Salisbury Transport Strategy

Final
Problems and Issues

December 2009

Notice

Document History

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Executive Summary

The Regional Spatial Strategy (RSS) for the South West and sets out the numbers of houses and jobs that should be provided for in Wiltshire 2026. The Secretary of State's Proposed Changes to the Draft RSS for the South West indicates a housing requirement of 12,400 homes for South Wiltshire for the period 2006-2026. This would require an average housing delivery of 620 dwellings per year.

This Problems and Issues report has considered the views of local residents at previous consultation events and used data collected as part of the development of Salisbury Transport Models to identify existing highway and public transport travel patterns within, to / from and through Salisbury in 2008. These models have been used to forecast the demand for travel in 2026 in light of the South Wiltshire Core Strategy.

This report has also considered the highway and public transport network provision in 2008. This includes an assessment of the highway network, which also provides the basis of the bus, walking and cycling network and a review of public transport service provision. The impact of present and future transport demand on the highway and public transport networks has also been assessed.

The transport problems and issues that face Salisbury now and are forecast to face Salisbury in the future are summarised below:

The network has constraints

- The highway network is currently constrained by the capacity of the A36 junctions at Park Wall Junction, St Mark's Roundabout, Castle Roundabout, St Paul's Roundabout and College Roundabout. The performance of these junctions affect the movement along the A36.
- The highway network is presently further constrained at Exeter Street Roundabout and problems here, as a result of delays due to buses, pedestrian crossings and drop-off traffic, affect New Harnham Bridge Road.
- The Harnham Gyratory currently performs well once traffic is able to access the gyratory, but there are delays on the approach roads.
- There is evidence of some through traffic between Wilton and Southampton Road routing through Harnham rather than the A36 as a result of contrainst at the junctions along the A36.
- Approximately 30% of traffic currently on Salisbury's roads is through traffic, and a higher proportion of HGV traffic is through traffic. This through traffic has to be accommodated at the same junctions as traffic accessing / egressing Salisbury.

Congestion affects network reliability

- Constraints at Park Wall Junction, St Mark's Roundabout, Castle Roundabout, St Paul's Roundabout, College Roundabout and Exeter Street Roundabout affect journey time reliability to motorists and bus passengers and results in re-routing to avoid these congestion hotspots.
- By 2026, highway congestion is forecast to increase by approximately 50% and delays are forecast to more than double in the morning peak and evening peak. As a result speeds are predicted to reduce by approximately 15% and 25% in the morning and evening peaks respectively.

Congestion affects the environment

- Salisbury has an air quality problem in the city centre, the entire city centre is currently air quality management area. With little industry within the city centre, the cause of this problem is traffic and HGV and bus traffic is the main cause.
- Salisbury's historically past is largely responsible for its narrow streets and many turns, the high demand for car parking within the city centre and HGV route to Churchfields are key contributors to the air quality problem and will continue to do so to some extent in the future.

- Whilst fuel and vehicle technology is predicted to reduce the impact of some vehicle emissions, transport-related carbon is forecast to increase by approximately 12% in the future.
- High traffic volumes also create noise and visual intrusion problems.

Congestion affects economic vitality

- Congestion will start to affect the economic vitality of Salisbury as business and retail may seek different locations to avoid congestion. Tourism may also suffer if Salisbury is perceived to be difficult to access due to congestion.

Walking and cycling could reduce congestion and improve health

- Heavy traffic and lack of sufficient walking and cycling facilities (safe crossings, dedicated and well signed routes etc) is viewed as a deterrent to walking and cycling. Increased traffic will act as a further deterrent.
- Walking and cycling could provide a more healthy form of travel.

Public transport is city centre focused

- There is currently only one high frequency, cross-city route (between Salisbury High School and Salisbury Hospital) but limited, direct service provision to the railway station and to Churchfields. As a result, for a range of cross-city movements, an interchange is required.
- The public transport network is forecast to receive considerable additional patronage and this may require additional service frequencies and routes

Public transport is also considered to be expensive and has limited services

- Bus provision for journeys within Salisbury presently has limited service provision early in the morning, at night and at the weekend.
- Salisbury Station does not have a bus interchange, has limited parking (which is usually full by 8:30am)

Public transport has limited priority over cars

- Whilst there is some bus priority (bus lanes and select vehicle detection), this is limited to certain corridors and is not comprehensive.

Parking and park and ride are not optimised to manage demand into Salisbury

- Salisbury presently has plentiful parking, which is well used and a good source of revenue, but this availability of parking may be resulting in high car dependency and related problems.
- At the moment Salisbury also has a high quality park and ride service that attracts passengers despite the ready availability of city centre parking yet this service is expensive to run and does not maximise returns by charging per vehicle rather than per person.

Limited focus on sustainable means of travel

- The motorised mode share of travel in Salisbury is car dominated (approximately 90%). Although the car mode share is below the County average for the journey to work, analysis shows high levels of car use for journeys to / from and within Salisbury both now and in the future.
- A focus on sustainable travel is required to ensure that the transport system delivers for everybody.

1. Introduction

Background

1.1 Wiltshire Council (WC) is developing an updated transport strategy for the Salisbury and Wilton area to frame the identification of investment and network operation priorities over the coming years. In part this is because many of the components of the existing strategy for Salisbury have been implemented as part of the Council's first and second Local Transport Plans (LTPs), and the strategy needs to inform the development of LTP3. The review of transport strategy is also critically driven by the need to plan effectively for growth in both housing and employment in the South Wiltshire area, of which Salisbury and Wilton are part, over the next 15 or so years.

1.2 The strategy therefore needs to contribute to the formulation of the Local Development Framework (LDF) for Wiltshire – which will define and shape the county's future development and form the basis of future planning decisions. Most immediately the transport strategy will support the formulation of the Core Strategy element of the LDF which will set out the spatial planning framework for South Wiltshire.

1.3 The Regional Spatial Strategy (RSS) for the South West and sets out the numbers of houses and jobs that should be provided for in Wiltshire 2026. The Secretary of State's Proposed Changes to the Draft RSS for the South West indicates a housing requirement of 12,400 homes for South Wiltshire for the period 2006- 2026. This would require an average housing delivery of 620 dwellings per year. The locations and confirmed levels of development, as currently envisaged by the South Wiltshire Core Strategy, are shown in Figure 1.1; the levels and locations of other developments remain as areas of search.

Approach to Transport Strategy Development

1.4 WC has commissioned consultants Atkins to prepare a transport strategy according to objective-led planning principles.

1.5 The strategy needs to define a set of transport initiatives for the Salisbury and Wilton area that that are able to address the impacts of additional transport demand caused by expected new development in the area up to 2026.

1.6 The strategy development process needs:

- to be based on a clear evidence base building upon a knowledge of existing and future transport and transport-related problems and using the transport model to identify, develop and assess alternative options as part of a systematic process of determining a preferred transport strategy.
- to be objective-led and use an evaluation framework that is able to demonstrate how a preferred strategy best meets the County's sustainable development objectives;
- to be developed with an appropriate level of stakeholder and public consultation to ensure that there is sufficient challenge on the transport measures within the strategy and to ensure that there is sufficient support from key stakeholders;
- to support and be linked with the County's wider Core Strategy development approach and timetable – including consultation; and
- to provide the framework for the subsequent development of an implementation plan and a more detailed parking strategy, including identifying funding sources

1.7 This overall process is shown in Figure 1.2.

Figure 1.1 – Location of Proposed Developments

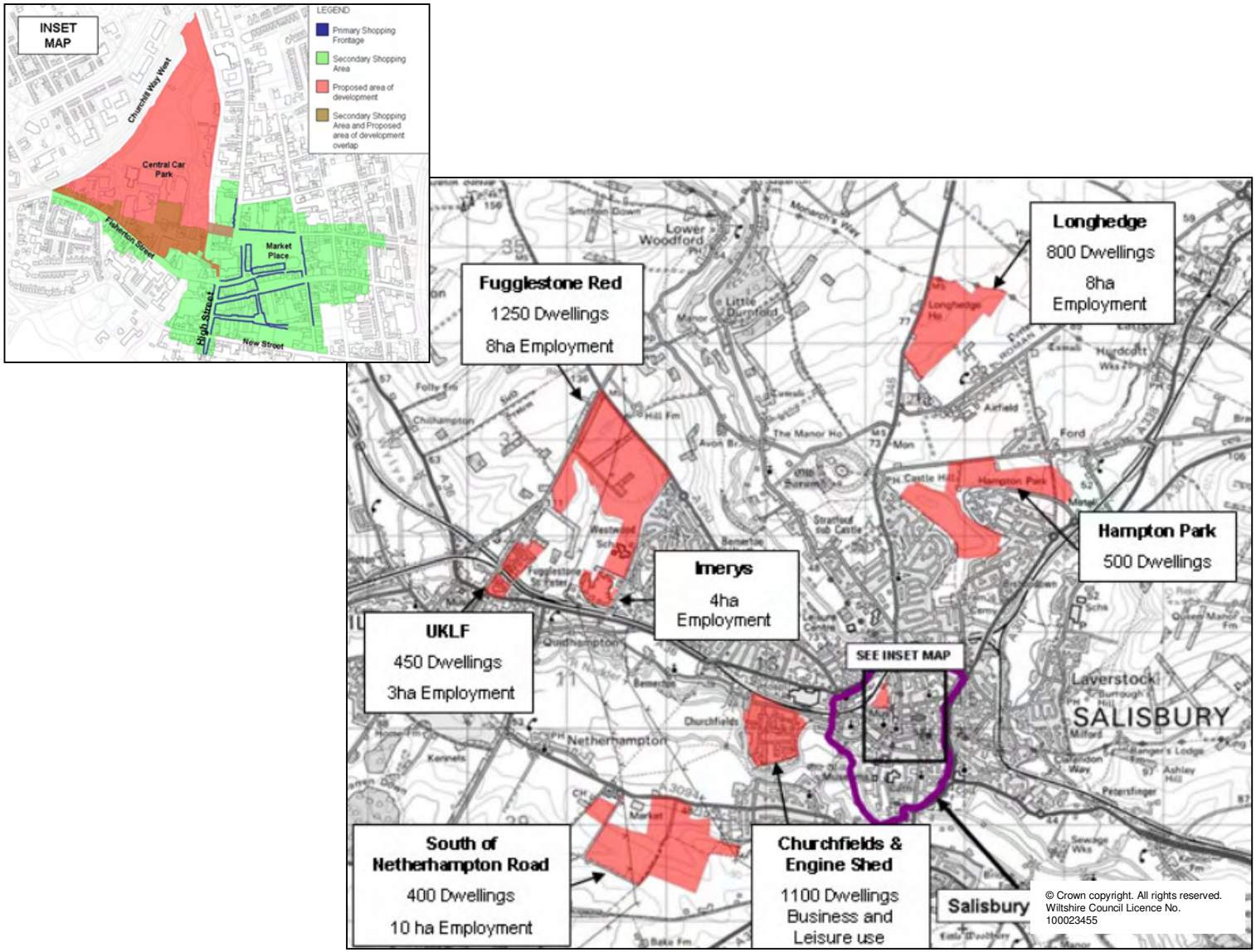
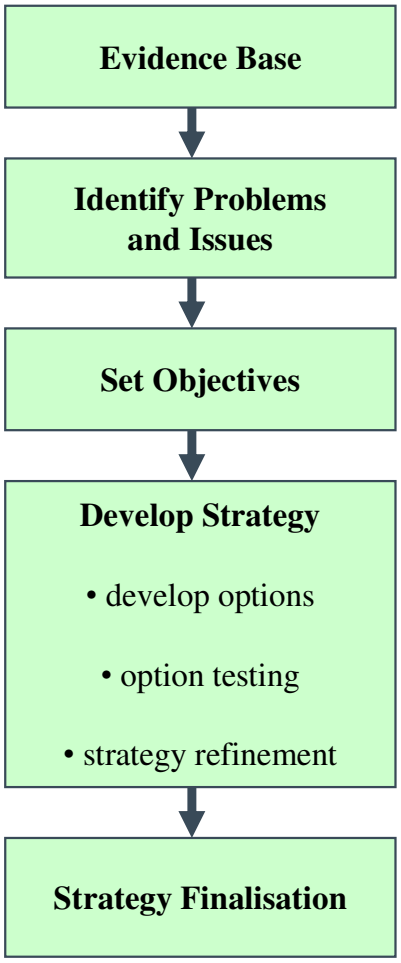


Figure 1.2 - Salisbury Transport Strategy Study Process



Role of this Document

1.8 This process means, first, establishing the scale, nature and impact of current and future transport problems and issues. This then enables the objectives for the transport strategy to be clearly defined and then guide the strategy development process. This document therefore presents a summary of transport problems and issues.

1.9 It provides input to a second key document – Strategy Objectives - that defines the objectives for the transport strategy, in terms of outcomes that the implementation of a preferred strategy is expected to contribute to.

1.10 The remainder of this document is structured as follows:

- Chapter Two summarises findings from recent stakeholder consultation on transport issues;
- Chapter Three reviews existing travel patterns;
- Chapter Four contains a review of the current transport network and performance;
- Chapter Five reviews future year travel patterns as a result of the South Wiltshire Core Strategy;
- Chapter Six considers the impact of this growth on the transport networks in 2026;
- Chapter Seven summaries the problems and issues;
- Chapter Eight provides a conclusion.

2. Consultation Summary

Introduction

2.1 A substantial amount of stakeholder consultation on transport issues in Salisbury has already been undertaken by Wiltshire Council. Existing consultation findings have been reviewed to provide an understanding of the problems and issues in developing an updated transport strategy. The key consultation exercises that have been undertaken in Salisbury in recent years, and comprise:

- Local Transport Plan 2 consultation in Salisbury;
- Local Transport Plan 2 consultation in Wilton;
- Salisbury Vision consultation; and
- Local Transport Plan 3 consultation.

Summary of Consultation

LTP2 Consultation

2.2 During the LTP2 consultation process in October 2004, participants were invited to a local meeting (Salisbury, Wilton etc) to discuss and record their local transport issues and concerns. These were prioritised into broad LTP themes and at the Salisbury and Wilton events three main themes emerged: parking, public transport and safety.

2.3 In Salisbury, public transport was the main concern for 12 out of 52 participants and parking was the main concern for 11 out of 52 participants. Walking and cycling were only main concerns for 5 participants.

2.4 In Wilton, 17 out of 31 participants cited road safety as their main concern.

Salisbury Vision

2.5 Between May 2006 and October 2007 a number of consultation events were held supporting the development of the Salisbury Vision. Three separate surveys were carried out (Our Place, Household and Yeahbut), totalling a response from 6131 individuals. In the first of the surveys, 79.5% of respondents positively agreed with supporting the overall aims of the vision:

- More office and employment space
- A bigger range of shops
- More housing and particularly affordable housing
- Additional high quality hotels
- Higher wages for employees
- Improved cultural facilities
- An improved public transport system
- A much more attractive and ‘green’ city
- A more pedestrian (and car driver) friendly city

2.6 In the Household and Yeahbut surveys, respondents were not asked to indicate their support for the overall aims of the Salisbury Vision and so a comparison with the Our Place survey is not possible. The level of support expressed in these two surveys for individual Salisbury Vision

projects ranged from 20.9% to 70.2% for the Household survey and from 36.3% to 74.5% for the Yeahbut survey. As a result of the differing survey methods, the Salisbury Vision Public Consultation Report (Graham Gould, 2008) concluded that it was not possible to determine the scale of any lack of support for specific projects.

LTP3 Consultation

2.7 LTP3 applies from 2011 onwards and is still in its development stages. A Consultation Issues Paper was produced by Wiltshire Council on the Local Transport Plan. A further round of consultation to inform the production of the LTP3 will commence in spring/summer 2010.

2.8 The Salisbury Campaign for Better Transport Group prepared a response to the consultation, stressing a focus on more improved public transport, active travel plans and measures to increase walking and cycling.

Problems and Issues

Parking

2.9 The perception of parking is that there is a lack of off-street parking in some locations (Wilton and Salisbury Station), and that this results in on-street parking or that on-street parking causes problems for other road users. There is a perceived lack of disabled parking.

2.10 Responses to the consultation include:

- park and ride undermines local bus services; and
- park and ride does not serve other key destinations (the hospital).

2.11 There were no comments about the availability or price of parking, although Salisbury Vision comments accept a reduction in parking capacity.

Public Transport

2.12 Public transport in Salisbury is perceived as being expensive, infrequent (especially early in the morning and in the evening / night).

2.13 In terms of expense, bus fares are set commercially. The park and ride service provides a low cost alternative to city centre parking, but this assumes that individuals have access to a car to access the park and ride site.

2.14 There is not a public transport interchange in Salisbury and this was highlighted in some of the consultation comments and other comments suggested that a public transport interchange in Salisbury should be developed.

Road Safety

2.15 Road safety was the main concern at the Wilton consultation and the main concern of some at the Salisbury consultation. The main concerns are associated with traffic speed, congestion and parking making the walking and cycling more difficult and thereby more unsafe.

Other Items

2.16 The various consultation events have raised concern lack of accessibility, too much congestion and the impact of traffic on the environment (air quality, noise and visual intrusion).

3. Existing Travel Patterns

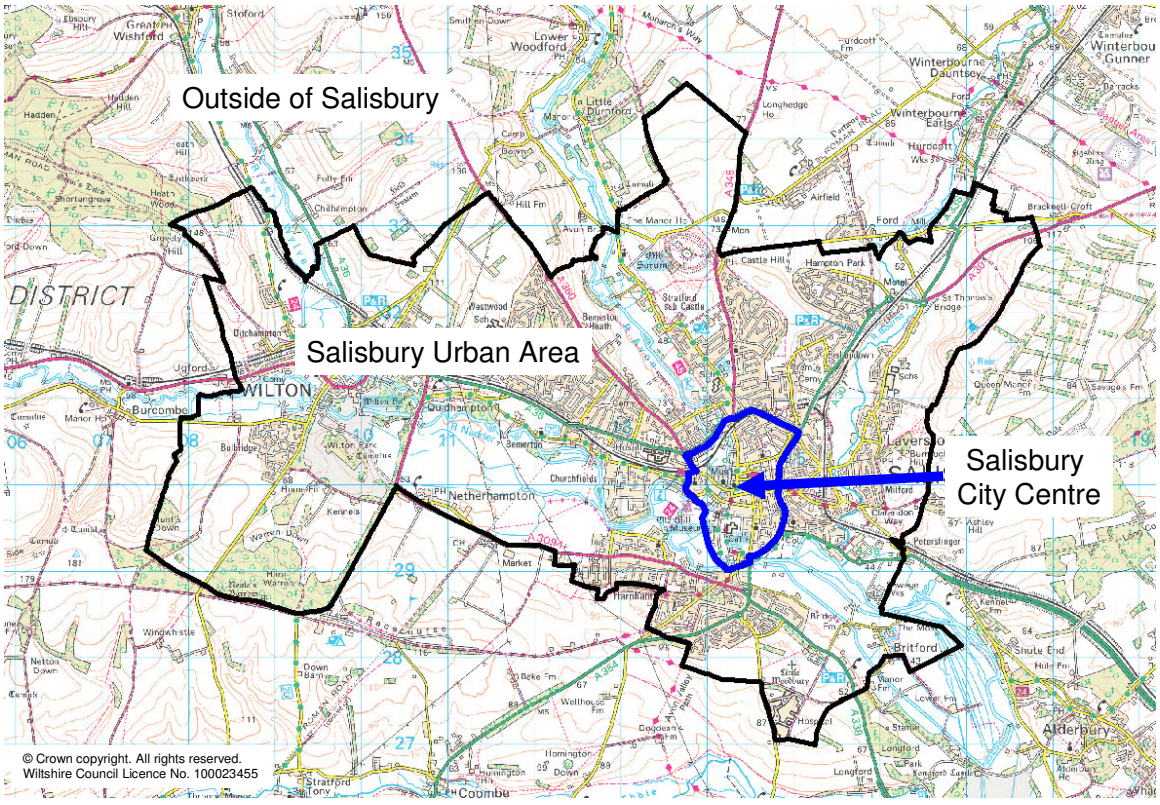
Introduction

3.1 This Chapter presents an analysis of existing travel patterns in the Salisbury area. Understanding current travel movements is a key element of determining the causes of existing transport problems and issues and provides a basis for projecting future transport demand.

3.2 Data collected in 2008 as part of the Salisbury Transport Model development provides estimates of people travelling in, to / from and through Salisbury by car and public transport. It has also been possible to determine cycling and walking patterns using school and work travel data to assist in understanding the overall travel patterns in Salisbury.

3.3 The analysis generally refers to Salisbury urban area (including the city centre) or Salisbury, external area, although the city centre is sometimes referred to. These areas are shown in Figure 3.1. The analysis of travel patterns is typically undertaken between 7am and 7pm (a 12 hour day[1]) on an average weekday.

Figure 3.1 – Definition of Salisbury Study Area



Trip-Making

Overall Levels of Person Trip-Making

3.4 Using highway and public transport survey data collected in 2008 it is possible to understand the levels of travel within, to / from and through Salisbury by motorised modes:

[1] 12 hour day calculated as AM peak hour x 2 + inter-peak hour x 6 + PM peak hour x 2

- road side interview surveys have provided data on movements across a cordon around Salisbury's urban fringe (although using other surveys and other data sources, it has also been possible to determine the travel patterns of journeys exclusively within Salisbury);
- bus ticket data provides a full range of travel on Wilts and Dorset Buses in Salisbury; and
- rail surveys covered rail users at Salisbury Station.

3.5 There are approximately 180,000 one-way motorised person trips within, to / from and through Salisbury between 7am and 7pm (Table 3.1). These trips include those made by car (as driver or passenger), by bus and by rail. Trips made within Salisbury are harder to determine as they are more difficult to collect, but it is estimated that approximately 60,000 motorised trips are made within Salisbury . These exclude light and heavy goods vehicle trips, which account for another 14,000 trips per 12hr day (approximately 10,000 light and 4,000 heavy goods vehicle trips).

3.6 It is estimated that internal trips represent one third of total person travel in Salisbury. However, If internal (Salisbury to Salisbury) trips are excluded:

- through trips represent approximately one third of 12hr day demand; and
- trips to and from Salisbury also represent one third of this demand.

Table 3.1 – Estimated Person Travel Demand for an Average Weekday (7am to 7pm)

From / To	Salisbury	Outside Salisbury	Total
Salisbury	60700	40300	101000
Outside Salisbury	40000	37100	77100
Total	100700	77400	178100

Source: Salisbury Transport Models

Mode Share

Motorised Modes

3.7 The mode share of travel by motorised modes, within, to / from and through Salisbury is dominated by road travel with over 90% of travel by road (Table 3.2). Bus travel has a 7% share for trips within, to, from and through Salisbury. Rail has a 3% share of travel to and from Salisbury but 6% share for through travel.

Table 3.2 – Estimated Person Mode Share by Motorised Modes for an Average Weekday (7am to 7pm)

Highway	From / To	Salisbury	Outside Salisbury
	Salisbury	93%	90%
	Outside Salisbury	90%	87%
Bus + P&R	**From / To**	**Salisbury**	**Outside Salisbury**
	Salisbury	7%	7%
	Outside Salisbury	7%	7%
Rail	**From / To**	**Salisbury**	**Outside Salisbury**
	Salisbury	0%	3%
	Outside Salisbury	3%	6%

Source: Salisbury Transport Models

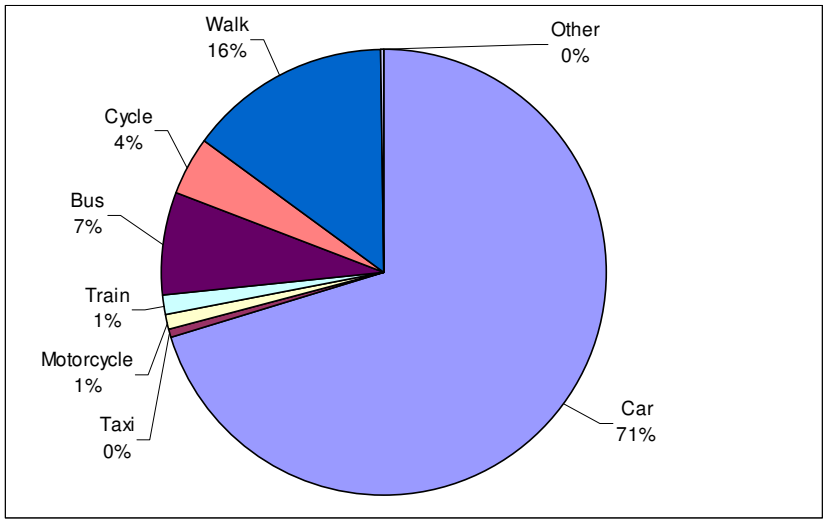
Travel to Work

3.8 The 2001 Census provides a means of determining the mode of travel for journeys to work into Salisbury (Figure 3.2) and a mode share for Salisbury residents' travel (Figure 3.3). In 2001 there were an estimated 33,000 jobs in Salisbury and 25,000 employed residents. The fact that Salisbury is a sub-regional employment centre has transport implications; as many employees have to travel long distances and are unlikely to be able to do this by walking and cycling.

3.9 Car travel has a 71% mode for work journeys into Salisbury and walking and cycling has a 20% mode share. However, considering the residents of Salisbury only, then the car has a slightly lower mode share for journeys to work at 65%, whilst walking and cycling are higher at 24%.

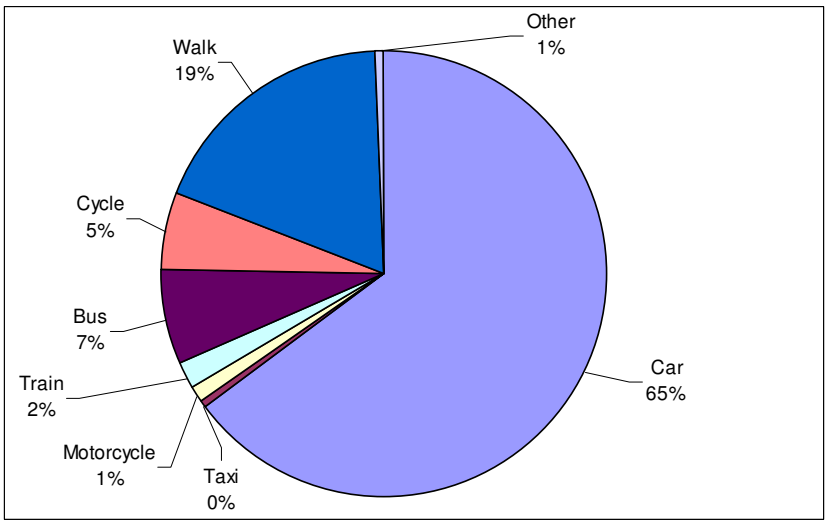
3.10 Across Wiltshire, the 2001 Census statistics show that 74% of journeys to work are by car, 18% by walking and cycling and 6% by public transport. As such, Salisbury has a lower car mode share for work journeys than the county average and a slightly greater proportion of journeys by walking, cycling and public transport. This reflects that Salisbury is the focus of public transport and is also one of the most urbanised parts of a very rural county and thus more able to facilitate journeys by walking, cycling and public transport

Figure 3.2 – Mode Share of People Working in Salisbury



Source: ONS 2001 Census

Figure 3.3 – Mode Share for Journey to Work of Salisbury Residents



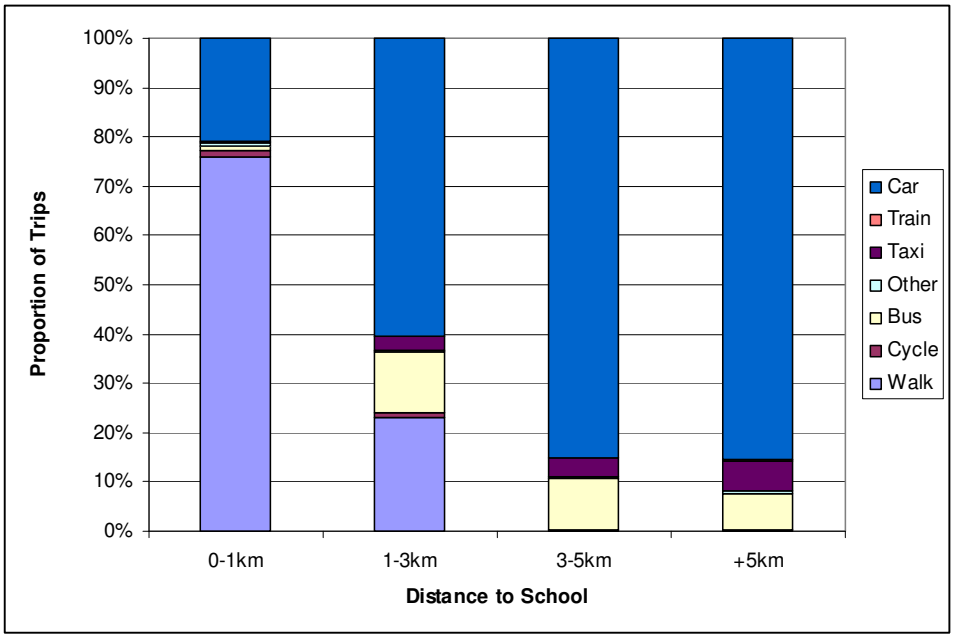
Source: ONS 2001 Census

Travel to School

3.11 The Wiltshire School Travel database contains for each pupil the mode and distance travelled to each school in Salisbury. For primary schools it is evident that walking is the most common mode for shorter distance trips and car the most common mode for longer distance trips (Figure 3.4) whilst bus has approximately a 10% mode share of trips ever 1km in length.

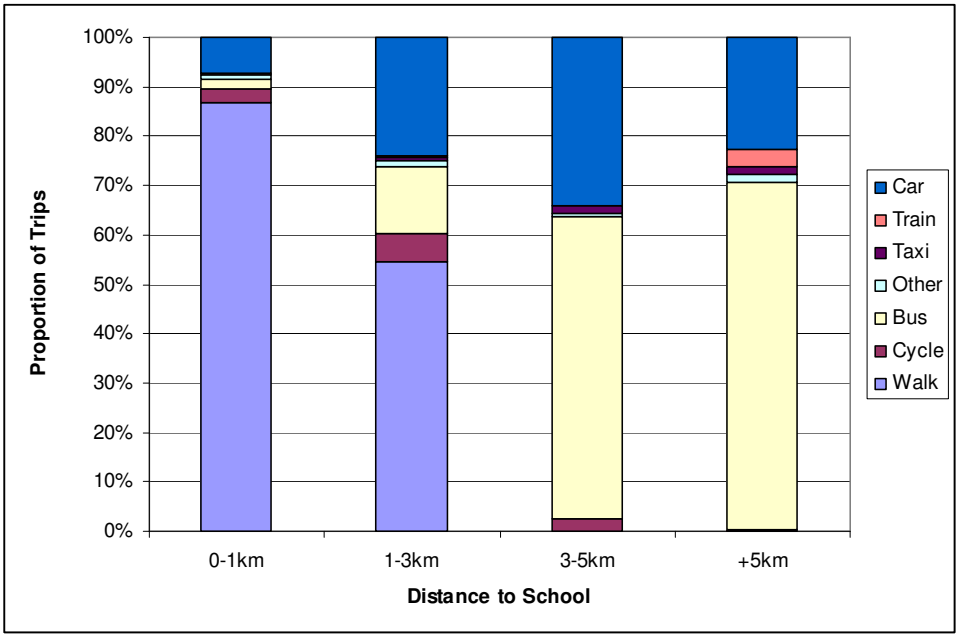
3.12 For secondary schools walking is the majority mode of travel for trips up to 3km in length whilst bus has the majority mode share for trips over 3km in length (Figure 3.5). It is noticeable that car is far less frequently used for secondary school pupils than primary school pupils and suggests a great level of independence of travel for children in this age range.

Figure 3.4 – Mode Share of Journeys to Primary School



Source: Wiltshire Council

Figure 3.5 – Mode Share of Journeys to Secondary School



Source: Wiltshire Council

Vehicle Trip-Making

Vehicle Trip-Making by Time of Day

3.13 Traffic in Salisbury can be characterised as one of the following three movements: internal trips (journeys within Salisbury); trips to/from Salisbury (journeys with only an origin or destination in Salisbury); and external trips (journeys through Salisbury).

3.14 In autumn 2008 road side interviews were conducted on all entry points into the Salisbury urban area. This provides detailed information regarding travel patterns to and from Salisbury for cars and goods vehicles. Using other data sources, it has also been possible to determine the travel patterns of journeys exclusively within Salisbury. It is possible to show this highway demand in a matrix form using the three different categories of trips. This is shown for the morning peak, inter-peak and evening peak in Table 3.3 and includes light and heavy goods vehicle movements.

Table 3.3 – Estimated Average Weekday Vehicle Demand by Time Period

From / To	Salisbury	Outside Salisbury	Total
Estimated Morning Peak Hour (8am-9am) Vehicle Demand			
Salisbury	5300	3000	8300
Outside Salisbury	3800	3700	7500
Total	9100	6700	15800
Estimated Inter-Peak Hour (average of 10m- 4pm) Vehicle Demand			
Salisbury	4000	2700	6700
Outside Salisbury	2600	2500	5100
Total	6600	5200	11800
Estimated Evening Peak Hour (5pm-6pm) Vehicle Demand			
Salisbury	5800	3500	9300
Outside Salisbury	3000	3100	6100
Total	8800	6600	15400

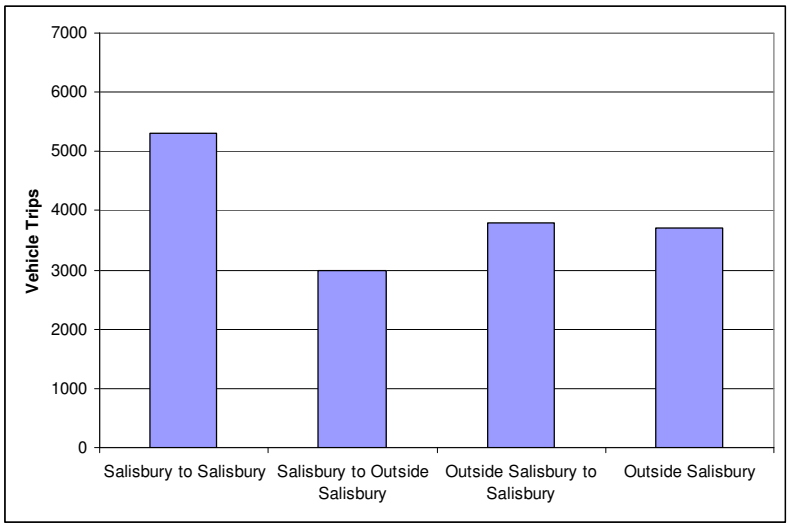
Source: Salisbury Transport Models

3.15 In the morning peak, approximately 30% of highway trips remain within Salisbury (Salisbury to Salisbury) whilst almost 25% of trips can be considered as trips that pass through Salisbury (external to external). There are more trips to Salisbury than from Salisbury in the morning peak, although there is still a significant number of trips that start in Salisbury leave Salisbury in the morning peak (Figure 3.6).

3.16 The inter-peak pattern of travel is broadly similar to the morning peak, although 35% of trips remaining within Salisbury and 20% of trips pass through Salisbury. The pattern of travel to and from Salisbury is more balanced. Overall, there is 25% less travel in an inter-peak hour than there is in a morning peak hour (.Figure 3.7).

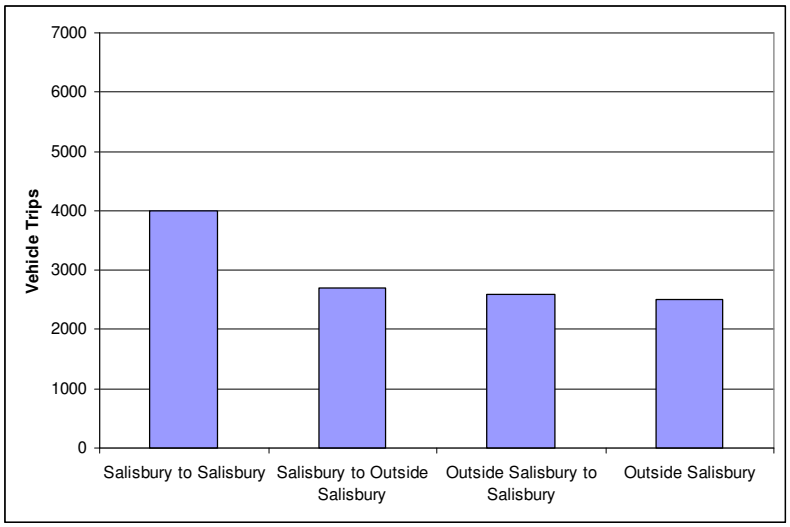
3.17 In the evening peak there is almost the same number of total trips as the morning peak. The evening peak is also a mirror of the morning peak, with the same number of trips returning to Salisbury as left in the morning (Figure 3.8).

Figure 3.6 - Estimated Average Weekday Morning Peak (8am-9am) Vehicle Demand



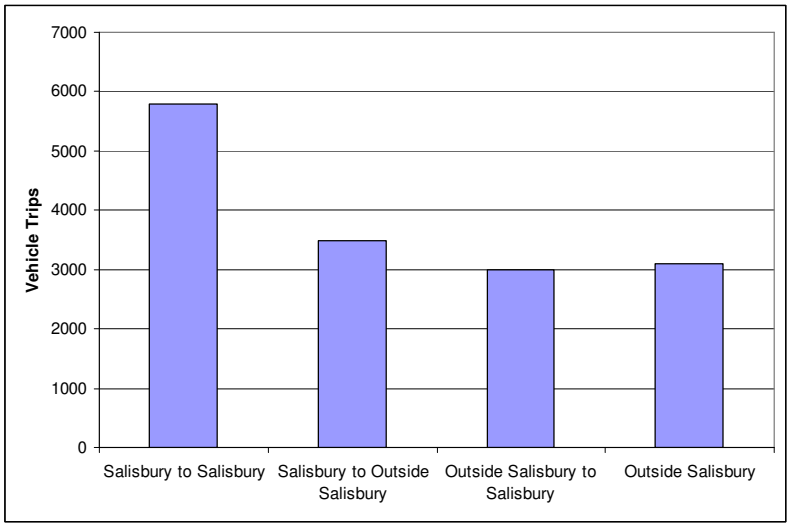
Source: Salisbury Transport Models

Figure 3.7 - Estimated Average Weekday Inter-Peak (average of 10am-4pm) Vehicle Demand



Source: Salisbury Transport Models

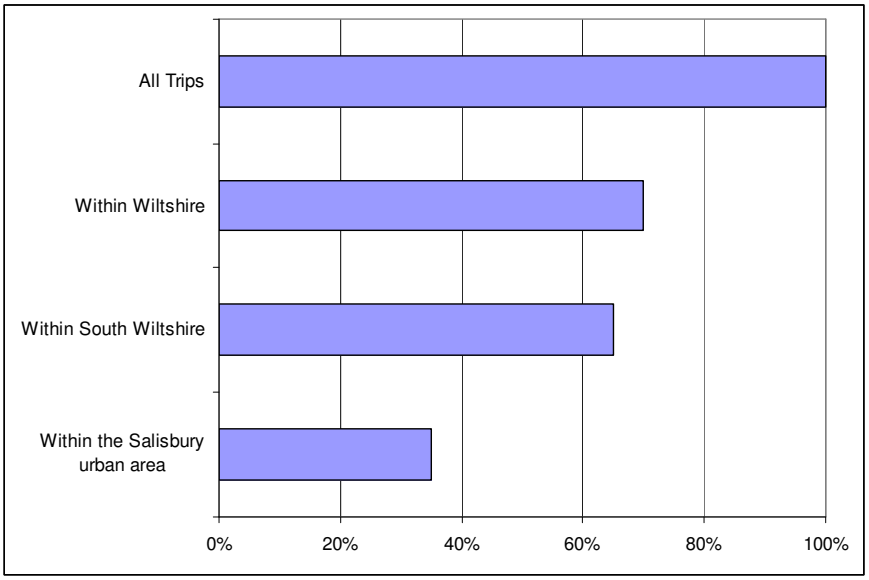
Figure 3.8 - Estimated Average Weekday Evening Peak (5pm-6pm) Vehicle Demand



Source: Salisbury Transport Models

3.18 A broader review of this demand for a 12 hour day between 7am and 7pm indicates that that the vast majority (70%) of trips to / from and through Salisbury has a origin and destination within Wiltshire. When considering HGV trips only, 40% of trips to / from and through Salisbury has a origin and destination within Wiltshire.

Figure 3.9 – Origin and Destination of Highway Trip (7am-7pm)



Source: Salisbury Transport Models

Vehicle Trip-Making by Corridor

3.19 Using the Salisbury Transport Model it is possible to deduce the destinations of traffic travelling along the key routes into Salisbury. The analysis focuses upon traffic entering Salisbury and reports whether this traffic visits the city centre, the urban area or passes through Salisbury (Figure 3.10). The purpose of this analysis is to discover which roads are used for through trips and which roads cater for local movements. This will be useful during the strategy development phase to prioritise interventions based upon the role and hierarchy of roads within Salisbury.

3.20 It is notable that the proportions of traffic for each destination is different on each road and indicates the purpose that the road serves. A brief summary is presented below:

- Over half of the traffic on the **A36 Salisbury Road** is through traffic in the morning peak but this drops to approximately 40% during the rest of the day. Only a very small proportion of traffic on this route accesses the city centre.
- By contrast, only 26% of traffic on the **A360 Devices Road** is through traffic in the morning peak, although this does rise to 40% in the evening. Over half of the traffic in the morning and evening peaks on this road has a destination in urban Salisbury.
- The **A345 Four Mile Road** has 37% of through traffic in the morning peak and this drops to 28% in the evening peak. With the majority of traffic on this road either ending a journey in the city centre or the urban area, this road clearly has a more local function.
- Throughout the day the greatest proportion of traffic on the **A338 Tidworth Road** is travelling to Salisbury urban area, as much as 57% in the morning peak. The analysis shows little demand for access to the city centre along this route.
- The **A30 London Road** has the majority of its traffic with a destination in Salisbury urban area and no more than 15% through traffic in the morning peak and 22% in the evening peak.

- The **A36 Southampton Road** has a slightly different composition to the A36 Salisbury Road in that less than 40% of traffic is through traffic and approximately 25% of traffic is to Salisbury City Centre.
- Traffic on the **A338 High Road** changes in nature throughout the day. In the morning peak the distribution is approximately one third to the city centre, the urban area and through traffic respectively. In the inter-peak and evening peak the composition changes to less than 20% to the city centre and approximately 40% each to the urban area and through traffic.
- Traffic on the **A354 Coombe Road** similarly changes in nature throughout the day. In the morning peak, over 50% of traffic is through traffic whilst in the inter-peak two thirds of traffic is travelling to Salisbury urban area and but this drops to 52% in the evening peak.

3.21 In summary, it is notable that there is a very small proportion of through traffic on the A30 London Road; and that the A36 and A338 are the main roads used by traffic travelling through Salisbury.

Analysis of Through Traffic on the A36

3.22 Taking this analysis further, Automatic Number Plate Recognition (ANPR) data was collected to determine the extent and nature of traffic passing through Salisbury either on the A36 or via Harnham. The proportions of the through traffic from Southampton Road and Wilton road using A36 and Harnham road is presented in Table 3.4.

3.23 The data shows that 21% of 12hr daily westbound traffic on the A36 travels from Southampton Road to Salisbury Road and 13% of 12hr daily eastbound traffic on the A36 travels from Salisbury Road to Southampton Road (the figures for total through traffic on these routes are higher and this implies that the A36 is not the only road used when making a through trip).

3.24 It is evident that there is a higher proportion of HGV making through journeys on the A36, with a greater proportion of through trips in a westbound direction than an eastbound direction. This reflects the strategic nature of the A36.

Table 3.4 – Through Traffic on A36 Between Southampton Road and Salisbury Road

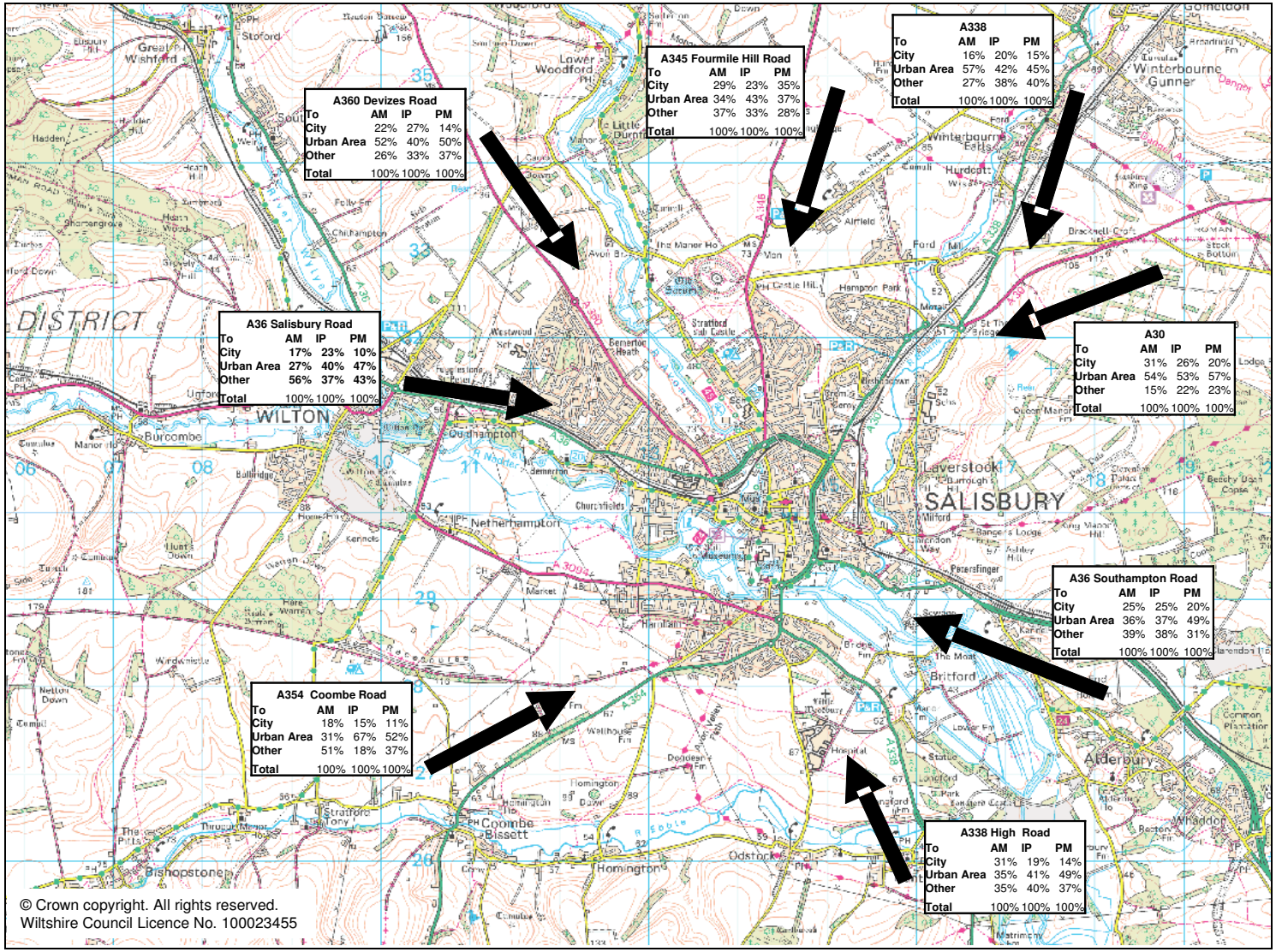
Route	Morning Peak	Inter-Peak	Evening Peak	12hr Day
Westbound light vehicles	16%	19%	18%	19%
Westbound heavy vehicles	42%	46%	39%	45%
Westbound total	**18%**	**22%**	**18%**	**21%**
Eastbound light vehicles	12%	12%	9%	11%
Eastbound heavy vehicles	26%	33%	9%	30%
Eastbound total	**13%**	**13%**	**9%**	**13%**

Source: Salisbury Transport Models Data Collection

3.25 The ANPR data can also be used to provide an indication of the route traffic took to pass though Salisbury. In a westbound direction there is a more or less equal split between the A36 and Netherhampton Road for traffic travelling between A36 Southampton Road and A36 Salisbury Road. In an eastbound direction two-thirds of cars and three-quarters of HGVs travel along the A36 in the morning peak and inter-peak but in the evening peak approximately only 50% travel along the A36 between A36 Salisbury Road and A36 Southampton Road.

3.26 Generally the journey times between the two routes to get between A36 Southampton Road and A36 Salisbury Road are very similar. The implication of this is that during the busiest times, approximately 150 vehicles are using the Harnham Gyratory for eastbound movements that could be completing a through route on the A36.

Figure 3.10 – Estimated Average Weekday Highway Corridor Demand by Time Period



Source: Salisbury Transport Models

Heavy Goods Vehicle Trip-Making

3.27 The road side interviews collected details of HGV movements. Estimates of HGV movements are shown in Table 3.5 and approximately half of the HGV demand passes through Salisbury.

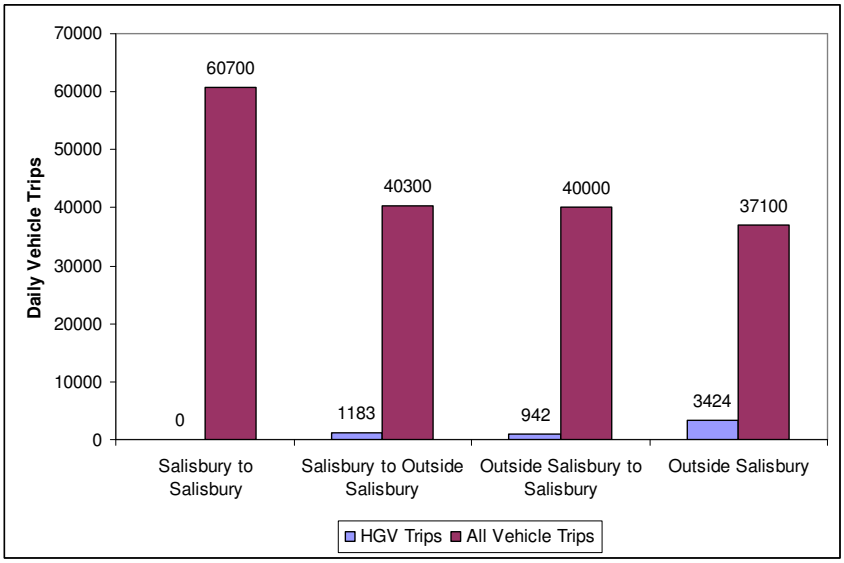
Table 3.5 – Estimated Average Weekday HGV Movements (7am to 7pm)

From / To	Salisbury	Outside Salisbury	Total
Salisbury	0	1200	1200
Outside Salisbury	940	2260	3200
Total	940	3460	4400

Source: Salisbury Transport Models

3.28 HGV demand represents 2% of total 12hr daily vehicle demand within, to / from and through Salisbury, but 9% of total 12hr daily through traffic (Figure 3.11). Detailed analysis of these HGV movements indicate that only 16% of the movements pass through Wiltshire, 84% have either an origin or destination in Wiltshire.

Figure 3.11 – Estimated Average Weekday HGV and All Vehicles Movements (7am to 7pm)



Source: Salisbury Transport Models

3.29 Within Salisbury the key destinations comprise the city centre, Churchfields and industrial and retail units the A36 Southampton Road. There are a range of HGV destination beyond Salisbury, including some close by at Tisbury, Amesbury and further a field.

Public Transport Trip-Making

Bus Trips by Time of Day

3.30 It is possible to show demand for bus travel in a matrix form and is shown for the morning peak, inter-peak and evening in Table 3.6. The data includes park and ride passengers but does not include long distance coach data (a survey by Atkins in July and August 2000 showed that on average, approximately 40 coaches visited Salisbury per day).

Table 3.6 – Estimated Average Weekday Bus and Park & Ride Person Demand

From / To	Salisbury	Outside Salisbury	Total
Estimated Morning Peak Hour (8am-9am) Person Demand			
Salisbury	515	175	690
Outside Salisbury	560	315	875
Total	1075	490	1565
Estimated Inter-Peak Hour (10am-4pm) Person Demand			
Salisbury	380	260	640
Outside Salisbury	220	240	460
Total	600	500	1100
Estimated Evening Peak Hour (5pm-6pm) Person Demand			
Salisbury	430	405	835
Outside Salisbury	180	295	475
Total	610	700	1310

Source: Salisbury Transport Models

3.31 There are approximately 1,600 bus journeys (including the bus element of park and ride) in the morning peak hour. One-third of these journeys are within Salisbury, another third from outside Salisbury to Salisbury and approximately one fifth travel through Salisbury urban area. These external to external trips are typically between areas adjacent to the urban areas of Salisbury. Approximately 10% of bus demand involves trips leaving Salisbury in the morning peak.

3.32 There are approximately 1,100 bus journeys (including the bus element of park and ride) each hour during the inter-peak. Almost one-third of these journeys are within Salisbury. There is more or less an equally distribution of trips into, out of and through Salisbury during the inter-peak period.

3.33 There are approximately 1,300 bus journeys (including the bus element of park and ride) in the evening peak hour. Over one-third of journeys are from Salisbury to other areas and just under one-third of journeys remain within Salisbury. There is a reasonable balance between inbound trips in the morning and outbound trips in the evening.

3.34 Rail demand has been derived from the annual survey by Wiltshire Council collected from platform interviews and therefore includes people boarding, alighting and interchanging at Salisbury. It is not complete representation of through traffic, as many rail passengers do not need to change train when travelling through Salisbury. It is possible to show this demand in a matrix form and is shown for the morning peak, inter-peak and evening in Table 3.7.

3.35 There are approximately 600 rail journeys in the morning peak hour. Approximately one-third of trips in the morning peak hour are into Salisbury, with most coming from the east and suggesting that rail is a reasonable mode for journeys to work to Salisbury. Almost half of the trips in the morning peak are through Salisbury; either to or from stations to the east of Salisbury. The nature of longer distance rail journeys may mean that some journeys are excluded from our analysis for travel between 7am and 10am.

3.36 There are over 350 rail journeys per hour in the inter-peak. Almost half of these journeys are through Salisbury, with an equal number to and from Salisbury.

3.37 There are over 700 rail journeys in the evening peak hour. Again, the majority are through Salisbury. The nature of long distance rail travel may mean that journeys returning to Salisbury are not completed within the 4pm to 7pm timeframe considered in this analysis.

Table 3.7 – Estimated Average Weekday Rail Person Demand

From / To	Salisbury	Outside Salisbury	Total
Estimated Morning Peak Hour (8am-9am) Person Demand			
Salisbury	0	130	130
Outside Salisbury	205	240	445
Total	205	370	575
Estimated Inter-Peak Hour (10am-4pm) Person Demand			
Salisbury	0	100	100
Outside Salisbury	90	165	255
Total	90	265	355
Estimated Evening Peak Hour (5pm-6pm) Person Demand			
Salisbury	0	245	245
Outside Salisbury	175	320	495
Total	175	565	740

Source: Salisbury Transport Models

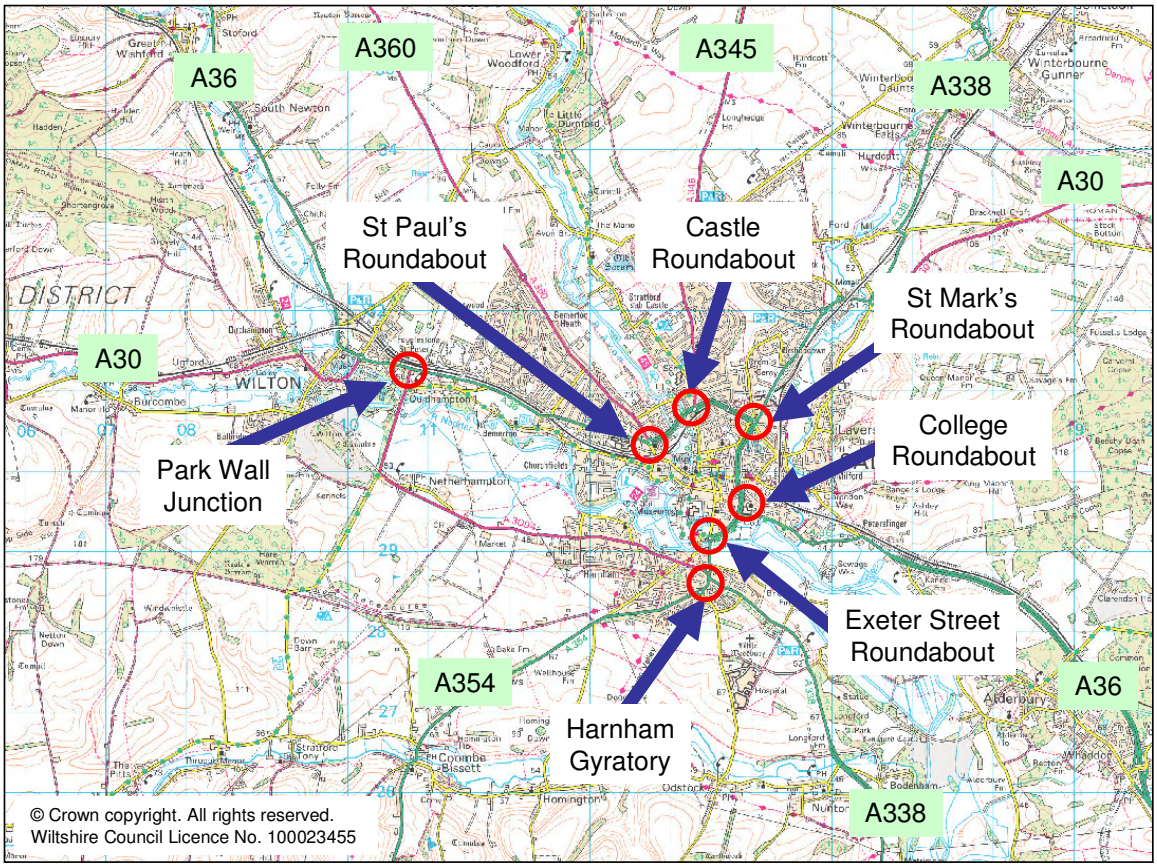
4. Transport Networks

Highway Network

4.1 The highway network provides access for motorists, freight, bus passengers and cyclists. Salisbury is a transport crossroads and is situated at the intersection of the A36, A338 and A30. The A36 is a Highways Agency Trunk Road and the A338 and A30 forms part of Wiltshire Council's strategic road network. The A36 runs from Southampton to Bath. The A338 runs north-south and links Poole and Bournemouth to Oxford. The A30 links the south west of England to London. Other roads into Salisbury include the A354 from the south and the A360 and A345 from the north (Figure 4.1).

4.2 The A36 provides the spine of the internal network in Salisbury, with each of the roads described above linking on to it. The A36 is dual carriageway from College Roundabout to St Paul's Roundabout. The A3094, running parallel to the A36 and passing through Harnham, forms an alternative route through Salisbury.

Figure 4.1 – Key Junctions in Salisbury



4.3 Each of the roads approaching Salisbury are typically single carriageway from the urban fringe to the city centre. The capacity of the highway network is therefore governed by the capacity of the key junctions on the A36 and the Harnham Gyratory.

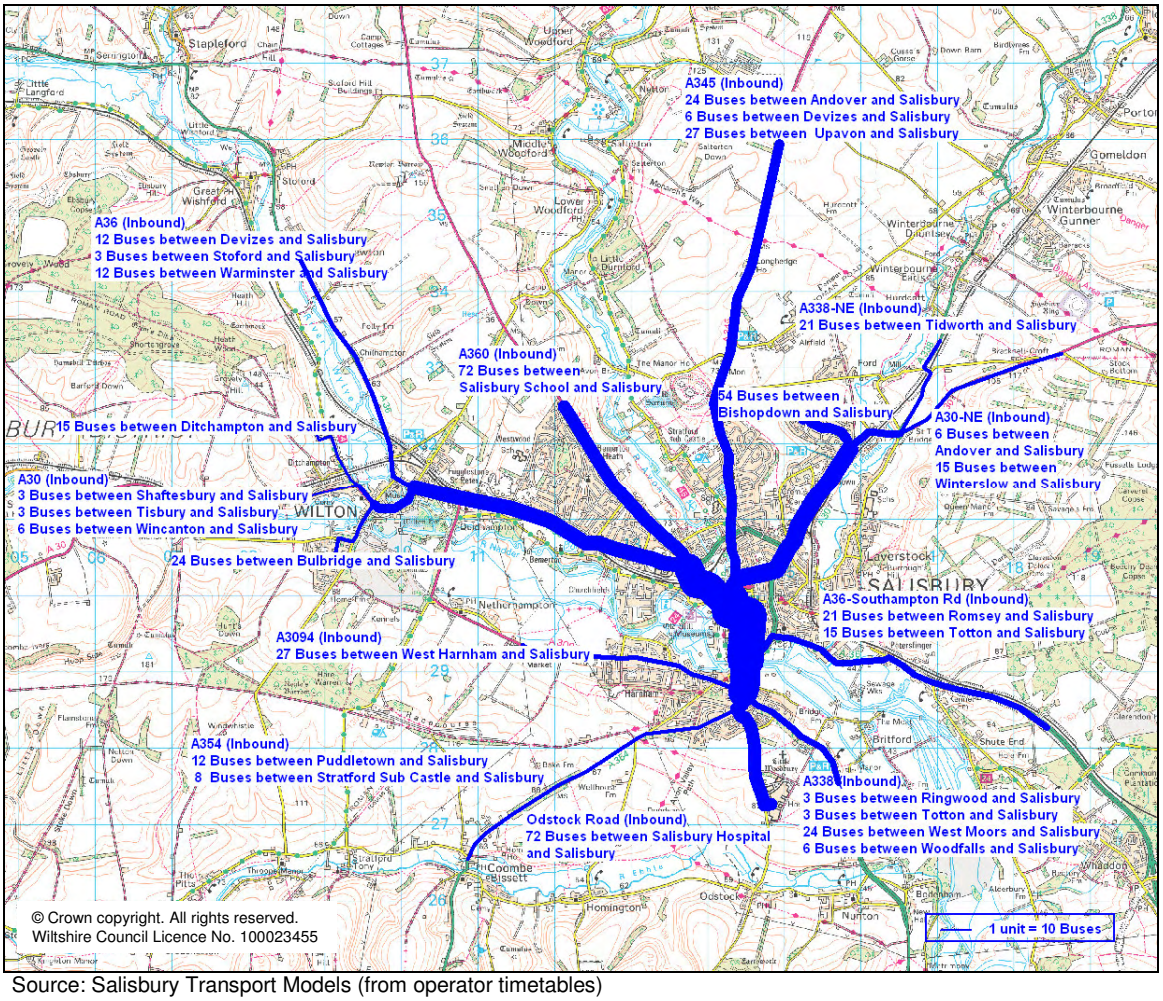
Bus Service Provision

4.4 Buses form the main public transport link between Salisbury and its surrounding towns and villages. The main operator of bus services in Salisbury is Wilts and Dorset Bus. Stagecoach, and Bodmans also provide a small number of bus services serving Salisbury.

4.5 The principal routes for buses serving Salisbury are shown in Figure 4.2; the diagram shows weekday service levels into Salisbury between 7am and 7pm. There are at least an average of two buses per hour on each of the corridors in Salisbury.

4.6 The most frequent service within Salisbury is the Pulseline service between Salisbury School and Salisbury Hospital, with 72 services per direction between 7am and 7pm. This provides a high level of cross-city service.

Figure 4.2 – Weekday Bus Service Levels to Salisbury between 7am and 7pm



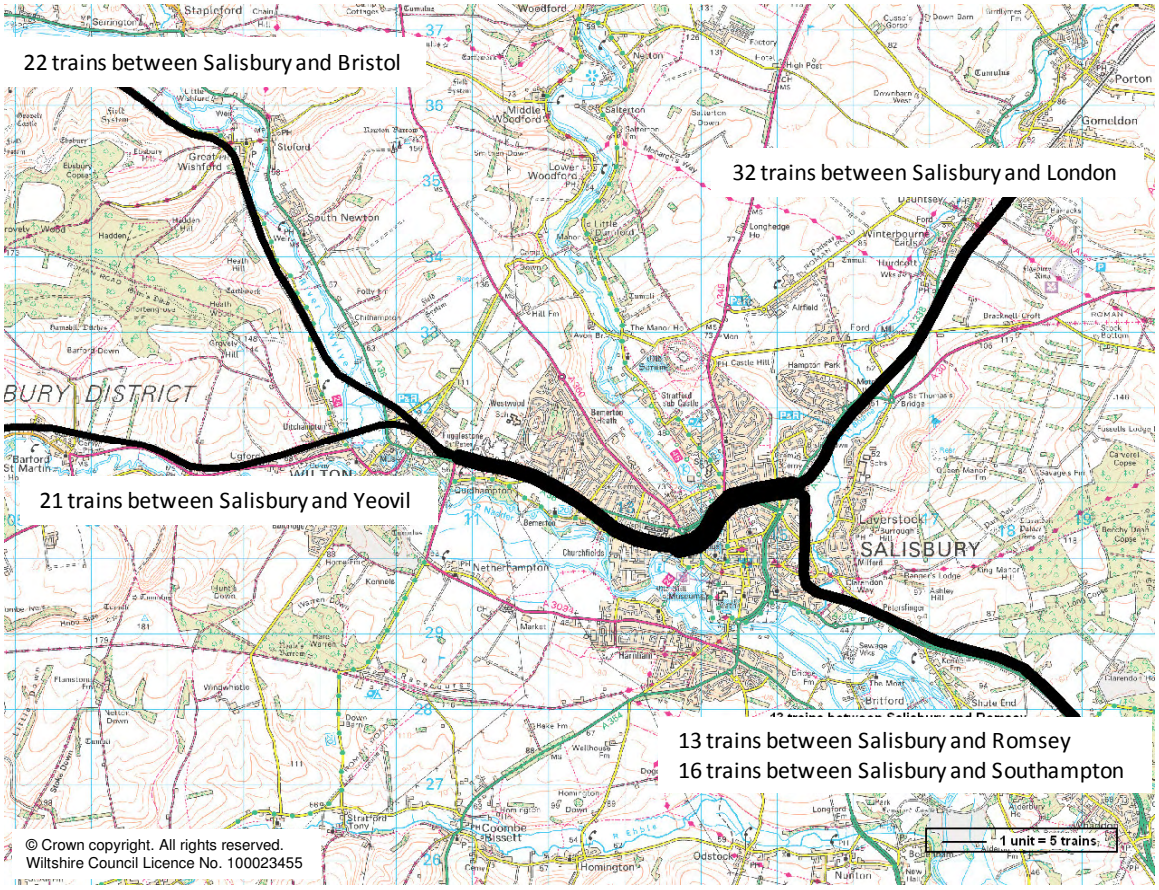
Source: Salisbury Transport Models (from operator timetables)

Rail Service Provision

4.7 Salisbury is a significant rail hub in the region. Salisbury Station is served by operators South West Trains and First Great Western and they provide services between the south west of England and London and the south coast and Bristol / Cardiff. Details of the services are shown in Figure 4.3.

4.8 The nature of rail services in Wiltshire means that Salisbury rail is only a viable option for sub-regional or longer-distance trips. The nearest stations are: Warminster (31km), Tisbury (20km), Grately (18km) and Dean (14km); Romsey and Andover are both also approximately 25-30km away.. Each station has approximately two stopping services per hour, which may be reasonable for some commuting and leisure trips but does not compete with the frequency or convenience of park and ride.

Figure 4.3 – Weekday Rail Service Levels through Salisbury



Source: Salisbury Transport Models (from operator timetables)

4.9 Salisbury Station has a car park, though this has limited capacity and is typically full early each day. Salisbury Station is approximately 1.25km from Salisbury Bus Station. The railway station is not directly served by bus services but services pass along Fisherton Street, which is a 250m walk away.

Parking and Park and Ride Provision

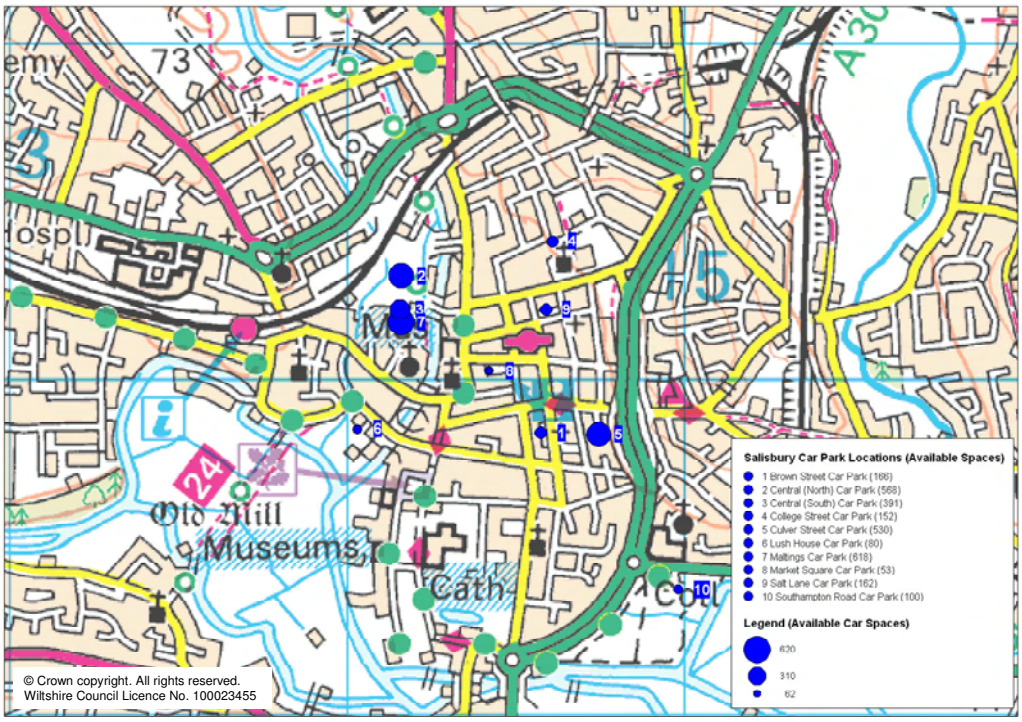
Car Parking

4.10 Salisbury has over 2800 public off-street parking spaces in the city centre spread over ten different sites operated by Wiltshire Council. The location of these car parks is shown in Figure 4.4 and the capacity and cost of parking at each car park is present in Table 4.1.

4.11 The largest cluster of parking is to the west of the city centre at The Maltings / Central Car Parks. There is easy access from these car parks to the A36 along Castle Street and Fisherton Street. Culver Street is another large car park to the east of the city and it too has easy access to the A36.

4.12 In addition to the sites operated by Wiltshire Council, there are other large car parks in the city centre that serve major retails stores. The Old George Street Mall also has a car park with 548 spaces and the Salisbury Station has 270 spaces. There are also a number of private, non-residential car parking spaces in the city centre and an exercise is currently underway to quantify the number of spaces.

Figure 4.4 – Car Parks in Salisbury



Source: Wiltshire Council Website

Table 4.1 – Salisbury City Centre Parking Spaces and Cost

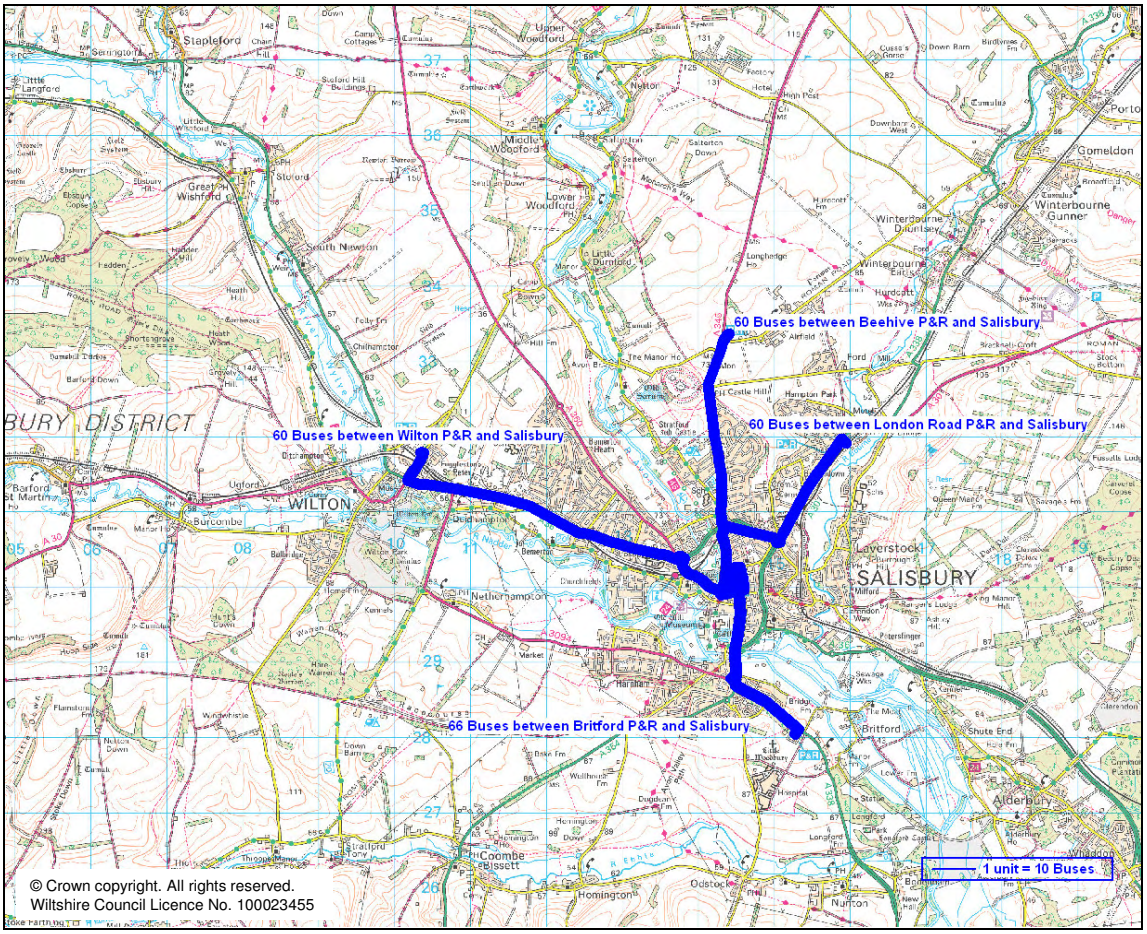
Car Park Site	Spaces	Stay	0-1 hr	1-2 hr	2-3 hr	3-4 hr	4-5 hr	+5 hr
Brown Street (East)	29	Short	£1.00	£2.00	£3.00	£3.60	£4.50	
Brown Street (West)	137	Short	£1.00	£2.00	£3.00	£3.60	£4.50	
Central (North)	568	Long	£1.00	£2.00	£2.80	£3.30	£4.00	£5.50
Central (South)	391	Short	£1.00	£2.00	£2.80	£3.30	£4.00	£6.00
College Street	152	Long	£1.00	£2.00	£2.80	£3.30	£4.00	£5.50
Culver Street	530	Long	£1.00	£1.80	£2.00	£2.60	£3.00	£4.00
Lush House	80	Short	£1.00	£2.00	£3.00	£3.60	£4.50	
Maltings	618	Short	£1.00	£2.00	£2.80	£3.30	£4.00	
Millstream	41	Long	£1.00	£2.00	£2.80	£3.30	£4.00	£5.50
Salt Lane	162	Short	£1.00	£2.00	£3.00	£3.60	£4.50	
Market Square	53	Short	£2.50	£5.00				
Southampton Road	100	Long	£0.90					£1.60
Old George Mall	*548*	*Private*	*£1.00*	*£2.00*	*£2.90*	*£4.00*	*£5.00*	*£7.00*
Railway Station	*270*	*Private*						*£5.50*

Source: Wiltshire Council Website, Old George Mall Website and National Rail Website

Park and Ride

4.13 Salisbury has four park and ride sites, each providing access to the city centre along key radial routes (Figure 4.5). Salisbury park and ride works on the principle of charging £2.50 per car rather than a fare per bus user; which is more common across the region. Salisbury park and ride provides a total of 1686 parking spaces (Table 2.2).

Figure 4.5 – Daily Park and Ride Services



Source: Salisbury Transport Models (from operator timetables)

Table 4.2 – Park and Ride Details

Name	Car Park Capacity	Frequency			Price (per vehicle)
		Morning Peak	Inter-Peak	Evening Peak	
Beehive P&R	400	6	4	6	£2.50
Wilton P&R	420	6	4	6	£2.50
Britford P&R	486	6	5	6	£2.50
London Road P&R	380	6	4	6	£2.50

Source: Salisbury Transport Models (from operator timetables)

Highway Network Performance

4.14 The significant junctions in the Salisbury highway network were highlighted in Figure 2.1. Using the Salisbury Transport Model, it is possible to assess the performance of these junctions across the day. The analysis considers total traffic volume against total junction capacity in the morning and evening peak to give each junction the following colour coding:

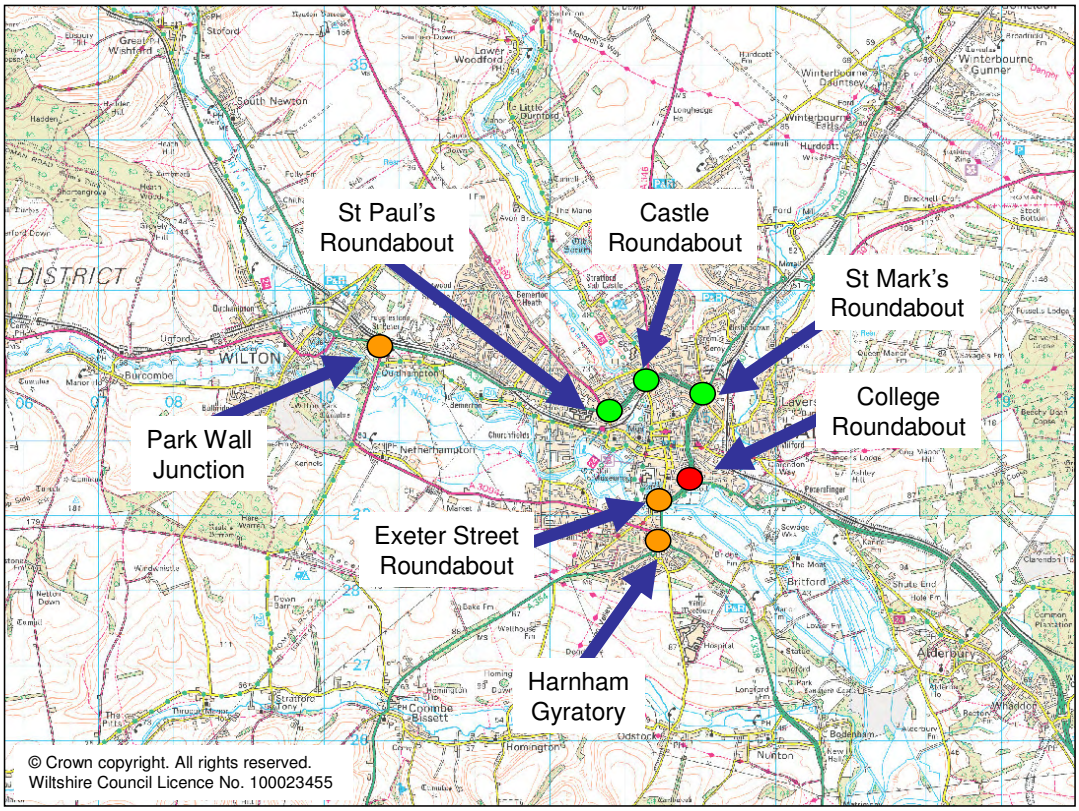
- Green – the junction is operating within 50% of capacity;
- Amber – the junction is operating between 50% and 70% of capacity; and
- Red – the junction is operating over 70% of capacity.

4.15 The aim of this analysis is to identify how the whole junction performs across the day, although detailed analysis by each arm of the junction and time period is presented below where atypical to the whole junction assessment.

4.16 The results of this analysis is shown in Figure 3.6 and Park Wall Junction, Exeter Street Roundabout, and the Harnham Gyratory are each operating between 50% and 70% of total junction capacity. College Roundabout operates in excess of 70% of capacity. The other junctions are operating below 50% of capacity, but still have some problems. The key performance issues at each junction are discussed below:

- **Park Wall Junction** is operating between 50% and 70% in the morning and evening peak and is near to capacity for movements between Wilton Road and Salisbury Road and from Salisbury Road to Netherhampton Road;
- **St Paul's Roundabout** generally operates under 50% of capacity overall but the A360 Devices Road arm of the junction operates at over 70% of capacity in the morning peak;
- **Castle Roundabout** generally operates under 50% of capacity overall but the Castle Road southbound and Churchill Way West (eastbound) arms of the junction operate at over 70% of capacity in the morning peak;
- **St Mark's Roundabout** overall performs under 50% of capacity, but Churchill Way North (eastbound) and Wain-A-Long arms of the junction both operate very close to capacity in both peaks;
- **College Roundabout** operates at over 70% of capacity on all arms of the junction in the morning and evening peak;
- **Exeter Street Roundabout** generally operates between 50% and 70% of capacity on its main arms but exceeds 70% of capacity from the New Bridge Road arm of the junction in the morning peak and from Exeter Street arm of the junction in the evening peak; and
- **Harnham Gyratory** generally operates between 50% and 70% of capacity within the gyratory, although the New Harnham Road and Downton Road arms of the junction both exceed 70% of capacity in the morning peak.

Figure 4.6 – Junction Performance Summary



Source: Salisbury Transport Models

Car Park and Park and Ride Performance

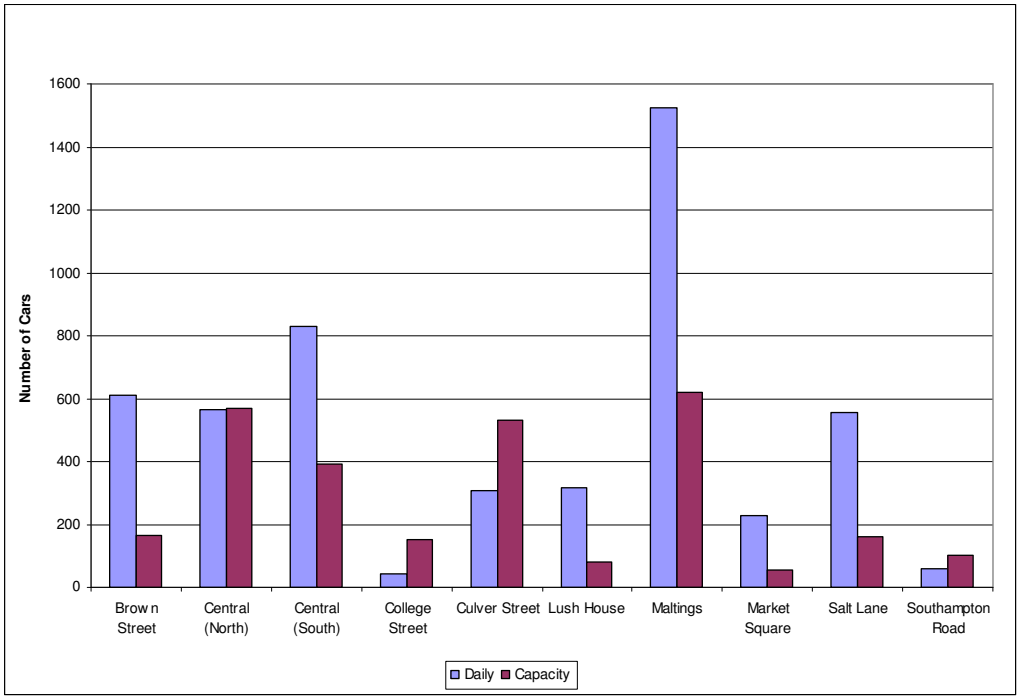
Car Park Utilisation

4.17 The capacity and demand of Salisbury city centre car parks is shown in Figure 3.8 from Monday to Saturday. It can be seen that at Brown Street, Central (South), The Maltings, Lush House, Market Square and Salt Lane that the spaces are occupied more than once during a day; indeed Brown Street, Lush House. Market Square and Salt Lane car parks typically experiencing triple occupancy during the day.

4.18 Similarly, of the long stay car parks it is apparent that Culver Street and Southampton Road car parks are typically under-occupied. Central (North) and College Street, the other long stay car parks, are both more than 60% occupied during the day.

4.19 There is considerable demand for car parking in Salisbury and car parking is a valuable source of revenue and the ready availability of parking makes Salisbury an attractive destination. The addition of park and ride over recent years has been done without change to the city centre parking stock.

Figure 4.7 - Car Park Spaces and Demand (Monday to Saturday)



Source: Wiltshire Council

Park and Ride Utilisation

4.20 Park and Ride use varies across the four sites (Table 4.3). Approximately 800 vehicles in total use the service on an average weekday and approximately 1000 vehicles use the service on average Saturday. Each park and ride vehicle contains 1.3 occupants on average, meaning that on an average weekday approximately 1000 people use park and ride.

4.21 Some park and ride sites are more popular than others. The Beehive and Wilton sites are over 50% occupied during the week, whilst London Road is under 30% occupied during the week. Demand is greater at the weekend, with all sites approximately 50% occupied.

Table 4.3 – Average Weekday and Average Saturday Park and Ride Demand

		Weekday		Saturday	
Site	Capacity	Demand	Occupancy	Demand	Occupancy
Beehive P&R	400	210	53%	320	81%
Britford P&R	486	190	38%	230	48%
London Road P&R	380	100	27%	230	59%
Wilton P&R	420	290	70%	210	50%
Total	1686	790	47%	990	59%

Source: Wiltshire Council

4.22 Detailed analysis shows that in the morning peak (8am to 9am), park and ride is used by one third of cars that pass the park and ride site and end their journey in the city centre. This figure falls to one sixth of cars that pass the park and ride site and end their journey in the city centre during the inter-peak (10am to 4pm).

Public Transport Network Performance

Rail Network Performance

4.23 The rail network is quite different from the bus network in that is does not provide a local service to Salisbury, but rather a sub-regional and regional service. The rail network is also operated at a regional level, with operators South West Trains and First Great Western providing services from London and the south coast to the south west and Wales.

4.24 In terms of journey performance, the time and frequency of sub-regional and regional services is presented in Table 4.4. The most frequent services are on the London route and the journey time to London is 90 minutes. The sub-regional services have at least 21 services between 7am and 7pm, which is approximately two per hour.

Table 4.4 – Rail Network Performance

Place	Time From Salisbury (Shortest to Longest)	Services between 7am and 7pm
Warminster	27 min	22
Tisbury	14 to 17 min	21
Grately	12 min	32
Dean	12 to 16 min	29
Trowbridge	39 min	22
Andover	19 min	32
Romsey	23 to 29 min	29
Bristol	73 min	22
London	90 min	32

Source: Network Rail

Bus Network Performance

4.25 The bus network in Salisbury is highly reliant on the highway network as there are no bus only roads and there is only bus lane provision along Castle Road. As such, delays on the highway network affect the bus network.

4.26 A measure of the bus network performance is an indication of the time and number of bus boardings required to get from a range of key origins to key destinations. The data has been obtained from the Salisbury Public Transport Model and includes average bus journey time, average waiting time and the average number of interchanges required. These averages are based upon all available options for making a journey and may not relate to a specific timetabled journey. The results are presented in Table 4.5 for the morning peak, Table 4.6 for the inter-peak and Table 4.7 for the evening peak.

4.27 The data shows that there are few cross city services as these movements require a interchange but that average waiting time is no more than 12 minutes, even if an interchange is required. Services from Castle Hill (north), Wilton (west) and Laverstock (east) all require an interchange to reach the hospital.

Table 4.5 – Morning Peak Modelled Bus Network Performance

		Castle Hill	Laverstock	Hospital	Wilton	Churchfields	City Centre
Castle Hill	Bus time		21	27	22	10	14
	Waiting time		9	10	11	6	6
	Interchanges		1	1	1	0	0
Laverstock	Bus time	26		23	28	16	13
	Waiting time	8		8	7	6	4
	Interchanges	1		1	1	1	0
Hospital	Bus time	26	15		29	17	16
	Waiting time	7	4		9	4	4
	Interchanges	1	0		1	0	1
Wilton	Bus time	29	22	32		12	19
	Waiting time	9	6	9		8	5
	Interchanges	1	0	1		0	0
Churchfields	Bus time	16	12	19	10		6
	Waiting time	5	3	4	8		1
	Interchanges	1	1	0	0		0
City Centre	Bus time	11	13	13	18	6	
	Waiting time	4	3	4	4	3	
	Interchanges	0	0	0	1	0	

Source: Salisbury Transport Models

Table 4.6 – Inter-Peak Modelled Bus Network Performance

		Castle Hill	Laverstock	Hospital	Wilton	Churchfields	City Centre
Castle Hill	Bus time		15	25	27	0	18
	Waiting time		9	12	11	0	11
	Interchanges		1	1	1	0	1
Laverstock	Bus time	25		12	16	5	10
	Waiting time	11		4	4	2	6
	Interchanges	1		0	0	0	0
Hospital	Bus time	24	13		27	14	13
	Waiting time	9	4		9	4	3
	Interchanges	2	0		1	0	0
Wilton	Bus time	25	23	30		10	17
	Waiting time	9	9	9		5	5
	Interchanges	1	1	1		0	0
Churchfields	Bus time	13	9	17	12		4
	Waiting time	6	4	4	7		2
	Interchanges	1	1	0	1		0
City Centre	Bus time	9	6	13	18	7	
	Waiting time	5	3	4	5	3	
	Interchanges	0	0	0	1	0	

Source: Salisbury Transport Models

Table 4.7 – Evening Peak Modelled Bus Network Performance

		Castle Hill	Laverstock	Hospital	Wilton	Churchfields	City Centre
Castle Hill	Bus time		15	27	26	10	13
	Waiting time		9	11	12	8	7
	Interchanges		1	1	1	0	0
Laverstock	Bus time	29		13	16	4	11
	Waiting time	13		4	3	2	7
	Interchanges	1		0	0	0	0
Hospital	Bus time	26	13		27	14	13
	Waiting time	9	4		9	4	3
	Interchanges	2	0		1	0	0
Wilton	Bus time	29	24	32		10	18
	Waiting time	10	9	9		5	5
	Interchanges	1	1	1		0	0
Churchfields	Bus time	16	10	19	12		5
	Waiting time	6	4	4	7		1
	Interchanges	1	1	0	1		0
City Centre	Bus time	10	7	13	18	6	
	Waiting time	7	3	4	4	3	
	Interchanges	0	0	0	1	0	

Source: Salisbury Transport Models

Walking and Cycling

4.28 Pedestrians and cyclists rely on the highway network for many of their journeys. The adequacy of facilities and the performance of the network in terms of congestion and safety cause concerns for pedestrians and cyclists.

4.29 In addition to footways adjacent to the highway network, pedestrian and cycleway provision in Salisbury includes: subways and over-bridges to assist crossing the A36, pedestrian crossings at significant destinations and pedestrian routes, pedestrianised roads around south and east of Market Square, cycle lanes and cycle tracks; and recommended cycle routes[2].

4.30 To gauge the additional problems and issues associated with walking and cycling in Salisbury, a summary of recent consultation comments regarding walking and cycling are listed below: (it should be stressed that such comments may not be representative or exhaustive):

- Walking:
  - Problems crossing at Catherine Street/Milford Street and New Canal crossroads
  - Lack of pedestrian crossings/facilities on Churchfields Road, Quidhampton, Lower Road
  - Lack of walking signs, for example from the Rail Station to the City Centre via Mill Road
  - Poor hedge maintenance restricts footways in many areas.
  - Too few pedestrian crossings and there is no footpath on Hindon lane to the new Tisbury centre development.
  - No continuous footpath on Park Road (route to school)
- Cycling:
  - Lack of segregated cycle lanes and linked up cycle routes; lack of cycle signing (e.g. to the hospital)
  - Cycling conflicts between HGV's and cyclists on Churchfields Road
  - Problems crossing the A36 and other areas such as St Mark's Roundabout
  - Difficulty in cycling and using train services
  - Not enough involvement from schools in promoting alternative transport
  - No covered cycle parking in the city centre
  - There are no cycling routes through Wilton and heavy traffic on the carriageway makes cycling difficult.

Accident Analysis

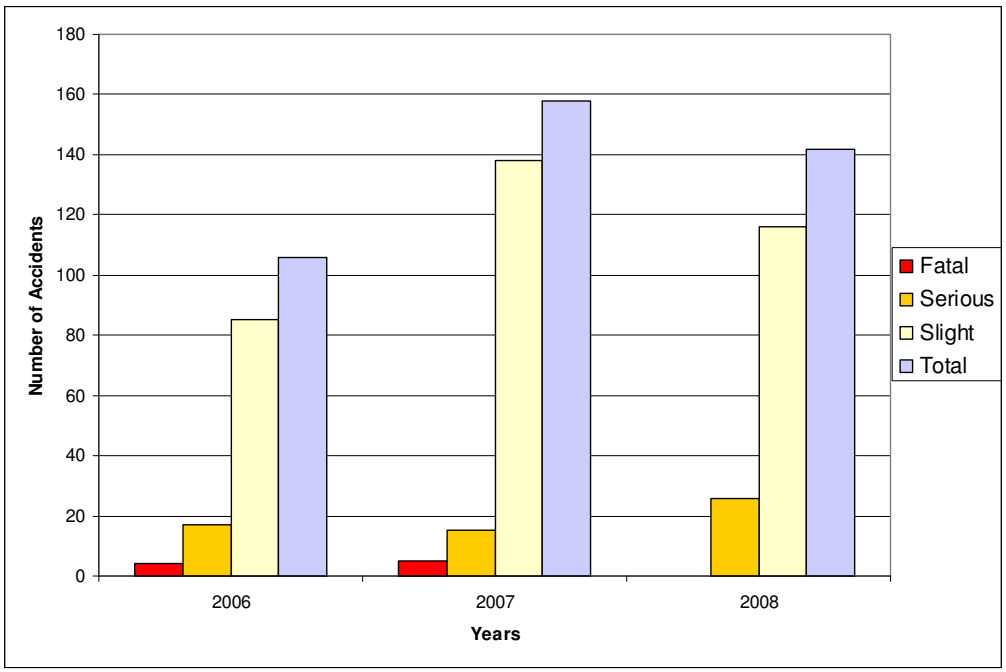
4.31 Injury Accident data supplied by Wiltshire Council reveals that there has been over 400 accidents in Salisbury between 2006 and 2008 inclusive. This is at an annual average of 3 fatal accidents, 19 serious accidents, and 113 slight accidents per year. The type of accident per year is shown in Figure 4.8 and shown graphically in Figure 4.9. The data excludes damage only accidents or accidents that did not involve the emergency services.

4.32 There is a wide dispersion of accidents in Salisbury, with accidents occurring both at and between junctions. The occurrence of accidents in the city centre and on residential roads indicates a need to educate and inform all road users about their relative priorities and responsibilities to each other.

[2] http://www.salisbury.gov.uk/cycle-map.pdf

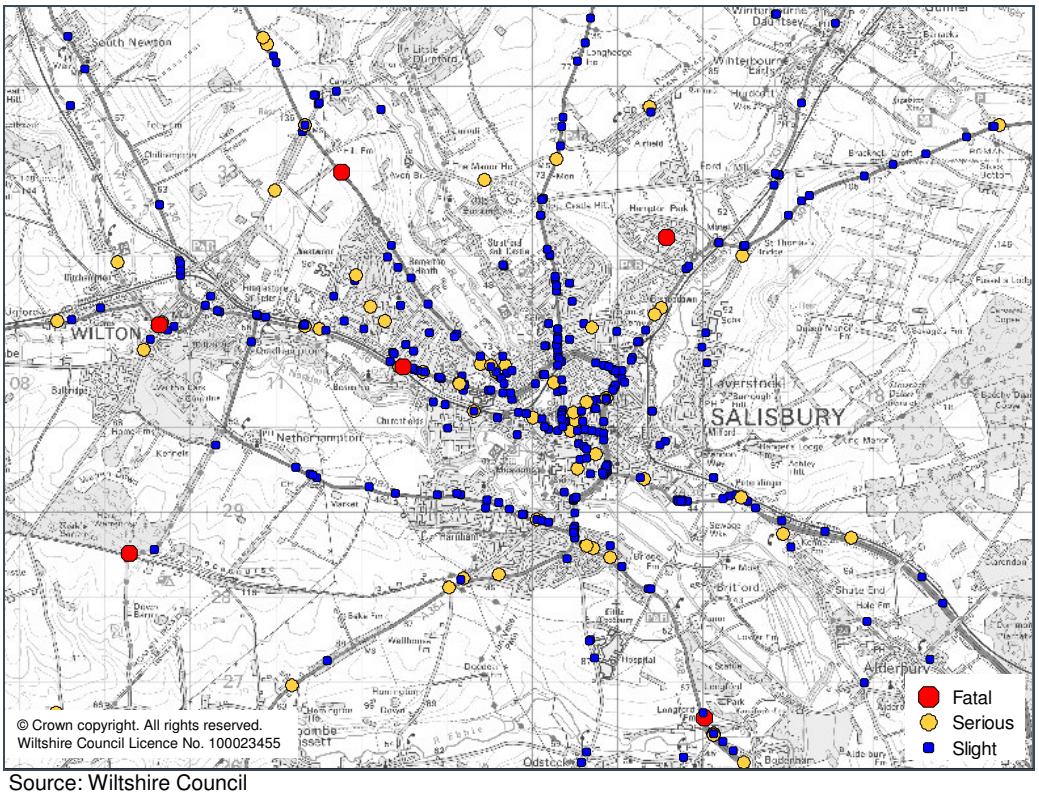
4.33 Salisbury has an accident rate of approximately 39 accidents per 100 million vehicle km based on the data provided from the past three years and transport model results. This is less than the national average for urban roads, which is 54 per 100 million vehicle km[3].

Figure 4.8 – Accidents in Salisbury between 2006 and 2008



Source: Wiltshire Council

Figure 4.9 – Location of Accidents in Salisbury between 2006 and 2008



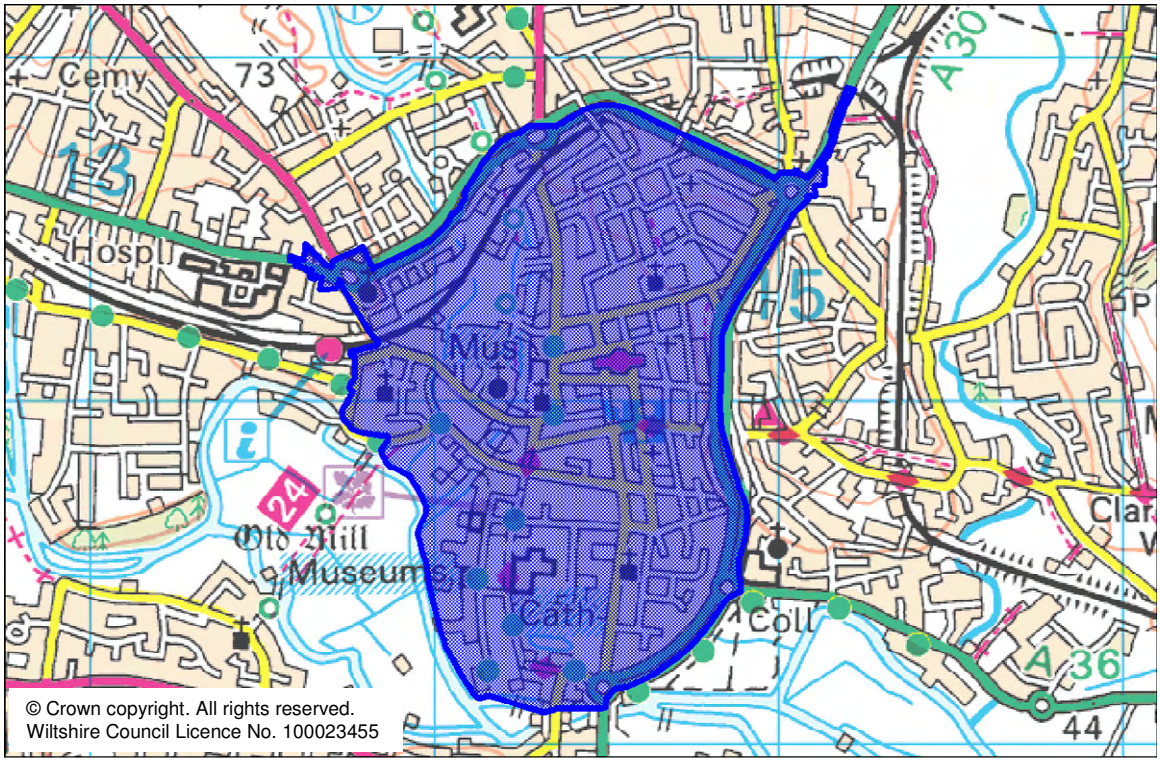
Source: Wiltshire Council

[3] http://www.dft.gov.uk/adobepdf/162469/221412/221549/227755/rrcgb2008.pdf

Air Quality Analysis

4.34 Air quality has been identified as a significant concern in Salisbury. At present, the whole of the city centre has been declared as an Air Quality Management Area (AQMA) and is shown in Figure 4.10. The AQMA has grown to incorporate more of the city centre over time and to enable a city centre-wide response to solving this problem.

Figure 4.10 – Salisbury AQMA Boundary



4.35 The *LAQM – Air Quality Progress Report 2008* (Salisbury District Council, 2008) demonstrates that:

- Bridge Street and Exeter Street continue to be well below the Air Quality Strategy objectives for PM10;
- NOX results at Bridge Street and Exeter Street are still above the annual mean objective; and
- the trend in NOX concentrations over the past three years seems to indicate a slight decrease at a number of sites in Salisbury, although a few sensitive sites showed an increase.

4.36 The reported concluded that the current AQMA should remain in Salisbury and that based on the monitoring data, no requirement is indicated to declare and extension to the AQMA in Devizes Road.

4.37 The *LAQM – Air Quality Progress Report* states that HGVs are the main contributors in terms of NOX levels, typically representing up to 30%-40% of the total concentrations at the façade of properties in the city centre. Overall, heavy vehicles (HGVs and buses) were found to be the main issue in Salisbury, as they contribute typically 50% to 60% of the total NOX emissions.

5. Future Year Travel Patterns

Introduction

5.1 The Salisbury Transport Models framework has been developed to represent a 2008 base year to which the model has been calibrated and validated; and a 2026 forecast year. The modelling framework for forecasting takes updated transport network and public transport services to reflect the opening of Petersfinger Park and Ride and projections of employment and dwelling land supplied by the Wiltshire Council[4] that are subsequently controlled to a national trip end model (TEMPRO) that has been devised by the Department for Transport (DfT) to ensure uniform forecasting across the country. Details of the forecasting process can be found in the Atkins report: *5076688 - PD 3 3 Forecast Report v5 111209.doc.*

5.2 The model compares the time and distance of travel in the base year with the time and distance of travel in the forecast year (using forecast network changes and land use) and determines mode of travel, time of travel, destination of travel and the final mode of travel (car or park and ride and bus or rail). This process is repeated until the model has adjusted the interactions between each element of the model and no further changes would be made. The modelling framework has been developed in accordance with DfT guidance and best practice.

Trip-Making

Overall Levels of Person Trip Making

5.3 Using the Salisbury Transport Models it is possible to understand the forecast demand for travel to/from and through Salisbury in 2026 by motorised modes. The nature of the model means that it is not possible to determine the future levels of walking and cycling.

5.4 There are approximately 215,000 one-way person trips on the highway network to / from and through Salisbury per 12hr day (Table 5.1). This is a 20% increase in person trip-making between 2008 and 2026. Most of the growth in travel occurs to/ from origins or destinations outside of Salisbury, with a 7% increase in person trips within Salisbury but a 28% increase in trips to / from and through Salisbury (Figure 5.1). This reflects the distribution of development, most of which is in the form of urban extension and infill.

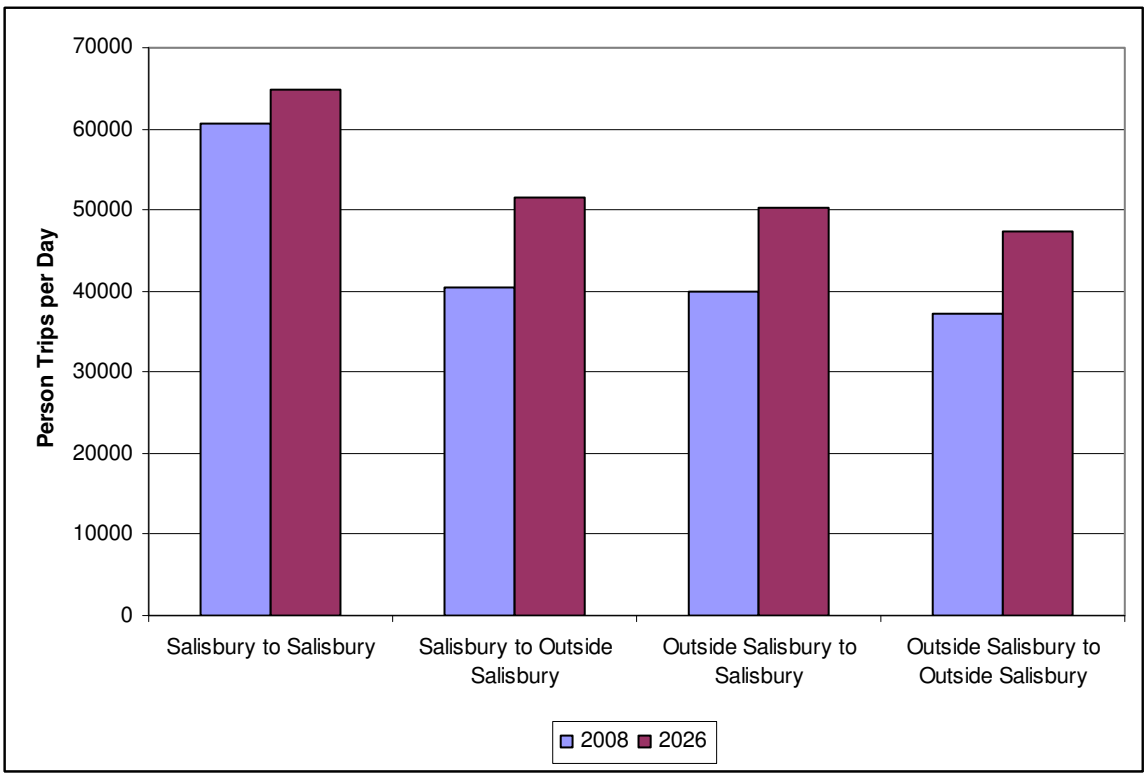
Table 5.1 –Forecast Person Travel Demand (7am to 7pm)

From / To	Salisbury	External	Total
Salisbury	64900	51500	116400
External	50400	47400	97800
Total	115300	98900	214200

Source: Salisbury Transport Models

[4] Development details sent to Atkins by V Albano contained in spreadsheet - *Revised Salisbury Transport Model 260809.xls*

Figure 5.1 – Base Year and Forecast Travel Demand



Mode Share (motorised modes)

5.5 The forecast mode share of travel in Salisbury is still dominated by the car (Table 5.2). However, there is a slight reduction in the share of person car trips and a slight increase in the share of person bus trips for journeys made to / from and within Salisbury.

Table 5.2 – Forecast Person Motorised Mode Share (7am to 7pm)

Highway	From / To	Salisbury	External
	Salisbury	92%	90%
	External	89%	88%
Bus	**From / To**	**Salisbury**	**External**
	Salisbury	8%	7%
	External	8%	7%
Rail	**From / To**	**Salisbury**	**External**
	Salisbury	0%	3%
	External	3%	5%

Source: Salisbury Transport Models

Vehicle Trip-Making

Vehicle Trip-Making by Time of Day

5.6 Traffic in Salisbury can be characterised as one of the following three movements: internal trips (journeys within Salisbury); trips to/from Salisbury (journeys with only an origin or destination in Salisbury); and external trips (journeys through Salisbury). Forecast year vehicle trip-making by time period is shown in Table 5.3. There is a 35% increase in daily vehicle trips. This increase reflects the 20% increase in daily person trips, combined with a reduction in vehicle occupancy and significant increases in light goods vehicle trips (as stated in DfT guidance).

Table 5.3 – Estimated Average Forecast Year Weekday Vehicle Demand by Time Period

From / To	Salisbury	Outside Salisbury	Total
Estimated Morning Peak Hour (8am-9am) Vehicle Demand			
Salisbury	6000	4500	10500
Outside Salisbury	5600	5400	11000
Total	11600	9900	21500
Estimated Inter-Peak Hour (average of 10m- 4pm) Vehicle Demand			
Salisbury	4700	3800	8500
Outside Salisbury	3600	3600	7200
Total	8300	7400	15700
Estimated Evening Peak Hour (5pm-6pm) Vehicle Demand			
Salisbury	6800	5400	12200
Outside Salisbury	4600	4700	9300
Total	11400	10100	21500

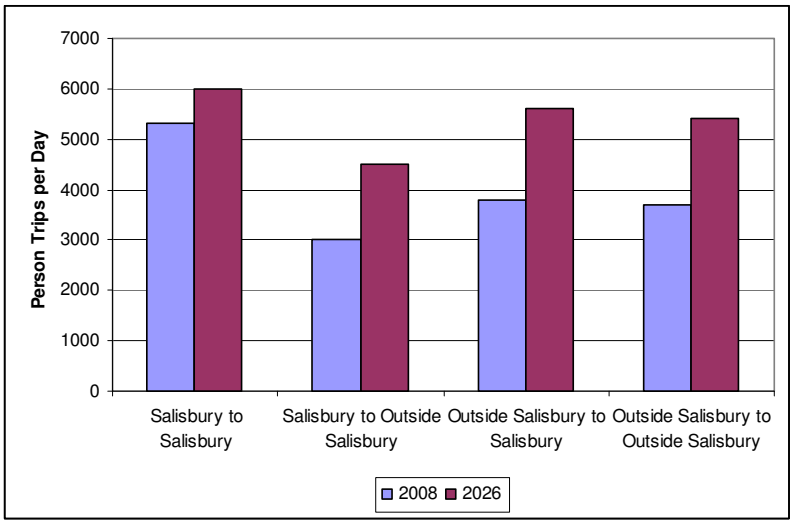
Source: Salisbury Transport Models

5.7 In the morning peak there is a 36% increase in highway demand within, to/from and through Salisbury (Figure 5.2). The increase in demand within Salisbury is quite modest (13%) whilst the largest increase occurs between Salisbury and areas outside of Salisbury (49%).

5.8 During the inter-peak there is a 33% increase in highway demand within, to/from and through Salisbury (Figure 5.3). Again, the increase in demand within Salisbury is quite modest (18%) compared to other movements. The largest increase occurs on trips through Salisbury (44%).

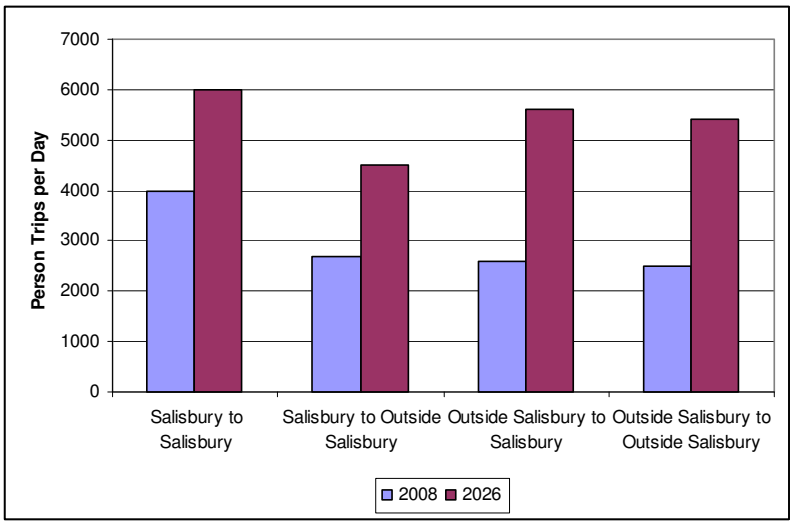
5.9 In the evening peak there is a 40% increase in highway demand within, to/from and through Salisbury (Figure 5.4). This evening peak has experienced the greatest increase in traffic and reflects the increases in highway demand from other time periods that is typically returning home in the evening peak.

Figure 5.2 – Estimated Base Year and Forecast Year Morning Peak Vehicle Demand



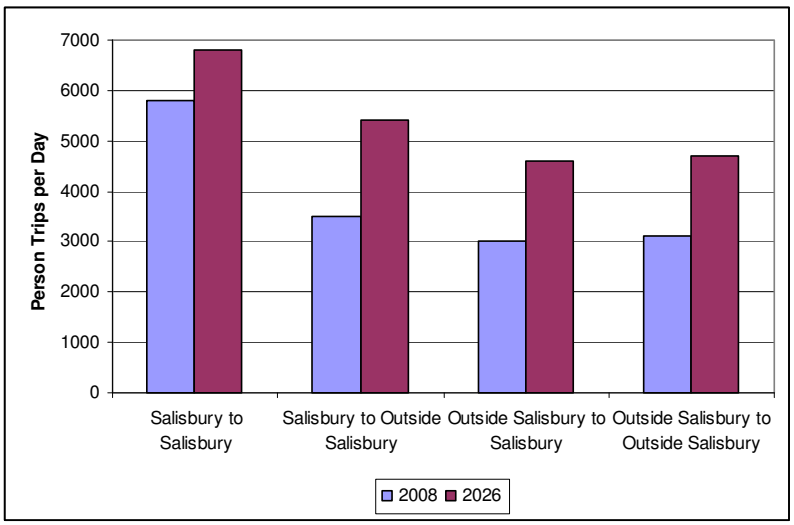
Source: Salisbury Transport Models

Figure 5.3 - Estimated Base Year and Forecast Year Inter-Peak Vehicle Demand



Source: Salisbury Transport Models

Figure 5.4 - Estimated Base Year and Forecast Year Evening Peak Vehicle Demand



Source: Salisbury Transport Models

Public Transport Trip-Making

Bus Trip-Making by Time of Day

5.10 As previously described, the car is the dominant mode for travel in, to/from and through Salisbury, although public transport is well used for some journey types. Future year bus demand by time of day is shown in Table 5.4. The daily increase in bus demand is 33% and this includes the 20% increase in person trips and an increase in park and ride demand.

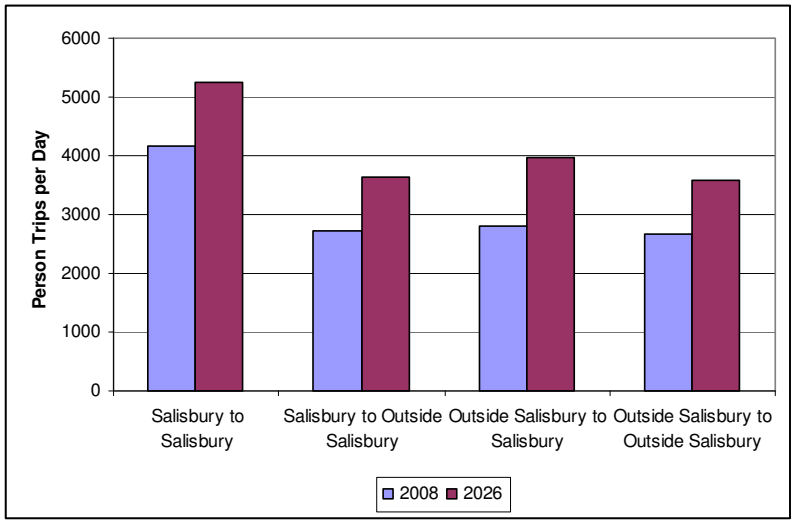
Table 5.4 – Estimated Average Forecast Year Weekday Bus Demand by Time Period

From / To	Salisbury	Outside Salisbury	Total
Estimated Morning Peak Hour (8am-9am) Bus Demand			
Salisbury	715	250	965
Outside Salisbury	770	435	1205
Total	1485	685	2170
Estimated Inter-Peak Hour (average of 10m- 4pm) Bus Demand			
Salisbury	460	330	790
Outside Salisbury	325	290	615
Total	785	620	1405
Estimated Evening Peak Hour (5pm-6pm) Bus Demand			
Salisbury	530	580	1110
Outside Salisbury	245	480	725
Total	775	1060	1835

Source: Salisbury Transport Models

5.11 There is a 26% increase in daily bus trip-making within Salisbury compared against the base year (Figure 5.5). The largest sector to sector increase between the base and forecast year was between trips from Outside Salisbury to Salisbury and reflects the level of urban fringe and infilling in neighbouring settlements as part of the Core Strategy Proposals.

Figure 5.5 – Estimated Average Base Year and Forecast Year Weekday Daily Bus Demand



Source: Salisbury Transport Models

Rail Trip-Making by Time of Day

5.12 There is very little change in rail demand between 2008 and 2026. The forecast demand is shown in Table 5.5. Daily rail trip-making increases by 10% between 2008 and 2026.

Table 5.5 – Estimated Average Forecast Year Weekday Rail Demand by Time Period

From / To	Salisbury	Outside Salisbury	Total
Estimated Morning Peak Hour (8am-9am) Bus Demand			
Salisbury	0	130	130
Outside Salisbury	205	275	480
Total	205	405	610
Estimated Inter-Peak Hour (average of 10m- 4pm) Bus Demand			
Salisbury	0	115	115
Outside Salisbury	105	175	280
Total	105	290	395
Estimated Evening Peak Hour (5pm-6pm) Bus Demand			
Salisbury	0	265	265
Outside Salisbury	205	345	550
Total	205	610	815

Source: Salisbury Transport Models

6. Forecast Year Network Performance

Introduction

6.1 This chapter provides a review of forecast year network performance. The Salisbury Transport Models are used to provide this information and demonstrate the impact that the Core Strategy will have on the highway and public transport networks.

Highway Performance

Network-Wide

6.2 The Salisbury Transport Model provides the only way of determining future year highway performance and using the model allows a comparison between the forecast year. The network performance is each summarised in terms of the following:

- Total Distance Travelled (pcu kilometres) - the total distance travelled on the modelled highway network multiplied by the number of passenger car units (pcu's);
- Total Travel Time (pcu hours) - the total time travelled on the modelled highway network including delays multiplied by the number of passenger car units (pcu's); and
- Average Network Speed (km/hr) - the average speed across the network.

6.3 It can be seen in Table 6.1 that total distance travelled increases in line with the increase in trip-making shown in the previous chapter. Where the increase in total distance travelled is greater than the increase in trips, it indicates that longer routes are being taken as a result of traffic aiming to avoid congestion – this occurs most notably in the evening peak.

6.4 Similarly, changes in travel time that are higher than the increase in vehicles indicates increased congestion. Again, travel time has increased most in the evening peak. The review of the increase in delay matches this observation.

6.5 The changes in average speed are a summary of the data above and show that traffic conditions have got worse in all time periods but more so in the morning peak and evening peak.

Table 6.1 – Summary of Change in Base Year to Forecast Year Highway Network Performance

Metric	Morning Peak	Inter-Peak	Evening Peak
Total Distance Travelled (pcu km)	35%	33%	42%
Total Travel Time (pcu hr)	56%	39%	74%
Average Network Speed (km/hr)	-16%	-5%	-23%

Source: Salisbury Transport Models

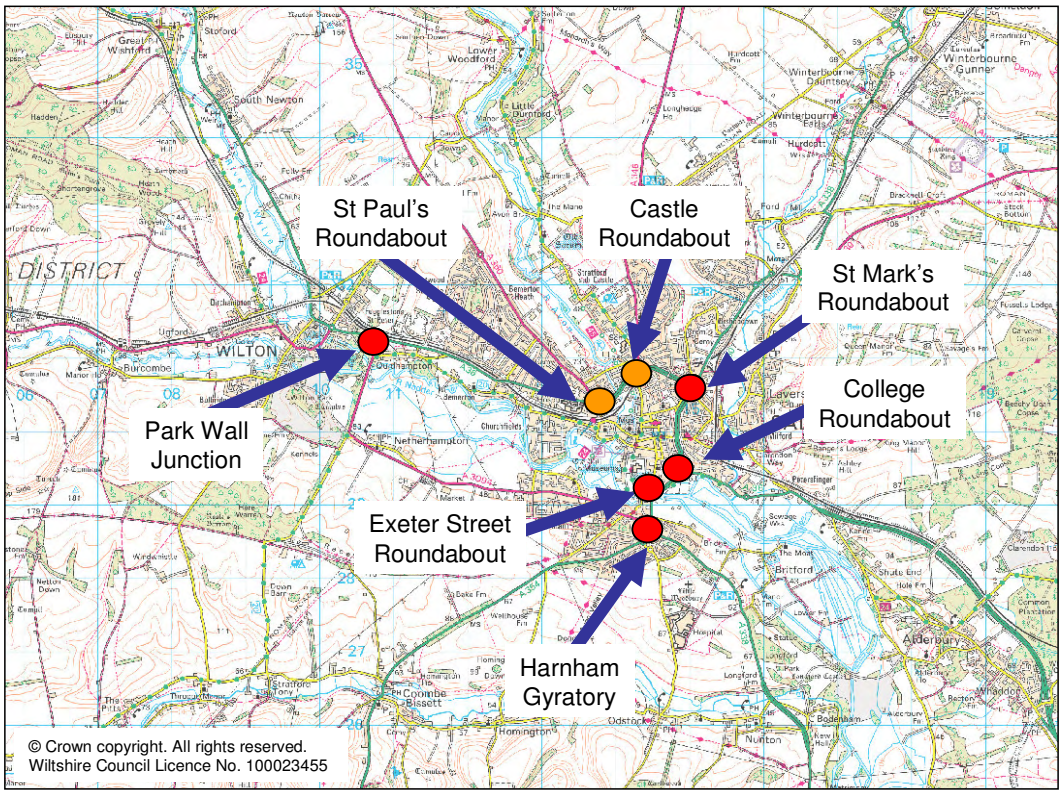
Junction Performance

6.6 The significant junctions in the Salisbury highway network were highlighted in Figure 2.1. Using the Salisbury Transport Model, it is possible to assess the performance of these junctions across the day in the forecast scenario. The analysis considers total traffic volume against total junction capacity in the morning and evening peak to give each junction the following colour coding:

- Green – the junction is operating within 50% of capacity;
- Amber – the junction is operating between 50% and 70% of capacity; and
- Red – the junction is operating over 70% of capacity.

6.7 The results of this analysis are shown in Figure 6.1. Park Wall Junction, St Marks Roundabout, College Roundabout, Exeter Street Roundabout, and the Harnham Gyratory all operate in excess of 70% of capacity. Only St Paul's Roundabout and Castle Roundabout operate in the region of 50% to 70% of capacity though some of the arms of these junctions exceed 70% capacity during the morning and evening peaks.

Figure 6.1 – Junction Performance Summary



Source: Salisbury Transport Models

Park and Ride Utilisation

6.8 The forecast years indicates a 218% increase in Park and Ride demand compared with the base year. Some of this increase will be as a result of the addition of Petersfinger Park and Ride; the rest is a result of increased attractiveness of park and ride rather than travelling to the city centre.

6.9 Some park and ride sites remain more popular than others, with the Beehive and Britford sites forecast to operate close to or at capacity by 2026. Weekday demand is forecast to double at the London Road site but demand has changed only a little at the Wilton site.

Table 6.2 – Forecast Average Weekday Park and Ride Demand

Site	Capacity	Demand	Occupancy / Turnover
Beehive P&R	400	475	119%
Britford P&R	486	534	110%
London Road P&R	380	222	58%
Wilton P&R	420	312	74%
Petersfinger P&R	650	180	28%
Total	2336	1723	74%

Source: Wiltshire Council

Air Quality Analysis

6.10 Using the Salisbury Transport Model it is possible to forecast changes in air quality in the AQMA that are a result of different traffic volumes and speeds by comparing changes in traffic flows and speeds and using DfT formula to convert the modelled outputs into NO_X, PM_{10} and CO_2. Note that this analysis is not compatible with the LAQM analysis in Chapter 4. This analysis uses changes in modelled vehicle speeds and modelled traffic flow to forecast changes in vehicular emissions; and has not been validated to base year conditions. The LAQM analysis considers all sources of emissions at particular locations within the AQMA.

6.11 The calculation of NO_X, PM_{10} and CO_2 is based upon NAEI emissions factors and fleet composition forecasts as recommended in DfT guidance. Modelled speed and flow in the morning peak and inter-peak has been used to calculate these changes in vehicle emissions. The calculations assume that vehicle fleet and fuel technology improves over time to reduce pollutants. This approach is consistent with DfT advice.

6.12 The changes in NO_X, PM_{10} and CO_2 are shown in Table 6.3. The changes in technology result in decreases in NO_X and PM_{10} but an increase in CO_2.

Table 6.3 – Changes in Vehicle Emissions within the AQMA

Emission	Change between 2008 and 2026
NO_X	-22%
PM_{10}	-23%
CO_2	+12%

Source: Salisbury Transport Models
Note that this analysis is not compatible with the LAQM analysis in Chapter 4. This analysis uses changes in modelled vehicle speeds and modelled traffic flow to forecast changes in vehicular emissions. This has not been validated to base year conditions. The LAQM analysis considers all sources of emissions at particular locations within the AQMA.

Public Transport Network Performance

6.13 Like the highway network, the public transport network is not forecast to change much between 2008 and 2026 in this do nothing scenario, although there will be additional park and ride bus services from Petersfinger park and ride. As the public transport network is not constrained by capacity, the modelled choice of routing will remain broadly similar to the base year. The bus network will be affected by changes in highway network speeds but the rail network will retain the same headway and journey speeds as the base year.

6.14 The overall public transport network performance for the whole of the modelled area is summarised in terms of the following:

- Total Travel Time (passenger hours) - the total time travelled on the modelled public transport network time;
- Total Distance Travelled (passenger kilometres) - the total distance travelled on the modelled public transport network multiplied by the number of passengers;
- Passenger boardings – the number of public transport boardings.

Bus Network-Wide

6.15 It can be seen in Table 6.4 that the increase in travel time and passenger boardings is similar to the increase in demand described in the previous chapter. The increase in distance travelled is not as large as the increase in travel time and suggests that bus journeys, despite becoming more frequent are also becoming shorter.

Table 6.4 – Summary of Change in Base Year to Forecast Year Bus Network Performance

	Morning Peak	Inter-Peak	Evening Peak
Total Travel Time (pax hr)	23%	11%	32%
Total Distance Travelled (pax km)	12%	5%	19%
Passenger boardings (pax)	29%	16%	40%

Source: Salisbury Transport Models

Rail Network-Wide

6.16 Rail network-wide statistics change little from the base year, as the journey times are the same and there is very little change in passenger trip making between base year and forecast year.

7. Summary of Problems and Issues

Introduction

7.1 This chapter provides a summary of base year and forecast year problems and issues. It builds upon the evidence provided in the previous chapters and highlights the issues that Salisbury presently faces as well as those problems the Salisbury may face in the future.

7.2 The summary follows the pattern of the previous chapters. In the *Strategy Objectives Report*, these problems and issues will be re-arranged to match broad study objectives.

Problems and Issues

7.3 The previous chapters have reviewed consultation comments, base year (2008) and forecast year (2026) transport demand and the impact of this demand on the transport networks in 2008 and 2026. The problems and issues can be summarised as:

- constraints on the highway network and competing routes to / from and through Salisbury results in congestion at key points in the base year and more so in the forecast year;
- congestion impacts on:
  - network reliability, which affects motorists and bus passenger;
  - the environment;
  - the attractiveness and economic vitality of the city; and
  - pedestrians and cyclists and their interaction with the highway network
- public transport is city centre focused, with few cross-city bus routes and no interchange between rail and bus;
- public transport is also considered to be expensive and has limited early morning, night and weekend services;
- there are only bus lanes along Castle Street and public transport otherwise has no priority over cars;
- parking, including park and ride, is generally readily available but the two systems are not optimised to manage demand into Salisbury;
- there is limited focus on sustainable means of travel.

7.4 These are described in more detail below.

7.5 Network constraints

- The highway network is currently constrained by the capacity of the A36 junctions at Park Wall Junction, St Mark's Roundabout, Castle Roundabout, St Paul's Roundabout and College Roundabout. The performance of these junctions affect the movement along the A36.
- The highway network is presently further constrained at Exeter Street Roundabout and problems here, as a result of delays due to buses, pedestrian crossings and drop-off traffic, affect New Harnham Bridge Road.
- The Harnham Gyratory currently performs well once traffic is able to access the gyratory, but there are delays on the approach roads.

- There is evidence of some through traffic between Wilton and Southampton Road routing through Harnham rather than the A36 as a result of contrainst at the junctions along the A36.
- Approximately 30% of traffic currently on Salisbury's roads is through traffic, and a higher proportion of HGV traffic is through traffic. This through traffic has to be accommodated at the same junctions as traffic accessing / egressing Salisbury.

7.6 Network reliability

- Constraints at Park Wall Junction, St Mark's Roundabout, Castle Roundabout, St Paul's Roundabout, College Roundabout and Exeter Street Roundabout affect journey time reliability to motorists and bus passengers and results in re-routing to avoid this congestion hotspots.
- By 2026, highway congestion is forecast to increase by approximately 50% and delays are forecast to more than double in the morning peak and evening peak. As a result speeds are predicted to reduced by approximately 15% and 25% in the morning and evening peaks respectively.

7.7 Environmental factors

- Salisbury has an air quality problem in the city centre, the entire city centre is currently air quality management area. With little industry within the city centre, the cause of this problem is traffic and HGV and bus traffic is the main cause.
- Salisbury's historically past is largely responsible for its narrow streets and many turns, the high demand for car parking within the city centre and HGV route to Churchfields are key contributors to the air quality problem and will continue to do so to some extent in the future.
- Whilst fuel and vehicle technology is predicted to reduce the impact of some vehicle emissions, carbon is forecast to increase in the future.
- High traffic volumes also creates noise and visual intrusion problems.

7.8 Economic vitality

- Congestion will start to affect the economic vitality of Salisbury as business and retail mayseek different locations to avoid congestion. Tourism may also suffer if Salisbury is perceived to be difficult to access due to congestion.

7.9 Walking and Cycling

- Heavy traffic and lack of sufficient walking and cycling facilities (safe crossings, dedicated and well signed routes etc) is view as a deterrent to walking and cycling.
- Increased traffic will act as a further deterrent.
- Walking and cycling can provide a health form of travel but increased congestion and lack of facilities will reduce this.

7.10 Public transport is city centre focused

- There is currently only one high frequency, cross-city route (between Salisbury School and Salisbury Hospital) and limited service provision to the railway station to Churchfields. For a number of other cross-city movements, an interchange is required.
- The public transport network is forecast to receive considerable additional patronage and this may require additional service frequencies and routes

7.11 Public transport is also considered to be expensive and has limited services

- Bus provision for journeys within Salisbury presently has limited service provision early in the morning, at night and at the weekend.

- Salisbury Station does not have a bus interchange, has limited parking (which is usually full by 8:30am)

7.12 Public transport has limited priority over cars

- Whilst there is some bus priority (bus lanes and select vehicle detection), this is limited to certain corridors and is not comprehensive.

7.13 Parking and park and ride are not optimised to manage demand into Salisbury

- Salisbury presently has plentiful parking, which is well used and a good source of revenue, but this ready availability of parking may be resulting in high car dependency and related problems.
- At the moment Salisbury also has a high quality park and ride service that attracts passengers despite the ready availability of city centre parking yet this service is expensive to run and does not maximise returns by charging per vehicle rather than per person.

7.14 Limited focus on sustainable means of travel

- The motorised mode share of travel in Salisbury is car dominated. Although the car mode share is below the County average for the journey to work, analysis shows high levels of car use for journeys to and from Salisbury both now and in the future.
- Without a focus on sustainable travel, there is little feedback to ensure that the transport system delivers for everybody.

8. Conclusions

8.1 The Regional Spatial Strategy (RSS) for the South West and sets out the numbers of houses and jobs that should be provided for in Wiltshire 2026. The Secretary of State's Proposed Changes to the Draft RSS for the South West indicates a housing requirement of 12,400 homes for South Wiltshire for the period 2006- 2026. This would require an average housing delivery of 620 dwellings per year.

8.2 This Problems and Issues report has considered the views of local residents at previous consultation events and used data collected as part of the development of Salisbury Transport Models to identify existing highway and public transport travel patterns within, to / from and through Salisbury in 2008. These models have been used to forecast the demand for travel in 2026 in light of the South Wiltshire Core Strategy.

8.3 This report has also considered the highway and public transport network provision in 2008. This includes an assessment of the highway network, which also provides the basis of the bus, walking and cycling network and a review of public transport service provision. The impact of present and future transport demand on the highway and public transport networks has also been assessed.

8.4 The transport problems and issues that face Salisbury now and are forecast to face Salisbury in the future are summarised below:

- constraints on the highway network and competing routes to / from and through Salisbury results in congestion at key points in the base year and more so in the forecast year;
- congestion impacts on:
  - network reliability, which affects motorists and bus passenger;
  - the environment;
  - the attractiveness and economic vitality of the city; and
  - pedestrians and cyclists and their interaction with the highway network
- public transport is city centre focused, with few cross-city bus routes and no interchange between rail and bus;
- public transport is also considered to be expensive and has limited early morning, night and weekend services;
- there are only bus lanes along Castle Street and public transport otherwise has no priority over cars;
- parking, including park and ride, is generally readily available but the two systems are not optimised to manage demand into Salisbury;
- there is limited focus on sustainable means of travel.

8.5 Growth in Salisbury is set to be significant over the next 20 years or so. Accommodating this growth in a financially constrained environment will be a challenge, but the Salisbury Transport Strategy provides an opportunity to consider how to best achieve this over the Core Strategy period.