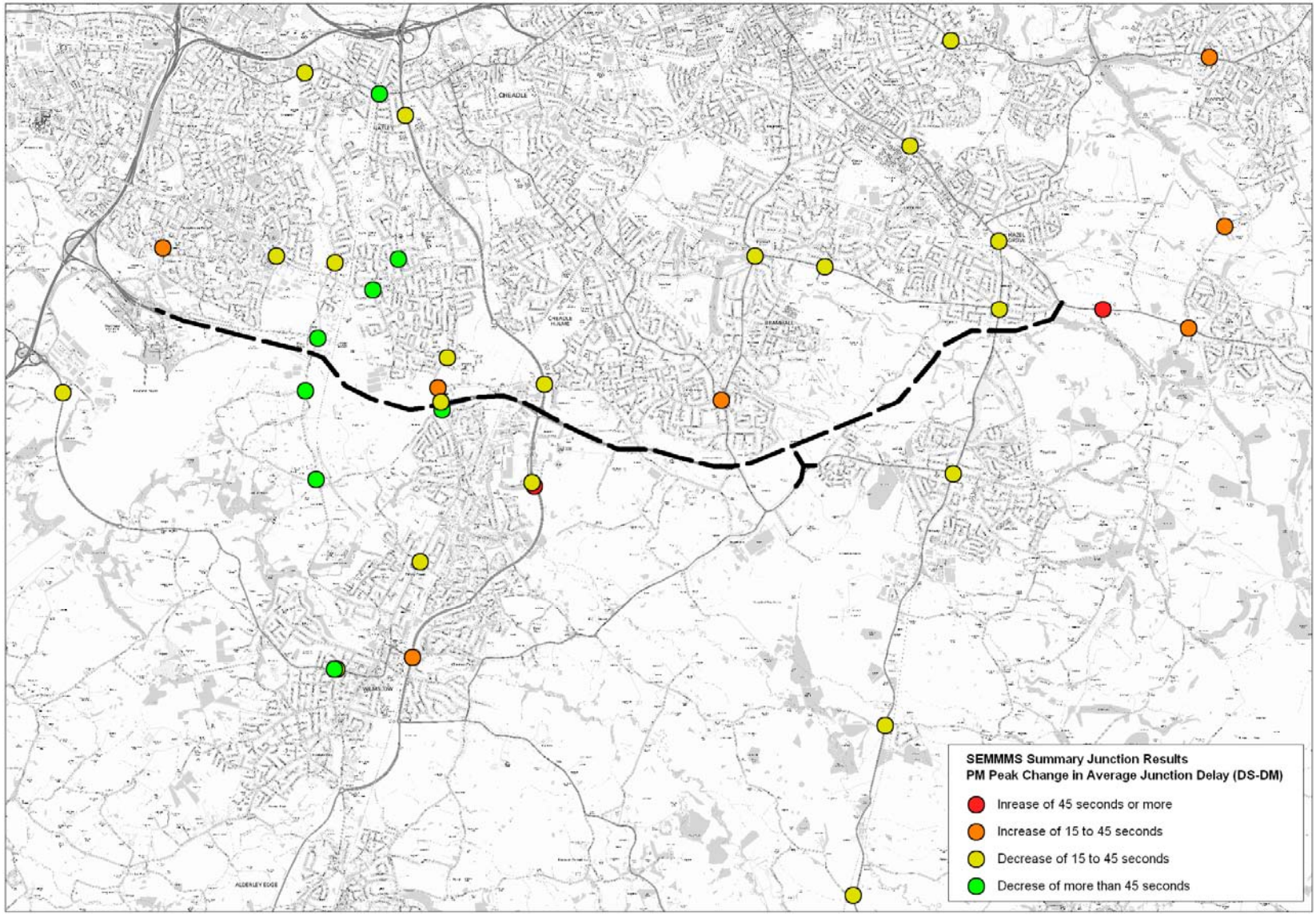


Figure 2.5 - 2032 Evening Peak Relief Road DF5 (Change in Average Junction Delay per PCU): Do-Something minus Do-Minimum



3. Minor Works Package Proposals

Introduction

3.1 Covering a large area of south-east Greater Manchester and North East Cheshire, the impact (positive and negative) resulting from full completion of the Scheme is geographically diverse. This ranges from Cheshire villages on the fringe of the Peak District and associated cross-country rural routes, to the south Manchester conurbation/ north Cheshire commuter belt dormitory towns.

3.2 Further to consultation with SMBC, CEC and MCC (detailed in **Appendix B**), this section of the report describes the proposals for a minor works package of complementary and mitigation measures, based on Relief Road DF5 model output, for the following priority areas:

Mitigation Proposals

- Wythenshawe Area;
- Handforth/ Stanley Green Area;
- Wilmslow Area
- Poynton Area;
- Bramhall Area; and
- A6 Hazel Grove to Whaley Bridge Corridor

Complementary Measures

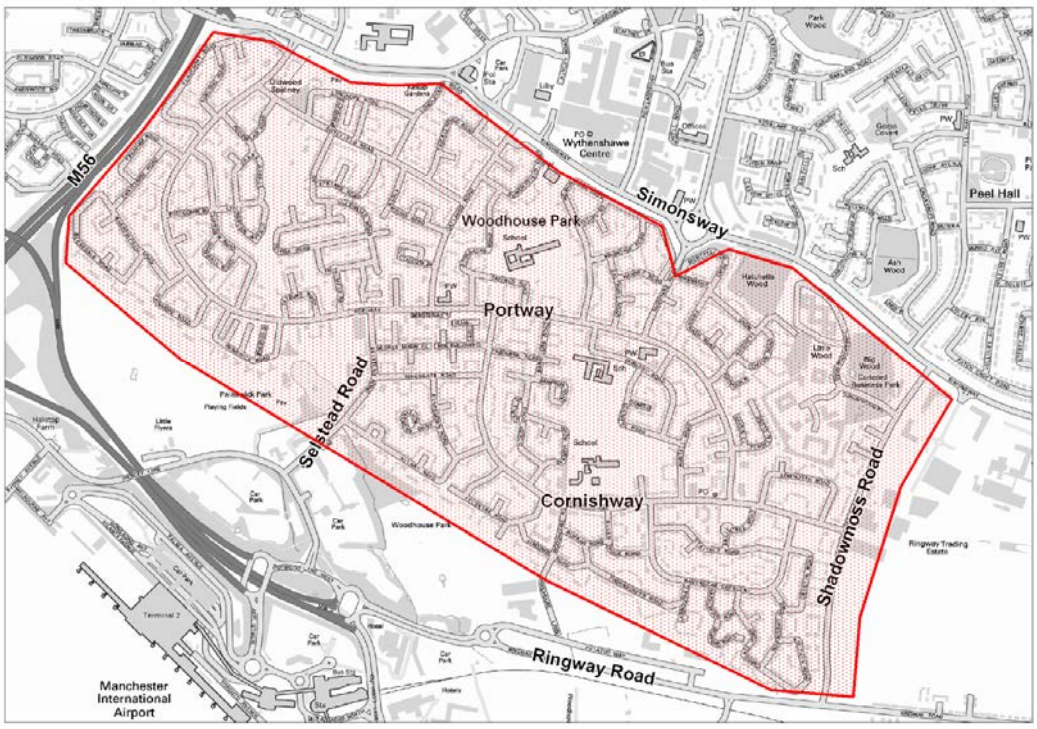
- Styal Road;
- Heald Green Area; and
- Hazel Grove Area.

Mitigation Proposals

Wythenshawe Area

3.3 On the basis of the Relief Road DF5 model output and further to consultation with MCC the Wythenshawe area of interest is shown **Figure 3.1** below.

Figure 3.1 – Wythenshawe Area



3.4 The remodelling of the Shadowmoss Road/ Ringway Road West junction which is necessary to facilitate the Scheme is predicted to result in some traffic re-assignment within the Wythenshawe area with Portway and Simonsway experiencing general increases in traffic levels – traffic which without the Scheme would use the Ringway Road West/ Styal Road junction. As a consequence increased junction delay is predicted at the Selstead Road/ Portway junction noting that Selstead Road is already traffic-calmed to discourage rat-running to/ from the Airport.

3.5 Simonsway is a local distributor road which provides an important east-west route within Wythenshawe both for vehicular traffic and pedestrians and cyclists. The route provides access to residential areas, Wythenshawe town centre, and the Ringway Trading Estate, as well as providing a strategic link to the motorway network via north facing slip on to the M56 at Junction 4. Portway and Cornishway provide single carriageway access routes to residential properties, occasional retail units and other uses. Traffic is free-flowing throughout the day and both routes are lightly traffic calmed in the form of coloured carriageway surfacing and shallow speed cushions.

3.6 The principle objective for the area is to discourage strategic traffic routeing through the Wythenshawe area to access the Airport, but at the same time retaining local accessibility to the Airport for Wythenshawe residents.

The introduction of a 20 mph zone focussed on Shadowmoss Road, Portway and Cornishway was found to offer the most effective solution with new and/or improved traffic calming features to further deter strategic traffic from using these routes to access the Airport. Further details on the nature and range of traffic calming measures will be subject to consultation with Manchester City Council.

3.7 Although Simonsway is predicted to experience some increase in traffic flow with the Scheme plus mitigation in place this is not matched by any noticeable increase in junction delay. It is considered therefore that given Simonsway's current role as a local distributor road, providing access to Wythenshawe town centre and the Ringway Trading Estate, such traffic flow increases would not materially alter the prevailing character of the road.

Traffic signage will play an important role in directing strategic traffic wishing to access the Airport to use the most appropriate routes through the area, notably Simonsway, Styal Road and the western section of the Relief Road.

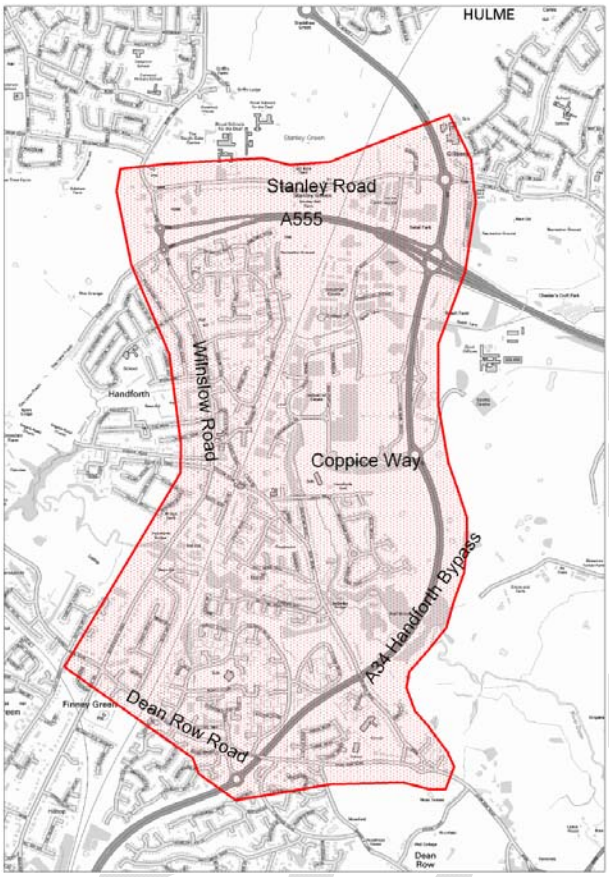
Handforth/ Stanley Green Area

3.8 On the basis of the Relief Road DF5 model output and further to consultations with SMBC and CEC the Handforth/ Stanley Green area of interest is shown **Figure 3.2** overleaf.

3.9 The Relief Road DF5 model output predicts increased traffic flows along the A34 Handforth bypass as a result of traffic attracted to the completed Scheme. The A34 is a key north-south radial route linking Cheshire with Manchester and intersects with the existing A555 via a four-arm grade separated roundabout gyratory.

3.10 Capacity issues along the A34 Handforth bypass are seen to be limiting the attractiveness of this route with some traffic routeing through Handforth town centre. It is intended that the A34 should be used for longer-distance journeys, with the B5358/ A555 junction used by more local traffic originating in Handforth.

Figure 3.2 – Handforth/ Stanley Green Area



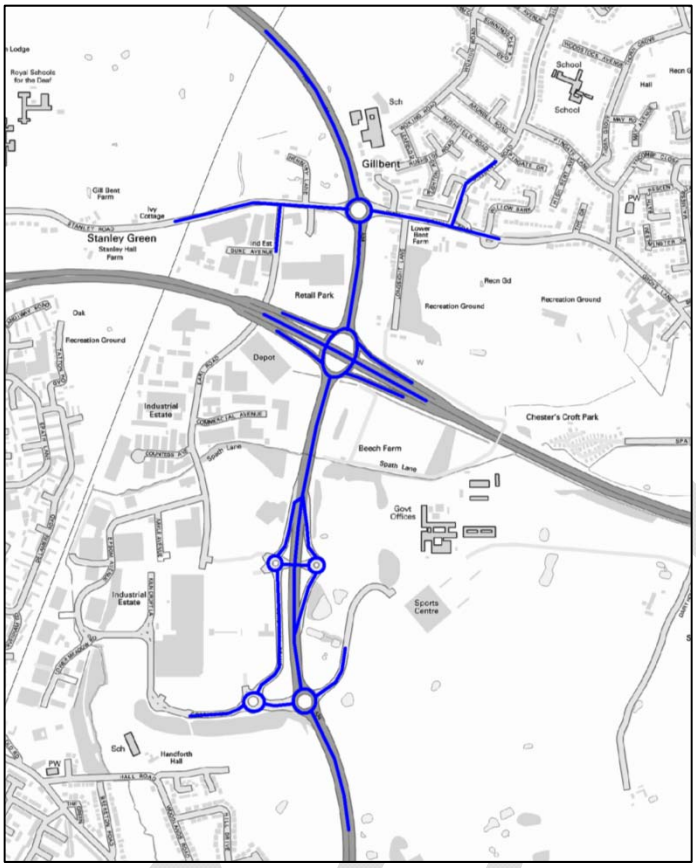
3.11 The Major Scheme works package features significant upgrades to the A34/ A555 junction to include provision of additional lanes on all approaches, additional circulatory lanes, and full signalisation of the roundabout. The transport assessment will show that the junction improvements proposed at the A34/ A555 can accommodate forecast traffic demand.

3.12 The A34 / Stanley Road 'Stanley Green' roundabout junction is an existing capacity constraint that generates significant queuing in the morning and evening peak periods and makes limited provision for pedestrians and cyclists. Cycle and pedestrian facilities are limited to Toucan crossings on both the northern and southern arms of the junction. However, the operation of these crossing facilities can exacerbate peak period congestion when large volumes of traffic turning to/ from the B5094 Grove Lane and Bramhall leading to significant queuing on the northbound and southbound A34 approaches.

3.13 Blocking back from this junction currently impacts on the northbound flow of traffic through the A555 junction, a situation that will deteriorate under future year traffic levels, with potential adverse impact on the Scheme operation. Indeed it is because of the significant delays predicted at the Stanley Green junction that some Relief Road traffic is found to use the B5358 Handforth dumb-bell junction in preference to the A34 junction.

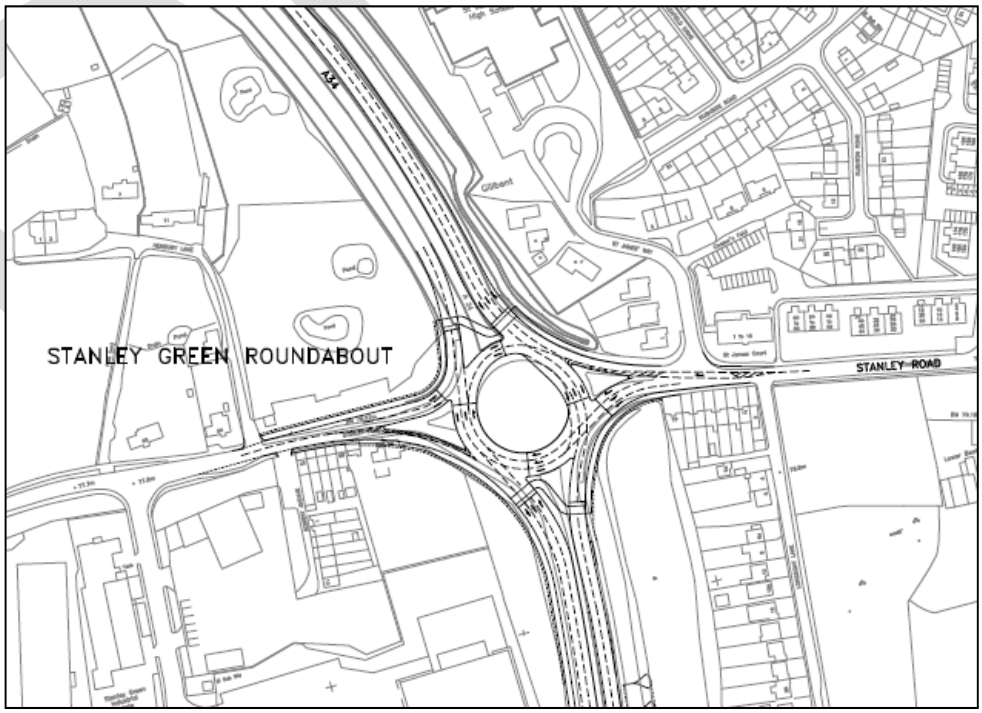
3.14 To better understand the blocking back effects of traffic using the A34 and the impact in operational terms that will arise from completion of the Relief Road, a micro-simulation Paramics highway model was developed for the A34/ Stanley Green area (as shown in **Figure 3.3** below) for testing of junction improvements.

Figure 3.3 – A34/ A555 Micro-simulation Model Area



3.15 The outcome of the modelling exercise was a recommendation for signalisation of the Stanley Green roundabout as presented in **Figure 3.4** below.

Figure 3.4 – Proposed Signalisation of Stanley Green Roundabout

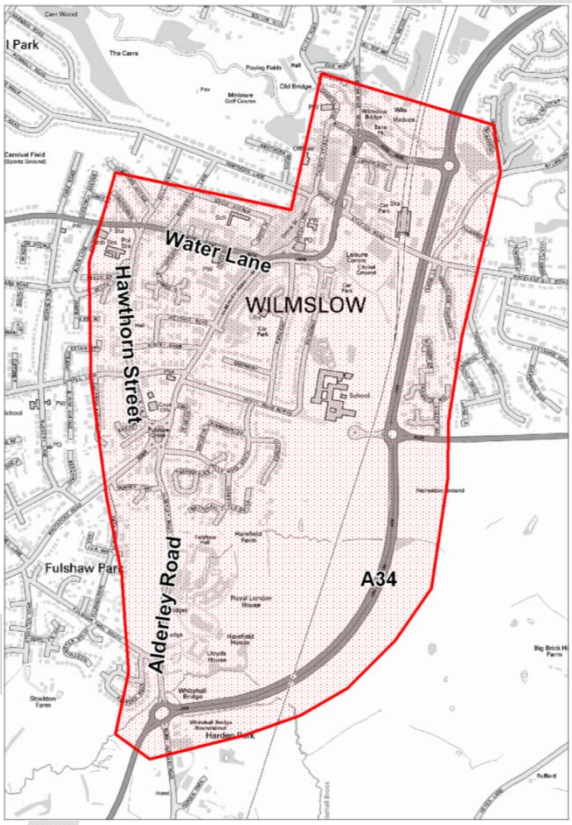


In addition to the proposed capacity enhancement to the A34 Stanley Green roundabout there is a need to discourage as far as is practicable strategic traffic from routeing via Handforth town centre. Incremental testing has shown that an environmental improvement scheme in Handforth town centre between School Road and Grangeway, supplemented by some traffic calming on the B5358 from the roundabout junction with Dean Row Road to the signalised junction with Manchester Road/ Wilmslow Road, would yield the desired effect.

Wilmslow Area

3.16 On the basis of the Relief Road DF5 model output and further to consultations with CEC the Wilmslow area of interest is shown **Figure 3.5** below.

Figure 3.5 – Wilmslow Area



3.17 With reference to **Figures 2.4** and **2.5** above, and **Figures B.7** and **B.8** in **Appendix B** there are predicted to be some reductions in average junction delay across both time periods in Wilmslow, notably the Alderley Road/ Knutsford Road roundabout in the morning peak, and A538 Altrincham Road/ Hawthorn Street in the evening peak.

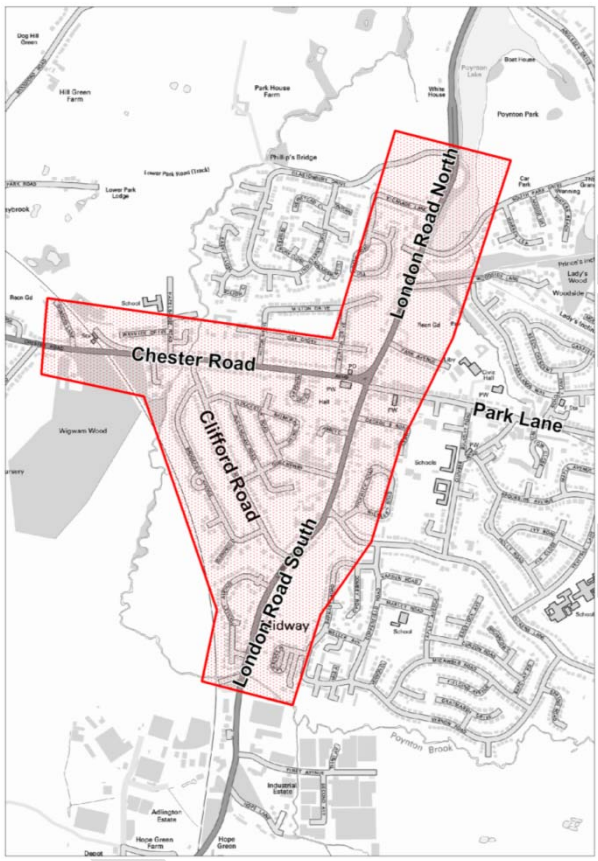
3.18 The only notable predicted increase in average junction delay occurs at the A34/ A538 Manchester Road roundabout. Predicted traffics flows on the A34 are high with or without completion of the Scheme. In the morning peak localised re-routing following completion of the Scheme results in an increase in traffic turning right from the A538 Manchester Road leads to an increase in delay to A34 southbound traffic. In the evening peak, an increase in traffic turning right from the A34 on to A538 Manchester Road leads to an increase in delay to A34 northbound traffic.

In order to offset the predicted delay to A34 traffic it is recommended that some form of capacity enhancement measure is introduced at the A34/ A538 Manchester Road roundabout as part of the minor works package.

Poynton Area

3.19 On the basis of the Relief Road DF5 model output and further to consultation with CEC the Poynton area of interest is shown **Figure 3.6** below.

Figure 3.6 – Poynton Area



3.20 The Poynton area is predicted to experience a general decrease in traffic flows following completion of the Scheme, including:

- Chester Road;
- London Road North;
- Park Lane;
- Middlewood Road;
- Dickens Lane;
- Station Lane; and
- Skellom Green Lane/ Moggie Lane/ Waterloo Road.

3.21 There is predicted to be some increase in traffic on London Road South in the morning peak, while in the evening peak there is predicted to be a reduction on London Road South but increase in traffic on Clifford Road. The only materially impact on junction performance resulting from the Scheme being in places is a beneficial reduction of more than 30 seconds average delay at the London Road South/ Chester Road junction in both the morning and evening peak hours under 2032 future year conditions.

3.22 The London Road South/ Chester Road junction forms a key component of the Poynton shared-space scheme which will provide public realm enhancements and traffic management changes to key routes within Poynton, and involves converting the signal control junction to a dumbbell

roundabout arrangement, with central pedestrian crossing between the two small roundabouts, and to provide a shared space environment on Park Lane including the junction with Bulkeley Road, as shown in **Figure 3.7** below.

Figure 3.7 – Poynton Shared-Space Scheme

3.23 The objective of the scheme is the creation of a shared space environment which aims to reduce segregation between pedestrians and vehicles. In practice, un-segregated space helps improve the so-called desire lines for pedestrians and aims to reduce wait times previously experienced at formalised crossing facilities. The redesign of the junction encourages vehicles to approach with caution allowing increased eye-contact between vehicles and pedestrians and enabling informal and unregulated pedestrian provision.

3.24 Notwithstanding the impact these local network changes may have on strategic through traffic, under both current and future year traffic flow conditions, the intention is for through traffic to continue to use the main London Road South junction rather than any alternative residential local distributor routes.

Clifford Road has the potential to act as an alternative route for through traffic to the London Road South/ Chester Road junction, for trips between Chester Road and London Road South (and vice versa). For this reason and to control traffic speeds, Clifford Road has already been traffic-calmed with shallow vertical deflections.

It is recommended that prior to and following completion of the Scheme that traffic flows on Clifford Road are monitored to ascertain whether or not it attracts increased through traffic between Chester Road and London Road South. The impact of the Park Lane shared-space scheme should be similarly monitored.

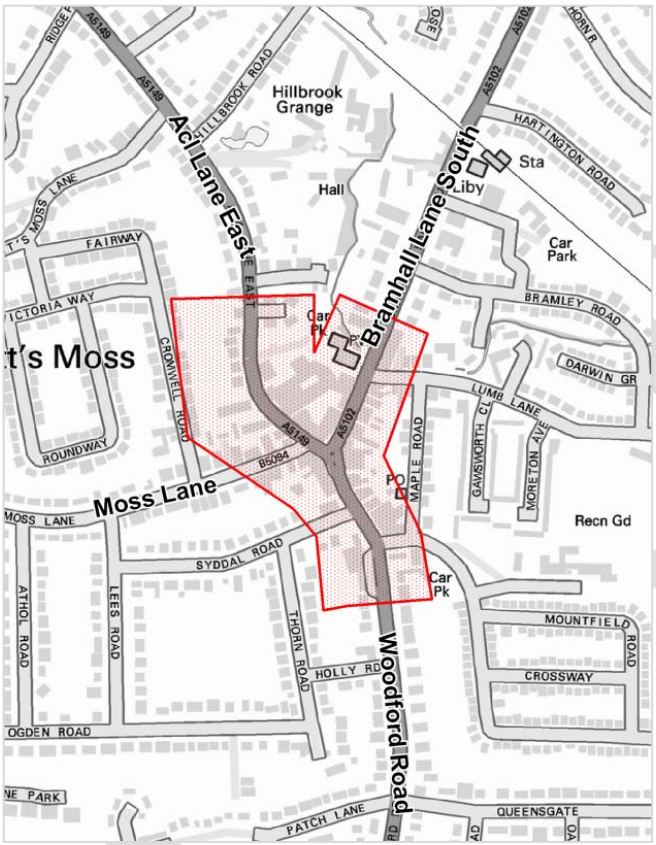
In the event that Clifford Road is shown to attract increased through traffic appropriate traffic management would be introduced to ensure as far as practicable that Clifford Road retains its function as a residential local distributor route. An appropriate traffic management scheme may comprise, for example, a 20 mph zone designation on Clifford Road along with the potential use of horizontal deflections to supplement the vertical deflections which are already in place. The final form of traffic management would be subject to consultation with Cheshire East Council.

Traffic signage will play an important role in directing strategic traffic that wishes to use the Relief Road to use the most appropriate route through Poynton.

Bramhall Area

3.25 On the basis of the Relief Road DF5 model output and further to consultation with SMBC the Bramhall area of interest is shown **Figure 3.8** below.

Figure 3.8 – Bramhall Area



3.26 The Ack Lane East/Bramhall Lane South junction is located at the heart of the vibrant Bramhall District Centre. The junction is a three-arm mini-roundabout with uncontrolled crossing facilities located on each arm of the roundabout. The Ack Lane East/Moss Lane three-arm priority junction lies to the immediate west of the mini-roundabout. The junctions currently experience peak period congestion due to the high volume of traffic passing through the District Centre and the close proximity of the two junctions, as well as catering for high pedestrian movements. With high traffic flows, and uncontrolled pedestrian crossing provision at the mini-roundabout intersection of key routes, the District Centre lacks adequate pedestrian crossing on key desire lines (although signalised pedestrian crossings exist to the immediate north of the mini-roundabout).

3.27 The Relief Road DF5 model output forecasts increased traffic flow and vehicle delay on Woodford Road in both the morning and evening peak periods.

The completion of the Relief Road scheme presents an opportunity to enhance the pedestrian environment and improve the public realm within the District Centre. A shared space scheme encompassing Ack Lane East /Bramhall Lane South and Ack Lane East/ Moss Lane junctions would complement the way in which these closely spaced junctions operate at busy times of the day, namely, as informal non-prioritised give-way junctions achieved through direct eye contact between drivers from different slow-moving traffic streams.

A6 Hazel Grove to Whaley Bridge

3.29 The A6 Buxton Road forms part of Stockport's strategic route network and performs an important role for the Greater Manchester City Region carrying traffic from the Peak District and beyond into Greater Manchester. The A6 also forms an important freight route, providing a direct link to/from Manchester that is utilised by a high volume of freight traffic.

3.30 Through Disley and High Lane the A6 is fronted by a mixture of open fields, wooded areas, residential and commercial properties, with numerous side-roads providing access to residential areas and onward connections to Marple and Whaley Bridge. To the west of Disley village centre, attempts have been made to reduce the width of carriageway through introduction of central hatching and cycle lanes as the road continues towards High Lane. Within High Lane itself, the wide carriageway accommodates numerous right-turn facilities, and occasional formalised on-street parking facilities. Elsewhere, double yellow line markings prevent on-street parking for the majority of the A6 through High Lane.

3.31 The A6 through Disley forms an Air Quality Management Areas (AQMA) for Cheshire East Council. The AQMA extends from the Market Street / Buxton Old Road crossroads eastwards to the junction with Redhouse Lane in the east. Traffic flow increases along the A6 may therefore have a negative impact on air quality within this monitoring area.

3.32 A constant high level of traffic movement creates an intimidating environment for vulnerable road users along the A6. As previously mentioned, cycle lanes are provided for a section of the A6 between Buxton Road and High Lane, but no facilities are provided elsewhere within this corridor.

3.33 Footways are generally adequate along this corridor, although the volume of traffic and HGVs in particular using this route detracts from the High Street environment within High Lane and Disley. Pedestrian crossing facilities are provided at the signalised junctions with Windlehurst Road and Buxton Old Road, along with occasional pedestrian refuge islands and Pelican crossings on Market Street in Disley and at two locations in High Lane.

3.34 The modelling of the A6 Hazel Grove to Whaley Bridge corridor shows traffic flow increases, both in terms of background traffic growth and longer distance traffic reassignment effects as a result of the introduction of the Scheme.

The nature of the surrounding land however means that it is not possible (nor desirable) to significantly increase network capacity. Accordingly, a package of mitigation measures is being developed aimed at assisting pedestrian and cycle safety along this length of the A6.

In parallel, CEC, SMBC, Derbyshire County Council, Peak District and TfGM will work together to develop a modal shift strategy for the A6 to Derbyshire which will complement the public transport enhancements the Scheme will secure in terms of increased reliability and efficiency of existing bus services in the corridor.

Impact of Mitigation Measures

3.35 The overall impact of implementing the mitigation measures in the DS scenario is presented in **Figures 3.10** and **3.11**. Comparison of flows against the DM scenario is presented in **Figures 3.12** and **3.13**.

3.36 In terms of the operational impact of the Scheme (plus mitigation), **Figures D.1** and **D.2** in **Appendix D** present a summary of the level of congestion across the highway network under the DS scenario with mitigation expressed through plots of the maximum volume to capacity ratio of any movement at a junction. **Figures 3.14** and **3.15** present the impact of the Scheme plus mitigation relative to the DM scenario in terms of the change in average junction delay (per pcu).

3.37 Select link analyses presenting the volume and routeing of traffic using the Relief Road as part of their journey during the morning peak at 2030 are contained in **Appendix E**, for the western, central and eastern sections of Scheme.

3.38 Finally, **Table 3.1** presents the effect the mitigation proposals will have on overall network hours as a proxy for gauging the impact on the economic benefit of the Scheme.

Table 3.1 – Relief Road DF5 Total Network Hours

Relief Road Model	Scenario	2032 AMP		2032 PMP	
		pcu-hrs	Diff pcu-hrs	pcu-hrs	Diff pcu-hrs
DF5	**DM**	58,629		55,857	
	DS (no mitigation)	57,718	-911	55,265	-592
	DS (plus mitigation)	57,339	-1,290	54,947	-910
	DS (plus mitigation but no Stanley Green)	57,753	-876	55,311	-546

3.39 The results presented in **Table 3.1** highlight that the proposed capacity enhancements to the A34/ Stanley Green junction provide significant economic benefits at peak times, and as such are integral to the Scheme and should be promoted as part of the Major scheme works package.

Figure 3.10 - 2032 Morning Peak Relief Road DF5 (Actual Flows): Do-Something (Impact of Mitigation Proposals)

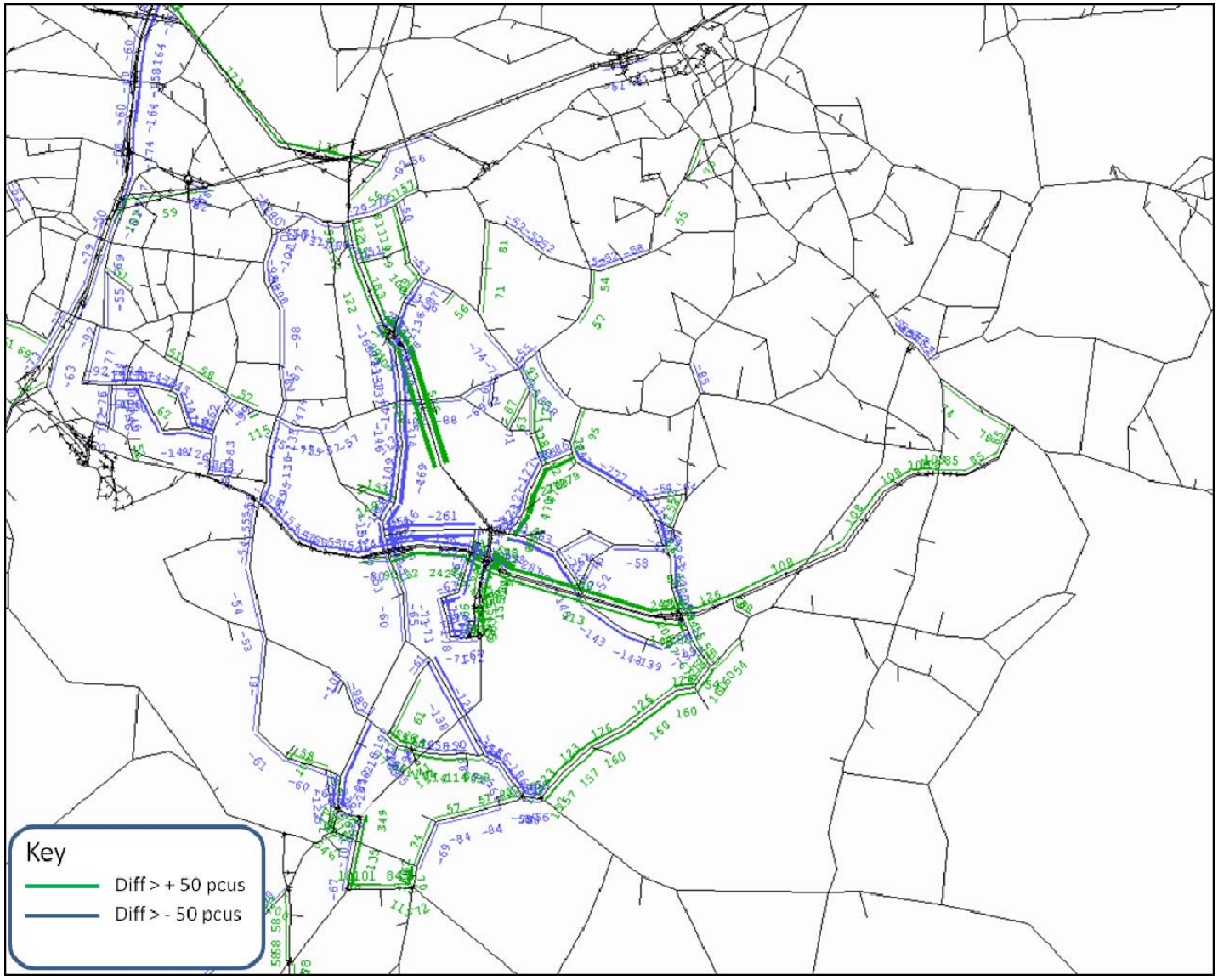


Figure 3.11 - 2032 Evening Peak Relief Road DF5 (Actual Flows): Do-Something (Impact of Mitigation Proposals)

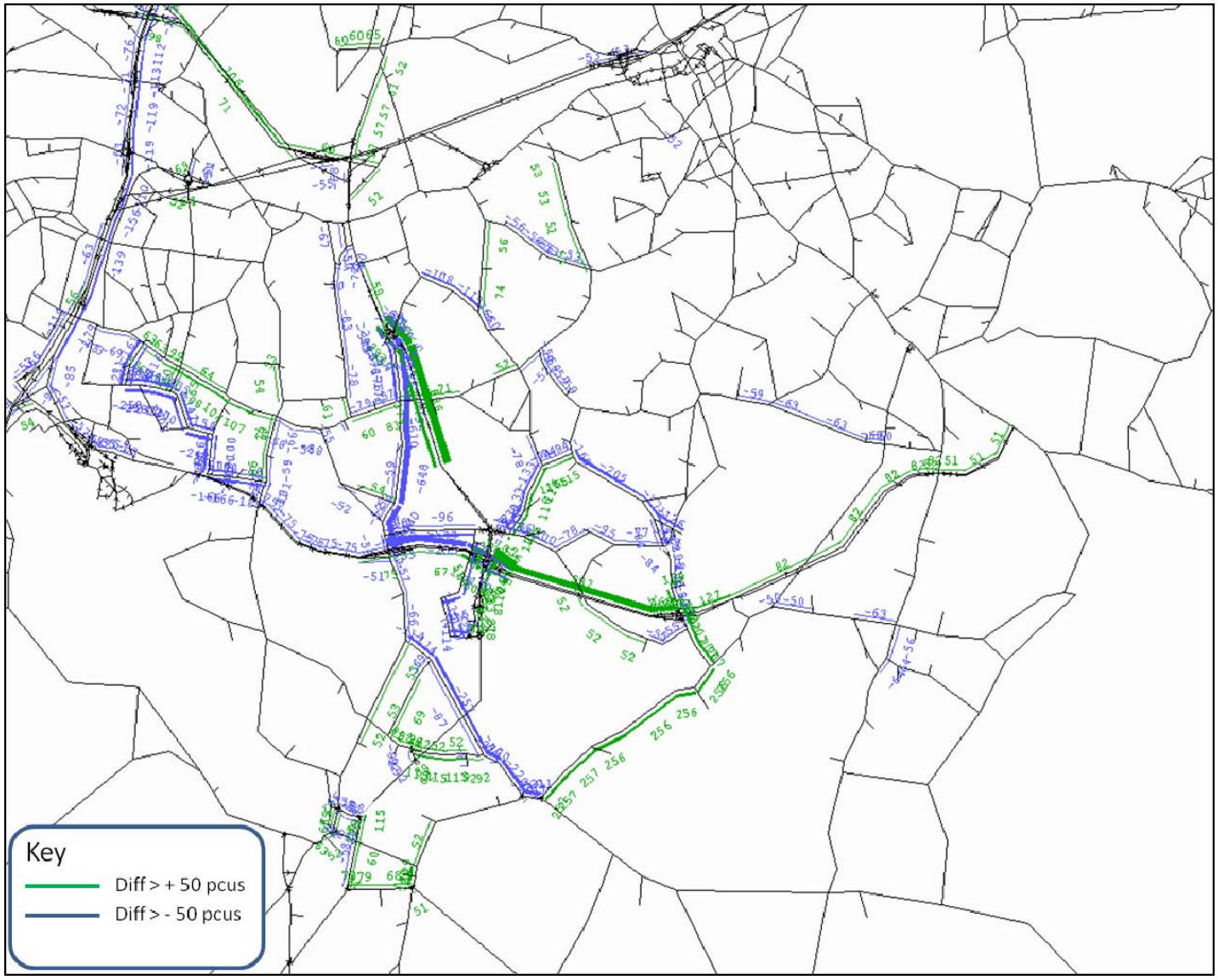


Figure 3.12 - 2032 Morning Peak Relief Road DF5 (Actual Flows): Do-Something (plus Mitigation) minus Do-Minimum

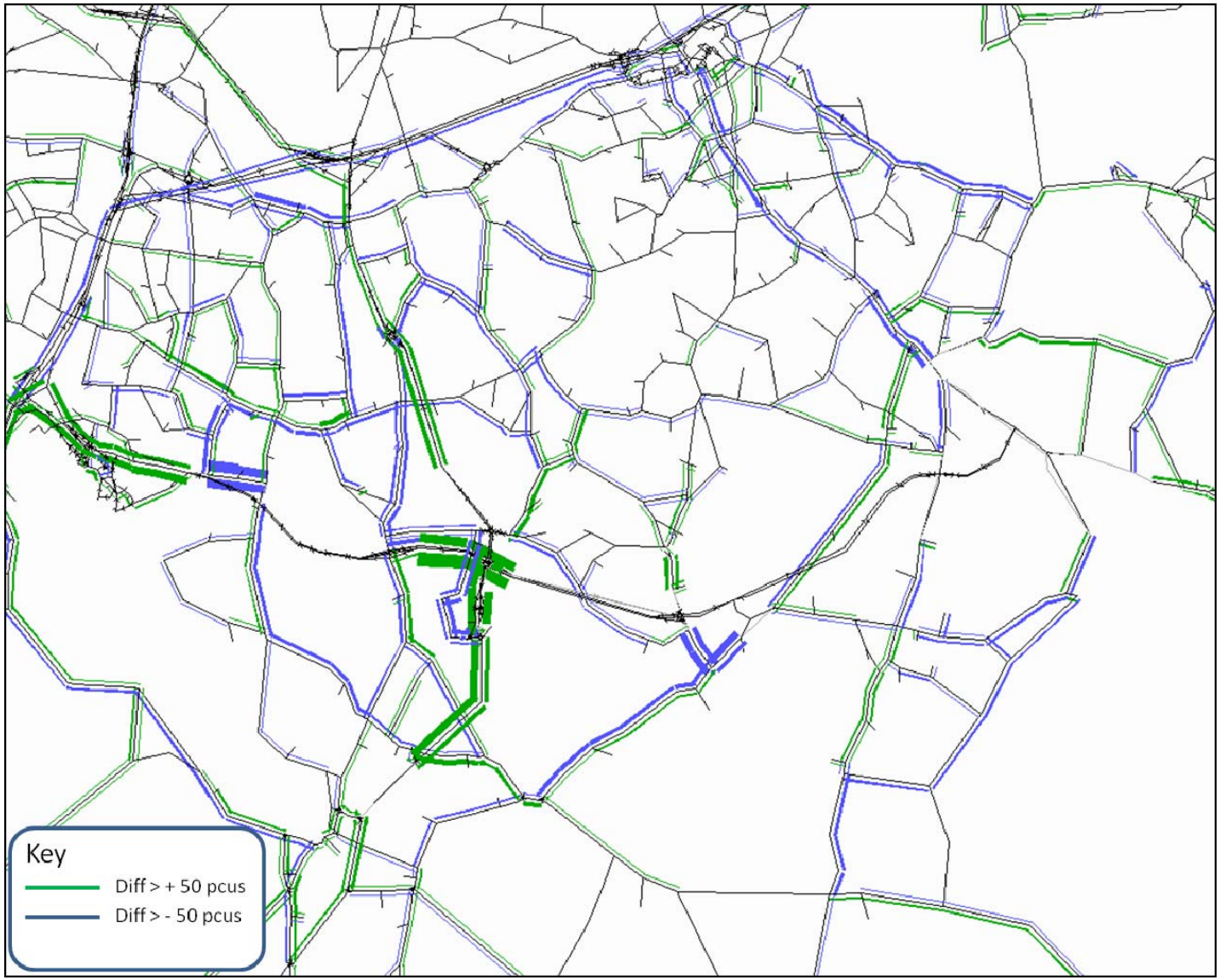


Figure 3.13 - 2032 Evening Peak Relief Road DF5 (Actual Flows): Do-Something (plus Mitigation) minus Do-Minimum

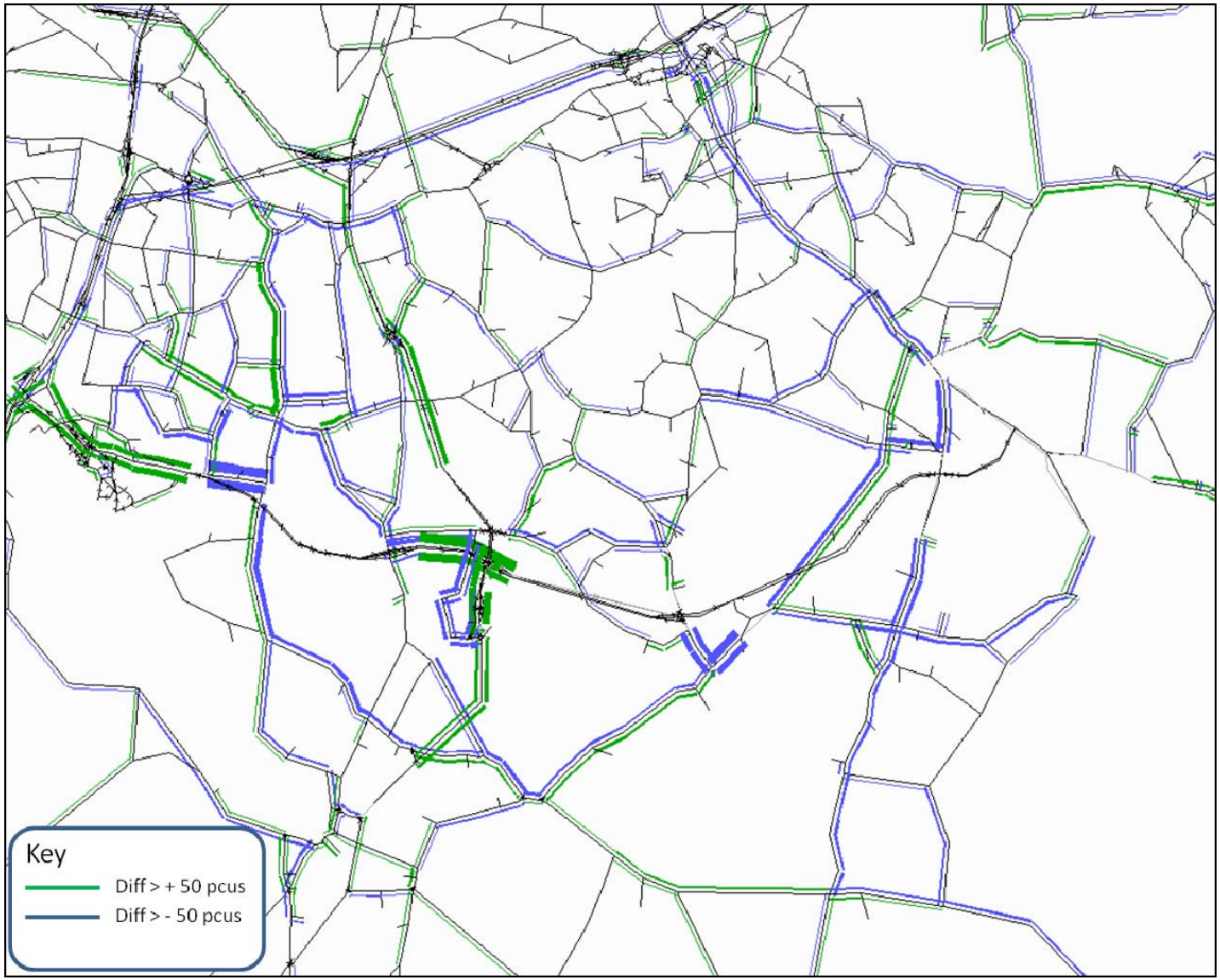


Figure 3.14 - 2032 Morning Peak Relief Road DF5 (Change in Average Junction Delay per PCU): Do-Something (plus Mitigation) minus Do-Minimum

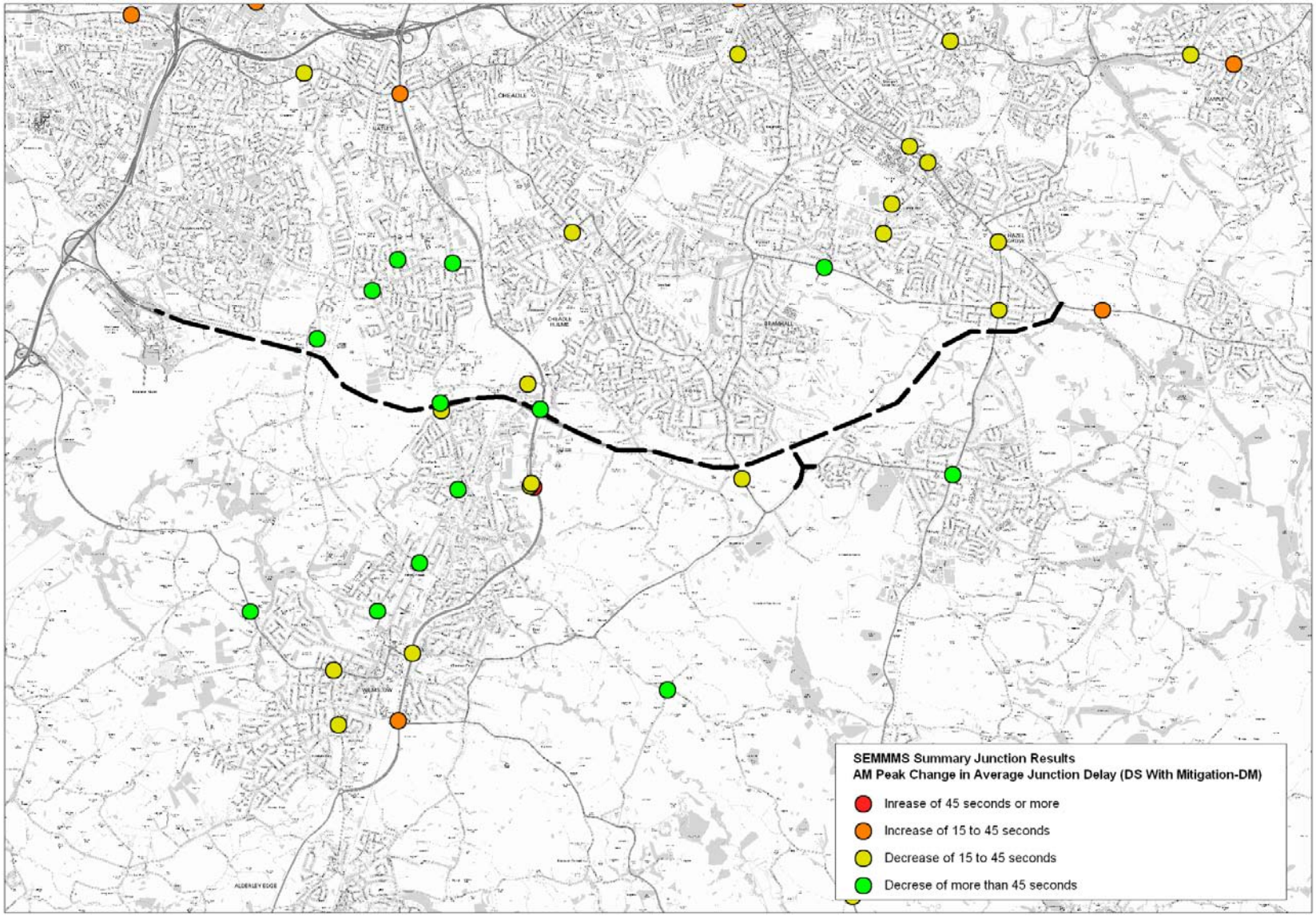
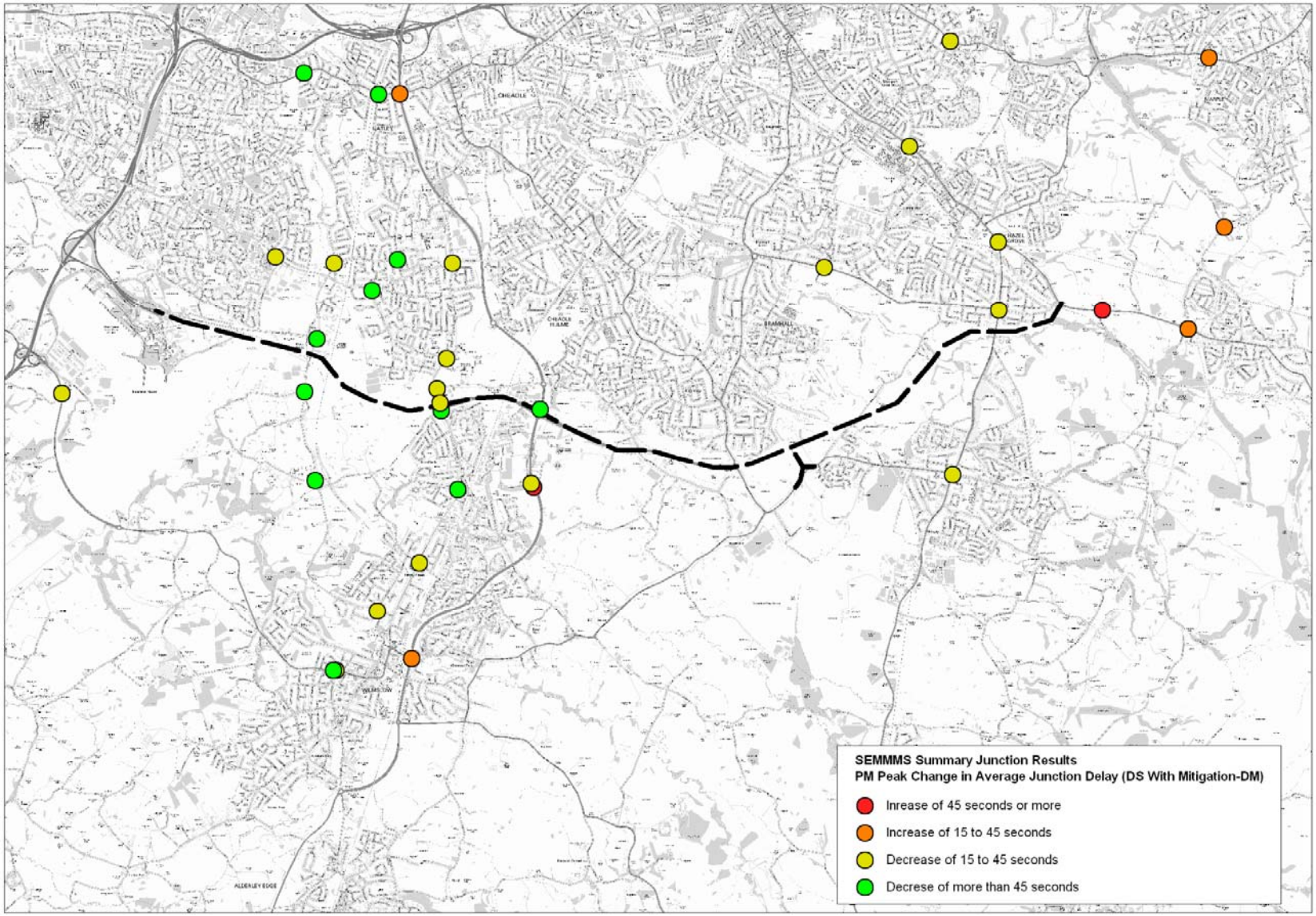


Figure 3.15 - 2032 Evening Peak Relief Road DF5 (Change in Average Junction Delay per PCU): Do-Something (plus mitigation) minus Do-Minimum



Scope for Complementary Measures

Public Transport Enhancement

3.40 The predominant impact of the Scheme is to reduce traffic across much of the adjacent area, providing a significant opportunity to enhance public transport infrastructure and services.

3.41 In terms of its impact on public transport, benefits afforded by the Scheme where traffic flow reductions are projected can be summarised as follows: -

- Increased reliability and efficiency of existing bus services on congested routes such as the A6 through Hazel Grove;
- Opportunities to provide sections of bus priority to further enhance bus services; and
- Opportunities to reassess phasing of signal junctions across the network to account for the changes in traffic flows.

3.42 At the small number of locations where traffic flows are projected to increase, resulting in the need to implement mitigation measures, there could be detrimental impacts on the operation and appeal of public transport. Where such instances occur, it will be necessary to design schemes in a manner that will minimise the effects on the operation of public transport. For example, traffic calming schemes will be designed with the views of bus operators in mind, and any junction signalisation schemes should consider the potential provision of bus priority where practical.

Interface with Existing Pedestrian / Cycle Network

3.43 As previously noted, the Scheme will include provision of a segregated pedestrian and cycle route adjacent to the new road and existing length of the A555, providing a new orbital link for the strategic cycle/pedestrian network. It is essential that this new orbital link is fully integrated with the existing local cycle and pedestrian network to maximise access to the new route and therefore maximise the benefits associated with the Scheme.

The Relief Road project team is currently developing proposals to connect the Scheme's pedestrian and cycle route with the existing local network to deliver an integrated and accessible new east-west link for pedestrians and cyclists. Details of these proposals will be provided following completion of a consultation exercise with CEC, MCC and SMBC.

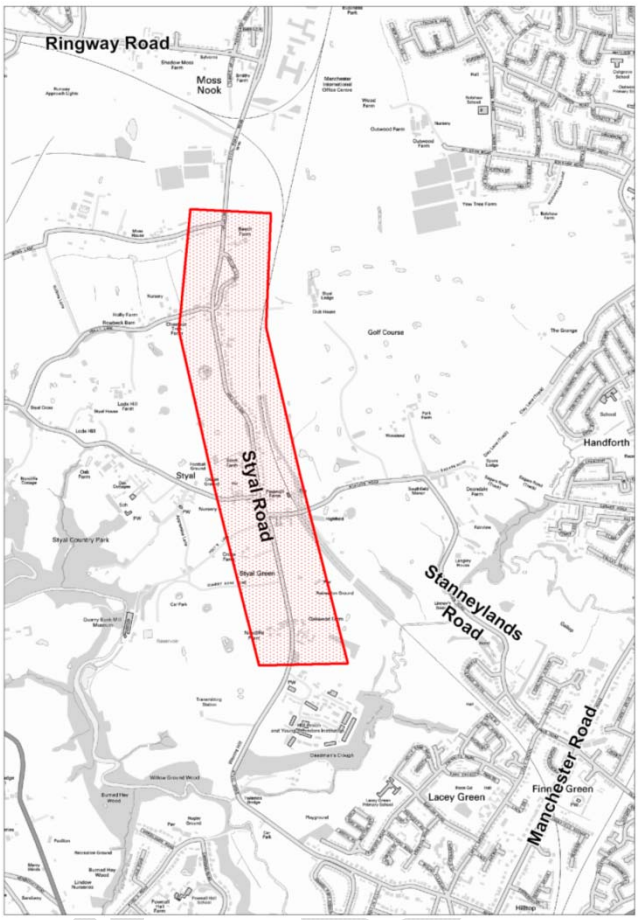
3.44 The provision of these new links to the existing network will be an important component of the package of complementary measures, providing a high-quality and direct east-west link and the step-change in provision of infrastructure for non-motorised modes required to encourage more people to choose cycling and walking as an alternative to the car.

Styal Road

3.45 On the basis of the Relief Road DF5 model output and further to consultation with CEC the Styal Road area of interest is shown **Figure 3.16** overleaf.

3.46 Styal Road currently provides a popular route to Manchester Airport from Handforth, Wilmslow and further afield. It is evident from the select link analyses presented in **Figures E.1** and **E.2** in **Appendix E** that these movements would continue to use Styal Road to access the Airport with the Scheme in place. Whilst it would be desirable in-principle to see this traffic using the A34, the scope and effectiveness of traffic calming along the length of Styal Road would be limited, particularly for local residents.

Figure 3.16 – Styal Road Area



In consultation with CEC it is considered that the most appropriate measure would be speed management treatment on Styal Road approaching the proposed junction with the Relief Road.

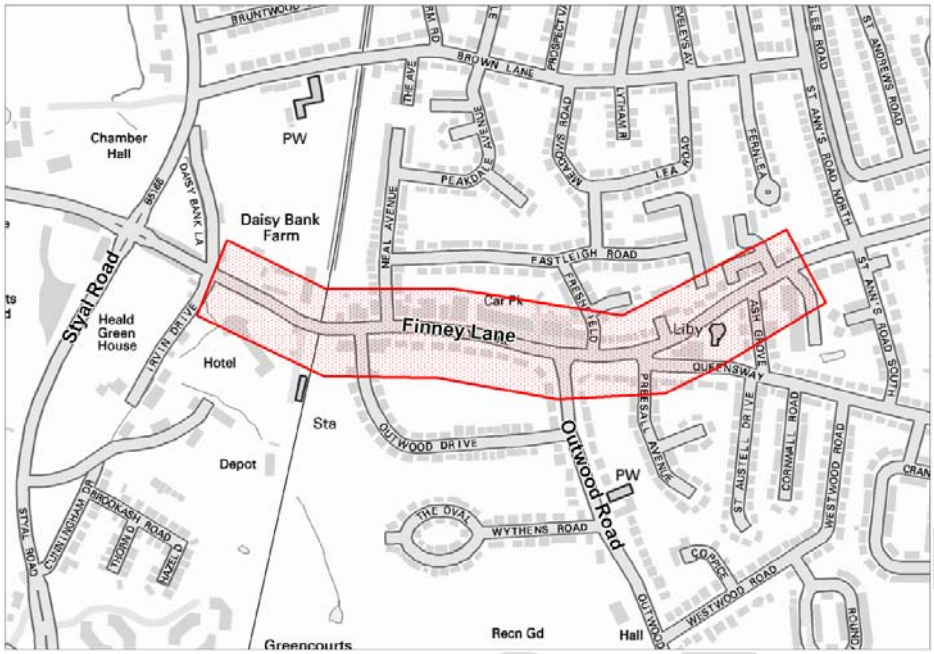
Traffic signage will play an important role in directing strategic traffic wishing to access the Airport to use the most appropriate routes through the area. For example, traffic from Macclesfield should be signed via Monks Heath and the Alderley Edge bypass to the A34. Currently the only signing is via Bonis Hall Lane.

Heald Green Area

3.47 On the basis of the Relief Road DF5 model output and further to consultation with SMBC the Heald Green area of interest is shown **Figure 3.17** overleaf.

3.48 Heald Green is a thriving Local Centre with a wide variety of retail outlets, shops and services and is therefore a focus for pedestrian activity. Due to its location and close proximity to the airport and motorway system, Heald Green shopping area serves the needs of the local Heald Green community as well as regular commuters who travel to and from Manchester Airport and Cheadle Royal Business and Retail Park. Finney Lane is predicted to experience significant reductions in traffic flow as a result of the Scheme.

Figure 3.17 – Heald Green Area



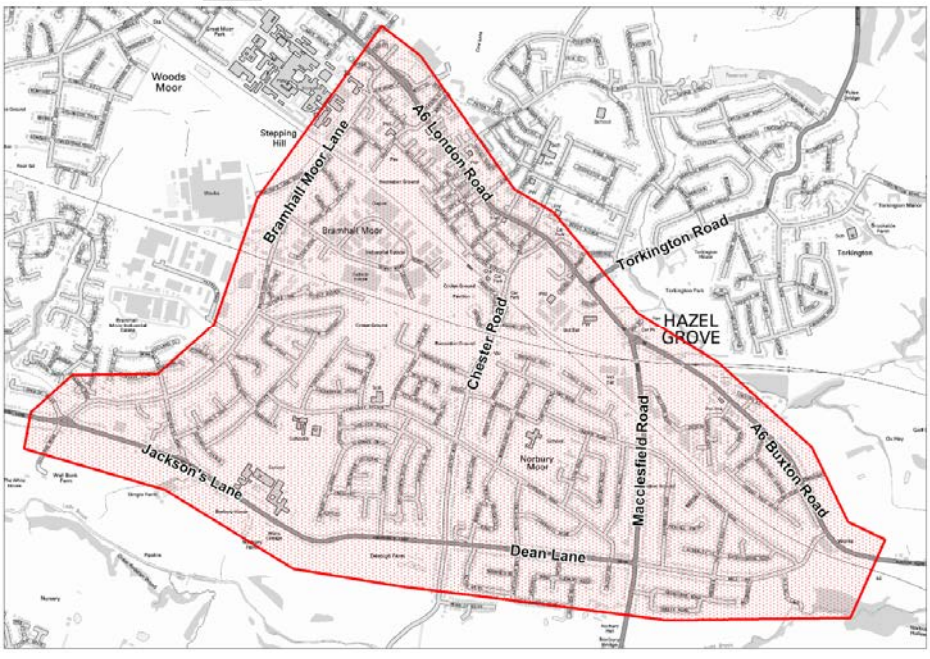
Notwithstanding recent public realm improvements, completion of the Scheme and the associated reduction in airport traffic flows will present an opportunity to afford greater priority to pedestrians by further enhancing pedestrian facilities/ environment in the District Centre.

3.49 The predominantly residential Outwood Road and Bolshaw Road would also experience significant reductions in traffic flow as traffic accessing the Airport re-routes to the Scheme. Both roads provide frontage access to primary schools and are located in traffic calmed 20mph zones.

Hazel Grove Area

3.50 On the basis of the Relief Road DF5 model output and further to consultation with SMBC the Hazel Grove area of interest is shown **Figure 3.18** below.

Figure 3.18 – Hazel Grove Area



3.51 The A6 through Hazel Grove currently carries high volumes of traffic, including a large proportion of HGVs and high frequency bus services. Significant traffic volumes and HGV use generates a number of problems including congestion, noise, severance, vibration, and poor air quality. All of these factors impact on the vitality of the District Centre.

3.52 Despite a high proportion of right-turning traffic at junctions along the A6, there is a lack of dedicated right-turning facilities for traffic due to the limited carriageway width available through the District Centre. As a consequence, through-traffic suffers significant delays as right-turning traffic blocks one of the two available lanes as it waits to turn right across a heavy flow of oncoming traffic.

3.53 Existing traffic levels and the width of available carriageway within the District Centre create further problems in respect of on-street parking and servicing/deliveries to the numerous retail and commercial properties that line the A6. Delivery vehicles frequently block one of the two available lanes for through traffic leading to delays not only during but also outside of peak periods. Parking restrictions prevent on-street parking through the District Centre, leading to a lack of parking overall for visitors to shops and properties.

3.54 TfGM, Stockport Council and Manchester City Council are proposing a Quality Partnership Scheme (QPS) along the A6 Corridor between Manchester, Stockport and Hazel Grove. The bus route is a key bus corridor in Greater Manchester, playing an important role in the local economy. The A6 corridor operates with the most frequent single bus service in Greater Manchester (the 192) and carries over 10 million passengers per year. The proposed QPS will ensure high standards of service for the passengers along this route and a commitment to the provision of quality infrastructure for bus operators. This includes bus lanes, upgraded bus stops and traffic management measures.

3.55 The Relief Road DF5 model predicts significant reductions in traffic flow along the A6 to the north of the junction with the A523 Macclesfield Road. Significant reductions in traffic flow through Hazel Grove District Centre present an opportunity to deliver highway and/or public realm improvements that benefit non-motorised and public transport users, right-turning traffic and visitors to shops and properties within the District Centre.

3.56 The A6 is predicted to experience significant reductions in traffic flow to the north of the new Relief Road junction. The A6 though Hazel Grove is currently made up of four relatively narrow lanes and carries a high proportion of heavy goods vehicles and buses. Frequent right-turning traffic significantly reduces capacity for through-traffic.

> The reduction in traffic through Hazel Grove presents the opportunity to reallocate road space in a more sustainable manner by for example, the introduction of bus lanes where space permits, and/ or by reducing the number of lanes to a single lane in each direction with a shared third lane for right-turning provision and pedestrian refuges.

3.57 The Relief Road DF5 model output forecasts do show increased traffic flow on Chester Road following completion of the Scheme. Interrogation of the model, however, shows that this increase is due to local reassignment effects which are a consequence of the beneficial reductions in traffic flows on the A6 through Hazel Grove following completion of the Scheme.

3.58 In the Do-Minimum scenario (without the Scheme), the A6 London Road/ Chester Road/ Grundey Street junction is predicted to be significantly overloaded with large junction delays in both the morning and evening peak periods under 2032 future year conditions. As a result a proportion of local traffic which would otherwise use this junction is predicted to switch to alternative routes such as the A523 Macclesfield Road and Bramhall Moor Lane junctions.

3.59 In contrast, in the Do-Something scenario (with the Scheme in place) the reduction in traffic on the A6 through Hazel Grove leads to reduced delays at the A6 London Road/ Chester Road/ Grundey Street junction that are sufficient to attract traffic back to Chester Road from these alternative routes. Therefore, despite a predicted increase in traffic flow on Chester Road, junction delays are predicted to be lower with the Scheme in place and for this reason mitigation is not considered to be necessary.

4. Environmental Mitigation Measures

4.1 The proposed scheme will affect local communities and the surrounding natural habitat. The environmental assessment is being undertaken in tandem with scheme design and will influence it to ensure any such effects are minimised and then more detailed mitigation strategies will be developed to minimise adverse impacts and seek to maximise any improvements to the environment. The following key principles will be adopted for the approach to mitigation:

- A 'nil detriment' approach will be adopted in relation to environmental impacts, such that the net impact of the scheme during construction and operation will be no worse than in the future year 'do-minimum' scenario;
- Negative impacts will be avoided where possible;
- Improvements to the environment will be carried out where such opportunities arise; and
- The road will be integrated, as far as practicable, within the existing landscape, and every attempt will be made to ensure that all created habitats are congruous within their landscape setting.

4.2 Specific mitigation principles for the key species and others (e.g. badgers, newts, bats, otters and breeding birds) and potential invertebrates will all be progressed in accordance with best practice, with specific mitigation measures (e.g. over-sizing of culverts and incorporation of animal passage shelves) incorporated into the engineering design as appropriate.

4.3 Impacts on the receiving human and physical environment will be mitigated by incorporating proposals to limit severance and loss of access (e.g. through the maintenance and replacement of public rights of way). The provision of exchange land for land taken by the preferred route will be a material consideration for areas of community land lost, and the identification of compensatory land will be conducted, with a specific need to maximise benefits/ minimise the detriment to individual business and agricultural holdings.

4.4 Where noise issues prevail, these will be mitigated through the use of appropriate road design and bunding, or landscaping features.

4.5 A detailed flood risk and drainage study is being undertaken and will influence the design of the scheme and potential mitigation measures.

4.6 Detailed mitigation strategies will be developed and incorporated into, and will inform, the detailed development of the preferred route as it progresses through the EA process. The key environmental issues, along with mitigation principles will be incorporated into a detailed environmental aspects register, which will form the basis for the preparation of a scheme specific environmental management plan, in accordance with ISO14001 and other best practice guidance.

5. Mitigation of Construction Impacts

5.1 Construction activities could create a number of impacts which would impact on the local environment and communities unless mitigated and managed, such as air quality, noise, vibration and dust. A construction code of practice is being developed in consultation with the relevant enforcement authorities and this will become part of the planning application and tender documentation.

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