Hastings Local Plan Transport Assessment and Mitigation Report

Prepared for
ESCC & HBC

May 2023

Jacobs U.K. Limited
2nd Floor, Cottons Centre
Cottons Lane
London, SE1 2QG, United Kingdom

Contents

Table(s)

Section Page

Figure(s)

Page

Document Issue

Revision History

Issue	Author	Date	Description
1	Chris Bryant	30/11/22	Draft for comment
2	Chris Bryant	23/03/23	Updated draft for comment
3	Chris Bryant	17/05/23	Final version

Technical Check

Role	Name	Signature	Date
Technical Lead	Steven Ward	Steven Ward	18/05/23

Approval

Role	Name	Signature	Date
Project Manager	James Glover	James Glover	18/05/23

ESH Approval

Role	Name	Signature	Date
Project Lead	Michelle Edser / Ian Moody	Michelle Edser / Ian Moody	18/05/23

Acronyms and Abbreviations

BRT	Bus Rapid Transit
BSIP	Bus Service Improvement Plan
B2C	Business-to consumer
C2X	Consumer-to-all-parties
CIHT	Chartered Institution of Highways & Transportation
CIL	Community Infrastructure Levy
DDRT	Digitally Demand Responsive Transport
DfT	Department for Transport
EAST	Early Assessment Sifting Tool
ESCC	East Sussex County Council
ESCWTM	East Sussex Countywide Transport Model / "Countywide Model"
EV	Electric Vehicle
FMR	Forecast Modelling Report
GPS	Global Positioning Satellite
HBC	Hastings Borough Council
HIF	Housing Infrastructure Fund
JTW	Journey to Work
LCWIP	Local Cycling and Walking Infrastructure Plans
LGF	Local Growth Fund
LGV	Light Goods Vehicle
LMVR	Local Model Validation Report
LP	Local Plan
LPA	Local Planning Authority
LSOA	Lower Super Output Area
LTA	Local Transport Authority
LTP	Local Transport Plan
MaaS	Mobility as a Service
MEH	Major Economic Hub
MRN	Major Road Network
MSOA	Middle Layer Super Output Area
NCN	National Cycle Network
NH	National Highways / Formerly HE - Highways England
NPPF	National Planning Policy Framework
PCT	Propensity to Cycle Tool
PCU	Passenger Car Units

PPG	Planning Policy Guidance
PRC	Practical Reserve Capacity
PT	Public Transport
RFC	Ratio to Flow Capacity
RIS	Road Investment Strategy
RTPI	Royal Town Planning Institute
SELEP	South East Local Enterprise Partnership
SHELAA	Strategic Housing and Economic Land Availability Assessment
SIP	Strategic Investment Plan
SOBC	Strategic Outline Business Case
SRN	Strategic Road Network
STA	Sustainable Transport Audit
STT	Sustainable Travel Town
TAG	Transport Assessment Guidance
TN	Transport Note
TfSE	Transport for the South East
TfWM	Transport for West Midlands
TRICS	Trip Rate Information Computer System
UCL	University College London
ZED	Zero Energy Development

1 Introduction

Hastings Borough Council (HBC) is preparing a new Local Plan as a framework for future development up to 2039 and is therefore undertaking evidence gathering and further engagement to help inform and shape the draft Plan ahead of Regulation 19 consultation, during 2023.

Widely recognised in through national and local policy, is the need for investment in transport infrastructure to meet current demand and, particularly by 'planning for people and places' through reducing the need to travel and enabling more walking, cycling, wheeling and use of public transport and the use of smart innovative transport solutions. The likely impacts of further growth will present additional transport challenges and opportunities across the borough and wider region, which will need assessment and appropriate mitigation as evidence of the acceptability and soundness of the Local Plan. Equally, the capacity of the existing transport network and the potential for it to change / expand will influence the quantum and location of additional growth that can be accommodated in the borough. This will be one factor influencing the extent to which Hastings is able to meet its objectively assessed needs, particularly for housing.

A SATURN based East Sussex Countywide Transport Model (ESCWTM / "Countywide model") has recently been developed to test transport schemes and appraise development impacts at a strategic level in East Sussex. The modelling approach and committed growth has been discussed and agreed with East Sussex County Council (ESCC), the Local Planning Authorities (LPAs) and with National Highways (NH).

The Countywide model provides a future year reference case which incorporates committed housing and economic growth alongside approved infrastructure in accordance with appraisal guidance. The reference case acts a basis with which to compare a modelled scenario incorporating forecast Local Plan growth to determine network impacts of travel demand as a result of the Local Plan, to facilitate closer links with the emerging Countywide LTP4 and to maximise sustainable and active travel opportunities.

Having completed Regulation 18 consultation, the Countywide model has been used to appraise and test the modelled transport network capacity and capability to enable delivery of the Local Plan. This technical work has been undertaken to understand the potential need for mitigation and to support the Regulation 19 evidence base.

This report sets out the outcomes of the ESCWTM analysis for Hastings in parallel with a local junction modelling appraisal of likely impacts and possible mitigations following Local Plan implementation. This technical work also highlights the need for assessment to move away from a traditional "predict and provide" approach on the highway network and that we utilise tools such as "decide and provide" and "monitor and manage" in order to maximise active and sustainable travel options.

2 General Approach

2.1 East Sussex Countywide Transport Model

The impacts of new development will extend beyond the local area and across boundaries into neighbouring districts. LPAs and county councils have a duty to cooperate with each other, and with other prescribed bodies, on strategic matters. This includes delivering effective infrastructure to support and mitigate the significant impacts of new development.

Application of the Countywide model enables the LPAs and ESCC to understand forecast impacts of the proposed Hastings Local Plan and for initial mitigation options to be developed to accommodate increased demand. Mitigation options will evolve further as the eventual preferred spatial strategies are finalised.

2.2 'Planning for People and Places'

The minimum expectation for any Local Plan is to mitigate the severe impacts of new development on the transport system, however, the wider policy agenda looks beyond this expectation and identifies the need to deliver a decarbonised, sustainable transport system and healthy, inclusive and high-quality places through the plan-making process. In September 2019, the Council declared a climate emergency and pledged to become carbon neutral by 2030. The Royal Town Planning Institute (RTPI)[1] has identified a framework (see Figure 2-1) to guide the role of spatial planning and achieve a decarbonised net-zero transport system.

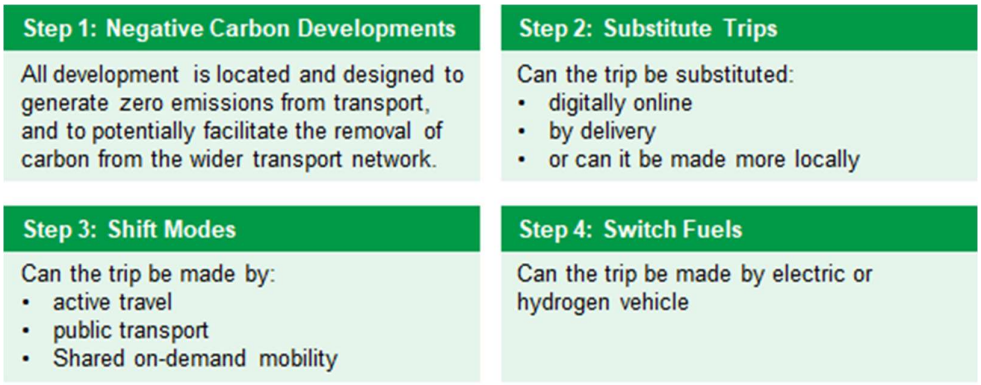


Figure 2-1 RTPI Sustainable Accessibility and Mobility Framework

This approach emphasises the need to move away from the traditional 'predict & provide' approach, where historic trends are used to forecast hypothetical futures to justify continual, and unsustainable provision of additional highway capacity, ultimately risking unconstrained levels of car-dependency. Wider industry guidance (TRICS[2] and CIHT[3]) is also pushing for a change, where a 'decide and provide' approach to actively choose preferred transport outcomes, is advocated. Transport for the South East (TfSE) applies this in their strategy to deliver sustainable growth and transport

[1] Net Zero Transport: the role of spatial planning and place-based solutions (RTPI 2021)

[2] Better planning, Better transport, Better places (CIHT 2019)

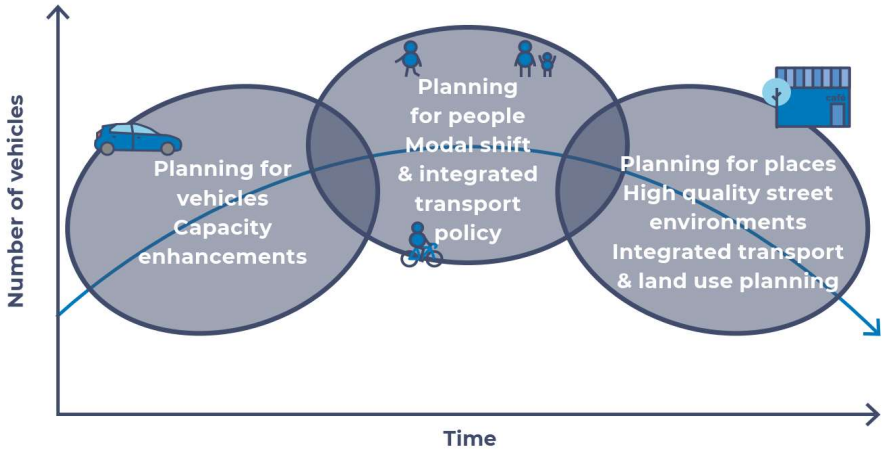
[3] Guidance Note on The Practical Implementation of The Decide & Provide Approach (TRICS 2021)

solutions up to 2050[4] in the South East region. This TfSE approach provides a relevant blueprint to cascade down to the county and borough level to start planning a preferred outcome for the new Hastings Local Plan, alongside the emerging East Sussex Local Transport Plan 4.

TfSE has initially adopted a traditional forecast demand modelling approach to understand how and where the transport network is likely to be constrained. However, rather than immediately applying car-based capacity solutions, the strategy advocates investment in public transport alternatives, integrated land use planning, demand management and embracing emerging technologies to solve problems in the future.

The approach follows three stages of evolution in transport planning policy perspectives (see Table 2-1), developed by Professor Peter Jones – UCL, to help guide transport and land use policy. The stages demonstrate how moving away from 'planning for vehicles' (predict and provide) to 'planning for people and places' (decide and provide) can reduce car use over time and deliver high quality places and environments for people to live.

Table 2-1 Evolution of Transport Planning policy (source: TfSE Transport Strategy for the South East)



Stage 1: **Planning for Vehicles**	TfSE recognise that the region is still largely in this first stage and, in the short term at least, targeted highway-based schemes will still be needed to address congestion 'hotspots' and also provide complementary measures for bus and active modes.
Stage 2: **Planning for People**	Focuses on the needs of different transport users, including pedestrians, cyclists, public transport passengers, people with reduced mobility, freight operators and car, van and powered two-wheeler drivers. Understanding these needs and encouraging modal shift to more sustainable transport modes could manage future demand and minimise adverse impacts on society and the environment.
Stage 3: **Planning for Places**	Promotes the integration of transport and land use that both encourage sustainable travel choices and also reduce the need and/or distance for travel.

The framework and initiatives for 'planning for people and places', by delivering well-planned, sustainable places for people to live and work, are already evident at a policy and physical level in the region. However, there is emphasis that more will need to be done, and at a faster rate, to put people and places at the heart of the transport system. The new Hastings Local Plan presents an opportunity to proactively plan development and transport in response to changing socio-economic, environmental and

[4] Transport Strategy for the South East (TfSE 2019)

technological futures and link more closely with the emerging East Sussex Local Transport Plan 4.

3 Hastings Context

3.1 Hastings Draft New Local Plan 2019 – 2039

The new Hastings Local Plan will plan and manage growth, regeneration and development in the borough up to 2039. The Council is testing a potential growth distribution based on their research of land supply and development potential, which provides an indication of the scale and distribution of residential developments and commercial floorspace. Tested sites (Figure 3-1) represent origins and destinations for potential new growth in traffic movements over and above the growth arising from committed developments, which is already captured in the forecast figures. It should be noted that the tested sites include only those with dwellings greater than 50 or employment area greater than 200m2 and may be subject to change.

Appendix A presents the full list of sites.

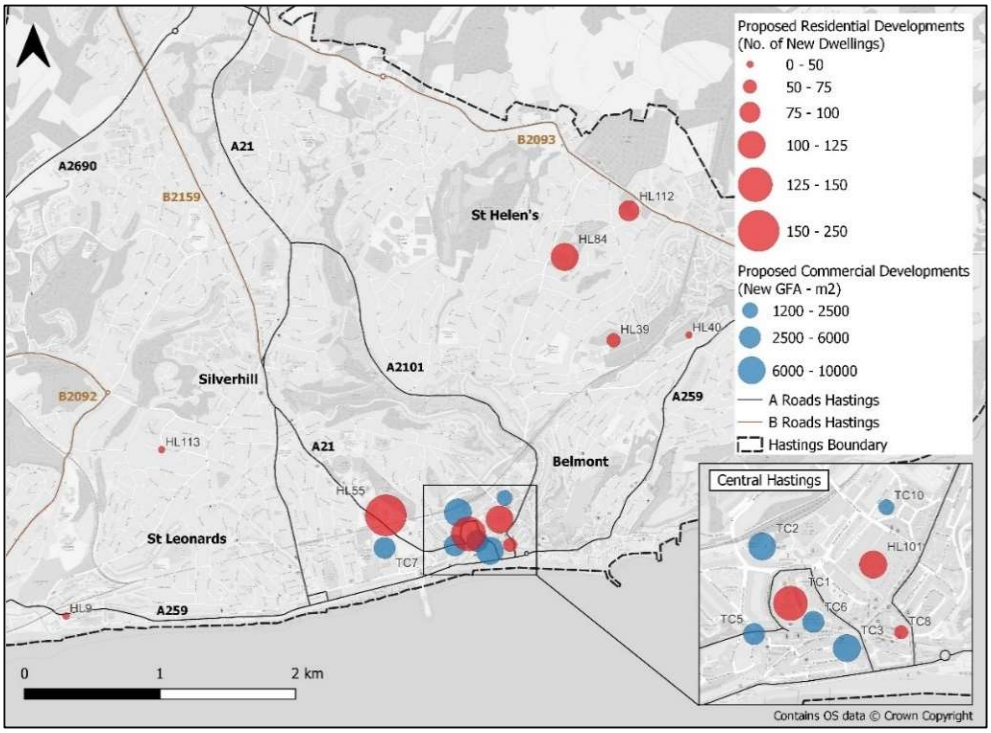


Figure 3-1 Tested sites

3.2 Vision and Objectives

In 2019, HBC declared a 'Climate Emergency' in the borough and pledged to become carbon net zero and fully climate resilient 2030. The Council's Draft New Local Plan Early Engagement[5] and adopted Climate Change Strategy (2022)[6] set out a vision, key priorities and transport themes that the new Local Plan will need to respond to and support the delivery of a Climate Emergency Action Plan (see Table 3-1).

[5] HBC Draft New Local Plan Early Engagement

[6] Climate Emergency Strategy 2020 – 2030

Table 3-1 Vision, Priorities & Key Transport Themes

Climate Change Strategy 2022
• Make Hastings carbon neutral by 2030 • Take advantage of new powers as they are made available to us by the central government • Work towards supplying 30% of the town's electricity by 2030 • Update the low carbon and renewable energy policies as part of the Local Plan review to deliver energy-efficient new developments and renewable energy projects • Update the Councils sustainable procurement policy to take account of climate change • Work with partners to increase the EV infrastructure in the town • Reduce the Councils and towns reliance on single-use plastics • Maintain Council land to maximise species diversity and mitigate species extinction • Incorporate an evaluation of climate change implications in all reports to council committees • Appoint a lead councillor 'Climate Change Champion' • Work with partners to help to deliver the climate change emergency commitments
New Local Plan Early Engagement Document Priorities
• Achieve and sustain a thriving economy and create new job opportunities • Improve public health and wellbeing • Protect and celebrate the town's natural and historic environment • Deliver homes that people can access and want in well-designed neighbourhoods • Address climate change and meet our zero carbon ambitions
Key Transport Themes[7]
• Deliver infrastructure supporting development growth, economic connectivity and the prioritisation of pedestrian movement • Bus service infrastructure and development that supports the delivery of services including enhanced routes linked to key growth areas • Measures that minimise car parking will be supported in areas of high public transport accessibility • Existing coach parking and coach drop-off points will be protected. • Enhancements that support increased rail capacity and high-speed services to London (inc improvements to the Marshlink Line) • Supporting station improvements that enable better integration with bus, cycle and pedestrian networks • Supporting new cycle and walking infrastructure • Support development along key transport corridors • Supporting permanent and temporary park-and-ride, park-and-stride, cycle/scooter hire, and other sustainable transport solutions

3.3 Wider Policy Context

The development of the Local Plan transport evidence base and the mitigation requirement will also need to respond to wider policy objectives and guidance. Table 3-2 summarises key national, regional and local transport policy guidance relevant to plan-making.

[7] Hastings Local Plan Consultation Draft, Strategic Policy 8: Transport Infrastructure https://hastings.oc2.uk/document/177/29408#d29427

Table 3-2 Wider transport policy and guidance

National Policy
The National Planning Policy Framework (NPPF) (Department for Communities and Local Government, 2021)
The NPPF sets out the government's planning policies for England and requires all plans to promote a sustainable pattern of development and be genuinely plan-led. It advises that transport issues should be considered from the earliest stages of plan-making so that potential impacts on transport networks can be addressed; so that opportunities for existing or proposed transport infrastructure, including charging technology and usage are realised, so that opportunities to promote walking, cycling and public transport are identified and pursued; so that the environmental impacts are identified, assessed and taken into account; and so that patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places. It advises that significant growth should be focused on locations which are or can be made accessible, through limiting the need to travel and offering a genuine choice of transport modes. It requires planning policies to be prepared with the active involvement of local highways authorities, other transport infrastructure providers and operators and neighbouring councils, so that strategies and investments for supporting sustainable transport and development patterns are aligned. In December 2022, the government published a consultation on proposed changes to the National Planning Policy Framework as a part of the Levelling Up and Regeneration Bill[8]. The consultation closed on the 2nd of March 2023, and proposed changes due to be adopted in Spring 2023.
National Planning Policy Guidance (NPPG) (Department for Communities and Local Government, 2021)
The PPG provides further plan-making guidance on preparing a transport evidence base, including recommending assessment at initial evidence stage, options testing and as preparation of the final submission.
DfT Circular 01/2022: The Strategic Road Network and the Delivery of Sustainable Development (2022) & The Strategic Road Network Planning for the future - A guide to working with Highways England on planning matters (2015)
National Highways (NH) has been, and will continue to be, engaged throughout the development of the emerging Local Plan evidence base. Circular 01/2022 sets out that National Highways will: • engage with the planning system • fulfil its remit to be a delivery partner for sustainable economic growth whilst maintaining, managing and operating a safe and efficient strategic road network It addresses the requirements for roadside facilities, including heavy goods vehicles (HGVs) driver services and new provisions for zero emissions vehicles.
Bus Back Better: National bus strategy for England (DfT, 2021)
The strategy provides a long-term commitment to funding and delivering more frequent, reliable and easier to use bus services to significantly increase passenger numbers and reduce congestion, carbon and pollution. The vision is for fully integrated and inclusive services, multi-modal ticketing, increased bus priority, reliable real-time information and turn-up-and-go frequencies. Funding is recognised as a key challenge, and the strategy provides support to Local Transport Authorities (LTAs) to access franchising powers. It also places an expectation on LTAs to commit to establishing, more flexible, Enhanced Partnerships across their entire areas and publish a Bus Service Improvement Plan (BSIP) to access continued central funding and support. The Local Plan will need to reflect the BSIP and integrate new housing and employment with enhanced public transport services and infrastructure delivery.
Gear Change: A bold vision for cycling and walking (DfT, 2020)
The Government has set out a vision for a step-change in cycling and walking, to double uptake over the next decade, and transform their role in the transport system where "Places will be truly walkable… Cycling and walking will be the natural first choice for many journeys with half of all journeys in towns and cities being cycled or walked by 2030." Cycling and walking needs to be placed at the heart of the decision-making and Local Plan-making process to deliver healthier, greener and safer environments with convenient access to travel.
Regional Policy

[8] https://www.gov.uk/government/consultations/levelling-up-and-regeneration-bill-reforms-to-national-planning-policy

Transport for the South East (TfSE) Transport Strategies (2020-22)

The TfSE transport strategy aims to support their vision for a net-zero carbon South East by 2050. The strategy sets out the different priorities underpinning the strategy for the environment and economy. Key themes of the strategy include promoting active travel and healthier lifestyles; reducing the impact of, and the need to travel; an affordable, accessible transport network; and a digitally smart transport network.

In Hastings, the strategy acknowledges the A21/Hastings Line (Hastings – Sevenoaks) as a strategic South East Radial Corridor. The strategy sets out that both the road and railway serving the A21/Hastings Main Line Corridor deliver poor connectivity to the Hastings area. The A21 is the least developed SRN road in the South East area and runs as a single carriageway for most of the route south of Pembury in Kent. Rail journeys from London to Hastings are typically 75% longer than from London to Brighton, even though the distances covered by these services are similar. This undermines the potential for this corridor to support regeneration and economic development in 'left behind towns' such as those in the Hastings area.

The strategy also identifies that the Ashford to Hastings railway line needs an increase in capacity, delivered by investing in rolling stock, track, junctions, signalling, and platforms.

TfSE Draft Strategic Investment Plan (SIP, 2022)

TfSE consulted on their draft SIP in mid-2022 and have prepared a revised draft in response to the consultation and input from local authorities across the region, government, Network Rail, National Highways and other key stakeholders. TfSE is currently seeking the approval of each of its constituent authorities on the revised draft SIP by March 2023 ahead of final approval by the TfSE Board and then submission to DfT. The draft revised SIP builds on the transport strategies, discussed above, and a wider evidence base to provide an emerging framework for investment in strategic multi-modal transport infrastructure, services and regulatory interventions up to 2050. The plan is seen as an enabler of future economic growth across different sectors and is intended to present a compelling case for government and private investors that a £45bn capital investment over 27 years (£1.5bn per year) could deliver the following by 2050 across four regional packages:

- 21,000 additional new jobs
- additional £4bn GVA per annum
- 1.4 mega tonnes reduction in equivalent CO_2 emitted
- 500,000 more rail trips each weekday
- 4 million fewer car trips each weekday
- 1.5 million more trips by bus, mass transit and ferry each weekday

Hastings is covered principally by the Kent, Medway and East Sussex package of interventions with a capital investment of £19.4bn needed up to 2050. TfSE recognises that funding the SIP will be the principal financial challenge and, at this stage, schemes have been prioritised into short-, medium- and longer-term delivery timescales with high level advice around the expected next steps to develop the business case and feasibility with key delivery partners.

Interventions regarding Hastings:

- Hastings/Bexhill Mass Rapid Transit
- High Speed 1 / Marsh Link - Hastings, Bexhill and Eastbourne Upgrade
- Faversham - Canterbury - Ashford - Hastings National Cycle Network Enhancements key local strategic cycle route scheme
- Royal Tunbridge Wells – Hastings National Cycle Network Enhancements
- Hastings and Bexhill Distributor Roads

South East Local Enterprise Partnership's (SELEP) Strategic Economic Plan (2014)

SELEP has identified the potential to provide investment opportunities on or close to the A21 for commercial, leisure and housing land uses. In Hastings, these include commercial developments at North Queensway. To enable new growth, SELEP are seeking investment in the Queensway Gateway Road, and a number of improvements to junctions and capacity improvements in Hastings and Bexhill.

Local Policy

ESCC Local Transport Plan 3 (LTP3) (2011-2026)

The East Sussex LTP3 sets out the county's vision and objectives and the strategy from 2011 to 2026. The LTP3 sets out ten transport specific objectives including congestion reduction, connectivity improvement, increasing the uptake of sustainable and active modes, reducing greenhouse gas emissions and air and noise pollution from transport.

Hastings is identified within LTP3 as a priority area to facilitate housing growth and to create sustainable communities through implementing local improvements to the strategic road network.

Emerging - East Sussex Local Transport Plan 4 (LTP4)

The ESCC Local Transport Plan is currently being reviewed. This commenced in 2022 and an early consultation with key stakeholders and the public has identified some emerging themes which the plan will focus on. These include:

OUR PEOPLE

- Accessibility, equity and social inclusion
- Safety, health and air quality
- Community and sense of place

OUR ENVIRONMENT

- Climate change and its impacts
- Our local environment and biodiversity

OUR GROWTH

- Sustainable economic growth
- Innovation through technology

A vison led approach underpins the review of the plan enabling a move towards planning for 'people and places. Further engagement with key stakeholders will be undertaken to develop a draft preferred transport strategy, which will be available for public consultation in autumn 2023. There will be integration between the local transport plan and the local plan through both policies and transport measures.

East Sussex Bus Service Improvement Plan (BSIP) (ESCC, 2021)

In line with the expectations of the Bus Back Better: National bus strategy for England, ESCC have prepared a BSIP. A key target of the BSIP is to initially reverse the decline in bus patronage and then grow it significantly in future years. This will be delivered by quality improvements, including bus priority schemes to improve reliability and punctuality, simplified and reduced fares and improved services in rural areas.

East Sussex's Local Cycling & Walking Infrastructure Plan: Let's get cycling and walking (ESCC, 2021)

The LCWIP sets out a proposed network of cycling and walking routes and measures in specific areas of the County. Importantly this will sit alongside the County Council's wider plans to improve mobility and transport over the next ten years and to deliver healthier, safer and more accessible new housing and employment through Local Plans. The LCWIP places people at its centre and focuses on understanding their needs and the places they want to get to by delivering an ambitious network of additional cycling and walking routes and measures to integrate with existing cycling and walking infrastructure.

Hastings Corporate Plan 2020-24 (HBC, 2020)

The Corporate Plan provides the strategic direction for the Council. It includes Priority Objectives and specific actions around themes including the Climate Emergency, increasing housing delivery and the supply of affordable homes throughout the Borough, and development of the local economy to lift the average indexed wage.

Hastings Borough Council Climate Emergency Strategy 2020 (HBC, 2020)

HBC declared a Climate Emergency in 2019 with the target of being carbon neutral by 2030. The Strategy sets out the Council's vision to reduce the impact on the environment and meeting this target through priorities around partnerships, energy, transport and environmental impact.

3.4 Area Profile

3.4.1 Local Geography

Hastings is a large urban seaside town and borough in the east of East Sussex, bordering the district of Rother (see Figure 3-2 for context and journey to work patterns with neighbouring areas). Hastings has a population of 92,554 (2020)[9]. On average, Hastings' estimated population age profile shows a younger population than East

9 East Sussex in Figures (accessed 10/2022)

Sussex with 61% aged between 16 and 64 (compared to 57% in East Sussex). Similarly, 21% of the population are estimated to be aged above 65, whereas 26% is estimated for the whole of East Sussex.

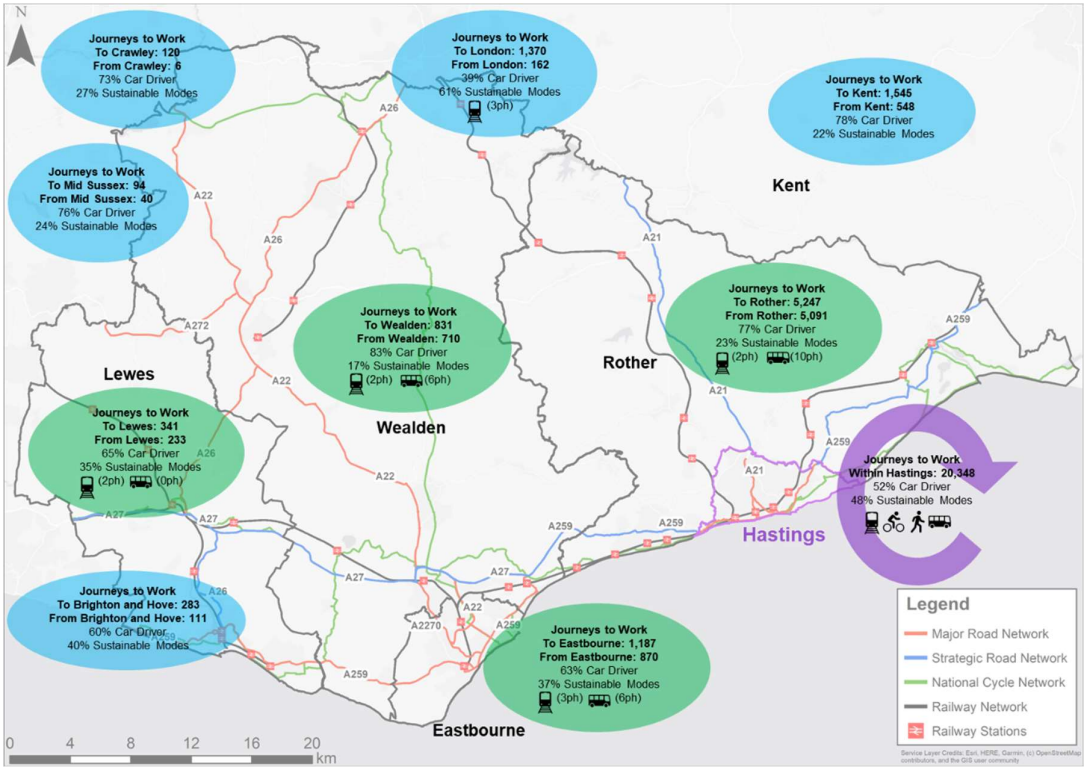


Figure 3-2 Hastings context and journeys to work patterns with neighbouring areas (Census 2011)

The average private vehicle mode share for all journey to work trips to and from Hastings is 68% (Census 2011). There are strong employment links with neighbouring Rother, Wealden, Eastbourne and Kent, accounting for 27% of all journeys to work. Over 72% of these journeys are made by car, indicating a relatively high dependency on car travel for daily commuting.

Of the people that live in Hastings, 75% also work in Hastings, this is the highest of all districts and boroughs in East Sussex. 19% travel to Rother with relatively low number travelling to Eastbourne, Lewes and Wealden. This provides the opportunity to support a greater level of active travel for short local journeys.

Only 38% of people that work in Hastings travel in from outside the borough; there are high rail mode shares from Eastbourne, Lewes and London reflecting the good train links to these places

Generally, the proportion of travel made by sustainable modes within Hastings borough is around 48% and the highest in comparison to neighbouring districts, where 45% of journeys are made by sustainable modes in Lewes, 31% in Wealden, 38% in Rother and 47% in Eastbourne.

Notably however, public transport use for internal journeys within Hastings is 10% and higher than the corresponding journeys made within Eastbourne (9%), Lewes (8%), Wealden (3%), Rother (3%).

3.4.2 Transport Connectivity

Road

The A27/A259 corridor (except within Hastings Borough boundary) forms part of the Strategic Road Network (SRN), managed by National Highways, and is the main east-west road link along the coast connecting the borough to the ports of Folkestone and Dover to the east and Newhaven to the west, running through the centre of Hastings. The A21 north of Baldslow also forms part of the SRN and provides the main north-south road link from Hastings to Tunbridge Wells and London. The A259 and A21 in Hastings borough boundary are part of the Major Road Network and are managed by the County Council. Several key junctions and roads on these corridors within Hastings are either reaching, or at capacity, with congestion and delay during peak hours.

Bus

Stagecoach is the main bus operator in the borough and an overview of key services connecting with neighbouring authorities, is summarised in Table 3-3. There are regular services between the coastal towns of Eastbourne, Bexhill and Rye.

Table 3-3 Key bus routes and frequency (Source: cartogold-ESCC – 10/2022)

Route Number	Destinations	Typical Hourly Frequency
2	Ashford - Hastings	1
20	Ore - Hollington	3
21/21A	St Helens - Hastings	4
22	Ore – Harley Shute	2
26/26A	Hastings – Conquest Hospital	6
29	Hastings – Northiam – Tenterden	6 services daily (Mon to Sat)
98/98A	Eastbourne - Hastings	2
99	Eastbourne - Hastings	3
100	Conquest Hospital – Rye	1
101	Conquest Hospital – Rye	1
304	Hastings – Battle	6 services daily (Mon to Sat)
305	Hawkhurst – Hastings	6 services daily (Mon to Sat)

Figure 3-3 shows the bus routes across Hastings and Bexhill.

Figure 3-3 Hastings and Bexhill Bus Network Map (source: Stagecoach)

Rail

Hastings borough contains four railway stations, Hastings, St Leonards Warrior Square, West St Leonards (managed by Southeastern), and Ore (managed by Southern rail).

The Hastings railway station is located on the Hastings Line to Tonbridge and East Coastway Line to Eastbourne (along with West St Leonards and St Leonards Warrior Square), and the Marshlink line to Ashford International (along with Ore).

The key direct rail services operating from key railway stations within Hastings are shown in Table 3-4.

The Hastings line is electrified but has a limited power supply south of Tunbridge Wells. However, the line is at its effective passenger capacity, and it is challenging to

add more 12 carriage trains without significant investment in the power supply. Services and journey times from Hastings to London and Kent along the south coast are considered slow and constrained by sections of singletrack and level-crossings on the Marshlink line. All services on the Marshlink line use diesel trains.

Table 3-4 Key direct rail routes, journey times and frequency

Origin	Destination	Average Journey Time	Typical Hourly Frequency
Ore	Ashford International	41 mins	1
	Hastings	3 mins	2
	Eastbourne	40 mins	2
	Gatwick	1 hr 40 mins	1
	London Victoria	2 hrs 15 mins	1
Hastings	Ashford International	44 mins	1
	Brighton	1 hr 20 mins	1
	Eastbourne	30 mins	3
	Gatwick	1 hr 38 mins	1
	London Charing Cross	1 hr 44 mins	2
	London Victoria	2 hrs 15 mins	1
	Tonbridge	52 mins	2

Active Travel

ESCC Local Cycling & Walking Infrastructure Plan - Sustrans (2018)[10] evidence base document sets out that Hastings is in a strong position to develop a high-quality cycling and walking network across the town, where the borough has strong policy in place to support delivery of schemes, as well as support from active local groups. Moreover, new housing and commercial development, which is coming forward across the borough hold the potential to provide high quality offroad links, and improvement works to their highway network.

This report also sets out the various barriers across the borough:

- A lack of dedicated cycling and walking routes to key destinations across the town, including schools, employment centres, and local amenities.
- High levels of traffic, travelling at 30mph, within residential areas across the town.
- Severance caused by major road in the town, due to a lack of dedicated crossing facilities.
- Low levels of service for pedestrians across the town, cause by poor quality footways and crossings.
- Significant gradients on connections from Hastings town centre to the north, east and west of the town.

10 https://consultation.eastsussex.gov.uk/economy-transport-environment/escc-lcwip-2020/supporting_documents/Appendix%205H%20%20Sustrans%20LCWIP%20Report%20Hastings%20Final%20Part%201.pdf

Hastings includes National Cycle Network (NCN) Route 2 running east-west along the coast. The majority of NCN in Hastings is off-road, apart from route through and around the Old Town to the Hastings Country Park Nature Reserve.

Outside of the NCN, there is cycle provisions across the Borough and intermittent sections of cycle trails or roads considered 'cycle friendly'. The LCWIP places an emphasis on supporting access by walk and cycle to local services and supporting wider projects that aid regeneration, growth in housing and employment and supporting the visitor economy.

Cycle parking is provided at key locations in the borough including Hastings Railway Station (75 spaces), West St Leonards (5 sheltered stands), St Leonards Warrior Square (6 stands), and only 2 stands available at Ore Railway Station. CCTV coverage is available at the Hastings, West St Leonards and Ore Railway Stations.

The East Sussex Pedal Power Scheme, eligible to anyone living within East Sussex, is operated by Active Cycling Projects Ltd on behalf of ESCC. This scheme allows individuals to rent a bicycle or e-bike for a chosen length of time with the option to return the bike or buy it outright at the end of the loan period. This scheme aims to make cycling more accessible and targets employers and employees across all districts in East Sussex.

Electric Vehicle Infrastructure

In Hastings, there are only 7 publicly accessible Electric Vehicle (EV) charging sites registered on Zap Map website, with 18 charging points in total. The EV charging points are shown in Figure 3-4 with a combination of rapid, fast or slow charging.

Typical locations for public charging points across Hastings include Public Parking sites (such as the Marina, Carlisle Parade, Pelham Place Car Parks), petrol service stations, and superstores (Morrisons and Tesco). Other locations for vehicle charging in Hastings can also be found at locations often restricted to staff / visitors / customers only. An EV strategy will be needed to provide publicly accessible points, meet anticipated demand and also encourage uptake.

ESCC are starting to prepare an EV strategy for the county and will engage with the Council to address the specific requirements in the borough and meet the demands of existing residents as well as supporting the delivery of new development through the Local Plan, including EV ready homes and on-street infrastructure.

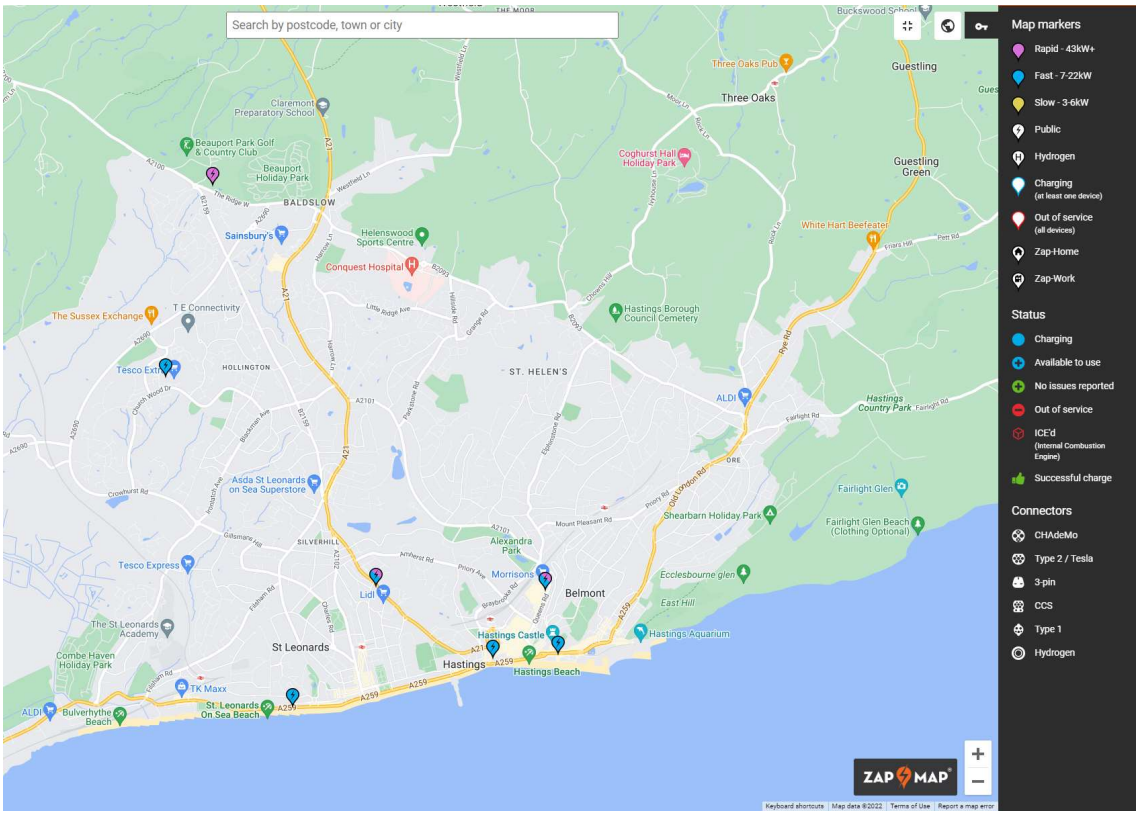


Figure 3-4 Current Hastings EV charging locations (Source: ZapMap – 10/2022)

3.5 Issues and Challenges

With varying and limited levels of public transport, active and sustainable travel accessibility across the borough, some of the key transport challenges in and around the borough include:

- The Council has committed to being carbon neutral by 2030
- A high proportion of commuting by car leading to congestion on the network
- Improvements to the bus infrastructure, journey time reliability and service frequencies to employment locations and key services are needed to make bus a more attractive mode choice in the borough
- Investment and improvements to existing rail services and journey times
- Lack of readily accessible EV charging infrastructure to meet existing and anticipated demand
- Bicycle theft and impact on encouraging active travel

4 Transport Scheme Pipeline

4.1 Overview

In advance of identifying new mitigation options, there are a range of schemes and initiatives already in the pipeline across Hastings borough and the wider area, which also need to be considered. Information is also provided at the end of this section of potential other schemes, which are either highlighted in the emerging draft TfSE SIP or being considered by HBC / ESCC in a parallel study. The following reports/studies have been used, alongside engagement with key stakeholders, to obtain the details of schemes that are already known about:

The Hastings Planning Strategy (2014)
Bexhill – Highways Capacity Assessment Report (Peter Davidson Consultancy Ltd – 2018)
A259 Junction Analysis (Peter Davidson Consultancy Ltd – 2019)
Infrastructure Delivery Plan (HBC – 2014)
Bus Service Improvement Plan – Infrastructure Statement (ESCC – 2021)
Local Cycling and Walking Infrastructure Plans (LCWIP) (ESCC – 2021)
TfSE - South Central Radial & Outer Orbital Area Studies (TfSE – due 2022)
TfSE – Draft Strategic Infrastructure Plan (2022)

4.2 List of Schemes

A long list of transport schemes has been identified with the Council and ESCC. These have been categorised by the 'level of certainty', mode of transport and body responsible for delivery in Table 4-1. Appendix B includes a more detailed summary of each scheme.

Table 4-1 Hastings Borough Council Pipeline Schemes and Status

Ref	Scheme name	Mode(s)	Delivery Lead
Committed (near certain / more than likely)			
1	Queensway Gateway Road	Highway	Highways
2	Bexhill Road bus priority measures (part of the BHLR complementary measures) – • Phase 2 - bus lane extension (w/b) to Glyne Gap roundabout • Phase 3 - bus lane (e/b) on approach to Filsham Road signalised junction/bus lane (w/b) on approach to Harley Shute Rd	Bus	ESCC
3	£2 Bus Fares Bus Passes / Subsidies	Bus	ESCC
4	Travel Plans		ESCC/HBC
5	Countywide 'Pedal Power' Electric Bicycles Promotion	Cycling	ESCC
6	Car Parking assessment and rationalisation	Highway	ESCC
7	Bus Service Improvement Plan Including: • East Sussex Enhanced Partnership • Bus Priority • Bus Service Support • Fares Support	Bus	ESCC

Ref	Scheme name	Mode(s)	Delivery Lead
	• Other Infrastructure • Enforcement • Marketing & Promotion		
Planned (reasonably likely)			
8	ESCC Local Cycling & Walking Infrastructure Plan schemes	Cycle and Walking	ESCC
Concept (uncertain)			
9	Hastings Bus Based Mass Transit	Bus	ESCC/TfSE
10	Hastings - Bexhill Rapid transit	Bus	ESCC/TfSE
11	A259 / Marshlink Level Crossings	Highway / Rail	Network Rail / NH / ESCC
12	Marshlink High speed services Partial	Rail	Network Rail
13	High Speed 1/Marshlink' Hastings, Bexhill & Eastbourne upgrade	Rail	Network Rail
14	Hydrogen Bus Programme	Bus	Metrobus / BHCC / ESCC
15	East Sussex Interurban Bus	Bus	ESCC/TfSE
16	Countywide mass transit	Bus	ESCC/TfSE
17	A21 Pembury – Hastings Safety enhancements (RIS2 scheme)	Highway	NH
18	A259 level crossing removal – east of Rye (Star and Guldeford level crossings)	Rail/Highway	NR
19	A21 Kippings Cross – Lamberhurst – dualling and Flimwell and Hurst Green Bypasses	Highway	NH
20	Hastings and Bexhill distributor roads	Highway	NH
21	Faversham – Canterbury – Ashford – Hastings – NCN enhancement	Cycling	Sustrans
22	East Sussex Local Cycleways	Cycling	ESCC
23	East Sussex Inter urban cycle ways	Cycling	ESCC
24	Tunbridge Wells - Hastings NCN enhancement	Cycling	Sustrans

4.3 LCWIP

The East Sussex Local Cycling & Walking Infrastructure Plan (LCWIP) sets out a plan for proposed cycling and walking networks and measures within specific areas of the county and received Member approval at the County Council's Cabinet meeting on 30th September 2021. It is focussed on areas where there are the greatest opportunities to increase levels of cycling and walking, with an emphasis on delivering infrastructure improvements which will support housing and those people who currently do not cycle or walk. The LCWIP walking and cycling proposals for the borough are shown in Figure 4-1 and Figure 4-2 with further details of the schemes in Appendix C.

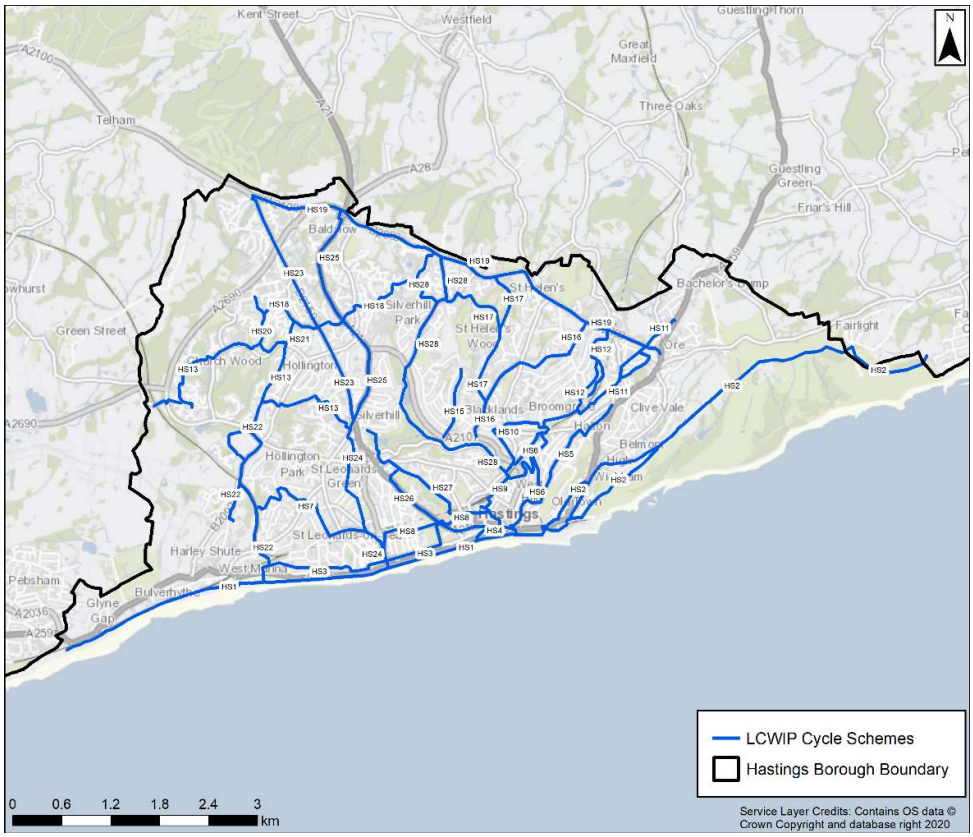


Figure 4-1 Hastings LCWIP Cycling Schemes

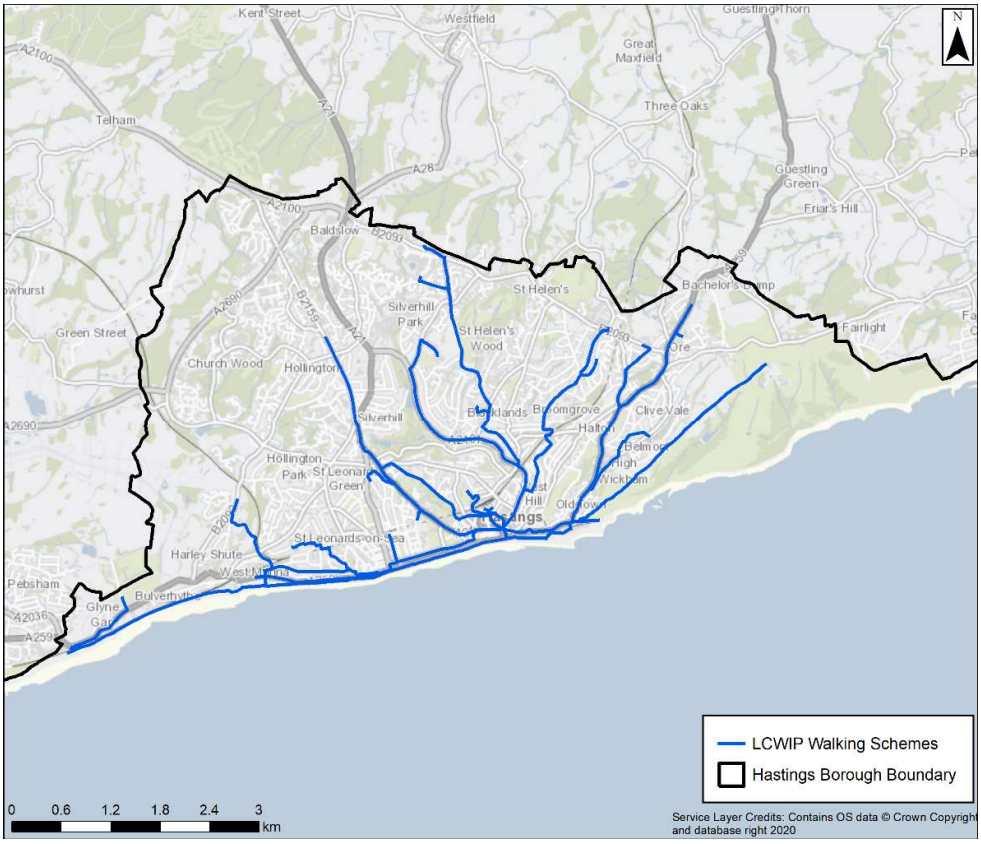


Figure 4-2 Hastings LCWIP Walking Schemes

It should be noted that the proposed cycling and walking network for Hastings indicates the potential alignment of a route or measure, with an emphasis on demonstrating how they can connect people with the places they may travel for everyday journeys. They do not contain detailed proposals.

4.4 Other Potential Schemes

4.4.1 TfSE Draft Strategic Investment Plan (SIP)

TfSE consulted on their draft SIP in mid-2022 and have prepared a revised final draft in response to the consultation and input from local authorities across the region, government, Network Rail, National Highways and other key stakeholders. TfSE are seeking their constituent authorities approval of the final draft SIP by March 2023 ahead of final sign off by the TfSE Board and submission to Government. The draft SIP builds on a suite of TfSE transport strategies and a wider evidence base to provide an emerging framework for investment in strategic multi-modal transport infrastructure, services and regulatory interventions up to 2050.

Hastings is covered principally by the proposed Kent, Medway and East Sussex package of interventions. This package identifies the need for a capital investment of £19.4bn up to 2050 and includes High Speed rail, mass transit, active modes and highway improvements. The potential schemes are at various levels of certainty, which overlap with the existing wider scheme pipeline, set out earlier in this section, and TfSE recognises that securing funding will be the principal financial challenge. Acknowledging that the draft SIP is subject to review, following the 2022 consultation, Figure 4-3 and Table 4-2 provide an illustrated summary of the locations and approximate funding timescales of the key schemes identified in the proposed Kent, Medway and East Sussex package of interventions that concern Hastings. Further engagement with TfSE and key partner bodies, including government and private investors, will be required to establish how these schemes will come forward within the Local Plan period.

Table 4-2 Scheme summary TfSE draft SIP Kent, Medway and East Sussex package (TfSE, 2022[11])

Ref	Scheme name	Timescale	Status > Next Step(s)	Promoter
W5	Ashford - Hastings National Cycle Network Enhancements	Short	Pre-SOBC > Feasibility	ESCC / KCC
W9 / W10	East Sussex Local and Inter-Urban Cycleways	Short	Pre-SOBC > Feasibility	ESCC
W11	Royal Tunbridge Wells - Hastings National Cycle Network Enhancements	Short	Pre-SOBC > Feasibility	ESCC
G7	Hastings / Bexhill Mass Rapid Transit	Medium	Pre-SOBC > Feasibility	ESCC
T2	High Speed 1 / Marsh Link - Hastings, Bexhill and Eastbourne Upgrade	Medium	SOBC > OBC	Network Rail
X4	A21 Safety Enhancements	Short	Pre-SOBC > Feasibility	National Highways
X25	A259 Level Crossing Removals – east of Rye	Medium	Pre-SOBC > Feasibility	National Highways
X27	Hastings and Bexhill Distributor Roads	Medium	Pre-SOBC > Feasibility	ESCC

11 TfSE (2022) – Draft Strategic Investment Plan Appendix A

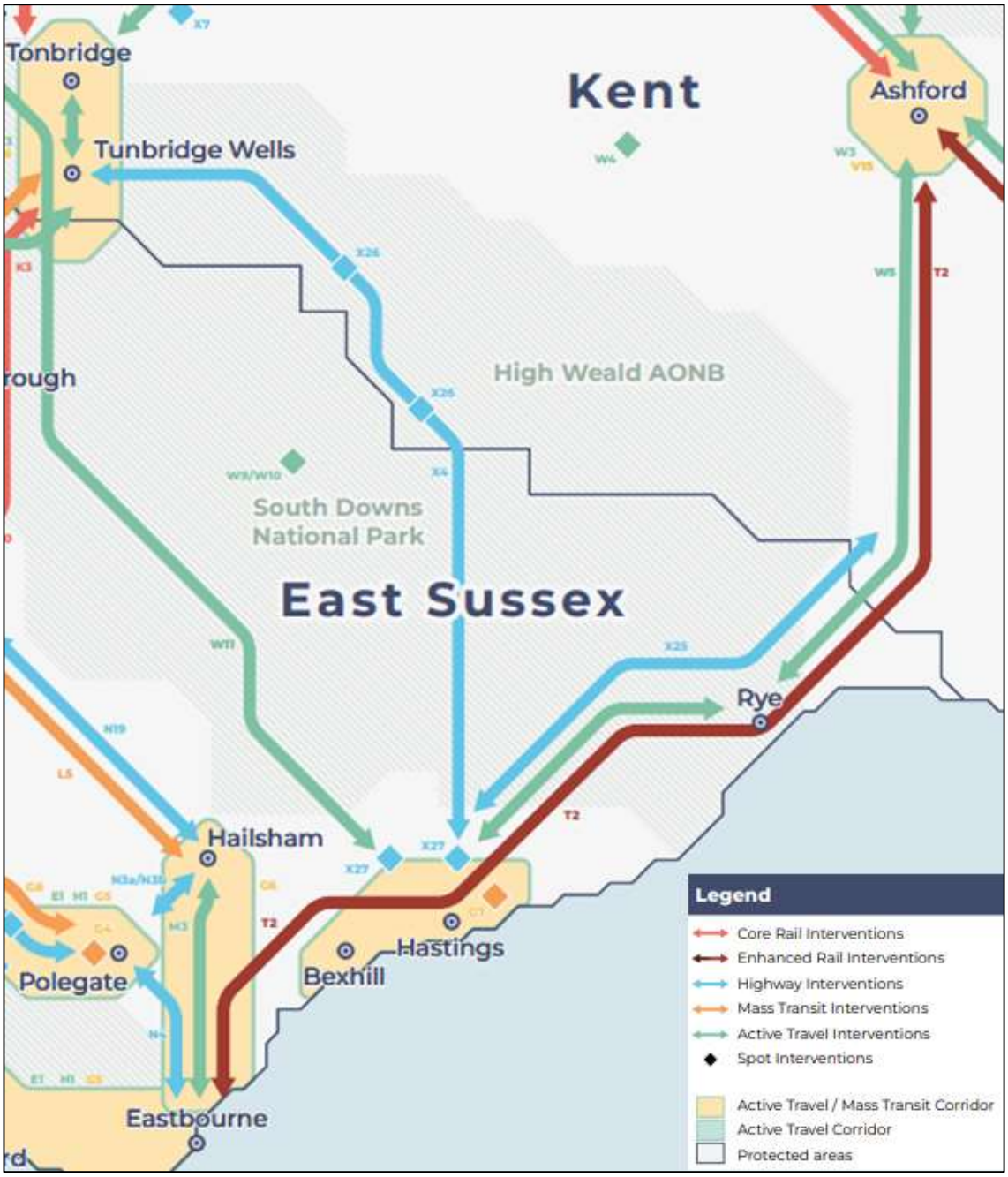


Figure 4-3 Map extract of TfSE draft SIP Kent, Medway and East Sussex package (TfSE, 2022[12])

12 TfSE (2022) – Draft Strategic Investment Plan

5 Forecast Modelling

5.1 ESCWTM Overview

The East Sussex Countywide Transport Model (ESCTWM) was the basis for assessing the transport impacts of the proposed HBC Local Plan developments. The ESCTWM was developed in spring 2022 with a number of applications in mind, in particular, the assessment of Local Plan impacts. The highway model was built using SATURN strategic modelling software in line with the Department for Transport (DfT) Transport Assessment Guidance (TAG) and is focussed on the area contained within the East Sussex County Boundary.

The development of the model's base year is described in the Local Model Validation Report (LMVR) (East Sussex Highways, April 2022), which forms part of the evidence base for the modelling methodology. The LMVR has been reviewed by National Highways (NH) who have confirmed their acceptance of the base model for Local Plan assessments in East Sussex.

5.2 Modelling Methodology

To assess the transport impacts of the proposed Local Plan development sites, a Reference Case scenario was created from the ESCWTM 2019 base model with traffic levels grown to the 2039 forecast year. The Reference Case included all committed development and committed highway schemes between 2019 and 2039 within Hastings borough[13].

The above-mentioned Reference Case scenario was recreated, but with the Local Plan development sites added. 16 of the proposed development sites were explicitly included whilst smaller sites (five) were included as part of the background growth rate. Windfall sites were also included in background growth. The scenario thus created is designated as the 'Do Something' scenario. This scenario was then quantitatively compared with the 'Reference Case' to isolate the predicted impacts of the Local Plan development sites. The locations of the proposed new Local Plan development sites (with dwellings >50 or employment area >200m2) are shown in Figure 3-1 in the section above.

5.3 Key Junction Impacts

Through consultation with HBC, a set of model output plots have been produced to help identify the impacts of the Do Something forecast scenarios as compared to the Do Minimum. Some of these outputs are presented in section 5 of the Forecast Modelling Report (FMR) (East Sussex Highways, October 2022) and include the following metrics:

- Flow difference (Reference Case against Do Something)
- Link volume/capacity ratio
- Node volume/capacity ratio
- Delay difference (Reference Case against Do Something)

[13] Hasting Local Plan Forecast Modelling Report, Jacobs. October 2022

- Average queue difference (Reference Case against Do Something)

These outputs have been used to understand which areas of the network are likely to be impacted most by the traffic generated by the Local Plan sites. Each of the outputs were analysed and professional judgement was applied in order to determine which junctions would require further examination. This analysis became the basis by which 9 key junctions were identified and would be further assessed in junction models to determine whether they would require measures to mitigate the impacts:

- J1 - B2093 The Ridge/Harrow Lane junction
- J2 - A2159/Blackman Avenue/Ashbrook Road
- J3 - A21/ Old Harrow Road mini roundabout
- J4 - A21/Harrow Lane mini roundabout
- J5 - A259/Harley Shute Road
- J6 - A259/Filsham Road
- J7 - The Ridge / Hillside Road
- J8 - The Ridge /Grange Road
- J9 - A21/ A28 Westfield Lane

After consultation with ESCC, the following 5 additional junctions were added to the list:

- J10 - Gillman's Hill/ Harley Shute Road roundabout
- J11 - Priory Avenue/ Braybrooke Road
- J12 - Glyne Gap roundabout
- J13 - A269 Dorset Road/A259
- J14 – A21/Queensway Road

Detailed reference case junction modelling results for these 14 junctions can be found in Section 7.

6 Sustainable Transport

6.1 The Case for Mitigation

The Countywide modelling indicates that the level of travel demand from committed development in the 2039 reference case, could be significant with parts of the network constrained in the future if car dependency is left unchecked. Analysis and network review suggest that parts of the network already suffer from delays in terms of existing junction capacity and available land within the highway boundary to provide additional capacity. Interventions are needed to encourage both entrenched and future car use to utilise other more sustainable modes. ESCC's LTP4 will review scheme prioritisation across the County and key stakeholders will need to work together to address these challenges.

An initial review of the likely scale and type of interventions needed to encourage modal shift and reduce predicted levels of car use on the network has been undertaken. These interventions would need to be developed into a comprehensive sustainable mitigation strategy to confirm what is deliverable and how it could support sustainable growth through the Local Plan.

To pursue this growth distribution, a phased approach would be likely to be needed across the plan period, moving from an enhanced 'business as usual' scenario in the short term towards more 'ambitious' scenarios towards the end of the Plan, transforming travel behaviour and responding to new and emerging technologies. Similarly, the study growth distribution is being assessed against forecast traffic patterns some 15+ years in the future, and uncertainties around external drivers of travel behaviour, such as net-zero carbon, technological changes, fuel prices, new ways of working and global events, emphasises the need for a proportionate and flexible approach to delivering specific measures.

This section provides an initial framework of evidence, opportunities and challenges facing the potential development option tested in this study to outline the potential for modal shift and sustainable transport options in Hastings. Potential impacts of the delivery of sustainable transport measures have not been explicitly considered in the operational modelling assessment. Inputs to the operational modelling come directly from the Countywide model forecasts.

6.2 Wider Evidence

The mapping of future travel behaviour trends is subject to levels of uncertainty with different socio-economic, environmental and technological drivers. The following sections explore the wider evidence of where future sustainable scenarios have been assessed and where initiatives have worked in practice, which could be applied in Hastings.

6.2.1 TfSE Sustainable Routes to Growth

TfSE[14] have tested distinct scenarios around the drivers of travel behaviour change to arrive at a preferred 'Sustainable Route to Growth', combining economic aspirations with the positive aspects of 'sustainable' and 'digital' futures, including:

14 Transport Strategy for the South East – Scenario Forecasting Summary Report (Steers 2019)

- Investment in sustainable transport to support cross-regional travel
- Targeted investment in orbital coastal strategic corridors (especially rail)
- Fast adoption of digital technology
- Demand management policies

TfSE looks beyond the 2039 Hastings Local Plan period and up to 2050. It provides an appropriate projection of the impacts of wider strategy interventions in the region, which could be translated into potential modal shift at a local level. Figure 6-1 illustrates TfSE's expected reductions in forecast car use (-9%), and corresponding increases in sustainable modes for their preferred 'Sustainable Route to Growth'. As part of their scenario testing, TfSE have also explored a potential 'Sustainable Future', where a more ambitious reduction in car use (-15%) might be achievable through a greater focus on demand management.

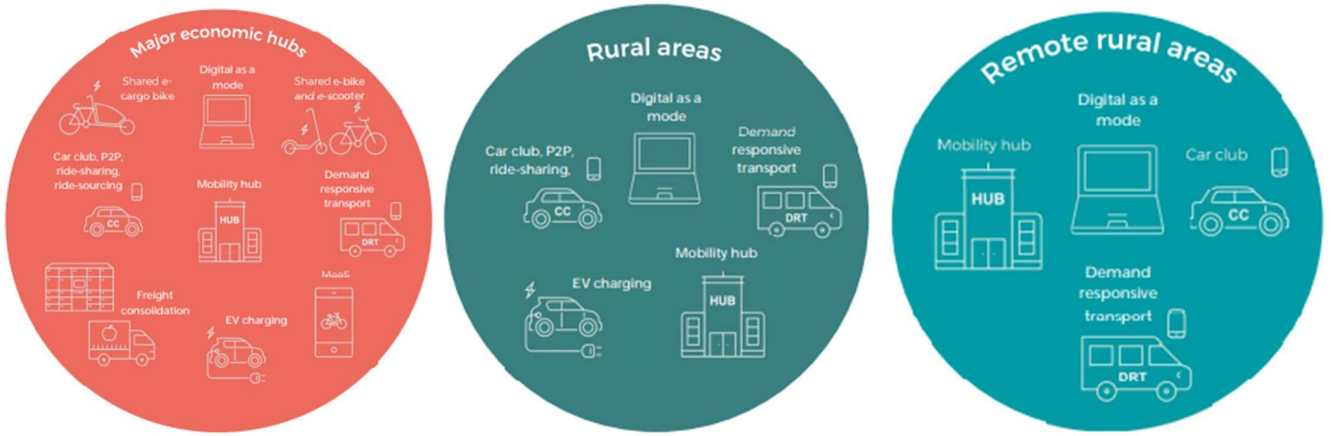
While this latter scenario is not necessarily being prioritised at a regional level, it could be considered in specific locations with the potential to support greater levels of sustainable access, such as connectivity with Hastings and surrounding districts, without compromising potential economic growth.

Figure 6-1 Transport Strategy for the South East, Mode Shift by Scenario (source TfSE 2019)[14]
**Walking and cycling trips potentially fall (-7%) in the Sustainable Route to Growth scenario due to a relative decline in the cost of other modes*

The roles of future mobility and digital connectivity are still in their infancy with only emerging evidence around 'what-works-well-and-where'. The TfSE Future Mobility Strategy[15] sets out a vision for the south east and provides a prioritised framework for 'place-based bundles' for different geographies. Figure 6-2 illustrates TfSE's priorities from very low (VL) to very high (VH) and the range of interventions that could typically be delivered across Hastings.

TfSE classify Hastings and Bexhill together as a coastal Major Economic Hub (MEH), similar to Eastbourne, defined as being less well connected to London and less attractive for London commuters, therefore attributing to higher levels of self-containment.

15 Future Mobility Strategy (TfSE 2021)



Intervention	MEH bundle	Rural bundle	Remote rural bundle
Shared mobility - e-bike	H	L	L
Shared mobility - e-scooter	H	L	L
Shared mobility - P2W (powered two wheeler)	H	M	L
Shared mobility - peer to peer vehicle sharing	H	H	M
Shared mobility - ride-sharing platforms	H	H	M
Shared mobility - business to customer vehicle sharing (e.g. car club)	H	H	H
Shared mobility - ride-sourcing - 'on-demand private hire/taxi'	H	M	M
Shared mobility - digital demand responsive transport (DDRT)	H	VH	VH
Automated (and ultimately autonomous) road mass transit	L	L	VL
Automated (and ultimately autonomous) FMLM shuttles	L	L	VL
FMLM delivery robots / shuttles (land-based)	M	L	VL
Low level air (drones) - freight	L	M	M
Low level air (drones) - passenger	L	L	L
Shared mobility - e-cargo bike	H	L	L
Digital-as-a-mode communications / services	H	VH	VH
Hubs (mobility / community asset / service)	VH	VH	VH
MaaS platform (including mobility credits and gameification)	H	M	L
Digital kerbside management applications	L	L	VL
Consolidation centres (regional, urban, micro)	H	L	VL
Business to business freight capacity exchanges	H	M	M
Business to customer freight capacity exchanges	H	M	M
Flexible streetscape	H	L	VL
Road space reallocation to future mobility modes e.g. lanes, kerb space	H	L	VL
Hydrogen refuelling infrastructure (all modes)	M	L	L
EV charging infrastructure (all modes)	H	M	L

Figure 6-2 TfSE Future Mobility Strategy – 'place-based bundles' priorities for Coastal MEHs, Rural and Remote Rural Areas (very low (VL) to very high (VH))

The TfSE approach provides a framework for Hastings to consider as part of the development focus alongside the emerging East Sussex Local Transport Plan 4. as a part of the draft Local Plan 2019-2039 and start moving from an enhanced 'business as usual' short term future to a more sustainable and technology based longer term future, by applying the following measures to reduce car dependency and ownership:

- Making active travel the first choice for short journeys, particularly in and around the urban area of Hastings/Bexhill
- Improvements to interurban public transport services to improve connectivity and reduce private vehicle dominance
- Placing zero-emission, frequent and accessible public transit connections between homes, places of work and key destinations
- Planning for and adapting to technology 'place-based bundles', reducing car dependency and ownership

6.2.2 Funding considerations

Careful consideration will need to be given to how this can be funded and delivered within the context of the Local Plan Infrastructure Delivery Plan and overall viability. Funding considerations could include:

- The 2021 Autumn Budget and Spending Review[16] included £3 billion for buses (including support for 4000 Zero emission buses). In April 2022 the Government allocated £1.08bn of this funding to Local Authorities, including ESCC, to deliver bus improvements through their BSIPs (East Sussex received £41.4m of which £19.1m is allocated towards revenue and fares support for bus services across the county). The Spending Review also included £2 billion for walking and cycling and £1.3 billion to support the roll out of charging infrastructure for Electric Vehicles.
- TfSE have published their draft SIP[17] for their region. Within this, Hastings is covered principally by the Kent, Medway and East Sussex package of interventions with a capital investment of £19.4bn needed up to 2050. TfSE recognises that funding the SIP will be the principal financial challenge and will involve both making the best use of funds directed from government and identifying new and innovative approaches that tap into the local and regional value that the interventions could generate. At this stage, schemes have been prioritised into short-, medium- and longer-term delivery timescales with high level advice around the expected next steps to develop the business case and feasibility with key delivery partners.
- The ESCC BSIP[18] and enhanced partnerships with operators will help unlock central funding and further support for public transport as part of a countywide approach.
- An updated ESCC Local Transport Plan (LTP) 4 will consider the prioritisation of available funding that East Sussex receive annually from Government for local transport infrastructure and sustainable travel, which could fund the delivery of

16 https://www.gov.uk/government/publications/autumn-budget-and-spending-review-2021-documents

17 https://transportforthesoutheast.org.uk/app/uploads/2022/06/TfSE-consultation-draft-SIP-summary-Jun-22.pdf

18 https://www.eastsussex.gov.uk/media/bolb153s/east-sussex-county-council-bus-service-improvement-plan-2021.pdf

local transport interventions to support the emerging spatial strategy across Hastings.

- Development contributions, through Section 106 and Community Infrastructure Levies (CILs), provide the mechanism for securing development specific funding for infrastructure in a district as well as match funding for any available central and regional funding opportunities. The appropriate pooling of contributions will need careful management and consideration.
- Explore wider funding opportunities, as and when they are announced, to support growth and infrastructure, similar to previous rounds of the Housing Infrastructure Fund (HIF), Local Growth Fund (LGF) and MRN funding, as well as the emerging NH Road Investment Strategy (RIS3) for any impacts on the SRN. While these opportunities have traditionally tended to allocate funding towards highway infrastructure, potentially locking in car dependent growth, a fresh approach is needed to deliver positive outcomes for innovative and sustainable transport infrastructure.
- Conventional appraisal metrics typically focus on car journey time savings and highway capacity, but do not capture carbon, health, wellbeing, economic and environmental impacts. Consider developing alternative multi-criteria approaches to modelling and appraisal with broader metrics relating to place, social interactions and quality. The DfT Early Assessment Sifting Tool (EAST) could be used with wider metrics to complement the transport planning policy perspective of 'planning for people and places' developed by Professor Peter Jones – UCL (see Table 2-1).

6.3 Sustainable Transport and Future Mobility Options

6.3.1 Planning for sustainable transport and future mobility

The emerging Local Plan process is an opportunity to apply a single strategy approach and integrate behaviour change across a range of different interventions to reduce car travel and continue to build consensus and commitment to the Council's vision and objectives.

This approach will need to integrate the infrastructure and technology requirements of physical interventions with the principles of urban design and placemaking as outlined in Figure 6-3. This will maximise the sum of the parts of each intervention and develop a coherent delivery strategy that encourages modal shift and improves the overall fabric of the borough's environment and public realm.

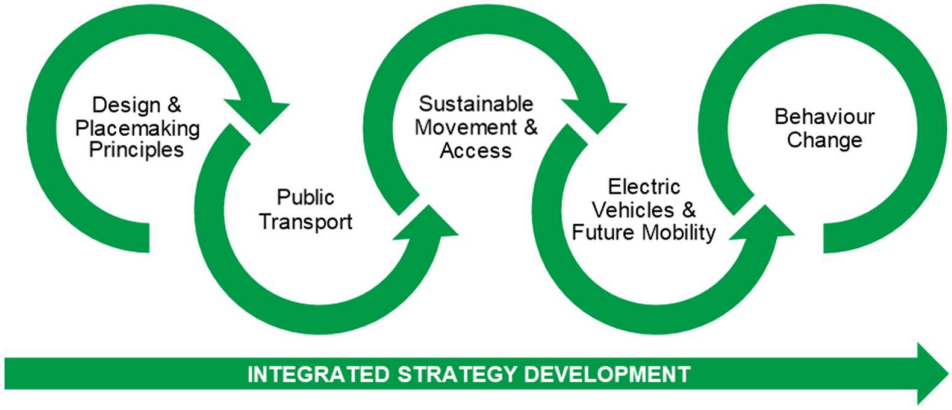


Figure 6-3 Integrating sustainable transport, placemaking and behaviour change strategy

6.3.2 Accessibility at New development

A key component of promoting accessibility to new development is a strategy for 'door to door' journeys which, should primarily be made by walking, cycling and/or public transport. Such a strategy needs to address the wider street, walking and cycling and local bus service networks within the borough, ensuring that people can travel from 'door to door' sustainably.

This builds on a parallel Sustainable Transport Audit (STA) study being undertaken to understand the existing level of sustainable accessibility to the potential development sites included in this study option. Analysis included the assessment of travel times and distance between key service attractors (destinations) and potential developments (origins). Further analysis of catchment areas for non-residential and mixed use (residential and non-residential) developments was also undertaken, to assess levels of accessibility to key catchment areas for employees and customers.

For every site, the minimum travel time via public transport, cycle and walk has been calculated to each of the nearest attractor types and accessibility scores were allocated based on journey time bands appropriate for each attractor type and each mode. This allowed an overall score to be allocated to each site for access to key attractors, for each mode, out of a total score. Scores are expressed as a % with 60%-100% representing good accessibility across all modes (PT, walking and cycling).

Accessibility to key services within reasonable time periods varies widely between different residential locations. Some sites would offer poor accessibility for potential residents to access necessary services via public transport, foot or cycle without intervention, due to the limited accessibility to efficient and reliable rail and bus connections.

Figure 6-4 illustrates the collective levels of accessibility by all sustainable modes for the new Local Plan option in relation to the key travel corridors identified to be most impacted by the forecast traffic growth (see section 5).

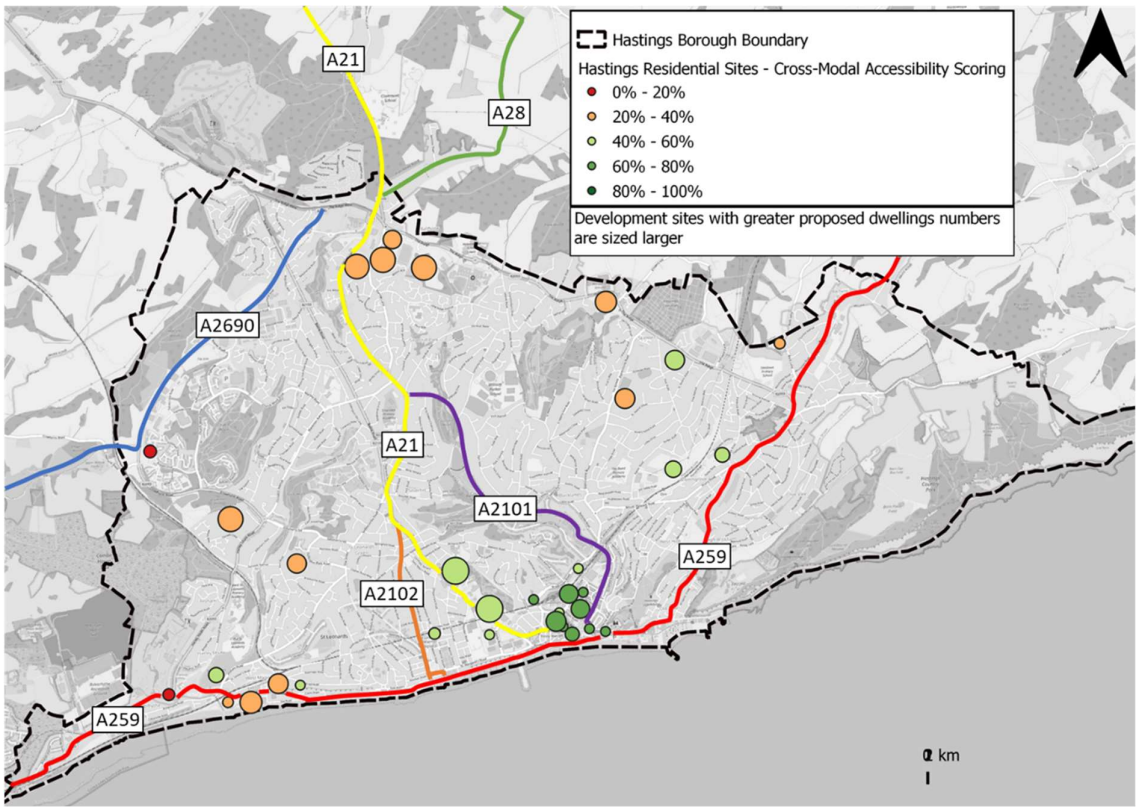


Figure 6-4 Levels of Accessibility of Hastings Local Plan sites and key corridors

In Hastings, the accessibility to key services within reasonable journey-times varies significantly depending on proximity to small key bus routes and rail connections. The general accessibility levels are highest (60-100%) in cluster locations within the vicinity of Hastings town centre and the Hastings railway station. The general accessibility levels across Hastings borough, outside of the town centre are relatively low, with some exceptions. The lowest levels of accessibility (0-20%) are located to the west of the borough, with one along the A259 in Bulverhythe, and another close to the A2690 in a residential area.

The largest potential development clusters have reasonable levels of accessibility (40-60%) closer to the town centre, but relatively low levels of accessibility (20-40%) on the north edge of the borough boundary. Larger developments provide greater opportunities to implement active and sustainable travel measures, which could improve public transport, walking and cycling accessibility in these areas further.

Opportunities and challenges for accessibility at new development are summarised below.

New development accessibility and active travel opportunities and challenges

Opportunities:

- Develop design principles to ensure that active travel and public transport connectivity (c. 400m from most homes) is planned for from the start to deliver attractive and healthy streets from day one and create '15-minute' neighbourhoods where largescale strategic development is proposed

- Explore the potential to improve networks and connectivity to rural settlements into Rother and more remote areas of Hastings e.g. potential for demand responsive bus services to supplement traditional fixed bus services
- Secure effective Travel Plans to complement and deliver overarching Hastings approach
- Deliver high quality housing close to attractive employment opportunities and/or close to public transport links (for travel outside of the borough e.g to Rother, Eastbourne, Ashford or London) and key services
- Development contributions to wider off-site improvements to active travel, bus, car clubs, micro-mobility initiatives, improve crossing facilities on 'key streets' and junctions
- Provide EV charging infrastructure for vehicles, e-bikes and e-scooters
- Deliver ultrafast/5G digital connectivity in urban areas and improve existing 3G/4G connectivity in across the borough
- Provide services, live/work balance and 'first/last mile' micro-hubs at larger sites, urban areas or larger villages, where multi-modal interchanges are likely to occur
- Review parking standards and consider car free/reduced parking at potential development in accessible/town centre locations e.g. higher density residential at / or near rail stations

Challenges:

- Unpredictable and phased delivery
- Connecting development in more remote areas to reliable public transport links
- Negotiating with developers, viability and level of contribution available from development and other sources
- Coordinating meaningful and sustained public transport contributions across groups of developments
- Additional traffic generation on constrained highway corridors e.g. A21 & A259 or railway services (e.g. Hastings to London)
- Capacity on existing public transport services and/or frequency of services to remote areas of the borough

6.3.3 Behaviour change

Behaviour change needs to be a key outcome of the strategy to change 'hearts and minds' and engender a partnership approach. Campaigns have traditionally focused on engagement with businesses and organisations to set up workplace and school travel plans to promote broader travel awareness and underpin more targeted initiatives to reduce car travel. Other emerging interventions, including the following, will also need to be considered as technologies and working practices continue to evolve.

Homeworking / Impact of Covid-19 opportunities and challenges

Opportunities:

In response to the COVID-19 pandemic, many organisations asked their employees to work from home where possible. This work-from-home 'experiment' has potentially accelerated and increased trends towards more flexible and remote working practices, digitalisation, and tele-working. There is consensus that UK businesses aim to implement hybrid work models, signalling that working from home and some level of travel reduction is likely to stay beyond the COVID-19 pandemic.

Analysis of DfT[19] data, comparing recent transport use with pre COVID-19 levels, shows that September 2022 car use is still approximately 5%-8% lower on different weekdays. This offset by an increase in LGV and HGV levels and overall motor vehicle use is nearer 1%-3% lower than pre COVID-19 levels. Rail and bus use are still 10%-20% lower than pre COVID-19 levels and a number of bus routes across East Sussex are subject to changes[20] and / or reduced levels of service as revenues fall. Levels of cycling have generally seen a sustained increase of 20%-40%.

The data is fluctuating, and travel patterns will potentially change as other policies influence behaviour, e.g. cost of living, however the lower levels of car use, higher levels of cycling and the adoption of more hybrid and flexible working arrangements can contribute to reduced and more sustainable travel in the future. Equally, reduced patronage, revenue and investment in bus networks presents a significant challenge that will need further consideration as part of any local or wider bus strategy going forward.

The continued investment and roll out of digital superfast broadband and 5G networks and the facilitation of local teleworking-hubs in new development and key destinations will also enable these travel reducing behaviours in Hastings.

Challenges:

- Potential for traffic levels to return to normal once restrictions are lifted without counter measures
- Evidence also points towards a potential substitution effect whereby people might be driving less for work but, at the same time, they might be driving more often for other purposes such as shopping, socialising or recreation at other times of day
- COVID-19 has led to reductions in public transport use, loss of revenue and the potential removal of marginal, yet vital, services
- Impacts on viability, vibrancy and service sector in town centres and the need to travel further for services

19 Transport use during the coronavirus (COVID-19) pandemic – (DfT 5/10/2022)

20 A new bus network for East Sussex (Stagecoach September 2022)

Reduced Car Ownership opportunities and challenges

Opportunities:

Car Clubs are short-term car rental services that allow members access to locally parked cars and the ability to pay by the minute, hour or day; car clubs offer an alternative model to private car ownership and can reduce the need for private parking and can encourage individuals to give up car ownership, inspiring a shift towards walking, cycling and public transport, whilst still having access to a vehicle for occasional journeys.

In Hastings, there is a car club operating by the name of Co Wheels, providing a convenient and flexible pay-as-you-go car rental scheme. Two cars are available to rent, located in the town centre Russell Street Car Park.

Car Sharing initiatives or recommendations within large residential areas and/or town and village centres can help to encourage increased vehicle occupancy. Several applications are widely available for mobile phones that can facilitate car sharing and incentives (such as priority parking) can help to encourage uptake, particularly if included within residential or commercial travel plans or packs.

Car free development could also be considered in some key settlements, particularly those in and around Hastings town centre, where it is in close proximity to public transport, mobility hubs or has a high number of short/localised commuter trips. Some development in large strategic sites, where a high level of trip internalisation could be realised, could also be considered for car free or reduced parking.

Case Studies:

Brighton & Hove City Council (BHCC) have recently explored the feasibility and costs of options for a 'Car Free City Centre and Ultra Low Emissions Zone'. Steers have produced an Initial Options Study[21] assessing the potential for car free, managed access and low traffic neighbourhood zones in areas close to Brighton station and seafront. The outcomes of this study recommended a phased approach to initially implement a car free zone in The Lanes area with the removal of on-street parking, modal filters to restrict through traffic and timed windows for deliveries. This would provide a lower risk starting point to expand wider interventions into other neighbouring city centre areas, including the North Laine / Cultural Quarter and New England Quarter, with additional measures to reduce traffic, improve air quality and improve accessibility for sustainable and active modes.

While Hastings is not the same scale as the city of Brighton & Hove, the scale of car free, managed access or low traffic interventions proposed in the options assessed could be transferable to neighbourhoods. Complementary measures could also provide affordable, accessible and sustainable transport alternatives through local mobility hubs, while maintaining a degree of access for residents or visitors where mobility can only be achieved by car.

[21] Car Free City Centre and Ultra Low Emissions Zone: Initial Options Study (Steers Oct-2020)

Completed in 2002, the **Beddington Zero Energy Development (BedZED) community in Sutton Borough** did not provide specific residential parking spaces with housing and parking must be paid for separately as an annual charge. Separating the cost of parking from housing, and investment in alternatives, including quality public transport, walking and cycling, has resulted in significantly lower car ownership levels (54%) than Sutton Borough as a whole (71%). The concept illustrates the potential for reducing overall car ownership in carefully selected areas, with good access to public transport at stations and good cycle and pedestrian connections to key services.

Source: Peabody.org.uk

Challenges:

- Repurposing existing car parking for dedicated car club spaces and/or priority parking for car sharing initiatives
- The cost of short-term car hire vs the perceived convenience of car ownership

Electric Vehicles opportunities and challenges

Opportunities:

In 2020 the Government announced sales of new petrol and diesel cars will end in the UK by 2030 and over £1.8bn will be invested in infrastructure and grants to increase access to zero-emission vehicles. At a local level, EVs will support the decarbonisation of the Local Plan and the borough will need to support their uptake by significantly enhancing the existing charging network through a range of policies e.g. traffic regulation orders, parking tariffs, residential parking zones and EV on-street infrastructure and at new developments. On-street charging on the existing road network, in the form of lamp posts, is a prime example of how infrastructure can be used to provide additional charging facilities for EVs and help to encourage the overall uptake in their usage.

Challenges:

- EV strategy needed to define the technology and appropriate roll out of infrastructure
- Not necessarily a universal solution to reducing car travel, congestion, overall particulate emissions or car ownership
- Implementing energy networks to supply EV charging infrastructure
- Planning and physical constraints to delivering widespread on-street charging infrastructure

6.3.4 Active Travel

Where possible, walking and cycling need to be the primary travel choices for shorter journeys. The LCWIP schemes provide a valuable starting point to improve the overall active travel environment in Hastings to:

- Ensure the existing street network is attractive for walking and cycling
- Improve walking and cycling connectivity between rural and urban areas (as well as cross-boundary into Rother)
- Filling in key missing links in the borough's existing cycling and walking network
- Reduce severance (e.g. caused by railway lines)
- Provide safe and convenient connections to the wider active travel network

Active travel opportunities and challenges

Opportunities:

In 2022 the Highway Code[22] updated the hierarchy for road users placing those most at risk in the event of a collision at the top of the hierarchy. This hierarchy will need to be established around key corridors and local connections to complement the overall public realm strategy. This design approach will promote a move away from car dominated roads and deliver seamless active, public transport and shared mobility sustainable movement corridors. There are a number of opportunities to capitalise on the ongoing LCWIP programme:

- Speed management / limit programme including 20mph zones for residential areas
- Designated quiet lanes
- Gateway / entry treatments into residential areas
- Continue to identify and address key gaps in the walking and cycling networks
- Improve crossing facilities on 'key streets' and at junctions
- Provide cycle parking and e-bike charging at destinations
- Develop programme of 'sustainable movement corridors' placing active travel, public transport and future shared mobility at the heart of the network

Potential for cycling:

The DfT Propensity to Cycle Tool (PCT)[23] for England and Wales provides a strategic planning tool and an evidence base to inform future cycling investment and policies that seek a wider shift towards sustainable transport. It tests different scenarios of change, at a local area level (MSOA or LSOA[24]), to understand the potential uptake in cycling that could be achieved in different parts of the country, including:

- the UK Governments target to double cycling in a decade

22 The Highway Code: 8 changes you need to know from 29 January 2022 (GOV.UK)

23 Propensity to Cycle Tool (PCT) (https://www.pct.bike/m/?r=east-sussex)

24 MSOA: middle layer super output area, av. population 7,500 / LSOA: lower layer super output area, av. population 1,650

- a more ambitious 'Go Dutch' scenario, applying cycling levels equivalent to the Netherlands (allowing for English and Welsh hilliness and trip distances)
- greater uptake of e-bikes

Cycling potential is calculated using a function based on trip distance and local gradient. The tool forecasts the following ranges in cycling to work mode share for both Hastings and East Sussex commuter trips for each scenario compared to the Census 2011 levels (see Table 6-1). This indicates that over and above the Government's policy expectation of doubling cycling, a greater level of investment in infrastructure, engagement and uptake in e-bikes could significantly increase cycling mode share across the borough, particularly in the e-Bike scenario (see Appendix D for corresponding plots for each scenario).

Table 6-1 Potential changes to Hastings cycling commuter mode share (PCT)

	Census 2011	DfT Target	'Go Dutch'	E-Bikes
Hastings	1-2%	3%-4%	11%-15%	21%-26%
East Sussex	3%	6%	16%	22%

Challenges:

- Inconsistent provision for cycling and walking connecting residential areas and key local trip attractors
- Distance between some rural / remote rural areas and urban or local centres with access to key facilities and/or public transport connectivity
- Lack of scope for fully segregated active travel on network due to land availability, building lines and on street parking
- Traffic congestion creating unhealthy, unsafe and car dominated environments
- Delivering continuous high quality, safe and convenient routes across the network to ultimately place 'sustainable movement corridors' at the top of street hierarchy
- Severance and safety concerns associated with the level crossings may discourage active travel
- Ensuring the level of healthier active travel activities is not substantially replaced by less active, but more convenient, new sustainable modes, e.g. e-scooters, e-bikes and Bus Rapid Transit (BRT)

6.3.5 Public Transport

Hastings town centre has reasonable public transport connections to the local bus and national rail networks, with links along the coast towards Eastbourne and Brighton to the west, and further afield to Ashford and London. The Borough generally has good levels of public transport accessibility, particularly with bus connectivity to settlements outside of the Hastings Borough such as Bexhill and Eastbourne however, there still tends to be a greater reliance on car travel.

Public transport initiatives will therefore need to be at the centre of encouraging transformational change to improve the provision, reliability and access to real-time information for all transport needs in order to reduce private vehicle reliance, particularly for shorter journeys.

Bus opportunities and challenges

Opportunities:

The following opportunities are at various stages of development and being considered along the key movement corridors and cross boundary routes:

- Committed scheme to implement bus priority measures (including bus lanes)
- TfSE are exploring the potential to implement mass bus rapid transit between Eastbourne, Hastings, as well as links to Bexhill

Movement towards cleaner fuels and EVs for the bus fleet will be needed to support the decarbonisation of the Local Plan and enhance the borough environment. The role of autonomous vehicles will also need to be reviewed in the longer term as technology and legislation permits.

Challenges:

- Overarching strategy is needed to integrate public transport with the Local Plan and other sustainable transport options
- Lack of scope on network for extended sections of fully segregated bus priority due to land availability, building lines and on street parking

Digital Demand Responsive Transport (DDRT) opportunities and challenges

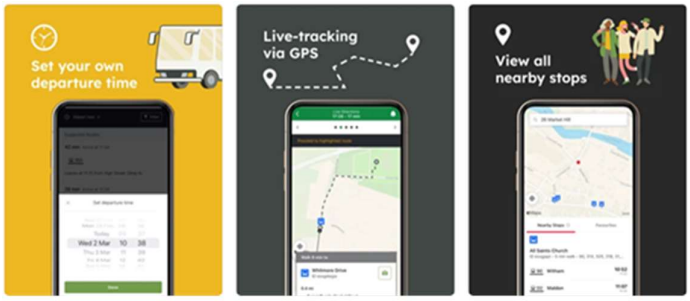
Opportunities:

ESCC are currently considering options for DDRT through their Bus Service Improvement Plan (BSIP). A number of UK schemes have trialled DDRT buses in recent years and they are seen as a potentially more flexible alternative to conventional buses, particularly for less profitable and rural routes, and would be expected to use cleaner fuels with the opportunity to ultimately be autonomous as technology permits.

Case study:

Essex County Council, as part of their Technology Strategy for Transport, undertook two pilot studies in 2018/19 to explore the effectiveness of digital tools to make passenger transport more efficient. These involved digitising home to school journeys through a commercially available app to match shared routes, vehicles and passengers. The pilots deployed a demand responsive service, over six months, to two relatively inaccessible colleges to explore demand, awareness of the scheme, route optimisation and revenue potential.

The pilots applied a data-led approach to demonstrate DDRT was technically feasible and provide a flexible alternative to traditional modes of travel or fill gaps in the transport network. This led to a successful £2.5m bid through the DfT's 2020 Rural Mobility Fund to deliver two DDRT services to connect and level-up areas in Essex that currently have little or no provision of public transport. "DigiGo"[25] was launched in 2022 connecting rural areas, to the south of Braintree and in central Essex, to key services and transport interchanges. Services are booked through a bespoke TravelEssex app (see figure), allowing users to specify when and where they want to travel, their fare and also monitor vehicle progress in real-time. The app also provides additional information on other available multi-modal options e.g. buses, trains and micro-mobility options (e-scooters and bike hire).



TravelEssex App (source Essex County Council)

Challenges:

- Developing successful business models to minimise any public subsidy and provide a good level of service
- DDRT is not necessarily a cheaper alternative and it should be seen as part of a blended solution with conventional fixed route services

Bus-based Rapid Transit (BRT) opportunities and challenges

Opportunities:

BRT would provide a great opportunity for modal shift in a borough like Hastings, particularly on the key A21 and A259 corridors, and could also feed into Rother. Sections of bus lanes, similar to that already exists on corridors in the town, provides a segregation for bus services from traffic that enables BRT services to operate with a limited-stop service to enhance the directness and reduce journey times. A review of international[26] case studies demonstrates that BRT is emerging as a leading mode of urban passenger transit. Success partly accredited to the evidence of moderate implementation costs, whilst maximising existing resources and stakeholder buy-in. The research indicates BRT can deliver significant reduction in car use on key corridors.

Case Study:

25 https://www.essexhighways.org/getting-around/ddrtdigigo/digigo

26 Effects of New Bus and Rail Rapid Transit Systems – An International Review (Ingvardson and Nielsen 2018)

Key examples in the South East include:

- Fastway in West Sussex (opened 2003) - 19% reduction[27] in traffic levels on key corridors from 2006-2013
- Fastrack at Ebbsfleet, Kent (opened 2006) - 19% of BRT passengers previously used private vehicles

The schemes rely on fully integrated, high quality bus services with segregated corridors to deliver improved and reliable public transport journey times to achieve modal shift. TfSE identify the need for mass transit / BRT in their draft SIP (2022) and are currently assessing the concept of as part of their outer orbital and south-central radial area studies (due in 2022) including the potential to improve intra-urban, rural and inter-urban services on key corridors serving Hastings and neighbouring Bexhill. The constrained A259, particularly between Hastings, Bexhill and Eastbourne, will stand to benefit most from a potential BRT solution and help deliver the principle of 'sustainable movement corridors'.

Challenges:

- Number of service providers and complexity of negotiating with several parties on ticketing prices and mechanisms
- Physical and environmental constraints of land availability, building lines, on-street parking and network capacity to deliver fully segregated bus priority
- Uncertainty, complexity and cost of delivering rapid transit and required infrastructure
- Delivering energy networks for cleaner buses e.g. EV or hydrogen fuelled

Rail opportunities and challenges

Opportunities:

TfSE identify rail travel as a priority in their draft SIP, Sustainable Route to Growth and, together with Network Rail and other stakeholders, are currently exploring longer term options to improve rail services in the region, including the concept two-stage upgrade to the **Marshlink High Speed** services:

- **Partial** – to include a new hourly service from Eastbourne/Bexhill/Hastings to London St Pancreas, a dedicated train in the peak which will join the Dover train in the off-peak. The upgrade will provide a 35-minute journey time saving from Bexhill direct train to London; and,
- **Full** – to include upgrade between Bexhill and Hampden Park to further reduce journey times, in addition to the partial scheme this will provide a 45-minute journey time saving for Bexhill direct train to London.

The concept scheme – at both partial and full stage – would significantly improve public transport connectivity between Hastings and London, where the existing

27 Crawley Fastway Case Study (Greener Transport Council)

hourly direct service to London Victoria takes approximately 2 hours. The improved connectivity would benefit proposed allocations across Hastings.

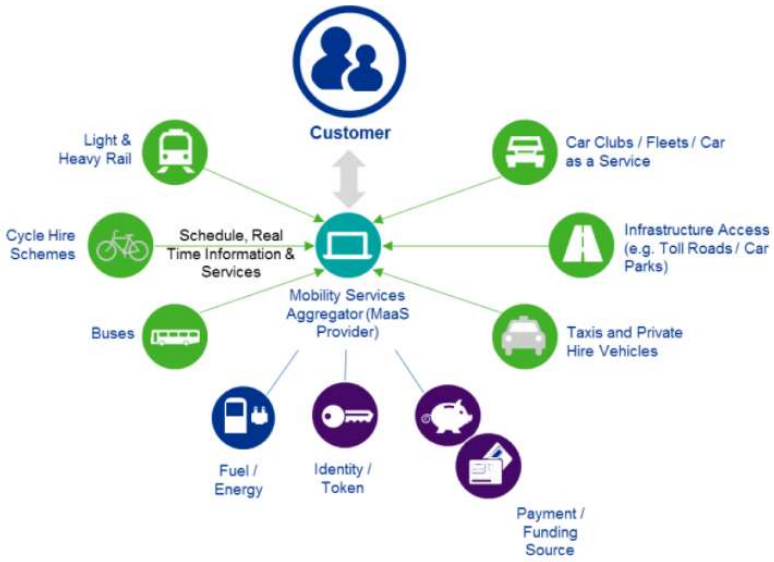
Hastings could also benefit from the introduction of Mobility Hub features (see below) offering improved interchanges to a range of first and last mile active or micro-mobility options, better access to bus services and a complementary high quality public realm offer.

Challenges:

- Uncertainty, complexity and cost of delivering rail solutions and required infrastructure
- Integrating services across all modes to optimise interchange at a mobility hub
- Improvements will have less impact in areas further away from railway stations, or with poor connections to the railway stations. May see an increase in private vehicles to the railway stations.

6.3.6 Future mobility

The trajectory towards future mobility is less certain than more traditional interventions and it will take time to pilot, evaluate and deliver a specific strategy for Hastings. Partnerships with established providers and digital incubators can work towards securing the transport data needed for the development of Mobility as a Service (MaaS), smart ticketing and digital demand responsive options. MaaS, as illustrated in the figure opposite[28], is the use of digital technology to seamlessly integrate and enhance public and private transport services through better journey information, integrated ticketing and payment systems to meet the complete mobility needs of the customer.



In practice, customers could have a choice of either pay-per-ride or monthly subscriptions where pre-purchase 'mobility packages / bundles' allows a customer to consume mobility across all providers participating in the scheme up to set limits e.g. a certain amount of travel by e-bike, travel by bus, use of a car club etc.

The concept of MaaS is still in its infancy and schemes are being rolled out with varying degrees of success across the world. The following opportunities and challenges will need to be considered as a starting point for future mobility measures.

Mobility as a Service (MaaS)

[28] MaaS Concept (Source: Greener Transport Solutions)

Opportunities:

The long-term trajectory for travel planning is likely to be towards MaaS. Establishing a steering group at an early stage, between key local authorities, transport providers and MaaS advisors, will ensure collaboration and sharing of knowledge as technology develops to tailor a MaaS strategy that is workable within both an urban and rural context.

Establishing digital platforms for transport services, with real-time trip planning, can provide the opportunity to better manage demand across the network by using pricing mechanisms to incentivise travel at less busy times, by more sustainable modes and make travel more accessible to a range of different user groups.[29]

Moovit currently provide a branded mobility application with real-time travel planning and information services in parts of East Sussex. Hastings and other districts could seek to establish an integrated fare payment system through Moovit as the company has successfully provided this service elsewhere through their 'plan, pay, and ride' system.

Case Study:

In March 2018, Transport for West Midlands (TfWM) joined forces with MaaS Global/Whim to trial the UK's first app-based MaaS scheme integrating taxis, National Express buses, Midland Metro trams, local train services, city bikes, rental cars and car club vehicles. The trial ended in 2021 and, while overall participation was lower than expected, lessons learned from the scheme have shown that a transport authority-led approach to MaaS was the right fit for the region and TfWM are in the process of tendering for a new MaaS partner. The key difference from the pilot being that they will look to build this on top of TfWM's successful Swift smartcard ticketing system.

Evidence is generally limited at this stage and the data from the TfWM Whim trial is commercially sensitive and not readily available. However, a 2019 study undertaken by Ramboll Group[30] of a similar MaaS Global/Whim scheme in Helsinki, implemented in 2017, highlights possible emerging travel trends associated with the scheme:

- A higher proportion (63%) of Whim members ride public transport than the metropolitan average (48%)
- Whim users are more likely to combine different modes with public transport including bicycle and taxi to solve the issue of first and last mile
- 95% of Whim trips are made by public transport and 68% of all Whim trips occur in areas with the highest public transport accessibility
- Amongst speculation that unlimited MaaS packages might lead to a significant upsurge in total trips and travel, the number of daily trips made by Whim users is similar to the metropolitan average (3.4 per day)
- Cycling, walking, and not just private car, trips could be replaced by increased uptake of public transport and taxi trips leading to potential active travel, health and well-being disbenefits

29 Mobility as a Service (MaaS) in the UK: change and its implications (Government Office for Science 2018)

30 WHIMPACT Insights from the world's first Mobility-as-a-Service (MaaS) system (Ramboll 2019)

Challenges:

- Inertia to change and uncertainties around appropriate business model and likely return for investors and partners
- Management of pricing and revenue distribution due to the complexity of the different fare systems and partners involved
- Negotiating with a number of major transport providers and procurement barriers to the range of services
- Unanticipated societal and environmental implications that could arise from a wholesale adoption of MaaS e.g. reduction in active travel, increased use of taxis to replace car trips
- Establishing a secure and accessible digitally connected eco-system

Shared Mobility Travel Hubs

Opportunities:

Mobility/Travel Hubs consist of decision, movement and opportunity spaces for users to seamlessly navigate between primary transport modes with more appropriate active or micro-mobility (e-scooters) travel modes to conveniently fulfil the first or last mile of a journey. Hubs can, but not exclusively, be provided at key public transport interchanges, such as railway and bus stations, to encourage modal shift for longer journeys and provide secure, convenient and safe interchange between modes. A network of micro-hubs would also enable end-to-end destinations to access different travel options, such as docking-hire stations, a car club (peer to peer vehicle sharing) or cycle freight, at a local level to support reduced car ownership and the burden of parking.

The integration of strategic mobility hubs at railway stations across Hastings, as well as more destination-based hubs at key employment or education sites with a network of boroughwide micro-mobility hubs will provide realistic and affordable mode choices to support the Council's vision for Hastings borough.

The position of these hubs would be aligned to the geography of Hastings and incorporate the distribution of the Town's railway stations, education & employment sites.

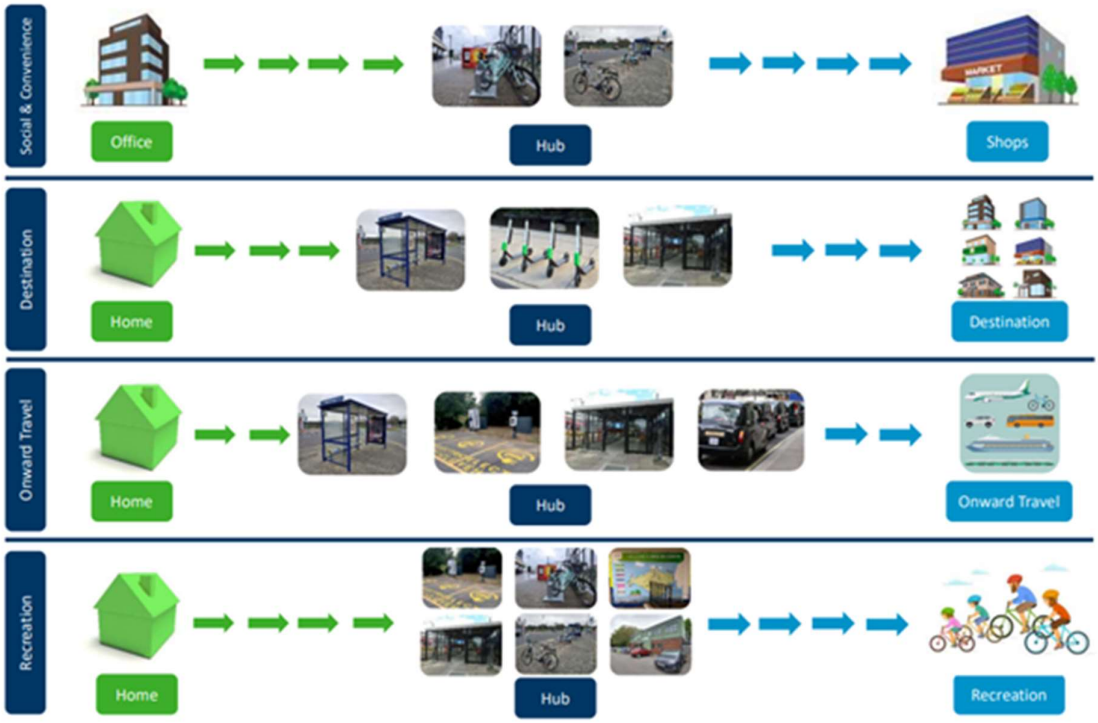
Case Study:

Solent Transport have developed a design guide[31] to help councils and transport authorities deliver successful Mobility Hubs for communities. The guide identifies four key purposes the hub could be used for:

- Destination – a hub that enables users to access a key destination e.g. place of work, gym, hospital or education and provides a range of mode choices including public transport, bicycles and scooters
- Onward travel – a larger hub located adjacent to connections with other modes of transport e.g. rail and bus stations where the use will be for a longer period of time and largely during commuting hours

[31] Mobility Hub Design Guide (Solent Transport)

- Social and Convenience – a smaller hub that allows the user to make shorter trips by bus, cycle or scooter with a quicker turnaround of use and linking key destinations
- Recreation – a hub linking users with events, leisure destinations and access to rural areas. Hubs may be seasonal or temporary and provide different transport options to cater for a broader range of users.



Mobility hub design concept (Source: Solent Transport)

Challenges:

- General lag with uptake, uncertainty and complexity of technological advancement and delivery
- Funding and investment and who takes ownership of delivering hub and securing necessary travel options
- Achieving 'critical mass' of hubs and micro-hubs to deliver truly flexible, convenient and accessible options for all

Freight and last-mile deliveries

The movement of freight and last-mile delivery to homes and businesses is growing with the rise of online shopping and digital services. The number of LGVs on the road is expected to rise by more than 20% (DfT)[32] over the next 15 years. COVID-19 restrictions have also increased deliveries for many goods and Royal Mail[33] has forecast that UK parcel volumes in the Business-to consumer (B2C) and Consumer-to-all-parties (C2X) sub-sectors will grow at approximately 5% per annum in the

[32] Road Traffic Forecasts 2018 (DfT)

[33] Last mile urban freight in the UK: how and why is it changing? (Government Office for Science – 2019)

medium term. Local Plan growth will influence this and there are a number of opportunities and challenges that could be considered to make last-mile freight delivery more sustainable in the borough's communities:

Opportunities:

- Freight, loading and delivery restrictions and / or consolidation points (e.g. lockers) in new development to reduce the number of trips, distances travelled and encourage use of more sustainable modes for last-mile delivery
- A network of cargobikes and e-cargobikes (see opposite) at mobility hubs and appropriate destinations can form a part of a borough-wide shared mobility system
- 'Lifestyle' couriers are becoming more common, often app-based and using sustainable transport modes, they provide a more flexible interface with the main logistics provider
- Mobile depots (see opposite) and micro-consolidation hubs can be used as staging posts on the edge of congested urban centres for smaller sustainable transport modes to undertake the last-mile delivery
- Technology and innovation will also play a significant role with the application of improved GPS tracking, dynamic route optimisation and the emerging potential of autonomous drone delivery vehicles in the air and on the ground being trialled e.g. Amazon, DHL and Matternet

e-cargo bike (Source: Cycling UK)

Mobile depot (Source: STRAIGHTSOL)

Challenges:

- Carriers' ability to cope with the ever-growing demand for parcel deliveries during peak periods will require additional infrastructure investment
- Consumers are demanding ever-faster, more reliable and convenient delivery services
- Rise in less efficient B2C and C2X deliveries with high first-time failure rates, lower drop densities and higher inter-drop distances
- Competition for road space between kerbside deliveries, priority for sustainable active and public transport modes and impacts of road traffic delays
- Impact of 'free' delivery options leading to low pricing models and restricting investment in more efficient infrastructure and cleaner carrier fleets
- Physical, legal and regulatory barriers to autonomous airborne and land-based drone delivery technology

6.4 Potential for modal shift

The wider evidence, discussed above, indicates that a package of different mobility solutions has very good potential to reduce car use across Hastings, notably:

- Up to 10% reduction in car trips with area wide 'smarter choice' travel strategy and investment similar to the Sustainable Travel Town (STT) programme in Hastings and neighbouring Bexhill
- Potential for Bus Rapid Transit (BRT) to reduce car use by up to 20% on key corridors, within the borough and cross-boundary, and be complemented by enhanced partnerships with bus operators and Digital Demand Responsive Transport (DDRT)
- Continued investment, scheme delivery and promotion of the health and wellbeing benefits of cycling, wheeling and walking, coupled with greater uptake of e-bikes, could significantly increase cycling and walking mode share for trips within the borough

This potential for future mode shift to sustainable modes of potentially 5-15% of trips in certain locations requires an integrated approach to development and transport planning, through greater linkage between the local plan and the East Sussex Local Transport Plan, which is currently being updated.

In the following section, operational modelling has not made a specific allowance for these potential impacts of sustainable modes. The appraisal of network performance represents a worst case, identifying proportionate and appropriate capacity improvements. The timing of which will depend on how growth comes forward and the degree to which sustainable travel alternatives are supported and delivered by key stakeholders.

7 Operational Modelling

7.1 Overview

The objective of this phase of work is to aid understanding of the likely impacts upon the transport network by Local Plan growth and to provide early options for mitigation, which align the Council's vision for a carbon neutral town, to potentially address some of the impacts. While the focus needs to be on sustainable solutions, it is acknowledged that a 5-10% reduction in car use is unlikely to address all the impacts of potential Local Plan growth, and unless car use can be further reduced at source (e.g. reduce the need to travel) or via additional mitigation then some form of improvements to highway capacity may be needed. It is however imperative that there is a move away from a traditional "predict and provide" approach on the highway network and that approaches such as "decide and provide" and "monitor and manage" are utilised. This should maximise active and sustainable travel options and ensure the most efficient and appropriate use of resources and funding.

The forecasted flows for 2039 'without' and 'with' local plan flows were extracted from the strategic modelling, to determine the difference of forecasted modelled flows from the existing base year and 2039. From this, the flow difference is added to the available base year counts. Where base counts are unavailable, the forecasted flows from the strategic modelling is used for junction modelling instead.

This section provides an initial capacity and concept review of the key junctions across Hastings, which have been identified for improvements from the ESCWTM outputs, listed in Table 7-1. Design commentary is purely observational at this stage and subject to more detailed design feasibility and assessment in both strategic and local junction models. Figure 7-1 shows the locations of each junction.

Table 7-1 Key junctions

Ref	Junction	Corridor	Initial Commentary
J1	The Ridge / Harrow Lane junction	B2093	Increased delays in AM and PM, extensive queues in PM
J2	B2159 / Blackman Avenue / Ashbrook Road	B2159	Increased delay on Northern approach affects reassignment in PM
J3	A21 / Old Harrow Road mini roundabout	A21	Delays in AM and PM
J4	A21 / Harrow Lane mini roundabout	A21	Delays in AM and PM
J5	A259 / Harley Shute Road	A259	Increased queuing in PM
J6	A259 / Filsham Road	A259	Increased queuing in AM
J7	The Ridge / Hillside Road	B2093	Delays in PM
J8	The Ridge / Grange Road	B2093	Delays in PM
J9	A21 / A28 Westfield Lane	A28 / A21	
J10	Gillman's Hill / Harley Shute Road roundabout	B2092	
J11	Priory Avenue / Braybrooke Road		Small increase in queuing
J12	Glyne Gap roundabout	A259	
J13	A269 Dorset Road/A259 junction	A259	
J14	A21 – Queensway Road	A21	

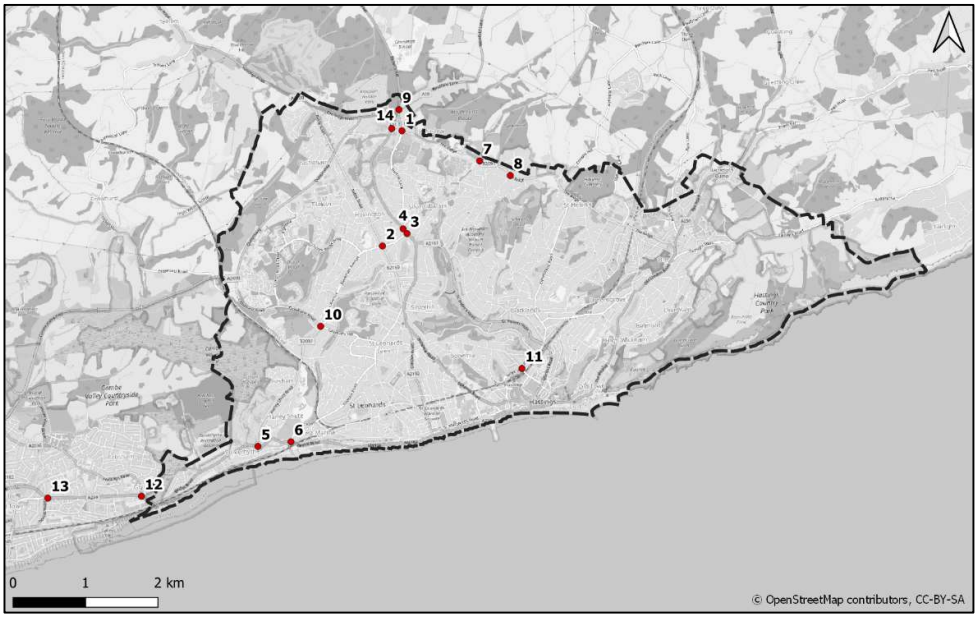


Figure 7-1 Key junction locations

The review translates the outputs from the Countywide model assessment, the potential for modal shift and, making use of available local junction modelling from National Highways, advises on potential capacity solutions at the key junctions. Consideration is also given to the possible cross-boundary effects that the Hastings Local Plan could have on key parts of the network and any emerging mitigation requirements at the boundary of the borough.

7.2 J1 – The Ridge / Harrow Lane

The Ridge / Harrow Lane junction is a three-arm mini-roundabout located to the north of the Borough between the A2100 and B2093, and adjacent to the A21.

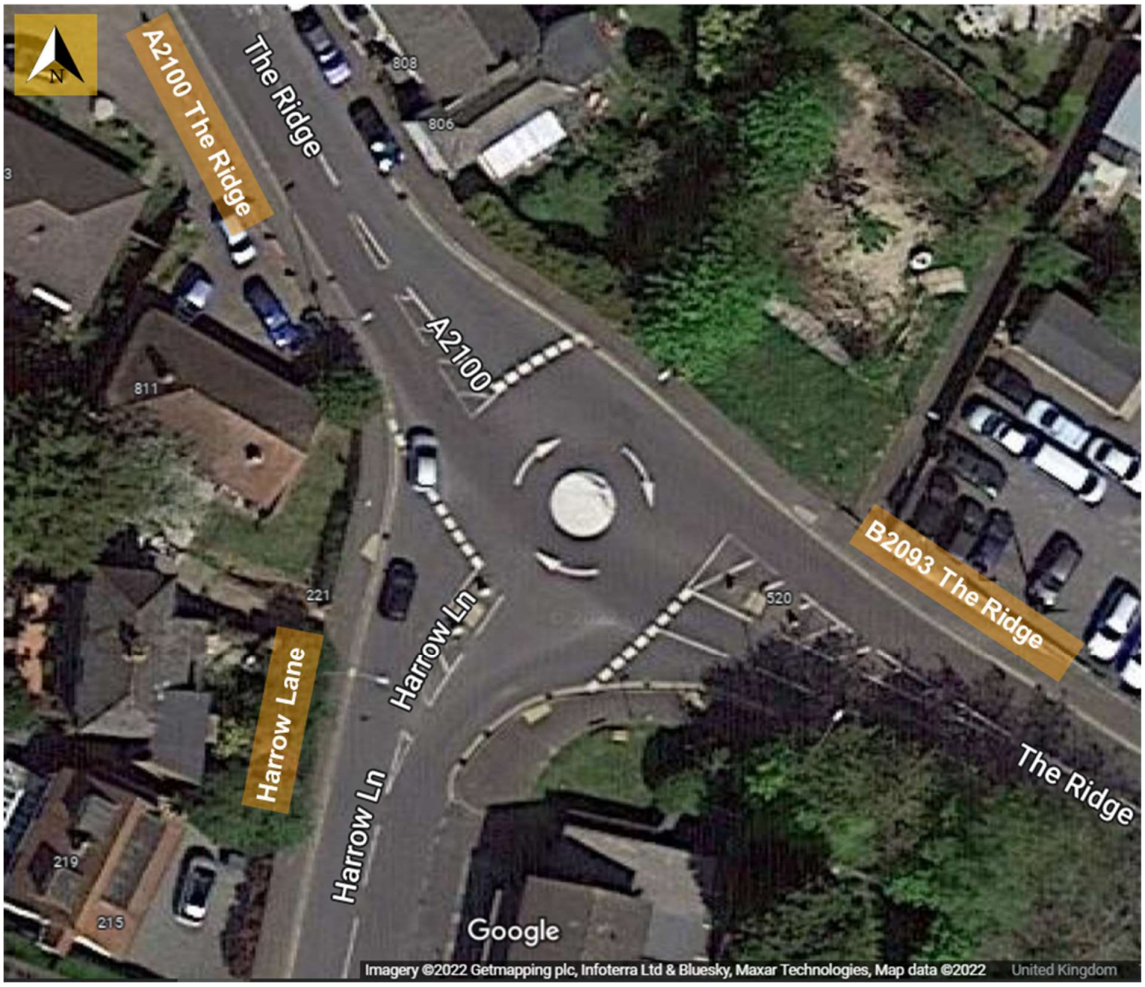


Figure 7-2 The Ridge / Harrow Lane junction overview

7.2.1 Modelling results

Table 7-2 and Table 7-3 below show the future forecast flows of the current junction from the Countywide model, comparing a 'with Local Plan' scenario and 'without Local Plan' scenario in 2040.

These show that a scenario with the Local Plan are around 2% higher than the 'without' Local Plan flows, where the existing junction is already considered congested with a high base traffic even without the Local Plan projections. A small increase in junction flows in the AM and PM peaks (42 and 51 vehicles respectively) is anticipated. The network is forecast to be under pressure at this location due to current conditions and committed growth. The Local Plan would add to this pressure and exacerbate queues and delays at this junction.

Table 7-2 The Ridge / Harrow Lane future flows without Local Plan

O/D	AM				PM			
	B2093 The Ridge (E)	Harrow Lane (S)	B2093 The Ridge (W)	**Total**	B2093 The Ridge (E)	Harrow Lane (S)	B2093 The Ridge (W)	**Total**
B2093 The Ridge (E)	0	192	853	**1046**	0	156	856	**1013**
Harrow Lane (S)	169	2	322	**493**	251	7	289	**547**

B2093 The Ridge (W)	698	140	0	**838**	732	191	2	**925**
Total	**868**	**334**	**1175**	**2377**	**983**	**354**	**1147**	**2484**

Table 7-3 The Ridge / Harrow Lane future flows with Local Plan

O/D	AM				PM			
	B2093 The Ridge (E)	Harrow Lane (S)	B2093 The Ridge (W)	**Total**	B2093 The Ridge (E)	Harrow Lane (S)	B2093 The Ridge (W)	**Total**
B2093 The Ridge (E)	0	197	879	**1077**	0	167	873	**1040**
Harrow Lane (S)	172	2	331	**505**	312	7	281	**600**
B2093 The Ridge (W)	699	138	0	**838**	702	192	2	**895**
Total	**871**	**338**	**1211**	**2419**	**1014**	**366**	**1156**	**2535**

Table 7-4 presents the future base modelling results for the existing junction. This details that cumulative junction delays would increase by around 3-minutes in the AM, whilst close to 7 and half minutes in the PM as a result of the Local Plan. This increase is particularly significant in the PM on the Harrow Lane (S) arm, with nearly a 6-minute increase in delay consequential of the local plan.

Table 7-4 The Ridge / Harrow Lane future base modelling results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2040 WO LP					
1 - B2093 The Ridge (E)	197.4	783.63	1.35	198.8	816.09	1.37
2 - Harrow Lane (S)	37.1	264.04	1.11	71.6	538.54	1.23
3 - B2093 The Ridge (W)	6.3	25.88	0.87	23.2	82.30	1.00
	2040 W LP					
1 - B2093 The Ridge (E)	227.0	898.48	1.39	**227.1**	**930.49**	**1.41**
2 - Harrow Lane (S)	44.5	328.59	1.14	**118.0**	**879.99**	**1.34**
3 - B2093 The Ridge (W)	6.2	25.59	0.87	**20.6**	**76.33**	**0.99**

7.2.2 Proposed Mitigation

A signalised junction layout is proposed as an improvement to the existing mini-roundabout, shown in Figure 7-3. The junction would become a T-junction with signals added to each arm. The highway boundaries would require extension to increase road space, and a flared lane added on the eastern arm (B2093).

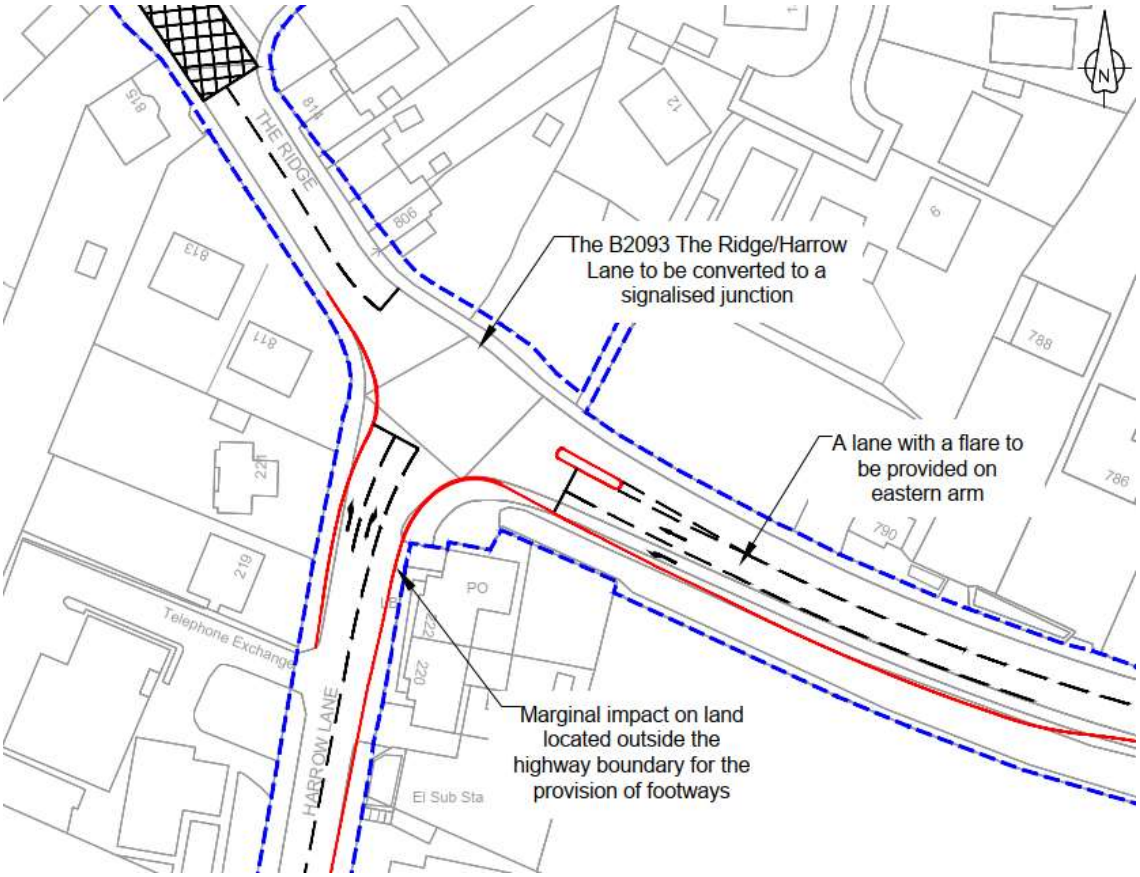


Figure 7-3 Proposed signalised junction at B2093 The Ridge/Harrow Lane

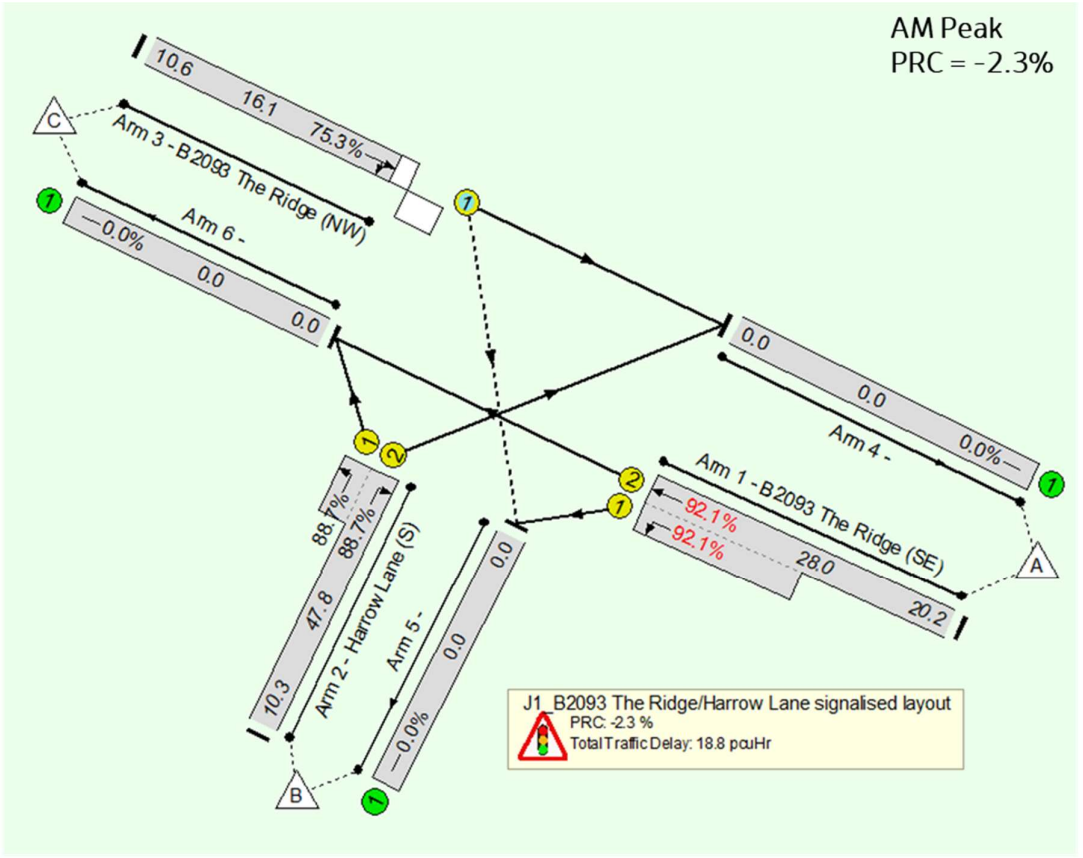
The modelling of this mitigation option with Local Plan flows is shown in Figure 7-4. The modelling flows show that this is likely to improve the junction and provide adequate capacity.

Without mitigation and with the Local Plan, The Ridge East arm is expected to have 139% ratio of flow to capacity (RFC) in the AM and 141% in the PM. However, the proposed mitigation scheme has the potential to improve the performance of the junction, reducing RFC to 92% in the AM and 110% in the PM.

It should be noted that the mitigation option is more responsive to the increase in traffic than the current mini-roundabout.

The Practical Reserve Capacity (PRC) is a measure of how much additional traffic could pass through a junction whilst maintaining a maximum degree of saturation of 90%, where in this instance, it indicates an improved degree of saturation in both peak periods in network capacity.

The signalisation of the junction (compared to the existing situation) provides the opportunity to incorporate pedestrian connectivity improvements at the junction to serve development allocations in the vicinity, as well as the existing community in the area. It would also enable potential improvements for bus movements with bus priority equipment installed into the signals. Further optioneering and feasibility investigation would be required.



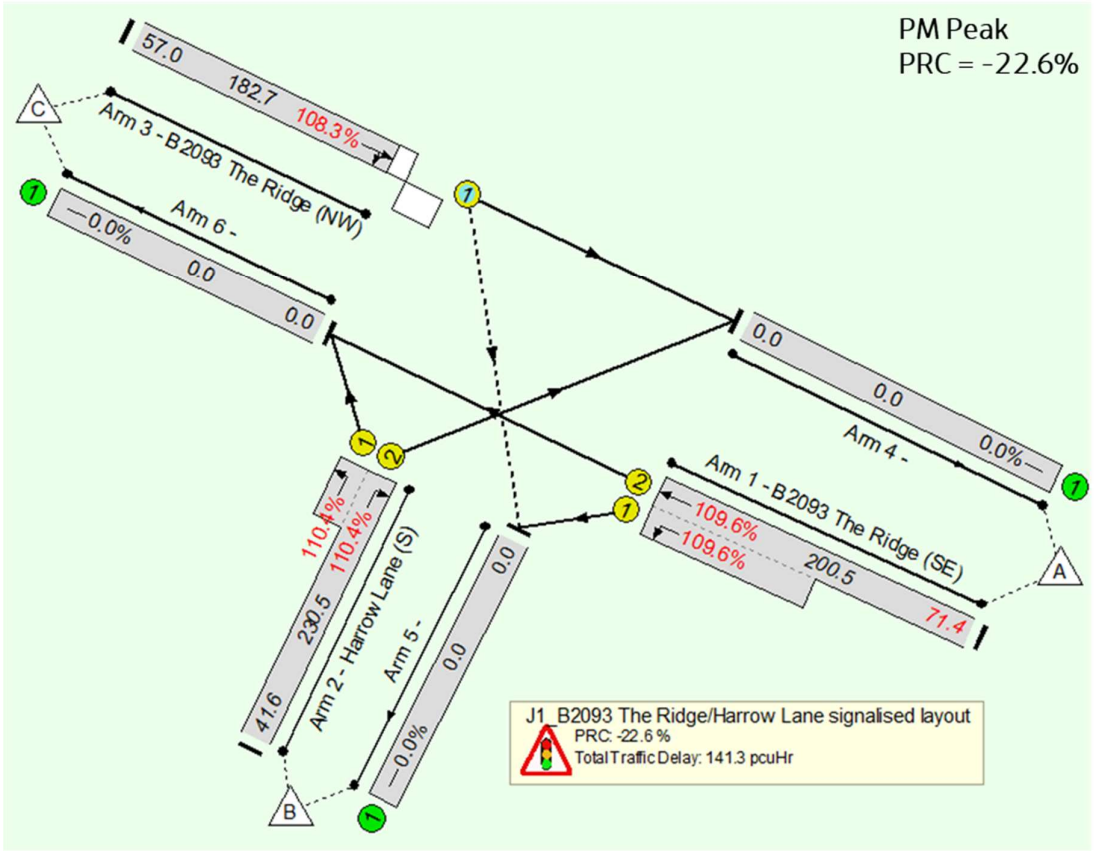


Figure 7-4 B2093 The Ridge/Harrow Lane – Mitigation Option Modelling – 'With' – LP flows

7.3 J2 - B2159 / Blackman Avenue / Ashbrook Road

The B2159 / Blackman Avenue / Ashbrook Road junction exists at a crossroads between the B2159, Blackman Avenue and Ashbrook Road located west of the A21 / Old Harrow Road junction.

Figure 7-5 B2159 / Blackman Avenue / Ashbrook Road junction overview

7.3.1 Modelling results

Table 7-5 and Table 7-6 below show the future forecast flows of the current junction from the Countywide model comparing a 'with Local Plan' and 'without Local Plan' scenario. In this, the 2039 flows show that a scenario with the Local Plan are around 1% higher than the 'without' Local Plan flows. Therefore, the existing junction is anticipated to operate within capacity, and mitigation is not required.

Table 7-5 B2159 / Blackman Avenue / Ashbrook Road future flows without Local Plan

O/D	AM					PM				
	B2159 Battle Rd (N)	**Ashbrook Rd (E)**	**B2159 Battle Rd (S)**	**Blackman Ave (W)**	**Total**	**B2159 Battle Rd (N)**	**Ashbrook Rd (E)**	**B2159 Battle Rd (S)**	**Blackman Ave (W)**	**Total**
B2159 Battle Rd (N)	0	150	361	97	**608**	0	255	219	71	**546**
Ashbrook Rd (E)	4	0	28	343	**374**	5	0	13	328	**346**
B2159 Battle Rd (S)	322	0	0	106	**429**	338	0	0	117	**455**
Blackman Ave (W)	93	571	193	0	**857**	56	648	214	0	**919**
Total	**419**	**721**	**581**	**547**	**2268**	**400**	**903**	**447**	**516**	**2265**

Table 7-6 B2159 / Blackman Avenue / Ashbrook Road future flows with Local Plan

O/D	AM					PM				
	B2159 Battle Rd (N)	**Ashbrook Rd (E)**	**B2159 Battle Rd (S)**	**Blackman Ave (W)**	**Total**	**B2159 Battle Rd (N)**	**Ashbrook Rd (E)**	**B2159 Battle Rd (S)**	**Blackman Ave (W)**	**Total**
B2159 Battle Rd (N)	0	153	367	100	**621**	0	288	198	71	**556**
Ashbrook Rd (E)	4	0	28	338	**370**	4	0	10	326	**340**
B2159 Battle Rd (S)	326	0	0	113	**439**	336	0	0	123	**459**
Blackman Ave (W)	92	588	204	0	**884**	62	664	207	0	**933**
Total	**421**	**741**	**600**	**550**	**2313**	**402**	**952**	**415**	**520**	**2289**

For reference, Figure A-1 and Figure A-2 **Error! Reference source not found.**in Appendix E present the future base modelling results for the junction with and without the Local Plan adjustments. These show that all approaches to the junction are close to capacity but operating within capacity.

7.4 J3 and J4 - A21 / Old Harrow Road and Harrow Lane

Two mini-roundabouts on the A21 off Old Harrow Road and Harrow Lane. The existing roundabouts are constrained, with multiple residential properties requiring access in the vicinity of the roundabouts.

Figure 7-6 A21 / Old Harrow Road and Harrow Lane junction overview

7.4.1 Modelling results

Table 7-7 and Table 7-8 show the future forecast flows of the current junction from the Countywide model comparing a 'with Local Plan' and 'without Local Plan' scenario.

In the modelling, the 2039 flows show that a scenario with the Local Plan are around 2% higher than the 'without' Local Plan flows. An increase of around 60-70 vehicles can be seen between the two scenarios in both peak periods.

Table 7-7 A21/Old Harrow Road & Harrow Lane Junctions future flows without Local Plan

O/D	AM					PM				
	A21 (NW)	Harrow Lane	A21 (SE)	Old Harrow Road	Total	A21 (NW)	Harrow Lane	A21 (SE)	Old Harrow Road	Total
A21 (NW)	0	82	731	292	**1105**	0	184	583	194	**961**
Harrow Lane	118	0	206	82	**406**	119	0	226	75	**420**
A21 (SE)	560	76	0	275	**911**	412	194	0	251	**856**
Old Harrow Road	309	42	430	0	**781**	295	139	671	0	**1105**
Total	**986**	**200**	**1366**	**650**	**3202**	**825**	**517**	**1481**	**520**	**3343**

Table 7-8 A21/Old Harrow Road & Harrow Lane Junctions future flows with Local Plan

O/D	AM					PM				
	A21 (NW)	Harrow Lane	A21 (SE)	Old Harrow Road	Total	A21 (NW)	Harrow Lane	A21 (SE)	Old Harrow Road	Total
A21 (NW)	0	84	738	296	**1117**	0	216	569	191	**976**
Harrow Lane	113	0	209	84	**406**	124	0	234	79	**436**
A21 (SE)	601	75	0	264	**940**	415	200	0	245	**860**
Old Harrow Road	321	40	440	0	**801**	298	143	703	0	**1144**
Total	**1035**	**199**	**1387**	**644**	**3265**	**837**	**560**	**1507**	**515**	**3417**

Table 7-9 shows the future base modelling results for the two mini-roundabouts. This shows that the junctions are operating over capacity without the Local Plan, and where the Local Plan would see little impact, with only around a 5-minute cumulative difference in delay across both junctions it is clear that the Harrow Lane and Old Harrow Road arms are constrained in the AM peak and PM peak respectively, with over a 30-minute delay suggested by the modelling, although it is unlikely to materialise on the ground as drivers make alternative route choices.

Table 7-9 A21/Old Harrow Road & Harrow Lane Junctions future base modelling results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2040 Future - 2040 WO LP						
3 - A21_Old Harrow Rd - 1 - A21 Sedlescombe Road North	34.2	108.58	1.00	10.1	36.54	0.92
3 - A21_Old Harrow Rd - 2 - A21 Sedlescombe Road North (SE)	106.3	471.68	1.22	52.9	190.22	1.10
3 - A21_Old Harrow Rd - 3 - Old Harrow Road	88.3	453.13	1.21	453.1	2197.54	1.76
4 - A21_Harrow Lane - 1 - A21 Sedlescombe Road North (NW)	88.2	277.35	1.14	54.4	171.19	1.09
4 - A21_Harrow Lane - 2 - Harrow Lane (NE)	139.9	1813.28	1.69	42.4	376.21	1.19
4 - A21_Harrow Lane - 3 - A21 Sedlescombe Road North (SE)	2.4	9.67	0.69	2.3	9.53	0.69
2040 Future - 2040 W LP						
3 - A21_Old Harrow Rd - 1 - A21 Sedlescombe Road North	34.7	109.57	1.00	8.2	29.98	0.90
3 - A21_Old Harrow Rd - 2 - A21 Sedlescombe Road North (SE)	129.2	559.94	1.26	55.5	202.05	1.11
3 - A21_Old Harrow Rd - 3 - Old Harrow Road	113.4	577.67	1.26	512.4	2500.45	1.83
4 - A21_Harrow Lane - 1 - A21 Sedlescombe Road North (NW)	94.7	302.35	1.15	63.7	205.48	1.11
4 - A21_Harrow Lane - 2 - Harrow Lane (NE)	142.1	1849.51	1.70	42.6	362.85	1.18
4 - A21_Harrow Lane - 3 - A21 Sedlescombe Road North (SE)	2.5	10.02	0.70	2.4	10.07	0.71

7.4.2 Proposed Mitigation

It is proposed that the existing mini-roundabouts are both converted into a staggered signalised junction, shown in Figure 7-7. This would include introducing two lane capacity approaches from the northwest and southeast A21, and Old Harrow Road. Two-lane sections would be introduced between the two junctions, introducing a right-hand turn from A21 onto Old Harrow Road and Harrow Lane. Access/egress from the multiple residential properties within the extent of the two signalised junctions will need to be accommodated safely.

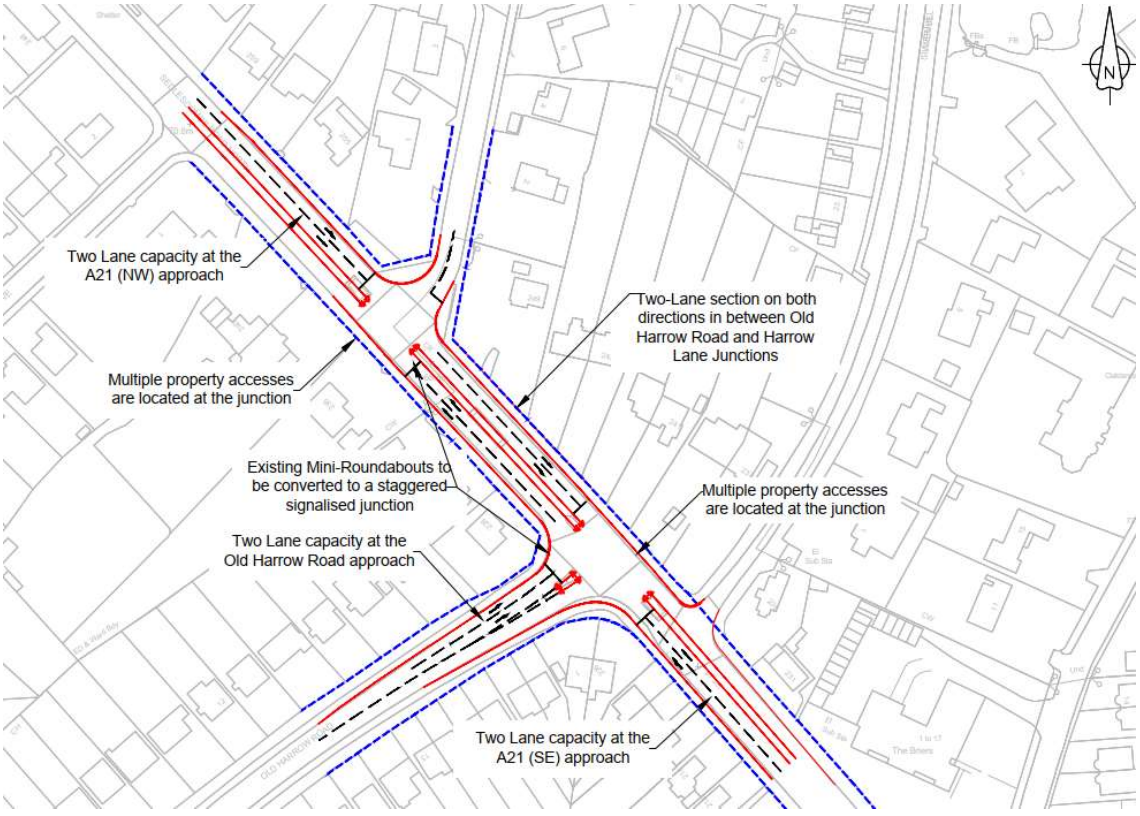


Figure 7-7 Proposed staggered signalised junction at A21/Old Harrow Road & Harrow Lane

The modelling of this mitigation option with Local Plan flows is shown in Figure 7-8 and Figure 7-9. This proposed mitigation is likely to provide adequate capacity, following the introduction of the Local Plan.

The mitigation is modelled to improve junction performance, with most arms operating under capacity in both peak periods. The Harrow Lane arm is expected to see an 80% reduction in the ratio of flow to capacity (RFC) in the AM peak, and the Old Harrow Road expecting a 70% reduction in the PM.

Without mitigation and with the Local Plan, the Harrow Lane arm is expected to have 170% RFC in the AM, whilst the Old Harrow Road arm sees 183% in the PM. The suggested junction mitigation has the potential to improve the performance of the junction, reducing RFC to 91% on the Harrow Lane arm and 113% on the Old Harrow Road arm in the PM, respectively.

The signalisation of the junction (compared to the existing situation) provides the opportunity to incorporate pedestrian connectivity improvements at the junction to serve development allocations in the vicinity, as well as the existing community in the area. It would also enable potential improvements for bus movements with bus priority equipment installed into the signals.

Further optioneering and feasibility investigation would be required.

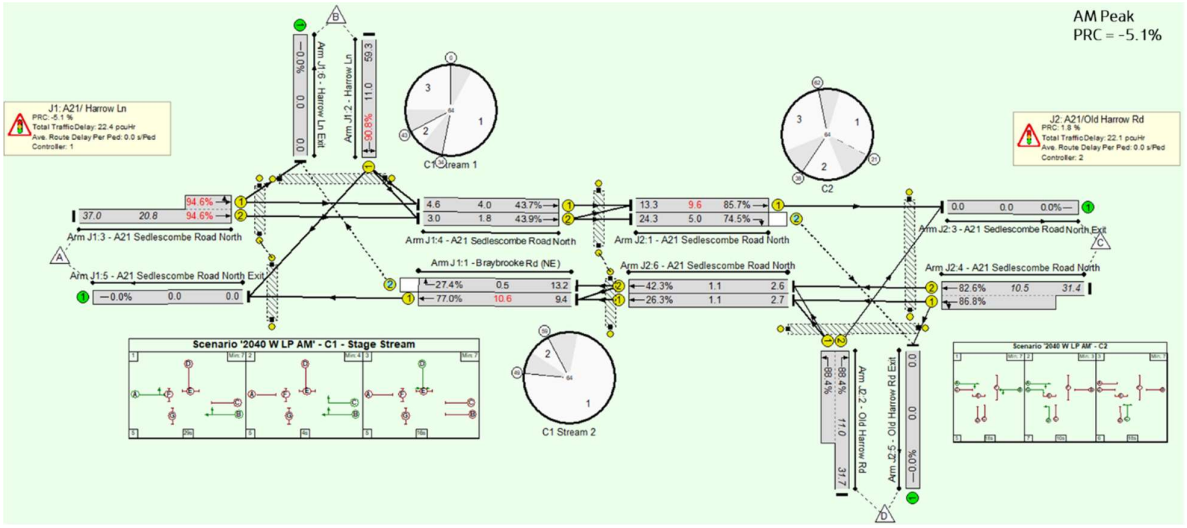


Figure 7-8 A21/ Old Harrow Road & Harrow Lane Junctions – Mitigation Option Modelling – 'With' LP flows AM Peak

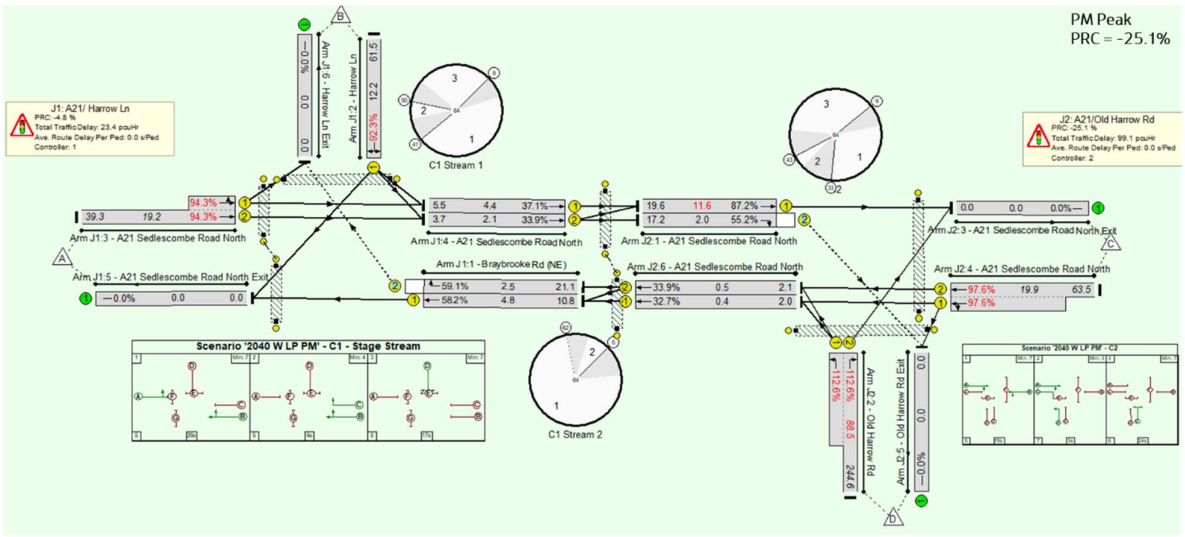


Figure 7-9 A21/ Old Harrow Road & Harrow Lane Junctions – Mitigation Option Modelling – 'With' LP flows PM Peak

7.5 J5 - A259 / Harley Shute Road

The junction between the A259 and Harley Shute Road is a signalised T-junction, located along the A259 in Bulverhythe.

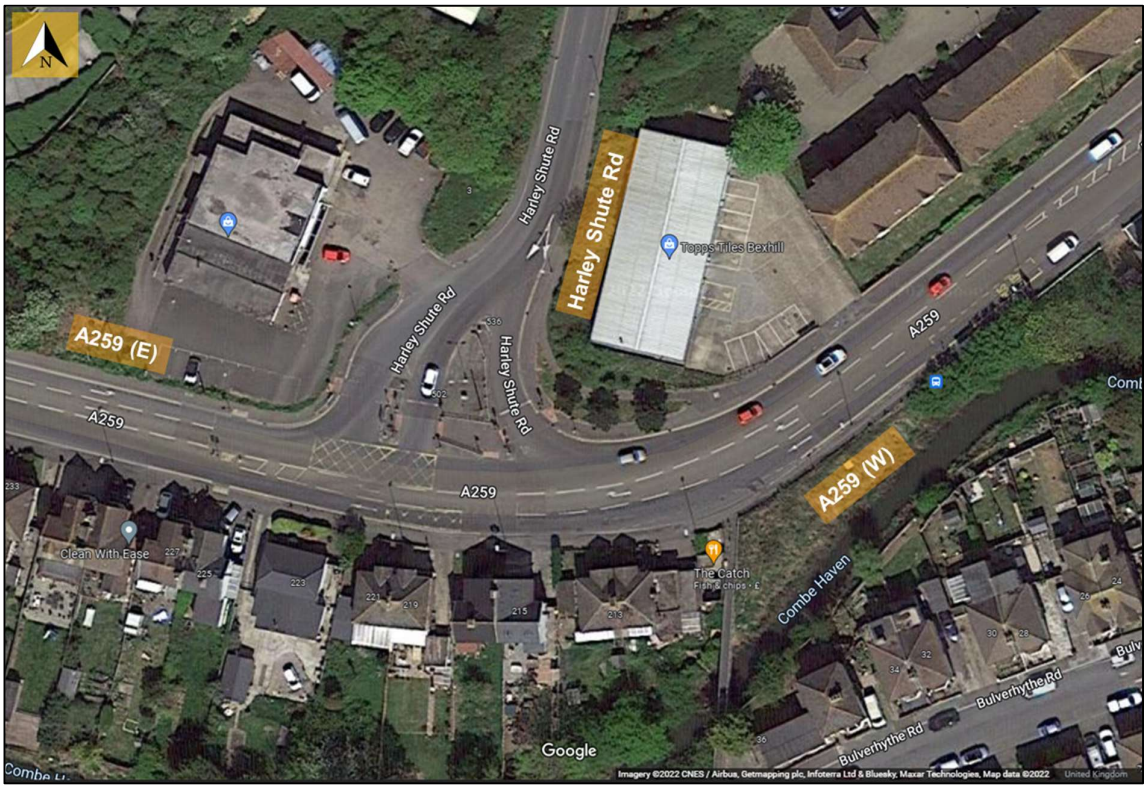


Figure 7-10 A259 / Harley Shute Road junction overview

7.5.1 Modelling results

Table 7-10 and Table 7-11 below show the future forecast flows of the current junction from the Countywide model comparing a 'with Local Plan' and 'without Local Plan' scenario.

The junction is expected to operate within capacity in the forecast scenario, 2039 'with' Local Plan flows are around 1% higher than 'without' Local Plan flows. As such, the existing junction is anticipated to operate within capacity, and mitigation is not required.

Table 7-10 A259 / Harley Shute Road future flows without Local Plan

O/D	AM				PM			
	Harley Shute Road	**A259 (E)**	**A259 (W)**	**Total**	**Harley Shute Road**	**A259 (E)**	**A259 (W)**	**Total**
Harley Shute Road	0	132	371	**503**	0	66	297	**363**
A259 (E)	91	0	915	**1005**	88	0	861	**950**
A259 (W)	330	908	0	**1238**	330	895	0	**1225**
Total	**421**	**1040**	**1286**	**2747**	**419**	**961**	**1159**	**2539**

Table 7-11 A259 / Harley Shute Road future flows with Local Plan

O/D	AM				PM			
	Harley Shute Road	**A259 (E)**	**A259 (W)**	**Total**	**Harley Shute Road**	**A259 (E)**	**A259 (W)**	**Total**
Harley Shute Road	0	132	378	**510**	0	67	293	**360**
A259 (E)	91	0	910	**1001**	90	0	876	**966**
A259 (W)	324	915	0	**1239**	318	928	0	**1246**
Total	**415**	**1046**	**1289**	**2750**	**408**	**996**	**1169**	**2572**

For reference Figure A-3 and Figure A-4 in Appendix E present the future base modelling results for the junction. These show that all arms have appropriate capacity with the Local Plan flows.

7.6 J6 - A259 / Filsham Road

The A259 / Filsham Road junction is a signal-controlled intersection on the A259 in the west St Leonards area.

Figure 7-11 A259 / Filsham Road junction overview

7.6.1 Modelling results

Table 7-12 and Table 7-13 below show the future forecast flows of the current junction from the Countywide model comparing a 'with Local Plan' and 'without Local Plan' scenario.

In this, the 2039 'with' Local Plan flows are 1-2% higher than the 'without' Local Plan flows, as such the Local Plan is not expected to have a significant impact on the junction. The existing junction is anticipated to operate within capacity, and mitigation is not likely to be required.

Table 7-12 A259 / Filsham Road future flows without Local Plan

O/D	AM					PM				
	Filsham Rd	A259 (WB)	Bulverhythe Rd	A259 (EB)	Total	Filsham Rd	A259 (WB)	Bulverhythe Rd	A259 (EB)	Total
Filsham Rd	0	60	32	418	**510**	0	109	38	237	**384**
A259 (WB)	49	0	13	755	**816**	48	0	19	698	**765**
Bulverhythe Rd	31	21	0	7	**59**	12	15	0	1	**28**
A259 (EB)	277	782	17	0	**1076**	249	729	2	0	**981**
Total	**358**	**863**	**61**	**1180**	**2462**	**310**	**853**	**59**	**936**	**2158**

Table 7-13 A259 / Filsham Road future flows with Local Plan

O/D	AM					PM				
	Filsham Rd	A259 (WB)	Bulverhythe Rd	A259 (EB)	Total	Filsham Rd	A259 (WB)	Bulverhythe Rd	A259 (EB)	Total
Filsham Rd	0	59	32	418	**509**	0	132	38	249	**420**
A259 (WB)	51	0	13	769	**833**	49	0	19	701	**769**
Bulverhythe Rd	31	21	0	7	**59**	12	15	0	1	**28**

A259 (EB)	272	794	17	0	**1083**	250	731	2	0	**983**
Total	**355**	**874**	**61**	**1194**	**2484**	**311**	**878**	**59**	**952**	**2200**

For reference, Figure A-5 and Figure A-6 in Appendix E present the future base modelling results for the junction with and without the Local Plan adjustments. These show that all approaches to the junction are operating within capacity.

7.7 J7 - The Ridge / Hillside Road

The Ridge / Hillside Road junction is a crossroad between B2093 The Ridge, Hillside Road and Beaney's Lane.

Figure 7-12 The Ridge / Hillside Road junction overview

7.7.1 Modelling results

Table 7-14 and Table 7-15 below show the future forecast flows of the current junction from the Countywide model comparing a 'with Local Plan' and 'without Local Plan' scenario.

The junction is expected to operate within capacity in the modelled year scenario, where 2039 'with' Local Plan flows are 3% higher than 'without' Local Plan flows, however traffic on the minor arm (Hillside Road) is likely to encounter moderate delays. In general, the existing junction is anticipated to operate within capacity, and mitigation is not required.

Table 7-14 The Ridge / Hillside Road future flows without Local Plan

O/D	AM	PM

	B2093 The Ridge (E)	Hillside Road	B2093 The Ridge (W)	Total	B2093 The Ridge (E)	Hillside Road	B2093 The Ridge (W)	Total
B2093 The Ridge (E)	0	0	723	**723**	0	0	679	**679**
Hillside Road	43	0	318	**361**	105	0	186	**292**
B2093 The Ridge (W)	633	174	0	**807**	787	96	0	**882**
Total	**676**	**174**	**1041**	**1891**	**892**	**96**	**865**	**1853**

Table 7-15 The Ridge / Hillside Road future flows with Local Plan

O/D	AM				PM			
	B2093 The Ridge (E)	Hillside Road	B2093 The Ridge (W)	Total	B2093 The Ridge (E)	Hillside Road	B2093 The Ridge (W)	Total
B2093 The Ridge (E)	0	0	737	**737**	0	0	726	**726**
Hillside Road	56	0	338	**394**	96	0	172	**268**
B2093 The Ridge (W)	640	173	0	**813**	828	90	0	**918**
Total	**696**	**173**	**1076**	**1945**	**924**	**90**	**898**	**1912**

Table 7-16 presents the future base modelling results for The Ridge / Hillside Road junction. This shows that the junction is operating close to maximum capacity at the peak times. A lower delay is expected in the PM peak following the Local Plan, whilst a higher delay of over 1 and half minutes is expected in the AM.

Table 7-16 The Ridge / Hillside Road future base modelling results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2040 WO LP					
Minor arm	9.3	89.44	0.94	9.4	110.88	0.96
Major arm (right turn)	4.0	12.00	0.67	1.8	5.88	0.43
	2040 W LP					
Minor arm	24.4	195.39	1.08	**8.0**	**103.36**	**0.94**
Major arm (right turn)	4.1	12.23	0.68	**1.9**	**5.79**	**0.43**

7.8 J8 - The Ridge / Grange Road

The Ridge / Grange Road junction is a T-junction between B2093 The Ridge and Grange Road.

Figure 7-13 The Ridge / Grange Road junction overview

7.8.1 Modelling results

Table 7-17 and Table 7-18 below show the future forecast flows of the current junction from the Countywide model comparing a 'with Local Plan' scenario and 'without Local Plan' scenario in 2039.

These show that demand in the with Local Plan scenario is around 3% higher than the 'without' Local Plan flows, and that the Local Plan is not expected to have a significant impact on the junction, however traffic on the minor arm (Grange Road) is likely to encounter moderate delays. In general, the existing junction is anticipated to operate within capacity, and mitigation is not required.

Table 7-17 The Ridge / Grange Road future flows without Local Plan

O/D	AM				PM			
	B2093 The Ridge (E)	Grange Road	B2093 The Ridge (W)	Total	B2093 The Ridge (E)	Grange Road	B2093 The Ridge (W)	Total
B2093 The Ridge (E)	0	366	723	**1089**	0	177	679	**856**
Grange Road	170	0	0	**170**	139	0	0	**139**
B2093 The Ridge (W)	676	0	0	**676**	890	0	0	**890**
Total	**845**	**366**	**723**	**1934**	**1029**	**177**	**679**	**1885**

Table 7-18 The Ridge / Grange Road future flows with Local Plan

O/D	AM				PM			
	B2093 The	Grange Road	B2093 The	Total	B2093 The	Grange Road	B2093 The	Total

	Ridge (E)		Ridge (W)		Ridge (E)		Ridge (W)	
B2093 The Ridge (E)	0	373	737	**1111**	0	178	725	**903**
Grange Road	177	0	0	**177**	125	0	2	**127**
B2093 The Ridge (W)	696	0	0	**696**	919	0	0	**919**
Total	**873**	**373**	**737**	**1984**	**1044**	**178**	**727**	**1948**

Table 7-19 presents the future base modelling results for The Ridge / Grange Road junction. This shows that the junction is operating below maximum capacity at the peak times. Only a small increase in delay is expected in the PM peak as a result of the Local Plan, whilst an additional 30 seconds of delay is expected in the AM.

Table 7-19 The Ridge / Grange Road future base modelling results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2040 WO LP					
Minor arm	4.7	99.67	0.86	2.3	56.99	0.71
Major arm (right turn)	0.0	0.00	0.00	0.0	0.00	0.00
	2040 W LP					
Minor arm	6.7	132.57	0.92	2.1	58.00	0.70
Major arm (right turn)	0.0	0.00	0.00	0.0	0.00	0.00

7.9 J9 - A21 / A28 Westfield Lane

This junction between the A21 and A28 is a T-Junction. There is a one-way slip from the southbound A21 onto the A28. There is an independent lane for right turns from the A21 northbound onto the A28.

It should be noted that any mitigation measures at this junction would need to be discussed and agreed with National Highways as the junction exists on the A21 Strategic Road Network.

This junction with Maplehurst Road is regularly used as a 'rat run' from the A21 to The Ridge and avoids the need to use the existing Junction Road junction. Whilst the Queensway Gateway Road, once completed, will change the road network in the area, there is still a concern locally that Maplehurst Road will continue to be used as a 'rat run'.

There was a condition as part of the original planning permission for the Queensway Gateway Road for the scheme promoter, Sea Change Sussex (SCS), to introduce traffic management measures to deter additional rat-running on Maplehurst Road. The permission was subsequently rescinded following a Judicial Review. However, the second permission issued by Hastings Borough Council for Queensway Gateway Road did not include the same condition so SCS are under no obligation to introduce measures linked to Maplehurst Road.

Therefore, at future feasibility assessment, there may be a need to restrict access in or out of the junction that ends up being taken forward.

Figure 7-14 A21 / A28 Westfield Lane junction overview

7.9.1 Modelling results

Table 7-20 and Table 7-21 show the future forecast flows from the Countywide model for the A21 / A28 Westfield Lane junction. This shows that the 2039 'with' Local Plan flows are marginally higher (around 1%) than the 'without' Local Plan flows. In the modelling, the existing junction already shows signs of congestion as base traffic is high.

Table 7-20 A21 / A28 Westfield Lane future flows without Local Plan

O/D	AM					PM				
	A21 (N)	A28 Westfield Ln	Maplehurst Road	A21 (S)	Total	A21 (N)	A28 Westfield Ln	Maplehurst Road	A21 (S)	Total
A21 (N)	0	33	215	676	**924**	0	30	235	769	**1034**
A28 Westfield Ln	19	0	179	338	**536**	6	0	218	272	**497**
Maplehurst Rd	9	105	0	78	**193**	87	257	0	49	**394**
A21 (S)	938	298	13	0	**1248**	507	184	54	0	**746**
Total	**966**	**437**	**407**	**1093**	**2902**	**601**	**471**	**507**	**1091**	**2671**

Table 7-21 A21 / A28 Westfield Lane future flows with Local Plan

O/D	AM					PM				
	A21 (N)	A28 Westfield Ln	Maplehurst Road	A21 (S)	Total	A21 (N)	A28 Westfield Ln	Maplehurst Road	A21 (S)	Total
A21 (N)	0	33	221	667	**921**	0	31	243	807	**1080**
A28 Westfield Ln	18	0	179	343	**540**	4	0	216	271	**491**

Maplehurst Rd	10	103	0	79	**192**	106	250	0	50	**405**
A21 (S)	951	302	13	0	**1266**	473	184	54	0	**712**
Total	**980**	**439**	**412**	**1089**	**2919**	**583**	**465**	**513**	**1127**	**2688**

Figure 7-15 and Figure 7-16 presents the future base modelling results for the junction. The junction layout is complicated and constrained, it is anticipated to operate over capacity even in the 'without' LP scenario, where RFC on Maplehurst Road in the evening peak is particularly high. The PM peak PRC in both scenarios are also very high.

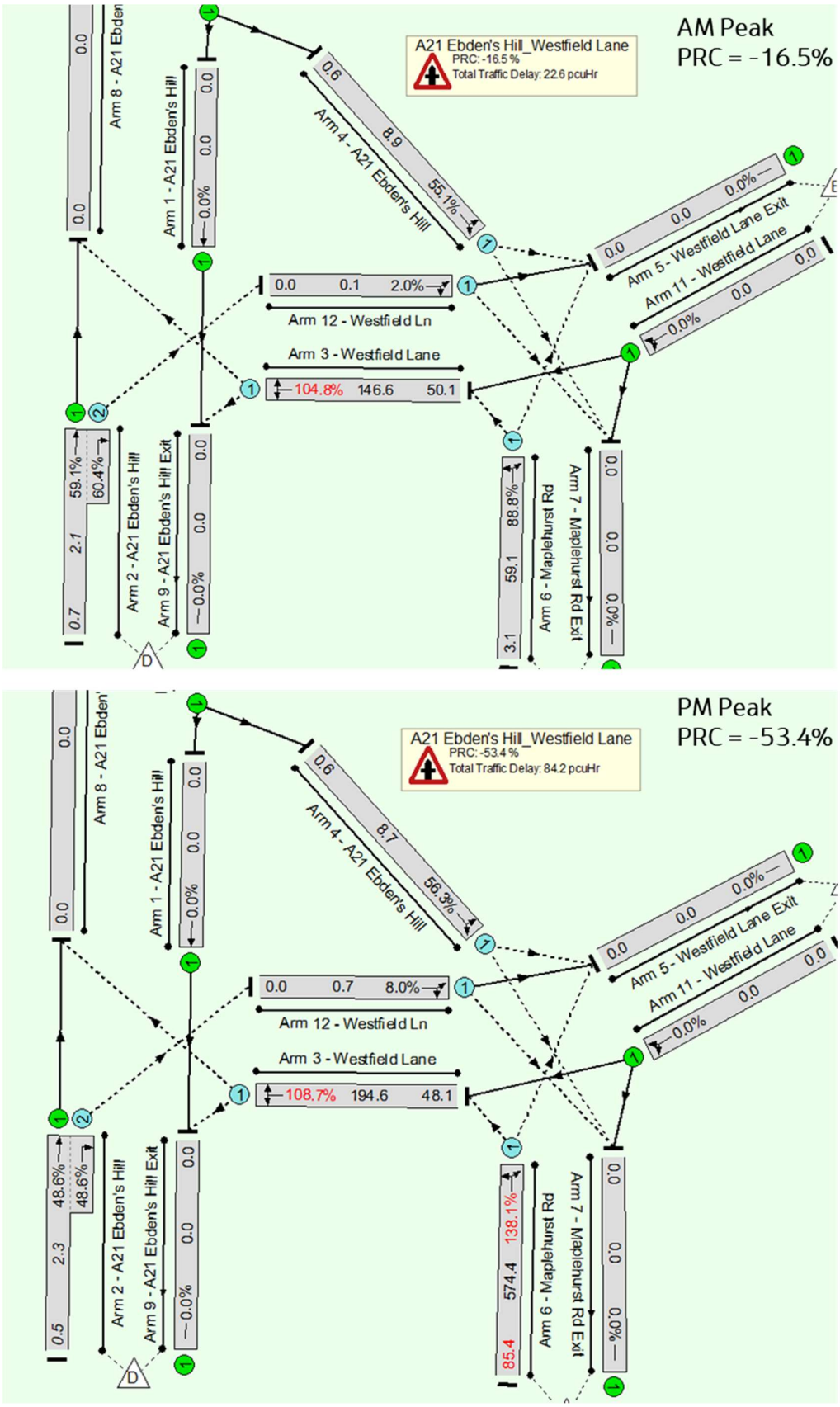


Figure 7-15 A21 / A28 Westfield Lane Future Base Modelling Results – 2039 'without' LP Flows

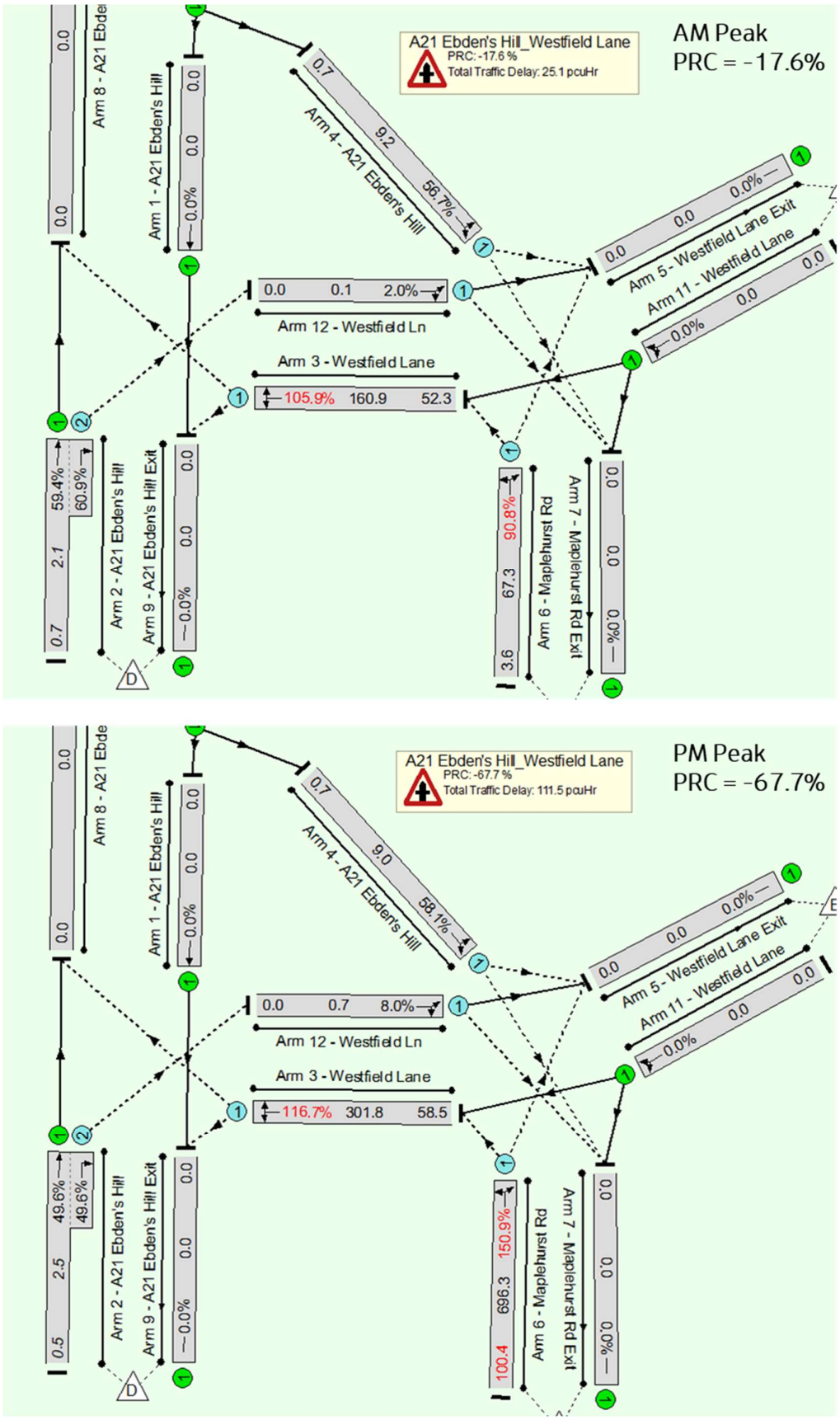


Figure 7-16 A21 / A28 Westfield Lane Future Base Modelling Results – 2039 'with' LP Flows

7.9.2 Proposed Roundabout Mitigation

Two mitigation options have been considered and both are forecast to provide capacity which is likely to improve junction operation.

This mitigation proposal would convert the existing junction into a four-arm roundabout, shown in Figure 7-17. This would include a two-lane approach on Westfield Lane and the A21 northbound and southbound approaches. Additional land may need to be acquired outside of the existing highway boundary for this option.

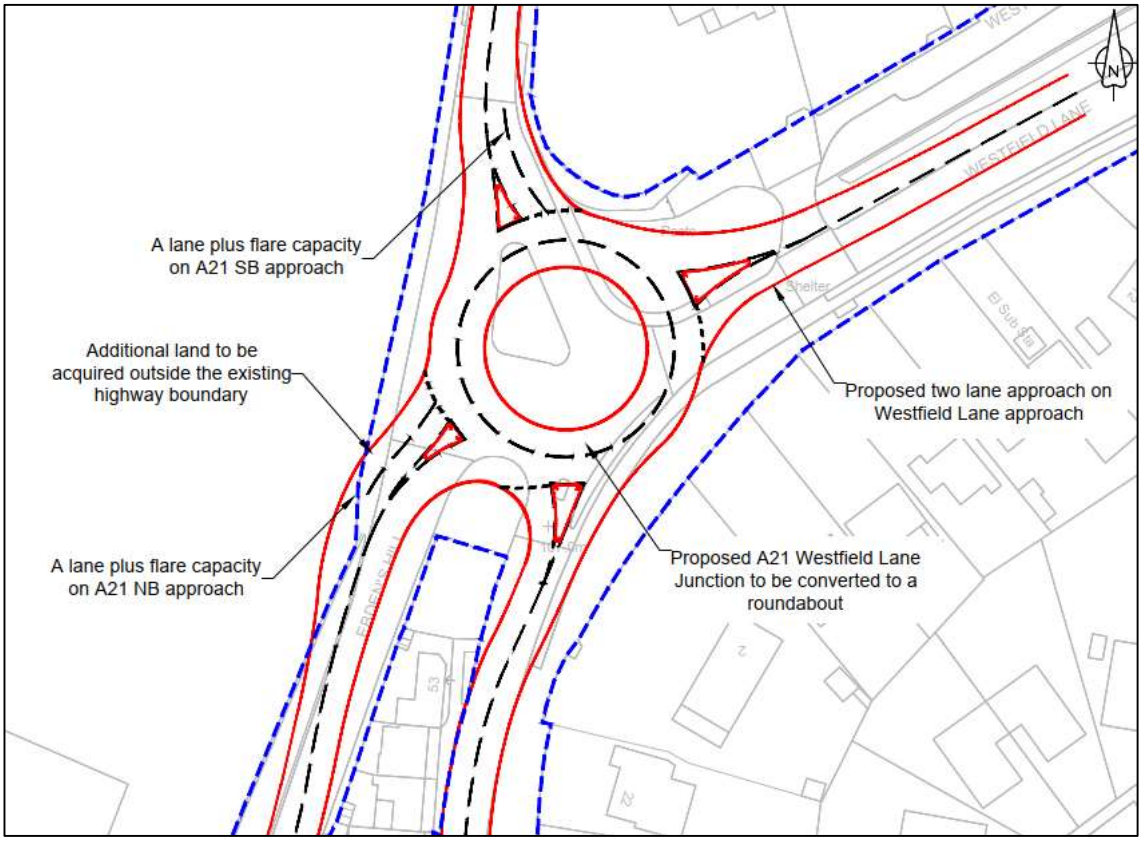


Figure 7-17 Proposed roundabout at A21 / A28 Westfield Lane

Table 7-22 shows the modelling results 'with' Local Plan flows for the roundabout mitigation option. This shows that flows through the roundabout would be below maximum capacity.

Without mitigation and with the Local Plan, the Maplehurst Road arm is expected to have a 91% RFC in the AM and 151% in the PM. However, the proposed roundabout mitigation scheme has the potential to improve the performance of the junction, reducing RFC to 40% in the AM and 84% in the PM.

Further optioneering and feasibility investigation would be required.

Table 7-22 A21 / A28 Westfield Lane – Roundabout Mitigation Option Modelling – 'With' LP flows

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2040 W LP - 2040 W LP					
A21 (N)	7.4	27.74	0.88	55.9	154.96	1.08
A28 Westfield Lane	7.8	50.48	0.90	8.9	63.19	0.92
Maplehurst Road	0.7	12.50	0.40	4.9	42.63	0.84
A21 (S)	12.4	34.23	0.93	1.6	7.26	0.59

7.9.3 Proposed Signalised Mitigation

This second mitigation proposal would convert the existing junction into a signalised junction, shown Figure 7-18. This would include a two-lane approach on Westfield Lane and the A21 northbound and southbound approaches. A two-lane exit included in the southbound A21, merging after around 100-150 metres. A slip would also run from the A21 southbound into Westfield Lane. Additional land may be required outside of the existing highway boundary for this option.

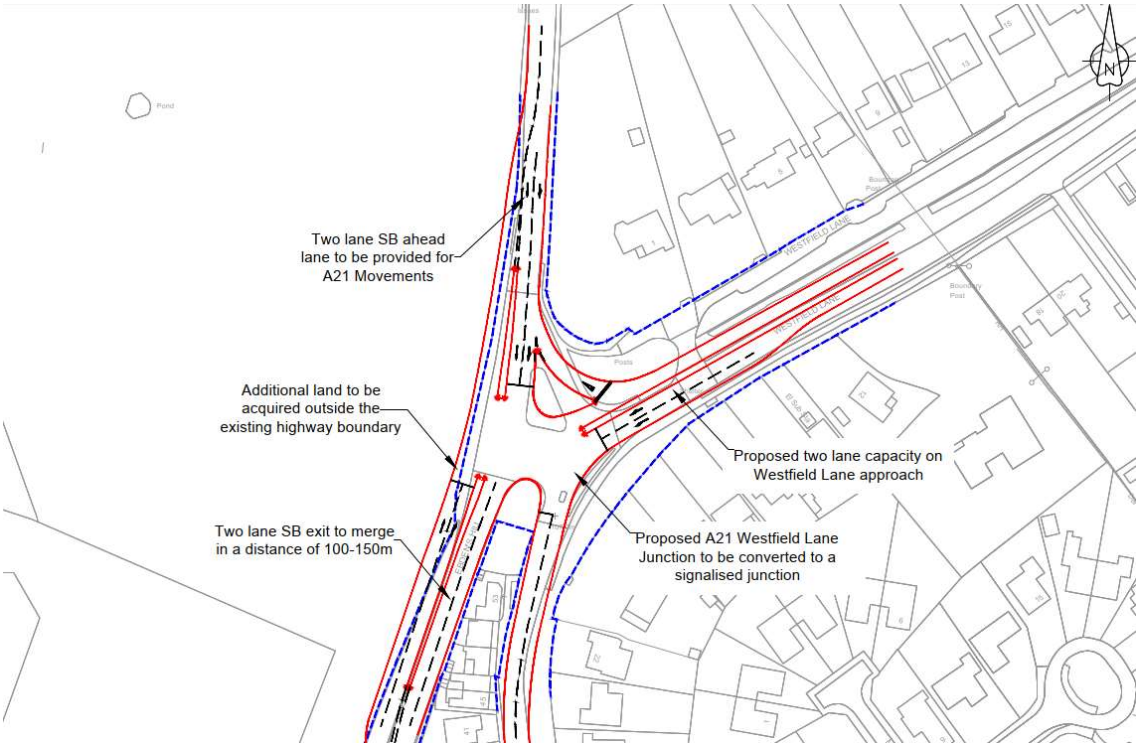


Figure 7-18 Proposed signalised junction at A21 / A28 Westfield Lane

Figure 7-19 shows the mitigation option modelling results 'with' Local Plan flows for the signalised junction. This shows that flows through the roundabout would be below maximum capacity, addressing previous issues, however some degree of queueing persists as a build-up of traffic occurs when waiting for signal changes.

Similarly to the roundabout option, the proposed signalised mitigation scheme has the potential to improve the performance of the junction, reducing RFC on Maplehurst

Road to 97% in the AM and 96% in the PM, however there is an increase in RFC anticipated on the other arms to the junction.

The signalisation of the junction (compared to the existing situation) provides the opportunity to incorporate pedestrian connectivity. It would also enable potential improvements for bus movements with bus priority equipment installed into the signals.

Further optioneering and feasibility investigation would be required.

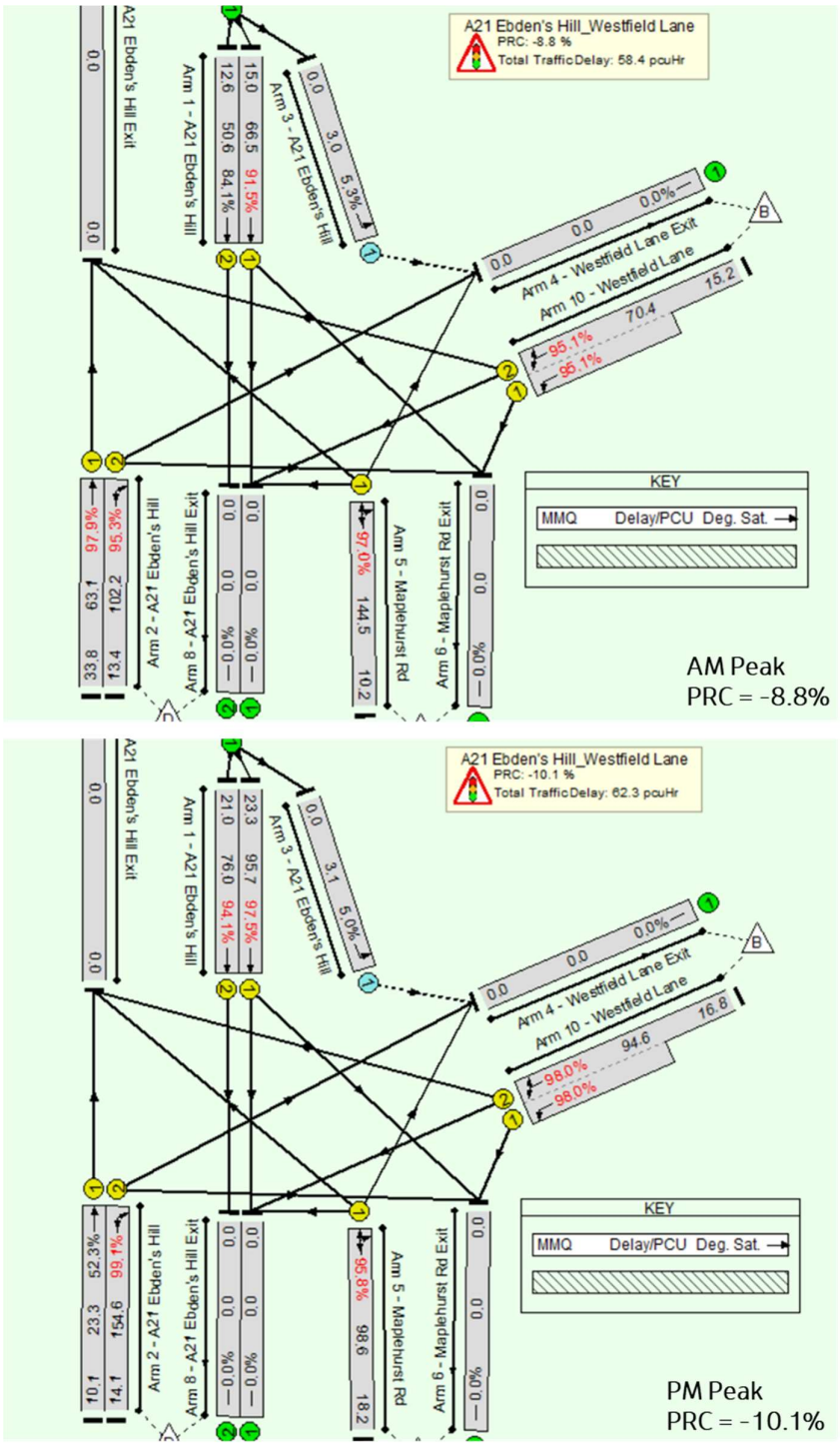


Figure 7-19 A21 / A28 Westfield Lane – Signalised Junction Mitigation Option Modelling – 'With' LP flows

7.10 J10 - Gillsmans Hill / Harley Shute Road

The Gillsmans Hill / Harley Shute Road junction is a four-arm roundabout between Gillsmans Hill / Harley Shute Road / Ironlatch Avenue and Crowhurst Road.

Figure 7-20 Gillman's Hill / Harley Shute Road junction overview

7.10.1 Modelling results

Table 7-23 and Table 7-24 below show the future forecast flows from the Countywide model for the existing junction comparing a 'with' Local Plan and 'without' Local Plan scenario.

The junction is expected to operate within capacity in the 2039 reference case scenario, where 2039 'with' Local Plan flows are 1-4% higher than 'without' Local Plan. The existing junction is anticipated to operate within capacity, and mitigation is not likely to be required.

Table 7-23 Gillsmans Hill / Harley Shute Road future flows without Local Plan

O/D	AM					PM				
	Ironlatch Avenue (NE)	Gillsmans Hill (SE)	Harley Shute Rd	B2092 (NW)	Total	Ironlatch Avenue (NE)	Gillsmans Hill (SE)	Harley Shute Rd	B2092 (NW)	Total
Ironlatch Avenue (NE)	0	179	301	100	**580**	0	145	218	75	**438**
Gillsmans Hill (SE)	217	0	99	451	**766**	140	0	97	364	**601**
Harley Shute Rd	320	120	0	304	**744**	225	71	0	128	**424**
B2092 (NW)	42	378	277	0	**697**	81	590	294	0	**965**
Total	**579**	**677**	**676**	**855**	**2787**	**446**	**806**	**608**	**568**	**2428**

Table 7-24 Gillsmans Hill / Harley Shute Road future flows with Local Plan

O/D	AM	PM

	Ironlatch Avenue (NE)	Gillsmans Hill (SE)	Harley Shute Rd	B2092 (NW)	Total	Ironlatch Avenue (NE)	Gillsmans Hill (SE)	Harley Shute Rd	B2092 (NW)	Total
Ironlatch Avenue (NE)	0	176	304	102	**582**	0	153	211	77	**442**
Gillsmans Hill (SE)	236	0	98	452	**786**	145	0	99	372	**615**
Harley Shute Rd	317	118	0	302	**737**	215	67	0	125	**408**
B2092 (NW)	42	388	281	0	**711**	83	655	294	0	**1032**
Total	**596**	**681**	**683**	**857**	**2817**	**443**	**876**	**604**	**574**	**2497**

Table 7-25 shows the future base modelling results for the Gillsmans Hill / Harley Shute Road junction. The existing junction is anticipated to operate within capacity, and mitigation is not forecast to be required.

Table 7-25 Gillsmans Hill / Harley Shute Road future base modelling results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	2040 WO LP					
1 - Ironlatch Avenue (N)	5.1	30.29	0.85	2.7	21.12	0.74
2 - Gillsmans Hill (E)	5.3	23.71	0.85	1.7	9.20	0.63
3 - Harley Shute Rd (S)	8.6	40.38	0.91	0.8	6.54	0.46
4 - B2092 Crowhurst Rd (W)	3.7	18.03	0.79	13.6	48.94	0.95
	2040 W LP					
1 - Ironlatch Avenue (N)	5.5	32.60	0.86	**3.2**	**24.66**	**0.77**
2 - Gillsmans Hill (E)	6.4	28.16	0.88	**1.7**	**9.40**	**0.64**
3 - Harley Shute Rd (S)	9.0	42.73	0.92	**0.8**	**6.44**	**0.44**
4 - B2092 Crowhurst Rd (W)	4.3	20.50	0.82	**28.5**	**88.40**	**1.02**

7.11 J11 - Priory Avenue / Braybrooke Road

The junction between Priory Avenue and Braybrooke Road is a signalised crossroads between Priory Avenue / Braybrooke Road / South Terrace. This junction is located just north of Hastings town centre.

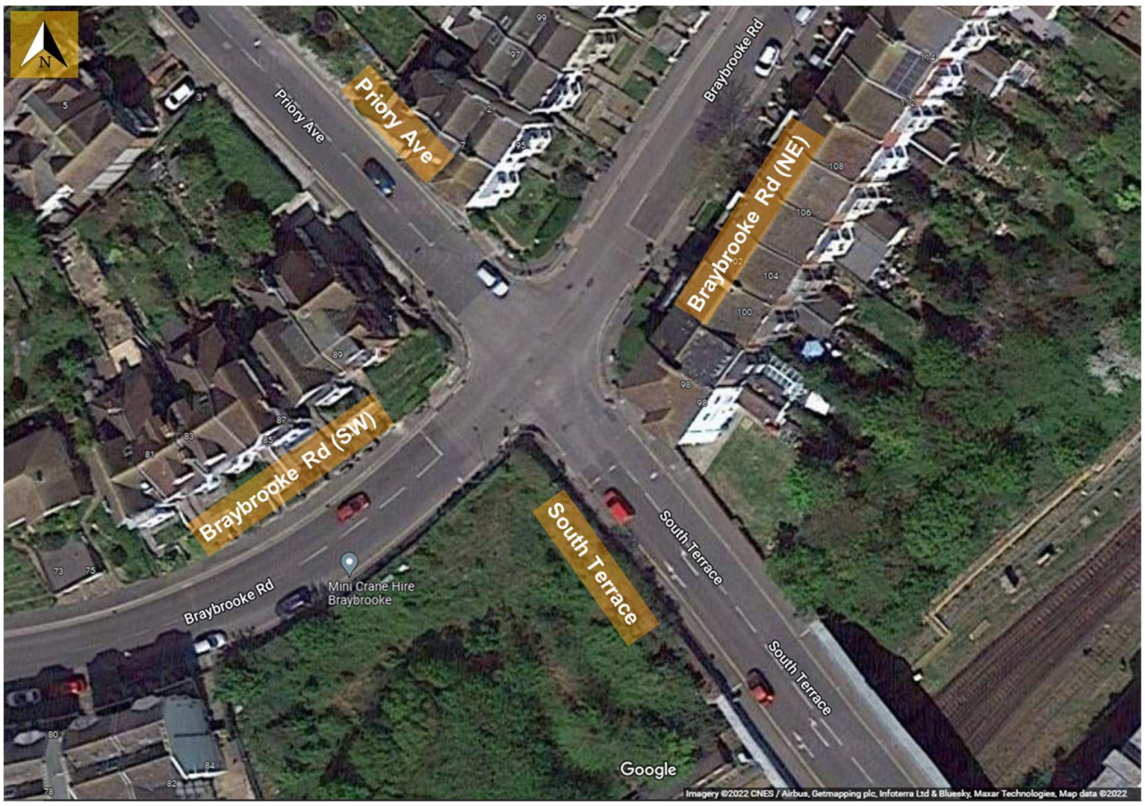


Figure 7-21 Priory Avenue / Braybrooke Road junction overview

7.11.1 Modelling results

Table 7-26 and Table 7-27 below show the future forecast flows from the Countywide model for the existing Priory Avenue / Braybrooke Road junction comparing a 'with' Local Plan and 'without' Local Plan scenario.

The junction is expected to operate within capacity in the modelled reference case scenario, where 2039 'with' Local Plan flows are 9-11% higher than 'without' Local Plan flows. As base traffic is relatively low, the Local Plan traffic growth is estimated to be moderate. However, the existing junction is still anticipated to operate within capacity, and mitigation is not required.

Table 7-26 Priory Avenue / Braybrooke Road future flows without Local Plan

O/D	AM					PM				
	Braybrooke Rd (NE)	**South Terrace (SE)**	**Braybrooke Rd (SW)**	**Priory Ave (NW)**	**Total**	**Braybrooke Rd (NE)**	**South Terrace (SE)**	**Braybrooke Rd (SW)**	**Priory Ave (NW)**	**Total**
Braybrooke Rd (NE)	0	65	390	89	**545**	0	34	305	119	**458**
South Terrace (SE)	122	0	64	84	**270**	208	0	77	125	**410**
Braybrooke Rd (SW)	174	16	0	11	**202**	274	23	0	13	**310**
Priory Ave (NW)	159	59	14	0	**232**	112	90	15	0	**216**
Total	**455**	**140**	**468**	**185**	**1249**	**594**	**147**	**397**	**257**	**1395**

Table 7-27 Priory Avenue / Braybrooke Road future flows with Local Plan

O/D	AM					PM				
	Braybrooke Rd (NE)	South Terrace (SE)	Braybrooke Rd (SW)	Priory Ave (NW)	Total	Braybrooke Rd (NE)	South Terrace (SE)	Braybrooke Rd (SW)	Priory Ave (NW)	Total
Braybrooke Rd (NE)	0	65	440	50	**556**	0	34	346	94	**473**
South Terrace (SE)	151	0	81	85	**316**	260	0	114	143	**517**
Braybrooke Rd (SW)	196	25	0	11	**231**	284	27	0	12	**323**
Priory Ave (NW)	159	61	17	0	**237**	117	76	17	0	**210**
Total	**506**	**151**	**538**	**146**	**1340**	**661**	**137**	**477**	**248**	**1523**

Error! Reference source not found.Error! Reference source not found. Figure A-7 and Figure A-8 in Appendix E show the mitigation option modelling results 'with' and 'without' Local Plan flows for the signalised junction. This shows that flows through the roundabout would be below maximum capacity and the suggested mitigation is likely to address previous issues, however queueing is still likely as a build-up of traffic occurs when waiting for signal changes.

Further optioneering and feasibility investigation would be required.

7.12 J12 - Glyne Gap roundabout

The Glyne Gap roundabout is a five-arm roundabout on the A259, which is on the Strategic Road Network and managed by National Highways, located just outside of the Hastings borough.

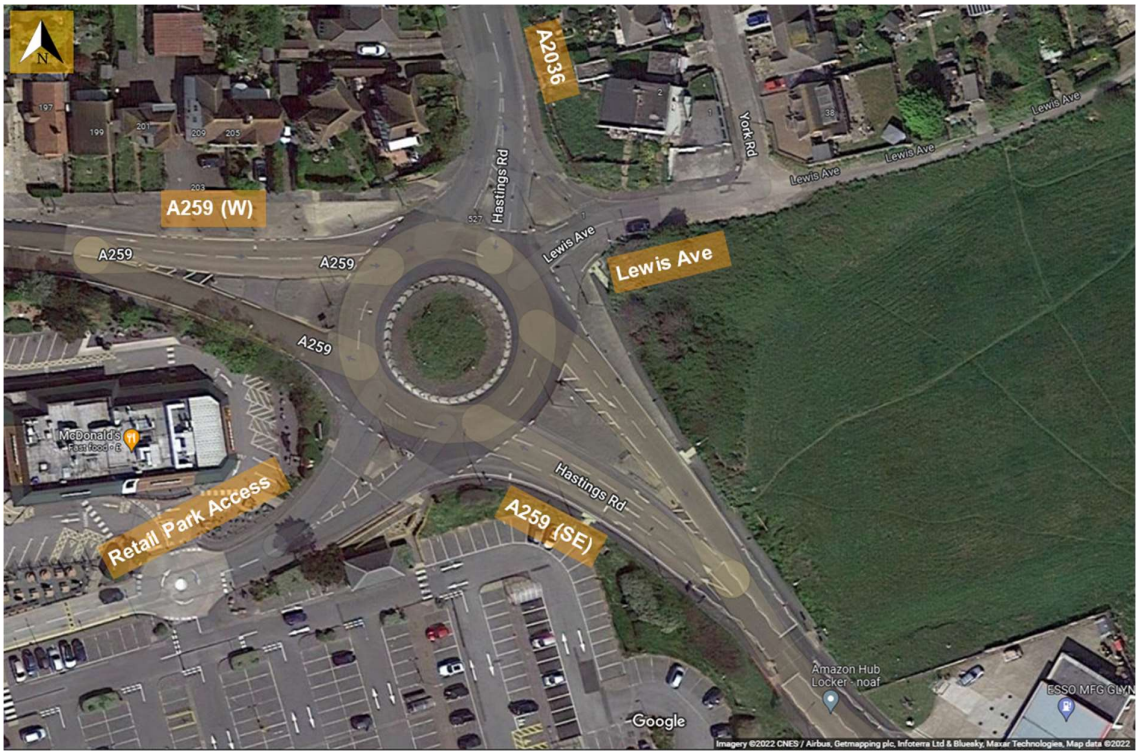


Figure 7-22 Glyne Gap roundabout junction overview

7.12.1 Modelling results

Table 7-28 and Table 7-29 show the future forecast flows from the Countywide model for the existing Glyne Gap roundabout. These show that the 2039 'with' Local Plan flows are marginally higher than the 'without' Local Plan flows. The flows show that the existing roundabout is already encountering delays. The Local Plan would add to this pressure and exacerbate queues and delays at this junction.

Table 7-28 Glyne Gap roundabout future flows without Local Plan

O/D	AM						PM					
	A2036	Lewis Ave	A259 (WB)	Retail Park	A259 (EB)	Total	A2036	Lewis Ave	A259 (WB)	Retail Park	A259 (EB)	Total
A2036	9	2	366	114	84	**575**	12	5	250	198	41	**506**
Lewis Ave	4	0	6	0	1	**11**	4	0	4	0	2	**10**
A259 (WB)	259	3	16	130	916	**1325**	226	1	2	201	620	**1051**
Retail Park	79	1	101	0	63	**244**	187	10	259	0	105	**560**
A259 (EB)	54	3	673	79	0	**808**	44	1	658	104	1	**808**
Total	**405**	**9**	**1162**	**323**	**1065**	**2964**	**473**	**17**	**1173**	**503**	**769**	**2935**

Table 7-29 Glyne Gap roundabout future flows with Local Plan

O/D	AM						PM					
	A2036	Lewis Ave	A259 (WB)	Retail Park	A259 (EB)	Total	A2036	Lewis Ave	A259 (WB)	Retail Park	A259 (EB)	Total
A2036	9	2	362	113	84	**571**	12	5	256	197	41	**511**
Lewis Ave	4	0	6	0	1	**11**	4	0	4	0	2	**10**
A259 (WB)	256	3	16	131	924	**1331**	232	1	2	201	624	**1060**
Retail Park	78	1	101	0	64	**244**	187	10	259	0	104	**560**
A259 (EB)	54	3	675	78	0	**811**	44	1	673	104	1	**822**
Total	**402**	**9**	**1161**	**323**	**1073**	**2968**	**478**	**17**	**1194**	**502**	**772**	**2964**

Table 7-30 shows the future base modelling results for the Glyne Gap roundabout. This shows that the existing roundabout layout is constrained on the A2036 arm and would operate over capacity without Local Plan growth.

Table 7-30 Glyne Gap roundabout future base modelling results

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	Glyne Gap - 2040 WO LP					
1 - A2036	83.5	525.20	1.31	74.7	506.31	1.32
2 - Lewis Road	0.0	10.91	0.04	0.0	12.70	0.04
3 - Hastings Road	2.8	6.92	0.73	1.5	4.57	0.59
4 - Retail Park	0.4	6.04	0.31	1.2	7.29	0.56
5 - De La Warr Road	1.2	4.96	0.54	1.5	6.20	0.60
	Glyne Gap - 2040 W LP					
1 - A2036	80.7	504.57	1.30	**81.0**	**562.03**	**1.36**
2 - Lewis Road	0.0	10.92	0.04	**0.0**	**12.91**	**0.04**
3 - Hastings Road	2.8	7.00	0.73	**1.5**	**4.60**	**0.60**
4 - Retail Park	0.5	6.08	0.31	**1.2**	**7.36**	**0.56**
5 - De La Warr Road	1.2	4.95	0.54	**1.6**	**6.43**	**0.62**

7.12.2 Proposed Mitigation

This mitigation proposal would improve the capacity available on the existing A2036 arm flare lane, shown in Figure 7-23.

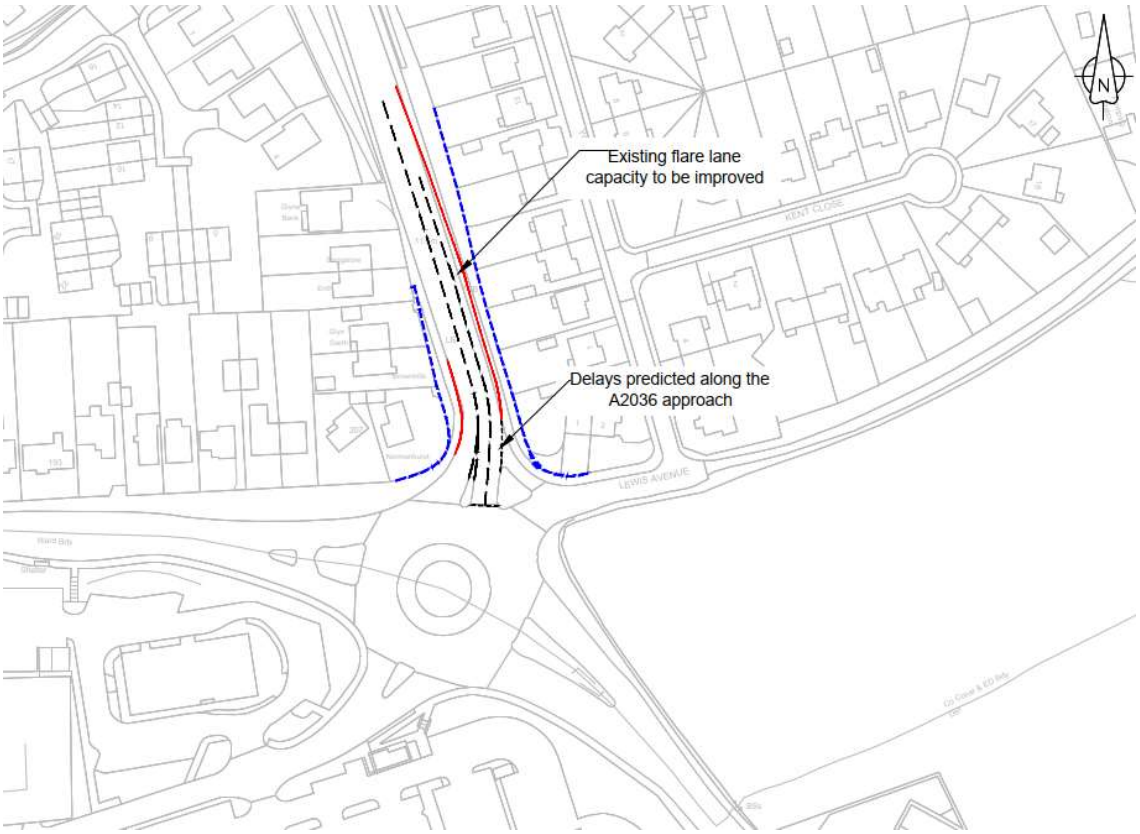


Figure 7-23 Proposed junction at the Glyne Gap roundabout

The modelling of this mitigation option with and without Local Plan flows is shown in Table 7-31. The proposed mitigation option suggested delivers a material improvement to capacity.

Without mitigation and with the Local Plan, the A2036 arm is expected to have 130% RFC in the AM and 131% in the PM. However, the proposed mitigation scheme has the potential to improve the performance of the junction, reducing RFC to 99% in the AM and 100% in the PM. The modelling assessment and proposed mitigation at this junction will require discussions with Rother District Council and National Highways.

Table 7-31 Glyne Gap roundabout – Roundabout Mitigation Option Modelling 2039 'without' and 'with' LP Flows

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
	Glyne Gap - 2040 WO LP					
1 - A2036	17.0	98.56	1.00	15.4	102.06	0.99
2 - Lewis Road	0.0	13.27	0.04	0.0	15.62	0.05
3 - Hastings Road	2.9	7.39	0.74	1.5	4.83	0.61
4 - Retail Park	0.5	6.17	0.31	1.3	7.40	0.56
5 - De La Warr Road	1.2	4.97	0.54	1.5	6.22	0.60
	Glyne Gap - 2040 W LP					
1 - A2036	15.8	93.03	0.99	18.7	120.18	1.02
2 - Lewis Road	0.0	13.22	0.04	0.0	16.11	0.05
3 - Hastings Road	3.0	7.48	0.75	1.6	4.88	0.61
4 - Retail Park	0.5	6.21	0.32	1.3	7.47	0.56
5 - De La Warr Road	1.2	4.96	0.54	1.6	6.45	0.62

7.13 J13 - A259 / A269 Dorset Road

The A259 King Offa Way / A269 junction is an intersection with multiple lanes on the A259, and slip-roads from the A269 onto De-La-Warr Road and the A259. This junction is also located outside of the Hastings borough.

Figure 7-24 A259 / A269 Dorset Road junction overview

7.13.1 Modelling results

Table 7-32 and Table 7-33 show the future forecast flows from the Countywide model for the existing junction comparing a 'with Local Plan' and 'without Local Plan' scenario. 2039 'with' Local Plan flows are marginally higher than 'without' Local Plan flows and base traffic is relatively moderate. Therefore, the junction is expected to operate within the capacity, so mitigation is not required.

Table 7-32 A259 / A269 Dorset Road future flows without Local Plan

O/D	AM					PM				
	Dorset Road	A259 (WB)	A269 Dorset Rd	A259 (EB)	Total	Dorset Road	A259 (WB)	A269 Dorset Rd	A259 (EB)	Total
Dorset Road	0	86	132	186	**403**	0	16	89	97	**203**
A259 (WB)	15	0	315	808	**1138**	24	0	277	586	**887**
A269 Dorset Rd	129	277	0	34	**439**	118	298	0	12	**428**
A259 (EB)	205	647	42	0	**894**	135	565	32	0	**732**
Total	**348**	**1010**	**489**	**1028**	**2875**	**278**	**879**	**398**	**695**	**2250**

Table 7-33 A259 / A269 Dorset Road future flows with Local Plan

O/D	AM					PM				
	Dorset Road	A259 (WB)	A269 Dorset Rd	A259 (EB)	Total	Dorset Road	A259 (WB)	A269 Dorset Rd	A259 (EB)	Total

Dorset Road	0	83	132	187	**401**	0	18	89	97	**204**
A259 (WB)	15	0	315	817	**1146**	24	0	277	590	**891**
A269 Dorset Rd	129	277	0	34	**439**	118	298	0	12	**428**
A259 (EB)	205	647	42	0	**893**	135	575	32	0	**742**
Total	**348**	**1006**	**489**	**1037**	**2880**	**277**	**891**	**398**	**700**	**2266**

For reference, Figure A-9 and Figure A-10 in Appendix E present the future base modelling results for the A259 / A269 Dorset Road junction with and without the Local Plan adjustments. These show that all approaches to the junction are operating within capacity. The A259 eastern arm and Dorset Road northern arm in the AM in both scenarios see higher flows, but still functioning below maximum road capacity.

7.14 J14 - A21 Queensway

This is currently a T-junction between the A21 and Junction Road.

Figure 7-25 A21 Queensway junction overview

7.14.1 Proposed mitigation

Figure 7-26 shows the proposed mitigation for the junction, with an indicative signalised layout that has been developed by Sea Change Sussex, who are the scheme promoter for the Queensway Gateway Road, and once implemented will

complete the gateway road through from Queensway to the A21. This layout has been modelled and assessed and found to operate without any significant delays.

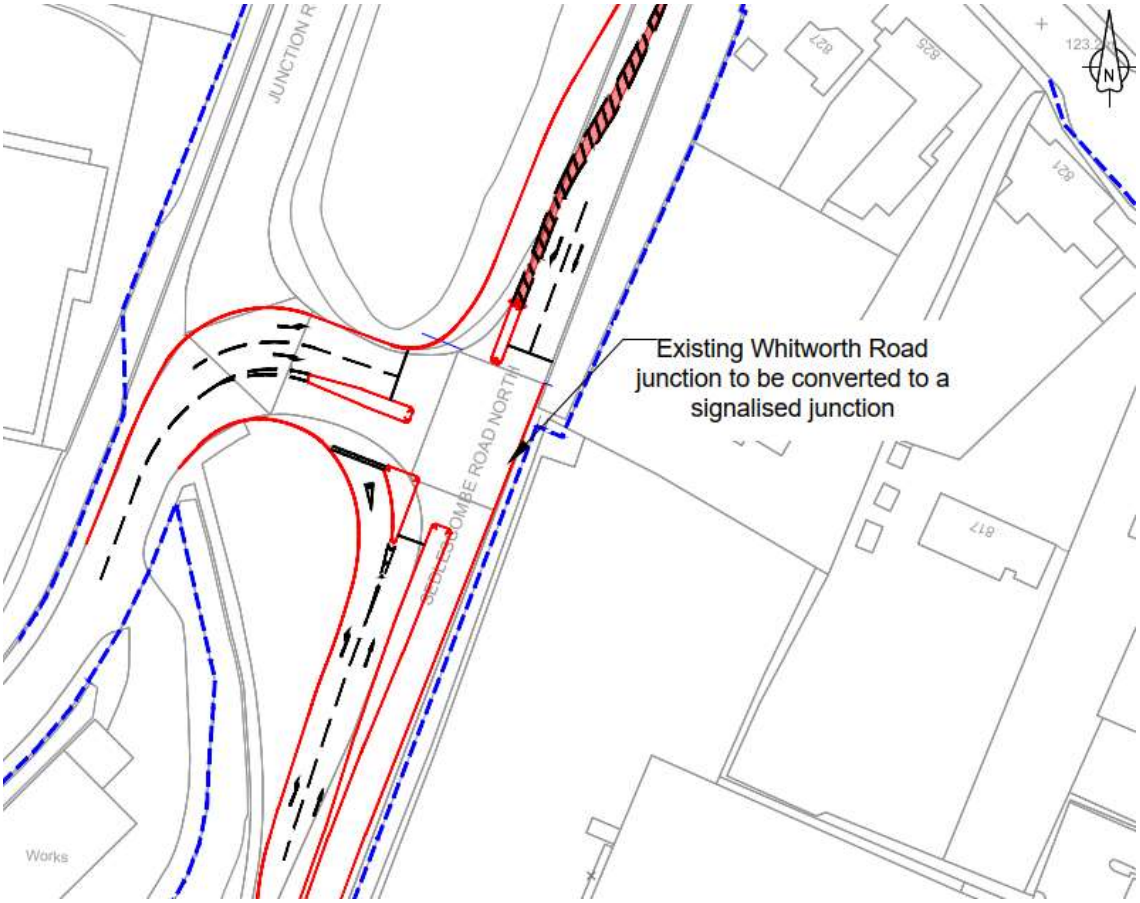


Figure 7-26 Proposed signalised junction at A21 Queensway

Table 7-34 and Table 7-35 below show the future flows of the proposed signalised junction comparing a 'with Local Plan' and 'without Local Plan' scenario. The 2039 'with' LP flows are around 2% higher than 'without' LP flows and base traffic is relatively moderate. This shows that the Local Plan impacts from the proposed junction layout would not be significant.

Table 7-34 A21 Queensway proposed junction future flows without Local Plan

O/D	AM				PM			
	A21 SB	Queensway	A21 NB	Total	A21 SB	Queensway	A21 NB	Total
A21 SB	35	747	371	**1154**	1	819	452	**1272**
Queensway	677	0	128	**805**	541	0	115	**656**
A21 NB	362	208	0	**570**	28	60	53	**141**
Total	**1075**	**955**	**499**	**2529**	**570**	**879**	**620**	**2069**

Table 7-35 A21 Queensway future flows with Local Plan

O/D	AM				PM			
	A21 SB	Queensway	A21 NB	Total	A21 SB	Queensway	A21 NB	Total
A21 SB	41	748	373	**1163**	2	829	473	**1305**
Queensway	702	0	130	**832**	548	0	113	**661**
A21 NB	365	212	0	**576**	27	60	54	**141**
Total	**1108**	**960**	**504**	**2571**	**577**	**889**	**640**	**2107**

The modelling of this mitigation option with and without local plan flows is shown in Figure 7-27 and Figure 7-28. This proposed mitigation is likely to provide adequate capacity.

Additional traffic management measures would be required in the vicinity to implement the scheme.

The section of Junction Road from The Ridge closed off to traffic provides the greater benefits to pedestrian and cyclist movements across the junction.

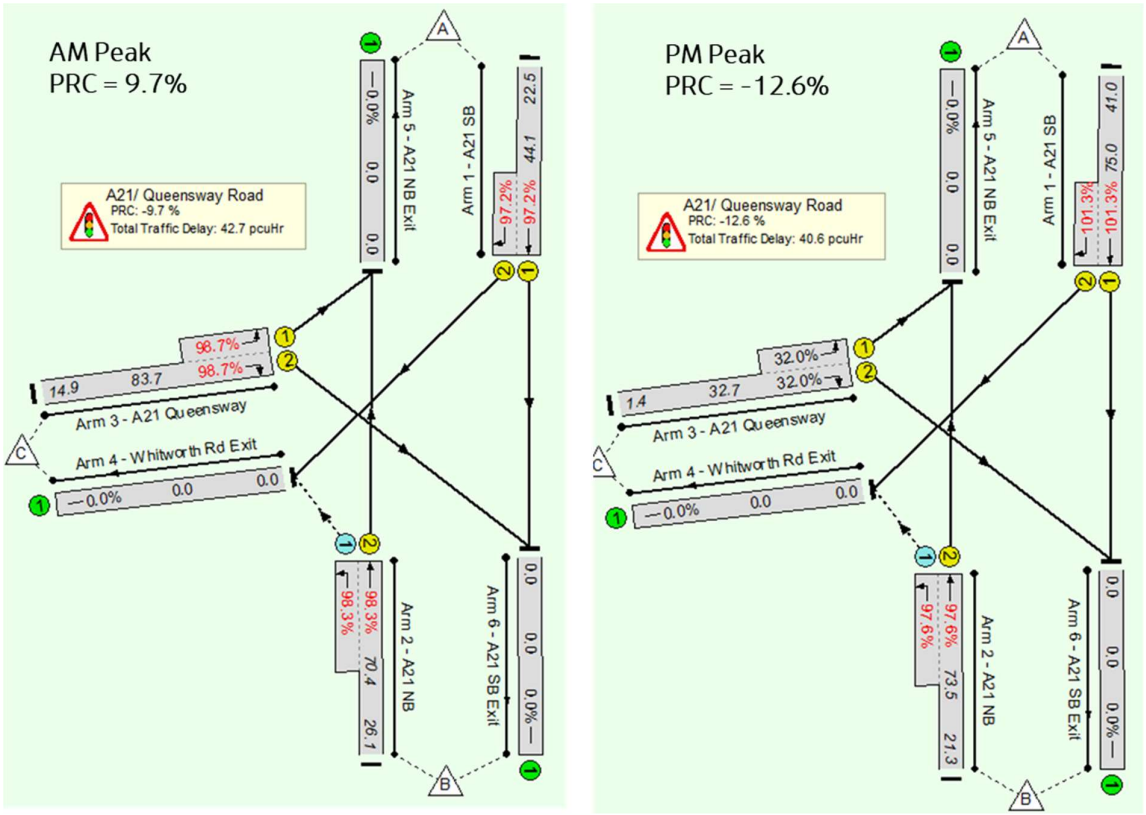


Figure 7-27 A21 Queensway – Mitigation Option Modelling – 'Without' LP flows

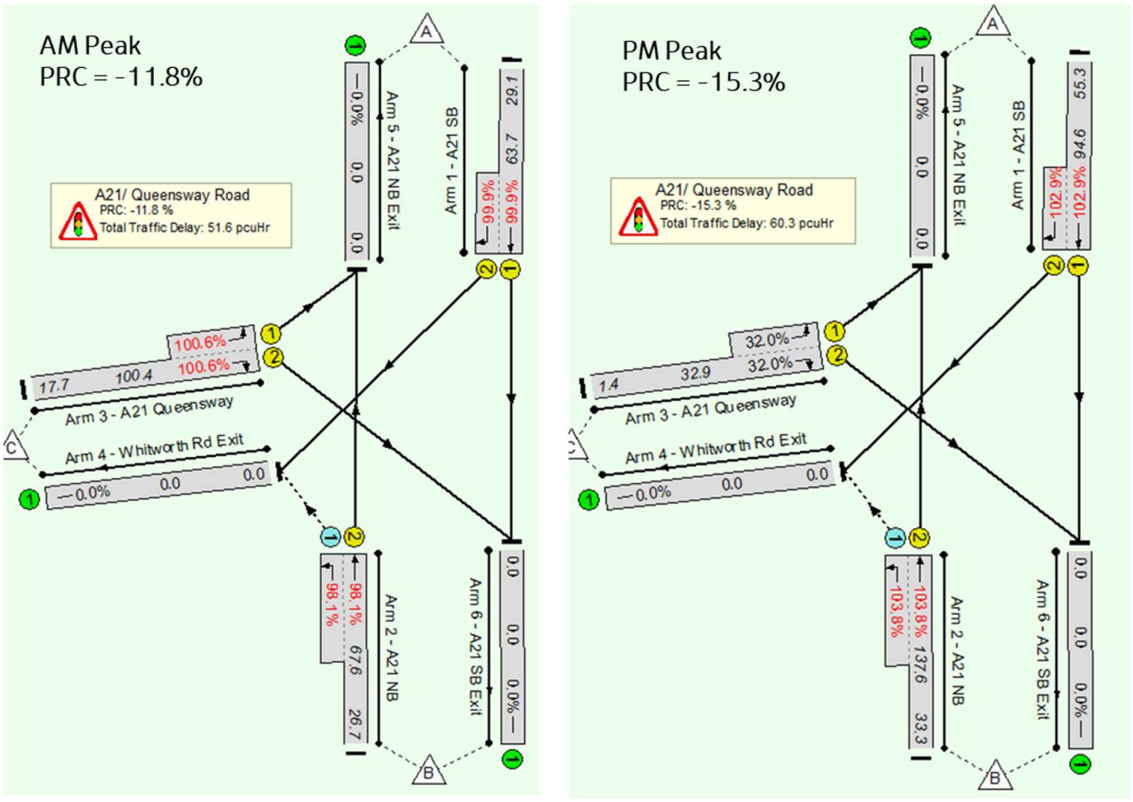


Figure 7-28 A21 Queensway – Mitigation Option Modelling – 'With' LP flows

7.15 Wider Mitigation

The impacts of wider additional cross-boundary Local Plan growth, from other districts, on the Hastings network may require additional mitigation. This will be considered once their growth strategies are known and modelled using the same approach taken for this piece of work. The cross-boundary impacts of the Hastings Local Plan on surrounding districts will be discussed with both Rother and Wealden District Councils with opportunities for mitigation identified.

7.16 Summary

Junction mitigations are demonstrated as likely to be needed on the A21, A259 and B2093 corridors which, with reasonable local improvements could be implemented to improve capacity at a junction level. It should be noted that the network is forecast to be under pressure at some identified locations due to current conditions and already committed growth. The Local Plan could add to this pressure and exacerbate queues and delays at identified junctions. Junctions recommended for intervention are likely to require transport mitigation. Such opportunities will be discussed with ESCC and NH where appropriate along with an approach to minimising travel by vehicle and maximising the use of alternative and sustainable modes or reducing the need to travel in the first place.

Potential junction mitigation measures have been modelled for the future year with the Local Plan scenario, and it has been demonstrated that traffic flows through each junction exceed junction capacity in some peak periods. These constraints may result in trip suppression and further consideration will be needed to explore the full potential

for active modes and bus priority to support the sustainable mode shift needed to support the mitigation of the Local Plan and achieve wider sustainability objectives.

It should be noted that all designs are subject to more detailed feasibility, land availability and junction modelling.

8 Summary and Further Work

8.1 Initial mitigation options summary

The ESCC Countywide highway model has been used to understand the likely impacts of Local Plan growth on the transport system at a strategic level. The model has an established future year reference case (2039), incorporating approved transport infrastructure changes, alongside approved housing and economic growth. The reference case acts a basis with which to compare a modelled scenario incorporating likely Hastings Local Plan growth to determine network impacts of travel demand as a result of the Local Plan.

This report has set out the outcomes of the ESCWTM analysis for Hastings in parallel with a local junction modelling appraisal of likely impacts and possible mitigations following Local Plan implementation at identified junctions across the borough.

The report has also provided an initial framework of evidence, opportunities and challenges facing the development option tested in this study to outline the potential for modal shift and sustainable transport options in Hastings. However, the identified potential impacts of the delivery of sustainable transport measures have not been explicitly considered in the operational modelling assessment. Inputs to the operational modelling have come directly from the Countywide model forecasts.

These outcomes of the initial junction mitigation review are summarised in Table 8-1.

Table 8-1 Summary of concept review options

Ref	Junction	Progress update	Mitigation summary	Mitigation required?
J1	B2093 The Ridge/Harrow Lane junction	Initial runs completed for the existing layout Preliminary investigation suggests mitigation require to the existing layout. Mitigation layout prepared	2039 'with' LP flows are around 2% higher than 'without' LP flows. Existing junction is already congested as base traffic is high, but the LP increase is low Existing mini-roundabout layout is constrained and would operate over its capacity in the 'without' LP scenario. The proposed mitigation (signalised junction) suggested and tested for the LP flows is likely to provide adequate capacity. However, proposed layout will be still constrained and might need marginal land intake outside the highway boundary. Further optioneering and feasibility investigation would be required.	Yes
J2	B2159/Blackman Avenue/Ashbrook Road	Initial runs completed for the existing layout	2039 'with' LP flows are around 1% higher than 'without' LP flows and base traffic is relatively moderate. Junction to operate within the capacity	No
J3 & J4	A21/ Old Harrow Road & Harrow Lane Junctions	Initial runs completed for the existing layout Preliminary investigation suggests mitigation require to the existing layout. Mitigation layout prepared, but does have issues to be resolved for its feasibility	2039 'with' LP flows are around 2% higher than 'without' LP flows. Existing junction is already congested as base traffic is high, but the LP increase is low Existing mini-roundabouts are constrained, with multiple properties have access from the junction. The existing junction would operate over its capacity in the 'without' LP scenario. The proposed mitigation (signalised junction) suggested and tested for the LP flows is likely to provide adequate capacity. But would like to have difficulty in signalised operations with multiple properties having access to it, and most likely to require their closure Further optioneering and feasibility investigation would be required.	Yes

J5	A259/Harley Shute Road Signalised Junction	Initial runs completed for the existing layout	2039 'with' LP flows are insignificantly higher (around 1%) than 'without' LP flows and base traffic is relatively moderate. Junction to operate within the capacity	No
J6	A259/Filsham Road Signalised Junction	Initial runs completed for the existing layout	2039 'with' LP flows are 1-2% higher than 'without' LP flows and base traffic is relatively moderate. Junction to operate within the capacity	No
J7	The Ridge / Hillside Road Priority Junction	Initial runs completed for the existing layout	2039 'with' LP flows are 3% higher than 'without' LP flows and base traffic is relatively moderate. Junction to operate within the capacity, minor arm traffic would mostly encounter moderate delays	No
J8	Grange Road / Hillside Road Priority Junction	Initial runs completed for the existing layout	2039 'with' LP flows are 3% higher than 'without' LP flows and base traffic is relatively moderate. Junction to operate within the capacity, minor arm traffic would mostly encounter moderate delays	No
J9	A21/ A28 Westfield Lane Junction	Initial runs completed for the existing layout Preliminary investigation suggests mitigation require to the existing layout. Mitigation layout prepared	2039 'with' LP flows are marginally higher (around 1%) than 'without' LP flows. Existing junction is already showing signs of congestion as base traffic is high Existing junction is a complicated/constrained layout and would operate over its capacity even in the 'without' LP scenario. Two mitigation options have been looked at and both predicted to provide the required capacity. Both layouts would need moderate land intake outside the existing highway boundary. Further optioneering and feasibility investigation would be required.	Yes
J10	Gillman's Hill/ Harley Shute Road roundabout	Initial runs completed for the existing layout	2039 'with' LP flows are 1-4% higher than 'without' LP flows and base traffic is relatively moderate Junction to operate within the capacity	No
J11	Priory Ave./Braybrooke Rd. Signalised Junction	Initial runs completed for the existing layout	2039 'with' LP flow are 9-11% higher than 'without' LP flows. As base traffic is relatively low, therefore the LP traffic growth estimated to be moderate. Junction to modelled to operate within the capacity.	No
J12	A259 Glyne Gap Roundabout	Initial runs completed for the existing layout Preliminary investigation suggests mitigation require to the existing layout. Mitigation layout prepared	2039 'with' LP flows are insignificantly higher than 'without' LP flows and base traffic is relatively moderate. Existing roundabout is already encountering delays as base traffic is moderate Existing roundabout layout is constrained and would operate over its capacity in the 'without' LP scenario (for the northern arm of A2036). Moderate improvement to increase flare capacity is suggested for the A2036 approach. Proposed mitigation option suggested is predicted to provide the required capacity	Yes
J13	A269 Dorset Road/A259 Junction	Initial runs completed for the existing layout	2039 'with' LP flows are insignificantly higher than 'without' LP flows and base traffic is relatively moderate. Junction to operate within the capacity	No
J14	A21 - Queensway Road	Initial runs completed for the future layout (indicative signalised layout)	2039 'with' LP flows are around 2% higher than 'without' LP flows and base traffic is relatively moderate. An indicative signalised junction layout is assessed and found to be operating without any significant delays The indicative layout needs further investigation and feasibility study. Additional traffic management measures would be required in the vicinity to implement the scheme.	Yes

8.2 Further work

Following on from this appraisal of HBC's Local Plan road network impacts, further tasks which will be required include:

- Liaison and discussion between ESCC, HBC and National Highways to agree a Statement of Common Ground related to the adoption of the Local Plan and transport network mitigation proposals.

- Consider and prioritise potential impacts of active modes and future mobility on reference case and local plan demand to estimate an allowance for reduced highway demand and test in next iteration operational junction assessments.
- Appraise impacts of junction mitigation in the Countywide model to assess traffic behaviour such as rerouting and demand at nearby junctions.
- Incorporate the sustainable transport and modal-shift opportunities identified in the assessment into the junction modelling and mitigation results to reflect scenarios with improvements beyond the highway boundary.
- As part of the review of the Local Transport Plan and to enable greater integration with the local plan, work in partnership with ESCC to undertake further transport studies to support the identification of further measures to create 'liveable towns and neighbourhoods'.

Appendices

Appendix A: Test Sites

Site Ref	Address	Proposed New Dwellings	Proposed New Employment GFA (m^2)
HL9	Seaside Road, West St Leonards	32	0
HL39	Ore Valley (Former Power Station)	55	0
HL40	Mount Pleasant Hospital, 7 Frederick Road	12	0
HL55	Summerfields	250	0
HL63	Rock Lane	27	0
HL84	Pilot Field, Elphinstone Road	120	0
HL87	Land North-West Winchelsea Lane	20	0
HL101	Priory Meadow, Hastings	120	0
HL104	Car park, 35 Shepherd Street	9	0
HL111	Gambier house, 111 West Hill Road and West House, 115 West Hill Road.	5	0
HL112	Playingfields of former Helenswood Academy (part); former Mount Denys, Ridgeway and Pinehill (2.78 ha total).	82	0
HL113	Former Westerleigh School and Playing Fields (2.71ha)	33	0
TC1	Priory St. Carpark and ESK	130	0
TC2	Station approach Car Park and Royal Mail Delivery Office	0	10000
TC3	Debenhams	0	8297
TC5	TC5: Observer building	0	2668
TC6	Former Post Office, Cambridge Road and Former University of Brighton Building, Priory Quarter	0	2900
TC7	White Rock Sports Park	0	3000
TC8	Corner of Wellington Place and Albert Road; Cinema, Queens Road; 1-7 Wellington Place	60	3500
TC9	Harold Place (site of former public conveniences)	0	200
TC10	Cornwallis Street Car Park	0	2200
	Windfall	555	0
TOTAL		**1510**	**32765**

Appendix B: Known Scheme Pipeline

Ref	Scheme name	Description
Committed (near certain / more than likely)		
1	Queensway Gateway Road	• Link road between Queensway and A21 south and running parallel to The Ridge
2	Bexhill Road bus priority measures (part of the BHLR complementary measures)	• Phase 2 - bus lane extension (w/b) to Glyne Gap roundabout • Phase 3 - bus lane (e/b) on approach to Filsham Road signalised junction/bus lane (w/b) on approach to Harley Shute Rd
3	£2 Bus Fares Bus Passes / Subsidies	
4	Travel Plans	
5	Countywide 'Pedal Power' Electric Bicycles Promotion	
6	Car Parking assessment and rationalisation	
7	Bus Service Improvement Plan	• East Sussex Enhanced Partnership • Bus Priority • Bus Service Support • Fares Support • Other Infrastructure • Enforcement • Marketing & Promotion
Planned (reasonably likely)		
8	ESCC Local Cycling & Walking Infrastructure Plan schemes	
Concept (uncertain)		
9	Hastings Bus Based Mass Transit	
10	Hastings - Bexhill Rapid transit	
11	A259 / Marshlink Level Crossings	• 2x level crossings at Starham East Guldeford - likely need to realign A259
12	Marshlink High speed services Partial	• New hourly service from Eastbourne, Bexhill, Hastings to London St Pancras throughout day • Dedicated train in the peak, joins Dover train in the off-peak • 19-minute journey time saving for Hastings direct train to London (7 minutes in off-peak)

Ref	Scheme name	Description
		• 35-minute journey time saving for Bexhill direct train to London
13	High Speed 1/Marshlink' Hastings, Bexhill & Eastbourne upgrade	• A259 diverted, upgrade of some crossings, some foot crossings closed & diverted • Upgrade between Bexhill and Hampden Park to reduce journey times • New hourly service from Eastbourne, Bexhill, Hastings to London St Pancras throughout day • Dedicated train in the peak, joins Dover train in the off-peak • 29-minute journey time saving for Hastings direct train to London (17 minutes in off-peak) • 45-minute journey time saving for Bexhill direct train to London
14	Hydrogen Bus Programme	• Newhaven Hydrogen Hub being considered
15	East Sussex Interurban Bus	
16	Countywide mass transit	
17	A21 Pembury – Hastings Safety enhancements (RIS2 scheme)	
18	A259 level crossing removal – east of Rye (Star and Guldeford level crossings)	
19	A21 Kippings Cross – Lamberhurst – dualling and Flimwell and Hurst Green Bypasses	
20	Hastings and Bexhill distributor roads	
21	Faversham – Canterbury – Ashford – Hastings – NCN enhancement	
22	East Sussex Local Cycleways	
23	East Sussex Inter urban cycle ways	
24	Tunbridge Wells - Hastings NCN enhancement	

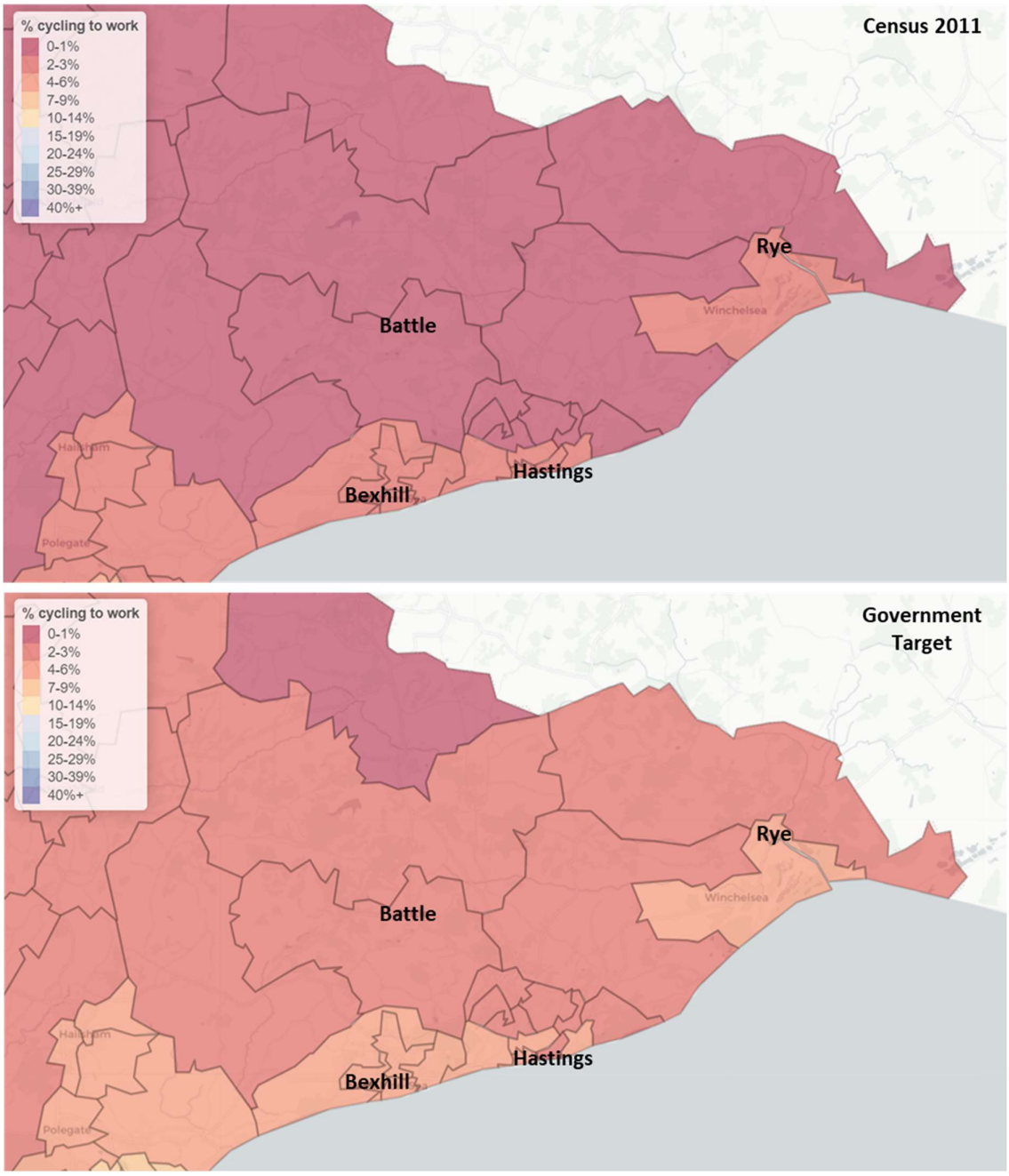
Appendix C: LCWIP Schemes

Scheme Proposal	
Cycling Schemes	
HS1 -	NCN2 Bulverhythe – Old Town
HS2 -	NCN2 Old Town - Fairlight
HS3 -	West St. Leonards – A21
HS4 -	Robertson Street / Wellington Place
HS5 -	West Hill
HS6 -	Hughenden Road – Queens Road
HS7 -	West St. Leonards – London Road
HS8 -	St. Leonards Warrior Square – Hastings Centre
HS9 -	Hastings Station - St. Helens Road
HS10 -	St Helens Road – Ore Station
HS11 -	Ore Station - The Ridge
HS12 -	Ore Station - The Ridge alternative
HS13 -	Robsack Wood - Hastings
HS15 -	Ashford Road
HS16 -	St. Helens Down
HS17 -	St. Helens Park Road
HS18 -	Tilekin to Conquest Hospital
HS19 -	The Ridge
HS20 -	Tile Barn Road Spur
HS21 -	Wishing Tree Road North Spur
HS22 -	Wishing Tree Road – NCN2
HS23 -	Battle Road to Silverhill
HS24 -	Silverhill – St. Leonards – NCN2
HS25 -	A21 – The Ridgeway - Silverhill
HS26 -	A21 – Silverhill to Hastings Station
HS27 -	Briscoes Walk
HS28 -	Conquest Hospital – Alexandra Park – Bethune Way
Walking Schemes	
H1 -	Core Walking Zone
H2 -	White Rock to Harley Shute Road
H3 -	Cornwallis Gardens to Hollington Old Lane
H4 -	Queens Rd to The Ridge
H5 -	Milward Road to Ivyhouse Lane
H6 -	The Bourne to Rye Road

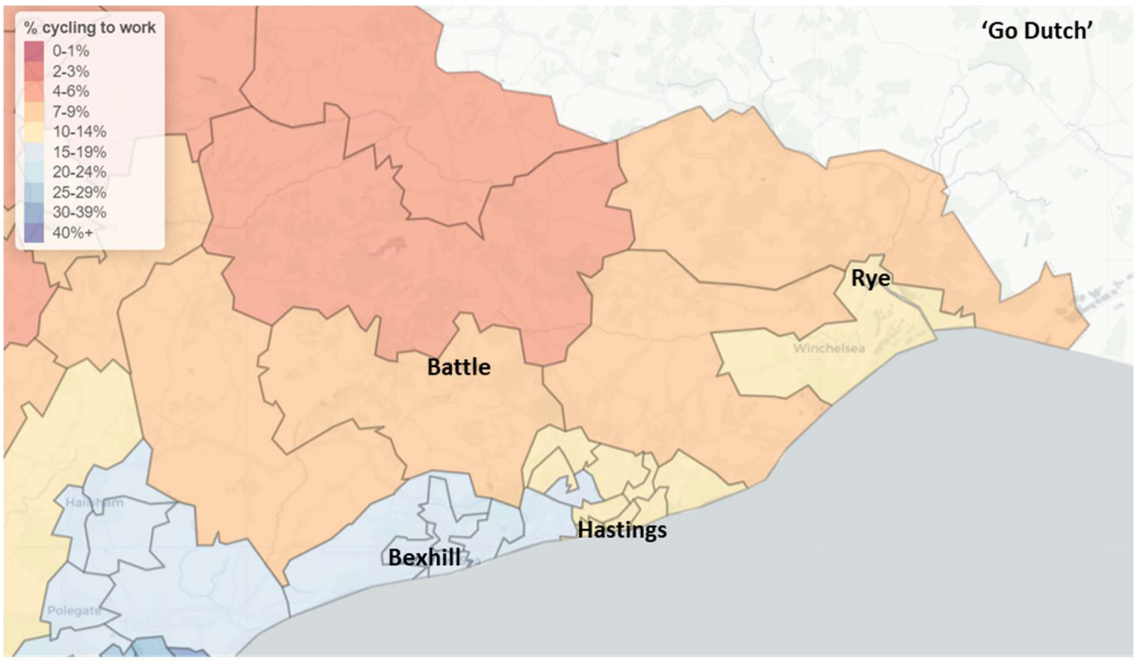
H7 -	Pelham Place to Barley Lane
BHS -	Bexhill-Hastings Seafront

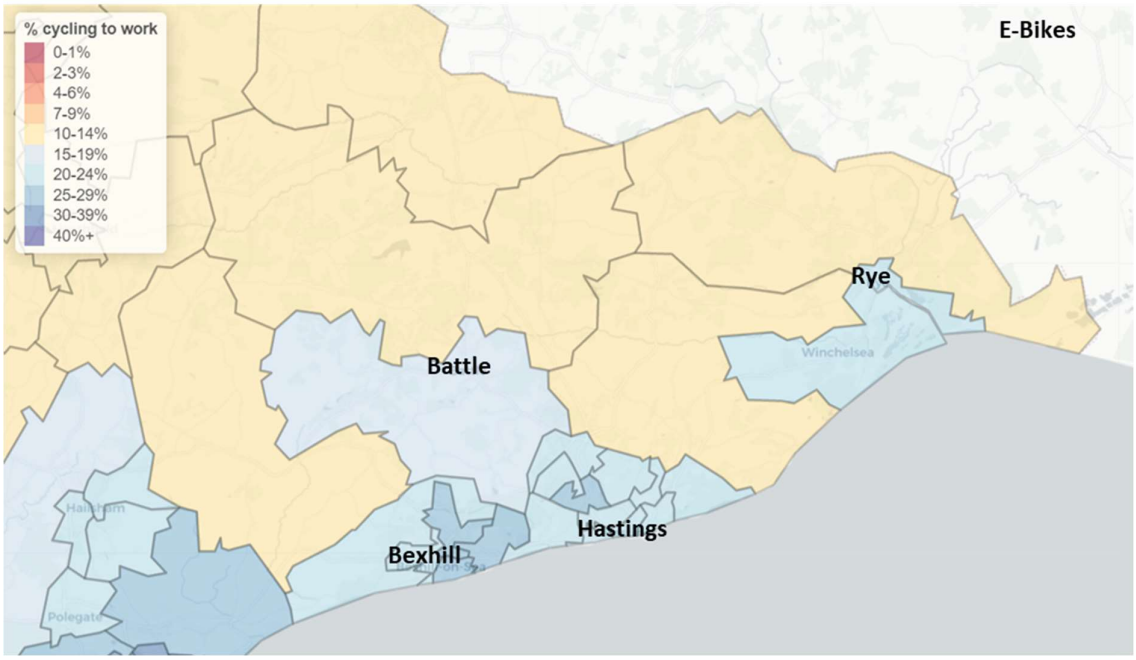
Appendix D: Propensity to Cycle Tool – Hastings Scenarios

Source: DfT Propensity to Cycle Tool (PCT[34]) – date October 2022



[34] www.pct.bike


% cycling to work
0-1%
2-3%
4-6%
7-9%
10-14%
15-19%
20-24%
25-29%
30-39%
40%+
'Go Dutch'
Rye
Battle
Hastings
Bexhill


% cycling to work
0-1%
2-3%
4-6%
7-9%
10-14%
15-19%
20-24%
25-29%
30-39%
40%+
E-Bikes
Rye
Battle
Hastings
Bexhill

Appendix E: Junction Modelling without mitigation

J2 - B2159 / Blackman Avenue / Ashbrook Road

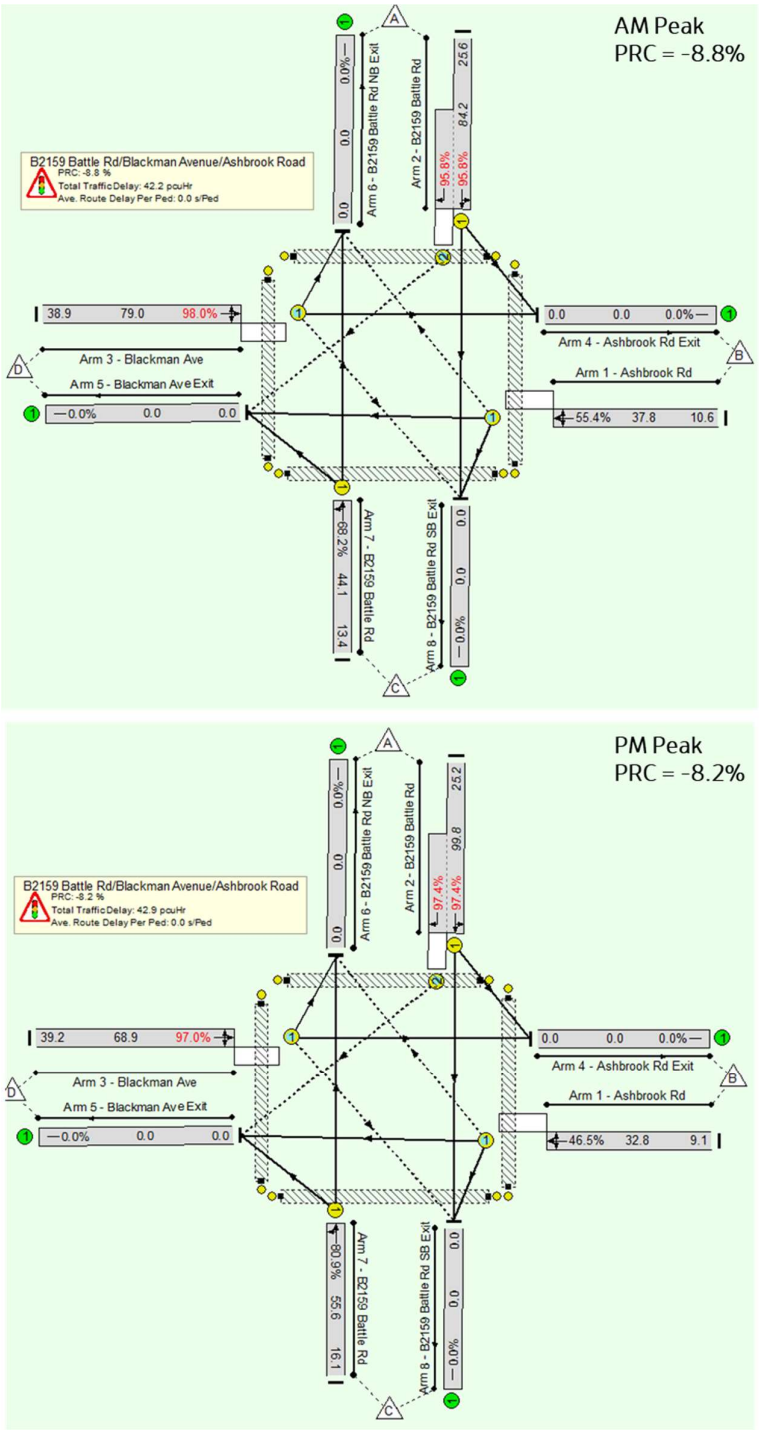


Figure A-1 B2159/Blackman Avenue/Ashbrook Road Future Base Modelling Results – 2039 'without' LP Flows

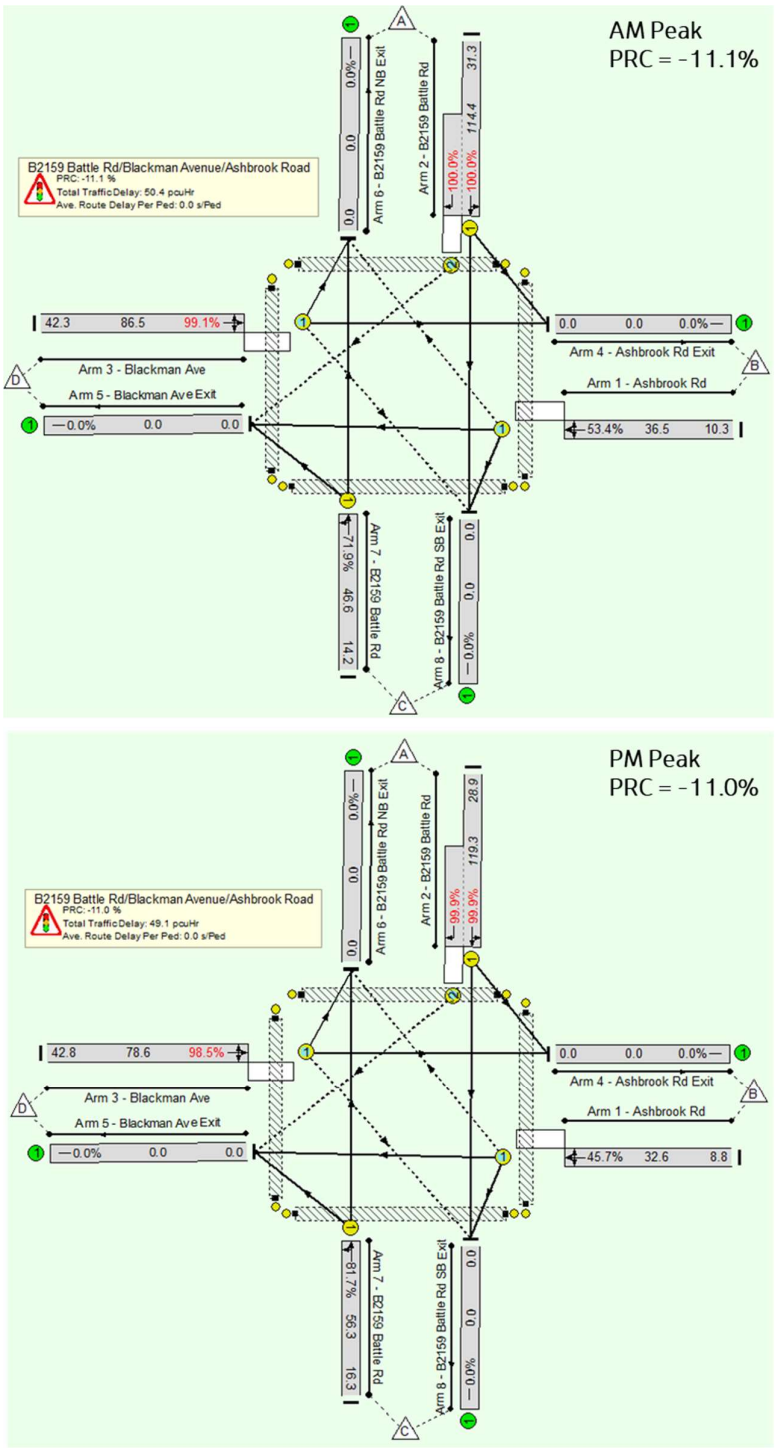


Figure A-2 B2159/Blackman Avenue/Ashbrook Road Future Base Modelling Results – 2039 'with' LP Flows

J5 - B2159 / Blackman Avenue / Ashbrook Road

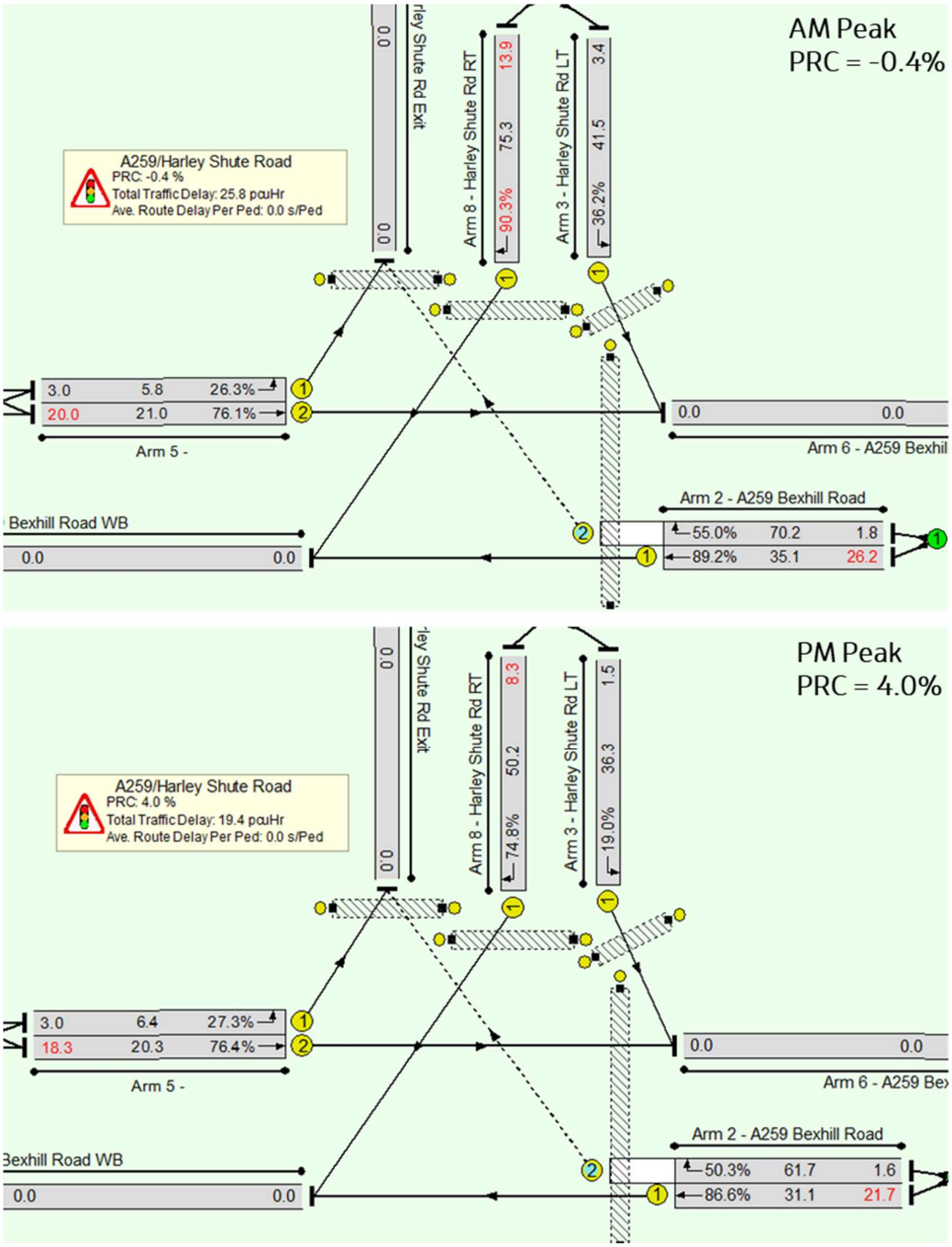


Figure A-3 A259 / Harley Shute Road Future Base Modelling Results – 2039 'without' LP Flows

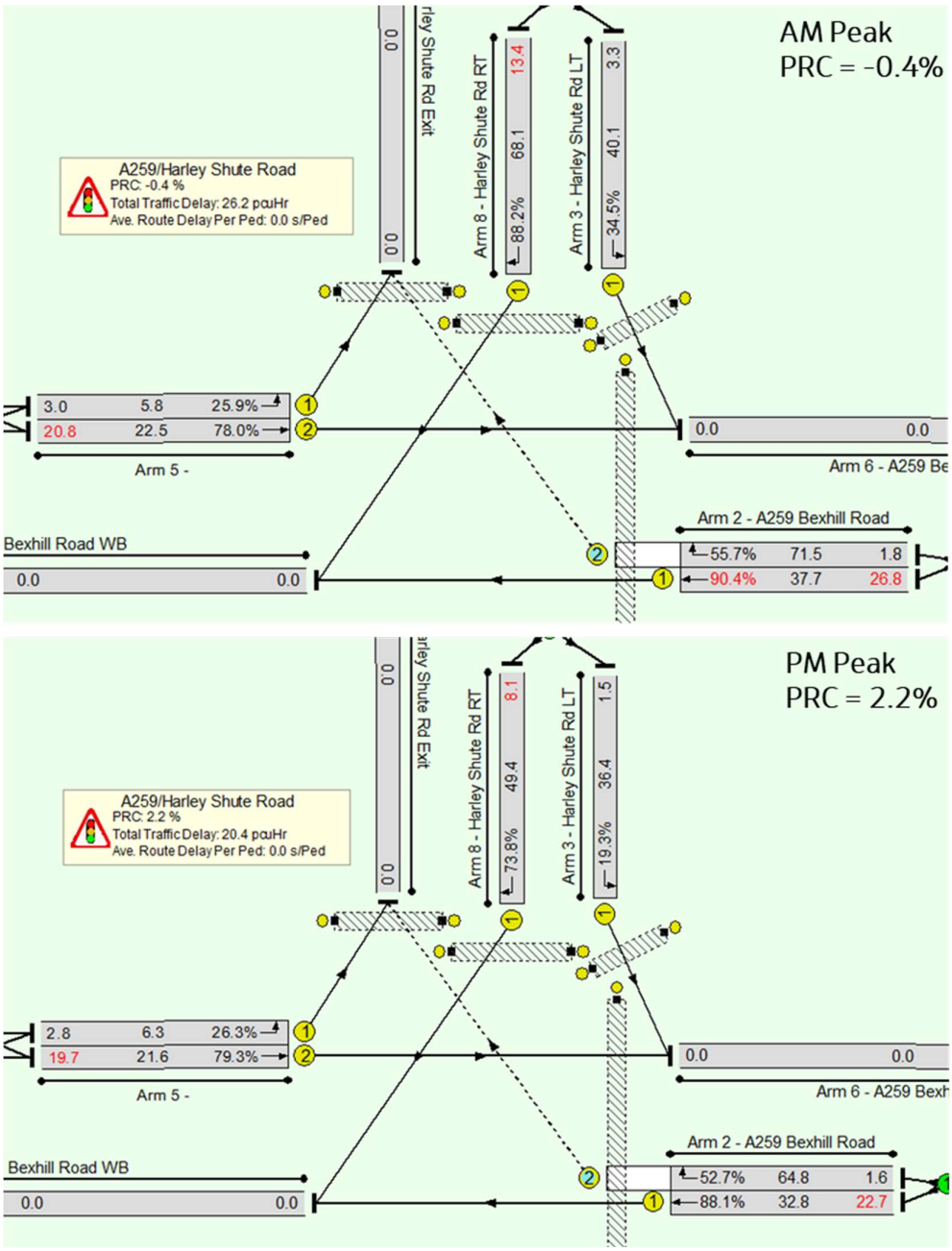


Figure A-4 A259 / Harley Shute Road Future Base Modelling Results – 2039 'with' LP Flows

J6 - A259 / Filsham Road

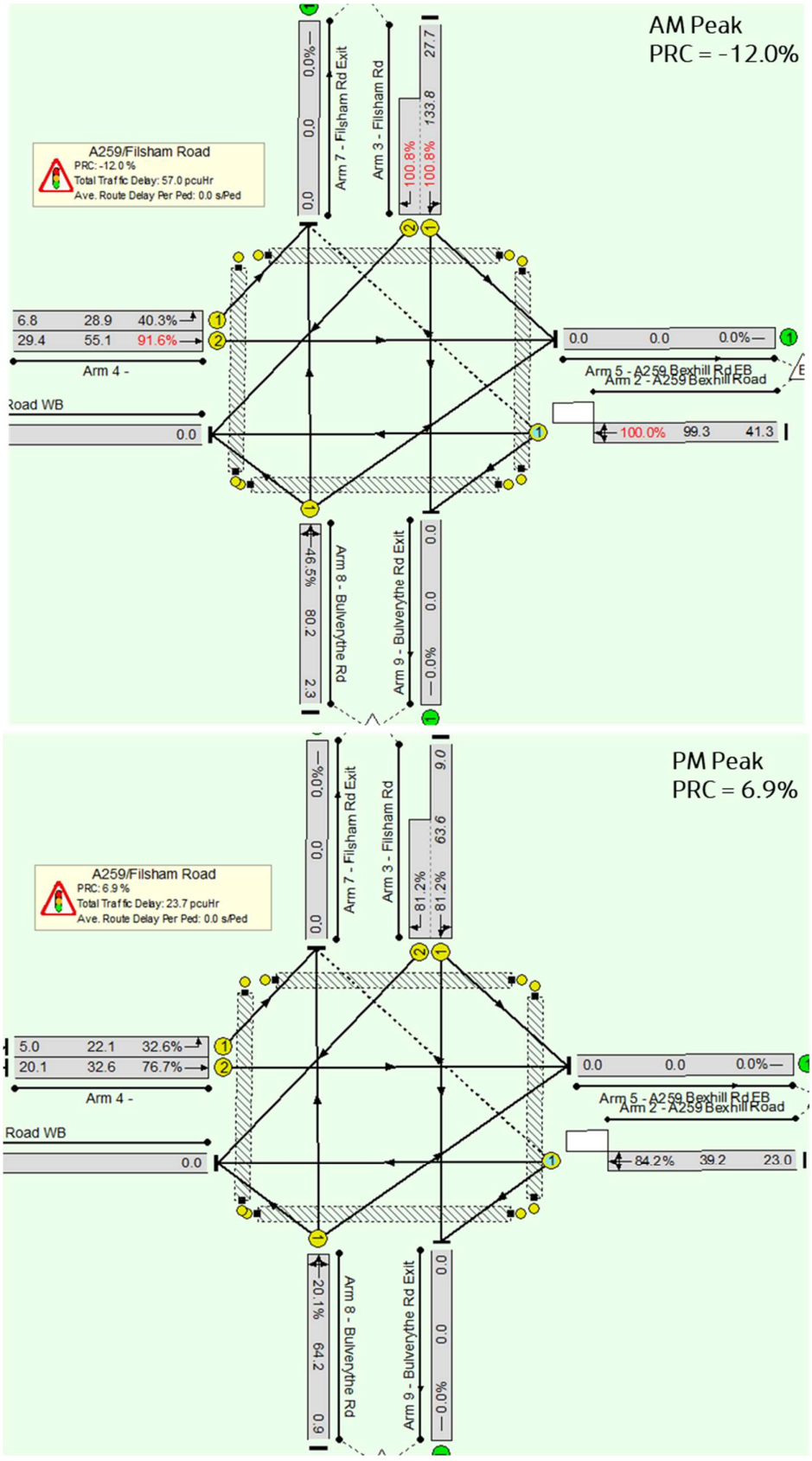


Figure A-5 A259 / Filsham Road Future Base Modelling Results – 2039 'without' LP Flows

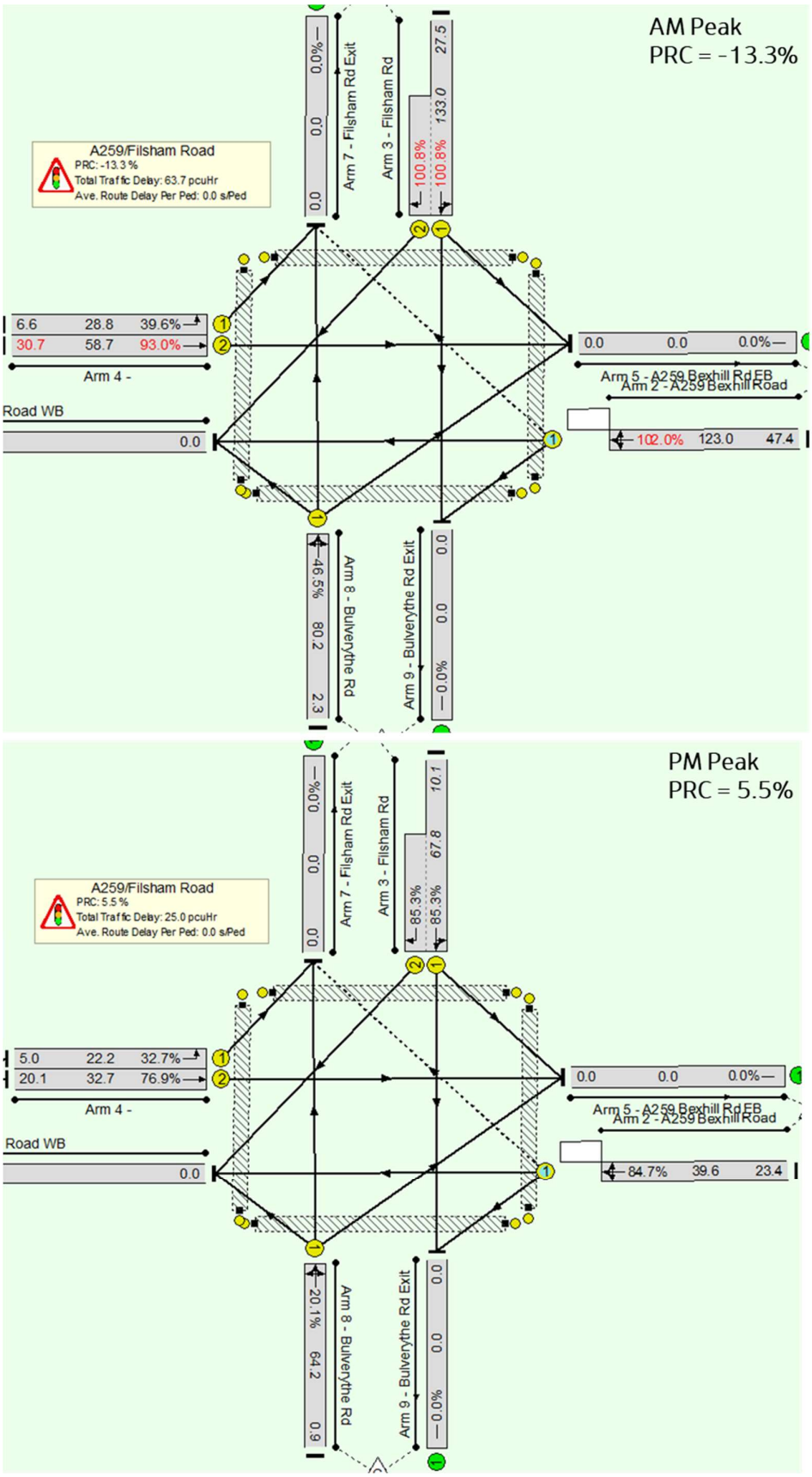


Figure A-6 A259 / Filsham Road Future Base Modelling Results – 2039 'with' LP Flows

J11 - Priory Avenue / Braybrooke Road

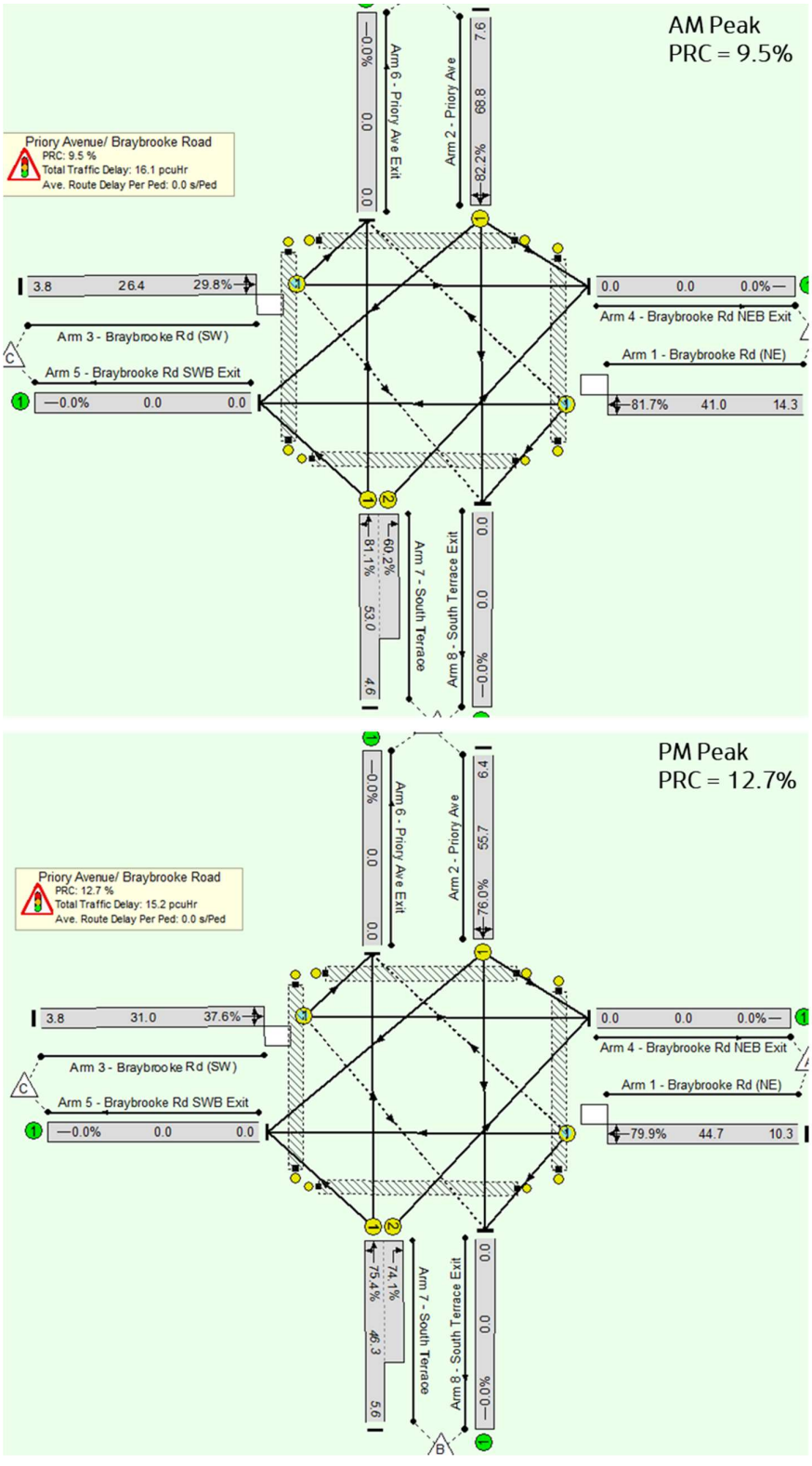


Figure A-7 Priory Avenue / Braybrooke Road Future Base Modelling Results – 2039 'without' LP Flows

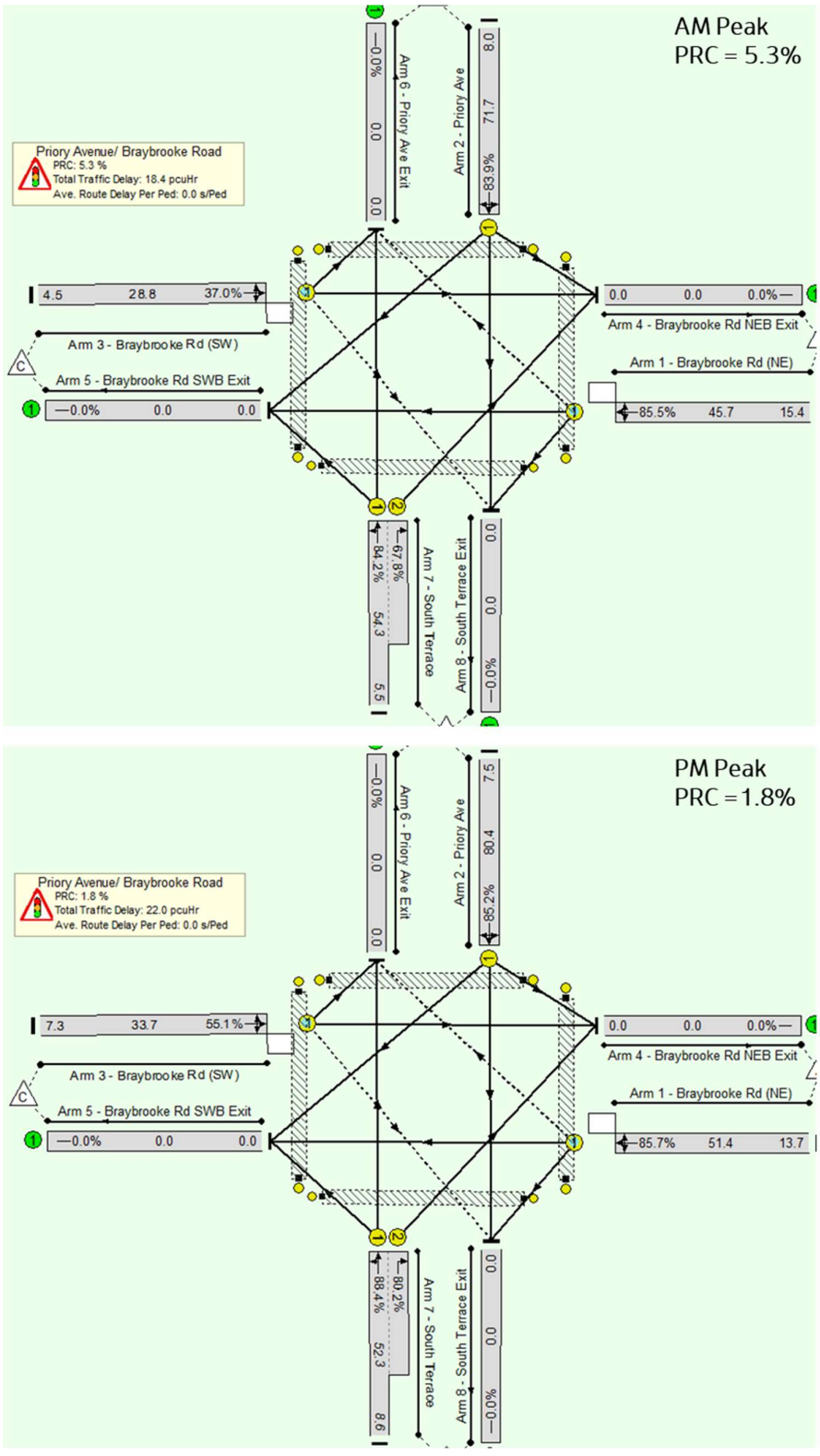


Figure A-8 Priory Avenue / Braybrooke Road Future Base Modelling Results – 2039 'with' LP Flows

J13 - A259 / A269 Dorset Road

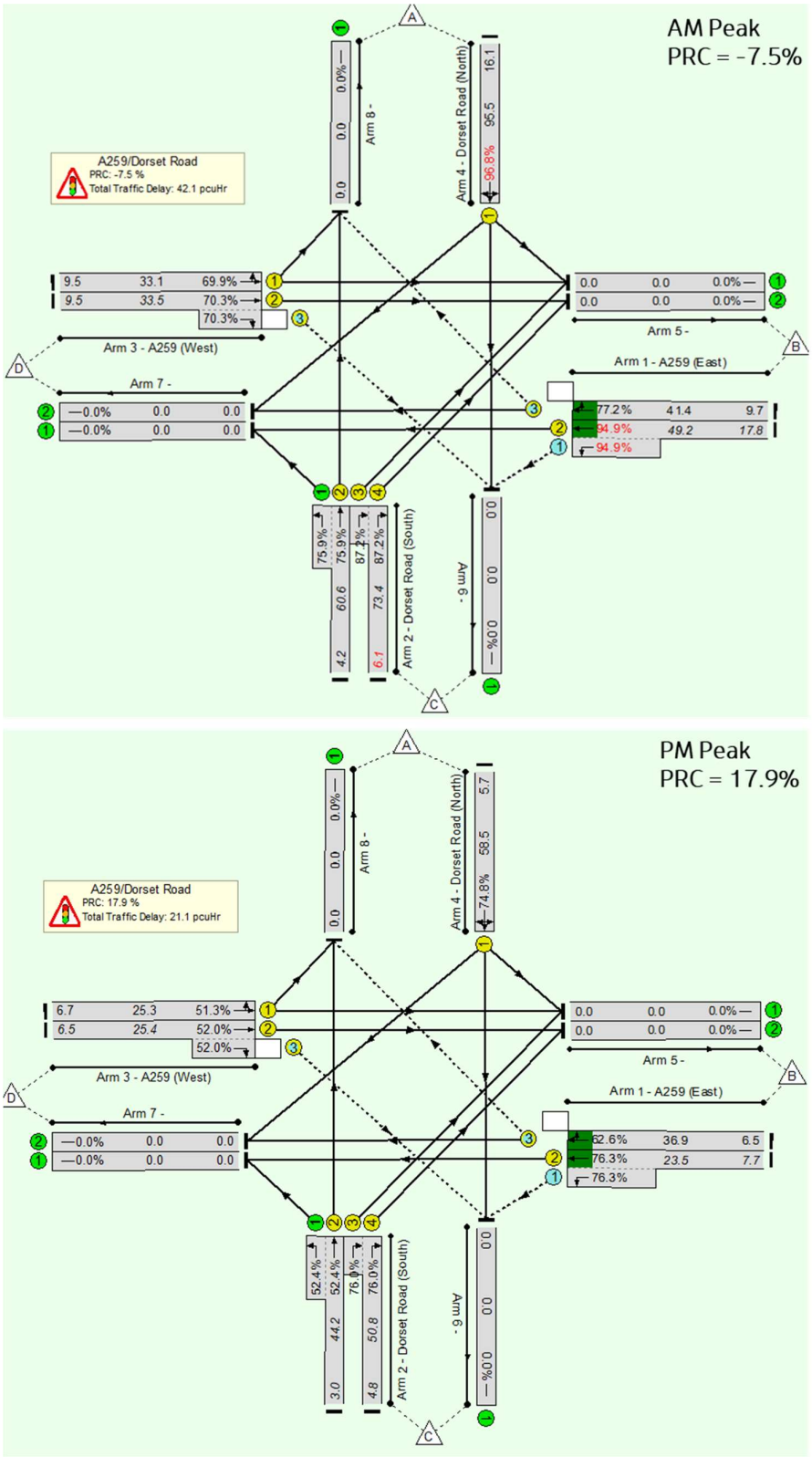


Figure A-9 A259 / A269 Dorset Road Future Base Modelling Results – 2039 'without' LP Flows

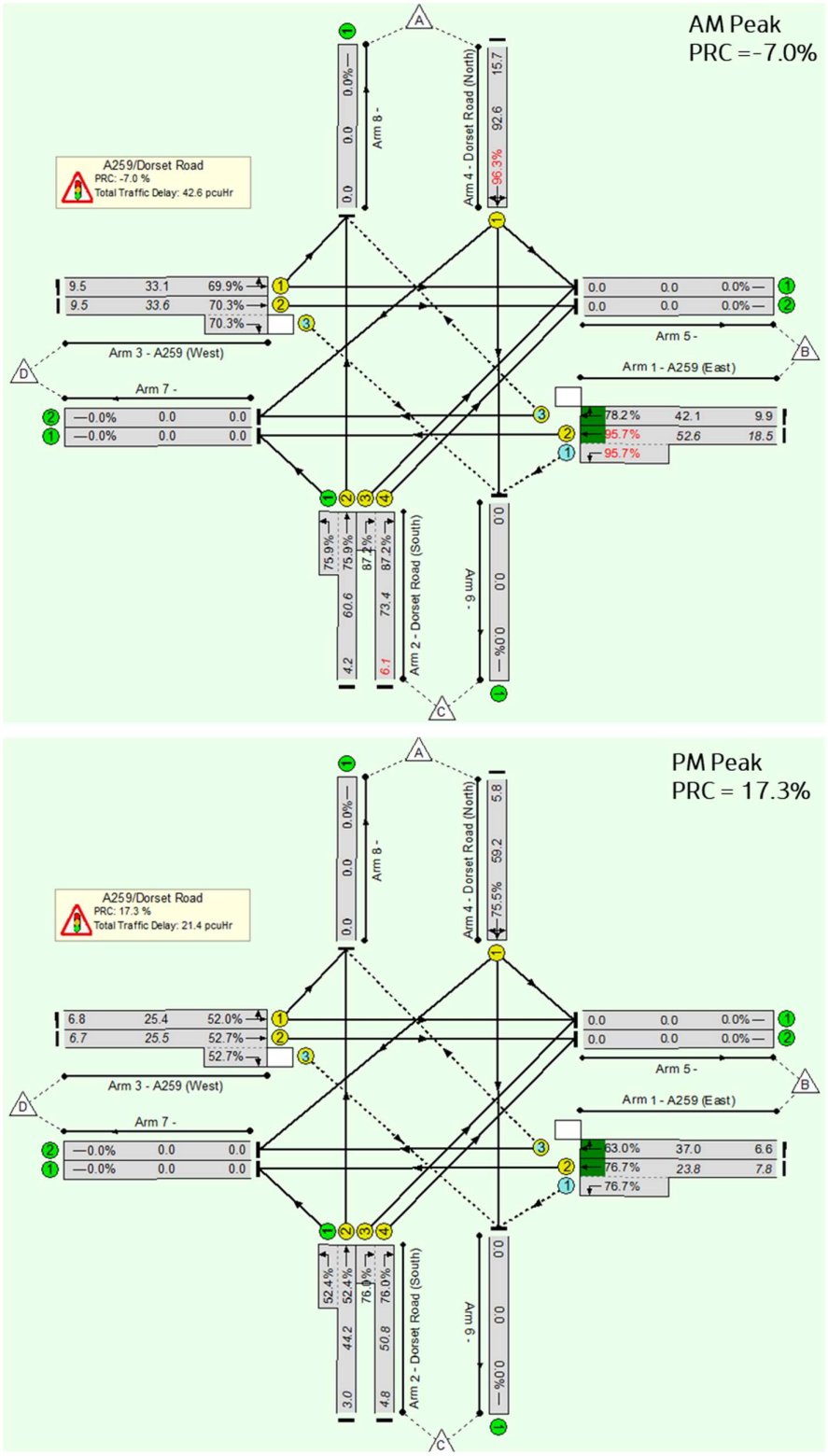


Figure A-10 A259 / A269 Dorset Road Future Base Modelling Results – 2039 'with' LP Flows