Trowbridge Transport Strategy Development

Report on Emerging Strategy

October 2012
Wiltshire Council

Wiltshire Council
Where everybody matters

Mott MacDonald

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Wiltshire Council

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Content

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Executive Summary

Significant levels of development are planned for Trowbridge over the next 14 years, as set out in Wiltshire Council's Core Strategy Pre-Submission document. Over the plan period (2006 to 2026), 25 hectares of employment land and at least 6,000 new homes will be provided within the Trowbridge Community Area. Of this provision, 2,600 dwellings and the 15 hectares of employment land will be located in the proposed Ashton Park Urban Extension to the south east of Trowbridge.

Trowbridge already experiences a number of transport-related problems, including peak hour congestion on the A350 and in the town centre, which will worsen with the proposed level of development if nothing is done to address the issues. Therefore, a Transport Strategy is required to ensure that the overall transport network can continue to operate satisfactorily.

A defined process for the development of a Transport Strategy has been followed:
- Review of national and local policy and relevant background material
- Identification of appropriate objectives for the Transport Strategy
- Identification and assessment of potential transport schemes and measures
- Development and assessment of strategy options, each containing a range of schemes and measures
- Consultation with Stakeholders.

The above process has led to the 'Emerging Strategy' outlined in **Table 1.1** overleaf. The strategy contains measures to encourage the use of sustainable travel modes, whilst also addressing the issue of traffic capacity on the strategic road network.

Traffic modelling has shown that the Emerging Strategy is successful in reducing traffic congestion, with average journey times in 2026 similar to those experienced in 2009 and with delays on the A350 minimised. The strategy will also reduce carbon emissions and emissions of oxides of nitrogen, compared to the Reference Case without the mitigation measures in place.

Table 1.1:   Components of the Emerging Strategy

Type	Scheme or Measure
Walking and cycling	Pedestrian and cycling improvements introduced on key corridors, including between the rail station and town centre
	New "at-grade" crossing facilities on County Way and at key junctions
	Cycle parking at all of the main town centre destinations
Public Transport	A high frequency bus service between Ashton Park and the town centre
	Bus priority measures at new developments and some key junctions, main bus stops upgraded
	Improvements to Trowbridge rail station, including redesigned station forecourt and interchange area
Smarter Choices	Developers are required to submit statutory Travel Plans (work place and residential)
	Measures and targets actively reviewed by a Travel Plan co-ordinator
	Continued use of and support for School Travel Plans
Demand Management	Maximise availability of the existing parking stock in the town centre for short stay use to support retail and visitor trips, whilst maintaining adequate long stay parking at the edge of the town centre
	All new developments in the town centre that include new publicly available private non-residential parking will be required to implement parking restrictions and charges consistent with those of the council run car parks in the town centre, in line with the county-wide parking strategy
	A delivery strategy to restrict the movement of heavy goods vehicles at certain times in the town centre
Road Improvement	A350 Yarnbrook Relief Road
	A350 West Ashton Relief Road
	Traffic capacity and pedestrian enhancements at critical areas/junctions in the town, including the Hill Street / Broad Street one-way system and A363 Holy Trinity gyratory

1.   Introduction

This report summarises the development of the proposed Transport Strategy for Trowbridge. Through assessment of possible transport measures and strategy options and subsequent consultation, an 'Emerging Strategy' has evolved.   This strategy consists of a range of measures, some of which are of strategic importance, whilst others focus on critical local issues.

To ensure a focused assessment of potential measures, a set of strategy objectives was developed to lead this process. A separate report has been produced detailing the derivation of the Trowbridge Transport Strategy objectives which are listed below:

- To reduce transport related emissions and address **climate change** and **local pollution;**
- Promoting **sustainable transport**, including better local bus services (reflecting national guidance and the Local Transport Plan);
- **Integrating development sites** with established communities to increase travel choice, based on comprehensive networks and linked facilities;
- **Improving accessibility** throughout the town with new walking and cycling networks;
- Improving **road safety**, particularly for vulnerable road users;
- Creating **better environments** for people, rather than vehicles, in the town centre, development sites and elsewhere;
- To protect the **natural environment**;
- To safeguard the **historic environment** and to promote **high quality new development**;
- **Delivering local employment** opportunities which can be **accessed by sustainable modes**, particularly in the professional sector, to support local activity and limit out-commuting (reflecting local aspirations); and
- **Supporting local development opportunities** to support containment of trips, with people living near where they work (supporting economic activity locally at a scale appropriate for a county town).

In addition to the objectives relevant to Trowbridge and the development of the town, Wiltshire Council also maintains a separate objective to improve the A350 strategic road corridor through Wiltshire. To reflect this, and due to the close proximity of the A350 corridor, the following strategy objective is also promoted.

- To maintain and, where feasible, **improve the performance of the A350 strategic road corridor**.

This report summarises the process of the strategy development and the background material taken into consideration. The measures included in the Emerging Strategy are then outlined and its impact on the road network in and around Trowbridge demonstrated through results of traffic modelling of predicted conditions in 2026 with the planned level of development in place.

2. Strategy Approach

The development of the Trowbridge Transport Strategy was based on a series of principles which have guided the decision making process throughout. The adopted approach has ensured that potential schemes and transport strategy options were identified using clear evidence and consistent techniques and that they relate to local and national policy requirements. The strategy approach principles are summarised as follows:

- The development of the strategy is based on existing and emerging evidence on transport problems, opportunities and constraints. The evidence includes comprehensive work which has reviewed the current opportunities and problems which face Trowbridge, supported by analysis of the impacts of the future development scenarios;
- The strategy uses a set of clear objectives which focus the delivery of the potential schemes and strategy options.
- It is critical that the Transport Strategy aligns with other local planning policy requirements and that it complies with the overarching national policy directions;
- To ensure that the Strategy can adapt to future challenges, the Strategy needs to complement and support the development scenarios for Wiltshire, as set out in the pre-submission draft of the Core Strategy. This will ensure that the Strategy is applicable to the development opportunities that may come forward in the period 2011 – 2026.

Figure 2.1:   Option Development and Assessment Approach
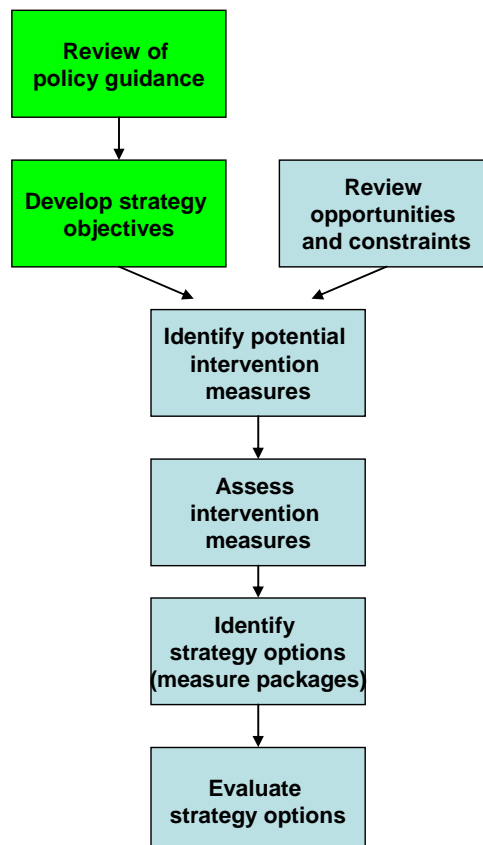
3.   Policy Background

A review of relevant national and local policy is provided below, together with references to recent work exploring the future development of Trowbridge and its community.

3.1   UK Climate Change

Climate Change is considered to be a central issue for the developing Wiltshire Core Strategy. Three of the "key drivers" in the Core Strategy Topic Paper 11: Transport relate to the need to reduce carbon emissions, these being:

- To reduce the dependency on the private car;
- Minimise long distance commuting by private and public transport; and
- Embrace new technology solutions, although recognise that this can only be part of the overall strategy.

The 2008 Climate Change Act set legally binding carbon targets and aims to cut the country's carbon emission by 34% by 2020 and 80% by 2050. The UK Government's Carbon Plan, published in March 2011, identifies that road transport produces 20% of all UK greenhouse gas emissions. The Plan states that the greatest priority is the development of appropriate vehicle technologies, and that this will have the largest impact in reducing overall emissions. Additionally, the need to "change behaviours" is promoted, and the development of transport schemes at the local level is needed to influence travel choice. Such measures would need to be delivered through the LTP and other supporting local transport strategies.

Wiltshire Council is a signatory to the Nottingham Declaration which commits the council to tackling the causes and effects of climate change and to encourage all sectors to do the same.

3.2   Transport White Paper

The Department for Transport's White Paper *Creating growth, cutting carbon*[1] has a key aim to address carbon emissions from transport and 'to reduce emissions at the local level, using the tools that are available to us now, principally by encouraging people to make more sustainable travel choices for shorter journeys' (para.1.4). It also introduces the concept of localism for transport decisions and the 'big society'.

3.3   Planning Policy Guidance

The *National Planning Policy Framework* was published in March 2012 and, in terms of development and transport, the policy confirms that:

> 'Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport.'

The policy states that the location of the development and the land use mix are important to encourage the use of sustainable modes:

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[1] Department for Transport (January 2011) *Creating growth, cutting carbon: making sustainable local transport happen.*

'Planning policies should aim for a balance of land uses within their area so that people can be encouraged to minimise journey lengths for employment, shopping, leisure, education and other activities.'

3.4 Guidance on Local Transport Plans

Guidance on Local Transport Plans[2] has five 'national transport goals':

- Support economic growth;
- Reduce carbon emissions;
- Promote equality of opportunity;
- Contribute to better safety, security and health; and
- Improve quality of life and a healthy natural environment.

These goals cover a wide range of issues including accessibility, climate change, development sites and social inclusion and were directed towards local authorities such as Wiltshire Council compiling LTPs and translating national objectives to the local level.

3.5 Local Transport Plan 3

The Wiltshire Local Transport Plan[3] sets out a number of strategic transport objectives that are consistent with the national guidance, with some of particular relevance to Trowbridge:

- SO1: To support and help improve the vitality, viability and resilience of Wiltshire's economy and market towns;
- SO2: To provide, support and/or promote a choice of sustainable transport alternatives including walking, cycling, buses and rail;
- SO5: To improve sustainable access to a full range of opportunities particularly for those people without access to a car;
- SO7: To enhance Wiltshire's public realm and street scene;
- SO11: To reduce the level of air pollutant and climate change emissions from transport;
- SO12: To support planned growth in Wiltshire and ensure that new developments adequately provide for their sustainable transport requirements and mitigate their transport impacts;
- SO13: To reduce the need to travel, particularly by car; and
- SO14: To promote travel modes that are beneficial to health.

3.6 Wiltshire Core Strategy

The Wiltshire Core Strategy Pre-submission Document was open for consultation between February and April 2012. A significant evidence base and a number of topic papers supported the main strategy document.

There are a series of overarching key principles which guide the development of the Strategy document, as follows:

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[2] Department for Transport (July 2009) *Guidance on Local Transport Plans.*

[3] Wiltshire Council (March 2011) *Wiltshire Local Transport Plan 2011-2026: strategy.*

- *Providing for the most sustainable pattern of development that minimises the need to travel and maximises the potential to use sustainable transport.*
- *Creating the right environment to deliver economic growth, delivering the jobs Wiltshire's population needs locally, and taking a flexible and responsive approach to employment land delivery.*
- *Phasing development to ensure that jobs and the right infrastructure are delivered at the right time to ensure that out-commuting, in particular to areas outside of Wiltshire, is not increased and development does not have a detrimental impact on infrastructure.*
- *Working towards lowering Wiltshire's carbon footprint through providing renewable energy, sustainable construction and location of development.*
- *Protecting and planning for the enhancement of the environment, wherever possible, including development of green infrastructure to support the health and wellbeing of communities.*
- *Providing high quality, well designed development, and ensuring full local community involvement in planning for significant new proposals.*
- *Providing the framework to deliver Neighbourhood Plans.*

The delivery of the above objectives is through the individual area spatial strategies including the "**Trowbridge Community Area Strategy**". Specific transport issues relating to the delivery of the Strategy include the following:

- *Strategic growth at south east Trowbridge will facilitate delivery of significant and focused improvements to the A350, particularly at Yarnbrook and West Ashton where existing junction arrangements are over capacity. This is currently a source of traffic congestion and improvements will have a significant benefit to the town.*
- *There is a requirement to provide a secondary school to the south east of Trowbridge, to serve the proposed urban extension and linked by a new road to recent developments at Paxcroft Mead and other planned development to the east of Trowbridge. This would help to address cross town traffic which is currently a problem as the only secondary schools are located to the west and south west of the town.*
- *Improvement needs to be made to the River Biss corridor to provide an attractive corridor connecting the town centre with the Ashton Park Urban Extension. The River Biss is currently an under-utilised resource and new development within the town must contribute to improving connectivity with the river and thereby improve the character of this important green corridor.*

Core Policy 29 – "Spatial Strategy: Trowbridge Community Area" confirms that:

Over the plan period (2006 to 2026), 25 hectares employment land and at least 6,000 new homes will be provided within the Community Area, of which 5,860 dwellings should occur at Trowbridge, including land identified to the south east of Trowbridge, which extends towards the A350 to the south and the railway line to the west, for strategic growth.

Of the above provision, 2,600 dwellings and the 15 hectares of employment land will be located in the Ashton Park Urban Extension.

3.7   Core Strategy Topic Paper 10: Transport

A number of topic papers have been produced to support the Wiltshire Core Strategy including one on transport[4]. This refers to the national and local policy context including the LTP and Community Plan and relates these to the Core Strategy.

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[4] Wiltshire Council (June 2011) *Draft topic paper 11: Transport. Wiltshire Core Strategy consultation.*

Policy T4 identifies the need for a Transport Strategy to be developed for Trowbridge. The strategy should identify a package of measures that will need to be implemented within the Core Strategy period, and should consider the following:

- *New and improved networks of routes for pedestrians and cyclists;*
- *Enhanced public transport services and facilities;*
- *Traffic management measures;*
- *Demand management measures;*
- *Selective road improvements;*
- *Interchange enhancements that are accessible by all; and*
- *Smarter choice measures.*

The package of measures identified through the development of the Strategy will be delivered using LTP funding and the use of appropriate developer contributions.

Policy T7 "Strategic Transport Network" includes the objective to improve the A350 national primary route at Yarnbrook/West Ashton. Due to the strategic importance of the route and its connections with other towns to the north and south, the Strategy identifies that:

"The proposed improvements to the A350 primary route, including those at Yarnbrook/West Ashton where journey times are unreliable, will provide significant relief and environmental benefits, particularly for local residents."

3.8 Transforming Trowbridge – Scoping and Vision Study (August 2010)

The Transforming Trowbridge initiative[5] includes a number of objectives associated with the partnership leading regeneration with lobbying, mobilizing investment and marketing. More specifically, an accessible and integrated transport system for Trowbridge is regarded as a key element in delivering the Urban Design Framework.

A number of key challenges are identified:

- The movement of traffic through town needs to be addressed to improve the current town environment for pedestrians;
- The town has a below national average usage of public transport, exacerbated by the lack of a bus depot facility and poor bus terminus facilities; and
- The rail station is poorly integrated with the town centre and other transport modes and there is low provision of safe pedestrian and cycle routes.

In response to the challenges identified, the Study highlights a series of areas where improvements to the transport network could be implemented. It is recognised that such improvements will need to be delivered through the LTP schemes or as part of major development proposals.

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[5] *Draft Transforming Trowbridge delivery plan* (www.transformingtrowbridge.org.uk/tt_delivery_plan_v3.doc)

3.9   Local Community Area Plan 2004 – 2014

The Area Plan was developed to identify the local needs and future aspirations, with the objective of improving the quality of life of those who live, work or visit the local area. Following extensive consultation, the key issues relating to "Transport, access and traffic" were as below:

- *Better mobility for those with disability;*
- *High increase in road traffic;*
- *Road safety;*
- *Condition of roads and pavements;*
- *Irresponsible parking and erosion of double yellow lines;*
- *Lack of public transport, especially for rural areas;*
- *Access to hospitals and other services; and*
- *Influence future transport planning.*

A series of key target indicators were included for each of the categories included within the Area Plan. The indicators included a target delivery date of 2008 and further work is required to confirm whether solutions were delivered in accordance with the objectives.

3.10   The Community Area Plan (Trowbridge 2011 – 2016)

The draft Plan has been developed by the Trowbridge Community Area Future Partnership (TCAF). TCAF is a Community Area Partnership (CAP) which is a local, independent and non-political body, and aims to bring together representatives from across the entire community. The Plan reviews the main transport planning issues as:

- More bus services and/or other transport solutions, particularly for the villages, rural areas and also in the evenings.
- Cheap train journeys to Bath, as part of supporting the Community Area Young People's Issues Group (CAYPIG) in its campaign to improve public transport for young people going to or from college, work or leisure activities.
- A local transport plan/strategy is required for the Trowbridge Community Area.
- A comprehensive parking strategy.
- A better road system and road signage around Trowbridge.
- Improvements to Trowbridge railway station facilities e.g. fully surfaced car parks and additional covered waiting rooms.
- Tackling speeding in the villages.
- Better access for people with disabilities, including more dropped kerbs.
- Reducing car journeys.
- Improving road safety.
- Upgrading pavements, particularly on the estates.

4. Transport Patterns and Opportunities

A comprehensive understanding of the existing transport conditions and opportunities in Trowbridge is critical for the successful delivery of the Strategy. This section reviews the existing transport trends and also the strengths and weaknesses that have influenced the development of the strategy and the manner in which it is implemented over the Core Strategy period.

4.1 Transport Patterns

The headline characteristics that influence travel patterns in Trowbridge at present are summarised in the following bullet points (some of which are based on 2001 census data):

Travel Patterns
- 68% of the town's working population work within Trowbridge;
- 27% of these employees walk to work;
- 44% of these employees drive to work;
- 69% of workers are employed within the public sector;
- 80% of "out" commuters drive;
- Trowbridge has a shopping catchment area that includes over 59,000 people;

Transport Services
- Trowbridge is served by regular train services which provide convenient connections to destinations including Bath, Bristol and Salisbury;
- The A350 provides good connections with towns to the south and north;
- There are a number of bus routes that connect with adjacent towns;
- The majority of residential areas are served by regular daytime bus services, although services are limited in the evening and at weekends;
- The town centre has 869 public off-street parking spaces operated by the Council, and 446 of these are free to use.

The patterns identify that a significant proportion of the town's population lives and works within the town. The commuting trends to and from other areas is presented in **Table 4.1** below:

Table 4.1:   Trowbridge Commuting Trends (Census Information 2001)

Town or Area	Working in Trowbridge & living in:	Living in Trowbridge & working in:
Trowbridge Urban Area**	**9018**	**9018**
Bradford on Avon Urban Area	662	321
Melksham Urban Area	759	704
Warminster Urban Area	375	184
Westbury Urban Area	765	360
Dilton Marsh Ward (inc. WWTE)	0	791
Ethandune Ward (inc. White Horse Business Park)	0	390
Rest of West Wiltshire District	1577	450
Chippenham Urban Area	226	422
Rest of North Wiltshire District	386	475
Devizes Urban Area	185	259
Rest of Kennet District	352	190
Rest of Wiltshire	194	113
Mendip District	718	251
Bath & NE Somerset Borough	578	1297
Swindon Unitary Authority	59	235
Bristol Unitary Authority	147	286
South Gloucestershire Borough	132	261
Rest of Great Britain	419	575
Offshore or Outside UK	0	25
Total travelling to a known fixed workplace	16552	16607

Source: Wiltshire Council

Table 4.1 demonstrates that approximately 74% of the Trowbridge working population are employed in the West Wiltshire area. The Bath area is also a significant employment zone, with almost 8% of the Trowbridge working population commuting to Bath.

46% of those working in Trowbridge commute from outside of the town, the majority of which (55%) comes from the West Wilts area, but the Mendip and Bath areas also generate a significant number of incoming trips (17% of all in-commuting).

4.2   Transport Opportunities

Trowbridge benefits from a number of transport opportunities, but there are also some significant constraints which have the ability to restrict movement and economic growth. The issues have been previously identified as part of the Transforming Trowbridge project, development of the Core Strategy and from a review of the issues as part of the Transport Strategy development.

A summary of the transport strengths and weaknesses which influence movement within Trowbridge is contained in **Table 4.2** below.

Table 4.2:   Trowbridge Transport Strengths and Weaknesses

Strengths	Weaknesses
Regular train services providing connections through to Portsmouth, Salisbury, Bath, Bristol and Cardiff.	Very limited rail services connect to Melksham, Chippenham and Swindon.
Trowbridge benefits from good road connections to surrounding towns, including the primary A350 route.	Limited capacity on the A350 at Yarnbrook and West Ashton results in peak hour delays on the strategic road network. The A361 County Way acts as a barrier between southern and eastern residential areas and the town centre. There is limited traffic capacity at several town centre junctions at peak times, leading to delays to buses and all traffic.
High density residential areas close to the town centre with good connectivity to the rail station.	New developments are not permeable and form barriers to movements between the town centre and surrounding residential districts, with little promotion of sustainable modes.
There is a network of footpaths which connect with outlying residential areas. High quality walking and cycle routes are provided through parks (such as Biss Country Park) providing connections with outlying areas.	A number of "distributor" roads have limited or no pedestrian facilities. There are several roundabouts, and the quality of pedestrian facilities is not consistent. Footpath routes can be of poor quality, narrow and unlit and some are heavily littered and suffer from graffiti.
The town centre has limited pedestrianisation but it is of high quality and provides a good urban realm.	Pedestrian way-finding is difficult in places and some pedestrian access routes are not obvious to the user.
There are a number of cycle routes provided, including a route on the A361.	There is a lack of a co-ordinated network of cycle routes.
Trowbridge is served by a good network of inter-urban bus services. Bus stop facilities are generally of good quality and real time information is provided to users.	Demand does not justify peak hour town bus services.

The existing issues identified above have been taken forward to inform the development of potential measures. The existing strengths help to demonstrate how transport contributes towards a successful Trowbridge and how these strengths can be further developed to ensure that the transport network is comprehensive and meets the needs of the residents, in both new and existing areas.

4.3   Committed Development

There are a number of "committed" developments that have been given planning permission in recent years, with associated transport improvements that will be implemented as the developments come forward. A summary of the development proposals and the transport schemes that are already committed is provided in **Table 4.3** below.

Table 4.3:   Committed Interventions

Development	Summary of Transport Commitments
East of Trowbridge Site – 650 dwellings	Construction of distribution road linking Leap Gate with West Ashton Road; Vehicular link with Green Lane (potential bus link); A350 / West Ashton Road junction improvements; West Ashton Road improvement works; Construction of the Hilperton Relief Road.
Southview Residential Development – 300 dwellings	Upgrade of pedestrian rail bridge; Provision of a temporary bus turning area.
Biss Farm Business Park – 12ha commercial development (subject to confirmation)	Improvements to the A361 County Way / West Ashton Road junction; Improvements to the A350 / West Ashton Road junction; Pedestrian connections with West Ashton Road.

5. Emerging Strategy

As outlined in Section 2, the Emerging Strategy has been developed through a systematic approach of agreeing suitable objectives and then considering how potential measures and strategy options could address these objectives.

A wide variety of potential improvement measures was considered, with an initial sifting process to identify which measures were realistic and appropriate to Trowbridge, as those included within the overall strategy need to be affordable and deliverable. The measures taken forward were then assessed individually against the agreed objectives, with additional analysis on potential physical and environmental constraints and scheme cost.

Measures were then grouped into three separate strategy options which were assessed, which was the subject of a separate report produced by Mott MacDonald in December 2011 (Options Assessment Report Ref. 296862/ITD/ITW/03/D). Throughout the process, the development of the strategy has been overseen by a Steering Group of Council officers.

Following feedback on the strategy options presented at a consultation event carried out by Wiltshire Council, the Emerging Strategy has been developed.

A summary of the measures that are contained in the Emerging Strategy is given in **Table 5.1** below, together with a cost estimate. To develop this cost estimate, examples of specific infrastructure schemes that could be implemented for each category have been allowed for as detailed in **Table 5.2,** as well as allowance for on-going expenditure (revenue costs).

Table 5.1:   Components of Emerging Strategy

Scheme Type	Scheme	Cost Estimate
Walking and cycling	Pedestrian and cycling improvements introduced on key corridors, including between the rail station and town centre	£520k
	New "at-grade" crossing facilities on County Way at the Hilperton Road roundabout and at key junctions	
	Cycle parking at all of the main town centre destinations	
Public Transport	A high frequency bus service between Ashton Park and the town centre	£400k + £100k p.a. revenue
	Bus priority measures at new developments and some key junctions, main bus stops upgraded	
	Improvements to Trowbridge rail station, including a redesigned station forecourt and car park area	
Smarter Choices	Developers are required to submit statutory Travel Plans (work place and residential)	£40k p.a. revenue
	Measures and targets actively reviewed by a Travel Plan co-ordinator	
	Continued use of and support for School Travel Plans	
Demand Management	Management of parking capacity in the town centre	£120k
	A delivery strategy to restrict the movement of heavy goods vehicle at certain times in the town centre	
Road Improvement	A350 Yarnbrook Relief Road	£13.9m
	A350 West Ashton Relief Road	
	Traffic capacity and pedestrian enhancements at critical areas/junctions in the town	
	Infrastructure cost	£14.94m
	Revenue cost over 10 years	£1.4m
	Total	£16.34m

Table 5.2: Example Schemes Allowed for in the Emerging Strategy

Scheme Type	Ref	Scheme
Walking and cycling	1	River Biss Corridor Route Enhancement
	2	A361 County Way / Ashton Street Crossing - improve pedestrian connections
	3	Rail station - town centre route enhancement
	4	Improve pedestrian wayfinding and town centre legibility
	5	A361 Frome Rd / A363 Bradley Rd roundabouts - pedestrian improvements
	6	A361 County Way / Hilperton Rd / Roundstone St roundabout - pedestrian Improvements
	7	Cycling improvements on two key corridors e.g. Green Lane / West Ashton Rd
	8	Installation of secure cycle parking at key destinations (e.g. rail station)
Public Transport	9	Trowbridge rail station forecourt improvement
	10	Bus only / priority connections to strategic development
	11	Local bus service review and consolidation with high frequency service between Ashton Park and the town centre
	12	Review and upgrade key bus stops
Smarter Choices	13	Support the development of workplace travel plans
	14	Continue to implement school travel plans and enhance measures
Demand Management	15	Maximise availability of the existing parking stock in the town centre for short stay use. New publicly available private non-residential parking in the town centre will be required to implement parking restrictions and charges consistent with those of the council run car parks
	16	A delivery strategy to restrict the movement of heavy goods vehicles at certain times in the town centre
Road Improvement	17	A350 Yarnbrook Relief Road – a new link road between the A363 and A350 to relieve the existing Yarnbrook roundabout and to provide access to the Ashton Park housing and employment developments
	18	A350 West Ashton Relief Road – an offline scheme running north of the existing A350 to relieve West Ashton and the existing signalised junction
	19	Charging facilities for "new technology" vehicles
	20	Review Hill Street / Broad Street one-way operation and alter gyratory
	21	A363 Holy Trinity gyratory - enhance pedestrian realm and traffic capacity
	22	B3105 Staverton Bridge Improvement

6.   Traffic Modelling Results

A SATURN traffic model for Trowbridge is available and this enables the potential impact of developments to be reviewed at a strategic level. The model can also be used to examine potential infrastructure schemes, as well as other measures such as the promotion of sustainable travel modes.

From a 2009 Base Year, the model has been used to predict traffic conditions in 2026 for the following scenarios:

- Reference Case   includes the trips associated with proposed Ashton Park development, as well as other committed and assumed developments in Trowbridge, as per the Core Strategy Pre-Submission document.

    Any improvement schemes are excluded other than those already committed, such as the Hilperton Relief Road and East Trowbridge Distributor Road.

    Allows for 'background' traffic growth due to increased car ownership and use and developments outside of the Trowbridge area.

- Emerging Strategy   as the Reference Case but with road improvement schemes and measures to encourage non-car modes in place, as outlined in **Table 5.2** above.
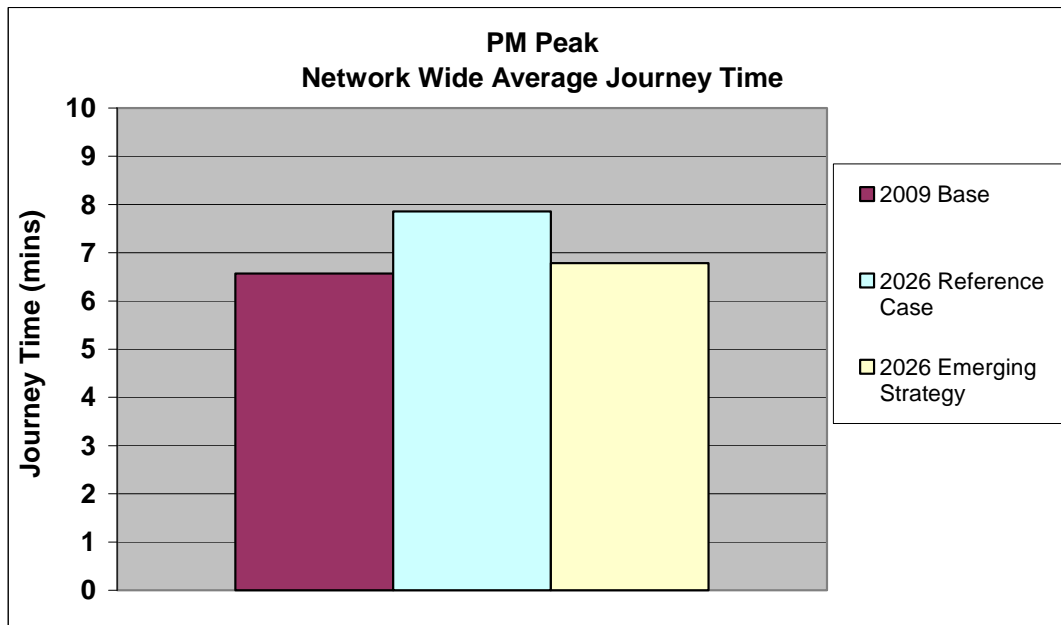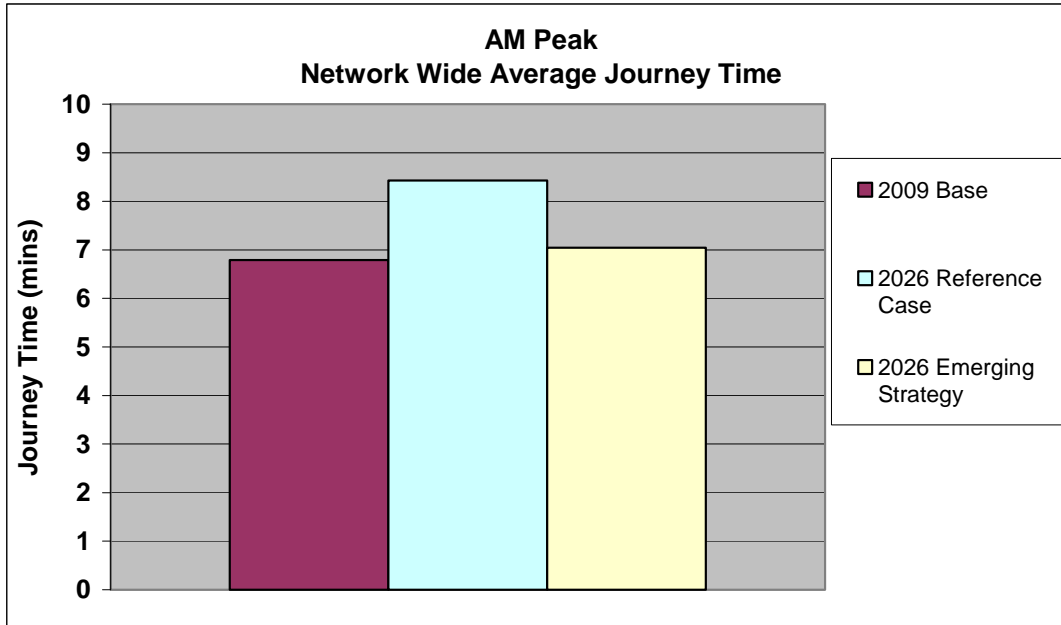
6.1   Network-wide Statistics

Figure 6.1 shows the average journey time for each scenario, using statistics from the whole model in the AM and PM peak hours.

The 2026 Reference Case shows an increase in average journey time of 1.6 minutes in the AM peak hours, compared to the 2009 Base, with a smaller increase of 1.3 minutes in the PM peak hour. The Emerging Strategy is successful in reducing the average journey time to a similar level to that in 2009.

Figure 6.2 shows the difference between the scenarios in terms of total distance travelled. The 2026 Reference Case shows a large increase in distance travelled over the 2009 Base, mainly due to general traffic growth. With the Emerging Strategy there is still a large increase but there is a small reduction from the Reference Case because the promotion of sustainable travel modes will reduce the number of car trips generated by the new development.

Table 6.1 contains the detailed statistics used for the graphs described above.

Figure 6.1: Network-wide Average Journey Times

Source: SATURN Model 2026

Figure 6.2: Network-wide Total Distance Travelled

AM Peak
Total Distance Travelled

- 2009 Base
- 2026 Reference Case
- 2026 Emerging Strategy

PM Peak
Total Distance Travelled

- 2009 Base
- 2026 Reference Case
- 2026 Emerging Strategy
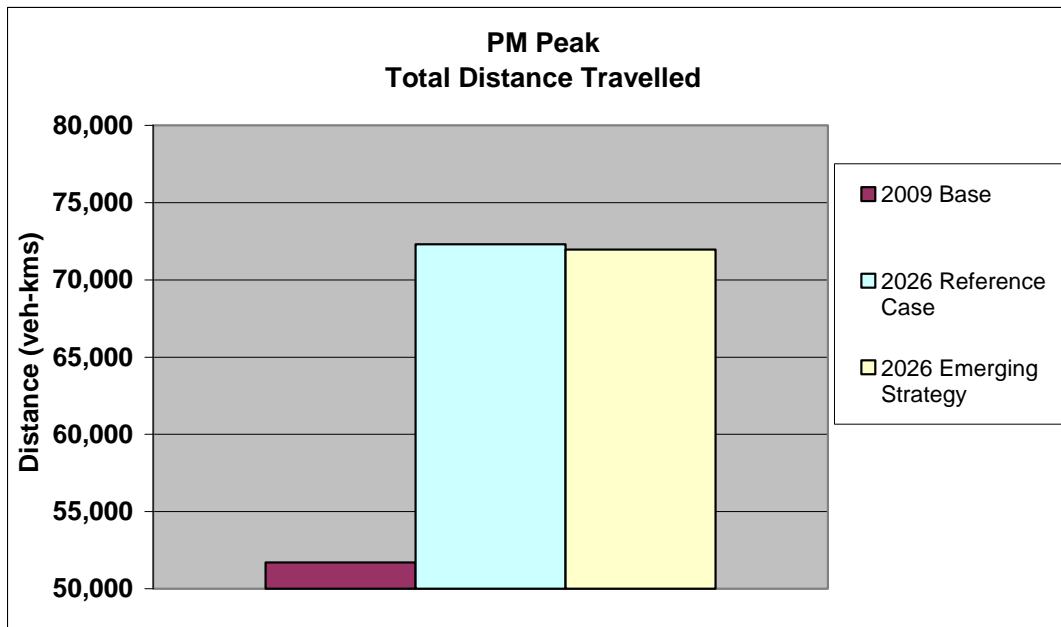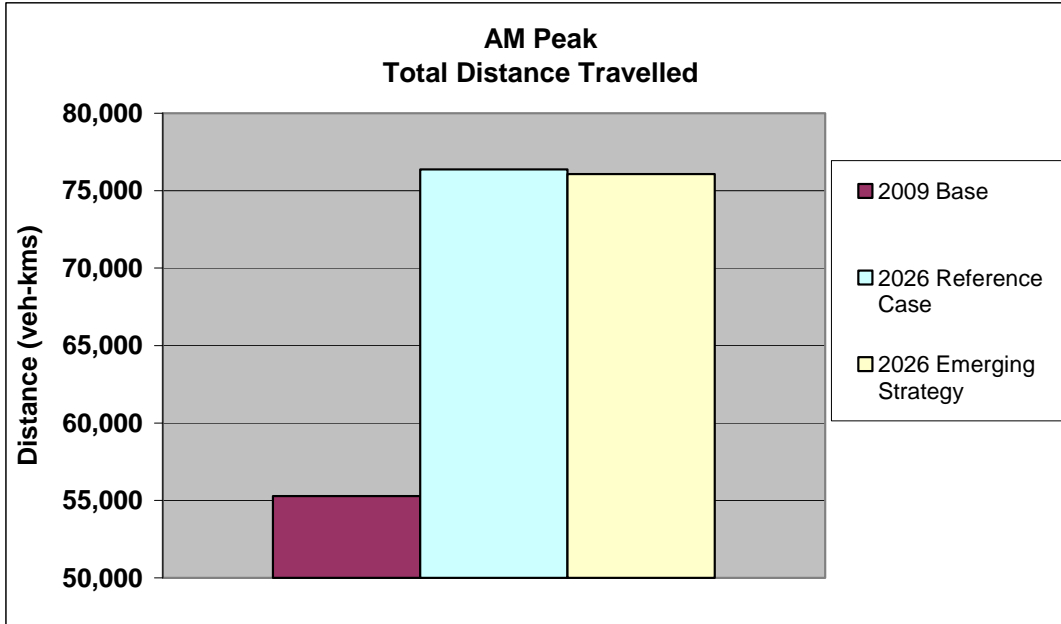
Source: SATURN Model 2026

Table 6.1:   Network-wide Model Statistics

		2009 Base	2026 Reference Case	2026 Emerging Strategy
AM Peak Hour				
Distance travelled (pcu-kms per hour)		55294	76372	76069
Change in Distance travelled Compared to "Reference Case"				-0.4%
Average Speed (kph)		32.7	26.0	31.9
Average Journey Time (mins)		6.8	8.4	7.0
Change in Journey Time Compared to "Reference Case" (mins)				-1.4
Number of Junctions >85% of Capacity		5	12	5
PM Peak Hour				
Distance travelled (pcu-kms per hour)		51707	72301	71964
Change in Distance travelled Compared to "Reference Case"				-0.5%
Average Speed (kph)		34.4	28.3	33.2
Average Journey Time (mins)		6.6	7.9	6.8
Change in Journey Time Compared to "Reference Case" (mins)				-1.1
Number of Junctions >85% of Capacity		3	10	7

6.2   Operation of Key Junctions

Looking at the road network in more detail, **Appendix A** contains diagrams of the road network assumed for each scenario highlighting any junctions which are close to or over capacity as follows:

       RED   demand/capacity ratio of over 85%

       AMBER   demand/capacity ratio of 70%- 85%

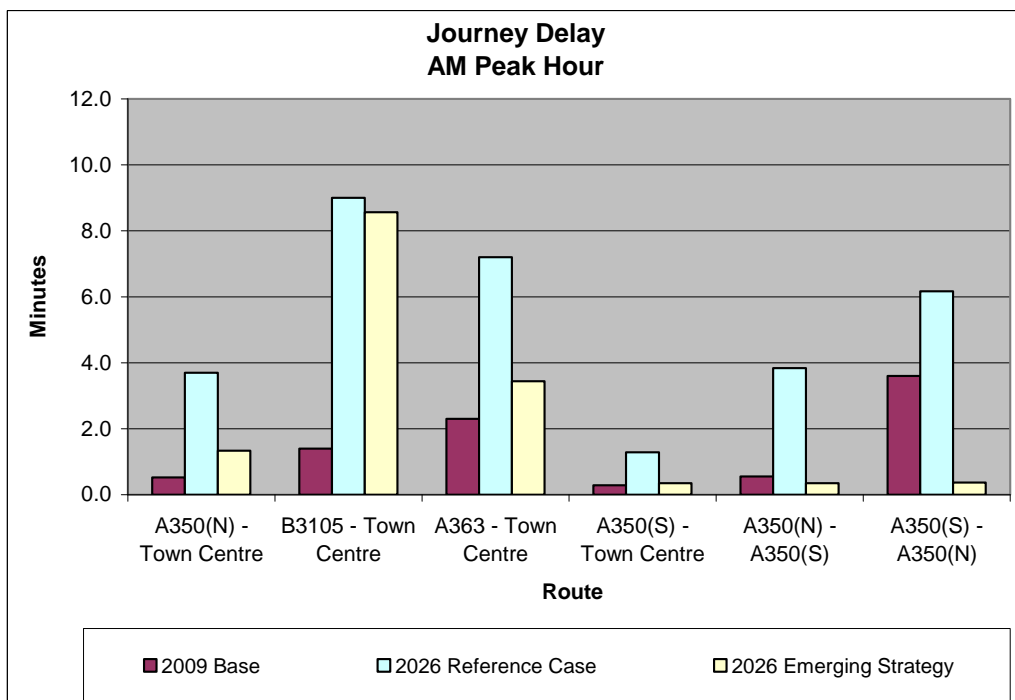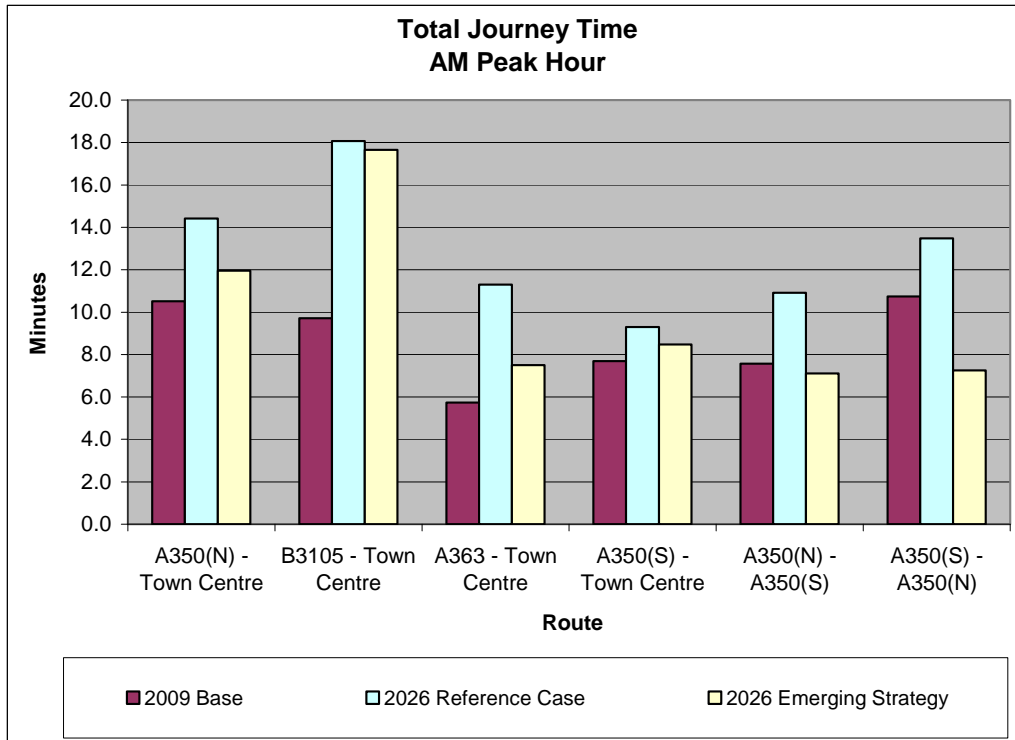   **GREEN**   demand/capacity ratio of less than 70%

The results of the modelling show that the Yarnbrook and West Ashton Relief Road schemes in the Emerging Strategy are successful in removing the congestion at these locations. However, many junctions in the town centre remain at or close to capacity.

6.3   Journey Times on Key Routes

Figure 6.3 gives the journey times on the main radial routes into the town centre in the AM peak hour, together with those for through traffic on the A350 in both directions. The total delay experienced on each route is shown separately, as a good measure of congestion on the network. **Figure 6.4** shows similar data for the PM peak hour. The routes which have been reviewed are shown in **Figure 6.5**.
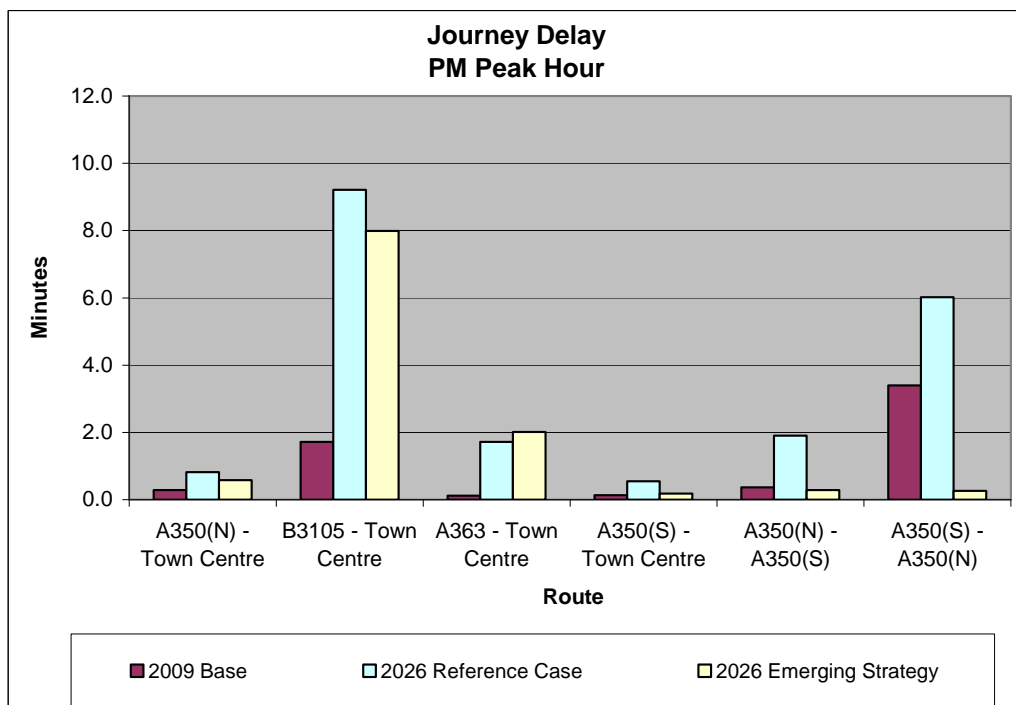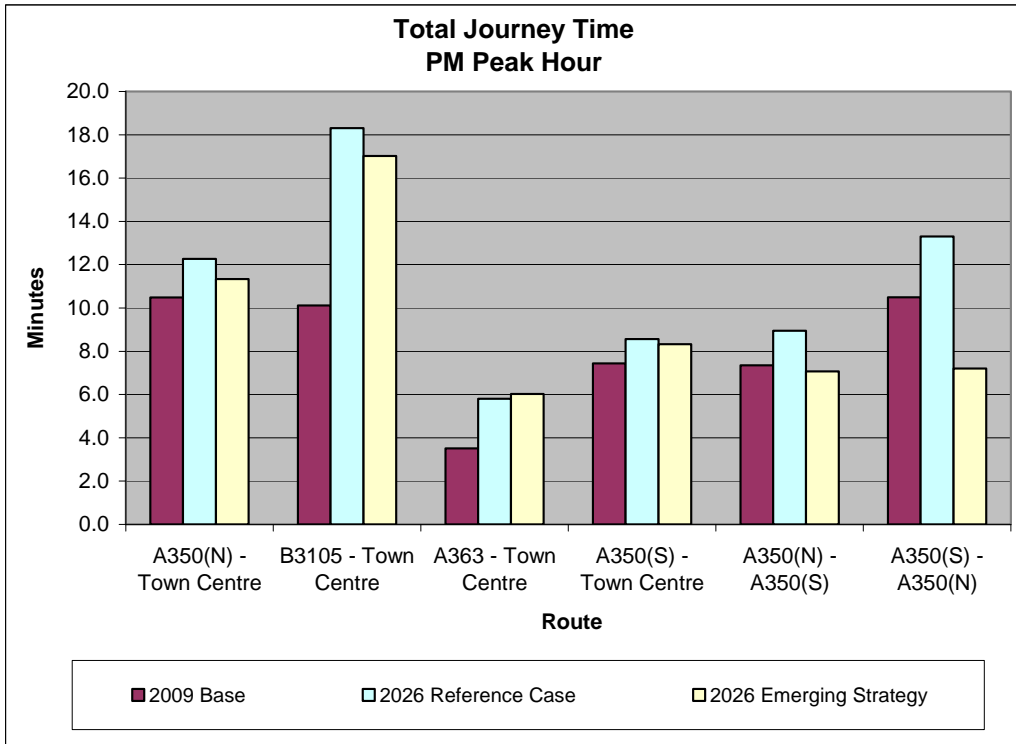
As can be seen, the Emerging Strategy minimises delays for through traffic on the A350, as well as for traffic into the town centre from the A350 in the south. Congestion remains from the north into the town centre via the B3105 (delays at Staverton) and, to a lesser extent, via the A363.
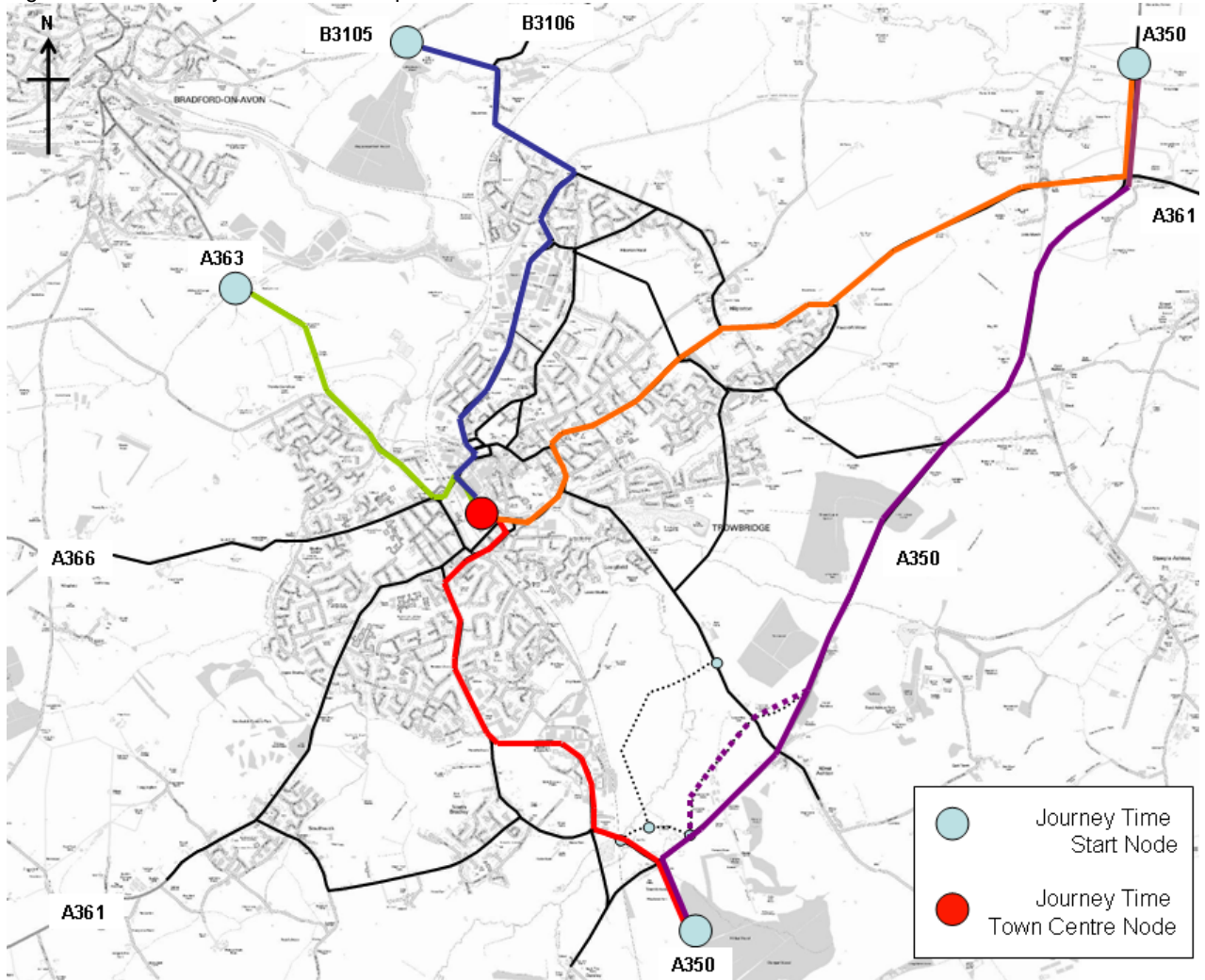
Figure 6.3: Journey Times on Key Routes – AM Peak Hour

**Total Journey Time
AM Peak Hour**

**Journey Delay
AM Peak Hour**

Source: SATURN Model 2026

Figure 6.4:   Journey Times on Key Routes- PM Peak Hour

Total Journey Time PM Peak Hour

Legend: ■ 2009 Base □ 2026 Reference Case □ 2026 Emerging Strategy

Journey Delay PM Peak Hour

Legend: ■ 2009 Base □ 2026 Reference Case □ 2026 Emerging Strategy

Source: SATURN Model 2026

Figure 6.5:   Journey Time Routes Map

Source: Contains Ordnance Survey data © Crown copyright and database right (2012)

6.4 Emissions to Air

The Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations have created the Emissions Factor Toolkit (EFT) to forecast the emissions from vehicles in the UK fleet up until 2025. The emission factors used in EFT are based on the current and predicted future fleet composition and were last updated in August 2012 (released as Version 5.1.3).

Vehicle technology improvements are expected in the following decade and vehicle manufacturers are working towards improved emissions from vehicles in accordance with the EU Directive of 95g/km of CO_2 by 2020. To achieve these reductions the fuel composition or vehicle efficiency must be improved.

It is possible to make estimations of vehicle emissions in the future using EFT if certain parameters are known. These include link length, annual average daily traffic (AADT), annual average speed, road type (rural, urban, motorway) and the ratio of light duty vehicles (LDV) to heavy duty vehicles (HDV). The EFT was run to forecast future emissions in the Trowbridge area using the results of the traffic modelling.

Using the EFT in this way does not provide an assessment of the potential impact on ambient air quality specifically (detailed dispersion modelling would be required for this). However, emissions are directly linked to ambient air quality and therefore the approach provides a good comparison of the scenarios.

With respect to ambient air quality impacts, emissions of oxides of nitrogen (NO_x) and particulate matter (PM_{10}) have been focussed on because these are the pollutants of most concern in the UK associated with road traffic emissions and health. Predictions of carbon emissions (CO_2) are also included and this allows the potential impact on operational greenhouse gases to be assessed.

The overall emissions have been calculated for the Reference Case and for the Emerging Strategy. **Table 6.2** shows the percentage change of NO_x, PM_{10} and CO_2 emissions between the two scenarios.

Table 6.2: Change in Emissions with the Emerging Strategy Compared to the Reference Case

Pollutant	% Change
NO_x	-4.9
PM_{10}	0.5
CO_2	-6.5

The Emerging Strategy gives a reduction in the emissions of NO_x and CO_2 but PM_{10} shows an increase as PM_{10} emissions increase as average vehicle speeds increase. Therefore, reducing congestion and allowing traffic to move at higher speeds is shown to increase PM_{10} emissions, compared to the Reference Case.

7. Conclusions

A Transport Strategy has been developed for Trowbridge to address the impact of traffic growth and additional trips associated with new development proposed in the Core Strategy.

Traffic modelling has shown that the Emerging Strategy is successful in reducing traffic congestion, with average journey times in 2026 similar to those experienced in 2009 and with delays on the A350 minimised. The strategy will also reduce carbon emissions and emissions of oxides of nitrogen, compared to the Reference Case without the mitigation measures in place.

Over the life of the Core Strategy, the Emerging Strategy is considered to be deliverable and affordable. Therefore, it is concluded that the Emerging Strategy is appropriate to mitigate against the impacts of the additional trips associated with the level of development proposed in the Core Strategy.

Appendix A.   Model Output Results

Figure A.1:   2009 Base - Junction Capacity Summary AM Period

Figure A.2:   2009 Base - Junction Capacity Summary PM Period
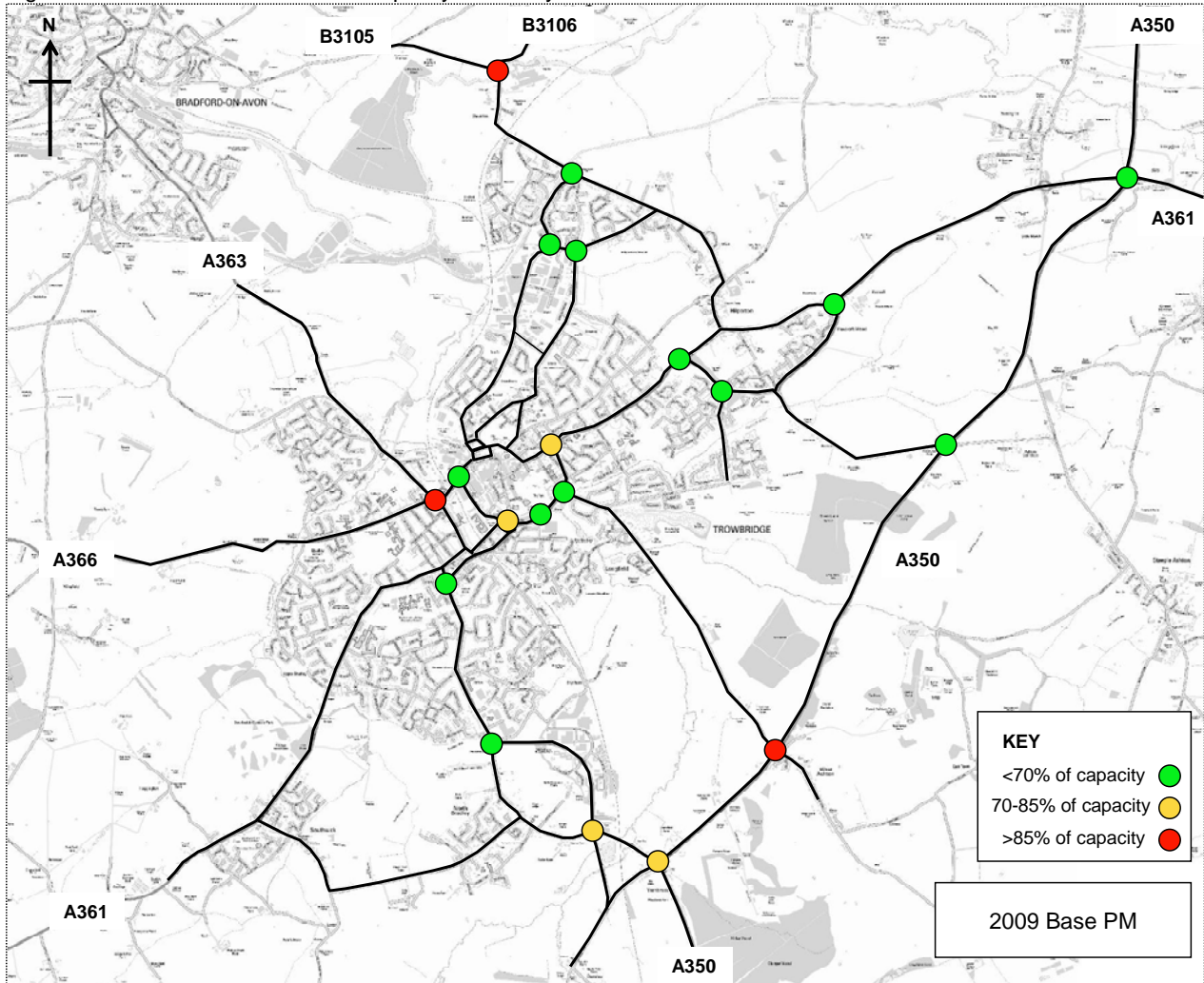
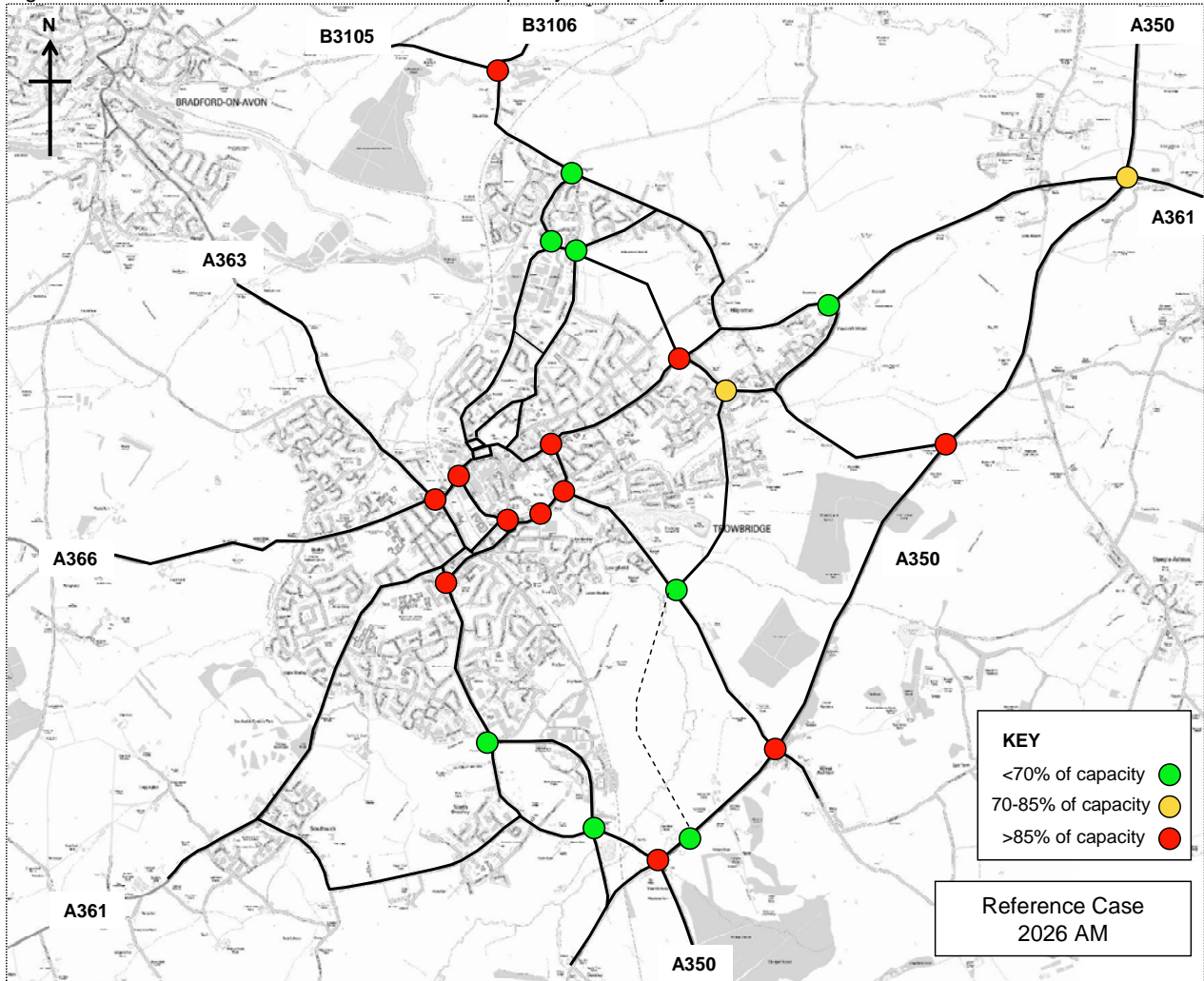Figure A.3:   2026 Reference Case - Junction Capacity Summary AM Period

Figure A.4:   2026 Reference Case - Junction Capacity Summary PM Period
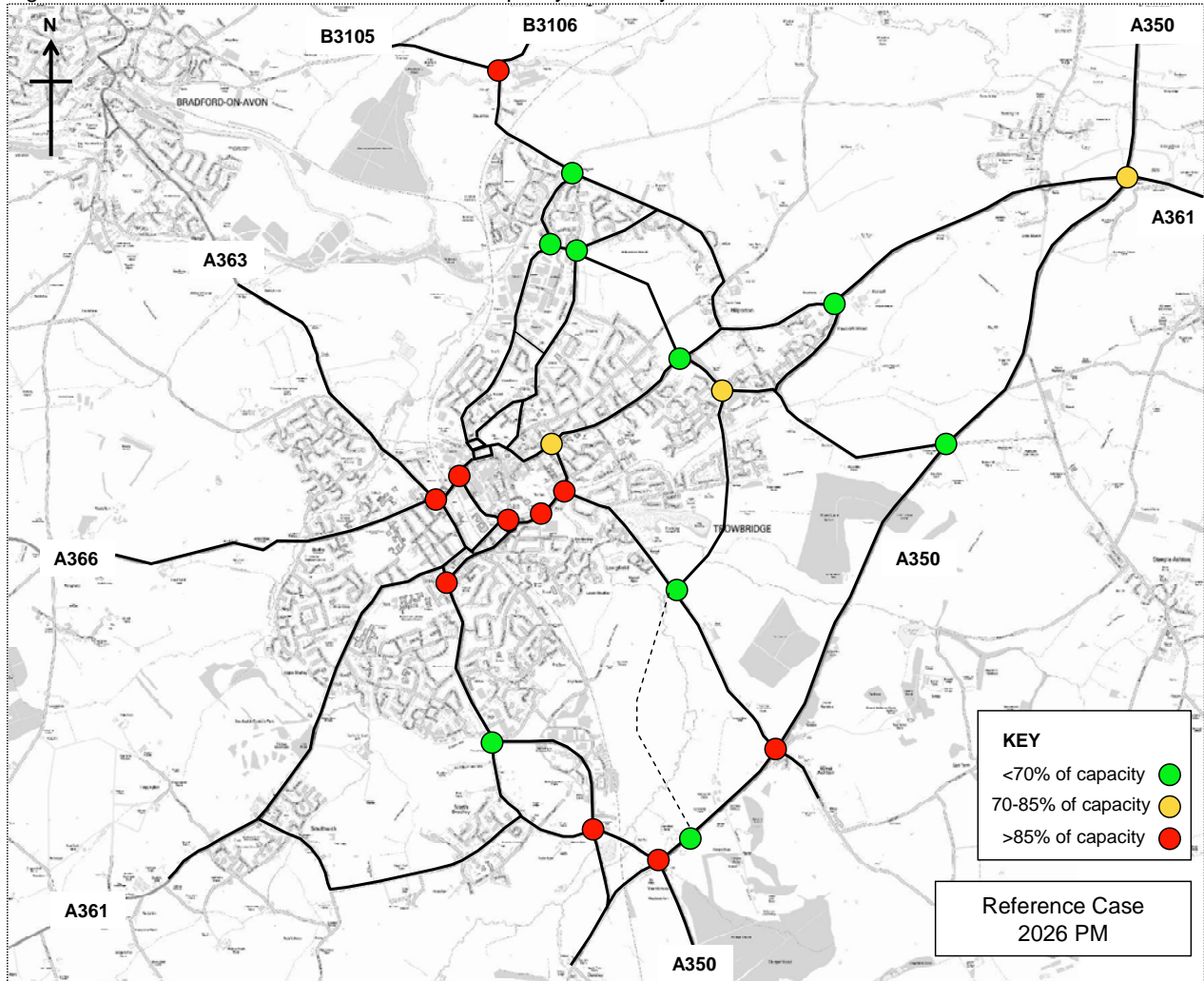
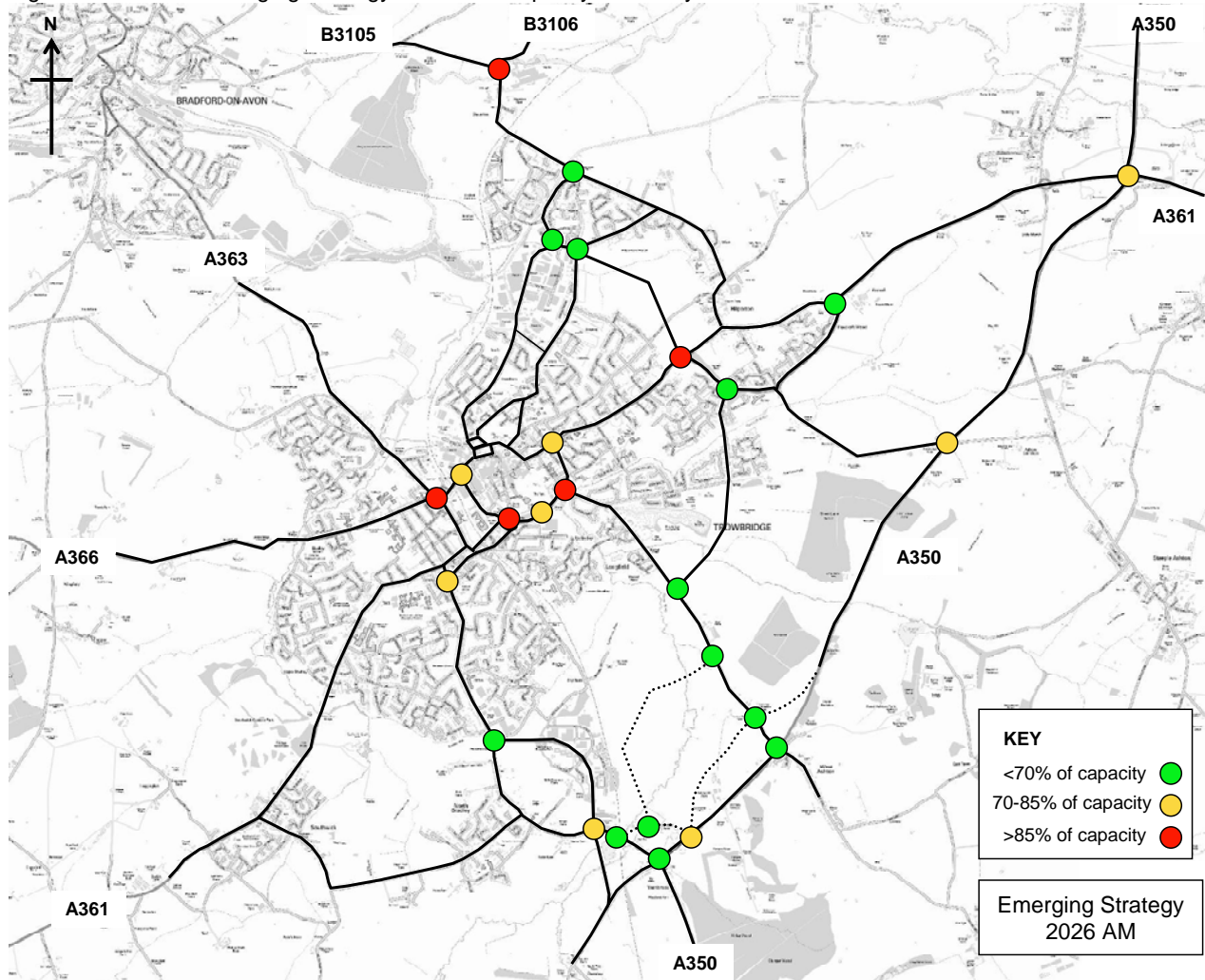Figure A.5:   2026 Emerging Strategy - Junction Capacity Summary AM Period

Figure A.6:   2026 Emerging Strategy - Junction Capacity Summary PM Period