



Chichester Transport Study 2024

Local Plan 2021-2039 Transport Assessment

On behalf of **Chichester District Council**



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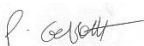

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Contents

Executive Summary 1

1 Introduction..... 11

1.1 Introduction 11

1.2 Local Context..... 11

1.3 Local Plan 2021-2039 12

1.4 Study Purpose 13

1.5 Transport Modelling Approach - Overview 13

1.6 Report Purpose 14

1.7 Report Structure 14

1.8 Other Considerations..... 15

2 Local Plan Development Assumptions 16

2.1 Introduction 16

2.2 2039 Local Plan Modelled Scenario..... 16

2.3 Housing Numbers under the Standard Method..... 19

3 Chichester Area Transport Model..... 21

3.1 Introduction 21

3.2 Base Year Model Development..... 23

3.3 Age of Model and Modelling Uncertainty - Model Verification Exercise..... 26

4 Reference Case Forecast Model Development 28

4.1 Overview..... 28

4.2 Committed Development and Schemes..... 29

4.3 Trip Rates 30

4.1 Strategic Sites – Trip Reduction..... 30

4.2 Trip Distribution 30

4.3 Reference Case Model Performance 31

5 Local Plan Scenario – No Mitigation 33

5.1 Introduction..... 33

5.2 2039 Flow Changes Local Plan Without mitigation..... 33

5.3 Summary of Flow Changes 34

5.4 Volume over Capacity (V/C), Delays and Queue Outputs 34

5.5 Safety Assessment..... 4

5.6 Seasonal Impacts 6

5.7 Impacts in Neighbouring Authority Areas 6

5.8 Summary 12

6 Northern Site Assessment 13

6.1 Introduction 13

6.2 Development Quanta 13

6.3 Trip Generation..... 13

6.4 Trip Distribution and Traffic Assignment 14

- 7 Gypsies and Travellers 23**
 - 7.1 Introduction 23
 - 7.2 Assessment 23
- 8 Impacts of Housing Numbers derived using the Standard Method 24**
 - 8.1 Introduction 24
 - 8.2 Analysis 24
- 9 Monitor and Manage..... 29**
 - 9.1 Introduction 29
 - 9.2 Monitoring Process..... 29
 - 9.3 The Modelling Process 30
 - 9.4 Monitor and Manage Approach 30
 - 9.5 Transport Infrastructure Management Group..... 31
- 10 Potential Sustainable Mitigation Measures 32**
 - 10.1 Introduction 32
 - 10.2 Sustainable Transport Schemes 33
 - 10.3 Modelling Analysis..... 50
 - 10.4 Scheme Impact on Local Plan Trips..... 56
 - 10.5 Benefits..... 60
 - 10.6 Conclusion 61
 - 10.7 Other Potential Sustainable Mitigation Measures 62
- 11 Potential Highway Mitigation Options 66**
 - 11.1 Introduction 66
 - 11.2 A27 Chichester Bypass Mitigation..... 67
 - 11.3 Chichester City Junction Mitigation 69
 - 11.4 Wider Chichester Area 73
 - 11.5 Neighbouring Authorities 74
 - 11.6 Highway Mitigation Modelling..... 74
 - 11.7 Short-Term Safety Led Assessment 79
 - 11.8 Highway Mitigation Scheme Costs..... 79
 - 11.9 Current Status of Developer Contributions Policy 88
 - 11.10 RIS 3 Process..... 88
- 12 Summary 89**
 - 12.1 Introduction 89
 - 12.2 Monitor and Manage..... 89
 - 12.3 Mitigation 89
 - 12.4 Summary of Outputs..... 89

Figures

Figure 3-1	Modelling Process.....	22
Figure 3-2	Chichester Area Transport Model Network.....	23
Figure 3-3	CATM Simulation Area Zoning System – Chichester District.....	25
Figure 3-4	CATM Simulation Area Zoning System – Chichester City.....	26
Figure 5-1	Junction Locations	35
Figure 5-2	A259 Comet Corner Junction V/C Outputs	8
Figure 5-3	A259 Oystercatcher Junction V/C Outputs	9
Figure 5-4	A27/Nyton Road Junction V/C Outputs	10
Figure 6-1	Actual Flow Difference LP minus Ref (PCU/hr) - AM Peak Hour	15
Figure 6-2	Actual Flow Difference LP minus Ref (PCU/hr) PM Peak	16
Figure 10-1	Location of Sustainable Transport Schemes	34
Figure 10-2	Graylingwell Cycle Route.....	34
Figure 10-3	Westgate Cycle Route Improvements	35
Figure 10-4	Fishbourne to Chichester Section Part 1 of 2.....	36
Figure 10-5	Fishbourne to Chichester Section Part 2 of 2.....	36
Figure 10-6	Bosham to Fishbourne Section Part 1 of 3.....	37
Figure 10-7	Bosham to Fishbourne Section Part 2 of 3.....	37
Figure 10-8	Bosham to Fishbourne Section Part 3 of 3.....	37
Figure 10-9	Nutbourne to Bosham Section Part 1 of 3.....	38
Figure 10-10	Nutbourne to Bosham Section Part 2 of 3.....	38
Figure 10-11	Nutbourne to Bosham Section Part 3 of 3.....	38
Figure 10-12	Southbourne to Nutbourne Section Part 1 of 2.....	39
Figure 10-13	Southbourne to Nutbourne Section Part 2 of 2.....	39
Figure 10-14	Emsworth to Southbourne Section Part 1 of 2.....	39
Figure 10-15	Emsworth to Southbourne Section Part 2 of 2.....	40
Figure 10-16	Hunston Cycle Route	41
Figure 10-17	A285 Westhampnett Road Corridor – Section 2.....	42
Figure 10-18	A285 Westhampnett Road Corridor – Section 3.....	42
Figure 10-19	A285 Westhampnett Road Corridor – Section 4.....	42
Figure 10-20	A285 Westhampnett Road Corridor – Section 5.....	43
Figure 10-21	A285 Westhampnett Road Corridor – Section 6.....	43
Figure 10-22	A285 Westhampnett Road Corridor – Section 7.....	43
Figure 10-23	A285 Westhampnett Road Corridor – Section 8.....	44
Figure 10-24	Oving Road – Option 1 – Section 1	44
Figure 10-25	Oving Road – Option 1 – Section 2	45
Figure 10-26	Oving Road – Option 1 – Section 3	45
Figure 10-27	Oving Road – Option 1 – Section 4	45
Figure 10-28	Northgate Gyratory Improvements.....	46
Figure 10-29	Bognor Road – Bus Scheme Part 1.....	47
Figure 10-30	Bognor Road – Bus Scheme Part 2.....	48
Figure 10-31	Bognor Road – Bus Scheme Part 3.....	48
Figure 10-32	Bognor Road – Bus Scheme Part 4.....	49
Figure 10-33	Road Corridors To / From Chichester Assessed in the Chichester SATURN Model	51
Figure 10-34	Combined Sustainable Transport Schemes	53
Figure 10-35	Bus Areas Affected by WSCC Sustainable Transport Scheme.....	55
Figure 10-36	Usual Residence to Place of Work	64
Figure 11-1	Location of Proposed Mitigations Junctions	67
Figure 11-2	Location of A27 Mitigation Junctions	68
Figure 11-3	A27 Junction Provisional Concept Schemes	68
Figure 11-4	Bognor Road and Vinnetrov Road combined Concept Schemes.....	69
Figure 11-5	A286 New Park Road/ A286 St Pancras Road Proposed Mitigation.....	70
Figure 11-6	Via Ravenna/ A259 Cathedral Way Roundabout Proposed Mitigation	71
Figure 11-7	A259 Cathedral Way/ Fishbourne Road/Terminus Road Proposed Mitigation	72
Figure 11-8	A286 Northgate/Oaklands Way Proposed Mitigation Scheme	73

Tables

Table 2-1 Local Plan 2021-2039 Development Quanta 16

Table 4-1 Committed and Adopted Local Plan Development assumed in Reference Case 29

Table 4-2 Trip Rates (Residential and Employment) 30

Table 4-3 Reference Case Convergence Statistics 31

Table 4-4 Network Summary Statistics 31

Table 5-1 AM – Max Volume to Capacity Ratio 1

Table 5-2 PM – Max Volume to Capacity Ratio 1

Table 5-3 AM – Max Delays (Total) (seconds)..... 2

Table 5-4 PM – Max Delays (Total) (seconds)..... 3

Table 5-5 AM – Max Average Queue Total (PCU) 3

Table 5-6 PM – Max Average Queue Total (PCU) 4

Table 5-7 Summary of throughput flows at selected Junctions. 7

Table 6-1 Northern Spatial Local Plan Dwelling Numbers 13

Table 6-2 Trip rates for AM (0800 – 0900) and PM (1700 – 1800)..... 13

Table 6-3 Trips generated to and from Northern sites AM (0800-0900) and PM (1700-1800)..... 14

Table 6-4 Flow changes in PCU/hour at key locations in AM peak hour 18

Table 6-5 Flow changes in PCU/hour at key locations in PM peak hour 19

Table 6-6 VC% comparison at key Junctions 22

Table 7-1 Gypsy and Traveller Site Trip Generation and Trip Rates (10 Units) 23

Table 8-1 SRN Junction Impacts Comparison without Mitigation 25

Table 8-2 Local Highway Impacts Comparison without Mitigation – AM Peak 26

Table 8-3 Local Highway Impacts Comparison without Mitigation – PM Peak 27

Table 10-1 Summary of Cost and Funding of Sustainable Transport Schemes..... 49

Table 10-2 Chichester Road Corridors PTC Assumptions 51

Table 10-3 Cycle Shift Assumption 52

Table 10-4 Fishbourne Roundabout – Cycle Shift from Car Driver Trips 53

Table 10-5 Whyke Roundabout – Cycle Shift from Car Driver Trips 54

Table 10-6 Bognor Roundabout – Cycle Shift from Car Driver Trips..... 54

Table 10-7 Portfield Roundabout – Cycle Shift from Car Driver Trips 55

Table 10-8 Potential Bus Shift Capture..... 56

Table 10-9 Bognor Roundabout – Bus Shift – Bus & Cycle Shift from Car Driver Trips..... 56

Table 10-10 Fishbourne Roundabout – AM Peak (08:00 – 09:00) 57

Table 10-11 Fishbourne Roundabout – PM Peak (17:00 – 18:00) 57

Table 10-12: Bognor Roundabout – AM Peak (08:00 – 09:00)..... 58

Table 10-13 Bognor Roundabout – PM Peak (17:00 – 18:00) 58

Table 10-14 Whyke Roundabout – AM Peak (08:00 – 09:00) 59

Table 10-15 Whyke Roundabout – PM Peak (17:00 – 18:00) 59

Table 10-16 Portfield Roundabout – AM Peak (08:00 – 09:00) 60

Table 10-17 Portfield Roundabout – PM Peak (17:00 – 18:00) 60

Table 10-18 Summary of Sustainable Transport Schemes Impact 61

Table 10-19 Conclusion of Sustainable Transport Schemes Impact on Respective Roundabouts 62

Table 11-1 AM – Max Volume to Capacity Ratio 75

Table 11-2 PM – Max Volume to Capacity Ratio 75

Table 11-3 AM – Max Delays (Total) (seconds)..... 76

Table 11-4 PM – Max Delays (Total) (seconds)..... 77

Table 11-5 AM – Max Average Queue Total (PCU) 77

Table 11-6 PM – Max Average Queue Total (PCU) 78

Table 11-7 A27 Junction Ranking 81

Table 11-8 Chichester Proposed Mitigation Costs –Local Plan 2021-2039 82

Table 11-9 A27 Proposed Mitigation Costs (£m) 84

Table 11-10 Overall Summary of Mitigation Costs (Rounded Up)..... 85

Table 11-11 National Highways A27 Estimated Maintenance Costs..... 85

Table 11-12 Chichester District Council Scheme Estimates..... 86

Table 11-13 WSCC Scheme estimates – Lower and Upper Estimate (A27 schemes) 86

Appendices

Appendix A	Local Model Validation Report
Appendix B	Model Verification
Appendix C	Reference Case Uncertainty Log
Appendix D	Reference Case Infrastructure Assumptions
Appendix E	Reference Case vs Local Plan Flow Changes
Appendix F	Reference Case vs Local Plan Volume to Capacity Ratio Comparisons
Appendix G	Reference Case vs Local Plan Link Delay Comparisons
Appendix H	Modelling Outputs within Arun
Appendix I	Impacts on Hampshire Roads
Appendix J	A27 Junctions Local Plan Flows -Sustainable Travel Mitigations Impacts
Appendix K	Terminus Road Feasibility and Fishbourne Roundabout Bus Priority
Appendix L	Reference Case versus Local Plan Flow Differences with Highway Mitigation
Appendix M	Interim Safety Led Assessment

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Executive Summary

Introduction

This transport study is undertaken to inform the transport evidence base for the Chichester Local Plan 2021-2039, meeting the requirements of the relevant national guidance. The transport study has been undertaken to cover the anticipated development levels created by the local plan within Chichester District. This current local plan review proposes 10,359 dwellings for the period 2021 to 2039 which equates to an average build out of 535 dwellings per annum (dpa) in the south of the Plan Area.

This updated Transport Assessment has been produced to support the plan to be submitted for examination and to address matters raised during the regulation 19 consultation, referred to in this document as the 'Regulation 19 Submission Plan'. This builds upon previous versions of the Transport Assessment. It takes onboard the most recent and ongoing dialogue between Chichester District Council (CDC) and West Sussex County Council (WSCC), as the Local Highway Authority and National Highways (NH), who manage the Strategic Road Network (SRN), which in the context of Chichester means the A27. The updates to the Transport Assessment have taken on board latest guidance with National Planning Policy Framework (NPPF) and DfT Circular 01/2022, Strategic Road Network and the Delivery of Sustainable Transport, which was issued in December 2022.

The key outcome of the latest dialogue and discussion has resulted in the emphasis of the transport evidence base, moving away from specific highway-led mitigation, to one that considers sustainable transport as a key aspect of any potential future mitigation, alongside potential highway mitigation and framing this in the context of a monitor and manage approach.

The Transport Model

The technical work underpinning the study utilises an industry standard mathematically based modelling package called SATURN. The SATURN highway only model is used to assess the impact of the local plan development on the highway network. During the process of model development, WSCC and NH have been engaged and have agreed the use of the modelling tool and the processes for developing the forecast models to assess the local plan impacts.

The base year of this model is 2014 and was inherited by Stantec for use within this study. This has been developed to represent traffic conditions in 2014 and uses independent traffic count and journey time data to validate the model to a standard as set out within guidance produced by the Department for Transport.

A Local Model Validation Report (LMVR) has been produced setting out the base year model development was submitted to stakeholders including Chichester District Council, WSCC and NH and a final LMVR agreed by all parties as being suitable for testing of future development scenarios. This model still forms the basis of the future development tests for this study.

The modelling work is used to inform the mitigation strategy required to support the local plan and inform more detailed junction modelling, using industry standard modelling packages, where required. Models have been developed to represent potential impacts at the end of the local plan period (2039), for the AM (0800-0900), Interpeak (IP) and PM (1700-1800) peak hours. Analysis has focussed on the more congested AM and PM peaks while the IP flows have been used together with AM and PM outputs to provide inputs for Air Quality assessments.

The modelling undertaken is based on the most unbiased and realistic set of assumptions. Background forecasts only include developments and schemes within Chichester and neighbouring authorities included within the geographical scope of the model, where the likelihood of them going ahead is near certain, or more than likely.

It is recognised that the model is now reaching the end of its useful life and therefore an exercise has been undertaken to justify the use of the data from the model to support the plan, in light of

commitments to move forward through the monitor and manage approach and update the model. New data was collected in November 2023 at junctions on the A27 to support this work and was analysed alongside other data from NH and WSCC sources, including link counts and journey time data. The key conclusions to be drawn from this work are:

- The traffic surveys undertaken in November 2023 are in the main suitable for use for further assessment.
- The data for Portfield Roundabout and journey times between Portfield and Bognor Road Roundabouts are not typical, therefore this data is not used in any further analysis,
- Analysis of the new data, alongside other data has shown that there was growth in traffic between 2014 and 2019, however the Pandemic has had an impact on traffic levels and the analysis indicates that, whilst there are variations, the 2014 and 2023 data is relatively comparable.
- A very high-level approach to growth in the local plan has indicated that the 2031 model is a good proxy for the end of the plan period and a 2031 model will be used as the Reference Case as detailed in Section 4.
- The approach to the provision of new evidence should be taken with the knowledge that there is a commitment to update the model following adoption of the Plan and that the 2031 model is a suitable tool for providing evidence at this time to provide further evidence as to the outcomes of the Transport Assessment work and to support the local plan.
- The 2031 model outputs clearly show that there are congestion issues at the A27 junctions, both on the Strategic (A27) and Local highway networks.
- There are some instances of what could be deemed to be inappropriate routing to the north, which will impact on the South Downs National Park (SDNP) and villages to the north and northwest of Chichester.
- Public transport services will be impacted by increased delays on the A259 approaches to Bognor Road Roundabout from the east and Fishbourne Road roundabout from the west, this being the route of the Stagecoach 700 bus service.
- There is a clear need for mitigation which is discussed further in the updated Transport Assessment and Monitor and Manage Proposal.

A comparison of 535dpa and 638 dpa demonstrates evidence of exponential increase in delays and queues for 638 dpa compared to 535 dpa to the extent that there is increased rat-running on roads through the SDNP and roads north of Chichester, with these delays and queues likely to be detrimental to the safe and efficient operation of buses/public transport services. These increases in delays and queues in most cases, will have a detrimental and material impact on the network, to the extent that this would be severe.

Local Plan Development

The Local Plan 2021-2039 development quanta that has been assumed in the transport modelling is shown in the Table below. Some development identified is included within the Reference Case. This development was committed through the adopted plan. The adopted Local Plan included a number of highway schemes on the A27, which have not been delivered. Earlier modelling work undertaken in 2018 (to Support Regulation 18 Consultation) identified the need for these schemes, plus additional

elements to build on these to facilitate and mitigate the impact of both the adopted and new local plan development. The modelling work for the Regulation 19 plan has therefore used these schemes.

Group	Location	Land use	Reference Case Quanta	Additional Quanta	Quanta Modelled	Total Quanta (Post Model & Pre Reg 19)
North East	Plaistow	Residential		25	25	25
	Kirdford	Residential		50	50	50
	Loxwood	Residential		220	220	220
	Wisborough	Residential		75	75	75
	Total Residential (Dwellings)		0	370	370	370
	Total Employment (Ha)		0	0	0	0
Western Corridor	Westbourne	Residential		30	30	30
	Southbourne	Residential		1,052	1,052	1,050
	Chidham	Residential		300	300	300
	Highgrove Farm, Bosham	Residential	50	200	250	295
	Fishbourne	Residential		30	30	30
	Total Residential (Dwellings)		50	1,612	1,662	1,705
	Total Employment (Ha)		0	0	0	0
Chichester and Eastern Corridor	Land at Maudlin Farm, Westhampnett	Residential		270	270	265
	Land east of Rolls Royce (Ha)	Employment		10	10	10
	Boxgrove	Residential		50	50	50
	Chichester City	Residential		300	300	270
	West of Chichester	Residential	1,600	0	1,600	1,600
	Tangmere SDL	Residential	1,000	300	1,300	1,300
	Westhampnett Strategic Development Location (SDL)	Residential	0	0	0	165
	Land East of Chichester, Oving	Residential		600	600	680
	Southern Gateway, Chichester	Residential		270	270	180

Group	Location	Land use	Reference Case Quanta	Additional Quanta	Quanta Modelled	Total Quanta (Post Model & Pre Reg 19)	
	Land South of Bognor Road, North Mundham	Employment		15	15	15	
	Total Residential (Dwellings)		2,600	1,790	4,390	4,510	
	Total Employment (Ha)		0	25		25	
Manhood Peninsula	Apuldram (SW Chichester)	Residential		0		0	
	Birdham	Residential		50	50	0	
	West Wittering	Residential		0	0	70	
	Earnley	Residential		0	0	130	
	East Wittering	Residential		0	0	0	
	North of Park Farm, Selsey	Residential		250	250	0	
	Hunston	Residential		150	150	0	
	North Mundham	Residential		50	50	105	
	Total Residential (Dwellings)				500	500	305
	Total Employment (Ha)				0	0	0
HDA	Runcton (glasshouse)	Employment		30	30	30	
	Runcton (class E/B8)	Employment		7	7	7	
	Tangmere (glasshouse)	Employment		7	7	7	
	Total Residential (Dwellings)				0	0	0
	Total Employment (Ha)			0	44	44	44
Total Residential (dwellings) Southern Plan Area			2,650	3,902	6,552	6,515	
Total Employment (Ha)			0	69	69	69	

In addition, since the modelling was undertaken but prior to the regulation 19 consultation, a number of sites have received planning consent and/or allocations/parish numbers have been altered. The proposed distribution in the Chichester Local Plan 2021-2039 has therefore altered as follows:

- Five sites on the Manhood Peninsula were granted planning permission, which total 305 dwellings, The new sites are:
 - Land to the West of Church Road, West Wittering – 70 dwellings
 - Earnley Concourse Clappers Lane, Earnley – 30 dwellings
 - Land south of Clappers Lane, Earnley – 100 dwellings

- Former Lowlands Nursery, Lagness Road – 39 dwellings
- Land South of Lowlands – 66 dwellings
- 165 dwellings were granted at Land within Westhampnett / North East Chichester Strategic Development Location (SDL)
- Land East of Chichester, Oving allocation increased from 600 to 680 dwellings
- 250 dwellings were removed from North Park Farm, Selsey.
- 150 dwellings were removed from Hunston
- 50 dwellings from Birdham were removed
- 120 dwellings were removed from Chichester City
- Highgrove Farm, Bosham was corrected to be 300 dwellings
- 120 dwellings were removed from Chichester City
- Highgrove Farm, Bosham was corrected to be 300 dwellings
- Small reductions in the number of dwellings on certain site allocations

The above changes are reflected in the far-right column of the above table and have resulted in 195 fewer dwellings allocated on the Manhood Peninsula, however there are 120 additional dwellings on the Chichester & Eastern corridor and 43 additional dwellings on the Western corridor. In addition to the sites/areas listed above a small number of other windfall sites across the southern plan area were permitted prior to regulation 19 consultation. These, in combination with the changes to the table above, represent inevitable adjustments as permissions come forward post modelling work, but in this case will have no material impact on the modelling outputs, and thus impact of the plan on the highway network.

Forecast Development Trip Rates

For all developments added to the models (Reference Case and Local Plan), vehicle trip rates have been derived using the industry standard TRICS software and also agreed amongst stakeholders. A trip rate is produced by land use type and provides the number of trips entering or leaving a development based on a rate per specified measure e.g. for residential this is per household and for employment per 100 square metres. These trip rates were agreed with WSCC and NH.

Reference Case Forecast Model

A Reference Case forecast model has been developed to represent future traffic conditions at without the consideration of the local plan development. The model review undertaken indicated that the 2031 forecast models produced for previous work, is representative of forecast flows in 2039 (or end of plan period), once COVID impacts and impact of lower growth in NTEM version 8.1 (compared to v7.2 used in the model development) are accounted for. Therefore, the 2031 model has been used for analysis purposes.

This model includes all committed development within Chichester District, including development within the adopted local plan and in neighbourhood plans that were 'made' before May 2021, as well as any committed development within neighbouring authorities. The Southern Gateway development allocation has been included in the Reference Case, however no mitigation schemes associated specifically with this development have been included. This is the same position as other schemes identified through the adopted local plan, and which have not yet been delivered.

Local Plan Forecast Model

The local plan Forecast model builds upon the Reference case model by adding the Local Plan 2021-2039 development information provided by CDC as outlined above.

The outputs from the local plan model are then compared to the Reference Case model outputs to show the impact of the Local Plan scenario. From this an evaluation is made to determine the requirements of further highway mitigation.

In undertaking the Local Plan model scenario, a 5% reduction in demands has been assumed within the strategic Local Plan locations to represent a reduction in trips as a result of development-specific travel planning and behaviour change packages encompassing smarter choices. The 5% reduction assumption was retained from the tests undertaken for the adopted local plan and was agreed with CDC as a plausible and achievable target. These have been implemented within the modelling by reducing the matrices accordingly. The 5% car trip reduction assumption has been retained from the previous 2018 study and was agreed by WSCC, CDC and NH (then Highways England). The reduction was applied in both the Reference Case and with local plan scenarios.

Model Outputs

The additional trips associated with local plan development indicates the following junctions experience significant impacts that require mitigating:

- A259/B2132 Comet Corner (Arun District)
- A286 New Park Road / A286 St Pancras Road
- A259 Via Ravenna / A259 Cathedral Way Roundabout
- A259 Cathedral Way/ Fishbourne Road East
- Fishbourne Road West / Appledram Lane South
- A27 Fishbourne Roundabout
- A27 Stockbridge Roundabout
- A27 Whyke Roundabout
- A27 Bognor Road Roundabout
- A27 Portfield Roundabout
- A27 Oving Junction
- A286 Northgate / A286 Oaklands Way

Analysis has also been undertaken on impacts within neighbouring authority areas. This shows that there are impacts on the A259 in Hampshire, with increased flows, mainly from the Southbourne development. These impacts are seen at Warblington Interchange and A259 roundabout in Emsworth.

Northern Site Assessment

The model used for the assessment of developments within the southern plan area does not cover the north of Chichester district in detail. Therefore, a separate assessment has been undertaken for these sites. This utilises a similar model which was developed for the Horsham Local Plan assessment.

Given the low level of development proposed in the north of the district, the modelling indicates that the impacts are negligible in both Chichester and neighbouring Horsham district, Waverley borough and the South Downs National Park.

Housing Numbers under the Standard Method

The assessment has been undertaken based on 535 dwellings per annum within the south of the Plan Area (allowing for a further 40 dpa in the area to the north east of the Plan Area of the National Park), however the standard method need figure indicates that CDC need to deliver 638 dwellings per annum. Assessment of the higher dwelling numbers has also been undertaken, which also included a 10% buffer on top of 638dpa and 250 dwellings in the North East plan area across the plan period.

The work indicates that the increase in housing numbers to 638 dpa will further increase traffic on minor routes to the north of Chichester, as the A27 congestion causes rerouting of both local trips and trips heading east on the A27. There are also increased delays on Bognor Road east approach to the Bognor Road roundabout, as well as on approaches to Stockbridge Roundabout and Whyke Roundabout, thus impacting on local bus service and making these more unreliable to the extent that the adverse impacts as a result of the increase to 638 dpa are considered to be severe. This element of work is discussed further in Section 8.

Monitor and Manage Process

A monitor and manage process will be set up and will include the setting up of a Traffic Infrastructure Management Group (TIMG), led by CDC and involving other stakeholders including WSCC and NH. The aim of the process and group will be to make recommendations regarding the most appropriate mitigation measures to implement to support development as it comes forward.

The monitor and manage process will make recommendations for a combination of possible sustainable, safety and capacity improvements across the strategic and localised highway improvements. The measures being considered will include enhanced walking, cycling, public transport and highway improvements which seek to address safety and/or capacity issues within a defined time period. Identified improvements will be subject to a monitoring process that will monitor the impact of development on the network and identify the nature and location of additional supporting measures necessary.

The measures set out in the methodology are not fixed, but flexible and will be amended as the Local Plan period progresses. Policy, funding and/or technical changes may promote amendments or new measures to be considered.

Sustainable Transport Mitigation

At a broader level, it is generally now considered that potential sustainable mitigation measures should have priority over highway capacity mitigation and hence a need to shift away from a 'Predict and Provide' approach towards a 'Monitor and Manage' approach. Given the long-term horizon of the local plan, there will always be uncertainty about the level of growth in travel that may materialise. Some significant changes in travel behaviour alongside technology advances have been seen in recent times, and the COVID-19 pandemic has accelerated these changes with significantly more people working at home and shopping online (virtual mobility). While the long-term impacts on travel behaviour are unknown, it has been demonstrated during these challenges that the potential exists to undertake activities remotely without the need to travel, by working from home or shopping online.

This study provides an overview of options which could be considered in the medium term to long term as an alternate or complementary mitigation measure to the highway mitigation considered for the Chichester plan area. The study provides an overview whether they are viable sustainable transport options.

WSCC provided a list of 16 Sustainable Transport Schemes, this list was reduced to nine after researching the information that was available. Seven of the schemes were not assessed due to the lack of information available limiting the ability for them to be assessed and modelled. If these discounted schemes were to be progressed further, they have the potential to be formally assessed.

Highway Mitigation

The 2018 Local Plan study identified a number of highway mitigation schemes both on the A27 Chichester Bypass, which is part of the SRN managed by NH, as well as on the local highway network in Chichester, which is managed by WSCC. Key to that mitigation are improvements to the six junctions on the SRN.

The Table below seeks to rank the 6 junctions along the A27 in priority of construction, on the premise that the ranking will be reviewed earlier through the local plan process. Smaller improvements at

multiple junctions (along with sustainable transport measures) may be the preferred approach, to avoid transferring impacts further downstream, if larger schemes are implemented at single junctions only.

PBA Ranking	Junction No.	Junction Name
1	13	Fishbourne Roundabout
2	16	Bognor Road Roundabout
3	18	Portfield Roundabout
4	19	Oving Junction
5	14	Stockbridge Roundabout
6	15	Whyke Roundabout

This phasing allows flexibility on scheme implementation based on funding and considers the NH emerging Road Investment Strategy Tranche 4 (RIS4) Process, in that the schemes are of sufficiently flexible design to support the RIS4 process and allow modification in the future and still maintain economic growth in the area.

Costs for highway mitigation have been estimated separately for schemes on the SRN (based on latest WSCC estimates) and those on WSCC network within Chichester.

The Table below shows a summary of the latest estimated costs for each Mitigation Area.

Mitigation Area	Full Implementation (CDC/WSCC Review Costs)	
	Lower Project Cost	Upper Project Cost
City and Wider Area Revised	£2,534,500	£2,534,500
A27 Corridor including Stockbridge Link Road	£89,390,000	£134,030,000
Overall Total Project Costs	£91,890,000	£136,530,000

Note: Highways England (HE) (now National Highways) Inflation adjusted costs included in brackets

CDC and WSCC have reviewed the historical scheme costs. WSCC considered the A27 Chichester bypass scheme costs only and estimated the Lower costs at £89,390,000 and the Upper costs at £134,030,000. Including the City Centre scheme costs indicates that the total cost of implementation could range between **£92m to £137m**.

A review of the A27 Chichester Bypass – Economic Assessment Report (July 2016) was undertaken to inform high-level assumptions of the potential NH operation and maintenance costs for the proposed mitigation schemes over a 60-year appraisal period.

The estimated operation and maintenance cost for the new A27 junctions over a 60-year period is estimated to be between **£7.75m - £9.68m**. It would be expected that there would be no maintenance costs for the first 5-to 10 years and the existing operation and maintenance costs are not considered, so these would be considered as a saving to NH not included within the figure above.

The current SPD will not be able to secure sufficient funds to meet the implementation and maintenance costs.

An analysis of impacts of traffic from committed and local plan developments on the SRN junctions has been undertaken. This helps to understand the impact of the development as a proportion of all traffic growth, and hence inform an apportionment of costs. This concludes that up to 28% of traffic growth between the base year and end of plan period, can be linked to committed and proposed local plan developments in Chichester. The modelling shows that all the junctions on the A27 Chichester bypass are well over capacity, even before adding in the local plan development and with the exception of Portfield Roundabout are actually shown to be over capacity in the base model year (2014) in one or both peaks.

Summary

In summary the key findings are that:

- The Local Plan 2021-2039 transport study evidence base has followed best practice develop future forecasts and undertake testing in order to understand the network impacts of the potential development scenario considered for the Local Plan 2021-2039.
- There is a recognition that the model used is now reaching the end of its useful life, however a recent verification exercise has been undertaken, utilising data collected in November 2023, shows the model is behaving as expected and given the commitment to update the model through the monitor and manage process, the evidence is robust at this stage.
- In the baseline scenario without the Local Plan 2021-2039 development, a number of junctions already experience capacity issues, this is also seen when looking at the new data collected for the verification purpose. This is projected to get worse, when the traffic generation anticipated from the proposed development scenario considered for the Local Plan 2021-2039, without mitigation are included.
- The study has indicated that, the impact of the forecast development up to 2039, requires a significant mitigation package, the majority of which is focused on the A27 if the impacts of development are to be fully mitigated.
- It is now considered that sustainable mitigation measures should have priority over highway capacity mitigation and hence a need to shift away from a 'Predict and Provide' approach towards a 'monitor and manage' approach. Given the long-term horizon of the local plan, there will always be uncertainty about the level of growth in travel that may materialise. Some significant changes in travel behaviour alongside technology advances have been seen in recent times, and the COVID-19 pandemic has accelerated these changes with significantly more people working at home and shopping online (virtual mobility).
- The sustainable measures should be accompanied by smaller scale highway improvements at the major junctions to deal with the safety impacts in a more affordable way and provide smaller targeted capacity enhancements.
- A monitor and manage process will be set up, supported by a TIMG led by CDC and supported by the two highway authorities (WSCC and NH), and also include other transport bodies and neighbouring authorities.
- The remit of the TIMG will be to monitor impacts of development going forward and make best use of the monies collected through the local plan process from developers, to provide suitable mitigation as appropriate. The group will also look to identify other potential sources of funding and support bids for funding where necessary.
- A series of sustainable transport schemes and highway mitigation schemes have been suggested as a starting point and to provide indication of likely costs to mitigate the local plan impacts. The TIMG will make recommendations as to which schemes should be delivered, firstly focusing on sustainable transport and then smaller scale highway improvements, thus pushing larger scale highway mitigation schemes further into the future.

- The study has undertaken an overview of options which could be considered in the medium term to long term as alternate or complementary mitigation measures to the junction schemes proposed for Chichester. The report provides an overview of the sustainable options particularly as to whether they are a viable sustainable option. The sustainable options considered are centred around mode change away from the car such as through potential to use park and ride, bus, cycling and walking as well as parking management to encourage this modal shift where possible.
- With the potential highway mitigation in place, the network conditions are generally projected to be comparable to those in the baseline suggesting that the proposed junction mitigation has the potential to mitigate and accommodate the growth provided for in this scenario.
- A comparison of 535dpa and 638 dpa (plus 10% buffer) demonstrates evidence of exponential increase in delays and queues for 638 dpa compared to 535 dpa to the extent that there is increased rat-running on roads through the SDNP and roads north of Chichester as a result of the additional, with these delays and queues likely to be detrimental to the safe and efficient operation of buses/public transport services. These increases in delays and queues in most cases, will have a detrimental and material impact on the network, to the extent that this would be severe.

1 Introduction

1.1 Introduction

- 1.1.1 Stantec has been commissioned by Chichester District Council (CDC) to assist in the development of the transport evidence base to support the Chichester Local Plan 2021-2039 which will set out development proposals within the district up to 2039. The commission has involved developing various iterations of a Transport Assessment (TA) to inform the preparation of the Chichester Local Plan 2021-2039 and supporting CDC in providing robust transport evidence to support the delivery of the plan.
- 1.1.2 In 2018, CDC appointed Stantec (Peter Brett Associates at the time) to undertake the Chichester Local Plan 2021-2039 Transport Study. The outcomes of this study were reported in 'Chichester District Council – Local Plan; Transport Study of Strategic Development Options and Sustainable Transport Measures, December 2018'. This report supported the Preferred Approach Consultation which took place between December 2018 and February 2019. and Regulation 19 Consultation.
- 1.1.3 Subsequent work was undertaken to support Regulation 19 Consultation which took place in February and March 2023. The Chichester Transport Study January 2023 was included within the evidence base for the consultation.
- 1.1.4 This updated Transport Assessment has been produced to support the Regulation 19 plan to be submitted for examination and named the 'Submission Plan' within this document. This builds upon previous versions of the Transport Assessment. It takes onboard the most recent and ongoing dialogue between CDC and West Sussex County Council (WSCC), as the Local Highway Authority and National Highways (NH), who manage the Strategic Road Network (SRN), which in the context of Chichester means the A27. The updates to the Transport Assessment have taken on board latest guidance with National Planning Policy Framework (NPPF) and DfT Circular 01/2022, Strategic Road Network and the Delivery of Sustainable Transport¹, which was issued in December 2022.
- 1.1.5 The key outcome of the latest dialogue and discussion has resulted in the emphasis of the transport evidence base, moving away from specific highway-led mitigation, to one that considers sustainable transport, including active travel, as key elements of any potential future mitigation, alongside potential highway mitigation and framing this in the context of a monitor and manage approach. This aligns with Circular 01/2022, which in Paragraph 15 states:

“The Transport Decarbonisation Plan and the Future of Freight Plan also recognise that local planning and highway authorities need help when planning for sustainable transport and developing innovative policies to reduce car dependency. This includes moving away from transport planning based on predicting future demand to provide capacity ('predict and provide') to planning that sets an outcome communities want to achieve and provides the transport solutions to deliver those outcomes (vision-led approaches including 'vision and validate,' 'decide and provide' or 'monitor and manage'). The company will support local authorities in achieving this aim through its engagement with their plan-making and decision-taking stages, while recognising the varying challenges that will be presented by certain sites based on their land use, scale and/or location.”

1.2 Local Context

- 1.2.1 Chichester is a second-tier local government area within West Sussex and thus is the planning authority. The district borders Arun and Horsham to the east and Havant in Hampshire to the west. The South Downs National Park sits in the centre of the district with

¹ [Strategic road network and the delivery of sustainable development - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/policies/strategic-road-network-and-the-delivery-of-sustainable-development)

the northern area including villages such as Loxwood and Wisborough Green bordering on Horsham's northern boundary.

- 1.2.2 Chichester is the main settlement within the district, with other areas of population including Southbourne, West Wittering, East Wittering, Selsey, Tangmere and Oving.
- 1.2.3 The main routes through the district are the A27 which forms part of the NH controlled SRN which runs east - west along the southern edge of Chichester City, and the A286 providing access from the south coast of Chichester district north along with the A285 through the South Downs National Park to the north of the district. The A259 connects Chichester with Bognor Regis and Littlehampton to the south east and towards Hampshire to the west.
- 1.2.4 Along the A27 six key junctions provide access between both sides of the A27, and include Fishbourne Roundabout, Stockbridge Roundabout, Bognor Road Roundabout, Whyke Roundabout, Bognor Roundabout, Oving Junction (signalised) and Portfield Roundabout.
- 1.2.5 Within Chichester itself, the A286 provides a ring road around the historical City Centre and the A259 providing access from Fishbourne Roundabout into the town centre.
- 1.2.6 In terms of other transport provision, Chichester is well served by public transport in parts. Trains operate from Chichester Railway Station on the West Coastway Line which has regular services between Brighton, London, Portsmouth and Southampton and Bognor Regis is a 20-minute journey time with a change at Barnham. There are also stations located at Southbourne, Nutbourne, Bosham and Fishbourne, within the district, to the west of Chichester. Chichester is also well served by frequent bus services operated by Stagecoach and Compass Travel. There are frequent services between Bognor Regis and Portsmouth (Service 700) which travels through Chichester, as well as more local services within Chichester itself and serving local villages and communities on the Manhood Peninsula and to the north of the city. Other more rural areas outside the city of Chichester and the main corridors are less well served.
- 1.2.7 Active travel provision is currently intermittent. There are shared used footpath/cycleways along the A259 between Bognor and Chichester and to the west of Chichester (including a segregated crossing of the A27 near Fishbourne). There is some cycle provision within Chichester, but much of the segregated provision is sub-standard and does not meet the current LTN1/20 guidance.

1.3 Local Plan 2021-2039

- 1.3.1 CDC is updating its Adopted Local Plan which currently sets out development plans and policies for the district for the period 2014 to 2029. The local plan was adopted in July 2015, and as part of the adoption process, the Planning Inspector required that CDC undertake a five-year review to address a shortfall in housing and employment provision to ensure sufficient housing would be planned to meet the longer-term needs of the area. As such, there is a requirement to review the current adopted local plan to provide a new policy framework for planning and development in the plan area up to 2039. This will form the Chichester Local Plan 2021-2039.
- 1.3.2 The adopted Chichester Local Plan included a set of mitigation measures at the six principal junctions along the A27 Chichester Bypass. Although, there have been minor works at the Portfield Roundabout in this timeline, and Oving junction has seen changes which provide priority to public transport. No other mitigation schemes have been delivered along the A27 corridor, as such the assessment considers the development from the adopted plan period as well as from the Local Plan 2021-2039.
- 1.3.3 A review of the committed developments and infrastructure identified, has been undertaken to ensure that the data accurately captures the position of specific schemes in the Chichester plan area and adjoining areas of Havant and Arun, as well as background traffic growth.

- 1.3.4 The current Arun Local Plan was adopted in 2018 and sets out development plans up to 2031. Work has commenced on a local plan update; however this is at an early stage and will see out future development needs up to 2041. The emerging Havant Local Plan was withdrawn in 2022 and early work has commenced on an update to that plan. The Adopted Core Strategy 2011 and the Allocation Plan 2014 form the current policy documents in Havant, while the latter sets out the development plans up to 2026.

1.4 Study Purpose

- 1.4.1 The purpose of the Local Plan Transport study is to provide a robust transport evidence base and identify potential measures that would support the delivery of the local plan development and mitigate any negative impacts. The aim of the study was not to address Chichester's current transport issues but seek not to exacerbate them as a result of proposed developments.
- 1.4.2 A highway traffic model has been used to support the development of the evidence base.

1.5 Transport Modelling Approach - Overview

- 1.5.1 To inform the Local Plan 2021-2039, computer modelling has been used to analyse the complex transport patterns that already take place in the Chichester area. The model used is known as the Chichester Area Transport Model (CATM) and has been used by Stantec to investigate travel patterns in and around the Chichester area. This includes taking account of changes in response to the policies and strategy of the Chichester Local Plan 2021-2039. The model is focused on the southern part of the district and does not extend far enough to consider impacts of development within the northern part of the district, Development proposals in the north of the district have been informed by a separate modelling approach which is reported further in Section 6.
- 1.5.2 Modelling work has been undertaken in line with relevant national guidance. This guidance is provided by the Department for Transport (DfT) and is known as Transport Analysis Guidance (TAG).
- 1.5.3 The modelling has focussed on the AM and PM peak hours as these are the most congested hours and hence where the impacts of the local plan are most likely to be significant.
- 1.5.4 The model, as per national guidance, is based on traffic conditions for an "average day" which in summary assumes a weekday, with all schools open and any data collection avoiding large events in the local area, which may skew the data. The modelling for the local plan process focuses on new residential and employment development. The modelling is not required to assess weekends, Bank Holidays or seasonal changes (see TAG Unit M1.2 Section 3.3.6) that may alter traffic flows in an area. In Chichester's case this could arise in the summer tourist season or when major events are held at Goodwood. For these types of assessment, which are regarded as infrequent occurrences for the purposes of this study, the Council would be required to carry out more localised studies. This approach reflects policy and recognises best practice in transport studies across the country.
- 1.5.5 The modelling undertaken provides a strategic view of the cumulative impacts of development within the district rather than specific impacts from specific developments. As such, developers are still required to undertake their own Transport Assessment to identify local impacts and mitigate them appropriately prior to planning consent.
- 1.5.6 Throughout the process both WSCC and NH were engaged and undertook reviews and provided comments on the study at various stages.
- 1.5.7 This model was originally based on data, travel patterns and flows from 2014. Whilst it is recognised that this data is now approaching the end of its useful life, new data has been collected to inform an exercise to demonstrate that the outputs from the model can still be

deemed to be verified for the purposes of the Chichester Local Plan 2021-2039, and in the context of the monitor and manage approach which is now being proposed. A summary of the model verification work is reported within Section 3.3. The monitor and manage approach is summarised in Section 9

1.6 Report Purpose

- 1.6.1 The purpose of this report is to provide a detailed assessment of the work undertaken to assess the impact of the preferred local plan development and to inform the Transport Evidence Base as part of the local plan process and assessment of the preferred scenario. This report is supported by Technical Appendices which provides more detailed information in regard of the development of the modelling tools and the modelling approach to assess the impacts of the wider development scenarios assessed. This report replaces the TA produced in January 2023, although this document remains for reference.
- 1.6.2 The report provides details on the tested Local Plan Scenario, its potential network impacts, the commitment to monitor and manage going forward and potential mitigation required to support and mitigate the proposed local plan development. The process is informed by relevant guidance including DfT's Transport Evidence Bases in Plan Making and Decision Taking² as well as DfT Circular 01/2022 Strategic Road Network and the Delivery of Sustainable Development³

1.7 Report Structure

- 1.7.1 Following this introduction, the report is set out as follows:
- Section 2 outlines the local plan development assumptions for this study update, which is focussed in the southern plan area.
 - Section 3 provides a high-level overview of the Chichester Area Transport Model (CATM) which underpins the Transport Assessment.
 - Section 4 discuss the development of the Reference Case scenario model which represents the future forecasts without the local plan. The section also discusses uncertainties associated with the modelling in light of its age and other factors.
 - Section 5 sets out the modelling outputs with local plan development based on 535 dwellings per annum in the south of the district.
 - Section 6 discusses the separate test undertaken for sites within the north of the district.
 - Section 7 includes analysis of Traveller and Gypsy sites.
 - Section 8 discusses the impacts of higher housing provision in the south of the district.
 - Section 9 provides an overview of the proposed monitor and manage process.
 - Section 10 provides an overview of potential delivery of sustainable mitigation measures to facilitate future development and impacts of introducing such measures.
 - Section 11 sets out the possible highway mitigation measures required to facilitate development, modelling outputs from testing such measures and costs of implementation of such measures.
 - Section 12 provides a summary and conclusions from the study.

² [Transport evidence bases in plan making and decision taking - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

³ [Strategic road network and the delivery of sustainable development - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

1.8 Other Considerations

- 1.8.1 Additional analysis associated with the traffic impacts of the local plan has also been undertaken and the output from this work is reported separately as set out below.
- A standalone study on Collision Analysis and hence associated Safety implications of the local plan development has been undertaken. This is reported within *Chichester Local Plan Review - District Wide Collision Review, Stantec, May 2022* and attached as Annex A.
 - Analysis has been undertaken of seasonal impacts and this is reported within a Technical Note '*Chichester Local Plan Review – Seasonal Impact Review, Stantec, April 2022*' attached as Annex B.
 - Environmental considerations in terms of Air Quality assessments are progressing separately following the conclusion of transport modelling which provides inputs for the air quality assessments. These assessments are reported in *Chichester Local Plan Review – Air Quality Assessment, Stantec, September 2022* which is attached as Annex C.

2 Local Plan Development Assumptions

2.1 Introduction

2.1.1 This section sets out the Local Plan Scenario that has been assessed for the Regulation 19 submission plan. For the previous Local Plan 2021-2039 transport evidence base in the 2018 study, three development scenarios were modelled. The scenarios were agreed with CDC. The forecasts for the scenarios all pertain to the impact on the highway network as of 2035 with a contingency to 2036 to take account of any project slippage. A list of the scenarios modelled as part of the previous 2035/36 Local Plan 2021-2039 is shown below Table 2-1 provides more detail on the development quanta of the three Local Plan 2021-2039 scenarios that were tested in the previous study in 2018.

- 2035 Reference Case
- 2035 with Local Plan 2021-2039 Development Scenario 1 (650 dwellings per annum (dpa))
- 2035 with Local Plan 2021-2039 Development Scenario 2 (800 dpa)
- 2035 with Local Plan 2021-2039 Development Scenario 3 (1000 dpa)

2.2 2039 Local Plan Modelled Scenario

2.2.1 The Local Plan 2021-2039 quanta of development assumed and modelled in the updated 2039 Local Plan 2021-2039 and the subject of this report, is summarised in Table 2-1. This consists of a single local plan scenario with 535 dwellings per annum within the south of the district.

2.2.2 In terms of the transport modelling, this has been based on the 2039 Reference Case scenario following which the local plan development assumptions were added on top of the Reference Case. It is noted that some of the development sites already have quanta in the Reference Case. Where this is the case, Table 2-1 shows the quanta assumed in the Reference Case, the additional local plan quanta and the resultant total quanta.

Table 2-1 Local Plan 2021-2039 Development Quanta

Group	Location	Land use	Reference Case Quanta	Additional Quanta	Quanta Modelled	Total Quanta (Post Model & Pre Reg 19)
North East	Plaistow	Residential		25	25	25
	Kirdford	Residential		50	50	50
	Loxwood	Residential		220	220	220
	Wisborough	Residential		75	75	75
	Total Residential (Dwellings)		0	370	370	370
	Total Employment (Ha)		0	0	0	0
Western Corridor	Westbourne	Residential		30	30	30
	Southbourne	Residential		1,052	1,052	1,050
	Chidham	Residential		300	300	300

Group	Location	Land use	Reference Case Quanta	Additional Quanta	Quanta Modelled	Total Quanta (Post Model & Pre Reg 19))
	Highgrove Farm, Bosham	Residential	50	200	250	295
	Fishbourne	Residential		30	30	30
	Total Residential (Dwellings)		50	1,612	1,662	1,705
	Total Employment (Ha)		0	0	0	0
Chichester and Eastern Corridor	Land at Maudlin Farm, Westhampnett	Residential		270	270	265
	Land east of Rolls Royce (Ha)	Employment		10	10	10
	Boxgrove	Residential		50	50	50
	Chichester City	Residential		300	300	270
	West of Chichester	Residential	1,600	0	1,600	1,600
	Tangmere SDL	Residential	1,000	300	1,300	1,300
	Westhampnett Strategic Development Location (SDL)	Residential	0	0	0	165
	Land East of Chichester, Oving	Residential		600	600	680
	Southern Gateway, Chichester	Residential		270	270	180
	Land South of Bognor Road, North Mundham	Employment		15	15	15
	Total Residential (Dwellings)		2,600	1,790	4,390	4,510
Total Employment (Ha)		0	25		25	
Manhood Peninsula	Apuldram (SW Chichester)	Residential		0		0
	Birdham	Residential		50	50	0
	West Wittering	Residential		0	0	70
	Earnley	Residential		0	0	130
	East Wittering	Residential		0	0	0
	North of Park Farm, Selsey	Residential		250	250	0

Group	Location	Land use	Reference Case Quanta	Additional Quanta	Quanta Modelled	Total Quanta (Post Model & Pre Reg 19))
	Hunston	Residential		150	150	0
	North Mundham	Residential		50	50	105
	Total Residential (Dwellings)			500	500	305
	Total Employment (Ha)			0	0	0
HDA	Runcton (glasshouse)	Employment		30	30	30
	Runcton (class E/B8)	Employment		7	7	7
	Tangmere (glasshouse)	Employment		7	7	7
	Total Residential (Dwellings)			0	0	0
	Total Employment (Ha)		0	44	44	44
Total Residential (dwellings) Southern Plan Area			2,650	3,902	6,552	6,515
Total Employment (Ha)			0	69	69	69

2.2.3 When considered in total, the local plan development is focused on Chichester and Eastern corridor of the southern plan area (4,390 dwellings were modelled), with 1,662 dwellings modelled on the western corridor, 500 dwellings modelled on the Manhood Peninsula and 370 dwellings in the north of the district.

2.2.4 For modelling purposes, each development site was assigned a zone in the model. Zones are used to describe the geographic start (origin) and end (destinations) of trips due to development, with trips aggregated across each zone.

2.2.5 The quanta for the sites in the north shown within the table have been added to the model, however the highway network is not detailed within this area and therefore a separate assessment was undertaken looking at dwelling numbers in the north. The output from this work is reported in a Section 6.

In addition, since the modelling was undertaken but prior to the regulation 19 consultation, a number of sites have received planning consent and/or allocations/parish numbers have been altered. The proposed distribution in the Chichester Local Plan 2021-2039 has therefore altered as follows:

- Five sites on the Manhood Peninsula were granted planning permission, which total 305 dwellings, The new sites are:
 - Land to the West of Church Road, West Wittering – 70 dwellings
 - Earnley Concourse Clappers Lane, Earnley – 30 dwellings
 - Land south of Clappers Lane, Earnley – 100 dwellings
 - Former Lowlands Nursery, Lagness Road – 39 dwellings
 - Land South of Lowlands – 66 dwellings

- 165 dwellings were granted at Land within Westhampnett / North East Chichester Strategic Development Location (SDL)
- Land East of Chichester, Oving allocation increased from 600 to 680 dwellings
- 250 dwellings were removed from North Park Farm, Selsey.
- 150 dwellings were removed from Hunston
- 50 dwellings from Birdham were removed
- 120 dwellings were removed from Chichester City
- Highgrove Farm, Bosham was corrected to be 300 dwellings
- 120 dwellings were removed from Chichester City
- Highgrove Farm, Bosham was corrected to be 300 dwellings
- Small reductions in the number of dwellings on certain site allocations

2.2.6 The above changes are reflected in the far-right column of the above table and have resulted in 195 fewer dwellings allocated on the Manhood Peninsula, however there are 120 additional dwellings on the Chichester & Eastern corridor and 43 additional dwellings on the Western corridor. In addition to the sites/areas listed above a small number of other windfall sites across the southern plan area were permitted prior to regulation 19 consultation. These, in combination with the changes to the table above, represent inevitable adjustments as permissions come forward post modelling work, but in this case will have no material impact on the modelling outputs, and thus impact of the plan on the highway network.

2.3 Housing Numbers under the Standard Method

- 2.3.1 In 2021 Stantec prepared an assessment of higher housing numbers for the future local plan which was set at 638 dwelling units per annum (dpa) at that time, based on the Government Standard Methodology Housing Targets for CDC. The supporting Transport Assessment showed that delivery of the level of housing consistent with that required by the standard method, coupled with the adopted Local Plan allocations which were yet to be mitigated on the A27 corridor, would require the adopted local plan mitigation schemes to be enhanced to accommodate this further Local Plan development, consisting of 638 dpa. At this time, the focus was on highway mitigation and the approach was agreed with NH and WSCC.
- 2.3.2 The outcome of the TA showed that the current local plan mitigation proposals would not be sufficient to avoid severe impact and that 5 of the 6 junctions on the A27 would require additional mitigation to support the emerging local plan allocation of 638 units plus the need for the Stockbridge Road Link. Combined with the more accurate cost assessment, this represented an increase in cost from £13million to between £89million and £134million for the now required works. It was determined that the adopted SPD which was designed to acquire the required funding for the mitigation would not be able to generate sufficient funds to meet the likely costs for the current local plan mitigation schemes and that there were no other viable lesser schemes between the adopted local plan mitigation and the upgraded junction improvements necessary to support a higher level of dwellings. As such CDC proposed a reduction in the units per year and a phased implementation of the proposed mitigation schemes, in order to establish a level of development that could be tolerated as part of a proposal to reduce the mitigation to a level that left the Local Plan 2021-2039 viable.
- 2.3.3 The junction improvements at Whyke and Stockbridge could only be done as a package in conjunction with a new link road. The collective cost of these works was more than the local plan could bear in relation to viability. This left Fishbourne and Bognor junctions as the only affordable options, as well as being the main strategic route for the Stagecoach coastline bus service from Portsmouth to Brighton.
- 2.3.4 At this time, with agreement with NH and WSCC, a lower housing level of 535 dwellings per annum (within the south of the Plan Area) was agreed to be tested. This led to further

discussions with WSCC and NH and agreement that improvements to the A27 Chichester Bypass within the plan period should focus on the Fishbourne and then Bognor Road junctions as standalone or phased schemes.

2.3.5 Further discussion of the impact of the higher housing numbers is provided within Section 8.

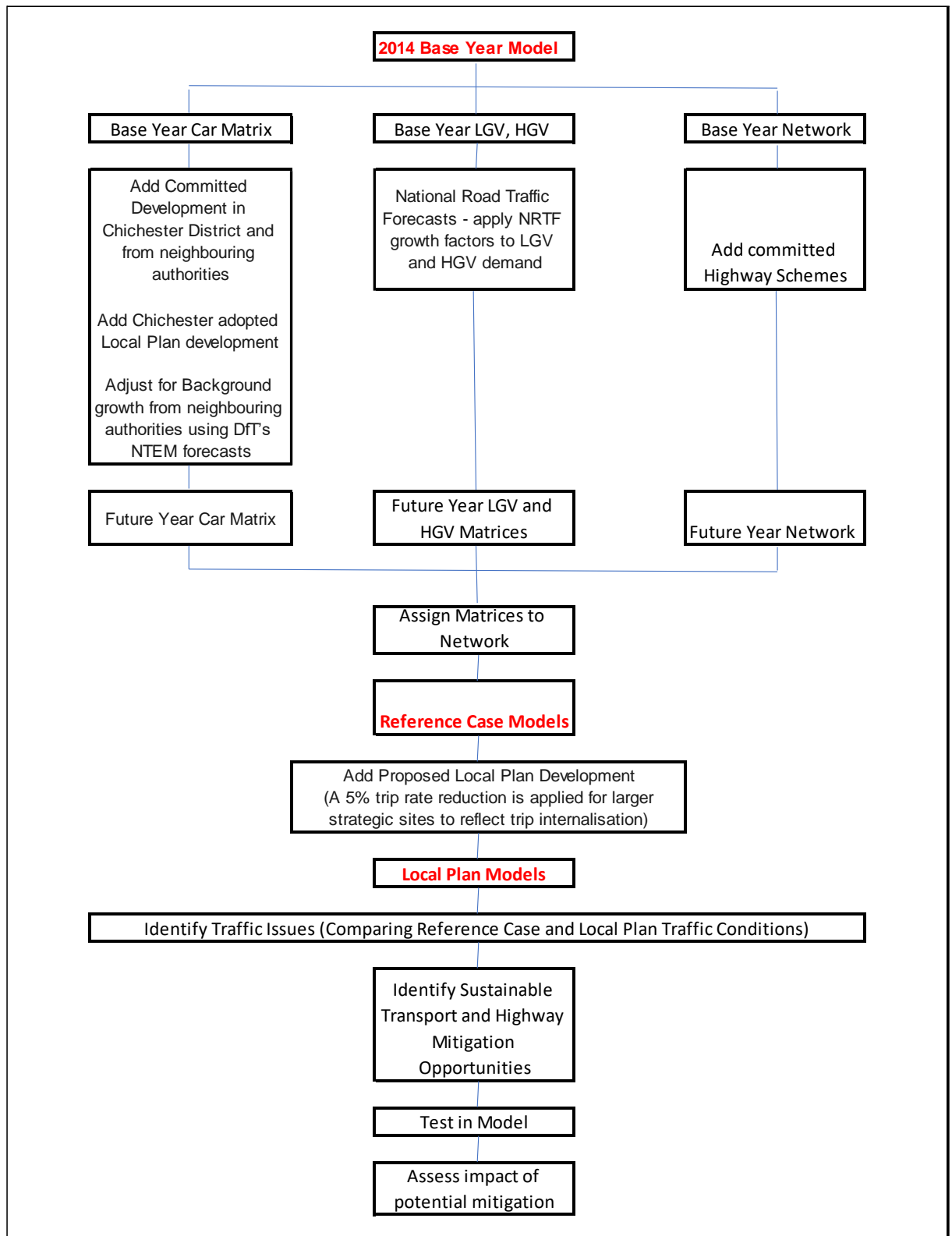
3 Chichester Area Transport Model

3.1 Introduction

- 3.1.1 The key modelling assessment tool used to inform this Local Plan 2021-2039 modelling is based upon a NH SATURN highway model known as the Chichester Area Transport Model (CATM). The CATM model was most recently validated to a 2014 base. The model was originally developed for NH to understand the impact of identified options to relieve congestion on A27 Chichester Bypass. Full details of the model development and validation are provided in the 'A27 Chichester Local Model Validation Report', produced by NH (Highways England at that time) in July 2016⁴.
- 3.1.2 For the purpose of testing the Local Plan 2021-2039, the CATM has been updated by Stantec to investigate travel patterns in and around the Chichester area with a view to understand the changes that may occur to those patterns in response to the policies and strategy of the Chichester Local Plan 2021-2039. The key update has been to extend the highway network to the west and south of Chichester where the original HE CATM model was less detailed. The trip matrices and data used to validate the earlier model were retained and therefore the model base year remained unchanged from 2014.
- 3.1.3 The model update has been detailed in the Chichester Area Transport Model Local Model Validation Report (LMVR), Stantec, August 2018. The LMVR was submitted to stakeholders including CDC, WSCC and NH. Comments from CDC, WSCC and NH were satisfactorily addressed and a final LMVR agreed by all parties. The updated base model was deemed a satisfactory and robust tool on which to develop future forecasts and inform the local plan testing. The LMVR is attached as Appendix A.
- 3.1.4 A proportionate approach to the modelling has been undertaken. Further detail as to the modelling approach used to assess the new allocations, is provided in the following sections of this report.
- 3.1.5 Figure 3-1 provides an overview of the modelling approach used to inform the study.

⁴ [A27 Chichester - LMVR 0.5 FINAL.pdf \(publishing.service.gov.uk\)](#)

Figure 3-1 Modelling Process



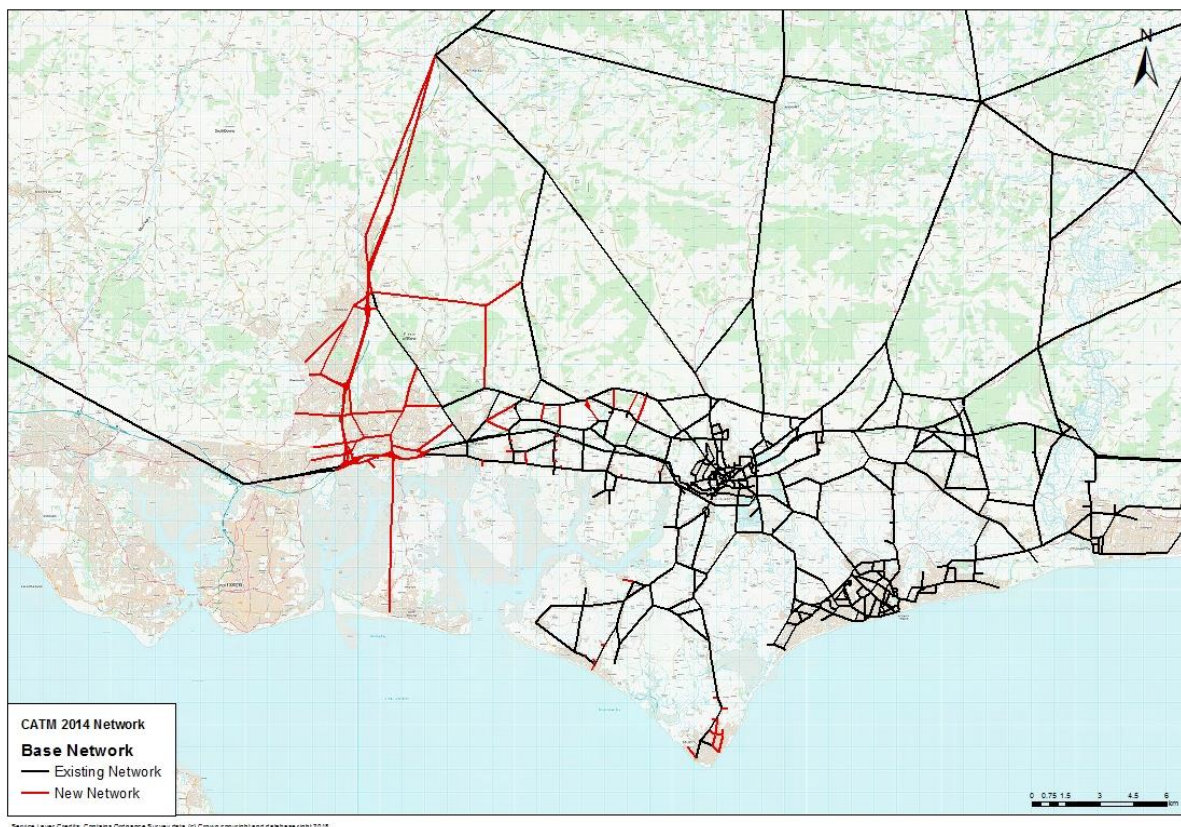
3.2 Base Year Model Development

Model Area

3.2.1 The area covered by the model is shown in Figure 3-2. The updated model covers the same area with the previous CATM 2014 model but with a more detailed network as indicated in red on the figure. The additional detail has been added to the following areas:

- Western edge of the model in Havant, including the A3(M) and the A3(M)/A27 junction).
- Between the A27 and the A259 to the west of Chichester.
- North of the A27 to the west of Chichester.
- South of Chichester on the Manhood peninsula, around West and East Wittering and Selsey.

Figure 3-2 Chichester Area Transport Model Network



Model Overview

3.2.2 The updated CATM has been developed using SATURN version 11.4.07H. This software is suitable for developing the network and assignment of the matrix. The matrix building process has been carried out within Microsoft Excel, with the final matrices converted to a SATURN format for assignment to the network.

3.2.3 One of the main benefits of using SATURN for the assignment process is that it is applicable to both urban and rural networks and can model peak hour congestion in sufficient detail. As a combined simulation and assignment model, SATURN also has the advantage that it enables detailed junction modelling to be undertaken.

- 3.2.4 The model in question is a highway simulation and assignment model only and does not include any multimodal (public transport or active mode) or demand modelling (which would be used to model trip suppression or changes to time trips are made for example). This is a proportionate and robust approach to assess the worst-case scenario.
- 3.2.5 The assignment element of the model predicts routes that drivers will choose and the way that traffic demand interacts with the available road capacity.
- 3.2.6 The aim of the assignment model is to reach an equilibrium where costs and flows are in balance under the assumption that individual users will seek to minimise their costs of travel through the network and they provide a good fit with observed data, checked through a validation process.

Modelled Year and Time Periods

- 3.2.7 This updated model has maintained a base year of 2014.
- 3.2.8 This study excludes the consideration of holiday/weekend traffic and other abnormal events within the study area.
- 3.2.9 Two peak hours have been represented within the model:
- Weekday AM peak hour (0800-0900)
 - Weekday PM peak hour (1700-1800)

Vehicle Types and Travel Purposes

- 3.2.10 The model has 5 user classes as follows:
- UC1: Cars for commuting
 - UC2: Cars for employer's business
 - UC3: Cars for other purposes
 - UC4: Lights Goods Vehicles (LGVs)
 - UC5: Heavy Goods Vehicles (HGVs)

Passenger Car Units (PCU) Factors

- 3.2.11 Passenger Car Units (PCU) are used as the standard unit for demand and capacity within the model. A PCU is a measure used primarily to assess highway capacity, for modelling purposes. Different vehicles are assigned different values, according to the space they take up. A car has a value of 1; smaller vehicles will have lower values, and larger vehicles will have higher values. This allows for the impact of large vehicles which take up more road space and take longer to clear junctions to be accounted for. The PCU factors used within the CATM are:
- Car – 1.0
 - Light Goods Vehicle (LGV) – 1.0
 - Heavy Goods Vehicle (HGV) – 2.3

Zoning System

- 3.2.12 The zoning system used for the CATM is based on 2011 Census geography with consistency between Census Output Areas, Districts and Counties maintained where possible. The zoning

system for this iteration of the CATM has largely been retained from the previous 2014 HE CATM model.

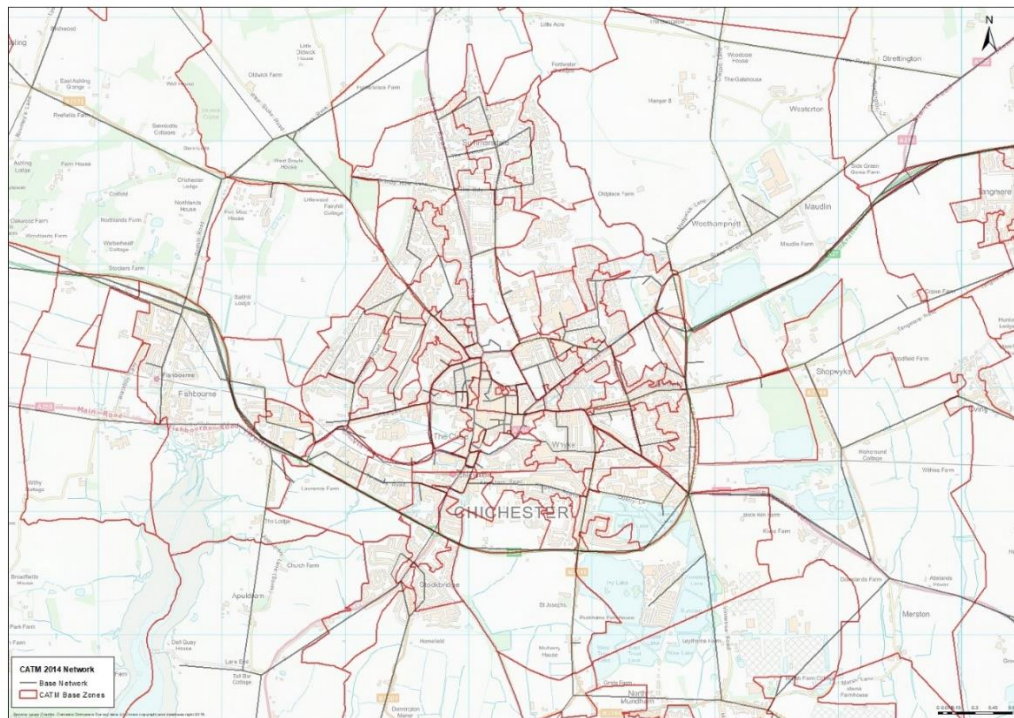
- 3.2.13 The model initially had a total of 257 zones. In anticipation of future local plan development zones, additional zones have been added to accommodate future local plan developments, thus taking the number of zones in the updated model to 296. The future local plan zones have no trips in the 2014 base year.
- 3.2.14 The benefit of using a zoning system based on the 2011 Census geography is the ease of use and comparison with planning data, such as population and employment estimates in both the development of the base model and for model forecasting onwards.
- 3.2.15 Zones 1 to 212 represent the core study area zones within Chichester, Arun and Havant, 213 to 252 are external zones representing geographical areas outside the core area) and 253 to 296 are for future development. To better replicate trip distribution in the western area of the model, a comparison between the existing zone structure in the previous iteration of the CATM and those in South East Region Traffic Model (SERTM)⁵ was undertaken. This resulted in the combination of some SERTM zones and trips that were subsequently used to replace or add trips onto existing zones of the CATM. As such this involved maintaining the matrices within the existing simulation network area, so not to affect the overall validation in the area within Chichester.
- 3.2.16 The revised zoning system is shown in Figure 3-3 for the wider model area and Figure 3-4 in the area around Chichester city.

Figure 3-3 CATM Simulation Area Zoning System – Chichester District



⁵ SERTM is one of a suite of highway models developed by Highways England which cover all of England. These models are used to assess Highways England Major Schemes. More information is available at [https://www.saturnsoftware.co.uk/ugm2015/SAT15UGM%20Highways%20England%20Regional%20Transport%20Models%20\(Final\).pdf](https://www.saturnsoftware.co.uk/ugm2015/SAT15UGM%20Highways%20England%20Regional%20Transport%20Models%20(Final).pdf)

Figure 3-4 CATM Simulation Area Zoning System – Chichester City



3.3 Age of Model and Modelling Uncertainty - Model Verification Exercise

- 3.3.1 As previously stated, the 2014 base year model utilises and is validated against traffic data and journey making patterns from that time. It is recognised that the model is now reaching the end of its useful life and that travel behaviour following the COVID-19 Pandemic has changed, with more home working, but increases in other types of journeys on the road such as deliveries resulting from the increased uptake of home shopping.
- 3.3.2 As well as the age of the data, the forecasting approach has made use of DfT TEMPro Software and National Trip End Model (NTEM) version 7.2 in producing forecasts. DfT released a new version of NTEM, version 8.1, in 2023 and this has lower growth than the previous version. The process for applying NTEM growth is detailed further in Section 4.
- 3.3.3 There is a commitment to update/replace the model at an early stage following the forthcoming plan submission and examination. This workstream will be included as part of the monitor and manage process being developed going forward and will be developed through the Transport Infrastructure Management Group (TIMG). However, to support the upcoming plan submission and examination, further work has been undertaken to review current traffic and compare with old data and the model to strengthen the evidence base as far as is possible at this time and justify the use of the outputs from the modelling to support the transport evidence base for the Regulation 19 submission plan.
- 3.3.4 A Technical Note (Appendix B) has been produced which provides outputs from a comparative exercise undertaken to demonstrate whether the outputs from the model can be deemed to be robust to support the local plan evidence base, given the commitments stated above. The note sets out the findings and evidence and seeks to get agreement to the findings and conclusions reached from NH and WSCC (The Highways Authorities). The exercise made use of newly collected data on the A27 (November 2023), as well as existing data sources on the A27 and the local highway network.
- 3.3.5 The four key questions that the note aims to answer are:

- Is the survey data collected in November 2023 typical of current traffic conditions on the A27 and wider network and what does this tell us about current conditions?
- How does the data compare to traffic conditions in 2014 when the model was developed and what have been the trends in traffic growth since then, with particular reference to impacts of changes in travel behaviour following the COVID-19 Pandemic?
- Can the modelling outputs produced to date still be used to provide suitable evidence to the local plan process, in light of commitment to update modelling at the right time?
- What do the relevant modelling outputs indicate in terms of conditions on the A27 and wider higher network?

3.3.6 The full outputs from the assessment undertaken are included within Annex A. The key conclusions to be drawn from this work are:

- The traffic surveys undertaken in November 2023 are in the main suitable for use for further assessment.
- The data for Portfield Roundabout and journey times between Portfield and Bognor Road Roundabouts are not typical, therefore this data is not used in any further analysis,
- Analysis of the new data, alongside other data has shown that there was growth in traffic between 2014 and 2019, however the Pandemic has had an impact on traffic levels and the analysis indicates that, whilst there are variations, the 2014 and 2023 data is comparable.
- A very high-level approach to growth in the local plan has indicated that the 2031 model is a good proxy for the end of the plan period (2039) and a 2031 model will be used as the Reference Case as detailed in Section 4.
- The approach to the provision of new evidence should be taken with the knowledge that there is a commitment to update the model following examination and that the 2031 model is a suitable tool to validate the outcomes of the Transport Assessment work and to support the progression of the local plan.
- The model outputs clearly show that there are current and future congestion issues at the A27 junctions, both on the Strategic (A27) and local highway networks.
- There are some instances of what could be deemed to be inappropriate routing to the north, which will impact on the South Downs National Park and villages to the north and northwest of Chichester.
- Public transport services will be impacted by increased delays on the A259 approaches to Bognor Road Roundabout from the east and Fishbourne Road roundabout from the west, this being the route of the Stagecoach 700 bus service.
- There is a clear need for mitigation which is discussed further in this Transport Assessment and also the Monitor and Manage Methodology.

4 Reference Case Forecast Model Development

4.1 Overview

- 4.1.1 This section sets out the development of the Reference Case models. The Reference Case forecasting establishes predicted changes in highway demand and traffic assignment between the base year model and a future year scenario.
- 4.1.2 In order to establish robust traffic forecasts the development of the Reference case model has been informed by TAG Unit M4 on model forecasting⁶. The guidance helps limit and define uncertainty around assumptions and traffic growth forecasts that feed into the reference case. This includes guidance on the development of an uncertainty log which summarises all known assumptions that feed into the model and the level of certainty of each assumption.
- 4.1.3 Also, DfT TAG provides guidance on the application of background growth assumptions stemming from the National Trip End Model (NTEM) and National Road Traffic Forecasts (NRTF).
- 4.1.4 The methodology used for the development of the Reference Case forecast modelling was agreed with WSCC, CDC and NH prior to the commencement of the development of the forecast models.
- 4.1.5 As noted in the conclusions of the model verification exercise in Section 3, the previously created 2031 Reference Case models are considered to be a good proxy for the end of the plan period (prior to adding on the new local plan Development). Therefore, in order to inform the local plan Transport Evidence base, the 2031 Reference Case models have been used to represent a forecast year of 2039. These consider committed growth within Chichester, as well as committed development in the neighbouring authorities of Havant and Arun and general background growth. The 2031 matrices were developed previously as part of the ongoing study and were developed assuming linear growth during the plan period and have therefore been factored down accordingly from the 2039 models. Given the finding reported in Section 3, this is deemed to be a proportionate and appropriate approach to be used to understand the future traffic conditions with the full local plan growth added on top, as detailed in Section 5.
- 4.1.6 The models for the Reference Case, for the AM peak and PM peak period have been created by using:
- Committed development information obtained from CDC, WSCC, Arun District Council and Havant Borough Council.
 - Adopted Chichester Local Plan 2029 Strategic Development sites.
 - Adjustments for background traffic growth using DfT's National Trip End Model (NTEM) data.
 - A forecast network including any committed highway schemes.
 - For LGV and HGV growth, National Road Traffic Forecasts (RTF18) from DfT National Traffic Model (NTM) have been used.
 - All matrices have then been reduced from 2039 based on linear annual growth.
- 4.1.7 At the time of undertaking the modelling, the definitive NTEM version was 7.2. This was subsequently replaced by NTEM v8.0 and v8.1 in 2023. In addition, NRTF18 has been

⁶ [TAG unit M4 forecasting and uncertainty - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/100573/tag-unit-m4-forecasting-and-uncertainty.pdf)

replaced by National Road Traffic Projections 2022 (NRTP22). However, the impact of this has also been considered within the model verification exercise.

- 4.1.8 The growth in traffic resulting from the committed development has been applied to the validated 2014 Base Year model to account for forecast changes in traffic demand that is projected to occur, regardless of the additional development being considered as part of this local plan scenario testing.
- 4.1.9 The Reference Case model is used as the basis of comparison with the emerging Local Plan 2021-2039 scenarios and will inform the transport mitigation required to deliver the local plan growth, in transport terms.

4.2 Committed Development and Schemes

- 4.2.1 Forecast development that has been included within the Reference Case model includes all residential and employment development that are expected to be completed by the end of the plan period within Chichester and the neighbouring authorities of Havant and Arun and factored down to reflect the lower growth expected by the end of the plan period.
- 4.2.2 Havant and Arun authorities were contacted to provide their development plans for inclusion in the Reference Case. The locations of the committed development were agreed with CDC and WSCC prior to the commencement of the Reference Case modelling. Other neighbouring local authorities to Chichester include East Hampshire District Council (EHDC), Waverley Borough Council (WBC) and Horsham District Council (HDC). Development within the South Downs National Park area has been included within the TEMPO growth. These are on the periphery of the study area within the buffer network of the model, and they are represented in the demand matrices through NTEM background growth.
- 4.2.3 A detailed list of all agreed development included in the Reference Case has been compiled into an ‘Uncertainty Log.’ The developments included in the Reference Case of the model development are based on guidance on WebTAG guidance on uncertainty, as summarised within Table A-2 of TAG Unit M-4, with development in the first two categories being included within the Reference Case model.
- 4.2.4 Any development external to the core modelled area in other authorities (other than Havant and Arun) are included within the DfT National Trip End Model (NTEM) growth assumptions. These are on the periphery of the study area within the buffer network of the model, and they are represented in the demand matrices through NTEM background growth. Trips from small sites were not explicitly modelled but are accounted for through NTEM growth factors.
- 4.2.5 Table 4-1 summarises the committed developments within Chichester that have been assumed in the Reference Case. They are also included in the Uncertainty Log. The full list of developments included within the Reference Case, including that from Havant and Arun, is provided in Appendix C.

Table 4-1 Committed and Adopted Local Plan Development assumed in Reference Case

Local Authority Area	Dwellings	Employment (Sq. M)
Chichester	6,727	91,490
Havant	8,881	139,725
Arun	16,821	313,486
TOTAL	32,429	404,976

- 4.2.6 32,429 dwellings has therefore been included in the 2039 Reference Case models.

Southern Gateway Scheme

4.2.7 The Reference Case also includes committed schemes assumed in the future network without the local plan. The list of schemes assumed is shown in Appendix D. A key point to note is that the Southern Gateway development proposals has been retained in the Reference Case, however no mitigation associated with the development has been included in the model.

4.3 Trip Rates

4.3.1 To generate trips from these committed developments, trip rates are required to be applied to each development depending on their type and peak period. The trip rates used in this study were agreed by stakeholders including CDC, WSCC and Highways England (now National Highways).

4.3.2 The agreed residential trip rates were for mixed private/affordable housing, and it was agreed that they would be used as global rates for suburban and out of town sites for the study. Residential trip rates are in units of trips/dwelling while employment trip rates are in units of trips/100 square metres of gross floor area.

4.3.3 Residential trip rates are in units of trips/dwelling while employment trip rates are in units of trips/100 square metres of gross floor area. The agreed trip rates (with WSCC and NH) are shown in Table 4-2.

Table 4-2 Trip Rates (Residential and Employment)

Peak	Trip Rate ID	Type	Arrivals	Departures	Total
AM	Residential	Residential	0.1200	0.3520	0.472
AM	Warehousing (Commercial)	Employment	0.168	0.076	0.244
AM	Business Park	Employment	1.686	0.169	1.855
AM	Fruit and Vegetable Farm	Employment	0.06	0.001	0.061
PM	Residential	Residential	0.31800	0.15900	0.477
PM	Warehousing (Commercial)	Employment	0.055	0.161	0.216
PM	Business Park	Employment	0.124	1.273	1.397
PM	Fruit and Vegetable Farm	Employment	0.003	0.006	0.009

4.1 Strategic Sites – Trip Reduction

4.1.1 A 5% reduction in demands has been assumed within the strategic local plan locations to represent a reduction in trips as a result of development-specific travel planning and behaviour change packages encompassing smarter choices. The 5% reduction assumption was retained from the tests undertaken for the adopted local plan and was agreed with CDC as a plausible and achievable target. These have been implemented within the modelling by reducing the matrices accordingly. The 5% car trip reduction assumption has been retained from the previous 2018 study and was agreed by WSCC, CDC and NH (then Highways England). The reduction was applied in both the Reference Case and with local plan scenarios.

4.2 Trip Distribution

4.2.1 The distribution of trips to and from the sites has been taken from an existing zone within the model which is deemed to have similar characteristics in terms of land use and location. These zones are referred as donor zones. Trip distribution refers to the trip making patterns

describing where a trip starts known as its Origin zone, and where the trip ends known as its Destination zone.

- 4.2.2 Trips from committed development sites have been distributed between zones based on existing zones within the model. This is standard practice and assumes that trip making patterns for new developments will be similar to existing trip making patterns.

4.3 Reference Case Model Performance

- 4.3.1 The model convergence statistics for the Reference Case models are summarised within Table 4-3. Model convergence is a measure of the stability of the model. The model will run through a number of iterations and will be deemed to converge when cost changes are seen to be stable and meet criteria set out with TAG guidance.
- 4.3.2 The statistics are provided for the final four assignment/simulation loops for each model, in line with TAG guidance. The results show that all the models achieve acceptable convergence and in particular all models achieve a gap value of less than 0.1%. A gap of under 1% is regarded as satisfactory and this is more than achieved by all the models. Good model convergence indicates that the models are stable and model results are considered to be robust.

Table 4-3 Reference Case Convergence Statistics

AM				PM			
Iteration	% GAP Delta	% Flow	%Cost Delays	Iteration	% GAP Delta	% Flow	%Cost Delays
28	0.017	99.2	99.5	37	0.0089	99.0	99.3
29	0.012	99.2	99.6	38	0.0094	99.1	99.4
30	0.016	99.2	99.7	39	0.0092	99.4	99.5
31	0.011	99.1	99.6	40	0.011	99.4	99.6

- 4.3.3 The low % GAP values of all models are less than 0.1%, and the high %Flow and %Delay values indicate that a satisfactory level of convergence has been achieved within the highway model in all cases.
- 4.3.4 To provide an additional measure of the operation of the model, network summary statistics have been extracted from the 2014 Base and Reference Case models and these are shown in Table 4-4. The summary statistics are a measure of network wide performance. It is generally to be expected that as traffic growth increases in the future, network performance will deteriorate as congestion increases. The summary statistics, in addition to giving a network wide indication of performance for each of the modelled scenarios, also provides a simple and easily understandable test that the models are behaving logically.
- 4.3.5 The model summary statistics indicate that the models are behaving as expected, and that the underlying trends in the summary statistics are logical and expected.

Table 4-4 Network Summary Statistics

Scenario	Trips (PCU/hr.)	Total Travel Time (PCU/Hr.)	Total Travel Distance (PCU KM/hr.)	Average Speed (KM/hr.)	Over Capacity Queues (PCU HRS/hr.)
AM 2014 Base	53,810	10,479	553,693	53	1,031
AM Reference Case	71,544	17,134	744,830	43	3,392

Scenario	Trips (PCU/hr.)	Total Travel Time (PCU/Hr.)	Total Travel Distance (PCU KM/hr.)	Average Speed (KM/hr.)	Over Capacity Queues (PCU HRS/hr.)
PM 2014 Base	53,001	9,923	540,535	55	803
PM Reference Case	69,458	16,069	714,583	45	3,286

5 Local Plan Scenario – No Mitigation

5.1 Introduction

- 5.1.1 This section reports on the impacts of the proposed 2039 Preferred Scenario Local Plan 2021-2039 development without any physical mitigation on place.
- 5.1.2 Following the creation of Reference Case forecasts, the Local Plan scenario development trips (extending the plan to 2039) were added on top of the Reference Case model demands to create the 2039 Local Plan Scenario without mitigation, for assignment in the traffic model. The agreed trip rates discussed in Section 4.3 were used to derive the trip generation of these developments. Similarly, a 5% reduction in trips was applied to strategic development sites.
- 5.1.3 The distribution of the local plan trips was based upon land use zones of a similar nature already included within the Reference Case.
- 5.1.4 All proposed local plan developments up to the end of the proposed plan period, detailed in Section 2, have been added on top of the Reference Case to create the 2039 Local Plan model scenario.
- 5.1.5 Analysis is provided for the AM and PM peak hours. The impacts have been assessed by looking at three main model parameters comparing the With Local Plan Scenario against the Reference Case. The parameters used are:
- Changes in Actual Link Flows in PCU/Hour.
 - A comparison and analysis of changes in Link Volume to Capacity Ratio (V/C %).
 - A comparison and analysis of changes in Link Delays in seconds.
 - A comparison and analysis of changes in queues in PCU.

5.2 2039 Flow Changes Local Plan Without mitigation

- 5.2.1 This analysis compares the flow changes of the 2039 Local Plan Scenario without mitigation, against the Reference Case flows. An increase in flows implies that the local plan results in higher flows than in the Reference Case, while a decrease implies that the local plan results in less flows, likely because of reassignment. The plots within Appendix E show the flow changes.
- 5.2.2 The flow changes indicate that there are significant flow increases on various roads within the study area including Chichester City. This includes flow increases on radial routes into Chichester as well as on routes on the northern edge of Chichester. This is as a result of the increased demands from local plan development. There is evidence of traffic rat running through the local highway network instead of using the A27 likely because of capacity constraints on the A27 Chichester Bypass junctions. This includes increased traffic on New Road and Downs Road to the north of Chichester both eastbound and westbound.
- 5.2.3 Similar trends in flow changes are seen in both the AM and PM peaks with some rat running through Chichester and use of roads to the north of Chichester evident as traffic assigns away from the A27 Chichester Bypass.
- 5.2.4 In both the AM and PM peaks, it is also noticeable that there are large increases in traffic volume on the network to the east of Chichester, which correlates to the local plan development located in this area.

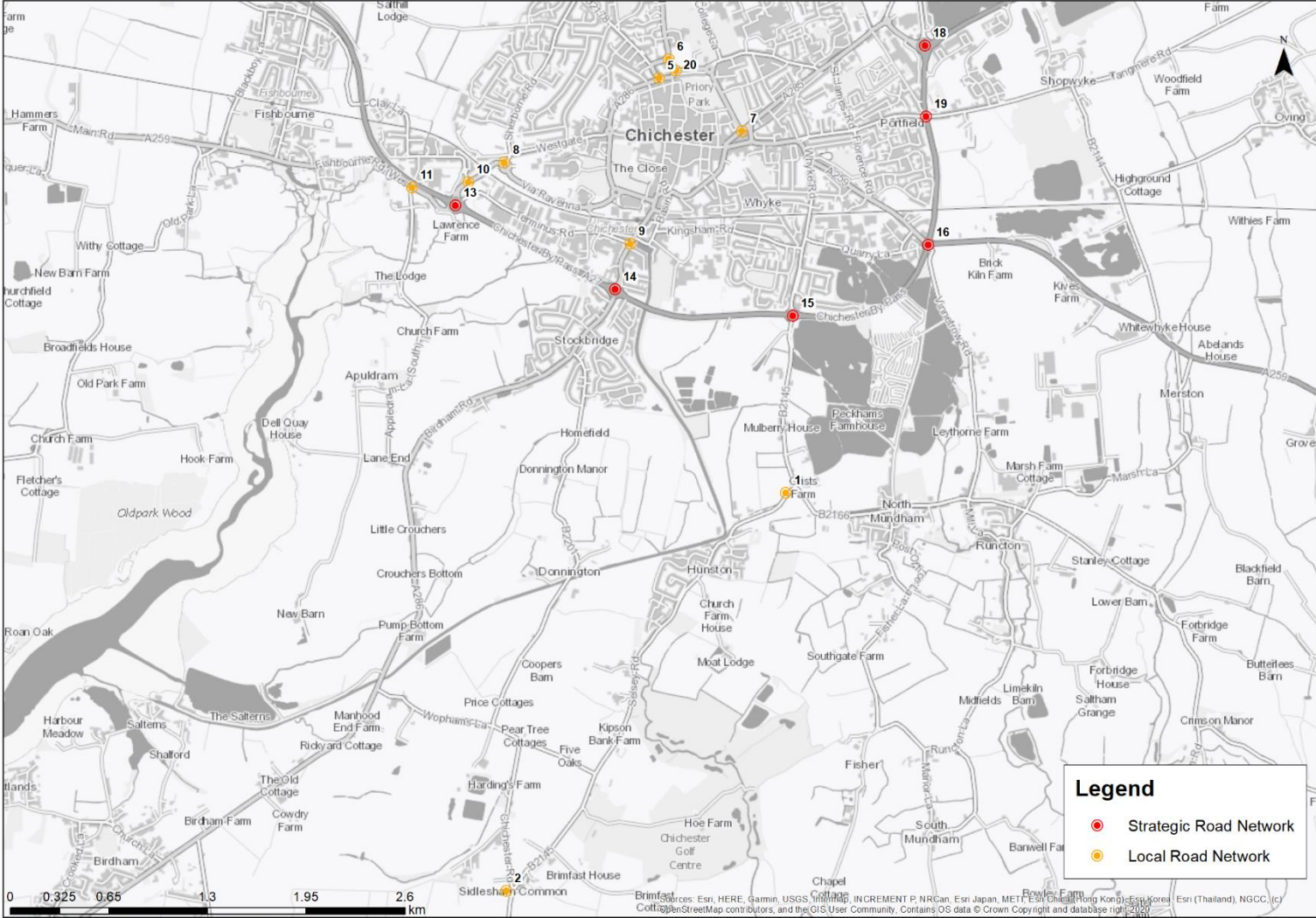
5.3 Summary of Flow Changes

- 5.3.1 It is considered the flow changes predicted by the model across the network are logical and to expectation. In the absence of mitigation, the flow analysis indicates that there are significant flow increases on various roads within the study area including Chichester City. This includes flow increases on radial routes into Chichester as well as on routes on the northern edge of Chichester. This is as a result of the increased demands from local plan development.
- 5.3.2 There is evidence of traffic rat running through the local highway network instead of using the A27 likely because of capacity constraints on the A27 Chichester Bypass junctions. This includes increased traffic on New Road and Downs Road to the north of Chichester both eastbound and westbound. The decreases seen on the A27 suggest traffic reassigning away from the A27 to use less suitable routes given the capacity constraints on the A27 in the absence of mitigation. This is the case in both the AM and PM peak hours.

5.4 Volume over Capacity (V/C), Delays and Queue Outputs

- 5.4.1 This section provides an indication of the operation of the junctions within the model by analysing the Volume over Capacity ratios (%), delays in seconds and queues in PCU. Where junctions are overcapacity (i.e., V/C greater than 100%, mitigation should provide a level of service (LOS) that is no worse than that in the Reference Case. The junctions included are shown in Figure 5-1. This focuses on junctions in Chichester district.
- 5.4.2 The analysis highlights those junctions which are deemed to require mitigation, by virtue of them being over capacity with the local plan development in place and being significantly worse than the Reference Case outputs.

Figure 5-1 Junction Locations



5.4.3 Table 5-1 to Table 5-6 provide a summarised tabulation of the V/C ratios, delays and queues at the key impacted junctions for the Reference Case and Local Plan without mitigation for both the AM and PM peak hours. Those junctions where the V/C indicates that with the local plan in place, mitigation is deemed to be required are shown in red. The V/C has been used as the main metric for determining mitigation need, whilst delays and queue data are provided for information.

5.4.4 Graphical plots of V/C are shown in Appendix F, while those of Delays are shown in Appendix G.

Table 5-1 AM – Max Volume to Capacity Ratio

Junction No.	Location	Reference Case	2039 LP Without Mitigation
1	B2145 / B2166	88	96
2	B2145/B2201	72	75
5	A286 Northgate / A286 Orchard Street	72	76
6	A286 Churchside / A286 Broyle Road	107	107
7	A286 New Park Road / A286 St Pancras Road	73	77
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	111	116
9	A286 Stockbridge Road/ Terminus Road	44	51
10	A259 Cathedral Way/ Fishbourne Road East	115	125
11	Fishbourne Road West / Appledram Lane South	72	74
13	Fishbourne Roundabout	122	132
14	Stockbridge Roundabout	117	120
15	Whyke Roundabout	117	120
16	Bognor Road Roundabout	124	130
18	Portfield Roundabout	101	104
19	Oving Junction	83	93
20	A286 Northgate / A286 Oaklands Way	99	100

Table 5-2 PM – Max Volume to Capacity Ratio

Junction No.	Location	Reference Case	2039 LP Without Mitigation
1	B2145 / B2166	87	94
2	B2145/B2201	99	102
5	A286 Northgate / A286 Orchard Street	91	95
6	A286 Churchside / A286 Broyle Road	53	64
7	A286 New Park Road / A286 St Pancras Road	104	107
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	55	66
9	A286 Stockbridge Road/ Terminus Road	149	149

Junction No.	Location	Reference Case	2039 LP Without Mitigation
10	A259 Cathedral Way/ Fishbourne Road East	90	103
11	Fishbourne Road West / Appledram Lane South	87	104
13	Fishbourne Roundabout	184	185
14	Stockbridge Roundabout	128	136
15	Whyke Roundabout	128	136
16	Bognor Road Roundabout	114	118
18	Portfield Roundabout	124	132
19	Oving Junction	124	132
20	A286 Northgate / A286 Oaklands Way	102	105

Table 5-3 AM – Max Delays (Total) (seconds)

Junction No.	Location	Reference Case	2039 LP Without Mitigation
1	B2145 / B2166	5.8	9.7
2	B2145/B2201	16.0	20.0
5	A286 Northgate / A286 Orchard Street	8.7	9.7
6	A286 Churchside / A286 Broyle Road	187.4	181.7
7	A286 New Park Road / A286 St Pancras Road	6.3	7.6
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	349.6	497.1
9	A286 Stockbridge Road/ Terminus Road	21.8	21.9
10	A259 Cathedral Way/ Fishbourne Road East	608.1	821.8
11	Fishbourne Road West / Appledram Lane South	13.6	21.1
13	Fishbourne Roundabout	673.4	929.5
14	Stockbridge Roundabout	528.4	512.2
15	Whyke Roundabout	523.9	558.7
16	Bognor Road Roundabout	673.8	728.4
18	Portfield Roundabout	87.9	108.3
19	Oving Junction	135.4	135.4
20	A286 Northgate / A286 Oaklands Way	22.4	27.4

Table 5-4 PM – Max Delays (Total) (seconds)

Junction No.	Location	Reference Case	2039 LP Without Mitigation
1	B2145 / B2166	13.4	19.3
2	B2145/B2201	99.3	124.8
3	A259/B2132 Comet Corner	363.8	366.9
4	A259/B2233 Oystercatcher	157.1	168.2
5	A286 Northgate / A286 Orchard Street	30.2	35.4
6	A286 Churchside / A286 Broyle Road	6.6	11.1
7	A286 New Park Road / A286 St Pancras Road	169.7	223.2
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	28.6	33.0
9	A286 Stockbridge Road/ Terminus Road	953.0	928.4
10	A259 Cathedral Way/ Fishbourne Road East	10.7	61.8
11	Fishbourne Road West / Appledram Lane South	40.4	196.0
13	Fishbourne Roundabout	1785.1	1740.3
14	Stockbridge Roundabout	807.7	891.2
15	Whyke Roundabout	766.0	867.7
16	Bognor Road Roundabout	386.7	519.9
18	Portfield Roundabout	679.8	864.6
19	Oving Junction	626.7	845.4
20	A286 Northgate / A286 Oaklands Way	123.5	175.8

Table 5-5 AM – Max Average Queue Total (PCU)

Junction No.	Location	Reference Case	2039 LP Without Mitigation
1	B2145 / B2166	0.9	2.2
2	B2145/B2201	1.1	1.3
5	A286 Northgate / A286 Orchard Street	0.9	1.1
6	A286 Churchside / A286 Broyle Road	23.0	23.0
7	A286 New Park Road / A286 St Pancras Road	0.7	0.9
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	31.7	44.9
9	A286 Stockbridge Road/ Terminus Road	1.2	1.4
10	A259 Cathedral Way/ Fishbourne Road East	24.4	38.8
11	Fishbourne Road West / Appledram Lane South	0.6	0.8
13	Fishbourne Roundabout	77.9	148.7

Junction No.	Location	Reference Case	2039 LP Without Mitigation
14	Stockbridge Roundabout	70.2	88.3
15	Whyke Roundabout	82.9	100.7
16	Bognor Road Roundabout	150.5	188.6
18	Portfield Roundabout	29.2	55.0
19	Oving Junction	5.5	6.3
20	A286 Northgate / A286 Oaklands Way	4.4	6.4

Table 5-6 PM – Max Average Queue Total (PCU)

Junction No.	Location	Reference Case	2039 LP Without Mitigation
1	B2145 / B2166	1.6	3.2
2	B2145/B2201	5.1	9.3
5	A286 Northgate / A286 Orchard Street	3.5	4.6
6	A286 Churchside / A286 Broyle Road	0.4	0.7
7	A286 New Park Road / A286 St Pancras Road	17.8	24.2
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	0.5	0.8
9	A286 Stockbridge Road/ Terminus Road	48.2	48.2
10	A259 Cathedral Way/ Fishbourne Road East	0.5	12.8
11	Fishbourne Road West / Appledram Lane South	1.4	20.7
13	Fishbourne Roundabout	99.3	105.9
14	Stockbridge Roundabout	49.0	82.6
15	Whyke Roundabout	42.0	69.6
16	Bognor Road Roundabout	102.9	133.4
18	Portfield Roundabout	136.6	173.3
19	Oving Junction	56.8	73.9
20	A286 Northgate / A286 Oaklands Way	19.6	32.1

5.5 Safety Assessment

5.5.1 A safety assessment was undertaken to review personal injury collision data for Chichester. This identified junctions where clusters of collisions had been recorded. The review was informed by collision data obtained from WSCC and covered the period commencing May 2016 through to April 2021, this being the latest data at the time of the assessment.

5.5.2 To identify locations where significant increases in traffic as a result of the local plan development may impact the identified collision clusters, the changes in traffic flows were

considered for the AM and PM peak hours. The traffic flow changes were obtained by comparing the Local Plan scenario against the Reference Case. The methodology and results of the assessment can be found in Annex A.

- 5.5.3 A review of the collision locations identified 11 junction clusters across the Chichester District. Of the 11 junction clusters found, 3 non-SRN junctions have no proposed highways improvements and could be materially impacted by the local plan development.
- 5.5.4 The 11 identified junctions where there has been a clustering of collision over the 5-year study period are listed below and include SRN junctions. (X) indicates junctions with no proposed mitigation.
- 1) Fishbourne Roundabout (Roundabout)
 - 2) Stockbridge Roundabout (Roundabout)
 - 3) Whyke Roundabout (Roundabout)
 - 4) Bognor Road Roundabout (Roundabout)
 - 5) A27 / B2144 (Signalised Junction)
 - 6) Portfield Roundabout (Roundabout)
 - 7) A259 / Fishbourne Road East (Priority Junction)
 - 8) A268 (Oaklands Way)/ Northgate (Gyratory)
 - 9) A286 / East Street (Priority Junction) (X)
 - 10) A259 / Drayton Lane Roundabout (Roundabout) (X)
 - 16) A286 Birdham / Wophams Lane (Priority Junction) (X)
- 5.5.5 A number of the junction clusters had mitigation measures identified as part of the Local Plan 2021-2039 which will help to improve safety for all road users and in turn reduce the risk of a collision.
- 5.5.6 The prioritisation and implementation of these mitigation measures will be taken forward through the monitor and manage process and as part of the TIMG.

5.6 Seasonal Impacts

- 5.6.1 The modelling for the local plan has not assessed weekends, bank holidays or seasonal changes that may alter traffic flows in the area. In Chichester's case this could arise in the summer tourist season or when major events are held at Goodwood for example. For these types of assessment, which are regarded as infrequent occurrences for the purposes of this study, the Council would be required to carry out more localised studies and implement specific traffic management to support the scale and nature of the event. This approach reflects policy and recognised best practice in transport studies across the country.
- 5.6.2 Some traffic flow analysis to compare how summer traffic flows differ from neutral months. Flow comparisons have been undertaken on the A27, on the A286 Birdham Road and on the B2145, the latter two sites representing flows on the local network associated with the Manhood Peninsula. The outputs from this work are reported in Annex B.

Summary on Traffic Flow Analysis

- 5.6.3 The count data analysis undertaken for the A27, A286 and B2145 indicates that generally, the average summer month flows are comparable to neutral month flows in the peaks and across the day. There are, however, days or instances when the summer month flows exceed the average month flows generally represented by the traffic model.
- 5.6.4 This is shown on the local network as analysed on the A286 Birdham Road and B2145 around or leading to/from the Manhood Peninsula during the Bank Holiday weekend days. For these specific and other atypical high flow days including on festival days, it would be expected that bespoke dedicated traffic management would be put in place to manage the unique traffic conditions.
- 5.6.5 The local plan assessment methodology is sound, in line with Industry and Government guidance and seeks to predict and manage the mitigation works across the local plan area. Therefore, there is no requirement for any seasonal assessments to be completed for the local plan process.

5.7 Impacts in Neighbouring Authority Areas

Arun

- 5.7.1 This section sets out summary of assessments made on the SATURN models for both Reference Case and Local Plan with Mitigation scenarios with the objective of understanding the impact of Chichester's local plan on mitigation schemes identified within Arun's adopted Local Plan. This work was done prior to using the 2031 as the Reference Case, therefore it provides a worse-case scenario of the impacts.
- 5.7.2 The models include committed mitigation schemes at A259/B2233 Oystercatcher Junction, B2132/A259 Comet Corner Junction and A27/Nyton Road junction included within both the Reference Case and Local Plan models. The first two fall within Arun District, however the latter is within Chichester.
- 5.7.3 This summary focuses on the difference in actual flows as well as vehicle capacity ratios at these junctions to identify whether the Chichester Local Plan traffic has any adverse impacts.

Traffic Flows

- 5.7.4 The traffic flow differences within Arun has focused on the Oystercatcher and Comet Corner junctions. The two schemes here have been identified as safety schemes, any noticeable additional traffic from Chichester Local Plan would be deemed to have a potential adverse impact.

5.7.5 Flow difference plots and turning flows are provided within Appendix H. A summary of traffic throughput at the junctions is provided in Table 5-7. The outputs show that the flow differences are insignificant when comparing the Reference Case and Local Plan with Mitigation scenarios and therefore the Chichester Local Plan is deemed to have no significant impact.

Table 5-7 Summary of throughput flows at selected Junctions.

Junction	AM Reference Case	AM LP Scenario
B2132/A259 Junction	3442	3425
Oystercatcher Junction	3881	3895
	PM Reference Case	PM LP Scenario
B2132/A259 Junction	3140	3104
Oystercatcher Junction	3740	3731

Vehicle Capacity Ratios.

- 5.7.6 This section focuses on all three junctions to determine whether there are any capacity issues as a result of the Chichester Local Plan development. Volume to Capacity Ratio (V/C) is used as the measure for this, with a figure of 100, indicating that a turn at the junction is at capacity.
- 5.7.7 Figure 5-3 shows the V/C outputs for the A259 Oystercatcher junction. This indicates that for nearly all scenarios, the junction operates within capacity. The A259 westbound approach does see an increase from 100% to 101% in the AM peak, when the local plan traffic is added, however there is no increase in delay, hence this increase in V/C is deemed to be insignificant and there is no material impact.
- 5.7.8 The same arm is also over capacity in the PM peak; however the local plan scenario does not increase above the Reference Case and therefore no material impact is seen.
- 5.7.9 Figure 5-4 shows the V/C outputs for the A27/B2233 Nyton Rd Junction. This indicates that all arms are well below capacity and therefore the Chichester Local Plan has no significant impact.

- 5.7.10 Figure 5-2 shows the V/C outputs for A259 Comet Corner Junction. This shows that the mitigation scheme operates well within capacity in the Chichester Local Plan Scenario.
- 5.7.11 Figure 5-3 shows the V/C outputs for the A259 Oystercatcher junction. This indicates that for nearly all scenarios, the junction operates within capacity. The A259 westbound approach does see an increase from 100% to 101% in the AM peak, when the local plan traffic is added, however there is no increase in delay, hence this increase in V/C is deemed to be insignificant and there is no material impact.
- 5.7.12 The same arm is also over capacity in the PM peak; however the local plan scenario does not increase above the Reference Case and therefore no material impact is seen.
- 5.7.13 Figure 5-4 shows the V/C outputs for the A27/B2233 Nyton Rd Junction. This indicates that all arms are well below capacity and therefore the Chichester Local Plan has no significant impact.

Figure 5-2 A259 Comet Corner Junction V/C Outputs

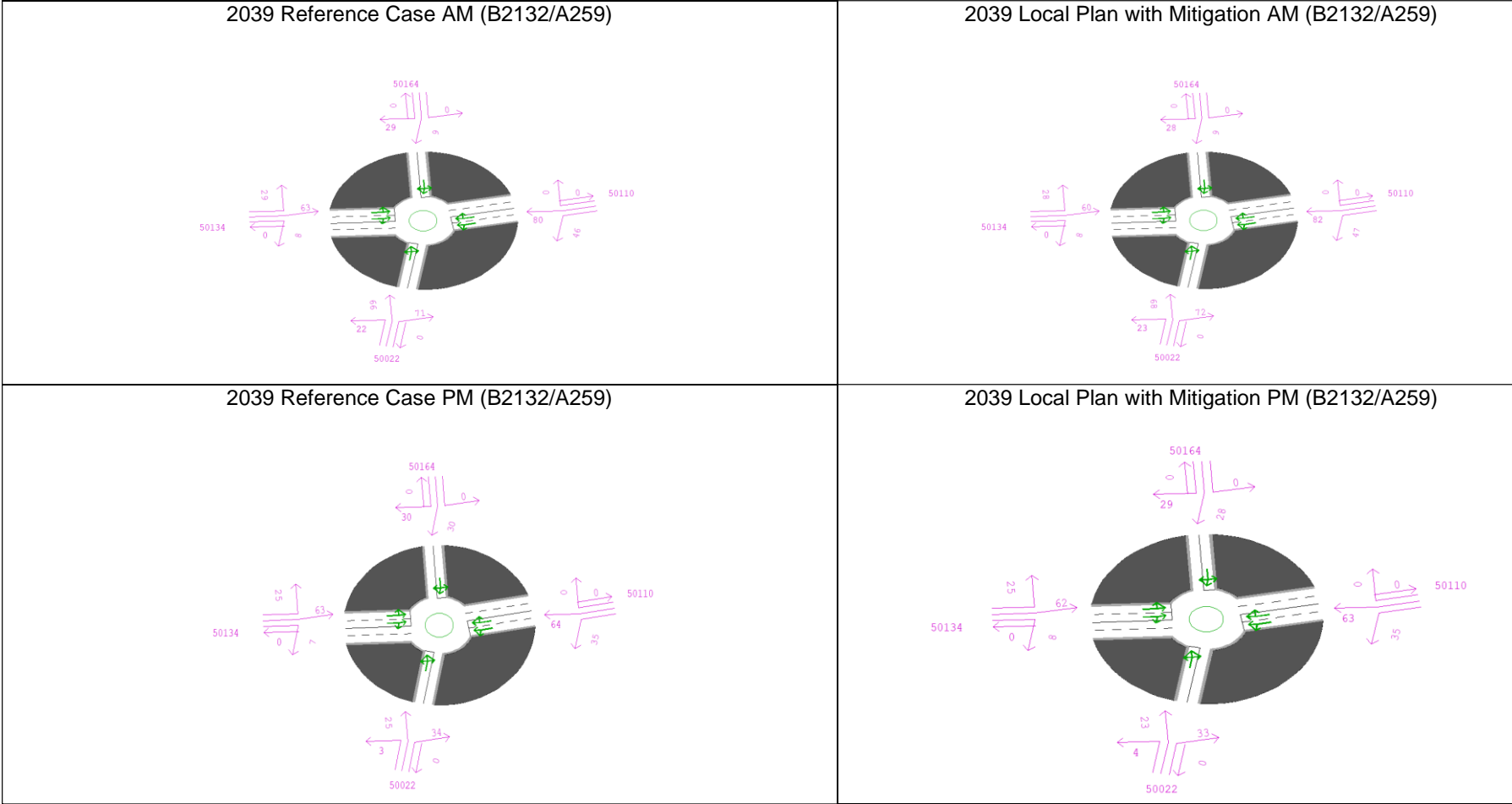


Figure 5-3 A259 Oystercatcher Junction V/C Outputs

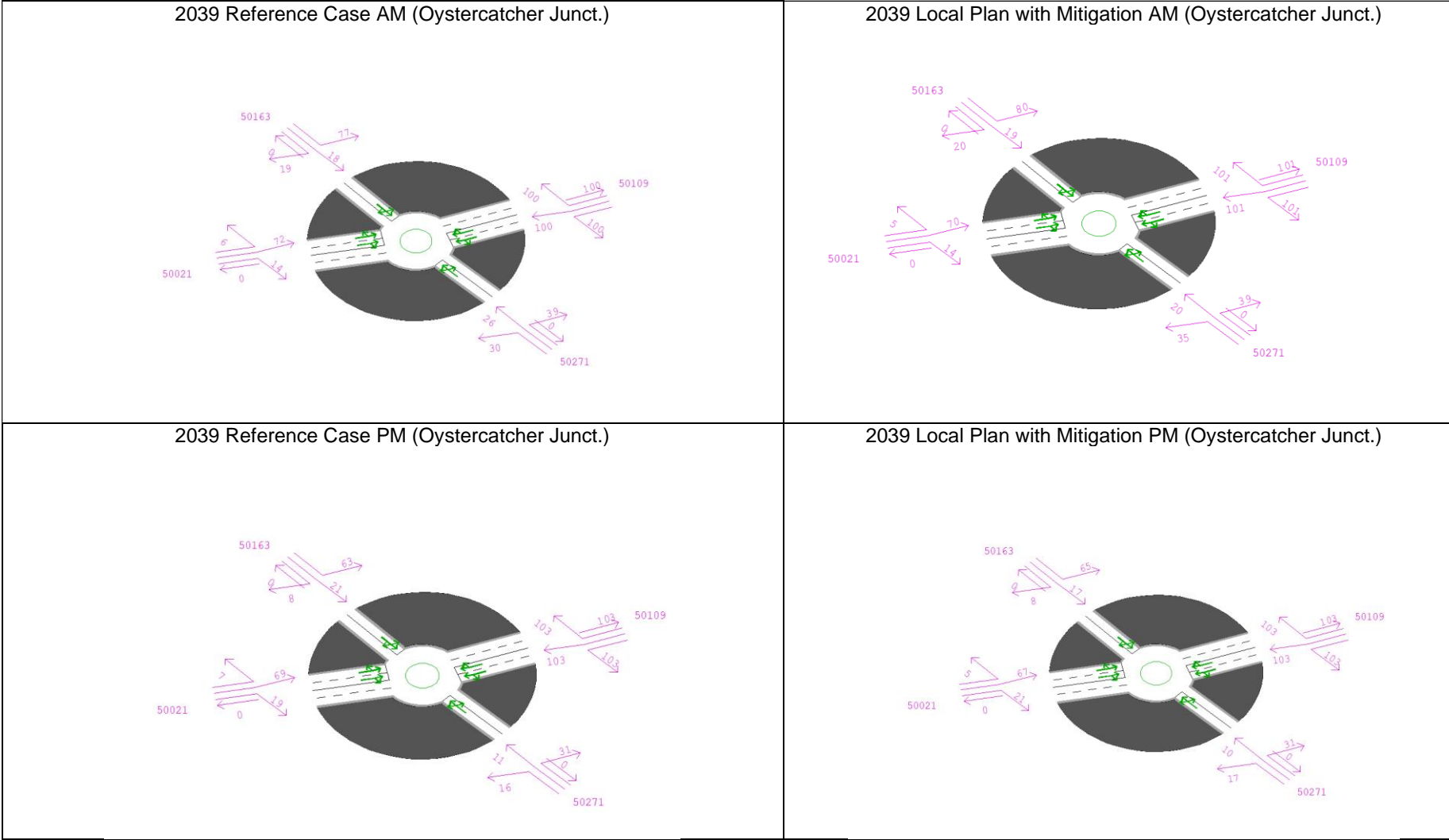
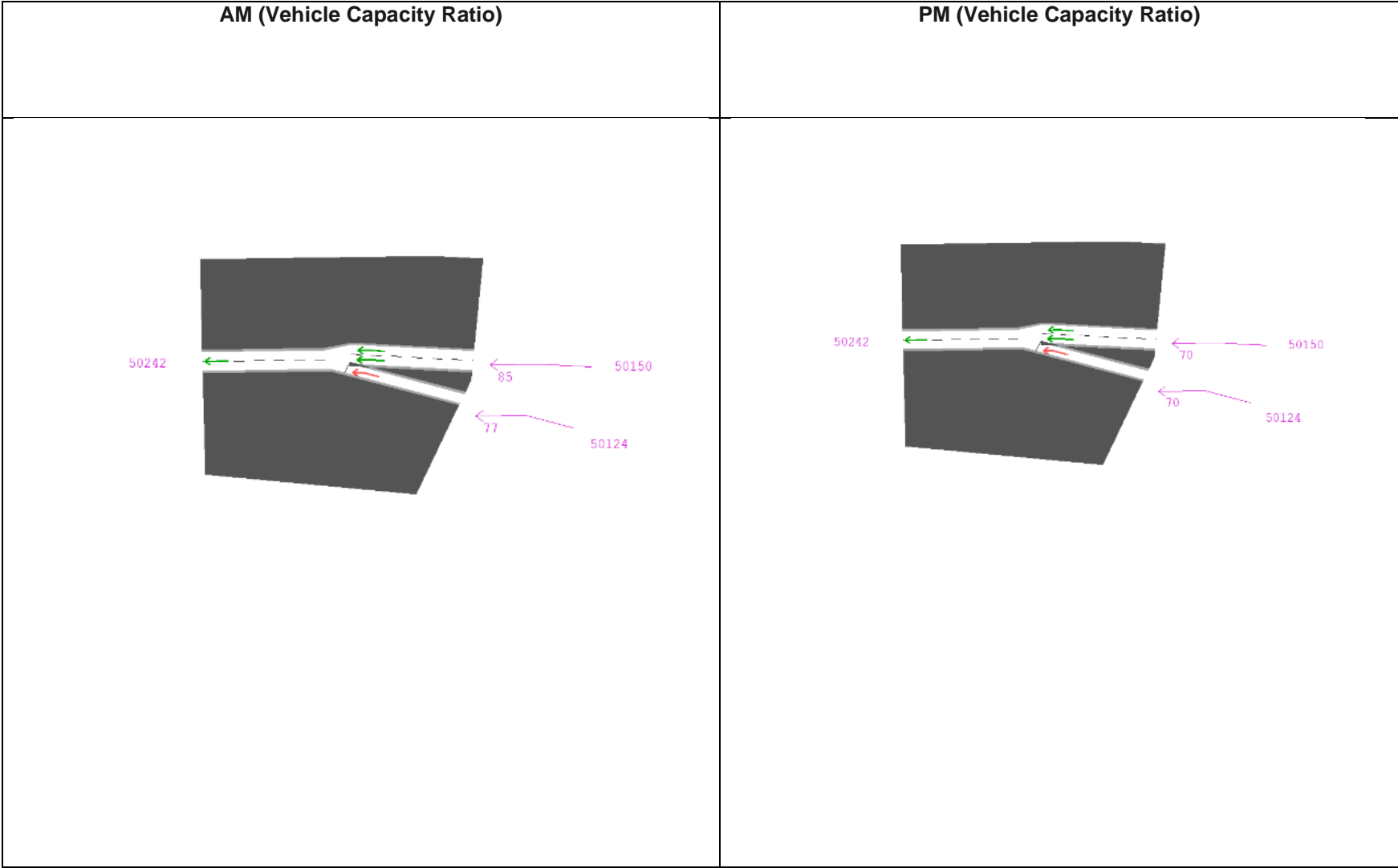


Figure 5-4 A27/Nyton Road Junction V/C Outputs



Summary

5.7.14 The outputs clearly indicate that the Chichester Local Plan does not have a detrimental or material impact on any of the three junctions. The Chichester Local Plan does not increase flows at the A259 Comet Corner and Oystercatcher junctions and the A27/Nyton Road junction operates within capacity.

Hampshire

5.7.15 Impacts were also considered on the Hampshire network to the west of Chichester: more details of the analysis can be found in Appendix I. This section only provides a summary of the analysis which considered the following:

- Flows on A259 within Hampshire
- Reassignment of Traffic resulting from local plan traffic and the addition of mitigation packages
 - The full mitigation package proposed for the local plan which includes a series of junction improvements along the A27, Stockbridge Link Road and highway mitigation within Chichester city.
 - Just the Fishbourne and Bognor Road Roundabout mitigation schemes
- Impacts at the A259/North Street Junction in Emsworth and the A27 Warblington Interchange.

5.7.16 The modelling analysis was undertaken for the Local Plan Without and With Mitigation and compared against the Reference Case.

Flows on A259

5.7.17 The modelling indicates that flows on the A259 increase when the Chichester Local Plan traffic is added, however the flows fall back to at least the Reference Case traffic levels, once the Fishbourne Roundabout mitigation schemes and the full mitigation schemes are added into the modelling.

Reassignment of traffic from A259

5.7.18 A series of select link analysis was used to inform reassignment impacts seen within the modelling. The analysis was undertaken on two screenlines, one to the east, nearer Chichester, and one to the west, just to the west of Southbourne.

5.7.19 The analysis indicates that the local plan, with Fishbourne mitigation scheme only, decreases the amount of traffic on the A259 in Hampshire as traffic uses the A27 instead. The largest impact is seen in the westbound direction, mainly due to traffic which was using Appledram Lane South and turning left onto the A259, now joining the A27 at the Stockbridge junction and staying on the A27 towards Hampshire. Increase in flows at Fishbourne junction, is having a knock-on impact with some additional trips now using Emsworth Common Road towards Havant, from Chichester District.

Impact of Local Plan on Junctions within Hampshire

5.7.20 Analysis was undertaken to understand the impacts of the Chichester Local Plan traffic on the A259/North Street junction in Emsworth and the A27 Warblington Interchange. In all scenarios analysed, the model indicates that the Warblington Interchange operates within capacity. Further analysis has been reported within Appendix I. This indicated that there are some impacts on Warblington Interchange and A259 roundabout in Emsworth, mainly caused by traffic from the Southbourne development. Further work would be required through the any site specific Transport Assessment in relation to development at Southbourne going forward to determine any mitigation requirements. Any potential mitigation requirements within

Hampshire will also be considered through schemes considered as part of the monitor and management process.

5.8 Summary

5.8.1 The additional trips associated with local plan development indicates the following junctions require consideration of mitigation:

- A286 New Park Road / A286 St Pancras Road
- A259 Via Ravenna / A259 Cathedral Way Roundabout
- A259 Cathedral Way/ Fishbourne Road East
- Fishbourne Road West / Appledram Lane South
- A27 Fishbourne Roundabout
- A27 Stockbridge Roundabout
- A27 Whyke Roundabout
- A27 Bognor Road Roundabout
- A27 Portfield Roundabout
- A27 Oving Junction
- A286 Northgate / A286 Oaklands Way

5.8.2 It should be noted that even prior to adding in the local plan development, all the junctions on the A27 Chichester bypass are over capacity in one or both modelled peak hours. With the exception of Portfield Roundabout, the junctions are also shown to be over or near capacity in the base year model (2014) before any additional background or local plan traffic is added, highlighting the fact that it is not just the local plan or committed Chichester development which leads to this situation.

6 Northern Site Assessment

6.1 Introduction

- 6.1.1 This section sets out the approach employed in understanding the impact of a revised local plan development at four locations within the north of the district (Kirdford, Plaistow and Ifold (combined) and Wisborough Green).
- 6.1.2 Further assessments are made to understand the impacts of trips generated, the distribution of development in the north of the district and to understand the impact on the local highway network for the final development quanta. It is noted that the assessment only looks at development trips and not at cumulative impacts. The aim is to identify if there are any flow increases from the local plan developments on any links and impacts on junctions which could be deemed significant.
- 6.1.3 The approach has made use of the Horsham Transport Model (HTM), which is a similar model to CATM and has also been developed using SATURN. The model has a base year of 2018 and forecast year of 2037. This model has been used to support the Horsham Local plan.

6.2 Development Quanta

- 6.2.1 The final local plan quantum of development at each of the four locations are detailed in Table 6-1.

Table 6-1 Northern Spatial Local Plan Dwelling Numbers

Kirdford	Loxwood	Plaistow and Ifold	Wisborough Green	Total
50	220	25	75	370

6.3 Trip Generation

- 6.3.1 Trip rates for trip generation have been summarised in Table 6-2 for both AM and PM peak hours. The table includes the trip rates used in the southern area assessment for comparison and it can be seen that the northern area trip rates are moderately higher, which reflects the more rural nature of the development sites.

Table 6-2 Trip rates for AM (0800 – 0900) and PM (1700 – 1800)

Trip Rate Assumption	Time Period	Origin	Destination	Total
Southern Area Trip rates	AM	0.352	0.12	0.472
Southern Area Trip rates	PM	0.159	0.318	0.477
Neighbourhood Centre/Edge of Town	AM	0.386	0.13	0.516
Neighbourhood Centre/Edge of Town	PM	0.154	0.332	0.486

- 6.3.2 Table 6-3 summarises the trips generated to and from the northern sites for each assumption of trip rates used.

Table 6-3 Trips generated to and from Northern sites AM (0800-0900) and PM (1700-1800)

Scenario No.	Northern Sites	AM			PM		
		Origin	Destination	Two-way	Origin	Destination	Two-way
Agreed Trip Rates	Kirdford	17.6	6.0	23.6	8.0	15.9	23.9
	Loxwood	77.4	26.4	103.8	35.0	70.0	104.9
	Plaistow & Iford	8.8	3.0	11.8	4.0	8.0	11.9
	Wisborough Green	26.4	9.0	35.4	11.9	23.9	35.8
Total		130.2	44.4	174.6	58.8	117.7	176.5
Neighbourhood Centre/Edge of Town	Kirdford	19.3	6.5	25.8	7.7	16.6	24.3
	Loxwood	84.9	28.6	113.5	33.9	73.0	106.9
	Plaistow & Iford	9.7	3.3	12.9	3.9	8.3	12.2
	Wisborough Green	29.0	9.8	38.7	11.6	24.9	36.5
Total		142.8	48.1	190.9	57.0	122.8	179.8
Percentage Difference (%)		10%	8%	9%	-3%	4%	2%

6.4 Trip Distribution and Traffic Assignment

- 6.4.1 The HTM model scenario used for this test includes the emerging Horsham District Local Plan development and the trip generation figures have been added on top to understand the impacts of this development on the highway network.
- 6.4.2 The four locations where development is proposed in the north are each represented by their own zone within the HTM. The new trips have been loaded on top of existing trips from the villages. The trip making patterns have therefore been maintained and these are derived from mobile network data. No changes have been made to the highway network.
- 6.4.3 The route that trips will take, has been determined by assigning the new matrix on to the highway network. This is then compared with the flows without the development to understand where the traffic flows are seen to increase. Flow difference plots are provided in Figure 6-1 and Figure 6-2.

Figure 6-1 Actual Flow Difference LP minus Ref (PCU/hr) - AM Peak Hour

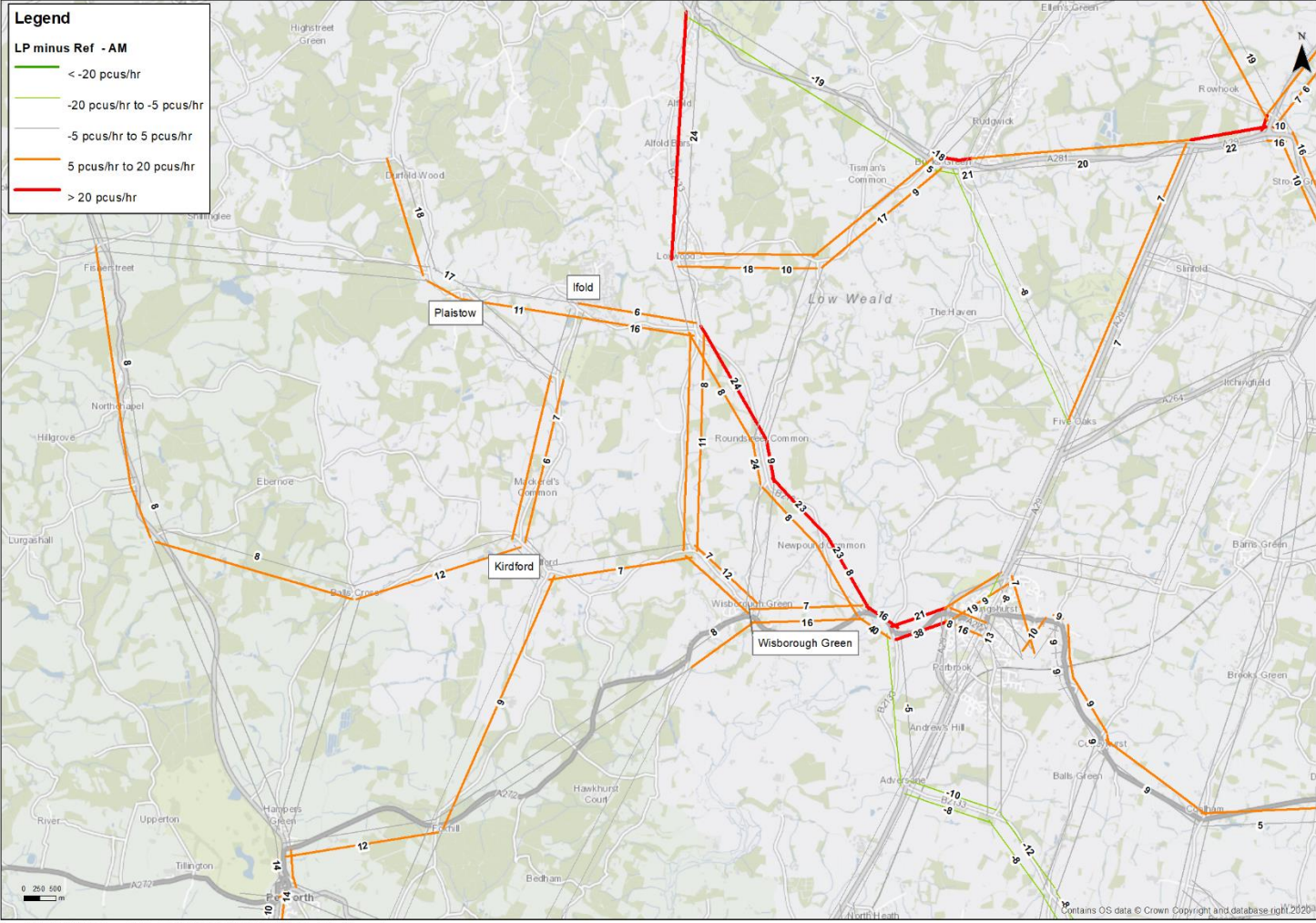
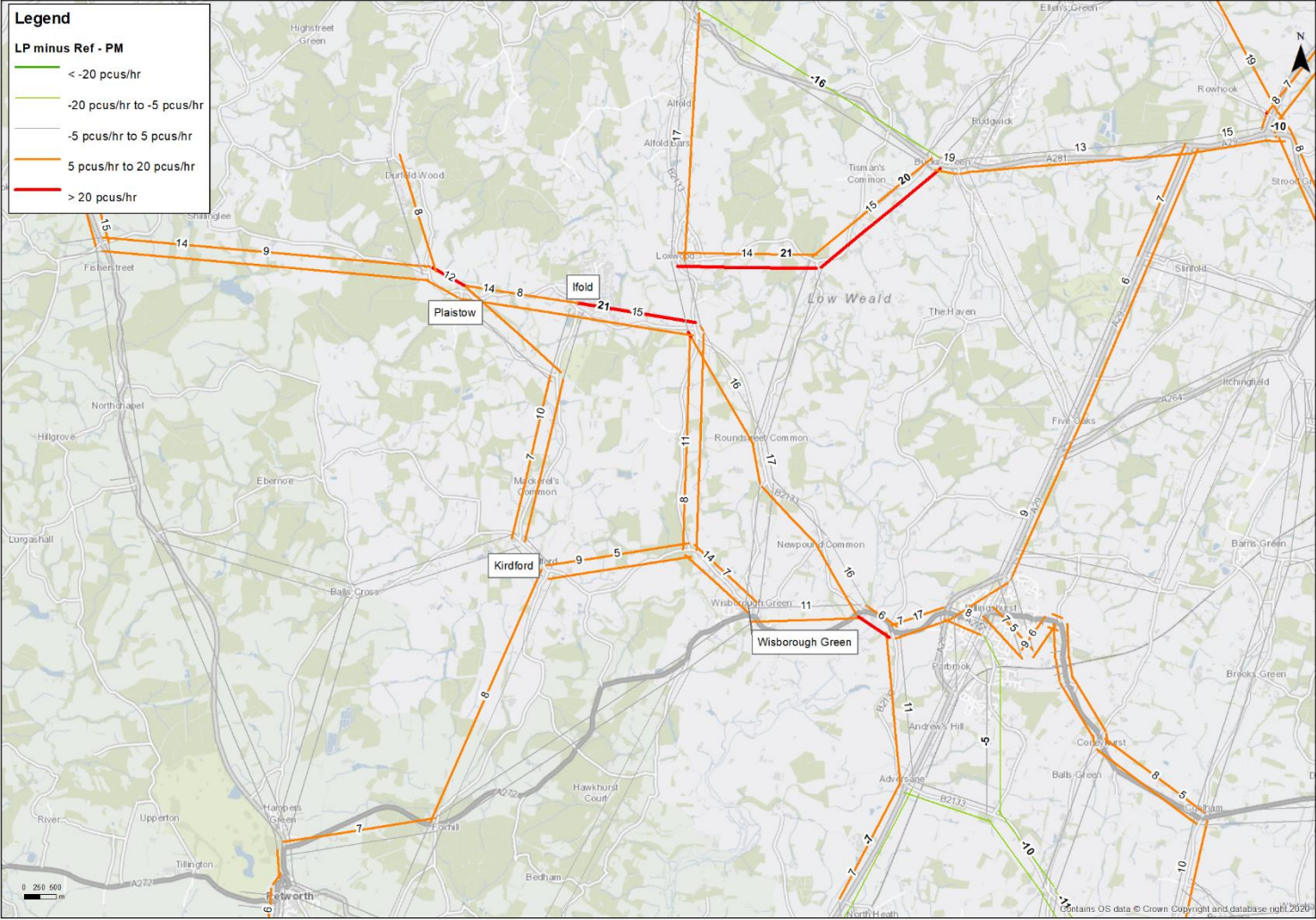


Figure 6-2 Actual Flow Difference LP minus Ref (PCU/hr) PM Peak



6.4.4 The flow difference plots indicate that the changes in flows as a result of the development northern area LP trips, are generally on the low side across the network in both the AM and PM peak hours. Directional changes in flow per hour are less than the threshold generally used for TA junction assessments of 50 PCU/hr.

6.4.5 A more detailed analysis of the flow differences is summarised in Table 6-4 in the AM peak hour and in Table 6-5 for the PM peak hour. It can be seen from the tables that in both the AM and PM peak hours the percentage change in directional and two-way flows is generally low. In the AM peak it ranges between 0% and 6% at the analysed locations and between 0% and 5% in the PM peak.

Table 6-4 Flow changes in PCU/hour at key locations in AM peak hour

Local Authority	Location	Direction	Ref	LP	Diff	Diff (%)
Chichester	A272 North Street, Petworth	NB	707	710	3	0%
		SB	366	380	14	4%
		2-Way	1073	1090	17	2%
	A272 Park Road (1way only road), Petworth	NB	707	710	3	0%
	East Road (1 way only road), Petworth	SB	366	380	14	4%
	A272 Horsham Road east of A283/North Street, Petworth	EB	393	396	3	1%
		WB	249	261	12	5%
		2-Way	642	657	15	2%
	A272 at Strood Green	NB	368	369	1	0%
		SB	191	196	5	3%
		2-Way	559	565	6	1%
	A272 Petworth Road, west of Durbans, Wisborough Green	EB	386	389	3	1%
		WB	227	235	8	4%
		2-Way	613	624	11	2%
	A272 Billinghamurst Road east of Durbans Road, Wisborough Green	EB	450	466	16	4%
		WB	327	334	7	2%
		2-Way	777	800	23	3%
	B2133 Newpound, north of B2133/A272 junction	NB	764	772	8	1%
SB		326	350	24	7%	
2-Way		1090	1122	32	3%	
A272 Newbridge Road, east of B2133/A272 junction	EB	776	816	40	5%	
	WB	1091	1106	15	1%	
	2-Way	1867	1922	55	3%	
Horsham	A272 Newbridge Road, west of A272/A29 Platts roundabout	EB	630	668	38	6%
		WB	745	765	20	3%
		2-Way	1375	1433	58	4%
		NB	1022	1041	19	2%
SB		726	735	9	1%	

Local Authority	Location	Direction	Ref	LP	Diff	Diff (%)
	A272 north of A272/A29 Platts roundabout	2-Way	1748	1776	28	2%
Waverley	A281, Grafham	NB	1711	1724	13	1%
		SB	1149	1152	3	0%
		2--Way	2860	2876	16	1%
	B2133 Loxwood Road, Alford	NB	464	489	25	5%
		SB	225	223	-2	-1%
		2-Way	689	712	23	3%
	Dunsfold Common Road	NB	371	388	17	5%
		SB	146	147	1	1%
		2-Way	517	535	18	3%
	B2127 at Ewhurst	NB	716	739	23	3%
		SB	335	332	-3	-1%
		2-Way	1051	1071	20	2%

Table 6-5 Flow changes in PCU/hour at key locations in PM peak hour

Local Authority	Location	Direction	Ref	LP	Diff	Diff (%)
Chichester	A272 North Street, Petworth	NB	490	497	7	1%
		SB	745	747	2	0%
		2-Way	1235	1244	9	1%
	A272 Park Road (1way only road), Petworth	NB	490	497	7	1%
	East Road (1 way only road), Petworth	SB	745	747	2	0%
	A272 Horsham Road east of A283/North Street, Petworth	EB	393	400	7	2%
		WB	392	394	2	1%
		2-Way	785	794	9	1%
	A272 at Strood Green	NB	355	354	-1	0%
		SB	367	366	-1	0%
		2-Way	722	720	-2	0%
	A272 Petworth Road, west of Durbans, Wisborough Green	EB	380	380	0	0%
		WB	402	404	2	0%
		2-Way	782	784	2	0%
	A272 Billingham Road east of Durbans Road, Wisborough Green	EB	494	497	3	1%
		WB	447	458	11	2%
		2-Way	941	955	14	1%
	B2133 Newpound, north of B2133/A272 junction	NB	328	344	16	5%
		SB	563	565	2	0%
		2-Way	891	909	18	2%
			EB	1056	1062	6

Local Authority	Location	Direction	Ref	LP	Diff	Diff (%)
	A272 Newbridge Road, east of B2133/A272 junction	WB	776	803	27	3%
		2-Way	1832	1865	33	2%
Horsham	A272 Newbridge Road, west of A272/A29 Platts roundabout	EB	782	788	6	1%
		WB	580	597	17	3%
		2-Way	1362	1385	23	2%
	A272 north of A272/A29 Platts roundabout	NB	945	948	3	0%
		SB	1004	1013	9	1%
		2-Way	1949	1961	12	1%
Waverley	A281, Grafham	NB	1040	1046	6	1%
		SB	1685	1693	8	0%
		2-Way	2725	2739	14	1%
	B2133 Loxwood Road, Alford	NB	152	156	4	3%
		SB	320	337	17	5%
		2-Way	472	493	21	4%
	Dunsfold Common Road	NB	181	182	1	1%
		SB	364	371	7	2%
		2-Way	545	553	8	1%
	B2127 at Ewhurst	NB	317	317	0	0%
		SB	564	582	18	3%
		2-Way	881	899	18	2%

Chichester District

- 6.4.6 The highest increase in trips in Chichester district are predicted on the A272 North Street in Petworth, A272 east of Durbans Road at Wisborough Green and Horsham Road east of A283/North Street, Petworth. At each of these locations, the two-way peak hour trips are less than a vehicle per minute in both the AM and PM peak hours. To put this in context, the increase in two-way trips for locations in Chichester district ranges between 6 trips per hour to 32 trips per hour in the AM peak hour; and between 2 trips per hour to 18 trips per hour. This is unlikely to have a material impact.
- 6.4.7 The modelling shows that there are no or small additional flows on the A272 to the west of Petworth and therefore there will be no significant impacts within Midhurst.

A27 Chichester Bypass (Strategic Road Network)

- 6.4.8 Trip increases on the A27 Chichester Bypass are also predicted to be minimal. In the AM peak hour, two-way trip increases of up to 8 PCU/hour are predicted, equivalent to a 0.6% increase. In the PM peak hour two-way trip increases of up to 11 PCU/hour are predicted equivalent to a 1% increase. This is unlikely to have a material impact. These figures should be seen as providing relative magnitude of changes rather than as absolute ones as the A27 SRN in the HTM is not modelled in detail or simulation.

Horsham District

- 6.4.9 The main increases are predicted on sections of the A272 around Billinghamurst as can be seen from Table 6-4 in the AM peak and Table 6-5 in the PM peak. Two-way flow increases of 55

PCU/hour (+3%) and 58 PCU/hour (+4%) are predicted on sections of the A272 west of Billingshurst in the AM peak. In the PM peak hour, the equivalent flow increases are 33 PCU/hour (+2%) and 23 PCU/hour (+2%) respectively. These figures all equate to less than a vehicle per minute increase which is unlikely to have a material impact. The draft Horsham Local Plan Transport Assessment does not indicate the need for any mitigation on the A272 at junctions close to Billingshurst,

- 6.4.10 There has also been a suggestion that developments in the north of Chichester may put pressure on parking at the railway station in Billingshurst, however this would only likely be used by people making longer distance trips to e.g. London or Crawley. The evidence from analysis of historic mobile network data suggested low trip numbers for these destinations.

Surrey/Waverley District

- 6.4.1 Roads in the Waverley District of Surrey are also predicted to experience some increases in traffic flows when comparing the northern site allocations and comparing the flows without the development. These are generally small increases in the region of 1 to 4%, two-way.

- A281 through Graftham, two-way flow increases of 16 PCU/hour (+1%) in the AM peak, and 14 PCU/hour (+1%) are predicted.
- B2133 Loxwood Road, Alfold, two-way flow increases of 23 PCU/hour (+3%) in the AM peak, and 21 PCU/hour (+4%) are predicted.
- Dunsfold Common Road, two-way flow increases of 18 PCU/hour (+3%) in the AM peak, and 8 PCU/hour (+1%) are predicted.
- B2127 through Ewhurst, two-way flow increases of 20 PCU/hour (+2%) in the AM peak, and 18 PCU/hour (+2%) are predicted. These figures all equate to less than a vehicle per minute increase which is unlikely to have a material impact.

- 6.4.2 A review of the transport evidence base for the Waverley Borough Local Plan⁷, indicated that there were no capacity issues predicted at the A281 Guildford/Horsham Road, A2133 Loxwood Road junction, Alfold (Tables 4.11 to 4.13 of the transport evidence for Scenarios 1 to 4). This indicated that the Ratio of Flow to Capacity (RFC) at the junction would be well below the critical value of 85%, the value at which capacity issues such as delays and congestion, would be expected to deteriorate rapidly with increasing flow.

- 6.4.3 Given the small number of additional trips from the proposed development from the north Chichester, it is deemed that this is unlikely to cause capacity issues.

The Mens Special Area of Conservation

- 6.4.4 The Mens Special Area of Conservation (SAC) lies just to the south of the four villages. This is an ecologically sensitive area where traffic and associated emissions have a negative impact, therefore any increase in flows needs to be ascertained.

- 6.4.5 The A272 at the Mens SAC is predicted to experience two-way flow increases of the order of 684 vehicles per day (Annual Average Daily Traffic – AADT), which is an 8.7% increase over the Reference Case.

- 6.4.6 A Habitats Regulations Assessment has been undertaken separately to report whether trips from these development locations would have a material impact on The Mens Special Area of Conservation (SAC).

⁷ https://www.waverley.gov.uk/Portals/0/Documents/services/planning-and-building/planning-strategies-and-policies/local-plan/Strategic_Transport_Assessment_Report_-_final.pdf?ver=x46yLC71ewBq7iGhqlM9fA%3d%3d

VC% Analysis for Key Junctions

Analysis of maximum VC% has been undertaken for key junctions in Chichester district and the neighbouring Horsham to determine whether the proposed developments have an adverse impact on these junctions. The results are summarised in

6.4.7 Table 6-6.

Table 6-6 VC% comparison at key Junctions

Junction Name	AM			PM		
	Ref VC%	LP VC%	Diff VC%	Ref VC%	LP VC%	Diff VC%
A272 North Street/A283 London Rd/A272 Horsham Rd junction, Petworth	65.0	65.0	0	45.0	45.0	0
A272 East Street/New Street/Angel Street, Petworth	47.0	49.0	2	95.0	96.0	1
A272 Billingham Rd/Durbans Rd, Wisborough Green	40.0	41.0	1	47.0	49.0	2
A272/B2133 Newpound	62.0	75.1	13	57.3	64.6	7
A272/B2133 Lordings Rd	41.7	59.4	18	51.9	56.6	5
A272/A29 Roundabout	35.4	39.5	4	45.6	47.7	2
A272/Stane St/Hilland Rd	61.7	66.2	4	78.1	92.1	14
Stane St/New Rd	81.7	86.3	5	86.1	93.4	7
Lordings Rd/Stane St- A29	50.7	56.7	6	80.3	94.2	14
B2133/Stane St A29	62.3	79.3	17	58.4	61.8	3

6.4.8 A VC% of 100% suggests that a junction is at capacity (subject to safety) and a VC% greater than 100% can suggest that a junction is overcapacity. It can be seen that none of the junctions are above this level in either the Reference Case or Local Plan in both the AM and PM peak hours.

Safety Assessment

6.4.9 The safety assessment that was undertaken as part of the wider transport evidence base for the Chichester Local Plan 2021-2039 and summarised in Annex A, considered five-year collision data up to 2022 across the Chichester Plan Area including the Northern Plan Area. The analysis did not identify accident clusters in the Northern Plan Area. This coupled with the predicted low increases from development traffic indicates that there would be an insignificant safety impact.

7 Gypsies and Travellers

7.1 Introduction

7.1.1 As part of the local plan process, CDC need to consider the needs for accommodation for Gypsies and Travellers. The main priority in the first instance is trying to achieve a 5-year supply.

7.1.2 89 further pitches have been identified in the first 5 years of the plan, and would include:

- 24 pitches from post 2021 consents
- 13 pitches from intensification
- 7 vacant/unimplemented pitches (1 additional pitch is expected to be made available on public site in Westbourne, but does not represent a net increase so not counted here),
- 45 from windfall on the basis of the last 10 years.

7.1.3 There is currently an identified need for a further 68 pitches in the later part of the plan period. It is anticipated that 27 of these will be delivered on strategic sites. Other than Southbourne broad location for development these will be in place of previously identified dwellings, and overall, there is no resultant increase in trips to that previously modelled across the plan area. The residual 41 pitches will be identified through a site allocations Development Plan Document (DPD) or delivered through windfall.

7.1.4 This results in an overall provision of a further 130 pitches over the plan period in addition to a further 40 Travelling Show people Plots beyond the modelled scenario.

7.2 Assessment

7.2.1 The TRICS database has been interrogated for similar sites and a single site with 10 units has been identified. The number of trips in the AM peak and PM peak hours is shown in Table 7-1.

Table 7-1 Gypsy and Traveller Site Trip Generation and Trip Rates (10 Units)

Time Period	Arrivals	Trip Rate/Hr.	Departures	Trip Rate/Hr.	Total	Trip Rate/Hr.
AM Peak	5	0.5	8	0.8	13	1.3
PM Peak	3	0.3	1	0.1	4	0.4

7.2.2 Given the likely dispersed nature of the allocation of units, the impacts on the local highway network are unlikely to have any significant impact on congestion or safety within the local area. If necessary, all or part of these additional units may be included as part of any analysis for the programmed monitor and manage process.

8 Impacts of Housing Numbers derived using the Standard Method

8.1 Introduction

- 8.1.1 As noted in Section 2.3, in 2021 Stantec prepared an assessment of housing numbers for the future local plan which was set at 638 dwelling units per annum (dpa) at that time, based on the Government Standard Methodology Housing Targets for CDC. The modelling at this time also allowed a 10% buffer on top of the 638 dwellings and a total of 250 dwellings across the North Eastern plan area, within the plan period. This modelling was undertaken based on information sent to Stantec by CDC in 2021, reflecting the spatial strategy at this time.
- 8.1.2 This section provides further analysis that demonstrates that the 535 dpa scenario (with a further 40dpa in the north of the district giving a total of 575 dpa) is an appropriate scenario and that the higher 638 dpa scenario adds further stress to an already congested network and hence is not a suitable scenario to take forward at this stage.

8.2 Analysis

- 8.2.1 The results of comparisons between the 535 dpa and a higher level of housing delivered within the district are now reported. The aim is to objectively consider that the implications of development beyond the 535 dpa within the south of the district, and whether this would place additional stress on an already overcapacity network.

Strategic Road Network Junctions

- 8.2.2 The data below shows the junctions forecast impacts and hence differences between 535 and 638 dpa across at each of the main 5 junctions along the A27 corridor without mitigation for a selection of links at those junctions for the AM and PM peaks. Table 8-1 shows the junctions forecast impacts the end of the plan period 2037/2039.
- 8.2.3 The outputs are only shown where there is an impact in a particular time period i.e. at some locations impacts are only seen in one of the modelled peak hours and not both.

Table 8-1 SRN Junction Impacts Comparison without Mitigation

Junction	Time Period (Peak Hour)	Link	Delay (MM: SS)			Queues (metres per lane)			Comments
			Ref Case	535dpa	638dpa	Ref Case	535dpa	638dpa	
Fishbourne Junction	AM	A27W arm	04:08	05:59	07:28	451	650	776	638 dpa significantly/exponentially increases delays over 535 dpa as well as shows a significant increase in queues. It demonstrates unsustainable high delays and queues.
Stockbridge Junction	AM	Stockbridge Road (S)	08:35	08:20	08:22	580	580	580	These figures indicate capacity issues from the Reference Case and getting worse with 535 dpa scenario and worse still with the 638 dpa scenario. No change in queue length with 638 dpa and 'unstable/static' delay in comparison to 535 dpa on Stockbridge (S) suggests this arm is at capacity and hence 638 dpa cannot be accommodated on the arm and likely results in reassignment to adjacent Whyke Junction. Side roads are key to realising sustainable travel/PT opportunities and 638 dpa will adversely impact these more than 535 dpa.
	PM	Stockbridge Road (N)	13:15	14:06	15:34	161	201	230	
	PM	Stockbridge Road (S)	05:12	08:05	08:00	350	581	581	
	PM	A27 W	01:41	02:44	03:39	184	325	446	
Whyke Junction	AM	Whyke Road (S)	08:39	09:17	09:52	587	719	765	This clearly demonstrates worsening conditions from the Reference Case which continue to get significantly worse between 535 dpa and 638 dpa scenarios. Increase in delays on Whyke Road (S) as well queues with 638 dpa compared to 535 dpa. This is worse in the PM peak for both delays and queues. Side roads key to sustainable travel/PT and 638 dpa will adversely impact these more than 535 dpa.
	PM	Whyke Road (N)	12:38	13:42	15:26	282	276	288	
	PM	Whyke Road (S)	02:34	05:50	06:26	224	529	587	
Bognor Road Junction	AM	A27 (N)	07:52	10:14	12:24	498	633	736	Demonstrating the unsustainable high delays and queues which worsen from the Reference Case through 535 dpa and worse still to 638 dpa. Generally, shows worsening of conditions with 638 dpa compared to 535 dpa. Bognor Road key to sustainable travel/PT and 638 dpa will adversely impact these more than 535 dpa.
	AM	Bognor Road E	08:55	11:08	11:02	492	610	635	
	PM	A27N	05:22	06:54	07:41	371	474	520	
Portfield Junction	PM	Chichester Bypass	11:08	12:48	14:59	147	181	216	Demonstrating the unsustainable high delays and queues which worsen from the Reference Case through 535 dpa and worse still to 638 dpa. Significant delay increases with 638 dpa compared to 535 dpa.

- 8.2.4 The table shows that the addition of 535 dpa or the 638 dpa makes conditions worse with increases in delays and queue lengths in most cases, which will have a material impact on the network, to the extent that this would be severe. The network is saturated as such the additional trips are not getting through the network as highlighted by the increase in delay and queues. The additional trips without mitigation are simply adding to the current queues and delays. In some cases the queues and delays are already at or above network limits, as such there is minimal change, which suggests that there are trips stuck within the wider network and cannot even reach these junctions.
- 8.2.5 The above statistics demonstrate that the A27 junctions are predicted to experience unsustainable high levels of delays and in some cases exceptionally long queues with the 638 dpa showing increased adverse impacts compared to 535 dpa. This includes worsening impacts on side roads with consequent adverse implications for sustainable modes including public transport. Side roads interfacing with the SRN such as A259 Fishbourne Road, A286 Stockbridge Road, B2145 Whyke Road, and A259 Bognor Road are vital bus routes and the increased worse conditions with 638 dpa compared to 535 dpa will have severe impacts on public transport.
- 8.2.6 In addition to the above impacts, it should be noted that the model shows that blocking back onto the Fishbourne Roundabout occurs in the AM peak period, from Cathedral Way, with a higher number of dwellings. This does not occur for a housing number based upon 535 dpa. This would create a safety issue of queuing onto the roundabout.

Wider Impacts

- 8.2.7 The data below is provided as a simplified extract of the modelling work to date, to demonstrate the premise of a severe impact on the local highway and further support the reduction in the unit per year provision for the Local Plan 2021-2039. The focus below is not the A27 links, but the side roads that serve the A27. The table shows that the local plan assessment has to also consider these impacts which are on roads managed by WSCC and not NH. The impacts on the local highway network where severe, would adversely impact bus services amongst other impacts.

Table 8-2 Local Highway Impacts Comparison without Mitigation – AM Peak

Link	535 dpa	638 dpa	% Change	Areas of Impact
B2178 at East Ashling	2,053 PCU's	2,089 PCUs	1.8%	South Downs National Park Kingley Vale National Nature Reserve
A259 west of Fishbourne.	1,785 PCUs	1,873 PCUs	4.9%	Increase will be seen in Hampshire with potential cross boundary concerns
B2146 Ratham Lane, north of Bosham.	315 PCUs	345 PCUs	9.5%	Increased flows through Bosham and on railway level crossing at Bosham with potential safety concerns at level crossing
Mouthey's Lane, between Clay Lane and B2178	262 PCUs	266 PCUs	1.5%	Northern part of Mouthey's Lane crosses into South Downs National Park and Kingley Vale National Nature Reserve
Salthill Road	322 PCUs	364 PCUs	13.0%	Salthill Park, increased flows on railway level crossing at Fishbourne with potential

Link	535 dpa	638 dpa	% Change	Areas of Impact
				safety concerns at level crossing
Hunters Race Rd	994 PCUs	995 PCUs	0.1%	Lavant. Hunters Race frequently used as rat run (see PM)
New Road	2,277 PCUs	2,350 PCUs	3.2%	New Road used as rat run by east-west-east through traffic to avoid congested A27 Chichester Bypass. Potential adverse impacts on settlements such as East and Mid Lavant

Table 8-3 Local Highway Impacts Comparison without Mitigation – PM Peak

Link	535 dpa	638 dpa	% Change	Areas of Impact
B2178 at East Ashling	1,608 PCU's	1,655 PCUs	2.9.%	(South Downs National Park and Kingley Vale National Nature Reserve).
A259 west of Fishbourne.	1,277 PCUs	1,396 PCUs	9.3%	Increase will be seen in Hampshire with potential cross boundary concerns
B2146 Ratham Lane, north of Bosham.	543 PCUs	732 PCUs	34.8%	Increased flows through Bosham and on railway level crossing at Bosham with potential safety concerns at level crossing
Mouthey's Lane, between Clay Lane and B2178	285 PCUs	351 PCUs	23.2%	Northern part of Mouthey's Lane crosses into South Downs National Park and Kingley Vale National Nature Reserve
Hunters Race Rd	741 PCUs	775 PCUs	4.6%	Lavant. Hunters Race Rd frequently used as rat run over to Lavant to avoid the A27, it requires navigating a single lane bridge with no visibility. Even a small additional amount of traffic would have a severe impact on safety, with any additional traffic and queues leading to drivers potentially taking greater risk.
New Road	1,652 PCUs	1,724 PCUs	4.4%	New Road used as rat run by east-west-east through traffic to avoid congested A27 Chichester Bypass. Potential worsening of adverse impacts on settlements such as East and Mid Lavant

8.2.8 Table 8 2 and Table 8 3 provides a summary of the key areas where the flow increases between 535 and 638, appear to be severe. Increases in flows will have an impact on community severance, air quality, South Downs National Park and on roads which may not be deemed suitable (through the city centre). The increases will also adversely impact bus

services. Settlements such as Lavant, West Ashling and East Ashling amongst others will also be adversely impacted by the higher flow increases from the 638 dpa compared to 535 dpa.

- 8.2.9 The largest impacts are seen to the west and north west of Chichester with traffic trying to avoid Fishbourne Roundabout, using alternative routes into Chichester. There are fewer opportunities for reassignment to east and south east, to avoid Bognor Road Roundabout.
- 8.2.10 The modelling has highlighted links and junctions within the city that are witnessing increased impact from the local plan proposals, given the existing congestion on the strategic network caused by re-routing to avoid the current congestion. Overall, the analysis has shown that the 638 dpa scenario would result in worse network conditions compared to 535 dpa with significantly worse adverse impacts on communities and bus services. The comparison of 535dpa and 638 dpa demonstrates evidence of exponential increase in delays and queues for 638 dpa compared to 535 dpa to the extent that there is increased rat-running on roads through the South Downs National Park (SDNP) and north of Chichester and delays likely to be detrimental to the safe and efficient operation of buses/public transport services. These increases in delays and queue lengths in most cases, will have a material impact on the network, to the extent that this would be severe.

9 Monitor and Manage

9.1 Introduction

- 9.1.1 The section provides a summary of the proposed monitor and manage approach. This defines the commitments to support the local plan programme based on an average build out of 535 dpa in the south of the district, for Chichester District Councils Local Plan for 2021 to 2039.
- 9.1.2 The monitor and manage process is subject to ongoing discussions between CDC, WSCC, NH and Arun District Council.
- 9.1.3 The requirements for the monitor and manage strategy are two-fold as follows:
- Development of a monitoring process which can be used going forward to inform discussions around the mitigation requirements resulting from impacts of developments as they come forward. This will require an understand the transport situation and conditions (sustainable travel and highway) in the south of Chichester District area, and specific impacts from individual development sites.
 - Update of the tools to be used to assist with providing an understanding of the impacts of potential mitigation measures.
- 9.1.4 The overarching aim of the monitor and manage process is to support delivery of housing through the local plan, supported by appropriate transport infrastructure, which will consider sustainable transport at the forefront, alongside highway mitigation where necessary. The focus on sustainable transport, would enable the smaller scale highway schemes to be considered within the mix, rather than large scale (and unaffordable) highway schemes.

9.2 Monitoring Process

- 9.2.1 A monitoring process will be agreed and set up at an early stage and action of the TIMG. The objective of the monitoring will be to provide a regular picture on the performance of the transport network (Highway, PT and Active Travel) as the development from the plan comes forward. This will also be informed by data from developers, in terms of travel plan monitoring, they will be needed to undertake as part of any monitoring they will have signed up to, within the planning context.
- 9.2.2 This output will show how successful measures implemented are in terms of mitigated impacts from local plan development and inform ongoing discussions around future mitigation requirements, which will be supported by the modelling detailed below.
- 9.2.3 A multi-agency transport monitoring report will be coordinated and provided every six months from plan adoption, setting out any progress on transport infrastructure delivery and providing an update on the evolution of the plan, and the success of activities and initiatives. The report will include the monitoring findings of multi modal data collected as part of the monitoring regime.
- 9.2.4 An annual transport monitor and manage plan shall be prepared that covers both development site specific monitoring, as well as monitoring on the local highway and strategic road network in the south of the district. Wider data will also be obtained for active travel and public transport modes.
- 9.2.5 Data collection methodology for the annual transport monitor and manage plan shall be agreed with the Local Highway Authority and NH. The principles set out below shall be engaged:

- Multi modal counts to understand the effects of sustainable transport measures from specific development sites (supported by site specific travel plan monitoring).
 - Data collection and collation on key links and junctions within the network. This will utilise existing data sources such as WSCC permanent count sites and NH traffic counts on the A27 as far as possible, supplemented by new data collection, for example to fill gaps in a cordon.
- 9.2.6 To make best use of ongoing monitoring of all travel, it would be appropriate to form or cordons or screenlines, which will not only show how transport usage has changed at specific points, but also show if overall usage has changed across the entire screenline. This will, for example, enable the analysis to show whether overall traffic flows are reduced, or rate of growth reduced as a result of implementation of sustainable travel measures, or whether traffic is increasing on the county highway network, as a result of congestion remaining at the A27 junctions.

9.3 The Modelling Process

- 9.3.1 The modelling process which has been defined within the methodology has been based on industry standard practice, considering neighbouring authority local plan allocations, background growth, current CDC commitments and the forecast demand for local plan period.
- 9.3.2 However, it is recognised that the model is now approaching the end of its useful life and also likely to be predicting a higher forecast level of future trips, as a result of changes in travel behaviour, post COVID and following the Department for Transport’s release of new growth data (TEMPRO v8) which is suggesting that growth to date and moving forward is less than previously predicted.
- 9.3.3 Therefore, the CDC Local Plan will utilise a monitor and manage methodology to promote the appropriate mitigation (with emphasis on sustainable transport and decarbonisation) within the funding limits and not follow a predict and provide methodology given the fluctuations between the historical and new forecast data. Notwithstanding this, the mitigation strategy will need to recognise that road safety needs to be maintained and focus on the delivery of safety enhancements and to ensure severe cumulative impacts do not result from the local plan development.

9.4 Monitor and Manage Approach

- 9.4.1 The Monitor and Manage Methodology document sets out a provisional range of supporting measures to support the local plan process to achieve a build out rate of 535 dpa and manage the impact of the additional development across the local and strategic network. These are detailed in the Monitor and Manage Methodology document and where modelling has been undertaken these are discussed further in Sections 10 and 11 below, in the context of modelling undertaken to date to understand potential impacts of delivering mitigation.
- 9.4.2 The monitor and manage approach is defined in the Local Plan 2021-2039 document under **Policy T1: Transport Infrastructure as set out below.**

Integrated transport measures will be developed to mitigate the impact of planned development on the highways network, improve highway safety and air quality, promote more sustainable travel patterns and encourage increased use of sustainable modes of travel, such as public transport, cycling and walking.

The council will work with National Highways, West Sussex County Council, other transport and service providers (including through the Transport and Infrastructure Management Group) and developers to provide a better integrated transport network and to improve accessibility to key services and facilities. All development is expected to demonstrate how it will support four key objectives to create an

integrated transport network which will alleviate pressure on the road network, improve highway safety, encourage sustainable travel behaviours and help improve air quality, by:

- Avoiding or minimising the need to travel by car;
- Enabling access to sustainable means of travel, including public transport, walking and cycling;
- Managing travel demand; and
- Mitigating the impacts of travel by car.

9.4.3 The monitor and manage process will manage a combination of possible sustainable, safety and capacity improvements across the strategic and localised highway improvements. The measures will include enhanced walking, cycling, and public transport commitments which seek to address safety and/or capacity issues or be considered within a defined time period. These works will be subject to a monitoring process that will define the actual demand on the network and the nature and location of supporting measures.

9.4.4 The measures in this methodology are not fixed, but flexible and will be amended as the local plan period progresses. Policy, funding and technical changes may promote amendments or new measures to be considered.

9.5 Transport Infrastructure Management Group

9.5.1 To deliver the monitor and manage process and seek opportunities and secure relevant funding, it is proposed to set up the TIMG. The creation of the TIMG will be supported by a Terms of Reference which defines the overall roles and responsibilities and powers of the partners involved.

9.5.2 The TIMG will need to be both a consultation and delivery body and will be made up of multiple organisations who will have differing roles in the group over the life span of the group.

10 Potential Sustainable Mitigation Measures

10.1 Introduction

- 10.1.1 There has been a general shift in government policy towards travel demand management and sustainable transport solutions and this has taken on renewed urgency with the need to tackle the Climate Change emergency and reduce carbon emissions.
- 10.1.2 In 2019, the UK passed laws to end its contribution to global warming by 2050. The target will require the UK to bring all greenhouse gas emissions to net zero by 2050, compared with the previous target of at least 80% reduction from 1990 levels. This will require additional action to reduce emissions across the whole economy including transport. The Climate Change Committee's 6th Carbon budget makes assumptions about how surface transport will contribute towards the Balanced Net Zero Pathway. A major contribution towards meeting this Balanced Net Zero Pathway is travel behavioural change and reduction in travel demand. The Pathway assumes a reduction of 9% in total car miles by 2035 and 17% by 2050.
- 10.1.3 It is considered that sustainable mitigation measures should have priority over highway capacity mitigation and promotes a shift away from a 'Predict and Provide' towards a 'Monitor and Manage' approach. Given the long-term horizon of the local plan, there will always be uncertainty about the level of growth in travel that may materialise. Some significant changes in travel behaviour alongside technology advances have been seen in recent times, and the COVID-19 pandemic has accelerated these changes with significantly more people working at home and shopping online (virtual mobility). While the long-term impacts on travel behaviour are unknown, it has been demonstrated during these challenges that the potential exists to undertake activities remotely without the need to travel, by working from home or shopping online. This approach is supported by the DfT/National Highways Circular 01/2022, Strategic Road Network and the Delivery of Sustainable Development.
- 10.1.4 This section provides an analysis of potential sustainable transport schemes provided by WSCC that could influence the number of trips on the road corridors in and out of Chichester. In particular, the transport schemes that have the potential to influence traffic movements at the junctions with the A27. The sustainable travel schemes include both active travel and public transport schemes. This provides an indication of what can be achieved through development and promotion of sustainable transport measures. The monitor and manage process will identify specific schemes which will assist in delivery of development in a sustainable manner, along with funding options for schemes.
- 10.1.5 To understand the level of impact the trips associated with local plan developments have on the A27 junctions, a comparison of flows has been carried out using the Chichester SATURN models, as reported within the "A27 Junctions Local Plan Flows" which is attached as Appendix J. This provides the proportion of local plan traffic seen at each junction.
- 10.1.6 The impact of the sustainable transport schemes will be analysed through car mode shift factors, taking into consideration existing forecast car vehicle travel demand of background trips, derived from the Chichester SATURN models. The modelling will provide a high-level benefit analysis of each scheme, forecasting the number and percentage of vehicle trips that the schemes have the potential to remove from the network. As noted in Section 4.1, a 5% reduction in demands has been assumed within the strategic local plan locations to represent a reduction in trips as a result of development-specific travel planning and behaviour change packages encompassing smarter choices.
- 10.1.7 This section summarises potential sustainable transport schemes in Chichester in relation to active travel and public transport being considered in August 2023. This will include the location of each scheme, provisional cost, and how it might be funded, based on available information at the time of writing.

10.1.8 Based on the modelling results, the schemes' potential to remove inbound car trips from the junction with the A27 will be ranked. This will provide an understanding on how the allocation of available budget could be used based on the schemes effectiveness in removing car trips from the local highway network and included in the monitor and manage process.

10.1.9 The section includes:

- **Sustainable Transport Schemes** – Provides an outline of the schemes, including type, location, proposals, cost and funding.
- **Modelling** – Outlining the modelling impacts on the A27 for the schemes.
- **Scheme Impact on Local Plan Trips** – Focuses on trips removed from junctions on the A27.
- **Benefits** – Providing the impact of each scheme on removing trips from the A27.

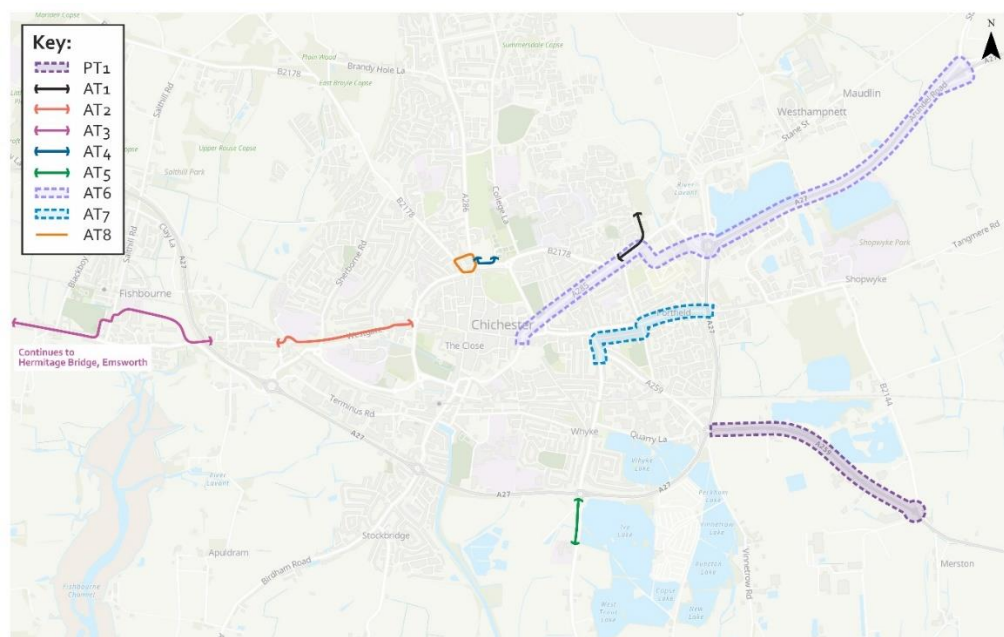
10.2 Sustainable Transport Schemes

10.2.1 WSCC provided a list of 16 sustainable transport schemes, this list was reduced to nine after researching the information that was available. Seven of the schemes were not formally assessed due to the lack of information currently available limiting the ability for them to be assessed and modelled. If sufficient further information on these omitted schemes becomes available, they have the potential to be formally assessed.

A total of nine sustainable travel schemes have been identified that are relevant to the A27 in terms of reducing the number of trips through the relevant junction. The nine sustainable transport schemes are shown in

10.2.2 Figure 10-1. Eight of these schemes are active travel schemes and one is a public transport scheme.

Figure 10-1 Location of Sustainable Transport Schemes



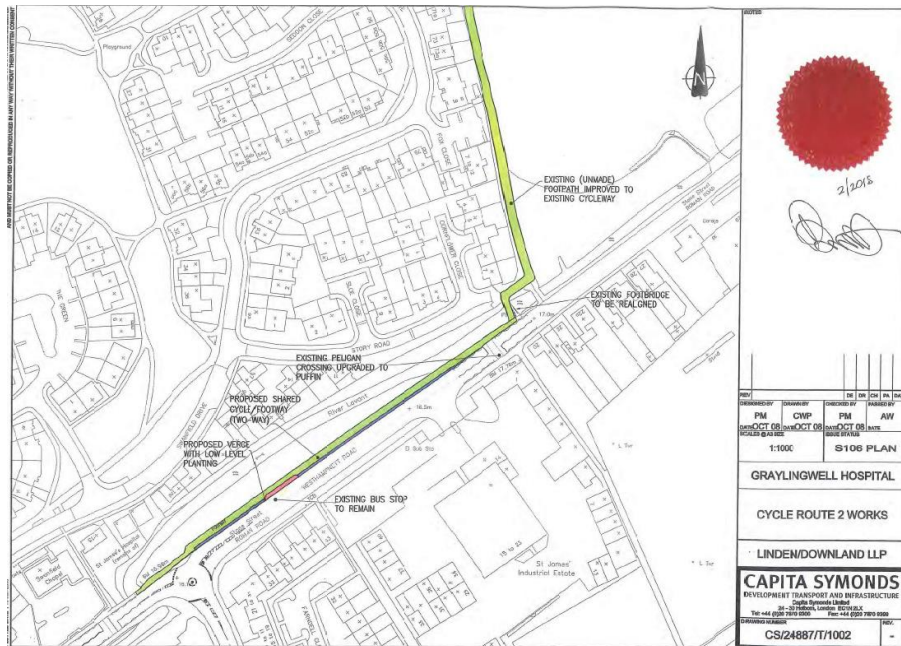
Active Travel Schemes

AT 1 – Graylingwell Cycle Route

10.2.3 The AT1 is located along the north side of Westhampnett Road, running between the St James' Road mini-roundabout junction to an existing footpath (3689) to the rear of Story Road. The scheme is displayed in

10.2.4 Figure 10-2.

Figure 10-2 Graylingwell Cycle Route



Source: Planning Ref: 14/01018/OUT

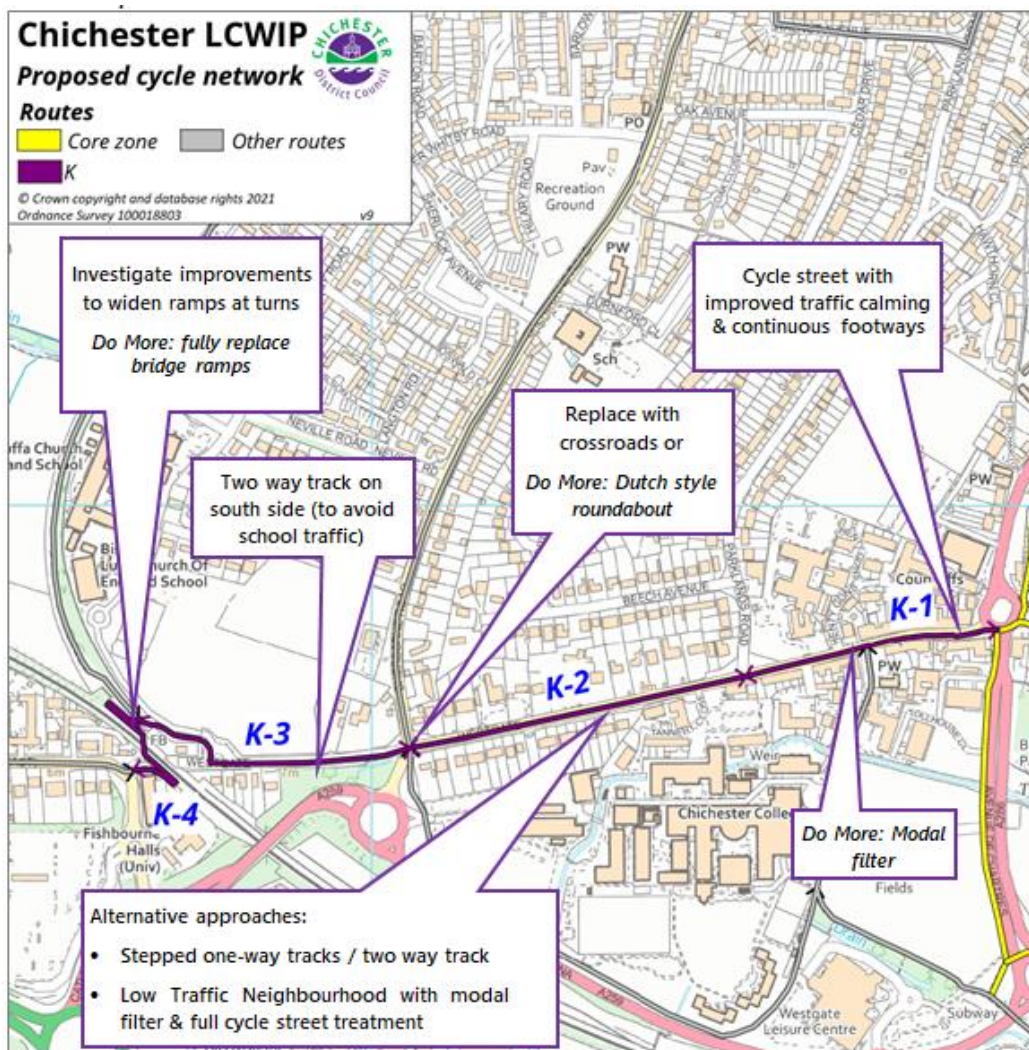
10.2.5 The scheme has been estimated to cost £1,022,000 as of the latest CDC Infrastructure Business Plan 2023/28 (IBP). Funding is being provided by Linden Homes as part of the planning application 14/01018/OUT through a S106 agreement, to procure and construct the works to a reasonable satisfaction of CDC.

AT 2 – Westgate Cycle Improvements

10.2.6 The AT2 is located between Westgate Roundabout and the Westgate / Sherborne Road mini roundabout, then west of Sherborne Road and onto the foot and cycle bridge that facilitates passage across the rail line. The proposed improvements are displayed in

10.2.7 Figure 10-3.

Figure 10-3 Westgate Cycle Route Improvements



Source: [Chichester District Council](#) LCWIP

10.2.8 The scheme has been estimated to cost £790,000 under the do-more scheme as of CDC IDP 2023-2028, with funding to be provided through 50% developer-funded and 50% grant-funded.

AT 3 – Chichester to Emsworth Cycle Route

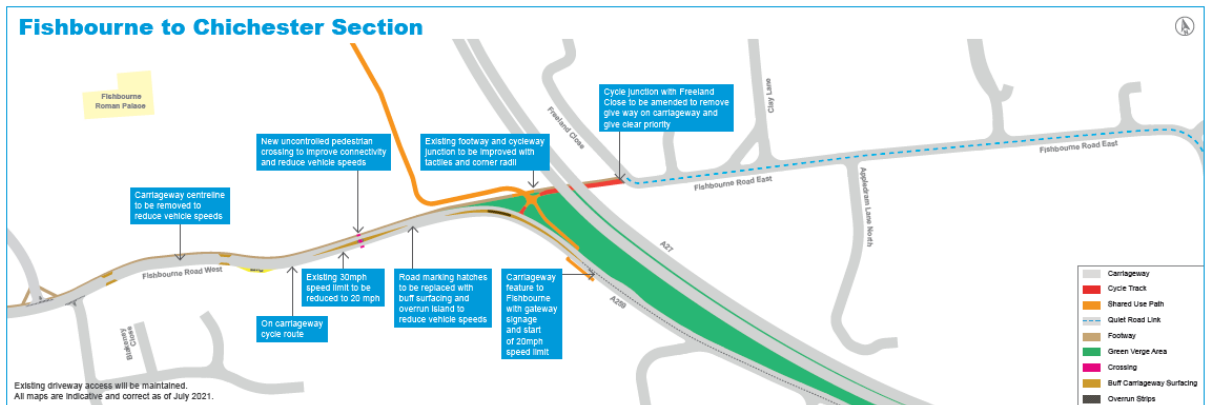
10.2.9 The AT3 is located between Chichester and Emsworth with improvements along the A259; due to the length of the scheme, it has been split into multiple sections to display the continuous improvements. The scheme will enable cyclists to travel between Chichester and Emsworth (and locations between) on segregated cycle tracks or shared-use paths. The cost estimate of the whole scheme is £5,000,000, with funding potentially being provided by the National Highways Cycling, Safety and Integration Designated Funds programme.

10.2.10 The justification for the scheme is to promote a modal shift, improve safety along the route and safeguard the environment.

Fishbourne to Chichester

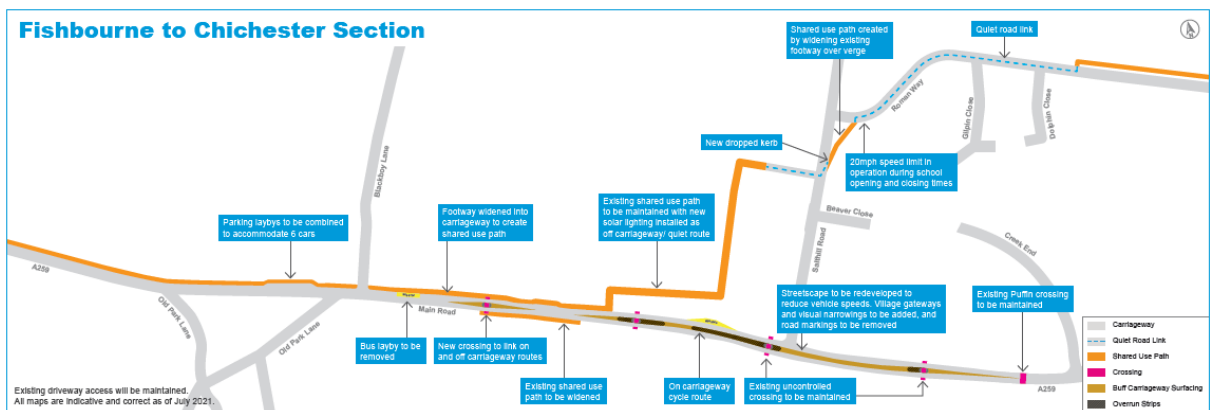
10.2.11 The first section of the Chichester to Emsworth is the Fishbourne to Chichester section; this is displayed in Figure 10-4 and Figure 10-5. The improvements include widening the footway to create a shared path, creating new crossings, removing the centre line, and reducing the speed limit to 20 mph.

Figure 10-4 Fishbourne to Chichester Section Part 1 of 2



Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Figure 10-5 Fishbourne to Chichester Section Part 2 of 2



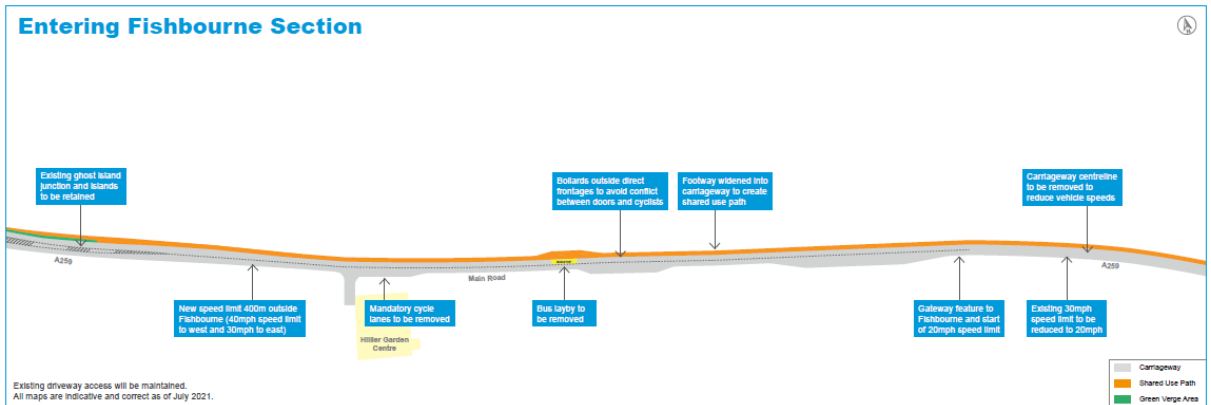
Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Bosham to Fishbourne

The second section is Bosham to Fishbourne, displayed in

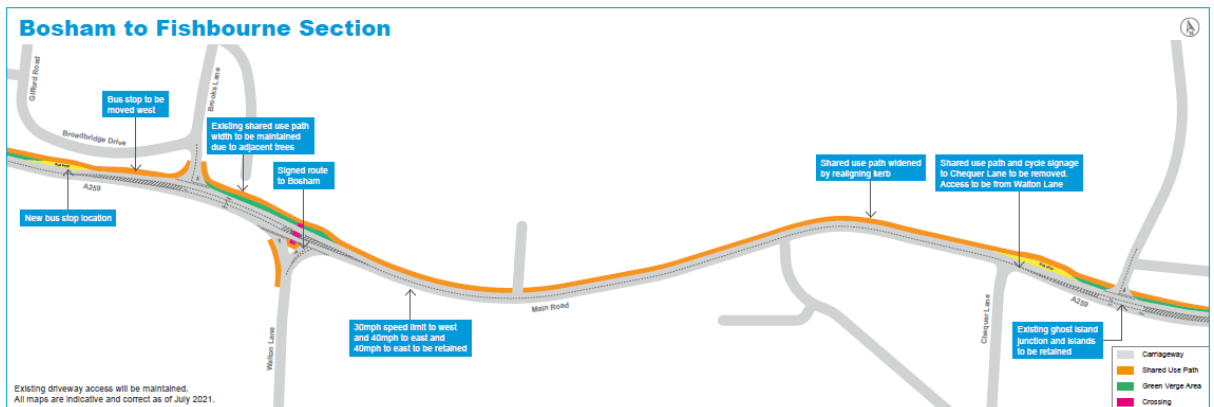
10.2.12 Figure 10-6 to Figure 10-8. The improvements include widening and clearing verges to create / maintain shared paths, new crossings, and adjustment to speed limits near residential areas along with the 20mph zone before Fishbourne.

Figure 10-6 Bosham to Fishbourne Section Part 1 of 3



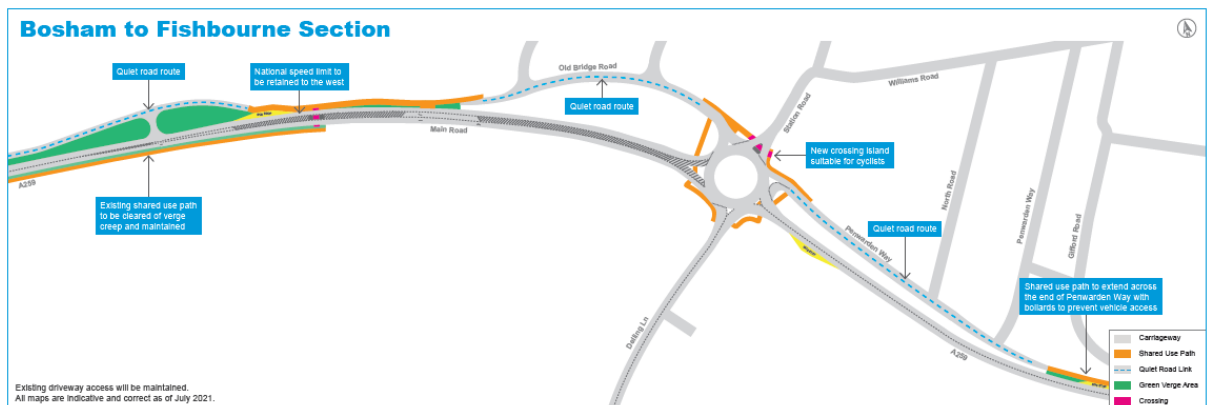
Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Figure 10-7 Bosham to Fishbourne Section Part 2 of 3



Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Figure 10-8 Bosham to Fishbourne Section Part 3 of 3

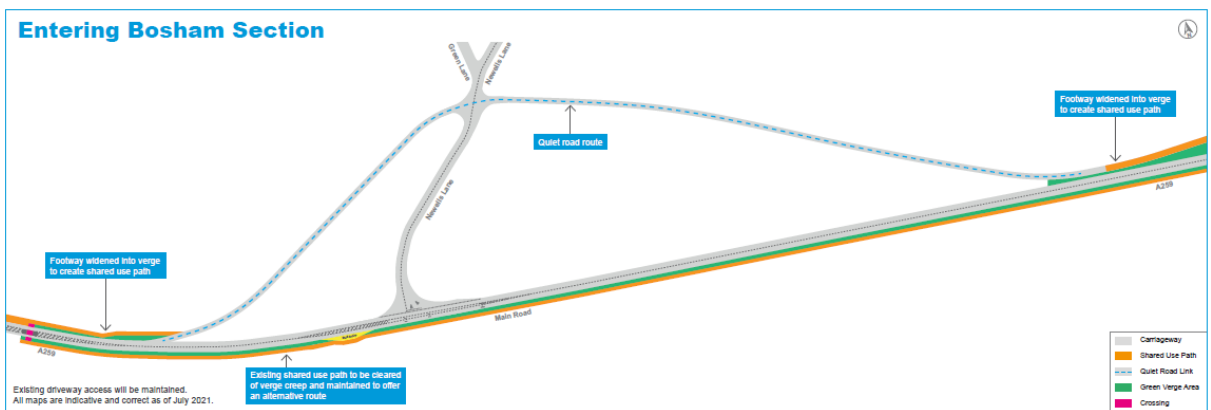


Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Nutbourne to Bosham

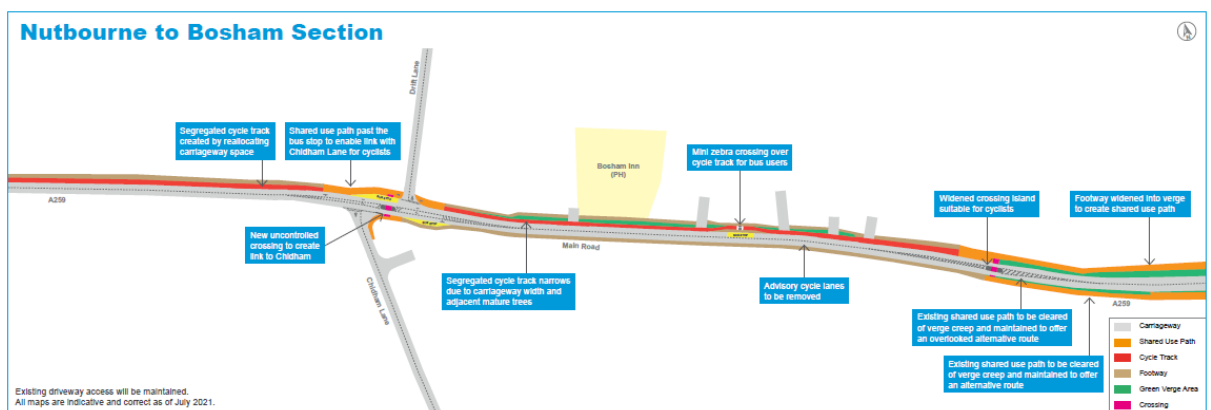
10.2.13 The middle section of the route is from Nutbourne to Bosham, shown in Figure 10-9 to Figure 10-11. The improvements to this section include widening into the verge and clearing of verge creep, new crossings, reallocation of the carriageway to segregated cycle track and reduction of speed limits.

Figure 10-9 Nutbourne to Bosham Section Part 1 of 3



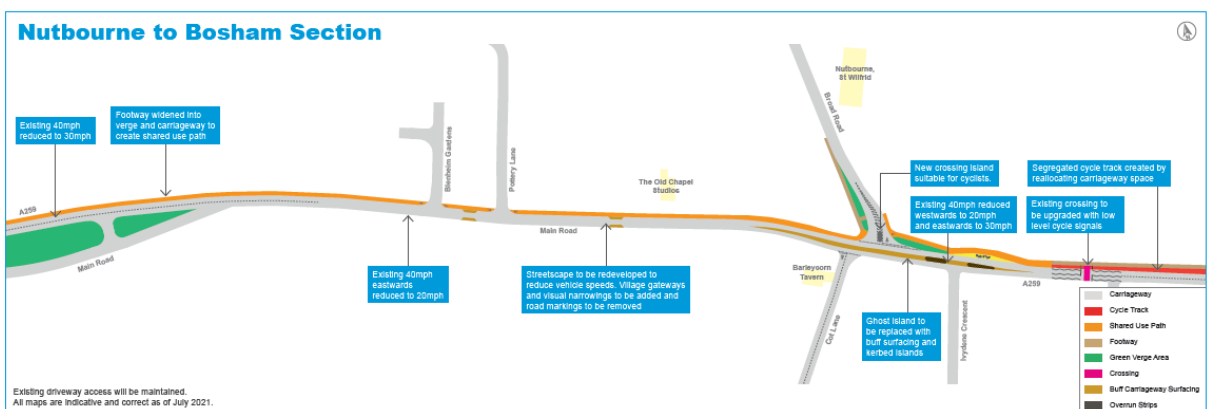
Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Figure 10-10 Nutbourne to Bosham Section Part 2 of 3



Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Figure 10-11 Nutbourne to Bosham Section Part 3 of 3

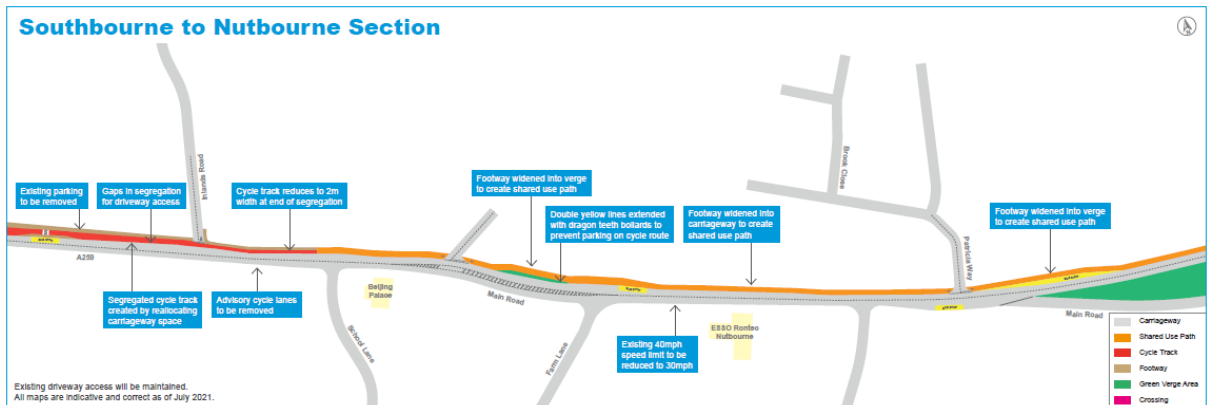


Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Southbourne to Nutbourne

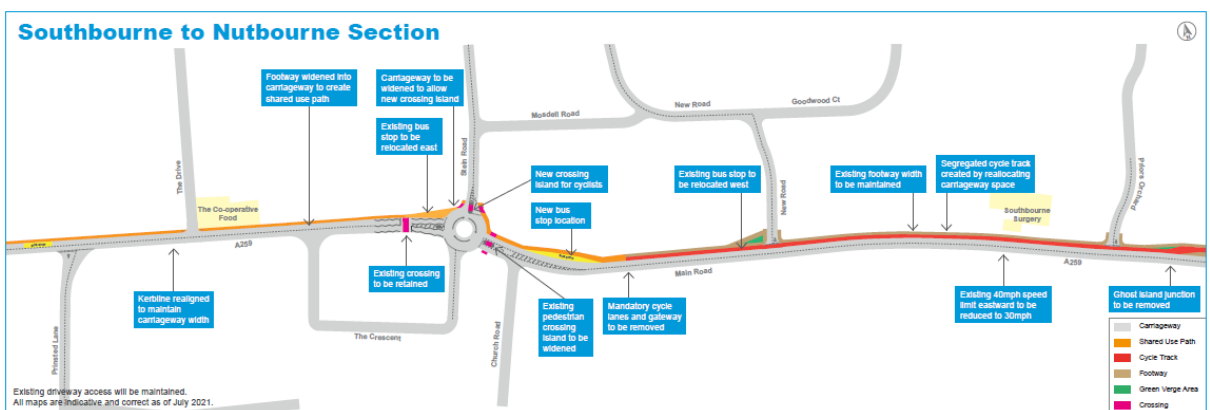
10.2.14 The fourth section is from Southbourne to Nutbourne, as shown in Figure 10-12 and Figure 10-13. The proposed improvements include widening footpaths into carriageways or verges to create shared-use paths, new and improved crossings at the A259 / Stein Road / The Crescent roundabout, and a reduction of speed limit from 40mph to 30mph east of Southbourne Surgery.

Figure 10-12 Southbourne to Nutbourne Section Part 1 of 2



Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Figure 10-13 Southbourne to Nutbourne Section Part 2 of 2

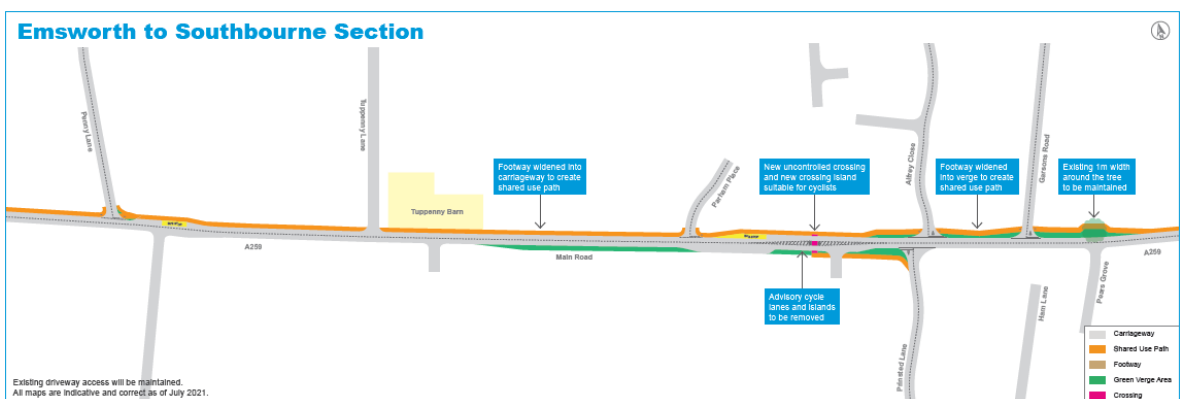


Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Emsworth to Southbourne

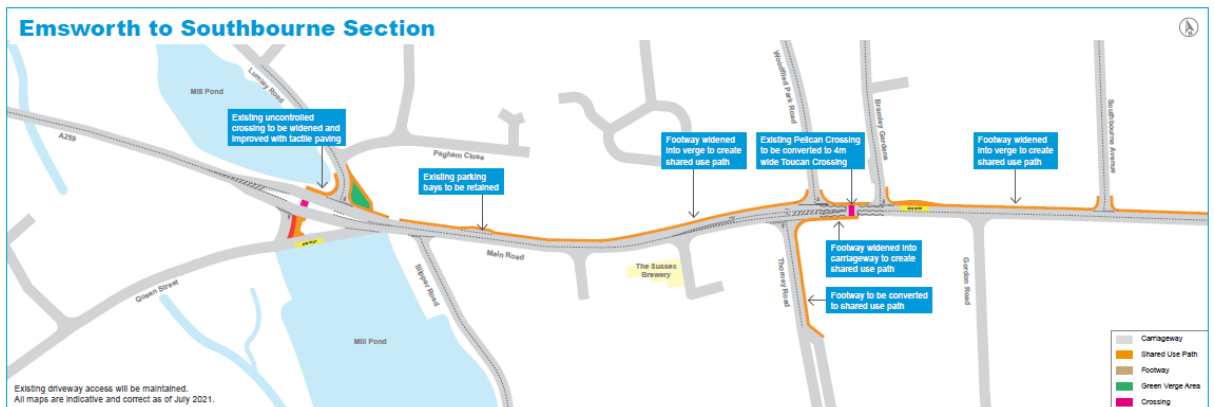
10.2.15 The final section of the route connects Emsworth to Southbourne; this section is displayed in Figure 10-14 and Figure 10-15. The proposed improvements along this section of the route includes widening of footways into the carriageway or verge to create shared-use paths, uncontrolled crossings at Lumley Road to be widened and the introduction of tactile paving, and an existing Pelican Crossing across the A259 between Woodfield Park Road and Bramley Gardens to be converted into a 4m wide Toucan crossing.

Figure 10-14 Emsworth to Southbourne Section Part 1 of 2



Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

Figure 10-15 Emsworth to Southbourne Section Part 2 of 2



Source: [A259 Chichester to Emsworth Walking and Cycling Improvements](#)

AT 4 – Oaklands Way

10.2.16 AT4 is located from College Lane to the Northgate Gyratory. The planned improvement will focus on enhancing the existing shared path to ensure continued access to Oaklands Parks and the University of Chichester. This will involve building a new ramp at the bus stop. In addition, the contraflow signs on the theatre access road will be made clearer. The scheme is estimated to cost £2,600,000. It is understood that funding for this scheme could be provided 50% developer funding and 50% grant funding.

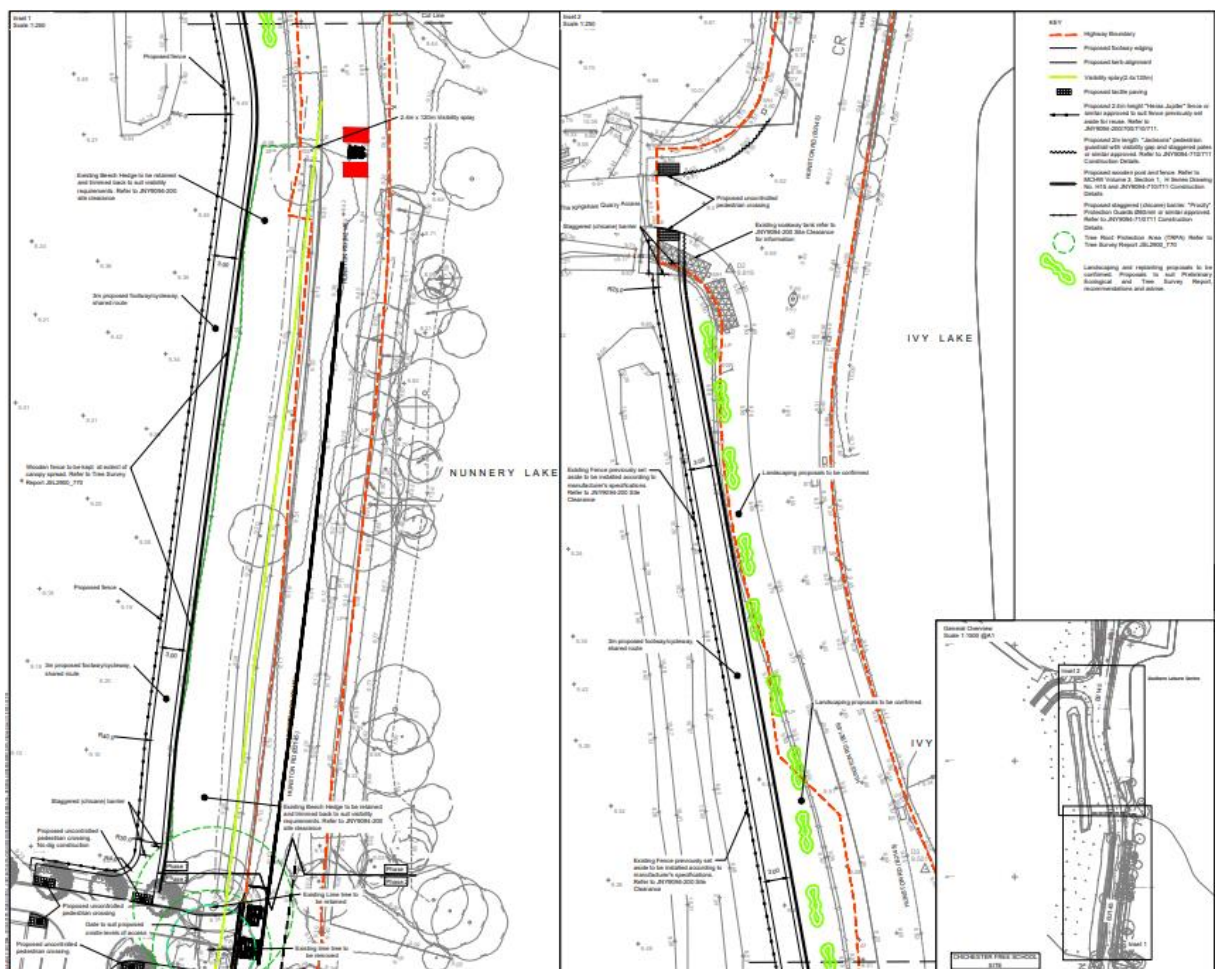
AT 5 – Hunston Cycle Route

10.2.17 The AT5 scheme is a cycle scheme located between Chichester Free School, along the western side of the B2145 carriageway, to a footbridge over the A27, consisting of a shared pedestrian / cycle route.

The estimated cost of AT5 is £919,800, with funding to be provided by WSCC. This scheme will allow for the safe passage for children attending Chichester Free School from north of the A27. The scheme is displayed in

10.2.18 Figure 10-16.

Figure 10-16 Hunston Cycle Route



Source: Planning Reference: 18/00197/FUL

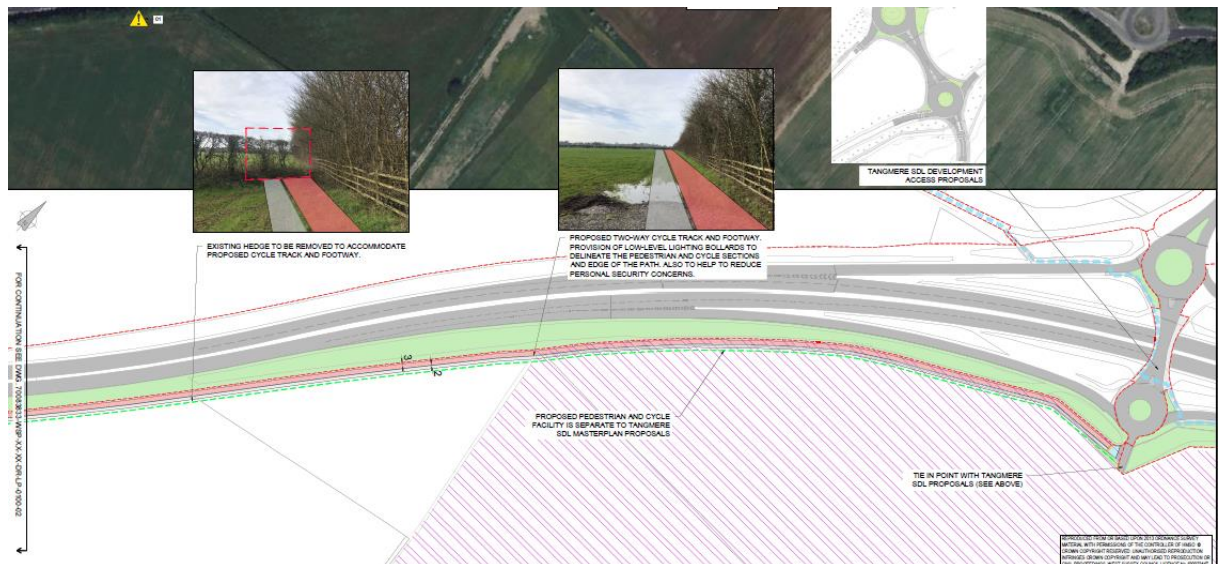
AT6 – Chichester – Tangmere Sustainable Transport Corridor

10.2.19 The AT6 scheme is a sustainable transport corridor that runs from Tangmere to Chichester City Centre, with alternations to the Westhampnett Road / Spitalfields Lane / St James' Road junction along the cycle route between A27 / A285 and City Centre. The proposed

improvements are for a two-way shared path along the improved crossings in the form of over-bridges and improved existing crossings along the route.

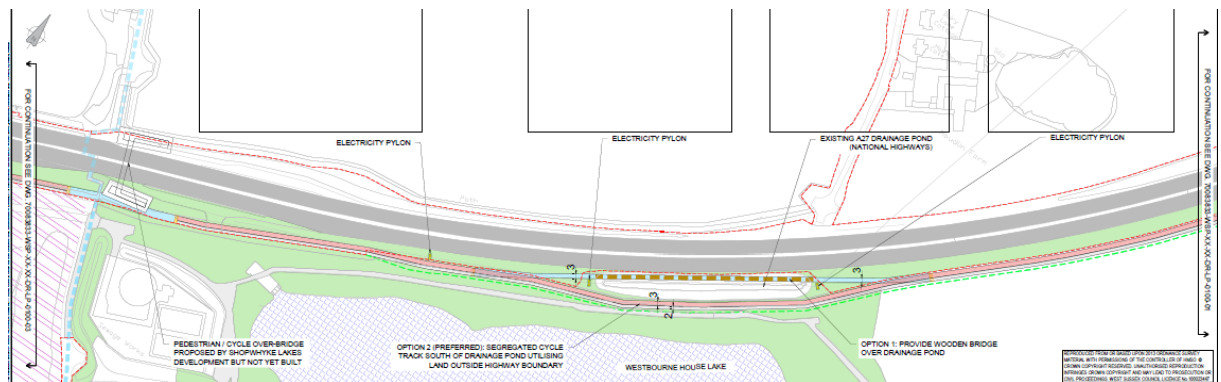
10.2.20 It is estimated that the total cost of the scheme will cost £6,600,000. The funding of the scheme could potentially be 50% developer funding and 50% grant funding. The proposed scheme is displayed below in Figure 10-17 to Figure 10-23.

Figure 10-17 A285 Westhampnett Road Corridor – Section 2



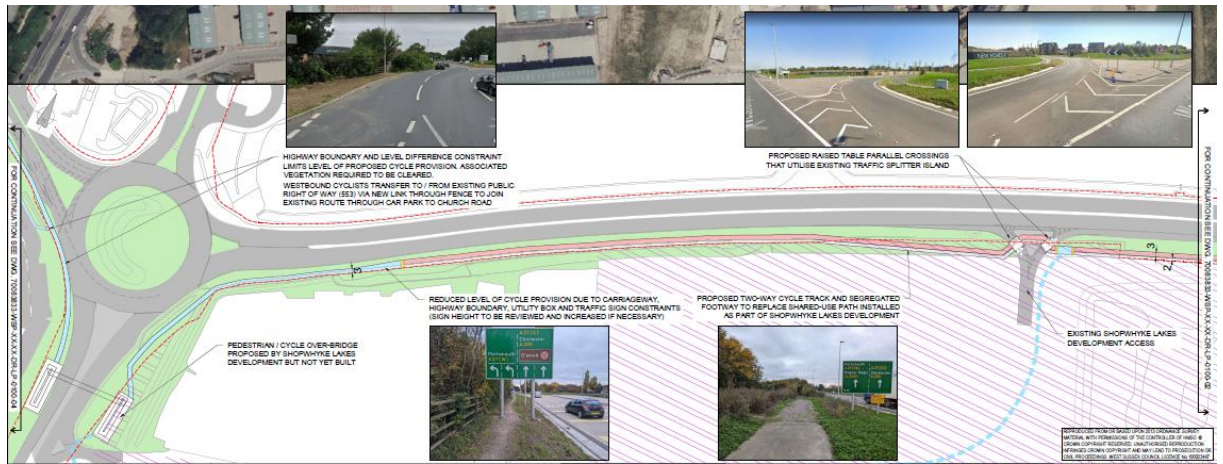
Source: A285 Westhampnett Road Corridor Feasibility Design

Figure 10-18: A285 Westhampnett Road Corridor – Section 3



Source: A285 Westhampnett Road Corridor Feasibility Design

Figure 10-19 A285 Westhampnett Road Corridor – Section 4



Source: A285 Westhampnett Road Corridor Feasibility Design

Figure 10-20 A285 Westhampnett Road Corridor – Section 5



Source: A285 Westhampnett Road Corridor Feasibility Design

Figure 10-21 A285 Westhampnett Road Corridor – Section 6



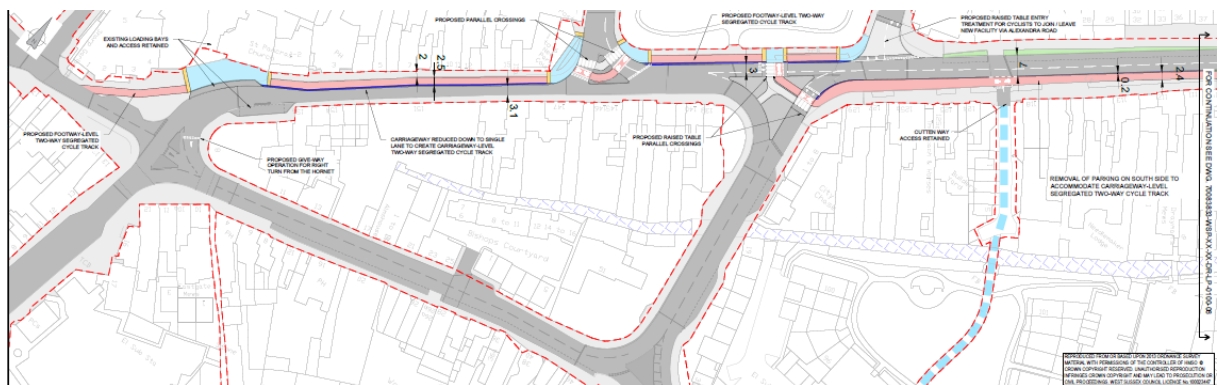
Source: A285 Westhampnett Road Corridor Feasibility Design

Figure 10-22 A285 Westhampnett Road Corridor – Section 7



Source: A285 Westhampnett Road Corridor Feasibility Design

Figure 10-23 A285 Westhampnett Road Corridor – Section 8



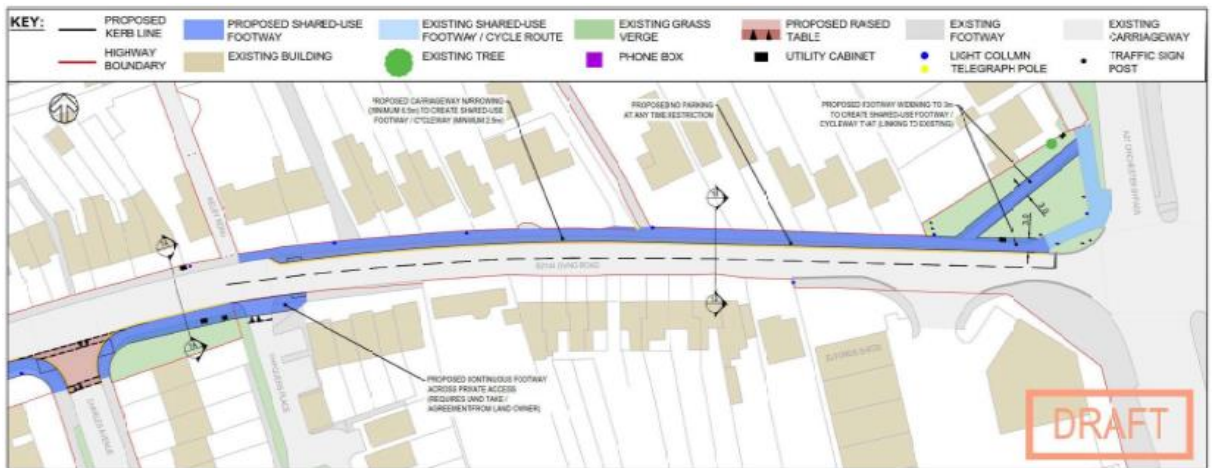
Source: A285 Westhampnett Road Corridor Feasibility Design

AT7 – City Centre to Portfield (via Oving Road) Sustainable Transport Corridor

10.2.21 The AT7 is a proposed sustainable transport corridor from the City Centre to Portfield, with improvements to sustainable transport facilities along the Oving Road corridor. Starting at the Oving Road junction with the A27 to Charles Avenue, then to Florence Road and along Pound Farm Road to A259, and finally ties into the existing network running towards Needlemakers. The scheme is estimated to cost £3,500,000 as of the Chichester District Council Infrastructure Business Plan 2023/28, with funding potentially being provided by WSCC, developer funding and grant funding.

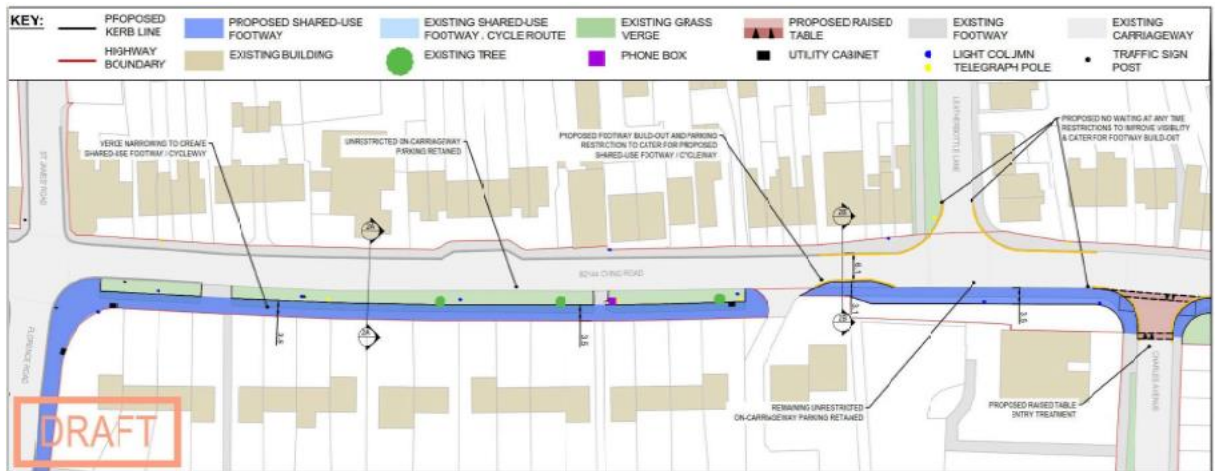
10.2.22 There are two proposed options for AT7; option 1 has been chosen as part of this assessment as it is the most comprehensive with a higher cost estimate, allowing for the most robust assessment. The scheme is displayed in Figure 10-24 to Figure 10-27.

Figure 10-24 Oving Road – Option 1 – Section 1



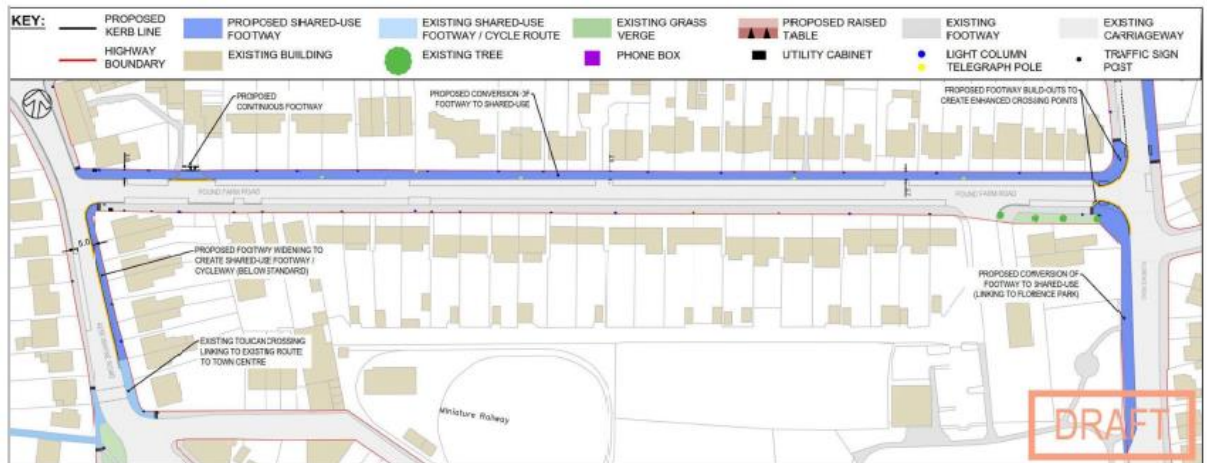
Source: Chichester Area Sustainable Transport Package: Phase 2

Figure 10-25 Oving Road – Option 1 – Section 2



Source: Chichester Area Sustainable Transport Package: Phase 2

Figure 10-26 Oving Road – Option 1 – Section 3



Source: Chichester Area Sustainable Transport Package: Phase 2

Figure 10-27 Oving Road – Option 1 – Section 4

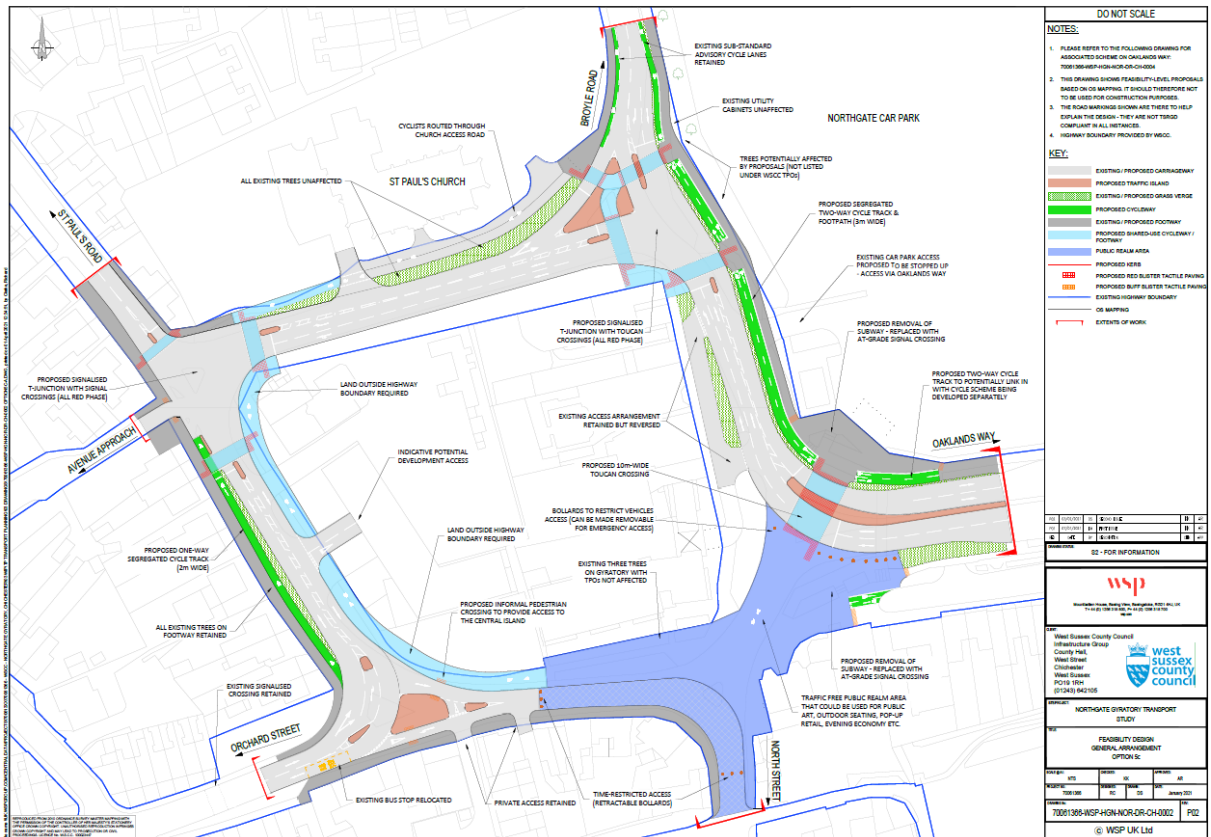


Source: Chichester Area Sustainable Transport Package: Phase 2

AT8 – Northgate Gyratory Improvements

10.2.23 AT8 is shown in Figure 10-28 It contains improvements to the Northgate Gyratory and the Oaklands Way Crossing. There are three proposed options. Option 5c will be used as this is the scheme with the highest cost, costing £6,367,000, with the Oaklands Way Crossing costing a further £1,013,000, with funding potentially being funded by 50% developer funding and 50% grant funding.

Figure 10-28 Northgate Gyratory Improvements



Source: Chichester Vision: Northern Gateway Transport Study

Public Transport

10.2.24 There has been one Public Transport (PT) scheme identified that is relevant to the A27 in terms of reducing the number of trips.

PT1 – Bognor Road

10.2.25 PT1 is located along the A259 on the approach to the Bognor Road Roundabout; the scheme is for the introduction of a bus lane in the westbound direction, with new bus stops on both sides of the A259 and a signalised bus gate to minimise bus delay.

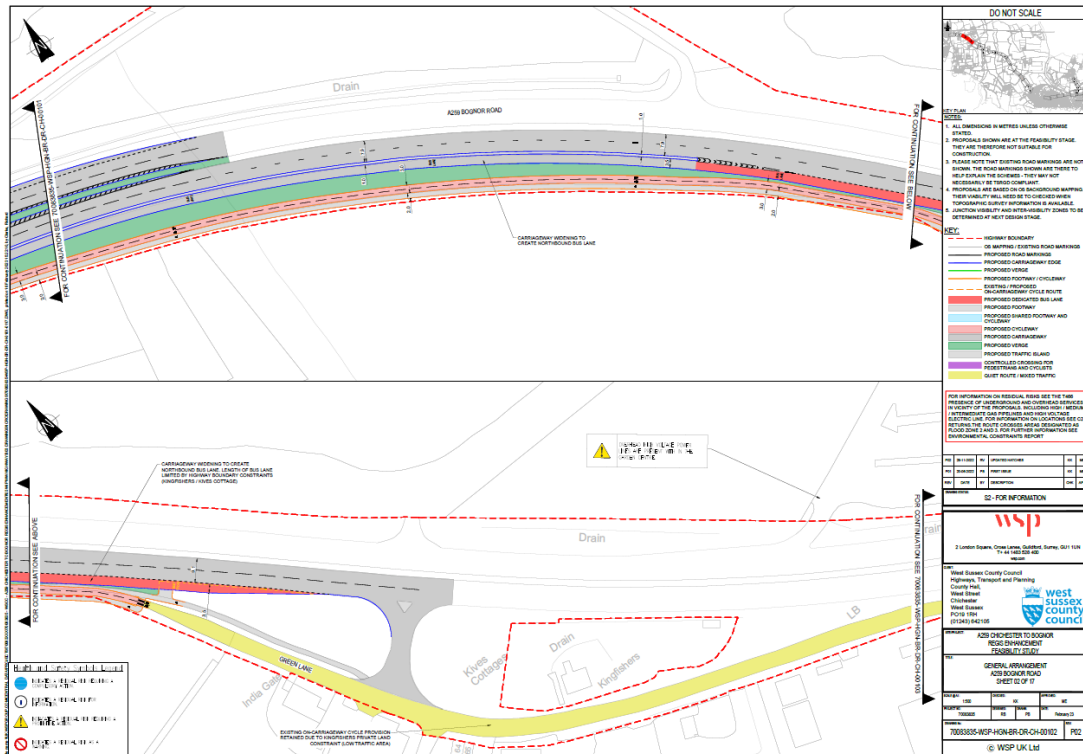
10.2.26 This scheme also incorporates a segregated two-way cycle track running to the south of the A259 corridor.

The total cost of the PT1 scheme is estimated to cost £11,750,000, with £109,437.50 secured through the planning application O/19/00619/FUL. The scheme is shown in Figure 10-29 to

10.2.27 Figure 10-32.

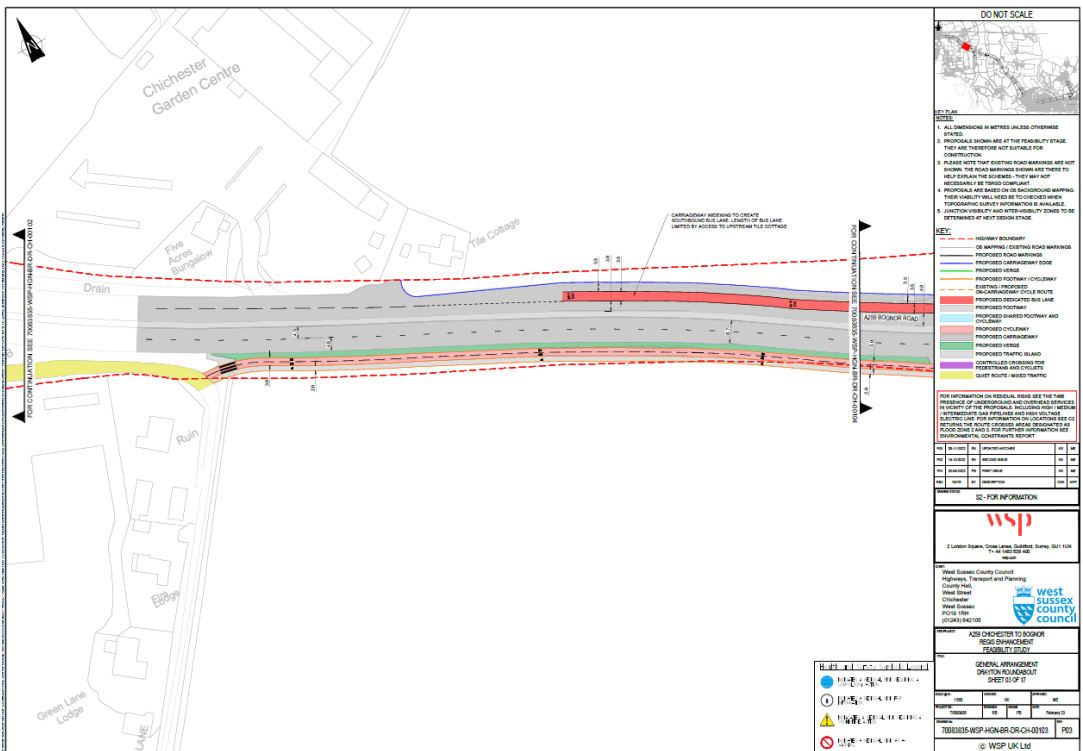
Figure 10-29 Bognor Road – Bus Scheme Part 1

Figure 10-30 Bognor Road – Bus Scheme Part 2



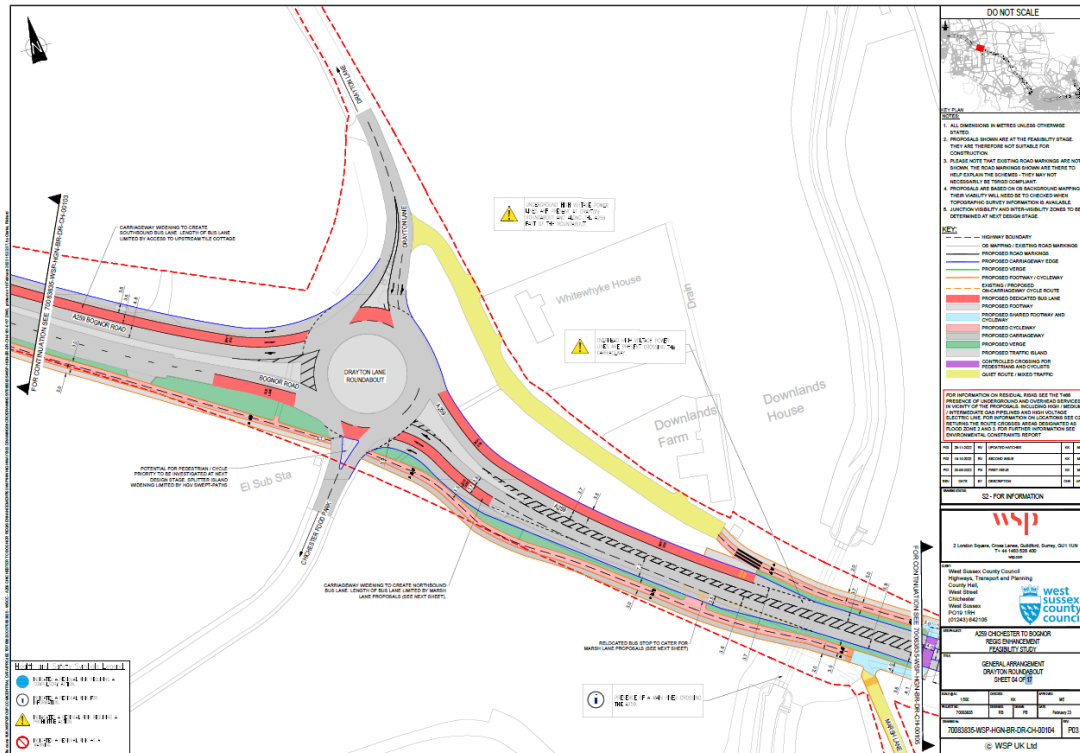
Source: A259 Chichester to Bognor Regis Enhancement Feasibility Study

Figure 10-31 Bognor Road – Bus Scheme Part 3



Source: A259 Chichester to Bognor Regis Enhancement Feasibility Study

Figure 10-32 Bognor Road – Bus Scheme Part 4



Source: A259 Chichester to Bognor Regis Enhancement Feasibility Study

Summary of Costing

10.2.28 Table 10-1 displays the cost and funding summary of each of the sustainable travel schemes.

Table 10-1 Summary of Cost and Funding of Sustainable Transport Schemes

Ref No.	Cost	Funding	% Funding Required
AT1	£1,022,000	Linden Homes S106 (14/01018/OUT)	0%
AT2	£790,000	Developer Contributions & Government grants	100%
AT3	£5,000,000	Government grants	100%
AT4	£2,600,000	Developer Contributions & Government grants (£105,000 planned for 2023/24)	96.0%
AT5	£919,800	WSCC Funded	0%
AT6	£6,600,000	Developer Contributions & Government grants	100%
AT7	£3,500,000	Developer Contributions & Government grants	100%
AT8	£6,367,000 + £1,013,000 (Oaklands Way Crossing)	Developer Contributions & Government grants	100%
PT1	£11,750,000	£109,437.50 secured through O/19/00619/FUL	99.1%

10.3 Modelling Analysis

Introduction

- 10.3.1 This section will summarise the results of the modelling conducted to quantify the impact of the sustainable travel schemes within Chichester and the surrounding area. It will provide the total number of trips that have the potential to change mode on the local highway network during the peak hour periods, particularly concerning the key junctions with the A27.
- 10.3.2 The modelling has been separated into two sections, active travel and public transport. This is due to the different methodologies required to quantify the potential reduction in trips as a result of these schemes.

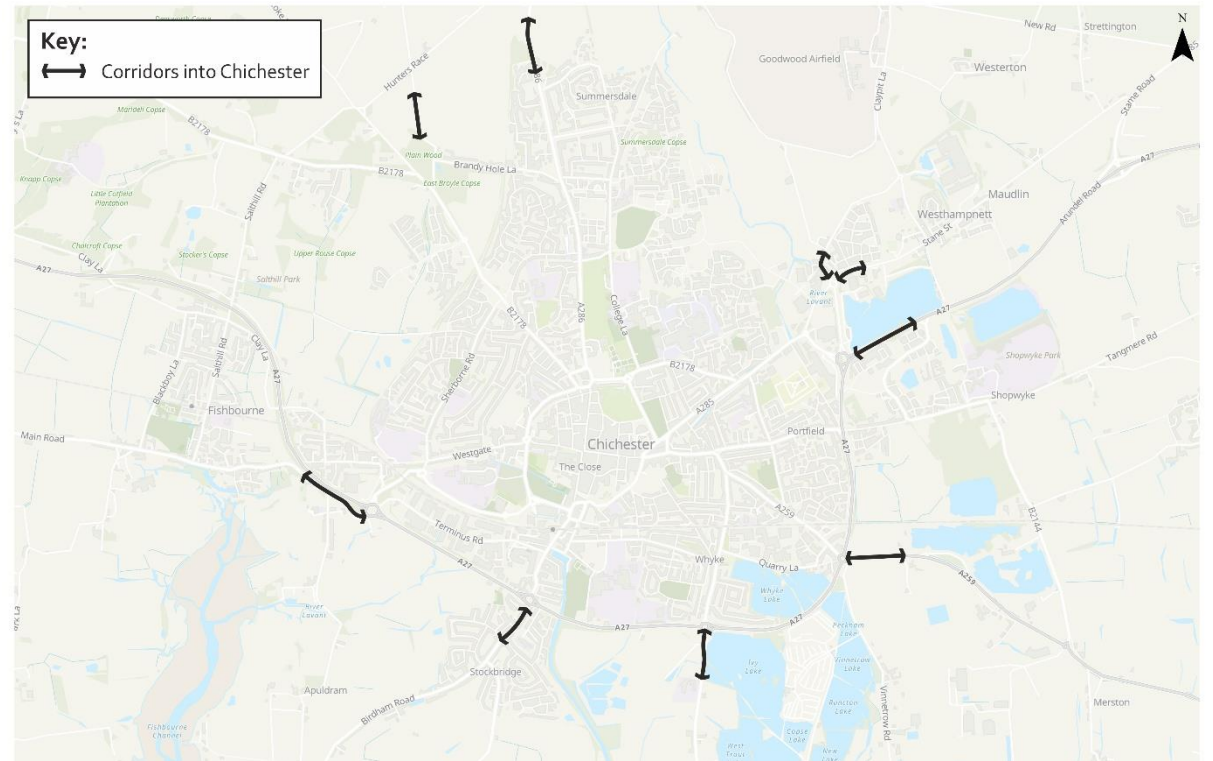
Active Travel

Methodology

- 10.3.3 A proportionate approach has been taken to assess the impacts of the sustainable travel schemes using the available forecast travel demand from the Chichester SATURN model and high-level evidence, based on assumptions of mode shift within the Propensity to Cycle Toolkit (PCT)⁸. The PCT uses data on travel patterns and demographic characteristics to model cycling demand and estimate the potential impact of different interventions on cycling levels.
- 10.3.4 The PCT prediction of mode shift has been taken for all census Lower Super Output Areas (LSOA) that can be classified as the Chichester Urban Area. This provided forecast car driver modal shift values localised to the area using existing census travel to work data and the PCT “government Target Near Market” scenario which provides forecast estimates of car driver mode shift resulting from cycle scheme implementation.
- 10.3.5 The PTC calculates a target car reduction of 269 car driver trips across Chichester. As this is a commute total it can be assumed that the trip reduction can be applied within the peak period (3 Hours), with a peak period to peak hour conversion factor of 0.5, resulting in a total of 135 car driver reduction within the Chichester Urban to both the AM Peak (08:00 – 09:00) (inbound) and the PM Peak (17:00 – 18:00) (outbound) as part of the commuter trip chain.
- 10.3.6 In order to apply the predicted car driver trip reduction in Chichester travel demand onto the road network and analyse the sustainable travel schemes by a case-by-case basis, the total car driver trip reduction target from the PCT has been applied across the specific links on the boundary of the Chichester urban area where sustainable travel schemes proposed. This is for trips less than 5km.
- This disperses the PCT car driver trip reduction estimate across the Chichester inbound/outbound corridors where sustainable travel schemes are proposed and provides an estimate of the mode shift that fall across these corridors. The corridor demand and trip distance analysis of less than 5km was assessed at the following locations shown in
- 10.3.7 Figure 10-33 within the Chichester 2037 SATURN forecast model, assessing background trips only within the scenario that has the local plan mitigation.

⁸ [Welcome to the Propensity to Cycle Tool \(PCT\)](#)

Figure 10-33 Road Corridors To / From Chichester Assessed in the Chichester SATURN Model



10.3.8 From the forecast SATURN model, the proportion of short distance trips across each corridor (less than 5km) is shown in the Table 10-2. This provides a weighted proportion that could change mode to cycling across Chichester and equates as a total to the 135 from the PTC forecast.

Table 10-2 Chichester Road Corridors PTC Assumptions

Road	AM Trips <5K	% of Total Short Trips	Car Driver Reduction Shift AM	PM Trips <5k	% of Total Short Trips	Car Driver Reduction Shift PM
A27 EB	50	4%	5	33	2%	3
A27 WB	38	3%	4	74	5%	7
Bognor Rd	190	14%	18	204	15%	20
Lavant Road	121	9%	12	83	6%	8
Fishbourne Road	162	12%	15	81	6%	8
Old Broyle Rd	259	18%	25	170	12%	16
Madgwick Lane	138	10%	13	138	10%	13
Roman Rd	210	15%	20	363	26%	35
Tangmere Rd	-	0%	-	-	0%	-
Stockbridge Road	196	14%	19	206	15%	20

B2145	38	3%	4	53	4%	5
Sums	1,402	100%	135	1,405	100%	135

10.3.9 Focusing the cycle shift total on the corridors that include sustainable travel schemes, Table 10-3 highlights the potential shift resulting from the application along the corridors and the total active travel scheme car driver reduction using the assumption of the PTC being applied specifically to the corridors in/out of Chichester, upon which a sustainable travel scheme is proposed.

10.3.10 This maintains the potential total car driver reduction shift of 135 and specifies them across the corridors where the sustainable travel schemes are proposed.

Table 10-3 Cycle Shift Assumption

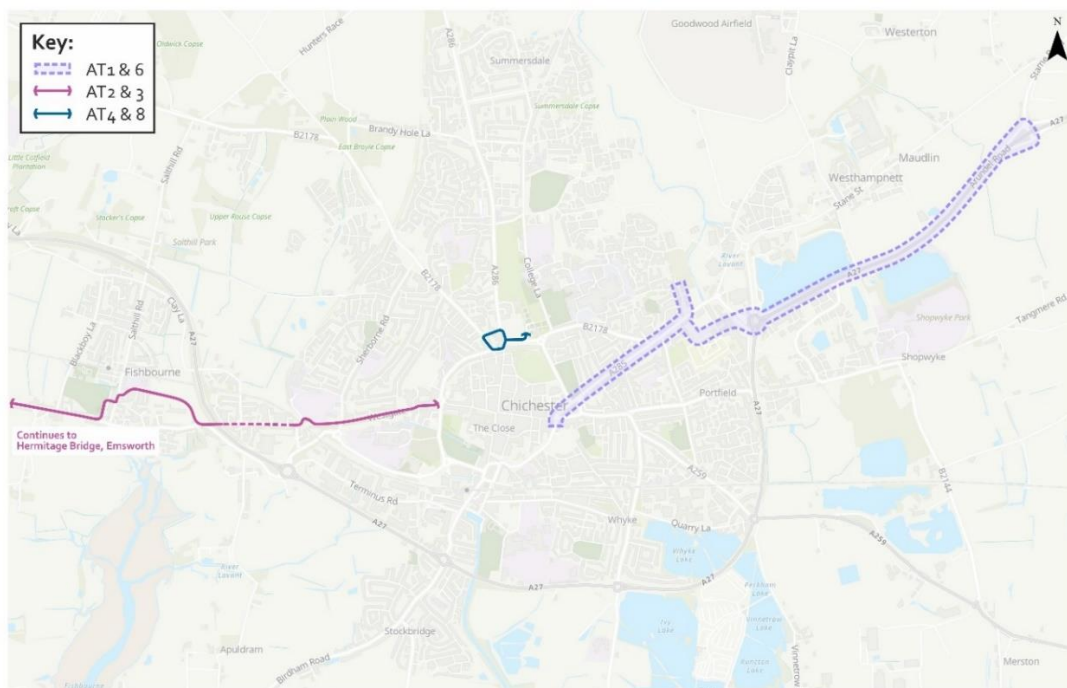
Road	AM Peak Hour (08:00 – 09:00)			PM Peak Hour (17:00 – 18:00)		
	Trips <5k	% of Total Short Trips	Car Driver Shift	Trips <5k	% of Total Short Trips	Car Driver Shift
A27 EB	50	10%	14	33	7%	10
A27 WB	38	8%	11	74	17%	22
Fishbourne Road	162	34%	46	81	18%	25
B2145	38	8%	11	53	12%	16
Bognor Road	190	40%	54	204	46%	62
Total	479		135	446		135

For the purpose of modelling the impacts of the active travel schemes along these corridors, a number of schemes have been combined due to their proximity and their interconnectivity; this is outlined below and is shown in

10.3.11 Figure 10-34.

- AT1 (Graylingwell) + AT6 (Chichester to Tangmere) = AT 1+6
- AT2 (Westgate) + AT3 (Chichester to Emsworth) = AT 2+3
- AT4 (Oaklands Way) + AT8 (Northgate Gyratory) = AT 4+8

Figure 10-34 Combined Sustainable Transport Schemes



10.3.12 Due to AT 4+8 distance from any arterial corridors into Chichester, it has not been modelled as its impacts will be localised to inner Chichester.

Junction Mode Shifts

10.3.13 The mode shifts highlighted in Table 10-3 have been applied at the junctions along the A27 using high-level proportionate assumptions of the tidal nature of commuter trips, with in-bound Chichester trips in the AM Peak and outbound Chichester trips within the PM peak. As such, the following tables highlight the arm specific traffic reductions that are forecast to occur as a result of the sustainable travel schemes.

Fishbourne Roundabout

10.3.14 Table 10-4 displays the mode shift from car driver to cycling in the AM and PM Peak on the minor arms of the Fishbourne Roundabout.

Table 10-4 Fishbourne Roundabout – Cycle Shift from Car Driver Trips

Arm	Cycle Shift – AM Peak	Cycle Shift – PM Peak
A259 (N)	-	25
Terminus Rd	-	-
A27 (E)	-	-
New link to the South East	-	-
A259 (W)	46	-
A27 (W)	-	-

Whyke Roundabout

10.3.15 Table 10-5 displays the mode shift from car driver to cycling in the AM and PM Peak on the minor arms of the Whyke Roundabout.

Table 10-5 Whyke Roundabout – Cycle Shift from Car Driver Trips

Arm	Cycle Shift – AM Peak	Cycle Shift – PM Peak
Whyke Rd (N)	-	16
A27 (E)	-	-
Whyke Rd (S)	11	-
A27 (W)	-	-

Bognor Roundabout

10.3.16 Table 10-6 displays the mode shift from car driver to cycling in the AM and PM Peak on the minor arms of the Bognor Roundabout.

Table 10-6 Bognor Roundabout – Cycle Shift from Car Driver Trips

Arm	Cycle Shift – AM Peak	Cycle Shift – PM Peak
A27 (N)	-	-
Bognor Road (E)	54	-
Vinnetrow Rd	-	-
A27 (S)	-	-
Bognor Rd (W)	-	62

Portfield Roundabout

10.3.17 displays the mode shift from car driver to cycling in the AM and PM Peak on the minor arms of the Portfield Roundabout.

Table 10-7 Portfield Roundabout – Cycle Shift from Car Driver Trips

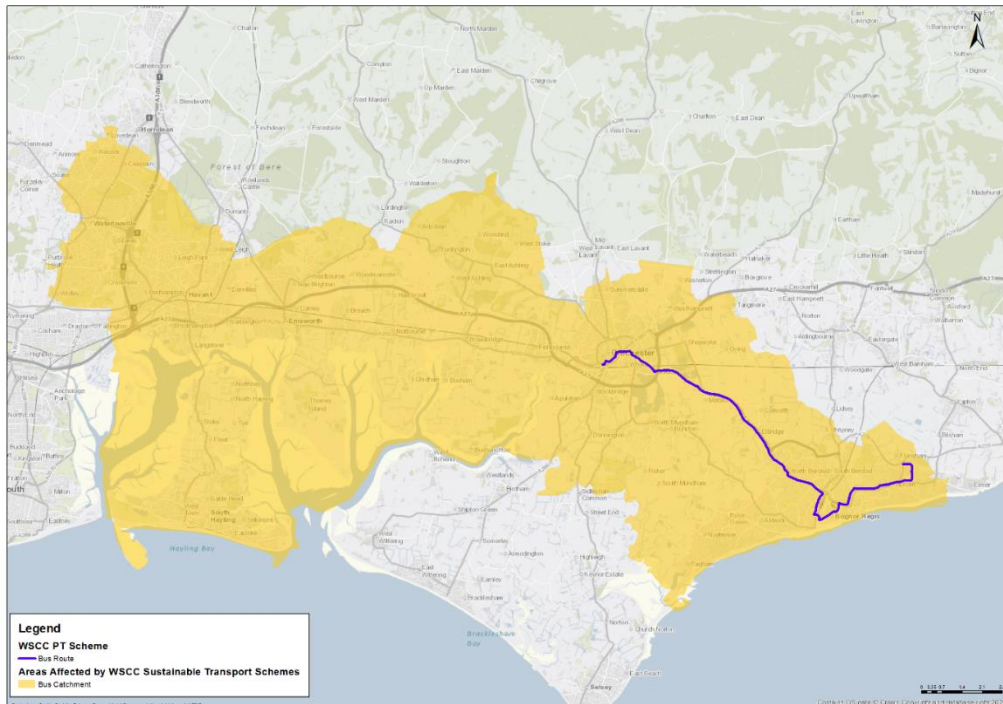
Arm	Cycle Shift – AM Peak	Cycle Shift – PM Peak
Chichester Bypass	-	-
A27 (E)	25	-
A27 (S)	-	-
Portfield Way	-	32

Public Transport

Methodology

10.3.18 To quantify the number of trips that have the potential to modal shift from car to public transport, a model area has been created for the bus catchment of the model scope, as shown in Figure 10-35, for the bus services 700 and U7. This captures the Middle Super Output Areas of Arun 012 – 019, Chichester 006 – 012, and Havant 003 – 020.

Figure 10-35 Bus Areas Affected by WSCC Sustainable Transport Scheme



10.3.19 From the 2011 Census Travel to Work, the number of commuter trips for both car and bus was calculated that would feasibly cross the bus route. A proportionate approach of a high-level assumption has been taken to the bus modal shift increase; it has been assumed that there could be a 30% increase in the number of commuter trips across the day, with 42% of those being captured from cars and taxis.

Results

10.3.20 Table 10-8 displays the number of commuter trips for cars and buses along with the bus modal shift capture along the service 700 bus route.

Table 10-8 Potential Bus Shift Capture

Middle Super Output Area	Car	Bus	Bus Shift Capture – Peak Period	Peak Period to Peak Hour
Arun 012 – 019	20,037	764	96	48
Chichester 006 – 12	14,854	375	47	24
Havant 003 - 020	34,394	1,127	142	71
Total	69,285	2,266	286	143

10.3.21 Table 10-9 displays the mode shift from car driver to bus and bus and cycle in the AM and PM peak hours on the minor arms of the Bognor Roundabout.

Table 10-9 Bognor Roundabout – Bus Shift – Bus & Cycle Shift from Car Driver Trips

Arm	AM Peak		PM Peak	
	Bus Shift	Bus + Cycle Shift	Bus Shift	Bus + Cycle Shift

A27 (N)	-	-	-	-
Bognor Road (E)	143	197	-	-
Vinnetrow Rd	-	-	-	-
A27 (S)	-	-	-	-
Bognor Rd (W)	-	-	143	205

10.4 Scheme Impact on Local Plan Trips

Introduction

10.4.1 This section of the note considers the total traffic flows on the junctions of the A27, the flows associated with the LP development, and the potential reduction in trips because of the sustainable travel schemes implementation.

Fishbourne Roundabout

10.4.2 Table 10-10 shows the flows at the Fishbourne junction on each arm during the AM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed AT 2+3.

Table 10-10 Fishbourne Roundabout – AM Peak (08:00 – 09:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Cycle Shift	LP Dev minus Cycle Shift	LP Dev minus Cycle Shift % of Demand
A259 (N)	892	66	7.4%	-	66	7.4%
Terminus Rd	-	-	-	-	-	-
A27 (E)	2705	96	3.5%	-	96	3.5%
New link to the South East	751	44	5.9%	-	44	5.9%
A259 (W)	1093	205	18.8%	46	159	14.5%
A27 (W)	2680	91	3.4%	-	91	3.4%
TOTAL	8121	502	6.2%	46	456	5.6%

10.4.3 Table 10-11 shows the flows at the Fishbourne junction during the PM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed AT 2+3.

Table 10-11 Fishbourne Roundabout – PM Peak (17:00 – 18:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Cycle Shift	LP Dev minus Cycle Shift	LP Dev Cycle Shift % of Demand
A259 (N)	1,608	62	3.9%	25	37	2.3%
Terminus Rd	-	-	-	-	-	-
A27 (E)	2,189	74	3.4%	-	74	3.4%
New link to the South East	1,258	156	12.4%	-	156	12.4%
A259 (W)	699	150	21.5%	-	150	21.5%
A27 (W)	2549	97	3.8%	-	97	3.8%
TOTAL	8303	539	6.5%	25	514	6.2%

Bognor Roundabout

10.4.4 Table 10-12 shows the flows at the Bognor junction during the AM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed PT1.

Table 10-12: Bognor Roundabout – AM Peak (08:00 – 09:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Bus/Cycle Shift	LP Dev minus Bus/Cycle Shift	LP Dev Cycle Shift % of Demand
A27 (N)	2466	307	12.4%	-	307	12.4%
Bognor Rd (E)	2595	105	4.0%	197	-92	-3.5%
Vinnetrow Rd	-	-	-	-	-	-
A27 (S)	2669	206	7.7%	-	206	7.7%
Bognor Rd (W)	704	75	10.7%	-	75	10.7%
Total	8434	693	8.2%	197	496	5.9%

10.4.5 Table 10-13 shows the flows at the Bognor junction during the PM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed PT1.

Table 10-13 Bognor Roundabout – PM Peak (17:00 – 18:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Cycle Shift	LP Dev minus Bus/Cycle Shift	LP Dev minus Bus/Cycle Shift % of Demand
A27 (N)	2533	212	8.4%	-	212	8.4%
Bognor Rd (E)	2054	243	11.8%	-	243	11.8%
Vinnetrow Rd	-	-	-	-	-	-
A27 (S)	2790	154	5.5%	-	154	5.5%
Bognor Rd (W)	1577	54	3.4%	205	-151	-9.6%
Total	8954	663	7.4%	205	458	5.1%

Whyke Roundabout

10.4.6 Table 10-14 shows the flows at the Whyke junction during the AM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed AT 1+6.

Table 10-14 Whyke Roundabout – AM Peak (08:00 – 09:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Cycle Shift	LP Dev minus Cycle Shift	LP Dev minus Cycle Shift % of Demand
Whyke Rd (N)	853	47	5.5%	-	47	5.5%
A27 (E)	2,462	152	6.2%	-	152	6.2%
Whyke Rd (S)	1,122	94	8.4%	11	83	7.4%
A27 (W)	2,422	187	7.7%	-	187	7.7%
Total	6,859	480	7.0%	11	469	6.8%

10.4.7 Table 10-15 shows the flows at the Whyke junction during the PM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed AT 1+6.

Table 10-15 Whyke Roundabout – PM Peak (17:00 – 18:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Cycle Shift	LP Dev minus Bus/Cycle Shift	LP Dev minus Cycle Shift % of Demand
Whyke Rd (N)	681	60	8.8%	16	44	6.5%
A27 (E)	2,605	181	6.9%	-	181	6.9%
Whyke Rd (S)	765	89	11.6%	-	89	11.6%
A27 (W)	2,945	159	5.4%	-	159	5.4%
Total	6,996	489	7.0%	16	473	6.8%

Portfield Roundabout

10.4.8 Table 10-16 shows the flows at the Portfield junction during the AM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed AT5.

Table 10-16 Portfield Roundabout – AM Peak (08:00 – 09:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Cycle Shift	LP Dev minus Cycle Shift	LP Dev minus Cycle Shift % of Demand
Chichester Bypass	371	55	14.8%	-	55	14.8%
A27 (E)	2,669	165	6.2%	25	140	5.2%
A27 (S)	2,295	168	7.3%	-	168	7.3%
Portfield Way	758	62	8.2%	-	62	8.2%
Total	6,093	450	7.4%	25	425	7.0%

10.4.9 Table 10-17 shows the flows at the Portfield junction during the PM peak hour. This includes the demand flows, along with the addition of local plan flows and the cycle shift due to the proposed AT5.

Table 10-17 Portfield Roundabout – PM Peak (17:00 – 18:00)

Arm	Local Plan with Mitigation					
	Demand	LP Dev Demand Trips Only	LP % of Trips	Cycle Shift	LP Dev minus Bus/Cycle Shift	LP Dev minus Cycle Shift % of Demand
Chichester Bypass	267	36	13.5%	-	36	13.5%
A27 (E)	2,813	198	7.0%	-	198	7.0%
A27 (S)	3,176	237	7.5%	-	237	7.5%
Portfield Way	424	31	7.3%	32	-1	-0.2%
Total	6,680	502	7.5%	32	470	7.0%

10.5 Benefits

Introduction

10.5.1 This section outlines the benefits of each sustainable travel schemes and how they reduce car trips on the local highway network, particularly the section of the A27 between, including Fishbourne and Bognor Roundabouts.

10.5.2 The schemes have been ranked based on their effectiveness in removing car trips; this provides insight into the effectiveness of each scheme in comparison to each. It should be noted, the purpose of a scheme will not be solely to reduce trips across the network, a scheme could have the purpose of improving safety along a link.

Summary of Benefits

10.5.3 As shown in Table 10-18, the sustainable travel schemes have been ranked based on their effectiveness at reducing trips at their relevant junctions across the network. The percentage decrease for the AM and PM peak is the decrease of the inbound trips that have been removed from the relevant junction on the A27.

Table 10-18 Summary of Sustainable Transport Schemes Impact

Ref	Roundabout	Cost	AM Peak			PM Peak		
			LP % of Trips (Demand)	LP minus Shift % of Trips (Demand)	Change	LP % of Trips (Demand)	LP minus Shift % of Trips (Demand)	Change
PT1	Bognor	£11,750,000	7.8%	5.6%	-2.2%	7.0%	4.8%	-2.2%
AT 1+6	Portfield	£7,622,000	7.1%	6.7%	-0.4%	7.6%	6.7%	-0.9%
AT 2+3	Fishbourne	£5,790,000	5.9%	5.3%	-0.6%	5.9%	5.7%	-0.2%

AT5	Whyke	£919,800	6.5%	6.4%	-0.1%	6.3%	6.1%	-0.2%
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10.5.4 The scheme that had the most significant impact on reducing the number of inbound car trips across the A27 was PT1; this is due to being the only public transport scheme along with having the compounding effect of a further shift from cyclists able to use the scheme, this resulted in a reduction of 2.2% and 2.2% in the AM and PM peak hour in comparison to the scheme not being implemented, respectively.

10.5.5 Although AT5 has little impact on the number of inbound car trips that are removed from Whyke Roundabout, the scheme has other benefits that would occur as a result of its implementation. It would link Chichester Free School and the crossing bridge over the A27 via a segregated traffic free route.

10.6 Conclusion

10.6.1 This section has outlined a total of 9 sustainable transport schemes, 8 of which are active travel and 1 being public transport.

10.6.2 Two separate modelling exercises were conducted, for active travel and public transport; this was done due to the nature of the areas that each mode could cover to capture a potential modal shift from car trips. Table 10-19 displays the schemes ranked based on their percentage decrease in inbound car trips on their respective roundabouts.

Table 10-19 Conclusion of Sustainable Transport Schemes Impact on Respective Roundabouts

Ref	Roundabout	Cost	AM Peak			PM Peak		
			LP % of Trips (Demand)	LP minus Shift % of Trips (Demand)	Change	LP % of Trips (Demand)	LP minus Shift % of Trips (Demand)	Change
PT1	Bognor	£11,750,000	7.8%	5.6%	-2.2%	7.0%	4.8%	-2.2%
AT 1+6	Portfield	£7,622,000	7.1%	6.7%	-0.4%	7.6%	6.7%	-0.9%
AT 2+3	Fishbourne	£5,790,000	5.9%	5.3%	-0.6%	5.9%	5.7%	-0.2%
AT5	Whyke	£919,800	6.5%	6.4%	-0.1%	6.3%	6.1%	-0.2%

10.6.3 This assessment only looked at the impact of the schemes on the inbound car trips on the junctions with the A27 that have proposed sustainable travel schemes on or by them. This limits the scope of the analysis; other factors should be considered when implementing any sustainable travel schemes, such as the safety for both car drivers, bus passengers, and those who use travel by active travel modes. An example is AT5, where there is minimal impact to Whyke Roundabout in AM and PM peak hour of 0.1% and 0.2%, respectively.

However, it connects Chichester Free School to a footway over the A27, allowing pupils to travel safely to and from school using active travel modes.

10.7 Other Potential Sustainable Mitigation Measures

10.7.1 This study has also considered potential future sustainable transport solutions centred around walking and cycling initiatives, public transport, parking management and possible park and ride as outlined below.

Walking and Cycling

10.7.2 The funds generated from the car parking management and office space charging schemes and other funding sources including developer contributions discussed above can be utilised to fund potential extension and enhancements of the current walking and cycling network within Chichester City. It could also fund potential regeneration of key movement areas within the city centre through the promotion of initiatives such as 'Healthy Streets.' Such initiatives could lead to an increase in sustainable modes of travel due to reduced reliance on driving.

10.7.3 'Healthy Streets,' alongside reducing vehicle trips within the city centre, could also help to reduce air and noise pollution, improve mental health, help combat social isolation and bring economic benefits to local shops through increased footfall.

10.7.4 Alongside the benefits noted above, Healthy Streets can also be used to focus on minimising road dangers, which will help to address the safety fears that people have about walking and cycling, supporting a longer-term movement away from reliance on the car to more sustainable travel modes.

Public Transport

10.7.5 The funds generated from the parking management schemes, local/nation funding schemes and developer contributions could also be utilised to fund potential public transport enhancements within the city centre including an expansion of the bus priority lane system within Chichester City Centre. This could reduce reliance on the car in the longer term towards sustainable public transport. A park and ride scheme could be incorporated within a bus priority lane network in the future depending on the uptake and successfulness of early bus priority trials.

10.7.6 Chichester City centre has a constrained existing public highway network. Therefore, any proposed dedicated public transport or light transit corridors that could be implemented would be at the expense of existing highway. This could be managed through a time-based system where certain routes are restricted to public transport only during specific times. E.g., peak hours.

Car Park Management

10.7.1 There would be an associated need for measures to reduce the appeal/availability of city centre car parking spaces to promote use of other sustainable forms of travel or possible park and ride schemes (discussed below). This could be through amending the charging scheme for both long- and short-term parking throughout the city centre or through the removal of car park spaces which could lead to future development areas becoming available.

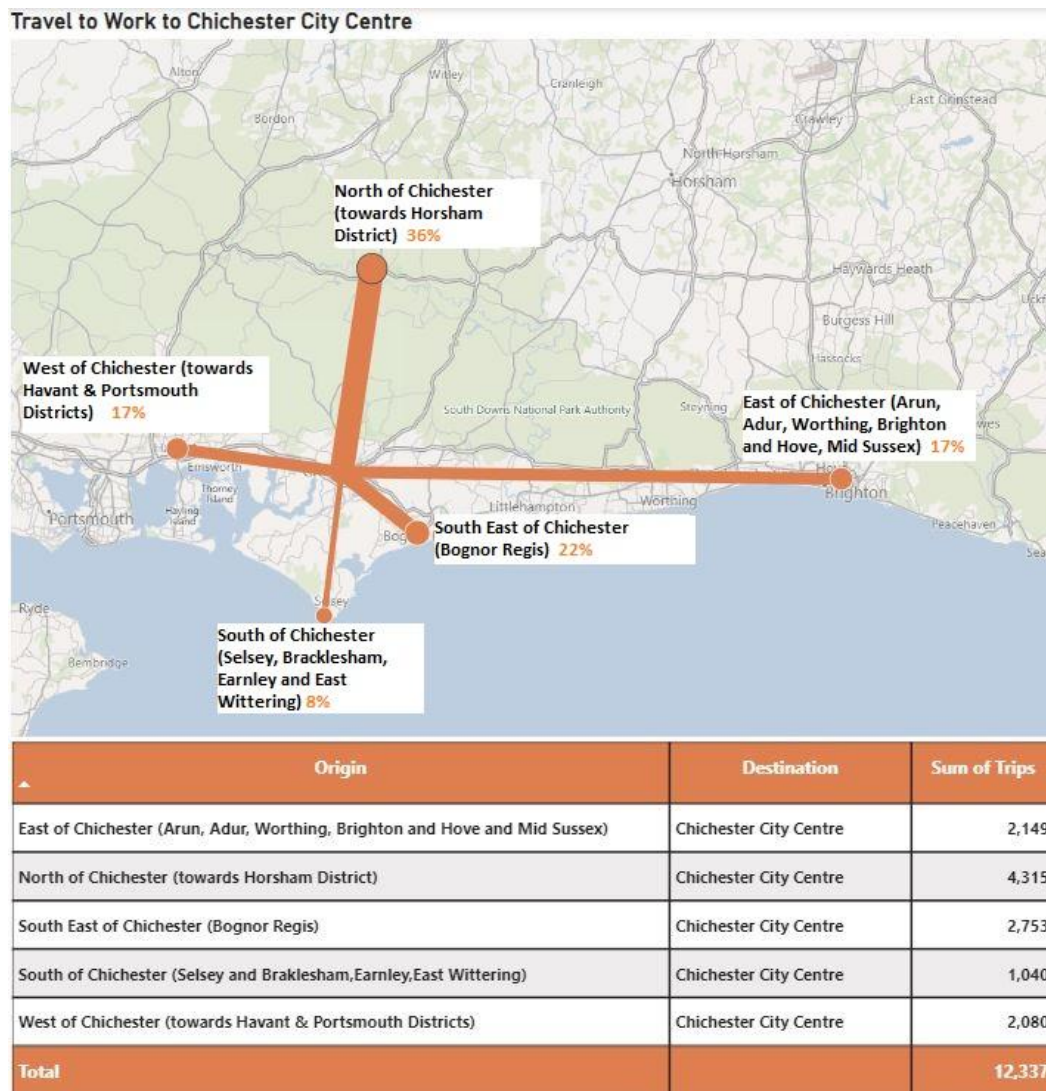
Park and Ride

10.7.2 Potential for Park and Ride (P&R) would need to be considered alongside car park management, in order to maximise potential usage. Increased parking charges for long stay, would make the park and ride a more attractive option.

10.7.3 To inform the potential demand for an employment-based P&R, which could remove some traffic through the junctions on the A27, the 2011 Census data⁹ for CDC area had been interrogated. This is the latest available data source and is now quite aged and will not consider any impacts from increased home working. Figure 10 36 shows the location of origin of car driver trips into the Chichester Urban area.

⁹ Census 2021 data is now available, but travel to work data was impacted by COVID and is therefore not a reliable source of data.

Figure 10-36 Usual Residence to Place of Work



10.7.4 The data shows the maximum potential demand who could switch to Park and Ride and indicates the dispersed nature of the trips. The trips from the North are the greatest, however it is likely these would be dispersed across a number of routes coming into Chichester. The data does not consider the availability of free parking at the destination, nor any shift working, which could deter people from using Park and Ride. In addition, realistically Park and Ride would not be able to serve the whole of Chichester but would most likely focus on the city centre and potentially large employment areas (although these are likely to currently have free car parking). The city centre is well served by existing rail from the east and west of Chichester and from Bognor Regis (with an interchange at Barnham). Therefore, the likely in-scope demand for an employment Park and Ride could be quite small but would require further investigation.

10.7.5 Locations for potential Park and Ride are also deemed to be limited.

Possible Issues

10.7.6 The District Council’s emerging Parking Strategy considers a single 400 space P&R facility located to the west of the city, around the Fishbourne Roundabout. This would be signed to capture those visiting the city from the west only, to minimise pulling additional trips along the A27 from the east. This would need to consider additional bus priority from the site into the city.

- 10.7.7 The site construction costs and allowance for facilities, based on a cost per space, could be in the region of £3,000 to £5,000 per car parking space with operational costs being £500k to £1million a year. These costs exclude the additional bus priority required from the P&R facility to the city centre.
- 10.7.8 The outlay, operational and maintenance costs need to be balanced with the revenue return from the scheme to support the long-term viability of the scheme.
- 10.7.9 There are a number of potential issues to promoting a Park and Ride scheme or similar sustainable options as outlined below:
- Schemes will not work in isolation.
 - The ratio of benefit to cost of schemes are likely to be initially lower than highway schemes.
 - Schemes address local issues only.
 - To achieve schemes may need highway to converted to bus priority/cycle scheme.
 - Multiple schemes would be needed to capture east/west demand.

Possible Benefits

- 10.7.10 There are a number of potential benefits to promoting a Park and Ride scheme or similar sustainable options as outlined below:
- Schemes may offer benefit to off peak demands (Retail/Tourist).
 - Potential schemes could be used to assist seasonal peaks.
 - As part of a wider linked City Strategy (which included a workplace parking charging scheme) there would be scope to lower vehicle trips in the city centre leading to clear streets and potential less noise and air pollution within the city centre.
 - Out of town provision would support reduction of parking in the city centre.

11 Potential Highway Mitigation Options

11.1 Introduction

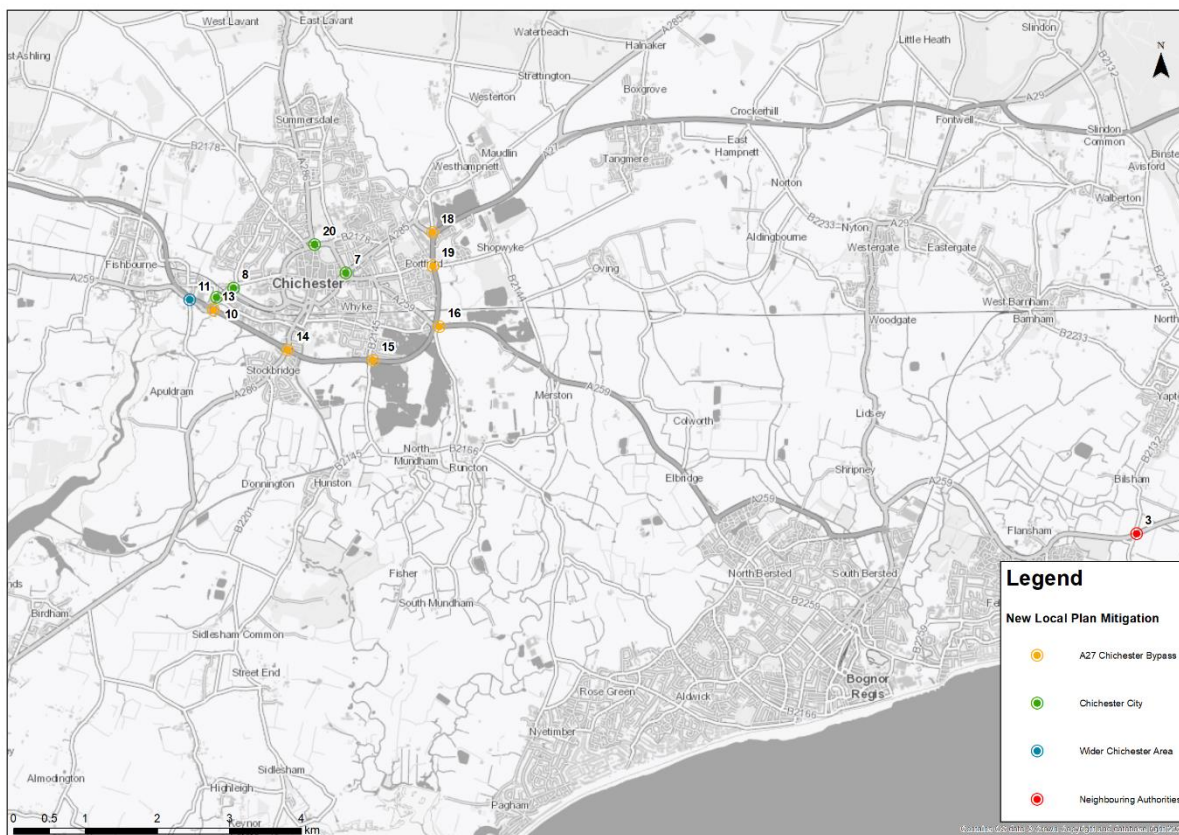
- 11.1.1 This section sets out potential highway mitigation schemes that could provide capacity to facilitate both adopted and new local plan demands. These would be considered through the TIMG as part of wider discussions on mitigation. The monitor and manage process would allow for smaller scale schemes to be considered and tested as necessary, which may be more affordable, which may provide mitigation (along with sustainable transport measures) to support the plan.
- 11.1.2 These would need to be considered in the long-term context, such that longer term, larger schemes could still be delivered on top of these, should this be required, and funding is found.
- 11.1.3 Modelling has been undertaken to consider the impacts of a series of mitigation schemes that could be required to support the plan. Once the 2039 Local Plan Scenario without mitigation models have been created, potential long-term highway mitigation schemes have been tested, which could accommodate the local plan demands.
- 11.1.4 Earlier modelling work undertaken in 2018 (for Regulation 18 consultation) used the highway schemes identified within the adopted plan, would not adequately mitigate the impact of that plan, along with development from the Local Plan 2021-2039. These schemes were therefore developed further to identify a mitigation package which would mitigate all development, and these schemes have been used within the modelling reported in this section.
- 11.1.5 Eleven junctions were identified as being likely to require mitigation, in a 'worse case' scenario as listed in Section 5.5. Six of these are on the A27 corridor, plus a new link road scheme known as the Stockbridge Link. The results also indicate that there are five local highway network mitigation schemes covering the city and wider Chichester District locations.

For ease of analysis, the mitigation schemes were broken down into four components as per below and their locations are illustrated in

11.1.6 Figure 11-1:

- A27 Chichester Bypass
- Chichester City
- Wider Chichester Area
- Neighbouring Local Authorities

Figure 11-1 Location of Proposed Mitigations Junctions



11.1.7 The adopted Chichester Local Plan (LP) 2014-2029, included a set of mitigation measures at the six principal junctions along the A27 corridor. Although, there have been works at the Portfield Roundabout and Oving junction in this timeline, no other mitigation schemes have been completed along the A27 corridor, as such the mitigation schemes defined in this report will also be required to consider the development from this plan period.

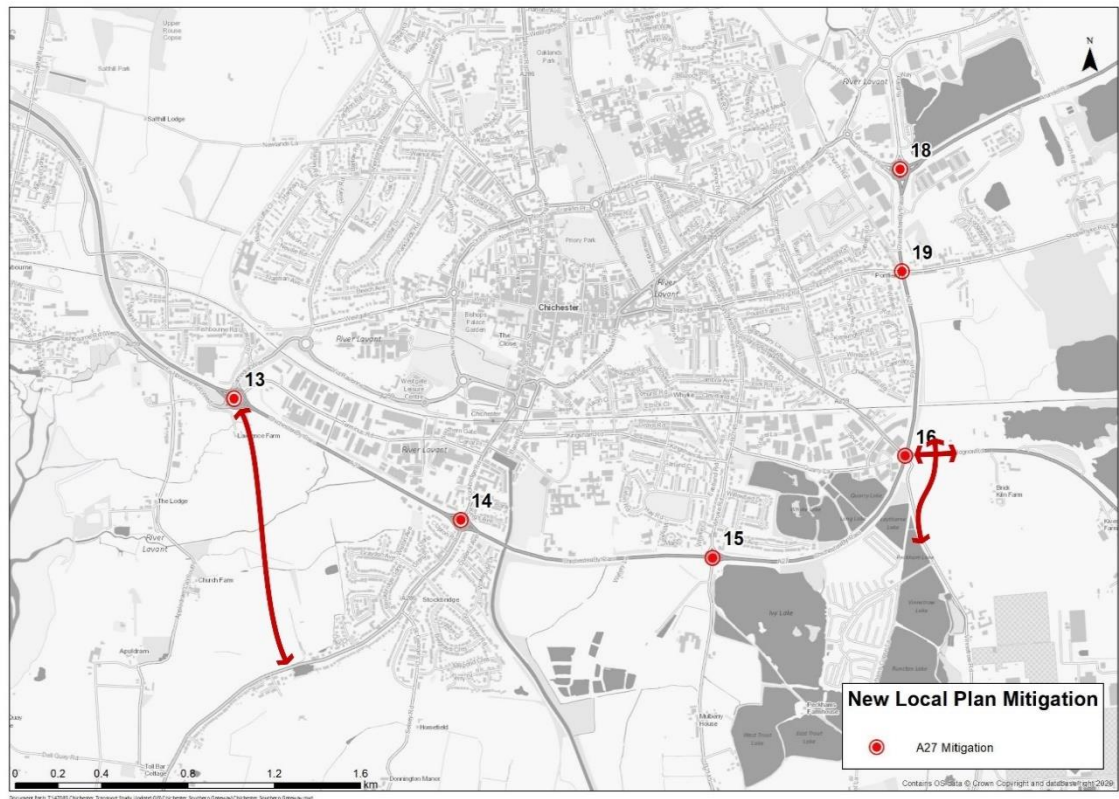
11.2 A27 Chichester Bypass Mitigation

11.2.1 Figure 11-2 shows the location of the six A27 mitigation schemes proposed on the SRN. The junctions are:

- Fishbourne Roundabout (Junction 13)
- Stockbridge Roundabout (Junction 14)
- Whyke Roundabout (Junction 15)
- Bognor Road Roundabout (Junction 16)
- Portfield Roundabout (Junction 18)
- Oving Junction (Junction 19)

11.2.2 The Stockbridge Link Road remains as a potential element within the mitigation package. This a local link that would connect to Fishbourne Roundabout by way of a new arm to Fishbourne Roundabout and link to the A286 Birdham Road, south west of Stockbridge. There are other delivery issues related to this scheme (costs, ground conditions and land availability), therefore it is unlikely to constitute an effective and deliverable mitigation scheme.

Figure 11-2 Location of A27 Mitigation Junctions



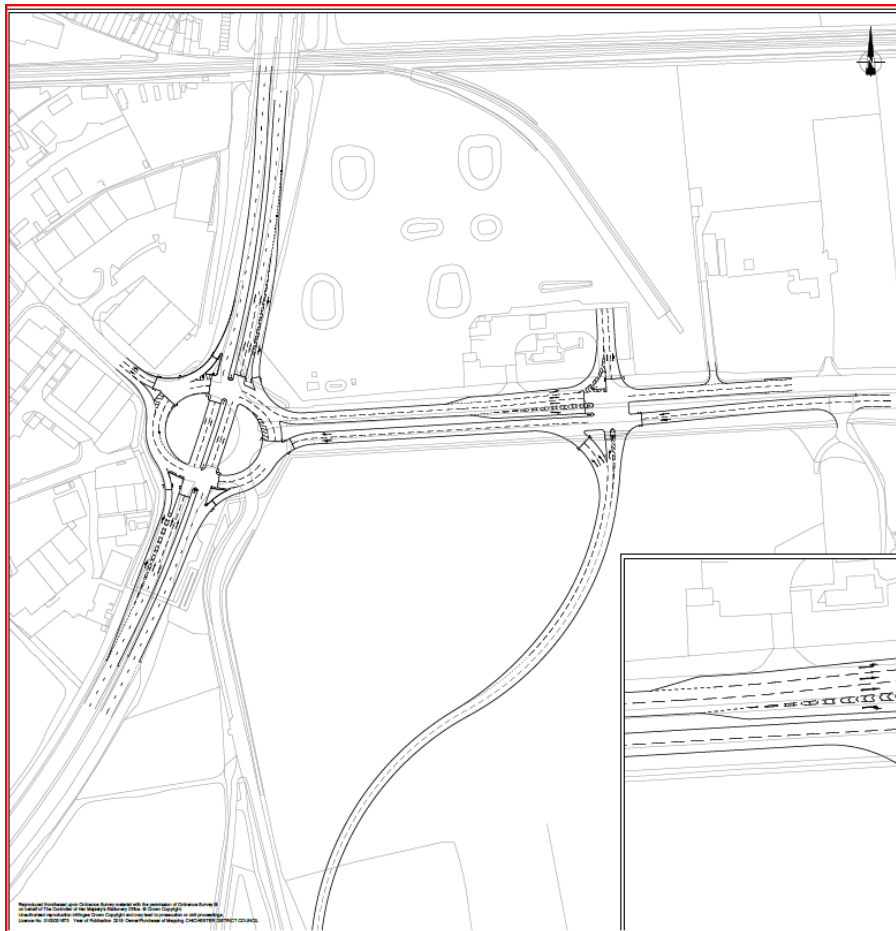
11.2.3 Figure 11-3 further illustrates the provisional A27 Chichester Bypass concept mitigation schemes. The Stockbridge Link Road is also illustrated. Also shown are the individual previously estimated costs of each scheme.

Figure 11-3 A27 Junction Provisional Concept Schemes

Fishbourne (Only) £5.95m	Stockbridge Road Jct £5.85m	Whyke Junction £5.24m	Stockbridge Link £25.2m
Bognor Road Jct (Only) £10.3	Oving Road Jct £1.4m	Portfield Road Jct £2.51m	

11.2.4 The Bognor Road scheme includes the modification of the junction into a 4-arm hamburger signalised junction, with the removal of the Vinnetrov Road link and its replacement link onto the Bognor Road at a new signalised Junction as shown in Figure 11-4.

Figure 11-4 Bognor Road and Vinnetrov Road combined Concept Schemes



11.3 Chichester City Junction Mitigation

11.3.1 The local plan assessment has indicated that the following junctions within Chichester city would require mitigation:

- A286 New Park Road / A286 St Pancras Road (Junction 7)
- A259 Via Ravenna / A259 Cathedral Way Roundabout (Junction 8)
- A259 Cathedral Way / Fishbourne Road East (Junction 10)

11.3.2 The lower development buildout has resulted in a lower requirement for mitigation, with some junctions operating within capacity or no worse than the Reference Case within the new assessment. Illustrative figures for the above mitigation schemes now follow. In light of the new West Sussex Transport Plan (WSTP) policies, WSCC's preference for mitigation for Chichester City Centre is to consider improvements to sustainable transport rather than additional highway capacity. Nevertheless, this report has provided physical mitigation schemes with a view to providing indicative costings that would be required for Chichester city centre mitigation.

Junction 7 A286 New Park Road / A286 St Pancras Road

The mitigation proposed for the New Park Road/St Pancras Road Junction is outlined in

11.3.3 Figure 11-5.

11.3.4 The mitigation scheme includes:

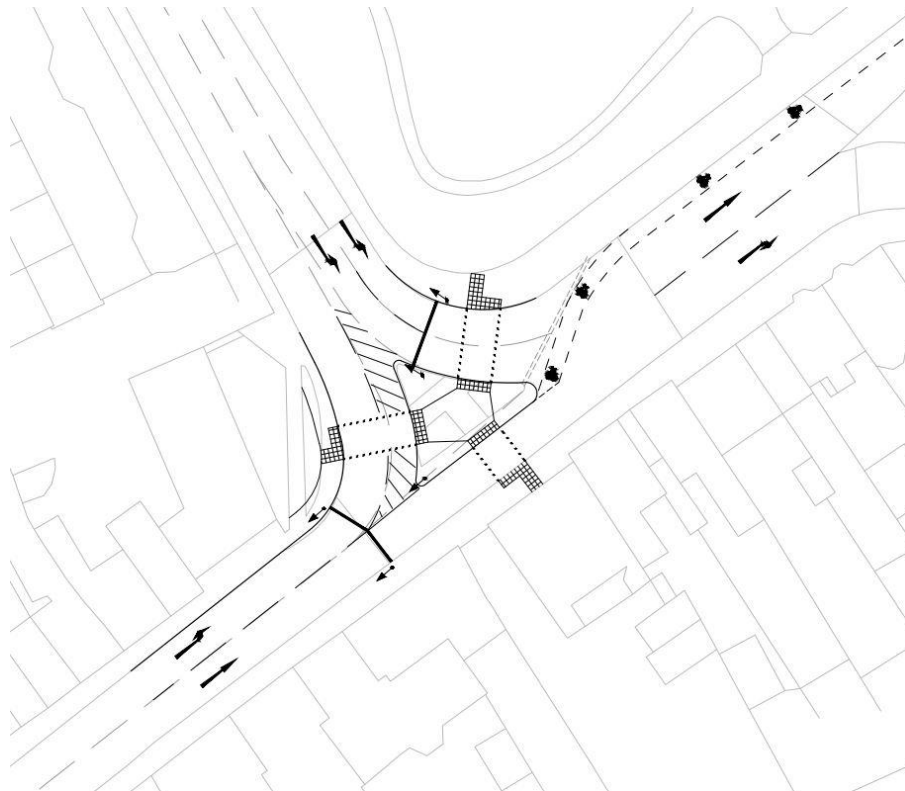
- New signalised junction between New Park Road southbound traffic and St Pancras Road eastbound traffic
- Provision of advisory cycle lane on St Pancras Road (east of junction).
- Potential reduction in speed limit on the St Pancras approach to the junction (to 20mph), thus making it less intimidating for cyclists, particularly if they wish to travel straight ahead.

11.3.5 Key constraints of this mitigation scheme:

- Statutory utility apparatus
- Existing street furniture
- Pavement/ kerb space for traffic signals

Lack of space for segregated provision for eastbound cyclists on approach to the signals whilst retaining two traffic lanes. As stated above it may be necessary to reduce speeds on the one-way section of St Pancras.

Figure 11-5 A286 New Park Road/ A286 St Pancras Road Proposed Mitigation



Junction 8 Via Ravenna / A259 Cathedral Way Roundabout

11.3.6 The mitigation proposed for the Via Ravenna/Cathedral Way Roundabout is outlined in Figure 11-6. This will be subject to sustainable mitigation measures being prioritised and a monitoring and manage approach confirming the need for the mitigation. This will need to be considered alongside any improvements at Fishbourne Roundabout and diversion of Terminus Road, due to potential for blocking back to the A27, particularly if through flows at Fishbourne Roundabout increase and potentially have a knock-on impact here.

11.3.7 The mitigation scheme includes:

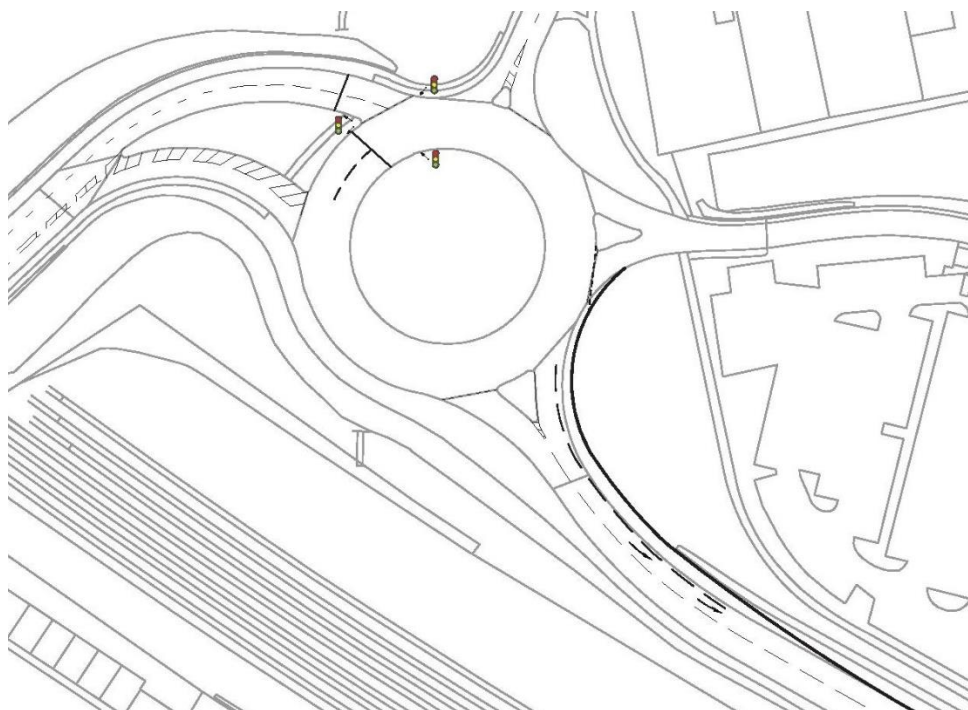
- New signalised arm between A259 Cathedral Way eastbound traffic and northbound traffic toward Westgate Road.
- Widening of Via Ravenna arm exit to two lanes before merging back to one lane 50m along Via Ravenna.

11.3.8 In the case of the first of these junctions, the mitigation may be required to avoid queuing back towards the A27, as well as for capacity issues.

11.3.9 Key constraints of this mitigation scheme:

- Statutory utility apparatus
- Existing street furniture
- Existing vegetation

Figure 11-6 Via Ravenna/ A259 Cathedral Way Roundabout Proposed Mitigation

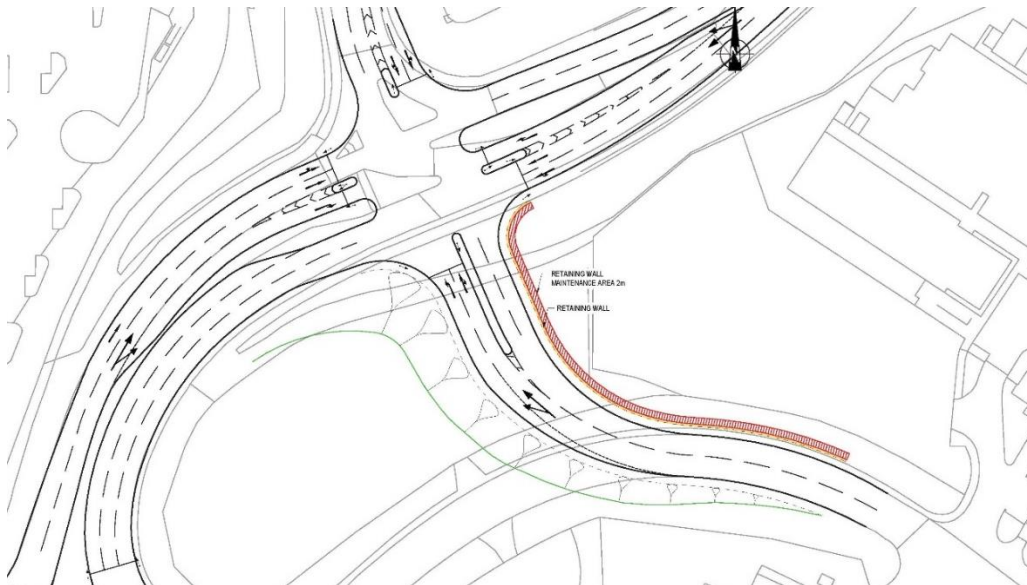


Junction 10 A259 Cathedral Way / Fishbourne Road / Terminus Road

The mitigation proposed for the Cathedral Way/Terminus Road Junction is outlined in

11.3.10 Figure 11-7.

Figure 11-7 A259 Cathedral Way/ Fishbourne Road/Terminus Road Proposed Mitigation



11.3.11 The mitigation scheme includes:

- Realignment of Terminus Road to create new junction onto Cathedral Way.
- Earthworks and retaining wall embankment to raise Terminus Road up to Cathedral Way.
- New signalised 4-way traffic signal junction.
- Removal of existing traffic islands to facilitate all movement crossroad junction.
- Widening of northbound Cathedral Way to facilitate dedicated right turn lane into Terminus Road.
- Widening of southbound Cathedral Way to facilitate dedicated right turn lane into Fishbourne Road East.

11.3.12 Key constraints of this mitigation scheme:

- Highway boundary and land ownership
- Statutory utility apparatus
- Existing street furniture
- Existing trees and vegetation
- Ground Conditions

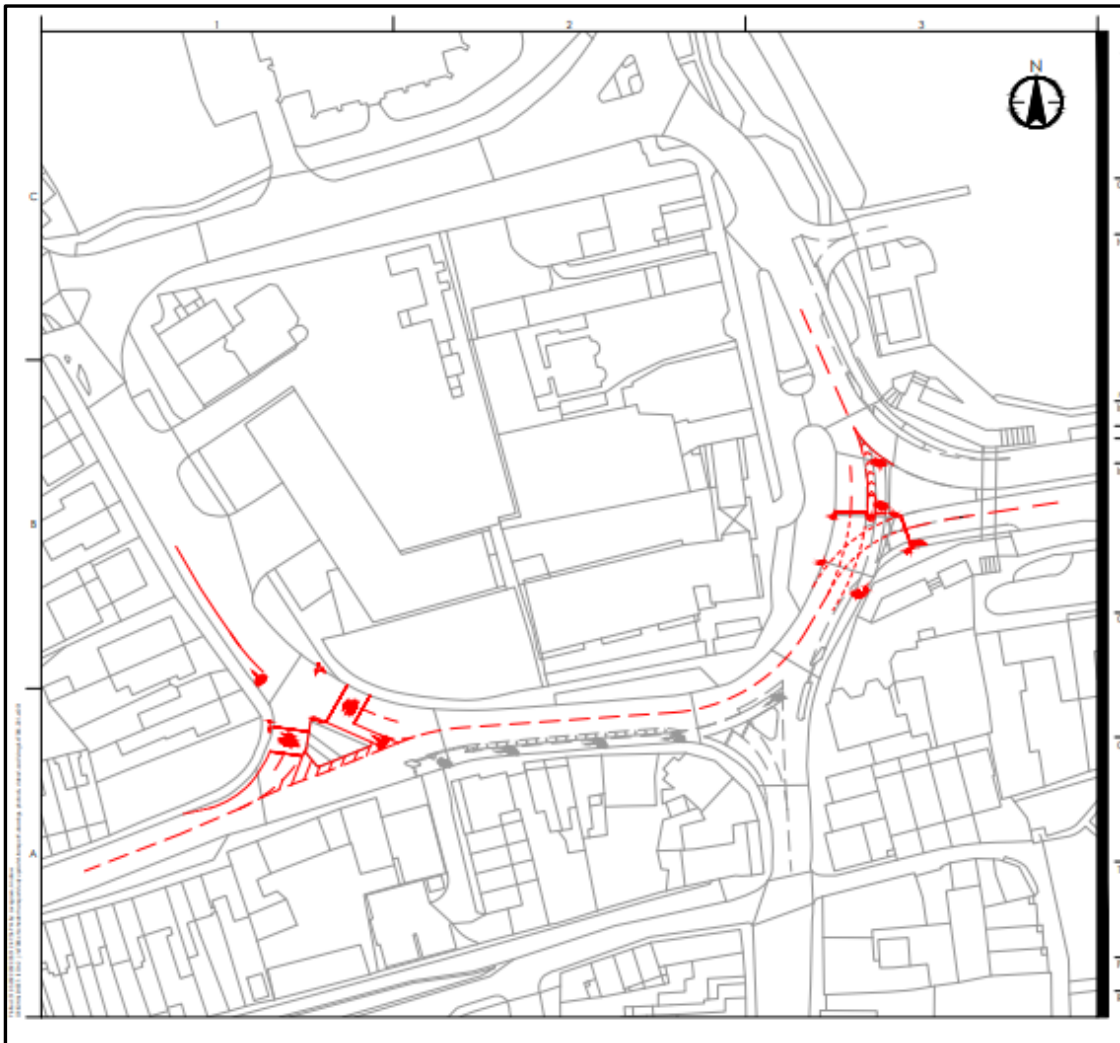
11.3.13 Additional work has been undertaken to look at the feasibility of realigning Terminus Road, as part of the Fishbourne Roundabout scheme. This additional work also examined the potential for bus priority on the A259 approaches (Fishbourne Road and Cathedral Way). Further detail is provided in Appendix K.

Additional Mitigation due to removal of Southern Gateway Scheme

11.3.14 An additional mitigation scheme has been identified in Chichester City as a result of the removal of the Southern Gateway Mitigation Scheme from the Reference Case. The scheme, which is located at the A286/B2178 Churchside gyratory (junction 20) involves signalling the A286 Oaklands Way approach arm junction from a priority junction, which would also provide more gaps for the northbound traffic to egress from the Northgate arm at the gyratory where capacity issues were also identified. The scheme is illustrated in

Figure 11-8. More detailed proposals and improvements for the gyratory are considered in Section 10, under scheme AT18.

Figure 11-8 A286 Northgate/Oaklands Way Proposed Mitigation Scheme



11.4 Wider Chichester Area

11.4.1 One further junction in the wider Chichester area has been identified as requiring mitigation:

- Fishbourne Road West / Appledram Lane South (Junction 11).

11.4.2 Appledram Lane itself is a narrow road of sub-standard width and alignment, with a significant number of residential properties on either side of the road. The modelling indicates that it is used as a rat-run, with traffic avoiding the A27. It also forms the eastern boundary of the Chichester Harbour Area of Outstanding Natural Beauty. It is therefore considered to be unsuitable for further capacity improvements at this junction and has not been taken forward as a mitigation measure.

11.4.3 Any improvements at Stockbridge Junction and/or Fishbourne Roundabout would reduce the level of rat running and likely negate the need for the scheme. Sustainable transport improvements on the A259 corridor, would also have a part to play in mitigating the impacts here.

11.5 Neighbouring Authorities

- 11.5.1 The neighbouring councils of Havant and Arun were consulted, and their local plan and proposed mitigation elements have been included in this assessment. This includes a mitigation scheme at the A259/B2132 Comet Corner junction in Arun (Junction 3).
- 11.5.2 This report does not at this time define cross boundary contributions associated with impact, this would be the subject of a further review. The study has also considered the other neighbouring local authorities comprising the South Downs National Park Authority, East Hampshire District Council, Waverley Borough Council, and Horsham District Council. However, Arun have been collecting money for potential mitigation schemes at both Bognor Road Roundabout and Whyke junction, which need to be considered going forward and included as part of the discussions through the monitor and manage process.

11.6 Highway Mitigation Modelling

Introduction

- 11.6.1 Following the creation of the 2039 Reference Case models and the 2039 Local Plan Scenario Without Mitigation, the highway mitigation schemes highlighted in Section 7 were coded into 2039 Local Plan Scenario Without Mitigation models in order to create the 2039 Preferred Local Plan Scenario with Mitigation to determine whether the mitigation was adequate:
- 11.6.2 The comparisons have again looked at flow changes in PCU/hour, link delays in seconds and Link Volume to Capacity ratio (V/C) as percentage (%) units.

Flow Changes Local Plan with Mitigation

- 11.6.3 This analysis compares the flow changes of the local plan with mitigation, against the Reference Case flows for the AM and PM peaks, respectively. Appendix L shows the flow changes graphically.
- 11.6.4 With mitigation in place, it is noted that there are large decreases in flows on northern routes in Chichester mainly on New Road and Downs Road as traffic that was running away from the A27 reassigns to use the A27. Consequently, the A27 Chichester Bypass shows an increase in flows throughout its length.
- 11.6.5 Similar trends in flow changes are seen in the PM peak with mitigation in place. These include large decreases in flows on northern routes in Chichester mainly on New Road and Downs Road as traffic that was running away from the A27 reassigns to use the A27.

Summary of Flow Changes

- 11.6.6 With mitigation in place, it is noted that there are large decreases in flows on northern routes in Chichester mainly on New Road and Downs Road as traffic that was running away from the A27 reassigns to use the A27. Consequently, the A27 Chichester Bypass shows an increase in flows throughout its length. This is the case in both the AM and PM peaks.

Volume over Capacity (V/C), Delays and Queue Outputs

- 11.6.7 The outputs are shown in
- 11.6.8 Table 11-1 to Table 11-6. The results are only shown for those junctions where mitigation is required. Junctions 12 and 17 are also included as these are additional junctions resulting from the Stockbridge Link Road and Bognor Road Roundabout mitigation schemes, respectively. No specific mitigation scheme has been included at Junction 11, but this has benefited from the provision of the Stockbridge LR as can be seen in the outputs.

Table 11-1 AM – Max Volume to Capacity Ratio

Junction No.	Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
7	A286 New Park Road / A286 St Pancras Road	107	107	71
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	115	123	75
10	A259 Cathedral Way/ Fishbourne Road East	129	141	108
11	Fishbourne Road West / Appledram Lane South	79	100	77
12	Stockbridge Link Road / A286 Birdham Road	-	-	36
13	Fishbourne Roundabout	132	146	102
14	Stockbridge Roundabout	125	124	96
15	Whyke Roundabout	125	127	85
16	Bognor Road Roundabout	127	135	92
17	Bognor Road / Vinnetrow Road	-	-	93
18	Portfield Roundabout	102	103	110
19	Oving Junction	94	95	107
20	A286 Northgate / A286 Oaklands Way	100	100	99

Table 11-2 PM – Max Volume to Capacity Ratio

Junction No.	Junction Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
3	A259/B2132 Comet Corner	112	114	76
7	A286 New Park Road / A286 St Pancras Road	106	110	110
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	41	56	40
10	A259 Cathedral Way/ Fishbourne Road East	63	103	117
11	Fishbourne Road West / Appledram Lane South	100	109	75
12	Stockbridge Link Road / A286 Birdham Road	-	-	97
13	Fishbourne Roundabout	191	189	106
14	Stockbridge Roundabout	136	142	61

Junction No.	Junction Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
3	A259/B2132 Comet Corner	112	114	76
7	A286 New Park Road / A286 St Pancras Road	106	110	110
15	Whyke Roundabout	136	142	60
16	Bognor Road Roundabout	118	126	84
17	Bognor Road / Vinnetrow Road	-	-	84
18	Portfield Roundabout	131	142	136
19	Oving Junction	131	143	109
20	A286 Northgate / A286 Oaklands Way	105	108	98

Table 11-3 AM – Max Delays (Total) (seconds)

Junction No.	Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
7	A286 New Park Road / A286 St Pancras Road	6.3	7.6	19.0
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	349.6	497.1	41.9
10	A259 Cathedral Way/ Fishbourne Road East	608.1	821.8	197.6
11	Fishbourne Road West / Appledram Lane South	13.6	21.1	24.5
12	Stockbridge Link Road / A286 Birdham Road	-	-	3.9
13	Fishbourne Roundabout	673.4	929.5	65.0
14	Stockbridge Roundabout	528.4	512.2	141
15	Whyke Roundabout	523.9	558.7	130
16	Bognor Road Roundabout	673.8	728.4	36.0
17	Bognor Road / Vinnetrow Road	-	-	29.3
18	Portfield Roundabout	87.9	108.3	289.6
19	Oving Junction	135.4	135.4	230.3
20	A286 Northgate / A286 Oaklands Way	27	27	13

Table 11-4 PM – Max Delays (Total) (seconds)

Junction No.	Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
7	A286 New Park Road / A286 St Pancras Road	169.7	223.2	197.3
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	28.6	33.0	45.3
10	A259 Cathedral Way/ Fishbourne Road East	10.7	61.8	363.3
11	Fishbourne Road West / Appledram Lane South	40.4	196.0	33.4
12	Stockbridge Link Road / A286 Birdham Road	-	-	22.0
13	Fishbourne Roundabout	1785.1	1740.3	136.9
14	Stockbridge Roundabout	807.7	891.2	124
15	Whyke Roundabout	766.0	867.7	352
16	Bognor Road Roundabout	386.7	519.9	29.2
17	Bognor Road / Vinnetrow Road	-	-	31.9
18	Portfield Roundabout	679.8	864.6	773.7
19	Oving Junction	626.7	845.4	222.5
20	A286 Northgate / A286 Oaklands Way	123	176	22

Table 11-5 AM – Max Average Queue Total (PCU)

Junction No.	Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
7	A286 New Park Road / A286 St Pancras Road	0.8	1.1	2.7
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	34.0	48.6	3.4
10	A259 Cathedral Way/ Fishbourne Road East	43.5	59.3	31.4
11	Fishbourne Road West / Appledram Lane South	0.8	1.3	1.0
12	Stockbridge Link Road / A286 Birdham Road	-	-	0.1
13	Fishbourne Roundabout	94.9	138.6	34.7
14	Stockbridge Roundabout	40.9	36.6	21.3

Junction No.	Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
15	Whyke Roundabout	58.6	75.1	27.6
16	Bognor Road Roundabout	144.4	180.4	3.6
17	Bognor Road / Vinnetrow Road	-	-	11.5
18	Portfield Roundabout	19.2	26.0	40.2
19	Oving Junction	6.5	6.6	10.0
20	A286 Northgate / A286 Oaklands Way	8	8	8

Table 11-6 PM – Max Average Queue Total (PCU)

Junction No.	Location	2039 Reference Case	2039 LP Without Mitigation	2039 LP With Mitigation
7	A286 New Park Road / A286 St Pancras Road	22.7	33.6	53.2
8	A259 Via Ravenna / A259 Cathedral Way Roundabout	0.3	0.5	0.9
10	A259 Cathedral Way/ Fishbourne Road East	0.8	14.0	36.4
11	Fishbourne Road West / Appledram Lane South	6.0	30.7	1.6
12	Stockbridge Link Road / A286 Birdham Road	-	-	4.5
13	Fishbourne Roundabout	73.8	86.7	69.6
14	Stockbridge Roundabout	43.5	81.7	12.4
15	Whyke Roundabout	32.3	56.4	20.4
16	Bognor Road Roundabout	105.9	135.8	4.1
17	Bognor Road / Vinnetrow Road	-	-	9.8
18	Portfield Roundabout	83.7	121.9	44.7
19	Oving Junction	71.4	96.3	29.8
20	A286 Northgate / A286 Oaklands Way	32	37	9

11.6.9 The outputs shown within the tables indicate that in most cases, the proposed mitigation will mitigate the impacts of the local plan development traffic. There are three junctions where impacts are still shown.

Portfield and Oving Junctions

11.6.10 Portfield and Oving junctions show some worsening with the mitigation in place. This is due to the fact that improvements at Bognor Roundabout increase the northbound throughput and

more traffic reaches the junctions to the north. There is likely to be an opportunity to reduce or omit this impact through better linking of signals or metering flows at Bognor, which would need to be considered in more detailed analysis. The knock-on impacts here would also likely be reduced should smaller schemes be provided with less additional capacity and lower levels of increased throughput as a result.

A286 New Park Road / A286 St Pancras Road

11.6.11 The mitigation scheme does not fully mitigate the impacts of local plan traffic at this junction. However, the delays are not that substantial. The mitigation scheme includes improvements for pedestrians and cyclists which will lead to increased use of active travel modes and reduce the need for physical mitigation here. Mode change would also assist with air quality management objectives.

A259 Cathedral Way/ Fishbourne Road East

11.6.12 The highest V/C is seen on the new link from Terminus Road at the new Cathedral Way/Fishbourne Road East Junction in the PM peak. The AM peak operates adequately. There is potential to optimise the traffic signal better, whilst confirming that traffic does not block back on Cathedral Way to Fishbourne Roundabout. The V/C for the northbound approach is below 70%.

11.6.13 A sensitivity test has shown that increasing the flare length will reduce the V/C on this approach to below 100% and does not cause additional queuing on other arms. Therefore. There may be potential to increase the flare on the new link as the highest flows seen on this arm are turning left from Terminus Road towards the A27.

11.7 Short-Term Safety Led Assessment

11.7.1 This section deals with an interim assessment between 2026 and 2031 of the possible local plan provision of residential units on the premise of only implementing certain junction mitigation improvements along the A27 corridor. The premise is to define if there is a threshold of development that can be supported by a reduced package of mitigation on the A27 corridor, while seeking to maintain a safety led operation of the A27 corridor.

11.7.2 This work arose at the time, through from ongoing dialogue with NH. The work provided an indication to NH on the potential impacts of proposed development on the SRN i.e., the A27 Chichester Bypass. The transport modelling also included analysis of the side roads, which are in WSCC control, mainly at Stockbridge and Whyke Junctions and in the city.

11.7.3 The transport modelling work was based on considerations of capacity constraints by looking at changes in delay in seconds and volume to capacity ratio (V/C%) as a result of flow changes from proposed LP development when compared to the Reference Case. The analysis did not consider a safety-based analysis (measured by queue lengths and potential for queues to extend to main carriageway) for example.

11.7.4 The safety led assessment looked beyond just using capacity constraint parameters to inform network performance. It is possible for delays and V/C to be high but for queues to be safely accommodated within available stacking capacity. In such cases, it may be possible for the network to accommodate more LP development than that determined based on considerations of capacity constraints alone.

11.7.5 The full report setting out the work undertaken, and the findings are included within the report attached as Appendix M.

11.8 Highway Mitigation Scheme Costs

Introduction

- 11.8.1 The Adopted Chichester Local Plan proposes a significant mitigation strategy for the district and specifically the A27 corridor. The mitigation proposals across the district are generally minor works. This document considered potential mitigation measures at the junctions identified to be impacted by the local plan development forecast for up to 2039.
- 11.8.2 Nine junctions have been identified as requiring mitigation as identified in Section 7.
- 11.8.3 In addition a new link road scheme known as the Stockbridge Link and modification to the Vinnetrow Road link has also been identified to support the delivery of the local plan.
- 11.8.4 Work undertaken by Stantec in 2018 set out the proposed mitigation schemes as well as a set of high-level costs for each of the schemes. The total cost of the A27 Corridor and link road was estimated at between £50 to £65 million based on lower and upper cost rates. For the purpose of consistency these costs have been retained within this report. The costs were reviewed by WSCC in 2022.

Approach to Scheme Cost Estimates

- 11.8.5 The mitigation costs were based on the previous work by Jacobs, Highway Agency (now National Highways) and understanding of similar recent projects and the locality. No industry standard references (such as SPONS civil engineering and highways pricing guide or similar) have been used, as the level of design at this stage is not progressed to a detailed enough level for their use to be appropriate. SPONS is an industry series of publications giving guidance on scheme cost estimation for civil engineering, architectural and various other professions and trades.
- 11.8.6 Since the 2018 review, construction costs have fluctuated considerably, but as stated for consistency the same outline costs have been maintained for reporting purposes.
- 11.8.7 No investigation has been carried out into specific land ownership details, or into the location details or cost of moving statutory undertakers and utility apparatus within the areas of the scheme. No design assessments were carried out at this stage to ascertain the deliverability of the proposals except where any Health and Safety concerns were raised.
- 11.8.8 Design fees, assumed legal fees, process fees, risk etc. have been included as a provisional sum only as detailed estimates cannot be calculated at this stage. Third Party compensation has **not** been included.
- 11.8.9 All proposals and associated cost are estimates and are subject to future detailed site investigations, detailed design and real price increases.

Local Plan Mitigation

- 11.8.10 There are three defined areas which are projected to require mitigation works (A27 Corridor, Inner Chichester and Wider Chichester). These lie across two highway authorities, namely NH (with respect to the A27) and WSCC (with respect to the Inner and Wider Chichester areas).
- 11.8.11 The scale of the changes to the junctions (especially along the A27) will inevitably also address, in part, the current issues.
- 11.8.12 In terms of the previous local plan process the following document and updates included policy for securing contributions for mitigations along the A27, 'The Planning Obligations & Affordable Housing Supplementary Planning Document (SPD)' was adopted by the Council on

26 January 2016 and took effect from 1 February 2016 at the same time as the CIL Charging Schedule. The SPD replaced “The Provision of Service Infrastructure Related to new Development in Chichester District” adopted in December 2004.

11.8.13 On 19 July 2016, the Council adopted a formal amendment to the SPD which added wording at Paragraphs 4.46 – 4.54 setting out the Council’s approach for securing development contributions to mitigate additional traffic impacts on the A27 Chichester Bypass. A detailed explanation of the methodology used for calculating A27 contributions is provided in a study undertaken for the Council by Jacobs. Paragraph 4.74 of the SPD stated that the off-site access management mitigation will be funded from S106 Contributions within the zone of influence of Chichester and Langstone Harbour. These figures will be increased on 1 April each year in line with the Retail Price Index (RPI) rounded to the nearest whole pound.

11.8.14 Evidence from the previous local plan process, suggests that for mitigation schemes along the A27, individual financial contributions to junctions result in a significant time delay in securing sufficient funds to complete those works and often lead to money spread across multiple junctions. As such it is recommended that the A27 contributions be pooled into a corridor fund, which seeks to fund individual junctions based on their deemed priority. This requires a review of the current SPD through Policy T1 of the Local Plan 2021-2039.

11.8.15 Table 11-7 provides a provisional ranking of the 6 key junctions along the A27 in priority. The premise is that the ranking is a starting point for the monitor and manage process but is reviewed as the plan moves forward, alongside sustainable transport and smaller highway schemes, which the Monitoring process might identify as preferred options. This offers a means of managing contributions more efficiently to secure works as early as possible as developments are forthcoming. The A27 is the primary corridor east/west for the region and as such the majority of developments will have trips utilising this corridor, therefore the ability to deliver improvements as required is inherent to reducing delay across the wider network.

Table 11-7 A27 Junction Ranking

Stantec Ranking	Junction No.	Junction Name
1	13	Fishbourne Roundabout
2	16	Bognor Road Roundabout
3	18	Portfield Roundabout
3	–	Stockbridge Link
4	19	Oving Junction
5	14	Stockbridge Roundabout
6	15	Whyke Roundabout

11.8.16 The provisional ranking was undertaken and Stantec’s suggested phasing at the time would allow the junctions to be built out over the plan period subject to funding so as to maintain economic growth. However, this would now be subject for the monitor and manage process. This phasing focuses on the gateways to Chichester (Fishbourne Roundabout & Bognor Road Roundabout) and seeks to generate the greatest benefits to future strategic development and as such provides the best balance between unlocking development and the improvements to the strategic highway network.

Chichester Highway Scheme Costs Summary

11.8.17 The proposed mitigation scheme costs have been produced for the three junctions not on the SRN and are provided at 2018 estimate in

11.8.18

11.8.19 Table 11-8. As stated in the report, there has been a fourth scheme added, which has brought the estimated contributions to around £2.6 million for localised mitigations.

Table 11-8 Chichester Proposed Mitigation Costs –Local Plan 2021-2039

Scheme	2018 Costs		2020 Costs	
	Construction	Project *	Construction	Project
A286 New Park Road / A286 St Pancras Road	£250,000	£372,500	N/A	N/A
Via Ravenna / A259 Cathedral Way Roundabout	£250,000	£372,500	N/A	N/A
A259 Cathedral Way / Fishbourne Road East	Included in Fishbourne Roundabout Scheme		N/A	N/A
A259 Fishbourne Road W / Appledram Lane	£550,000	£819,500	N/A	N/A
A286 Northgate/Oaklands Way	N/A	N/A	£675,000	£1,000,000
Overall Total	£1,050,000	£1,564,500	£1,725,000	£2,564,500

*Project costs include construction costs

A27 Highway Scheme Costs Summary

11.8.20 The construction costs for the schemes on the SRN have undergone a number of reviews which is discussed in this section. Tables 11-9 to 11-12, below, are included for context and to provide background to the evolution of the estimated costs for the proposed works to the A27 Chichester Bypass. Table 11-13 represents the most up-to-date and robust approach to cost estimation to date, and which is used in Policy T1 of the Chichester Local Plan 2021-2039.

11.8.21 Ongoing consultation with CDC, WSCC and NH resulted in a high-level analysis of the Jacobs CDC Local Plan Costs (March 2013) and the Highways England A27 improvements costs (October 2016).

11.8.22 Stantec reviewed the NH schemes and used them as a basis to inform the proposed mitigation schemes for the A27 junctions outlined above. NH provided Stantec with additional cost information which provided a more detailed breakdown of the estimated costs associated with each junction. A review of the NH costs highlighted that two junction's costs, previously costed separately by Stantec, had been combined. The two junctions that had been combined under the NH schemes are outlined below:

- Fishbourne Mitigation Scheme – Incorporated both the Fishbourne Roundabout Scheme and Cathedral Way/ Terminus junction and road diversion scheme.
- Bognor Mitigation Scheme – Incorporated both Bognor Road Roundabout Scheme and Vinnetrow/ Bognor Road junction and road diversion scheme.

11.8.23 The above junction's costs are now shown combined to provide a more robust mitigation cost for each scheme given that both elements of each mitigation scheme would need to be fully constructed in order to achieve the desired benefits.

11.8.24 The NH costs were analysed and incorporated into the Stantec estimated costs to provide a cost range for each proposed mitigation scheme along the A27.

The proposed A27 mitigation costs are summarised in Table 11-9. All A27 mitigation schemes would be required to be implemented in Scenario 1. Stantec has applied an optimum bias¹⁰ of 1.49 to the Stantec estimated construction costs. Stantec optimism bias includes an estimated cost for design fees, assumed legal fees, process fees and risk. The NH costs and OPT Bias have been extracted from the A27 Chichester Option Cost breakdown table and modified to reflect the proposed Stantec junction mitigation schemes.

¹⁰ [Microsoft Word - GreenBook_optimism_bias.doc \(publishing.service.gov.uk\)](#)

Table 11-9 A27 Proposed Mitigation Costs (£m)

Junction Name	Construction Costs only (£m)			Lower Construction	Upper Construction	Lower OPT Bias Stantec	Upper OPT Bias NH *	Lower Project Cost	Upper Project Costs
	Jacobs (2013)	National Highways Cost (2014)	Stantec Costs (2018)	Stantec (£m)	NH (£m)	1.49	Varies	Stantec (£m)	NH (£m)
Fishbourne including Cathedral Way / Fishbourne Road East	£1.734** (£1.93)	£3.4 (£3.7)	£4.61	£3.4 (£3.7) (NH)	£4.61 (Stantec)	1.61* (NH)	1.49 (Stantec)	£5.48 (£5.95) (NH)	£6.87 (Stantec)
Stockbridge Roundabout	£2.644 (2.94)	£4.8 (£5.22)	£3.09	£3.09	£4.8 (£5.22)	1.49	1.12	£4.61	£5.38 (£5.85)
Whyke Roundabout	£2.225 (£2.48)	£4.3 (£4.68)	£2.52	£2.52	£4.3 (£4.68)	1.49	1.12	£3.76	£4.82 (£5.24)
Bognor Road Roundabout including Bognor Road / Vinnetrow Road Diversion	£1.22*** (£1.36)	£10***** (£10.87)	£6.93	£6.93	£10 (£10.87)	1.49	1.61	£10.33	£16.1 (£17.51)
Oving	£0.459 (£0.51)	£0.8 (£0.87)	£0.5	£0.5	£0.8 (£0.87)	1.49	1.61	£0.75	£1.29 (£1.4)
Portfield	£0.619 (£0.69)	£1.8***** (£1.96)	£0.66	£0.66	£1.8 (£1.96)	1.49	1.28	£0.99	£2.31 (£2.51)
Stockbridge Link Road	-	£18.1**** (£19.68)	£14.84	£14.84	£18.1 (£19.68)	1.49	1.28	£22.12	£23.17 (£25.19)
Overall Total	£8.901 (£9.91)	£43.2 (£46.98)	£33.15	£31.94 (£32.24)	£44.41 (£47.89)			£48.04 (£48.51)	£59.94 (£64.57)

Note: construction costs are at a price base of Q3, 2018 – inflation to 2018 for NH (8.74%) and Jacobs (11.31%) costs have been included table in the brackets

*OPT Bias for NH schemes based on chosen options growth factor

** Costs does not include Terminus Road/ Cathedral Way Junction

*** Cost does not include new junction at Vinnetrow / Bognor Road or hamburger roundabout.

****Estimated cost for section been proposed in Stantec mitigation scheme. Assumptions taken to reduce original £38.1m NH cost to £18.1m

*****Estimated cost for NH with no flyover constructed and associated earthworks/ retaining structures and widening

*****NH scheme dedicated slip lane. Stantec scheme includes widening of exiting carriageway.

Note

The NH **construction and project costs** exclude:

- Options and Development Phase Costs
- Land costs
- Statutory Undertakers Costs
- Employers Agent Supervision Costs
- Non-Recoverable VAT Allowances
- Inflation beyond Q3 2018
- Portfolio Risks

Note

The Stantec **construction and project costs**

exclude:

- Options and Development Phase Costs
- Land costs
- Statutory Undertakers Costs
- Employers Agent Supervision Costs
- Non-Recoverable VAT Allowances
- Inflation beyond Q3 2018
- Portfolio Risks
- Land Contamination and Remediation costs

Overall Proposed Highway Mitigation Costs Summary

11.8.25 Table 11-10 shows a summary of the estimated project costs.

Table 11-10 Overall Summary of Mitigation Costs (Rounded Up)

Mitigation Area	Full Implementation	
	Lower Project Cost	Upper Project Cost
Chichester City and Wider Area	£1,564,500	£1,564,500
City and Wider Area Revised	£2,564,500	£2,564,500
A27 Corridor including Stockbridge Link Road	£48,040,000 (£48,510,000)	£59,940,000 (£64,570,000)
Overall Total Project Costs	£50,540,000 (£51,010,000)	£62,440,000 (£67,070,000)

Note: NH Inflation adjusted costs included in brackets

11.8.26 The total cost for the implementation of proposed mitigation works was estimated to be between approximately £50-70 million subject to the options applied.

National Highways A27 Estimated Maintenance Costs

11.8.27 Alongside a further review of the estimated scheme costs, further information has been requested by CDC and WSCC about potential maintenance costs that NH could seek for each proposed junction scheme over a 60-year period. A review of the A27 Chichester Bypass – Economic Assessment Report (July 2016) was undertaken to inform a high-level assumption of potential NH operation and maintenance costs. Therefore, a high-level assumption based on 25% of the project costs over a 60-year appraisal period has been calculated and is shown in Table 11-11. These costs would need to be discussed and confirmed with NH.

Table 11-11 National Highways A27 Estimated Maintenance Costs

Junction Name	Lower Maintenance	Upper Maintenance
	Stantec (£m)	NH (£m)
Fishbourne including Cathedral Way / Fishbourne Road East	£1.37	£1.72
Stockbridge Roundabout	£0.69	£0.81
Whyke Roundabout	£0.56	£0.72
Bognor Road Roundabout including Bognor Road / Vinnetrov Road Diversion	£1.55	£2.42
Oving Junction	£0.11	£0.19
Portfield Roundabout	£0.15	£0.35
Stockbridge Link Road	£3.32	£3.48
Overall Total	£7.75	£9.68

11.8.28 The maintenance cost for the A27 junctions over a 60-year period is estimated to be between **£7.75m - £9.68m**. It would be expected that there would be no maintenance costs for the first

5-to 10 years and the existing operation and maintenance costs are not considered, so these would be considered as a saving to NH not included within the figure above.

Chichester District Council A27 Highway Mitigation Assessment of Costs

11.8.29 In order to ensure a more up-to-date and robust cost estimate of the schemes a further review of the scheme costs was undertaken by CDC in September 2022 for agreement. The costs put forward by CDC are shown in Table 11-12 and started from the Stantec estimates in Table 11-9 above.

Table 11-12 Chichester District Council Scheme Estimates

Works	2018 Pref App.	2022 (incl. BCIS = 23.6%)	20% Design Risk	2022 Total (with design risk included)
Fishbourne Junction	£5.95m	£7.3m	£1.46m	£8.76m
Bognor Junction	£10.3m	£12.73m	£2.55m	£15.28m
Stockbridge Link	£25.2m	£31.15m	£6.23m	£37.38m
Stockbridge Roundabout	£5.85m	£7.23m	£1.45m	£8.68m
Whyke Roundabout	£5.24	£6.48m	£1.3m	£7.78m
City Centre	£2.36m	£3.09m	£0.62m	£3.71m
Portfield Roundabout	£2.51m	N/A-Complete	N/A-Complete	N/A-Complete
Oving Junction	£1.4m	N/A-Complete	N/A-Complete	N/A-Complete
Total	£58.81	£67.98m	£13.61m	£81.59m

11.8.30 The CDC assessment of costs was recognised as likely to under represent the potential cost of the schemes and WSCC undertook a review of the Lower Construction and Upper Construction figures in Table 11-9. This culminated in an estimate of scheme costs at Quarter 2 2022 prices. The WSCC review looked at the SRN mitigation schemes and not the city centre schemes. A summary of the scheme costs is shown in Table 11-13.

Table 11-13 WSCC Scheme estimates – Lower and Upper Estimate (A27 schemes)

Works	Lower Estimate	Upper Estimate
Fishbourne Junction including Terminus and Cathedral Way	£9.52m	£12.90m
Bognor Road Roundabout including Bognor Road / Vinnetrov Road Diversion	£19.39m	£30.42m
Stockbridge Link	£41.53m	£55.08m
Stockbridge Roundabout	£8.65m	£14.61m
Whyke Roundabout	£7.05m	£13.10m
Portfield Roundabout	£1.85m	£5.49m
Oving Junction	£1.40m	£5.49m
Total	£89.39m	£134.03m

Apportionment of A27 Scheme Costs

- 11.8.31 The modelling methodology not only considers the traffic growth from the local plan, but also considers other growth associated with trips travelling to/from and through Chichester. This section seeks to demonstrate how much the proposed local plan and committed development contributed to flow increases on the SRN junctions compared to background growth and hence inform cost apportionment of the schemes.
- 11.8.32 The mitigation in the context of this study refers to the improvements required to offset identified impacts from the local plan development proposals, which would be a matter for the plan. However, further infrastructure that would be required to address existing issues or those created by background traffic fall outside the plan. It is fair to say that the level of existing congestion identified in the modelling, means that forecast impacts of the local plan developments and scale of infrastructure required to make the network not severely worse off are disproportionately greater than they would be if the without-plan scenario was not already congested.
- 11.8.33 If CDC were able to consider the impact of their own development traffic on the network the impact would be far less than the modelled forecast indicates. The majority of growth in demand is due to background growth, however this cannot be easily separated from growth attributable to the Chichester Local Plan and therefore this, alongside the existing congestion issues influences the required mitigation schemes, even though this is not a direct impact from the local plan development proposals alone.
- 11.8.34 The SATURN model was used to estimate demands impacting the SRN A27 Chichester Bypass split into LPR and committed development and background growth. Analysis was undertaken at each of Fishbourne, Bognor, Whyke and Stockbridge Roundabouts on the SRN. For each junction, the flows (2 way by direction) have been determined for each approach arm in the 2014 Base Model and in the 535dpa scenario Plan Year model (assumed to be 2039). This was used to estimate growth due to CDC proposed development and due to background growth. This also included an analysis of through traffic on the A27.
- 11.8.35 In order to circumvent modelling limitations such as suppressed trips in the more congested AM and PM peak hours, the flow analysis was undertaken at AADT level by converting model AM and PM peak flows accordingly.
- 11.8.36 The results indicate that at Fishbourne junction, Chichester development contribute only 28% of the growth at the junction between 2014 Base Year and 2038 Local Plan year. At Bognor Junction this figure is also estimated at 28%. The figures at Stockbridge and Whyke Roundabouts are 14% and 18%, respectively. This will be proportionately less when considering only new development proposed by the Local Plan 2021-2039 (i.e. that which is not already committed), which is approximately a third of the overall development envisaged by the Plan.
- 11.8.37 It is considered therefore, that CDC would be expected to contribute these proportions towards scheme mitigation costs. It should also be noted, as stated in Section 5.5, the majority of the A27 Chichester bypass are over capacity in the base year model (2014), with the exception of Portfield Roundabout. All the junctions are shown to be over capacity without the local plan traffic added in. Therefore, it is clear that the issues seen at these junctions are not just a result of the local plan and committed development traffic, but other background and existing traffic also impact on performance of the junctions.

Further work

- 11.8.38 The schemes outlined above are high level concept designs with estimated high-level costs which would require further assessments to finalise design and costs as per below:

- Possible planning application
- Detailed design
- A business case
- C2 and C3 utility searches/ diversions / costings
- land ownership confirmation
- Environmental and Ecology assessments
- Ground investigation exercises

11.8.39 The next steps are likely be a business case assessment to be undertaken for each of the proposed A27 mitigation schemes in order to refine the cost into more developed estimates which can then be used to direct, and in some cases secure, funding streams.

11.9 Current Status of Developer Contributions Policy

11.9.1 The current SPD which secures the developer contributions is unlikely to be able to secure sufficient funding for the initial works for Fishbourne and Bognor Road schemes in the short term and it is not forecast to secure sufficient funds to support the entire A27 and City Centre mitigation package by the end of the local plan period of 2039. A revised policy approach is currently being developed through Policy T1 of the Local Plan 2021-2039, that once adopted will enable higher level of funds to be collected going forward.

11.9.2 Whilst the funding of the revised policy will be higher, it is still not anticipated to be sufficient to fund the full mitigation package and will therefore need to be focused on the monitor and manage approach, which may include works to one or more junctions in addition to a range of other sustainable transport measures.

11.10 RIS 3 Process

11.10.1 The Department for Transport (DfT) has begun preparing for the next road investment period for RIS 3 as published in December 2021 which covers the Road Investment Strategy 3 (RIS3), period for 1 April 2025 to 31 March 2030.

11.10.2 The report outlined the objectives for developing RIS3, which are improved safety for all, improved environmental outcomes, improved network performance, growing the economy, managing and planning the Strategic Road Network for the future and develop a technology-enabled network.

11.10.3 As part of the 32 projects being developed, NH have listed the A27 Chichester improvements which covers all the junction set out in this report. There is no certainty on securing budgets beyond the current feasibility stage, however CDC and WSCC are working with NH to promote the scheme coming forward.

12 Summary

12.1 Introduction

- 12.1.1 This report has set out the findings of a considerable body of work undertaken by Stantec, to understand the likely impacts of a future development growth option considered for the Local Plan 2021-2039 in relation to the operation of the highway network. Using modelling techniques and assumptions which are based on approved methodologies and best practice, the growth scenario has been appraised against a Reference (baseline) position. The local plan period extends to 2039, with local plan development proposals for the period 2021 to 2039. The CATM 2014 Base year model has been used as the basis from which 2037 Reference Case forecasts have been developed. It is considered that the 2037 Reference Case forecasts are sufficiently robust to account for the two-year period between 2037 and 2039. This was the modelling is on the impacts in the south of Chichester District, with a separate assessment and report produced, examining impacts in the north of Chichester District.
- 12.1.2 The study follows on from work undertaken in 2018 that looked at three local plan scenarios. This study has focussed and tested a single local plan spatial scenario for the period to 2039.

12.2 Monitor and Manage

- 12.2.1 Given the level of uncertainty in relation to travel making patterns, as supported by recent work undertaken in developing an Uncertainty Toolkit, it is recommended that a monitor and manage approach is adopted to review the mitigation requirements going forward. This approach is being developed in close liaison with NH and WSCC. The monitor and manage process will require the setting up of a TIMG led by CDC who will work to deliver the best outcomes as the local plan progresses.

12.3 Mitigation

- 12.3.1 The study has considered and tested both potential sustainable transport and highway mitigation options. These options are not set in stone, but delivery will be guided by the monitor and manage process and the TIMG who will monitor the impacts of development as it comes forward and identify the best solutions for mitigating impacts with funds collected through the local plan and other potential funding sources.

12.4 Summary of Outputs

- 12.4.1 In summary the key findings are that:
- The Local Plan 2021-2039 transport study evidence base has followed best practice to develop future forecasts and undertake testing in order to understand the network impacts of the potential development scenario considered for the Local Plan 2021-2039.
 - There is a recognition that the model used is now approaching the end of its useful life, however a recent verification exercise has been undertaken, utilising data collected in November 2023, shows the model is behaving as expected and given the commitment to update the model through the monitor and manage process, the evidence is proportionate and sufficiently robust at this stage.
 - In the baseline scenario without the local plan development, a number of junctions already experience capacity issues, this is also seen when looking at the new data collected for the verification purpose. This is projected to get worse, when the traffic generation anticipated from the proposed development scenario considered for the Local Plan 2021-2039, without mitigation are included.

- The study has indicated that, the impact of the forecast development up to 2039, requires a significant mitigation package, the majority of which is focused on the A27 if the impacts of development are to be fully mitigated.
- The results indicate that at Fishbourne junction, Chichester development contribute only 28% of the growth at the junction between 2014 Base Year and 2038 Local Plan year. At Bognor Junction this figure is also estimated at 28%. The figures at Stockbridge and Whyke Roundabouts are 14% and 18%, respectively. This will be proportionately less when considering only new development proposed by the Local Plan 2021-2039 (i.e. that which is not already committed), which is approximately a third of the overall development envisaged by the Plan.
- It is now considered that sustainable mitigation measures should have priority over highway capacity mitigation and hence a need to shift away from a 'Predict and Provide' approach towards a 'monitor and manage' approach. Given the long-term horizon of the local plan, there will always be uncertainty about the level of growth in travel that may materialise. Some significant changes in travel behaviour alongside technology advances have been seen in recent times, and the COVID-19 pandemic has accelerated these changes with significantly more people working at home and shopping online (virtual mobility).
- A monitor and manage process will be set up, supported by a TIMG led by CDC and supported by the two highway authorities (WSCC and NH), and also include other transport bodies and neighbouring authorities.
- The remit of the TIMG will be to monitor impacts of development going forward and make best use of the funding collected through the local plan process from developers, to provide suitable mitigation as appropriate. The group will also look to identify other sources of funding and support bids for funding where necessary. The TIMG will also be responsible and scoping of future modelling work.
- With the potential highway mitigation in place, the network conditions are generally projected to be comparable to those in the baseline suggesting that the proposed junction mitigation has the potential to mitigate and accommodate the growth provided for in this scenario.
- A series of sustainable transport schemes and highway mitigation schemes have been suggested as a starting point and to provide indication of likely costs required to mitigate the local plan impacts.
- The study has undertaken an overview of options which could be considered in the medium term to long term as alternate or complementary mitigation measures to the junction schemes proposed for Chichester. The report provides an overview of the sustainable options particularly as to whether they are a viable sustainable option to effect modal shift in a cost-effective way. The sustainable options considered are centred around mode change away from the car such as through potential to use park and ride, bus, cycling and walking as well as setting out wider areas for further work to be undertaken, including parking management and workplace parking charging to encourage this modal shift where possible.
- A comparison of 535dpa and 638 dpa demonstrates evidence of exponential increase in delays and queues for 638 dpa compared to 535 dpa to the extent that there is increased rat-running on roads through the SDNP and roads north of Chichester, with these delays and queues likely to be detrimental to the safe and efficient operation of buses/public transport services. These increases in delays and queues in most cases, will have a detrimental and material impact on the network, to the extent that this would be severe.

Appendix A Local Model Validation Report

Appendix B Model Verification

Appendix C Reference Case Uncertainty Log

Appendix D Reference Case Infrastructure Assumptions

Appendix E Reference Case vs Local Plan Flow Changes

Appendix F Reference Case vs Local Plan Volume to Capacity Ratio Comparisons

Appendix G Reference Case vs Local Plan Link Delay Comparisons

Appendix H Modelling Outputs within Arun

Appendix I Impacts on Hampshire Roads

Appendix J A27 Junctions Local Plan Flows - Sustainable Travel Mitigations Impacts

Appendix K Terminus Road Feasibility and Fishbourne Roundabout Bus Priority

Appendix L Reference Case versus Local Plan Flow Differences with Highway Mitigation

Appendix M Interim Safety Led Assessment