



Trowbridge Transport Strategy Development

Options Assessment Report

December 2011
Wiltshire Council

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	October 2011	D Friel / S Finney	S Finney	N Richardson	Draft
B	November 2011	D Friel	S Finney	N Richardson	First Issue
C	November 2011	D Friel	S Finney	N Richardson	Second Issue
D	December 2011	D Friel	S Finney	N Richardson	Final Issue

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1. Introduction

This report summarises the process undertaken to identify potential transport schemes and measures which could contribute to an overall Transport Strategy for Trowbridge. The strategy will consist of a range of measures, some of which are likely to be of strategic importance, whilst others may focus on critical local issues.

To ensure a focused assessment of potential measures, a set of strategy objectives has been 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**.

A long list of potential measures has been produced, with an initial sifting process used to discard any measures that are not in line with policy or are not appropriate to Trowbridge. The measures included within the overall strategy need to be affordable and deliverable. The measures taken forward have then been assessed individually against the above objectives, with additional analysis on potential physical and environmental constraints and scheme cost.

Individual measures have then been drawn together into packages to form strategy “options” and these options have been tested using the SATURN strategic highway model.

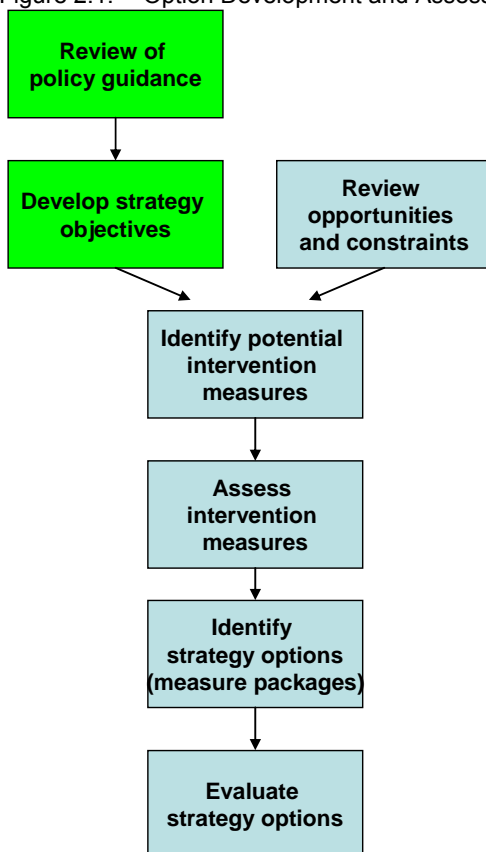
This report covers the assessment of measures and strategy options to inform the process of identifying a preferred strategy option, which will take place with inputs from the Council and key stakeholders.

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. 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.

3.1 Transport Patterns

3.1.1 Existing 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 3.1** below:

Table 3.1: 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 3.1 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).

3.1.2 Future Development Impacts

The planned development offers a major opportunity to improve the transport facilities offered throughout the town. Wiltshire Council has been progressing the Core Strategy for development up to 2026, and consulted on the Core Strategy Consultation Document in June-August 2011. In response to economic appraisal work and consultation responses, the Core Strategy has been amended with the pre-submission draft now based on:

- Up to 6,000 new homes in Trowbridge, of which 2,600 are proposed in an area to the south east of the town;
- An additional 15 hectares of employment land will be provided in the same development area;
- The implementation of this large scale development to the south east of the town is expected to require significant improvements to the A350 road corridor.

Due to the scale of the development proposed in the pre-submission draft Core Strategy, the potential adverse impacts and the significant opportunities for transport enhancements form a core element of the Transport Strategy. The potential development also provides the greatest opportunity for funding.

This transport review has considered the following Ashton Park Urban Extension scenarios:

- Development Scenario 1 - as the Core Strategy Consultation Document – 2,650 dwellings and 30ha of mixed employment; and,
- Development Scenario 2 - as the pre-submission draft – 2,600 dwellings and 15ha of mixed employment.

These two scenarios have been fully reviewed throughout the assessment of individual transport measures and option packages.

3.2 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 3.2** overleaf.

Table 3.2: 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.	<p>Limited capacity on the A350 at Yarnbrook and West Ashton results in peak hour delays on the strategic road network.</p> <p>The A361 County Way acts as a barrier between southern and eastern residential areas and the town centre.</p> <p>There is limited traffic capacity at several town centre junctions at peak times, leading to delays to buses and all traffic.</p>
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.
<p>There is a network of footpaths which connect with outlying residential areas.</p> <p>High quality walking and cycle routes are provided through parks (such as Biss Country Park) providing connections with outlying areas.</p>	<p>A number of “distributor” roads have limited or no pedestrian facilities. There are several roundabouts, and the quality of pedestrian facilities is not consistent.</p> <p>Footpath routes can be of poor quality, narrow and unlit and some are heavily littered and suffer from graffiti.</p>
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.
<p>Trowbridge is served by a good network of inter-urban bus services.</p> <p>Bus stop facilities are generally of good quality and real time information is provided to users.</p>	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.

3.3 Core Strategy Consultation

The consultation period for the emerging Wiltshire Core Strategy ran from Monday 13 June until Monday 8 August 2011. In relation to transport and development opportunities in Trowbridge over ninety responses were made. The following points summarise many of the key issues that were raised through the consultation exercise:

- A variety of road capacity concerns were identified, including potential impacts within the town centre and across the wider network;
- There was concern that in response to the proposed growth options the local carbon emission targets could not be achieved;
- The potential impact of development on the strategic road network, and in particular the A350 junctions, was raised by a number of consultees;
- Several responses identified the need for high quality pedestrian and cycle links across the town;

- Specific comments were made regarding the River Biss corridor and the potential impacts of new development;
- Several responses identified that there is a particular need to upgrade the Trowbridge Rail Station;
- Concerns were raised that major road improvements will promote out-commuting and divert funding away from the town centre;
- A series of comments related to Hilperton Relief Road, several in support of the scheme although some questioned the need for the road;
- Several consultees raised general concerns regarding the impact of HGVs across the highway network.

3.4 Transforming Trowbridge

The Transforming Trowbridge project, commissioned by Wiltshire Council, identified a series of enhancements that should be taken forward to form a strategy for the future of Trowbridge (final report published in August 2010). The key transport findings and the guiding principles that should be applied to future strategy work are summarised in **Table 3.3** overleaf. The full Transforming Trowbridge outcomes are included in **Appendix A**.

The principles identified by the Transforming Trowbridge project are considered to be critical in the successful delivery of the Transport Strategy. To support this, intervention measures that support the overall regeneration objectives must form the core component of the Strategy initiatives.

The interventions that are already committed as part of approved development plans and measures that would be required to support a town wide strategy are presented and reviewed in the following sections.

Table 3.3: Transforming Trowbridge – Transport Guiding Principles

	Walking	Cycling	Bus use	Rail use	Traffic	Parking
Improve the gateways and approaches to the town centre	Reducing severance effects of main roads by creating more at-grade crossings				Reinforce slow speed culture and promote walk/cycle as well as car access	
Integrate new development	Linking sites with the town centre, rail station and employment locations		Link sites with town centre and station with routes that are more direct and easier than car use	Ensure that there are links from sites to the station	Ensure that car access is not advantaged e.g. speed, parking, length of route from sites	
Make the best use of existing infrastructure	Reallocating road space for walking	Improving conditions for cyclists e.g. slowing traffic	Restrain car access to the town centre further to encourage priority bus access	Promote services including improved Trowbridge-Melksham-Chippenham-Swindon	Rationalizing capacity and reallocating under-used space to walk, cycle and bus; reduce severance effects of main roads	Convert long stay spaces to short stay in premium locations
Manage car park supply and demand	New links from car parks to key destinations		Ensure that parking does not incentivise car use (cost or convenience) compared with bus use	Support parking at station but develop walk/cycle/bus options also	Easy, free parking encourages traffic	Introduce charges to cover maintenance costs and support other modes; transfer long stay spaces to the periphery; address private non-residential parking with travel plans
Improve the town centre pedestrian environment	Give more priority to walking; calmer, cleaner environment	Improved access and secure cycle parking; transfer from car improves air quality	Retain and improve bus access		Reduce traffic speeds and restrict access to certain streets; reduces noise and pollution and improves safety	Reduce demand for parking
Encourage healthier, more active and sustainable transport modes	Promote healthier living; develop a programme of walking initiatives including schools and workplaces	Promote healthier living; develop a programme of cycle training including workplaces	Support bus use e.g. walking routes to stops		Rebalance priority for access by car compared with other modes; reduced demand improved air quality	Discouraging long stay parking will help reduce intrusive traffic

	Walking	Cycling	Bus use	Rail use	Traffic	Parking
Reduce travel and increase town centre activity	Make walking routes direct, legible and safe	Make cycling the mode of choice for local trips	Actively promote bus use		Reduce traffic by promoting other modes	
Make better use of the railway	Improve access to the station	Improve access to the station and ensure cycle parking security	Integrate bus services i.e. timetabling and fares	Promote services, improve station and range of journey options		Ensure capacity for rail users
Embrace future technologies			Extend real time information, new payment methods e.g. mobile phones and contactless/ smart cards	Integrated ticketing with bus e.g. PlusBus	Reduce vehicle emissions by new technologies and reduced demand	Variable message signing for car park occupancy

4. Committed Interventions

There are a number of “committed” developments that have been given planning permission in recent years, with a number of 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 4.1** below.

Table 4.1: 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.

The delivery of the transport schemes listed in **Table 4.1** is reliant on the approved development proposals coming forward. The implementation of the transport measures is dependent on planning obligations associated with the timetable of development schemes and therefore the strategy needs to be positioned so that the delivery of other elements can react to the potential delay of other transport infrastructure improvements.

Wiltshire Council has provided details of the Section 106 Agreements that are associated with approved development and the funding available, a summary of which is provided in **Appendix B**.

Where not already allocated to particular schemes, such as the Hilperton Relief Road, it is assumed that these Section 106 Agreement funds will be used to implement localised measures and, as such, the funds would not be available for the schemes over the wider area in the preferred transport strategy.

5. Intervention Measures

There is a wide variety of potential improvement measures that could be included within the Trowbridge Transport Strategy. The interventions considered for the Strategy within this work are summarised in the following sections.

5.1 Walking

Promotion of walking trips is a core component of any successful Transport Strategy. This section describes the measures that could be implemented across Trowbridge to further encourage walking and to ensure that the pedestrian routes are as safe as possible.

5.1.1 Safe Walking Routes Strategy

A comprehensive walking strategy for the town centre and the surrounding residential areas has considerable potential to encourage residents to access local services without using the private car. There are a number of opportunities to introduce new walking routes and enhance existing facilities. Some facilities are already of a high standard and a view of the route through the Biss Country Park is shown in **Figure 5.1** below.

Figure 5.1: Walking routes through Biss Country Park



A comprehensive strategy would ensure that schemes are implemented as development comes forward and that complete routes can be provided.

5.1.2 Rail Station to Town Centre Route Improvement

The pedestrian environment between Trowbridge rail station and the town centre has been identified by the TransformingTrowbridge project as an area for improvement, as it forms an important 'gateway' into the town. Way-finding between the station and town centre is poor for visitors to the town and the quality of the route falls below the standards observed in other parts of the town centre. A view of the route is shown in **Figure 5.2** below.

Figure 5.2: Stallard Street view (towards rail station)



Improvement of the pedestrian route along this corridor would also need to include a review of the wider public realm. These enhancements could have a significant influence on the number of users accessing the station on foot or by bike.

In October 2011, a planning application for the redevelopment of the former Bowyers factory site was submitted to Wiltshire Council. The site would take access direct from Stallard Street and has the potential to significantly alter the vehicular and pedestrian routes between the rail station and the town centre. It is expected that improvements would be secured as part of any planning approval for the site.

5.1.3 At-Grade Pedestrian Crossing Improvements

Trowbridge benefits from an established pedestrian network and a number of the routes are segregated from the road network. However, there are a number of locations where the pedestrian crossing facilities would benefit from improvement, in particular on the key corridor routes to the town centre and to other main destinations, such as schools and the hospital.

The standard of provision needs to be consistent across Trowbridge and meet Disability Discrimination Act standards, to ensure that the town centre is accessible to all users.

There are a number of locations where the implementation of improvements would assist users, examples being:

- A361 Frome Road / A363 Bradley Road roundabouts;
- A361 County Way / Hilperton Road / Roundstone Street roundabout;
- Green Lane / West Ashton Road corridor;
- Wyke Road/ Canal Road roundabout; and
- Castle Street corridor.

5.1.4 Segregated Pedestrian Crossings Enhancements

Whilst providing benefits to motorists and rail users, the A361 and the rail line running through the town do form barriers to pedestrian and cyclist movements. There are a number of pedestrian crossing facilities and an example of the current provision is provided in **Figure 5.3** below.

Figure 5.3: Existing Rail Pedestrian Crossings



It is understood that one of the rail line crossings will be improved in response to development proposals at Southview and there are also opportunities to improve other rail crossings and routes across the A361 as other development sites come forward. Improvements to these crossing facilities would significantly increase accessibility to the proposed development sites.

The scheme options include:

- A361 Pedestrian footbridge and underpasses;
- Dursley Road rail bridge;
- Drynham Road / Southview rail bridge; and
- Drynham Road / Bramley Lane rail bridge.

5.2 Cycling

5.2.1 Cycle Network Strategy

To complement a comprehensive walking strategy, the cycle network strategy would need to be of the same standard. Cycling provides a significant opportunity for encouraging residents in outlying areas to reduce the use of the private car for relatively short trips. In places Trowbridge has good cycle facilities,

however, some links are missing and in other areas the quality of the network is poor and does not encourage use.

Figure 5.4: Cyclist in vulnerable position



It is widely accepted that the standard of the cycle network infrastructure has a significant impact on the level of use and there is significant potential to improve provision across Trowbridge.

5.2.2 Cycle Parking Strategy

In conjunction with the delivery of a cycle strategy, the provision of high quality parking facilities is important in encouraging Trowbridge residents to cycle. Parking is needed at key destinations, such as the rail station and in the town centre and needs to be secure but also attractive for the user.

Figure 5.5: Trowbridge Rail Station cycle parking



The impact of the provision of additional cycle parking is difficult to evaluate in isolation, however, it is a fundamental element of an overall cycling strategy. Locations for cycle parking enhancements include:

- Trowbridge Rail Station;
- All secondary schools;
- Town centre supermarkets; and
- Trowbridge hospital and doctors surgeries.

5.2.3 Key Cycle Corridor Routes

Within the implementation of new development opportunities, there will be a need to review cycle facilities along certain key corridors (the River Biss for example). New development could significantly increase demand along these corridors and the opportunity to further promote cycling to and from these developments could be constrained if the appropriate supporting infrastructure is not provided. The potential corridors for review include:

- River Biss Corridor;
- Green Lane / West Ashton Road;
- A361 Frome Road;
- A366 Wingfield Road;
- A361 Hilperton Road;
- B3106 Canal Road / Seymour Road; and
- A363 Bradford Road.

5.2.4 Cycle Awareness Scheme

As part of “Smarter Travel Choice” campaigns (see **Section 5.4**), cycle awareness schemes have been demonstrated to have significant beneficial impacts in promoting cycle use. Opportunities to bring forward cycle awareness schemes as part of School and Workplace Travel Plans would have a positive impact on the success of the cycle strategy for Trowbridge.

5.3 Public Transport

5.3.1 New Rail Station / Rail Halt

The Ashton Park urban extension development scenario has identified an indicative location for a new “rail halt”. Whilst an additional rail halt does have the potential to encourage a higher number of rail users, this needs to be balanced against the overall delay for other passengers and the proximity to the existing station. It is unlikely that a new halt would result in a positive business case.

Furthermore, the proposal is not included in local or national policy documents and it is unlikely that any government funding would be made available for such a scheme.

5.3.2 Provision of Additional Rail Services

There is an ongoing campaign to increase the frequency of the rail services routed via Trowbridge with the main focus being the promotion of additional services through Melksham and on to Swindon.

In February 2011 the Wessex Chamber of Commerce released a strategy report (Delivering Strategies – TransWilts Rail, MVA Consultancy) which promoted the introduction of a north to south Wiltshire rail

service. This service would connect Swindon with Salisbury and the market towns in between. The Chamber of Commerce identify how this additional service has the potential to relieve the A350 and A36 corridors.

5.3.3 Tram / Light Rail Network

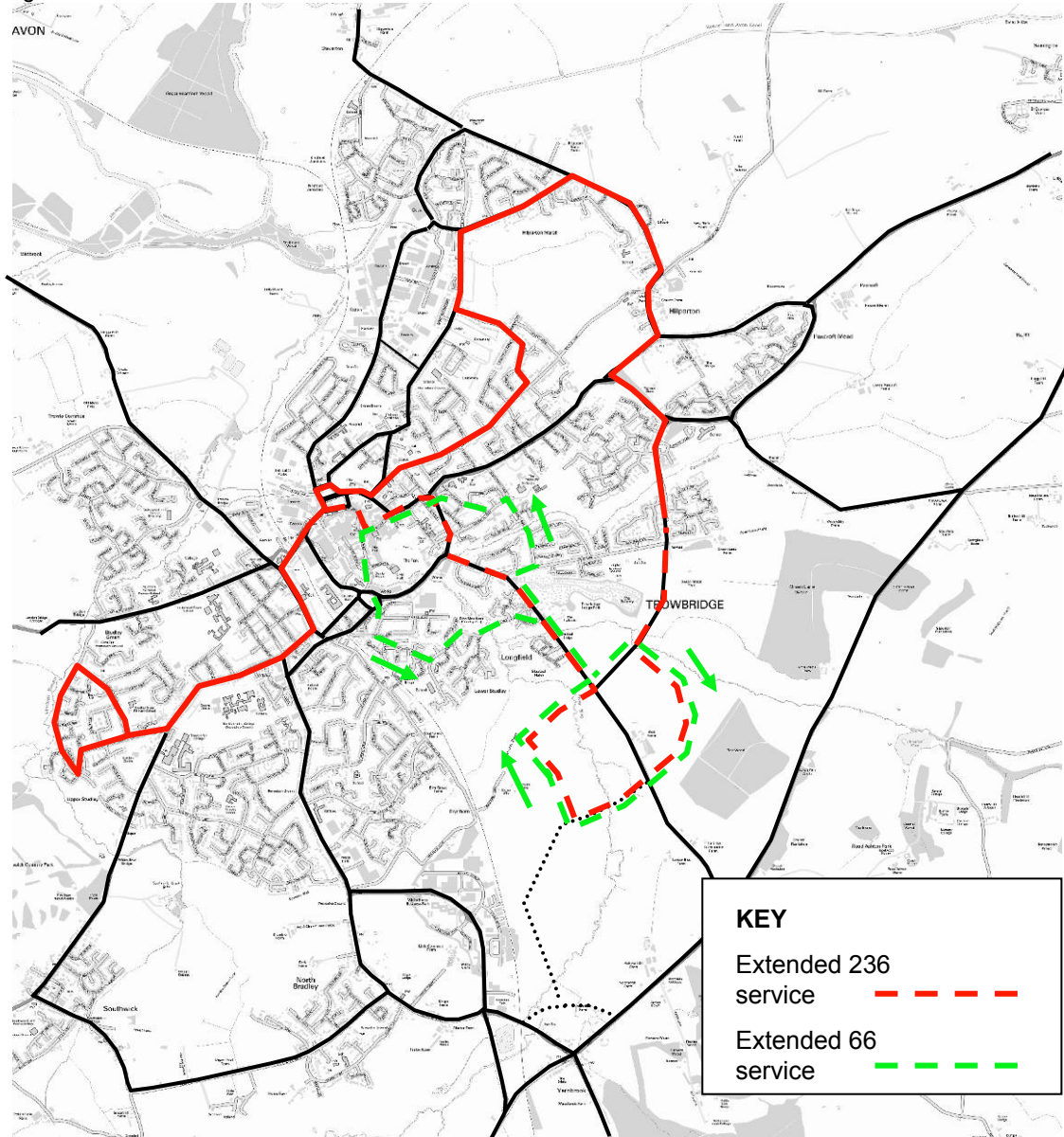
The introduction of mass transit networks requires significant patronage to make such systems economically viable. Funding opportunities for such major schemes are also limited and the scheme implementation would require supporting demand management initiatives (for example, the Nottingham Tram network extension is being implemented with a workplace parking levy scheme).

5.3.4 Trowbridge Bus Service Enhancements

With the delivery of the strategic development sites, there is a need to consider the operation and routing of bus services across Trowbridge. All bus services would ideally be of a frequency that encourages use and be operated on routes that provide journey time advantages over the use of the private car.

Potential changes to serve the Ashton Park urban extension are illustrated in **Figure 5.6**. The 236 service could be extended to form a two-way circular route, passing through the proposed housing area to the east and west of West Ashton Road. The 66 circular route could also be extended to give 3 buses/hour to/from the town centre, when combined with the 236 service. Bus journey times and attractiveness to users would be maximised if bus gates were used to give direct routes to and through the new housing areas. The improved operation could possibly be subsidised by the developer for the first few years of operation, until it became a self-funding service.

Figure 5.6: Potential Bus Services



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5.3.5 Public Transport Infrastructure Improvement

Trowbridge has two main public transport facilities. The rail station is located approximately 500 metres from the town centre and a view of its forecourt is provided in **Figure 5.7** below.

Figure 5.7: Trowbridge Rail Station view



The rail station forecourt and car park environment has had little recent investment and the pedestrian / cycle routes are not defined through the car park area. The existing arrangements do not present an attractive gateway to the town and this does not encourage rail use.

The main bus interchange is positioned in the centre of Trowbridge on Castle Street, adjacent to the taxi rank. A view of the arrangements is shown in **Figure 5.8** below. This facility has been the subject of significant recent investment and is considered to work well: a formal bus station is not warranted.

Figure 5.8: Trowbridge Town Centre bus interchange



5.3.6 Bus Priority Measures

There are limited bus priority measures provided in Trowbridge. Such measures are usually implemented in response to traffic congestion and the subsequent delay to the bus services.

As traffic congestion problems develop through the strategy period, the introduction of more priority measures would help to maintain and encourage bus use. Such measures could be implemented on:

- Holy Trinity Gyratory;
- B3106 Stallard Street;
- Green Lane / West Ashton Road;
- A361 Frome Road;
- A366 Wingfield Road;
- A361 Hilperton Road; and
- B3106 Canal Road / Seymour Road.

In addition to a review of individual bus priority measures, the implementation of any future highway scheme in the town should recognise the need to develop bus priority measures within the design of any improvements, to mitigate for increased delays to buses associated with traffic growth in the town centre. Depending on the opportunities to implement priority measures and the impact of local congestion problems, the timetables of buses serving the town centre may need to be reviewed.

5.4 Smarter Choices

The potential impact of Smarter Choices is significant and the promotion of alternative transport modes above the use of the private car can deliver widespread changes in travel patterns.. With new development in Trowbridge coming forward, there is a significant opportunity to deliver a Smarter Travel Choice campaign across the town.

As part of the Smarter Choice initiative, all future new development proposals should be accompanied by one or more of the following strategies:

- Residential Travel Plans;
- Workplace Travel Plans; and
- School Travel Plans.

Depending on future funding opportunities it may also be possible to develop Travel Plans for existing commercial and residential areas.

5.5 Demand Management and Parking

5.5.1 Rationalise Car Park Access Routes

Routes to the main car parking areas need to be easily accessible for motorists and pedestrians alike. The availability of short and long stay parking needs to be clearly signed and the access routes need to be designed to avoid sensitive residential areas.

Walking routes between the town centre need to be direct, convenient and safe to use by all potential users. It has been identified that there are a number of routes which do not meet this criteria, and areas of concern include routes to the following car parks:

- St Stephen's Place multi-storey;
- Broad Street car park;
- Church Street car park;
- Lovemead car park; and
- Court Street car park.

5.5.2 Traffic Calming Strategy

To ensure that there is a consistent approach to encouraging walking and cycling and that traffic speeds are effectively controlled, more widespread traffic calming could be implemented. There are a number of residential and town centre areas where the private car dominates and where formal traffic calming measures may be justified to reduce speeds and enhance the street environment.

The design of future housing developments must support the principle that walking and cycling are prioritised. This being the case, the design of new development should not need the introduction of traffic calming, however, it may be necessary to retro-fit calming measures into residential areas where roads dominate and where traffic speeds are recorded as being too high.

An audit of traffic speeds and road traffic accident trends would help to identify the areas of greatest concern and this would be a useful tool to help direct any funding that may become available.

5.5.3 Road User Charging

The introduction of road user charging mechanisms, either at a local or national level, has been debated and reviewed in policy consultations over the last decade. The London Congestion Zone is the only UK example of a successfully implemented scheme, although other major cities are currently considering the implications of implementing similar schemes.

It is considered that local road user charging is only appropriate in major urban conurbations and therefore this measure would not be appropriate for Trowbridge.

5.5.4 Car Park Strategy

Wiltshire Council has recently implemented a county wide car parking strategy with the objective of ensuring that the cost of parking in each of the county towns is consistent and that the revenue is sufficient to cover the costs of the car park operations.

This parking review (completed in 2010) included all off-street car parks across Trowbridge and pricing recommendations have now been implemented. St Stephen's Place multi storey car park remains free to use and this parking stock (446 spaces) continues to focus parking and associated traffic movements in this area of the town.

5.5.5 Electric Car Charge Points

The promotion of alternative fuel vehicles is a core element of the government's future transport and carbon reduction policies. To support these policy objectives, there is a need to provide suitable vehicle charging points at car parking locations throughout the town centre.

The switch to electric-only vehicles is likely to gather pace over the strategy period, and therefore the need for charging facilities could become extensive.

5.5.6 Park and Ride

In large towns or cities, Park and Ride schemes have had a significant impact in reducing traffic movements within the urban centres. Park and Ride has been introduced in Salisbury and is a central policy of the transport strategy for the city. The scheme has been recently extended so that the parking opportunities cover all of the main road routes in and out of the town.

Successful Park and Ride strategies are complemented by a parking strategy which ensures that the long stay edge of town facilities are used in preference to the spaces provided in the town centre. Effective strategies also require that each of the main road routes in and out of the town centre have easy access to a Park and Ride car park. Each of the car parks needs to be served by a high frequency (every 15 minutes or better) quality bus service, with the bus stop infrastructure also being of the highest quality.

The development of new Park and Ride sites requires significant capital and ongoing revenue investment. Allocation of Park and Ride car park sites, reduction of long stay town centre parking and commitments to upgrade bus corridors would also need to be included within the Wiltshire Core Strategy if Park & Ride was to be pursued for Trowbridge.

5.5.7 Workplace Parking Levy

Workplace parking levy schemes have been considered for major urban conurbations and a scheme is now being implemented in the city of Nottingham. A levy scheme is not considered to be appropriate for a market town the size of Trowbridge.

5.6 Traffic

5.6.1 Town Centre Pedestrianisation

As shown in **Figure 5.9**, Trowbridge town centre benefits from a recent enhancement to the pedestrian environment.

Figure 5.9: Trowbridge town centre view



For this particular area, the pedestrian environment is considered to be of high quality and the options for further pedestrianisation are limited. As discussed in **Section 5.6.5** below, there may be opportunities to improve the pedestrian realm in Manvers Street and Wicker Hill, however, this improvement would not remove all vehicle trips.

5.6.2 Freight Access Route Strategy

There are a number of commercial areas within Trowbridge, and each of these requires good access by heavy goods vehicles. The routes to and from each of the commercial areas needs to be evaluated to ensure that sensitive residential areas are protected from the potentially negative impacts of large vehicles.

In association with the delivery of the Hilperton Relief Road, Wiltshire Council is progressing the implementation of weight restrictions on the B3105 through Hilperton. These measures will alter the movements of freight vehicles across Trowbridge and supplementary restrictions may be needed to complement those already promoted by the Council.

5.6.3 Town Centre “Gateways” Enhancement

The Transforming Trowbridge project identified that the arrival into the town centre required enhancement and that additional information would improve way-finding to important destinations such as the rail station, the hospital and the town centre car parks. The Transforming Trowbridge project also identified that landscaping improvements on the key corridors into the town centre are also warranted. The key road corridor routes are:

- West Ashton Road;
- A361 Frome Road;
- A366 Wingfield Road;
- A361 Hilperton Road;
- B3106 Canal Road / Seymour Road; and
- A363 Bradford Road.

5.6.4 Strategic Road Improvements

The A350 corridor which runs to the east of Trowbridge suffers from peak hour congestion. In particular, queues can occur at the West Ashton traffic signals (the junction between the A350 and Bratton Road) and at the Yarnbrook Roundabout (the junction between the A350, the A363 and Hawkeridge Road). A view of the existing West Ashton signals arrangement is shown in **Figure 5.10** below.

Figure 5.10: West Ashton traffic signals view



The opportunities to improve the road corridor could help to mitigate the impact of background traffic growth and possibly future development traffic. The complete A350 corridor from Yarnbrook past West Ashton could be improved to relieve congestion at these two junctions and to tackle the historic road safety problem.

Separate, smaller scale improvements to each junction are an alternative:

- A350 West Ashton Signal Improvements;
- A350 Yarnbrook Roundabout Relief Road.

5.6.5 Other Highway Improvements

Limited congestion is also experienced in the town centre. Schemes to maximise traffic capacity at the following locations could be considered:

- Stallard Street / Bythesea Road mini-roundabout;
- Broad Street gyratory;
- Holy Trinity gyratory;
- Longfield gyratory;
- A361 County Way.

The review of the local highway network has identified that the Stallard Street / Bythesea Road mini-roundabout, and its interaction with the rail station car park access, has a significant impact on the traffic capacity through the town centre. A junction improvement at this location, and possible rationalisation of the station car park access, is likely to result in journey time reductions for all vehicles including the bus

services that currently get held up here. The constrained nature of the junction hinders any capacity improvement at the current time, however, the redevelopment of the former Bowyers site, which is adjacent to the junction, provides an opportunity for improvement. Opportunities to increase traffic capacity need to be progressed as part of any future development of the site.

The Broad Street gyratory, located immediately to the north of the town centre, currently operates as a “one-way” network. Due to the nature of the one-way operation, all vehicles travelling south from the northern part of Trowbridge are routed along Manvers Street and Wicker Hill. Both of these routes form part of the town centre and experience high levels of pedestrian activity, business deliveries and bus movements. To improve the public realm of these areas, Wiltshire Council has previously promoted a scheme to alter the current one-way arrangement which would remove “through traffic” from Manvers Street and sections of Wicker Hill. The scheme would deliver a significant public realm enhancement and should also result in journey time reductions for all traffic, particularly buses using Wicker Hill.

The B3105 at Staverton also experiences congestion where it crosses the River Avon, due to the traffic signals that limit use of the bridge to one way at a time. Capacity problems would be removed with a new or widened bridge to allow two-way use but this would require major structural works and has previously been ruled out. However, a smaller traffic management scheme could still deliver significant reductions in delay times. Initial analysis has identified that significant benefits could be achieved if the southbound B3106 approach to the junction from Holt was closed and, as a result, the traffic signal timing could be adjusted. However, any option that includes the partial closure of the B3106 would require a detailed analysis of the impacts and consultation with the local community.

6. Initial Sifting of Measures

The potential intervention measures have been reviewed against the requirements of the relevant policy and background documents (including the Core Strategy Consultation Document, LTP3 and the Transforming Trowbridge work). The applicability of the separate initiatives to meeting the needs of Trowbridge has also been considered.

It is important to note that future development proposals should be assessed on their own merits and additional measures may be required to ensure that any adverse are fully mitigated. Any additional measures should fully accord with the overall Transport Strategy objectives and measures should not detract from those schemes that are already included as core elements.

It should also be noted that the proposed Ashton Park Urban Extension has been fully considered within this work to develop a Transport Strategy and the traffic predicted to be generated by the site has been taken into account.

The first stage of appraisal has been undertaken in line with the principles of the Department for Transport's "Early Assessment and Sifting Tool". This tool helps to review, at a high level, whether schemes should be taken forward to a more detailed stage of appraisal.

The results of this initial assessment are presented in **Table 6.1** overleaf, highlighting the schemes that are not considered realistic and appropriate to Trowbridge in the period to 2026.

More detailed analysis of the measures taken forward for possible inclusion within the strategy options is presented in the following sections.

Table 6.1: Review of Long List of Transport Strategy Measures

	Potential Measure	To review within strategy	Notes
Walking	Strategy to develop safe walking routes that form a legible network	✓	Need for improvement has been identified; Accords with relevant policy requirements
	Enhance pedestrian routes between the town centre and the rail station	✓	Need for improvement has been identified; Accords with relevant policy requirements
	Develop “at grade” crossing facilities along key routes into the town centre	✓	Need for improvement has been identified; Accords with relevant policy requirements
	Improved road crossings and improved lighting / signing	✓	Need for improvement has been identified; Accords with relevant policy requirements
Cycling	Creating a comprehensive cycle network, which may include road space reallocated from general traffic, new road crossings and land take	✓	Need for improvement has been identified; Accords with relevant policy requirements
	Installation of secure cycle parking at strategic locations	✓	Need for improvement has been identified; Accords with relevant policy requirements
	Introduce cycle corridors on key radial routes into the town centre (River Biss corridor for example)	✓	Need for improvement has been identified; Accords with relevant policy requirements
	Cycling education/campaigning to raise awareness and participation, linked to school and workplace travel plans	✓	Need for improvement has been identified; Accords with relevant policy requirements
Public Transport	Tram / Light Rail System	X	Unlikely to be applicable to Trowbridge Does not relate to policy requirements
	Implement new rail station / halt	X	Unlikely to be applicable to Trowbridge Does not relate to policy requirements
	Investigation of the scope for more trains e.g. TransWilts proposals for trains from Trowbridge to Melksham, Chippenham and Swindon subject to line capacity and pathing constraints	✓	Accords with relevant policy requirements; Implementation possibly beyond the study scope
	Changes to the local bus network to make it legible to potential users together with better stop arrangements in the town centre, improved service information	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements

	Potential Measure	To review within strategy	Notes
	Identification and review of interchange locations, especially bus-bus and rail-bus	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	Introducing bus priority measures at local congestion pinch-points	✓	Need for improvement has been identified; Accords with relevant policy requirements
	Rationalise existing and future bus routes	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	Revenue support for additional bus services, such as channelling parking revenue towards other aspects of transport	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	Continuing the Local Transport Fund bid for rail service enhancements and station improvements	✓	Accords with relevant policy requirements; Implementation possibly beyond the study scope
Smarter Choices	Introduce residential travel plans for all new development proposals	✓	Accords with relevant policy requirements
	Support the development of workplace travel plans	✓	Accords with relevant policy requirements
	Continue to implement school travel plans and enhance measures	✓	Accords with relevant policy requirements
Demand Management and Parking	Rationalise access to the town centre car parks	✓	To be reviewed as part of the strategy development Accords with relevant policy document
	Develop a road hierarchy and limit movements in "sensitive" areas	✓	To be reviewed as part of the strategy development Accords with relevant policy document
	Restrictions on vehicle movements and speeds	✓	To be reviewed as part of the strategy development Accords with relevant policy document
	Road user charging	X	Unlikely to be applicable to Trowbridge Does not relate to policy requirements
	Implementing a strategy for public off-street parking spaces to improve short stay parking availability and help generate revenue to fund other strategy measures	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	Introduce facilities for "new technology" vehicles	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	Park and Ride	X	Unlikely to be applicable to Trowbridge Does not relate to policy requirements
	Restrictions on private non-residential spaces through the development control process and possibility charging with a modest workplace charging levy	X	Unlikely to be applicable to Trowbridge Does not relate to policy requirements

	Potential Measure	To review within strategy	Notes
	Measures to manage movement and slow traffic in residential areas	✓	Need for improvement identified; Accords with relevant policy document
	Further pedestrian prioritisation within the town centre (allowing for delivery vehicles, cycling and buses)	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	Local strategy for delivery vehicle access and routes for goods vehicles passing through the town	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
Traffic	Improved town “gateways”, way-finding and junction arrangements	✓	Need for improvement identified; Accords with relevant policy document
	Enhancements to A350 strategic road network	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	Junction capacity improvements in the town centre	✓	To be reviewed as part of the strategy development Accords with relevant policy requirements
	B3105 Staverton Bridge Crossing Improvements	✓	Need for improvement identified

7. Assessment of Potential Measures

7.1 Objectives Review

The intervention measures which have been retained following the initial sifting process have been evaluated against the Strategy objectives (see **Section 2**). Such a review of individual intervention measures before the development of strategy options is helpful as it demonstrates which of the measures contribute towards the overall strategy objectives.

The approach used to assess how the individual measures comply with the strategy objectives is summarised in **Table 7.1** below.

The review of the potential intervention measures against the strategy objectives is presented in **Table 7.2** overleaf, based on a qualitative judgement as to whether the impact is:

Major beneficial
Moderate beneficial
Slight beneficial
Neutral
Slight adverse
Moderate adverse
Major adverse

Table 7.1: Measure Review Approach

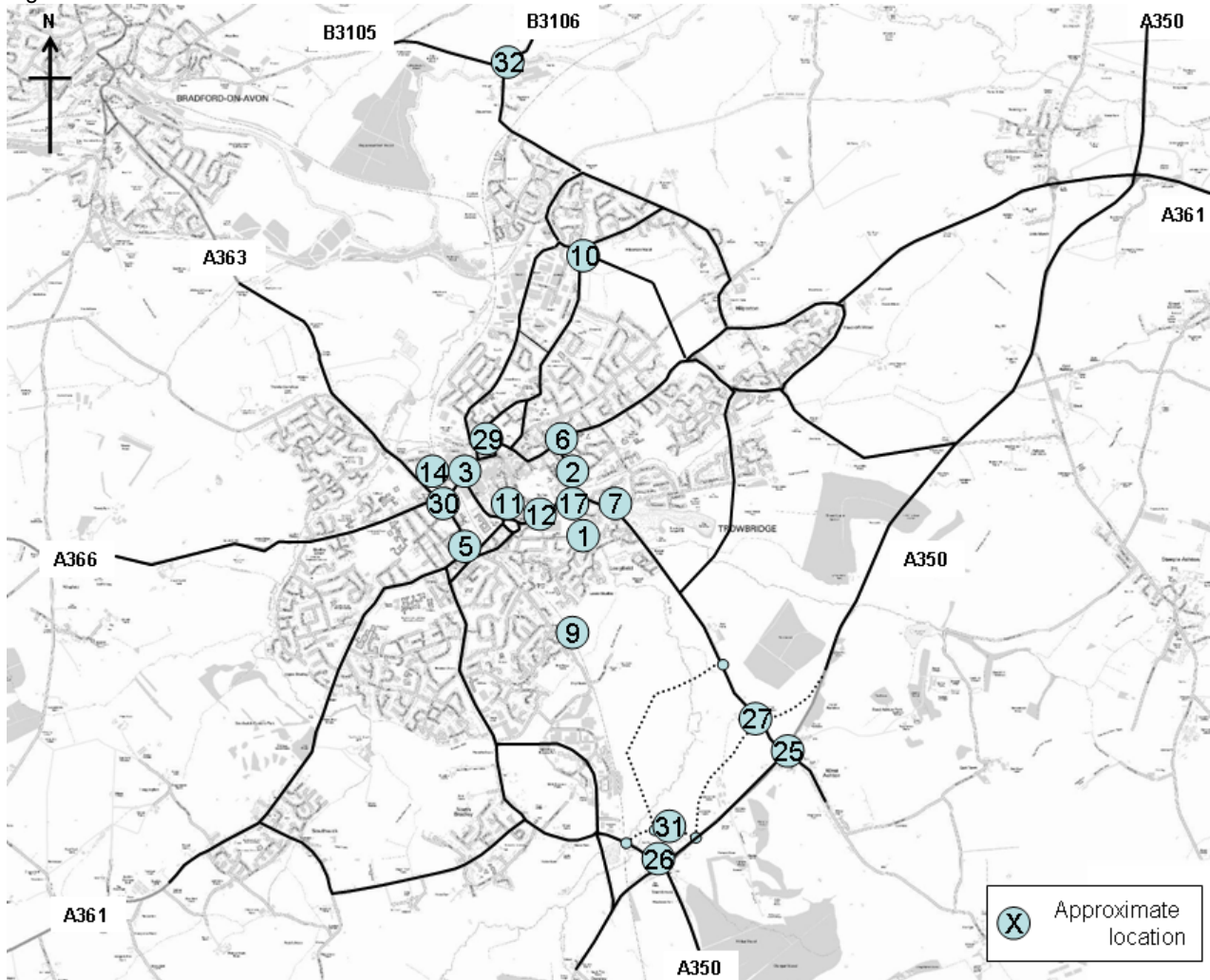
Strategy Objective	Assessment Approach
To reduce transport related emissions and address climate change and local pollution	To meet the objective, the transport measure should: Provide opportunities for safe and convenient non-motorised trips; and Limit emissions by reducing vehicle kilometres travelled.
Promoting sustainable transport, including better local bus services (reflecting national guidance and the Local Transport Plan)	To meet the objective, the transport measure should: Provide opportunities for high quality, safe and convenient non-motorised trips; and Improve interchange between transport modes.
Integrating development sites with established communities to increase travel choice, based on comprehensive networks and linked facilities	To meet the objective, the transport measure should: Provide development opportunities with a choice of transport connections; and Ensure that the wider development impacts can be mitigated.
Improving accessibility throughout the town with new walking and cycling networks	To meet the objective, the transport measure should: Deliver improved facilities that promote walking and cycling across Trowbridge; and Provide increased pedestrian priority within Trowbridge town centre.
Improving road safety, particularly for vulnerable road users	To meet the objective, the transport measure should: Provide enhanced transport facilities which support the safe movement of all Trowbridge residents, workers and visitors.
Creating better environments for people, rather than vehicles, in the town centre, development sites and elsewhere	To meet the objective, the transport measure should: Promote the needs of people above the movement of private cars; and Ensure that all transport facilities are high quality and safe for all users.
To protect the natural environment	To meet the objective, the transport measure should: Support policies which protect countryside designations including greenfield areas; and Ensure that potentially adverse transport impacts are mitigated.
To safeguard the historic environment and to promote high quality new development	To meet the objective, the transport measure should: Protect sensitive historic sites through the provision of infrastructure that reflects local heritage; Support the delivery of high quality development by providing suitable connections via all transport modes; and Ensure that potential adverse impacts are mitigated.
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)	To meet the objective, the transport measure should: Support the delivery of high quality development by providing suitable connections via all transport modes; Provide local improvements to encourage movements through the town; and Ensure that potential adverse impacts are mitigated.
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)	To meet the objective, the transport measure should: Encourage the delivery of development by providing suitable connections via all transport modes; Provide local improvements to encourage movements through the town; and Ensure that potential adverse impacts are mitigated.
To maintain and, where feasible, improve the performance of the A350 strategic road corridor.	To meet the objective, the transport measure should: Deliver improvements to the A350 which improve journey times, reduce congestion and reduce road traffic accidents.

Table 7.2: Measure Assessment table

Scheme Type	Scheme Ref	Scheme	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	Supporting local development opportunities to support containment of trips, with people living near where they work	To maintain and, where feasible, improve the performance of the A350 strategic road corridor
Walking and cycling	1	River Biss Corridor Route Enhancement	Slight beneficial	Neutral	Major beneficial	Major beneficial	Slight beneficial	Major beneficial	Slight adverse	Neutral	Major beneficial	Moderate beneficial	Neutral
	2	A361 County Way / Ashton Street Crossing - Improve pedestrian connections	Neutral	Neutral	Neutral	Slight beneficial	Slight beneficial	Slight beneficial	Neutral	Neutral	Neutral	Slight beneficial	Neutral
	3	Rail station - town centre route enhancement	Slight beneficial	Major beneficial	Moderate beneficial	Major beneficial	Moderate beneficial	Major beneficial	Neutral	Neutral	Neutral	Neutral	Neutral
	4	Improve pedestrian wayfinding and town centre legibility	Slight beneficial	Neutral	Slight beneficial	Major beneficial	Moderate beneficial	Major beneficial	Neutral	Slight beneficial	Neutral	Slight beneficial	Neutral
	5	A361 Frome Rd / A363 Bradley Rd roundabouts - Pedestrian improvements	Neutral	Neutral	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Neutral	Neutral	Slight beneficial	Neutral
	6	A361 County Way / Hilperton Rd / Roundstone St Rbt - Pedestrian Improvements	Neutral	Neutral	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Neutral	Neutral	Slight beneficial	Neutral
	7	Green Lane / West Ashton Rd corridor improvement	Neutral	Neutral	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Neutral	Slight beneficial	Slight beneficial	Neutral
	8	Installation of secure cycle parking at key destinations (i.e. rail station)	Slight beneficial	Moderate beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
	9	Rail corridor - improvement of pedestrian / cycle crossings	Neutral	Neutral	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Neutral	Major beneficial	Slight beneficial	Neutral
	10	Wyke Rd / Canal Rd Roundabout Pedestrian Improvements	Neutral	Neutral	Slight beneficial	Slight beneficial	Slight beneficial	Slight beneficial	Neutral	Neutral	Neutral	Slight beneficial	Neutral
	11	Castle Street Pedestrian Improvements	Neutral	Neutral	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Neutral	Neutral	Slight beneficial	Neutral
	12	A361 County Way Pedestrian / Cycle Overbridge - Realm enhancements	Neutral	Neutral	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Neutral	Major beneficial	Slight beneficial	Neutral
	13	Ensure future development are "permeable" for pedestrians	Neutral	Neutral	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Neutral	Major beneficial	Slight beneficial	Neutral
Public Transport	14	Trowbridge rail station forecourt improvement	Slight beneficial	Major beneficial	Neutral	Moderate beneficial	Neutral	Moderate beneficial	Neutral	Neutral	Neutral	Neutral	Neutral
	15	TransWiltis rail service enhancements	Moderate beneficial	Major beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
	16	Bus only / priority connections to strategic development	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Slight beneficial	Neutral	Neutral	Major beneficial	Neutral	Neutral
	17	A361 corridor bus priority measures	Slight beneficial	Moderate beneficial	Moderate beneficial	Moderate beneficial	Neutral	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Neutral
	18	Local bus service review and consolidation	Slight beneficial	Major beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Major beneficial	Neutral	Neutral
	19	Bus stop upgrade review	Neutral	Moderate beneficial	Neutral	Neutral	Neutral	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Neutral
Smarter Choices	20	Introduce residential travel plans for all new development proposals;	Moderate beneficial	Neutral	Moderate beneficial	Moderate beneficial	Slight beneficial	Neutral	Neutral	Neutral	Major beneficial	Moderate beneficial	Neutral
	21	Support the development of workplace travel plans; and	Moderate beneficial	Neutral	Moderate beneficial	Moderate beneficial	Slight beneficial	Neutral	Neutral	Neutral	Major beneficial	Moderate beneficial	Neutral
	22	Continue to implement school travel plans and enhance measures.	Moderate beneficial	Neutral	Moderate beneficial	Moderate beneficial	Slight beneficial	Neutral	Neutral	Neutral	Slight beneficial	Moderate beneficial	Neutral
Demand Management	23	Relocate long-stay parking from St Stephens Place	Neutral	Moderate beneficial	Neutral	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
	24	Apply new restrictions (including possible charges) to parking in St Stephens Place	Neutral	Moderate beneficial	Neutral	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Road Improvement	25	A350 West Ashton Traffic Signals - Capacity Enhancements	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Moderate adverse	Neutral	Slight beneficial	Neutral	Moderate beneficial
	26	A350 Yarnbrook Relief Road	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Moderate adverse	Neutral	Slight beneficial	Neutral	Major beneficial
	27	A350 Yarnbrook and West Ashton Relief Road	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Neutral	Major adverse	Slight adverse	Slight beneficial	Slight adverse	Major beneficial
	28	Charging facilities for "new technology" vehicles	Slight beneficial	Slight beneficial	Neutral	Neutral	Neutral	Neutral	Slight beneficial	Neutral	Neutral	Neutral	Neutral
	29	Review Broad Street operation and alter gyratory	Slight beneficial	Neutral	Neutral	Slight beneficial	Slight beneficial	Slight beneficial	Neutral	Slight beneficial	Neutral	Neutral	Neutral
	30	A363 Holy Trinity gyratory - enhance pedestrian realm and traffic capacity	Slight beneficial	Neutral	Neutral	Slight beneficial	Slight beneficial	Slight beneficial	Neutral	Slight beneficial	Neutral	Neutral	Neutral
	31	Strategic Development Site Access Road	Slight beneficial	Neutral	Slight beneficial	Neutral	Neutral	Neutral	Moderate adverse	Neutral	Major beneficial	Neutral	Major beneficial
32	B3105 Staverton Bridge Improvement	Slight beneficial	Neutral	Neutral	Neutral	Slight beneficial	Neutral	Neutral	Neutral	Slight beneficial	Slight adverse	Neutral	

The location of site specific intervention measures is shown in **Figure 7.1** below (area wide measures are not shown).

Figure 7.1: Intervention Measures Location



Source: Contains Ordnance Survey data © Crown copyright and database right (2011)

The individual intervention measures that have been evaluated against the strategy objectives in **Table 7.2** also need to be considered in terms of the benefits that could be generated and also the deliverability of the measures. This is considered in the following section.

7.2 Measure Deliverability

The deliverability of individual intervention measures could be constrained by cost, environmental and / or physical issues. A high level assessment of the issues that may need to be overcome with each scheme has been undertaken to review the potential need for further detailed work at the implementation stage. Where constraints exist or are likely, it may be possible for negative impacts to be mitigated, although

further investigation will be required to identify whether this can be achieved. The potential issues which would need to be overcome and which could influence the delivery of the measures are:

Physical constraints – limitations could include third party owned land and significant local infrastructure or services which restrict opportunities for the delivery of transport schemes.

Environmental constraints – some local areas will be sensitive to change. It may be possible to mitigate some impacts, however, if the implications are severe, the delivery of infrastructure could be restricted.

The results of the deliverability assessment are presented in **Table 7.3** overleaf.

At this stage of the Strategy development, the identification of potential constraints to the delivery of individual measures should not preclude their inclusion within a Strategy Option. However, it is important to acknowledge that the successful delivery of the Strategy will be dependent on it being affordable and deliverable and obtaining development planning approvals. Further detailed assessment work would be appropriate at the planning application stage.

Table 7.3: Scheme Constraint Assessment

Scheme Type	Ref	Scheme	Physical Issues to be Overcome	Environmental Issues to be Overcome	Estimated Indicative Cost
Walking and cycling	1	River Biss Corridor Route Enhancement	Possible	Possible	£100k
	2	A361 County Way / Ashton Street Crossing - Improve pedestrian connections	Unlikely	Unlikely	£50k
	3	Rail station - town centre route enhancement	Unlikely	Unlikely	£50k
	4	Improve pedestrian wayfinding and town centre legibility	Possible	Unlikely	£20k
	5	A361 Frome Rd / A363 Bradley Rd roundabouts - Pedestrian improvements	Possible	Unlikely	£50k
	6	A361 County Way / Hilperton Rd / Roundstone St Rbt - Pedestrian Improvements	Possible	Unlikely	£70k
	7	Green Lane / West Ashton Rd corridor improvement	Unlikely	Unlikely	£100k
	8	Installation of secure cycle parking at key destinations (i.e. rail station)	Unlikely	Unlikely	£30k
	9	Rail corridor - improvement of pedestrian / cycle crossings	Possible	Unlikely	£100k
	10	Wyke Rd / Canal Rd Roundabout Pedestrian Improvements	Possible	Unlikely	£100k
	11	Castle Street Pedestrian Improvements	Unlikely	Unlikely	£50k
	12	A361 County Way Pedestrian / Cycle Overbridge - Realm enhancements	Unlikely	Unlikely	£50k
	13	Ensure future development are "permeable" for pedestrians	Unlikely	Unlikely	-
Public Transport	14	Trowbridge rail station forecourt improvement	Unlikely	Unlikely	£200k
	15	TransWilts rail service enhancements	Unlikely	Unlikely	Revenue based
	16	Bus only / priority connections to strategic development	Possible	Unlikely	£100k
	17	A361 corridor bus priority measures	Possible	Unlikely	£50k
	18	Local bus service review and consolidation	Unlikely	Unlikely	£100k-£300k per annum
	19	Bus stop upgrade review	Possible	Unlikely	£50k
Smarter Choices	20	Introduce residential travel plans for all new development proposals	Unlikely	Unlikely	£50k per annum
	21	Support the development of workplace travel plans	Unlikely	Unlikely	£20k per annum

Scheme Type	Ref	Scheme	Physical Issues to be Overcome	Environmental Issues to be Overcome	Estimated Indicative Cost
	22	Continue to implement school travel plans and enhance measures	Unlikely	Unlikely	£20k per annum
Demand Management	23	Relocate long-stay parking from St Stephens Place	Possible	Possible	£100k
	24	Apply new restrictions (including possible charges) to parking in St Stephens Place	Unlikely	Unlikely	£20k
Road Improvement	25	A350 West Ashton Traffic Signals - Capacity Enhancements	Possible	Possible	£500k
	26	A350 Yarnbrook Relief Road	Possible	Possible	£6m
	27	A350 Yarnbrook and West Ashton Relief Road	Possible	Possible	£12m
	28	Charging facilities for "new technology" vehicles	Possible	Unlikely	Unknown
	29	Review Broad Street operation and alter gyratory	Possible	Unlikely	£1.7m
	30	A363 Holy Trinity gyratory - enhance pedestrian realm and traffic capacity	Possible	Unlikely	£100k
	31	Strategic Development Site Access Road	Possible	Possible	Assumed to be developer funded
	32	B3105 Staverton Bridge Improvement	Possible	Possible	£100k

8. Option Development

To identify the most appropriate overall Transport Strategy for Trowbridge, the possible intervention measures have been packaged into three different options, covering a wide range of approaches to the delivery of the Strategy. Even with developer funding towards measures, it is unlikely that all of the proposals could be afforded and therefore the options will need to prioritise the delivery of certain measures. The potential options considered as part of this assessment are presented below.

Option 1 – Alternative Modes - investment focused in alternative travel modes and increased travel choice.

Option 2 – Balanced Delivery - measures that mitigate the impact of future development scenarios.

Option 3 – Highway Capacity Focus - to enhance the road network and provide additional capacity on the strategic network.

At this stage, the options have been chosen to give a range of responses so they should be taken as being indicative of the overall strategy, rather than being prescriptive on exactly which measures make up the option.

In all scenarios it will be a requirement that future development proposals provide suitable access to the development site and these access arrangements are not included within the strategy option development. The provision of additional offsite infrastructure will be reviewed within the strategy option.

8.1 Strategy Option Components

A summary of the measures included within each potential strategy option is provided in the **Table 8.1**, together with a high level cost estimate based on the approximate cost of the individual elements.

A constant element of each option is the delivery of the A350 Yarnbrook Relief Road (measure 26 included in **Table 7.2**). This scheme would provide access to the proposed Ashton Park Urban Extension and is therefore needed whichever approach is adopted for the transport strategy. The cost of the scheme, approximately £6 million, will also remain constant for each of the options.

The measures will be introduced through the strategy period (up to 2026), and it is likely that some measures will not be fully defined and implemented until development proposals come forward.

Table 8.1: Strategy Option Components

	Walking	Cycling	Public Transport	Smarter Choices	Demand Management	Road Improvements
Option 1 Alternative Transport Modes	Comprehensive walking strategy and pedestrian improvements throughout the town; New "at-grade" crossing facilities on County Way and at key junctions; Improved public realm and way-finding in the town centre. Upgraded rail line crossings.	Introduction of a cycle strategy that includes segregated routes on some of the key corridors; Cycle parking at all of the main town centre destinations.	Significant investment in bus services throughout the town, with a high frequency service between Ashton Park and the town centre; Bus priority measures at new developments and other key links/junctions; Improvements to Trowbridge rail station, including redesigned station forecourt and improved pedestrian/cycle access.	A Travel Plan co-ordinator / team will actively develop a "Sustainable Travel Town" Plan for Trowbridge. The team will work with local employers, schools and residents to encourage alternative travel modes.	Reassignment of some town centre long stay car parks to short stay only; Traffic calming strategy implemented to focus improvements at locations where safety needs to be improved and where speeds need to be reduced; A delivery strategy to limit access to town centre destinations at the busiest times.	Broad Street scheme; Junction amendments to improve pedestrian and bus facilities and address road safety problems; Electricity charge points provided at the main town centre car parks.
Measures included (as listed in Table 7.2)	Ref 1, 2, 4, 5, 6, 10, 11 Cost £440k	Ref 7, 8, 9, 12 Cost £190k + £200k for 2 more corridors	Ref 3, 14, 16, 17, 18, 19 Cost £450k + £100k for 2 other corridors Revenue £100k pa + £200k for other services	Ref 20, 21, 22 Revenue £90k pa	Ref 23, 24 Cost £120k + £250k for traffic calming	Ref 28, 29, 30 Cost £1.8m
Total cost £3.55m + £390k revenue pa (over ten years)						
Option 2 Balanced Delivery	Pedestrian Improvements introduced on key corridors only; New "at-grade" crossing facilities on County Way and at key junctions.	Improvements introduced on key corridors only; Cycle parking at all of the main town centre destinations.	A high frequency service between Ashton Park and the town centre; Bus priority measures at new developments and some key junctions; Improvements to Trowbridge rail station, including redesigned station forecourt and interchange area.	Developers are required to submit statutory Travel Plans and identify appropriate modal share targets; Measures and targets actively reviewed by a Travel Plan co-ordinator.	Reassignment of some town centre long stay car parking areas; A delivery strategy to limit access to town centre destinations at the busiest times.	A350 West Ashton signals "on line" improvement; Broad Street scheme; Staverton Traffic Management Scheme; Capacity and pedestrian enhancements at other critical junctions; Electricity charge points provided at the main town centre car parks.
Measures included (as listed in Table 7.2)	Ref 1, 2, 4, 5, 6 Cost £290k	Ref 7, 8 Cost £130k + £100k for 1 more corridor	Ref 3, 14, 16, 18, 19 Cost £400k Revenue £100k pa	Ref 21, 22 Revenue £40k pa	Ref 23, 24 Cost £120k	Ref 25, 28, 29, 30, 32 Cost £2.3m
Total cost £3.34m + £140k revenue pa (over ten years)						
Option 3 Highway Capacity Focus	Maintenance of existing footpaths and pedestrian crossings.	Maintenance of existing cycle infrastructure.	Improvements to Trowbridge rail station, including redesigned station forecourt and interchange area.	Developers are required to submit statutory Travel Plans and identify appropriate modal share targets.	Reassignment of some town centre long stay car parks to short stay only.	A350 West Ashton Relief Road; Broad Street scheme; Staverton Traffic Management Scheme; Capacity enhancements on the A361 County and at other critical junctions; Electricity charge points provided at the main town centre car parks.
Measures included (as listed in Table 7.2)	Funded by LTP	Funded by LTP	Ref 3, 14 Cost £250k	Ref 22 Revenue £20k pa	Ref 23, 24 Cost £120k	Ref 27, 28, 29, 30, 32 Cost £7.9m
Total cost £8.27m + £20k revenue pa (over ten years)						

In addition to the total costs identified for each of the option scenarios, an additional £6 million is required to fund the A350 Yarnbrook Relief Road which would provide vehicular access to the proposed Ashton Park Urban Extension. A summary of the option costs is provided in **Table 8.2** below:

Table 8.2: Scenario Cost Summary

Option	Option Infrastructure Cost	Option Revenue cost (over ten years)	A350 Yarnbrook Relief Road	Total Cost
Option 1 Alternative Transport Modes	£3.55 million	£3.90 million	£6.00 million	£13.45 million
Option 2 Balanced Delivery	£3.34 million	£1.40 million	£6.00 million	£10.74 million
Option 3 Highway Capacity Focus	£8.27 million	£200,000	£6.00 million	£14.47 million

8.2 Traffic Modelling Review

Peter Finlayson Associates (PFA) has developed a SATURN traffic model for Trowbridge and this enables the potential impact of developments to be reviewed at a strategic level. The model can also be used to examine land use options and the potential impact of the promotion of sustainable travel modes.

Two different sets of assumptions on the land allocation for the Ashton Park site have been modelled:

Development Scenario 1 - as the Core Strategy Consultation Document – 2,650 dwellings and 30ha of mixed employment;

Development Scenario 2 - as the pre-submission draft of the Core Strategy – 2,600 dwellings and 15ha of mixed employment.

The model has been used to test the impact of the three Strategy options, with both of the above land allocations, in both the AM and PM peak hours in 2026.

8.2.1 Reference Case

The 'Reference Case' model scenario includes the trips associated with proposed Ashton Park development, as set out above, as well as other committed and assumed developments in Trowbridge.

The model also allows for 'background' growth due to increased car ownership and use and developments outside of the Trowbridge area. Full details are provided in the PFA Report 'Trowbridge Traffic Model - 2026 Model Forecasting, Problems & Issues' (June 2011).

Any improvement schemes are excluded other than those already committed, such as the Hilperston Relief Road and East Trowbridge Distributor Road (as detailed in **Table 4.1**).

No changes to the model trip rates or internal trip volumes have been made in this scenario. The results of this modelling exercise have been used to "benchmark" the transport strategy options.

8.2.2 Option 1 - Alternative Modes

Apart from the A350 Yarnbrook Relief Road (which is included in all options), this scenario assumes little or no road spending, with the majority of funds spent on improving alternative modes, increased travel choice and travel awareness campaigns.

With the implementation of the Core Strategy development areas, it should be expected that the proposal would be better integrated than the sites recorded in the TRICS database. Furthermore, research undertaken as part of the Sustainable Travel Town projects demonstrated that a reduction in car trips of approximately 8% would be expected¹ if travel awareness campaigns supported the delivery of sustainable travel initiatives. This model scenario has been developed to assess the possible impacts of such a scenario.

To review possible future travel trends and also to identify how these may alter with a change in response to the implementation of strategies, a review of the multi-modal information contained within the TRICS database has been undertaken. The database contains wide ranging travel data collected from other similar developments across England, and with that information average rates for each transport mode can be developed. The trip generation that could be expected for a 2,650 dwelling residential development (as proposed by the Wiltshire Core Strategy Consultation Document) are presented in **Table 8.3** below for the different modes.

Table 8.3: Transport Trip Generation in 2026 (development of 2650 dwellings, 60% private and 40% affordable)

	AM Peak Hour		PM Peak Hour		Daily	
	Generation	Attraction	Generation	Attraction	Generation	Attraction
Public Transport	51	13	21	33	268	266
Walking	613	135	204	277	2441	2313
Cycling	29	6	33	37	243	252
Car Drivers	827	373	554	856	6162	6002
Car Sharers	497	90	233	287	2024	1791
Total	2017	617	1044	1490	11138	10625

Source: Trip rates from TRICS database (2011(b) v6.8.2) applied

The trip rates included in **Table 8.3** would be expected if a “traditional” development and transport planning approach was taken. In the morning peak hour, approximately 45% of all trips are undertaken by car drivers. These trips are solely related to the strategic development site and would be in addition to all trips generated by other parts of Trowbridge.

To develop the scenario where private car trips have been reduced to respond to sustainable travel initiatives, it has been assumed that there would be:

- 20% increase in public transport use;
- 20% increase in cycling;
- 10% increase in car sharing; and
- 10% increase in walking.

¹ The Effects of Smarter Choices Programmes in Sustainable Travel Towns: Summary Report, DfT, 2010

The results of these possible changes to travel patterns are presented in **Table 8.4** below.

Table 8.4: Reduced Car Transport Trip Generation in 2026 (development of 2650 dwellings, 60% private and 40% affordable)

	AM Peak Hour		PM Peak Hour		Daily	
	Generation	Attraction	Generation	Attraction	Generation	Attraction
Public Transport	61	16	25	40	322	319
Walking	674	149	224	305	2685	2544
Cycling	35	7	40	44	292	302
Car Drivers	700	347	500	786	5613	5488
Car Sharers	547	99	256	316	2226	1970
Total	2017	617	1044	1490	11138	10625

The information presented in **Table 8.4** demonstrates that the scale of intervention described above would result in an 8% reduction in car trips generated by the development i.e. similar to the reductions recorded as part of the Sustainable Travel Town initiatives. This level of reduction has been applied to all 'internal to internal' Trowbridge trips in the traffic model, as it is these trips that are most likely to respond to sustainable travel initiatives.

Lower trip rates have also been assumed for the new major housing development sites, in line with the assumed split of private and affordable housing, as described for Option 2 below.

Within this scenario the link road between the A350 and the A363 would be provided (Yarnbrook Relief Road), as this would provide access to the Core Strategy development site allocation, but the West Ashton Relief Road has been excluded. No other capacity improvement schemes have been included within the model.

8.2.3 Option 2 - Balanced Approach

As part of this assessment, the residential trip rates included in the model have been revised to reflect increased funding in sustainable travel modes, this being an alternative to investment in road building. The trip rates used have been taken from the TRICS database (version 2011(b) v6.8.2) and the average rates reflect the proposed 60 / 40 split for private and affordable housing respectively. Considering the location of the development and the commitment of Wiltshire Council to promote sustainable travel modes, these alternative car trip rates are appropriate for use in this scenario. The trips rates used are presented in **Table 8.5** below.

Table 8.5: Alternative Residential Trip Rates

	AM Peak Hour		PM Peak Hour		Daily	
	Generation	Attraction	Generation	Attraction	Generation	Attraction
Car trips per dwelling	0.312	0.141	0.209	0.323	2.325	2.265

Source: TRICS database (2011(b) v6.8.2)

This model scenario has been undertaken to review the potential impact of delivery an “online improvement” to the West Ashton traffic signals, instead of the major Relief Road scheme. The signal junction layout has been amended to include the following improvements:

- Introduction of a dedicated left turn lane on the A350 northbound arm;
- Increased length of two lanes at the signal stop line on the West Ashton Road southbound arm.

Within this scenario the link road between the A350 and the A363 would be provided (Yarnbrook Relief Road) as this would provide access to the Core Strategy development site allocation.

8.2.4 Option 3 – Highway Capacity Focus

The PFA model of the Core Strategy 2026 land use option has been used and modified by Mott MacDonald to include the highway infrastructure measures shown in **Appendix C**, to include the full Yarnbrook and West Ashton Relief Road schemes. As for the other Options, the schemes associated with committed developments, such as the Hilperton Relief Road and East Trowbridge Distributor Road, are included.

No changes to the model trip rates or internal trip volumes have been made in this scenario.

8.2.5 Modelling Results with Development Scenario 1

For Development Scenario 1, **Figure 8.1** shows the difference in average journey time for each option compared to the Do Nothing situation, using statistics from the whole model in the AM and PM peak hours.

All options show a reduction in average journey time of over one minute in both peak hours, compared to the Reference Case, with Option 3 having slightly more benefits than the other two options.

Figure 8.2 shows the difference between the options and Do Nothing in terms of total distance travelled. Option 1 has the smallest increase, followed by Option 2, as these options are based on modal switch away from car to other modes. Option 3 is similar to the 2026 Base with No Improvements.

Looking at the road network in more detail, **Appendix D** contains diagrams of the road network assumed for each option 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%

It should be noted that these scales are different to those adopted in the PFA ‘Problems and Issues Report’ as 85% (not 70%) has been taken as the threshold when junctions are considered to be close to capacity, in line with industry standards. Furthermore, PFA used the average demand/capacity ratio for the whole junction, whereas the figures for the worst arm have been used here, as often one arm of a junction experiences much worse congestion than the others.

The results of the modelling show that the full Yarnbrook and West Ashton Relief Road schemes are successful in removing the congestion at these locations. However, there are neighbouring junctions which

are then shown to approach capacity (the Ashton Road signal junction to the north and A363 Westbury Road roundabout to the west), with the release of the previous junction constraints.

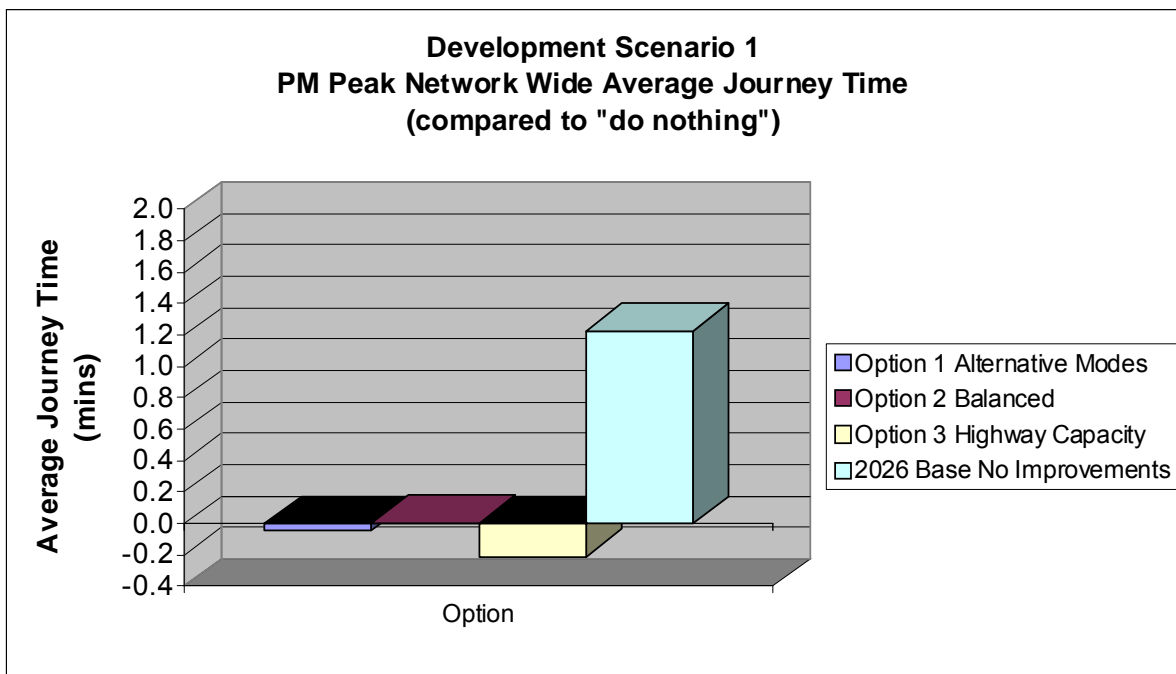
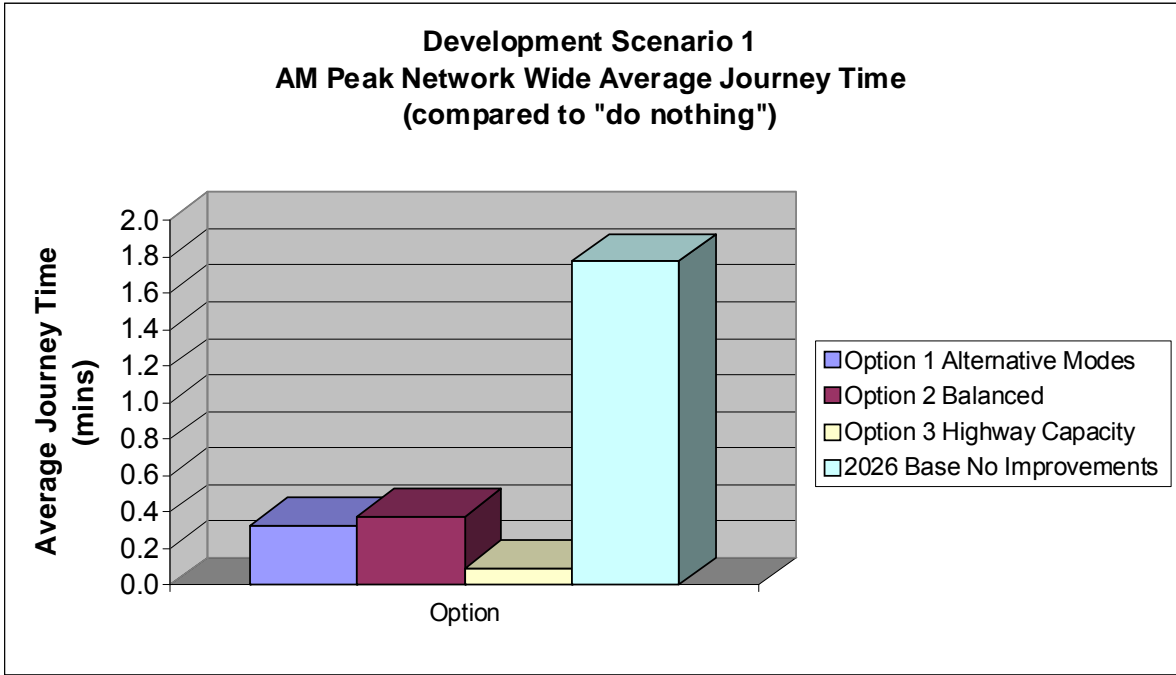
Whilst the demand/capacity ratios indicate which junctions are likely to be the constraints in the future, using these figures does not give a good measure of the overall operation of the network. **Figure 8.3** overleaf gives the journey times on the main radial routes into the town centre in the AM 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 8.4** shows similar data for the PM peak hour. The routes which have been reviewed are shown in **Figure 8.5**.

As can be seen, with all options congestion remains from the north into the town centre via the B3105 (delays at Staverton) and, to a lesser extent, via the A363 (delays at Holy Trinity gyratory).

Through traffic management improvements at Staverton, it should be possible to reduce the delay on the B3105 but it is recognised that this may be a sensitive scheme (involving banning traffic from using the southbound B3106 between Holt and Staverton). Therefore, the scheme has not been assumed to be in place in the traffic modelling analysis.

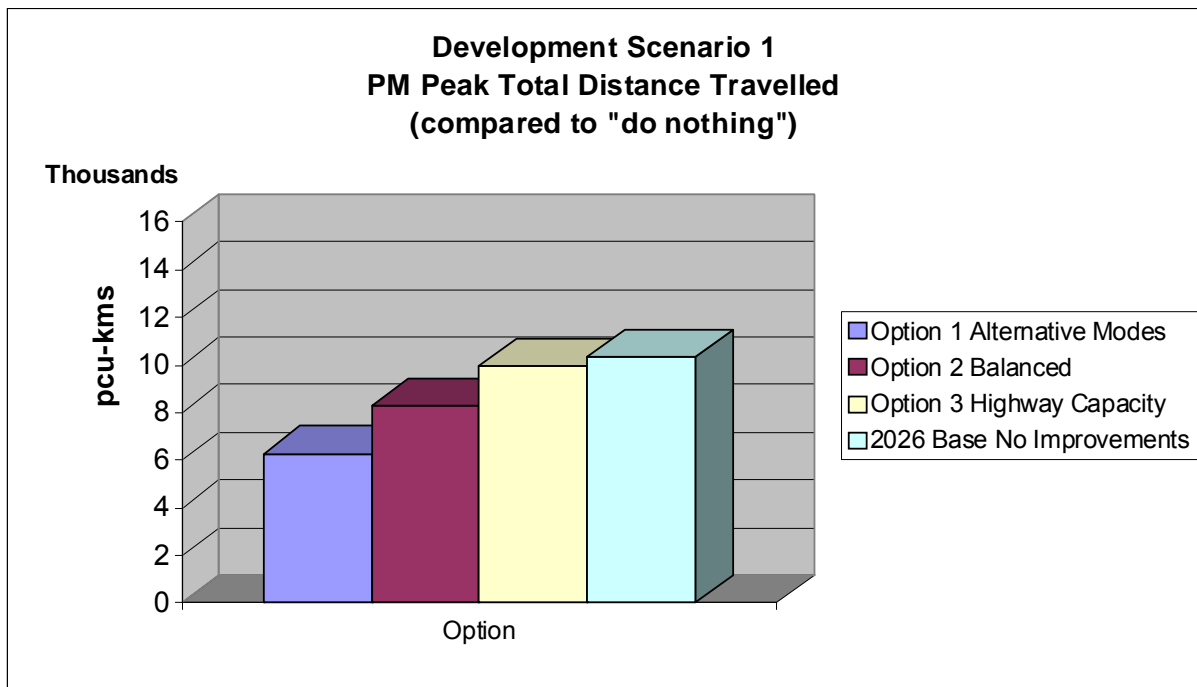
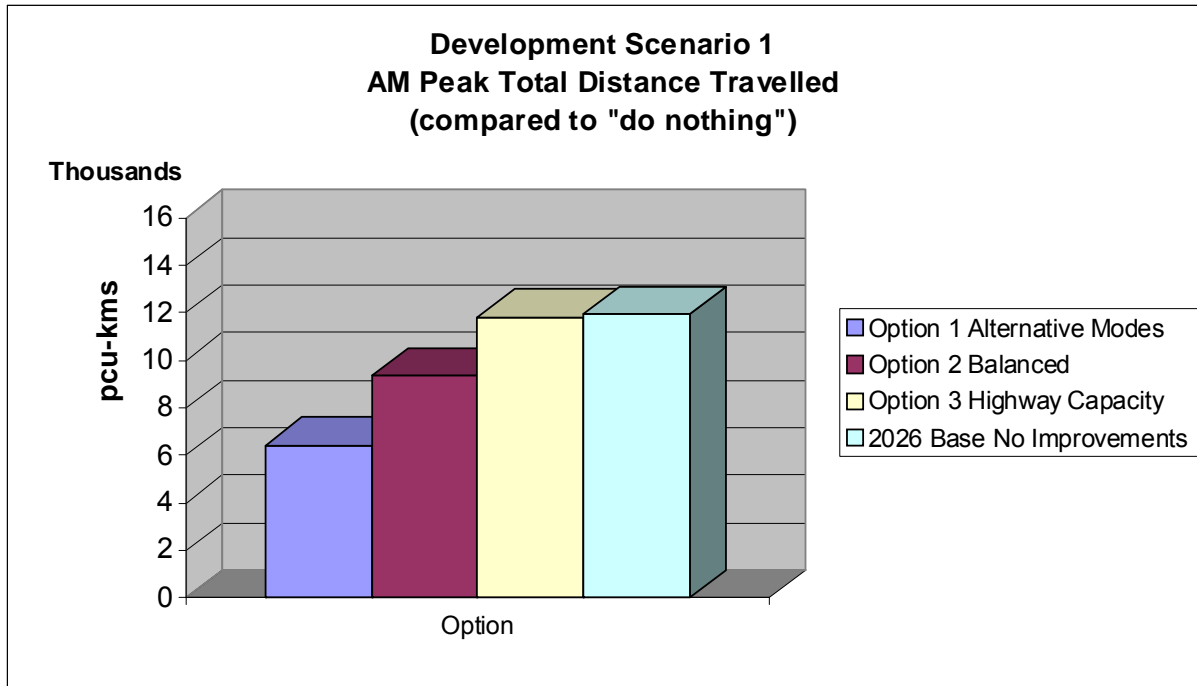
Option 1 also shows a delay of 5 minutes on the northbound A350 but both Options 2 and 3 reduce this delay to less than 2 minutes.

Figure 8.1: Development Scenario 1 - Overall Average Journey Time in 2026



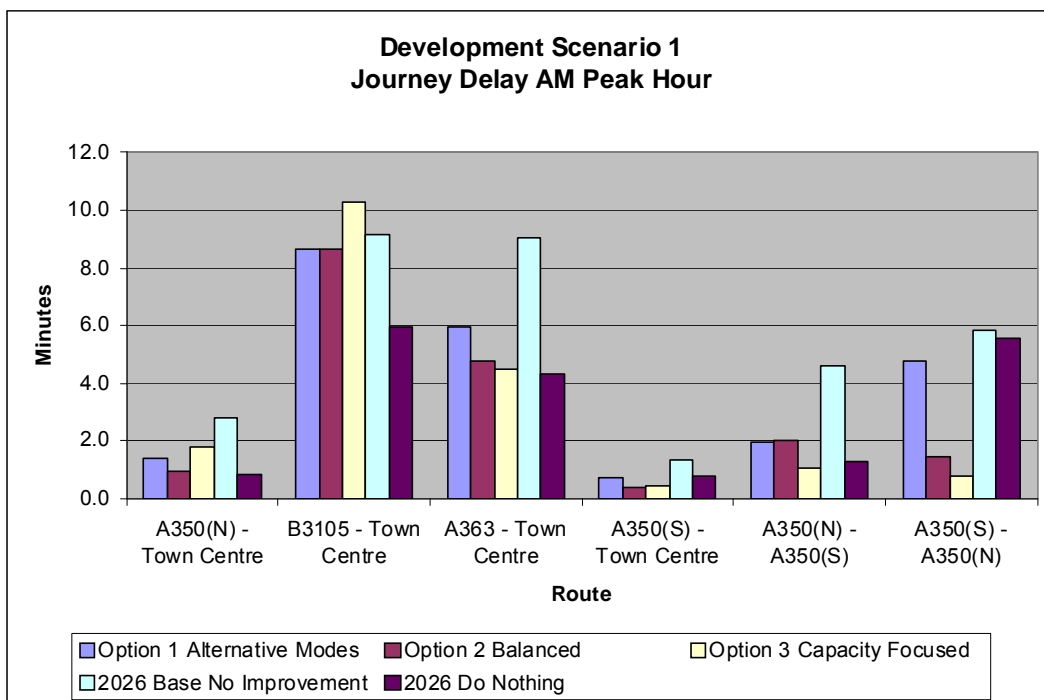
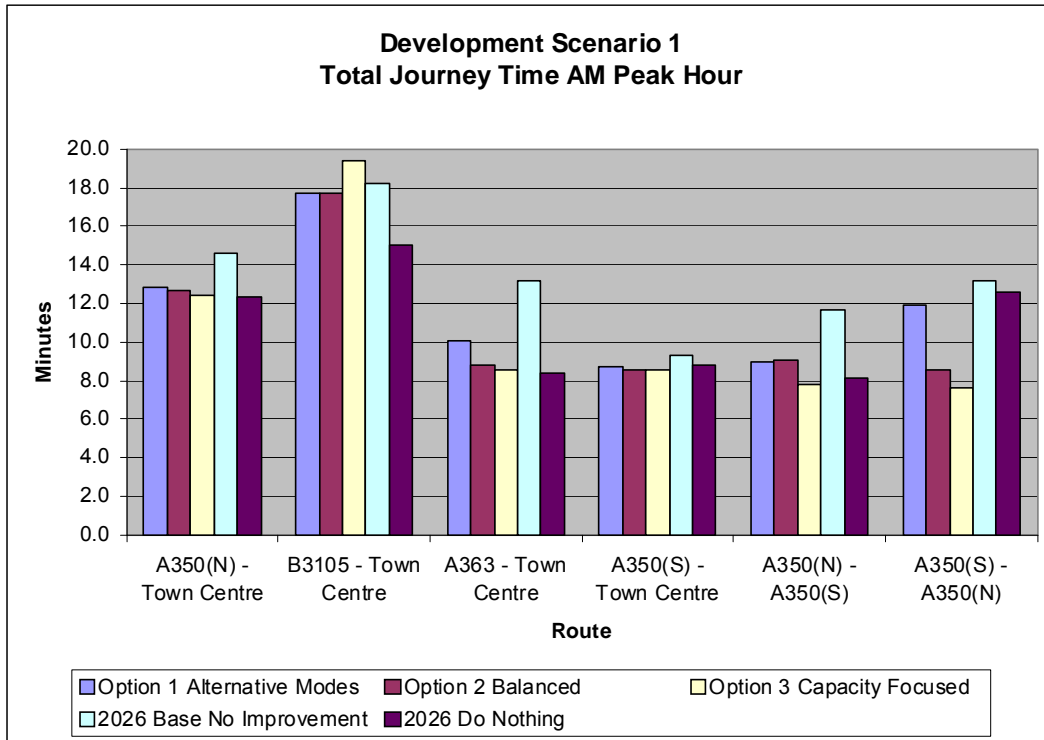
Source: SATURN Model 2026

Figure 8.2: Development Scenario 1 - Overall Distance Travelled in 2026



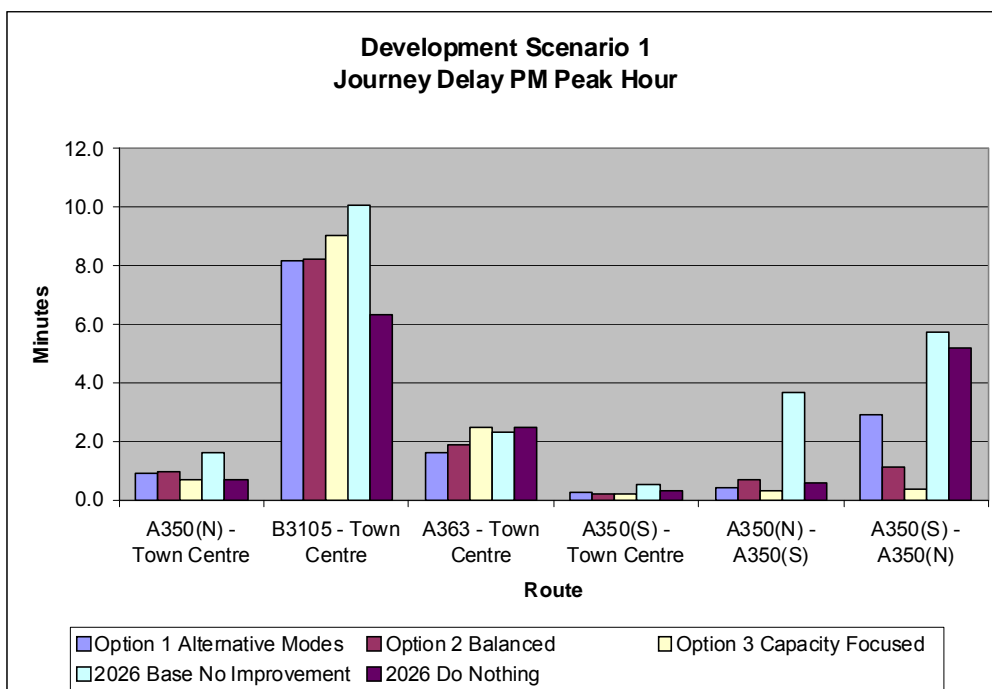
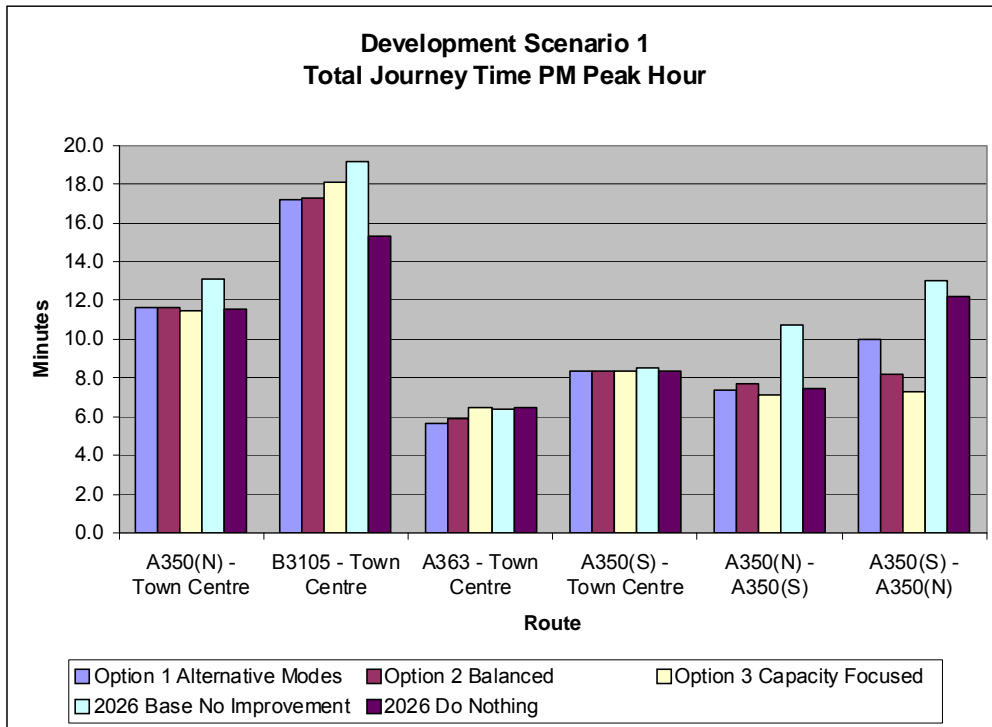
Source: SATURN Model 2026

Figure 8.3: Development Scenario 1 - Modelled Journey Times and Delays – 2026 AM Peak



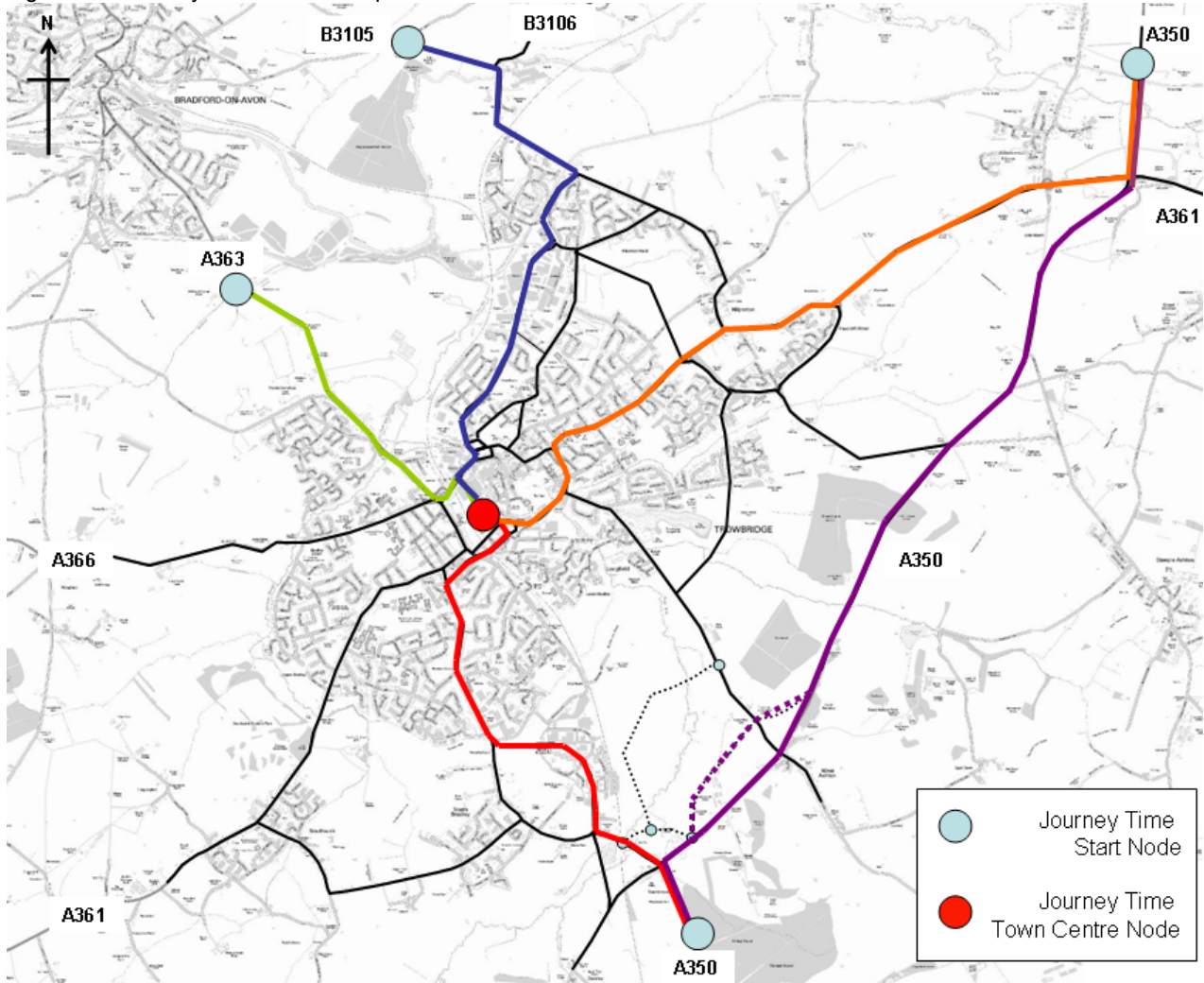
Source: SATURN Model 2026 AM Peak

Figure 8.4: Development Scenario 1 - Modelled Journey Times and Delays – 2026 PM Peak



Source: SATURN Model 2026 PM Peak

Figure 8.5: Journey Time Routes Map



Source: Contains Ordnance Survey data © Crown copyright and database right (2011)

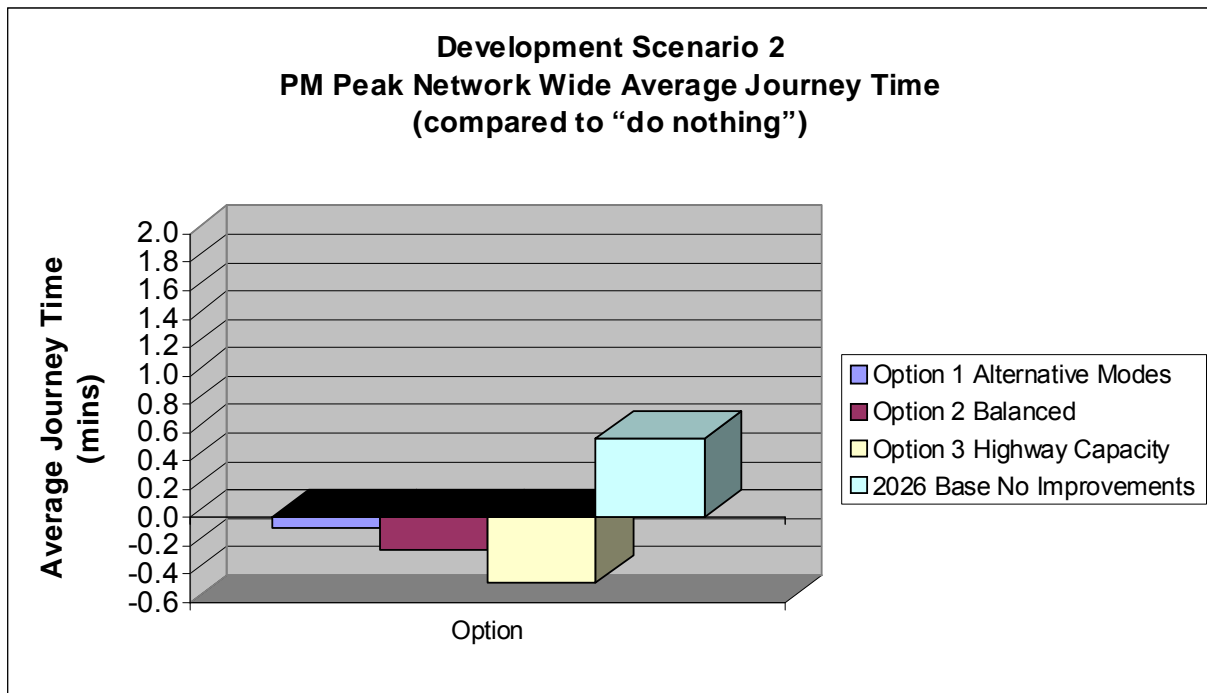
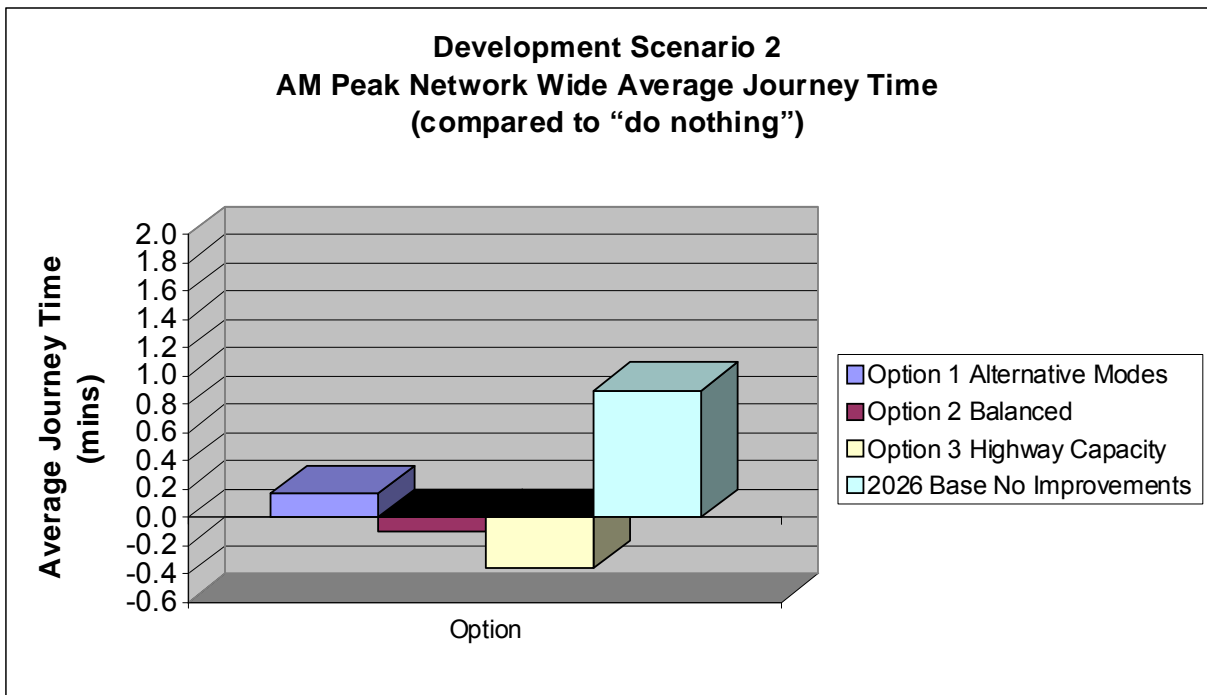
8.2.6 Modelling Results with Development Scenario 2

Similar modelling results have been produced for Development Scenario 2, with reduced employment allocation at Ashton Park (15ha compared to 30ha in the Core Strategy Consultation Document). These are shown in **Figures 8.7 - 8.10**, with junction capacity diagrams in **Appendix D**.

The average journey time with the Scenario 2 Reference Case is nearly a minute less than the Scenario 1 Reference Case, due to there being 560 fewer trips in the model in the AM peak (and 412 less trips in the PM peak). As a result, the options show a similar pattern of change in journey time as before but with a smaller reduction from the Reference Case.

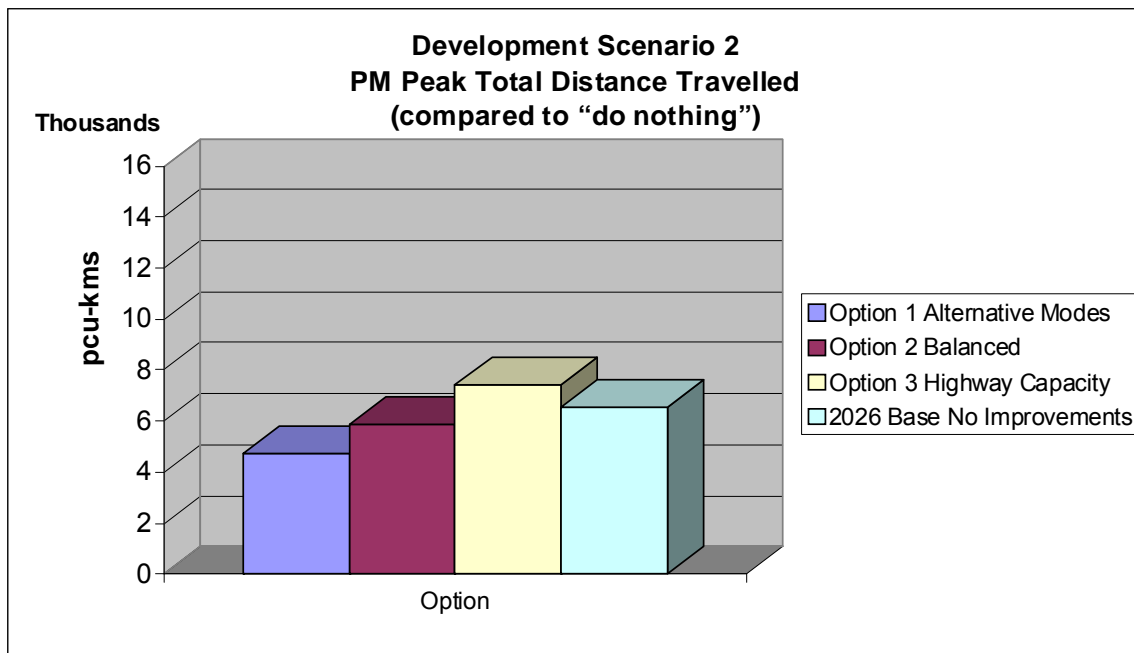
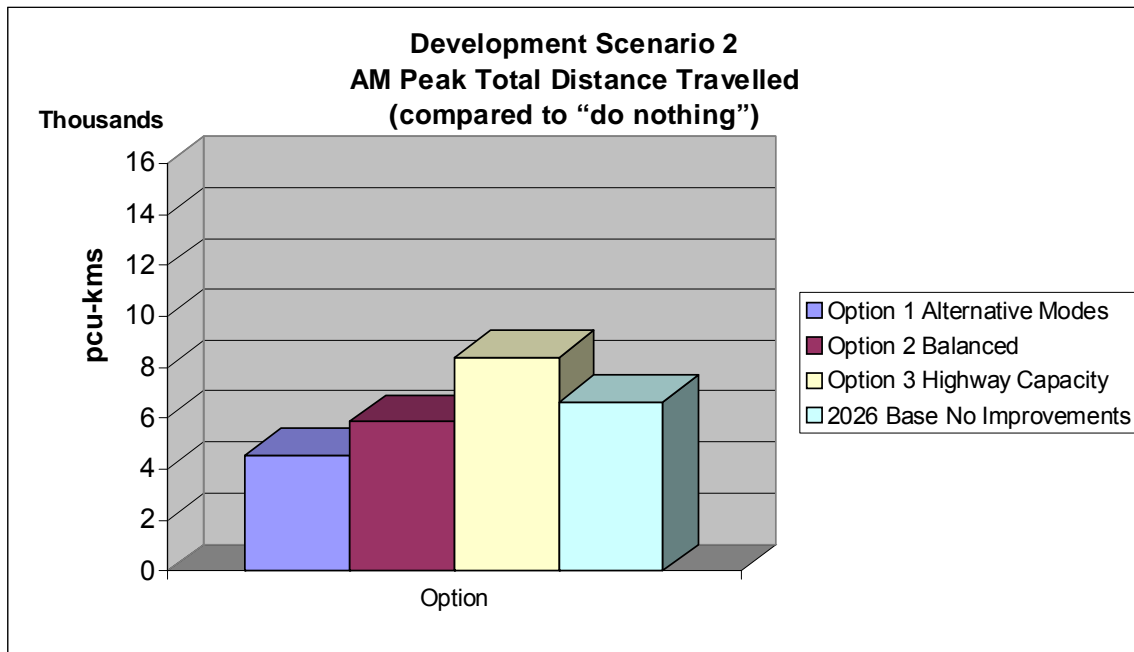
In terms of total distance travelled, Option 3 now shows a slight increase compared to the Reference Case, with small reductions for Options 1 and 2.

Figure 8.6: Development Scenario 2 - Overall Average Journey Time in 2026



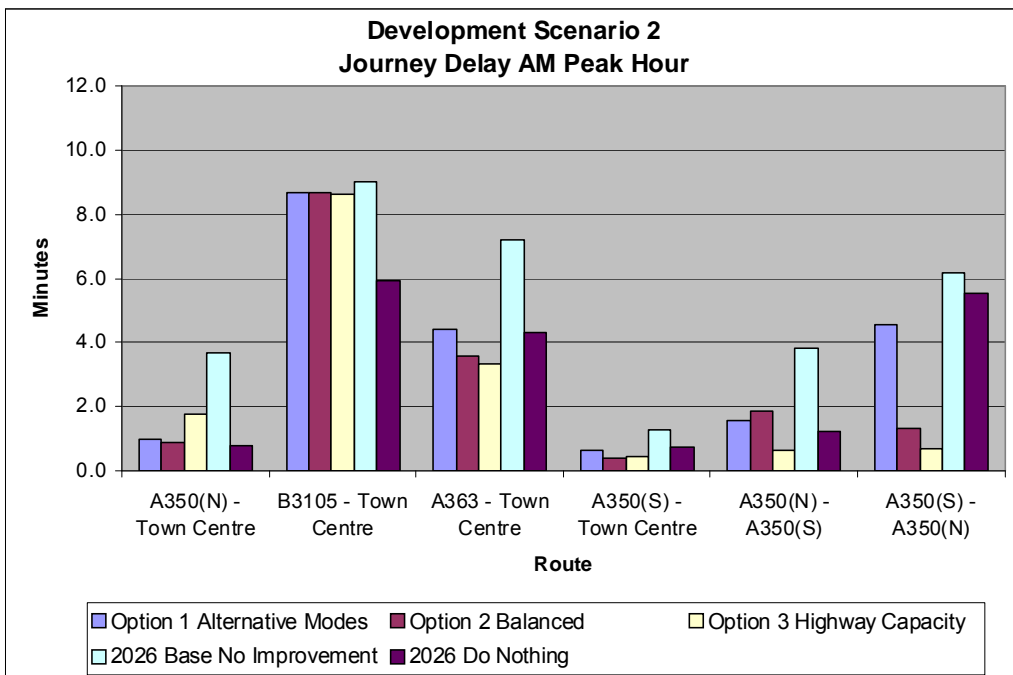
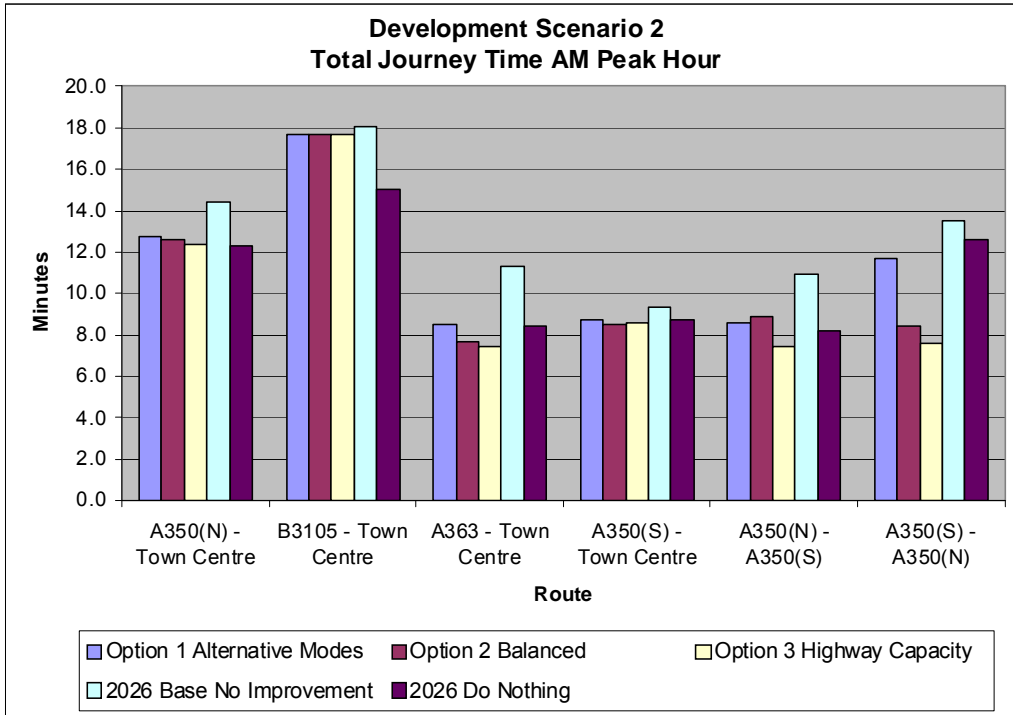
Source: SATURN Model 2026

Figure 8.7: Development Scenario 2 - Overall Distance Travelled in 2026



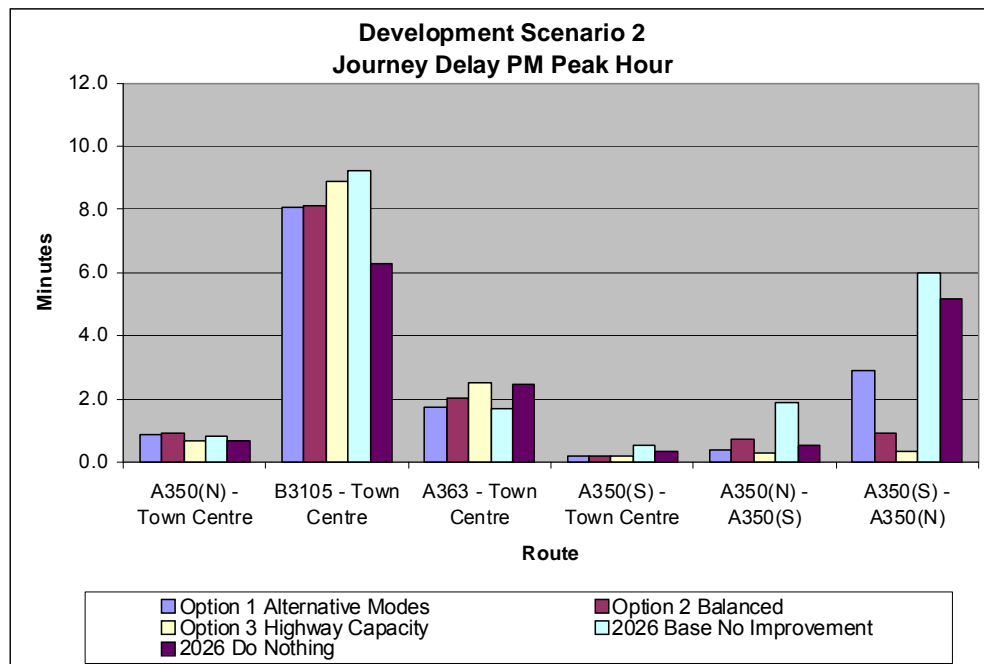
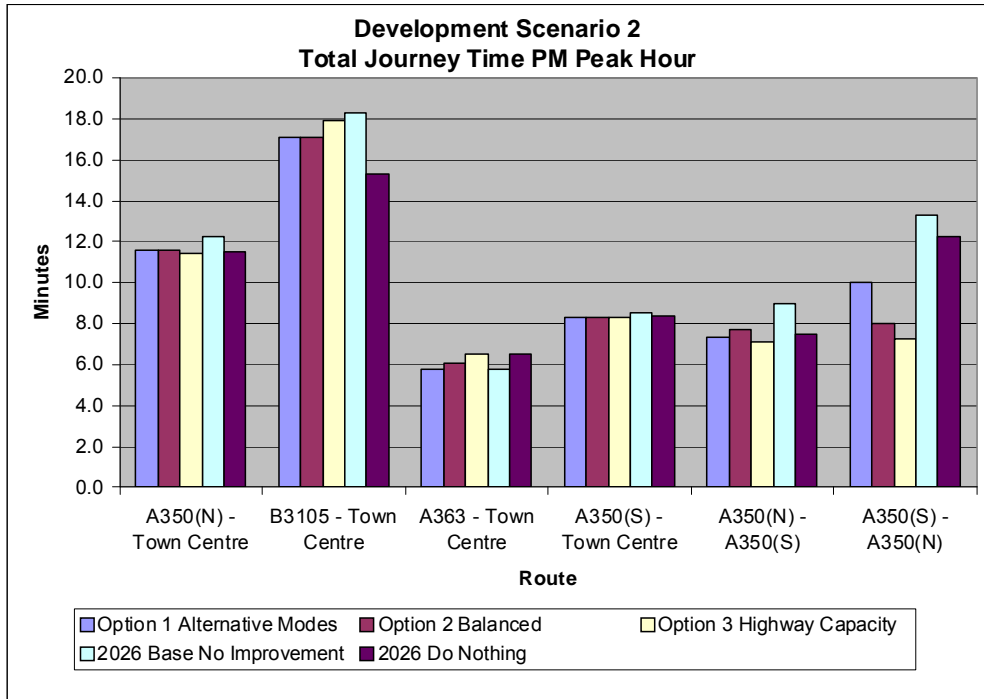
Source: SATURN Model 2026

Figure 8.8: Development Scenario 2 - Modelled Journey Times and Delays – 2026 AM Peak



Source: SATURN Model 2026 AM Peak

Figure 8.9: Development Scenario 2 - Modelled Journey Times and Delays – 2026 PM Peak



Source: SATURN Model 2026 PM Peak

8.2.7 Comparison of Employment Scenarios

Table 8.6 and **Table 8.7** compare the modelling results with the two different scenarios for quantum of employment land. Scenario 2 (reduced employment allocation) results in a significant reduction in total distance travelled in the 2026 Reference Case, of around 5,300 vehicle-kms in the AM peak hour (and 3,700 vehicle-kms in the PM peak).

This, in turn, reduces the congestion in the Reference Case, as well as the average journey times. In terms of journey times on the key radial routes and junction capacities, the differences in results are fairly small but less congestion is evident.

Table 8.6: Results with Development as Core Strategy Consultation Document (Scenario 1)

	Option 1 Alternative Modes	Option 2 Balanced	Option 3 Highway Capacity	2026 Reference Case	2026 Do Nothing
AM Peak Hour					
Distance travelled (pcu-kms per hour)	76153.7	79043.5	81541.2	81672.6	69719.5
Change in Distance travelled Compared to "Do Nothing"	9.2%	13.4%	17.0%	17.1%	
Average Speed (kph)	28.4	28.8	29.9	24.6	29.5
Average Journey Time (mins)	7.9	7.9	7.6	9.3	7.5
Change in Journey Time Compared to "Do Nothing" (mins)	0.3	0.4	0.1	1.8	
Number of Junctions >85% of Capacity	11	11	8	12	9
PM Peak Hour					
Distance travelled (pcu-kms per hour)	72045.6	74040.8	75707.7	76080.1	65773.1
Change in Distance travelled Compared to "Do Nothing"	9.5%	12.6%	15.1%	15.7%	
Average Speed (kph)	31.1	31.1	32.1	26.8	30.5
Average Journey Time (mins)	7.3	7.3	7.1	8.5	7.3
Change in Journey Time Compared to "Do Nothing" (mins)	0.0	0.0	-0.2	1.2	
Number of Junctions >85% of Capacity	9	9	8	10	8

Table 8.7: Results with Reduced Employment Development (Scenario 2)

	Option 1 Alternative Modes	Option 2 Balanced	Option 3 Highway Capacity	2026 Reference Case	2026 Do Nothing
AM Peak Hour					
Distance travelled (pcu-kms per hour)	74245.2	75582.9	78096.9	76371.9	69719.5
Change in Distance travelled Compared to "Do Nothing"	6.5%	8.4%	12.0%	9.5%	
Average Speed (kph)	29.1	30.1	31.3	26.0	29.5
Average Journey Time (mins)	7.7	7.4	7.2	8.4	7.5
Change in Journey Time Compared to "Do Nothing" (mins)	0.2	-0.1	-0.4	0.9	
Number of Junctions >85% of Capacity	10	10	8	12	9
PM Peak Hour					
Distance travelled (pcu-kms per hour)	70532.9	71667.9	73194.9	72301.1	65773.1
Change in Distance travelled Compared to "Do Nothing"	7.2%	9.0%	11.3%	9.9%	
Average Speed (kph)	31.2	31.7	32.9	28.3	30.5
Average Journey Time (mins)	7.2	7.1	6.8	7.9	7.3
Change in Journey Time Compared to "Do Nothing" (mins)	-0.1	-0.2	-0.5	0.6	
Number of Junctions >85% of Capacity	9	9	8	10	8

8.3 Emissions to Air

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 November 2010 (released as Version 4.2.2).

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 CO₂ 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 2025 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 EFT in this way does not provide an assessment of the various Options' 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 Options.

Strategy options have been assessed using the EFT based on the traffic modelling results. With respect to ambient air quality impacts, emissions of oxides of nitrogen (NO_x) and particulate matter (PM₁₀) have been focussed on because these are the pollutants of most concern in the UK associated with road traffic emissions and health. Predicting carbon emissions allows the various Options' potential impact on operational greenhouse gases to be assessed.

The overall emissions have been calculated for the Reference Case and for each option, using the two different employment land use scenarios. **Table 8.8** and **Table 8.9** show the percentage change of NO_x, PM₁₀ and carbon emissions between the Reference Case and the three Options.

The figures for carbon show 'equivalent CO₂' (CO₂e) which is the concentration of CO₂ that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas.

Table 8.8: Development Scenario 1: Change in Emissions Compared to the Reference Case

Pollutant	Change in Emissions		
	Option 1 (%)	Option 2 (%)	Option 3 (%)
NO _x	-8.0	-7.7	-5.3
CO ₂ e	-6.6	-6.1	-5.3
PM ₁₀	+0.5	+2.6	+2.6

Table 8.9: Development Scenario 2: Change in Emissions Compared to the Reference Case

Pollutant	Change in Emissions		
	Option 1 (%)	Option 2 (%)	Option 3 (%)
NO _x	-7.1	-6.7	-4.4
CO ₂ e	-5.8	-5.3	-4.5
PM ₁₀	+0.6	+2.9	+2.8

The figures show that there will be a reduction in the emissions of NO_x and carbon for all three Options, with Option 1 having the greatest reduction. The scale of reduction reduces slightly with the lower level of employment trips.

For all three Options, the PM₁₀ shows an increase in emissions, with the smallest increase in Option 1 and little difference between Option 2 and Option 3. Unlike NO_x and carbon, PM₁₀ emissions increase as average vehicle speeds increase. Therefore, reducing congestion and allowing traffic to move at higher speeds is shown to increase PM₁₀ emissions, compared to the Reference Case.

8.4 Strategy Objectives Review

An evaluation of the overall strategy options against the objectives is presented in **Table 8.10** overleaf. The methodology for assessing how the strategy options conform with the overall objectives is similar to that shown in **Table 7.1** but based on the modelling results where appropriate.

Based on these over-arching objectives, there is not a significant difference in the outcomes of the assessment of the two different development scenarios. Hence, separate assessment tables are not shown for Development Scenarios 1 and 2 and the scenario should not influence the choice of overall transport strategy.

Table 8.10: Strategy Options Assessment

Option Ref	Strategy Option	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	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)	To maintain, and where feasible, improve the performance of the A350 strategic road corridor
1	Alternative Modes	Moderate beneficial	Major beneficial	Major beneficial	Major beneficial	Moderate beneficial	Major beneficial	Major beneficial	Slight beneficial	Moderate beneficial	Slight beneficial	Slight beneficial
2	Balanced Investment	Slight beneficial	Moderate beneficial	Moderate beneficial	Slight beneficial	Slight beneficial	Moderate beneficial	Moderate beneficial	Slight beneficial	Moderate beneficial	Slight beneficial	Moderate beneficial
3	Highway Capacity Focus	Slight beneficial	Moderate adverse	Major adverse	Major adverse	Neutral	Major adverse	Slight adverse	Slight adverse	Slight adverse	Slight beneficial	Major beneficial

Appendices

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Appendix A. Transforming Trowbridge Principles

Table A.1: Transforming Trowbridge Principles

Guiding Principle	Detail
Improve the gateways and approaches to the town centre	<p>To improve the arrival points to the town centre by enhancing landscaping with selective planting along the main routes and by introducing a series of way finding signs to promote the town centre facilities.</p> <p>New development along the main routes around the town should have active uses facing onto the roads and be of high quality design, as these will form the first impression of the town of those arriving by car.</p>
Integrate new development	<p>There are several redundant sites close to the town centre which need regeneration. Improved transport linkages to these sites by all modes of transport will help to realise their potential. In addition, the local growth agenda will see many more houses built to the east of the town centre. These will create more demand for travel so it is essential that infrastructure, associated with sustainable modes of travel in particular, is provided. Aligning the vision with the growth and regeneration agenda is therefore very important</p>
Make the best use of existing infrastructure	<p>The ring road is a key movement corridor yet currently only favours private car travel. Pedestrian and cycle routes should be provided along its length with linkages east and west to the neighbouring residential areas. In addition, whilst not heavily used by buses, the ring road could be provided with bus priority measures to enhance circulation of bus services and perhaps re-routing away from town centre roads.</p> <p>Crossings of the ring road should be improved and be made in favour of at-grade facilities. However, this will result in slightly increased travel times for general traffic and therefore, needs to be done as part of further restricted access to the town centre roads.</p>
Manage car park supply and demand	<p>Currently the town is well served with parking yet access to some of the car parks require travelling through the centre of the town. All car parks should have access restricted to 'from the ring road' only (or Wicker Hill, Church Street and Union Street to the west).</p> <p>Long stay parking should be moved further from the town centre encouraging 'Park and Walk' amongst commuters. Short stay parking aimed at visitors and shoppers should be maintained closer to the town centre. The need for disabled parking will remain in the town centre.</p>
Promote good linkages	<p>These need to be improved if cycling and walking is to be encouraged. Recent development in the town centre have not considered pedestrians and cyclists well and opportunities have been missed to open up new links. However, with the opportunity of further new development in the town, linkages for pedestrians and cyclists should be identified at an early stage.</p> <p>Routes to the station, along the River Biss, through the Bowyers site and east to the urban extensions should be identified. All should provide direct, safe and obstruction-free passage to key destinations in the town centre.</p>
Improve the town centre pedestrian environment	<p>The town centre environment is already of a high quality. However, it could be further enhanced for pedestrians and cyclists by allocating more space away from the car. Traffic on Castle Street and Fore Street in particular, currently acts to sever the town centre environment. Measures could be put in place to reduce the dominance of traffic on these streets.</p> <p>Creating more space for pedestrians in the town centre will help to animate the space and provide the opportunity for greater activity and events to take place.</p>
Encourage healthier, more active and sustainable transport modes	<p>Smarter Travel initiative – greater emphasis needs to be given to non-car modes of transport. The health and wellbeing benefits of smarter choices travel should be emphasised. Marketing and campaigns to encourage take up of smarter choices have proved successful in the Sustainable Travel DemonstrationT owns with a potential 15-20% shift away from the private car. It might be that consideration should be given to demand management measures also such as raising parking charges especially for commuter trips.</p>

Guiding Principle	Detail
Reduce travel and increase town centre activity	Having more residential properties in the town centre not only reduces trip making, it also enlivens the town centre especially in the evenings. This in turn makes it safer for pedestrians and cyclists thereby encouraging these modes above car and taxi use.
Make better use of the railway	Enhance the railway station environment with improved interchange with complementary modes. This should include encouragement of sustainable access modes balanced with appropriate levels of car parking.
Embrace future technologies	Recognising the part transport technology may play in the future, the town can be seen to be embracing and encouraging modes of transport with alternative energy supplies. For example, priority spaces in car parks, electric charge points, charging incentives etc. could be used to clearly send a message that Trowbridge wants to embrace environmentally friendly transport.

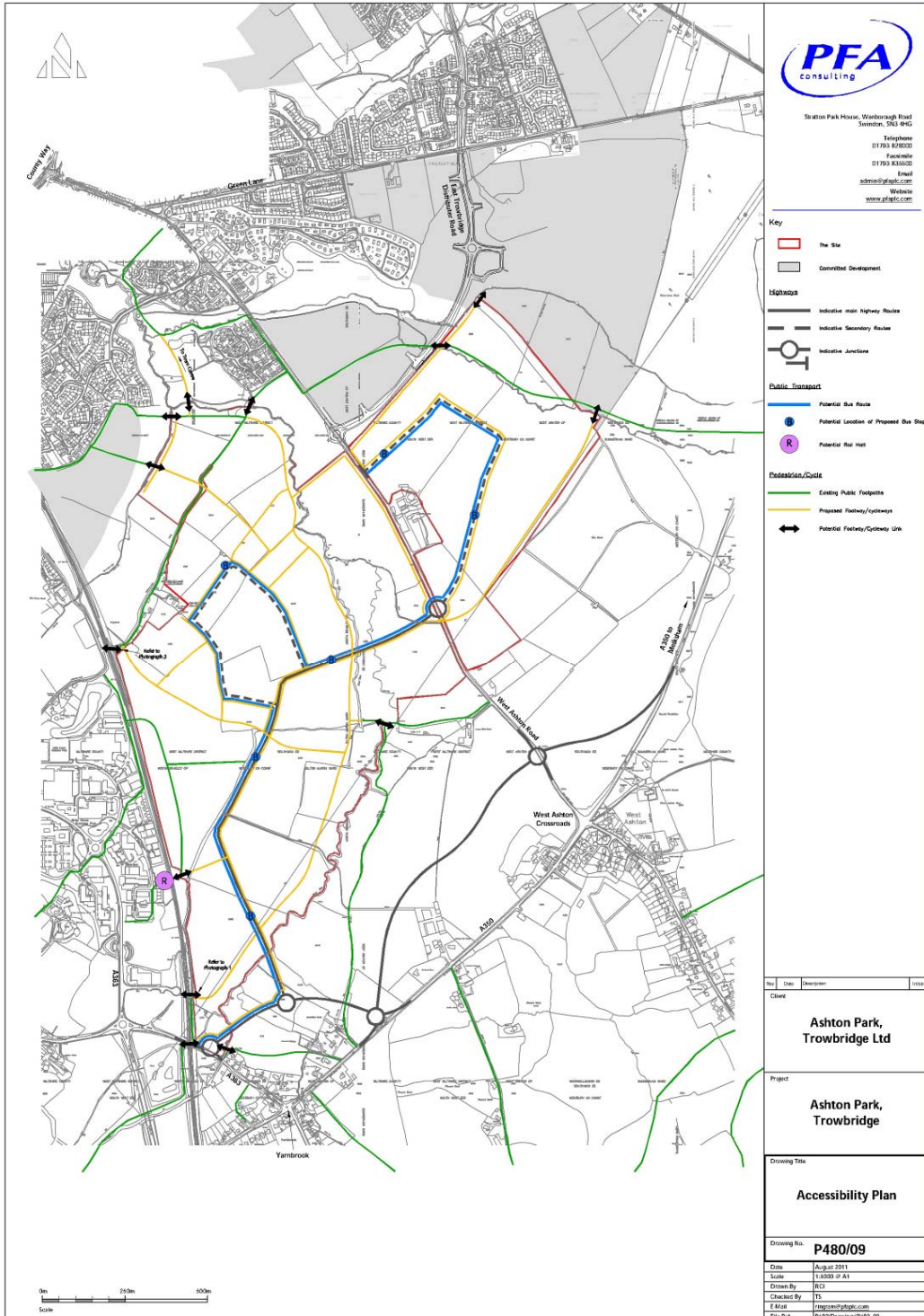
Source: Transforming Trowbridge (Final Report August 2010)

Appendix B. Summary of Section 106 Agreements

Ref	Development	Scheme	Contribution
3296	LAND SOUTH OF HILPERTON MARSH MIDDLE LANE, HILPERTON	BRIDLEWAY SURFACING	£20,000
3296	LAND SOUTH OF HILPERTON MARSH MIDDLE LANE, HILPERTON	TRAFFIC CALMING	£10,000
3296	LAND SOUTH OF HILPERTON MARSH MIDDLE LANE, HILPERTON	WEIGHT RESTR'T'N	£15,000
3349	LAND AT SOUTHVIEW, TROWBRIDGE	Highways (public transport £100,000 & pedestrian / cycle links £15,000)	£40,000
3333/02	Halfway Cottage, Hilperton	Bus Gate	£22,500
3349	LAND AT SOUTHVIEW, TROWBRIDGE	Highways Improvement (transport & pedestrian/cycle links totalling £115000	£50,000
3349	LAND AT SOUTHVIEW, TROWBRIDGE	Highways Improvement (transport & pedestrian/cycle links totalling £115000	£25,000
3449	Shires Gateway, Wincanton Site, Bythesea ROAD, TROWBRIDGE	Accessibility Scheme(s) to site	£50,000
3449	Shires Gateway, Wincanton Site, Bythesea ROAD, TROWBRIDGE	Real time Car Park Signage	£100,000
3449/02	Shires Gateway, Wincanton Site, Bythesea ROAD, TROWBRIDGE	Car Park Signage	£15,000
3451	Land opposite Paxcroft Farm, Paxcroft, HILPERTON		
3468	SITE H8A LAND SOUTH OF THE GRANGE, ASHTON ROAD, HILPERTON	Public Transport East side of Trowbridge	£24,500
3480	Former Ushers Bottling Plant, CONIGRE / UNION STREET, TROWBRIDGE	Wider Highways Network	£200,000
3481	Stallard Street, Trowbridge	Bus Stop improvements in vicinity of site	£10,000
3488	Blue Hills, Devizes Road, Hilperton	Pub transpt E Trowbridge	£24,500
3495/01	LAND OPPOSITE PROSPECT PLACE, TROWBRIDGE		
3496	LAND ADJOINING HILPERTON DRIVE/ASHTON ROAD, HILPERTON	Public Transportation	£17,250
3497	Mortimer Street/County Way(formerly Peter BLACKS) TROWBRIDGE	Footbridge	£100,000
3497	Mortimer Street/County Way(formerly Peter BLACKS) TROWBRIDGE	Pedestrian Link Improvement	£7,500
3497	Mortimer Street/County Way(formerly Peter BLACKS) TROWBRIDGE	Car Park Variable Message Signing	£100,000
3511	Land at Ashton Road, Paxcroft Mead, HILPERTON	Public Transport Facilities serving Paxcroft	£15,825
3519	Land to North of Green Lane, Trowbridge,	Bus Gate	£11,295
3519	Land to North of Green Lane, Trowbridge,	Towards Hilperton Relief Road cycle/peds Quarterway/ Lane school turning head/ Fire stn subway/ cycle links Paxcroft Pr School/ or as agreed with owner	£920,000
3567	AREA H8 LAND NORTH OF PAXCROFT WAY, TROWBRIDGE		£196,000
3567	AREA H8 LAND NORTH OF PAXCROFT WAY, TROWBRIDGE	Public Transport Facilities	£84,000
3315/01	SILVER STREET LANE, TROWBRIDGE	Footpaths and Cycleways	£5,000
3333	Halfway Cottage Trowbridge	Towards Hilperton Relief Road	£113,643
3289	East Trowbridge	Bus gate + TROs	£50,795
3527	Trowbridge RFC Green Lane	Ped / cycle improvements	£270,000
3350	SW Elmfield Trowbridge	Bus stops Staverton Marina	£5,000
3455	95-133 Frome Road Trowbridge	Ped Crossing Frome Road	£15,000
Total			£2,517,808

Appendix C. Ashton Park Access Proposals

Figure C.1: Core Strategy Highway Options (PFA scenario)



Source: Peter Finlayson Associates

Appendix D. Model Results Output

Figure D.1: 2026 Do Nothing - Junction Capacity Summary AM Period

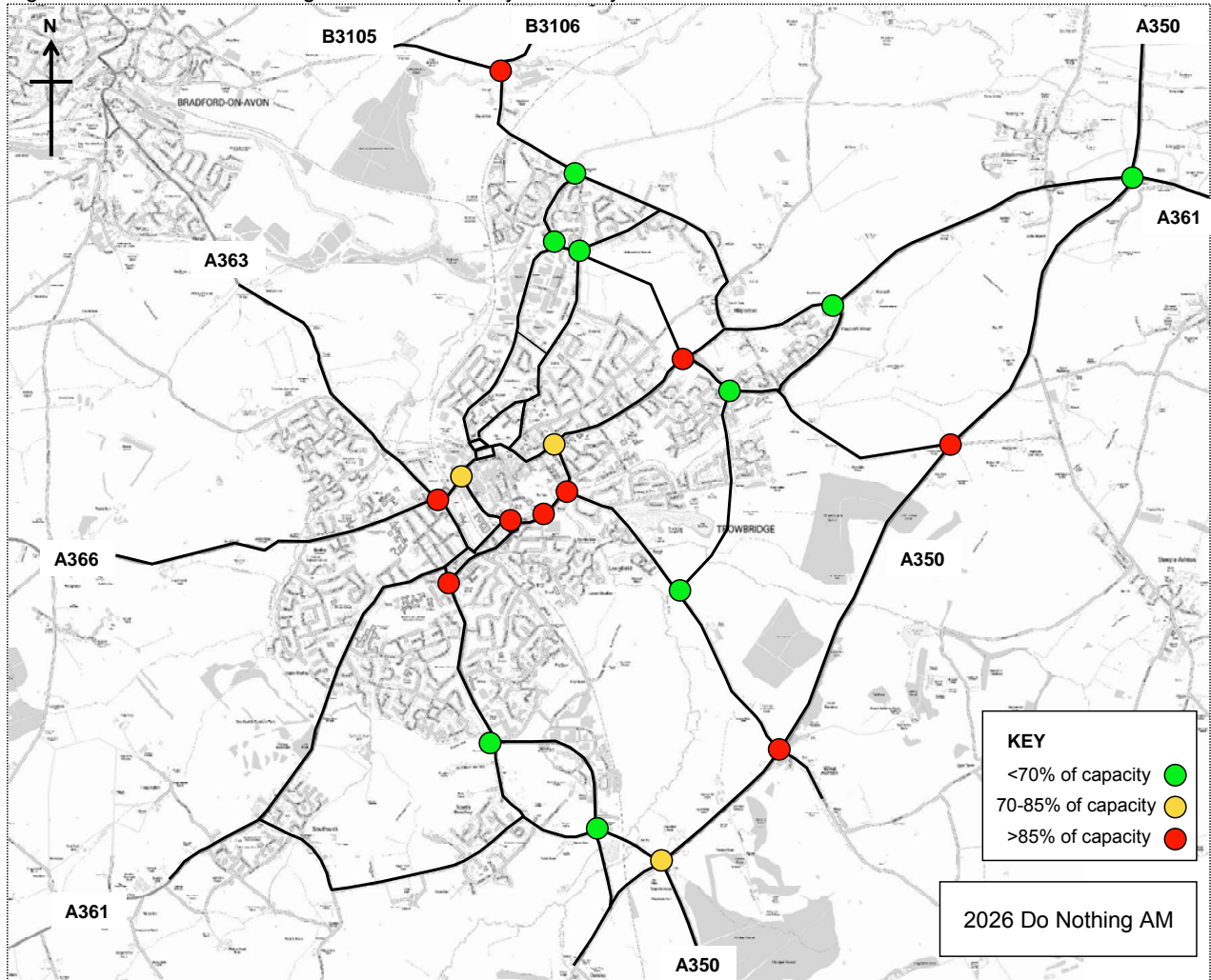


Figure D.2: 2026 Do Nothing - Junction Capacity Summary PM Period

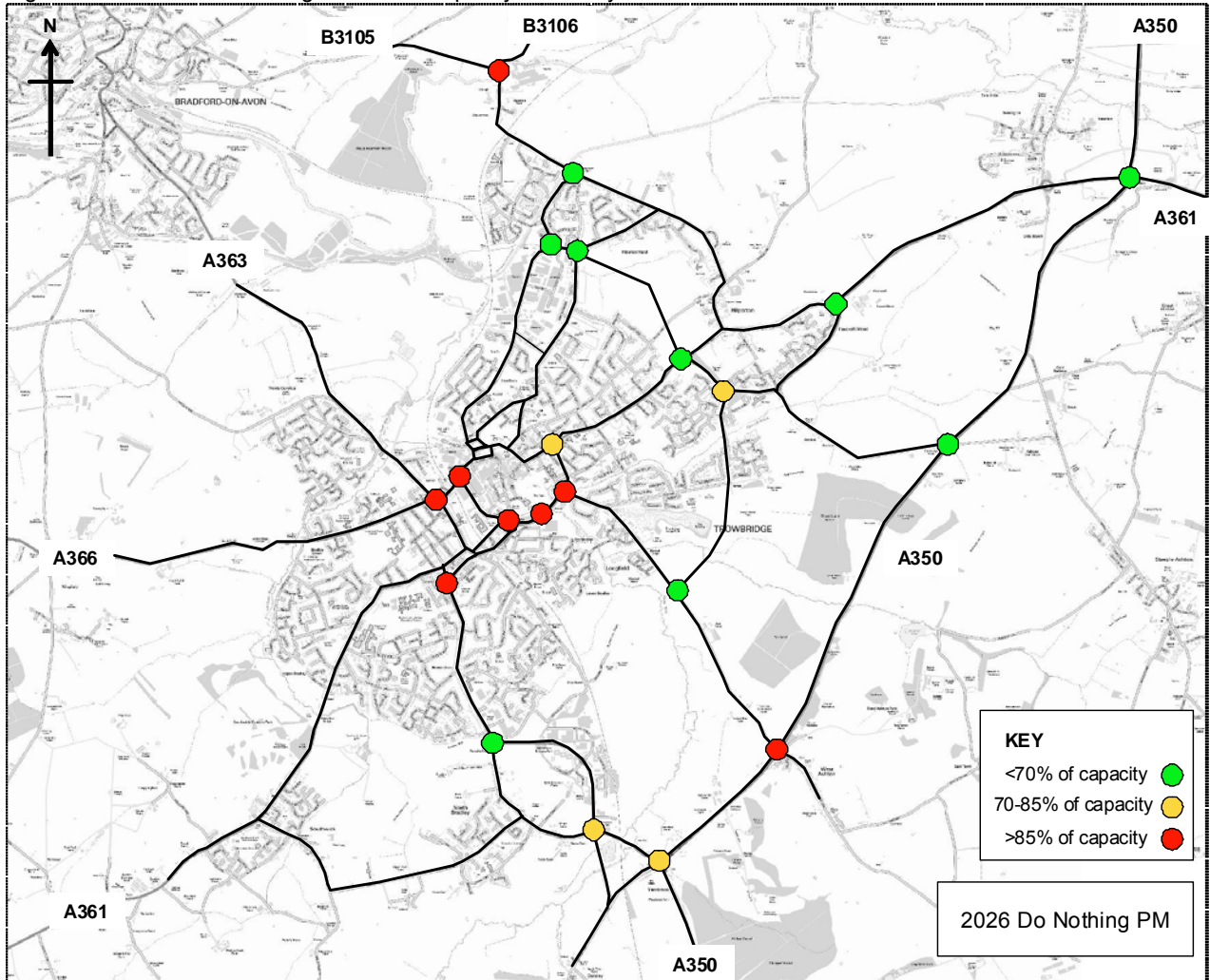


Figure D.3: Development Scenario 1: 2026 Base No Improvements - Junction Capacity Summary AM Period

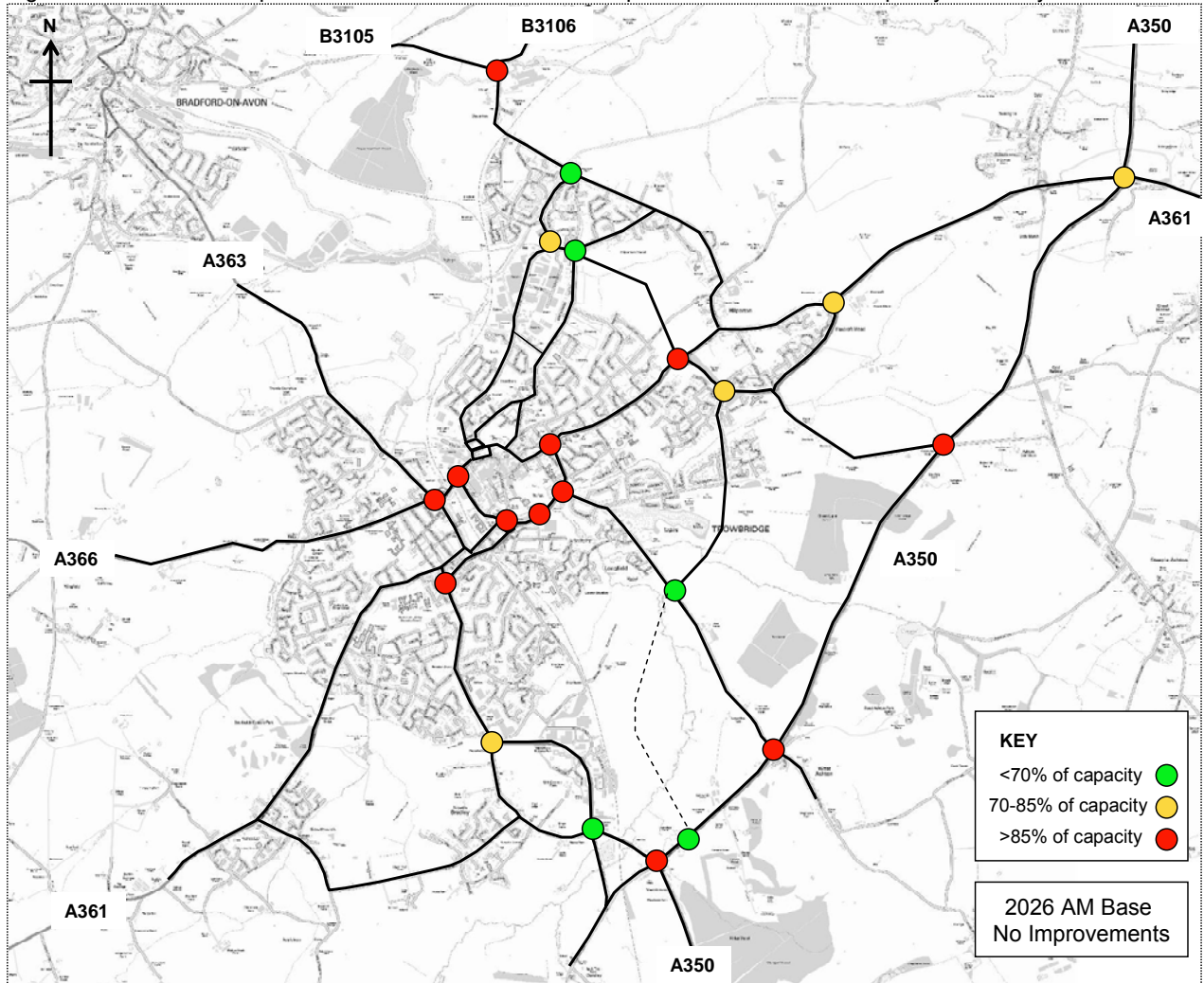


Figure D.4: Development Scenario 1: 2026 Base No Improvements - Junction Capacity Summary PM Period

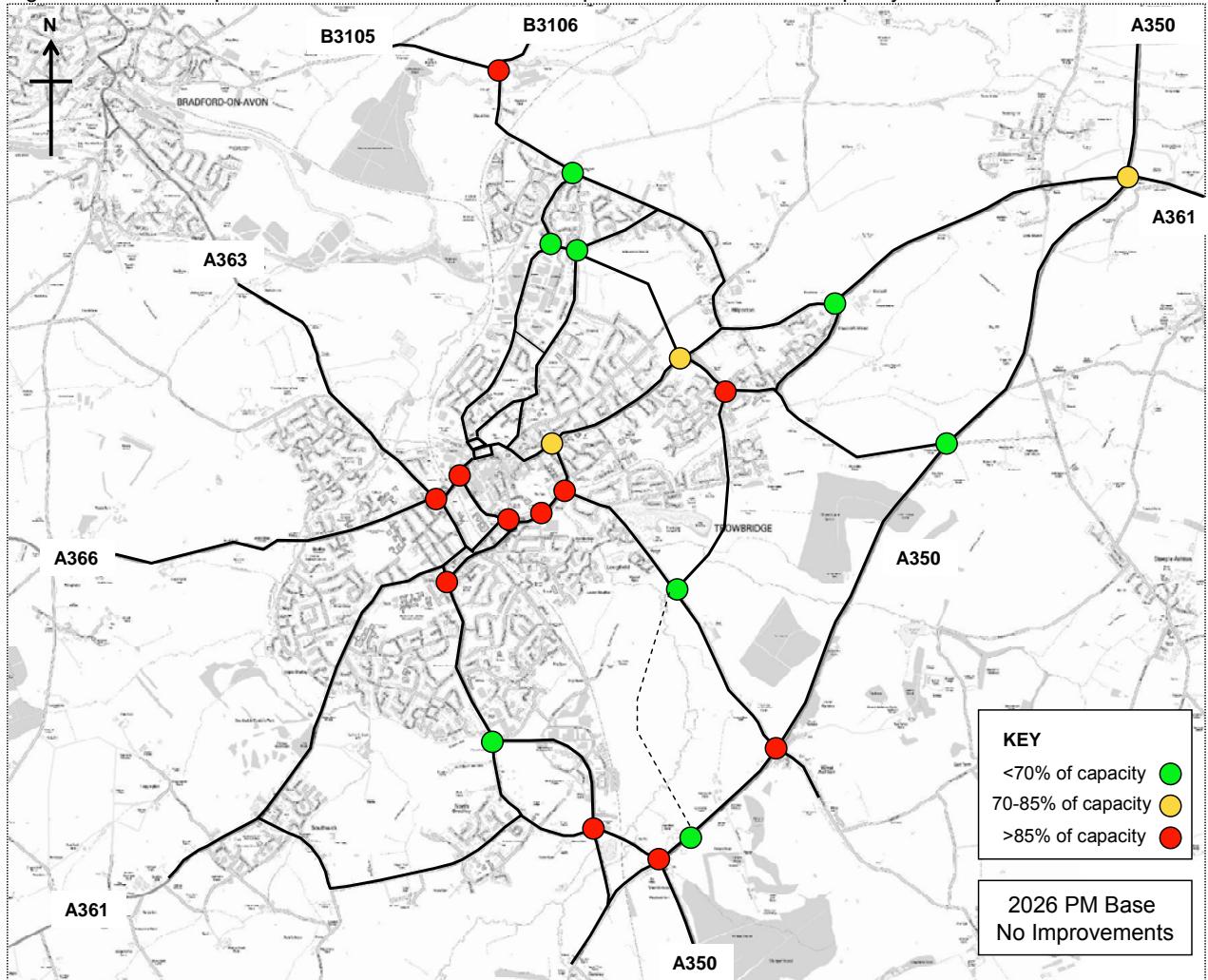


Figure D.5: Development Scenario 1: Option 1 Alternative Modes - Junction Capacity Summary AM Period

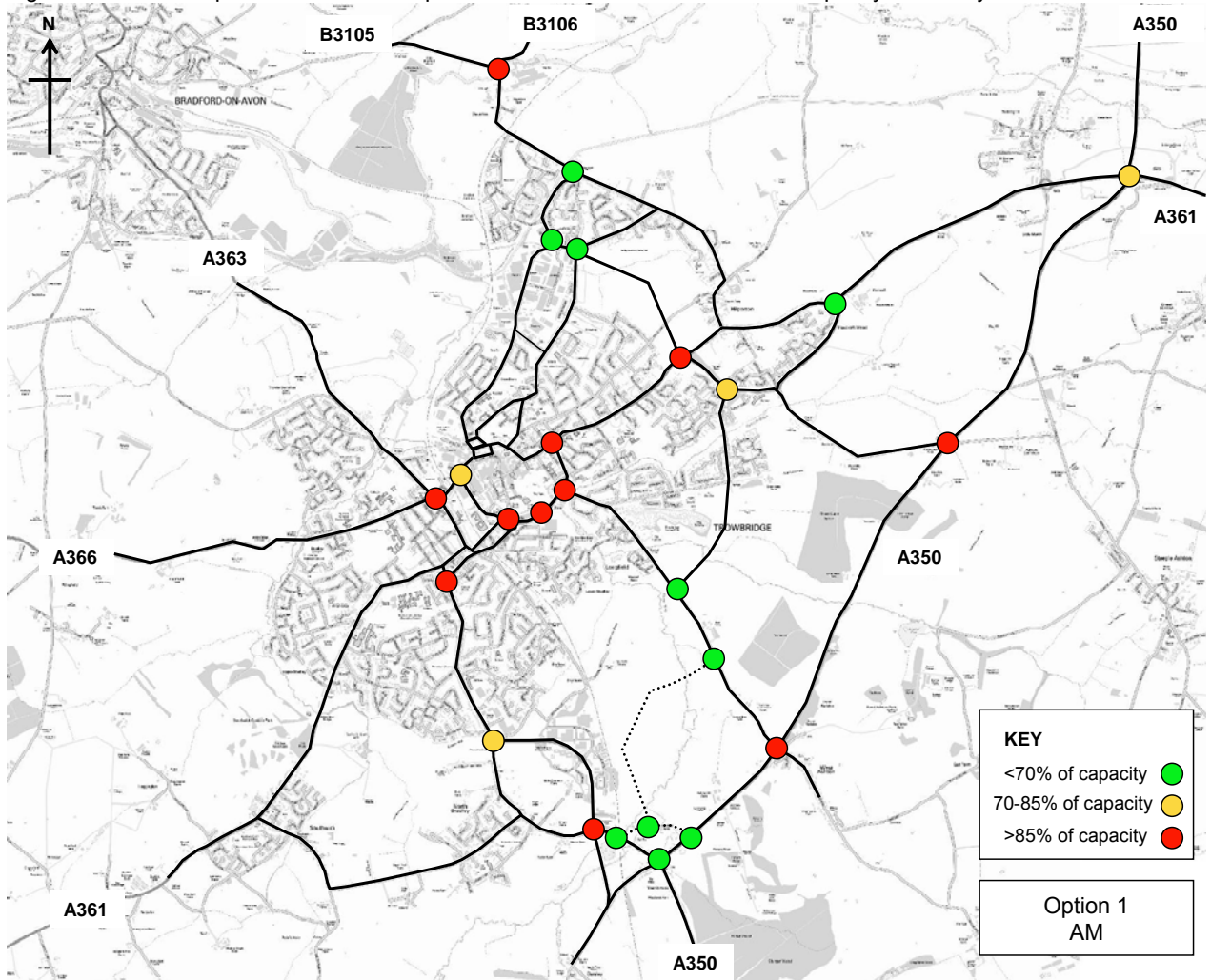


Figure D.6: Development Scenario 1: Option 1 Alternative Modes - Junction Capacity Summary PM Period

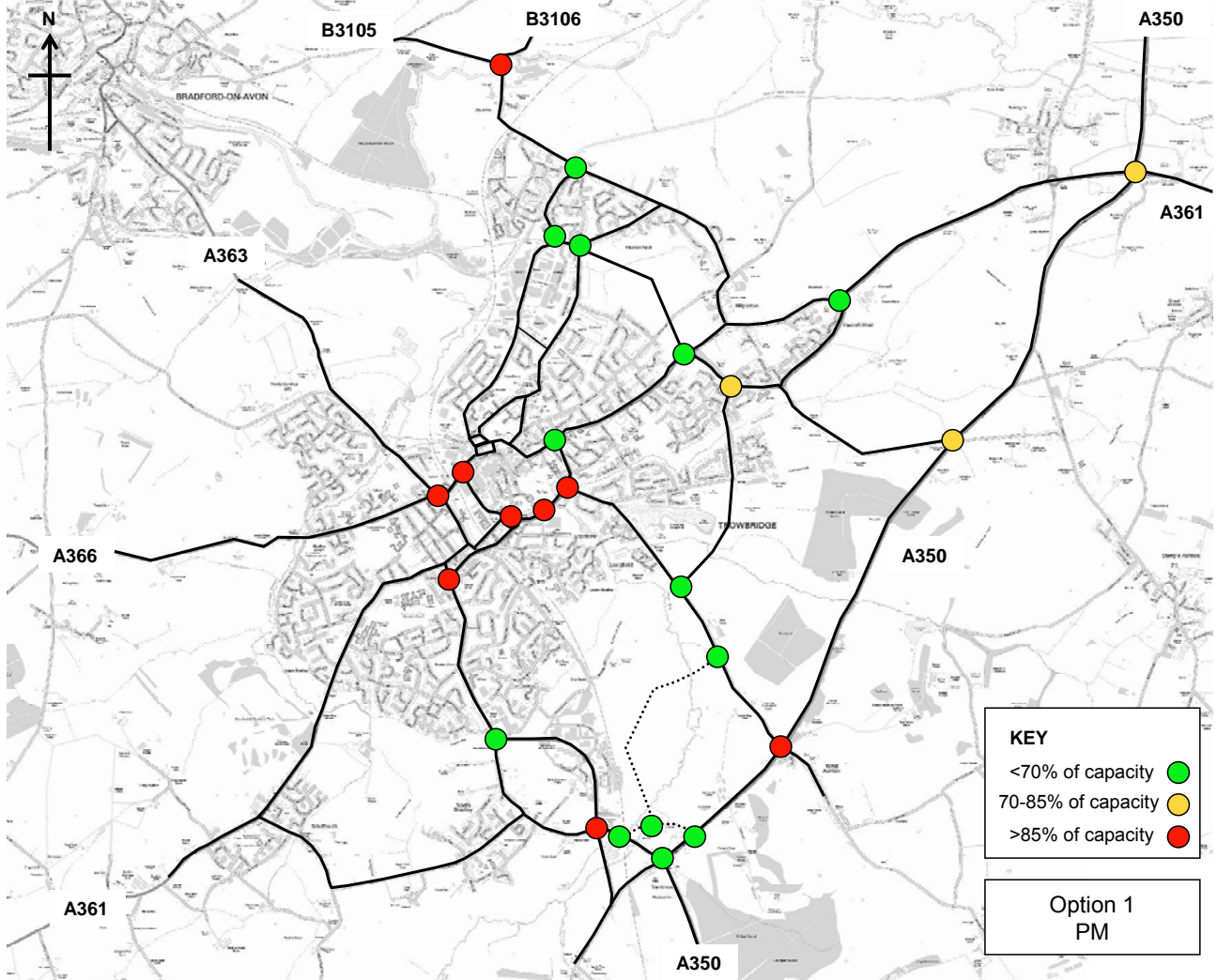


Figure D.7: Development Scenario 1: Option 2 Balanced - Junction Capacity Summary AM Period

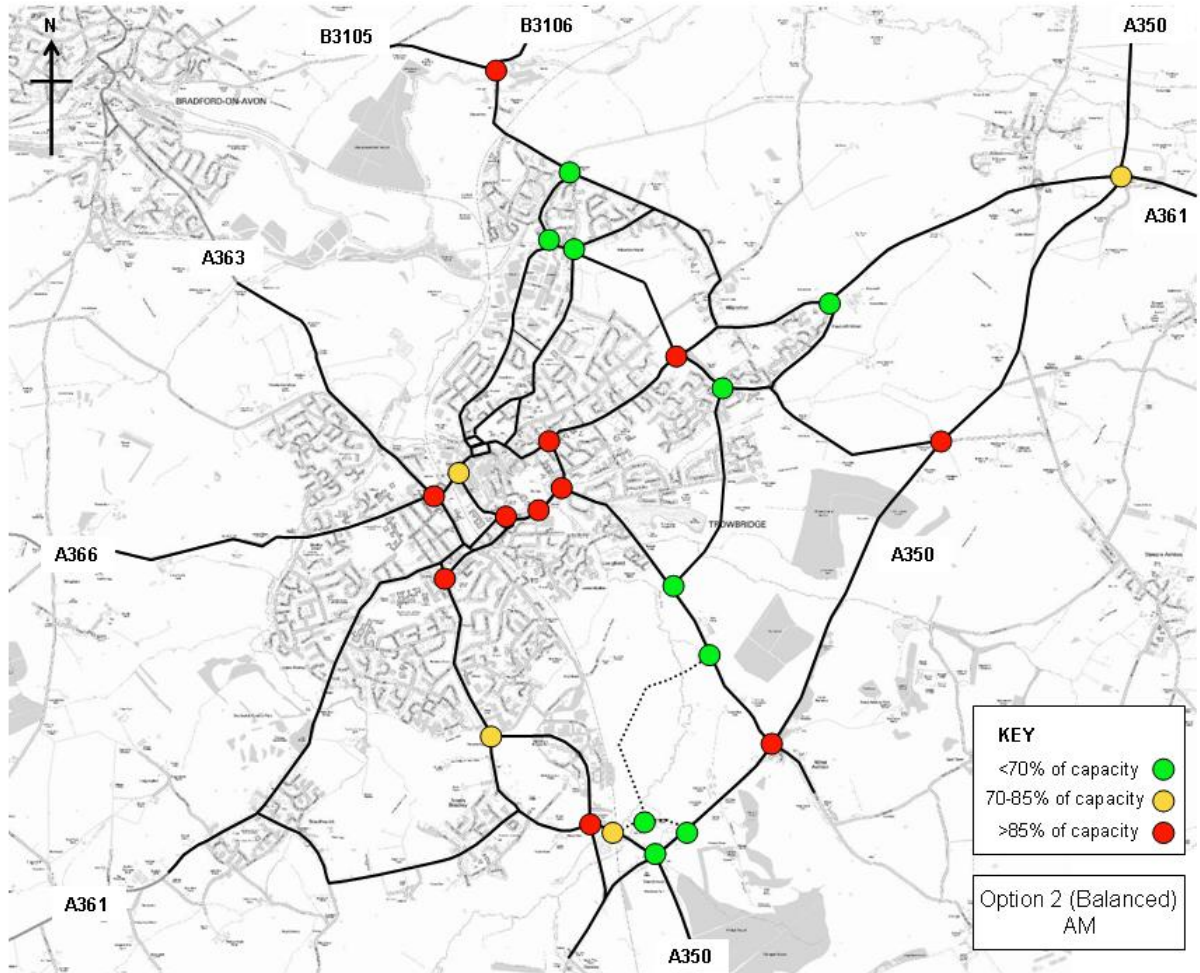


Figure D.8: Development Scenario 1: Option 2 Balanced - Junction Capacity Summary PM Period

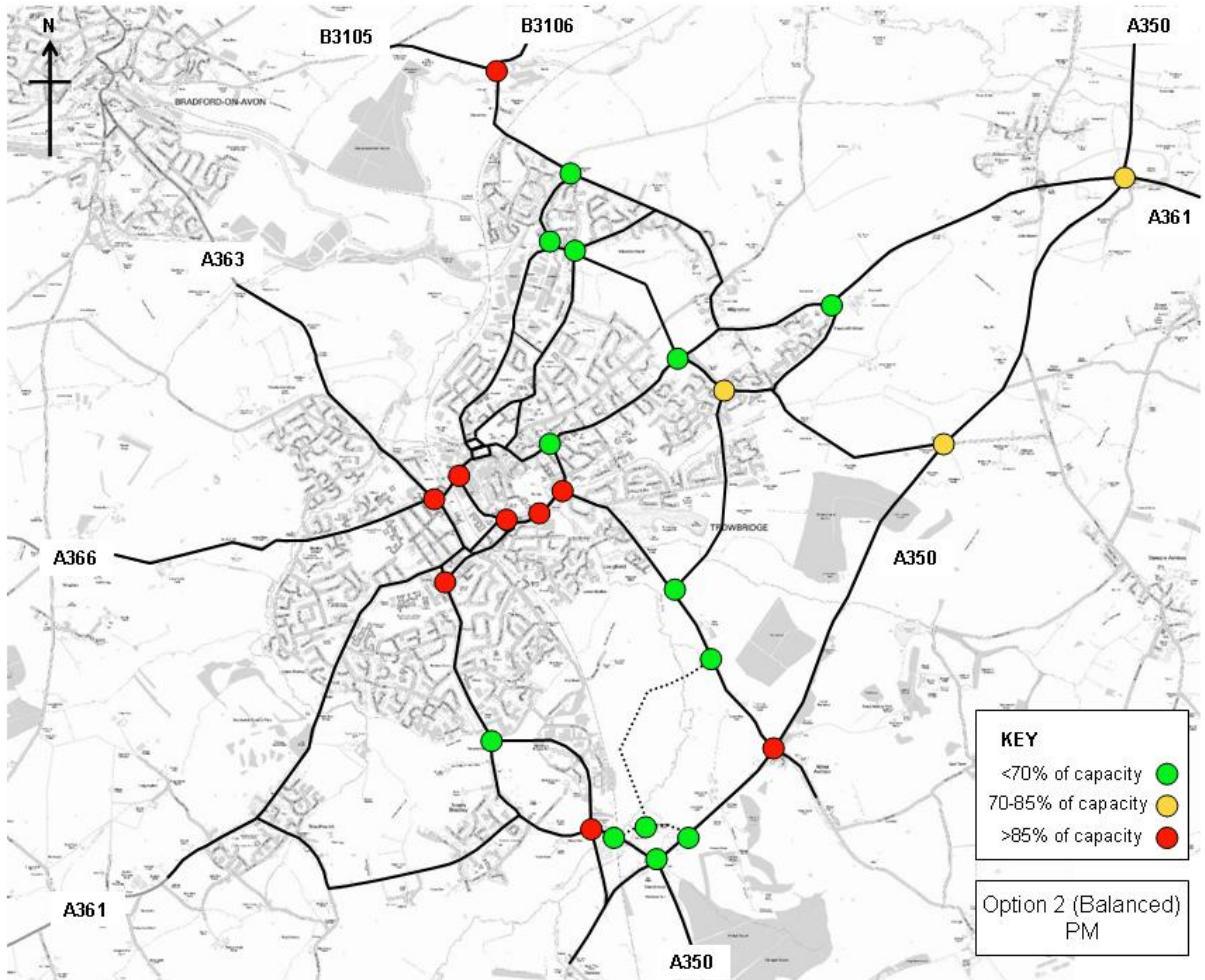


Figure D.9: Development Scenario 1: Option 3 Highway Capacity - Junction Capacity Summary AM Period



Figure D.10: Development Scenario 1: Option 3 Highway Capacity - Junction Capacity Summary PM Period

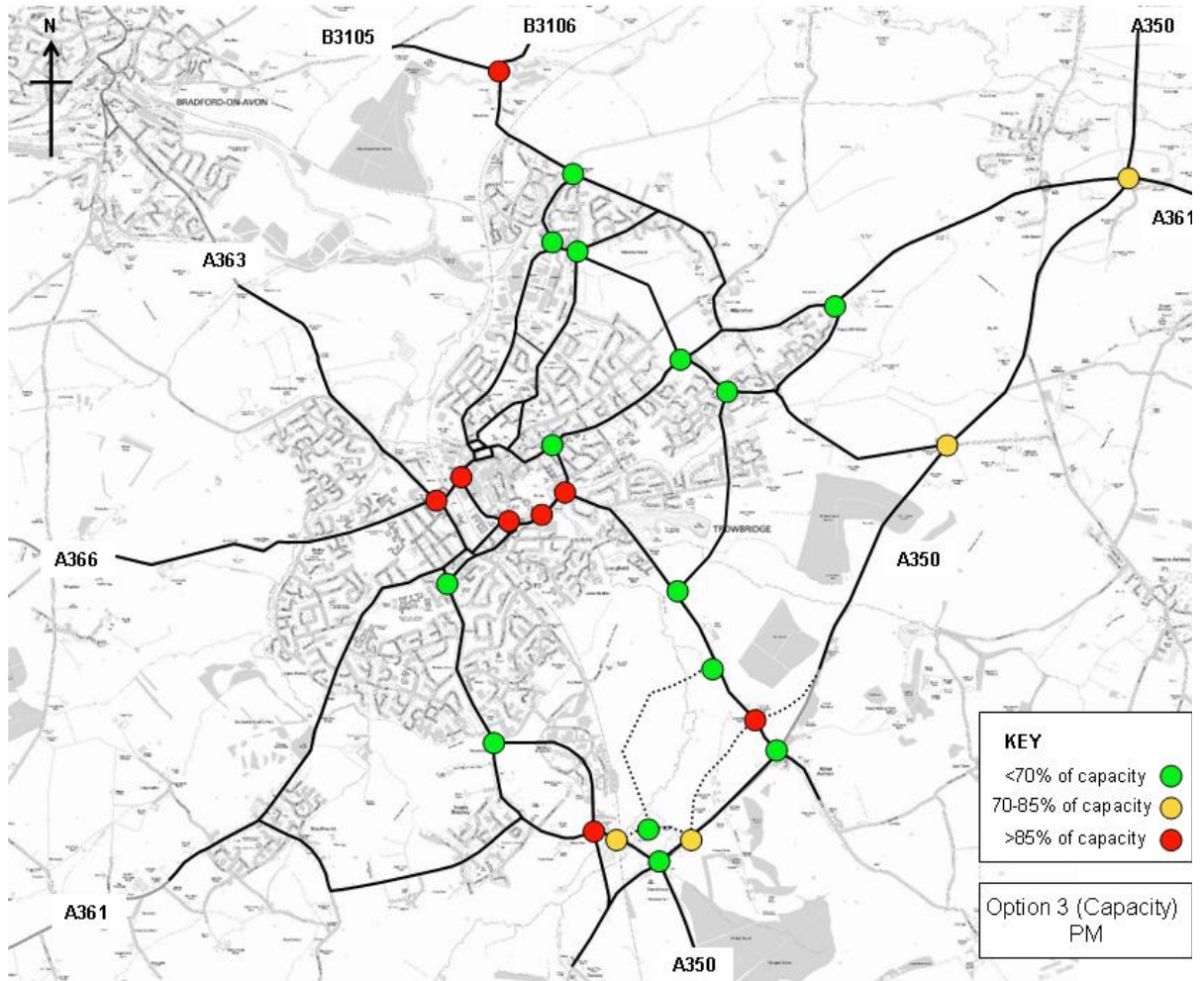


Figure D.11: Development Scenario 2: 2026 Base No Improvements - Junction Capacity Summary AM Period

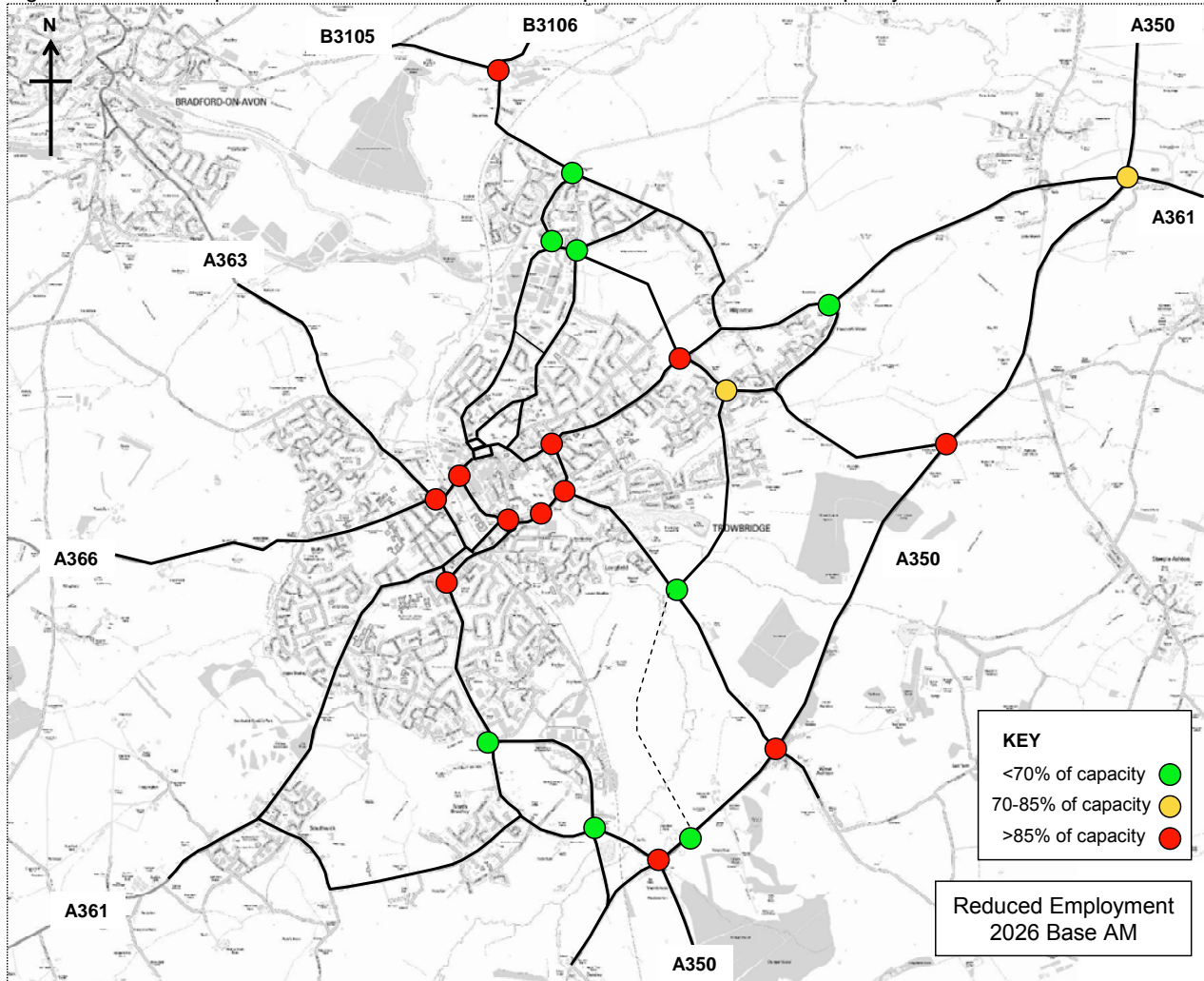


Figure D.12: Development Scenario 2: 2026 Base No Improvements - Junction Capacity Summary PM Period

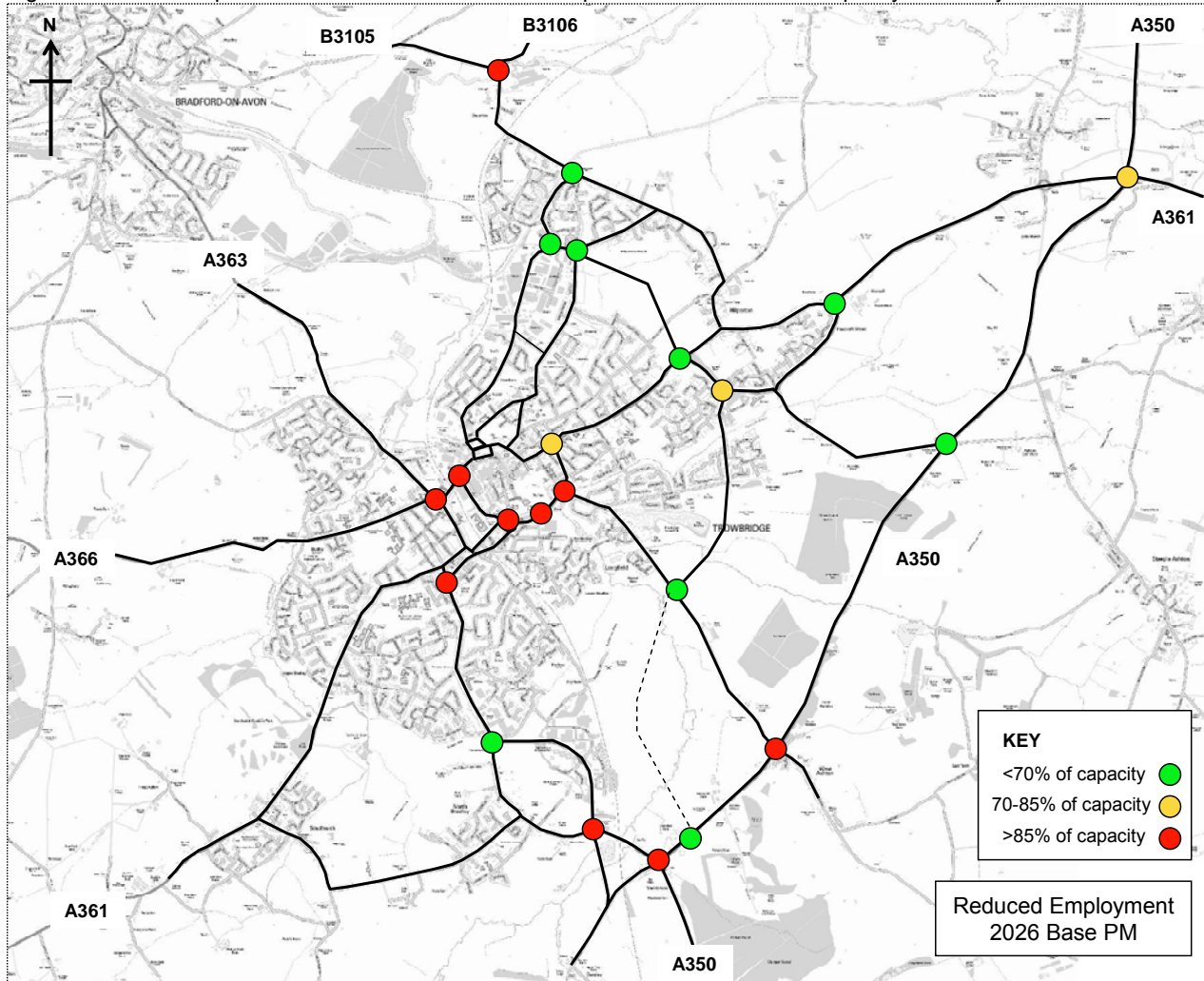


Figure D.13: Development Scenario 2: Option 1 Alternative Modes - Junction Capacity Summary AM Period

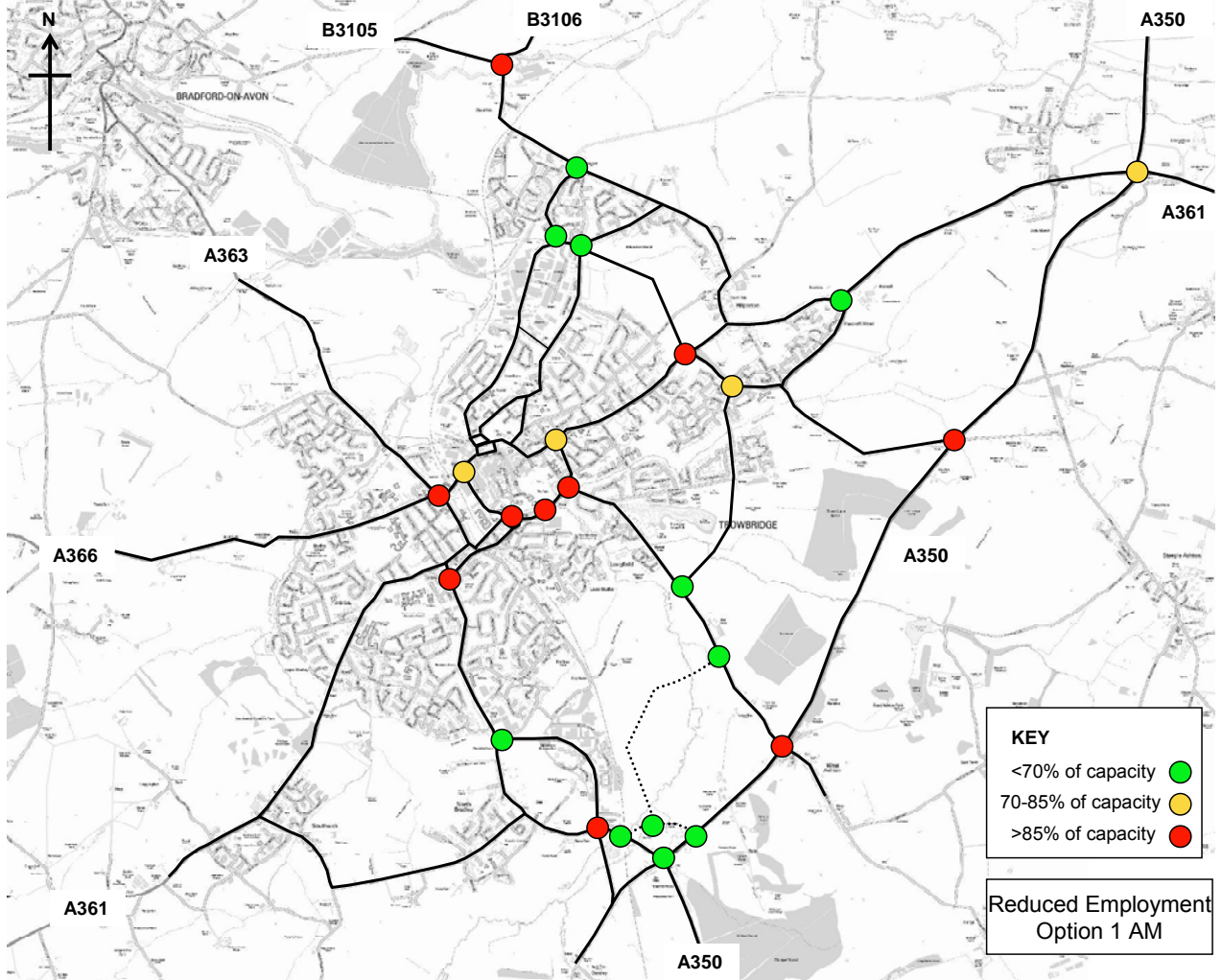


Figure D.14: Development Scenario 2: Option 1 Alternative Modes - Junction Capacity Summary PM Period

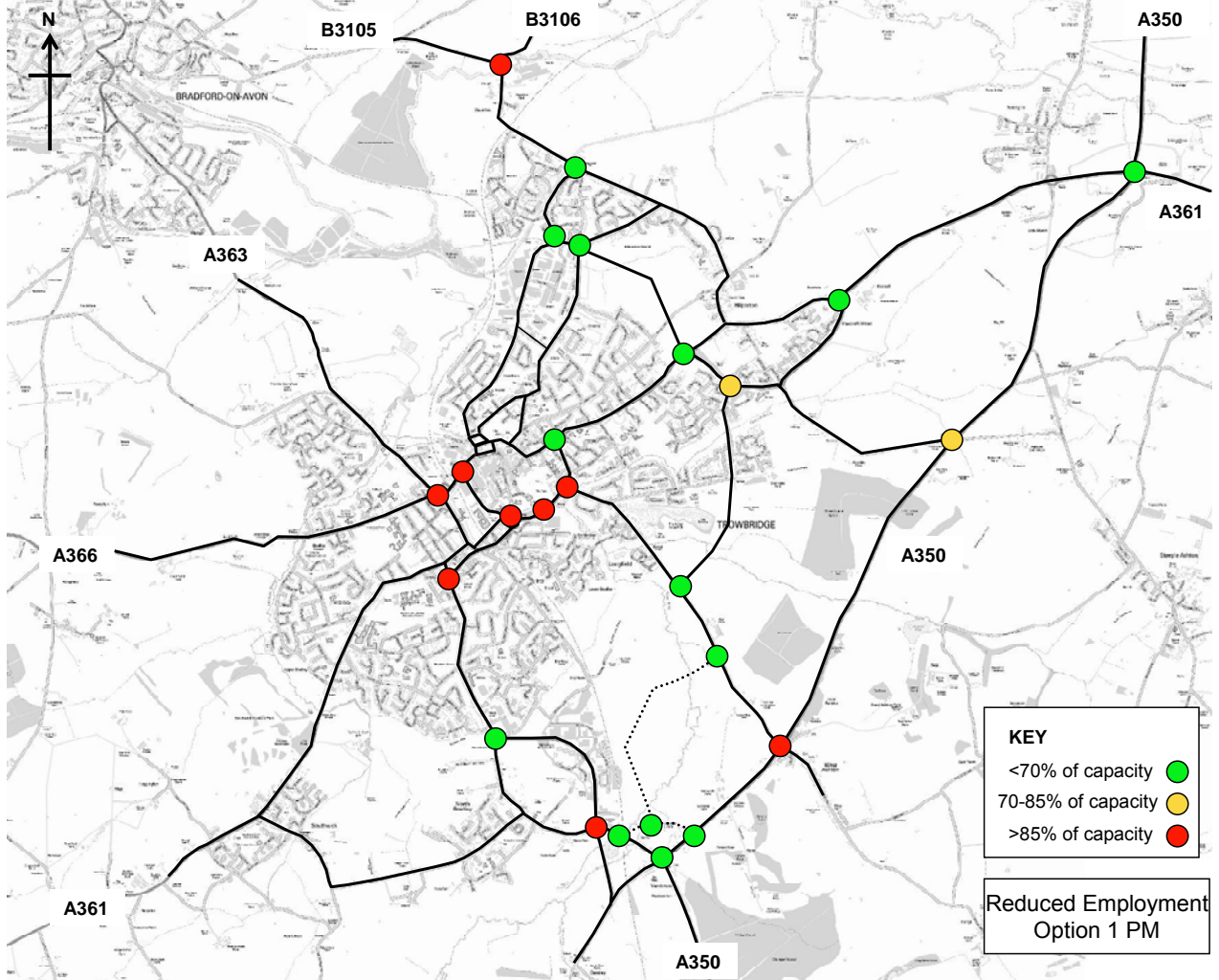


Figure D.15: Development Scenario 2: Option 2 Balanced - Junction Capacity Summary AM Period

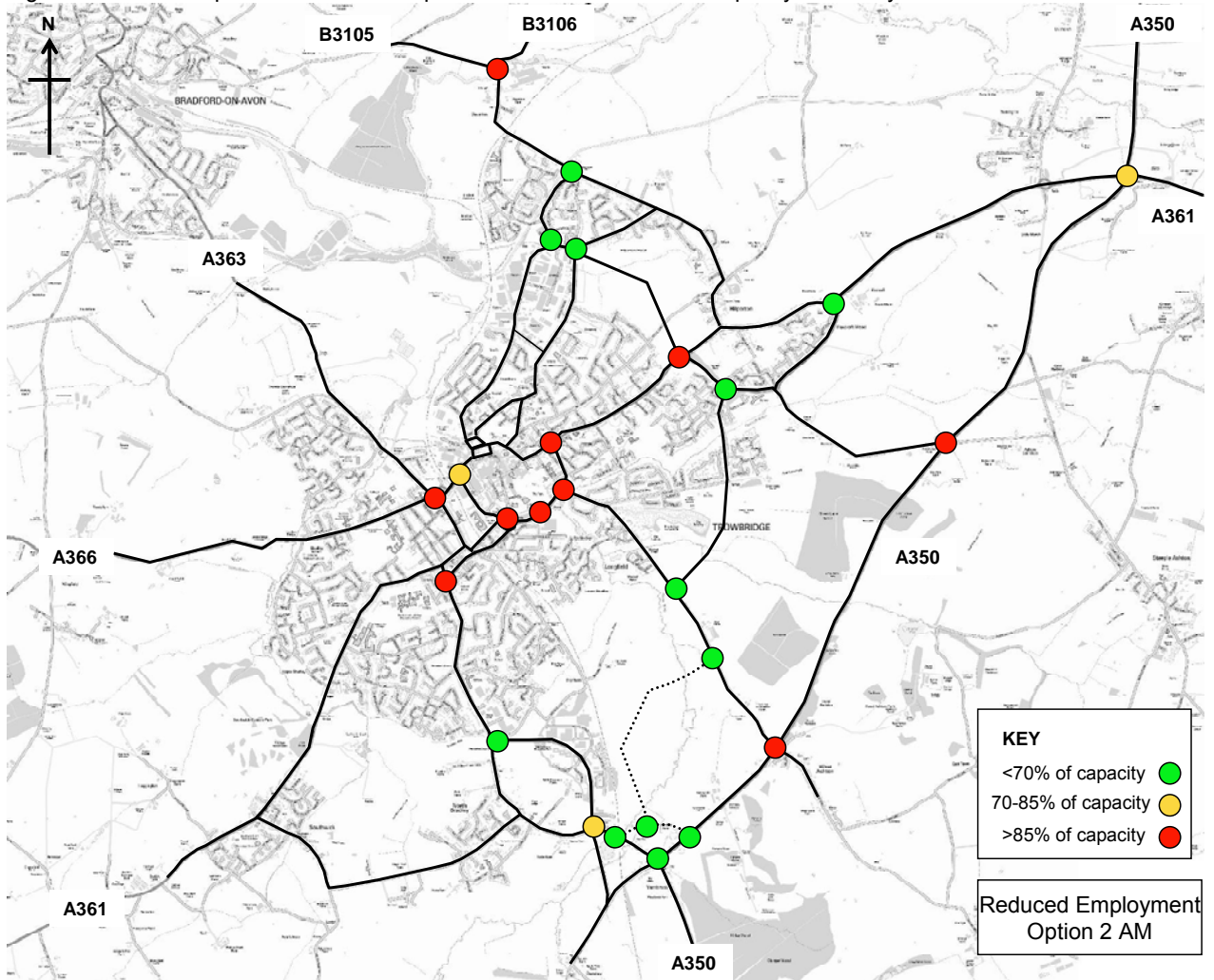


Figure D.16: Development Scenario 2: Option 2 Balanced - Junction Capacity Summary PM Period

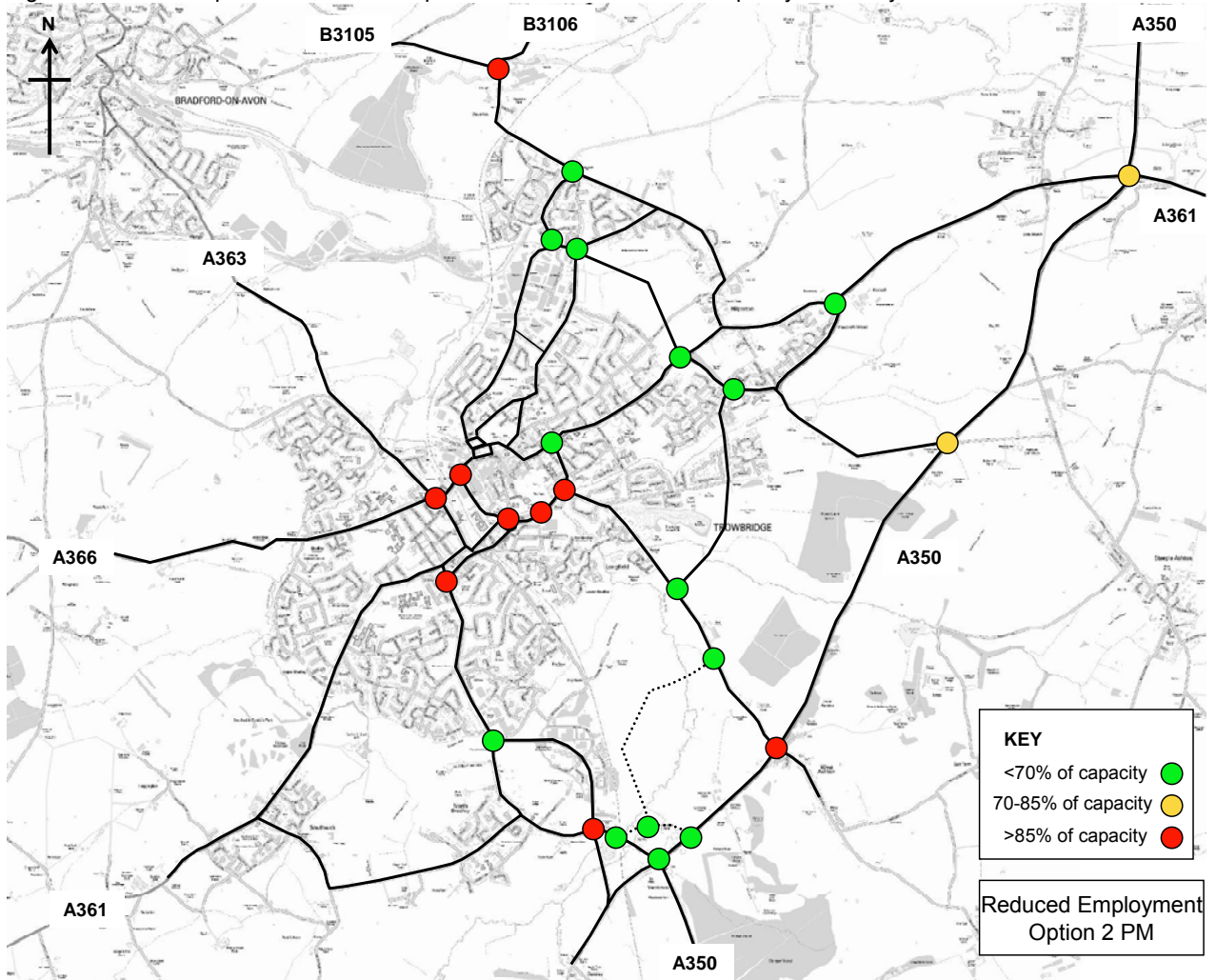


Figure D.17: Development Scenario 2: Option 3 Highway Capacity - Junction Capacity Summary AM Period

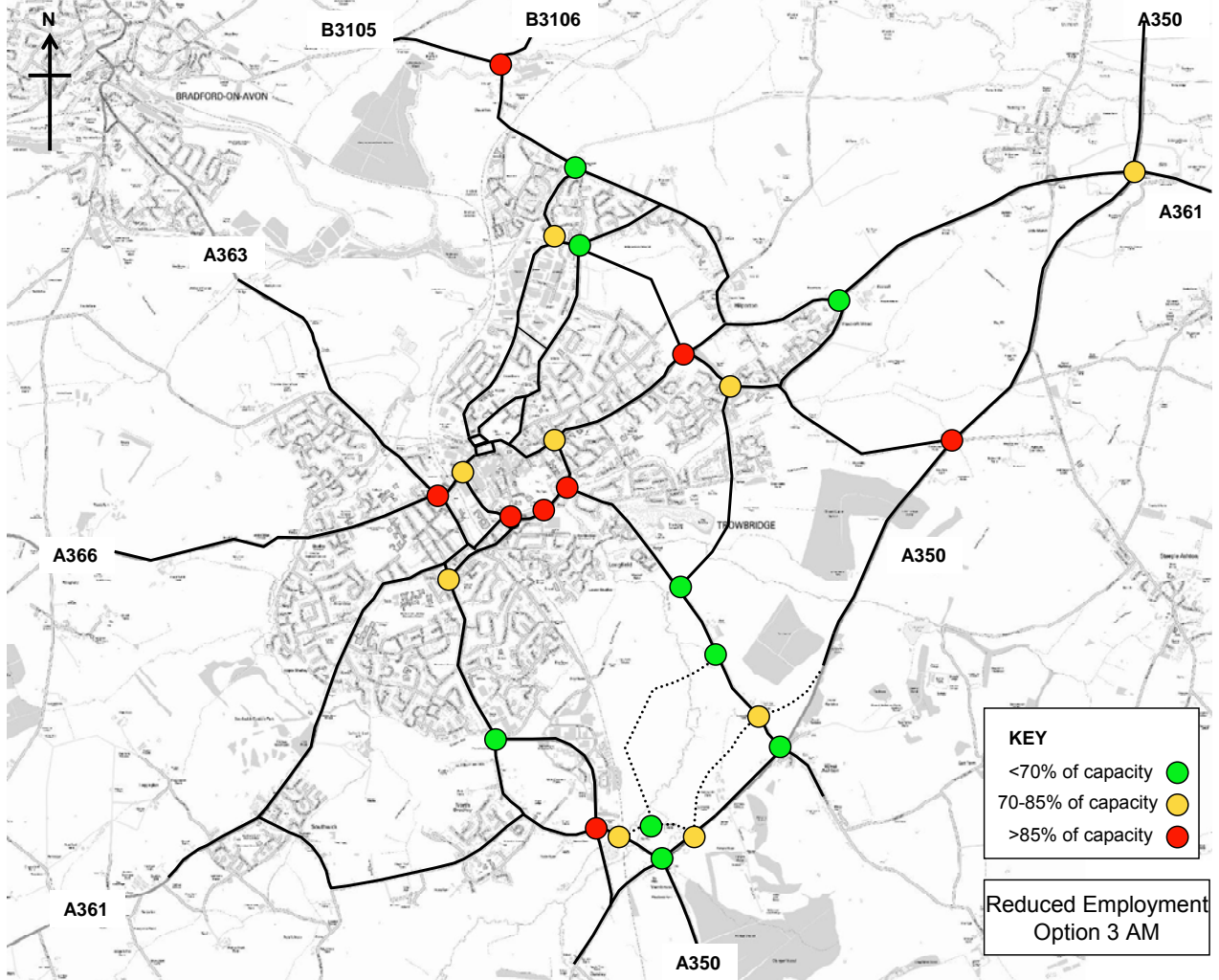


Figure D.18: Development Scenario 2: Option 3 Highway Capacity - Junction Capacity Summary PM Period

