AtkinsRéalis

Study Report

Wiltshire Council

September 2024

MARLBOROUGH TRAFFIC STUDY

AtkinsRéalis - Baseline / Référence

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Client signoff

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1. Introduction & Background Context

1.1 Introduction of the Study

AtkinsRéalis has been commissioned by Wiltshire Council and Marlborough Town Council to conduct a traffic study in Marlborough town centre which considers options for improvements to mitigate current traffic issues, with supporting microsimulation modelling to test selected intervention options. This study is necessitated by the seemingly volatile nature of the traffic network in Marlborough town centre, which may be made worse by increased traffic volumes in the future.

An inception meeting took place on 23rd November 2023 with representatives from AtkinsRéalis, Marlborough Town Council and Wiltshire Council. The vision and objectives for this study were confirmed thereafter:

1. To improve traffic flow resilience around the town centre.
2. To improve air quality in the town centre.
3. To reduce traffic collisions and improve safety.
4. To maintain/improve bus service provision.
5. To reduce carbon impact of traffic.
6. To retain or improve active travel provision for walking, cycling and wheeling in Marlborough.

1.2 Existing Transport Context

The town is made up of narrow streets with insufficient capacity for the number of vehicles passing through the town, leading to congestion which consequently has a detrimental impact on air quality. There have been numerous collisions in the town centre in recent years involving vehicles, pedestrians and cyclists including one collision resulting in fatality on the High Street. An overview of the town centre is shown in Figure 1-1 below.

Although the High Street caters for two-way traffic with a 20mph speed limit, there is a large amount of physical activity and on-street parking which might pose a safety risk for pedestrians emerging onto the carriageway from behind parked vehicles. The A4 to the west side of the town centre experiences a large amount of footfall and therefore frequent use of the pedestrian signals, which leads to traffic build up especially during start/end of college day and the start/end of the school term. This increases the potential and incidence of traffic gridlock at the junctions adjacent to these pedestrian signals.

The A346 to the east of the town is designated as a primary route with appropriate signage (part of the Strategic Road Network). A significant amount of HGV traffic is expected along the route. A large amount of through traffic also travels along the A346 in the North/South direction. This includes a large proportion of HGVs, this conflicts with east/west movements, causing congestion for local traffic through the narrow streets of the town putting pressure on the local road network. Major conflict points around the town are controlled by 5 mini roundabouts, which experience unbalanced flows and are prone to gridlock. This situation produces a lot of stop-start traffic that contributes to the worsening of the air quality in the town centre. The town centre is prone to gridlock and exhibits volatility and high sensitivity to minor incidents such as roadworks, vehicle breakdowns and some improperly parked vehicles.

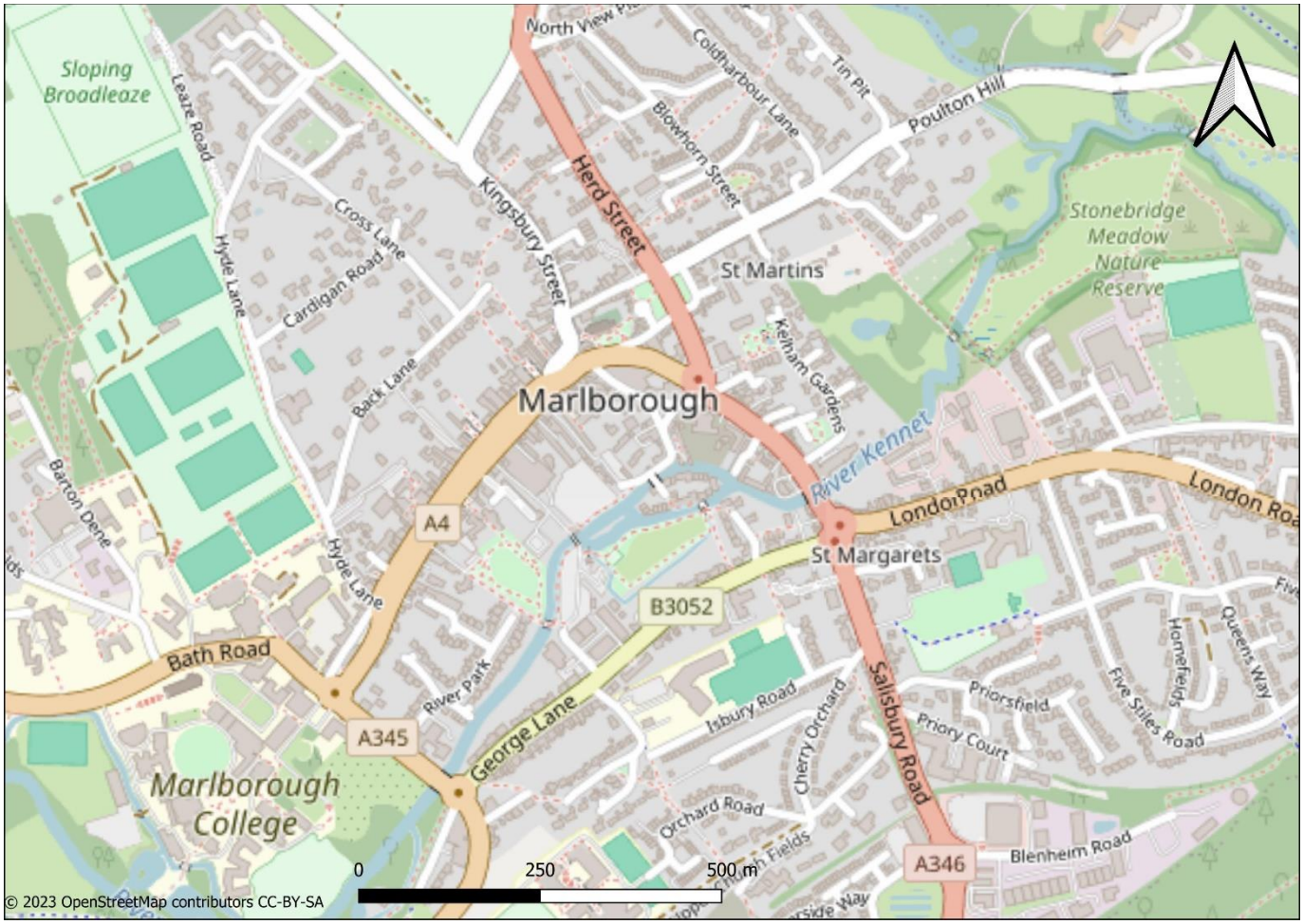

Figure 1-1 – Overview of Marlborough Town Centre

1.3 Policy Context

1.3.1 Marlborough Area Neighbourhood Plan (MANP) 2021-2036

The Marlborough Area Neighbourhood Plan (MANP) 2021-2036 has set an objective to protect and enhance the area's most valued open spaces and improving connectivity. The plan notes that 680 homes are targeted to be built in the Marlborough area from 2006 – 2026 and sets out a requirement for another 680 homes in the period 2016 – 2036 as part of a wider strategy for the Swindon Housing Market Area within which Marlborough sits. However, it equally recognises that this level of growth poses a challenge given Marlborough sits within a constrained location compared to the wider Housing Market Area. Proposals for these locations will be required to demonstrate how the effects of traffic they will generate can and will be effectively mitigated, considering existing problems on the strategic highway network in the area. In addition, the proposals will be required to deliver excellent footpath and cycleway provision within their sites and to maximise opportunities to improve connectivity in the immediate area.

The Neighbourhood Plan allocates land adjacent to Marlborough Rugby Club for informal public car parking use. The Plan also includes proposals to establish additional public car parking spaces at other suitable locations in the town, including EV charging points. It also includes proposals to make better use of underutilised land for parking. The use of shuttle bus services at weekends to serve the town centre will be encouraged. The Plan outlines that the Councils are looking to invest their Community Infrastructure Levy (CIL) funds to secure a range of improvements

to the network of footpaths and cycleways to encourage non-car journeys within the area as far as possible, for example between the town and Savernake Forest, and between the town and Savernake Hospital. There is general concern about the traffic build up at busy times on the A346 & A4 through Marlborough, as the congestion both affects air quality and greatly inconveniences residents of the Councils within the MANP area. Some areas of improvement have been proposed including Marlborough High Street, traffic congestion, public transport, and employment opportunities.

1.3.2 The Wiltshire Local Transport Plan 3 (LTP3) Strategy

The Wiltshire LTP3 Strategy outlines a number of goals and strategic objectives for Wiltshire. These goals centre around economic growth, reducing carbon, improving health and safety, improving quality of life and the natural environment, and promoting equality of opportunity to all residents. These they hoped to achieve using some strategies such as;

- Minimising traffic delays,
- Improving journey time reliability,
- Reducing the need to travel by private car,
- Reducing number of casualties and improving safety for all road users,
- Reducing the impact of traffic on people's lives and the natural & built environment, and
- Improving sustainable access to opportunities for people without access to a car.

The LTP3 also indicated that the council has declared six Air Quality Management Areas (AQMAs) where air quality fails to meet objectives, and this includes Marlborough.

1.3.3 Air Quality Action Plan (AQAP) for Wiltshire 2023

Wiltshire Council is in the process of developing an AQAP for the six AQMAs outlining actions to address the issues of air quality in the area from 2023 to 2026. Traffic is identified as the main source of air pollution. The lack of transport options has been highlighted as a contributor to residents tending to opt to use private vehicles. The AQMA in Marlborough was declared in 2011 for exceedances of the annual mean objective for nitrogen dioxide and covers the entire town as shown in Figure 1-2. The annual mean nitrogen dioxide concentrations across the Marlborough AQMA have fluctuated but have shown steady improvement over the last few years with lower concentrations. Some exceedances remain in the Marlborough AQMA, and measures have been set to target these areas to reduce pollution further. After diesel cars, LGVs were found to be the next dominant source of NOx. Generally, buses and HGVs were found to contribute around 10%-15% of NOx emissions.

It has been observed that the exceedances of the nitrogen dioxide annual mean are on the A346 through the town. The AQAP suggests a range of alternative strategies such as integrating active travel with other public transport modes such as bus and rail, establishment of EV charging stations around the public parking spaces in the town centre, delivery of foot and cycleway provision. These strategies aim to encourage the uptake of electric vehicles, improve social inclusion, reduce general traffic and reduce the reliance on private car within the town centre.

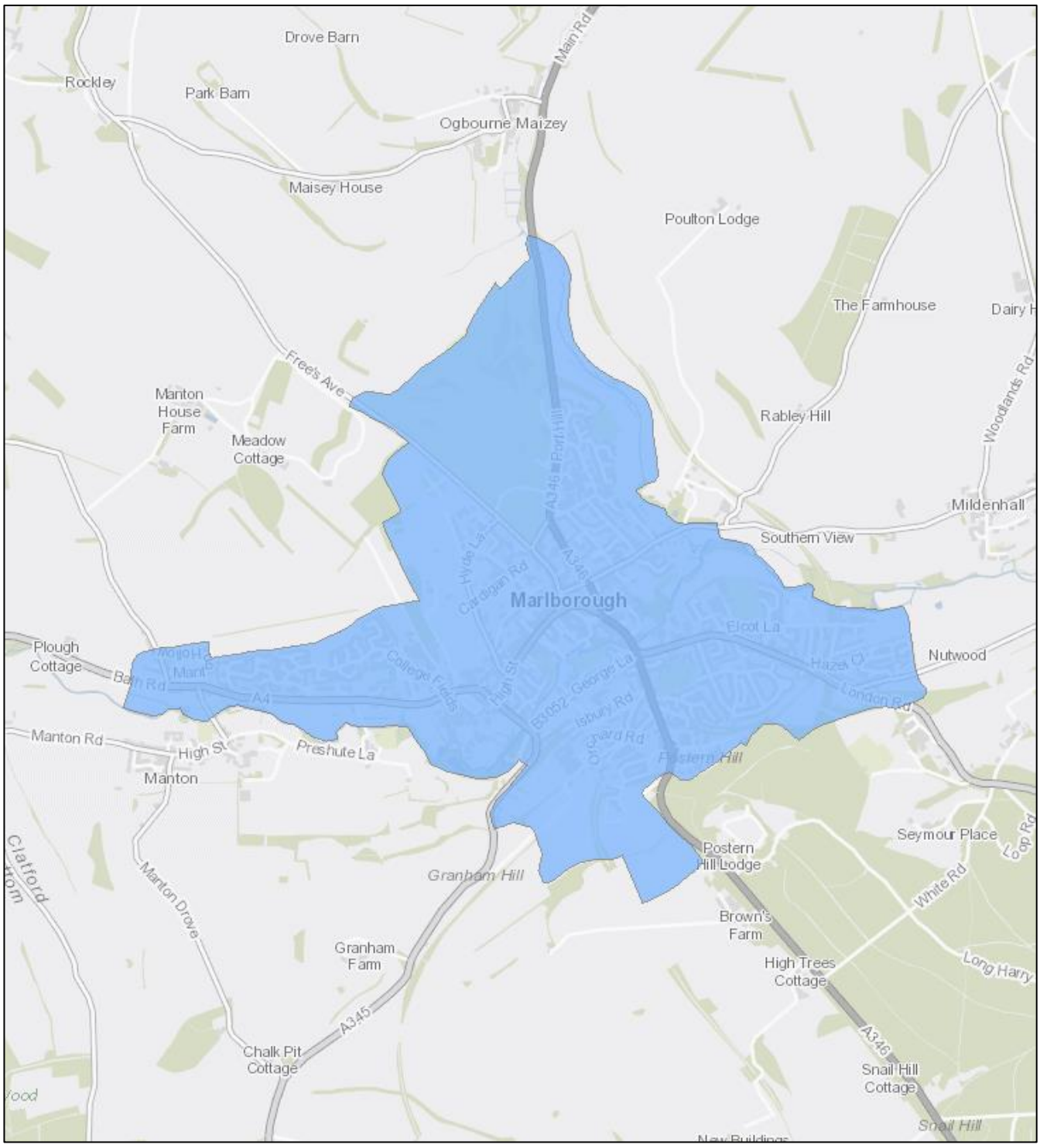

Figure 1-2 – Air Quality Management Area boundary for Marlborough

Source: AQMAs interactive map (defra.gov.uk)

1.4 A417 Missing Link Scheme

The A417 Missing Link scheme is an expansion and improvement scheme between Gloucester and Swindon. A new link will bypass the Air Balloon roundabout to improve traffic flow. This will follow the route of the current A417 but will swing away before it reaches the Air Balloon roundabout. Two extra lanes will be added to the road and the gradient down Crickley Hill will be reduced from 10% to 8% to improve traffic flow. Work on the scheme is currently ongoing. The location of the scheme in relation to Marlborough town centre is shown in Figure 1-3.

The A417 links to the M4 North of Marlborough and the A346 which passes through the Marlborough town centre. Increased traffic on this link implies the potential of increased traffic numbers through Marlborough along the A346. The South-West Regional Traffic model, used by National Highways as the basis for the A417 scheme model, predicts a 3.4% and 5.0% increase in projected traffic for the design year 2041 along the A346 to the north and south of Marlborough respectively due to the implementation of the scheme. This estimates an average of around 70 additional vehicle trips per hour will use the route in the interpeak period 10:00-16:00. In the 2041 AM and PM peak periods, which are 07:00-10:00 and 16:00- 19:00, the model suggests around 50 additional vehicle trips will use the route per hour. This projected uplift in traffic numbers has been considered in the course of this traffic study.

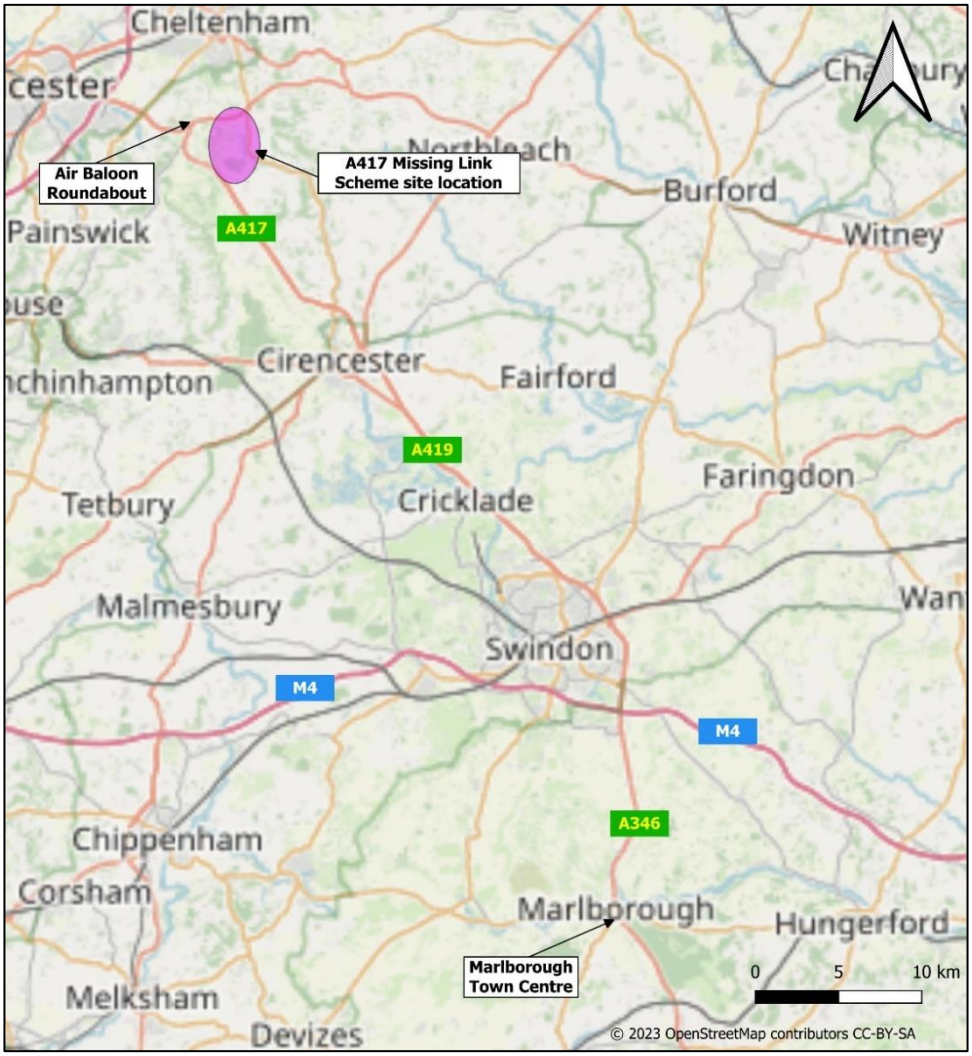

Figure 1-3 – A417 Missing Link Scheme Overview

1.5 Collision Analysis

This section presents collision data within Marlborough. The collision data was obtained from the Department for Transport (DfT) website and was also received as a collated STATS19 report from Wiltshire Council. STATS19 is a collection of datasets that consists of descriptive variables about each reported collision in the road traffic casualty database provided by the Department for Transport (DfT). The collated STATS19 report is created when a STATS19 form is used to access and process the datasets from the database.

For the period between January 2018 and December 2022, a total of 40 collisions were recorded, of which 34 were categorised as slight collisions, five were categorised as serious (significant and long-term injuries) and one was fatal. The statistics are shown in Table 1-1 and Figure 1-4.

Table 1-1 - Reported Road Traffic Collisions for Marlborough (2018 to 2022)

Severity	2018	2019	2020	2021	2022	Total
Fatal	0	0	1	0	0	1
Serious	0	0	1	2	2	5
Slight	5	7	6	7	9	34
Total	5	7	8	9	11	40

Data source: Road Safety Data - data.gov.uk, Wiltshire County Council Stats19 Data

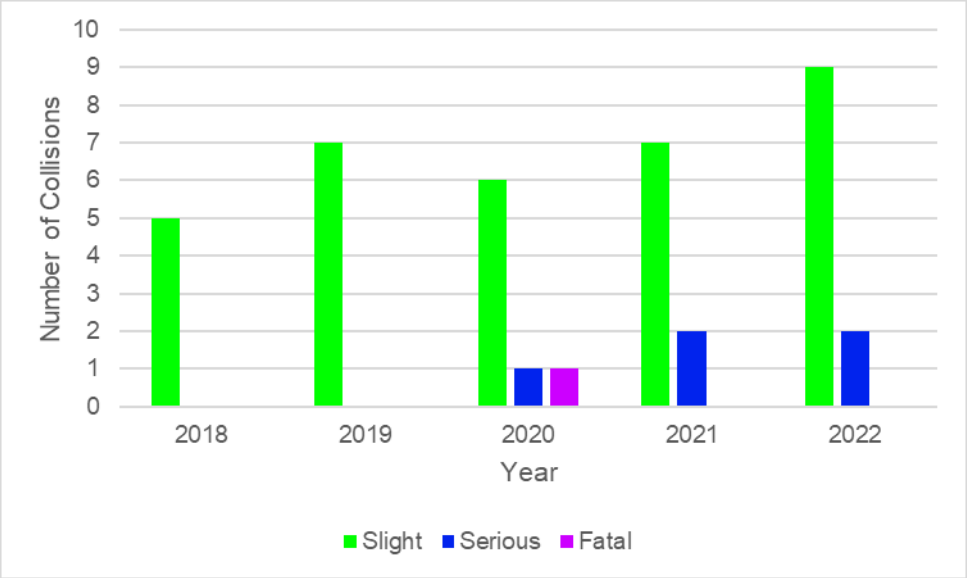

Figure 1-4 - Reported Road Traffic Collisions for Marlborough

Data source: Road Safety Data - data.gov.uk, Wiltshire County Council Stats19 Data

The analysis showed a relatively constant collision rate, with a small increase in collisions year upon year, with 2022 having close to double the number of collisions as seen in 2018. The analysis also revealed that the collisions followed a seasonal pattern with collisions occurring more frequently during the summer, autumn, and winter seasons [June – February] and occasionally (5 out of the total 40) during the spring seasons [March – May].

1.5.1 Analysis Overview

There were 12 slight collisions that occurred from 2018 till 2019, with 10 collisions being reported due to the driver and/or pedestrian not looking properly, one collision due to a vehicle hitting a pedestrian on the nearside and one that occurred during a police chase.

The analysis showed a gradual increase in collision severity type from 2020 to 2022. Looking into the cause of the collisions that were serious and fatal between 2020 - 2022, three serious collisions were due to reckless driving and the driver failing to look properly. One serious collision was due to poor manoeuvring, and another was due to the pedestrian failing to look properly and causing a serious collision with a car. One serious collision and the one fatal incident were both due to a loss of control and bad manoeuvring, but it was also reported that the drivers in both these incidents had a disability and a medical episode respectively.

Similar causes were also seen in the slight accidents that were gradually increasing from 2020 till 2022. During this period, a total of 22 slight collisions occurred. Of these 22 collisions, 16 collisions reported their cause towards the driver and/or pedestrian failing to look properly and/or were careless about their speed and surroundings. One slight collision was also reported as being due to aggressive driving and manoeuvring. Other than these causes, two collisions were due to the driver getting nervous and one collision each was due to the driver being unfamiliar with the vehicle ahead of them, a vehicle following too closely with other vehicles and the vehicle itself having defective brakes.

From this analysis, a recurring collision factor is observed where most collisions occurring in Marlborough are due to the driver or the pedestrian failing to look properly. This is then followed by collisions caused by drivers or pedestrians being careless. The locations of collisions, shown by severity, are presented in Figure 1-5.

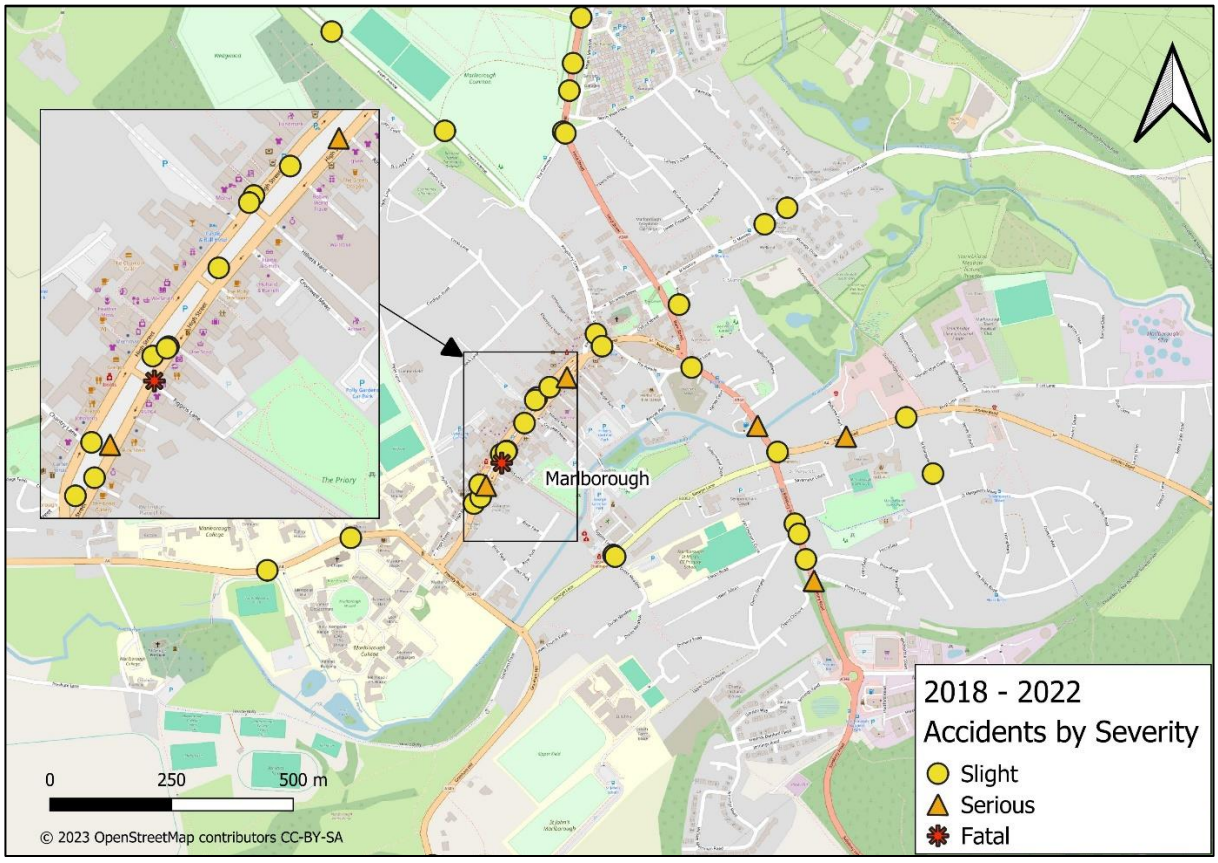

Figure 1-5 - Locations of collisions by severity (January 2018 to December 2022)

1.5.2 Pedestrian and Cyclist Involvement

Pedestrian and cyclist involvement in these collisions has also been analysed. From the 40 collisions reported in Marlborough, 20 collisions involved pedestrians and cyclists. A summary of this analysis is shown in Table 1-2 and Figure 1-6.

Table 1-2 - Reported pedestrian and cyclist involvement in traffic collisions for Marlborough (2018 to 2022)

Involvement	2018	2019	2020	2021	2022	Total
Pedestrian	1	6	2	5	5	19
Cyclist	0	0	0	0	1	1
Total	1	6	2	5	6	20

Data source: Road Safety Data - data.gov.uk, Wiltshire County Council Stats19 Data

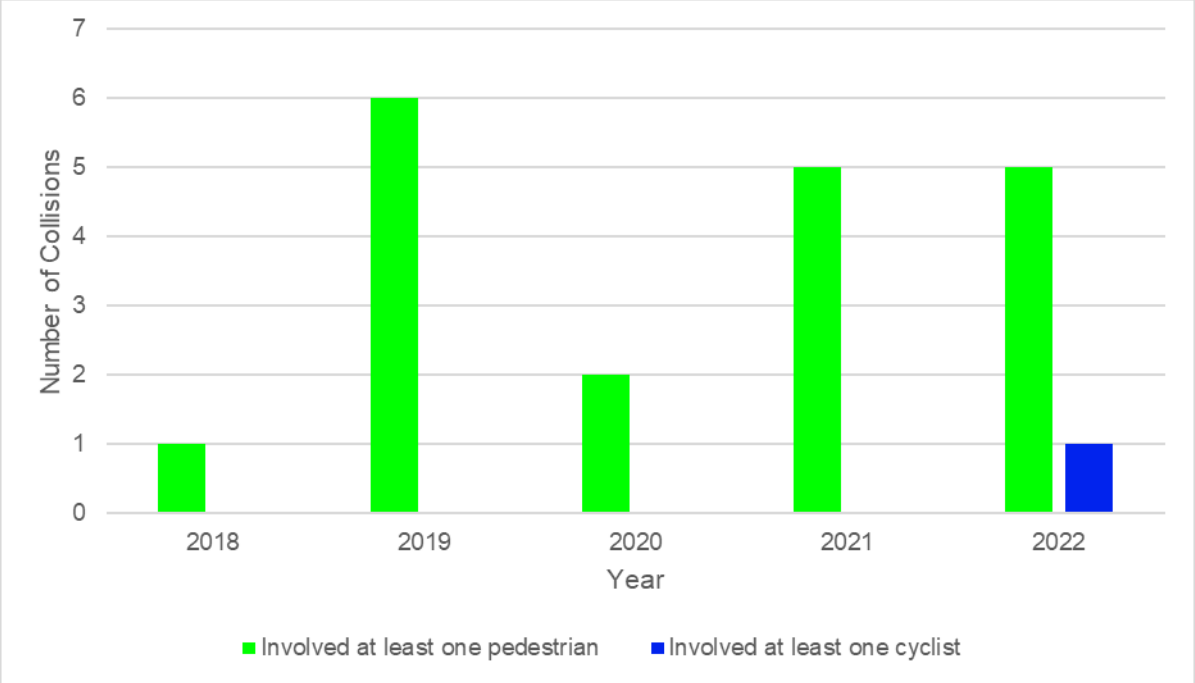

Figure 1-6 - Reported pedestrian and cyclist involvement in traffic collisions for Marlborough (2018 to 2022)

Data source: Road Safety Data - data.gov.uk

This analysis shows that there is a considerable involvement of pedestrian collisions throughout Marlborough from 2018 to 2022, with the statistics showing a sharp spike of pedestrian casualty involvement from 2018 to 2019 and then a sudden drop in 2020 due to the Covid-19 lockdowns. The pedestrian accident rate has remained the same for 2021 and 2022. One cyclist collision occurred in November 2022 in the High Street area.

When looking into the collisions that involved pedestrians and cyclists, it is again observed that 19 of the 20 collisions were due to the driver and/or pedestrian not looking properly, were careless about their speed & their surroundings and/or was following too closely to a pedestrian. One of the 20 collisions was due to the driver of the main vehicle being unfamiliar with the model of the vehicle in front of them, thereby hitting the vehicle in the rear, causing the main vehicle to lurch back, and hit a pedestrian.

A map showing the locations of collisions involving pedestrians and/or cyclists is presented in Figure 1-7.

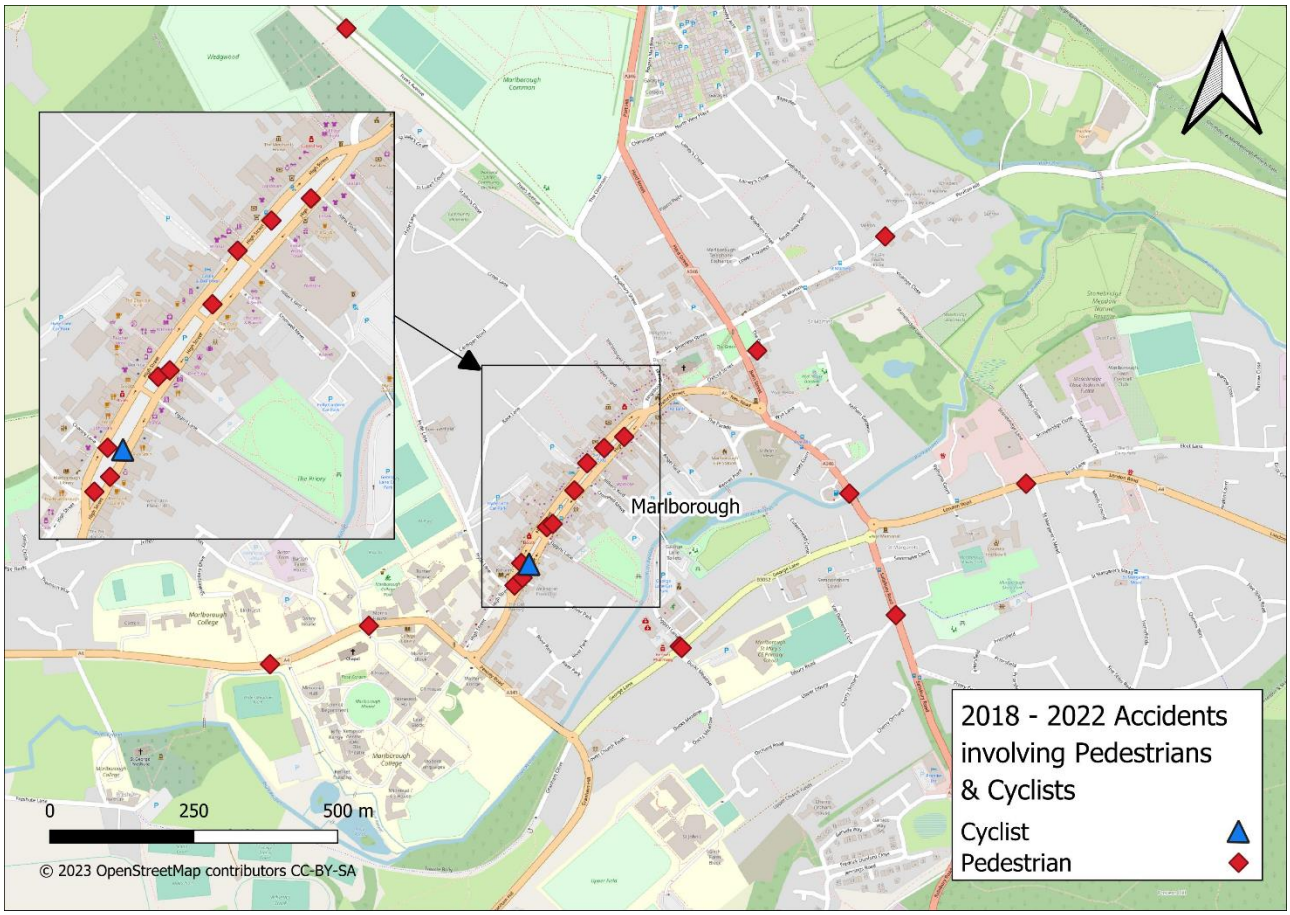

Figure 1-7 - Locations of collisions involving pedestrians and cyclists (October 2018 to December 2022)

1.5.3 High Street

It was observed that a cluster of collisions of varying severity are reported in High Street, with the rest distributed amongst other roads all around Marlborough.

It is important to further analyse the collisions on High Street as they are linked to the street parking conditions and the layout present on High Street.

Out of the 14 collisions reported in High Street, five of them were due to vehicles reversing out of parking spaces and colliding with a pedestrian. Two collisions occurred when a pedestrian was crossing the road across High Street. Five collisions were due to vehicles misjudging their surroundings and causing multiple collisions with other vehicles such as vans, cars, motorcycles, a cycle, and a pedestrian. One incident involved a careless pedestrian who collided with a stationary car.

The fatal incident involved a car that took a bad manoeuvre, drove into a wall and metal railings, and then overturned. The STATS19 report described the cause of this incident was due to the driver having a ‘medical episode’.

Wiltshire Council has addressed the concerns through various interventions, such as informal crossings and a 20mph speed limit, and no effective mitigation measures have been identified. Other than significant amendments to the quantity and layout of the central parking, there would appear to be no effective actions that could be taken to

reduce the pedestrian collision issue. The Marlborough Town Council is currently looking into alternative public realm improvement to the High Street area which will aim to help alleviate this issue.

1.5.4 Other Locations

A total of 26 collisions occurred outside of High Street.

As mentioned in the previous sections, 20 of these collisions were caused due to the driver and/or pedestrians failing to look properly and/or careless driving. Of the remaining six, two are due to a nervous driver (both slight), one with the driver being unfamiliar with the vehicle model in front of them (slight), one with the vehicle hitting a pedestrian with its nearside wing (slight), another with reported poor manoeuvring & illness (serious) and one slight vehicle collision that occurred during a police chase.

While the 20 collisions reported that their causes were due to the driver and/or pedestrians failing to look properly and/or careless driving, three slight collisions of these 20 collisions reported that their causes were also due to the locations where the incidents occurred. The Kingsbury Street collision in 2020, the Salisbury Road collision (between a car and a motorcycle) in 2021 and the Granham Hill collision in 2022, occurred at locations where the road layout became narrow due to parked cars (Salisbury Road) or had tight bends to navigate (Kingsbury Street & Granham Hill).

1.5.5 Conclusion

In summary, the total number of reported road traffic collisions involving pedestrians and cyclists between 2018 and 2022 saw an increase from 2018 to 2019, with a decrease in 2020 likely due to COVID-19 measures, followed by a steady increase in collision and severity type till 2022. There is a higher involvement of pedestrian collisions than cyclists (there is only one reported cyclist collision). 2022 had the highest number of total reported collisions (including car occupants, pedestrians, and cyclists). There was a large concentration of collisions of varying severity types and casualty types reported in the High Street area. A large recurring cause factor in these collisions were drivers/pedestrians failing to look properly and were exhibiting careless or reckless driving/behaviour.

1.6 Study Approach

Background Context

For the study to achieve its set aims, a good understanding of the local context of the traffic situation in the town centre is required. This provides a key understanding of the current traffic situation, issues and travel behaviour, the geospatial orientation of the town with key resident areas and destinations, relevant local, regional and national policies, adjacent proposed and ongoing schemes that will have a future impact on the town centre traffic and the road safety situation to ensure future proposals do not compromise the safety of all transport users. A key understanding of all these is crucial to ensuring the outcomes of the study meet with the requirements of all relevant stakeholders. The background context has been covered in this section. Subsequent sections will detail the rest of the study approach.

To achieve the aims of this study, to consider options for improvements to mitigate current traffic issues in Marlborough town centre, supporting microsimulation modelling will be used to evaluate proposed interventions for a future year scenario. The approach to this study will involve a sequence of tasks to enable the efficient development of the model and the testing of interventions. Figure 1-8 provides a flowchart of the sequence of tasks that make up the study approach. An overview of these tasks follows to provide relevant context to each step of the study process.

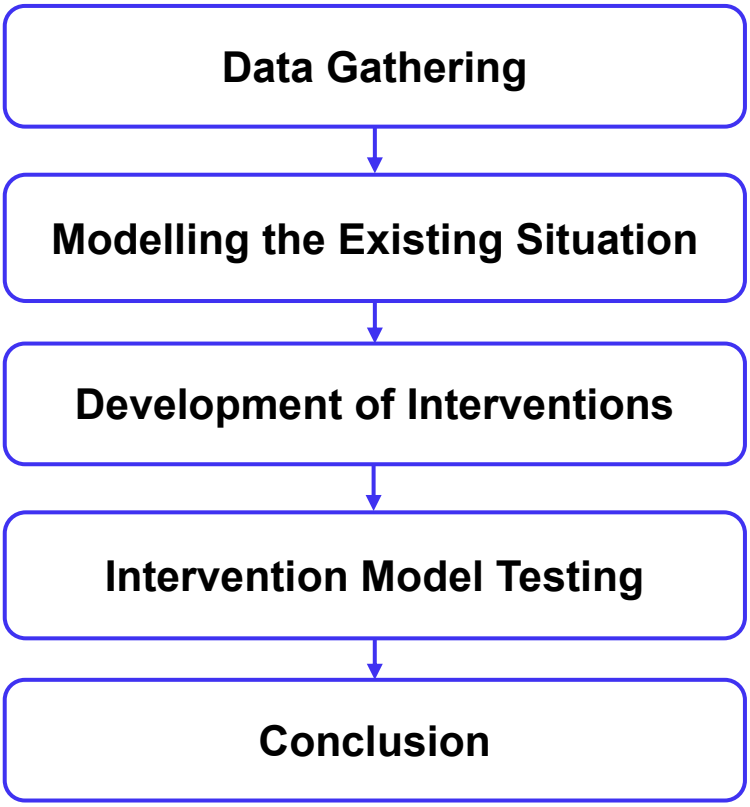

Figure 1-8 – Study Approach Flowchart

Data Gathering

With the relevant context being set out, data gathering exercises are carried out to obtain relevant information to feed into the study. Primary data is collected using various survey methods including a site visit, to obtain data on traffic counts and journey times. This is used as part of the microsimulation model development process. Additional data is collected which is equally relevant to the model development process such as current and proposed traffic speed control measures, public transport service and any other schemes being proposed/undertaken by the local/regional authority which are relevant to the study.

Modelling the Existing Situation

The initial step in the use of microsimulation modelling in the study is the development of a model for the existing situation. This is known as the Base model. For this study VISSIM microsimulation model software package is used, and a base year of 2023 is used for the base model. This process involves coding the existing transport infrastructure of the town into the VISSIM model and inputting all the data that has been gathered into the model to calibrate a model that replicates the existing conditions. The base model results are validated according to industry standards set out by the DfT to ensure the model is fit for purpose.

Development of Interventions

Having developed a base model that is fit for purpose, the next step is to consider intervention options to alleviate the traffic situation. A longlist of options is created following a design workshop looking at all possible interventions that can be implemented to improve the traffic situation in the town centre. After the creation of the longlist, a Multi-Criteria Assessment Framework (MCAF) is developed to assess each option on the list against the already set out study objectives. Each option is assessed and scored against the framework criteria. From the scoring of these

options, the most preferred options are then selected from the longlist to form the interventions that are tested using microsimulation modelling.

Intervention Model Testing

The selected interventions are tested using the model that has been developed. To ensure the sustainability of the interventions being proposed, the model testing is carried out for a future year scenario. This study uses the future year of 2041 to align with the Wiltshire Local Transport Plan, assuming the preferred intervention is implemented in 2026 with an additional 15 years of forecast traffic growth. First, the 2023 Base model is updated using forecast data to obtain the 2041 model without any interventions. This is called the Do-Nothing Scenario (2041 DN). This Do-Nothing model is developed to compare the results of the intervention against a benchmark scenario where no intervention is implemented. This gives a benchmark to evaluate the impact of the proposed interventions against the study aims and objectives.

After the Do-Nothing model is developed, the selected interventions are coded into the model to obtain the Do-Something scenario. This study tests three intervention options which gives three models for the Do-Something scenario (2041 DS1, 2041 DS2 and 2041 DS3). The results of these models are evaluated against the benchmark Do-Nothing (2041 DN) model in order to quantify and evaluate the impact of the interventions.

Conclusion

At the end of the modelling exercise, the tested intervention model results are evaluated, and a conclusion is reached on a preferred way forward. This summarises the final conclusion from the study and provides context for relevant next steps to be taken by the local/regional authority.

Subsequent chapters of this report will outline the details of these tasks to provide sufficient context of the process followed to attain the final results and achieve the study outcomes. The rest of the report will be structured as follows:

- Section 2 – Data Gathering
- Section 3 – Modelling Existing Situation
- Section 4 – Proposed Interventions
- Section 5 – Intervention Model Testing and Comparison
- Section 6 – Conclusion and Next Steps

2. Data Gathering

2.1 Traffic Count Data

Traffic count data was obtained in November 2023. Classified turning counts were obtained at 12 key junctions in Marlborough town. Pedestrian count data was also obtained for five signalised pedestrian crossings and three zebra crossings around the town. Automatic traffic counts were also obtained at seven key entry/exit points into the town. The locations of the traffic count sites are shown in Figure 2-1.

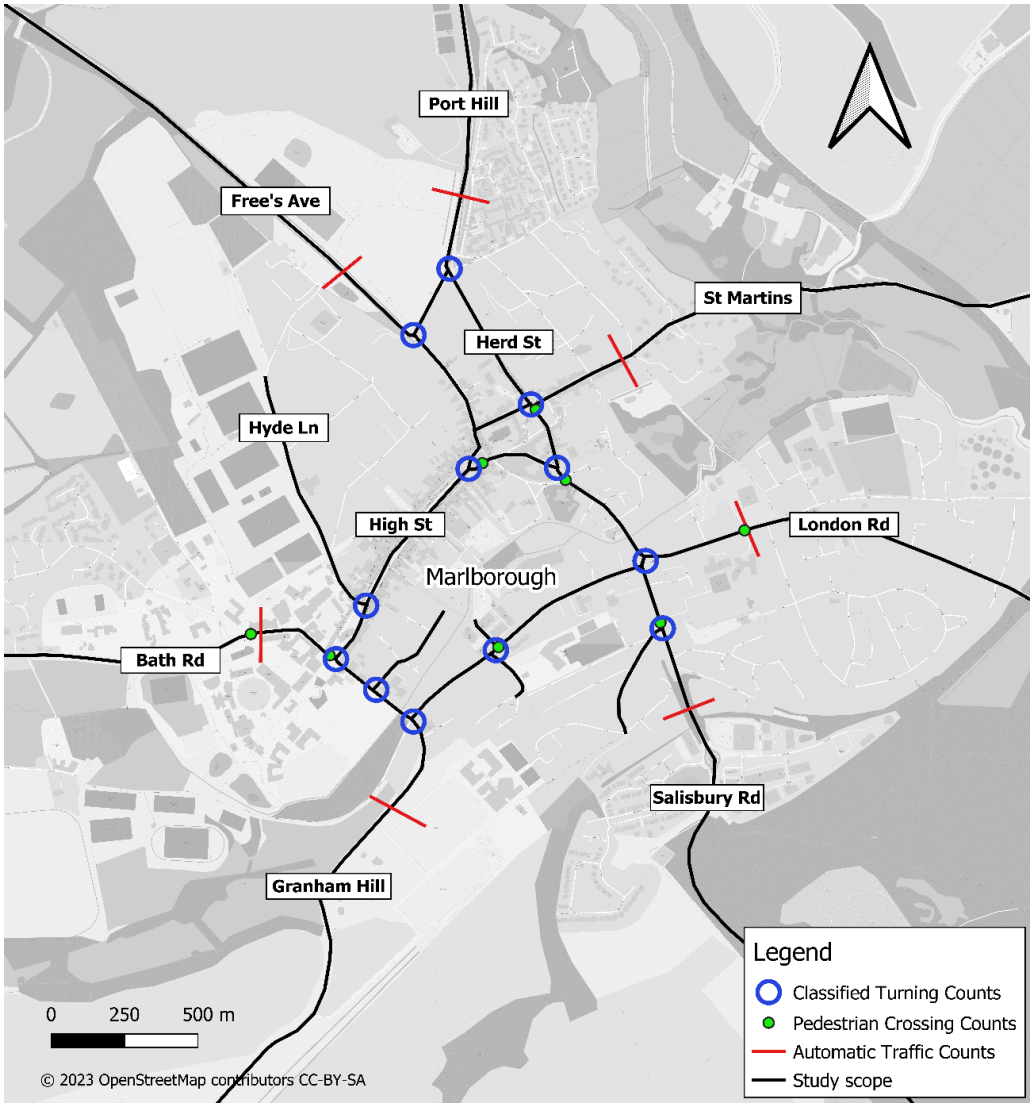

Figure 2-1 - Traffic Count Data Locations

Based on the analysis of the traffic data, it was found that the morning peak hour was 07:45-08:45 and the evening peak hour was 16:00-17:00. These are the two time periods in the day where there is the most traffic, typically aligning with commuting times and the morning school run.

2.2 Journey Time Data

Journey time data has been sourced from Satellite-Navigation (Sat-Nav) devices from TomTom. Motorists who use Sat-Nav devices have the option to voluntarily allow anonymous data about their journeys to be collected and used to provide a range of services, including the analysis of historic journey times along specific routes. Journey times have been obtained from 20th October 2023 to 20th November 2023 for only Tuesdays, Wednesdays and Thursdays within the determined AM peak (07:45 - 08:45) and PM peak (16:00 – 17:00), to ensure data was consistent with normal peak period traffic conditions.

The routes chosen for journey time evaluation are shown in Figure 2-2 and include:

- A4 (Bath Road) to A345 (Granham Hill) via Pewsey Road
- A346 - Port Hill to Salisbury Road via Herd Street and London Road
- B3052 (George Lane) to A4 (London Road)
- A4 (High Street) to A346 (Salisbury Road) via New Road and London Road

Note that journey times have been evaluated for both directions on each route.

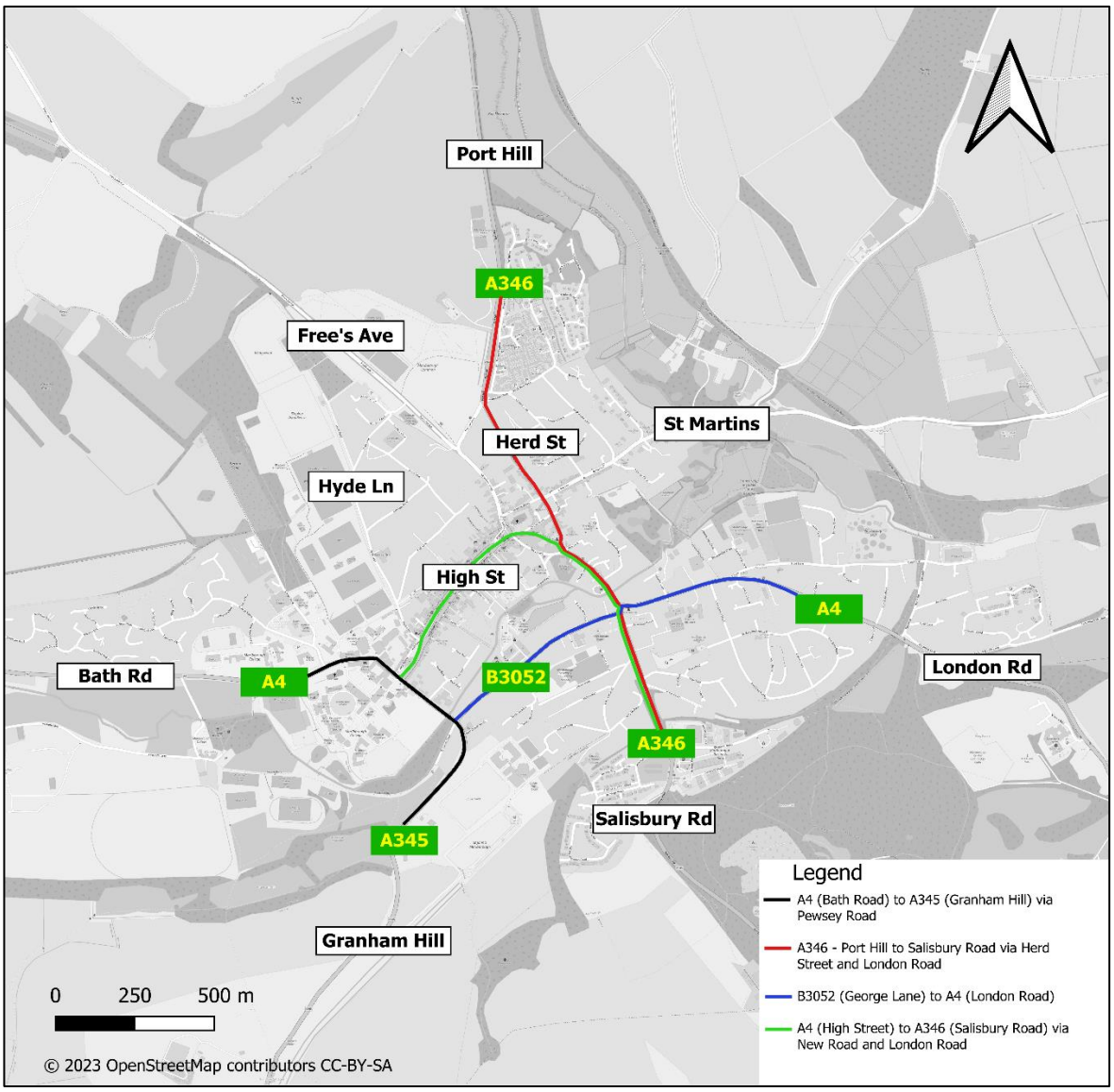

Figure 2-2 - Journey Time Routes

2.3 Additional Data

Stakeholders from Marlborough Town Council and Wiltshire Council provided additional information on the existing traffic situation and proposed transport related schemes in Marlborough.

2.3.1 Bus Service

Information on bus services including timetable/frequency information and bus routes was obtained from Wiltshire Council. This included eight conventional bus services with fixed routes and frequencies, and two demand responsive bus services without a structured frequency or route.

2.3.2 Traffic Speed Control

Wiltshire Council and Marlborough Town Council have provided information on existing and proposed speed control measures.

- Existing 40mph speed limit order along Frees Avenue and Hyde Lane
- Proposed traffic calming measures at Port Hill and Frees Avenue by introducing a 40mph speed limit zone between the national speed limit of 60mph and the 30mph speed limit on entrance into Marlborough in order to slow down incoming vehicles, ease the transition to a 30mph speed limit zone and improve safety within the town.
- Proposed extension of the 20mph speed limit in town centre as part of the Local Highway and Footway Improvement Groups (LHFIG) request. Areas under investigation for implementation include Port Hill, The Common, Herd Street, Back Lane, Hyde Lane, Pewsey Road, Granham Hill, George Lane, London Road, Salisbury Road, Bath Road, Cross Lane and St. John's Close

It is worth noting that the proposed speed control measures need to be 'self-enforcing'. As well as extending the 20mph speed limit zone, road narrowing and speed cushions could be considered. The carriageway narrowing could also lead to a widened footway area for public realm improvements/ walking and cycling facilities.

2.3.3 HGV Trips

Wiltshire Council provided information received from TJ Morris, operators of Home Bargains, about their expected changes to their HGV routes that travel through Marlborough. This anticipated reduction in Home Bargains HGVs has been factored into the model building exercise.

2.3.4 Proposed One-Way System

Marlborough Town Council and Wiltshire Council are proposing plans to limit traffic movement on The Parade to one-way movement allowing movement from the High Street into the central parking area. The plan involves the installation of No Entry signs and kerbed build outs to restrict traffic from the parking area from moving north towards the High Street. This section of The Parade would be one-way southbound only.

3. Modelling the Existing Situation

3.1 Introduction

This section details the process and outcome of modelling the existing situation, i.e., the 'base' model. This model has been validated using industry best practice, the Department for Transport's Transport Analysis Guidance (TAG), to ensure that it is a good representation of the existing situation. The full details of the TAG criteria and the base model validation results benchmarked against the criteria is available in the study Technical Note. The model is verified to be fit for purpose and was be used to assess proposed interventions.

3.2 Model Network

The extent of the microsimulation base model network is shown in Figure 3-1.

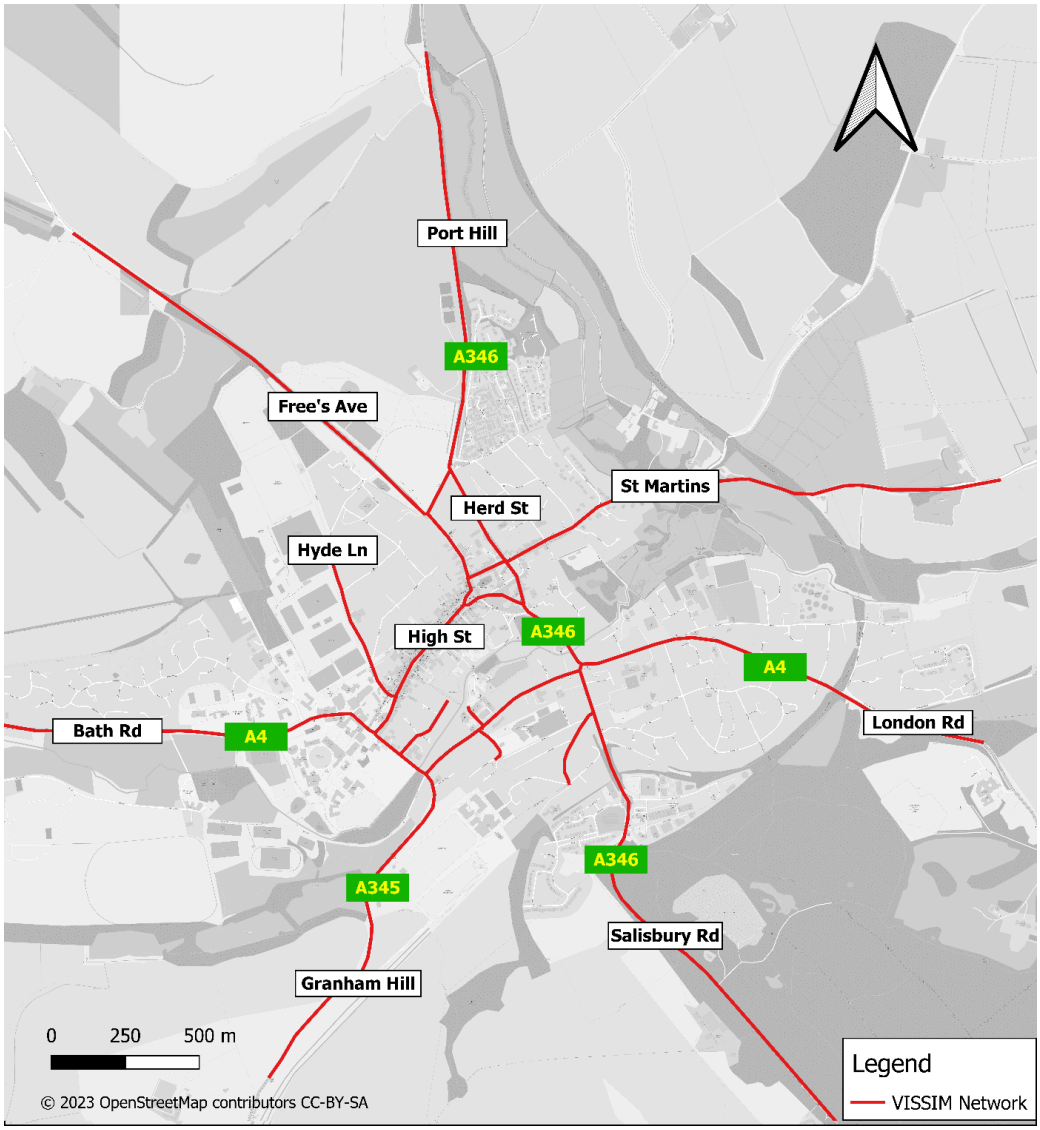

Figure 3-1 - Model Network

3.3 Base Model Results

Model runs cover the AM and PM peak hour periods (AM = 07:45 - 08:45, PM = 16:00 - 17:00). These peak hours were determined by an analysis of empirical traffic counts (discussed in section 2.1) which identified the busiest hour within each peak period (AM = 7:00 - 10:00, PM = 16:00 - 19:00).

Each separate model run recreates a representation of the operation of traffic within the network. Figure 3-2 and Figure 3-3 show screenshots of the base model in operation for the AM and PM peak hours. Average speed is used as a measure to denote the traffic flow situation. A lower average speed denotes greater congestion levels as vehicles will not be able to move quickly through the network while greater average speed denotes less congestion as vehicle flow freely though the network and are able to achieve higher travel speeds.

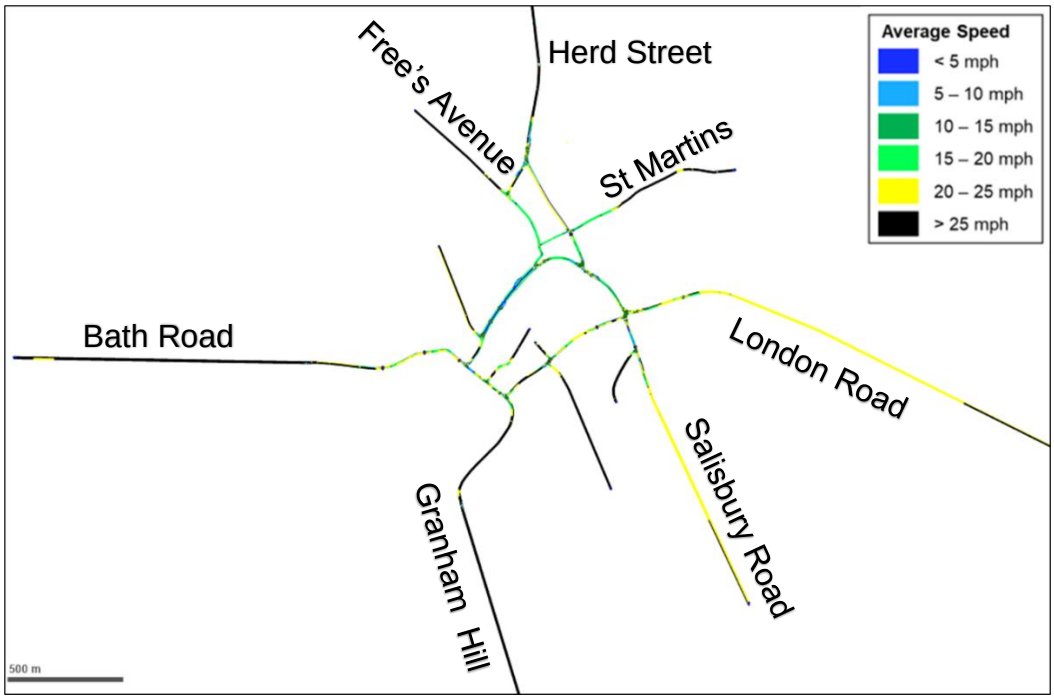

Figure 3-2 – 2023 Base AM – Marlborough Town Centre

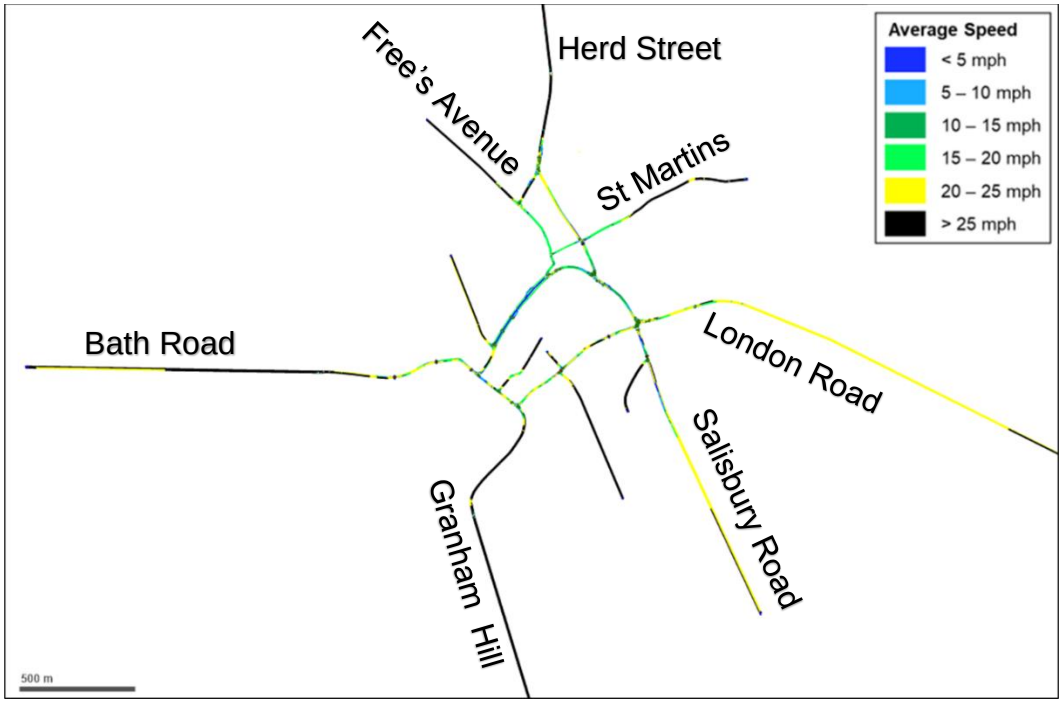

Figure 3-3 – 2023 Base PM – Marlborough Town Centre

Currently, most traffic uses the A346 (Port Hill, Herd Street, London Road and Salisbury Road) when travelling north and south through the town. This route is particularly congested, especially given the proportion of HGVs and the use of mini roundabouts to separate conflicting movements at the major junctions along the route.

4. Development of Interventions

4.1 Option Development and Assessment

The section details the intervention options that have been proposed and those which have been assessed using the microsimulation models.

Following a series of meetings with Marlborough Town Council and Wiltshire Council officers, site visits and analysis of the traffic data, a longlist of 21 proposed intervention options (16 fundamental options and five complementary options) was developed by project team and stakeholders (Appendix A). These options on the longlist could be taken individually or strategically combined with one another to come up with a proposed intervention to alleviate the traffic congestion Marlborough.

A high-level assessment of the longlisted options against the scheme aims was completed. Six factors were used for the Multi-Criteria Assessment Framework (MCAF) evaluation as listed below:

1. Traffic flow resilience – To improve traffic flow resilience around the Town centre.
2. Air Quality – To improve air quality in the Town centre.
3. Active Travel Provision – To retain or improve active travel provision for walking, wheeling and cycling.
4. Collision Reduction – To reduce traffic collisions and improve safety.
5. Bus Service – To maintain or improve bus service provision.
6. Other Impact – Deliverability, Cost, Public opinion, Practicality.

The first five factors outline the five objectives of the scheme agreed upon by the stakeholders, while the sixth factor covers any other considerations on the feasible delivery of an option as an intervention.

Each factor was evaluated qualitatively against a 5-level scale of impact assessment criteria ranking as shown below in Table 4-1

Table 4-1: MCAF Impact Ranking

Strong Beneficial Impact	
Slight Beneficial Impact	
No/neutral Impact	
Slight Negative Impact	
Strong Negative Impact	

The project team, in consultation with the Marlborough Town Council and Wiltshire Council officers evaluated each option on the longlist and assessed them on the 5-level scale. An overview of the MCAF evaluation of the longlist and their locations around the town centre are shown in Table 4-2 and Figure 4-1 respectively. Full details of the criteria assessment are available in the detailed longlist provided in Appendix A.

Table 4-2: MCAF Option Longlist Evaluation

Options	Description	Traffic Flow resilience	Air Quality	Active Travel Provision	Collision Reduction	Bus Service	Other Impact
Option 1	Left turn ban from New Road						
Option 2	Signalise Barn Street/London Road/ New Road junction						
Option 3	The Parade One-Way Eastbound						
Option 4	The Parade One-Way Westbound						
Option 5	The Parade Partial Two-way						
Option 6	New Road One-Way						
Option 7	Signalise London Road/Salisbury Road with max. Land take						
Option 8	Signalise London Road/Salisbury Road with min. Land take						
Option 9	Signalise Bath Road/Pewsey Road/High Street junction						
Option 10	Signalise Herd Street/St Martins with Silverless entry only						
Option 11	Signalise Herd Street/St Martins with Silverless exit only						
Option 12	Parking restrictions on Pewsey Road						
Option 13	Priority giveaway along Pewsey Road with build-outs						
Option 14	Signalise Pewsey Road/Granham Hill/George Lane Junction						
Option 15	Change signal strategy at crossings to maximise traffic flow						
Option 16	Town centre gating strategy						
Option 17	20mph limit within Town Centre						
Option 18	Road space reallocation for improved Active travel provision						
Option 19	Designated Zebra Crossings at High Street						
Option 20	High Street Parking Improvement						
Option 21	Pedestrianisation of Hilliers Yard						

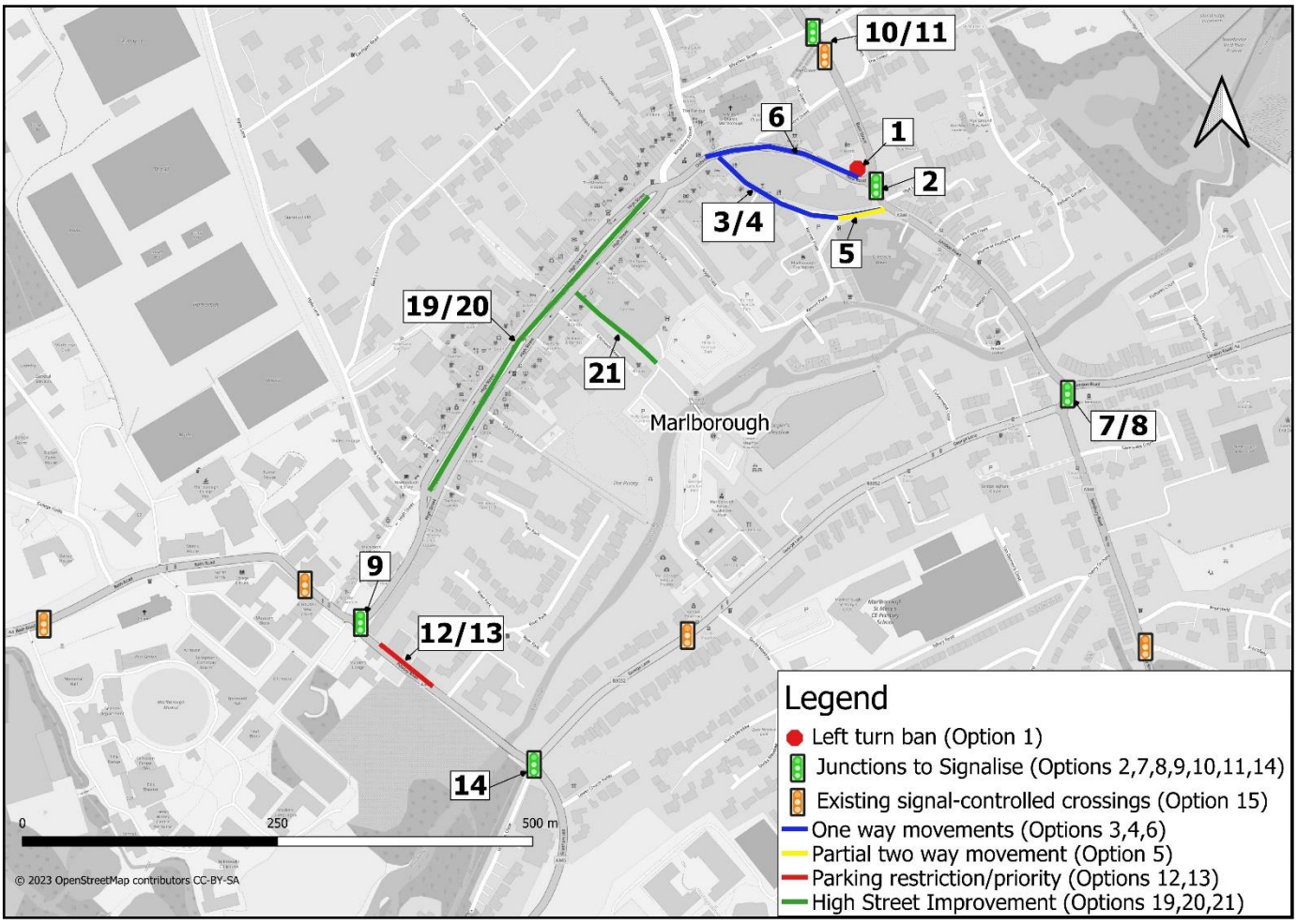

Figure 4-1: Location of Options across Marlborough Town Centre

4.2 Intervention Option Selection and Testing

After consideration and assessment of the 21 options on the longlist, three intervention options were selected as preferred choices for model testing. These three intervention options are made up of different combinations of the options listed on the longlist and were agreed by the project team and stakeholders to be evaluated using the validated microsimulation model. Each of these intervention options will be tested using the model in a future scenario for the year 2041.

In order to assess the impact of the intervention options selected, the base model is updated for the future year scenario for a future year of 2041 without any intervention and run to obtain the results for the traffic situation in the future. This forecast model for year 2041 without any intervention is referred to as the Do-Nothing scenario (2041 DN). The intervention options are then modelled for the same year 2041 with the interventions implemented in the model to compare with the Do-Nothing scenario. These models which include the intervention options are referred to as the Do-Something scenario (2041 DS1, 2041 DS2 and 2041 DS3). The components of these three intervention options are detailed below:

- **1st Intervention (2041 DS1)** – a combination of Option 2 – Barn Street/London Road/New Road signal control junction, Option 5 – The Parade Partial Two-way and Option 8 – London Road/George Lane/Salisbury Road signal control junction (with minimum land take), as it focuses on easing movement on the North-South corridor.

- **2nd Intervention (2041 DS2**) – a combination of Option 2 – Barn Street/London Road/New Road signal control junction with a controlled crossing point on the Barn Street and New Road arms to replace the existing uncontrolled crossing points, Option 5 – The Parade Partial Two-way and Option 12 – Introduce No Waiting Restriction (7am – 10am to 3pm – 7pm) on Pewsey Road i.e., 'Removal' of existing parking provision. This will be tested with a high pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction.

- **3rd Intervention (2041 DS3)** – a combination of Option 2 – Barn Street/London Road/New Road signal control junction with a controlled crossing point on the Barn Street and New Road arms to replace the existing uncontrolled crossing points, Option 5 – The Parade Partial Two-way and Option 12 – Introduce No Waiting Restriction (7am – 10am to 3pm – 7pm) on Pewsey Road i.e., 'Removal' of existing parking provision. This 3rd intervention will be tested with a low pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction as a sensitivity test to the 2nd intervention.

The decision was made to model the 1st intervention (2041 DS1) initially and review its results before proceeding with testing other interventions, as the 1st intervention model offered a useful indication of the effect of traffic signal operation on the network especially through the major North-South corridor on the A346. The model results were analysed and presented to the project team for discussion. Following the results, the decision was made to proceed by excluding Option 8 from the subsequent interventions. The 2nd and 3rd interventions were then modelled with the inclusion of Option 15 with varying degrees of pedestrian demand at the signal-controlled crossing points.

5. Intervention Model Testing and Comparison

5.1 Forecast Traffic Growth

To estimate the traffic flows in 2041, Trip End Model Presentation Programme (TEMPRO) v8.0 was used for cars and the 2022 National Road Traffic Projections (NRTP) was used for LGVs and HGVs. These sources provided the growth factors that were used to forecast the traffic flow within Marlborough town centre for the future scenario in the year 2041 to be used in the modelling.

5.2 2041 Do-Nothing (2041 DN)

The Do-Nothing (DN) scenario comprises of the 2023 base network with the 2041 forecast traffic flows. Figure 5-1 and Figure 5-2 show screenshots of the 2041 Forecast model (2041 DN) in operation for the AM and PM peak hours respectively.

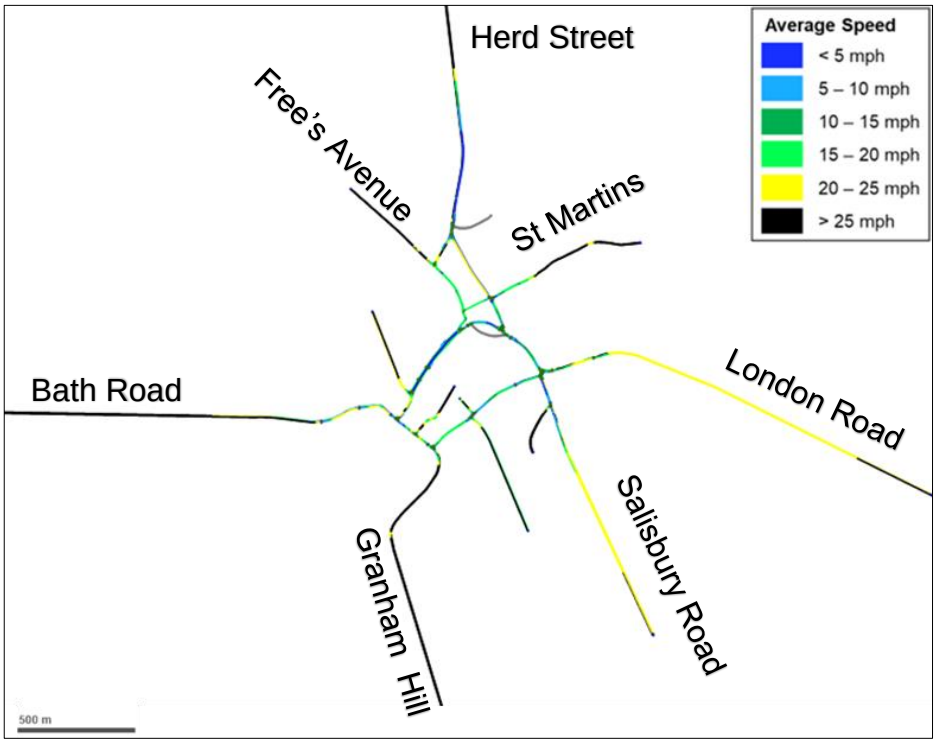

Figure 5-1 - 2041 DN for AM Peak – Marlborough Town Centre

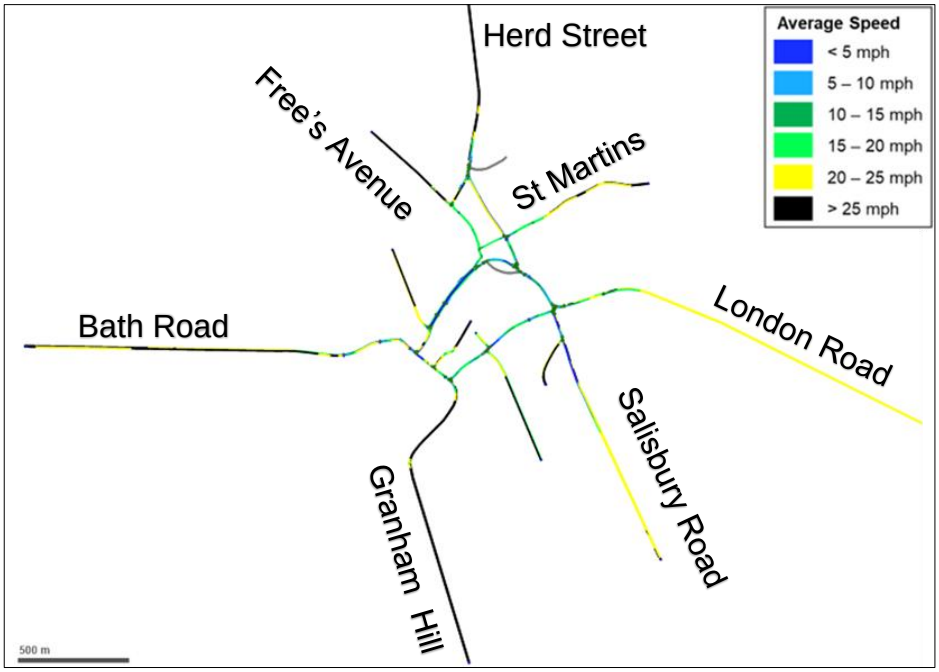

Figure 5-2 - 2041 DN for PM Peak – Marlborough Town Centre

The average speed plots show that the average speed reduces as the network gets busier in the 2041 DN model especially along Port Hill when compared with the Base model in Figure 3-2 and Figure 3-3. This is because of increased traffic on the network due to traffic growth between 2023 and 2041.

5.3 1st Intervention Model (2041 DS1)

Figure 5-3 and Figure 5-4 show the screenshots of the 2041 DS1 model in operation for the AM and PM peak hours respectively. With the introduction of the interventions in 2041 DS1 - a combination of Barn Street/London Road/New Road signal control junction, The Parade Partial Two-way and London Road/George Lane/Salisbury Road signal control junction (with minimum land take), there appears to be widespread reduction in average speed across the entire model network when compared to the 2041 DN scenario.

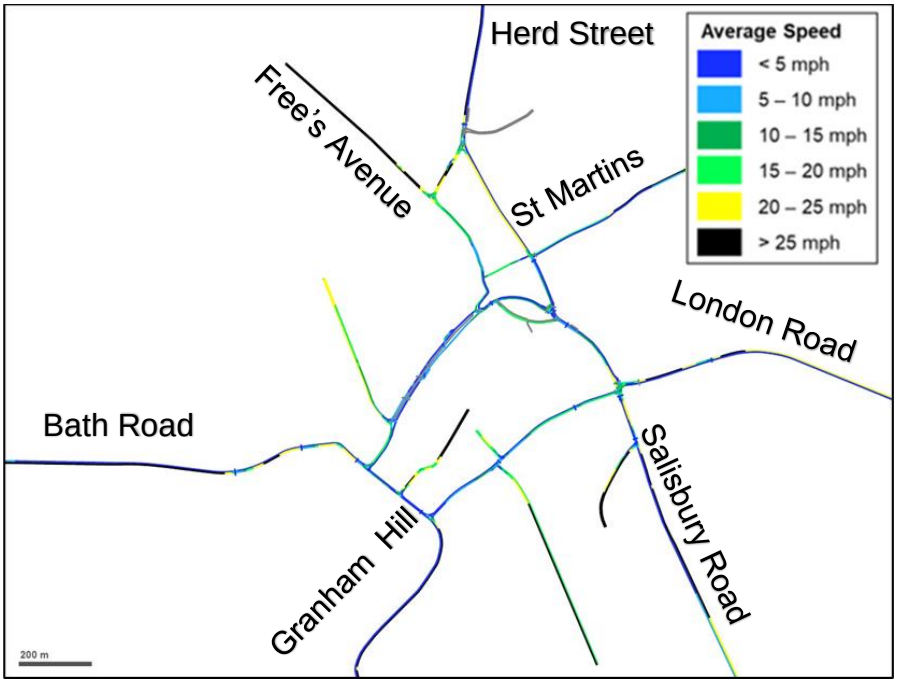

Figure 5-3 - 2041 DS1 for AM Peak – Marlborough Town Centre

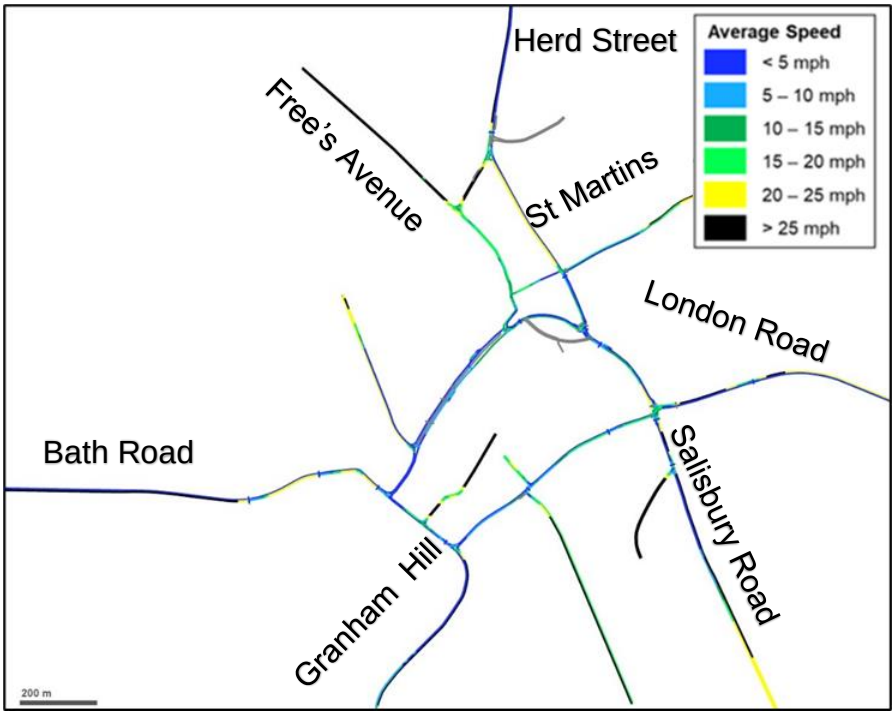

Figure 5-4 - 2041 DS1 for PM Peak – Marlborough Town Centre

This indicates that the traffic movement slows down due to a high rate of congestion making it difficult for vehicles to flow through the network. Within the model, it was observed that the introduction of signal controls at the two junctions, especially at the London Road/George Lane/Salisbury Road junction, led to the build-up of vehicle queues within the network which hindered free flow of traffic.

5.4 2nd Intervention Model (2041 DS2)

Figure 5-5 and Figure 5-6 show the screenshots of the 2041 DS2 in operation for the AM and PM peak hours respectively. The introduction of the interventions in 2041 DS2 - a combination of Barn Street/London Road/New Road signal control junction with a controlled crossing point on the Barn Street and New Road arms to replace the existing uncontrolled crossing points, The Parade Partial Two-way and Introducing No Waiting Restriction (7am – 10am to 3pm – 7pm) on Pewsey tested with a high pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction - has reduced the congestion across the entire model network compared to the 2041 DS1 scenario which increased the average network speed. However, it does not present a better overall outcome when compared to the 2041 DN scenario where no intervention is implemented. While there is some improvement in average speed along some routes, a greater reduction in average speed is observed along most others indicating that the overall congestion within the network has not been improved.

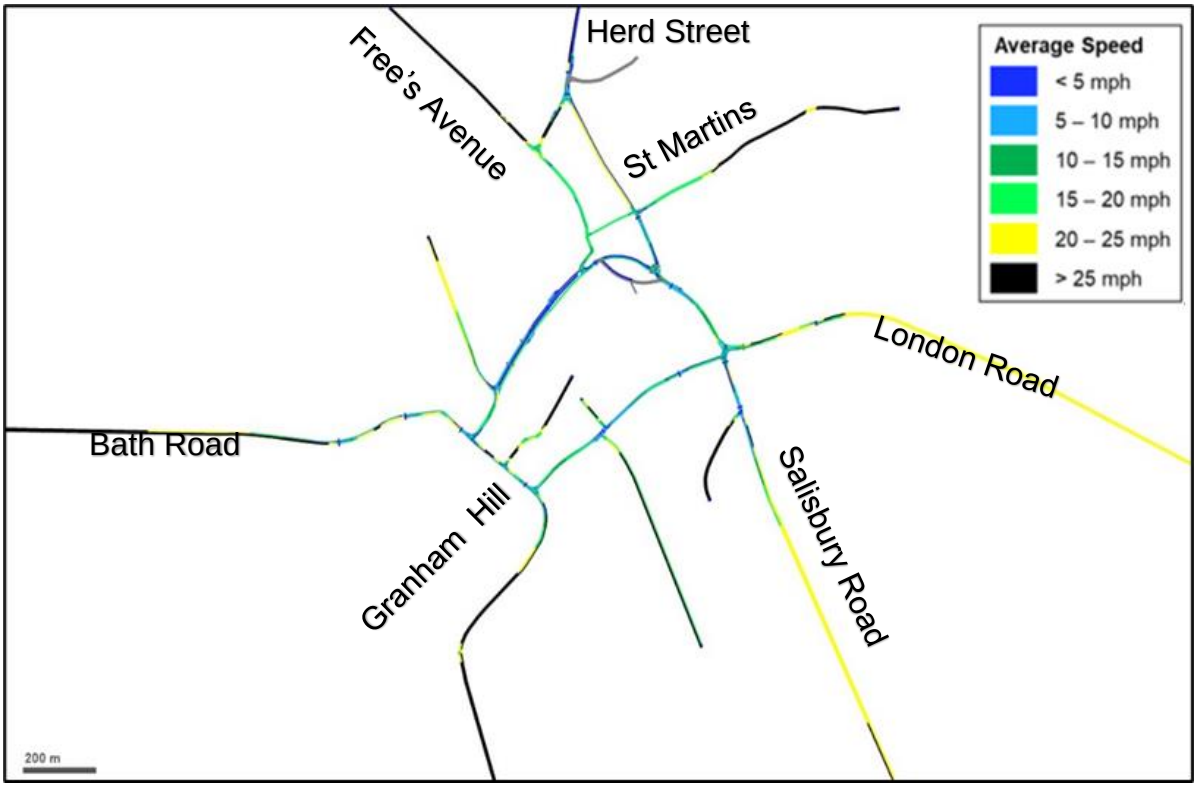

Figure 5-5 - 2041 DS2 for AM Peak– Marlborough Town Centre

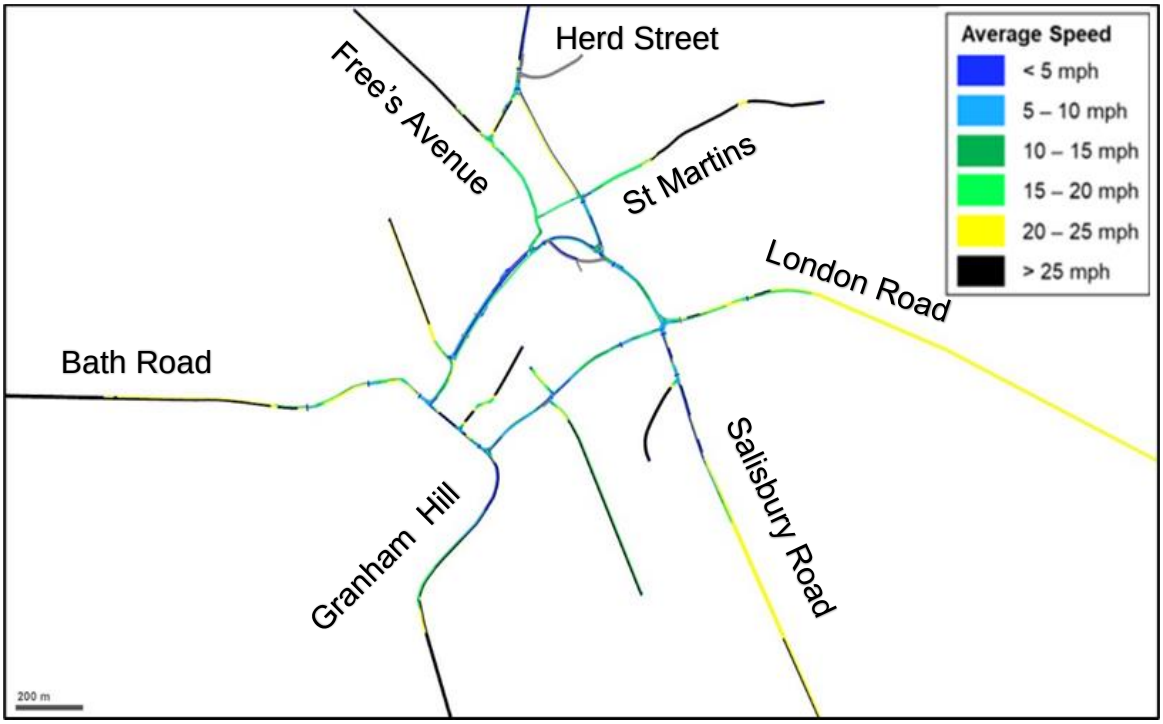

Figure 5-6 - 2041 DS2 for PM Peak – Marlborough Town Centre

5.5 3rd Intervention Model (2041 DS3)

The 2041 DS3 is a sensitivity test to the 2041 DS2 with a low pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction. This scenario was tested to account for the assumption that the junction is not a 'hot zone' for pedestrian movement and the crossings will likely not be used so often. Figure 5-7 and Figure 5-8 show the screenshots of the 2041 DS3 in operation for the AM and PM peak hours.

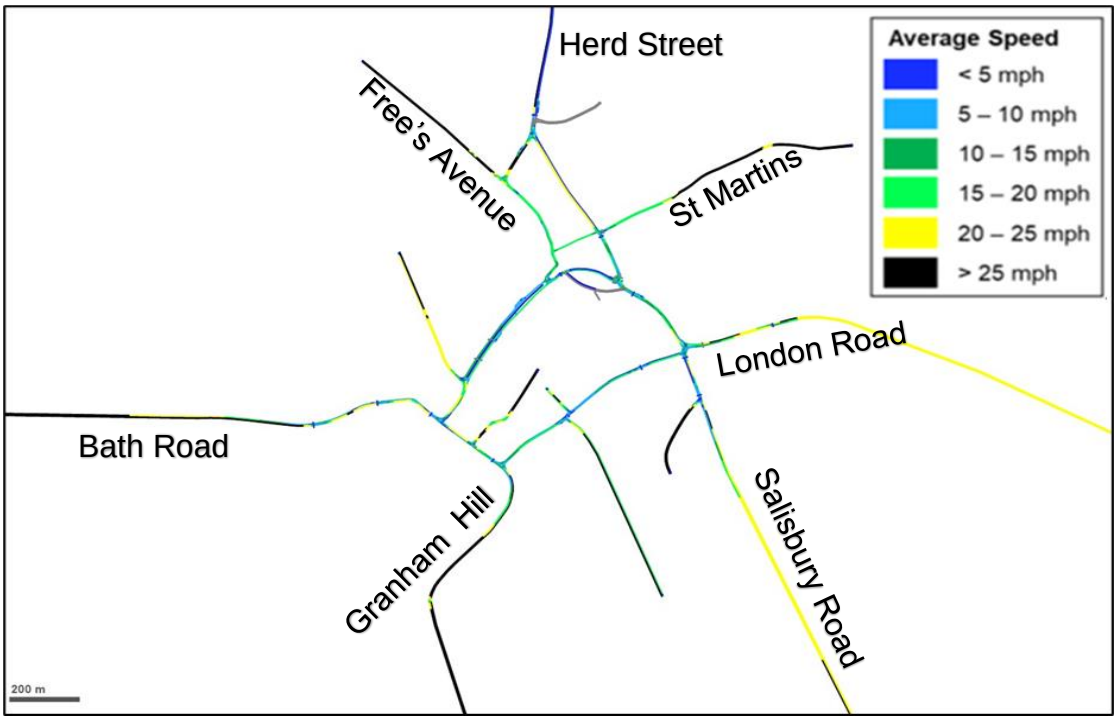

Figure 5-7 - 2041 DS3 for AM Peak – Marlborough Town Centre

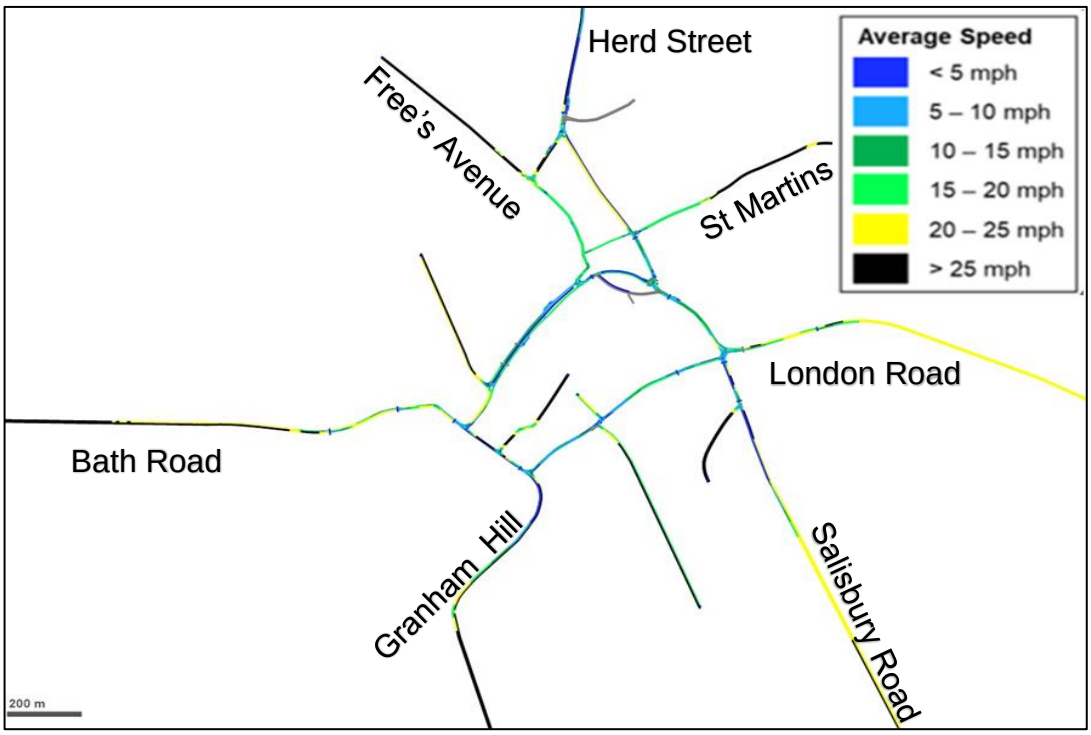

Figure 5-8 - 2041 DS3 for PM Peak – Marlborough Town Centre

With the low pedestrian demand, there appears to have been further increase in average network speed across the entire model network compared to the 2041 DS2 scenario. The reduced frequency of the pedestrian demand would result in less disruption to traffic movements which is expected to improve overall average speed. This however is not significantly better when compared to the 2041 DN scenario, where there are no interventions implemented. This will be further explained in the following section that highlights and compares in more detail the model results from each of the modelled scenarios.

5.6 Network Comparison

5.6.1 Network Performance

The network performance results parameters selected include average delay per vehicles, average speed per vehicles, total travel time by all vehicles, total delay, average and total stops and air quality parameters for Carbon dioxide (CO_2), Nitrogen Oxides (NO_x) and Particulate Matter (PM). The total stops are a measure of the number of times all vehicles stop within the model network while the average stops are the average number of times each vehicle stops within the model network. A higher number of total/average stops could indicate increased congestion on the network. Table 5-1 and Table 5-2 below provide an overview of the 2041 models' network performance results compared to the 2023 base model, for the AM and PM peaks respectively.

Table 5-1 - AM Network Performance Results

Parameter	2023 Base	2041 DN	2041 DS1	2041 DS2	2041 DS3
Average Delay (s)	76	136	530	187	162
Average Stops	4	9	17	11	10
Average Speed (mph)	19	15	4	12	13
Average Stopped Delay (s)	22	45	405	86	65

Parameter	2023 Base	2041 DN	2041 DS1	2041 DS2	2041 DS3
Total Travel Time (hr)	409	555	1,202	644	597
Total Delay (hr)	132	252	1,007	355	302
Total Stops	24,879	57,400	116,042	72,826	66,615
Carbon dioxide (CO_2) (g)	2,637,949	2,608,001	2,521,870	2,725,262	2,696,648
Nitrogen Oxides (NO_x) (g)	2,485	952	1,414	1,073	1,022
Particulate Matter (PM) (g)	43	35	36	37	36

Table 5-2 - PM Network Performance Results

Parameter	2023 Base	2041 DN	2041 DS1	2041 DS2	2041 DS3
Average Delay (s)	85	134	752	246	193
Average Stops	4	8	21	13	11
Average Speed (mph)	19	16	4	12	14
Average Stopped Delay (s)	22	42	596	119	77
Total Travel Time (hr)	402	511	1,271	670	600
Total Delay (hr)	120	204	1,075	380	297
Total Stops	20,388	43,132	107,079	74,063	61,534
Carbon dioxide (CO_2) (g)	2,575,225	2,489,142	2,476,685	2,627,494	2,616,674
Nitrogen Oxides (NO_x) (g)	2,242	710	1,196	835	802
Particulate Matter (PM) (g)	40	33	34	34	35

Table 5-1 and Table 5-2 shows that 2041 DS1 network performance is significantly worse than the 2041 DN model due to a high rate of congestion making it difficult for vehicles to flow through the network. The network performance results of 2041 DS2 and DS3 are found to be better than that of 2041 DS1. However, the network performance for 2041 DS1, DS2 and DS3 appear to be worse than the performance in the 2041 DN model. For the air quality parameters (CO_2, NO_x and PM), the modelled results for the 2041 DN model show reduced emissions when compared to the 2023 Base model. Despite increased levels of traffic modelled for the future year 2041, this decrease may be attributed to the change of the future vehicle fleet assumed by the model to electric vehicles with zero tail-pipe emissions. There is some further reduction in the modelled CO_2 for the 2041 DS1 when compared to the 2041 DN. The Air Quality parameters for 2041 DS2 and DS3 appear to be worse than the modelled quantities in the 2041 DN model.

Figure 5-9 and Figure 5-10 illustrate the total travel time and total delay across the network for AM and PM peak hours across all modelled scenarios.

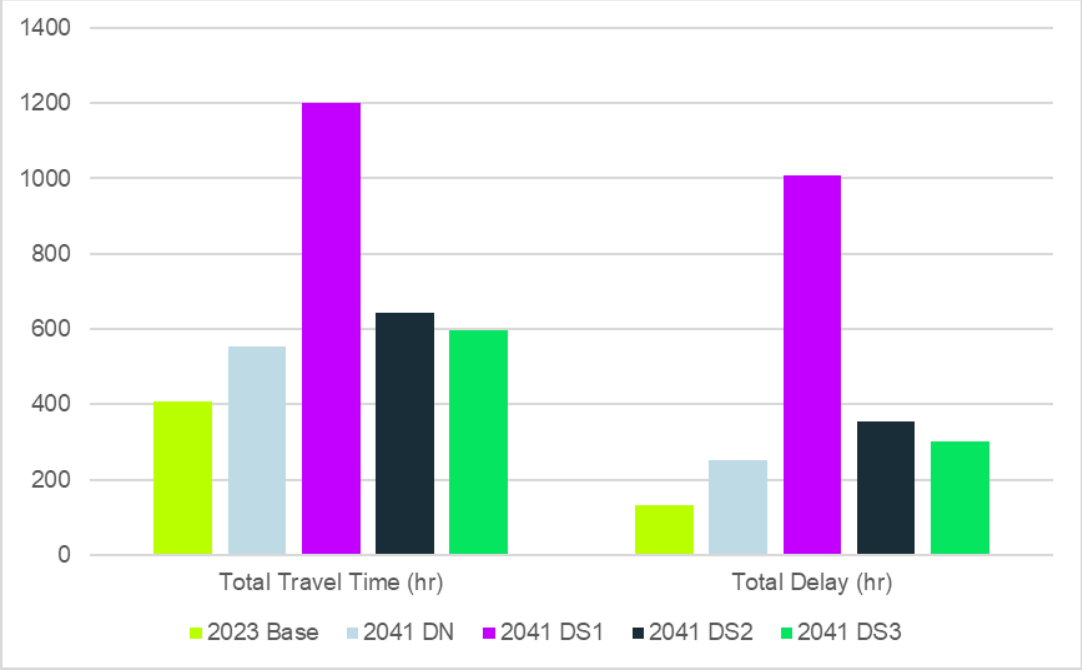

Figure 5-9 - AM Peak Model Results

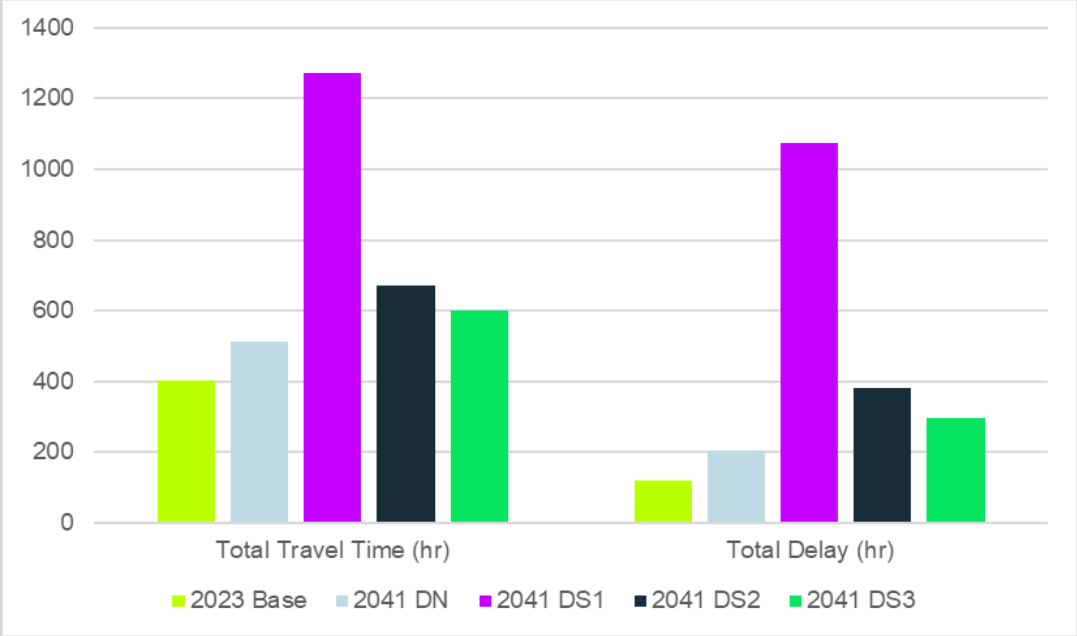

Figure 5-10 - PM Peak Model Results

As can be seen, the total travel time and the total delay for all three scenarios with intervention schemes implemented (2041 DS1, DS2 and DS3) are greater than the 2041 DN scenario which has no intervention schemes implemented. According to the modelling, this implies that the performance of the Marlborough town traffic network is likely to be worsened by the implementation of any of these interventions. More details about the journey time results of individual travel routes within the network can be seen below.

5.6.2 Journey Time Results

Table 5-3 shows the journey time routes for eight routes within the modelled network (four two-way routes). These journey time routes as stated in Section 2.2 were used for the base model validation as well as to evaluate the

effect of the interventions in the 2041 Do-Nothing and 2041 Do-Something Scenarios. The results are shown in Figure 5-11 and Figure 5-12 for both AM and PM peak hours respectively.

Table 5-3 - Journey Time Routes

Route	Direction	From	To
Route 1	Northbound	Granham Hill	Bath Road
Route 2	Southbound	Bath Road	Granham Hill
Route 3	Northbound	Salisbury Road	Port Hill
Route 4	Southbound	Port Hill	Salisbury Road
Route 5	Eastbound	George Lane	London Road
Route 6	Westbound	London Road	George Lane
Route 7	Eastbound	High Street	Salisbury Road
Route 8	Westbound	Salisbury Road	High Street

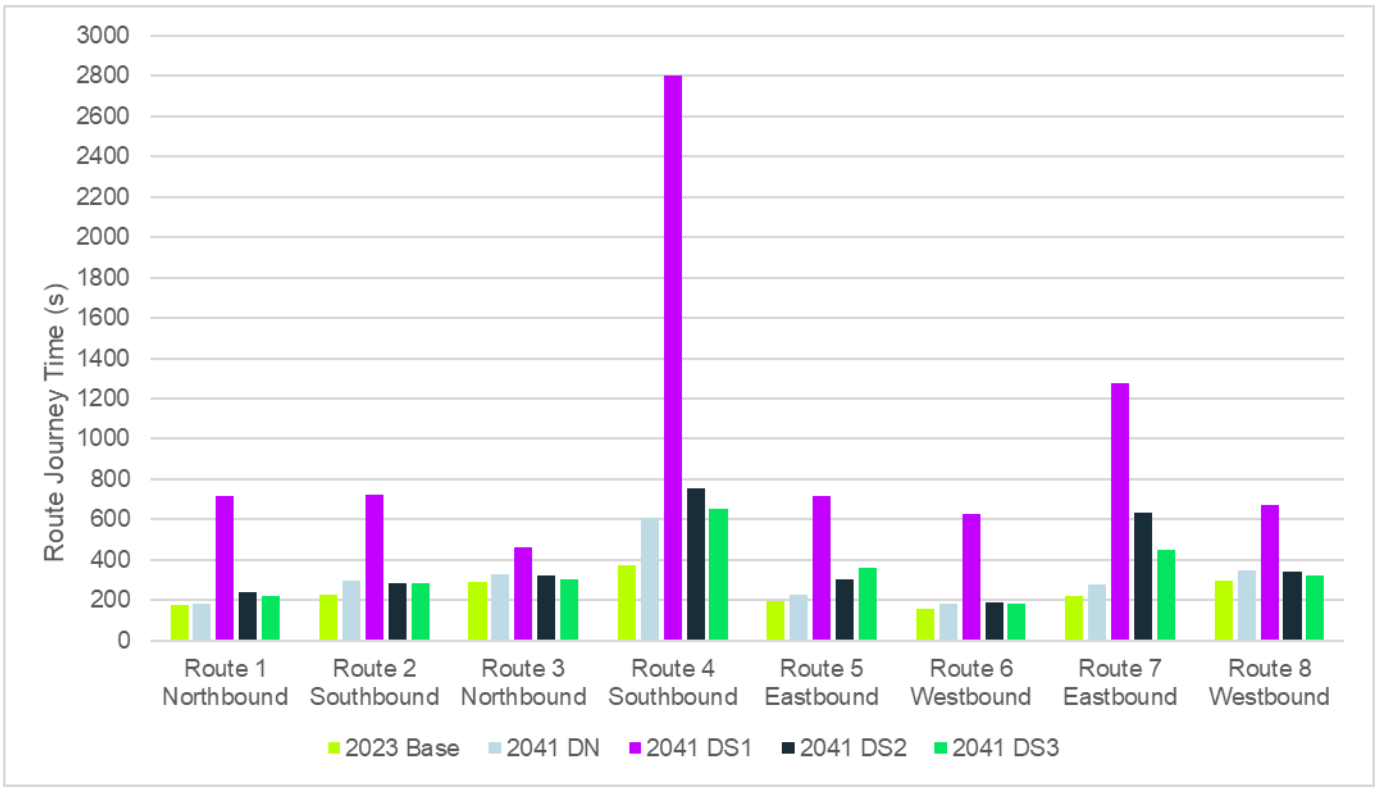

Figure 5-11 - AM Peak Journey Time Results

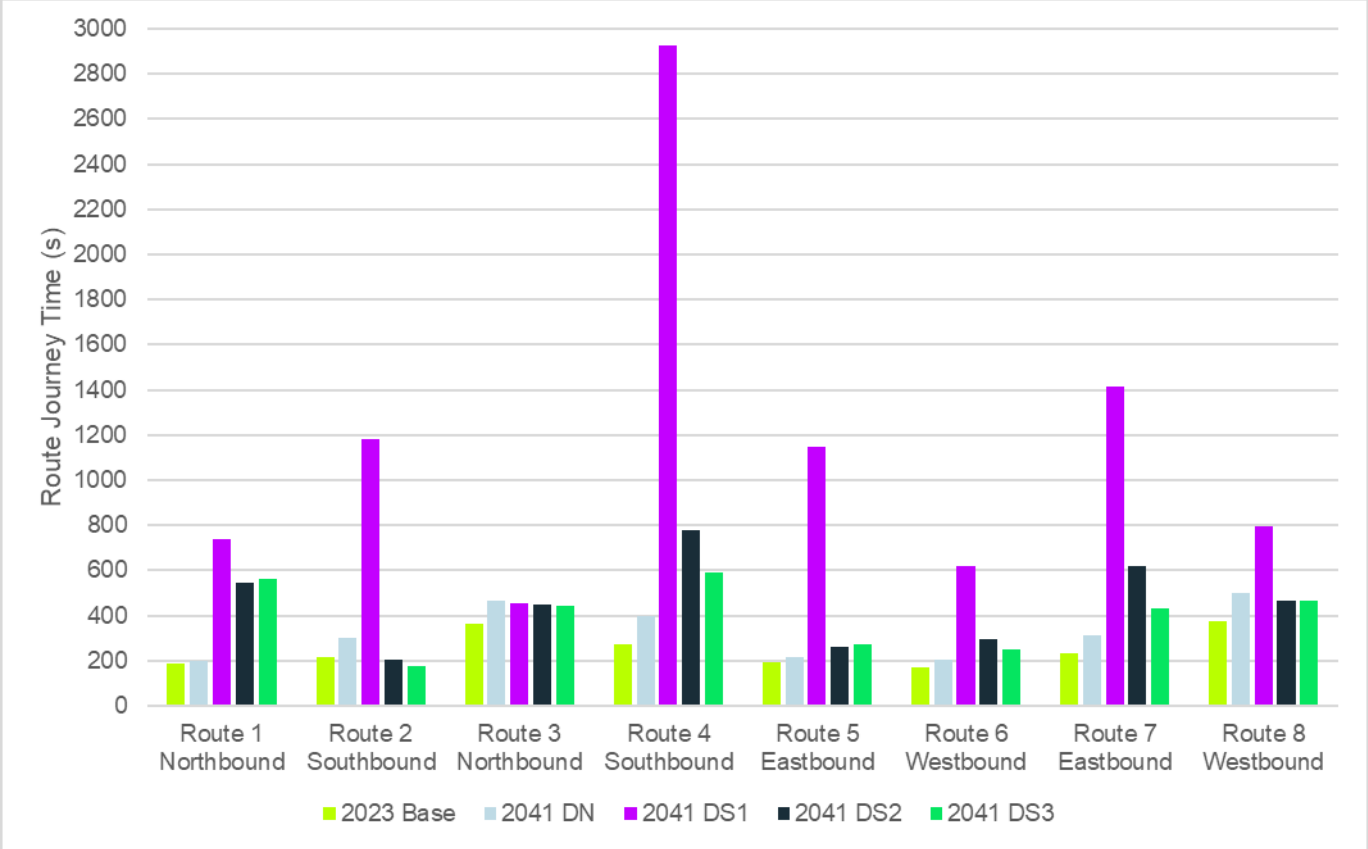

Figure 5-12 - PM Peak Journey Time Results

These results indicate that while all eight routes have increased journey times in the 2041 DS1 scenario when compared to the 2041 DN scenario, some routes show some decreased journey times in the 2041 DS2 and DS3 scenarios when compared to the 2041 DN scenario. Routes 2,3 and 8 for both the AM and PM peak show improved journey times with the implementation of the last two intervention schemes.

The improvement in journey time along Route 2 (Bath Road to Granham Hill) is due to the introduction of parking restrictions along Pewsey Road thereby removing the parked vehicles which previously introduced a pinch-point and slowed down southbound traffic during the peak periods. This allows vehicles to flow freely and move quicker through the route. This however has an opposite effect on the northbound traffic along Pewsey Road (Route 1). Without the pinch-point created by the parked vehicles, the free-flowing vehicles through Pewsey Road results in more vehicles from Pewsey Road approaching the Bath Road/Pewsey Road/High Street roundabout thereby introducing more queues for the northbound movement and increasing their journey time, especially in the PM peak period. Comparing the results from the two routes (northbound and southbound) in both peak periods, the net change showed an increase in the journey time along Pewsey Road due to the introduction of the parking restrictions.

The improvement in journey time along Route 3 (Salisbury Road to Port Hill) is due to the signal controls introduced at the Barn Street/London Road/New Road junction. The signal control allows the northbound movement not to be impeded by the vehicles moving from and to the side roads to the west (The parade and New Road). With the current roundabout, the northbound traffic would have to give way to traffic circulating within the roundabout. However, with signal control, the northbound movement is provided dedicated green light phase. This same effect is not observed in the southbound movement (Route 4) because there is no side road to the east of the junction. Therefore, with the current roundabout, the southbound movement experiences less disruptions due to giving way at the roundabout and flows more freely, however, the introduction of signal control disrupts the current “free flow” situation thereby increasing journey time for traffic moving along this route.

The improvement in journey time along Route 8 (Salisbury Road to High Street) is due to a similar reason for that of Route 3 explained previously. Traffic movements along Route 8 moves northbound then turn eastward to the High Street via New Road. The improvement in the northbound traffic along the A346 due to the signal controls, will equally be reflected along this route. This also means that the previously explained increased journey times experienced by the southbound traffic along the A346 (Route 4) would be experienced by traffic along Route 7 which moves from the High Street westward through New Road and then toward Salisbury Road via the Barn Street/London Road/New Road signal-controlled junction.

6. Conclusion and Next Steps

AtkinsRéalis has been commissioned by Wiltshire Council and Marlborough Town Council to conduct a traffic study in Marlborough town centre which considers options for improvements to mitigate current traffic issues, with supporting microsimulation modelling to test three selected intervention options. This study was necessitated by the seemingly volatile nature of the traffic network in Marlborough Town centre, which may be made worse by increased traffic volumes in the future.

The approach to assessing the impacts of the interventions was a forecast year microsimulation traffic modelling assessment between a future Do-Nothing scenario and the proposed intervention 'Do-Something' scenarios. A forecast year of 2041 was chosen to align with the Wiltshire Local Transport Plan, assuming the preferred intervention is implemented in 2026 with an additional 15 years of forecast traffic growth. The Do-Nothing scenario comprises of the 2023 base network setup with increased traffic for the 2041 forecast traffic flows.

The three intervention options considered as part of the study include the following:

- **1st Intervention (2041 DS1)** – a combination of:
  - Barn Street/London Road/New Road signal control junction,
  - The Parade Partial Two-way and
  - London Road/George Lane/Salisbury Road signal control junction (with minimum land take).

  This intervention focused on easing movement on the North-South corridor.
- **2nd Intervention (2041 DS2)** – a combination of:
  - Barn Street/London Road/New Road signal control junction with a controlled crossing point on the Barn Street and New Road arms to replace the existing uncontrolled crossing points,
  - The Parade Partial Two-way and
  - Introduce no waiting restriction (7am – 10am to 3pm - 7pm) on Pewsey Road i.e., 'Removal' of existing parking provision.

  This was tested with a high pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction.
- **3rd Intervention (2041 DS3**) – a combination of:
  - Barn Street/London Road/New Road signal control junction with a controlled crossing point on the Barn Street and New Road arms to replace the existing uncontrolled crossing points,
  - The Parade Partial Two-way and
  - Introduce No Waiting Restriction (7am – 10am to 3pm - 7pm) on Pewsey Road i.e., 'Removal' of existing parking provision.

  This 3rd intervention was tested with a low pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction as a sensitivity test to the 2nd intervention.

The VISSIM model assessment showed that with the introduction of the interventions in 2041 DS1, there appeared to be widespread reduction in average speed across the entire model network when compared to 2041 DN. A significant rise in journey times across almost all routes for 2041 DS1 was predicted by the model. This indicates that the traffic speed slowed down due to a high rate of congestion making it difficult for vehicles to flow through the network. The introduction of the London Road/George Lane/Salisbury Road signal arrangement incurred significant delays to the highway network and resulted in a bottleneck junction along the A346 corridor. This bottleneck obstructed the efficient operation of the signal controls at the Barn Street/London Road/New Road junction leading to severe delays and congestion along the A346 corridor, which propagated across the whole town centre network.

The network performance results of 2041 DS2 and DS3 were found to be better than that of 2041 DS1 except for the CO_2 component of the air quality emissions results. However, all the three network performance results showed overall worse results than the 2041 DN scenario. In the 2041 DS2 and DS3, an increase in journey times was predicted for five out of the eight routes which were used to validate the model.

These results indicated that while all eight routes have increased journey times in the 2041 DS1 scenario when compared to the 2041 DN scenario, Routes 2,3 and 8 for both the AM and PM peak showed improved journey times with the implementation of the last two intervention schemes.

The improvement in journey time along Route 2 (Bath Road to Granham Hill) was due to the introduction of parking restrictions along Pewsey Road thereby removing the parked vehicles which had introduced a pinch-point and slowed down southbound traffic during the peak periods. This allowed vehicles to flow freely and move quicker through the route. This provided a good indication that the parking restrictions on Pewsey Road would have some merit to improve the southbound movement. This however appeared to have an opposite effect on the northbound traffic along Pewsey Road (Route 1). Without the pinch-point created by the parked vehicles, the free-flowing vehicles through Pewsey Road resulted in more vehicles from Pewsey Road approaching the Bath Road/Pewsey Road/High Street roundabout thereby introducing more queues for the northbound movement and increasing their journey time, especially in the PM peak. Comparing the results from the two routes (northbound and southbound), the net change showed an increase in the journey time along Pewsey Road due to the introduction of parking restrictions.

There was a slight reduction in journey time for the northbound movement along the route from Salisbury Road to Port Hill for both 2041 DS2 and DS3 compared to 2041 DN. There was equally a reduction in journey time for the northbound traffic along the route from Salisbury Road to High Street via New Road in both 2041 DS2 and DS3 compared to 2041 DN for both peak periods. Whilst there was an increase in journey time for the southbound traffic between Port Hill and Salisbury Road along the A346 corridor, particularly during the evening peak period.

The improvement in journey time along Route 3 (Salisbury Road to Port Hill) and Route 8 (Salisbury Road to High Street) was due to the signal controls introduced at the Barn Street/London Road/New Road junction. The signal controls allow the northbound traffic not to be impeded by the vehicles moving from and to the side roads (The parade and New Road). With the current roundabout, the northbound traffic would have to give way to traffic circulating within the roundabout. However, with signal control, the northbound traffic was provided dedicated green light phase which improves its journey time. This same effect was not observed for traffic moving in the opposite direction (Route 4 and Route 7) because there is no side road to the east of the junction. Therefore, with the current roundabout, southbound traffic along the A346 experienced less disruptions due to giving way at the roundabout and flows more freely. However, the introduction of signal control disrupts the current “free flow” situation thereby increasing journey time for traffic moving along this route.

Table 6-1 gives a Multi-Criteria Assessment Framework (MCAF) comparison of the three interventions against the scheme objectives. As shown, none of the interventions were able to meet the scheme objectives. In conclusion, this study has demonstrated that the volatile traffic situation in Marlborough town centre is difficult to resolve through local improvements to the highway network within the town. It is therefore recommended that for long term improvement to the traffic situation in Marlborough town centre, interventions are required from a more strategic network management perspective.

Table 6-1 – MCAF Comparison of Interventions

	Scheme Objectives					Other Impacts
Intervention Description	**Traffic Flow Resilience**	**Improve Air Quality**	**Retain/Improve Active Travel Provision**	**Collision Reduction**	**Maintain/Improve Bus Service Provision**	**Deliverability (Cost, Public opinion, practicality etc)**
1st Intervention (2041 DS1) – a combination of Barn Street/London Road/New Road signal control junction, The Parade Partial Two-way and London Road/George Lane/Salisbury Road signal control junction (with minimum land take)	The provision of traffic signals can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346. Along the Parade where one-way system is implemented should have slow but steady traffic movement. Compared to the Do-Nothing scenario, results in greater congestion and reduction in average speed across the network due to blocking back from the southern junction. Due to the layout of the junction, signal control does not work more efficiently than the double mini roundabout. **Adverse effect vs 2041 Do Nothing with overall greater increase in journey times.**	Compared to the Do-Nothing scenario results in reduced Carbon dioxide emissions but greater increase in Nitrogen Oxides and Particulate matter emissions. Same when compared to the 2nd and 3rd Interventions. Less emissions than the Base year 2023 mostly due to predicted changes in vehicle fleet by 2041. **Small adverse effect vs 2041 Do Nothing for NOx and PM but with improved CO_2.**	The inclusion of traffic signals and slowing down of general traffic provides protected pedestrian and cyclist crossing facilities/ opportunities. One-way traffic streets are easier for pedestrians and cyclists to navigate and there may be scope for footway widening along The Parade. **Some opportunity to redefine the character of the town, promote more active travel and discourage through traffic.**	Signal control eliminates vehicle conflict points by providing dedicated time for each vehicle movement at junctions and allows protected crossing for active travel modes. Slower moving traffic also aids the reduction in collision severity where a collision does occur. There is however some potential for driving behaviour to become more aggressive due to frustrated drivers sitting in long queues of traffic. **Some potential to reduce occurrence and severity of collisions, although driver frustration could lead to more aggressive driving behaviour.**	No impact to routing of existing bus services along A346 but routes through The Parade would have to be reviewed to accommodate the one-way system. Bus journey times would be delayed by general increased journey times on the network due to congestion generated by both signalised junctions. Limited options for the use of a bus gate or bus lanes to mitigate this due to constraints. **Unacceptable impact upon bus journey times - option is not viable if this can't be addressed through other bus priority measures.**	High cost of implementing traffic signals at junctions and land take. Costs to implement the one-way system is dependent on enforcement measures. By leaving The Parade as a partial two-way could enable emergency vehicles to respond to emergency incidents in both directions. Given increased journey times and reduced average speed across the town centre when compared to the 2041 Do Nothing scenario, network resilience is reduced in the event of major incidents.
2nd Intervention (2041 DS2) – a combination of Barn Street/London Road/New Road signal control junction with a controlled crossing point on the Barn Street and New Road arms to replace the existing uncontrolled crossing points, The Parade Partial Two-way and introducing No Waiting Restriction (7am – 10am to 3pm – 7pm) on Pewsey Road i.e., 'Removal' of existing parking provision. This will be tested with a high pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction.	The provision of traffic signals can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346. Along the Parade where one-way system is implemented should have slow but steady traffic movement. Compared to the Do-Nothing scenario, results in slightly increased overall journey times across network. Reduced journey times for southbound traffic on Pewsey Road due to removal of pinch-point but increased journey times for northbound movement. Net change results in increased journey time along Pewsey Road. **Addresses key pinch-point but slight adverse effect vs 2041 Do Nothing with overall increase in journey times.**	Compared to the Do-Nothing scenario results in greater increase in Carbon dioxide, Nitrogen Oxides and Particulate matter emissions. Reduced Nitrogen Oxides and Particulate matter when compared to the 1st Intervention. Increased Carbon dioxide but reduction for other emissions than the Base year 2023 mostly due to predicted changes in vehicle fleet by 2041. **Small adverse effect vs 2041 Do Nothing across the measured emissions.**	The inclusion of traffic signals with controlled crossings and slightly lower average speeds compared to the 2041 Do Nothing scenario provides protected pedestrian and cyclist crossing facilities/ opportunities One-way traffic streets are easier for pedestrians and cyclists to navigate and there may be scope for footway widening along The Parade. Removing on-street parking provision will provide room for on-carriageway cycle movements. **Some opportunity to redefine the character of the town and promote active travel modes.**	Signal control eliminates vehicle conflict points by providing dedicated time for each vehicle movement at junctions and allows protected crossing for active travel modes. Slower moving traffic also aids the reduction in collision severity where a collision does occur. Removal of pinch point will result in elimination of potential conflict between opposite traffic streams on Pewsey Road while giving way to each other **Some potential to reduce occurrence and severity of collisions.**	No impact to routing of existing bus services along A346 but routes through The Parade would have to be reviewed to accommodate the one-way system. Bus journey times would be delayed by slightly reduced average speed and increased journey times on the network. Limited options for the use of a bus gate or bus lanes to mitigate this due to constraints. No bus routes along Pewsey Road so no impact from removal of pinch point. **Adverse impact upon bus journey times - option is not viable if this can't be addressed through other bus priority measures.**	High cost of implementing traffic signals at junction. Lower cost compared to 1st Intervention because of no land take and implementation at just one junction. Costs to implement the one-way system is dependent on enforcement measures. By leaving The Parade as a partial two-way could enable emergency vehicles to respond to emergency incidents in both directions. Expected resistance from affected residents for parking restrictions along Pewsey Road. Given increased journey times across the town centre when compared to the 2041 Do Nothing scenario, network resilience is reduced in the event of major incidents.

	Scheme Objectives					Other Impacts
Intervention Description	**Traffic Flow Resilience**	**Improve Air Quality**	**Retain/Improve Active Travel Provision**	**Collision Reduction**	**Maintain/Improve Bus Service Provision**	**Deliverability (Cost, Public opinion, practicality etc)**
3rd Intervention (2041 DS3) – a combination of Barn Street/London Road/New Road signal control junction with a controlled crossing point on the Barn Street and New Road arms to replace the existing uncontrolled crossing points, The Parade Partial Two-way and Introducing No Waiting Restriction (7am – 10am to 3pm – 7pm) on Pewsey Road i.e., 'Removal' of existing parking provision. This will be tested with a low pedestrian demand at the proposed signal-controlled crossings at New Road/Barn Street/London Road junction as a sensitivity test to the 2nd intervention.	Compared to the Do-Nothing scenario, results in slightly increased overall journey times across network. However, results in slightly decreased overall journey times when compared to the 2nd Intervention. Reduced journey times for southbound traffic on Pewsey Road due to removal of pinch-point but increased journey times for northbound movement. Slightly less increase when compared to 2nd intervention however, net change results in increased journey time along Pewsey Road. **Addresses key pinch-point but slight adverse effect vs 2041 Do Nothing with overall increase in congestion and journey times**. **Slightly better results than 2nd Intervention.**	Compared to the Do-Nothing scenario results in greater increase in Carbon dioxide, Nitrogen Oxides and Particulate matter emissions. Reduced Carbon dioxide and Nitrogen Oxides when compared to the 2nd Intervention with no net change in Particulate Matter. Increased Carbon dioxide but reduction for other emissions than the Base year 2023 mostly due to predicted changes in vehicle fleet by 2041. **Small adverse effect vs 2041 Do Nothing across the measured emissions.**	Not much difference in active travel facility provision compared the 2nd Intervention. This intervention provides the same facilities with reduced pedestrian demand at the controlled crossings. **Some opportunity to redefine the character of the town and promote active travel modes.**	Similar to 2nd Intervention with reduced conflict points due to intervention facilities. Reduced pedestrian demand at provided controlled crossing could indicate pedestrians are crossing at other locations thereby introducing new potential conflict points. **Some potential to reduce occurrence of collisions - new potential conflict points can be mitigated by analysing pedestrian desire lines within town centre.**	Compared to 2nd Intervention, improved journey times on network will improve bus journey times. Reduced demand at signals will also improve bus movement through the junction. Compared to 2041 Do Nothing scenario, bus journey times are still adversely impacted by this intervention. **Adverse impact upon bus journey times - option is not viable if this can't be addressed through other bus priority measures.**	Similar to 2nd Intervention above.

Strong beneficial impact
Slight beneficial impact
No / neutral impact
Slight Negative impact
Strong Negative impact

APPENDICES

Appendix A. Option Long List

Option			Scheme Aims										Other		
			Traffic Flow Resilience		Improve Air Quality		Retain/Improve Active Travel Provision		Collision Reduction		Maintain/Improve Bus Service Provision		Deliverability (Cost, Public opinion, practicality etc)		Overview Summary
No	Name	Description	Impact	Notes	Impact	Notes	Impact	Notes	Impact	Notes	Impact	Notes	Impact	Notes	
Fundamental Traffic Management Options															
1	Ban left turn movement from New Road to A346 Herd Street	Divert northbound vehicles and HGVs from High Street through Kingsbury Street, through the Common and then to PortHill Additional measures may be needed to mitigate traffic impacts (e.g. crossings, parking management, street improvements on diversion route)	Slight beneficial impact	The diversion of vehicles through Kingsbury Street will remove the left turn traffic entering the A346 Herd Street, this will help to create Slow and steady traffic along this important north-south corridor.	Slight beneficial impact	The left turning traffic into Kingsbury Street does not need to giveaway as they have priority as a through movement. Reduces instances of stop-start congestion at the A346 Herd Street/New Road roundabout which may improve air quality.	No / neutral impact	Seemingly easier for pedestrians and cyclists to navigate around the New Road-London Road junction as vehicles are banned from turning left.	Strong Negative impact	3 slight collisions are reported along Kingsbury Street. There could be an increase in collisions due to the increased traffic through diversion.	Slight Negative impact	Can impact bus punctuality as the bus route will need to be reviewed and altered	Slight Negative impact	There are on-street parking provision along Kingsbury Street for local residents. The carriageway width may need to be widened at certain locations to accommodate the increased traffic demand.	While the measure can reduce the traffic load on the New Road-London Road -A346 junction, the diverted route brings an uncertainty of safety risks and how well the network resilience will work for the diverted route.
2	Barn Street/London Road/New road signal control junction (including The Parade)	Replace Mini-roundabout with signal controls for vehicles and pedestrians. This measure would require a reduced Kerb radius on the junction and the possibility of a widened footpath on London Road Westside.	Strong beneficial impact	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong beneficial impact	Provision of protected pedestrian and cyclist crossing facilities	Strong beneficial impact	Eliminates vehicle conflict points. Allows protected crossing for active travel modes	No / neutral impact	No impact to routing of existing bus services. Bus journey times may be interrupted by signals. Impact might be mitigated by overall improved journey times	Strong beneficial impact	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak).	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346. Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak). Potential objection to placing traffic signals in historic street environment.
3	The Parade One-Way Eastbound	One-way eastbound on The Parade. Additional measures may be needed to mitigate traffic impacts (e.g. crossings, parking management, street improvements) Other additional traffic calming measures can be introduced like stone pavings to indicate a pedestrian area & reduced carriageway width.	Slight beneficial impact	Locations where one-way system is implemented should have slow but steady traffic movement.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Slight beneficial impact	Seemingly easier for pedestrians and cyclists to navigate one-way traffic streets as there maybe scope for footway widening	No / neutral impact	No collisions along these locations recorded over the past 5 years. No impact by introduction of one-way	Slight Negative impact	Can impact bus punctuality as the bus route will need to be reviewed and altered	Slight Negative impact	Costs to implement the one-way system is dependent on enforcement measures. This measure could have some delay impact on the Emergency Vehicles who need to travel westbound to response to emergency incidents.	Engagement with bus operator is required to agree the bus route. This measure could have some delay impact on the Emergency Vehicles who need to travel westbound to response to emergency incidents.
4	The Parade One-Way Westbound	One way westbound on The Parade Additional measures may be needed to mitigate traffic impacts (e.g. crossings, parking management, street improvements) Other additional traffic calming measures can be introduced like stone pavings to indicate a pedestrian area & reduced carriageway width.	Slight beneficial impact	Locations where one-way system is implemented should have slow but steady traffic movement.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Slight beneficial impact	Seemingly easier for pedestrians and cyclists to navigate one-way traffic streets as there maybe scope for footway widening	No / neutral impact	No collisions along these locations recorded over the past 5 years. No impact by introduction of one-way	Slight Negative impact	Can impact bus punctuality as the bus route will need to be reviewed and altered	Slight Negative impact	Costs to implement the one-way system is dependent on enforcement measures. This measure could have some delay impact on the Emergency Vehicles who need to travel eastbound to response to emergency incidents.	Engagement with bus operator is required to agree the bus route. This measure could have some delay impact on the Emergency Vehicles who need to travel eastbound to response to emergency incidents.
5	The Parade Partial Two-way	One-way westbound on The Parade to the west of The Parade Mews, the East of the Parade Mews is to remain as a two way towards A346. Additional measures may be needed to mitigate traffic impacts (e.g. crossings, parking management, street improvements) Other additional traffic calming measures can be introduced like stone pavings to indicate a pedestrian area & reduced carriageway width.	Strong beneficial impact	Locations where one-way system is implemented should have slow but steady traffic movement. By having a two-way after the car park towards the A346 will enable vehicle flexibility to take a U-turn and the Emergency Vehicles to go out in any direction through the Parade.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Slight beneficial impact	Seemingly easier for pedestrians and cyclists to navigate one-way traffic streets as there maybe scope for footway widening	No / neutral impact	No collisions along these locations recorded over the past 5 years. No impact by introduction of one-way	Slight Negative impact	Can impact bus punctuality as the bus route will need to be reviewed and altered	Slight beneficial impact	Costs to implement the one-way system is dependent on enforcement measures. By leaving The Parade as a partial two-way could enable emergency vehicles to response to emergency incidents in both directions.	Engagement with bus operator is required to agree the bus route. By leaving The Parade as a partial two-way could enable emergency vehicles to response to emergency incidents in both directions.
6	New Road One-Way	The direction of one way system along the New Road will be pending on the scheme interventions at the Parade as set out under Options 3, 4 and 5.	Slight beneficial impact	Locations where one-way system is implemented should have slow but steady traffic movement.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Slight beneficial impact	Seemingly easier for pedestrians and cyclists to navigate one-way traffic streets as there maybe scope for footway widening	No / neutral impact	No collisions along these locations recorded over the past 5 years. No impact by introduction of one-way	Slight Negative impact	Can impact bus punctuality as the bus route will need to be reviewed and altered	Slight Negative impact	Costs to implement the one-way system is dependent on enforcement measures.	Engagement with bus operator is required to agree the bus route.
7	London Road/George Lane/Salisbury Road signal control junction	Replace double mini roundabouts with signalised 4-arm junction (Staggered Junction with Land Take)	Strong beneficial impact	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong beneficial impact	Provision of protected pedestrian and cyclist crossing facilities	Strong beneficial impact	Eliminates vehicle conflict points. Allows protected crossing for active travel modes	No / neutral impact	No impact to routing of existing bus services. Bus journey times may be interrupted by signals. Impact might be mitigated by overall improved journey times	Slight beneficial impact	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak). Possibility to coordinate with Options 1-6 to enable N/S green wave or platooning and improved network performance. The increased Land Take will cost more.	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak). Potential objection to placing traffic signals in historic street environment. Flexible and safer route choices.
8	London Road/George Lane/Salisbury Road signal control junction	Replace double mini roundabouts with signalised 4-arm junction (Staggered Junction with Minimum or no Land Take)	Strong beneficial impact	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong beneficial impact	Provision of protected pedestrian and cyclist crossing facilities	Strong beneficial impact	Eliminates vehicle conflict points. Allows protected crossing for active travel modes	No / neutral impact	No impact to routing of existing bus services. Bus journey times may be interrupted by signals. Impact might be mitigated by overall improved journey times	Strong beneficial impact	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak) Possibility to coordinate with Options 1-6 to enable N/S green wave or platooning and improved network performance.	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak). Potential objection to placing traffic signals in historic street environment. Flexible and safer route choices. This option aims to address the space constraints for the unconventional layout and reduce land take as much as possible.
9	Bath Road/Pewsey Road/High Street signal control junction	Replace Mini-roundabout with signal controls for vehicles and pedestrians	Strong beneficial impact	Allocated vehicle phases prevents gridlock at junction and improves flow on arm(s) with higher volumes while providing protected entry for lower volume arms	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong beneficial impact	Provision of protected pedestrian and cyclist crossing facilities	Strong beneficial impact	Eliminates vehicle conflict points. Allows protected crossing for active travel modes	No / neutral impact	No impact to routing of existing bus services. Bus journey times may be interrupted by signals. Impact might be mitigated by overall improved journey times	Strong Negative impact	While the signalisation of the junction can have a positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak), there are technical challenges to find suitable locations for signal head and stop line placement. There is also a carriageway level difference between the existing carriageway and footway, where there is a barrier and wall separation.	Technically challenge to add signal heads and stop lines despite the probable benefits.

Option			Scheme Aims										Other		
			Traffic Flow Resilience		Improve Air Quality		Retain/Improve Active Travel Provision		Collision Reduction		Maintain/Improve Bus Service Provision		Deliverability (Cost, Public opinion, practicality etc)		Overview Summary
No	Name	Description	Impact	Notes	Impact	Notes	Impact	Notes	Impact	Notes	Impact	Notes	Impact	Notes	
Fundamental Traffic Management Options															
10	Herd Street/St Martins/Barn Street signal control junction (Silverless one-way entry)	Include signal controls for vehicles and pedestrians at the junction. Silverless remains with one way eastbound toward the junction with less green time.	Slight beneficial impact	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346. By having Silverless Street as a one-way entry adds a traffic phase to the signal cycle time.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong beneficial impact	Provision of protected pedestrian and cyclist crossing facilities	Strong beneficial impact	Eliminates vehicle conflict points. Allows protected crossing for active travel modes	No / neutral impact	N/S Bus journey times may be interrupted by pedestrian signals. Bus journey times may be improved by reduced queue on St Martins. No impact on service routing.	Slight beneficial impact	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak) Potential High Cost Possibility to coordinate with Options 1-8 to enable N/S green wave or platooning and improved network performance	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346. Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak)
11	Herd Street/St Martins/Barn Street signal control junction (Silverless one-way exit)	Include signal controls for vehicles and pedestrians at the junction. Silverless becomes one way westbound away from junction.	Strong beneficial impact	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346. By having Silverless Street exit only would reduce a need for a traffic signal stage under the Method of Control which reduce the junction lost time.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong beneficial impact	Provision of protected pedestrian and cyclist crossing facilities	Strong beneficial impact	Eliminates vehicle conflict points. Allows protected crossing for active travel modes	No / neutral impact	N/S Bus journey times may be interrupted by pedestrian signals. Bus journey times may be improved by reduced queue on St Martins. No impact on service routing.	Slight beneficial impact	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak) Potential High cost Possibility to coordinate with Options 1-8 to enable N/S green wave or platooning and improved network performance	The provision of traffic signal can regulate the traffic entry from all approaches, priority can be provided for the important north-south corridor movement along the A346. Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak)
12	Parking restrictions on Pewsey Road	Double yellow lines to restrict on-street parking for full length of Pewsey Road to allow steady flow of two way traffic	Strong beneficial impact	Steady flow of two way traffic prevents queue build-up at adjacent junctions and allows junctions operate optimally	Strong beneficial impact	By having no waiting restrictions will remove the on-street parking 'pinch point'. Reduces instances of stop-start traffic will improve air quality.	Slight beneficial impact	By removing on-street parking provision will provide room for on-carriageway cycle movements.	Strong beneficial impact	The no waiting restrictions will remove the on-street parking 'pinch point', and the two opposite traffic streams will not need to give way to each other and eliminate the conflicts.	No / neutral impact	No impact to routing of existing bus services.	Slight Negative impact	By removing parking, there would be a public disagreement, especially along Pewsey Road residents who will be affected by this intervention.	Parking Restrictions would require parking space to be relocated nearby. The measure will also free up traffic flows along that route. The affected residential parties will have to be consulted.
13	Priority giveaway along Pewsey road	Road signs and build-outs with give-way lines, indicating traffic flow priority along Pewsey road due to parked vehicles. Priority given to southbound vehicles exiting Bath/High Street/Pewsey road junction	Slight beneficial impact	Priority rules prevent blocking of roadway due to obstruction of two way flow caused by parked vehicles	No / neutral impact	This intervention aims to formalise the current traffic arrangement with a clearly set out priority strategy. Minimal Impact to Air Quality	No / neutral impact	No impact on pedestrians and cyclists' movement	Slight beneficial impact	By having a priority rule and physical build out, the northbound traffic streams will give way to the southbound movements and effectively manage the conflict area.	No / neutral impact	No impact to routing of existing bus services.	Slight Negative impact	This measure would require the cost of adding buildouts, priority signs and enforcements. While a southbound movement is prioritised due to the higher flow from Bath Road, it is unknown if this priority would have some drawback on the wider network.	Parking space would be retained however there is a possibility that this measure could create queues down towards Granham Hill-George Lane junction.
14	Pewsey Road/Granham Hill/George Lane signal control junction	Replace the mini-roundabout with signal control to, overall, enable the signal coordination across the Marlborough Town Network.	Strong beneficial impact	By signalising Pewsey Rd-Granham Hill-George Lane Junction, the network coordination for the whole network can be done and traffic flow into Town Centre can be controlled.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong beneficial impact	Provision of protected pedestrian and cyclist crossing facilities	Strong beneficial impact	Eliminates vehicle conflict points. Allows protected crossing for active travel modes	No / neutral impact	No impact to routing of existing bus services. Bus journey times may be interrupted by signals. Impact might be mitigated by overall improved journey times	Slight beneficial impact	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak) Possibility to coordinate with other options to enable N/S & E/W green wave or platooning and improved network performance	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak). Potential objection to placing traffic signals in historic street environment.
15	Change signal strategy at all existing signalised crossings to maximise traffic flow green time	Increase the green time for vehicles at signalised crossings to reduce lost time and the emissions being produced as there is a more continuous flow.	Strong beneficial impact	Increasing the green time along the main route will allow for more vehicles to pass through during the busier periods.	Slight beneficial impact	Reduces instances of stop-start congestion which may improve air quality.	Strong Negative impact	Pedestrians and cyclists' wait at crossing point will increase	Strong Negative impact	Longer wait times at crossings could lead to impatience and dangerous crossing manoeuvres increasing collision likelihood	Strong beneficial impact	It is expected to have overall journey times improvement	Strong beneficial impact	This does not require any costs and can be easily implemented.	With increased vehicle green time, there will be better journey times overall however with decreased pedestrian green times, pedestrians and cyclists will have to wait longer.
16	Town centre gating strategy	Use signal controls to delay inflow of traffic into the town centre from all entry points. Also increase the green time for vehicles at signalised Junctions within town centre to progress the outflow of traffic from the town centre.	Strong beneficial impact	This measure will prevent over-capacity of the town network through signal coordination.	No / neutral impact	Reduces instances of stop-start congestion which may improve air quality in the town centre. However this might be offset by emissions due to increased queuing on town entry points.	No / neutral impact	No impact on pedestrians and cyclists' movement	No / neutral impact	There would be no impact on collision reduction.	Slight Negative impact	Bus journey times may be interrupted by signals.	Slight beneficial impact	Positive impact on network resilience allowing dynamic traffic control across different time periods (peak and off-peak). However, this is dependent on signalisation across the network.	By implementing a network-wide signal coordination, the chances of congestion & incoming queues would be increased but the traffic outflow can be controlled.
Complimentary Traffic Management Options - could form part of various fundamental options															
17	20mph limit within Town Centre	20mph on some or all roads within study area. LHFIG planned extension of 20mph areas	Slight beneficial impact	Will lead to an overall reduction in traffic speed, however issues with congestion/stop-start will remain during busy hours.	Slight beneficial impact	Slower vehicles emit less greenhouse gas emissions	Slight beneficial impact	Perception of safety might encourage more walking and cycling	Slight beneficial impact	No change in space allocation. However, some improvement to perception of safety due to slower moving traffic during off-peak hours.	Slight Negative impact	Limiting buses to 20mph may reduce bus journey times	No / neutral impact	No impact on network resilience but might likely have public disagreements.	Imposing 20mph zones within the Town centre would improve pedestrian safety, however may still not really reduce the overall congestion issue. Public consultation would be necessary
18	Road space reallocation for improved walking and cycling provision	Improving walking and cycling paths by reallocating road space to include walking paths, protected cycle track or advisory cycle lanes, such as The Parade, New Road and High Street	No / neutral impact	Little/no impact on traffic flow Might lead to reduced local traffic volumes due to more walking and cycling	Slight beneficial impact	Increase in use of active travel modes could lead to reduced car use and emissions	Strong beneficial impact	Increase in dedicated walking and cycling spaces results in increased active travel provision	Slight beneficial impact	Allocated walking and cycling spaces reduces conflict incidences between vehicles and pedestrians/cyclist, especially with protected cycle tracks	No / neutral impact	No impact to routing of existing bus services	Slight beneficial impact	Provides alternative modes of travel for network users	Potential objection to road space re-allocation by local residents
19	Designated Pedestrian Crossing at High Street	Providing designated zebra crossing point(s) for pedestrians on the High Street to improve safety due to large amount of footfall in the area	Slight Negative impact	Frequent use of the zebra crossing might result in traffic queue build-up on the High Street	Slight Negative impact	Minimal impact on congestion / traffic flow Possible impact in emissions due to stationary vehicles waiting at crossings	Strong beneficial impact	Increase in dedicated pedestrian crossing facilities results in increased active travel provision	Strong beneficial impact	Designated crossing point for pedestrians will provide safe crossing paths and reduce the incidence of collision occurrence and near misses	Slight Negative impact	Bus services might be delayed due to traffic queue build-up on the High Street	No / neutral impact	No impact on network resilience	Technically feasible. The Parking Arrangements and the route flexibility along High Street would be affected due to the addition of designated Parking crossing.
20	High Street Parking Improvement	Slightly raised/level separated parking spaces between carriageway at High Street	No / neutral impact	No impact on Traffic Flow Resilience	No / neutral impact	Minimal Impact to Air Quality	Strong beneficial impact	Safer walking and cycling environment on High Street	Strong beneficial impact	Physical separation of carriageway and parking space Easy recognition of roadway and safety consciousness for pedestrians and parked cars	No / neutral impact	No impact to routing of existing bus services.	No / neutral impact	No impact on network resilience. Potential High Cost. Technically feasibility to be considered.	This measure could help control the traffic speed, flow and pedestrian safety but requires costs for renovation.
21	Pedestrianisation of Hilliers Yard	Ban Car entry into High Street through Hilliers Yard and make Hilliers Yard a Pedestrian and Cyclist only street.	No / neutral impact	While no impact on Traffic Flow, resilience is expected. This measure prevents potential collision and congestion risks to other road users on High Street from Hilliers Yard.	No / neutral impact	Minimal Impact to Air Quality	Strong beneficial impact	Safer walking and cycling environment on Hilliers Yard	Slight beneficial impact	Collision risk between Hilliers Yard and High Street is reduced due to the removal of car entry.	No / neutral impact	No impact to routing of existing bus services.	Slight beneficial impact	Very minimal impact on network resilience. Potential costs due to enforcement. It can practically be implemented subject to public opinion.	This measure can improve the safety of pedestrians and cyclists travelling along Hilliers Yard and reduce the collision risk with cars but it would have negligible impact on the network.

Strong beneficial impact
Slight beneficial impact
No / neutral impact
Slight Negative impact
Strong Negative impact

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