# Great Yarmouth Third River Crossing

OUTLINE BUSINESS CASE
MARCH 2017

**Supporting Document 7 – Forecasting Report (Paramics)** 







## Great Yarmouth Third River Crossing

#### **Forecasting Report**

Paramics Discovery Model

March 2017

Produced for

Norfolk County Council

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## **Document Control Sheet**

Project Title Great Yarmouth Third River Crossing

Report Title Paramics Discovery Forecast Report

Report ref no. 1076653-MOU-GEN-XX-TN-TP-0005

Version 1

Status Final

Report Date 24 March 2017

#### Record of Issue

Version	Status	Author	Date	Checked by	Date	Approved by	Date
1	Final	Angel Gonzalez	24/03/17	Ged Jennings	24/03/17	Amanda Fogg	27/03/17

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#### 1 Introduction

#### 1.1 Background

Norfolk County Council (NCC) has appointed Mouchel to prepare an Outline Business Case (OBC) relating to a proposed Third River Crossing in Great Yarmouth.

To support the OBC, extensive transport modelling and appraisal work has been undertaken in order to select a preferred option, forecast the likely scheme impact and quantify its benefits.

This includes the development of a tiered modelling approach, including both a SATURN model (used for strategic analysis and to feed into the economic appraisal) and a Paramics Discovery model (used to assist in the option selection process and to more accurately forecast operational performance).

This report describes the forecast models developed in the Paramics Discovery microsimulation model in order to compare the relative operational performance of the three preferred options defined in the Final Option Assessment Report<sup>1</sup> (options 32, 33 and 37). The development and validation of this Paramics model is covered separately in the Local Model Validation Report<sup>2</sup>.

The Paramics model forecasts described in this report have been used in the option selection process to identify the preferred and next best options to be included in the Outline Business Case submission.

It should be noted that, due to programme constraints, this version of the Paramics model pre-dates the completion of the SATURN model update in the Outline Business Case submission and will therefore need to be updated to improve consistency with the SATURN modelling, once this has been formally approved by DfT. It is therefore proposed that the Paramics model be further refined and used to review and optimise the design of the preferred option in future stages, if the scheme is approved by DfT and taken forward through the next funding gateway.

<sup>&</sup>lt;sup>1</sup> Document reference 1076653-MOU-GEN-XX-RP-Z-0001

<sup>&</sup>lt;sup>2</sup> Document reference 1076653-MOU-GEN-XX-TN-TP-0002

Figure 1 Study Area for the Paramics Discovery Model GREAT YARMOUTH

Figure 1 shows the study area of the microsimulation model:

#### 1.2 Purpose of this Report

The aim of this report is to test the operational performance of the three shortlisted options 32, 33 and 37 and produce output statistics for comparison including journey times, travel distances and queue lengths.

This report also includes full details regarding the network developments included in the model, the assumptions considered to assess the impact of the proposed bridge openings and the modelled scenarios.

## 2 Forecast Assumptions

#### 2.1 Growth Rates

The traffic growth factors were obtained through version 7 of the Trip End Model Presentation Program (TEMPro). The data source of the software is the National Trip End Model (NTEM) forecasts created by the Transport Appraisal and Strategic Modelling Division of Department for Transport (DfT). The growth rates were calculated for the whole town of Great Yarmouth, for every time period.

The base year of the matrices is 2016, therefore there is a requirement to calculate a conversion factor to convert the base matrices into the forecast years of 2023 and 2038.

TEMPro provides two different factors, one for origin trips and another for destination trips. The average of these values was calculated to obtain the growth factor between 2016-2023 and 2016-2038.

Table 1 and Table 2 below show the traffic growth rates.

2016-2023 Peak Origin Destination **Average Period** 1.0689 ΑM 1.0617 1.0653 IΡ 1.0856 1.0865 1.0861 ΡМ 1.0671 1.0647 1.0659

Table 1 TEMPro Growth Rates 2016-2023

Table 2 TEMPro Growth Rates 2016-2038

	2016-2038					
Peak Period	Origin	Destination	Average			
AM	1.1763	1.1951	1.1857			
IP	1.2435	1.2435	1.2435			
PM	1.1924	1.1826	1.1875			

The derived forecast year matrices are included in Appendix A.

#### 2.2 Local Road Network Improvements

NCC provided information regarding potential network developments within the Great Yarmouth area. These improvements are planned to be constructed between 2017 and 2023 so the do-minimum forecast Paramics models will include them. The proposals are described below in further detail:

#### 2.2.1 Fullers Hill Roundabout Improvements

An initial option was provided by NCC for this junction and it was subsequently refined during a previous Mouchel study. This process was explained in the Technical Note that Mouchel produced in December 2016 ("*Draft GYTC Options Testing Tech Note 081216*"). Changes from the existing situation are:

- Increase in the number of lanes on the north approach from two to three, allowing the right turn in two lanes.
- Increase the length of the second short lane on north exit arm.
- The roundabout's shape has been changed from an oval central island to a circular design with an Inscribed Circle Diameter of approximately 54m.
- It is proposed to amend the number of the circulatory lanes from two to three between the north and south approaches with appropriate hatching and markings.

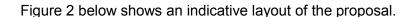




Figure 2 Fullers Hill Roundabout Scheme

## 2.2.2 Great Yarmouth Station Access and Improvements to Rail Station Forecourt and Surrounding Highways

The shared access to the Train Station and ASDA will be redesigned to allow the currently banned right turn from the exit of the station. The other movements of the existing junction remain unchanged. In addition, new facilities will be included in order to make access to the Station easier for pedestrians and cyclists.

Figures 3 and 4 below show the layout of the proposal.

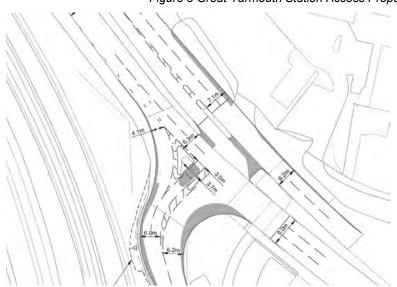
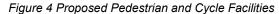


Figure 3 Great Yarmouth Station Access Proposal





## 2.2.3 Improvements to North Quay and The Conge and Great Yarmouth Trafalgar Rd Improvements.

Both improvements are focused on enhancing the pedestrian and cycle facilities in Great Yarmouth town centre. The proposals include the following changes:

- Reduce North Quay southbound from two lanes to one between the Aldi/Staples access and The Conge.
- Reduce North Quay southbound and northbound from two lanes to one at the pedestrian crossing between The Conge and Brewery St.

- Change the pedestrian crossing to a Toucan controlled crossing.
- Add a dedicated right turn lane from North Quay southbound to Bowling Green Walk.
- Reduce the carriageway of The Conge to 6m and resurface it with red aggregate to make it pedestrian/cyclist friendly. The realigned carriageway will run parallel with an unsegregated cycleway/footway.
- Reduce the number of lanes in North Quay northbound from two to one along the section between St Francis Way and The Conge.
- Make the offside lane of North Quay northbound at St Francis Way into a right turn lane into St Francis Way.
- Convert the existing pedestrian crossings to a Toucan crossings at Trafalgar Road/Nelson Road Central and Marine Parade.
- Increase the widths of the pedestrian footways along Trafalgar Road.

Figures 5 and 6 below show the layout of both proposals.

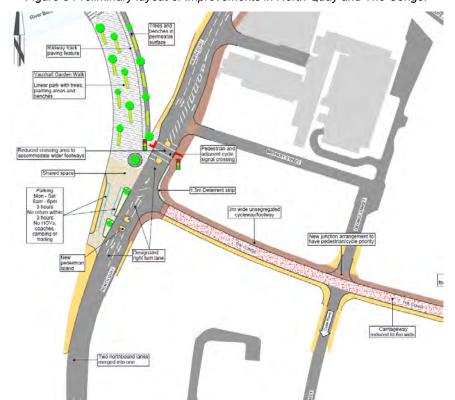


Figure 5 Preliminary layout of Improvements in North Quay and The Conge.

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Figure 6 Proposed Improvements in Trafalgar Road.

#### 2.3 Potential Strategic Road Network Improvements

There remains uncertainty over the location and form of improvements along the Strategic Road Network (SRN) in the vicinity of Great Yarmouth and therefore the SATURN model submitted with the OBC classifies these schemes as "reasonably foreseeable" or "hypothetical" and as such they have not been included in the future do minimum SATURN networks. This also applies to the Station Access proposal described above, which at the time of writing is understood to form part of Highways England's potential improvement scheme at Vauxhall roundabout.

However, in the Paramics modelling documented in this report, potential improvements at Vauxhall roundabout, the Station access, Gapton Hall roundabout and Harfreys roundabout are included. The assumed improvements at the three roundabouts take the form of relatively low cost at-grade improvements including signalisation and localised widening. Indicative layouts are shown below:

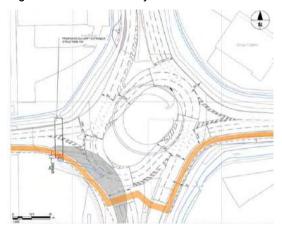


Figure 7 Indicative Vauxhall Roundabout Scheme

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Figure 8 Indicative Gapton Hall Roundabout Scheme





#### 2.4 Proposed Bridge lifts

Mouchel have undertaken extensive liaison with the Port Authority regarding the proposed Third River Crossing scheme. This includes reviewing a detailed database of vessel movements along the River at the location of the proposed Third River Crossing provided by the Port Authority.

Extensive design work has also been undertaken by Mouchel's highways and bridges specialists and advice sought from specialist M&E contractors in order to progress the design of the proposed bridge structure and its operating regime. Further details are included in the report prepared by Mouchel "Existing and Future Navigation Requirements of Peel Ports Great Yarmouth and other Port Users"<sup>3</sup>.

The opening duration of the bridge is dictated by 2 factors: bridge movement and vessel movement.

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<sup>&</sup>lt;sup>3</sup> Document Reference 1076653-MOU-GEN-XXRP-MAR-0001

The time taken for the bridge to open and close comprises the time to clear the bridge of traffic and the time for the bridge to raise, while closing time includes the bridge lowering and the traffic controls lifting. The duration will vary depending on the nature of the traffic control system installed, with control of pedestrians being a potential limiting factor. In total, a time of 240 seconds may be required to allow the safe clearance and opening of the bridge.

The vessel movement time includes the transit time; that is the time a vessel is manoeuvring through the bridge passage, and the approach time; the time taken for the vessel to approach the bridge following opening. The location of the bridge, on a bend in the river, potentially increases both the approach and transit times in comparison with a bridge with a straight approach.

The vessel movement database used to estimate the bridge lifts was provided by the Port Authority of Great Yarmouth. The database was used to create different patterns of openings for 3 days in order to produce a range of usage: less than 10 (Low Day), between 10 and 20 (Average Day) and more than 20 vessels movements (High Day). When the vessel timings suggest the movements would overlap or occur within 1-3 minutes of each other, it was assumed that the bridge would remain open to accommodate the multiple vessel movements.

Three ranges of opening timings were calculated through the database for each pattern Low Day, Average Day and High Day. Further information regarding the bridge lift patterns is included in Appendix B.

#### 2.5 Forecast Scenarios

In order to improve the accuracy of the model to forecast detailed operational performance relating to the timing and frequency of bridge openings, this real data was used.

Two different scenarios were created to analyse the impact of the bridge lifts through the microsimulation model:

#### 2.5.1 Average Case Scenario

The aim of this scenario is to replicate a typical operational day for the proposed bridge. The samples of "Average Day" were checked in order to choose the one which was most appropriate for the purpose of this scenario.

The following criteria were taken into account to choose a sample for modelling the Average Case Scenario:

- The total duration of the bridge openings and the number of lifts during the peak period. Both must be between the maximum and minimum of the values in the sample.
- The number of lifts during the peak hour. The traffic model provides outcomes only during the peak hour so, it was considered necessary at least one bridge lift along this hour.

Table 3 contains the sample data used for the calculation of the Average Case Scenario, with the chosen values highlighted.

Table 3 Samples of Average Case Scenario

Pattern	Sample	Period	Openings Peak Period	Total Duration Peak Period	Openings Peak Hour	Total Duration Peak Hour
Average Day	1	AM	3	00:16:19	1	00:07:46
Average Day	2	AM	3	00:15:16	0	00:00:00
Average Day	3	AM	3	00:28:27	0	00:00:00
Average Day	1	IP	4	00:21:08	1	00:04:23
Average Day	2	IP	1	00:04:23	1	00:04:23
Average Day	3	IP	2	00:10:34	1	00:05:54
Average Day	1	PM	4	00:21:47	1	00:04:21
Average Day	2	PM	4	00:19:55	2	00:08:46
Average Day	3	PM	4	00:31:59	1	00:04:21

As shown above, Sample 1, Sample 3 and Sample 2 were chosen to reproduce the Average Case Scenario for AM, IP and PM respectively.

Further details about the opening times and durations of each bridge lift are included in Appendix C.

#### 2.5.2 Worst Case Scenario

The purpose of the Worst Case Scenario is to reproduce a day of high demand due to a large number of vessels movements, resulting in more frequent and longer duration openings than in a typical average day.

The samples of "High Day" were reviewed in order to choose the one which was most appropriate for the purpose of this scenario.

The following criteria were taken into account to choose a sample for modelling the scenario:

- The total duration of the bridge openings and the number of lifts during the peak period. Both must be the maximum values in the sample if possible.
- The number of lifts during the peak hour. The number of openings must be the maximum possible during the peak hour.

Table 4 contains the sample data used for the calculation of the Worst Case Scenario, with the chosen values highlighted.

Table 4 Samples of Worst Case Scenario

Pattern	Sample	Period	Openings Peak Period	Total Duration Peak Period	Openings Peak Hour	Total Duration Peak Hour
High Day	1	AM	6	00:26:33	2	00:08:55
High Day	2	AM	3	00:20:48	1	00:09:33
High Day	3	AM	4	00:32:00	2	00:14:48
High Day	1	IP	3	00:22:46	1	00:09:11
High Day	2	IP	4	00:17:57	0	00:00:00
High Day	3	IP	6	00:30:09	1	00:04:21
High Day	1	PM	6	00:29:03	2	00:09:20
High Day	2	PM	3	00:12:56	2	00:08:44
High Day	3	PM	7	00:42:58	2	00:10:22

Therefore Sample 3 was chosen to reproduce the "Worst Case Scenario" for AM, IP and PM.

Further details about the opening times and durations of each bridge lift are included in Appendix C.

## 3 Scheme Appraisal

#### 3.1 Do Minimum

The Do Minimum model was built by adding the future network improvements into the calibrated 2016 Base Model.

The model was used to forecast the traffic in Great Yarmouth in 2023 and 2038 without the proposed Third River Crossing. The signal timings of the main corridors within the model were updated from 2016 to 2023 and 2038, in some cases making use of separate Linsig models to ensure optimisation is achieved. The majority of these junctions run under SCOOT control, so it is considered appropriate to optimise timings in the future year scenarios.

#### 3.2 Option 32

The Option 32 model was developed by adding in the proposed scheme to the previously developed do minimum models.

Option 32 comprises a four lane bridge which ties back into the local road network on the western side at a proposed new roundabout with William Adams Way/Suffolk Road. The western approach to the bridge from the new roundabout will oversail Southtown Road, which will remain open to traffic. William Adams Way will be realigned to accommodate the new roundabout and bridge approach and tie into the strategic road network at Harfreys roundabout.

At the eastern side, the bridge will tie back into South Denes Road at a new signalised junction close to Sutton Road.

A change of direction is proposed on the one-way Sutton Rd to make it an exit from the new signal junction. A corresponding change of direction is also proposed for Swanston's Rd to the south. These proposed changes will reduce the number of conflict movements at the proposed signal junction whilst maintaining the flow of traffic in the local area for the east-west movements between South Denes Road and Admiralty Road.

The signal timings of the proposed junction have been optimised. The main junctions included in the Do Minimum model have also been reviewed and optimised where required to accommodate the changes in traffic patterns produced by the new crossing point.

Figure 10 below shows the design of the Option 32.

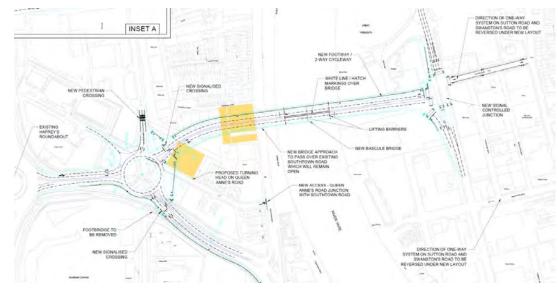


Figure 10 Great Yarmouth Model. Option 32

#### 3.3 Option 33

Option 33 is similar to option 32, but comprises a three lane bridge which will operate a tidal flow system to provide two lanes in the predominant direction of traffic flow – eastbound in the morning peak and westbound in the evening peak. Usage of the lanes will be signed by overhead and advance signage to ensure drivers choose the correct lanes in good time

In order to accurately model the operational performance of the bridge and adjacent junctions during all time periods, two different models were built. The first includes the AM and IP periods when the movements towards the Peninsula are largest and two lanes eastbound are provided. The second includes the PM period when the highest flow moves towards West and two lanes westbound are provided.

The signal timings of the proposed signalised junction have been optimised. The main junctions included within the model have been reviewed and optimised when required.

Figure 11 below shows the design of the Option 33.

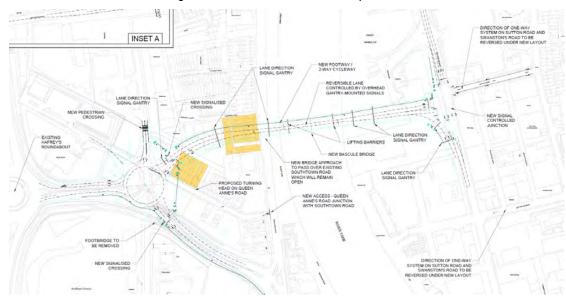


Figure 11 Great Yarmouth Model. Option 33

#### 3.4 Option 37

Option 37 comprises a lower level, two lane bridge crossing which ties in at grade to a new signalised junction with Southtown Road on the western side. At the eastern side, the bridge ties into a new signalised junction on South Denes Road similar to that proposed for options 32 and 33.

In order to improve operational efficiency of the proposed signalised junction on the western side of the bridge, a variant on the design incorporating a left turn facility from Beccles Road to the new link road was tested, as indicated on the image below.

The signal timings of the proposed junctions have been optimised using Linsig. The main junctions included within the model have been reviewed and optimised when required.

Figure 12 below shows the design of the Option 37 variant tested.



Figure 12 Great Yarmouth Model. Option 37

#### 3.5 Bridge Openings in the model

The bridge lifts have been modelled by using a combination of different features of the software such as vehicle restrictions, traffic lights and additional links, as well as link cost factors.

- Two vehicles restrictions were modelled to control whether the bridge is opened to traffic or not. The first restriction, called "Bridge Opened", controls the times the vehicles can cross whereas the one called "Bridge Closed" controls the times when the bridge is lifted.
- Two overlapping links were used to model the lifting bridge, one of them is affected by the "Bridge Opened" restriction while the other has the "Bridge Closed" restriction.
- In order to model the number of vehicles willing to wait while the bridge is closed to traffic, a combination of increasing the link cost factors (from 1.0 to 1.5) and traffic lights have been included. The traffic lights are activated at the same time that the bridge is lifted. The length of the red light stage is equal to the duration of time that the bridge is closed to traffic. When the vehicles start their route choice calculations they would consider the delay due to the red stage and the additional cost of crossing the bridge. As a result, only some vehicles would experience a benefit from using another route instead of waiting until the bridge is opened to traffic again.

#### 3.6 Traffic Signal Optimisation

The main junctions included within the model have been optimised using Linsig. The traffic flows which feed the optimisation tool were obtained from 5 runs of the Paramics Discovery model. The timings of all the junctions were optimised for the forecast year of 2038. The process to obtain the best optimisation is an iterative procedure. Thus, the model was run several times, gathering the 2038 flow results of AM, IP and PM peaks. The microsimulation flows fed into the optimisation software until the whole network showed the best possible road conditions in terms of congestion and capacity of junctions.

NCC provided traffic signal controller specifications and as-built drawings where the data was available, for twenty-five signal controlled junctions and pedestrian crossings within the study area network as indicated in Figure 13 below:

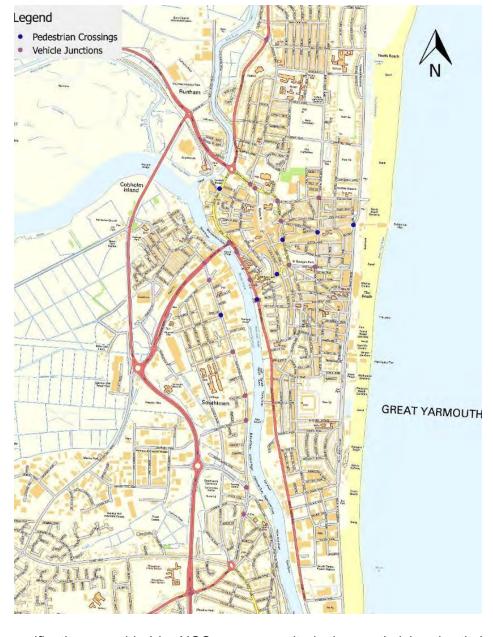


Figure 13 Traffic Signal Controller Information Available

The specifications provided by NCC were consulted when optimising the timings of the junctions. When the detailed information was not available, default intergreens of 5 seconds were defined for opposite vehicle phases and 10 seconds for pedestrian/vehicle phases. Figure 14 below shows an example of the signal specifications provided:

CHECK LIST required: VARIABLE MESSAGE SIGNS-SEE DWG 024

Figure 14 Signal Specifications provided by NCC

Further details regarding the signalised junctions within the microsimulation model are included in the LMVR prepared by Mouchel.

The signal timings of the following junctions have been calculated:

- Harfreys Roundabout.
- Vauxhall Roundabout.
- Gapton Hall Roundabout.
- Haven Bridge junctions. The Linsig model includes the following junctions in order to guarantee the best operation between them:
  - o Pasteur Road with Southtown.

- Southtown with Station Road.
- o North Quay with Haven Bridge.
- o Hall Quay with Regent Street.
- Great Yarmouth Station Access.
- Option 32, 33 and 37 proposed signalised crossings.

The signal timings obtained from Linsig were included in the microsimulation model and tested. The operation of the traffic lights was observed while running the model and where necessary the timings were tweaked in order to obtain better performance. The intergreens between phases were retained, only the green times were amended.

Further details about the signal specifications and Linsig optimisations are included in Appendix D and E.

#### 4 Forecast Results

#### 4.1 Methodology

Each model was run five times in order to collect enough data for comparison purposes. Option 32, 33 and 37 were run taking into account both bridge opening scenarios: Worst Case Scenario and Average Case Scenario mentioned above.

The Do Minimum model is not dependent on the bridge liftings so, the model results can be directly compared to the Average and Worst Case scenario results of the Option 32, 33 and 37. The following data was gathered:

- Total Journey Times and Total Travelled Distance. These results were obtained as the average of the journey times and distances per vehicle and the three modelled periods.
- Maximum and Average Queue Lengths. In order to compare the queue stock capacity of each proposal, the length of queues in both sides of the river Yare was gathered.
- Sectoral Data. An analysis of grouped zones in sectors was conducted in order to provide a higher level indication of modelled performance.
- Forecast Traffic in Great Yarmouth. Flows were collected along several roads in order to study the impacts of the improvements in the movements within the network.

#### 4.2 **Journey Time and Distance Comparison**

The journey time (JT) and distance (JD) data was gathered from the models and then processed through the Data Analysis Tool (DAT) within Paramics Discovery. The results were processed separately, obtaining the JT and JD per vehicle and period.

In order to assist the comparison between the Average Case Scenario and the Worst Case Scenario, the model outputs were summarised as the average of the JT and JD per vehicle for the three modelled periods. Further details about the Journey Time and Journey Distance by results are included in Appendix F.

The analysis of the Journey Times (JT) and Distances (JD) per vehicle shows slight differences between the Worst Case Scenario and the Average Case Scenario. However, as expected, the scheme generates more benefits, in terms of reduced travel time and distance, in the Average Case Scenario.

Table 5 and Table 6 show the JT and JD improvements due to the construction of the new bridge for the Average Case Scenario compared to the Do Minimum model.

Table 5 Average Case Scenario. 2023 Average Network Improvements

2023	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	109,170	2,603	-	-	281	-	-
Option 32	109,267	2,538	66	2.52%	269	12	4.30%
Option 33	109,281	2,539	64	2.47%	269	12	4.22%
Option 37	109,246	2,533	71	2.72%	277	4	1.48%

Table 6 Average Case Scenario. 2038 Average Network Improvements

2038	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	121,984	2,622	-	-	329	-	-
Option 32	122,756	2,552	70	2.68%	291	38	11.52%
Option 33	122,738	2,552	71	2.69%	292	37	11.30%
Option 37	122,424	2,551	71	2.72%	311	19	5.65%

Table 7 shows the aggregate savings of journey time and journey distance for the Average Case Scenario.

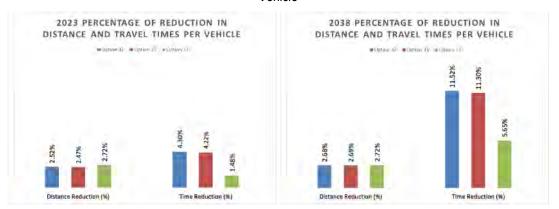
Table 7 Average Case Scenario. Aggregate savings of JT and JD.

2023	Vehicles	Total Distance (m)	Reduction (m)	Total Journey Time (s)	Reduction (s)
Do Min	109,170	284,144,403	ı	30,656,804	-
Option 32	109,267	277,221,279	6,923,124	29,375,070	1,281,734
Option 33	109,281	277,366,867	6,777,536	29,400,413	1,256,391
Option 37	109,246	276,572,017	7,572,386	30,231,789	425,015

2038	Vehicles	Total Distance (m)	Reduction (m)	Total Journey Time (s)	Reduction (s)
Do Min	121,984	319,680,152	ı	40,219,537	-
Option 32	122,756	313,060,558	6,619,593	35,786,851	4,432,686
Option 33	122,738	312,980,112	6,700,039	35,872,101	4,347,436
Option 37	122,424	312,103,104	7,577,048	38,090,568	2,128,968

Figure 15 shows the JT and JD percentage of reduction per vehicle in the Average Case Scenario compared to the Do Minimum model.

Figure 15 Average Case Scenario. 2023 and 2038 Average Percentage of Reduction in JT and JD per Vehicle



The percentage of reduction in JT is larger in 2038 than 2023, which is realistic considering the Do Minimum 2038 network is more congested. The distance reduction does not experience too much variation between 2023 and 2038. The reason is because the only difference between the Do Minimum and the proposals is the possibility to use the new bridge to cross towards the Peninsula.

Table 8 and Table 9 show the JT and JD improvements per vehicle due to the construction of the third bridge for the Worst Case Scenario compared to the Do Minimum model.

Table 8 Worst Case Scenario. 2023 Average Network Improvements

2023	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	109,170	2,603	-	=	281	=	-
Option 32	109,276	2,545	59	2.25%	271	10	3.49%
Option 33	109,294	2,546	58	2.21%	271	9	3.35%
Option 37	109,219	2,542	62	2.37%	280	1	0.23%

Table 9 Worst Case Scenario. 2038 Average Network Improvements

2038	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	121,984	2,622	-	1	329	-	-
Option 32	122,661	2,559	63	2.41%	295	34	10.26%
Option 33	122,591	2,560	62	2.38%	296	33	10.02%
Option 37	122,380	2,560	62	2.36%	321	8	2.37%

Table 10 shows the aggregate savings of Journey Time and Journey Distance for the Average Case Scenario.

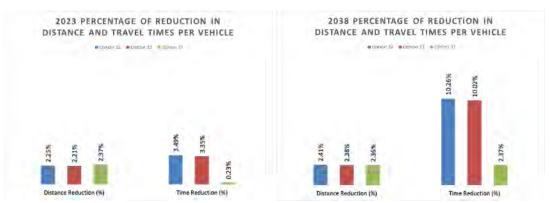
Table 10 Worst Case Scenario. Aggregate savings of JT and JD.

2023	Vehicles	Total Distance (m)	Reduction (m)	Total Journey Time (s)	Reduction (s)
Do Min	109,170	284,144,403	-	30,656,804	-
Option 32	109,276	277,991,905	6,152,497	29,628,599	1,028,205
Option 33	109,294	278,159,998	5,984,404	29,673,137	983,667
Option 37	109,219	277,519,179	6,625,224	30,615,114	41,690

2038	Vehicles	Total Distance (m)	Reduction (m)	Total Journey Time (s)	Reduction (s)
Do Min	121,984	319,680,152	-	40,219,537	-
Option 32	122,661	313,705,204	5,974,948	36,278,594	3,940,943
Option 33	122,591	313,612,485	6,067,666	36,350,851	3,868,685
Option 37	122,380	313,145,158	6,534,993	39,440,525	779,012

Figure 16 shows the percentage reduction in the Worst Case Scenarios of the Journey Times and Distances compared to the Do Minimum model.

Figure 16 Worst Case Scenario. 2023 and 2038 Average Percentage of Reduction in JT and JD per Vehicle



The Worst Case Scenario results are similar to those obtained for the Average Case Scenario. The differences between the scenarios are caused by the different time and duration of the bridge openings of each scenario.

In conclusion, the proposed bridge will relieve congestion within town centre, creating new shorter routes to avoid the congested areas of Great Yarmouth and therefore reducing the journey times and distances. Moreover, the results show that Option 32 as the best proposal in terms of JT and JD reductions.

#### 4.3 Queue Length Comparison

In order to understand the build-up of queues when the bridge is closed to traffic, the maximum length of the queues on both sides of the River Yare has been analysed. The queue data was extracted in intervals of five minutes, in every modelled period and where the future junctions will be located.

Table 11 and Figure 17 indicate the location of the queue measurements carried out for Option 32 and 33.

Table 11 Option 32 and 33. Queue Length Measurements.

ID	Queue Measurement Option 32 and 33	Comments
1	SB South Denes Road	Queue due to signalised junction
2	NB South Denes Road	Queue due to signalised junction
3	WB East Side Bridge plus SB South Denes Road	Queue due to bridge closing
4	WB East Side Bridge plus NB South Denes Road	Queue due to bridge closing
5	EB East Side Bridge	Queue due to signalised junction
6	EB West Side Bridge plus WB William Adams Way	Queue due to bridge closing
7	EB West Side Bridge plus EB William Adams Way	Queue due to bridge closing
8	WB West Side Bridge	Queue due to roundabout

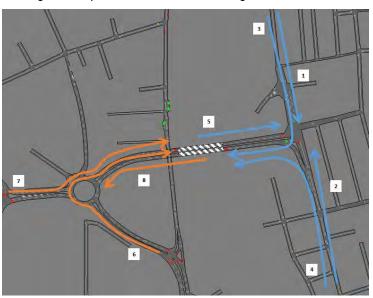


Figure 17 Option 32 and 33. Queue Length Measurements.

Table 12 and Figure 18 indicate the location of the queue measurements carried out for Option 37.

Table 12 Option 37. Queue Length Measurements.

ID	Queue Measurement Option 37	Comments
1	SB South Denes Road	Queue due to signalised junction
2	NB South Denes Road	Queue due to signalised junction
3	WB East Side Bridge plus SB South Denes Road	Queue due to bridge closing
4	WB East Side Bridge plus NB South Denes Road	Queue due to bridge closing
5	EB East Side Bridge	Queue due to signalised junction
6	EB West Side Bridge plus EB William Adams Way	Queue due to bridge closing
7	EB West Side Bridge plus NB Southtown Rd	Queue due to bridge closing
8	EB West Side Bridge plus SB Southtown Road	Queue due to bridge closing
9	NB Southtown Road	Queue due to signalised junction
10	SB Southtown Road	Queue due to signalised junction
11	EB William Adams Way	Queue due to signalised junction
12	WB West Side Bridge	Queue due to signalised junction

Figure 18 Option 37. Queue Length Measurements.

The purpose of this comparison is to identify which option performs best when the bridge is closed to traffic. The maximum queues of the modelled scenarios have been combined by year, ie the queue length values shown in the following tables correspond to the maximum value gathered for AM, PM and IP and not only one specific modelled period.

Moreover, due to the proximity of Harfreys Roundabout and the crossing between Beccles Road and Southtown to the future location of the bridge, an analysis of the impact of the gueues on these junctions has been performed.

In order to more effectively analyse the results, a queue threshold has been defined as the minimum queue length which would block back to the adjacent junctions. These defined threshold values are detailed in the table below.

 ID
 Option 32 and 33
 Option 37

 6
 484
 368

 7
 375

 11
 325

Table 13 Queue Threshold (m)

Therefore, the operation of Harfreys Roundabout and Beccles Road/Southtown junction would be affected when the queues reach the lengths shown above.

Table 14 below shows the maximum queue for each scenario by 2023.

Table 14 2023 Max Queue (m) for Average Case Scenario and Worst Case Scenario

ACS 2023	Option 32	Option 33	Option 37
1	126	165	531
2	79	75	260
3	161	166	711
4	189	182	397
5	159	158	157
6	154	360	407
7	154	341	299
8	147	128	223
9	-	-	239
10	-	-	164
11	-	-	359
12	-	-	53

WCS 2023	Option 32	Option 33	Option 37
1	119	252	564
2	97	104	312
3	158	206	724
4	245	249	445
5	161	168	167
6	247	279	424
7	296	329	293
8	176	161	222
9	-	-	229
10	-	-	160
11	-	-	356
12	-	-	53

In order to facilitate the understanding of the tables above, a complementary graphic analysis has been carried out as well. Figures 19 to 24 show graphically the maximum length of queues for both scenarios and the three options in 2023.

Option 32. ACS 2023 Maximum queue lengths

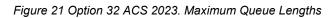
Legend
Maximum queue length

Figure 19 Option 32 ACS 2023. Maximum Queue Lengths

Option 32. WCS 2023 Maximum queue lengths

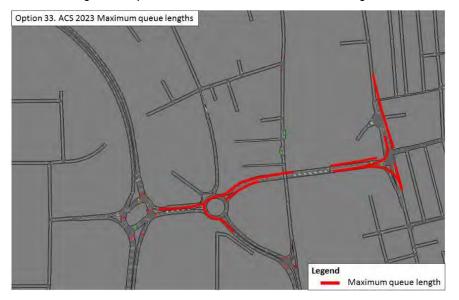
Option 32. WCS 2023 Maximum queue lengths

Figure 20 Option 32 WCS 2023. Maximum Queue Lengths



Legend

Maximum queue length

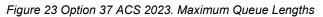


Option 33. WCS 2023 Maximum queue lengths

Legend

Maximum queue length

Figure 22 Option 33 WCS 2023. Maximum Queue Lengths





Option 37, WCS 2023 Maximum queue lengths

564 m

Legend

Maximum queue length

Figure 24 Option 37 WCS 2023. Maximum Queue Lengths

An inspection of the results shows that the shortest queues are produced by Option 32, whilst Option 37 generates the longest queues. In addition, the Worst Case Scenario generally causes longer queues due to the larger frequency and duration of the bridge openings.

The queue at location 6 in Option 33 almost reaches Harfreys roundabout and extends back towards Southtown Road. This means the operation of the proposed roundabout between Harfreys and Beccles Roads could be affected by bridge closures by 2023. Option 37 shows generally larger queues than the other options, with forecast queues reaching Harfreys Roundabout (queue locations 6 and 11).

Table 15 below shows the maximum queue for each scenario by 2038.

Table 15 2038 Max Queue (m) for Average Case Scenario and Worst Case Scenario

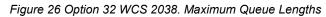
ACS 2038	Option 32	Option 33	Option 37
1	173	208	660
2	77	113	334
3	181	245	828
4	203	307	471
5	158	161	167
6	161	283 339	415
7	161		301
8	158	183	231
9	9 -		242
10			172
11	11 -		355
12	-	-	54

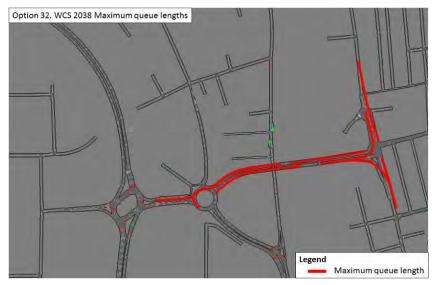
WCS 2038	Option 32	Option 33	Option 37
1	184	180	628
2	108	134	266
3	205	280	778
4	255	339	397
5	163	167	166
6	282	450	418
7	343	419	314
8	174	167	235
9	-	-	244
10	-	-	173
11	-	-	356
12	-	-	54

Figures 25 to 30 show graphically the maximum length of queues for both scenarios and the three options in 2038.



Figure 25 Option 32 ACS 2038. Maximum Queue Lengths



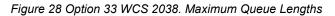


Option 33. ACS 2038 Maximum queue lengths

Legend

Maximum queue length

Figure 27 Option 33 ACS 2038. Maximum Queue Lengths



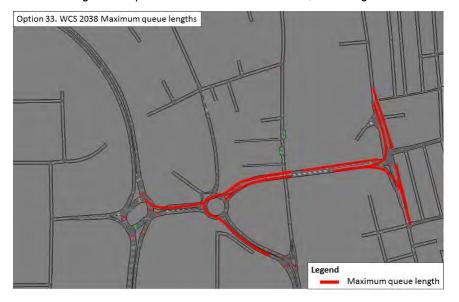
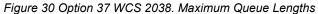




Figure 29 Option 37 ACS 2038. Maximum Queue Lengths





As expected, queue lengths increase between 2023 and 2038 in line with increases in demand. The table shows Option 32 has the shortest forecast queues while the bridge is closed to traffic. This is because Option 32 has two lanes in each direction on the bridge and therefore the capacity to stock and dissipate the queues is greater than that for Options 33 and 37.

The forecast queues in Option 33 do not reach Harfreys Roundabout in the Average Scenario, but do in the Worst Case Scenario. Option 37 shows longer queues than in 2023, reaching Harfreys Roundabout in both scenarios.

In summary, Option 32 shows the best results in terms of forecast queue lengths, and does not impact on the operation of Harfreys Roundabout and the junction of Beccles Road with Southtown Road. In addition, when queues 1 to 5 are compared, it can be

seen that the forecast queue lengths are longer in Options 33 and 37, which would result in more congestion and delays on the Peninsula compared with Option 32.

Further details regarding the build-up and dissipation of queues for each scenario, modelled period and year are included in Appendix F.

#### 4.4 Sectoral Analysis

The aim of this analysis is to disaggregate the benefits of the proposed Third River Crossing in terms of journey time and distance across the modelled area by location.

The sector by sector analysis has been undertaken by merging adjacent zones. The 119 zones within the Paramics Discovery model were grouped into 5 sectors. Three of them included Great Yarmouth Peninsula, Town Centre and the Northern Area of the town, while the last 2 merged the zones of the North of Gorleston and Southtown respectively.

The results were obtained for both forecast years (2023 and 2038) and scenarios (Average and Worst Case). The model outcomes were compared with the Do Minimum model of the corresponding year.

In parallel, a sector appraisal was carried out in TUBA (Transport User Benefit Appraisal), feeding the software with the SATURN model results. In order to maintain the similarity between both analyses, the chosen sectors in TUBA were adapted to the Paramics Discovery Zones.

Figure 31 and Figure 32 below show the TUBA sectors and the Paramics Discovery zones grouped in each sector.

And the second s

Figure 31 TUBA Sectors

SECTOR ZONE PLAN Legend Sector Zone Plan ☐ Peninsula South □ Town Centre Peninsula North Southtown Gorleston North

Figure 32 Paramics Sector Zone Plan

The outputs detailed in the following section refer to the average increase/reduction in journey times/distances for drivers travelling between sector pairs during the three modelled periods.

Table 16 and Table 17 show the 2023 Average Case Scenario results compared to the Do Minimum, with a negative value indicating savings of time and distances.

Table 16 ACS 2023. Do Minimum Travel Time Comparison

	Do Minimum Travel Time Difference (s)						
ACS 2023	<b>Gorleston North</b>	Peninsula North	Peninsula South	Southtown	Town Centre		
Option 32							
Gorleston North	0	-23	-259	-9	-76		
Peninsula North	-9	-5	1	-7	-3		
Peninsula South	-195	5	1	-69	23		
Southtown	-6	-14	-119	2	-30		
Town Centre	-26	-5	4	-13	1		
Option 33							
Gorleston North	0	-24	-258	-9	-74		
Peninsula North	-8	-6	1	-7	-3		
Peninsula South	-195	4	1	-64	22		
Southtown	-6	-15	-116	3	-29		
Town Centre	-24	-6	6	-12	1		
Option 37							
Gorleston North	-1	-15	-209	3	-49		
Peninsula North	10	-5	5	5	-2		
Peninsula South	-161	9	2	-7	21		
Southtown	10	-14	-83	6	-29		
Town Centre	12	-6	13	-4	2		

The results demonstrate substantial improvements in journey times with the Third River Crossing scheme in place. As expected, the largest reductions were observed in the trips between Peninsula South to Gorleston South, Gorleston North to Peninsula South Southtown and Peninsula South.

Nevertheless, since the proposed bridge will result in some drivers using new routes, the traffic levels and journey times between some sector pairs may increase slightly as a result. For instance, the journey time has slightly increased between Peninsula South and Peninsula North, and also between Town Centre and Peninsula South.

Table 17 ACS 2023. Do Minimum Travel Distance Comparison

	Do Minimum Travel Distance Difference (m)						
ACS 2023	<b>Gorleston North</b>	Peninsula North	Peninsula South	Southtown	Town Centre		
Option 32							
Gorleston North	0	-68	-2,242	-22	-491		
Peninsula North	-48	-2	9	-20	-4		
Peninsula South	-2,485	32	-4	-845	32		
Southtown	6	-7	-828	8	29		
Town Centre	-335	-2	27	1	0		
Option 33							
Gorleston North	0	-67	-2,227	-18	-489		
Peninsula North	-47	-2	2	-18	-5		
Peninsula South	-2,505	28	-2	-832	34		
Southtown	13	-9	-826	9	27		
Town Centre	-326	-5	24	4	-1		
Option 37							
Gorleston North	1	-70	-2,284	3	-493		
Peninsula North	-50	-1	2	-30	-6		
Peninsula South	-2,530	15	-4	-787	19		
Southtown	6	-14	-984	-4	-33		
Town Centre	-307	-5	15	-20	1		

In terms of journey distance comparisons, there is a strong correlation between the reduction/increase of journey times and distances.

Table 18 and Table 19 show the 2023 Worst Case Scenario results compared with the Do Minimum.

Table 18 WCS 2023. Do Minimum Travel Time Comparison

	Do Minimum Travel Time Difference (s)						
WCS 2023			Peninsula South	Southtown	<b>Town Centre</b>		
Option 32							
Gorleston North	0	-21	-233	-9	-63		
Peninsula North	-8	-4	3	-6	-4		
Peninsula South	-148	6	1	-46	21		
Southtown	-6	-10	-95	2	-25		
Town Centre	-16	-4	5	-10	1		
Option 33							
Gorleston North	0	-22	-225	-7	-62		
Peninsula North	-7	-5	2	-5	-3		
Peninsula South	-148	8	1	-43	23		
Southtown	-7	-12	-92	4	-25		
Town Centre	-15	-5	5	-9	1		
Option 37							
Gorleston North	0	-17	-158	3	-30		
Peninsula North	12	-7	7	4	-2		
Peninsula South	-60	15	2	47	26		
Southtown	13	-15	-39	7	-22		
Town Centre	32	-7	18	-2	1		

The Worst Case Scenario results show rather similar results when compared to the Average Case Scenario. However, the reductions in JT are lower since the bridge is opened more often and for longer durations.

Table 19 WCS 2023. Do Minimum Travel Distance Comparison

	Do Minimum Travel Distance Difference (m)						
WCS 2023	Gorleston North	Peninsula North	Peninsula South	Southtown	Town Centre		
Option 32							
Gorleston North	2	-54	-2,200	-25	-445		
Peninsula North	-37	-1	17	-13	-4		
Peninsula South	-2,408	26	3	-764	25		
Southtown	7	-2	-777	7	33		
Town Centre	-288	-5	21	6	1		
Option 33							
Gorleston North	2	-58	-2,096	-15	-434		
Peninsula North	-34	-3	3	-14	-5		
Peninsula South	-2,442	27	-6	-771	30		
Southtown	9	-6	-771	12	34		
Town Centre	-273	-2	13	6	-1		
Option 37							
Gorleston North	1	-56	-2,180	4	-447		
Peninsula North	-45	-4	5	-30	-4		
Peninsula South	-2,234	20	-5	-665	21		
Southtown	18	-11	-911	-3	-24		
Town Centre	-274	-5	19	-16	-3		

Similarly, the difference between the Journey Distance savings in both scenarios is not too large.

Table 20 and Table 21 show the 2038 Average Case Scenario results compared to the Do Minimum.

Table 20 ACS 2038. Do Minimum Travel Time Comparison

	Do Minimum Travel Time Difference (s)						
ACS 2038	<b>Gorleston North</b>	Peninsula North	Peninsula South	Southtown	<b>Town Centre</b>		
Option 32							
Gorleston North	0	-93	-314	-34	-142		
Peninsula North	-33	-24	-3	-28	-19		
Peninsula South	-225	-1	1	-82	25		
Southtown	-26	-79	-170	-18	-91		
Town Centre	-69	-41	-1	-43	-9		
Option 33							
Gorleston North	0	-92	-311	-33	-138		
Peninsula North	-27	-23	-3	-25	-20		
Peninsula South	-213	0	1	-77	24		
Southtown	-25	-83	-171	-21	-93		
Town Centre	-62	-43	-1	-41	-8		
Option 37							
Gorleston North	-1	-65	-241	-4	-94		
Peninsula North	5	-20	4	1	-14		
Peninsula South	-153	8	2	2	23		
Southtown	5	-66	-122	7	-77		
Town Centre	-3	-33	13	-19	-6		

The benefits resulting from the bridge have increased by 2038, reducing the journey times between some sector pairs by up to over five minutes per driver. In addition, the travel times of trips towards Southtown have reduced as a consequence of the reduction of congestion within town centre.

Table 21 ACS 2038. Do Minimum Travel Distance Comparison

	Do Minimum Travel Distance Difference (m)						
ACS 2038	<b>Gorleston North</b>	Peninsula North	Peninsula South	Southtown	<b>Town Centre</b>		
Option 32							
Gorleston North	-2	-54	-2,243	-14	-465		
Peninsula North	-62	-17	17	-38	-22		
Peninsula South	-2,548	35	0	-823	34		
Southtown	11	-43	-883	9	-32		
Town Centre	-359	-27	18	-2	-4		
Option 33							
Gorleston North	1	-54	-2,235	-17	-458		
Peninsula North	-60	-16	12	-30	-22		
Peninsula South	-2,517	36	2	-820	33		
Southtown	13	-52	-881	4	-38		
Town Centre	-355	-30	11	0	-3		
Option 37							
Gorleston North	-2	-61	-2,276	17	-460		
Peninsula North	-52	-15	14	-37	-20		
Peninsula South	-2,458	17	3	-738	18		
Southtown	19	-55	-1,020	11	-80		
Town Centre	-312	-21	10	-28	-7		

The journey distance comparison above shows similar reductions when compared with to the 2023 results. The main reason is because the distance between two different sectors depends on the route followed by drivers and so these values do not change significantly between 2023 and 2038.

The proposed Third River Crossing enables some drivers to avoid the congested zones of the A12 and Town Centre and other main roads. Thus, the scheme reduces the Journey Times compared with the Do Minimum.

Table 22 and Table 23 show the 2038 Worst Case Scenario results compared to the Do Minimum.

Table 22 WCS 2038. Do Minimum Travel Time Comparison

	Do Minimum Travel Time Difference (s)						
WCS 2038	<b>Gorleston North</b>	Peninsula North	Peninsula South	Southtown	<b>Town Centre</b>		
Option 32							
Gorleston North	0	-86	-279	-31	-125		
Peninsula North	-30	-22	-2	-26	-19		
Peninsula South	-170	2	1	-59	23		
Southtown	-24	-73	-141	-15	-83		
Town Centre	-54	-39	-1	-38	-9		
Option 33							
Gorleston North	0	-86	-269	-28	-124		
Peninsula North	-29	-23	-2	-28	-20		
Peninsula South	-165	5	2	-55	24		
Southtown	-21	-73	-141	-14	-82		
Town Centre	-49	-39	0	-38	-8		
Option 37							
Gorleston North	-1	-59	-182	2	-58		
Peninsula North	16	-23	5	8	-16		
Peninsula South	-27	16	3	82	34		
Southtown	25	-45	-38	33	-52		
Town Centre	27	-38	21	-12	-4		

The additional bridge openings in the worst case scenario have a relatively minor impact on travel time reductions compared with the average case, and still show significant reductions compared with the do minimum.

Table 23 WCS 2038. Do Minimum Travel Distance Comparison

	Do Minimum Travel Distance Difference (m)						
WCS 2038 Gorleston North		Peninsula North	Peninsula South	Southtown	Town Centre		
Option 32							
Gorleston North	-2	-40	-2,170	-14	-408		
Peninsula North	-57	-16	17	-27	-22		
Peninsula South	-2,445	34	2	-753	30		
Southtown	13	-40	-827	12	-33		
Town Centre	-303	-30	7	14	-3		
Option 33							
Gorleston North	-1	-35	-2,142	-13	-410		
Peninsula North	-52	-18	4	-29	-22		
Peninsula South	-2,462	43	7	-746	37		
Southtown	14	-42	-798	9	-31		
Town Centre	-287	-28	5	-1	-4		
Option 37							
Gorleston North	-1	-42	-2,168	17	-406		
Peninsula North	-49	-19	9	-43	-26		
Peninsula South	-2,222	20	-1	-589	33		
Southtown	31	-41	-932	20	-77		
Town Centre	-280	-27	15	-29	0		

A similar pattern is observed for travel distance savings

In summary, the largest journey time and distance reductions per vehicle have been obtained with Option 32, followed closely by Option 33 and finally, Option 37.

A graphic analysis sector by sector, as well as a detailed analysis by period and year, have been included in Appendix F.

#### 4.5 Forecast Traffic in Great Yarmouth

A forecast traffic analysis has been undertaken in order to study the impact of the new bridge on the main roads within the network. The traffic data was gathered during the peak hour for the following locations:

- Breydon Bridge.
- Haven Bridge.
- Great Yarmouth Third Bridge.
- A12 between Gapton Hall and Harfreys Rdbs.
- A12 between Beccles Rd and Harfreys Rdb.
- William Adams Way.
- Southtown Rd.
- Suffolk Rd.
- S Denes Rd on the North of the future bridge location.
- S Denes Rd on the South of the future bridge location.
- Acle New Road between Vauxhall and Fullers Hill Rdbs.
- Fullers Hill.
- North Quay.

- South Quay.
- Beccles Road.

The peak hour results of the model have been converted to AADT, flows, using expansion factors calculated from 2016 annual database of permanent traffic counts conducted by Highways England. Further details have been included graphically in Appendix F.

Table 24 and Table 25 show the forecast AADT flows crossing each bridge in 2023 in each scenario.

Table 24 Average Case Scenario. 2023 Bridge's AADT flows

	Site	Do Min	Option 32	Option 33	Option 37
	Breydon Bridge	34,503	32,188	32,180	32,143
	GY3RC	0	12,586	12,504	12,321
Ī	Haven Bridge	30,540	20,364	20,470	20,606

Table 25 Worst Case Scenario. 2023 Bridge's AADT flows

Site	Do Min	Option 32	Option 33	Option 37
Breydon Bridge	34,503	32,105	32,382	32,148
GY3RC	0	12,577	12,241	12,001
Haven Bridge	30,540	20,651	20,639	20,872

The results show Option 32 has more traffic crossing the new bridge and reduces the number of vehicles using the existing Breydon and Haven bridges. The traffic crossing the proposed Third Crossing in the Worst Case Scenario is lower than in the Average Case Scenario since the duration and the number of times the bridge is closed to traffic is greater. It is observed that some vehicles are rerouting when the new bridge is lifted and using the existing bridges to complete their trips.

The number of vehicles rerouting and crossing Haven and Breydon bridges in Option 33 is greater than in Option 37. The main reason for this behaviour is due to the roundabout of the Option 33 between Southtown and Harfreys Roundabout which allows more route choices than Option 37.

Figure 33 and Figure 34 show forecast AADT at by 2023 for each scenario.

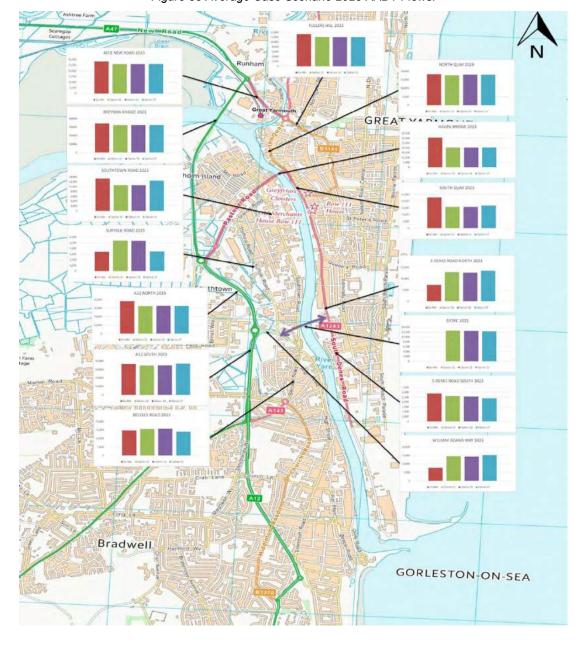


Figure 33 Average Case Scenario 2023 AADT Flows.

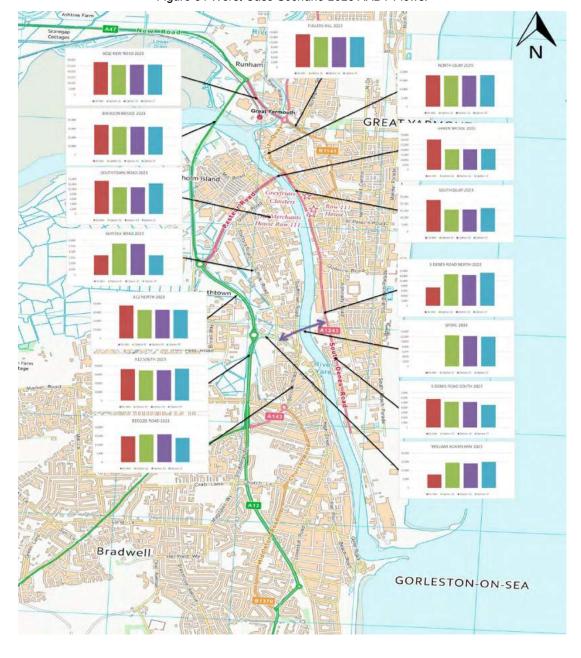


Figure 34 Worst Case Scenario 2023 AADT Flows.

The model forecasts a reduction in traffic flows crossing the city centre through South Quay, Haven Bridge, Acle New Road and Fullers Hill in both scenarios. The Option 32 and 33 results indicate that the traffic flows along William Adams Way and Beccles Road would increase as a consequence of the construction of the Third River Crossing whereas the traffic on Haven Bridge and the A12 would decrease.

Option 37 shows the same effect on William Adams Way, however the model predicts that traffic would increase on the A12 between Beccles New Road and Harfreys Roundabout and decrease along Beccles New Road. This behaviour is caused by congestion at the western junction of the Option 37 layout when the bridge is closed to traffic, resulting in drivers choosing the A12 route instead of Beccles Road.

Southtown Road traffic would decrease and traffic on Suffolk Road would increase in Option 32 and 33 while the distribution of vehicles in Option 37 is similar to the Do Minimum. This is because the vehicles arriving from the Peninsula can access Suffolk Road directly from the new roundabout under Options 32 and 33. Option 37 does not allow this movement without driving through Harfreys Roundabout and the connection with Southtown Rd encourages drivers travelling towards the north to choose this route.

Table and Table 26 show the forecast traffic for AM, IP and PM crossing each bridge by 2038 in each scenario.

Do Min Option 32 Site Option 33 Option 37 Breydon Bridge 37,520 35,290 35,369 34,856 GY3RC 0 14,950 14,623 14,290 23,593 Haven Bridge 36,123 23,416 24,218

Table 26 Average Case Scenario. 2038 Bridges' AADT

Table 26 Worst Case Scenario. 2038 Bridges' AADT

Site	Do Min	Option 32	Option 33	Option 37			
Breydon Bridge	37,520	35,603	35,667	34,816			
GY3RC	0	14,651	14,308	14,072			
Haven Bridge	36,123	23,557	23,885	24,578			

The results suggest that Option 32 is more effective than the other two options in reducing the traffic levels on Breydon and Haven bridges.

Similar to the 2023 demand scenario, more vehicles are forecast to cross the Third River Crossing in the Average Case Scenario than in the Worst Case Scenario.

The number of vehicles rerouting has slightly increased compared with the 2023 scenarios because the flows across the proposed Third River Crossing have increased as well. However, the difference is lower in Option 37 than the other options. This is

because in Option 32 and 33 the vehicles can easily reroute on either side of the River Yare whereas the increased congestion forecast for Option 37 deters this.

The traffic flow analysis across the network was repeated for 2038. The results obtained show a parallel distribution of traffic among the different roads and models as the traffic profiles shown in 2023.

Figure 35 and Figure 36 show forecast AADT on various roads across the network for 2038 in each scenario.

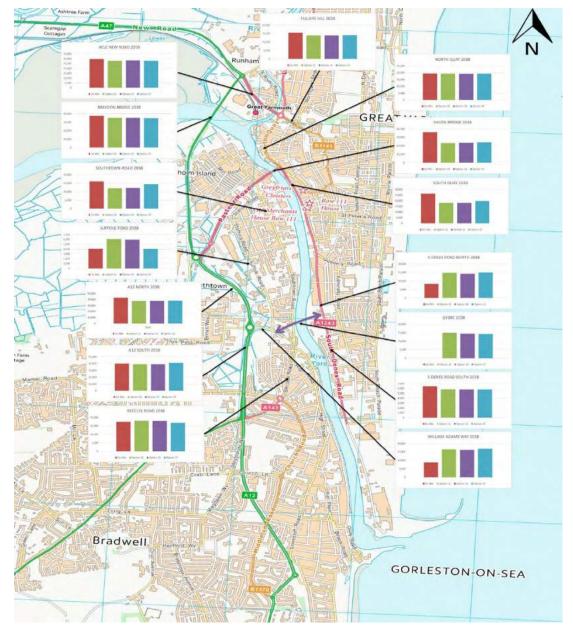


Figure 35 Average Case Scenario 2038 AADT Flows.

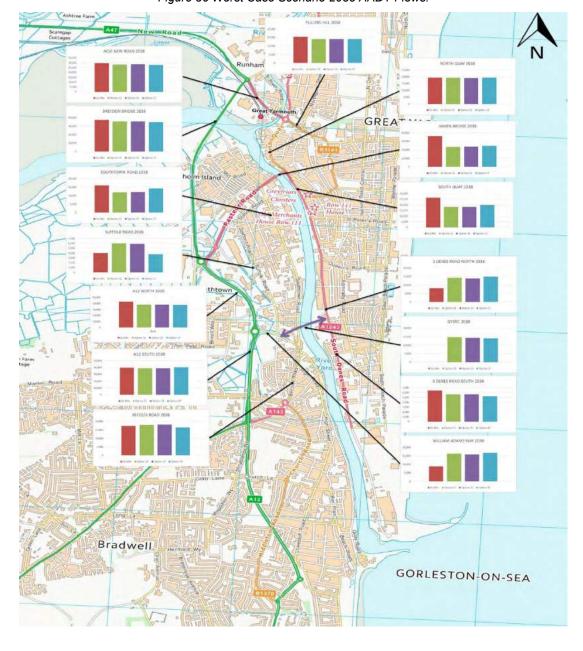


Figure 36 Worst Case Scenario 2038 AADT Flows.

#### 5 Conclusions

The proposed Third River Crossing, in combination with signal optimisation and the other improvements included in the do minimum will provide significant benefits to the town centre and wider area.

Each option is forecast to reduce the level of congestion, delays and queues in Great Yarmouth town centre. Nevertheless, Option 32 demonstrates the best performance overall, reducing queue lengths, journey times and distances when compared with the other options. In addition, the largest forecast traffic flows across the proposed Third River Crossing is produced by Option 32.

The Third River Crossing is forecast to reduce journey times and distance between different locations across Great Yarmouth and the surrounding area. The number of heavy vehicles travelling through the town centre would be reduced, since the scheme will provide a direct access to the main industrial areas of Great Yarmouth on the south of the Peninsula and between the peninsula and Harfreys Industrial Estate and the strategic road network to the west.

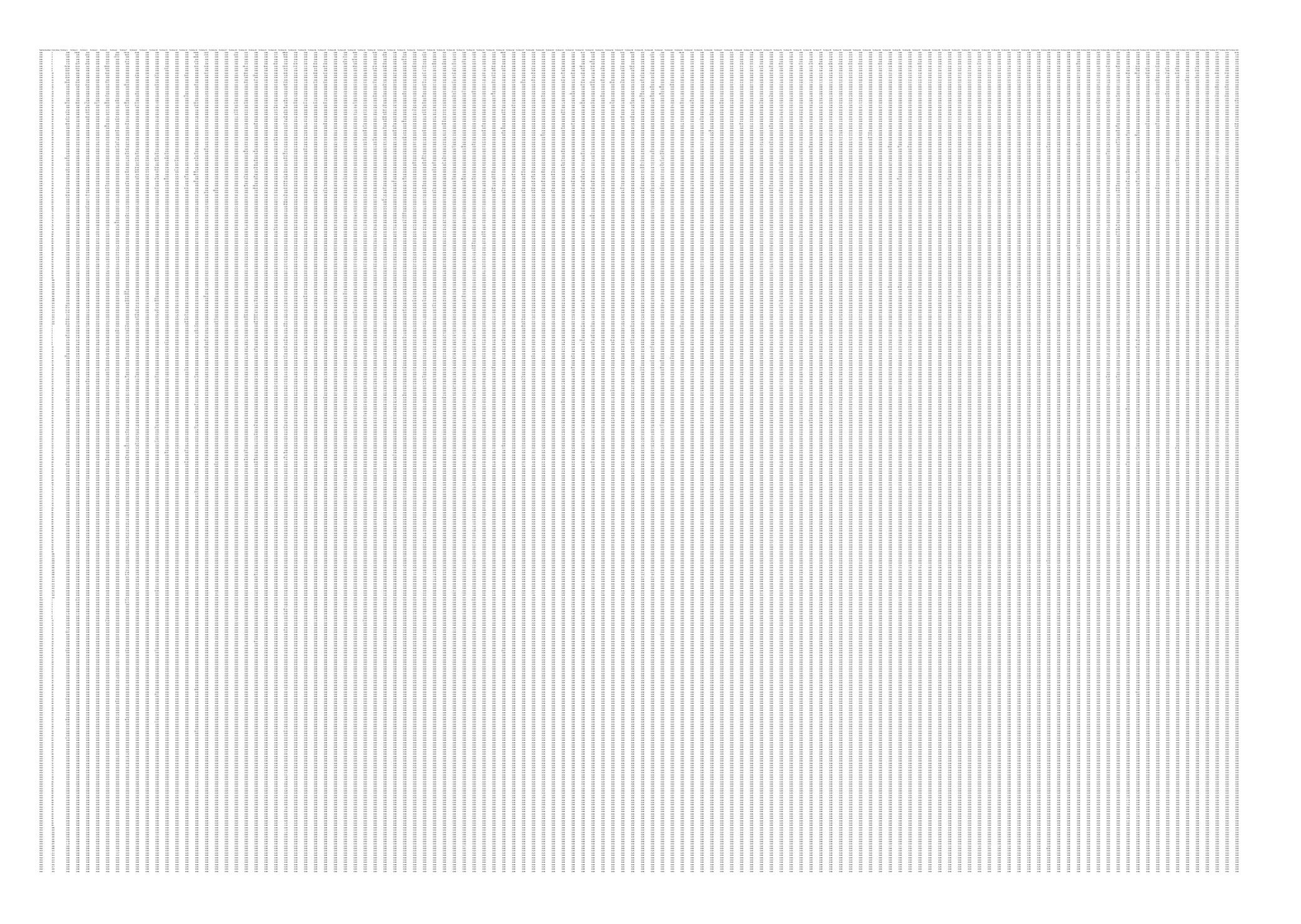
The proposed Third River Crossing is forecast to attract traffic mainly from the A12 and the town centre, therefore freeing up future capacity.

#### **APPENDIX A. Forecast Matrices**

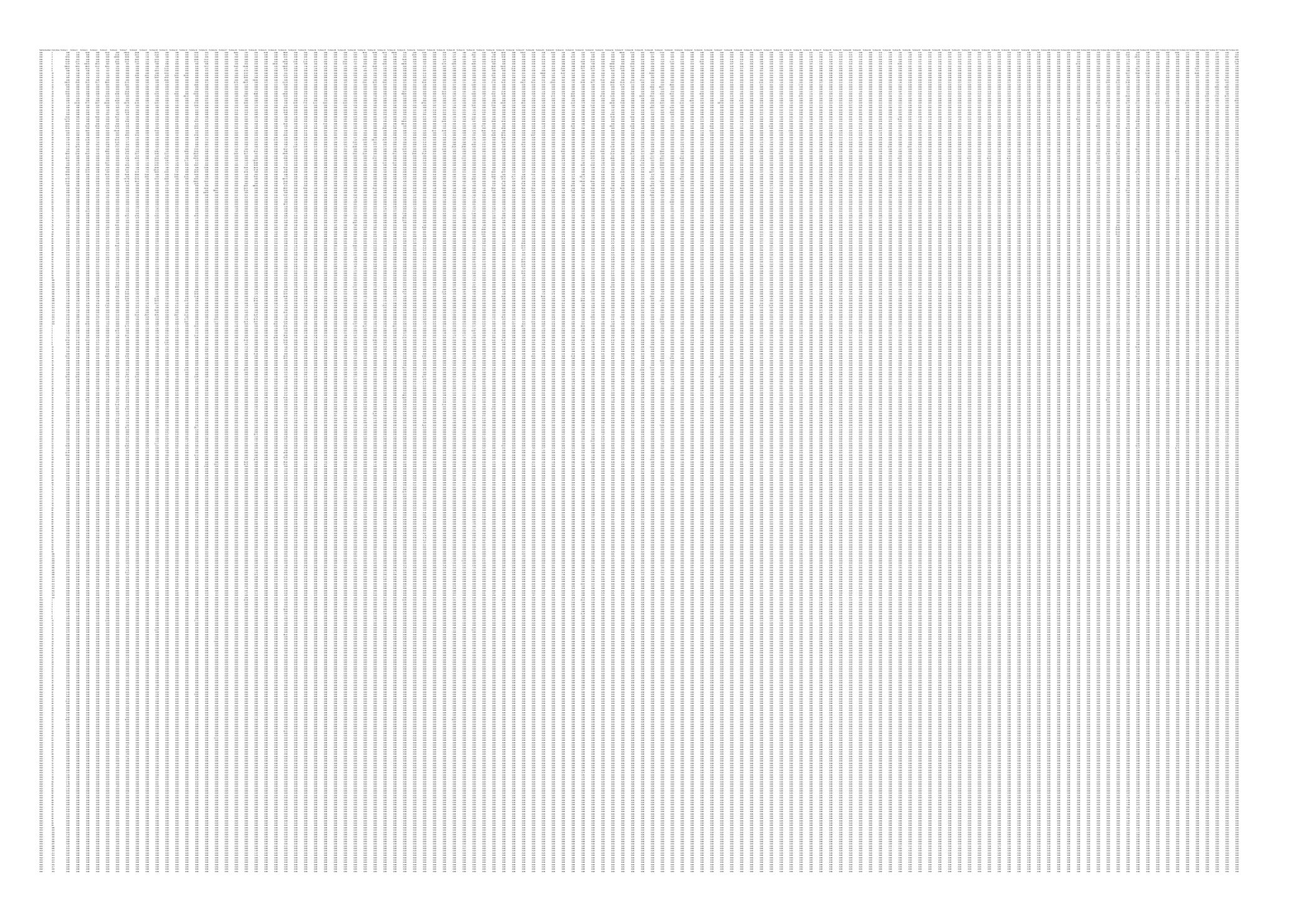
### APPENDIX A\_1. AM 2023 Forecast Matrices

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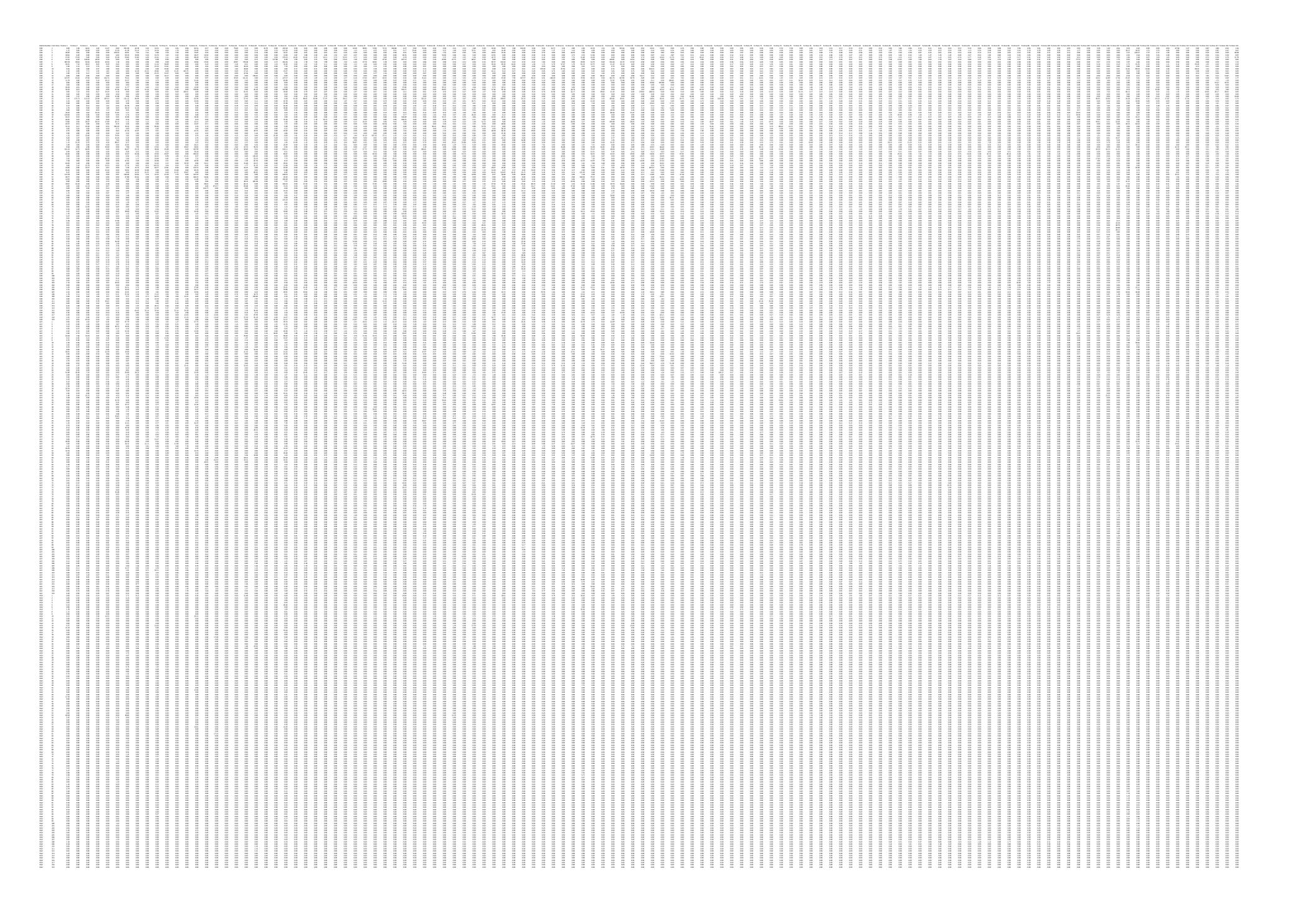
#### APPENDIX A\_2. AM 2038 Forecast Matrices



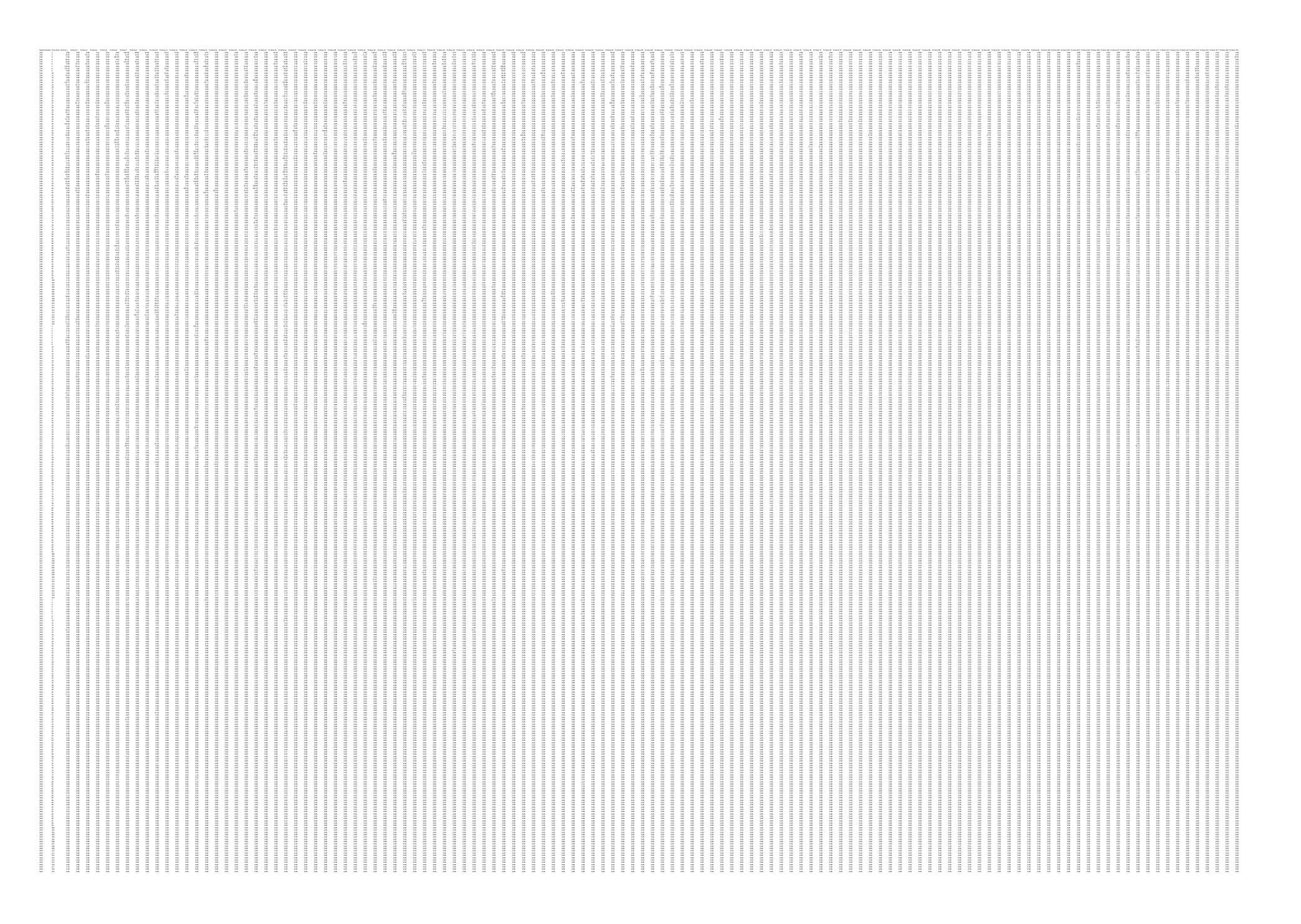
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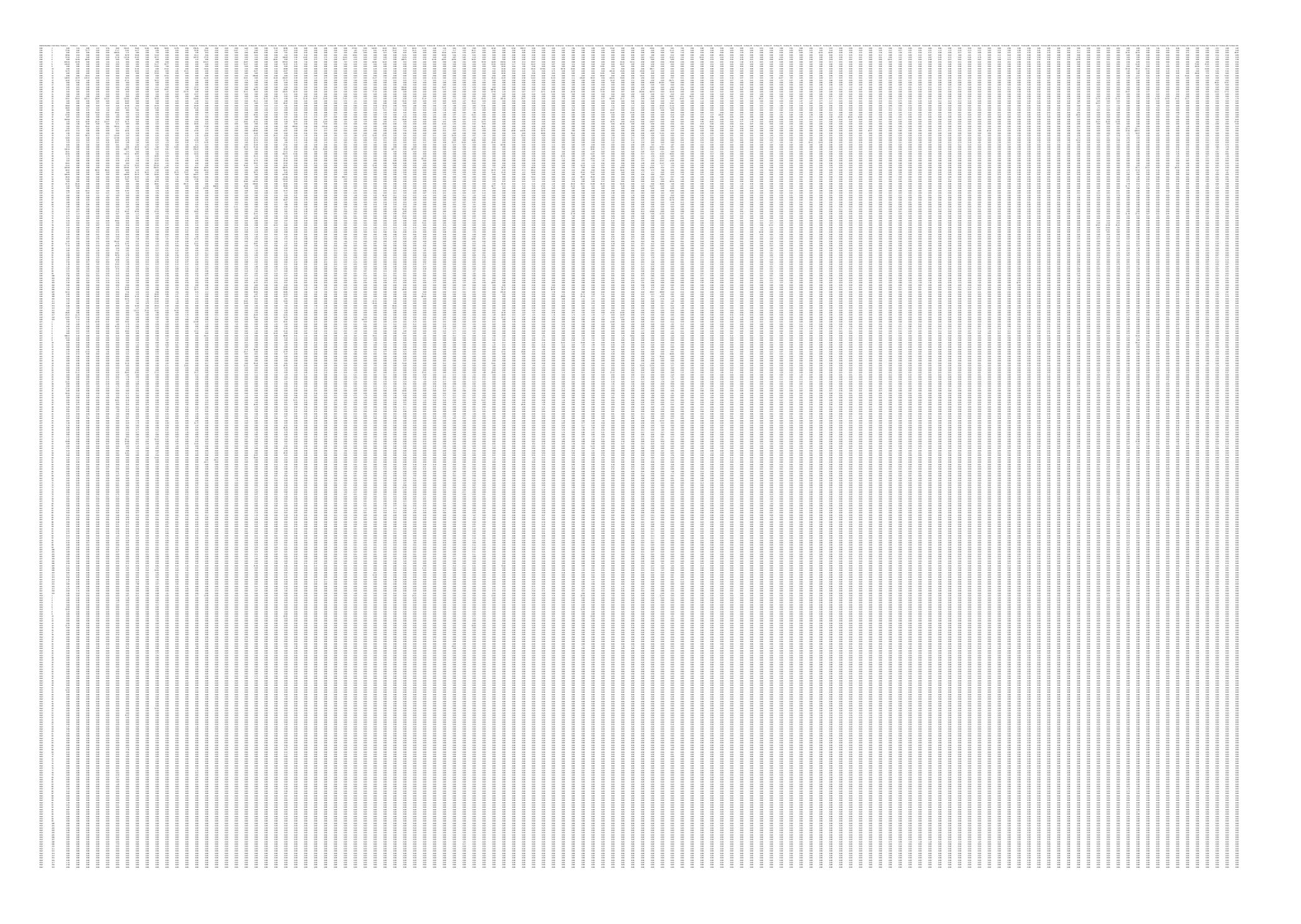
# APPENDIX A\_4. IP 2038 Forecast Matrices



# APPENDIX A\_5. PM 2023 Forecast Matrices



# APPENDIX A\_6. PM 2038 Forecast Matrices



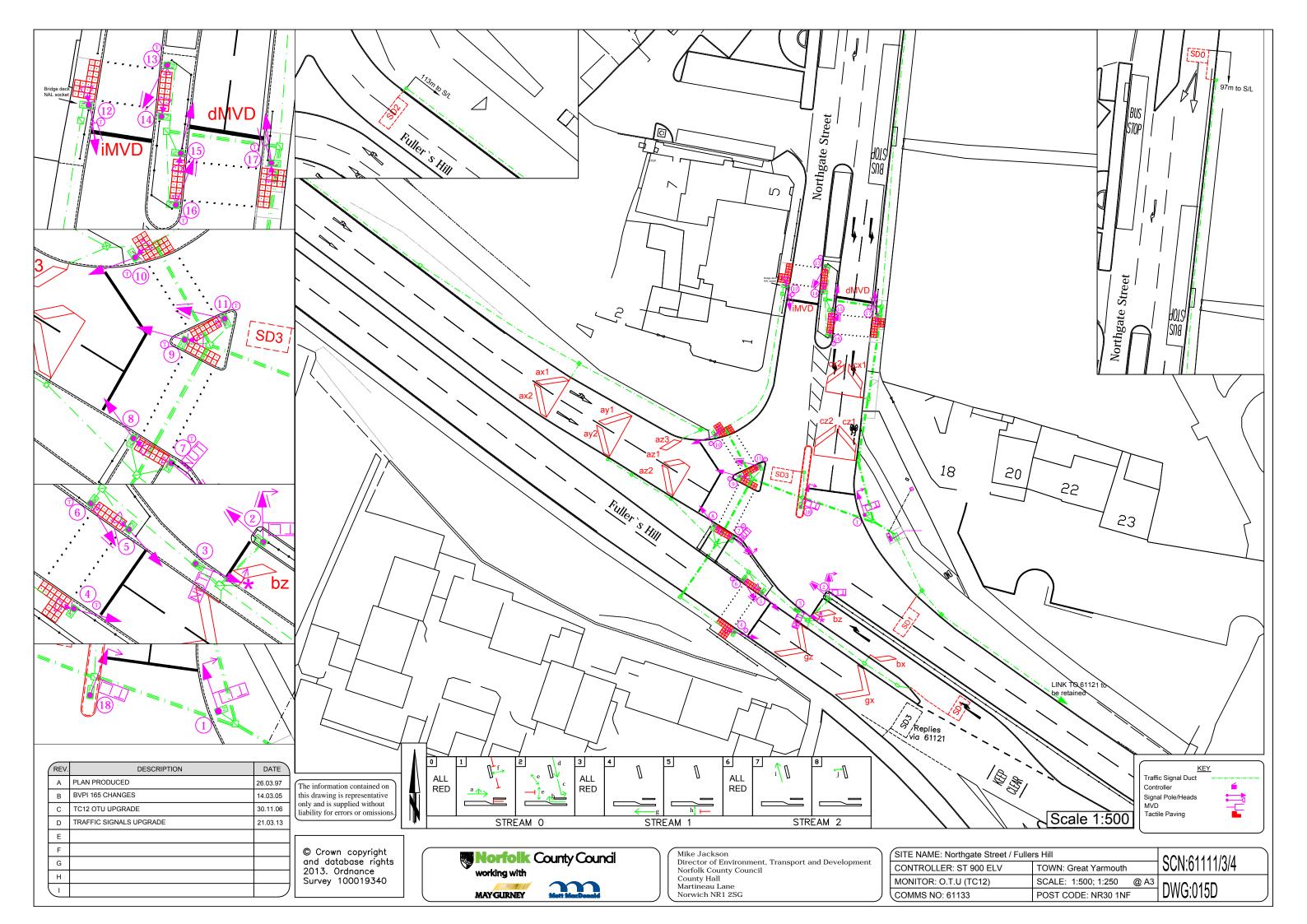
#### APPENDIX B. Vessel Movement Data

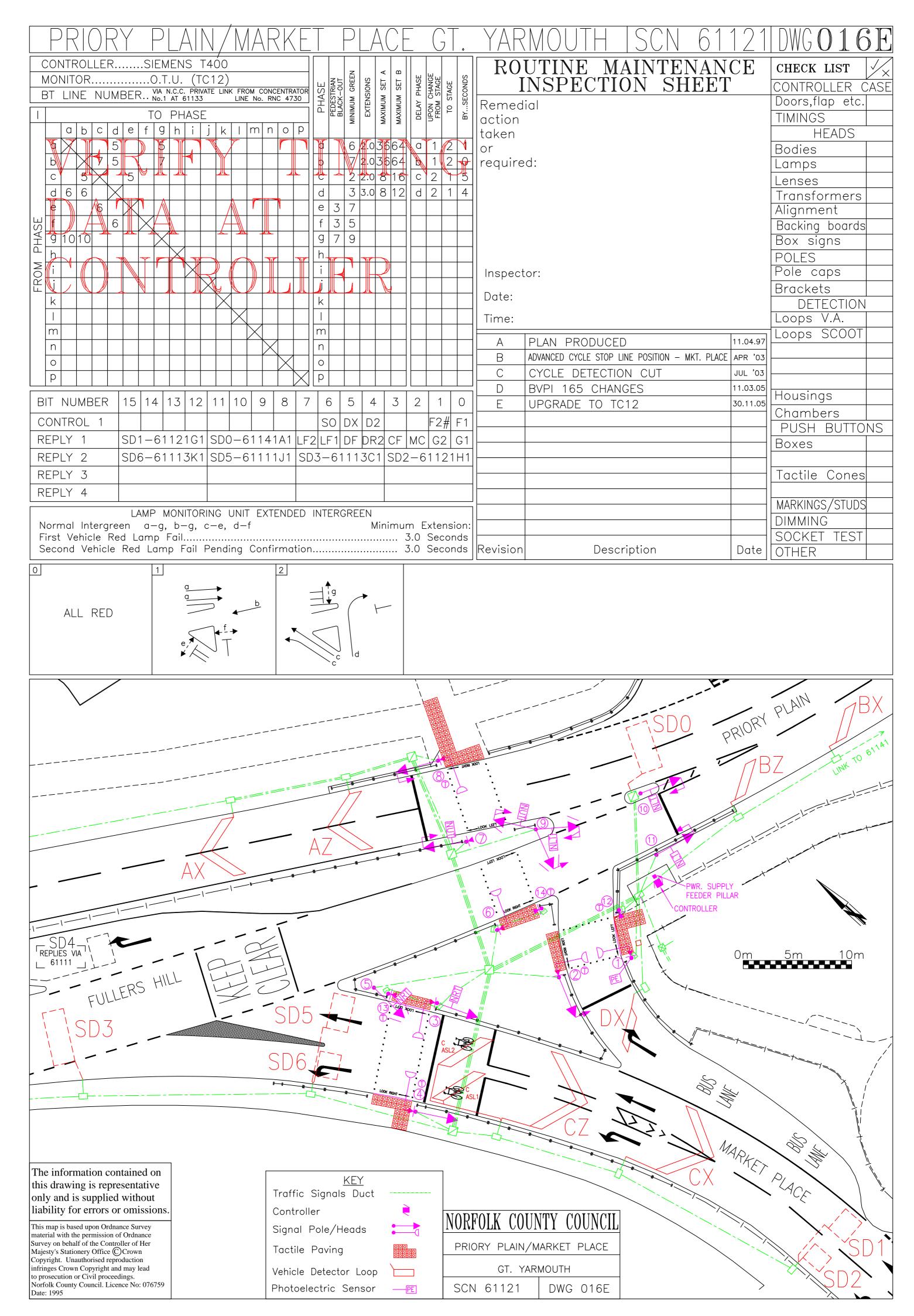
Day Type Low Day Low Day	Pattern 1	ID 45687 45689	Movement Class DEPARTURE DEPARTURE	Vessel Name CHARLOTTE ICENI VENTURE	GRT 19 101	1.30 3.20	ALI	13.6 23	CLASS FVL WBT	21H 29A	08:48:00	Date 25/04/2015 25/04/2015	Bridge Lift 1	Operation 230 230	26.31 44.49	Approach 0.00 0.00	4.27 4.57	05:57:00 08:48:00	
Low Day Low Day Low Day Low Day Low Day	1 1 2 2	45693 45694 45696 51213 51214	SHIFT ARRIVAL ARRIVAL ARRIVAL DEPARTURE	BIBBY TETHRA ICENI VENTURE LORE PRAHM PUTFORD TERMINATOR EASTERN AURA	134 101 1156 1504 30	3.00 3.20 3.40 4.50 0.90	OWN ALI CPS ASC EON	27.5 23 58 65.2 16	SUR WBT GEN SBY WSV	21F 29A 25 31A 15	10:43:00 10:51:00 15:44:00 01:26:00 07:51:00	25/04/2015 25/04/2015 25/04/2015 29/02/2016 29/02/2016	1 1 1 1	230 230 230 230 230	53.19 44.49 112.19 126.13 30.95	0.00 0.00 64.37 92.26 0.00	4.72 4.57 6.78 7.47 4.35	15:44:00 01:26:00	
Low Day Low Day Low Day Low Day	2 2 2 2	51215 51222 51223 51227	SHIFT ARRIVAL DEPARTURE ARRIVAL	PUTFORD TRADER  DALBY TRENT  DALBY TRENT  EASTERN AURA	40 40 30	5.00 1.80 1.80 0.90	ASC ALI ALI EON	20 20 16	SBY WBT WBT WSV	31C 29A 29A 15	08:34:00 13:26:00 13:54:00 16:01:00	29/02/2016 29/02/2016 29/02/2016 29/02/2016	1 1 1 1	230 230 230 230	123.04 38.68 38.68 30.95	86.07 0.00 0.00 0.00	7.32 4.48 4.48 4.35	13:54:00 16:01:00	13:58:29 16:05:21
Low Day Low Day Low Day Low Day Low Day	2 2 3 3	51229 51232 48591 48597 48598	SHIFT DEPARTURE DEPARTURE DEPARTURE ARRIVAL	PUTFORD TERMINATOR PUTFORD TRADER SEACAT RESOLUTE EASTERN GALENE NORFOLK TERN	1504 1329 74 9 42	4.50 5.20 1.30 0.90 1.80	ASC ASC ALI EON	65.2 63.6 22 12	SBY SBY WBT WBT	31A 31C 29A 15	18:03:00 20:23:00 03:30:00 08:03:00 09:01:00	29/02/2016 29/02/2016 18/09/2015 18/09/2015 18/09/2015	1 1 1 1	230 230 230 230 230	126.13 123.04 42.55 23.21 32.88	92.26 86.07 0.00 0.00 0.00	7.47 7.32 4.54 4.22 4.38		20:30:19 03:34:33
Low Day Low Day Low Day Low Day	3 3 3	48600 48601 48605 48606	SHIFT DEPARTURE ARRIVAL SHIFT	MALAVIYA TWENTY NORFOLK TERN EASTERN GALENE VOS FAMOUS	2151 42 9 1325	4.20 1.80 0.90 4.20	PET EON EON SEL	72.2 17 12 50	SUP WBT WBT SUP	31B 15 15 21C	11:59:00 12:24:00 15:07:00 16:15:00	18/09/2015 18/09/2015 18/09/2015 18/09/2015	1 1 1	230 230 230 230	139.65 32.88 23.21 96.71	119.30 0.00 0.00 33.42	8.15 4.38 4.22 6.00	15:07:00 16:15:00	12:07:09 12:28:23 15:11:13 16:21:00
Average Day Average Day Average Day Average Day	3 1 1 1	48608 34695 34698 34697 34700	SHIFT ARRIVAL ARRIVAL DEPARTURE DEPARTURE	PUTFORD ARTEMIS  LEONID LEONOV  PUTFORD ATHENA  EASTERN AURA  HEIDI JANE	1190 2506 1188 30 0	4.70 4.10 4.70 0.90 0.50	PET GYL ASC EON	60 89.5 58.2 16 9	SBY GEN SBY WBT FVL	31A 14A 31C 15 23C		13/11/2013	1 1 1 1	230 230 230 230 230	115.96 173.11 112.65 30.95 17.41	71.91 186.23 65.30 0.00 0.00	6.96 9.82 6.80 4.35 4.12	06:26:00 07:22:00	06:35:49 07:28:48
Average Day Average Day Average Day Average Day Average Day	1 1 1 1	34702 34701 34704 34706	ARRIVAL DEPARTURE ARRIVAL ARRIVAL	HEIDI JANE SPIRIT OF HOTON SPIRIT OF HOTON EASTERN AURA	0 45 45 30	0.50 1.00 1.00 0.90	OWN ALI ALI EON	9 17.2 17.2	FVL WBT WBT	23C 29D 29D 15	11:33:00 11:49:00 13:40:00	13/11/2013 13/11/2013 13/11/2013 13/11/2013	1 1 1 1	230 230 230 230 230	17.41 17.41 33.27 33.27 30.95	0.00 0.00 0.00 0.00	4.12 4.39 4.39 4.35	11:33:00 11:49:00 13:40:00	11:37:07 11:53:23
Average Day Average Day Average Day Average Day	1 1 1 1 2	34707 34708 34709 34713	ARRIVAL ARRIVAL SHIFT ARRIVAL ARRIVAL	SOUTH WIND RV DISCOVERY PUTFORD ATHENA MANA	0 87 1188 2193	1.00 3.00 4.80 4.50	FUG ASC ASC	10 24 58.2 74 89.5	RVL SBY SUP	23A 21H 31C 21B 14A	17:23:00 17:57:00 23:02:00	13/11/2013 13/11/2013 13/11/2013	1 1 1 1	230 230 230 230 230	19.34 46.42 112.65 143.13	0.00 0.00 65.30 126.27	4.16 4.61 6.80 8.32	17:23:00 17:57:00 23:02:00	23:10:19
Average Day Average Day Average Day Average Day Average Day	2 2 2 2	34695 34698 34697 34700 34702	ARRIVAL  ARRIVAL  DEPARTURE  DEPARTURE  ARRIVAL	PUTFORD ATHENA EASTERN AURA HEIDI JANE HEIDI JANE	2506 1188 30 0	4.10 4.70 0.90 0.50 0.50	ASC EON OWN	58.2 16 9	GEN SBY WBT FVL	31C 15 23C 23C	07:22:00 07:53:00 09:42:00	13/11/2013 13/11/2013 13/11/2013 13/11/2013 13/11/2013	1 1 1 1	230 230 230 230 230	173.11 112.65 30.95 17.41 17.41	186.23 65.30 0.00 0.00 0.00	9.82 6.80 4.35 4.12 4.12	07:22:00 07:53:00 09:42:00	07:28:48 07:57:21 09:46:07
Average Day Average Day Average Day	2 2 2 2	34701 34704 34706 34707	DEPARTURE ARRIVAL ARRIVAL ARRIVAL	SPIRIT OF HOTON SPIRIT OF HOTON EASTERN AURA SOUTH WIND	45 45 30 0	1.00 1.00 0.90 1.00	ALI ALI EON OWN	17.2 17.2 16 10	WBT WBT WBT FVL	29D 29D 15 23A	13:40:00 15:55:00 17:08:00	13/11/2013 13/11/2013 13/11/2013 13/11/2013	1 1 1 1	230 230 230 230	33.27 33.27 30.95 19.34	0.00 0.00 0.00 0.00	4.39 4.39 4.35 4.16	13:40:00 15:55:00 17:08:00	11:53:23 13:44:23 15:59:21 17:12:09
Average Day Average Day Average Day Average Day Average Day	2 2 2 3 3	34708 34709 34713 40819 40823	ARRIVAL SHIFT ARRIVAL ARRIVAL SHIFT	RV DISCOVERY PUTFORD ATHENA MANA PINTA FS TAURUS	87 1188 2193 2190 2610	3.00 4.80 4.50 3.20 4.00	ASC ASC CPS RWE	24 58.2 74 82 81.9	SBY SUP GEN SUP	21H 31C 21B 27A 21B	23:02:00	13/11/2013 13/11/2013 13/11/2013 04/09/2014 04/09/2014	1 1 1 1	230 230 230 230 230	46.42 112.65 143.13 158.61 158.41	0.00 65.30 126.27 157.21 156.83	4.61 6.80 8.32 9.10 9.09	17:57:00 23:02:00	18:03:48
Average Day Average Day Average Day Average Day	3 3 3	40825 40824 40829 40832	ARRIVAL DEPARTURE DEPARTURE ARRIVAL	PUTFORD SHORE EASTERN GALENE HAVEN CRUISER HAVEN CRUISER	638 9 0	3.70 0.90 1.00 1.00	SMI EON OWN	48.8 12 13 13	SBY WBT FVL FVL	31C 15 21H 21H	07:10:00 07:51:00 09:11:00 11:35:00	04/09/2014 04/09/2014 04/09/2014 04/09/2014	1 1 1	230 230 230 230	94.39 23.21 25.15 25.15	28.78 0.00 0.00 0.00	5.89 4.22 4.25 4.25	09:11:00 11:35:00	09:15:15 11:39:15
Average Day Average Day Average Day Average Day Average Day	3 3 3 3	40833 40834 40835 40836 40841	SHIFT DEPARTURE DEPARTURE DEPARTURE ARRIVAL	MTS INDUS MINERVA HIGHLAND LAIRD SMIT SPEY MINERVA	202 2305 96 202	3.60 2.00 4.20 1.60 2.00	OWN OWN SEL ALI OWN	25.6 49 72 27.8 49	PAS SUP ASR PAS	21C 21C 31E 29D 21C	12:29:00 13:33:00 15:25:00 15:28:00 15:40:00	04/09/2014 04/09/2014 04/09/2014 04/09/2014 04/09/2014	1 1 1 1	230 230 230 230 230	49.42 94.78 139.26 53.69 94.78	0.00 29.56 118.53 0.00 29.56	4.66 5.91 8.13 4.73 5.91	13:33:00 15:25:00	13:38:54 15:37:51
Average Day Average Day Average Day Average Day	3 3 3	40837 40839 40840 40844	DEPARTURE ARRIVAL DEPARTURE DEPARTURE	MTS INDUS EASTERN GALENE WATERFALL MINERVA	104 9 35 202	3.60 0.90 1.60 2.00	OWN EON GSL OWN	25.6 12 16 49	TUG WBT SUR PAS	21C 15 29A 21C	15:49:00 15:50:00 16:28:00 18:17:00	04/09/2014 04/09/2014 04/09/2014 04/09/2014	1 1 1 1	230 230 230 230 230	49.42 23.21 30.95 94.78	0.00 0.00 0.00 29.56	4.66 4.22 4.35 5.91	15:49:00	15:57:53 16:32:21
Average Day Average Day Average Day High Day High Day	3 3 1 1	40845 40848 40852 53828 53829	DEPARTURE ARRIVAL ARRIVAL SHIFT DEPARTURE	PUTFORD SHORE HIGHLAND LAIRD MINERVA MCS BLUE NORTHER MCS BLUE NORTHER	2305 202 107 107	3.50 4.20 2.00 2.10 2.10	SMI SEL OWN DEN DEN	48.8 72 49 25.8 25.8	SBY SUP PAS WBT	31C 31B 21C 21F 16A	18:19:00 18:27:00 20:39:00 06:04:00 06:46:00	04/09/2014 04/09/2014 04/09/2014 28/06/2016	1 1 1 1	230 230 230 230 230	94.39 139.26 94.78 49.81 49.81	28.78 118.53 29.56 0.00 0.00	5.89 8.13 5.91 4.66 4.66	06:04:00	18:36:55 20:44:54 06:08:40 06:50:40
High Day High Day High Day High Day	1 1 1 1	53835 53834 53832 53836	ARRIVAL SHIFT DEPARTURE DEPARTURE	HAVEN SUPPORTER MPI NAPOLEON EASTERN AURA DALBY SWALE	25 56 30 40	2.30 1.20 0.90 1.10	R7M DOW EON GSL	13.1 21.9 16 23	TUG WBT WSV WSV	24A 21F 15 16A	07:32:00 07:53:00 08:00:00 08:49:00	28/06/2016 28/06/2016 28/06/2016 28/06/2016	1 1 1 1	230 230 230 230	25.30 42.26 30.95 44.49	0.00 0.00 0.00 0.00	4.25 4.54 4.35 4.57	07:32:00 07:53:00 08:00:00 08:49:00	07:36:15 07:57:32
High Day High Day High Day High Day High Day High Day	1 1 1 1	53839 53838 53841 53844 53845	ARRIVAL DEPARTURE SHIFT DEPARTURE DEPARTURE	EN AVANT 9 HAVEN CRUISER HAVEN SEAVOYAGER HAVEN SUPPORTER HAVEN SEAVOYAGER	134 0 260 25 260	3.40 0.90 0.60 2.30 0.60	OWN OWN NUT R7M SEL	23 13 34 13.1 34	FVL BGE TUG BGE	21C 21H 30A 24A 24A	09:24:00 09:41:00 10:55:00 13:27:00 13:27:00	28/06/2016 28/06/2016 28/06/2016 28/06/2016 28/06/2016	1 1 1 1	230 230 230 230 230	44.49 25.15 65.76 25.30 65.76	0.00 0.00 0.00 0.00 0.00	4.57 4.25 4.93 4.25 4.93	09:24:00 09:41:00 10:55:00 13:27:00	09:28:34 09:45:15 10:59:56 13:36:11
High Day High Day High Day High Day High Day	1 1 1 1	53848 53846 53847 53851	ARRIVAL DEPARTURE DEPARTURE ARRIVAL	HAVEN SEAVOTAGER  HAVEN CRUISER  DALBY OUSE  OFFSHORE WENDUINE  DALBY SWALE	0 99 66 40	1.00 1.40 1.30 1.10	OWN ALI CPS GSL	13 26.7 25.1 23	FVL WSV WBT WSV	21H 29A 21F 16A	14:30:00 14:36:00 14:36:00 15:15:00	28/06/2016 28/06/2016 28/06/2016 28/06/2016	1 1 1 1 1	230 230 230 230 230	25.15 51.64 48.63 44.49	0.00 0.00 0.00 0.00	4.95 4.25 4.69 4.64 4.57	14:30:00 14:36:00 15:15:00	14:34:15
High Day High Day High Day High Day	1 1 1 1	53850 53849 53852 53854	ARRIVAL DEPARTURE SHIFT ARRIVAL	DALBY OUSE EN AVANT 9 VOS FAIRNESS EASTERN AURA	99 134 1325 30	1.40 3.40 4.20 0.90	ALI OWN SEL EON	26.7 23 50 16	WSV TUG OSV WSV	29A 21C 21A 15	15:16:00 15:37:00 15:52:00 16:17:00	28/06/2016 28/06/2016 28/06/2016 28/06/2016	1 1 1 1	230 230 230 230	51.64 44.49 96.71 30.95	0.00 0.00 33.42 0.00	4.69 4.57 6.00 4.35	15:37:00 15:52:00 16:17:00	15:25:16 15:41:34 15:58:00 16:21:21
High Day High Day High Day High Day High Day High Day	1 1 1 1	53855 53856 53862 53864 53865	ARRIVAL SHIFT ARRIVAL ARRIVAL ARRIVAL	MCS BLUE NORTHER MCS BLUE NORTHER DIAN KINGDOM DALBY WHARFE OFFSHORE WENDUINE	107 107 365 65 66	2.10 2.10 4.90 1.00 1.13	DEN DEN OWN ALI CPS	25.8 25.8 30 19 25.1	WBT WBT TUG WSV WBT	16A 16A 21C 29A 16A	16:40:00 17:15:00 17:42:00 18:42:00 19:36:00	28/06/2016 28/06/2016 28/06/2016 28/06/2016 28/06/2016	1 1 1 1	230 230 230 230 230	49.81 49.81 58.03 36.75 48.63	0.00 0.00 0.00 0.00 0.00	4.66 4.66 4.80 4.45 4.64		17:46:48 18:46:27
High Day High Day High Day High Day	1 1 1	53866 53868 53872 53871	ARRIVAL DEPARTURE ARRIVAL DEPARTURE	MPI NAPOLEON DALBY WHARFE DALBY WHARFE DALBY WHARFE	56 65 65	1.40 1.30 1.30 1.30	ALI ALI ALI	21.9 19 19 19	WBT WSV WSV	21F 29A 29A 29A	20:24:00 22:28:00 22:41:00 23:02:00	28/06/2016 28/06/2016 28/06/2016 28/06/2016	1 1 1	230 230 230 230	42.26 36.75 36.75 36.75	0.00 0.00 0.00 0.00	4.54 4.45 4.45 4.45	23:02:00	20:28:32 22:32:27 22:45:27 23:06:27
High Day High Day High Day High Day High Day High Day	1 2 2 2 2	53873 21261 21262 21263 21264	ARRIVAL DEPARTURE ARRIVAL DEPARTURE ARRIVAL	DALBY WHARFE KONINGIN JULIANA FREYJA VIKING AURELIA VOE EARL	65 672 2596 742 200	4.30 4.60 4.60 3.70	ALI CPS ASC CPS DEL	19 47.8 73.4 53.7 24	SUR SUP RVL TUG	29A 31C 31C 31D 21G	23:24:00 00:21:00 00:42:00 01:48:00 03:17:00	28/06/2016 17/07/2012 17/07/2012 17/07/2012 17/07/2012	1 1 1 1	230 230 230 230 230	36.75 92.42 141.97 103.87 46.50	0.00 24.84 123.95 47.74 0.00	4.45 5.79 8.27 6.36 4.61	00:42:00 01:48:00	00:50:16 01:54:22
High Day High Day High Day High Day	2 2 2 2	21265 21266 21267 21268	DEPARTURE DEPARTURE DEPARTURE DEPARTURE	CHINOOK WILDCAT 3 EDEN ROSE MODI	38 25 95 199	1.80 1.50 2.00 1.40	LVG LVG LVG LVG	17 17 19 17.7	WBT WBT WBT	21F 21E 21F 21F	04:50:00 04:53:00 04:54:00 05:10:00	17/07/2012 17/07/2012 17/07/2012 17/07/2012	1 1 1	230 230 230 230	32.88 32.88 36.75 34.24	0.00 0.00 0.00 0.00	4.38 4.38 4.45 4.40	04:50:00 05:10:00	05:03:13 05:14:24
High Day High Day High Day High Day High Day	2 2 2 2 2	21272 21269 21271 21274 21275	ARRIVAL DEPARTURE DEPARTURE ARRIVAL DEPARTURE	PUTFORD PROVIDER  MARINECO SHAMAL  SHEERKHAN  PUTFORD ACHATES  GENESIS	1822 126 46 1043 12	4.70 2.20 1.90 3.70 0.90	LVG TMS SBS EON	68.5 26 17 58 11.2	SBY WBT WBT SBY WBT	31D 21H 35A 31E 15	06:10:00 06:24:00 06:49:00 07:08:00 07:56:00	17/07/2012 17/07/2012 17/07/2012 17/07/2012 17/07/2012	1 1 1 1	230 230 230 230 230	132.42 50.29 32.88 112.19 21.68	0.00 0.00 64.37 0.00	7.79 4.67 4.38 6.78 4.19	06:24:00 06:49:00	06:17:47 06:28:40 06:53:23 07:14:47
High Day High Day High Day High Day	2 2 2 2	21276 21280 21282 21286	DEPARTURE SHIFT DEPARTURE ARRIVAL	EASTERN AURA ARCHER HMS ARCHER HMS MARINECO SHAMAL	30 40 40 126	0.90 1.90 1.90 2.20	MOD MOD LVG	16 20 20 26	WBT RNU RNU WBT	15 21H 12A 21F	07:57:00 09:55:00 11:09:00 11:45:00	17/07/2012 17/07/2012 17/07/2012 17/07/2012	1 1 1	230 230 230 230	30.95 38.68 38.68 50.29	0.00 0.00 0.00 0.00	4.35 4.48 4.48 4.67	09:55:00 11:09:00 11:45:00	
High Day High Day High Day High Day High Day	2 2 2 2 2	21287 21288 21292 21293 21295	ARRIVAL SHIFT SHIFT SHIFT SHIFT	MODI MODI MARINECO SHAMAL GARDIAN 10 MARINECO SHAMAL	199 199 126 20 126	1.50 1.50 2.20 1.80 2.20	LVG LVG LVG GSL LVG	17.7 17.7 26 20 26	WBT WBT WBT SUR WBT	12A 21G 21F 29A 21F	11:59:00 12:48:00 14:33:00 14:41:00 15:22:00	17/07/2012 17/07/2012 17/07/2012 17/07/2012 17/07/2012	1 1 1 1	230 230 230 230 230	34.24 34.24 50.29 38.68 50.29	0.00 0.00 0.00 0.00	4.40 4.40 4.67 4.48 4.67		12:03:24 12:52:24 14:37:40 14:45:29 15:26:40
High Day High Day High Day High Day	2 2 2 2	21297 21299 21300 21303	ARRIVAL ARRIVAL ARRIVAL ARRIVAL	EASTERN AURA SHEERKHAN GENESIS EDEN ROSE	30 46 12 95	0.90 1.90 0.90 1.90	EON TMS EON LVG	16 17 11.2 19	WBT WBT WBT	15 35A 16A 21E	16:49:00 17:18:00 18:26:00 19:18:00	17/07/2012 17/07/2012 17/07/2012 17/07/2012	1 1 1	230 230 230 230	30.95 32.88 21.68 36.75	0.00 0.00 0.00 0.00	4.35 4.38 4.19 4.45	16:49:00 17:18:00 18:26:00 19:18:00	17:22:23 18:30:12 19:22:27
High Day High Day High Day High Day High Day	2 3 3 3	21309 12315 12317 12319 12321	ARRIVAL DEPARTURE ARRIVAL DEPARTURE DEPARTURE	WILDCAT 3  MARINECO SHAMAL  PUTFORD PROTECTOR  GENESIS  EASTERN AURA	25 126 1822 12 30	1.50 2.20 4.90 0.90	LVG LVG ASC EON	17 26 68.5 11.2 16	WBT WBT SBY WBT	21E 21E 31C 15	21:06:00 06:30:00 07:11:00 07:58:00 08:02:00	17/07/2012 09/09/2011 09/09/2011 09/09/2011 09/09/2011	1 1 1 1	230 230 230 230 230	32.88 50.29 132.42 21.68 30.95	0.00 0.00 104.84 0.00 0.00	4.38 4.67 7.79 4.19 4.35	21:06:00 06:30:00 07:11:00 07:58:00	21:10:23 06:34:40 07:18:47 08:06:21
High Day High Day High Day High Day	3 3 3	12322 12329 12327 12330	DEPARTURE ARRIVAL DEPARTURE ARRIVAL	LIA LORD NELSON OOSTERSCHELDE EASTERN AURA	22 368 224 30	1.80 4.10 2.90 0.90	OWN OWN GYP EON	15.3 54.7 38.1 16	SUR STG STG WBT	21B 21C 21A 15	08:14:00 08:14:00 09:06:00	09/09/2011	1 1 1 1	230 230 230 230 230	29.59 105.80 73.66 30.95	0.00 51.61 0.00 0.00	4.33 6.46 5.06 4.35	08:14:00 09:06:00	08:20:27 09:11:04 09:15:25
High Day High Day High Day High Day High Day	3 3 3 3	12332 12336 12335 12338 12342	SHIFT ARRIVAL DEPARTURE SHIFT ARRIVAL	CHARTWELL OCEAN SPRITE EASTERN AURA CHARTWELL OOSTERSCHELDE	106 1499 30 106 224	1.80 4.70 0.90 1.80 2.90		26.6 61 16 26.6 38.1	SUR SUP WBT SUR STG	25 31D 15 25 21A	10:10:00 10:58:00 11:05:00	09/09/2011 09/09/2011 09/09/2011 09/09/2011 09/09/2011	1 1 1 1	230 230 230 230 230	51.45 118.03 30.95 51.45 73.66	0.00 76.05 0.00 0.00 0.00	4.69 7.07 4.35 4.69 5.06		10:17:04 11:02:21 11:09:41
High Day High Day High Day High Day	3 3 3	12341 12339 12343 12344	ARRIVAL SHIFT DEPARTURE SHIFT	EASTERN AURA SOUTHERN STAR EASTERN AURA OCEAN SPRITE	30 286 30 1499	0.90 2.50 0.90 4.70	EON CPS EON SBS	16 35.4 16 61	WBT SUR WBT SUP	15 31D 15 31D	12:13:00 12:31:00 13:00:00 14:04:00	09/09/2011 09/09/2011 09/09/2011 09/09/2011	1 1 1	230 230 230 230	30.95 68.39 30.95 118.03	0.00 0.00 0.00 76.05	4.35 4.97 4.35 7.07	12:13:00 12:31:00 13:00:00 14:04:00	12:17:21 12:35:58 13:04:21 14:11:04
High Day High Day High Day High Day	3 3 3 3	12345 12351 12346 12349	ARRIVAL ARRIVAL DEPARTURE SHIFT	EASTERN AURA GENESIS OOSTERSCHELDE CONFIDANTE	30 12 224 208	0.90 2.10 2.90 2.20	EON EON OWN GSL	16 11.2 38.1 28	WBT WBT STG SUR	15 15 21A 16A	14:18:00 15:54:00 16:00:00 16:00:00	09/09/2011 09/09/2011 09/09/2011 09/09/2011	1 1 1 1	230 230 230 230	30.95 21.68 73.66 54.16	0.00 0.00 0.00 0.00	4.35 4.19 5.06 4.74	14:18:00 15:54:00 16:00:00	14:22:21 15:58:12 16:09:48
High Day High Day High Day High Day High Day	3 3 3 3	12347 12354 12359 12361 12360	DEPARTURE ARRIVAL ARRIVAL ARRIVAL SHIFT	ATLANTIC GUARDIAN OOSTERSCHELDE VIGILANT HMCC LIA PUTFORD PROTECTOR	224 254 22 1822	3.60 2.90 2.50 1.00 4.90	OWN MOD OWN ASC	55 38.1 42.8 15.3 68.5	SBY STG GOV SUR SBY	31B 21A 21D 21B 31C	17:19:00 17:37:00	09/09/2011	1 1 1 1	230 230 230 230 230	106.38 73.66 82.79 29.59 132.42	52.77 0.00 5.57 0.00 104.84	5.06 5.31 4.33 7.79	16:14:00 17:00:00 17:19:00 17:37:00 18:06:00	17:05:04 17:24:18 17:41:20
High Day High Day High Day High Day High Day	3 3 3 3	12365 12366 12371 12370 12372	SHIFT DEPARTURE ARRIVAL ARRIVAL SHIFT	MARINECO SHAMAL OOSTERSCHELDE OOSTERSCHELDE RONRIX KOMMANDOR	126 224 224 2501 1573	2.10 2.90 2.90 5.30 4.40	LVG OWN OWN GYL RIC	26 38.1 38.1 96.3 68.5	WBT STG STG GEN OSV	21E 21A 21A 14A 29B	19:19:00 19:50:00 22:15:00 22:20:00	09/09/2011 09/09/2011	1 1 1 1	230 230 230 230 230	50.29 73.66 73.66 186.17 132.51	0.00 0.00 0.00 212.34 105.03	4.67 5.06 5.06 10.48 7.79	19:19:00	19:23:40 19:55:04 22:30:29

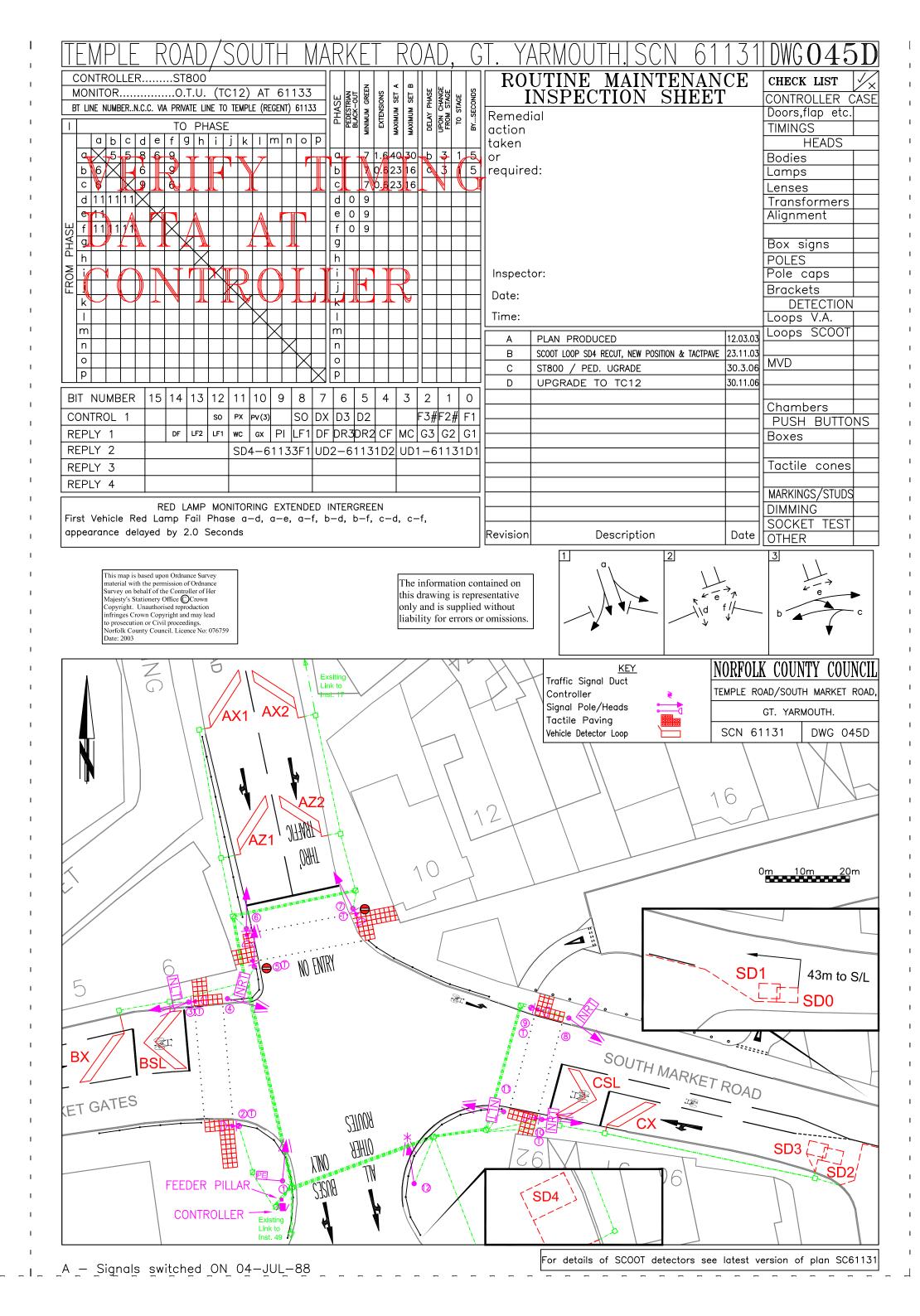
## APPENDIX C. Modelled Scenarios

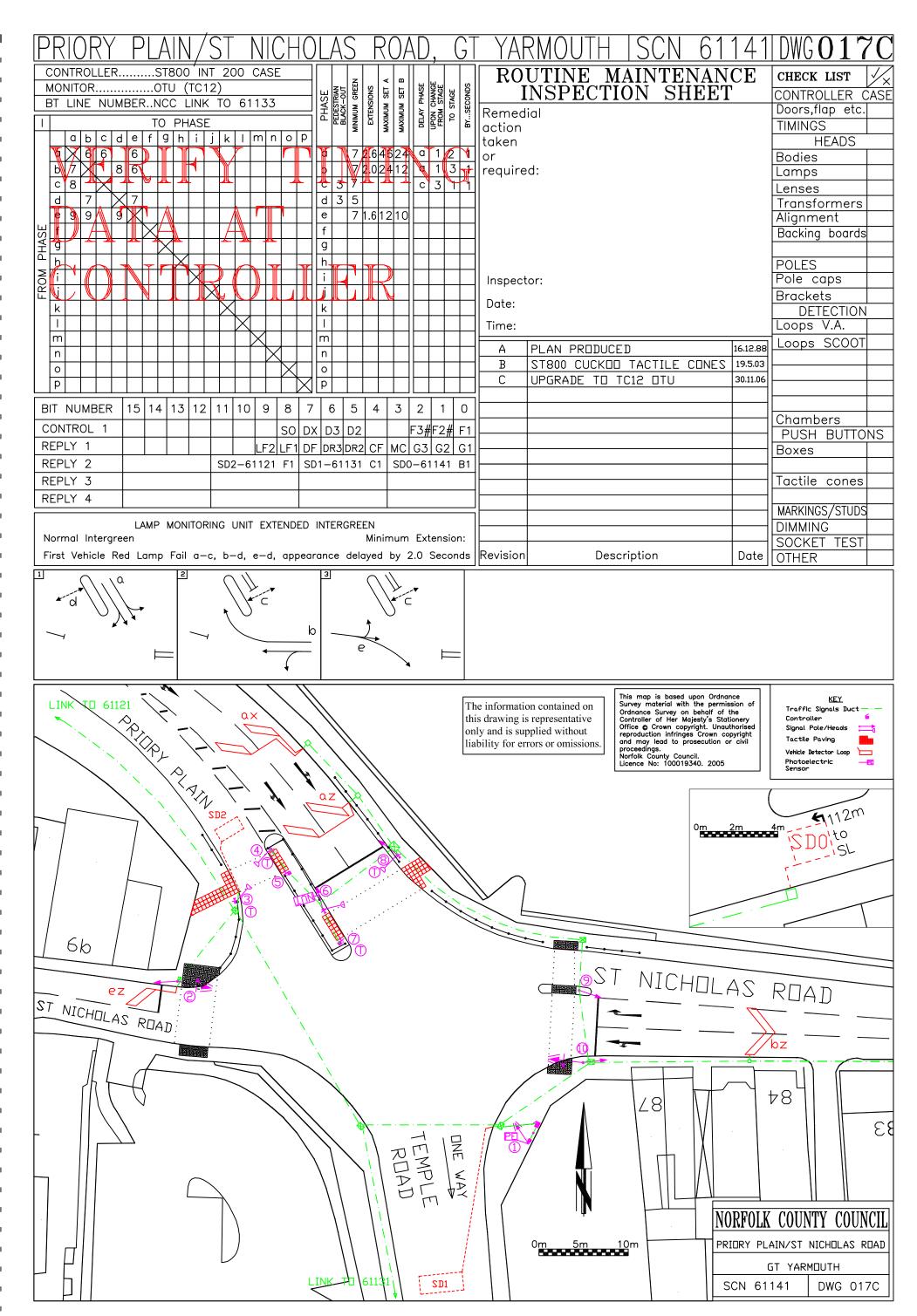
Pattern	Sample	<b>Total Time</b>	Open	Close	Period
Average Day	1	00:04:12	07:47:00	07:51:12	AM
Average Day	1	00:04:21	07:54:00	07:58:21	AM
Average Day	1	00:07:46	08:44:00	08:51:46	AM
Average Day	3	00:04:39	12:29:00	12:33:39	IP
Average Day	3	00:05:54	13:33:00	13:38:54	IP
Average Day	1	00:04:15	16:00:00	16:04:15	PM
Average Day	1	00:04:21	16:26:00	16:30:21	PM
Average Day	1	00:08:59	17:40:00	17:48:59	PM
Average Day	1	00:04:12	18:02:00	18:06:12	PM
High Day	3	00:07:47	07:11:00	07:18:47	AM
High Day	3	00:08:21	07:58:00	08:06:21	AM
High Day	3	00:06:27	08:14:00	08:20:27	AM
High Day	3	00:09:25	09:06:00	09:15:25	AM
High Day	3	00:05:04	11:59:00	12:04:04	IP
High Day	3	00:04:21	12:13:00	12:17:21	IP
High Day	3	00:04:58	12:31:00	12:35:58	IP
High Day	3	00:04:21	13:00:00	13:04:21	IP
High Day	3	00:07:04	14:04:00	14:11:04	IP
High Day	3	00:04:21	14:18:00	14:22:21	IP
High Day	3	00:04:12	15:54:00	15:58:12	PM
High Day	3	00:09:48	16:00:00	16:09:48	PM
High Day	3	00:06:29	16:14:00	16:20:29	PM
High Day	3	00:05:04	17:00:00	17:05:04	PM
High Day	3	00:05:18	17:19:00	17:24:18	PM
High Day	3	00:04:20	17:37:00	17:41:20	PM
High Day	3	00:07:47	18:06:00	18:13:47	PM

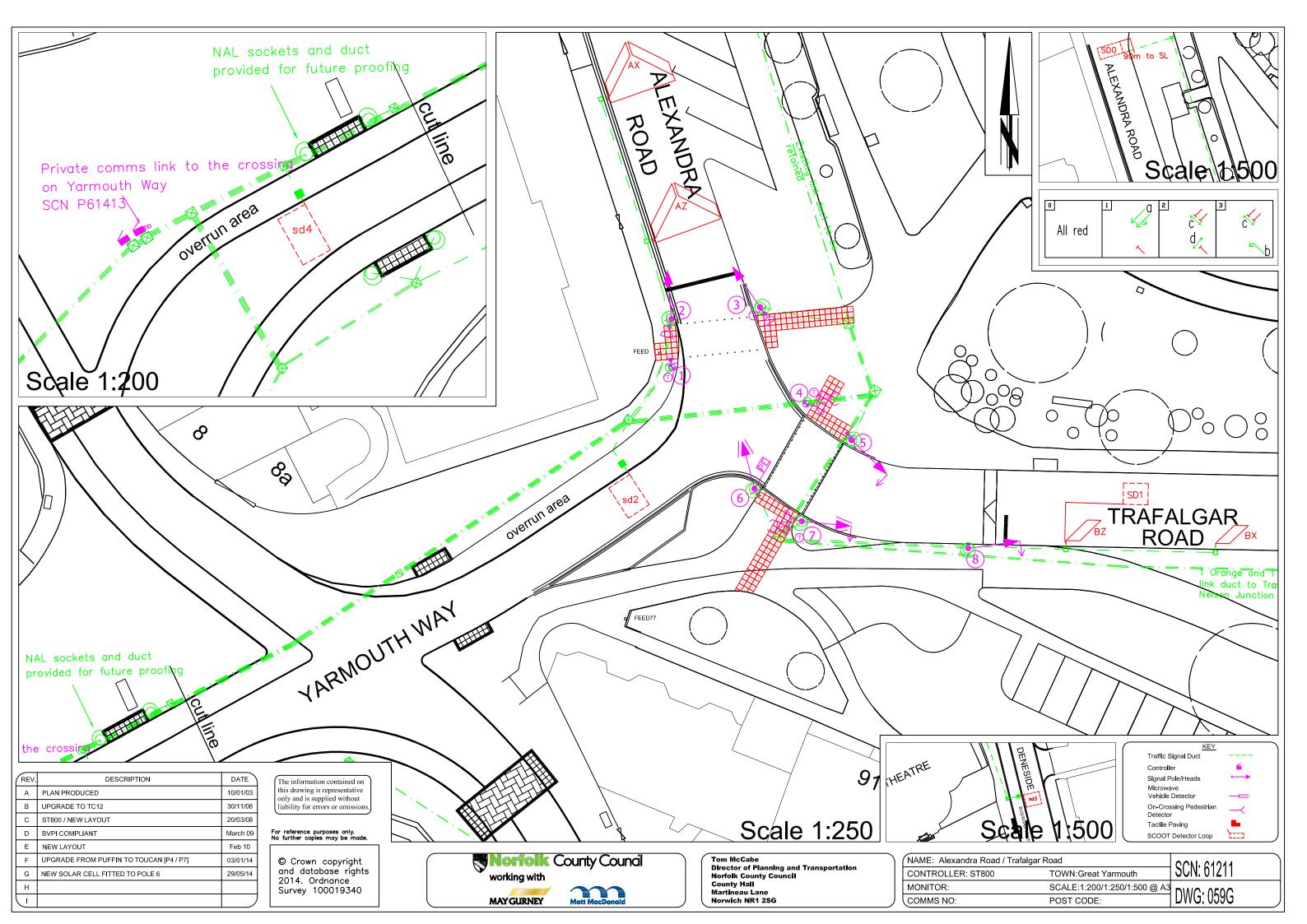
## APPENDIX D. Signal Specifications

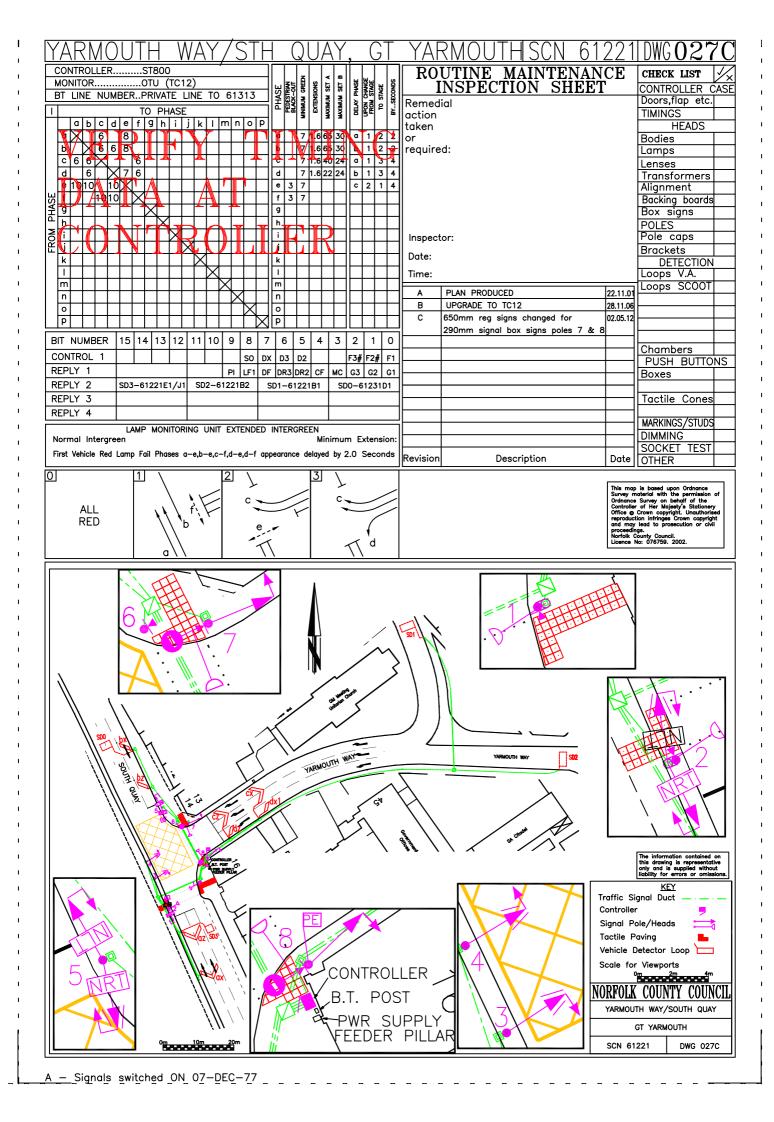


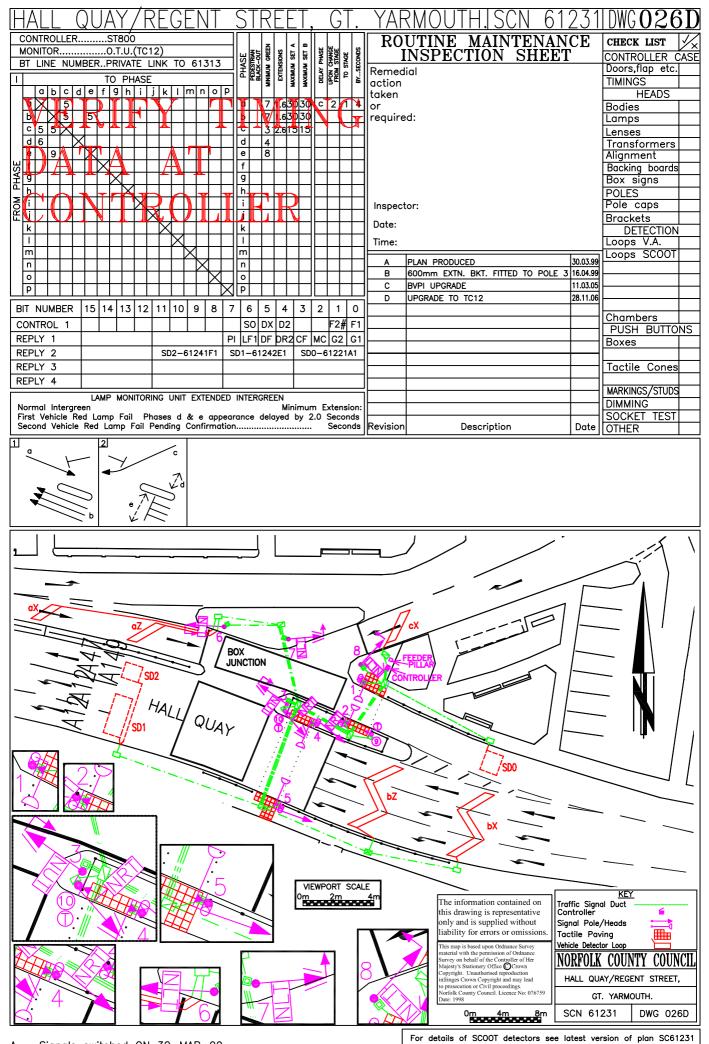


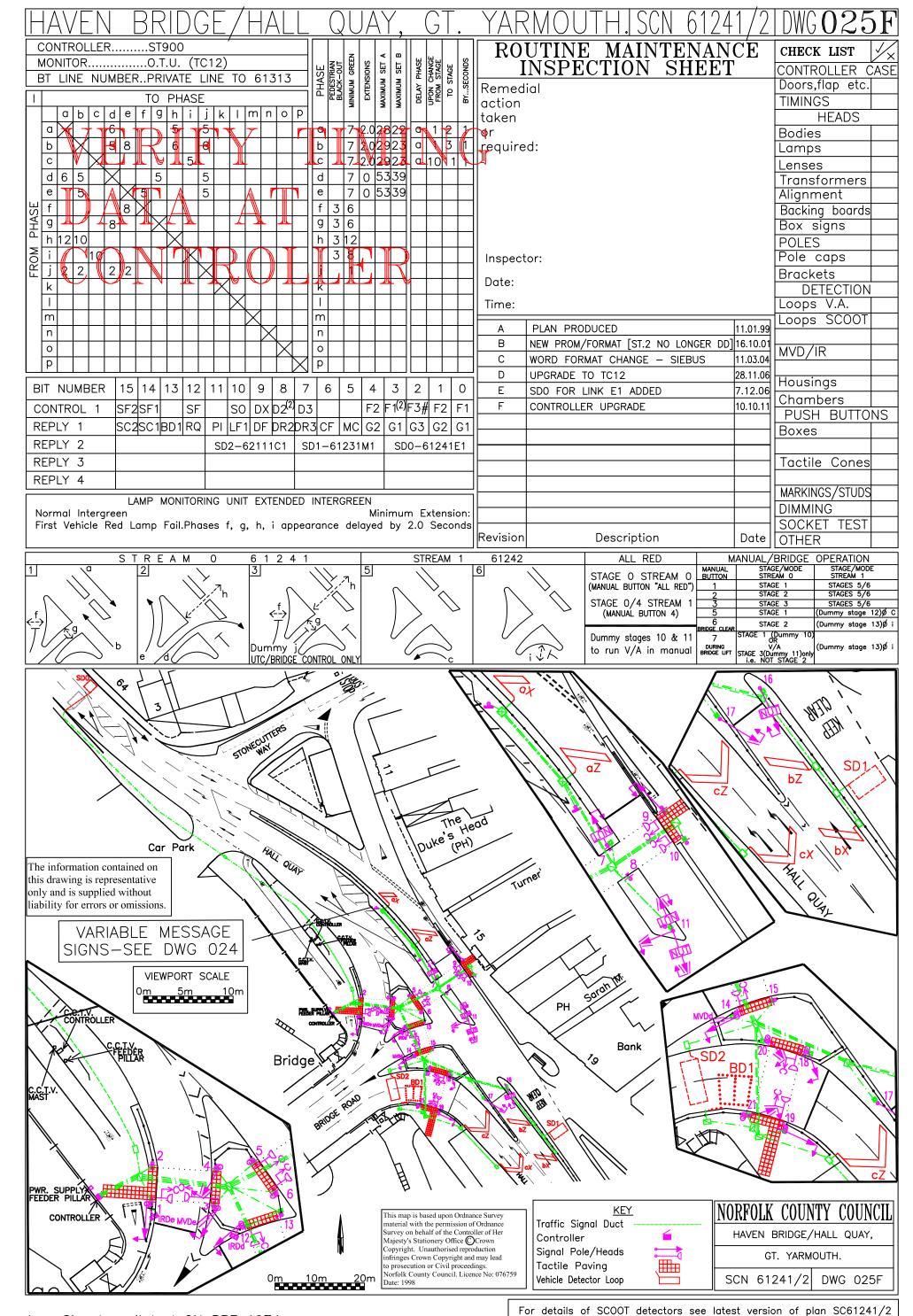


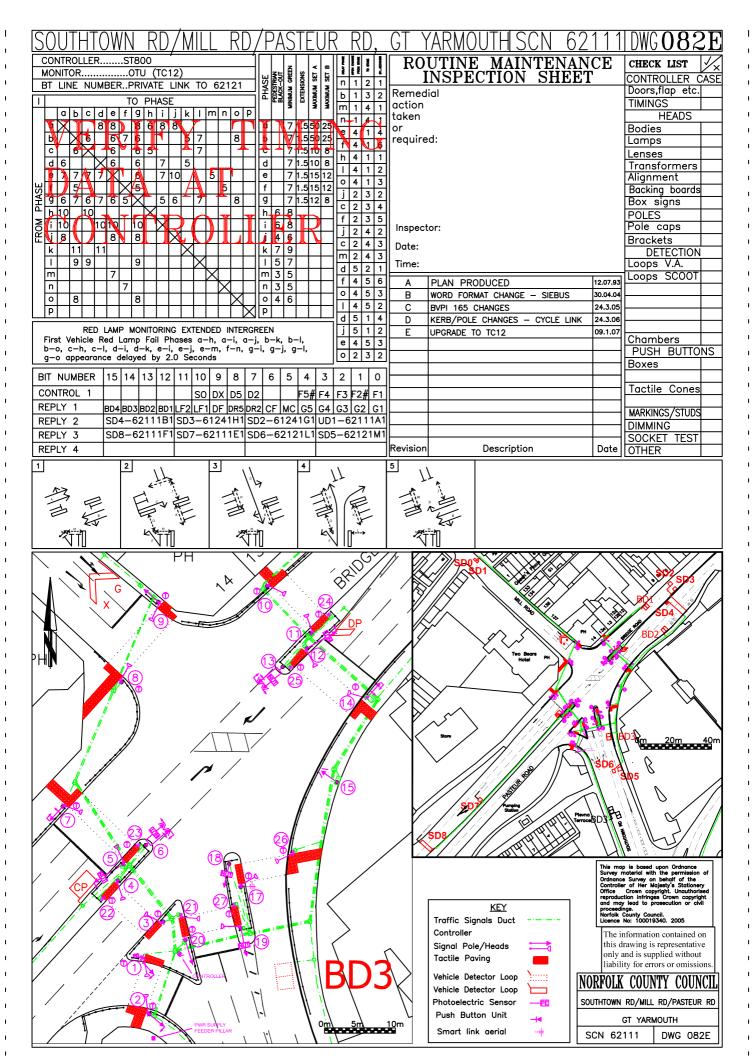


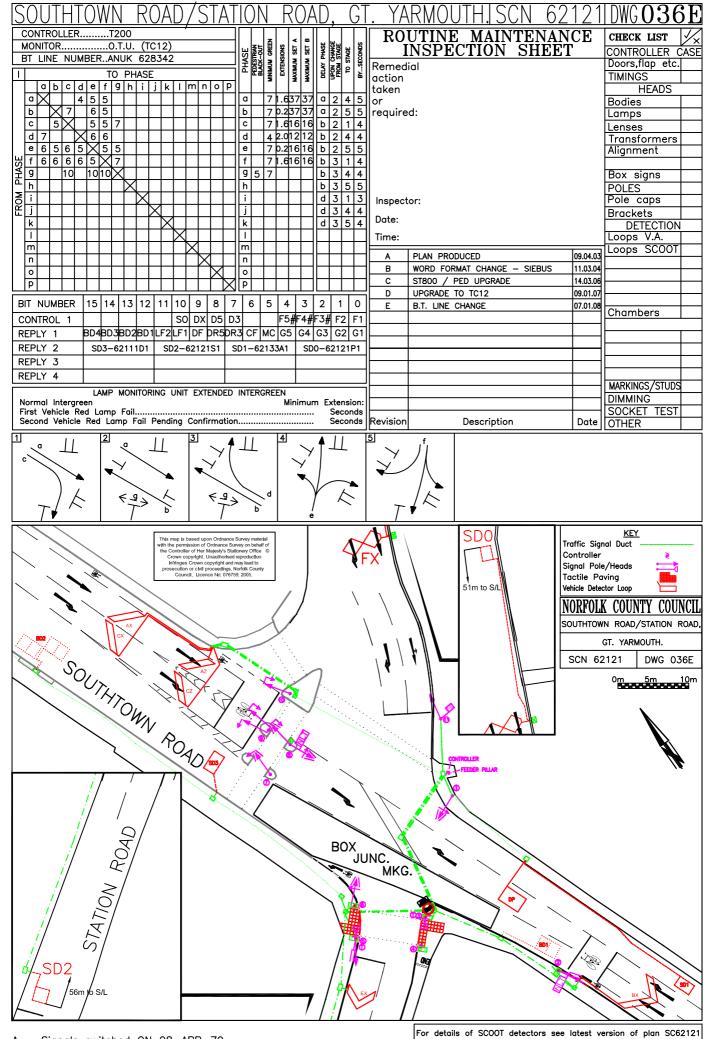




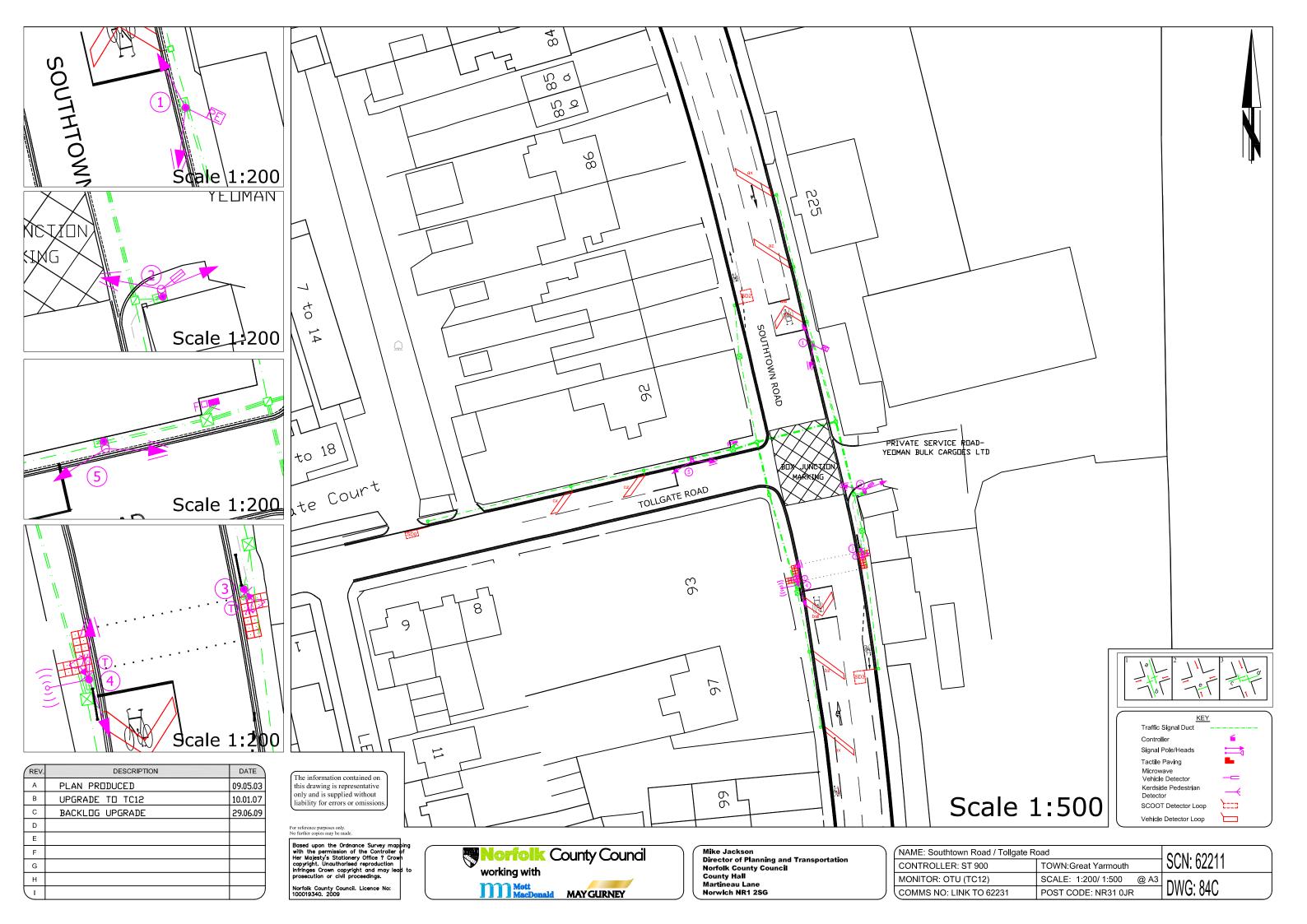


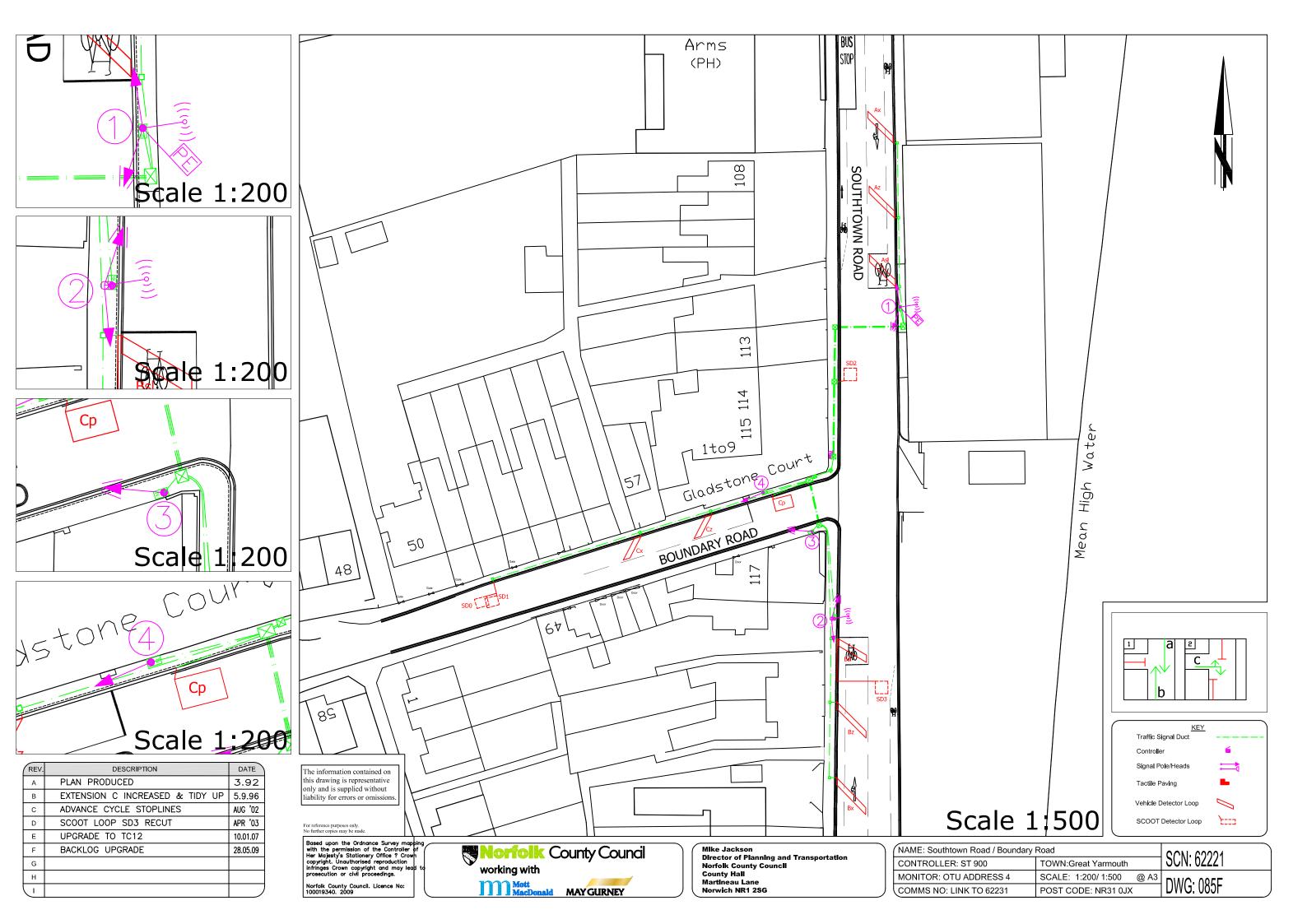


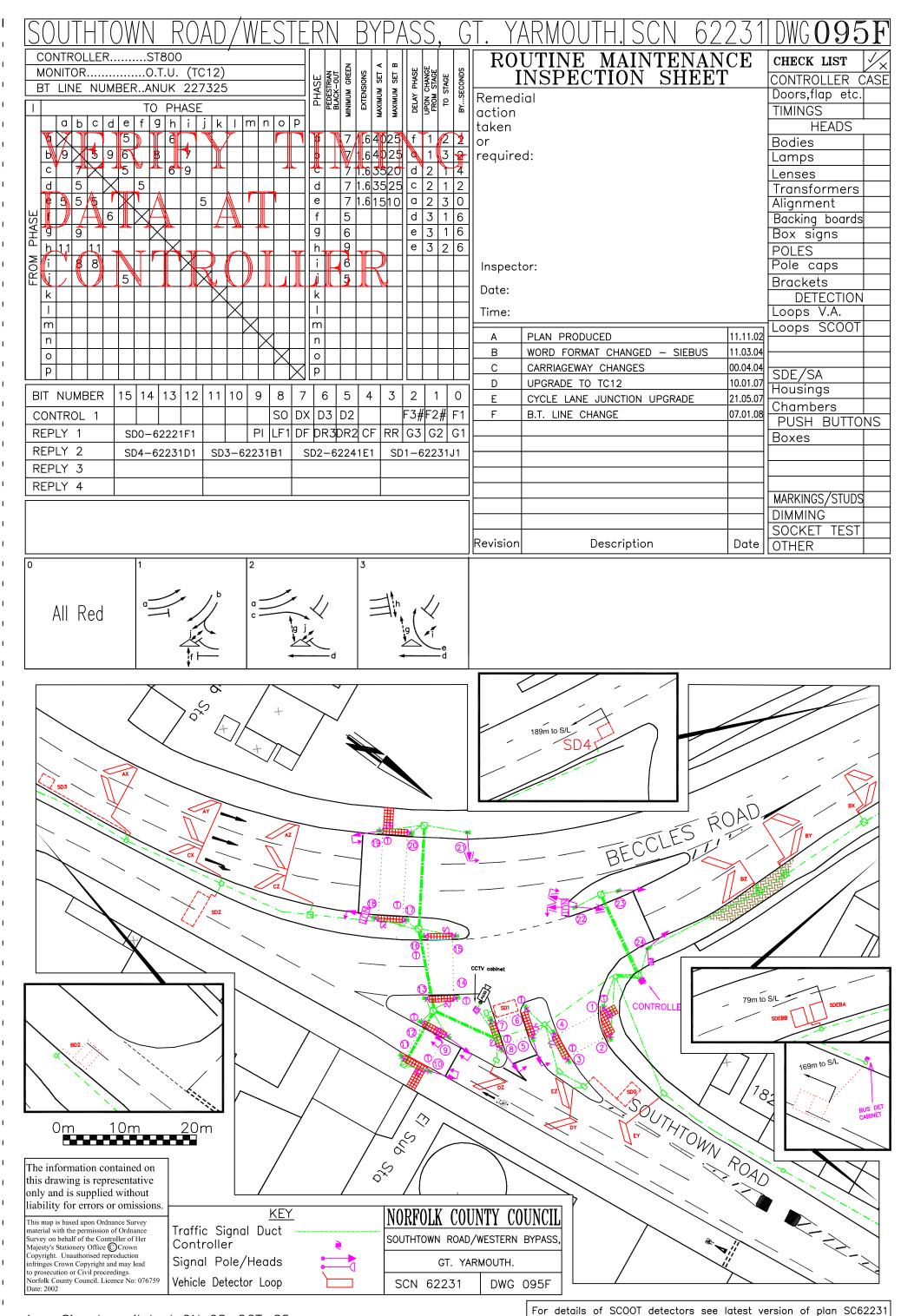


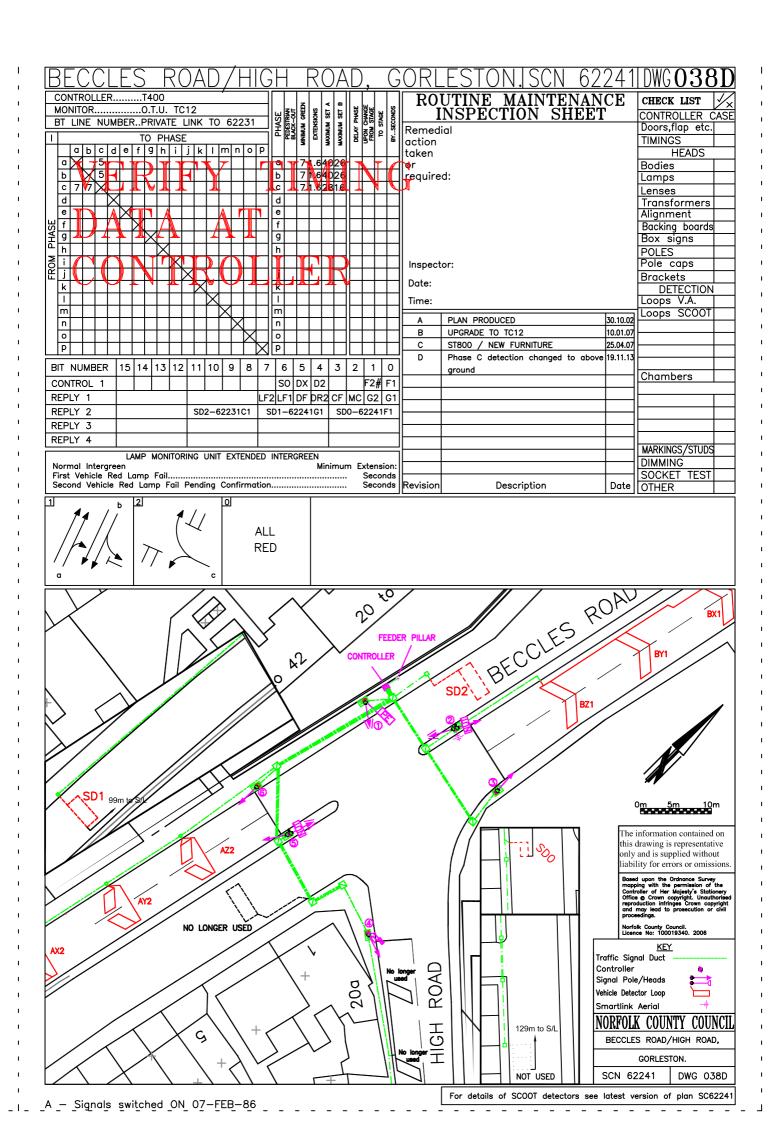


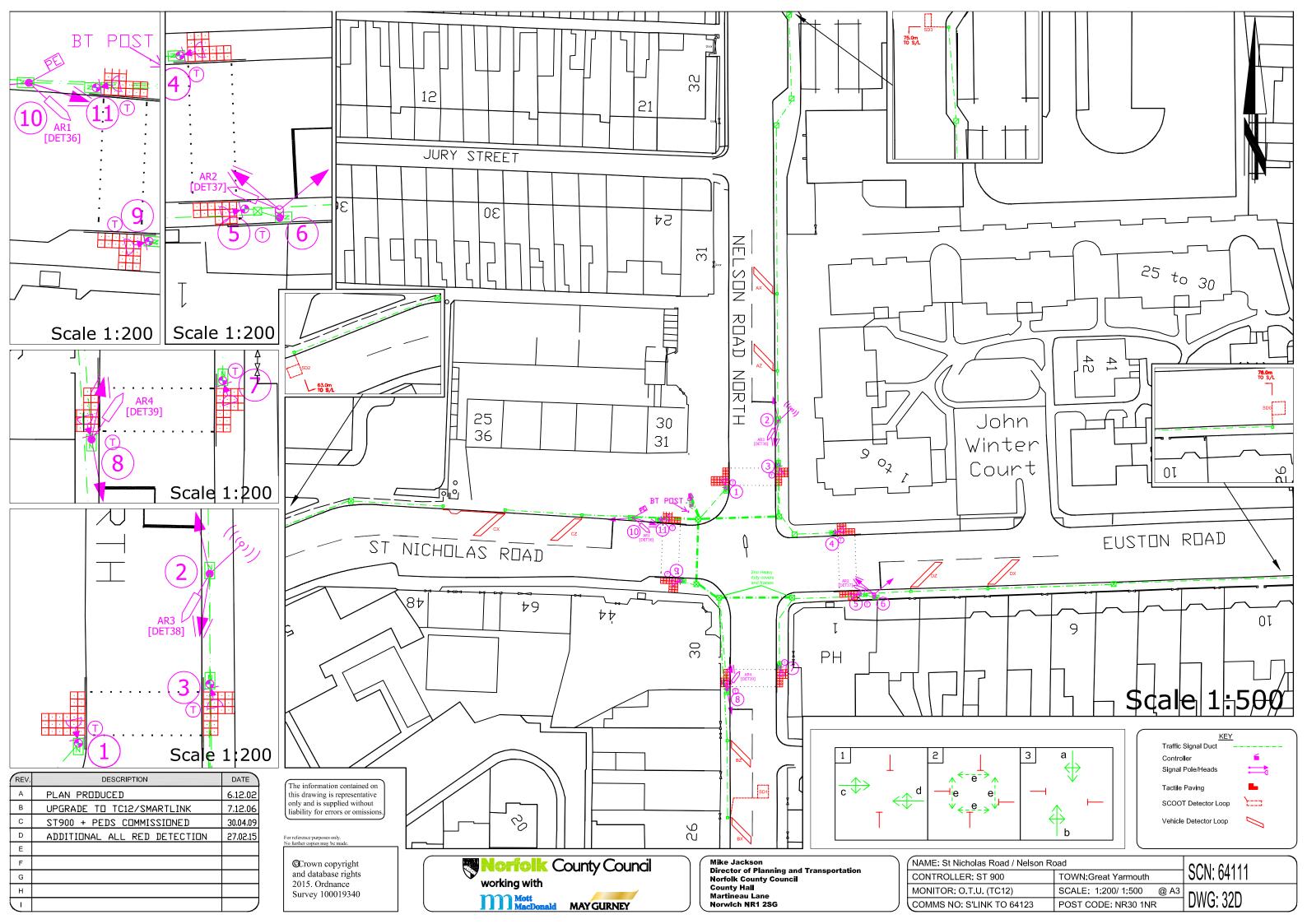


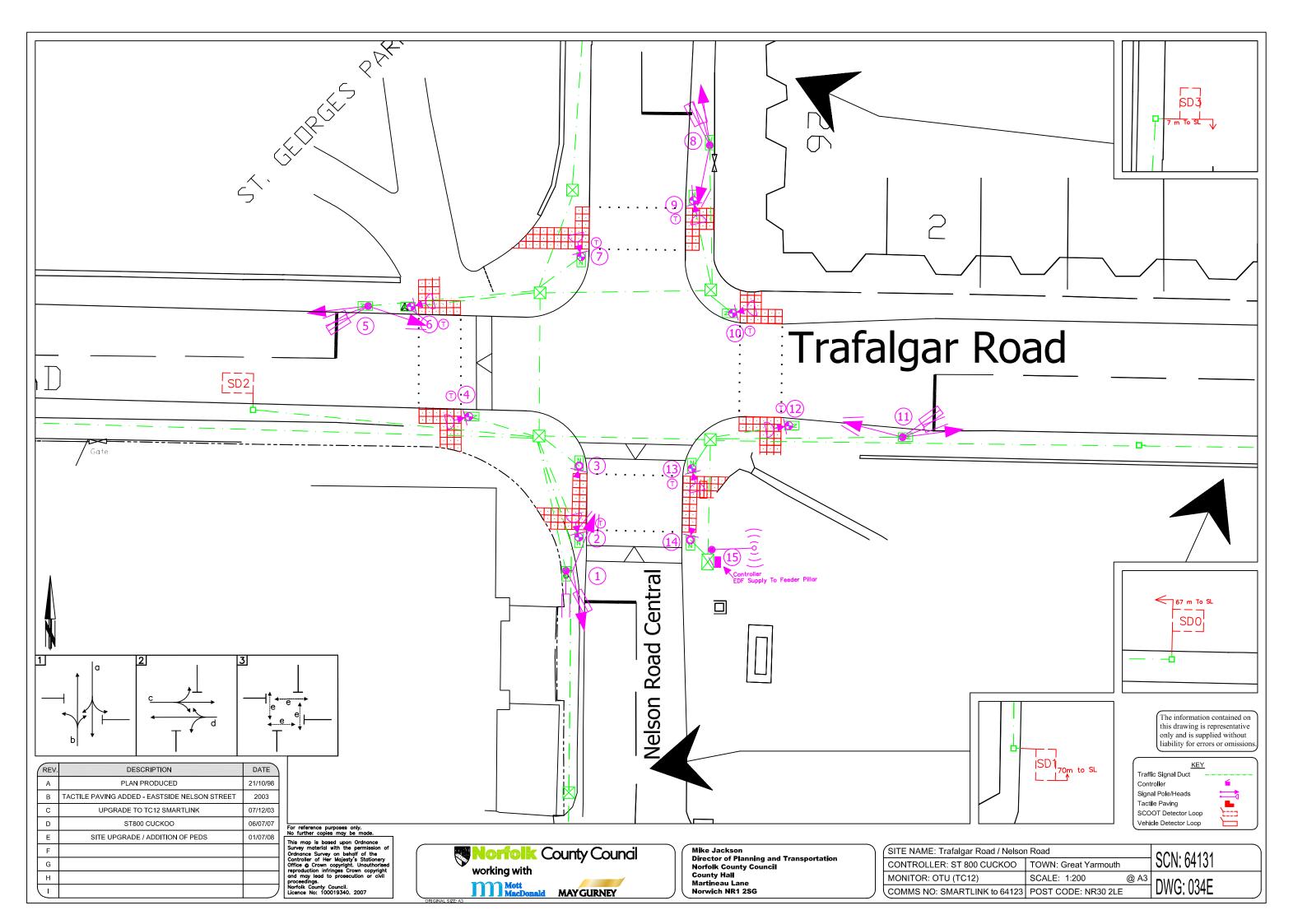


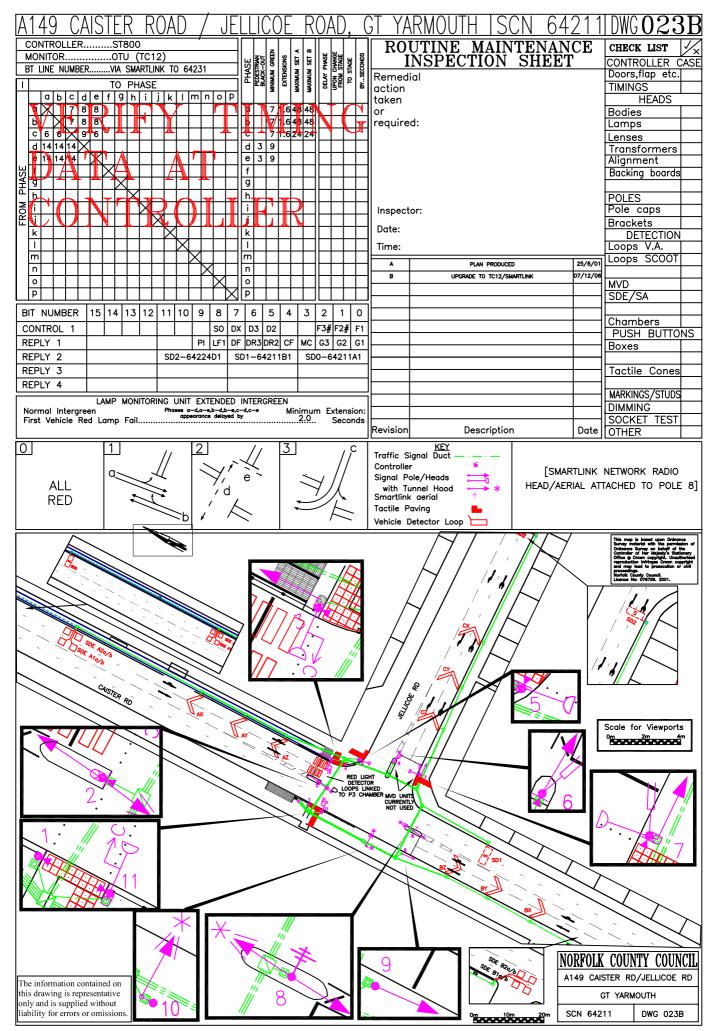


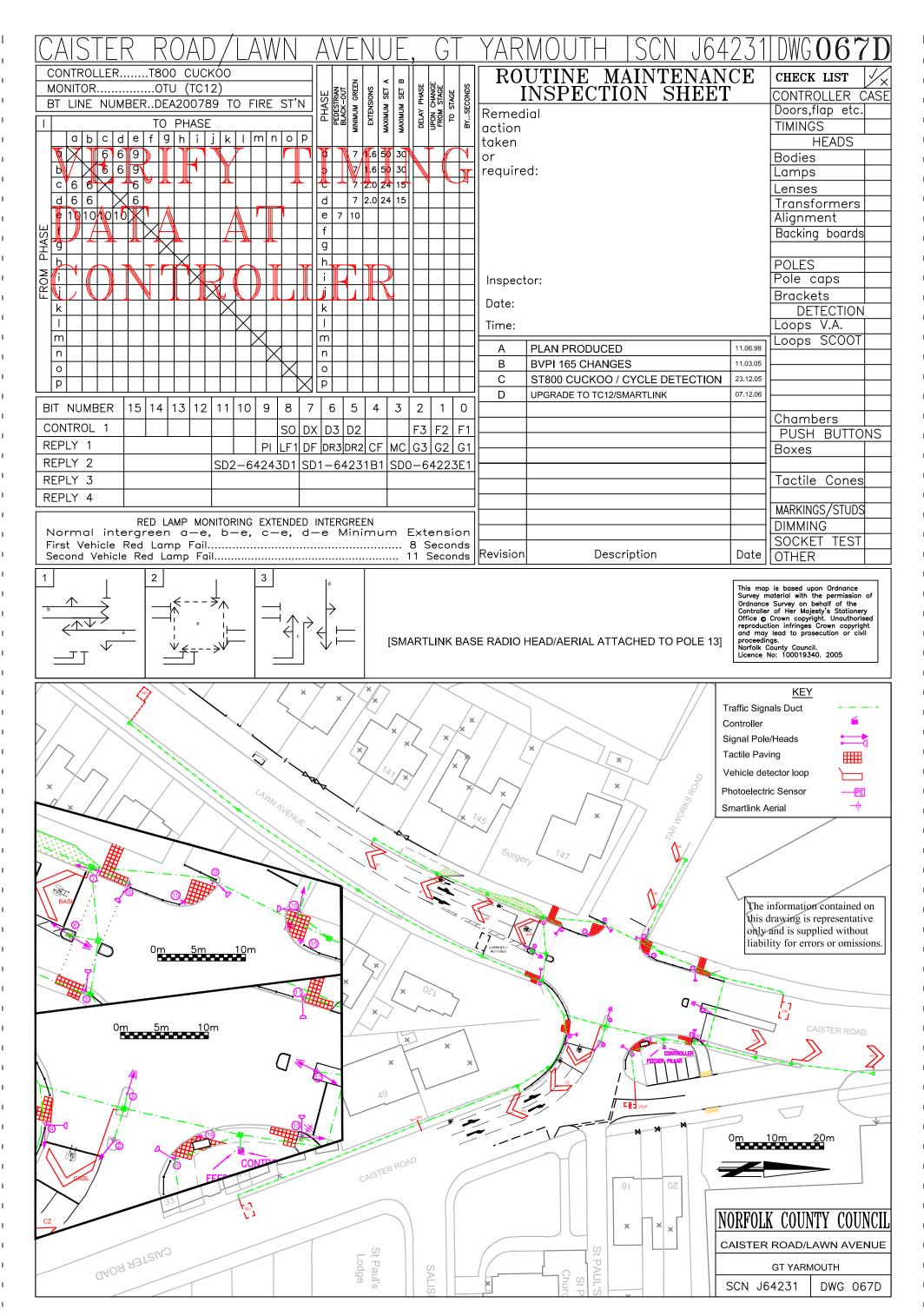


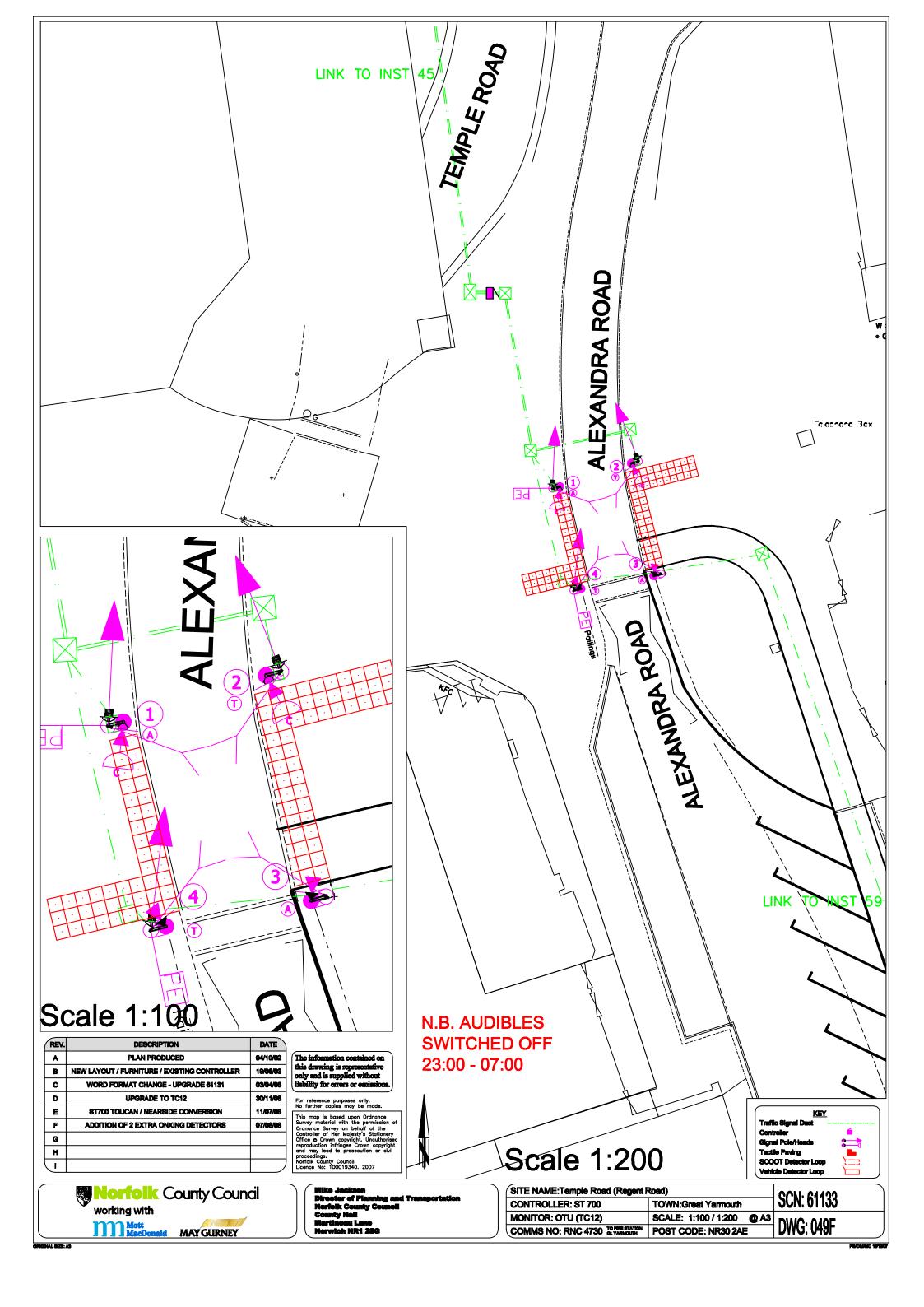


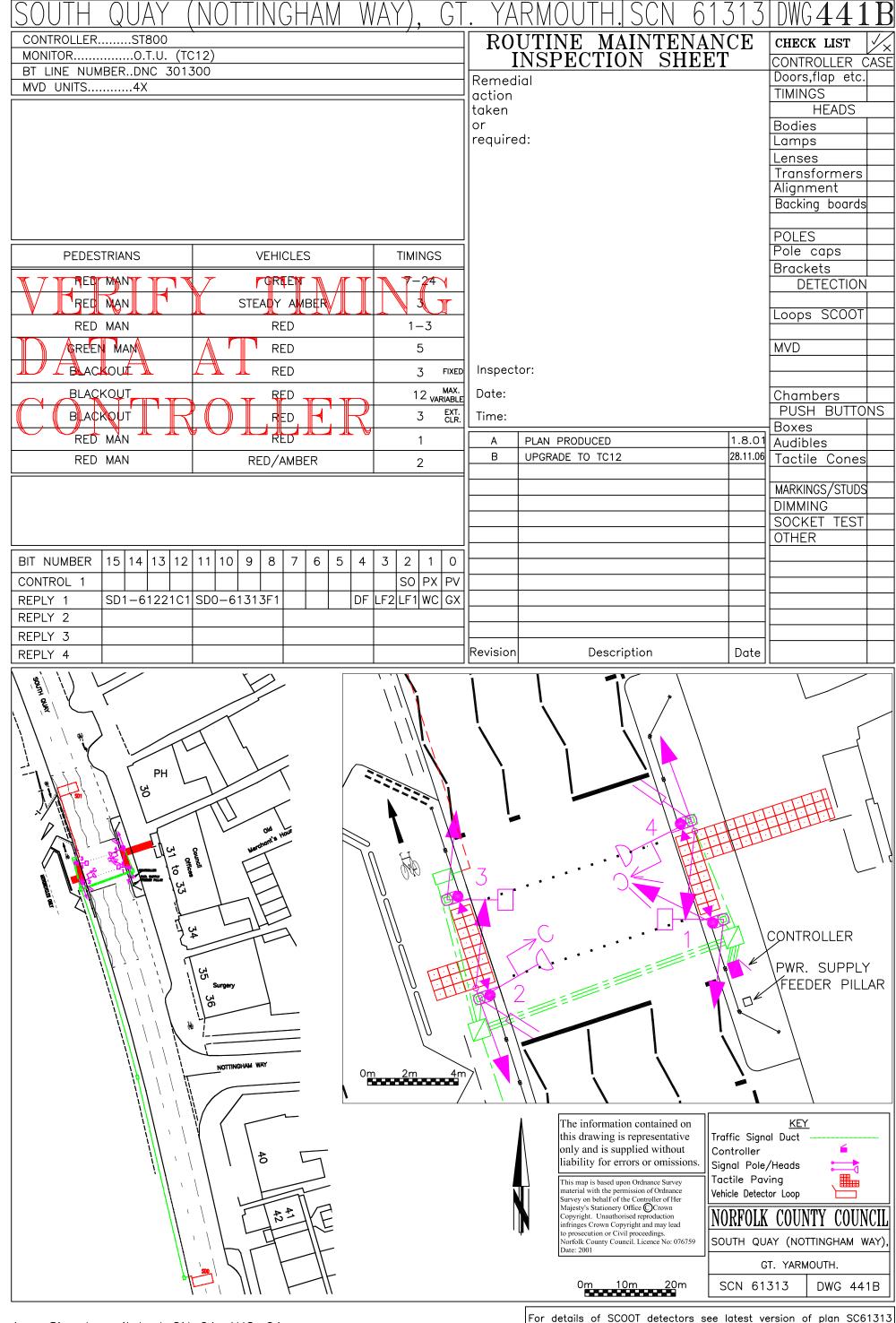


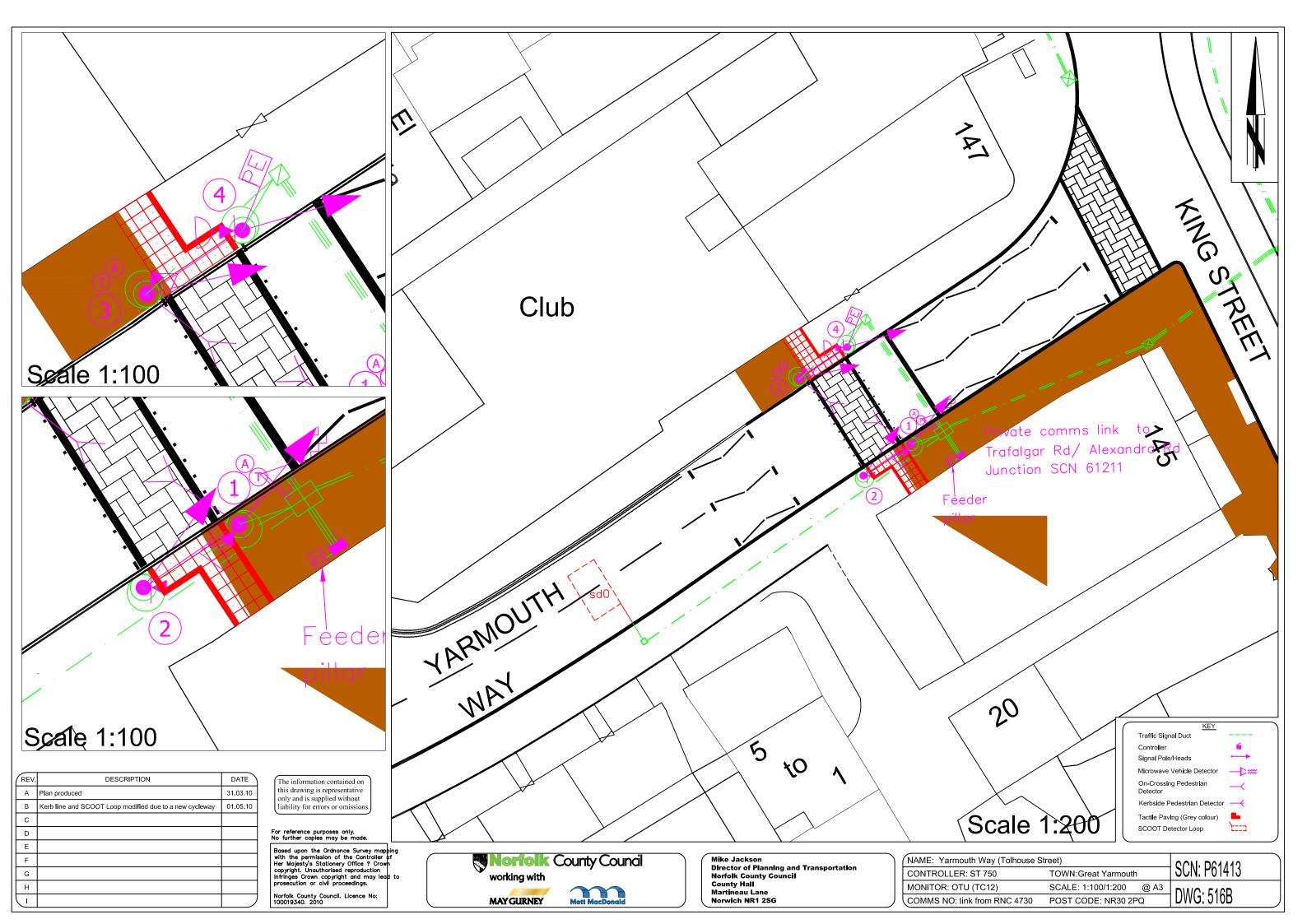


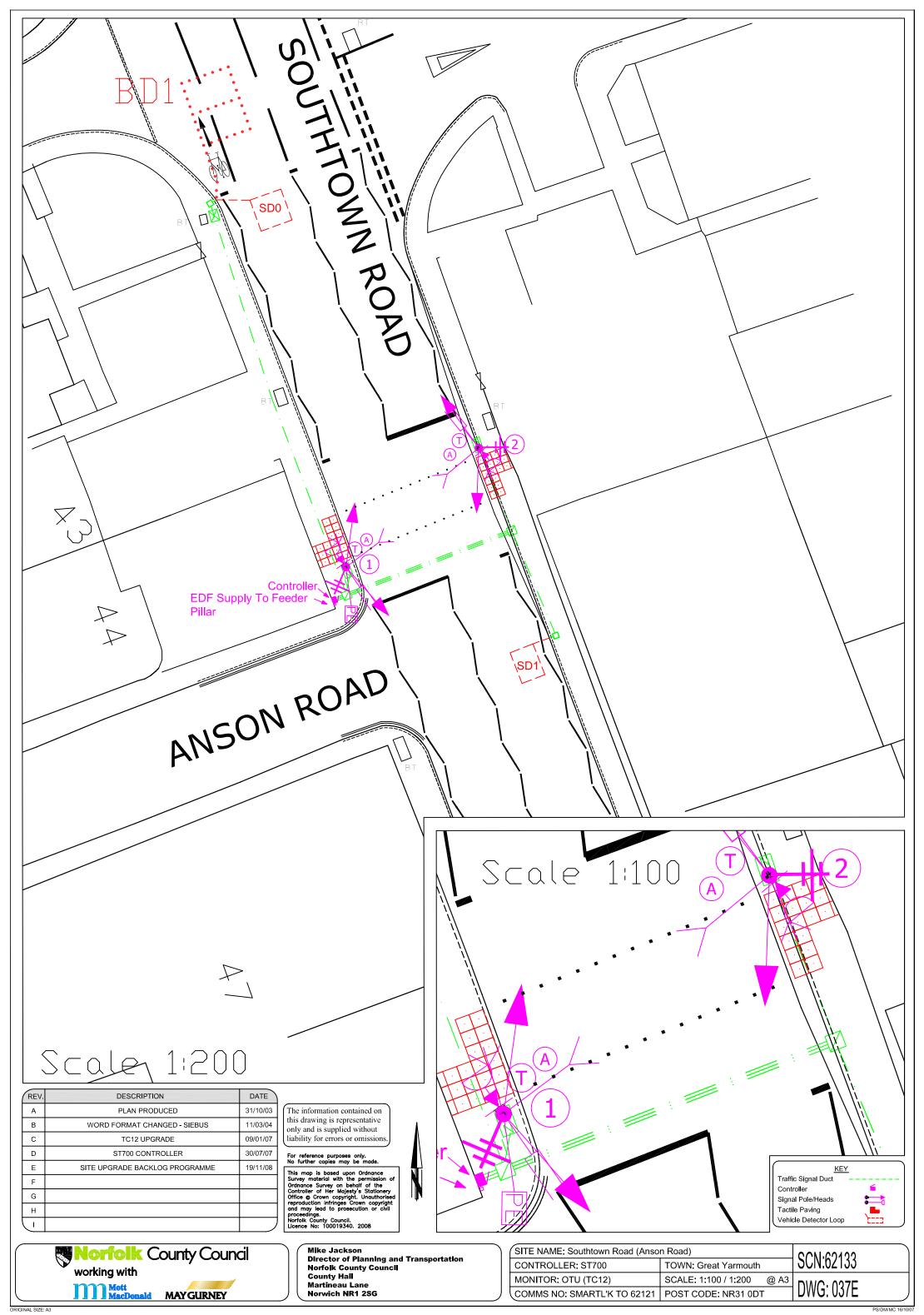


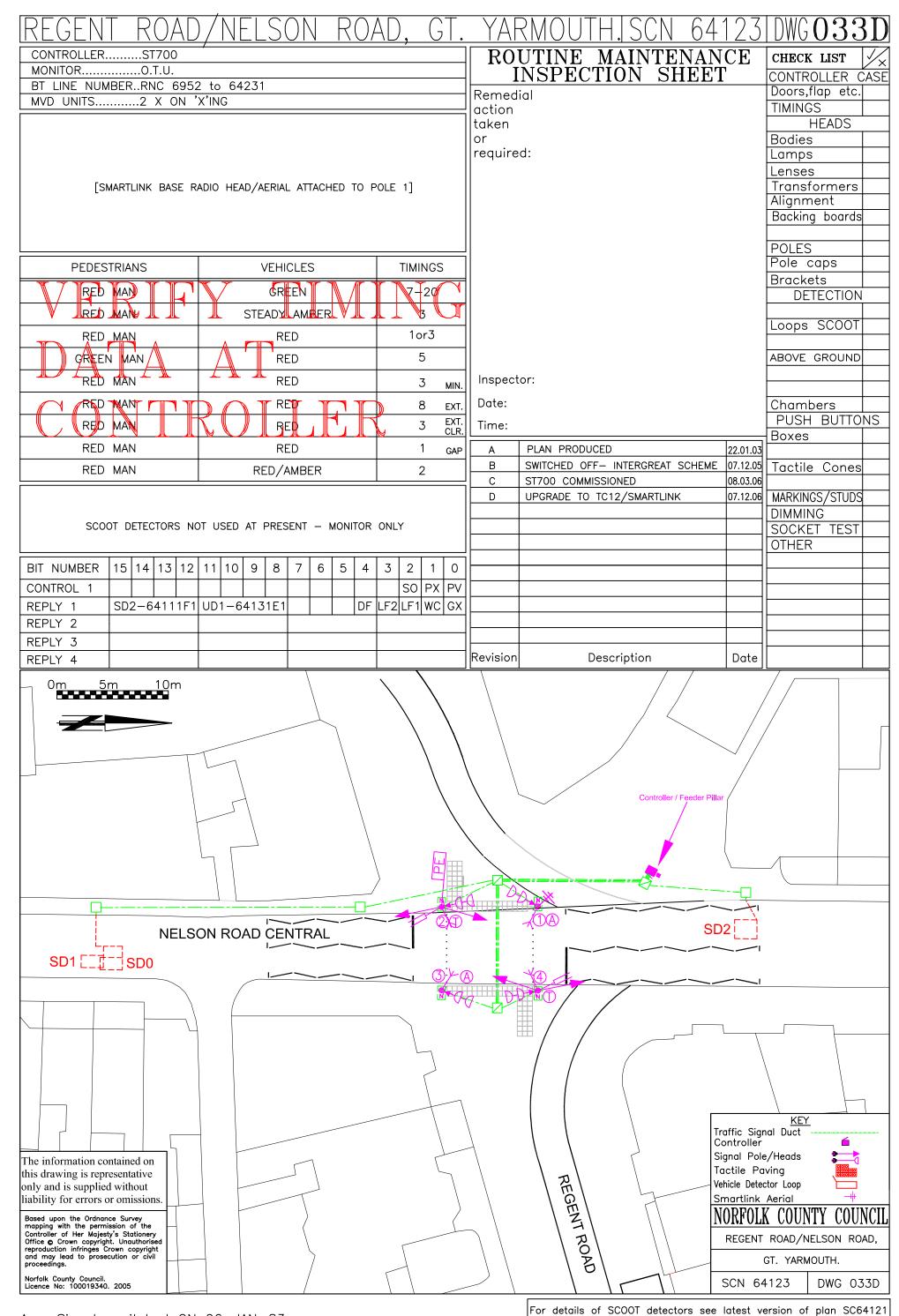




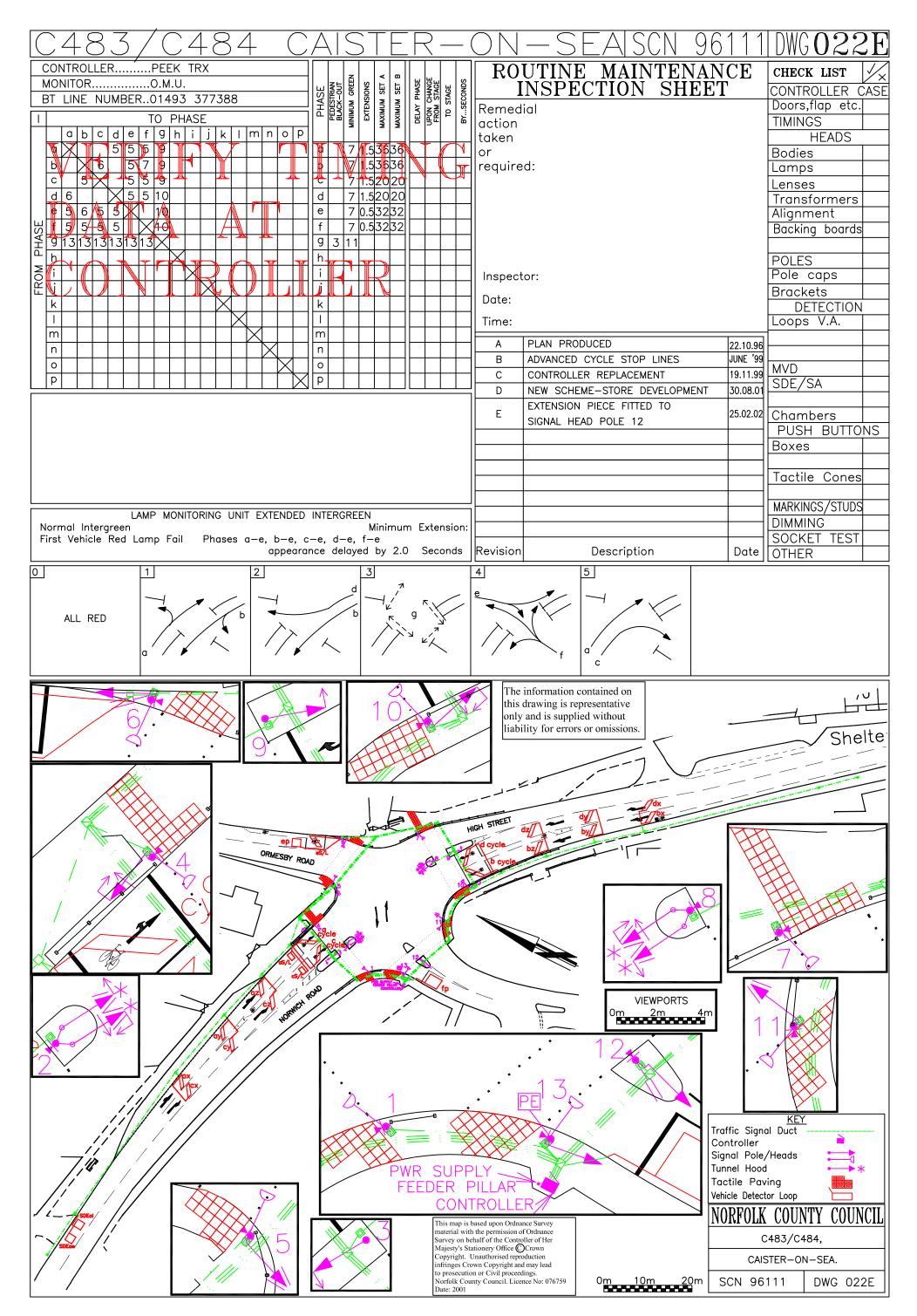


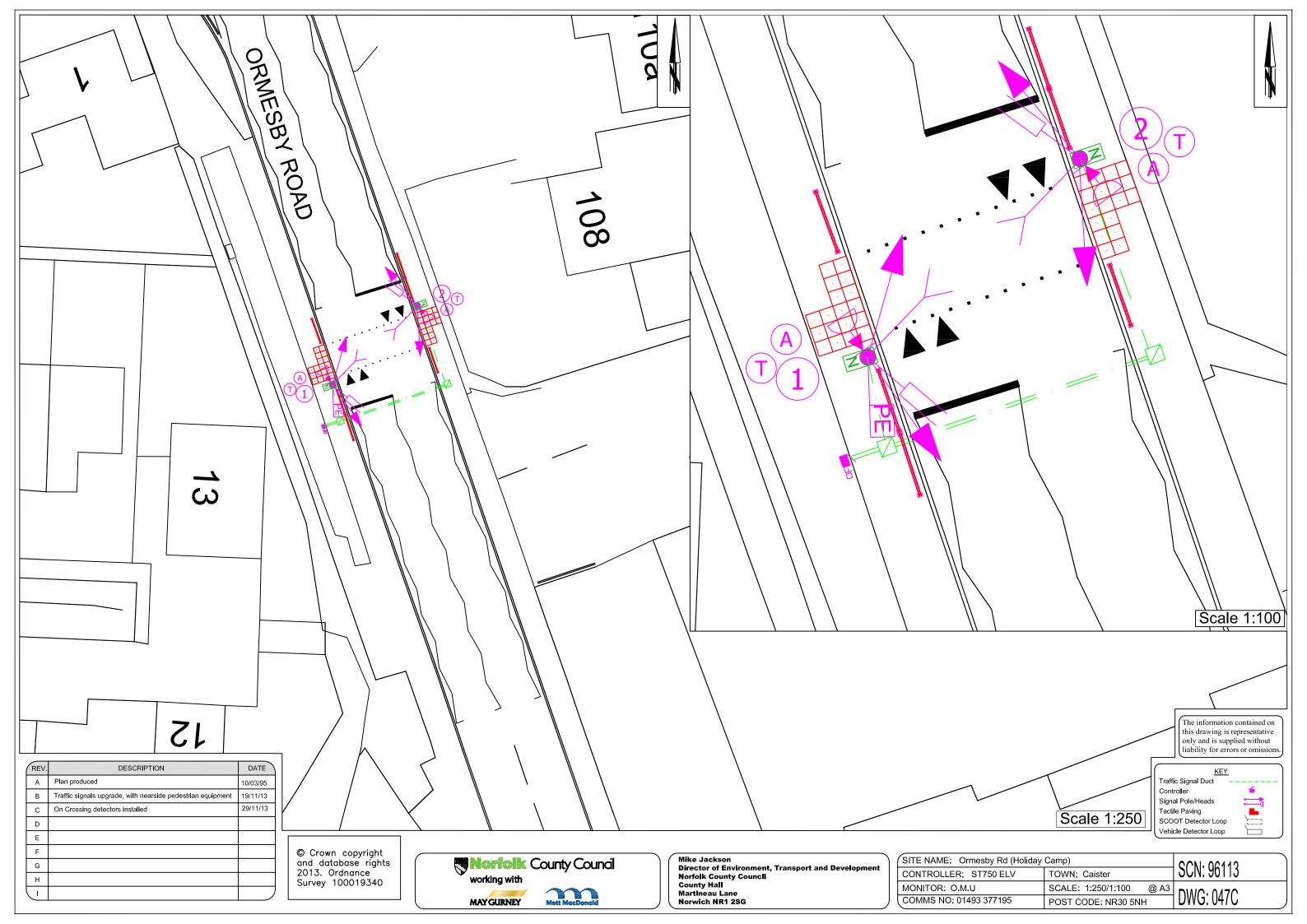


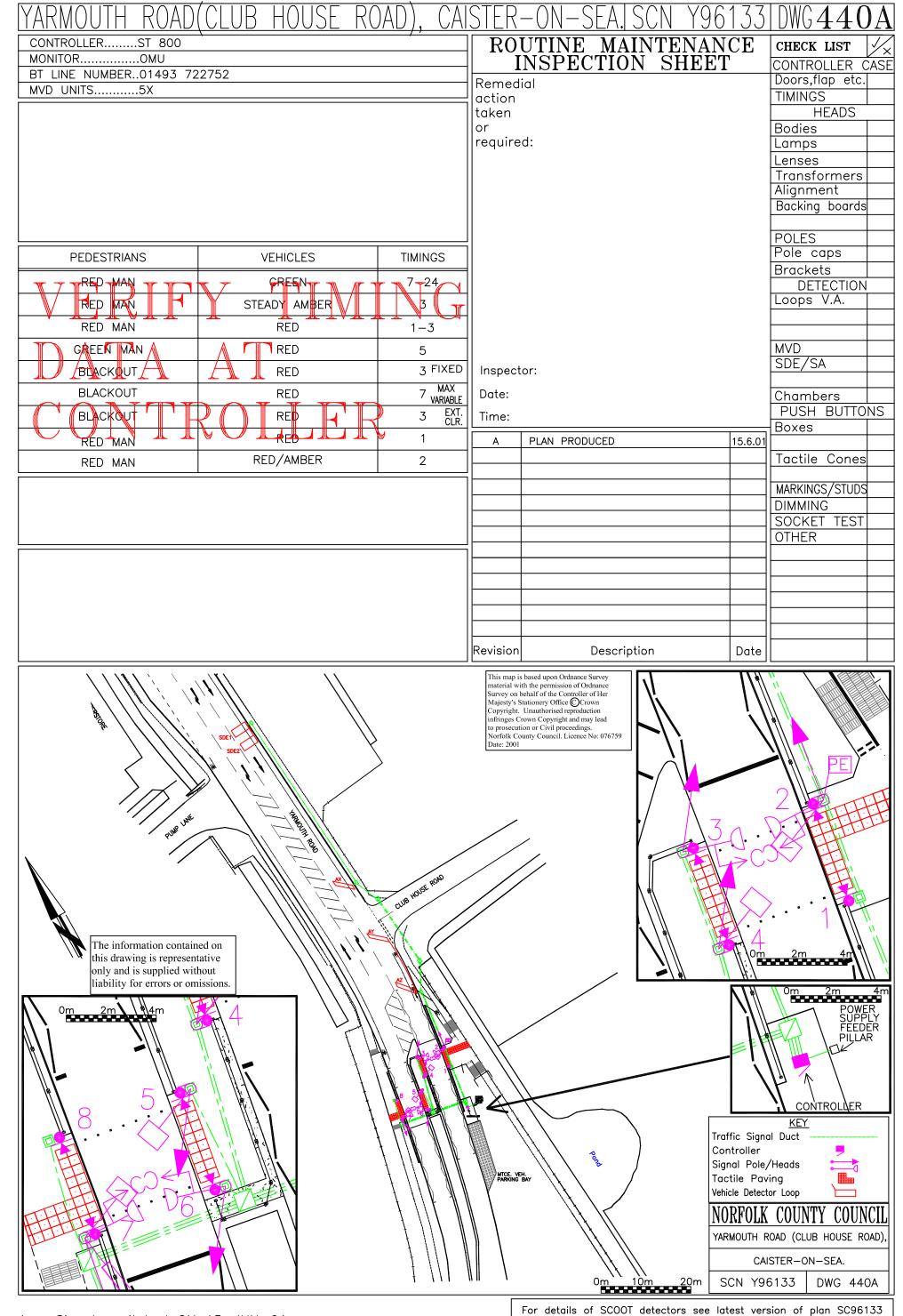


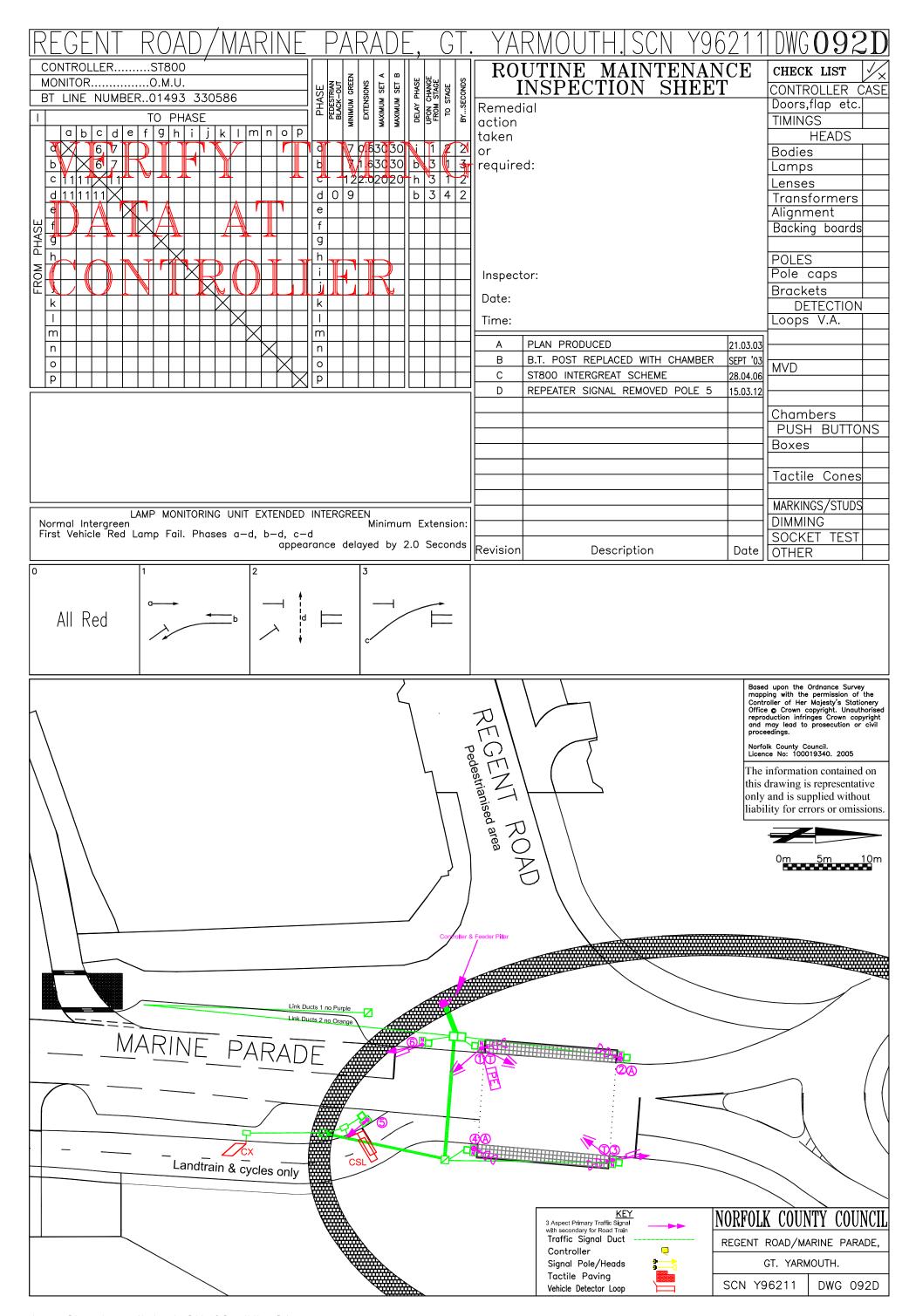


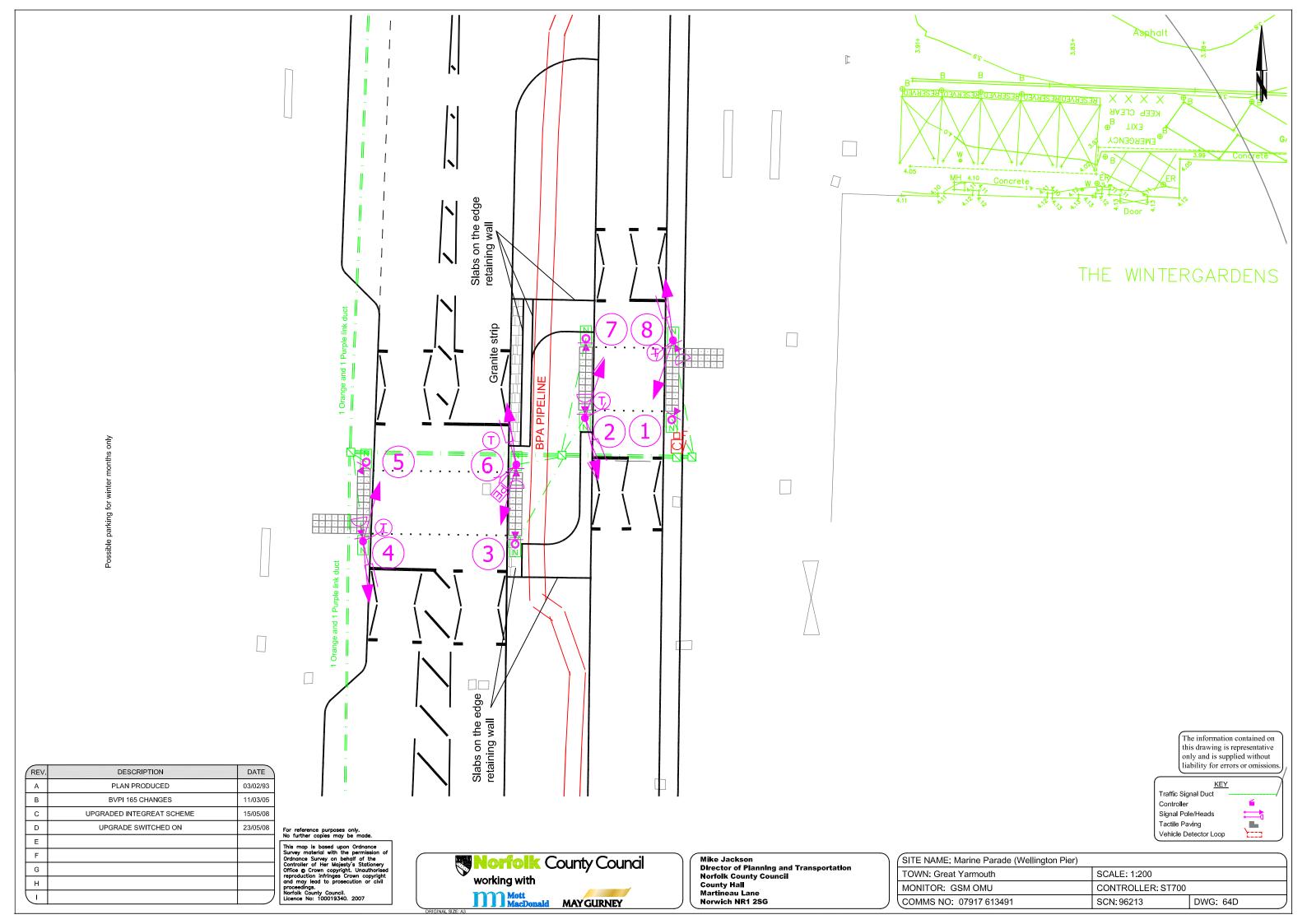


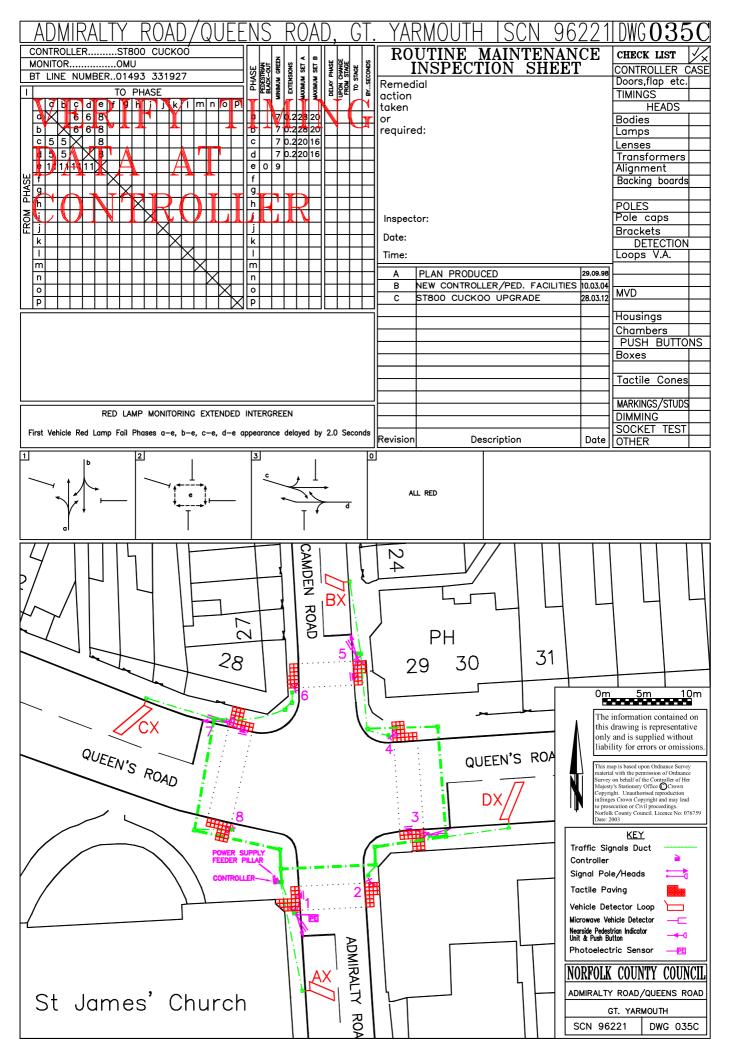


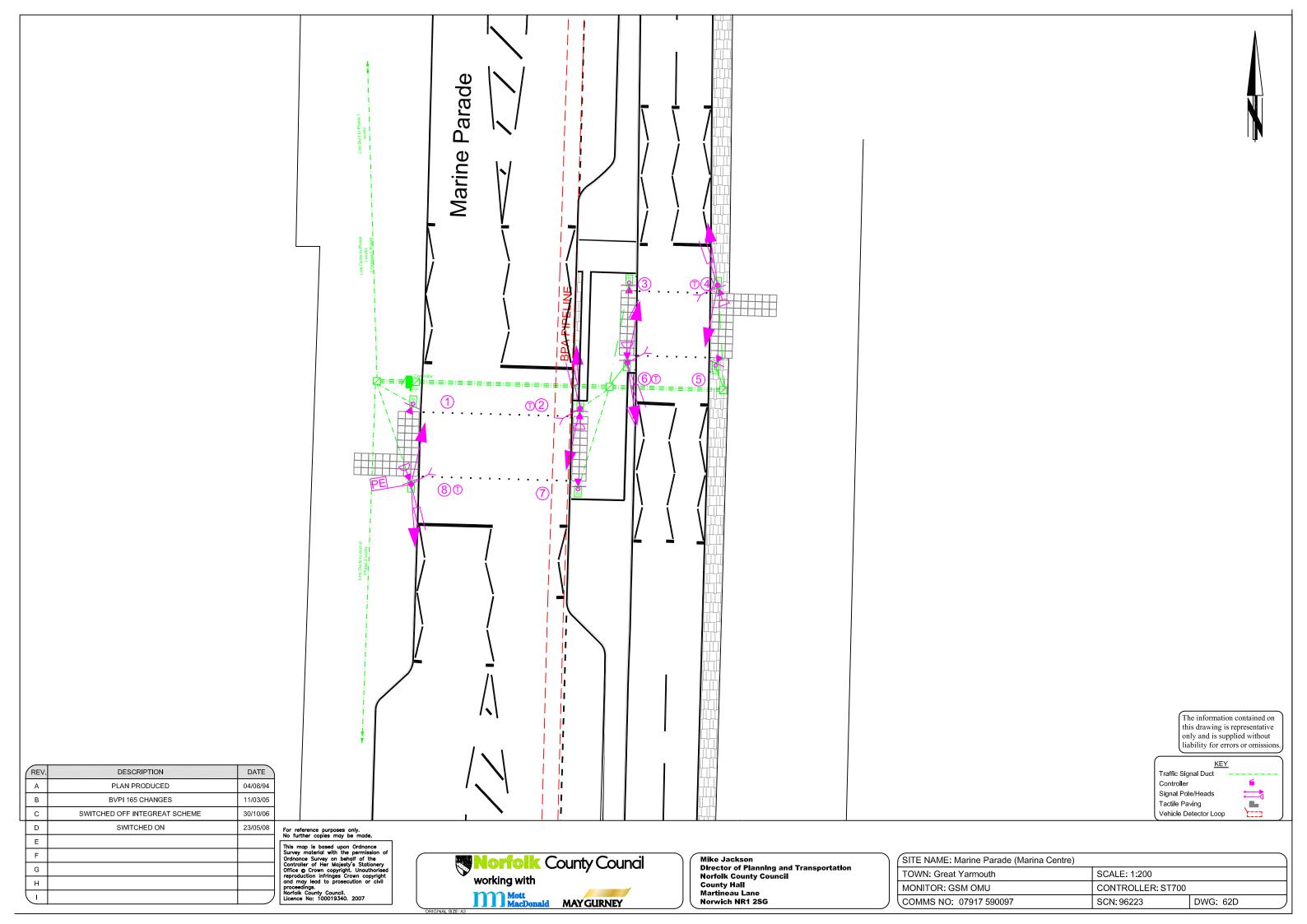


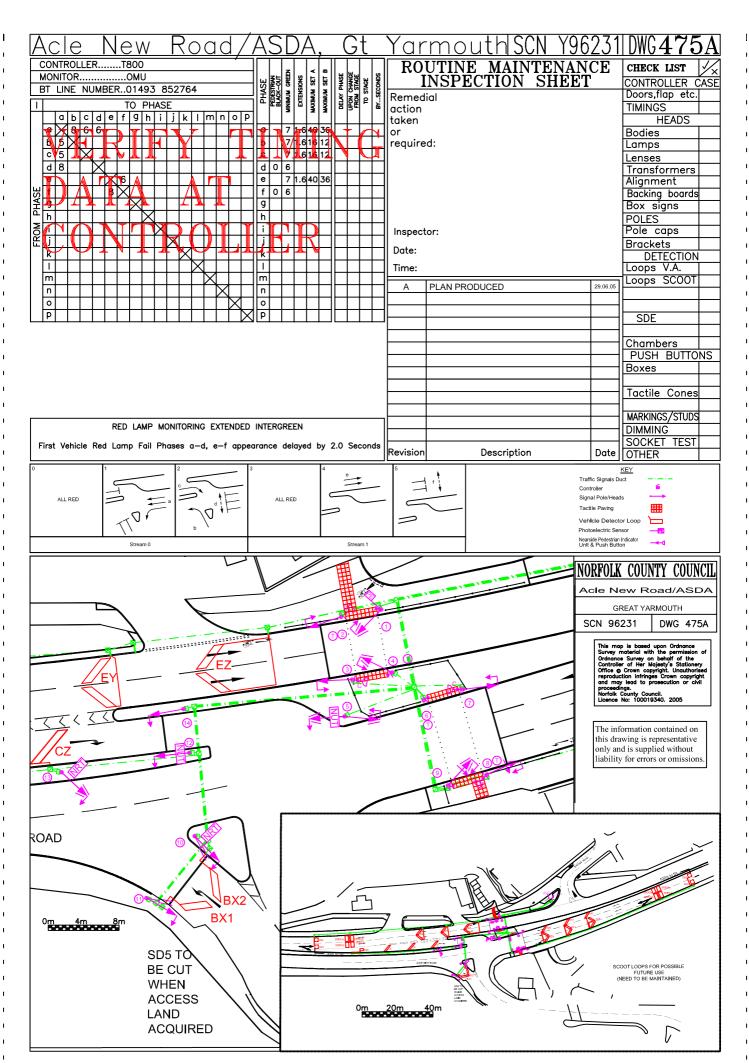


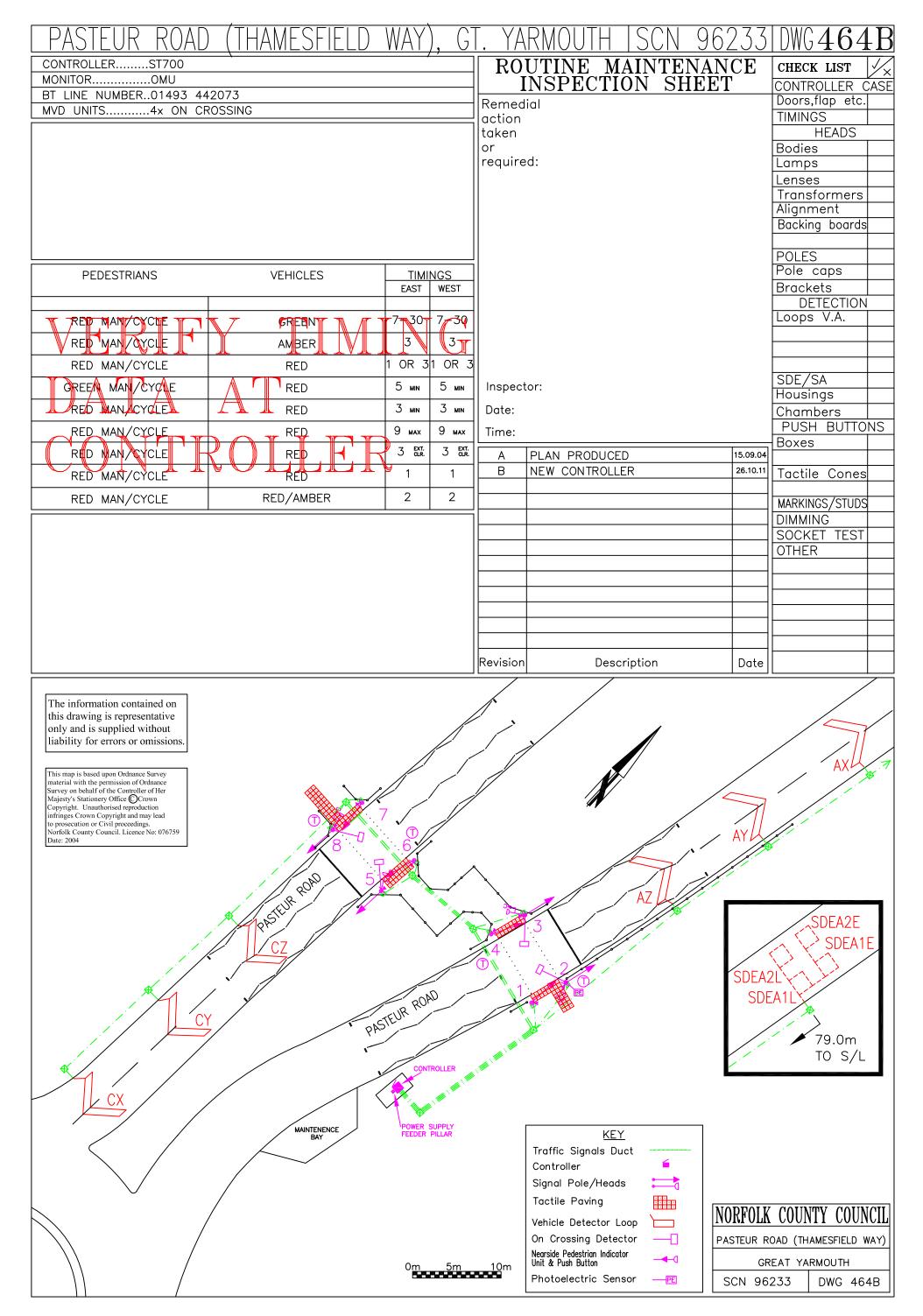


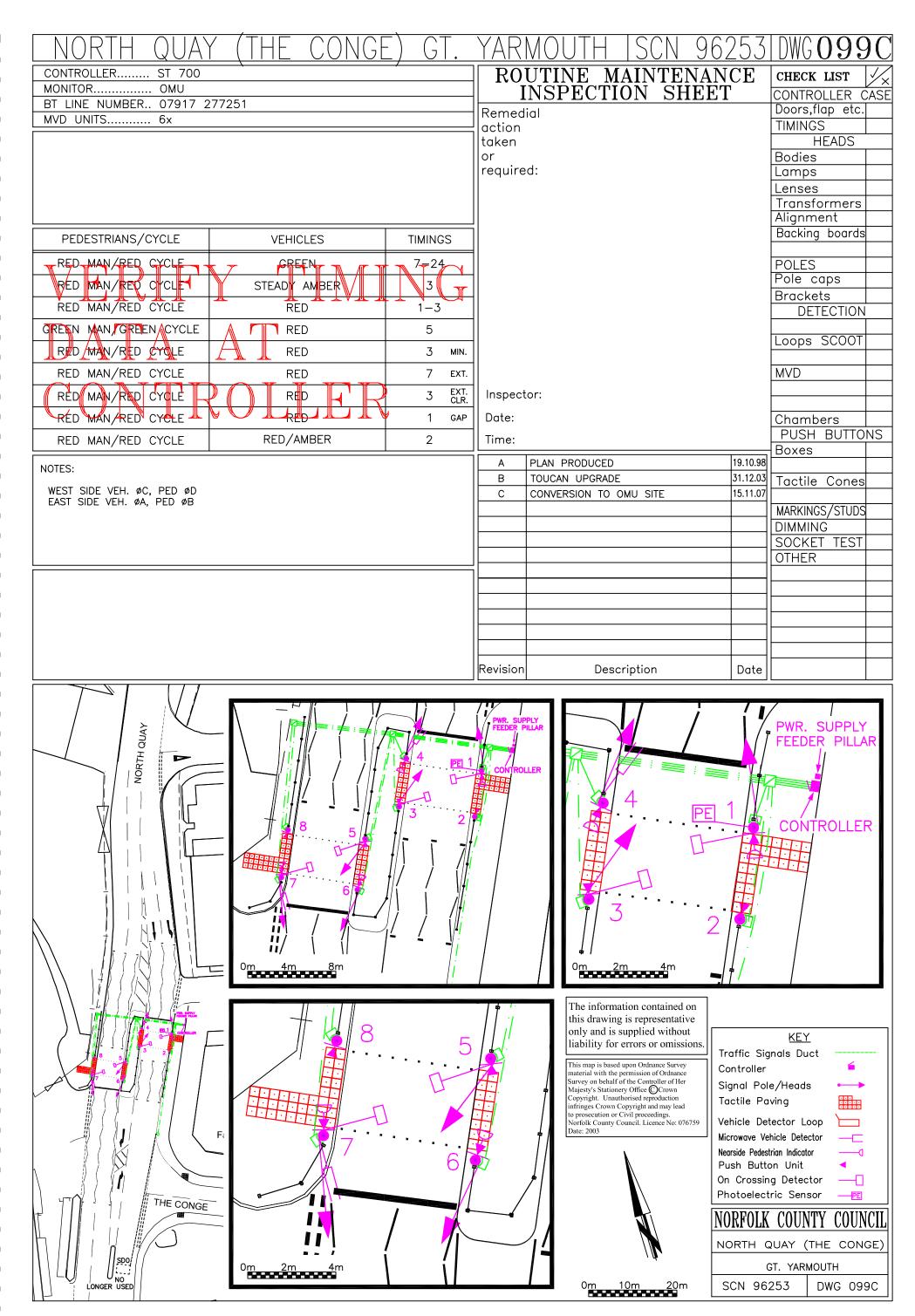


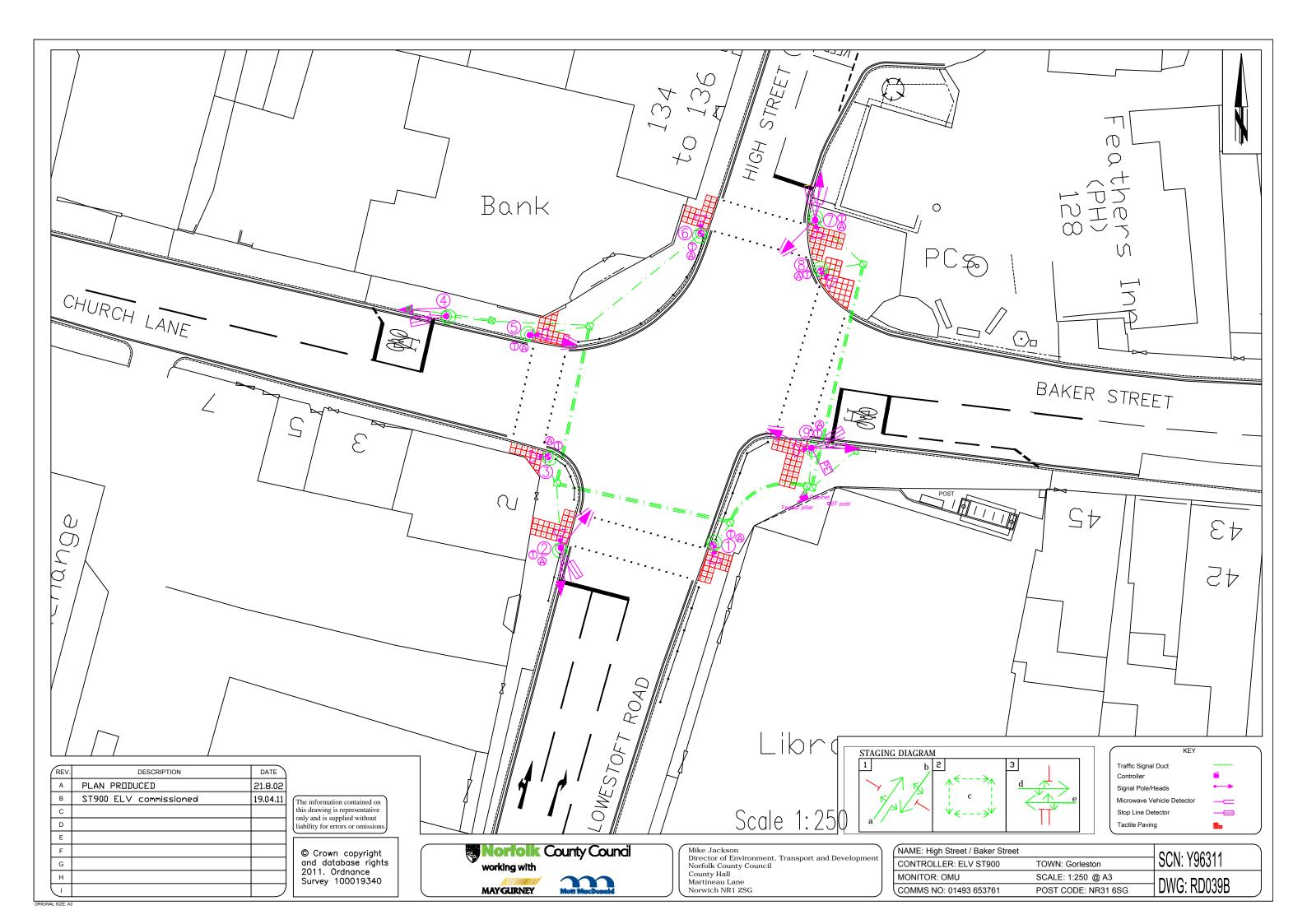


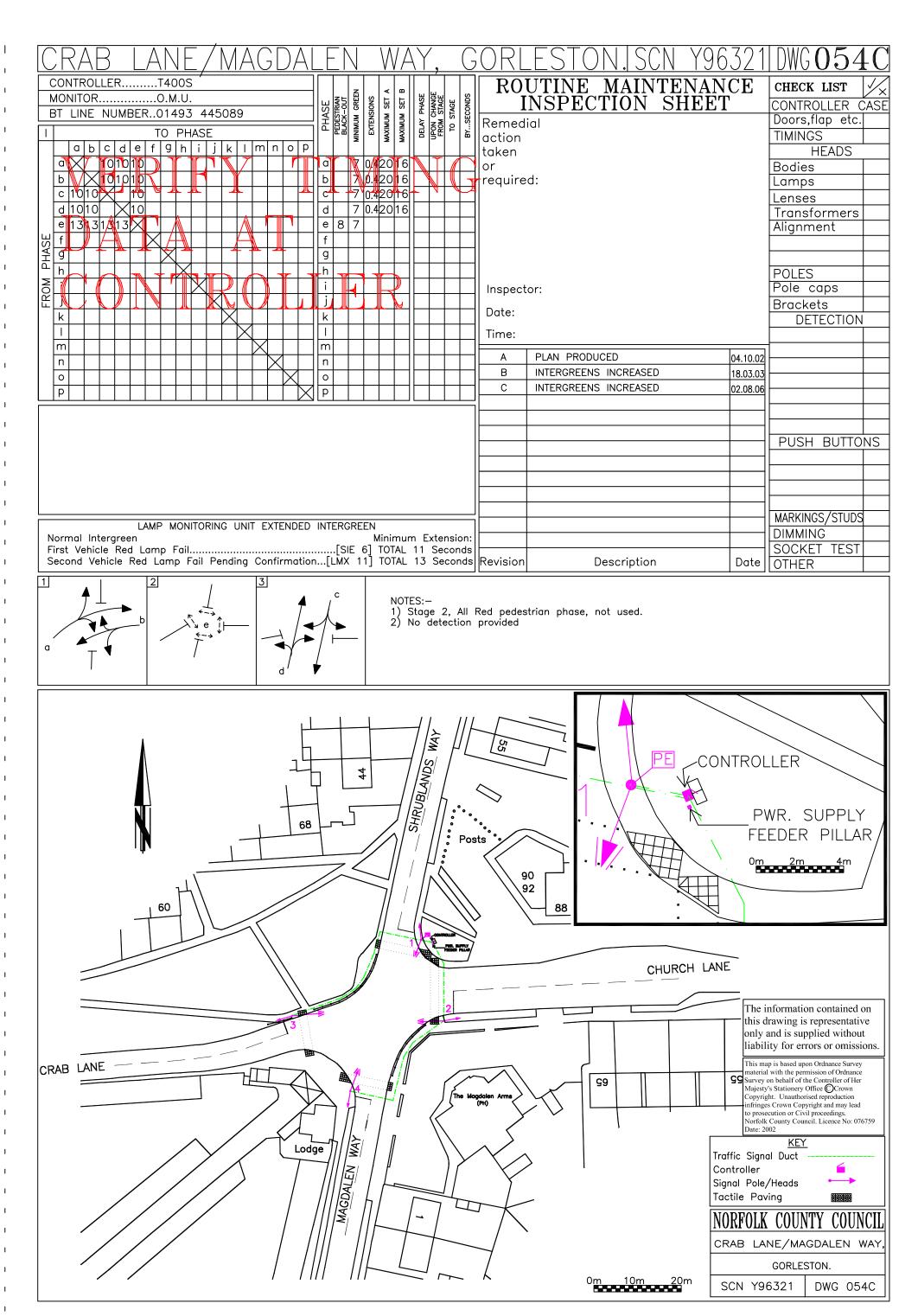


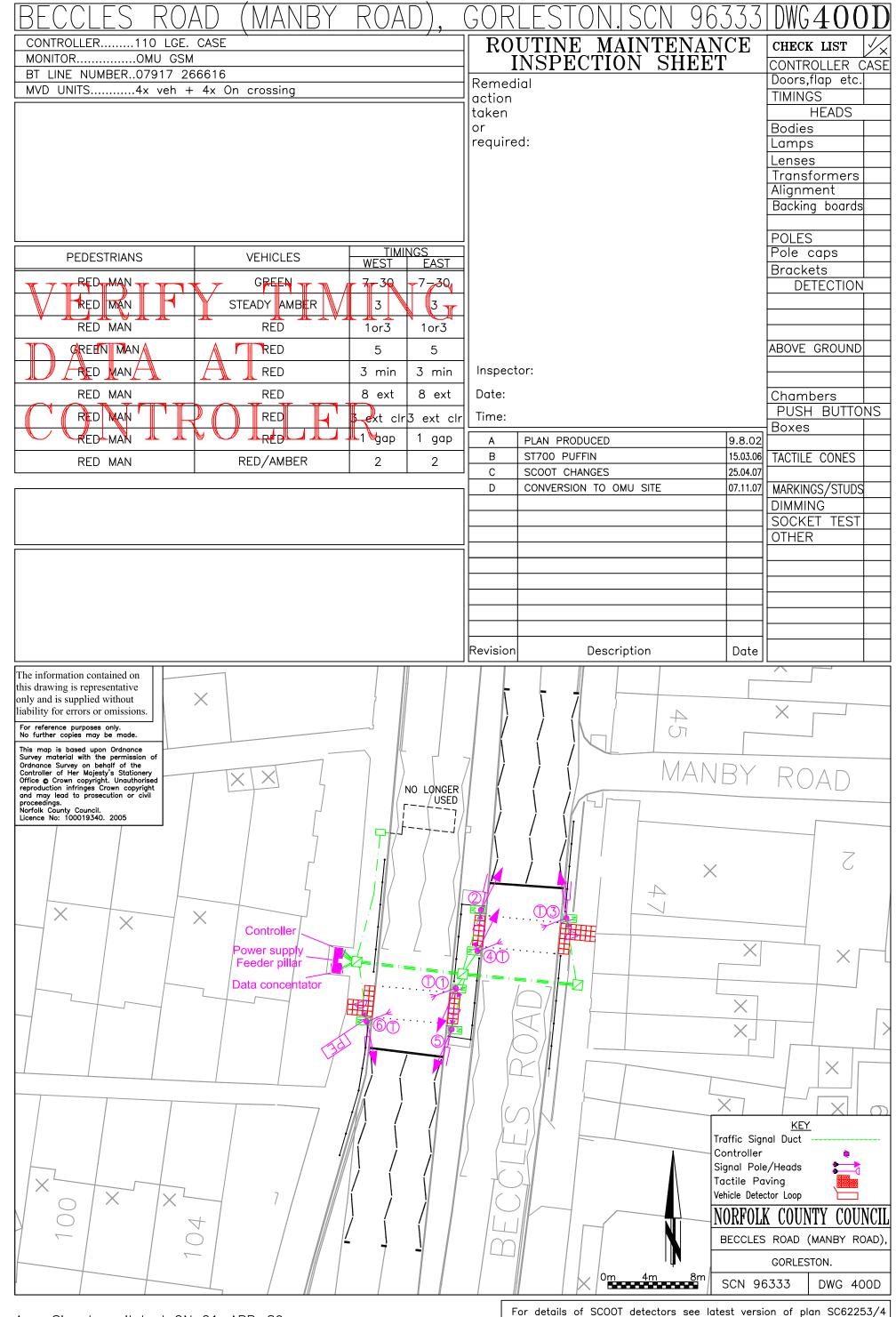


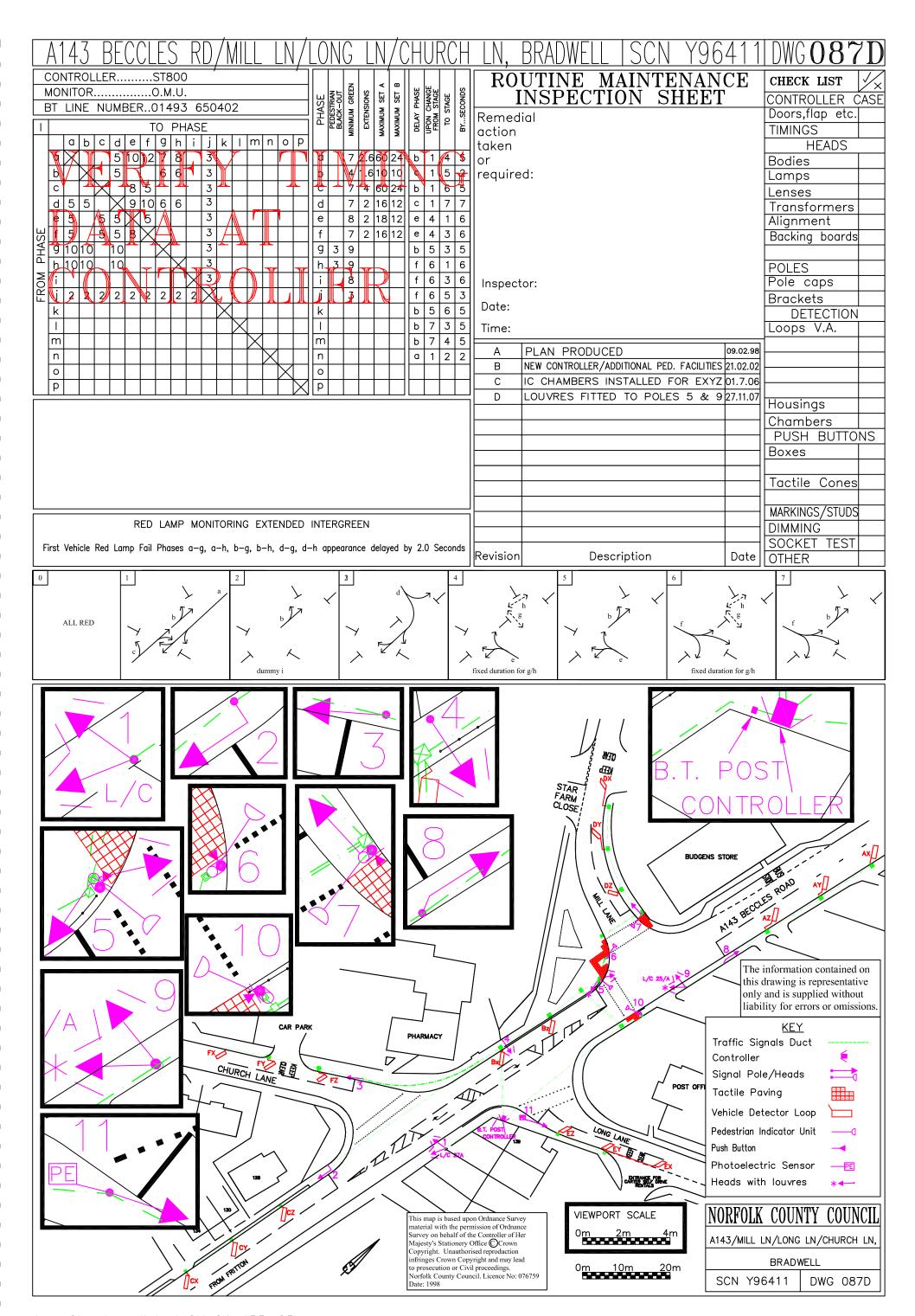












### APPENDIX E. Linsig Signal Optimisation

### Do Minimum\_Gapton Hall

**User and Project Details** 

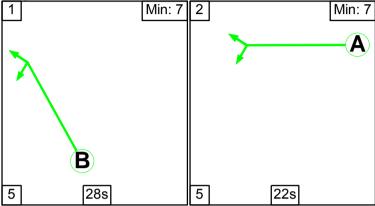
Project:	Great Yarmouth Third River Crossing
Title:	Forecast Report
Company:	Mouchel

Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

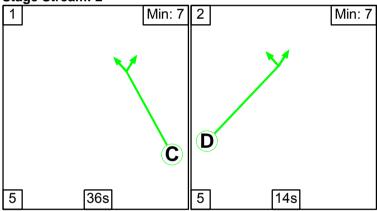
C1

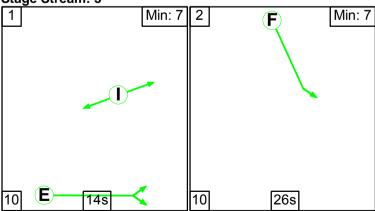
### Stage Sequence Diagram

Stage Stream: 1

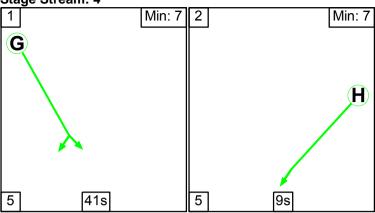


Stage Stream: 2

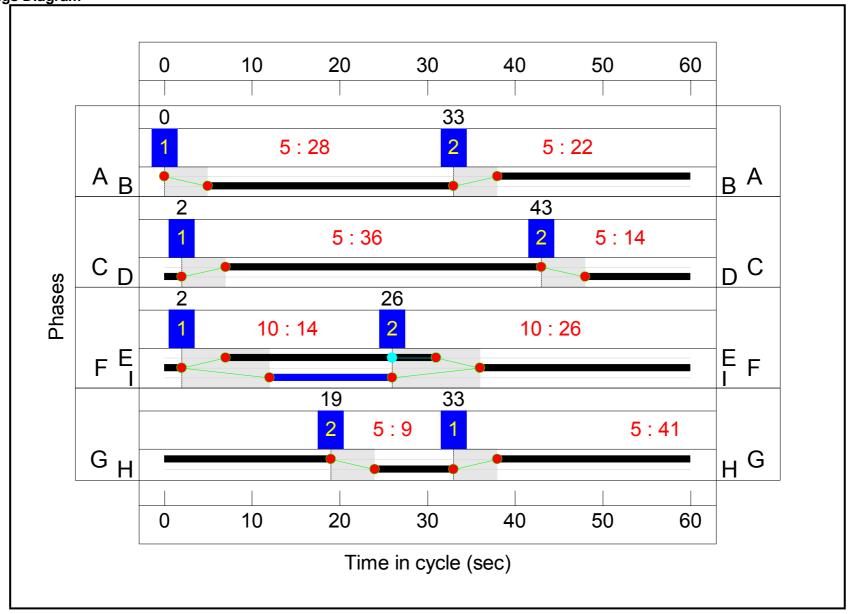




Do Minimum\_Gapton Hall Stage Stream: 4

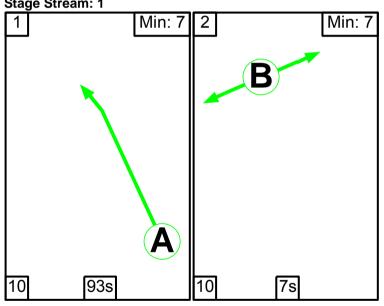


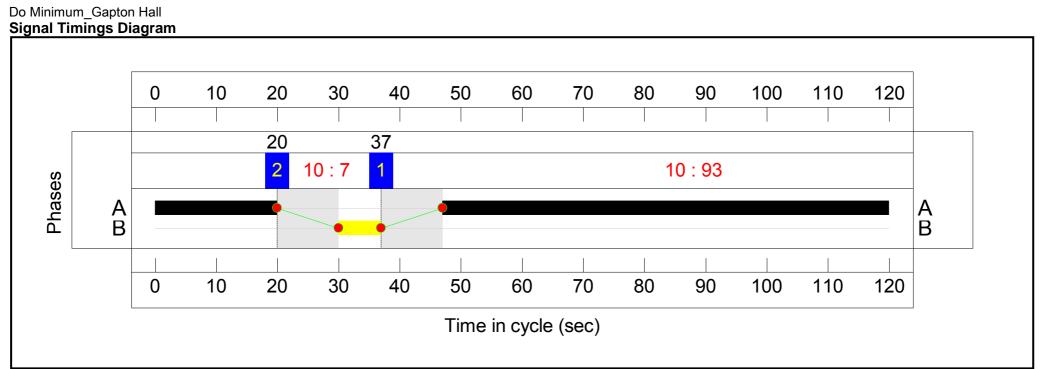
Do Minimum\_Gapton Hall **Signal Timings Diagram** 



Phase			Stone	Green Period 1			
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time	
А	Gapton Hall Rdb 4 Ahead Right	Traffic	1	22	38	0	
В	NB A12 3 lanes Left Ahead	Traffic	1	28	5	33	
С	Gapton Hall Rdb 1 Right Ahead	Traffic	2	36	7	43	
D	NB Gapton Hall 2 Lanes Ahead Left	Traffic	2	14	48	2	
Е	Gapton Hall Rdb 2 Right Ahead	Traffic	3	24	7	31	
F	SB A 12 3 Lanes Ahead	Traffic	3	26	36	2	
G	Gapton Hall Rdb 3 Right Ahead	Traffic	4	41	38	19	
н	WB Pasteur Road 2 lanes Ahead	Traffic	4	9	24	33	
I	Pedestrians across	Pedestrian	3	14	12	26	

C2 Stage Sequence Diagram Stage Stream: 1





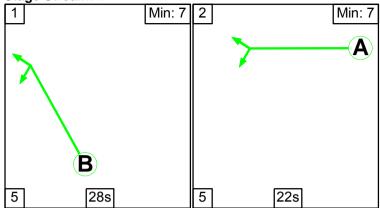
Phase Name		Phase	Stage	Gre	een Perio	d 1
	Description		Stream	Total Green	Start Time	End Time
Α	NB A12 Pedestrian Cross Ahead	Traffic	1	93	47	20
В	Pedestrians across	Pedestrian	1	7	30	37

	Lane Green Times  Junction: Gapton Hall Roundabout								
Lane	Description	Туре	Phases	Start Green	End Green				
2/1	NB A12 3 lanes Left	U	В	5	33				
2/2	NB A12 3 lanes Ahead	U	В	5	33				
2/3	NB A12 3 lanes Ahead	U	В	5	33				
4/1	NB Gapton Hall 2 Lanes Ahead Left	U	D	48	2				
4/2	NB Gapton Hall 2 Lanes Ahead	U	D	48	2				
6/1	Gapton Hall Rdb 1 Ahead	U	С	7	43				
6/2	Gapton Hall Rdb 1 Right Ahead	U	С	7	43				
6/3	Gapton Hall Rdb 1 Right	U	С	7	43				
7/1	Gapton Hall Rdb 2 Ahead	U	Е	7	31				
7/2	Gapton Hall Rdb 2 Right Ahead	U	Е	7	31				
7/3	Gapton Hall Rdb 2 Right	U	Е	7	31				
8/1	Gapton Hall Rdb 3 Ahead	U	G	38	19				
8/2	Gapton Hall Rdb 3 Ahead	U	G	38	19				
8/3	Gapton Hall Rdb 3 Right	U	G	38	19				
9/1	Gapton Hall Rdb 4 Ahead	U	Α	38	0				
9/2	Gapton Hall Rdb 4 Right	U	Α	38	0				
9/3	Gapton Hall Rdb 4 Right	U	Α	38	0				
10/1	NB A12 Pedestrian Cross Ahead	U	Α	47	20				
10/2	NB A12 Pedestrian Cross Ahead	U	Α	47	20				
16/1	SB A 12 3 Lanes Ahead	U	F	36	2				
16/2	SB A 12 3 Lanes Ahead	U	F	36	2				
16/3	SB A 12 3 Lanes Ahead	U	F	36	2				
19/1	WB Pasteur Road 2 lanes Ahead	U	Н	24	33				
19/2	WB Pasteur Road 2 lanes Ahead	U	Н	24	33				

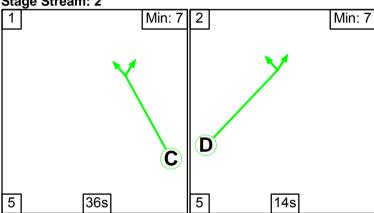
Do Minimum\_Gapton Hall Scenario 2: 'AM 2038' (FG2: 'AM 2038', Plan 1: 'Network Control Plan 1')

#### **Stage Sequence Diagram**

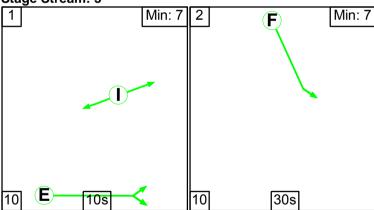
Stage Stream: 1

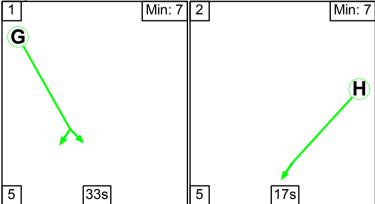


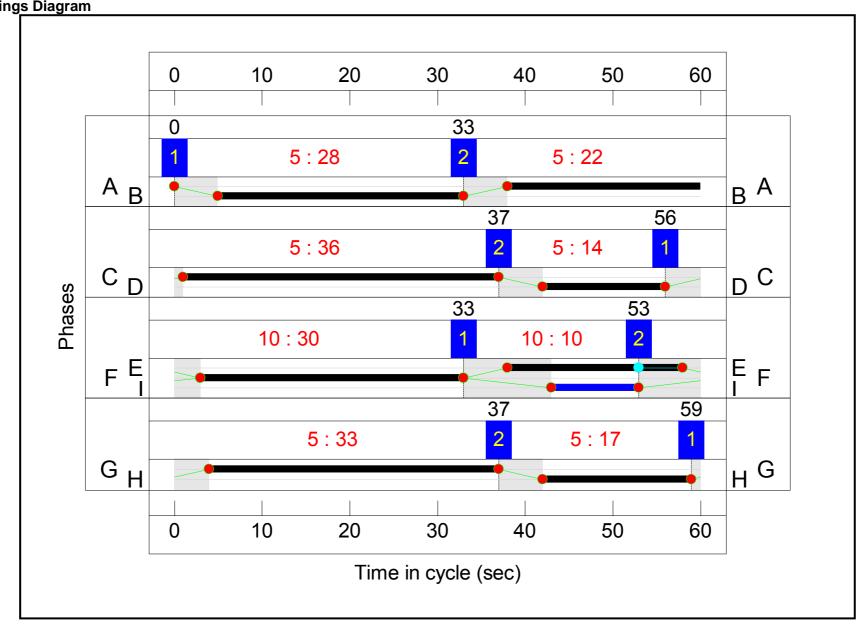
Stage Stream: 2





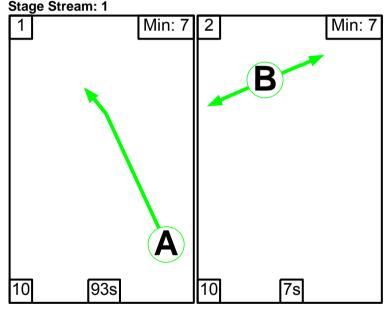


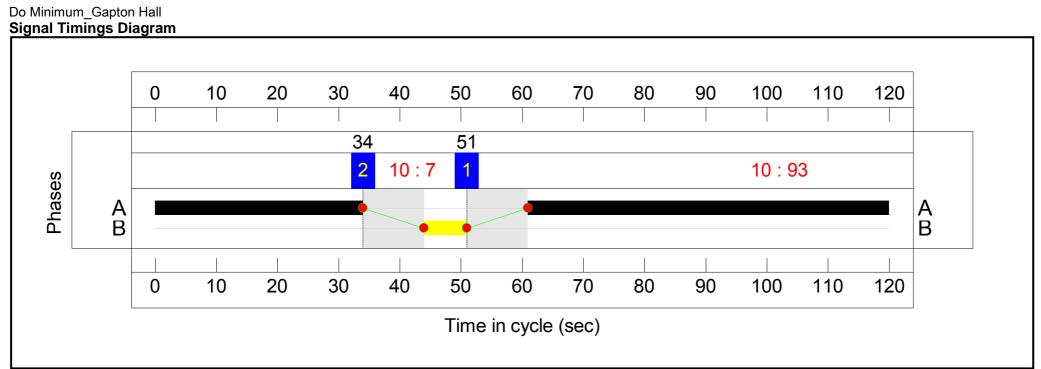




Phase			Stone	Green Period 1			
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time	
Α	Gapton Hall Rdb 4 Ahead Right	Traffic	1	22	38	0	
В	NB A12 3 lanes Left Ahead	Traffic	1	28	5	33	
С	Gapton Hall Rdb 1 Right Ahead	Traffic	2	36	1	37	
D	NB Gapton Hall 2 Lanes Ahead Left	Traffic	2	14	42	56	
Е	Gapton Hall Rdb 2 Right Ahead	Traffic	3	20	38	58	
F	SB A 12 3 Lanes Ahead	Traffic	3	30	3	33	
G	Gapton Hall Rdb 3 Right Ahead	Traffic	4	33	4	37	
н	WB Pasteur Road 2 lanes Ahead	Traffic	4	17	42	59	
I	Pedestrians across	Pedestrian	3	10	43	53	

C2 Stage Sequence Diagram Stage Stream: 1





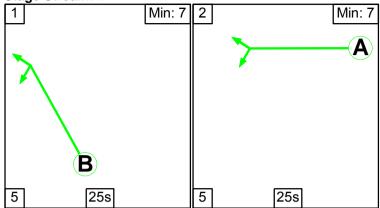
Phase Name	Description	Phase	Stage Stream	Green Period 1			
				Total Green	Start Time	End Time	
Α	NB A12 Pedestrian Cross Ahead	Traffic	1	93	61	34	
В	Pedestrians across	Pedestrian	1	7	44	51	

Junction: Gapton Hall Roundabout								
Lane	Description	Туре	Phases	Start Green	End Green			
2/1	NB A12 3 lanes Left	U	В	5	33			
2/2	NB A12 3 lanes Ahead	U	В	5	33			
2/3	NB A12 3 lanes Ahead	U	В	5	33			
4/1	NB Gapton Hall 2 Lanes Ahead Left	U	D	42	56			
4/2	NB Gapton Hall 2 Lanes Ahead	U	D	42	56			
6/1	Gapton Hall Rdb 1 Ahead	U	С	1	37			
6/2	Gapton Hall Rdb 1 Right Ahead	U	С	1	37			
6/3	Gapton Hall Rdb 1 Right	U	С	1	37			
7/1	Gapton Hall Rdb 2 Ahead	U	Е	38	58			
7/2	Gapton Hall Rdb 2 Right Ahead	U	Е	38	58			
7/3	Gapton Hall Rdb 2 Right	U	Е	38	58			
8/1	Gapton Hall Rdb 3 Ahead	U	G	4	37			
8/2	Gapton Hall Rdb 3 Ahead	U	G	4	37			
8/3	Gapton Hall Rdb 3 Right	U	G	4	37			
9/1	Gapton Hall Rdb 4 Ahead	U	Α	38	0			
9/2	Gapton Hall Rdb 4 Right	U	Α	38	0			
9/3	Gapton Hall Rdb 4 Right	U	Α	38	0			
10/1	NB A12 Pedestrian Cross Ahead	U	Α	61	34			
10/2	NB A12 Pedestrian Cross Ahead	U	Α	61	34			
16/1	SB A 12 3 Lanes Ahead	U	F	3	33			
16/2	SB A 12 3 Lanes Ahead	U	F	3	33			
16/3	SB A 12 3 Lanes Ahead	U	F	3	33			
19/1	WB Pasteur Road 2 lanes Ahead	U	Н	42	59			
19/2	WB Pasteur Road 2 lanes Ahead	U	Н	42	59			

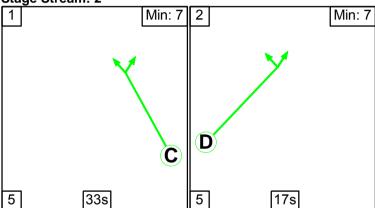
Do Minimum\_Gapton Hall Scenario 3: 'IP 2038' (FG3: 'IP 2038', Plan 1: 'Network Control Plan 1')

### **Stage Sequence Diagram**

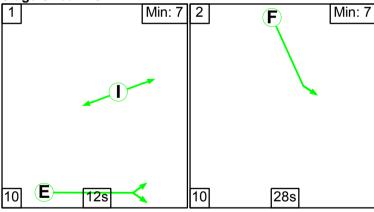
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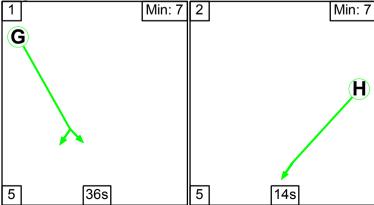




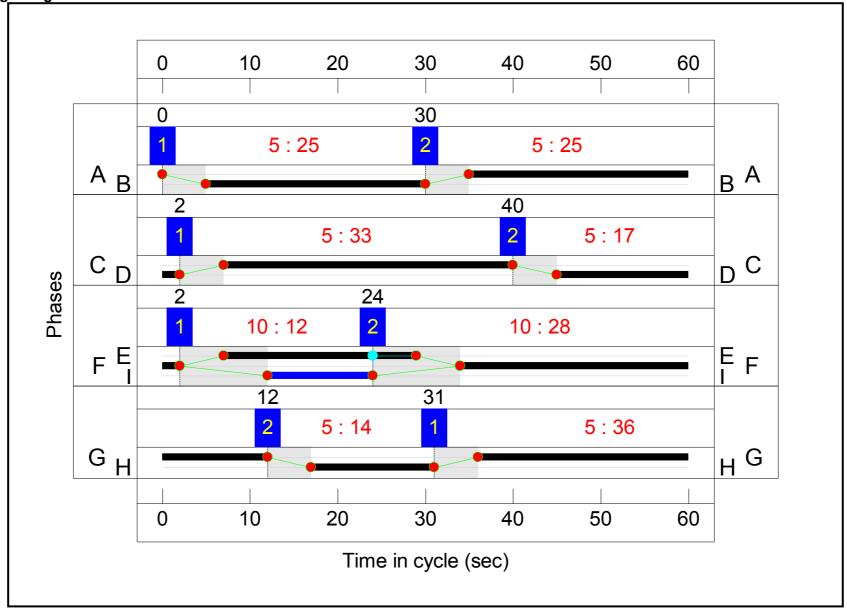






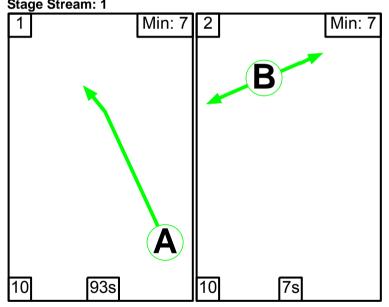


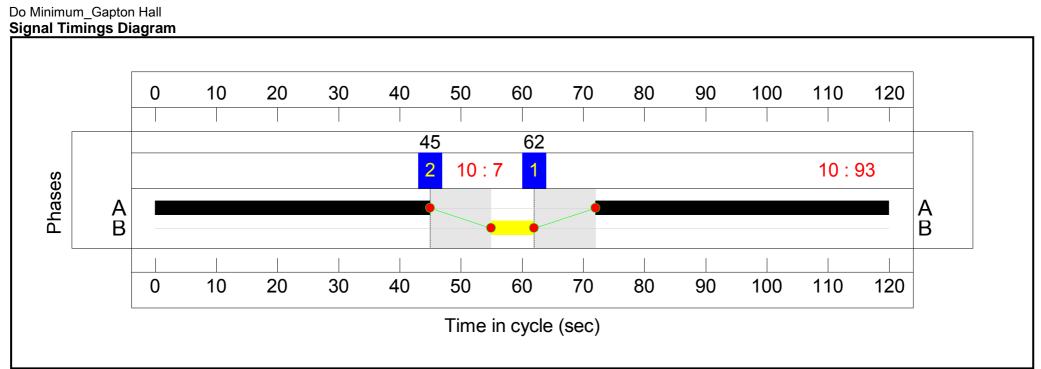




Phase			Stone	Green Period 1		
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time
Α	Gapton Hall Rdb 4 Ahead Right	Traffic	1	25	35	0
В	NB A12 3 lanes Left Ahead	Traffic	1	25	5	30
С	Gapton Hall Rdb 1 Right Ahead	Traffic	2	33	7	40
D	NB Gapton Hall 2 Lanes Ahead Left	Traffic	2	17	45	2
Е	Gapton Hall Rdb 2 Right Ahead	Traffic	3	22	7	29
F	SB A 12 3 Lanes Ahead	Traffic	3	28	34	2
G	Gapton Hall Rdb 3 Right Ahead	Traffic	4	36	36	12
Н	WB Pasteur Road 2 lanes Ahead	Traffic	4	14	17	31
I	Pedestrians across	Pedestrian	3	12	12	24

C2 Stage Sequence Diagram Stage Stream: 1





Phase Name		Phase	Stano	Green Period 1			
	Description		Stream	Total Green	Start Time	End Time	
Α	NB A12 Pedestrian Cross Ahead	Traffic	1	93	72	45	
В	Pedestrians across	Pedestrian	1	7	55	62	

	Lane Green Times  Junction: Gapton Hall Roundabout								
Lane	Description	Туре	Phases	Start Green	End Green				
2/1	NB A12 3 lanes Left	U	В	5	30				
2/2	NB A12 3 lanes Ahead	U	В	5	30				
2/3	NB A12 3 lanes Ahead	U	В	5	30				
4/1	NB Gapton Hall 2 Lanes Ahead Left	U	D	45	2				
4/2	NB Gapton Hall 2 Lanes Ahead	U	D	45	2				
6/1	Gapton Hall Rdb 1 Ahead	U	С	7	40				
6/2	Gapton Hall Rdb 1 Right Ahead	U	С	7	40				
6/3	Gapton Hall Rdb 1 Right	U	С	7	40				
7/1	Gapton Hall Rdb 2 Ahead	U	Е	7	29				
7/2	Gapton Hall Rdb 2 Right Ahead	U	Е	7	29				
7/3	Gapton Hall Rdb 2 Right	U	Е	7	29				
8/1	Gapton Hall Rdb 3 Ahead	U	G	36	12				
8/2	Gapton Hall Rdb 3 Ahead	U	G	36	12				
8/3	Gapton Hall Rdb 3 Right	U	G	36	12				
9/1	Gapton Hall Rdb 4 Ahead	U	Α	35	0				
9/2	Gapton Hall Rdb 4 Right	U	Α	35	0				
9/3	Gapton Hall Rdb 4 Right	U	Α	35	0				
10/1	NB A12 Pedestrian Cross Ahead	U	Α	72	45				
10/2	NB A12 Pedestrian Cross Ahead	U	Α	72	45				
16/1	SB A 12 3 Lanes Ahead	U	F	34	2				
16/2	SB A 12 3 Lanes Ahead	U	F	34	2				
16/3	SB A 12 3 Lanes Ahead	U	F	34	2				
19/1	WB Pasteur Road 2 lanes Ahead	U	Н	17	31				
19/2	WB Pasteur Road 2 lanes Ahead	U	Н	17	31				

### Do Minimum\_Harfreys Roundabout

### Do Minimum\_Harfreys Roundabout

#### **User and Project Details**

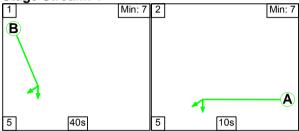
Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

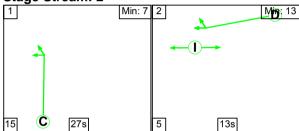
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### Stage Sequence Diagram

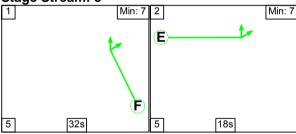
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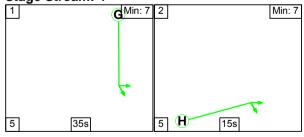


Stage Stream: 2

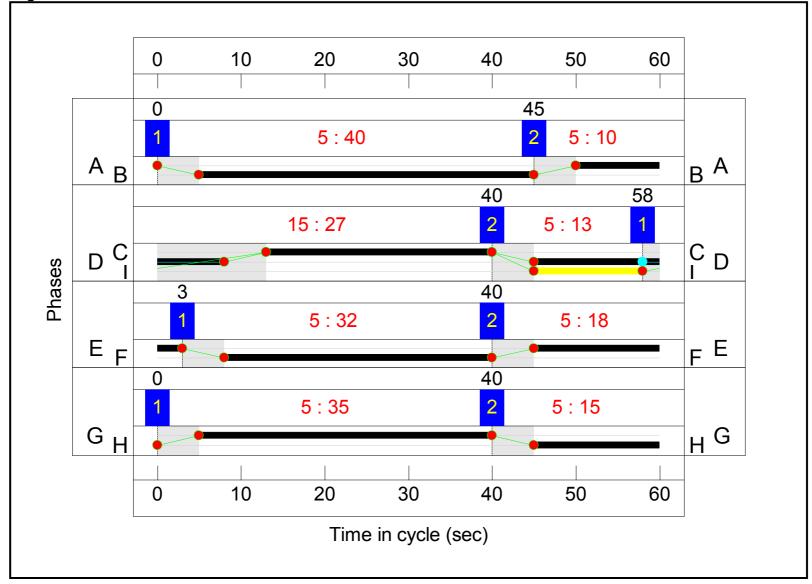


Stage Stream: 3



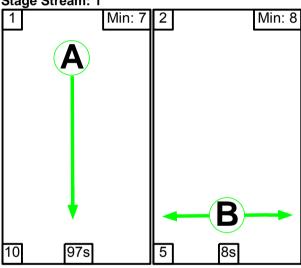


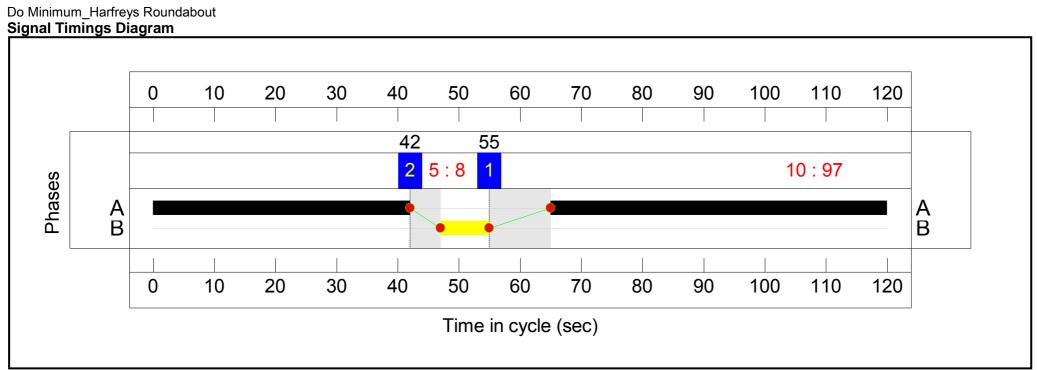
Do Minimum\_Harfreys Roundabout **Signal Timings Diagram** 



Phase	g-	Phase	Stage	Green Period 1		
Name	Description		Stream	Total Green	Start Time	End Time
Α	Ahead Left	Traffic	1	10	50	0
В	Right Ahead	Traffic	1	40	5	45
С	Ahead Left	Traffic	2	27	13	40
D	Right Ahead	Traffic	2	23	45	8
Е	Ahead Left	Traffic	3	18	45	3
F	Right Ahead	Traffic	3	32	8	40
G	Ahead Left	Traffic	4	35	5	40
Н	Right Ahead	Traffic	4	15	45	0
I	Pedestrians across	Pedestrian	2	13	45	58

C2 Stage Sequence Diagram Stage Stream: 1





Phase Name	Description	Phase	Stage Stream	Green Period 1		
				Total Green	Start Time	End Time
Α	Ahead	Traffic	1	97	65	42
В	Pedestrians across	Pedestrian	1	8	47	55

Junct	Junction: Unnamed Junction								
Lane	Description	Туре	Phases	Start Green	End Green				
1/1	Left	U	Α	50	0				
1/2	Ahead Left	U	Α	50	0				
1/3	Ahead	U	Α	50	0				
2/1	Left	U	С	13	40				
2/2	Ahead	U	С	13	40				
2/3	Ahead	U	С	13	40				
2/4	Ahead	U	С	13	40				
3/1	Ahead Left	U	Е	45	3				
3/2	Ahead	U	Е	45	3				
4/1	Left	U	G	5	40				
4/2	Ahead	U	G	5	40				
4/3	Ahead	U	G	5	40				
4/4	Ahead	U	G	5	40				
5/1	Ahead	U	D	45	8				
5/2	Right Ahead	U	D	45	8				
5/3	Right	U	D	45	8				
6/1	Ahead	U	F	8	40				
6/2	Right Ahead	U	F	8	40				
6/3	Right	U	F	8	40				
7/1	Ahead	U	Н	45	0				
7/2	Right Ahead	U	Н	45	0				
7/3	Right	U	Н	45	0				
8/1	Ahead	U	В	5	45				
8/2	Ahead	U	В	5	45				
8/3	Right	U	В	5	45				
9/1	Ahead	U	Α	65	42				
9/2	Ahead	U	Α	65	42				

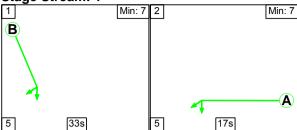
Do Minimum\_Harfreys Roundabout

Scenario 2: 'AM 2038' (FG2: 'AM 2038', Plan 1: 'Network Control Plan 1')

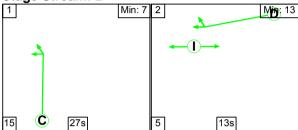
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### **Stage Sequence Diagram**

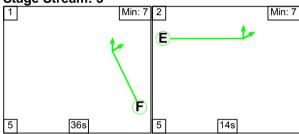
Stage Stream: 1

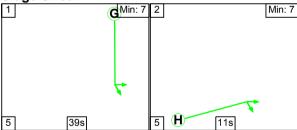


Stage Stream: 2

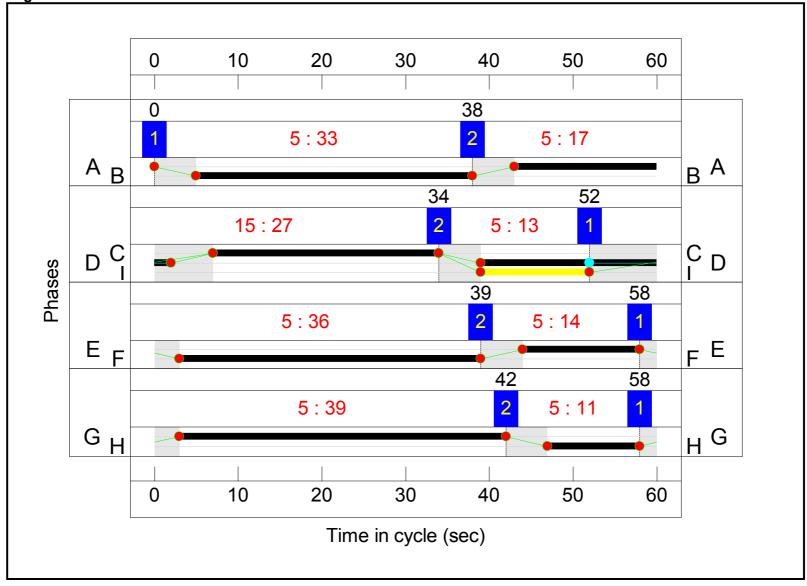


Stage Stream: 3



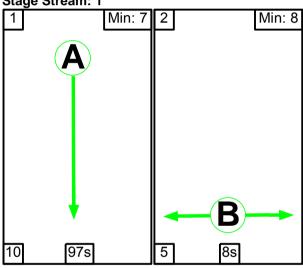


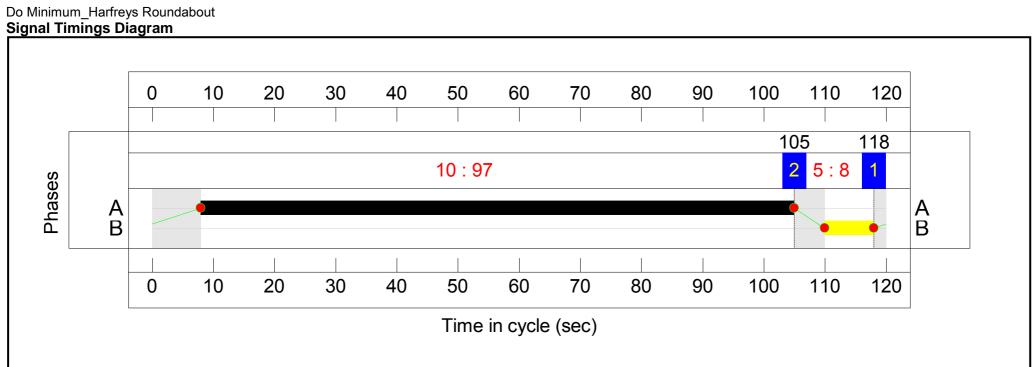
Do Minimum\_Harfreys Roundabout **Signal Timings Diagram** 



Phase Name	Description	Phase	Stage Stream	Green Period 1		
				Total Green	Start Time	End Time
Α	Ahead Left	Traffic	1	17	43	0
В	Right Ahead	Traffic	1	33	5	38
С	Ahead Left	Traffic	2	27	7	34
D	Right Ahead	Traffic	2	23	39	2
Е	Ahead Left	Traffic	3	14	44	58
F	Right Ahead	Traffic	3	36	3	39
G	Ahead Left	Traffic	4	39	3	42
Н	Right Ahead	Traffic	4	11	47	58
I	Pedestrians across	Pedestrian	2	13	39	52

C2 Stage Sequence Diagram Stage Stream: 1





Phase Name	Description	Phase	Stage Stream	Green Period 1		
				Total Green	Start Time	End Time
Α	Ahead	Traffic	1	97	8	105
В	Pedestrians across	Pedestrian	1	8	110	118

Junction: Unnamed Junction								
Lane	Description	Туре	Phases	Start Green	End Green			
1/1	Left	U	Α	43	0			
1/2	Ahead Left	J	Α	43	0			
1/3	Ahead	J	Α	43	0			
2/1	Left	U	С	7	34			
2/2	Ahead	J	С	7	34			
2/3	Ahead	J	С	7	34			
2/4	Ahead	J	С	7	34			
3/1	Ahead Left	U	Е	44	58			
3/2	Ahead	J	Е	44	58			
4/1	Left	כ	G	3	42			
4/2	Ahead	U	G	3	42			
4/3	Ahead	J	G	3	42			
4/4	Ahead	J	G	3	42			
5/1	Ahead	J	D	39	2			
5/2	Right Ahead	U	D	39	2			
5/3	Right	J	D	39	2			
6/1	Ahead	J	F	3	39			
6/2	Right Ahead	U	F	3	39			
6/3	Right	U	F	3	39			
7/1	Ahead	U	Н	47	58			
7/2	Right Ahead	כ	Н	47	58			
7/3	Right	U	Н	47	58			
8/1	Ahead	J	В	5	38			
8/2	Ahead	U	В	5	38			
8/3	Right	J	В	5	38			
9/1	Ahead	C	Α	8	105			
9/2	Ahead	U	Α	8	105			

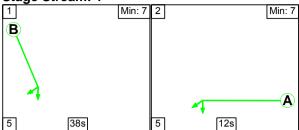
Do Minimum\_Harfreys Roundabout

Scenario 3: 'IP 2038' (FG3: 'IP 2038', Plan 1: 'Network Control Plan 1')

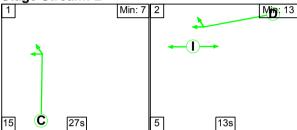
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### **Stage Sequence Diagram**

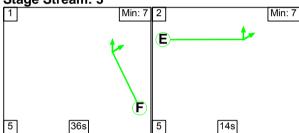
Stage Stream: 1

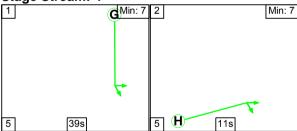


Stage Stream: 2

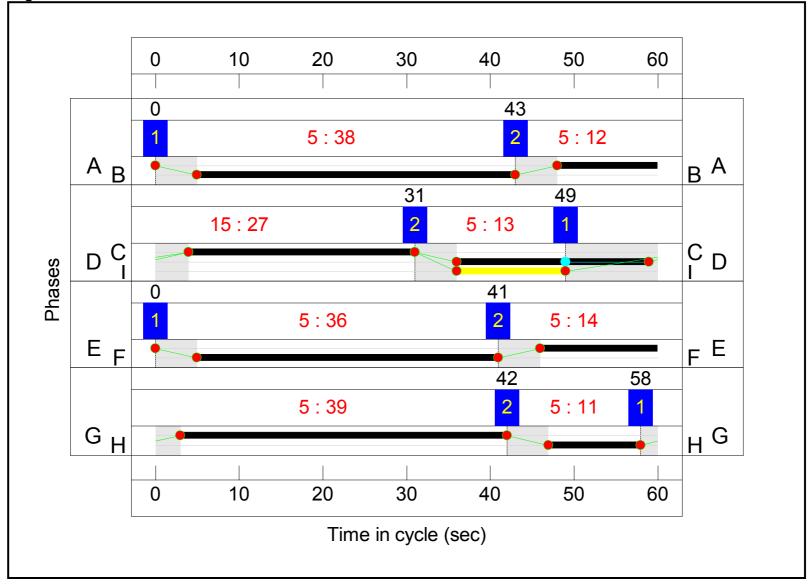


Stage Stream: 3



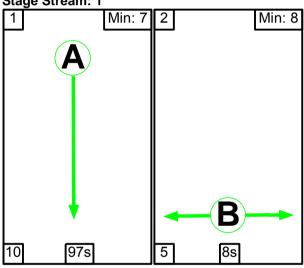


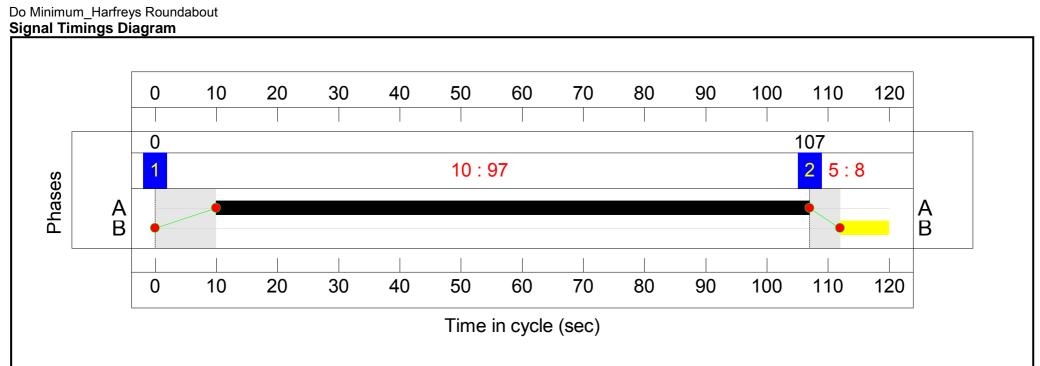
Do Minimum\_Harfreys Roundabout **Signal Timings Diagram** 



Phase	I DESCRIPTION Phase		Stone	Green Period 1		
Name		Stage Stream	Total Green	Start Time	End Time	
Α	Ahead Left	Traffic	1	12	48	0
В	Right Ahead	Traffic	1	38	5	43
С	Ahead Left	Traffic	2	27	4	31
D	Right Ahead	Traffic	2	23	36	59
Е	Ahead Left	Traffic	3	14	46	0
F	Right Ahead	Traffic	3	36	5	41
G	Ahead Left	Traffic	4	39	3	42
Н	Right Ahead	Traffic	4	11	47	58
I	Pedestrians across	Pedestrian	2	13	36	49

C2 Stage Sequence Diagram Stage Stream: 1





## Do Minimum\_Harfreys Roundabout **Phase Timings**

Phase			Stago	Green Period 1			
Name	Description	Phase	Stream	Total Green	Start Time	End Time	
Α	Ahead	Traffic	1	97	10	107	
В	Pedestrians across	Pedestrian	strian 1		112	0	

#### **Lane Green Times**

Junct	Junction: Unnamed Junction										
Lane	Description	Туре	Phases	Start Green	End Green						
1/1	Left	U	Α	48	0						
1/2	Ahead Left	U	Α	48	0						
1/3	Ahead	U	Α	48	0						
2/1	Left	U	С	4	31						
2/2	Ahead	U	С	4	31						
2/3	Ahead	U	С	4	31						
2/4	Ahead	U	С	4	31						
3/1	Ahead Left	U	Е	46	0						
3/2	Ahead	U	Е	46	0						
4/1	Left	U	G	3	42						
4/2	Ahead	U	G	3	42						
4/3	Ahead	U	G	3	42						
4/4	Ahead	U	G	3	42						
5/1	Ahead	U	D	36	59						
5/2	Right Ahead	U	D	36	59						
5/3	Right	U	D	36	59						
6/1	Ahead	U	F	5	41						
6/2	Right Ahead	U	F	5	41						
6/3	Right	U	F	5	41						
7/1	Ahead	U	Н	47	58						
7/2	Right Ahead	U	Н	47	58						
7/3	Right	U	Н	47	58						
8/1	Ahead	U	В	5	43						
8/2	Ahead	U	В	5	43						
8/3	Right	U	В	5	43						
9/1	Ahead	U	Α	10	107						
9/2	Ahead	U	Α	10	107						

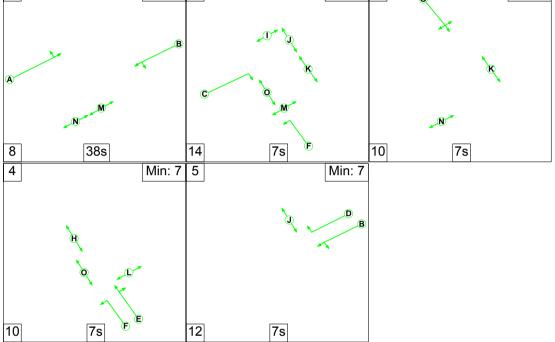
**User and Project Details** 

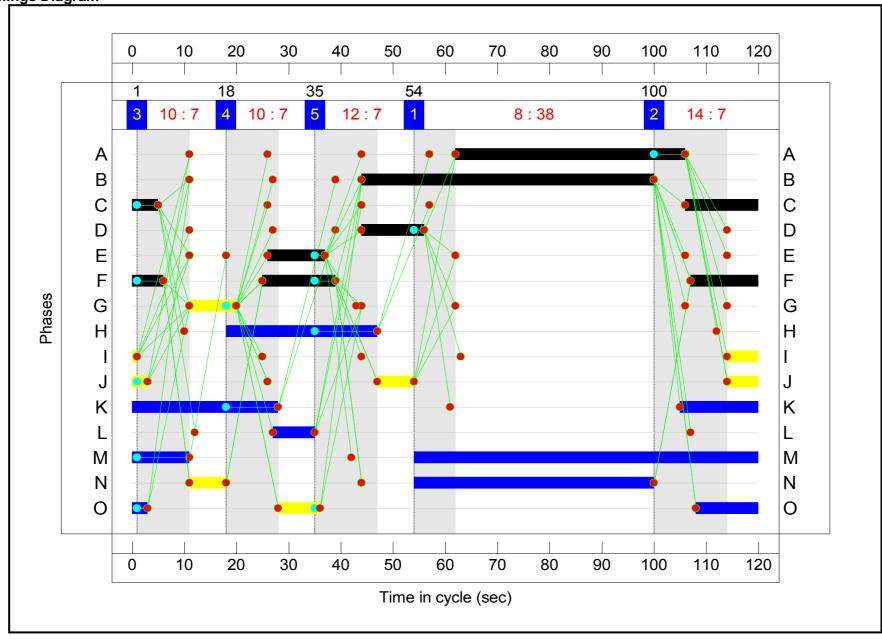
Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

Min: 7

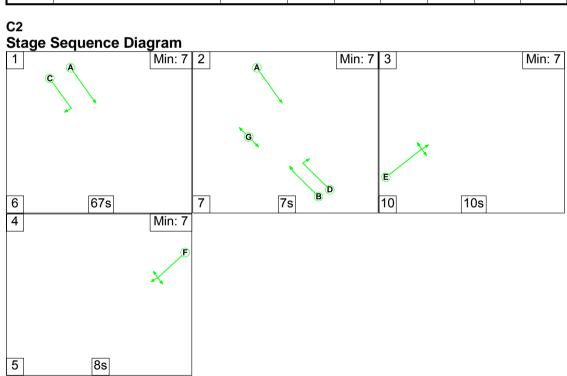
Scenario 1: 'AM 2038' (FG3: 'AM 2038', Plan 1: 'Network Control Plan 1')

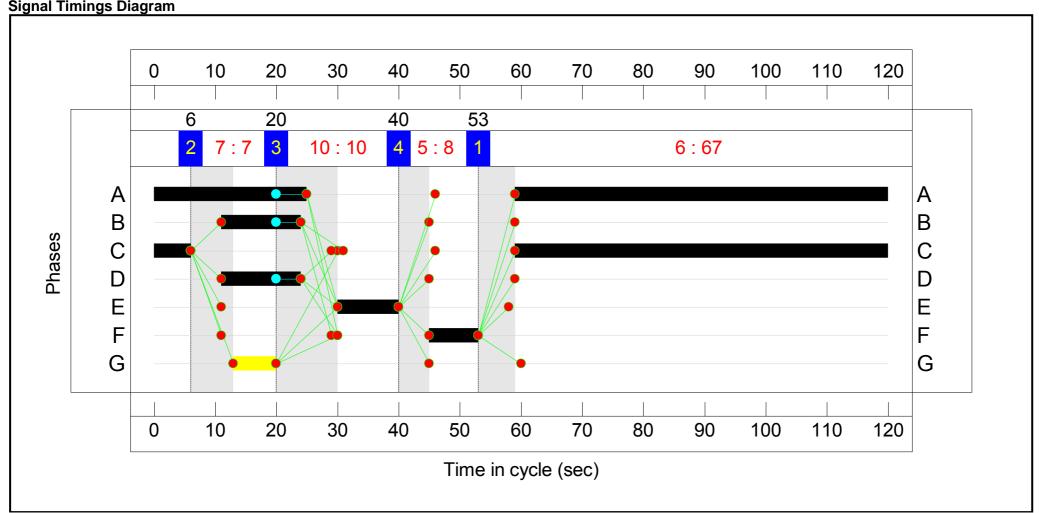






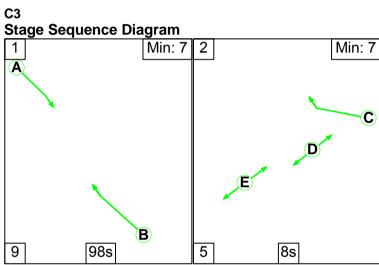
Phase	Tilling 5		Gre	en Perio	d 1	Gre	een Perio	d 2
Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
Α	Pasteur Road EB 1 Ahead Left	Traffic	44	62	106			
В	Pasteur Road WB 2 Ahead Left	Traffic	56	44	100			
С	Pasteur Road EB 1 Right	Traffic	19	106	5			
D	Pasteur Road WB 2 Right	Traffic	12	44	56			
Е	Southtown NB 2 Right Ahead	Traffic	11	26	37			
F	Southtown NB 2 Left	Traffic	19	107	6	14	25	39
G	SouthTown SB 1 Left Right Ahead	Traffic	9	11	20			
Н	Pedestrians across	Pedestrian	29	18	47			
ı	Pedestrians across	Pedestrian	7	114	1			
J	Pedestrians across	Pedestrian	9	114	3	7	47	54
K	Pedestrians across	Pedestrian	43	105	28			
L	Pedestrians across	Pedestrian	8	27	35			
М	Pedestrians across	Pedestrian	77	54	11			
N	Pedestrians across	Pedestrian	46	54	100	7	11	18
0	Pedestrians across	Pedestrian	15	108	3	8	28	36

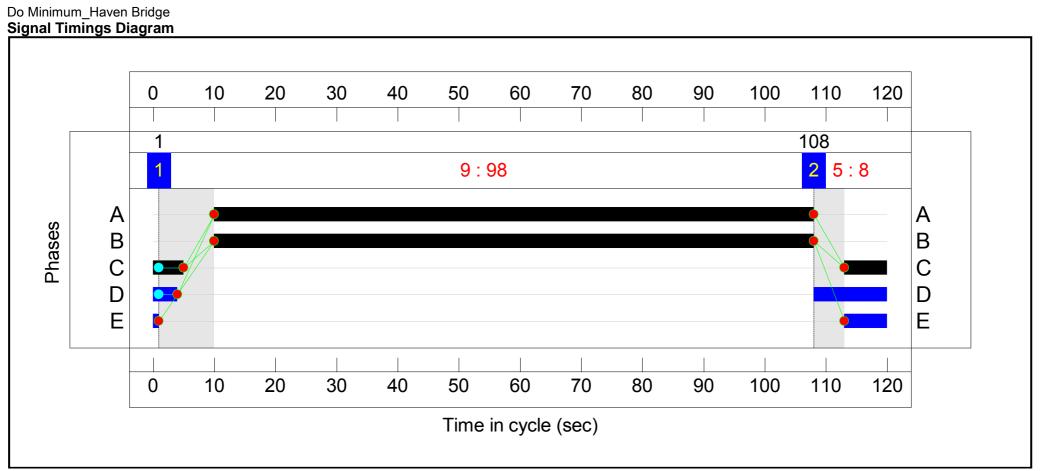




Phase	_		Green Period 1			
Name	Description	on Phase		Start Time	End Time	
Α	Ahead	Traffic	86	59	25	
В	Southtown NB 4 Ahead	Traffic	13	11	24	
С	Right	Traffic	67	59	6	
D	Southtown NB 4 Right	Traffic	13	11	24	
Е	Suffolk EB 1 Left Ahead Right	Traffic	10	30	40	
F	Suffolk WB 2 Ahead Right Left	Traffic	8	45	53	
G	Pedestrians across	Pedestrian	7	13	20	

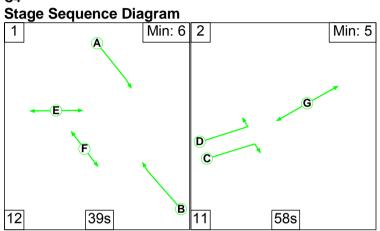


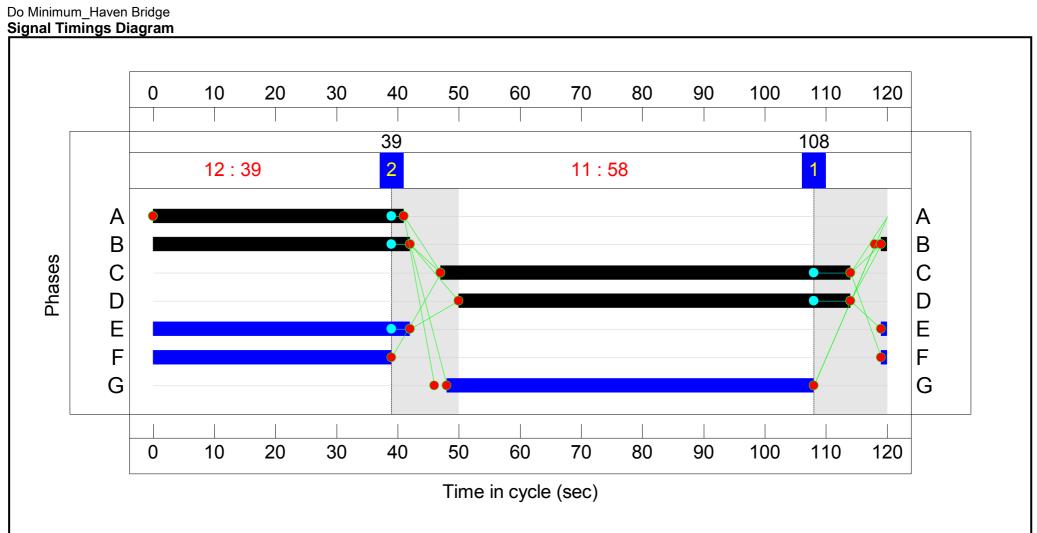




Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 3 Ahead	Traffic	98	10	108	
В	S Quay NB 1 Ahead	Traffic	98	10	108	
С	Regent St WB Ahead	Traffic	12	113	5	
D	Pedestrians across	Pedestrian	16	108	4	
Е	Pedestrians across	Pedestrian	8	113	1	







Phase	90		Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 1 Ahead	Traffic	41	0	41	
В	Ahead	Traffic	43	119	42	
С	Pasteur Road EB 3 Right	Traffic	67	47	114	
D	Pasteur Road EB 3 Left	Traffic	64	50	114	
Е	Pedestrians across	Pedestrian	43	119	42	
F	Pedestrians across	Pedestrian	40	119	39	
G	Pedestrians across	Pedestrian	60	48	108	

#### I ane Green Times

	Junction: J1: Pasteur Road With Southtown									
Lane	Description	Туре	Phases	Start Green	End Green					
J1:1/1	Pasteur Road EB 1 Ahead Left	U	Α	62	106					
J1:1/2	Pasteur Road EB 1 Ahead	U	Α	62	106					
J1:1/3	Pasteur Road EB 1 Right	U	С	106	5					
J1:3/1	0 44 ND 01 6	U	_	107	6					
	Southtown NB 2 Left		F	25	39					
J1:3/2	Southtown NB 2 Right Ahead	U	Е	26	37					
J1:3/3	Southtown NB 2 Right	U	Е	26	37					
J1:5/1	Pasteur Road WB 2 Ahead Left	U	В	44	100					
J1:5/2	Pasteur Road WB 2 Ahead	U	В	44	100					
J1:5/3	Pasteur Road WB 2 Right	U	D	44	56					
J1:7/1	SouthTown SB 1 Left		G	11	20					
J1:7/2	SouthTown SB 1 Right Ahead	U	G	11	20					

Junctio	Junction: J2: Southtown with Suffolk									
Lane	e Description		Phases	Start Green	End Green					
J2:1/1	Suffolk EB 1 Left Ahead Right	U	Е	30	40					
J2:4/1	Southtown NB 4 Ahead	U	В	11	24					
J2:4/2	2:4/2 Southtown NB 4 Right		D	11	24					
J2:8/1	Suffolk WB 2 Ahead Left	U	F	45	53					
J2:8/2	Suffolk WB 2 Right	U	F	45	53					
J2:11/1 Ahead		U	Α	59	25					
J2:11/2	Right	U	С	59	6					

Do Minimum\_Haven Bridge

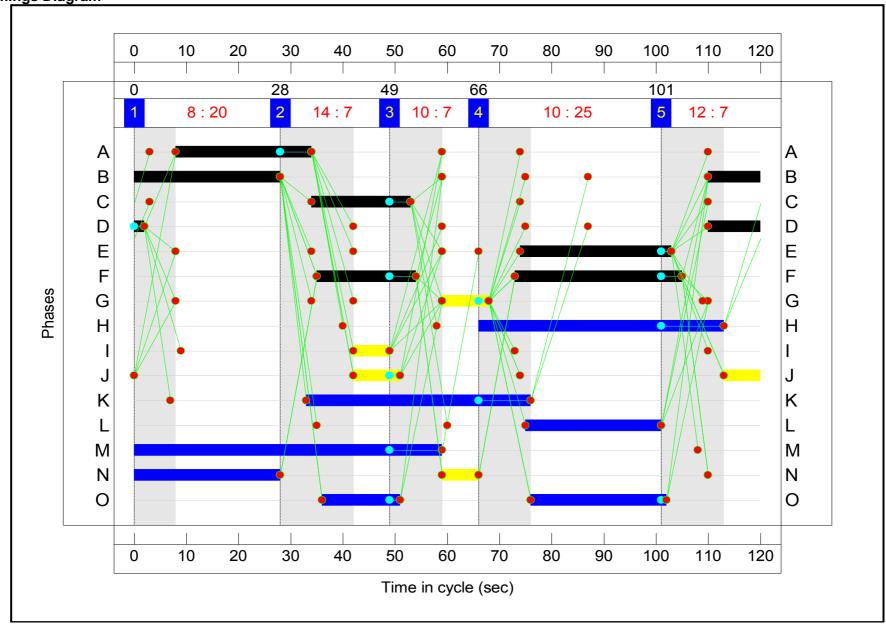
Junctio	Junction: J3: Hall Plain										
Lane	Description	Туре	Phases	Start Green	End Green						
J3:2/2	Hall Quay SB 3 Ahead	U	Α	10	108						
J3:3/1	S Quay NB 1 Ahead	U	В	10	108						
J3:3/2	S Quay NB 1 Ahead	U	В	10	108						
J3:3/3	S Quay NB 1 Ahead	U	В	10	108						
J3:6/1	Regent St WB Ahead	U	С	113	5						

Junctio	Junction: J4: Haven Bridge										
Lane	Description	Туре	Phases	Start Green	End Green						
J4:2/1	Hall Quay SB 1 Ahead	U	Α	0	41						
J4:3/1	Pasteur Road EB 3 Left	U	D	50	114						
J4:3/2	Pasteur Road EB 3 Right	U	С	47	114						
J4:7/1	Ahead	U	В	119	42						

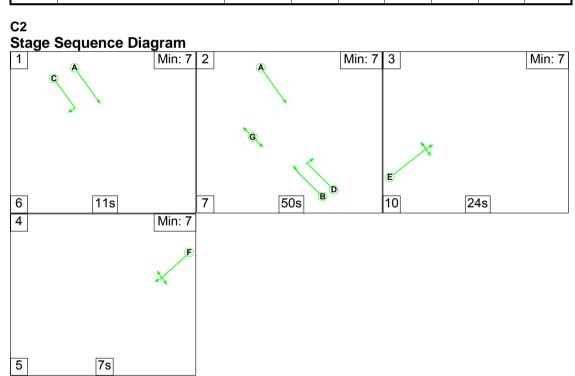
Scenario 2: 'PM 2038' (FG4: 'PM 2038 Average Case', Plan 1: 'Network Control Plan 1') C1

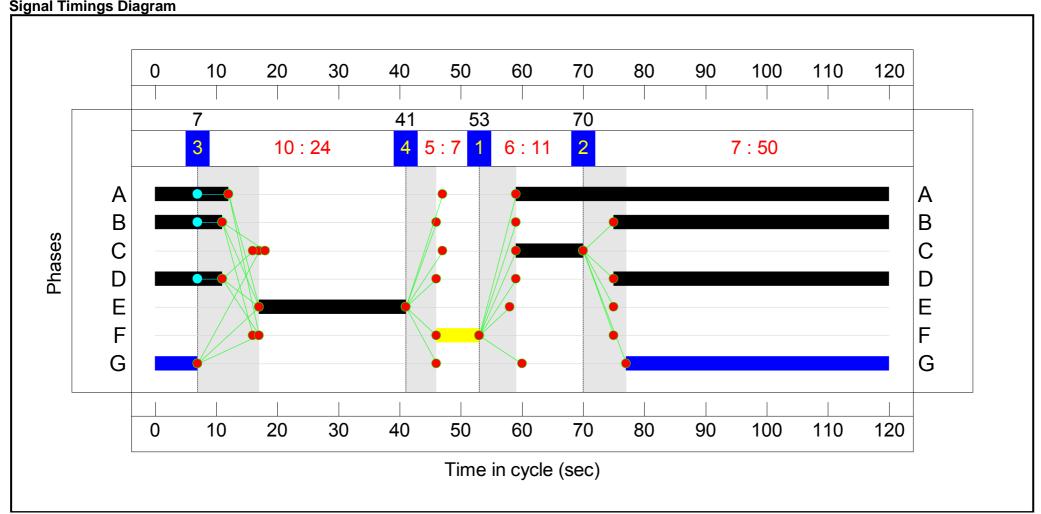
Stage Sequence Diagram

Min: 7 2 Min: 7 3 Min: 7 N 20s 7s 10 7s 4 Min: 7 5 Min: 7 10 12 7s 25s



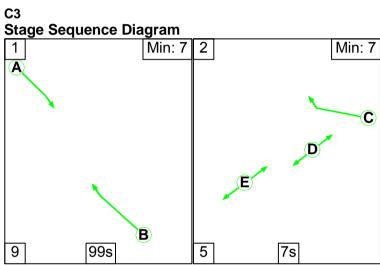
Phase	Tilling 5		Gre	en Perio	d 1	Gre	en Perio	d 2
Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
Α	Pasteur Road EB 1 Ahead Left	Traffic	26	8	34			
В	Pasteur Road WB 2 Ahead Left	Traffic	38	110	28			
С	Pasteur Road EB 1 Right	Traffic	19	34	53			
D	Pasteur Road WB 2 Right	Traffic	12	110	2			
Е	Southtown NB 2 Right Ahead	Traffic	29	74	103			
F	Southtown NB 2 Left	Traffic	19	35	54	32	73	105
G	SouthTown SB 1 Left Right Ahead	Traffic	9	59	68			
Н	Pedestrians across	Pedestrian	47	66	113			
ı	Pedestrians across	Pedestrian	7	42	49			
J	Pedestrians across	Pedestrian	9	42	51	7	113	0
K	Pedestrians across	Pedestrian	43	33	76			
L	Pedestrians across	Pedestrian	26	75	101			
М	Pedestrians across	Pedestrian	59	0	59			
N	Pedestrians across	Pedestrian	28	0	28	7	59	66
0	Pedestrians across	Pedestrian	15	36	51	26	76	102

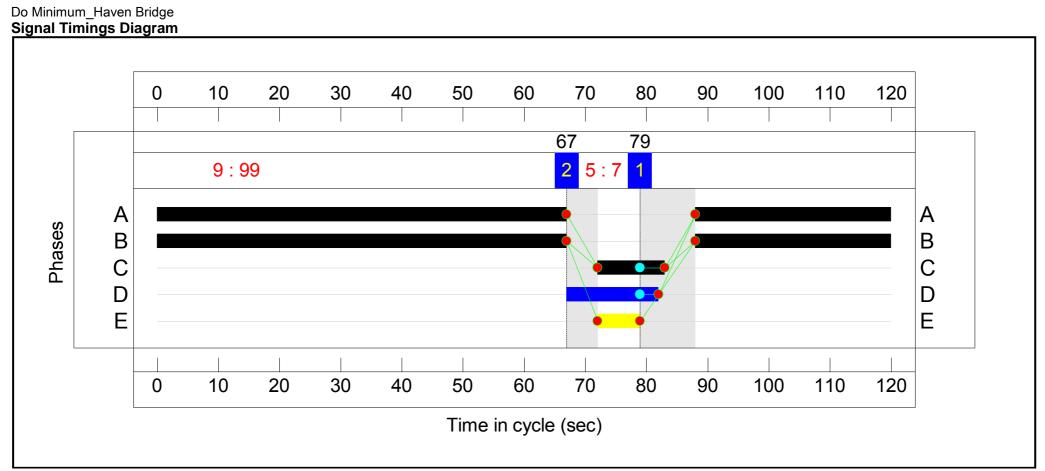




Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	73	59	12	
В	Southtown NB 4 Ahead	Traffic	56	75	11	
С	Right	Traffic	11	59	70	
D	Southtown NB 4 Right	Traffic	56	75	11	
E	Suffolk EB 1 Left Ahead Right	Traffic	24	17	41	
F	Suffolk WB 2 Ahead Right Left	Traffic	7	46	53	
G	Pedestrians across	Pedestrian	50	77	7	

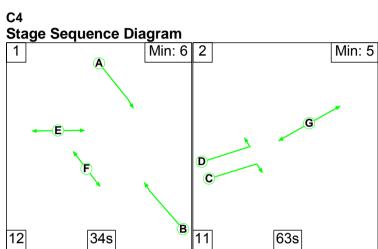


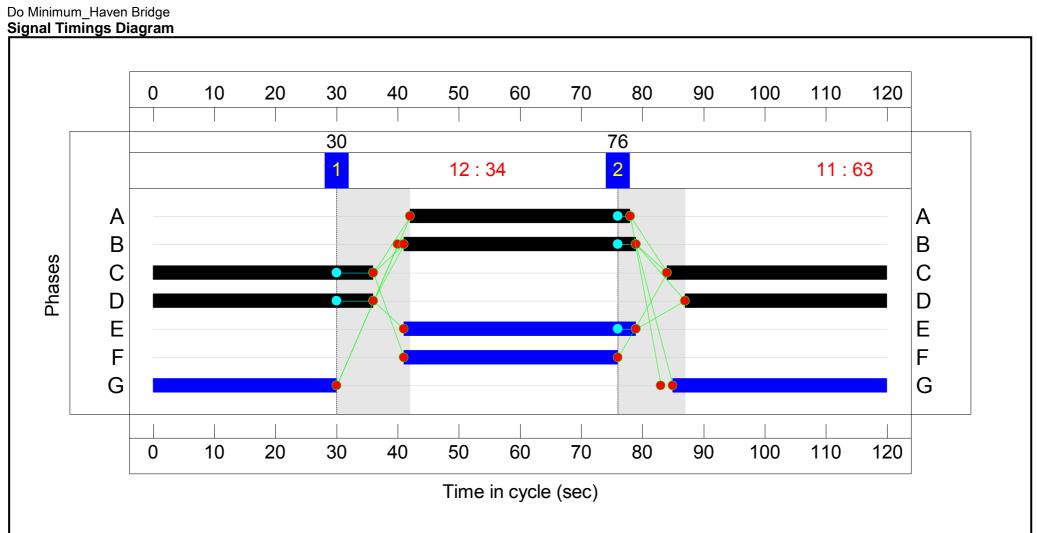




Phase	<b>J</b>		Green Period 1			
Name	Description Phase	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 3 Ahead	Traffic	99	88	67	
В	S Quay NB 1 Ahead	Traffic	99	88	67	
С	Regent St WB Ahead	Traffic	11	72	83	
D	Pedestrians across	Pedestrian	15	67	82	
Е	Pedestrians across	Pedestrian	7	72	79	







Phase	90		Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 1 Ahead	Traffic	36	42	78	
В	Ahead	Traffic	38	41	79	
С	Pasteur Road EB 3 Right	Traffic	72	84	36	
D	Pasteur Road EB 3 Left	Traffic	69	87	36	
Е	Pedestrians across	Pedestrian	38	41	79	
F	Pedestrians across	Pedestrian	35	41	76	
G	Pedestrians across	Pedestrian	65	85	30	

#### I ane Green Times

	Junction: J1: Pasteur Road With Southtown								
Junctio	on: J1: Pasteur Road With Sout	ntown	I	l					
Lane	Description	Туре	Phases	Start Green	End Green				
J1:1/1	Pasteur Road EB 1 Ahead Left	U	Α	8	34				
J1:1/2	Pasteur Road EB 1 Ahead	U	Α	8	34				
J1:1/3	Pasteur Road EB 1 Right	U	С	34	53				
J1:3/1	Courthtourn ND 2 Loft	U	F	35	54				
	Southtown NB 2 Left	U	F	73	105				
J1:3/2	Southtown NB 2 Right Ahead	U	E	74	103				
J1:3/3	Southtown NB 2 Right	U	E	74	103				
J1:5/1	Pasteur Road WB 2 Ahead Left	U	В	110	28				
J1:5/2	Pasteur Road WB 2 Ahead	U	В	110	28				
J1:5/3	Pasteur Road WB 2 Right	U	D	110	2				
J1:7/1	SouthTown SB 1 Left	U	G	59	68				
J1:7/2	SouthTown SB 1 Right Ahead	U	G	59	68				

Junctio	Junction: J2: Southtown with Suffolk									
Lane	Description	Туре	Phases	Start Green	End Green					
J2:1/1	Suffolk EB 1 Left Ahead Right	U	E	17	41					
J2:4/1	Southtown NB 4 Ahead	U	В	75	11					
J2:4/2	Southtown NB 4 Right	U	D	75	11					
J2:8/1	Suffolk WB 2 Ahead Left	U	F	46	53					
J2:8/2	Suffolk WB 2 Right	U	F	46	53					
J2:11/1	Ahead	U	Α	59	12					
J2:11/2	Right	U	С	59	70					

Do Minimum\_Haven Bridge

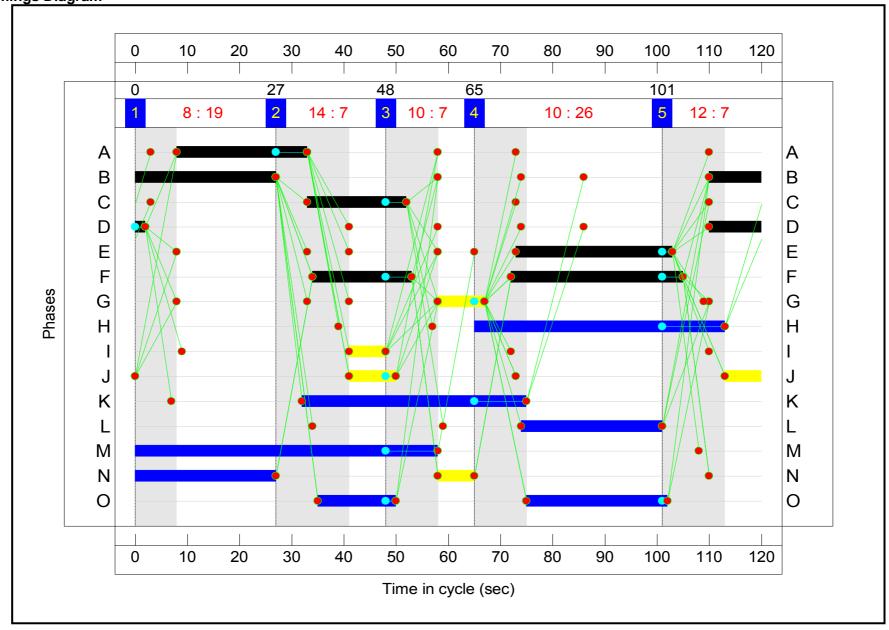
Junction: J3: Hall Plain									
Lane	Description	Туре	Phases	Start Green	End Green				
J3:2/2	Hall Quay SB 3 Ahead	U	Α	88	67				
J3:3/1	S Quay NB 1 Ahead	U	В	88	67				
J3:3/2	S Quay NB 1 Ahead	U	В	88	67				
J3:3/3	S Quay NB 1 Ahead	U	В	88	67				
J3:6/1	Regent St WB Ahead	U	С	72	83				

Junctio	Junction: J4: Haven Bridge									
Lane	Description	Туре	Phases	Start Green	End Green					
J4:2/1	Hall Quay SB 1 Ahead	U	Α	42	78					
J4:3/1	Pasteur Road EB 3 Left	U	D	87	36					
J4:3/2	Pasteur Road EB 3 Right	U	С	84	36					
J4:7/1	Ahead	U	В	41	79					

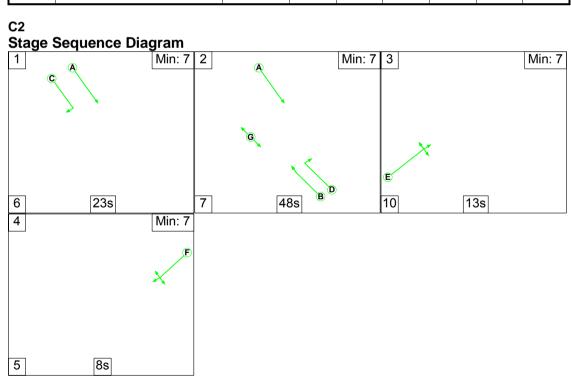
Scenario 3: 'IP 2038' (FG5: 'IP 2038 Average Case', Plan 1: 'Network Control Plan 1') C1

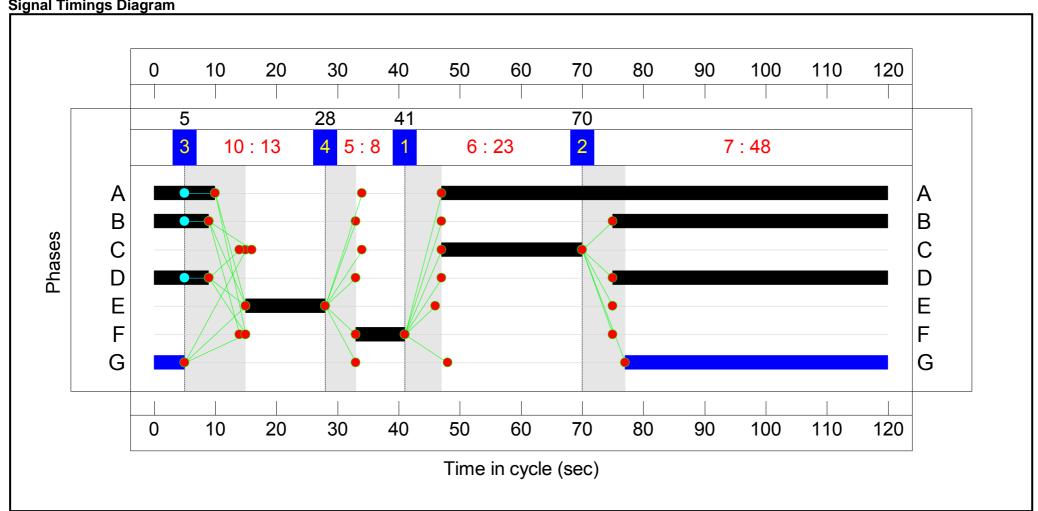
Stage Sequence Diagram

Min: 7 2 Min: 7 3 Min: 7 N 7s 10 7s 19s 4 Min: 7 5 Min: 7 10 12 7s 26s



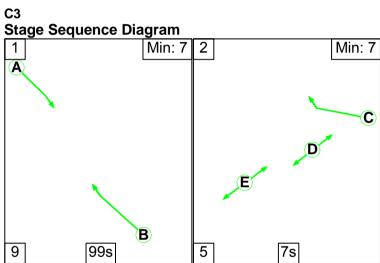
Dhaas			Gre	een Perio	d 1	Green Period 2		
Phase Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
Α	Pasteur Road EB 1 Ahead Left	Traffic	25	8	33			
В	Pasteur Road WB 2 Ahead Left	Traffic	37	110	27			
С	Pasteur Road EB 1 Right	Traffic	19	33	52			
D	Pasteur Road WB 2 Right	Traffic	12	110	2			
Е	Southtown NB 2 Right Ahead	Traffic	30	73	103			
F	Southtown NB 2 Left	Traffic	19	34	53	33	72	105
G	SouthTown SB 1 Left Right Ahead	Traffic	9	58	67			
Н	Pedestrians across	Pedestrian	48	65	113			
1	Pedestrians across	Pedestrian	7	41	48			
J	Pedestrians across	Pedestrian	9	41	50	7	113	0
K	Pedestrians across	Pedestrian	43	32	75			
L	Pedestrians across	Pedestrian	27	74	101			
М	Pedestrians across	Pedestrian	58	0	58			
N	Pedestrians across	Pedestrian	27	0	27	7	58	65
0	Pedestrians across	Pedestrian	15	35	50	27	75	102

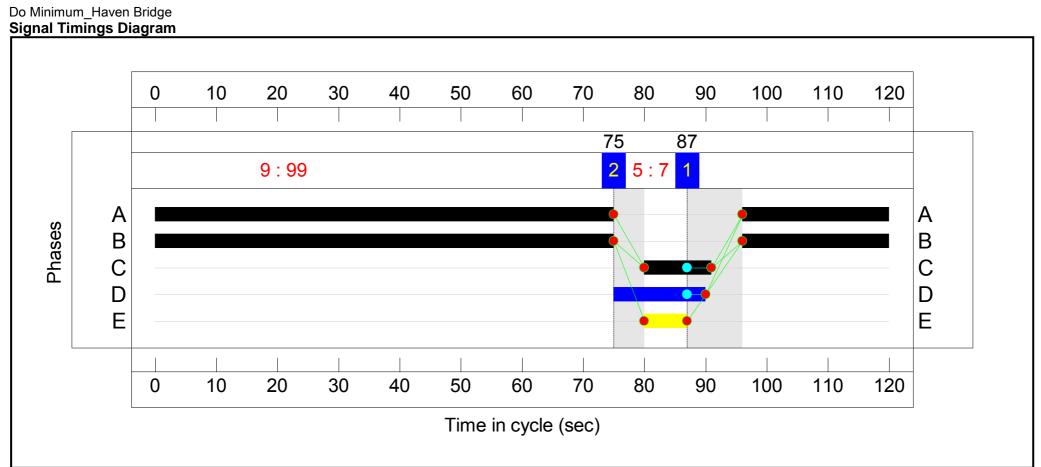




Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	83	47	10	
В	Southtown NB 4 Ahead	Traffic	54	75	9	
С	Right	Traffic	23	47	70	
D	Southtown NB 4 Right	Traffic	54	75	9	
E	Suffolk EB 1 Left Ahead Right	Traffic	13	15	28	
F	Suffolk WB 2 Ahead Right Left	Traffic	8	33	41	
G	Pedestrians across	Pedestrian	48	77	5	

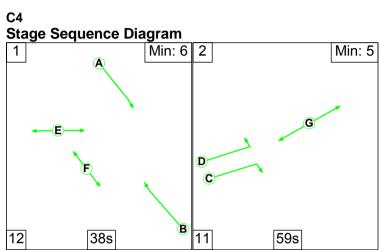


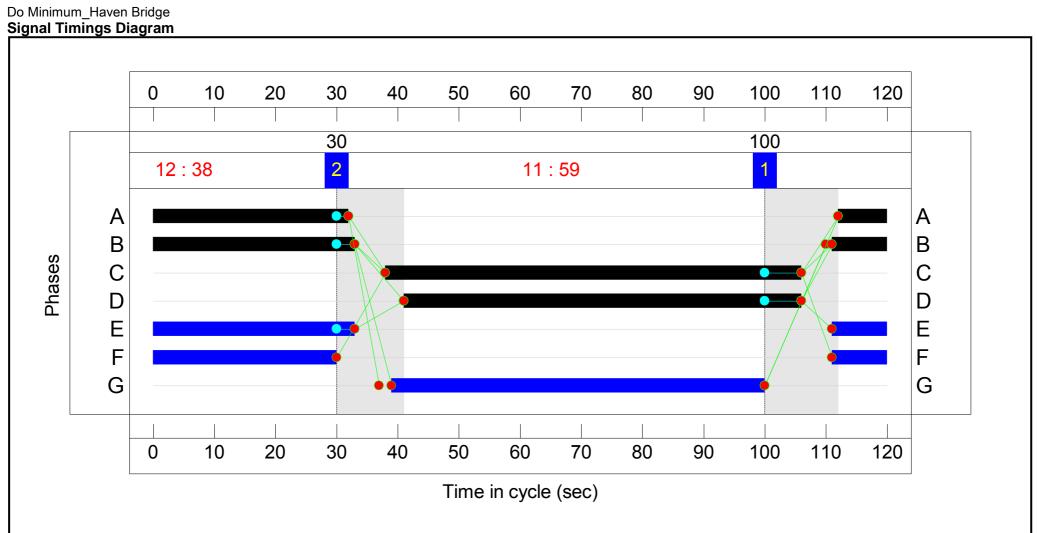




Phase			Green Period 1			
Name	Description Phase	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 3 Ahead	Traffic	99	96	75	
В	S Quay NB 1 Ahead	Traffic	99	96	75	
С	Regent St WB Ahead	Traffic	11	80	91	
D	Pedestrians across	Pedestrian	15	75	90	
Е	Pedestrians across	Pedestrian	7	80	87	







Phase	90		Green Period 1			
Name	ne Description Phase	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 1 Ahead	Traffic	40	112	32	
В	Ahead	Traffic	42	111	33	
С	Pasteur Road EB 3 Right	Traffic	68	38	106	
D	Pasteur Road EB 3 Left	Traffic	65	41	106	
Е	Pedestrians across	Pedestrian	42	111	33	
F	Pedestrians across	Pedestrian	39	111	30	
G	Pedestrians across	Pedestrian	61	39	100	

#### **Lane Green Times**

Junctio	Junction: J1: Pasteur Road With Southtown									
Lane	Description	Туре	Phases	Start Green	End Green					
J1:1/1	Pasteur Road EB 1 Ahead Left	U	Α	8	33					
J1:1/2	Pasteur Road EB 1 Ahead	U	Α	8	33					
J1:1/3	Pasteur Road EB 1 Right	U	С	33	52					
J1:3/1	Southtown NB 2 Left	U	F	34	53					
	Southtown NB 2 Left	U	Г	72	105					
J1:3/2	Southtown NB 2 Right Ahead	U	Е	73	103					
J1:3/3	Southtown NB 2 Right	U	Е	73	103					
J1:5/1	Pasteur Road WB 2 Ahead Left	U	В	110	27					
J1:5/2	Pasteur Road WB 2 Ahead	U	В	110	27					
J1:5/3	Pasteur Road WB 2 Right	U	D	110	2					
J1:7/1	SouthTown SB 1 Left	U	G	58	67					
J1:7/2	SouthTown SB 1 Right Ahead	U	G	58	67					

Junction: J2: Southtown with Suffolk							
Lane	Description Type Phases Start Green				End Green		
J2:1/1	Suffolk EB 1 Left Ahead Right	U	E	15	28		
J2:4/1	Southtown NB 4 Ahead	U	В	75	9		
J2:4/2	Southtown NB 4 Right	U	D	75	9		
J2:8/1	Suffolk WB 2 Ahead Left	U	F	33	41		
J2:8/2	Suffolk WB 2 Right	U	F	33	41		
J2:11/1	Ahead	U	Α	47	10		
J2:11/2	Right	U	С	47	70		

Do Minimum\_Haven Bridge

Junction: J3: Hall Plain							
Lane	Description	Туре	Phases	Start Green	End Green		
J3:2/2	Hall Quay SB 3 Ahead	U	Α	96	75		
J3:3/1	S Quay NB 1 Ahead	U	В	96	75		
J3:3/2	S Quay NB 1 Ahead	U	В	96	75		
J3:3/3	S Quay NB 1 Ahead	U	В	96	75		
J3:6/1	Regent St WB Ahead	U	С	80	91		

Junction: J4: Haven Bridge							
Lane	Description	Туре	Phases	Start Green	End Green		
J4:2/1	Hall Quay SB 1 Ahead	U	Α	112	32		
J4:3/1	Pasteur Road EB 3 Left	U	D	41	106		
J4:3/2	Pasteur Road EB 3 Right	U	С	38	106		
J4:7/1	Ahead	U	В	111	33		

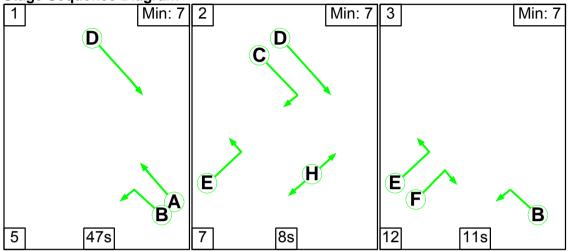
### Do Minimum\_Access Station **Signal Timings**

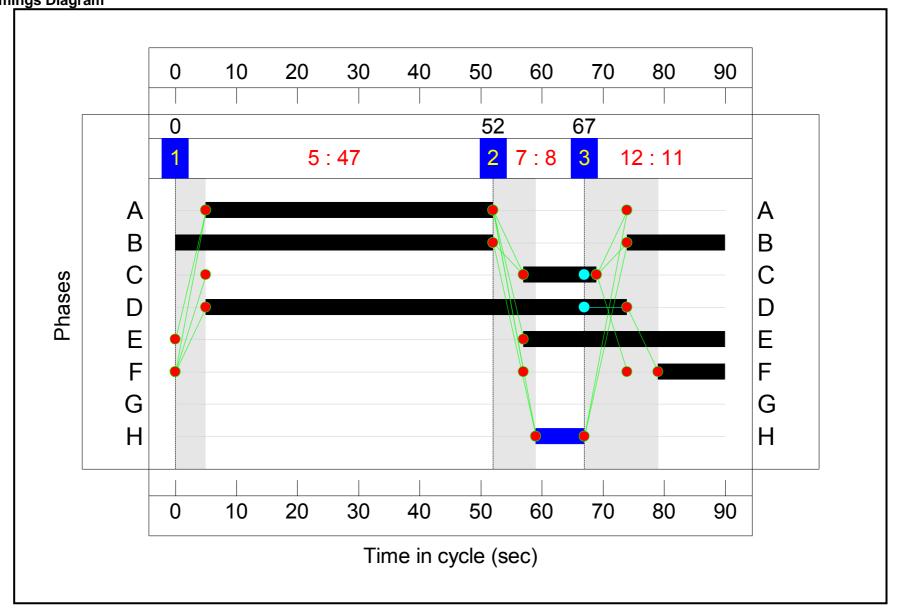
**User and Project Details** 

Project:	Great Yarmouth Third Crossing			
Title:	Forecast Report			
Company:	Mouchel			

Scenario 1: 'PM 2038' (FG4: 'PM 2038', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram





## Do Minimum\_Access Station Phase Timings

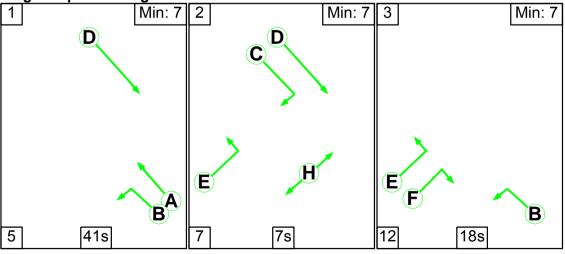
Phase			Green Period 1		
Name	Description	Phase	Total Green	Start Time	End Time
Α	Ahead	Traffic	47	5	52
В	Left	Traffic	68 74		52
С	Right	Traffic	12	57	69
D	Ahead	Traffic	69	5	74
Е	Left	Traffic	33	57	0
F	Right	Traffic	11	79	0
G	Pedestrians across	Pedestrian			
Н	Pedestrians across	Pedestrian	8	59	67

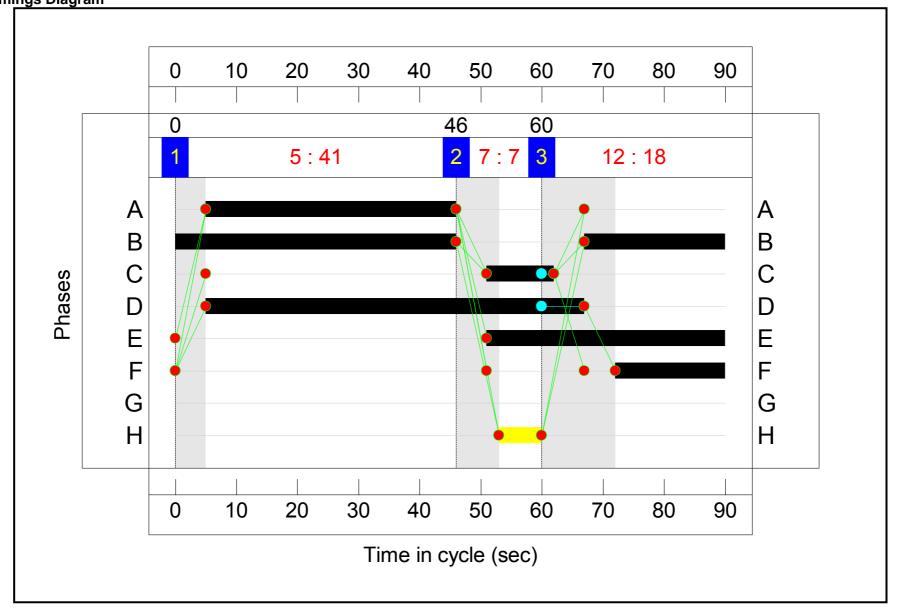
#### **Lane Green Times**

Junction: Station Access							
Lane	Description	Туре	Phases	Start Green	End Green		
1/1	Ahead	U	D	5	74		
1/2	Ahead	U	D	5	74		
1/3	Right	U	С	57	69		
2/1	Left	U	В	74	52		
2/2	Ahead	U	Α	5	52		
2/3	Ahead	U	Α	5	52		
5/1	Left	U	Е	57	0		
5/2	Right	U	F	79	0		

Scenario 2: 'AM 2038' (FG5: 'AM 2038', Plan 1: 'Network Control Plan 1')

**Stage Sequence Diagram** 





# Do Minimum\_Access Station Phase Timings

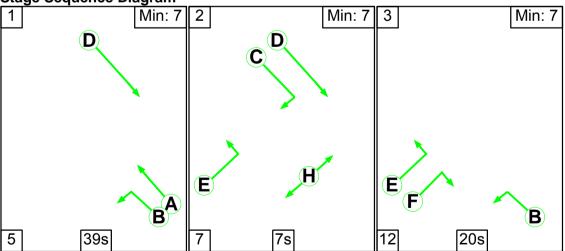
Phase			Green Period 1		
Name	Description	Phase	Total Green	Start Time	End Time
Α	Ahead	Traffic	41	5	46
В	Left	Traffic	ic 69 6		46
С	Right	Traffic	11	51	62
D	Ahead	Traffic	62	5	67
Е	Left	Traffic	39	51	0
F	Right	Traffic	18	72	0
G	Pedestrians across	Pedestrian			
Н	Pedestrians across	Pedestrian	7	53	60

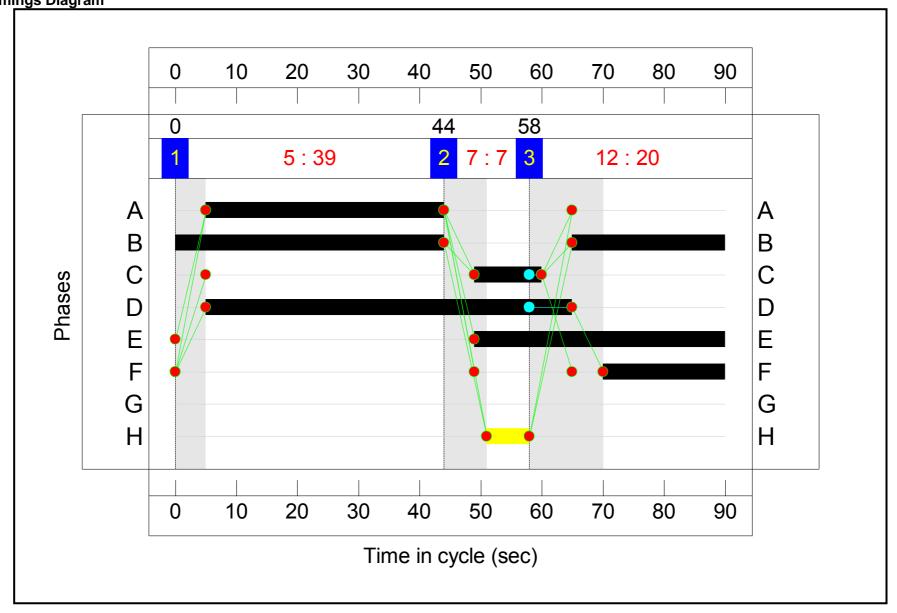
#### **Lane Green Times**

Junction: Station Access							
Lane	Description	Туре	Phases	Start Green	End Green		
1/1	Ahead	U	D	5	67		
1/2	Ahead	U	D	5	67		
1/3	Right	U	С	51	62		
2/1	Left	U	В	67	46		
2/2	Ahead	U	Α	5	46		
2/3	Ahead	U	Α	5	46		
5/1	Left	U	Е	51	0		
5/2	Right	U	F	72	0		

Scenario 3: 'IP 2038' (FG6: 'IP 2038', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram





# Do Minimum\_Access Station Phase Timings

Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	39	5	44	
В	Left	Traffic	69	65	44	
С	Right	Traffic	11	49	60	
D	Ahead	Traffic	60	5	65	
Е	Left	Traffic	41	49	0	
F	Right	Traffic	20	70	0	
G	Pedestrians across	Pedestrian				
Н	Pedestrians across	Pedestrian	7	51	58	

Junct	Junction: Station Access										
Lane	Description	Туре	Phases	Start Green	End Green						
1/1	Ahead	U	D	5	65						
1/2	Ahead	U	D	5	65						
1/3	Right	U	С	49	60						
2/1	Left	U	В	65	44						
2/2	Ahead	U	Α	5	44						
2/3	Ahead	U	Α	5	44						
5/1	Left	U	Е	49	0						
5/2	Right	U	F	70	0						

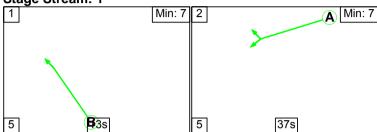
**User and Project Details** 

Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

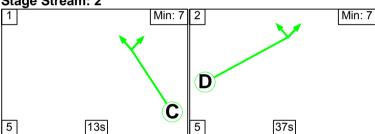
Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

**Stage Sequence Diagram** 

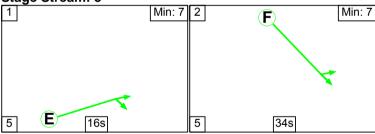
Stage Stream: 1

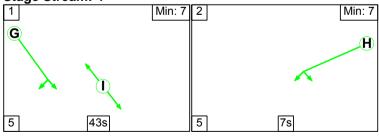


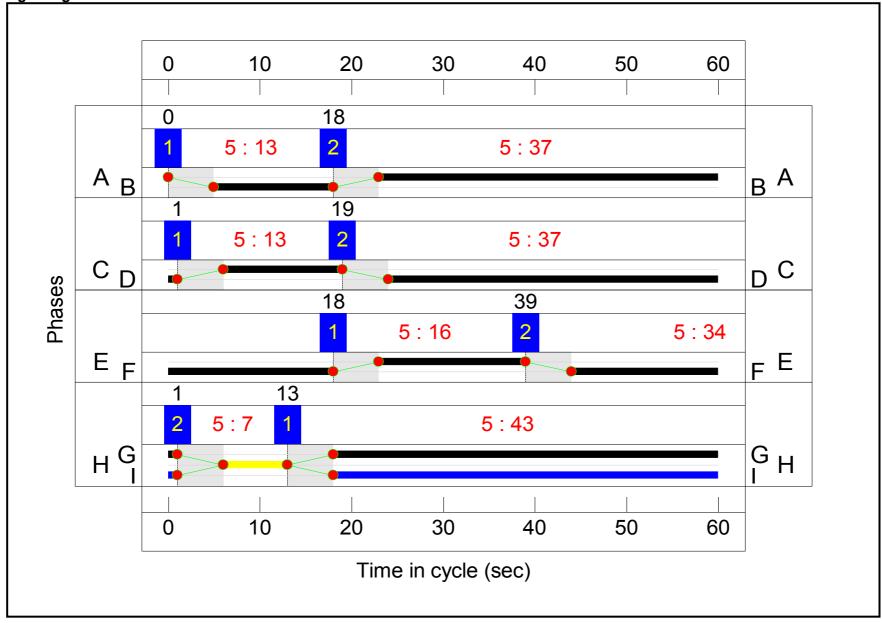
Stage Stream: 2



Stage Stream: 3

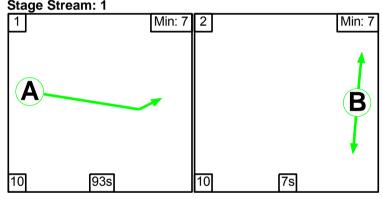


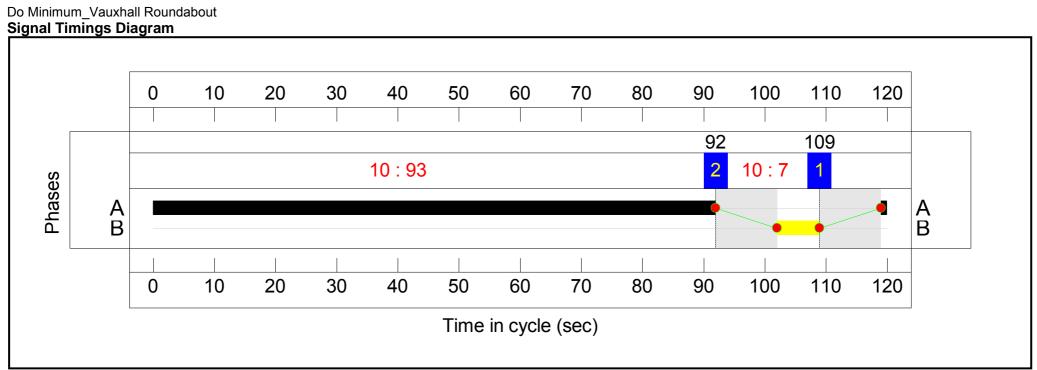




Phase	Description		Stage	Green Period 1		
Name		Phase	Stream	Total Green	Start Time	End Time
Α	Rdb Arm 4 Right Ahead	Traffic	1	37	23	0
В	WB Acle New Road Rdb Ahead	Traffic	1	13	5	18
С	Rbd Arm 1 Right Ahead	Traffic	2	13	6	19
D	A12 NB Ahead Left	Traffic	2	37	24	1
Е	Rdb Arm 2 Right Ahead	Traffic	3	16	23	39
F	EB Acle New Road Ahead Left	Traffic	3	34	44	18
G	Rdb Arm 3 Right Ahead	Traffic	4	43	18	1
Н	SB Runham Road Ahead Left	Traffic	4	7	6	13
I	Pedestrians across	Pedestrian	4	43	18	1

C2
Stage Sequence Diagram
Stage Stream: 1





Phase			Stage	Gre	een Perio	d 1
Name	Description	Stream	Total Green	Start Time	End Time	
Α	NB Runham Road Ahead	Traffic	1	93	119	92
В	Pedestrians across	Pedestrian	1	7	102	109

Junction: J1: WB Acle New Road Diverge										
Lane	Description	Туре	Phases	Start Green	End Green					
	No data to display									

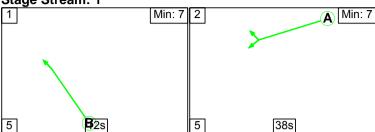
Junctio	n: J2: Vauxhall Roundabout				
Lane	Description	Туре	Phases	Start Green	End Green
J2:1/1	WB Acle New Road Rdb Ahead	U	В	5	18
J2:1/2	WB Acle New Road Rdb Ahead	U	В	5	18
J2:2/1	Rbd Arm 1 Ahead	U	С	6	19
J2:2/2	Rbd Arm 1 Right Ahead	U	С	6	19
J2:2/3	Rbd Arm 1 Right	U	С	6	19
J2:3/1	Rdb Arm 2 Ahead	U	Е	23	39
J2:3/2	Rdb Arm 2 Right	U	E	23	39
J2:3/3	Rdb Arm 2 Right	U	E	23	39
J2:4/1	Rdb Arm 3 Ahead	U	G	18	1
J2:4/2	Rdb Arm 3 Right Ahead	U	G	18	1
J2:4/3	Rdb Arm 3 Right	U	G	18	1
J2:5/1	Rdb Arm 4 Ahead	U	Α	23	0
J2:5/2	Rdb Arm 4 Right Ahead	U	Α	23	0
J2:5/3	Rdb Arm 4 Right	U	Α	23	0
J2:7/1	SB Runham Road Ahead Left	U	Н	6	13
J2:8/1	NB Runham Road Ahead	U	Α	119	92
J2:9/1	A12 NB Left	U	D	24	1
J2:9/2	A12 NB Ahead	U	D	24	1
J2:9/3	A12 NB Ahead	U	D	24	1
J2:11/1	EB Acle New Road Left	U	F	44	18
J2:11/2	EB Acle New Road Ahead	U	F	44	18
J2:11/3	EB Acle New Road Ahead	U	F	44	18

Scenario 2: 'AM 2038' (FG2: 'AM 2038', Plan 1: 'Network Control Plan 1')

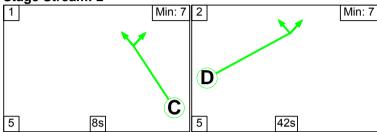
C1

### **Stage Sequence Diagram**

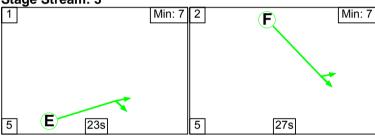
Stage Stream: 1

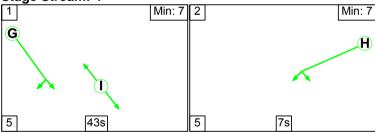


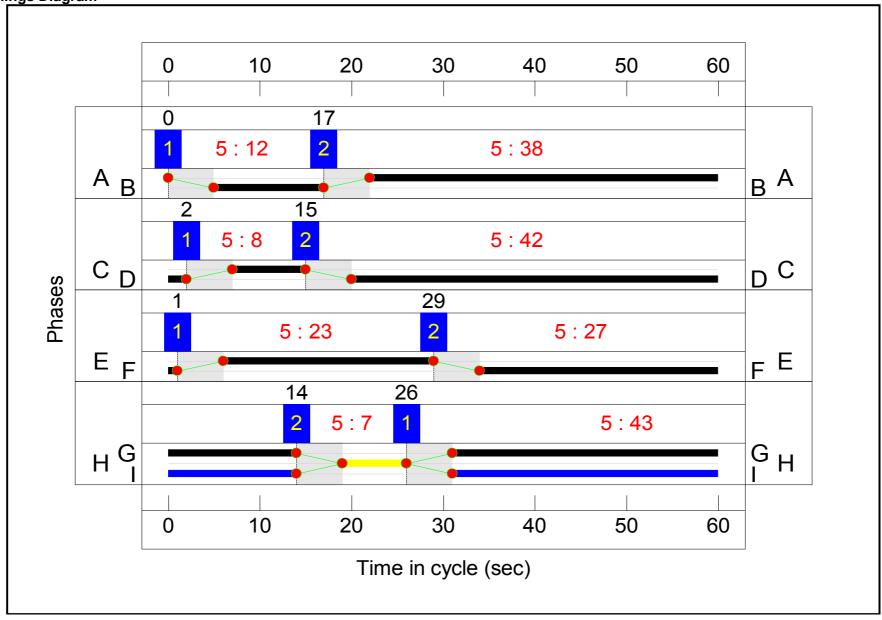




Stage Stream: 3

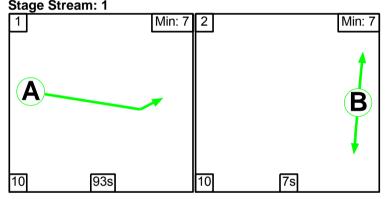


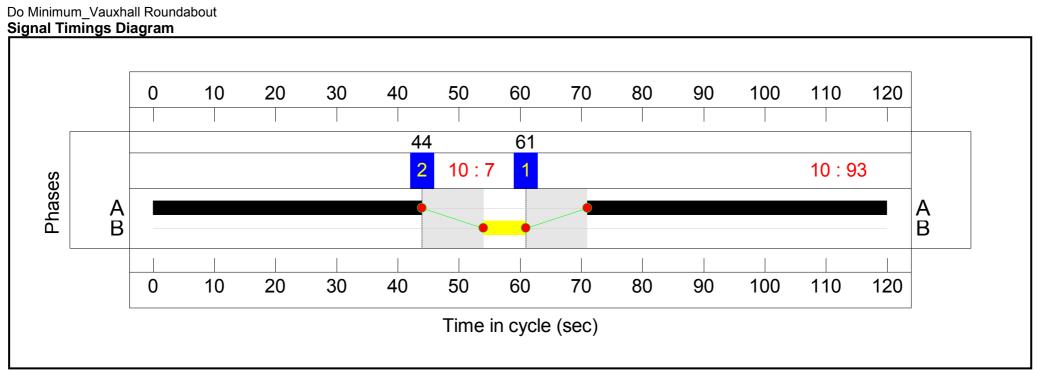




Phase	Description		Stage	Green Period 1		
Name		Phase	Stream	Total Green	Start Time	End Time
Α	Rdb Arm 4 Right Ahead	Traffic	1	38	22	0
В	WB Acle New Road Rdb Ahead	Traffic	1	12	5	17
С	Rbd Arm 1 Right Ahead	Traffic	2	8	7	15
D	A12 NB Ahead Left	Traffic	2	42	20	2
Е	Rdb Arm 2 Right Ahead	Traffic	3	23	6	29
F	EB Acle New Road Ahead Left	Traffic	3	27	34	1
G	Rdb Arm 3 Right Ahead	Traffic	4	43	31	14
н	SB Runham Road Ahead Left	Traffic	4	7	19	26
I	Pedestrians across	Pedestrian	4	43	31	14

C2
Stage Sequence Diagram
Stage Stream: 1





Phase	Phase Name Description Phase		Stage	Green Period 1		
		Stream	Total Green	Start Time	End Time	
Α	NB Runham Road Ahead	Traffic	1	93	71	44
В	Pedestrians across	Pedestrian	1	7	54	61

Junction: J1: WB Acle New Road Diverge										
Lane	Lane Description Type Phases Start Green End Green									
	No data to display									

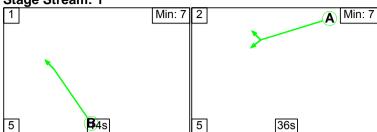
Junction	Junction: J2: Vauxhall Roundabout									
Lane	Description	Туре	Phases	Start Green	End Green					
J2:1/1	WB Acle New Road Rdb Ahead	U	В	5	17					
J2:1/2	WB Acle New Road Rdb Ahead	U	В	5	17					
J2:2/1	Rbd Arm 1 Ahead	U	С	7	15					
J2:2/2	Rbd Arm 1 Right Ahead	U	С	7	15					
J2:2/3	Rbd Arm 1 Right	U	С	7	15					
J2:3/1	Rdb Arm 2 Ahead	U	Е	6	29					
J2:3/2	Rdb Arm 2 Right	U	Е	6	29					
J2:3/3	Rdb Arm 2 Right	U	E	6	29					
J2:4/1	Rdb Arm 3 Ahead	U	G	31	14					
J2:4/2	Rdb Arm 3 Right Ahead	U	G	31	14					
J2:4/3	Rdb Arm 3 Right	U	G	31	14					
J2:5/1	Rdb Arm 4 Ahead	U	Α	22	0					
J2:5/2	Rdb Arm 4 Right Ahead	U	Α	22	0					
J2:5/3	Rdb Arm 4 Right	U	Α	22	0					
J2:7/1	SB Runham Road Ahead Left	U	Н	19	26					
J2:8/1	NB Runham Road Ahead	U	Α	71	44					
J2:9/1	A12 NB Left	U	D	20	2					
J2:9/2	A12 NB Ahead	U	D	20	2					
J2:9/3	A12 NB Ahead	U	D	20	2					
J2:11/1	EB Acle New Road Left	U	F	34	1					
J2:11/2	EB Acle New Road Ahead	U	F	34	1					
J2:11/3	EB Acle New Road Ahead	U	F	34	1					

Scenario 3: 'IP 2038' (FG3: 'IP 2038', Plan 1: 'Network Control Plan 1')

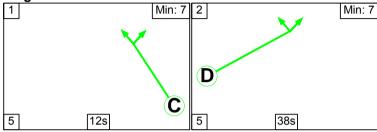
C1

### **Stage Sequence Diagram**

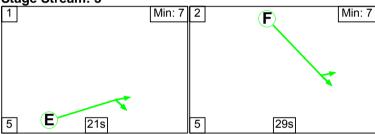
Stage Stream: 1

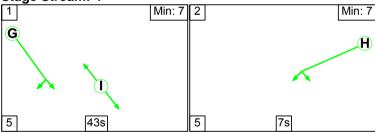


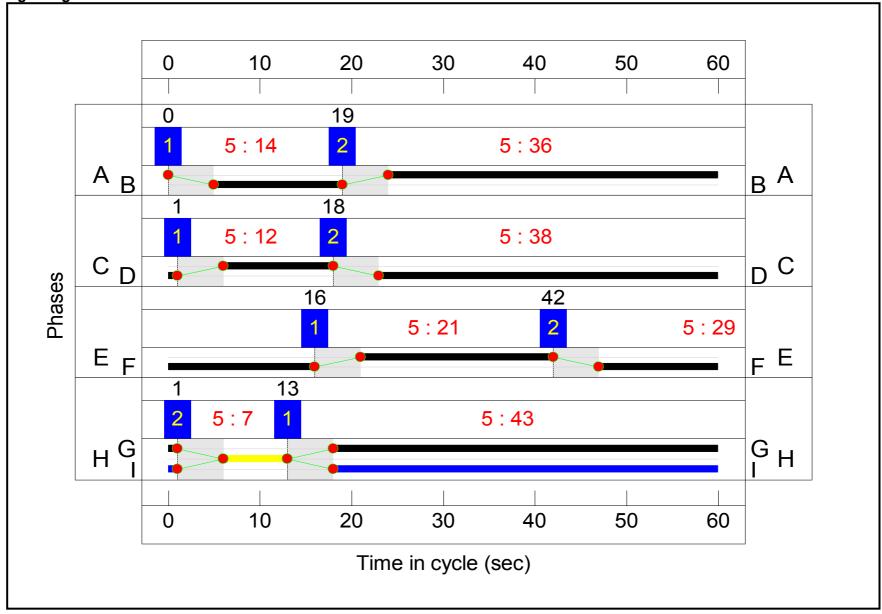




Stage Stream: 3

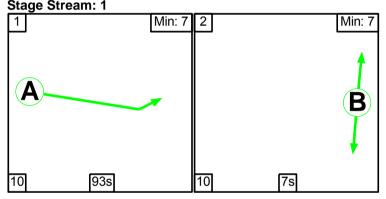


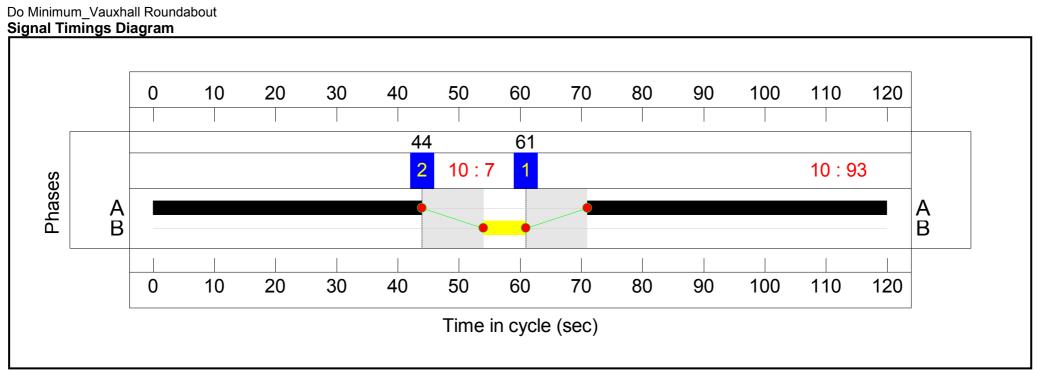




Phase			Stage	Green Period 1		
Name	Description	Phase	Stream	Total Green	Start Time	End Time
Α	Rdb Arm 4 Right Ahead	Traffic	1	36	24	0
В	WB Acle New Road Rdb Ahead	Traffic	1	14	5	19
С	Rbd Arm 1 Right Ahead	Traffic	2	12	6	18
D	A12 NB Ahead Left	Traffic	2	38	23	1
Е	Rdb Arm 2 Right Ahead	Traffic	3	21	21	42
F	EB Acle New Road Ahead Left	Traffic	3	29	47	16
G	Rdb Arm 3 Right Ahead	Traffic	4	43	18	1
Н	SB Runham Road Ahead Left	Traffic	4	7	6	13
I	Pedestrians across	Pedestrian	4	43	18	1

C2
Stage Sequence Diagram
Stage Stream: 1





Phase			Stage	Green Period 1			
Name	Description	Phase	Stream	Total Green	Start Time	End Time	
Α	NB Runham Road Ahead	Traffic	1	93	71	44	
В	Pedestrians across	Pedestrian	1	7	54	61	

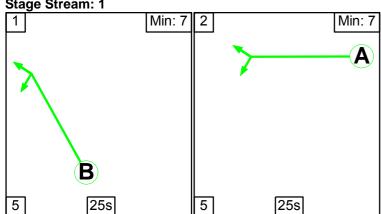
Junction: J1: WB Acle New Road Diverge								
Lane	Lane Description Type Phases Start Green End Green							
No data to display								

Junction: J2: Vauxhall Roundabout									
Lane	Description	Туре	Phases	Start Green	End Green				
J2:1/1	WB Acle New Road Rdb Ahead	U	В	5	19				
J2:1/2	WB Acle New Road Rdb Ahead	U	В	5	19				
J2:2/1	Rbd Arm 1 Ahead	U	С	6	18				
J2:2/2	Rbd Arm 1 Right Ahead	U	С	6	18				
J2:2/3	Rbd Arm 1 Right	U	С	6	18				
J2:3/1	Rdb Arm 2 Ahead	U	Е	21	42				
J2:3/2	Rdb Arm 2 Right	U	E	21	42				
J2:3/3	Rdb Arm 2 Right	U	Е	21	42				
J2:4/1	Rdb Arm 3 Ahead	U	G	18	1				
J2:4/2	Rdb Arm 3 Right Ahead	U	G	18	1				
J2:4/3	Rdb Arm 3 Right	U	G	18	1				
J2:5/1	Rdb Arm 4 Ahead	U	Α	24	0				
J2:5/2	Rdb Arm 4 Right Ahead	U	Α	24	0				
J2:5/3	Rdb Arm 4 Right	U	Α	24	0				
J2:7/1	SB Runham Road Ahead Left	U	Н	6	13				
J2:8/1	NB Runham Road Ahead	U	Α	71	44				
J2:9/1	A12 NB Left	U	D	23	1				
J2:9/2	A12 NB Ahead	U	D	23	1				
J2:9/3	A12 NB Ahead	U	D	23	1				
J2:11/1	EB Acle New Road Left	U	F	47	16				
J2:11/2	EB Acle New Road Ahead	U	F	47	16				
J2:11/3	EB Acle New Road Ahead	U	F	47	16				

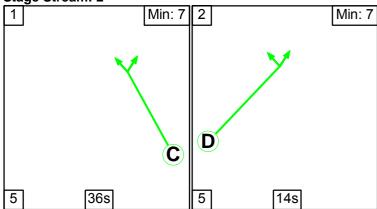
**User and Project Details** 

Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

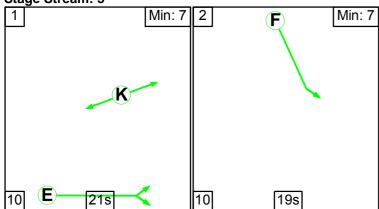
Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')
Stage Sequence Diagram
Stage Stream: 1



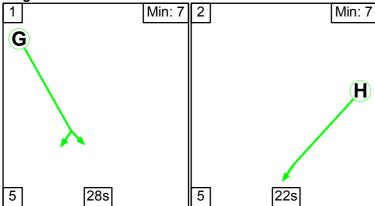


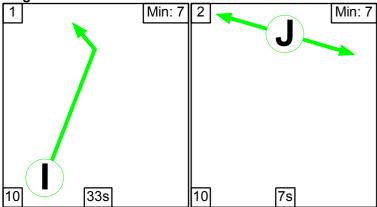


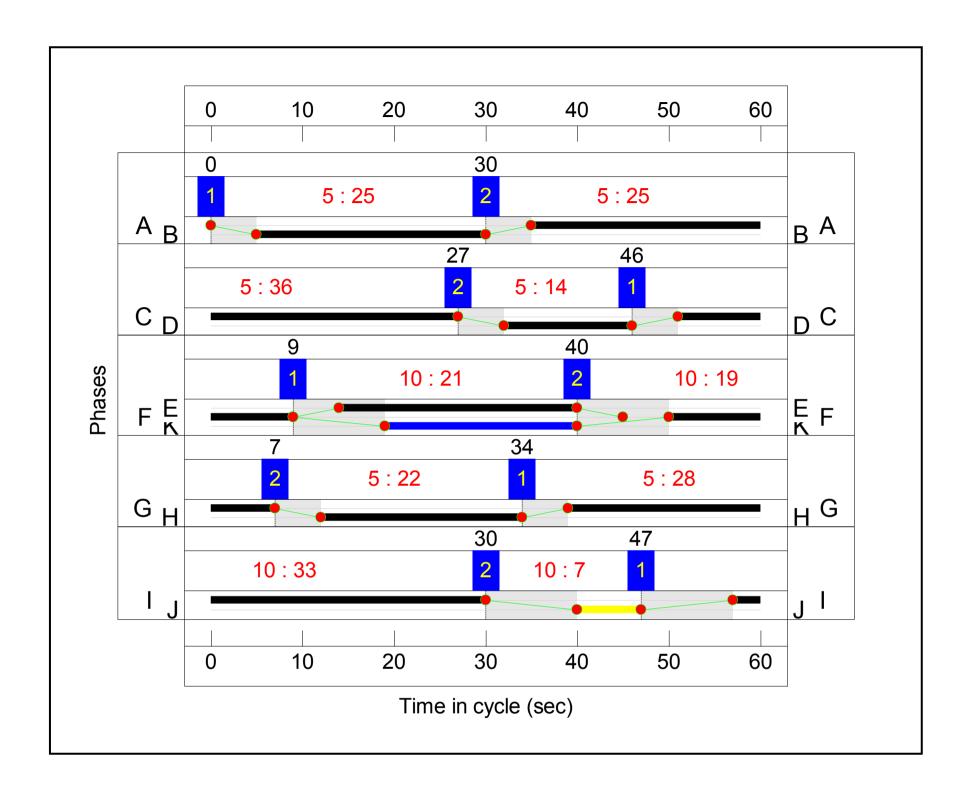
## Stage Stream: 3



### Stage Stream: 4







Option 32 and 33\_Gapton Hall Roundabout Phase Timings

Phase			Stone	Green Period 1			
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time	
А	Gapton Hall Rdb 4 Ahead Right	Traffic	1	25	35	0	
В	NB A12 3 lanes Left Ahead	Traffic	1	25	5	30	
С	Gapton Hall Rdb 1 Right Ahead	Traffic	2	36	51	27	
D	NB Gapton Hall 2 Lanes Ahead Left	Traffic	2	14	32	46	
Е	Gapton Hall Rdb 2 Right Ahead	Traffic	3	26	14	40	
F	SB A 12 3 Lanes Ahead	Traffic	3	19	50	9	
G	Gapton Hall Rdb 3 Right Ahead	Traffic	4	28	39	7	
Н	WB Pasteur Road 2 lanes Ahead	Traffic	4	22	12	34	
I	NB A12 Pedestrian Cross Ahead	Traffic	5	33	57	30	
J	Pedestrians across	Pedestrian	5	7	40	47	
K	Pedestrians across	Pedestrian	3	21	19	40	

Lane Green Times										
Junct	Junction: Gapton Hall Roundabout									
Lane	Description	Туре	Phases	Start Green	End Green					
2/1	NB A12 3 lanes Left	U	В	5	30					
2/2	NB A12 3 lanes Ahead	U	В	5	30					
2/3	NB A12 3 lanes Ahead	U	В	5	30					
4/1	NB Gapton Hall 2 Lanes Ahead Left	U	D	32	46					
4/2	NB Gapton Hall 2 Lanes Ahead	U	D	32	46					
6/1	Gapton Hall Rdb 1 Ahead	U	С	51	27					
6/2	Gapton Hall Rdb 1 Right Ahead	U	С	51	27					
6/3	Gapton Hall Rdb 1 Right	U	С	51	27					
7/1	Gapton Hall Rdb 2 Ahead	U	Е	14	40					
7/2	Gapton Hall Rdb 2 Right Ahead	U	E	14	40					
7/3	Gapton Hall Rdb 2 Right	U	E	14	40					
8/1	Gapton Hall Rdb 3 Ahead	U	G	39	7					
8/2	Gapton Hall Rdb 3 Ahead	U	G	39	7					
8/3	Gapton Hall Rdb 3 Right	U	G	39	7					
9/1	Gapton Hall Rdb 4 Ahead	U	Α	35	0					
9/2	Gapton Hall Rdb 4 Right	U	Α	35	0					
9/3	Gapton Hall Rdb 4 Right	U	Α	35	0					
10/1	NB A12 Pedestrian Cross Ahead	U	I	57	30					
10/2	NB A12 Pedestrian Cross Ahead	U	I	57	30					
16/1	SB A 12 3 Lanes Ahead	U	F	50	9					
16/2	SB A 12 3 Lanes Ahead	U	F	50	9					
16/3	SB A 12 3 Lanes Ahead	U	F	50	9					
19/1	WB Pasteur Road 2 lanes Ahead	U	Н	12	34					
19/2	WB Pasteur Road 2 lanes Ahead	U	Н	12	34					

### Signal Timings

### **User and Project Details**

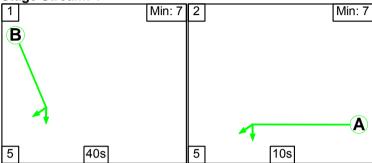
Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

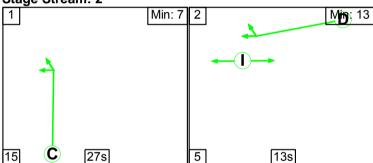
C1

### Stage Sequence Diagram

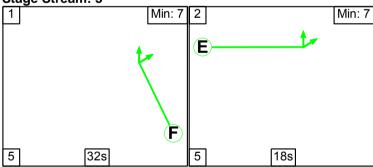
Stage Stream: 1

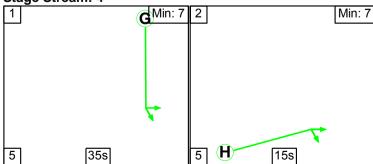


Stage Stream: 2

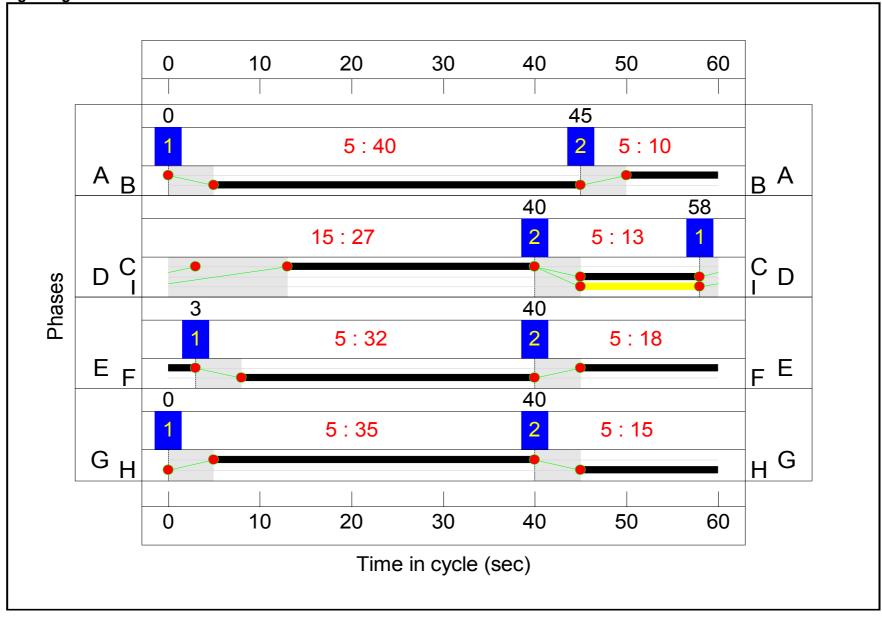


Stage Stream: 3





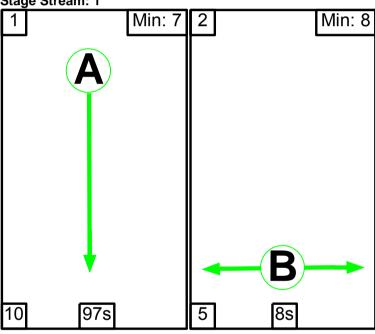
Option 32 and 33\_Harfreys Roundabout

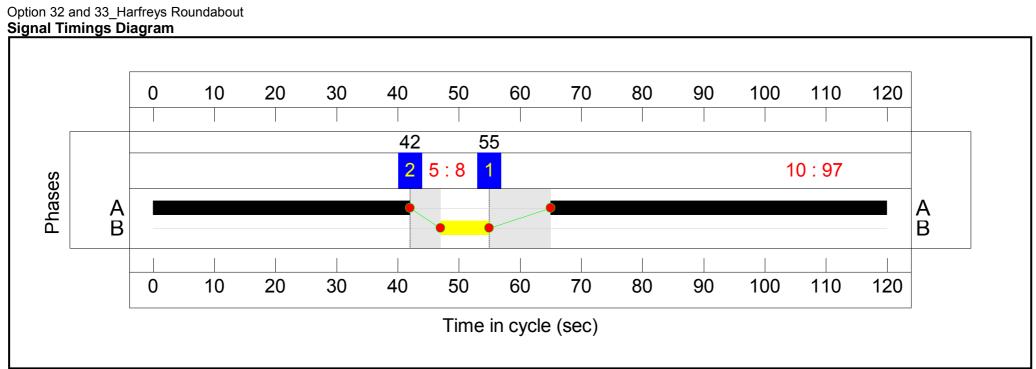


# Option 32 and 33\_Harfreys Roundabout **Phase Timings**

Phase			Stage	Green Period 1			
Name	Description	Phase	Stream	Total Green	Start Time	End Time	
Α	Ahead Left	Traffic	1	10	50	0	
В	Right Ahead	Traffic	1	40	5	45	
С	Ahead Left	Traffic	2	27	13	40	
D	Right Ahead	Traffic	2	13	45	58	
Е	Ahead Left	Traffic	3	18	45	3	
F	Right Ahead	Traffic	3	32	8	40	
G	Ahead Left	Traffic	4	35	5	40	
Н	Right Ahead	Traffic	4	15	45	0	
I	Pedestrians across	Pedestrian	2	13	45	58	

C2 Stage Sequence Diagram Stage Stream: 1





# Option 32 and 33\_Harfreys Roundabout **Phase Timings**

Phase Name	Description		Stage	Green Period 1			
		Phase	Stream	Total Green	Start Time	End Time	
Α	Ahead	Traffic	1	97	65	42	
В	Pedestrians across	Pedestrian	1	8	47	55	

Junction: Unnamed Junction								
Lane	Description	Туре	Phases	Start Green	End Green			
1/1	Left	J	Α	50	0			
1/2	Ahead Left	U	Α	50	0			
1/3	Ahead	U	Α	50	0			
2/1	Left	U	С	13	40			
2/2	Ahead	U	С	13	40			
2/3	Ahead	U	С	13	40			
2/4	Ahead	U	С	13	40			
3/1	Ahead Left	U	Е	45	3			
3/2	Ahead	U	Е	45	3			
4/1	Left	U	G	5	40			
4/2	Ahead	U	G	5	40			
4/3	Ahead	U	G	5	40			
4/4	Ahead	U	G	5	40			
5/1	Ahead	U	D	45	58			
5/2	Right Ahead	U	D	45	58			
5/3	Right	U	D	45	58			
6/1	Ahead	U	F	8	40			
6/2	Right Ahead	U	F	8	40			
6/3	Right	U	F	8	40			
7/1	Ahead	U	Н	45	0			
7/2	Right Ahead	U	Н	45	0			
7/3	Right	U	Н	45	0			
8/1	Ahead	U	В	5	45			
8/2	Ahead	J	В	5	45			
8/3	Right	U	В	5	45			
9/1	Ahead	U	Α	65	42			
9/2	Ahead	U	Α	65	42			

## Option 32 and 33\_Haven Bridge **Signal Timings**

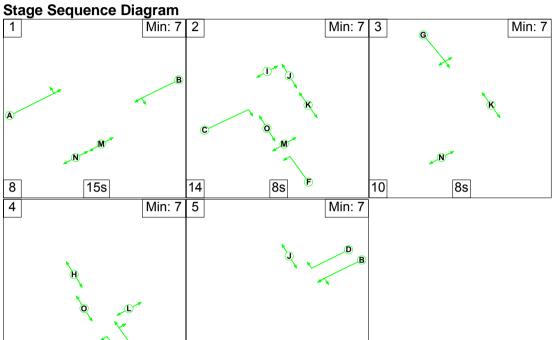
10

27s

**User and Project Details** 

Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

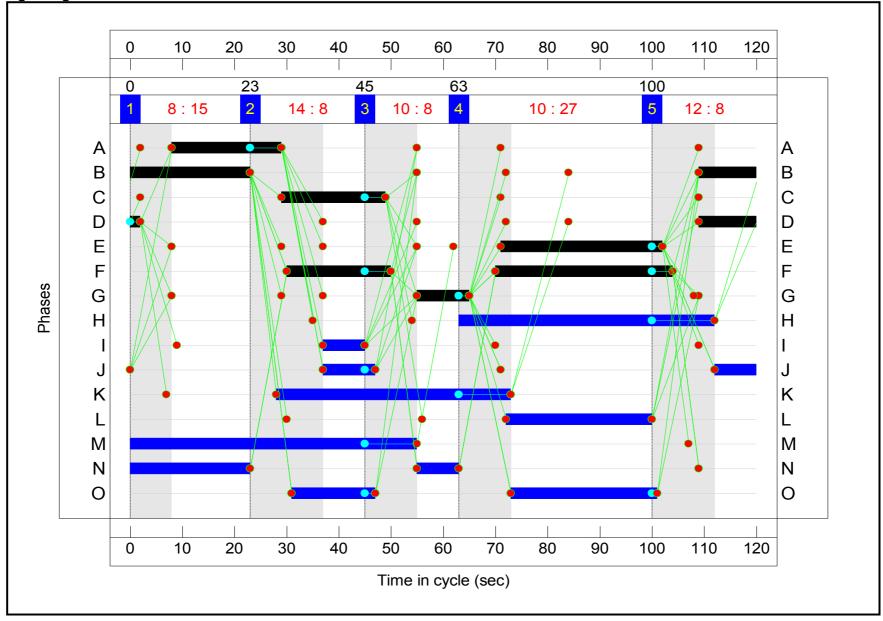
Scenario 1: 'Worst Case' (FG1: 'PM 2038 Worst Case', Plan 1: 'Network Control Plan 1')



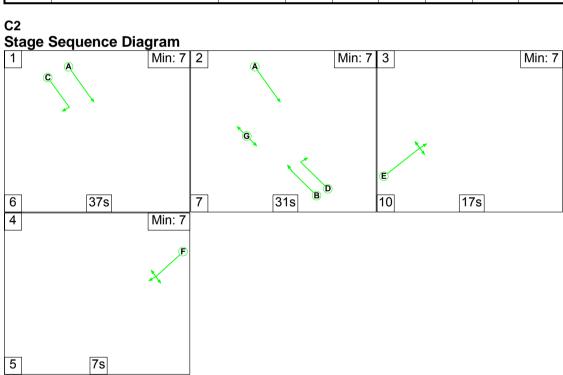
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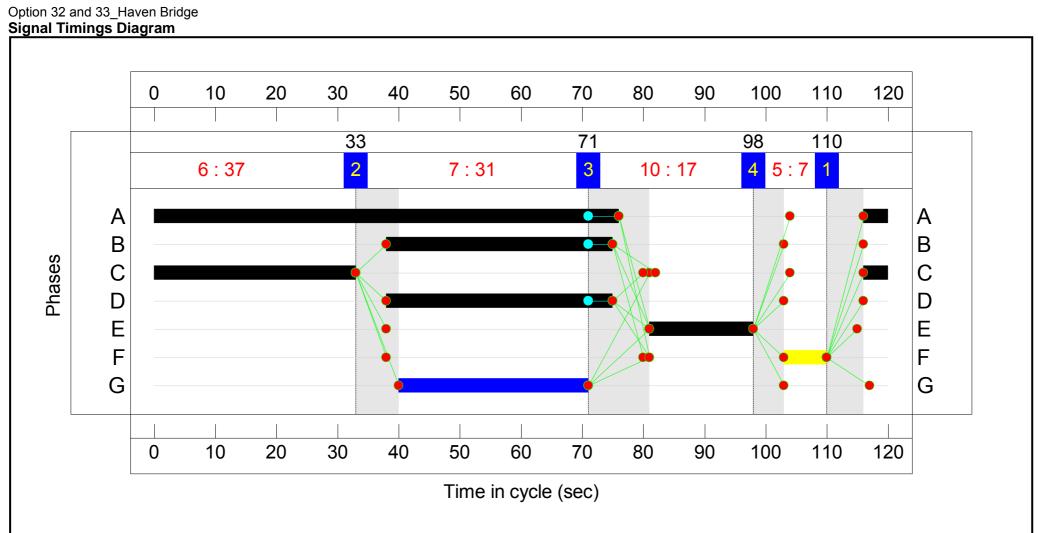
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Option 32 and 33\_Haven Bridge **Signal Timings Diagram** 



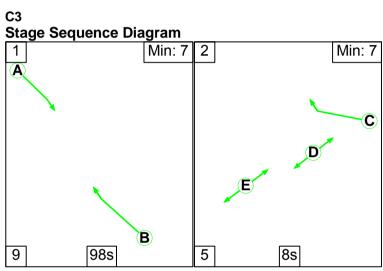
	Tillings		Gre	een Perio	d 1	Green Period 2			
Phase Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time	
Α	Pasteur Road EB 1 Ahead Left	Traffic	21	8	29				
В	Pasteur Road WB 2 Ahead Left	Traffic	34	109	23				
С	Pasteur Road EB 1 Right	Traffic	20	29	49				
D	Pasteur Road WB 2 Right	Traffic	13	109	2				
Е	Southtown NB 2 Right Ahead	Traffic	31	71	102				
F	Southtown NB 2 Left	Traffic	20	30	50	34	70	104	
G	SouthTown SB 1 Left Right Ahead	Traffic	10	55	65				
Н	Pedestrians across	Pedestrian	49	63	112				
1	Pedestrians across	Pedestrian	8	37	45				
J	Pedestrians across	Pedestrian	10	37	47	8	112	0	
K	Pedestrians across	Pedestrian	45	28	73				
L	Pedestrians across	Pedestrian	28	72	100				
М	Pedestrians across	Pedestrian	55	0	55				
N	Pedestrians across	Pedestrian	23	0	23	8	55	63	
0	Pedestrians across	Pedestrian	16	31	47	28	73	101	

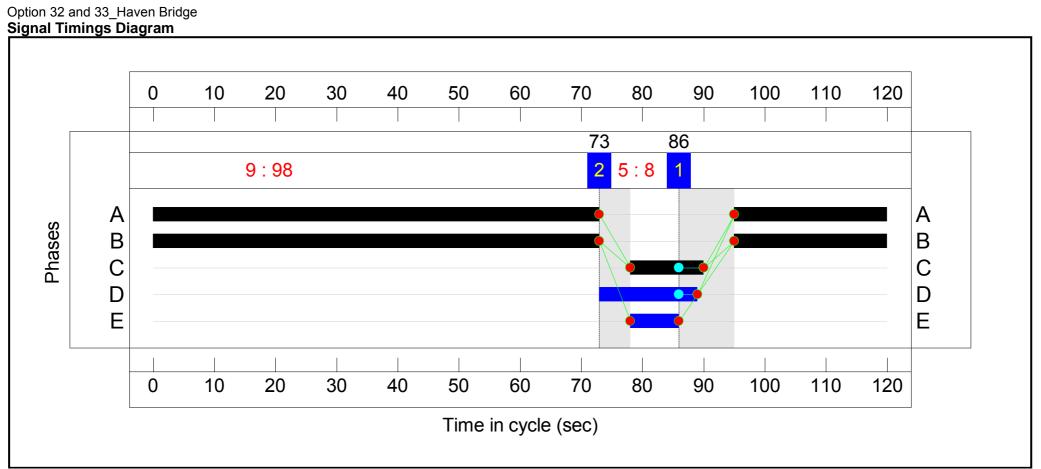




Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	80	116	76	
В	Southtown NB 4 Ahead	Traffic	37	38	75	
С	Right	Traffic	37	116	33	
D	Southtown NB 4 Right	Traffic	37	38	75	
Е	Suffolk EB 1 Left Ahead Right	Traffic	17	81	98	
F	Suffolk WB 2 Ahead Right Left	Traffic	7	103	110	
G	Pedestrians across	Pedestrian	31	40	71	

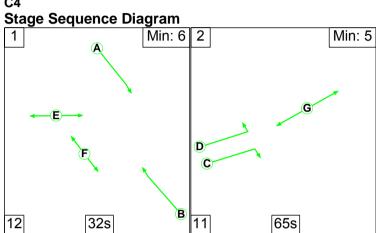


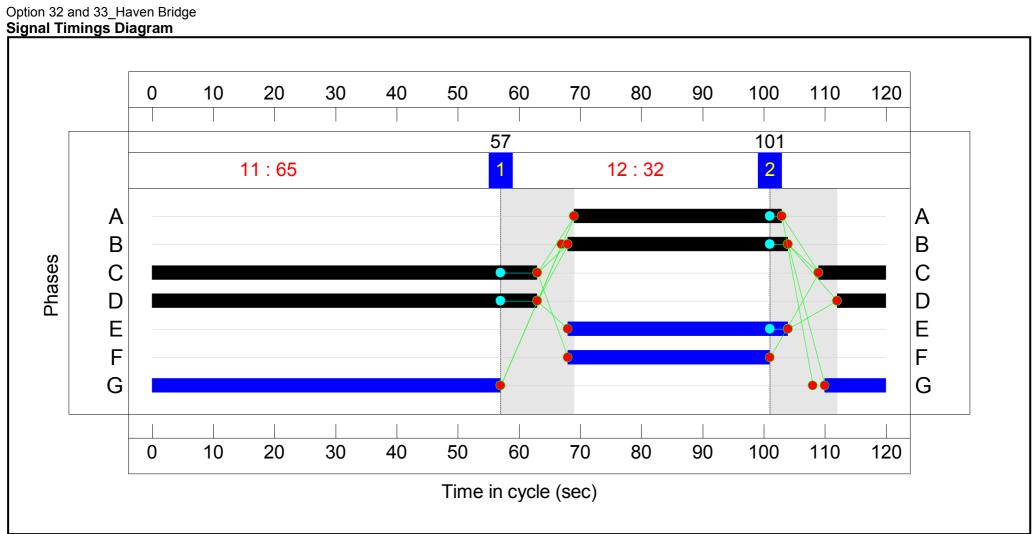




Phase Name			Green Period 1			
	Description	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 3 Ahead	Traffic	98	95	73	
В	S Quay NB 1 Ahead	Traffic	98	95	73	
С	Regent St WB Ahead	Traffic	12	78	90	
D	Pedestrians across	Pedestrian	16	73	89	
Е	Pedestrians across	Pedestrian	8	78	86	







Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 1 Ahead	Traffic	34	69	103	
В	Ahead	Traffic	36	68	104	
С	Pasteur Road EB 3 Right	Traffic	74	109	63	
D	Pasteur Road EB 3 Left	Traffic	71	112	63	
Е	Pedestrians across	Pedestrian	36	68	104	
F	Pedestrians across	Pedestrian	33	68	101	
G	Pedestrians across	Pedestrian	67	110	57	

Junction: J1: Pasteur Road With Southtown							
Lane	Description	Туре	Phases	Start Green	End Green		
J1:1/1	Pasteur Road EB 1 Ahead Left	U	Α	8	29		
J1:1/2	Pasteur Road EB 1 Ahead	U	Α	8	29		
J1:1/3	Pasteur Road EB 1 Right	U	С	29	49		
J1:3/1	O HA NEGATI	_	30	50			
	Southtown NB 2 Left	U	F	70	104		
J1:3/2	Southtown NB 2 Right Ahead	U	Е	71	102		
J1:3/3	Southtown NB 2 Right	U	Е	71	102		
J1:5/1	Pasteur Road WB 2 Ahead Left	U	В	109	23		
J1:5/2	Pasteur Road WB 2 Ahead	U	В	109	23		
J1:5/3	Pasteur Road WB 2 Right	U	D	109	2		
J1:7/1	SouthTown SB 1 Left	U	G	55	65		
J1:7/2	SouthTown SB 1 Right Ahead	U	G	55	65		

Junction: J2: Southtown with Suffolk							
Lane	Description	Туре	Phases	Start Green	End Green		
J2:1/1	Suffolk EB 1 Left Ahead Right	U	E	81	98		
J2:4/1	Southtown NB 4 Ahead	U	В	38	75		
J2:4/2	Southtown NB 4 Right	U	D	38	75		
J2:8/1	Suffolk WB 2 Ahead Left	U	F	103	110		
J2:8/2	Suffolk WB 2 Right	U	F	103	110		
J2:11/1	Ahead	U	Α	116	76		
J2:11/2	Right	J	С	116	33		

Option 32 and 33 Haven Bridge

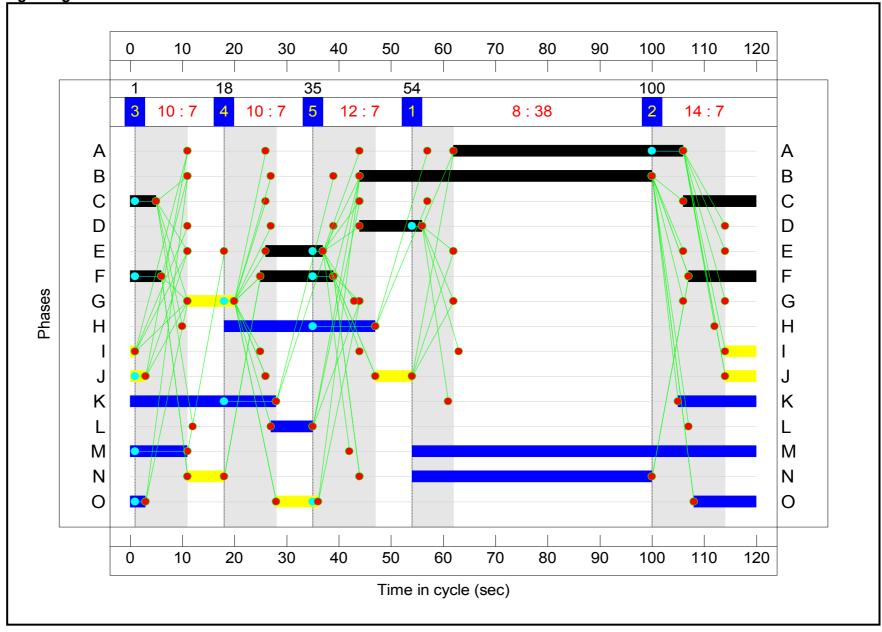
Junction: J3: Hall Plain								
Lane	Description	Туре	Phases	Start Green	End Green			
J3:2/2	Hall Quay SB 3 Ahead	U	Α	95	73			
J3:3/1	S Quay NB 1 Ahead	U	В	95	73			
J3:3/2	S Quay NB 1 Ahead	U	В	95	73			
J3:3/3	S Quay NB 1 Ahead	U	В	95	73			
J3:6/1	Regent St WB Ahead	U	С	78	90			

Junction: J4: Haven Bridge							
Lane	Description	Туре	Phases	Start Green	End Green		
J4:2/1	Hall Quay SB 1 Ahead	U	Α	69	103		
J4:3/1	Pasteur Road EB 3 Left	U	D	112	63		
J4:3/2	Pasteur Road EB 3 Right	U	С	109	63		
J4:7/1	Ahead	U	В	68	104		

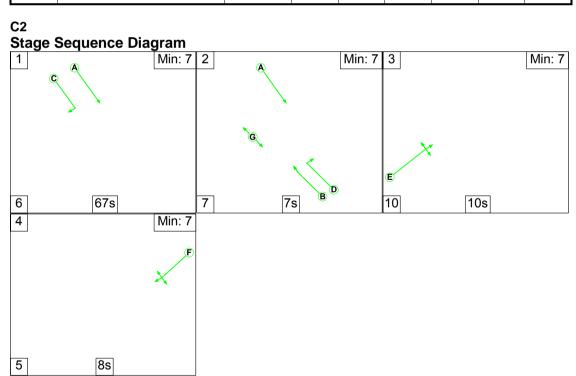
Scenario 2: 'AM 2038 Average' (FG2: 'AM 2038', Plan 1: 'Network Control Plan 1') C1

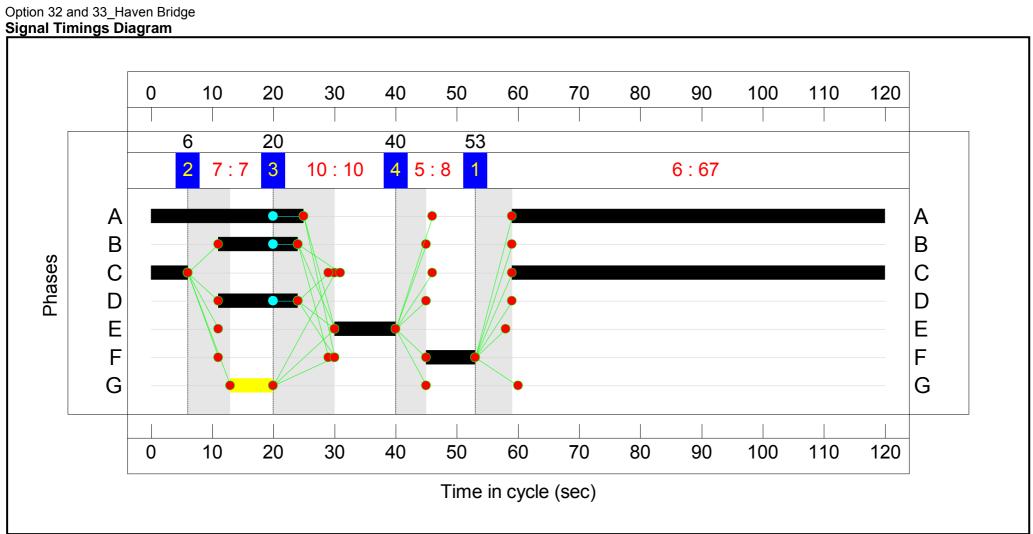
Stage Sequence Diagram

| Min: 7 Min: 7 Min: 7 N 38s 10 7s 7s 14 5 4 Min: 7 Min: 7 12 7s 10 7s



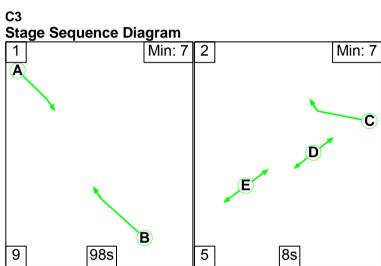
Dhaas			Gre	een Perio	d 1	Gre	en Perio	d 2
Phase Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
Α	Pasteur Road EB 1 Ahead Left	Traffic	44	62	106			
В	Pasteur Road WB 2 Ahead Left	Traffic	56	44	100			
С	Pasteur Road EB 1 Right	Traffic	19	106	5			
D	Pasteur Road WB 2 Right	Traffic	12	44	56			
Е	Southtown NB 2 Right Ahead	Traffic	11	26	37			
F	Southtown NB 2 Left	Traffic	19	107	6	14	25	39
G	SouthTown SB 1 Left Right Ahead	Traffic	9	11	20			
Н	Pedestrians across	Pedestrian	29	18	47			
I	Pedestrians across	Pedestrian	7	114	1			
J	Pedestrians across	Pedestrian	9	114	3	7	47	54
K	Pedestrians across	Pedestrian	43	105	28			
L	Pedestrians across	Pedestrian	8	27	35			
М	Pedestrians across	Pedestrian	77	54	11			
N	Pedestrians across	Pedestrian	46	54	100	7	11	18
0	Pedestrians across	Pedestrian	15	108	3	8	28	36

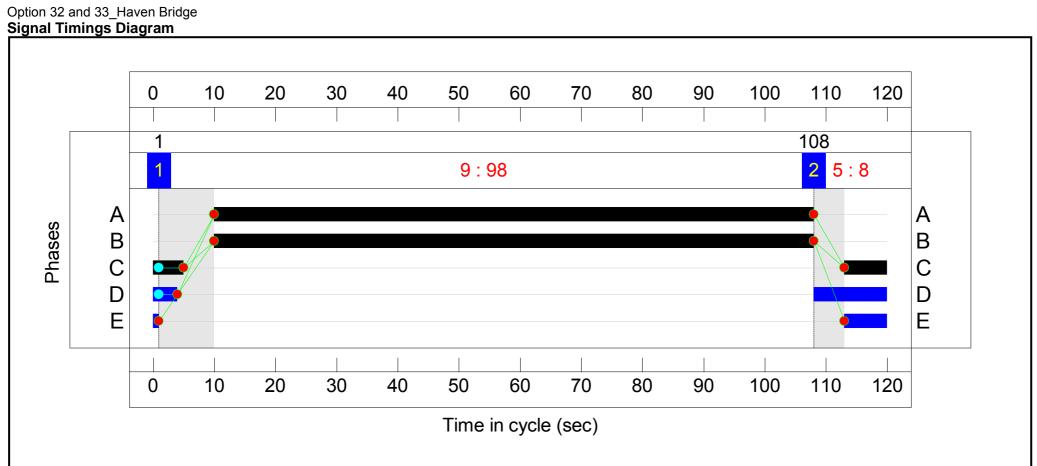




Phase	_		Green Period 1			
Name Description	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	86	59	25	
В	Southtown NB 4 Ahead	Traffic	13	11	24	
С	Right	Traffic	67	59	6	
D	Southtown NB 4 Right	Traffic	13	11	24	
E	Suffolk EB 1 Left Ahead Right	Traffic	10	30	40	
F	Suffolk WB 2 Ahead Right Left	Traffic	8	45	53	
G	Pedestrians across	Pedestrian	7	13	20	



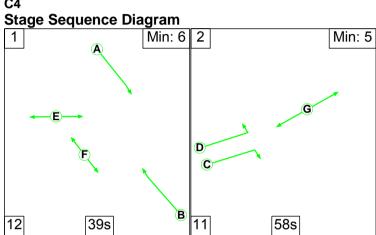


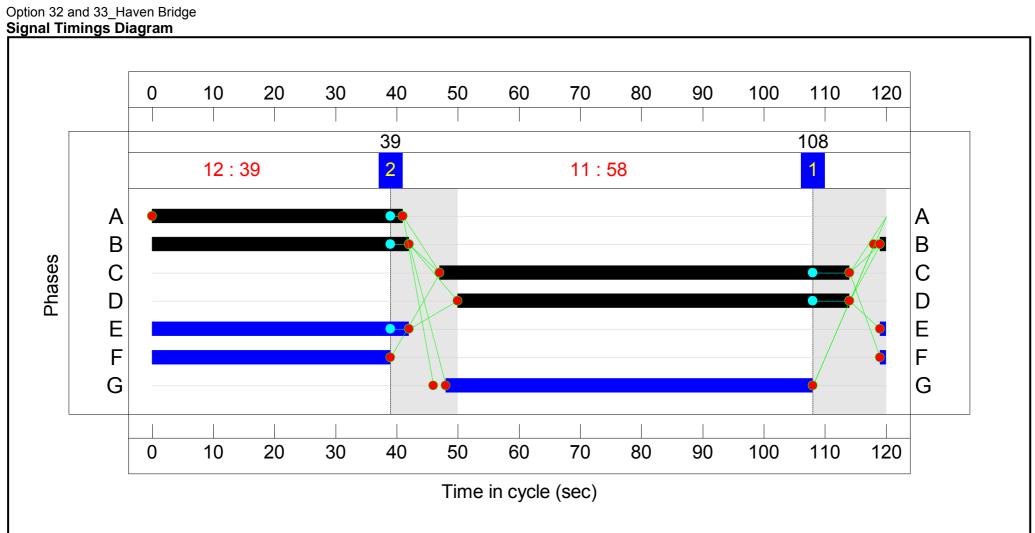


Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 3 Ahead	Traffic	98	10	108	
В	S Quay NB 1 Ahead	Traffic	98	10	108	
С	Regent St WB Ahead	Traffic	12	113	5	
D	Pedestrians across	Pedestrian	16	108	4	
Е	Pedestrians across	Pedestrian	8	113	1	









Phase			Green Period 1			
Name Des	Description	n Phase		Start Time	End Time	
Α	Hall Quay SB 1 Ahead	Traffic	41	0	41	
В	Ahead	Traffic	43	119	42	
С	Pasteur Road EB 3 Right	Traffic	67	47	114	
D	Pasteur Road EB 3 Left	Traffic	64	50	114	
E	Pedestrians across	Pedestrian	43	119	42	
F	Pedestrians across	Pedestrian	40	119	39	
G	Pedestrians across	Pedestrian	60	48	108	

Lane Green Times								
Junctio	on: J1: Pasteur Road With Sout	ntown	l	ı				
Lane	Description	Туре	Phases	Start Green	End Green			
J1:1/1	Pasteur Road EB 1 Ahead Left	U	Α	62	106			
J1:1/2	Pasteur Road EB 1 Ahead	U	Α	62	106			
J1:1/3	Pasteur Road EB 1 Right	U	С	106	5			
J1:3/1	Southtown NB 2 Left	U	F	107	6			
	Southtown NB 2 Left	U	F 1	25	39			
J1:3/2	Southtown NB 2 Right Ahead	U	Е	26	37			
J1:3/3	Southtown NB 2 Right	U	E	26	37			
J1:5/1	Pasteur Road WB 2 Ahead Left	U	В	44	100			
J1:5/2	Pasteur Road WB 2 Ahead	U	В	44	100			
J1:5/3	Pasteur Road WB 2 Right	U	D	44	56			
J1:7/1	SouthTown SB 1 Left	U	G	11	20			
J1:7/2	SouthTown SB 1 Right Ahead	U	G	11	20			

Junctio	Junction: J2: Southtown with Suffolk								
Lane	Description	Туре	Phases	Start Green	End Green				
J2:1/1	Suffolk EB 1 Left Ahead Right	U	E	30	40				
J2:4/1	Southtown NB 4 Ahead	U	В	11	24				
J2:4/2	Southtown NB 4 Right	U	D	11	24				
J2:8/1	Suffolk WB 2 Ahead Left	U	F	45	53				
J2:8/2	Suffolk WB 2 Right	U	F	45	53				
J2:11/1	Ahead	U	Α	59	25				
J2:11/2	Right	U	С	59	6				

Option 32 and 33 Haven Bridge

Junction: J3: Hall Plain								
Lane	Description	Туре	Phases	Start Green	End Green			
J3:2/2	Hall Quay SB 3 Ahead	U	Α	10	108			
J3:3/1	S Quay NB 1 Ahead	U	В	10	108			
J3:3/2	S Quay NB 1 Ahead	U	В	10	108			
J3:3/3	S Quay NB 1 Ahead	U	В	10	108			
J3:6/1	Regent St WB Ahead	U	С	113	5			

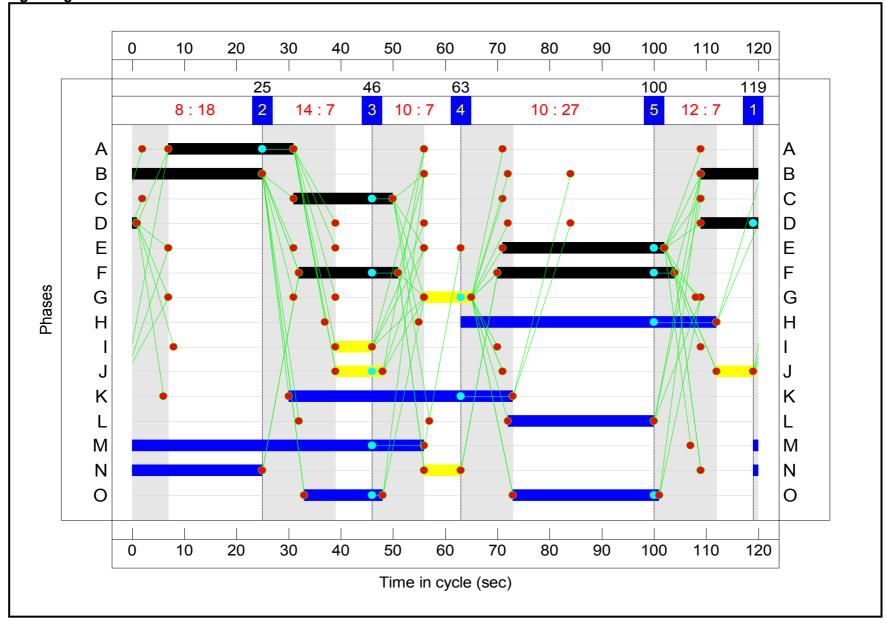
Junction: J4: Haven Bridge							
Lane	Description	Туре	Phases	Start Green	End Green		
J4:2/1	Hall Quay SB 1 Ahead	U	Α	0	41		
J4:3/1	Pasteur Road EB 3 Left	U	D	50	114		
J4:3/2	Pasteur Road EB 3 Right	U	С	47	114		
J4:7/1	Ahead	U	В	119	42		

Scenario 3: 'PM 2038 Average' (FG3: 'PM 2038 Average Case', Plan 1: 'Network Control Plan 1') C1

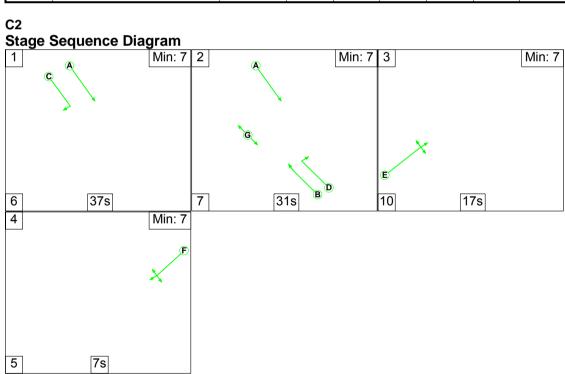
Stage Sequence Diagram

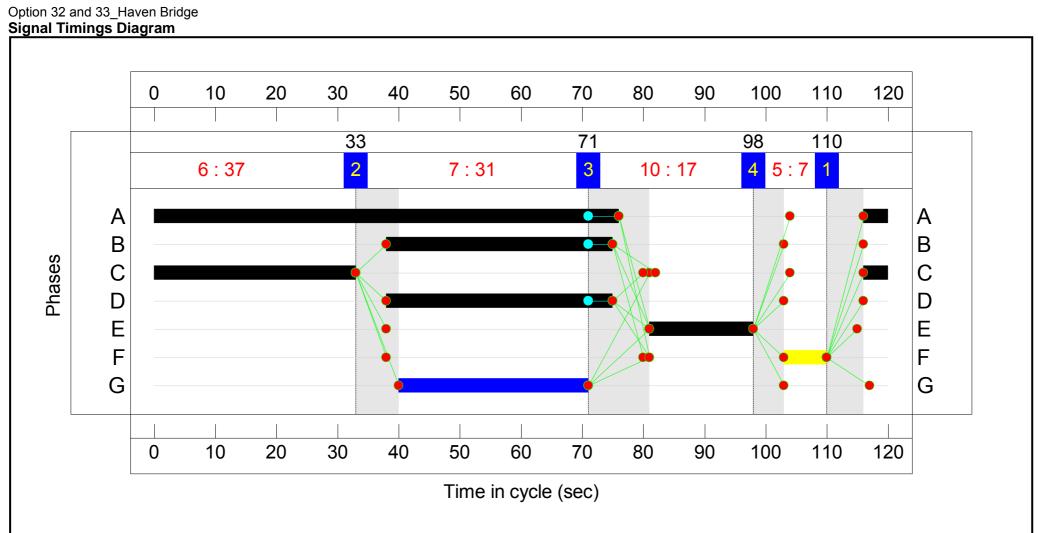
| Min: 7 Min: 7 Min: 7 N 18s 10 7s 7s 14 4 5 Min: 7 Min: 7 12 7s 10 27s

Option 32 and 33\_Haven Bridge **Signal Timings Diagram** 



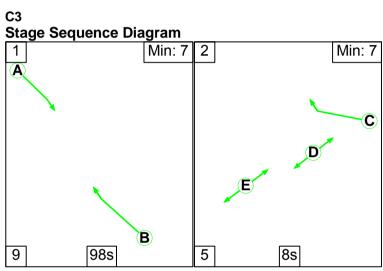
Phase			Gre	een Perio	d 1	Gre	een Perio	d 2
Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
А	Pasteur Road EB 1 Ahead Left	Traffic	24	7	31			
В	Pasteur Road WB 2 Ahead Left	Traffic	36	109	25			
С	Pasteur Road EB 1 Right	Traffic	19	31	50			
D	Pasteur Road WB 2 Right	Traffic	12	109	1			
Е	Southtown NB 2 Right Ahead	Traffic	31	71	102			
F	Southtown NB 2 Left	Traffic	19	32	51	34	70	104
G	SouthTown SB 1 Left Right Ahead	Traffic	9	56	65			
Н	Pedestrians across	Pedestrian	49	63	112			
1	Pedestrians across	Pedestrian	7	39	46			
J	Pedestrians across	Pedestrian	9	39	48	7	112	119
K	Pedestrians across	Pedestrian	43	30	73			
L	Pedestrians across	Pedestrian	28	72	100			
М	Pedestrians across	Pedestrian	57	119	56			
N	Pedestrians across	Pedestrian	26	119	25	7	56	63
0	Pedestrians across	Pedestrian	15	33	48	28	73	101

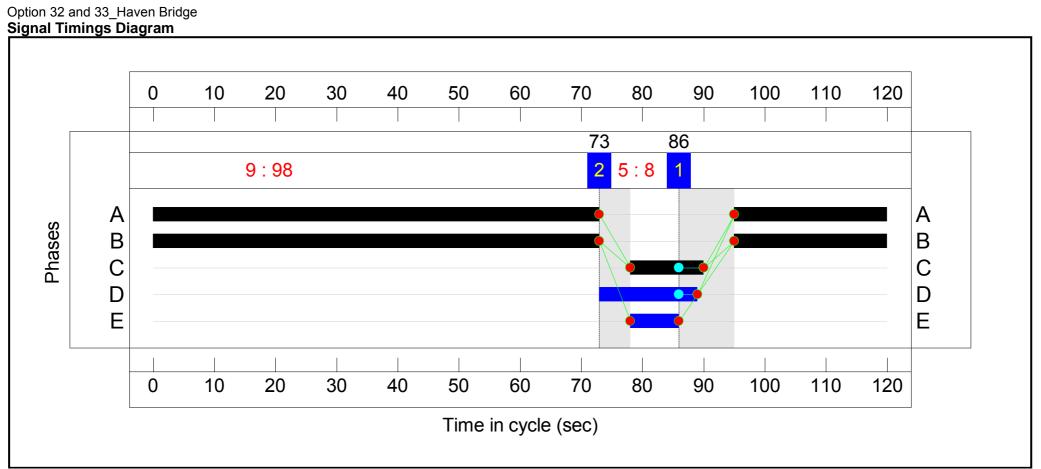




Phase	_		Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	80	116	76	
В	Southtown NB 4 Ahead	Traffic	37	38	75	
С	Right	Traffic	37	116	33	
D	Southtown NB 4 Right	Traffic	37	38	75	
E	Suffolk EB 1 Left Ahead Right	Traffic	17	81	98	
F	Suffolk WB 2 Ahead Right Left	Traffic	7	103	110	
G	Pedestrians across	Pedestrian	31	40	71	

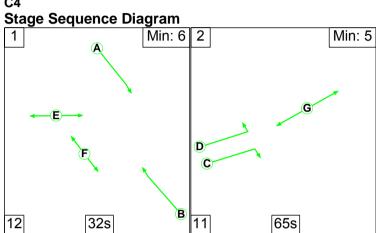


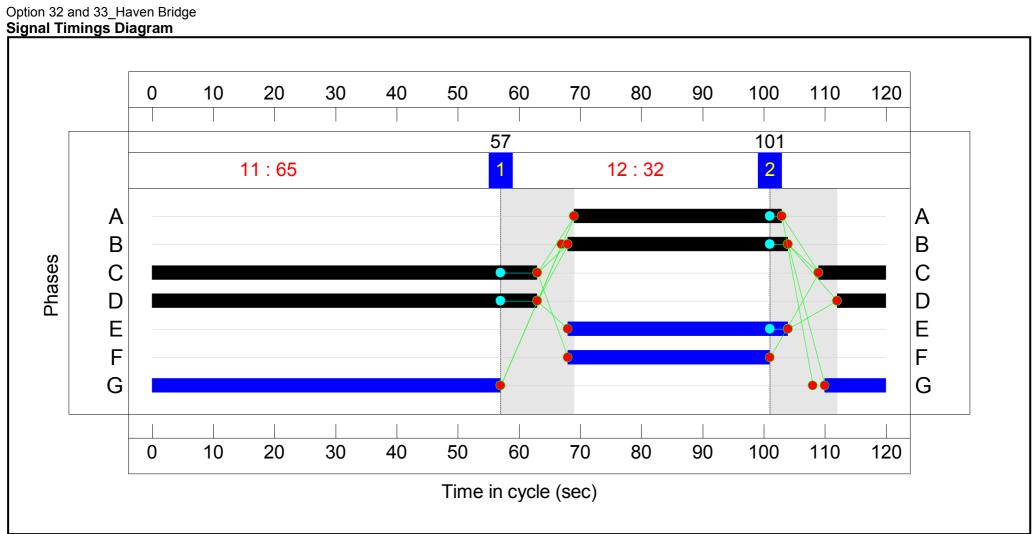




Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Hall Quay SB 3 Ahead	Traffic	98	95	73	
В	S Quay NB 1 Ahead	Traffic	98	95	73	
С	Regent St WB Ahead	Traffic	12	78	90	
D	Pedestrians across	Pedestrian	16	73	89	
Е	Pedestrians across	Pedestrian	8	78	86	







Phase			Gre	Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time		
Α	Hall Quay SB 1 Ahead	Traffic	34	69	103		
В	Ahead	Traffic	36	68	104		
С	Pasteur Road EB 3 Right	Traffic	74	109	63		
D	Pasteur Road EB 3 Left	Traffic	71	112	63		
Е	Pedestrians across	Pedestrian	36	68	104		
F	Pedestrians across	Pedestrian	33	68	101		
G	Pedestrians across	Pedestrian	67	110	57		

Junctio	Junction: J1: Pasteur Road With Southtown						
Lane	Description	Туре	Phases	Start Green	End Green		
J1:1/1	Pasteur Road EB 1 Ahead Left	U	Α	7	31		
J1:1/2	Pasteur Road EB 1 Ahead	U	Α	7	31		
J1:1/3	Pasteur Road EB 1 Right	U	С	31	50		
J1:3/1	Southtown NB 2 Left		F	32	51		
	Southtown NB 2 Left	Southtown NB 2 Left U F		70	104		
J1:3/2	Southtown NB 2 Right Ahead	U	Е	71	102		
J1:3/3	Southtown NB 2 Right	U	Е	71	102		
J1:5/1	Pasteur Road WB 2 Ahead Left	U	В	109	25		
J1:5/2	Pasteur Road WB 2 Ahead	U	В	109	25		
J1:5/3	Pasteur Road WB 2 Right	U	D	109	1		
J1:7/1	SouthTown SB 1 Left	U	G	56	65		
J1:7/2	SouthTown SB 1 Right Ahead	U	G	56	65		

Junctio	Junction: J2: Southtown with Suffolk						
Lane	Description	Туре	Phases	Start Green	End Green		
J2:1/1	Suffolk EB 1 Left Ahead Right	U	E	81	98		
J2:4/1	Southtown NB 4 Ahead	U	В	38	75		
J2:4/2	Southtown NB 4 Right	U	D	38	75		
J2:8/1	Suffolk WB 2 Ahead Left	U	F	103	110		
J2:8/2	Suffolk WB 2 Right	U	F	103	110		
J2:11/1	Ahead	U	Α	116	76		
J2:11/2	Right	U	С	116	33		

Option 32 and 33 Haven Bridge

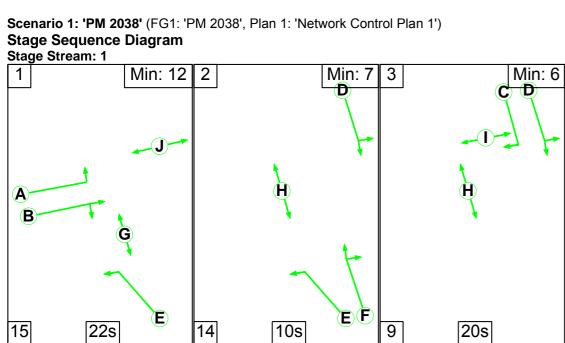
Junction: J3: Hall Plain							
Lane	Description	Туре	Phases	Start Green	End Green		
J3:2/2	Hall Quay SB 3 Ahead	U	Α	95	73		
J3:3/1	S Quay NB 1 Ahead	U	В	95	73		
J3:3/2	S Quay NB 1 Ahead	U	В	95	73		
J3:3/3	S Quay NB 1 Ahead	U	В	95	73		
J3:6/1	Regent St WB Ahead	U	С	78	90		

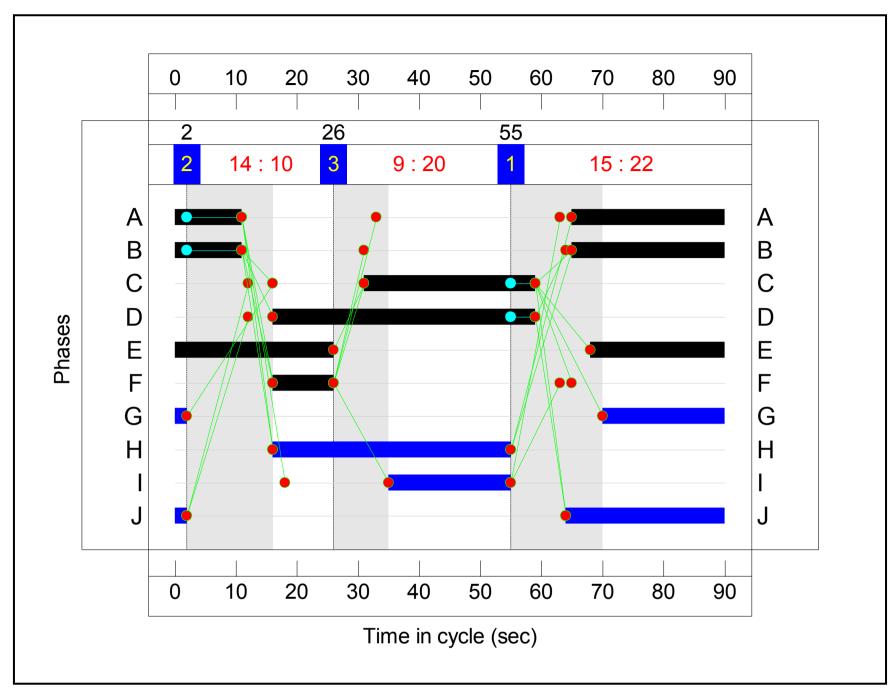
Junctio	Junction: J4: Haven Bridge							
Lane	Description	Туре	Phases	Start Green	End Green			
J4:2/1	Hall Quay SB 1 Ahead	U	Α	69	103			
J4:3/1	Pasteur Road EB 3 Left	U	D	112	63			
J4:3/2	Pasteur Road EB 3 Right	U	С	109	63			
J4:7/1	Ahead	U	В	68	104			

Option 32 and 33\_Proposed East Bridge Junction **Signal Timings** 

**User and Project Details** 

Project:	reat Yarmouth River Crossing	
Title:	Forecast Report	
Company:	Mouchel	



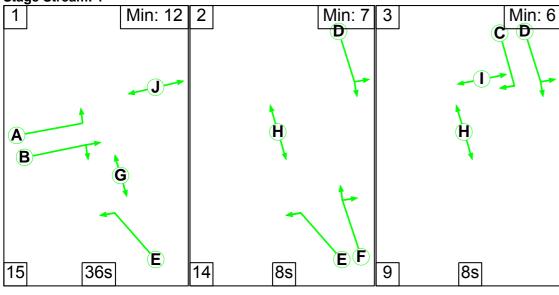


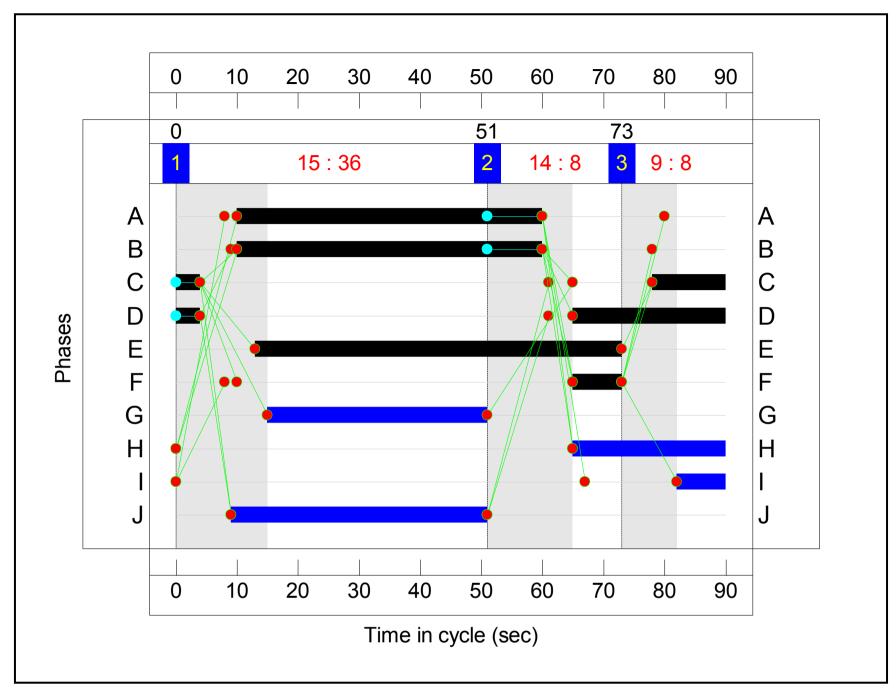
Option 32 and 33\_Proposed East Bridge Junction Phase Timings

Dhasa	Phase		Storio	Green Period 1		
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time
Α	Left	Traffic	1	36	65	11
В	Right Ahead	Traffic	1	36	65	11
С	Right	Traffic	1	28	31	59
D	Ahead Left	Traffic	1	43	16	59
Е	Left	Traffic	1	48	68	26
F	Ahead Right	Traffic	1	10	16	26
G	Pedestrians across	Pedestrian	1	22	70	2
Н	Pedestrians across	Pedestrian	1	39	16	55
ı	Pedestrians across	Pedestrian	1	20	35	55
J	Pedestrians across	Pedestrian	1	28	64	2

Junct	Junction: Proposed east junction						
Lane	Description	Туре	Phases	Start Green	End Green		
1/1	Ahead Left	U	D	16	59		
1/2	Right	U	С	31	59		
1/3	Right	U	С	31	59		
2/1	Left	U	Α	65	11		
2/2	Right Ahead	U	В	65	11		
3/1	Left	U	Е	68	26		
3/2	Left	U	Е	68	26		
3/3	Ahead Right	U	F	16	26		

Scenario 2: 'AM 2038' (FG2: 'AM 2038', Plan 1: 'Network Control Plan 1')
Stage Sequence Diagram
Stage Stream: 1



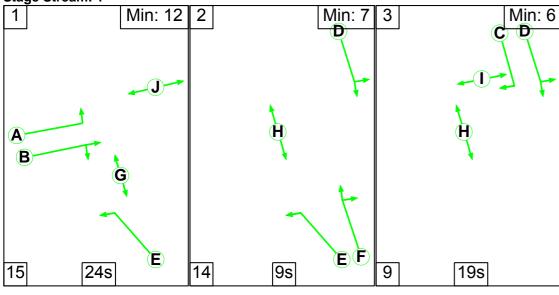


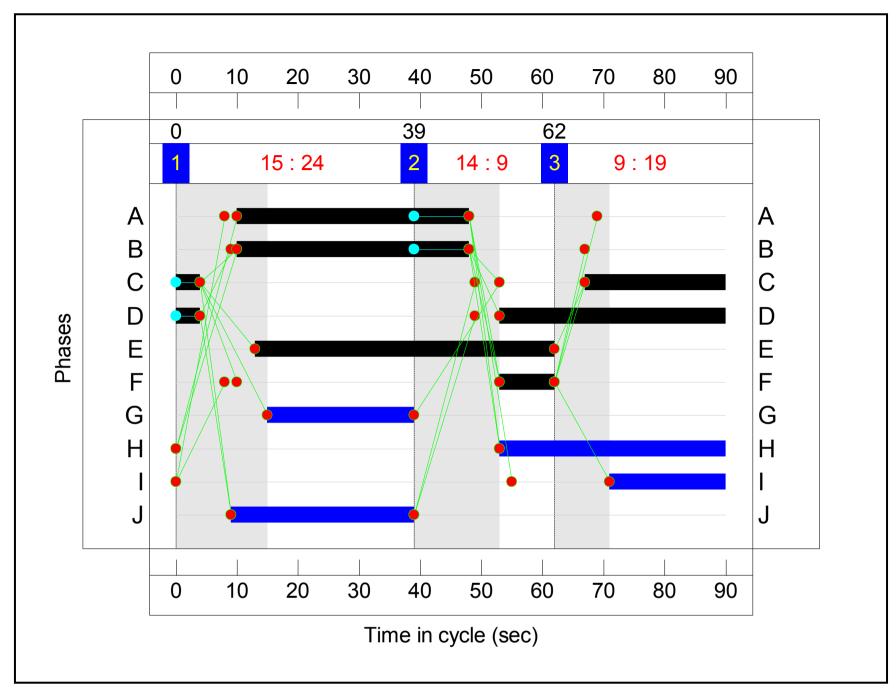
Option 32 and 33\_Proposed East Bridge Junction Phase Timings

Phone	Phase		Stone	Green Period 1		
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time
Α	Left	Traffic	1	50	10	60
В	Right Ahead	Traffic	1	50	10	60
С	Right	Traffic	1	16	78	4
D	Ahead Left	Traffic	1	29	65	4
Е	Left	Traffic	1	60	13	73
F	Ahead Right	Traffic	1	8	65	73
G	Pedestrians across	Pedestrian	1	36	15	51
Н	Pedestrians across	Pedestrian	1	25	65	0
I	Pedestrians across	Pedestrian	1	8	82	0
J	Pedestrians across	Pedestrian	1	42	9	51

Junct	Junction: Proposed east junction							
Lane	Description	Туре	Phases	Start Green	End Green			
1/1	Ahead Left	U	D	65	4			
1/2	Right	U	С	78	4			
1/3	Right	U	С	78	4			
2/1	Left	U	Α	10	60			
2/2	Right Ahead	U	В	10	60			
3/1	Left	U	Е	13	73			
3/2	Left	U	E	13	73			
3/3	Ahead Right	U	F	65	73			

Scenario 3: 'IP 2038' (FG3: 'IP 2038', Plan 1: 'Network Control Plan 1')
Stage Sequence Diagram
Stage Stream: 1





Option 32 and 33\_Proposed East Bridge Junction **Phase Timings** 

Phone	Phase		Stone	Green Period 1		
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time
Α	Left	Traffic	1	38	10	48
В	Right Ahead	Traffic	1	38	10	48
С	Right	Traffic	1	27	67	4
D	Ahead Left	Traffic	1	41	53	4
Е	Left	Traffic	1	49	13	62
F	Ahead Right	Traffic	1	9	53	62
G	Pedestrians across	Pedestrian	1	24	15	39
Н	Pedestrians across	Pedestrian	1	37	53	0
I	Pedestrians across	Pedestrian	1	19	71	0
J	Pedestrians across	Pedestrian	1	30	9	39

Junct	Junction: Proposed east junction							
Lane	Description	Туре	Phases	Start Green	End Green			
1/1	Ahead Left	U	D	53	4			
1/2	Right	U	С	67	4			
1/3	Right	U	С	67	4			
2/1	Left	U	Α	10	48			
2/2	Right Ahead	U	В	10	48			
3/1	Left	U	Е	13	62			
3/2	Left	U	Е	13	62			
3/3	Ahead Right	U	F	53	62			

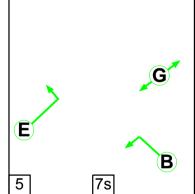
# Option 32 and 33\_Station Access **Signal Timings**

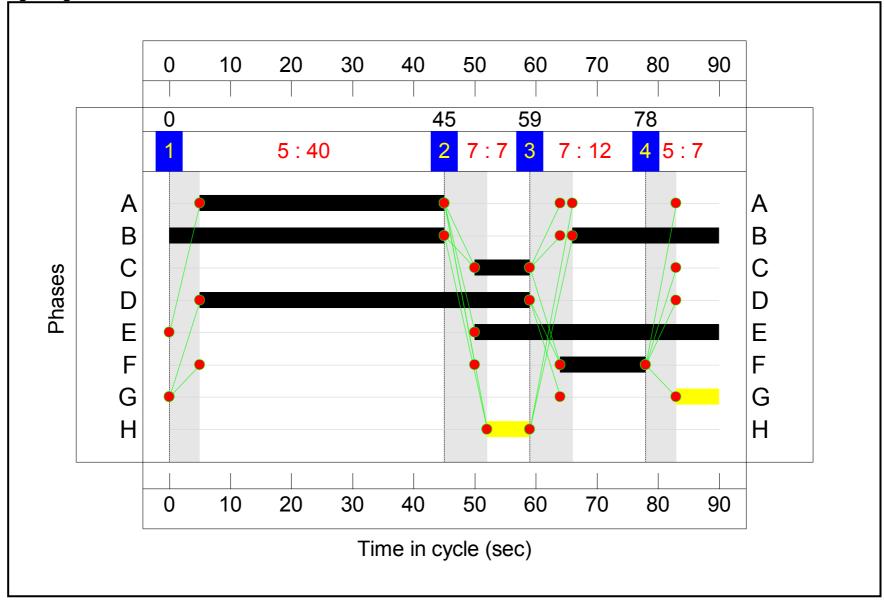
**User and Project Details** 

Project:	Great Yarmouth Third Crossing	
Title:	Forecast Report	
Company:	Mouchel	

Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram Min: 7 Min: 5 D E B 40s 12s 7s Min: 7





# Option 32 and 33\_Station Access **Phase Timings**

Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	40	5	45	
В	Left	Traffic	69	66	45	
С	Right	Traffic	9	50	59	
D	Ahead	Traffic	54	5	59	
Е	Left	Traffic	40	50	0	
F	Right	Traffic	14	64	78	
G	Pedestrians across	Pedestrian	7	83	0	
Н	Pedestrians across	Pedestrian	7	52	59	

Junction: Station Access								
Lane	Description	Туре	Phases	Start Green	End Green			
1/1	Ahead	U	D	5	59			
1/2	Ahead	U	D	5	59			
1/3	Right	U	С	50	59			
2/1	Left	U	В	66	45			
2/2	Ahead	U	Α	5	45			
2/3	Ahead	U	Α	5	45			
5/1	Left	U	Е	50	0			
5/2	Right	U	F	64	78			

## Signal Timings

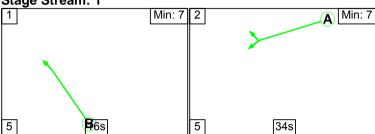
**User and Project Details** 

Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

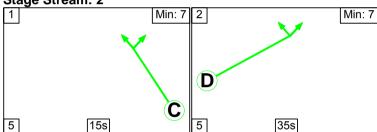
Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

**Stage Sequence Diagram** 

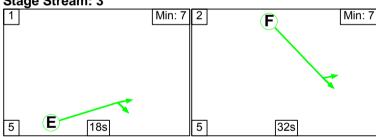
Stage Stream: 1



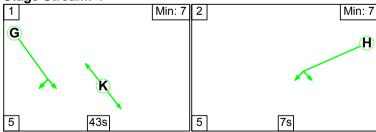




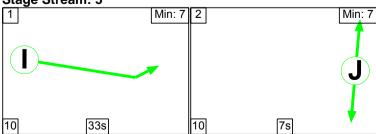
Stage Stream: 3

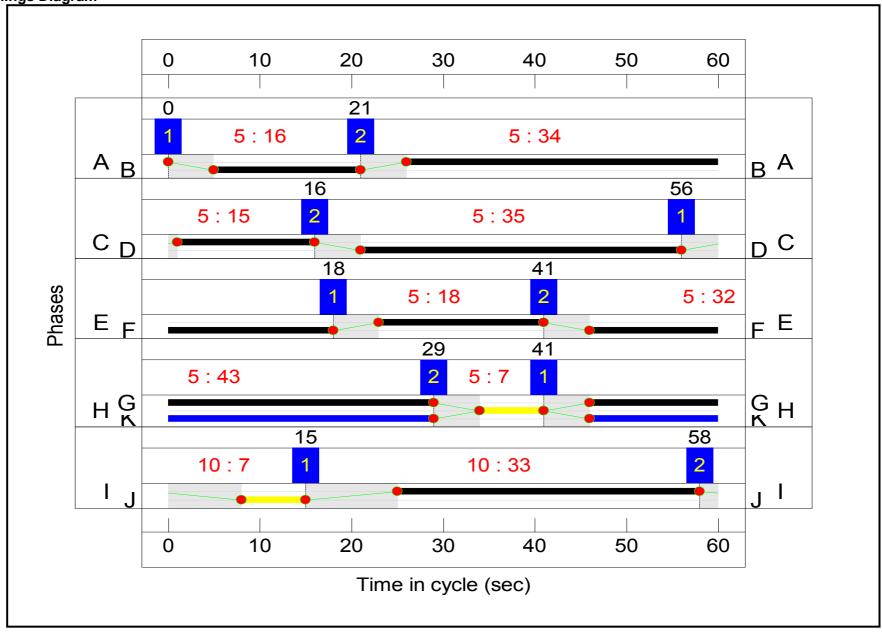


### Stage Stream: 4



Stage Stream: 5





# Option 32 and 33\_Vauxhall Roundabout **Phase Timings**

Phase			Stage	Gre	een Perio	d 1
Name	Description	Phase	Stream	Total Green	Start Time	End Time
Α	Rdb Arm 4 Right Ahead	Traffic	1	34	26	0
В	WB Acle New Road Rdb Ahead	Traffic	1	16	5	21
С	Rbd Arm 1 Right Ahead	Traffic	2	15	1	16
D	A12 NB Ahead Left	Traffic	2	35	21	56
Е	Rdb Arm 2 Right Ahead	Traffic	3	18	23	41
F	EB Acle New Road Ahead Left	Traffic	3	32	46	18
G	Rdb Arm 3 Right Ahead	Traffic	4	43	46	29
Н	SB Runham Road Ahead Left	Traffic	4	7	34	41
ı	NB Runham Road Ahead	Traffic	5	33	25	58
J	Pedestrians across	Pedestrian	5	7	8	15
K	Pedestrians across	Pedestrian	4	43	46	29

Junct	Junction: J1: WB Acle New Road Diverge							
Lane	Lane Description Type Phases Start Green End Green							
No data to display								

Option 32 and 33 Vauxhall Roundabout

Junctio	n: J2: Vauxhall Roundabout				
Lane	Description	Туре	Phases	Start Green	End Green
J2:1/1	WB Acle New Road Rdb Ahead	U	В	5	21
J2:1/2	WB Acle New Road Rdb Ahead	U	В	5	21
J2:2/1	Rbd Arm 1 Ahead	U	С	1	16
J2:2/2	Rbd Arm 1 Right Ahead	U	С	1	16
J2:2/3	Rbd Arm 1 Right	U	С	1	16
J2:3/1	Rdb Arm 2 Ahead	U	Е	23	41
J2:3/2	Rdb Arm 2 Right	U	Е	23	41
J2:3/3	Rdb Arm 2 Right	U	Е	23	41
J2:4/1	Rdb Arm 3 Ahead	U	G	46	29
J2:4/2	Rdb Arm 3 Right Ahead	U	G	46	29
J2:4/3	Rdb Arm 3 Right	U	G	46	29
J2:5/1	Rdb Arm 4 Ahead	U	Α	26	0
J2:5/2	Rdb Arm 4 Right Ahead	U	Α	26	0
J2:5/3	Rdb Arm 4 Right	U	Α	26	0
J2:7/1	SB Runham Road Ahead Left	U	Н	34	41
J2:8/1	NB Runham Road Ahead	U	I	25	58
J2:9/1	A12 NB Left	U	D	21	56
J2:9/2	A12 NB Ahead	U	D	21	56
J2:9/3	A12 NB Ahead	U	D	21	56
J2:11/1	EB Acle New Road Left	U	F	46	18
J2:11/2	EB Acle New Road Ahead	U	F	46	18
J2:11/3	EB Acle New Road Ahead	U	F	46	18

## Option 37\_Harfreys Roundabout

## Signal Timings

### **User and Project Details**

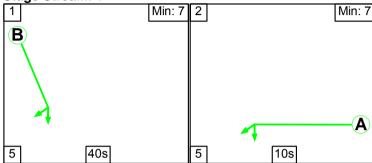
Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

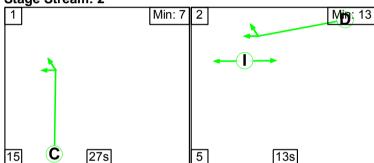
C1

## Stage Sequence Diagram

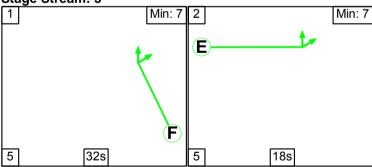
Stage Stream: 1



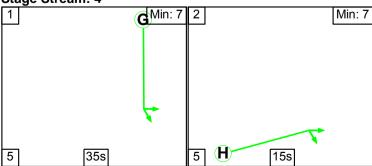
Stage Stream: 2



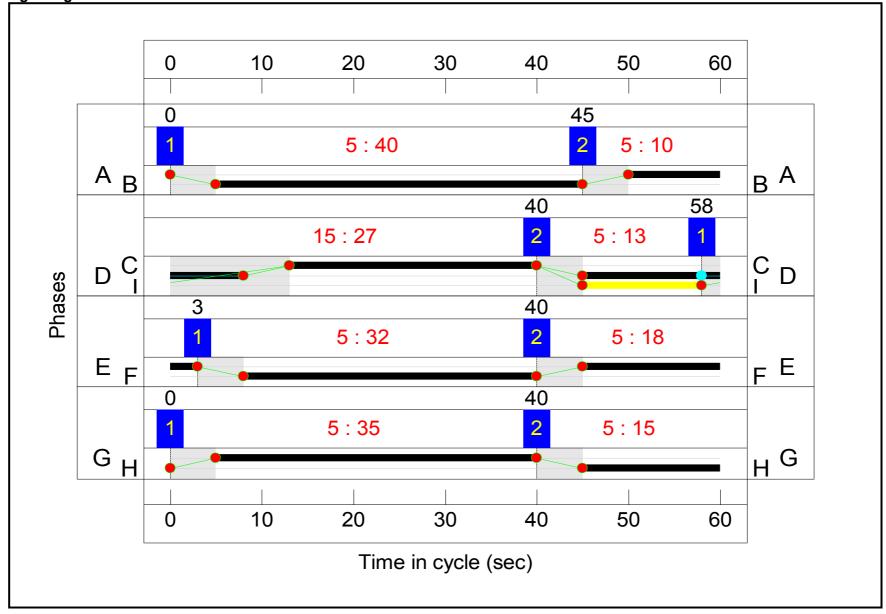
Stage Stream: 3



Stage Stream: 4



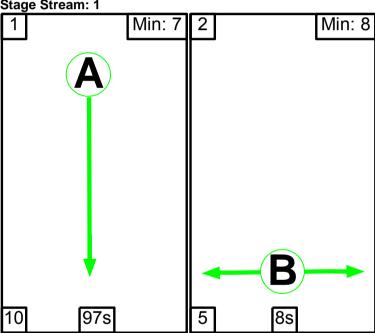
Option 37\_Harfreys Roundabout **Signal Timings Diagram** 

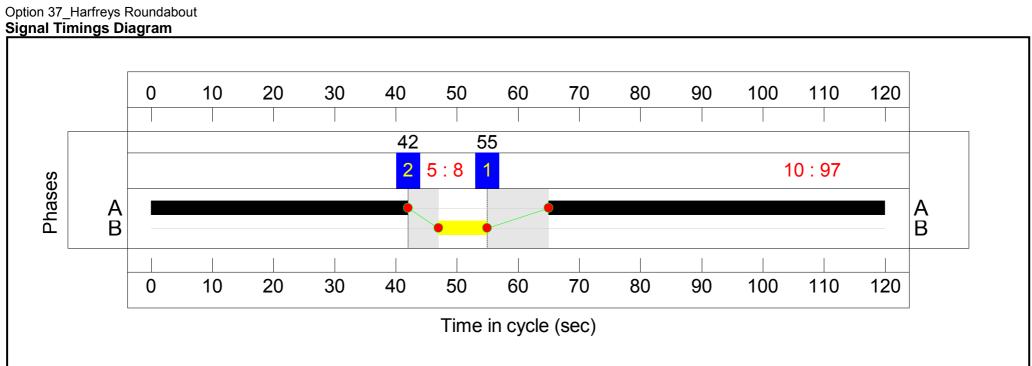


# Option 37\_Harfreys Roundabout **Phase Timings**

Phase	ge		Storio	Green Period 1		
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time
Α	Ahead Left	Traffic	1	10	50	0
В	Right Ahead	Traffic	1	40	5	45
С	Ahead Left	Traffic	2	27	13	40
D	Right Ahead	Traffic	2	23	45	8
Е	Ahead Left	Traffic	3	18	45	3
F	Right Ahead	Traffic	3	32	8	40
G	Ahead Left	Traffic	4	35	5	40
Н	Right Ahead	Traffic	4	15	45	0
I	Pedestrians across	Pedestrian	2	13	45	58

C2 Stage Sequence Diagram Stage Stream: 1





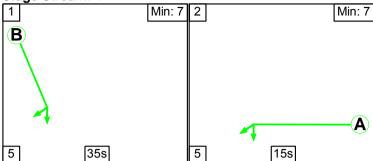
# Option 37\_Harfreys Roundabout **Phase Timings**

Phase			Stage	Green Period 1		
Name	Description	Phase	Stream	Total Green	Start Time	End Time
Α	Ahead	Traffic	1	97	65	42
В	Pedestrians across	Pedestrian	1	8	47	55

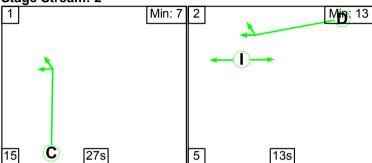
Junct	ion: Unnamed	Junctio	on		
Lane	Description	Туре	Phases	Start Green	End Green
1/1	Left	J	Α	50	0
1/2	Ahead Left	U	Α	50	0
1/3	Ahead	U	Α	50	0
2/1	Left	U	С	13	40
2/2	Ahead	U	С	13	40
2/3	Ahead	U	С	13	40
2/4	Ahead	U	С	13	40
3/1	Ahead Left	U	Е	45	3
3/2	Ahead	U	E	45	3
4/1	Left	U	G	5	40
4/2	Ahead Left	U	G	5	40
4/3	Ahead	U	G	5	40
4/4	Ahead	U	G	5	40
5/1	Ahead	U	D	45	8
5/2	Right Ahead	U	D	45	8
5/3	Right	U	D	45	8
6/1	Ahead	U	F	8	40
6/2	Right Ahead	U	F	8	40
6/3	Right	U	F	8	40
7/1	Ahead	U	Н	45	0
7/2	Right Ahead	U	Н	45	0
7/3	Right	U	Н	45	0
8/1	Ahead	U	В	5	45
8/2	Ahead	U	В	5	45
8/3	Right	U	В	5	45
9/1	Ahead	U	Α	65	42
9/2	Ahead	U	Α	65	42

Scenario 2: 'AM 2038' (FG2: 'AM 2038', Plan 1: 'Network Control Plan 1')

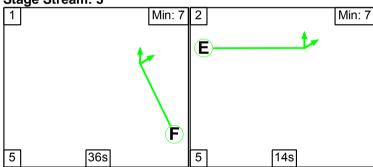
#### Stage Sequence Diagram Stage Stream: 1



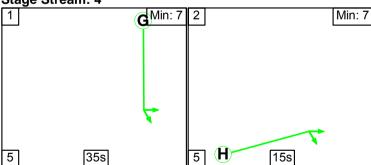




#### Stage Stream: 3

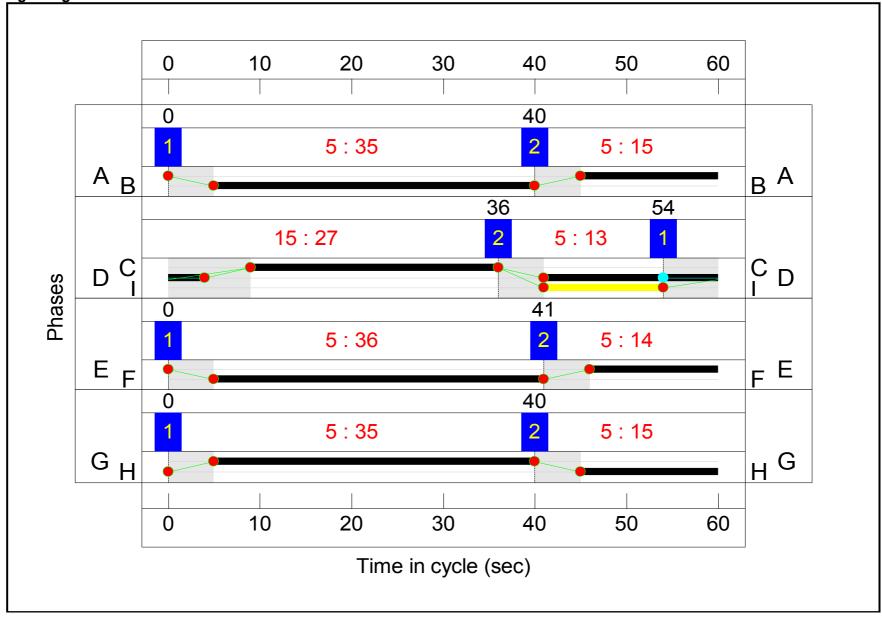


#### Stage Stream: 4



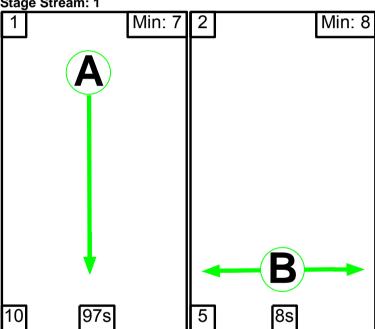
Option 37\_Harfreys Roundabout **Signal Timings Diagram** 

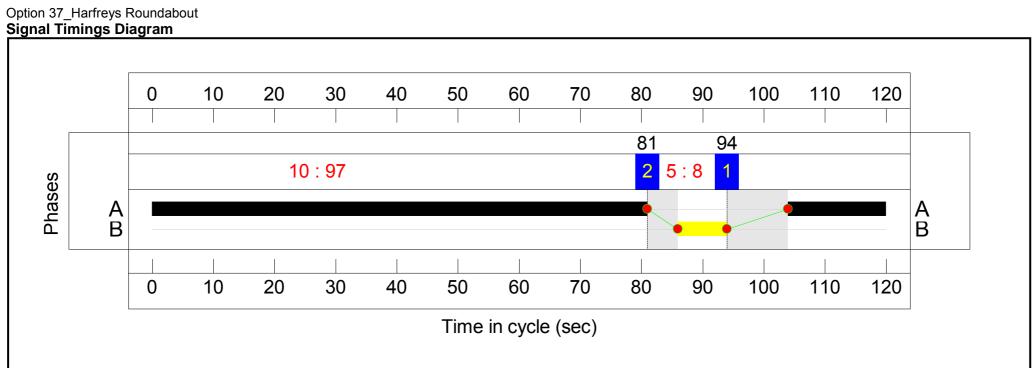




Phase	ge		Stone	Green Period 1			
Name	Description	Phase	Stage Stream	Total Green	Start Time	End Time	
Α	Ahead Left	Traffic	1	15	45	0	
В	Right Ahead	Traffic	1	35	5	40	
С	Ahead Left	Traffic	2	27	9	36	
D	Right Ahead	Traffic	2	23	41	4	
Е	Ahead Left	Traffic	3	14	46	0	
F	Right Ahead	Traffic	3	36	5	41	
G	Ahead Left	Traffic	4	35	5	40	
Н	Right Ahead	Traffic	4	15	45	0	
I	Pedestrians across	Pedestrian	2	13	41	54	

C2 Stage Sequence Diagram Stage Stream: 1





Phase			Stage	Green Period 1			
Name	Description	Phase	Stream	Total Green	Start Time	End Time	
Α	Ahead	Traffic	1	97	104	81	
В	Pedestrians across	Pedestrian	1	8	86	94	

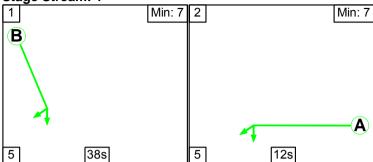
Junct	Junction: Unnamed Junction									
Lane	Description	Туре	Phases	Start Green	End Green					
1/1	Left	U	Α	45	0					
1/2	Ahead Left	J	Α	45	0					
1/3	Ahead	J	Α	45	0					
2/1	Left	U	С	9	36					
2/2	Ahead	J	С	9	36					
2/3	Ahead	J	С	9	36					
2/4	Ahead	J	С	9	36					
3/1	Ahead Left	U	Е	46	0					
3/2	Ahead	J	Е	46	0					
4/1	Left	כ	G	5	40					
4/2	Ahead Left	U	G	5	40					
4/3	Ahead	J	G	5	40					
4/4	Ahead	J	G	5	40					
5/1	Ahead	J	D	41	4					
5/2	Right Ahead	U	D	41	4					
5/3	Right	J	D	41	4					
6/1	Ahead	J	F	5	41					
6/2	Right Ahead	U	F	5	41					
6/3	Right	U	F	5	41					
7/1	Ahead	U	Н	45	0					
7/2	Right Ahead	כ	Н	45	0					
7/3	Right	U	Н	45	0					
8/1	Ahead	J	В	5	40					
8/2	Ahead	J	В	5	40					
8/3	Right	U	В	5	40					
9/1	Ahead	U	Α	104	81					
9/2	Ahead	U	Α	104	81					

Scenario 3: 'IP 2038' (FG3: 'IP 2038', Plan 1: 'Network Control Plan 1')

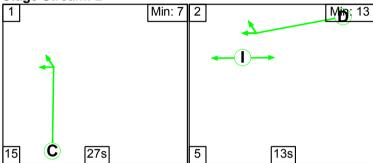
C1

#### **Stage Sequence Diagram**

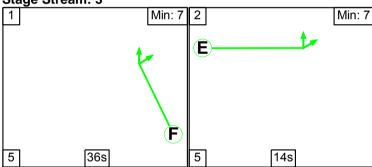
Stage Stream: 1



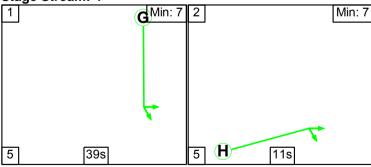




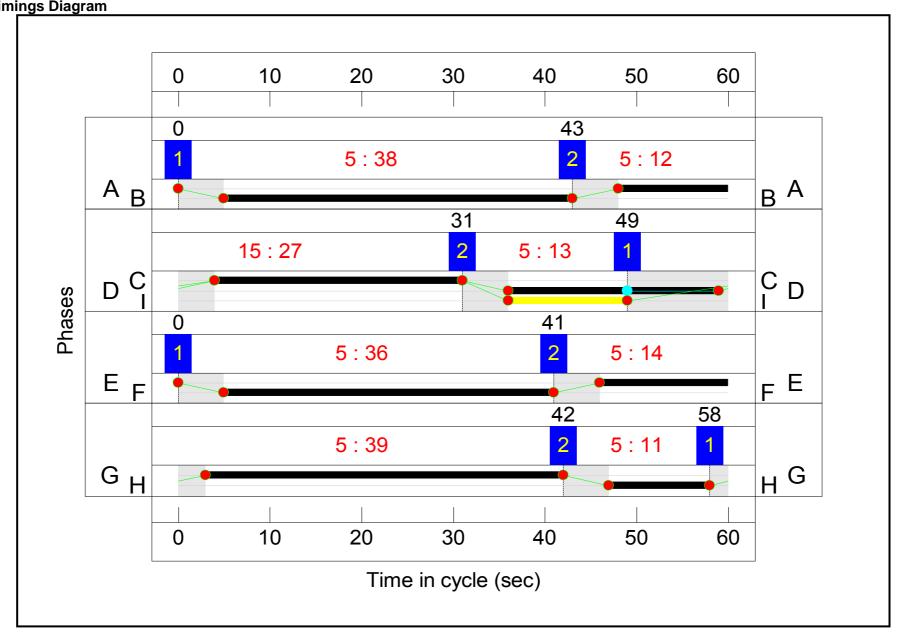
#### Stage Stream: 3



#### Stage Stream: 4

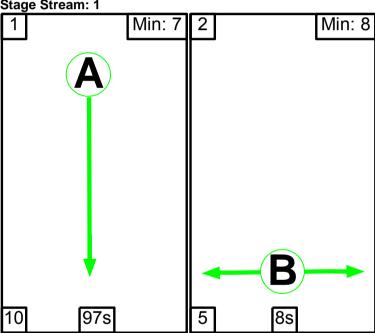


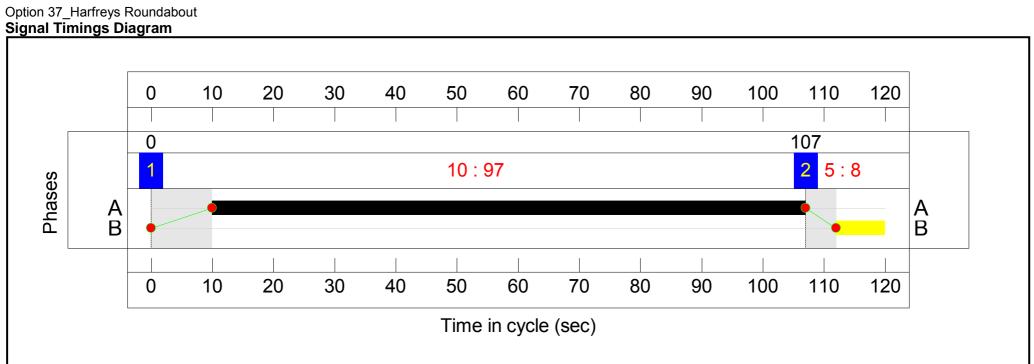
Option 37\_Harfreys Roundabout **Signal Timings Diagram** 



Phase	g-		Stage	Green Period 1			
Name	Description	Phase	Stream	Total Green	Start Time	End Time	
Α	Ahead Left	Traffic	1	12	48	0	
В	Right Ahead	Traffic	1	38	5	43	
С	Ahead Left	Traffic	2	27	4	31	
D	Right Ahead	Traffic	2	23	36	59	
Е	Ahead Left	Traffic	3	14	46	0	
F	Right Ahead	Traffic	3	36	5	41	
G	Ahead Left	Traffic	4	39	3	42	
Н	Right Ahead	Traffic	4	11	47	58	
I	Pedestrians across	Pedestrian	2	13	36	49	

C2 Stage Sequence Diagram Stage Stream: 1





Phase			Stage	Gre	een Perio	d 1
Name	Description	Phase	Stream	Total Green	Start Time	End Time
Α	Ahead	Traffic	1	97	10	107
В	Pedestrians across	Pedestrian	1	8	112	0

Junct	ion: Unnamed	Juncti	on		
Lane	Description	Туре	Phases	Start Green	End Green
1/1	Left	U	Α	48	0
1/2	Ahead Left	U	Α	48	0
1/3	Ahead	U	Α	48	0
2/1	Left	U	С	4	31
2/2	Ahead	U	С	4	31
2/3	Ahead	U	С	4	31
2/4	Ahead	U	С	4	31
3/1	Ahead Left	U	Е	46	0
3/2	Ahead	U	Е	46	0
4/1	Left	U	G	3	42
4/2	Ahead Left	U	G	3	42
4/3	Ahead	U	G	3	42
4/4	Ahead	U	G	3	42
5/1	Ahead	U	D	36	59
5/2	Right Ahead	U	D	36	59
5/3	Right	U	D	36	59
6/1	Ahead	U	F	5	41
6/2	Right Ahead	U	F	5	41
6/3	Right	U	F	5	41
7/1	Ahead	U	Н	47	58
7/2	Right Ahead	U	Н	47	58
7/3	Right	U	Н	47	58
8/1	Ahead	U	В	5	43
8/2	Ahead	U	В	5	43
8/3	Right	U	В	5	43
9/1	Ahead	U	Α	10	107
9/2	Ahead	U	Α	10	107

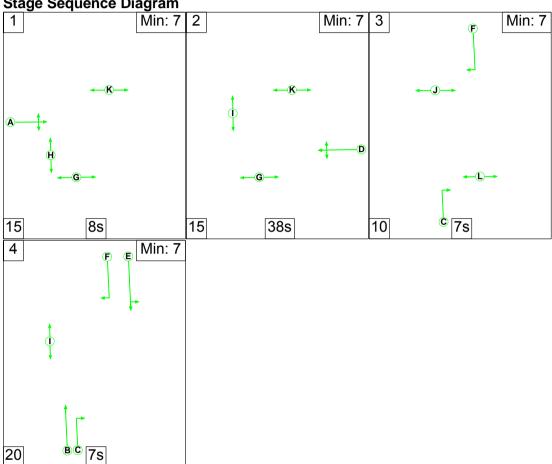
## Option 37\_Third Cross Junctions **Signal Timings**

**User and Project Details** 

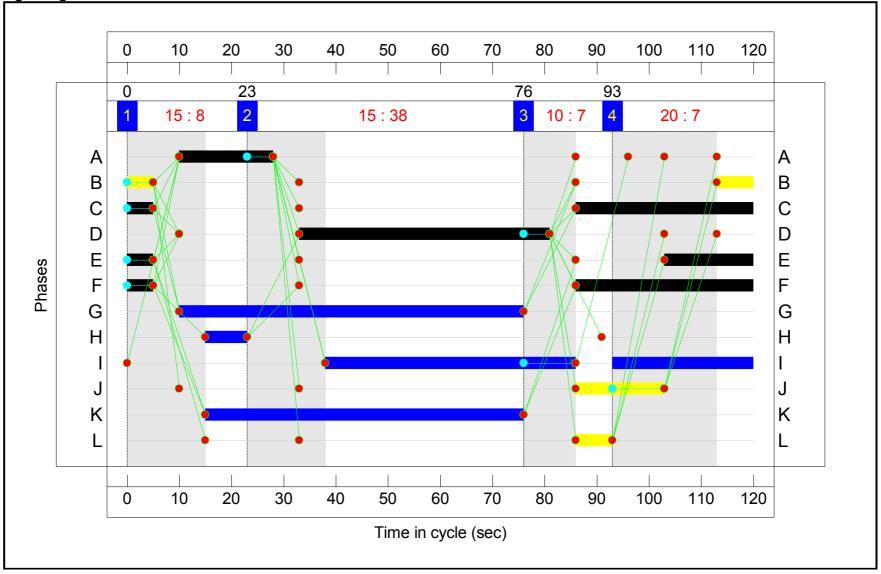
Project:	Great Yarmouth Third Crossing
Title:	Forecast Report
Company:	Mouchel

Scenario 1: 'PM 2038' (FG1: 'PM 2038', Plan 1: 'Network Control Plan 1')

**Stage Sequence Diagram** 

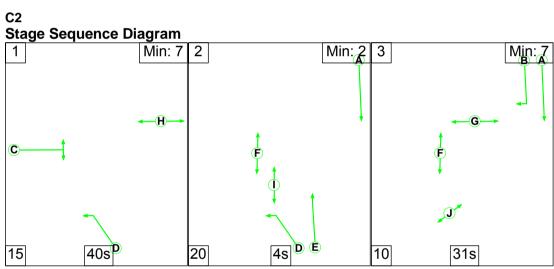


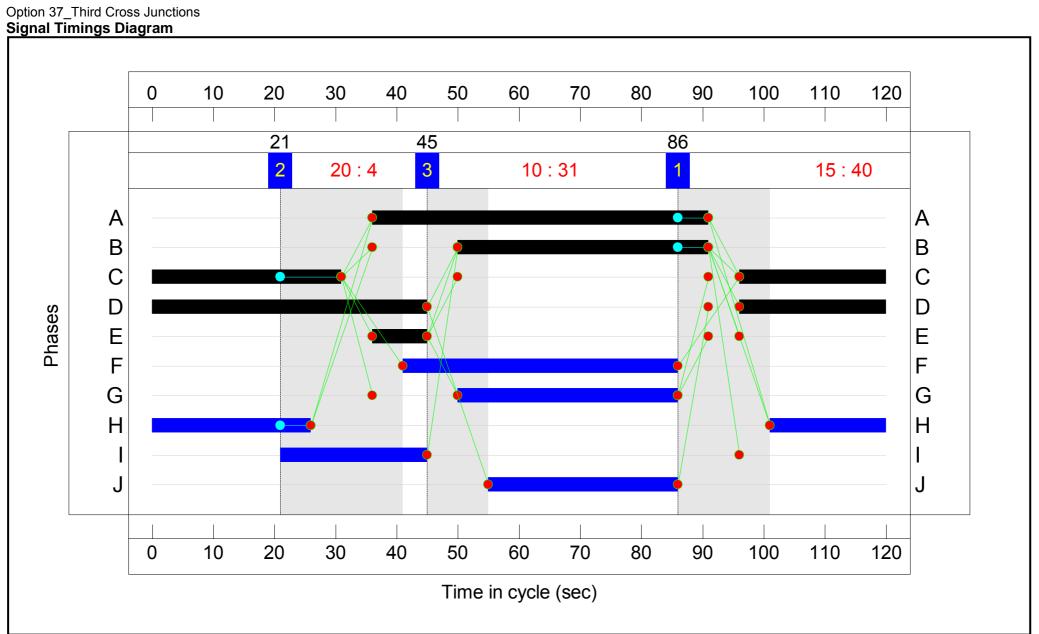
Option 37\_Third Cross Junctions **Signal Timings Diagram** 



Phase			Gre	een Perio	d 1	Gre	en Perio	d 2
Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
Α	Left Right Ahead	Traffic	18	10	28			
В	Ahead	Traffic	12	113	5			
С	Right	Traffic	39	86	5			
D	Right Left Ahead	Traffic	48	33	81			
Е	Ahead Left	Traffic	22	103	5			
F	Right	Traffic	39	86	5			
G	Pedestrians across	Pedestrian	66	10	76			
Н	Pedestrians across	Pedestrian	8	15	23			
1	Pedestrians across	Pedestrian	48	38	86	27	93	0
J	Pedestrians across	Pedestrian	17	86	103			
K	Pedestrians across	Pedestrian	61	15	76			
L	Pedestrians across	Pedestrian	7	86	93			







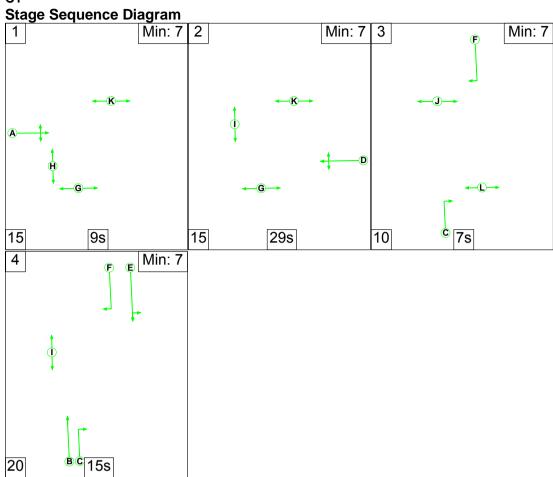
Phase			Gre	een Perio	d 1
Name	Description	Phase	Total Green	Start Time	End Time
Α	Ahead	Traffic	55	36	91
В	Right	Traffic 41 50		91	
С	Left Right	Traffic	55	96	31
D	Left	Traffic	69	96	45
Е	Ahead	Traffic	9	36	45
F	Pedestrians across	Pedestrian	45	41	86
G	Pedestrians across	Pedestrian	36	50	86
Н	Pedestrians across	Pedestrian	45	101	26
I	Pedestrians across	Pedestrian	24	21	45
J	Pedestrians across	Pedestrian	31	55	86

Junctio	Junction: J1: Westside Junction									
Lane	Description	Туре	Phases	Start Green	End Green					
J1:1/1	Ahead	U	В	113	5					
J1:1/2	Ahead	U	В	113	5					
J1:1/3	Right	0	С	86	5					
J1:3/1	Ahead Left	U	Е	103	5					
J1:3/2	Ahead	U	Е	103	5					
J1:3/3	Right	0	F	86	5					
J1:6/1	Right Left Ahead	U	D	33	81					
J1:7/1	Left	U	Α	10	28					
J1:7/2	Ahead	U	Α	10	28					
J1:7/3	Right	U	Α	10	28					

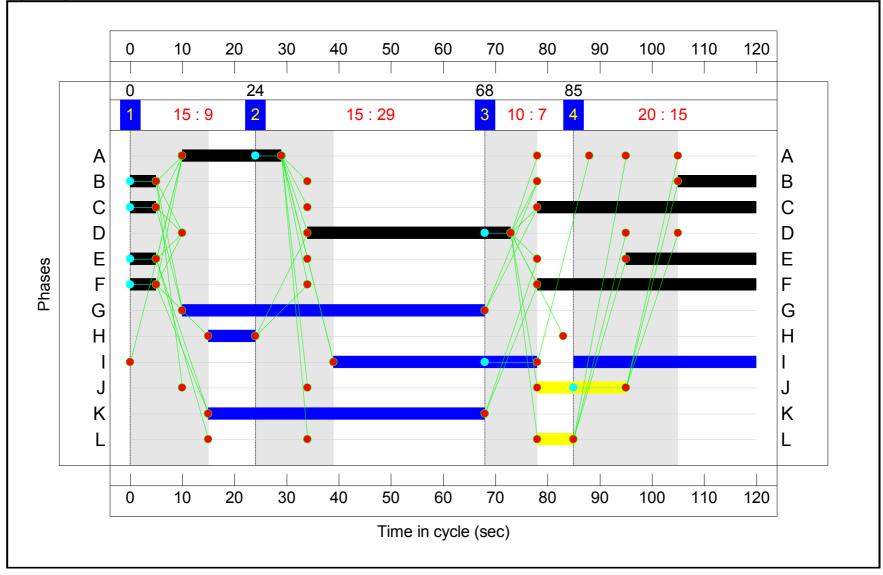
Junction: J2: Eastside Junction									
Lane	Description	Туре	Phases	Start Green	End Green				
J2:1/1	Left	U	С	96	31				
J2:1/2	Right	U	С	96	31				
J2:3/1	Ahead	U	Α	36	91				
J2:3/2	Right	U	В	50	91				
J2:5/1	Left	U	D	96	45				
J2:5/2	Ahead	U	Е	36	45				

Scenario 2: 'AM 2038' (FG2: 'AM 2038', Plan 1: 'Network Control Plan 1') C1



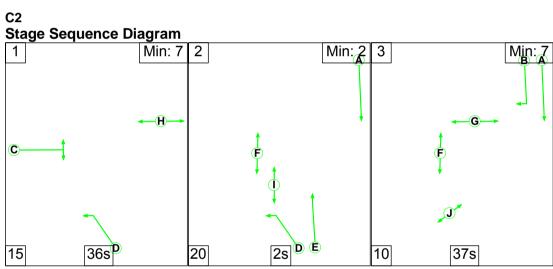


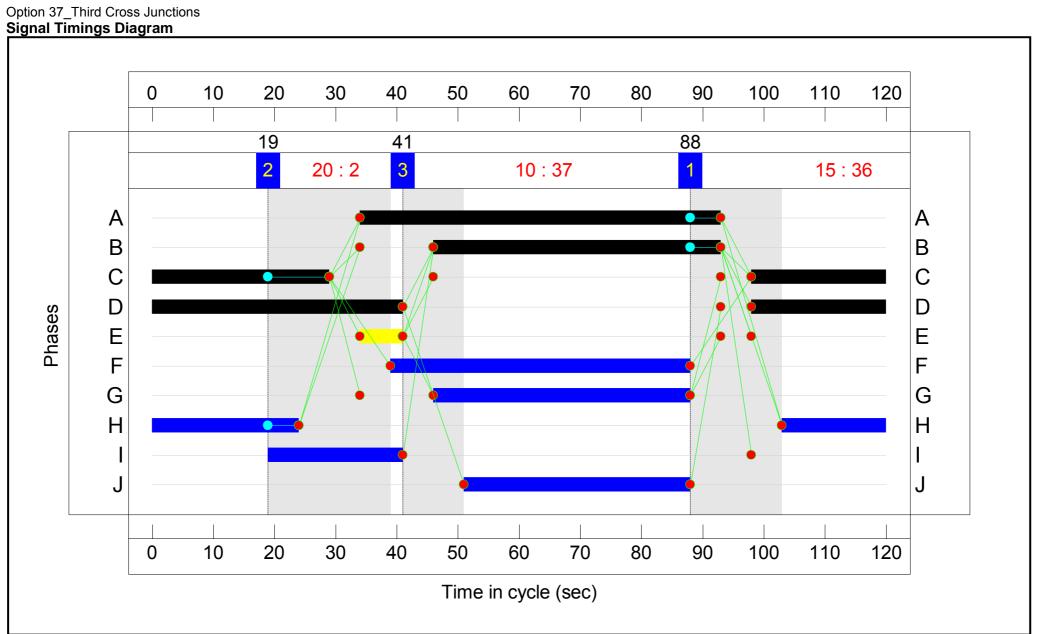
Option 37\_Third Cross Junctions **Signal Timings Diagram** 



Phase			Gre	een Perio	d 1	Gre	een Perio	d 2
Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
Α	Left Right Ahead	Traffic	19	10	29			
В	Ahead	Traffic	20	105	5			
С	Right	Traffic	47	78	5			
D	Right Left Ahead	Traffic	39	34	73			
Е	Ahead Left	Traffic	30	95	5			
F	Right	Traffic	47	78	5			
G	Pedestrians across	Pedestrian	58	10	68			
Н	Pedestrians across	Pedestrian	9	15	24			
ı	Pedestrians across	Pedestrian	39	39	78	35	85	0
J	Pedestrians across	Pedestrian	17	78	95			
K	Pedestrians across	Pedestrian	53	15	68			
L	Pedestrians across	Pedestrian	7	78	85			





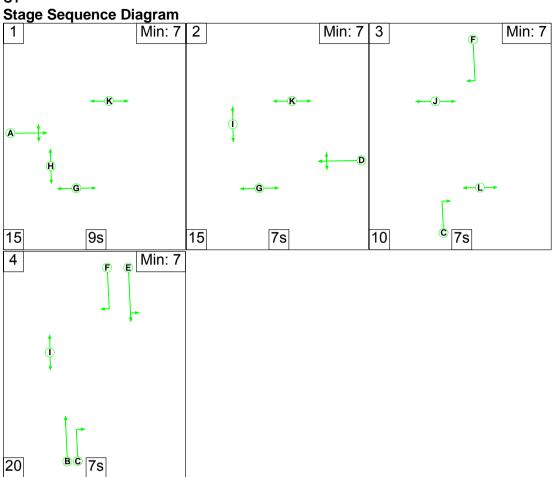


Phase			Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	59	34	93	
В	Right	Traffic	47	46	93	
С	Left Right	Traffic	51	98	29	
D	Left	Traffic	63	98	41	
E	Ahead	Traffic	7	34	41	
F	Pedestrians across	Pedestrian	49	39	88	
G	Pedestrians across	Pedestrian	42	46	88	
Н	Pedestrians across	Pedestrian	41	103	24	
I	Pedestrians across	Pedestrian	22	19	41	
J	Pedestrians across	Pedestrian	37	51	88	

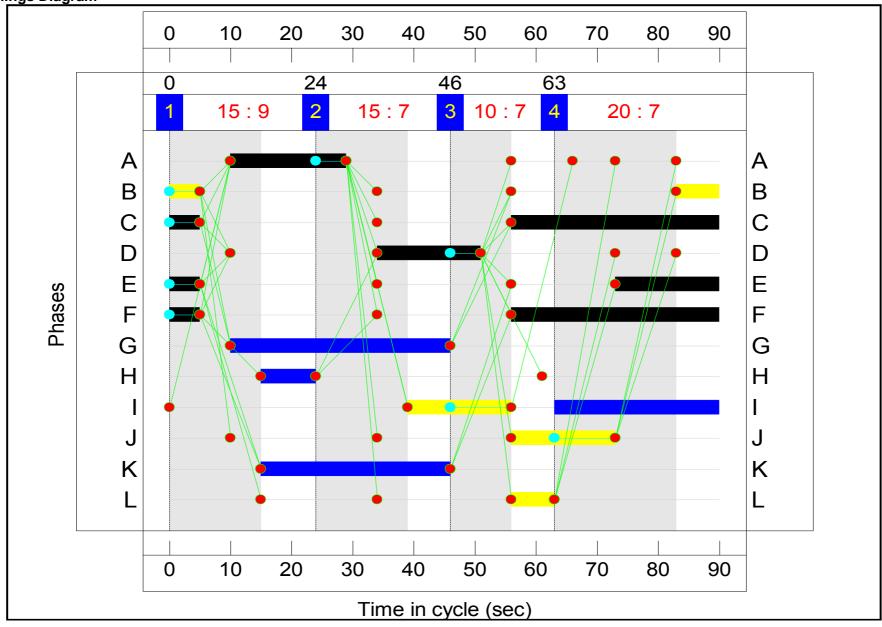
Junction: J1: Westside Junction								
Lane	Description	Туре	Phases	Start Green	End Green			
J1:1/1	Ahead	U	В	105	5			
J1:1/2	Ahead	U	В	105	5			
J1:1/3	Right	0	С	78	5			
J1:3/1	Ahead Left	U	Е	95	5			
J1:3/2	Ahead	U	Е	95	5			
J1:3/3	Right	0	F	78	5			
J1:6/1	Right Left Ahead	U	D	34	73			
J1:7/1	Left	U	Α	10	29			
J1:7/2	Ahead	U	Α	10	29			
J1:7/3	Right	U	Α	10	29			

Junction: J2: Eastside Junction								
Lane	Description	Туре	Phases	Start Green	End Green			
J2:1/1	Left	U	С	98	29			
J2:1/2	Right	U	С	98	29			
J2:3/1	Ahead	U	Α	34	93			
J2:3/2	Right	U	В	46	93			
J2:5/1	Left	U	D	98	41			
J2:5/2	Ahead	U	Е	34	41			

Scenario 3: 'IP 2038' (FG3: 'IP 2038', Plan 1: 'Network Control Plan 1') C1

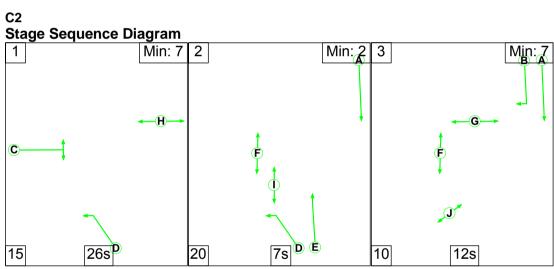


Option 37\_Third Cross Junctions **Signal Timings Diagram** 

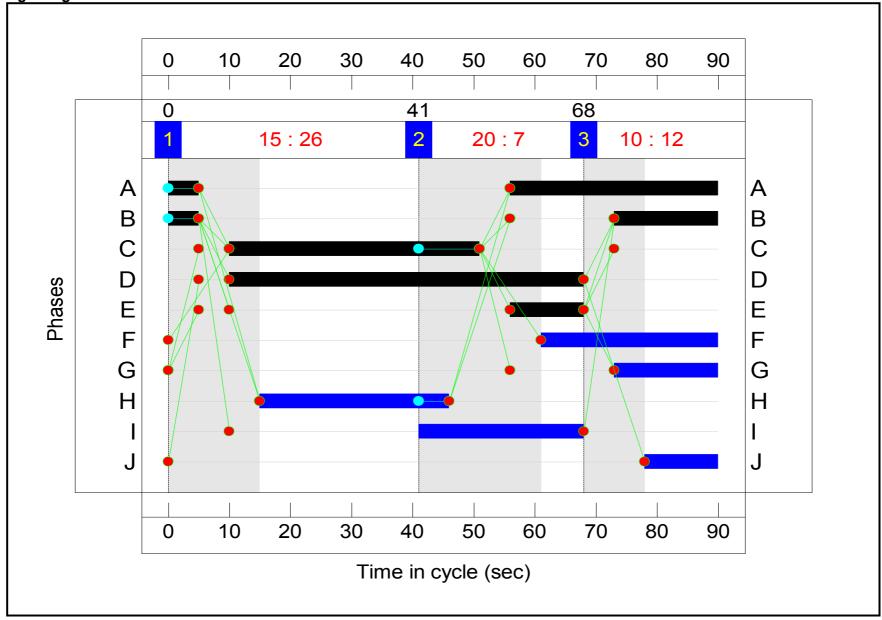


Phase			Gre	een Perio	d 1	Gre	en Perio	d 2
Name	Description	Phase	Total Green	Start Time	End Time	Total Green	Start Time	End Time
Α	Left Right Ahead	Traffic	19	10	29			
В	Ahead	Traffic	12	83	5			
С	Right	Traffic	39	56	5			
D	Right Left Ahead	Traffic	17	34	51			
Е	Ahead Left	Traffic	22	73	5			
F	Right	Traffic	39	56	5			
G	Pedestrians across	Pedestrian	36	10	46			
Н	Pedestrians across	Pedestrian	9	15	24			
- 1	Pedestrians across	Pedestrian	17	39	56	27	63	0
J	Pedestrians across	Pedestrian	17	56	73			
K	Pedestrians across	Pedestrian	31	15	46			
L	Pedestrians across	Pedestrian	7	56	63			





Option 37\_Third Cross Junctions **Signal Timings Diagram** 



Phase	_		Green Period 1			
Name	Description	Phase	Total Green	Start Time	End Time	
Α	Ahead	Traffic	39	56	5	
В	Right	Traffic	22	73	5	
С	Left Right	Traffic	41	10	51	
D	Left	Traffic	58	10	68	
Е	Ahead	Traffic	12	56	68	
F	Pedestrians across	Pedestrian	29	61	0	
G	Pedestrians across	Pedestrian	17	73	0	
Н	Pedestrians across	Pedestrian	31	15	46	
I	Pedestrians across	Pedestrian	27	41	68	
J	Pedestrians across	Pedestrian	12	78	0	

Junction: J1: Westside Junction								
Lane	Description	Туре	Phases	Start Green	End Green			
J1:1/1	Ahead	U	В	83	5			
J1:1/2	Ahead	U	В	83	5			
J1:1/3	Right	0	С	56	5			
J1:3/1	Ahead Left	U	Е	73	5			
J1:3/2	Ahead	U	Е	73	5			
J1:3/3	Right	0	F	56	5			
J1:6/1	Right Left Ahead	U	D	34	51			
J1:7/1	Left	U	Α	10	29			
J1:7/2	Ahead	U	Α	10	29			
J1:7/3	Right	U	Α	10	29			

Junction: J2: Eastside Junction								
Lane	Description	Туре	Phases	Start Green	End Green			
J2:1/1	Left	U	С	10	51			
J2:1/2	Right	U	С	10	51			
J2:3/1	Ahead	U	Α	56	5			
J2:3/2	Right	U	В	73	5			
J2:5/1	Left	U	D	10	68			
J2:5/2	Ahead	U	Е	56	68			

#### APPENDIX F. Forecast Results

# APPENDIX F\_1. Average Case Scenario Traffic Forecast

Figure 1 Average Case Scenario AM 2023

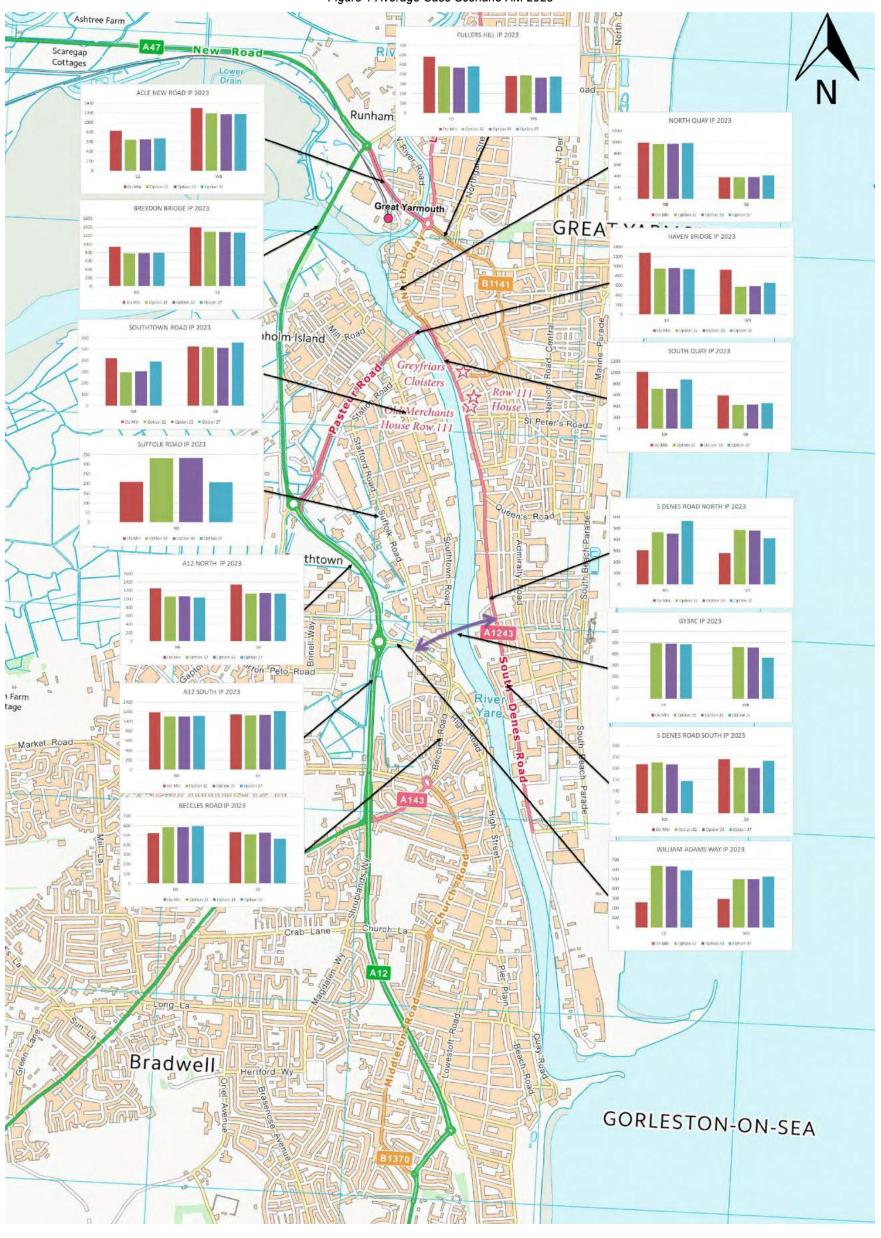


Figure 2 Average Case Scenario IP 2023

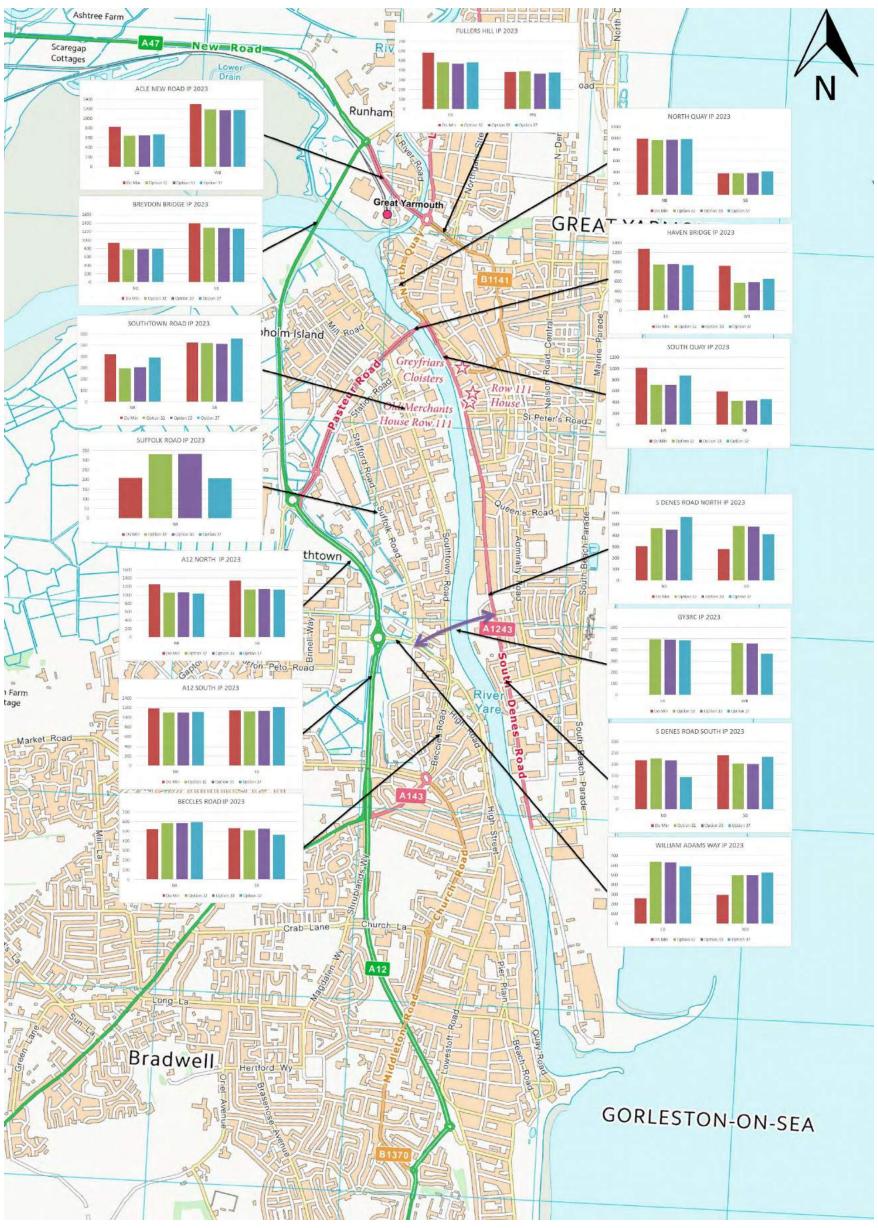


Figure 3 Average Case Scenario PM 2023

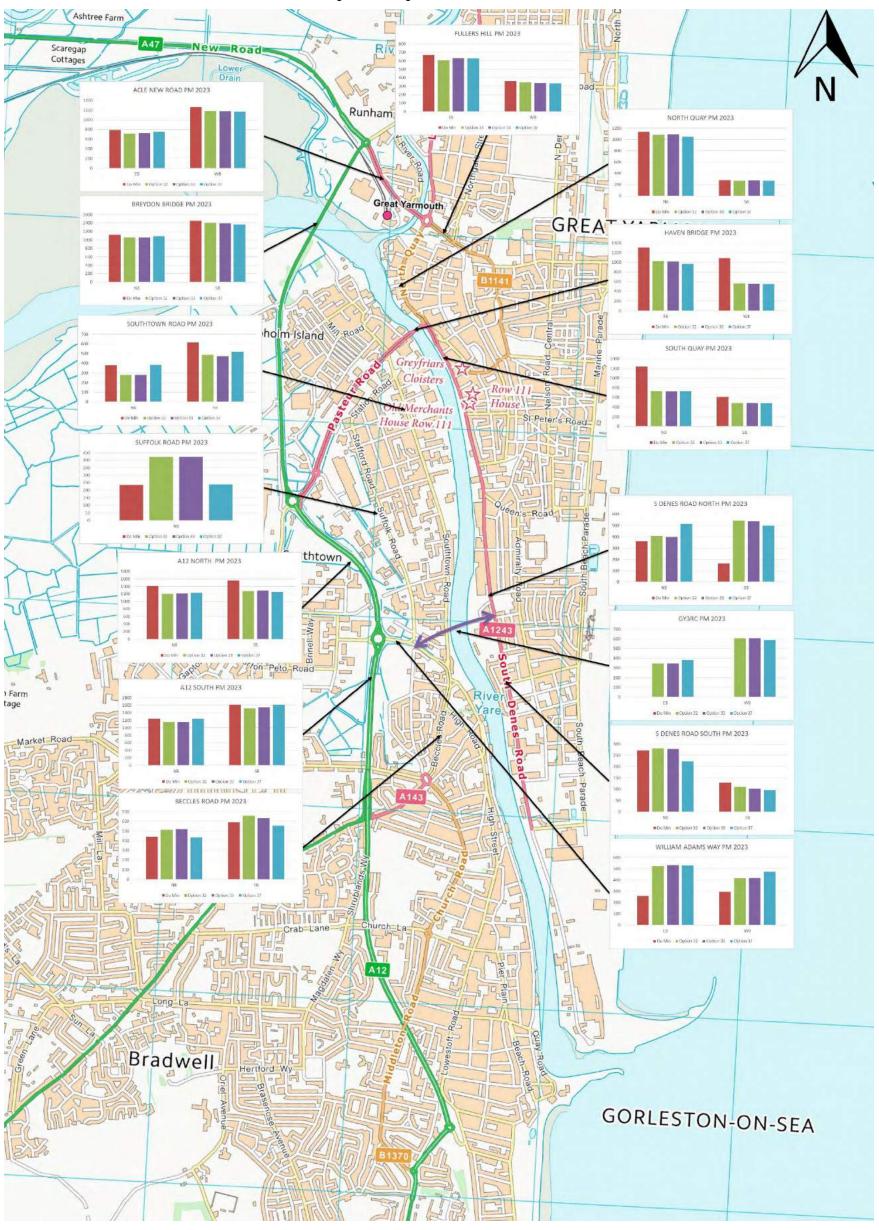


Figure 4 Average Case Scenario AADT 2023

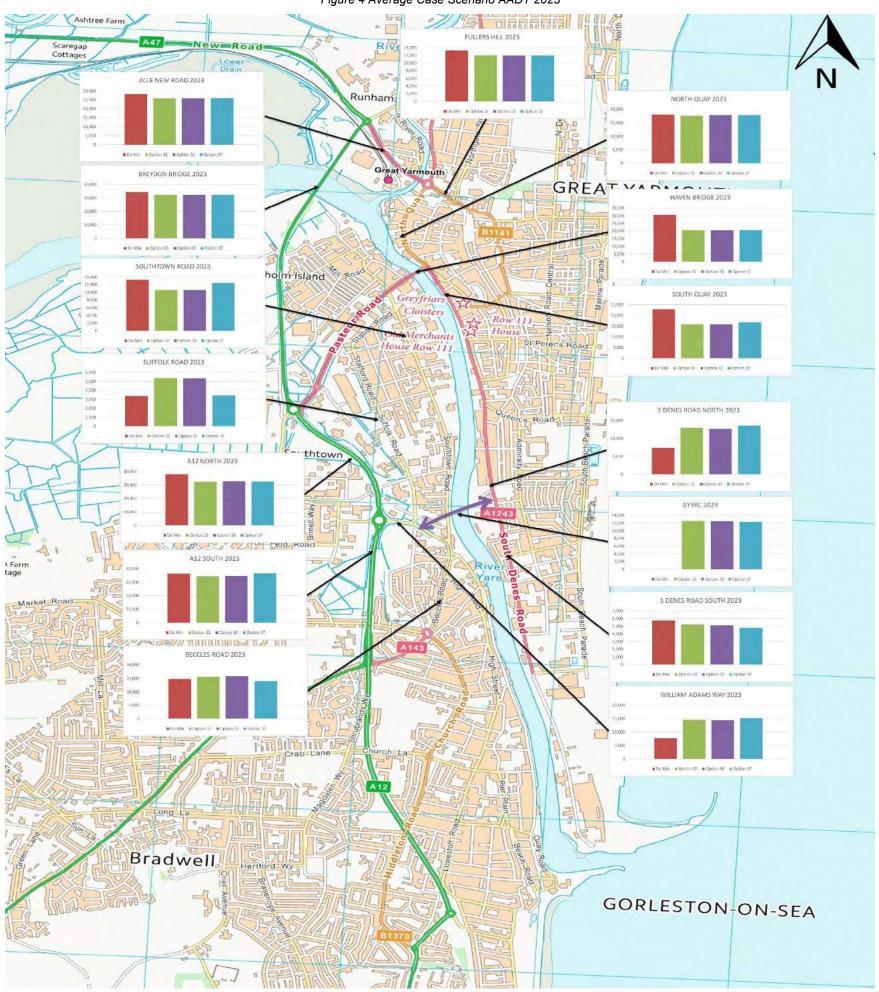


Figure 5 Average Case Scenario AM 2038

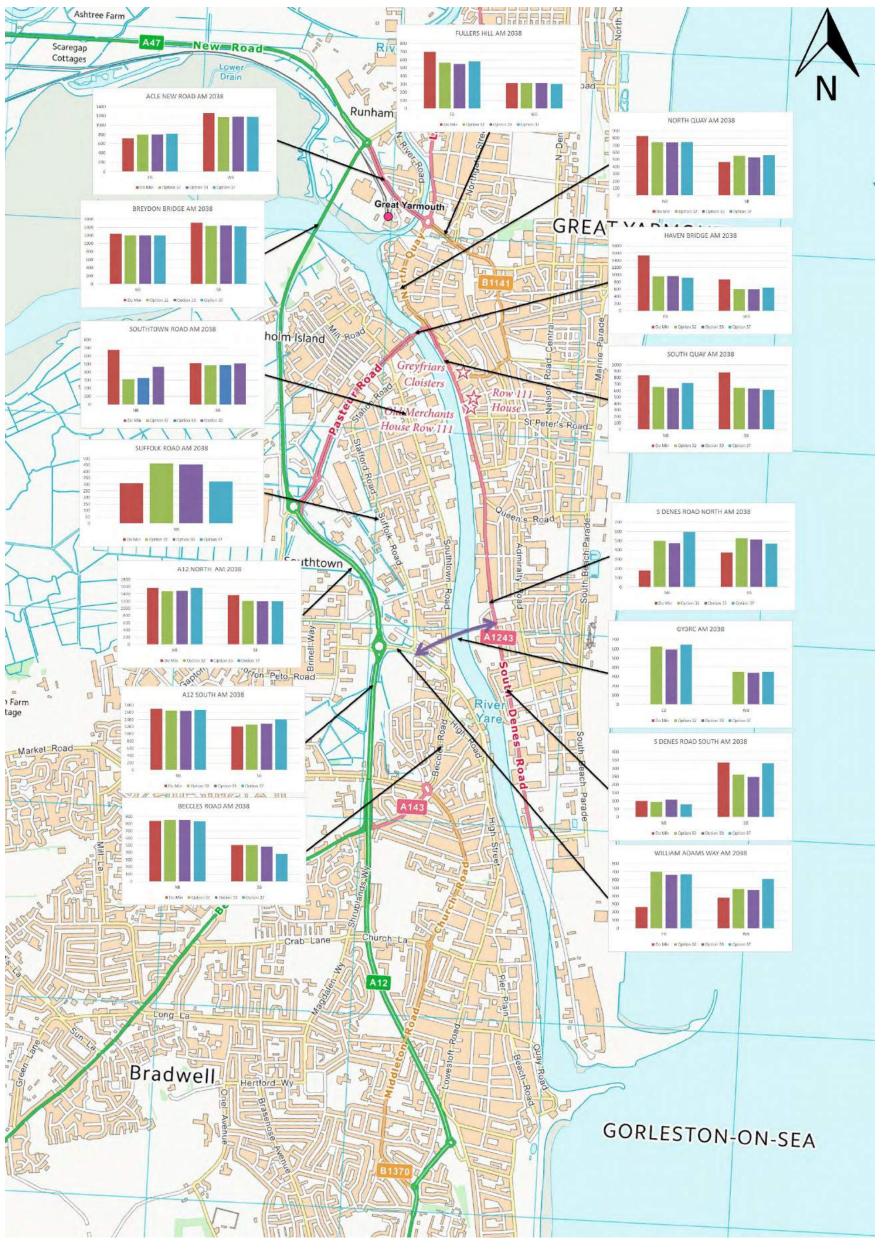


Figure 6 Average Case Scenario IP 2038

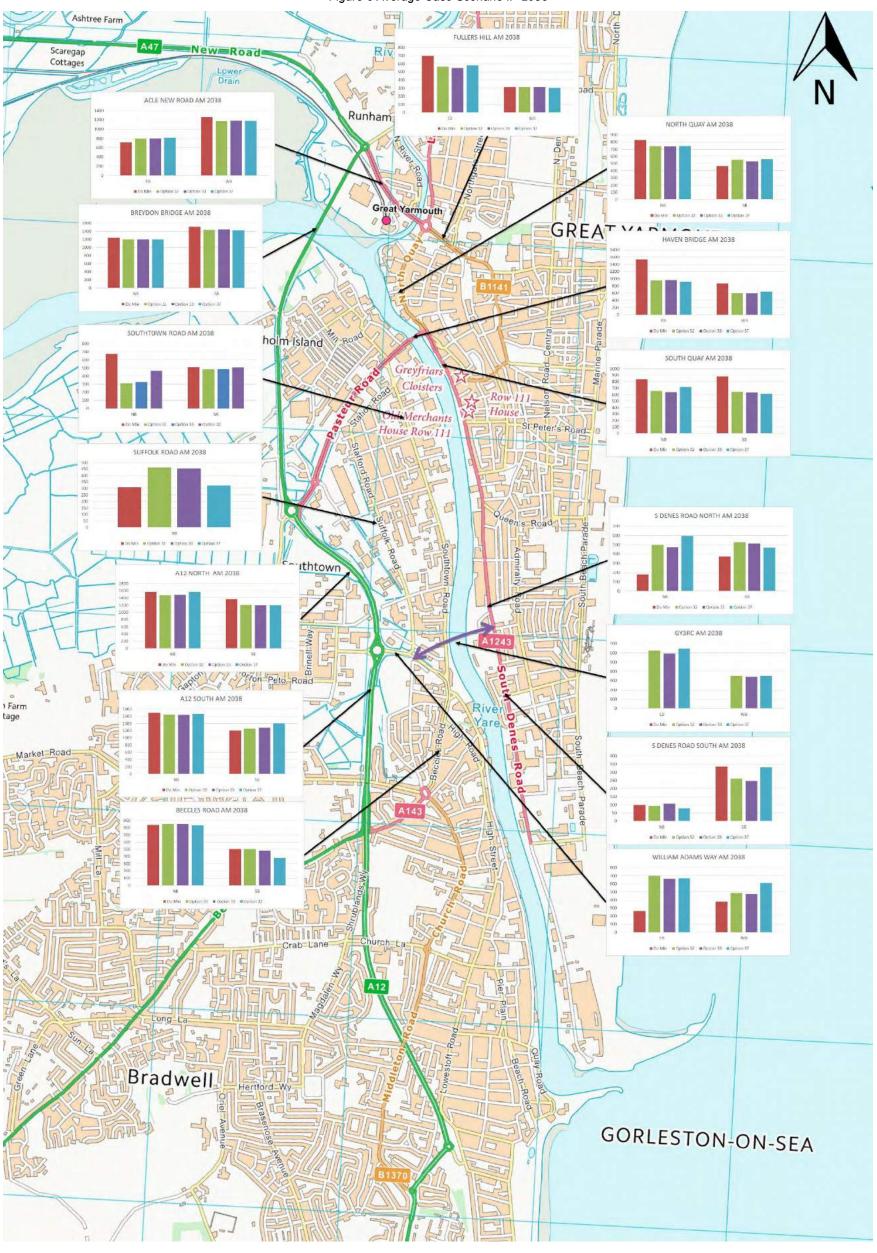


Figure 7 Average Case Scenario PM 2038

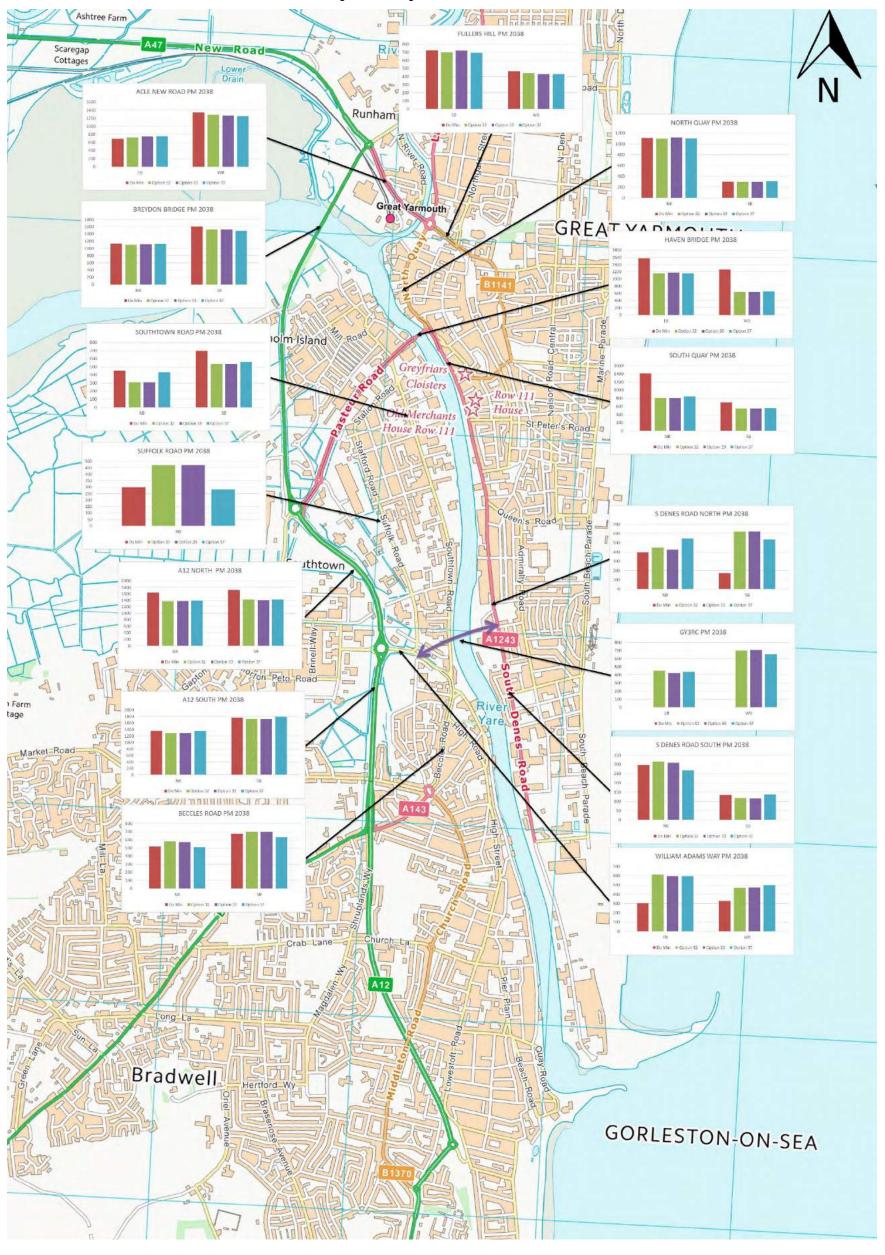
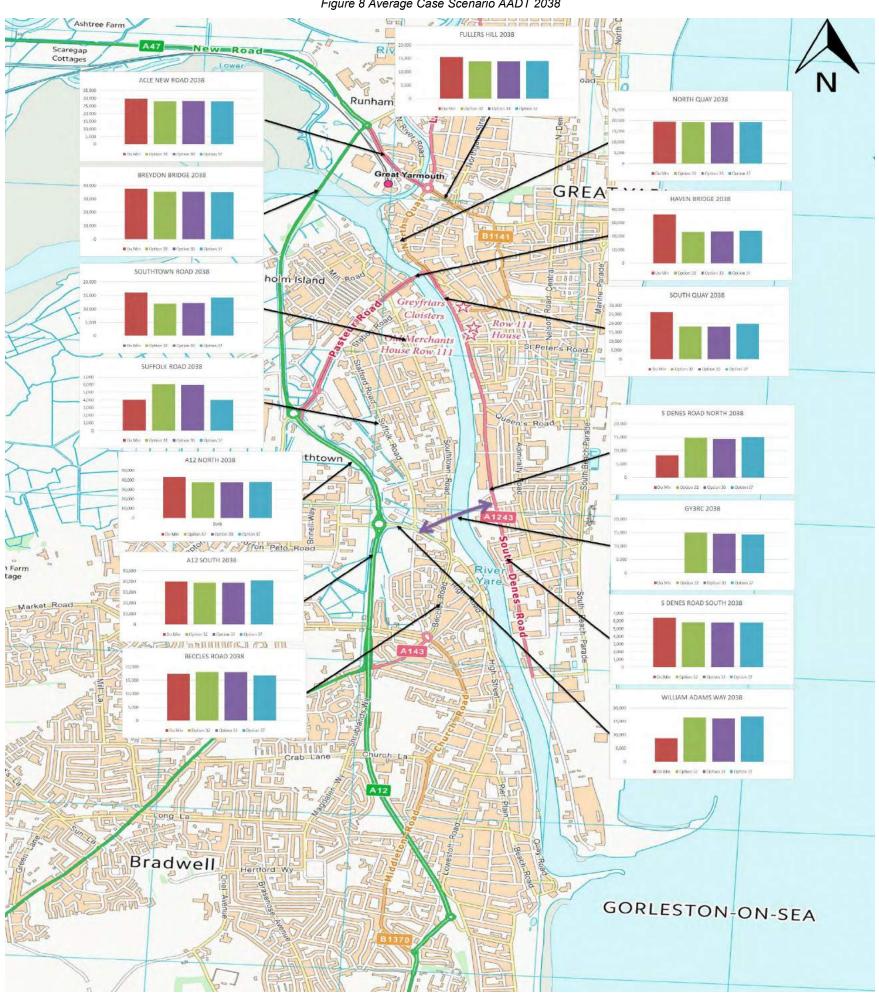


Figure 8 Average Case Scenario AADT 2038



# APPENDIX F\_2. Worst Case Scenario Traffic Forecast

Figure 1 Worst Case Scenario AM 2023

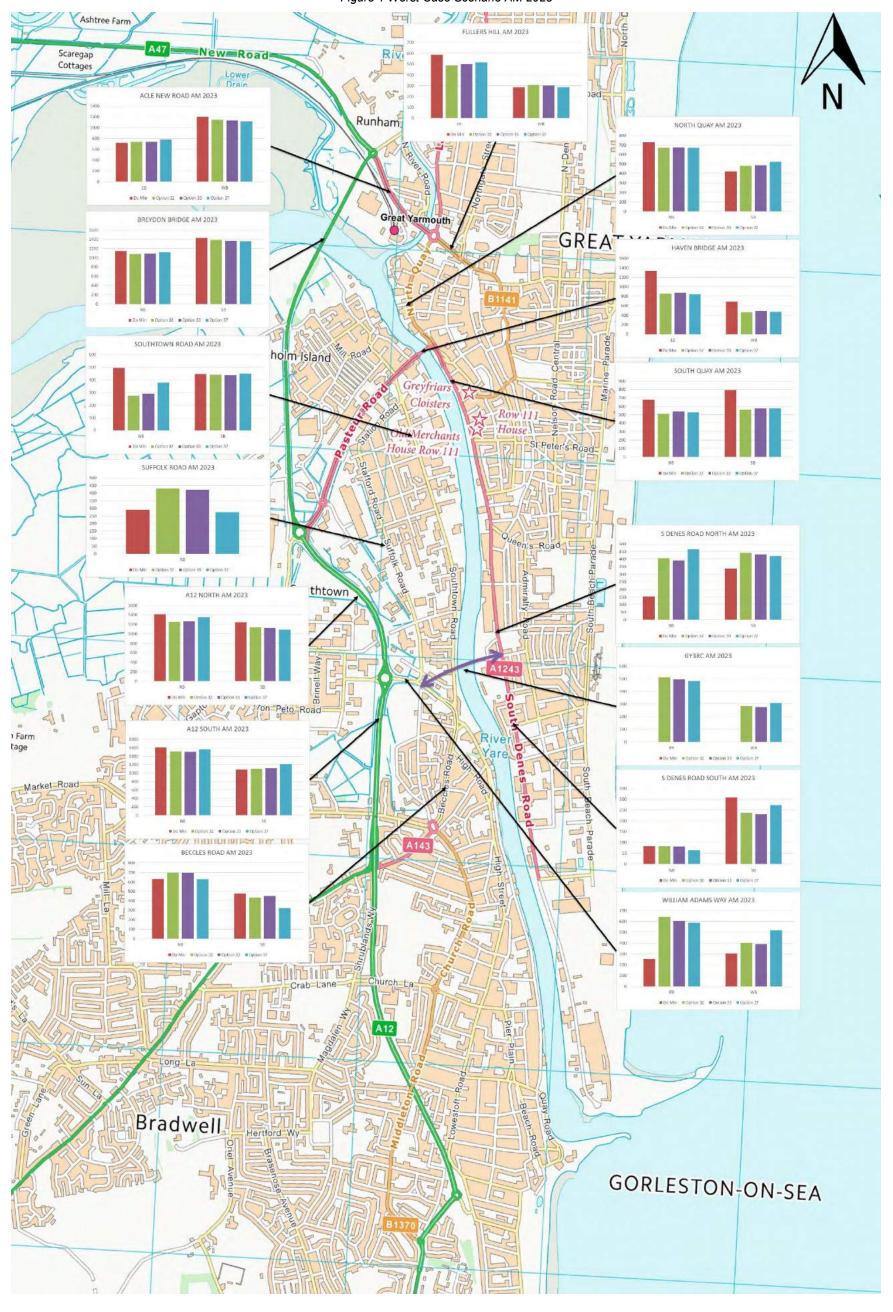


Figure 2 Worst Case Scenario IP 2023

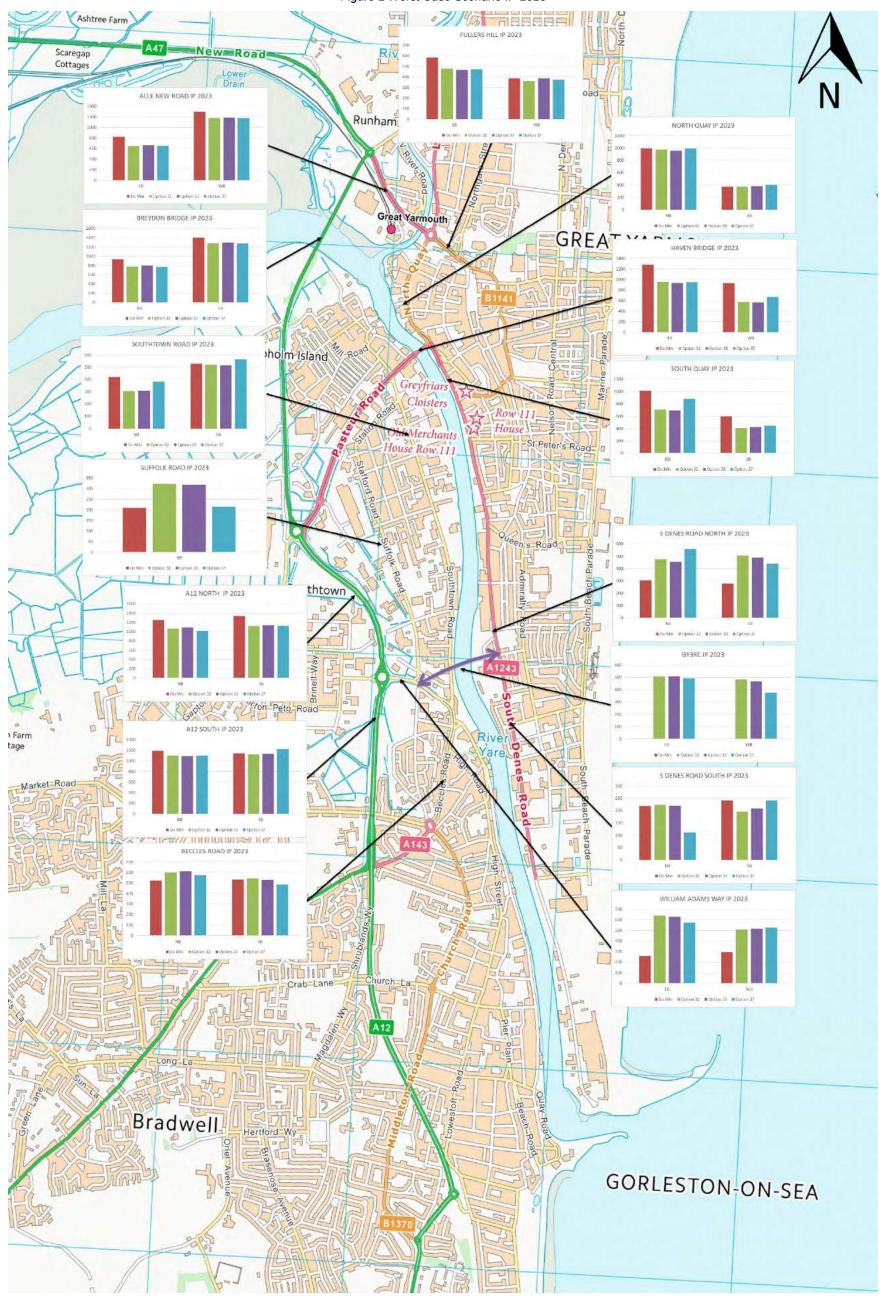


Figure 3 Worst Case Scenario PM 2023

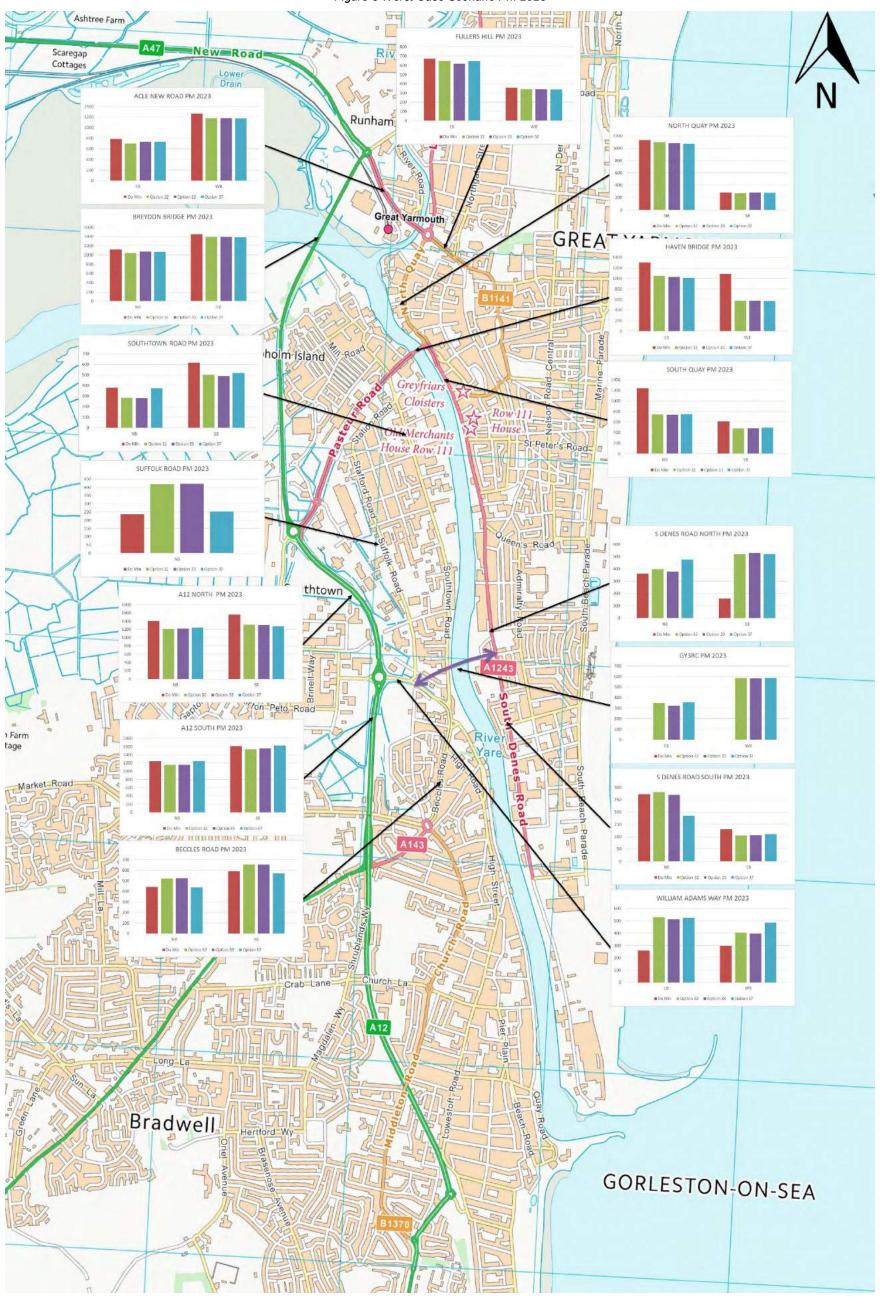


Figure 4 Worst Case Scenario AADT 2023

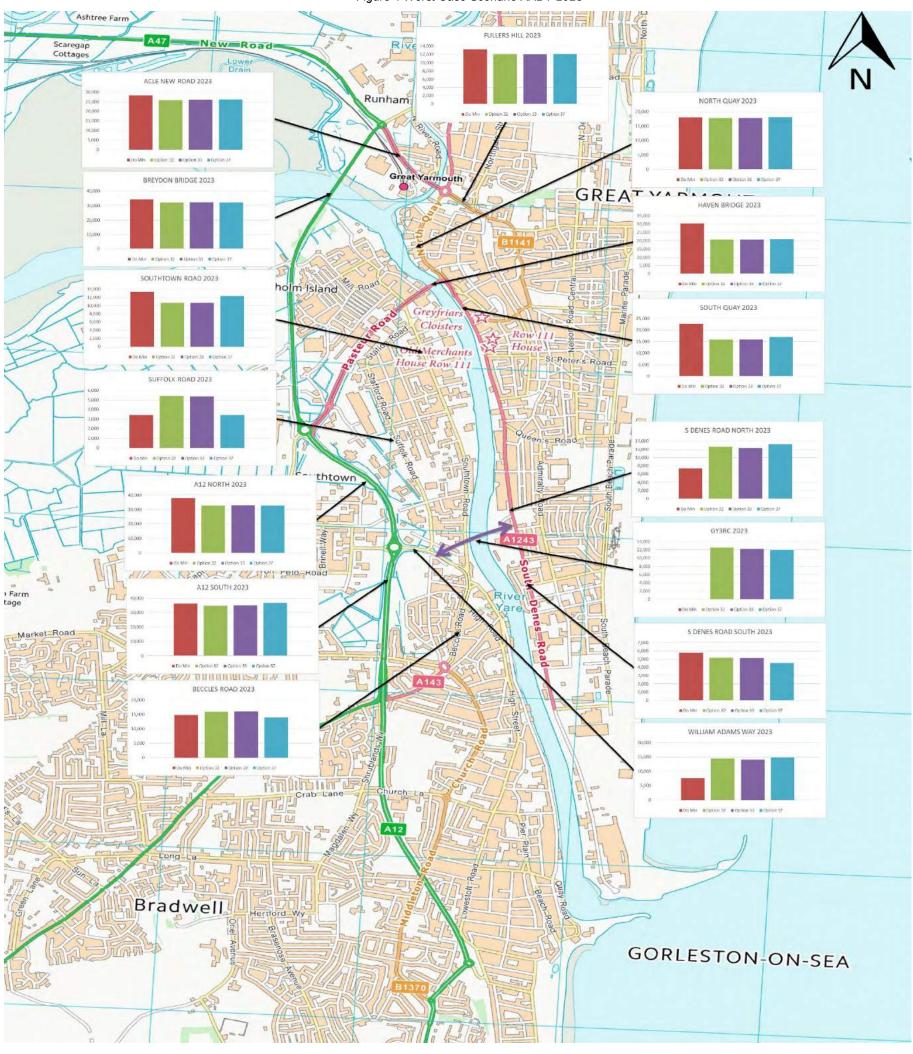


Figure 5 Worst Case Scenario AM 2038

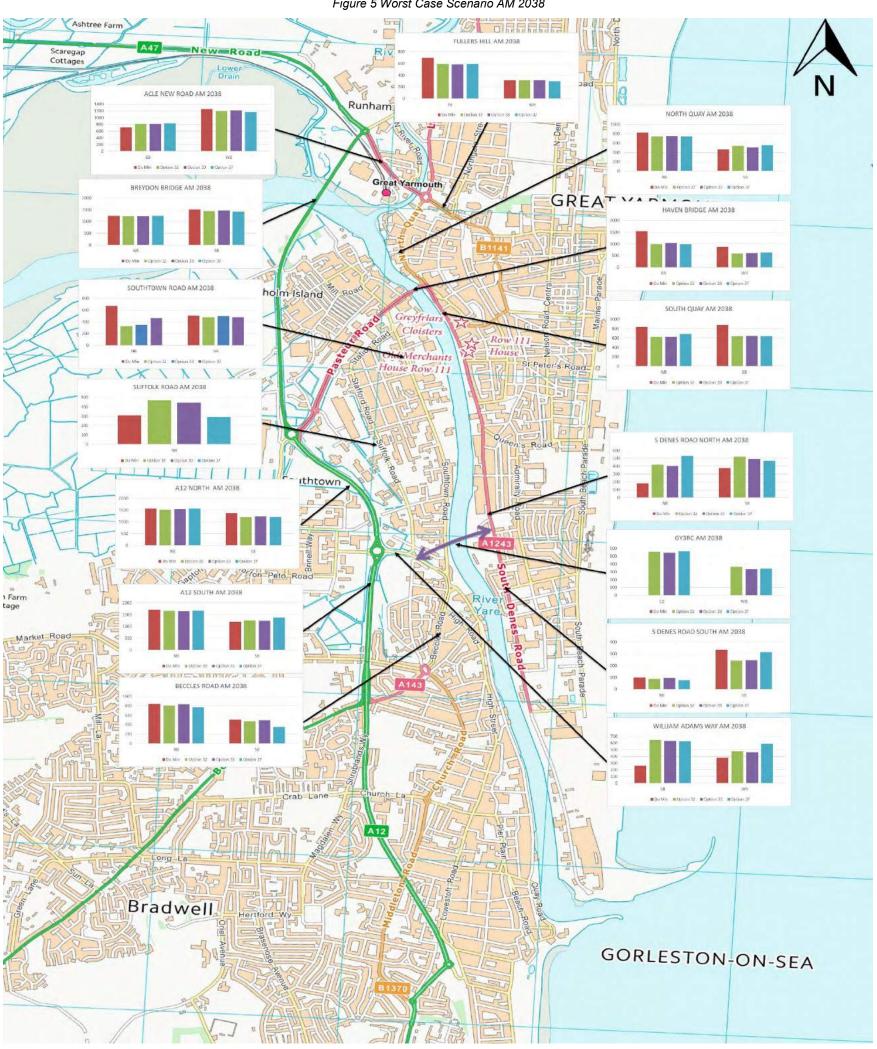


Figure 6 Worst Case Scenario IP 2038

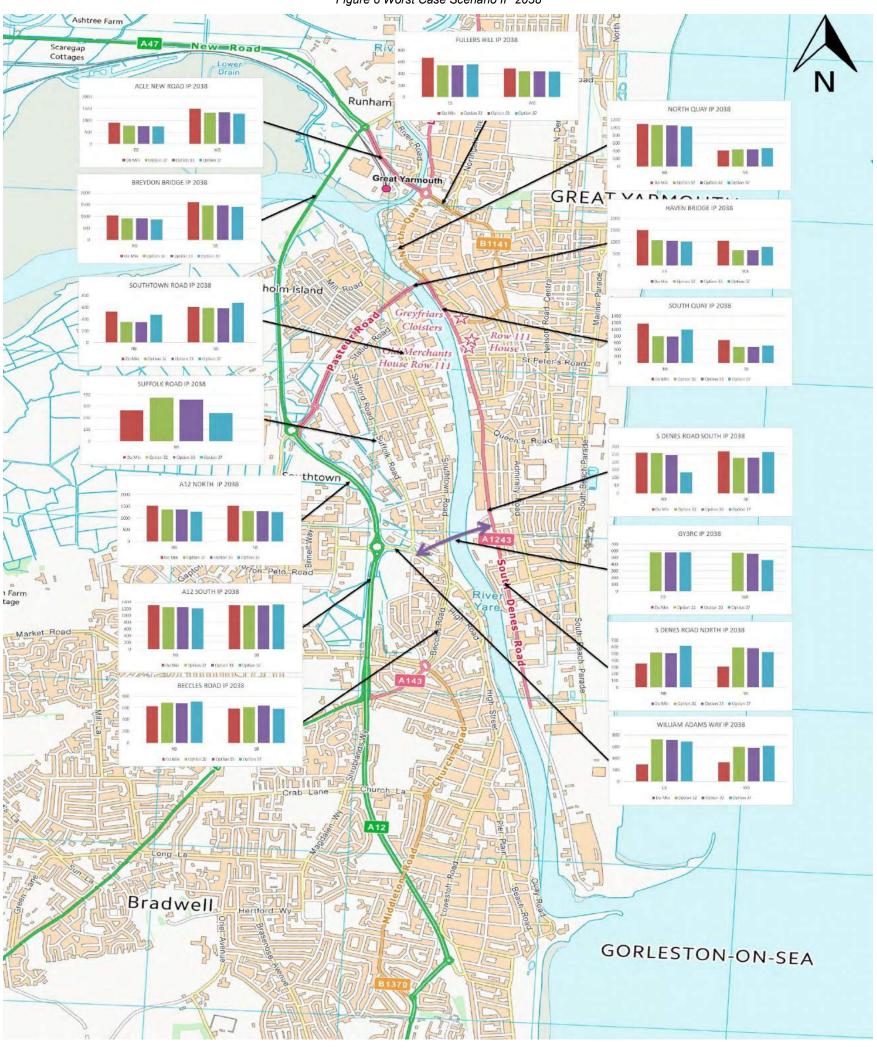


Figure 7 Worst Case Scenario PM 2038

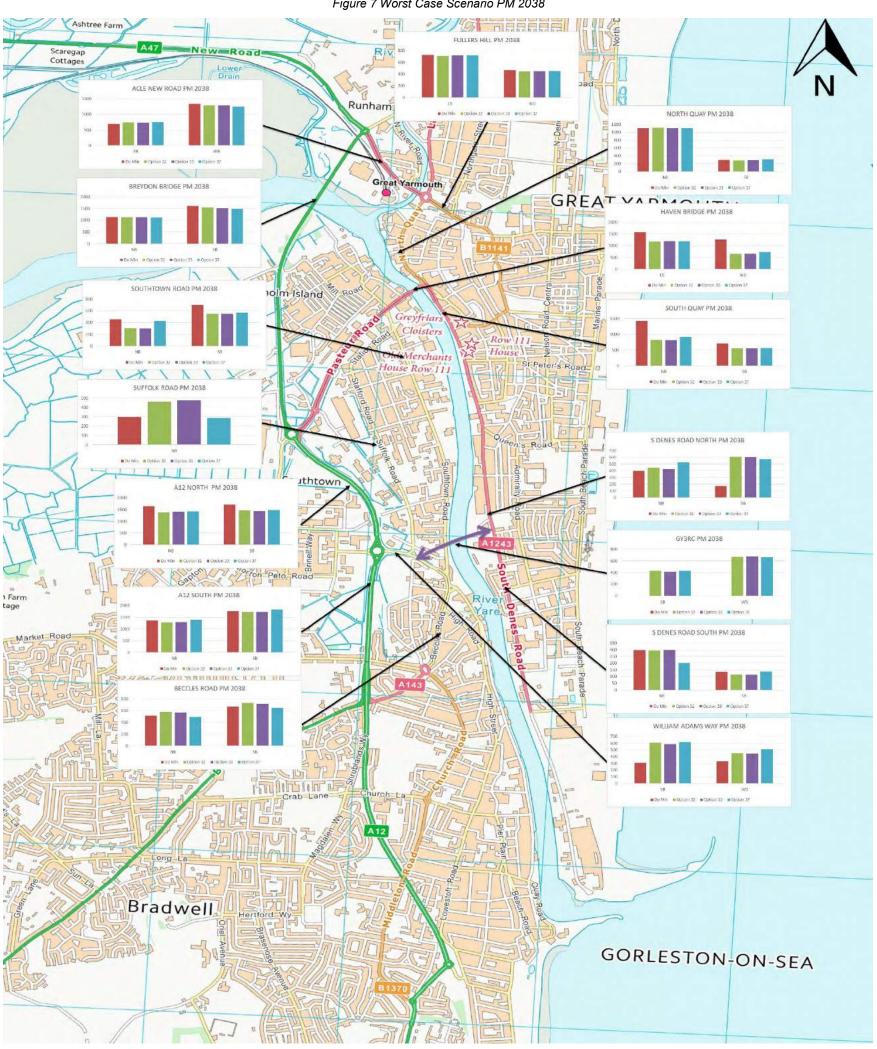
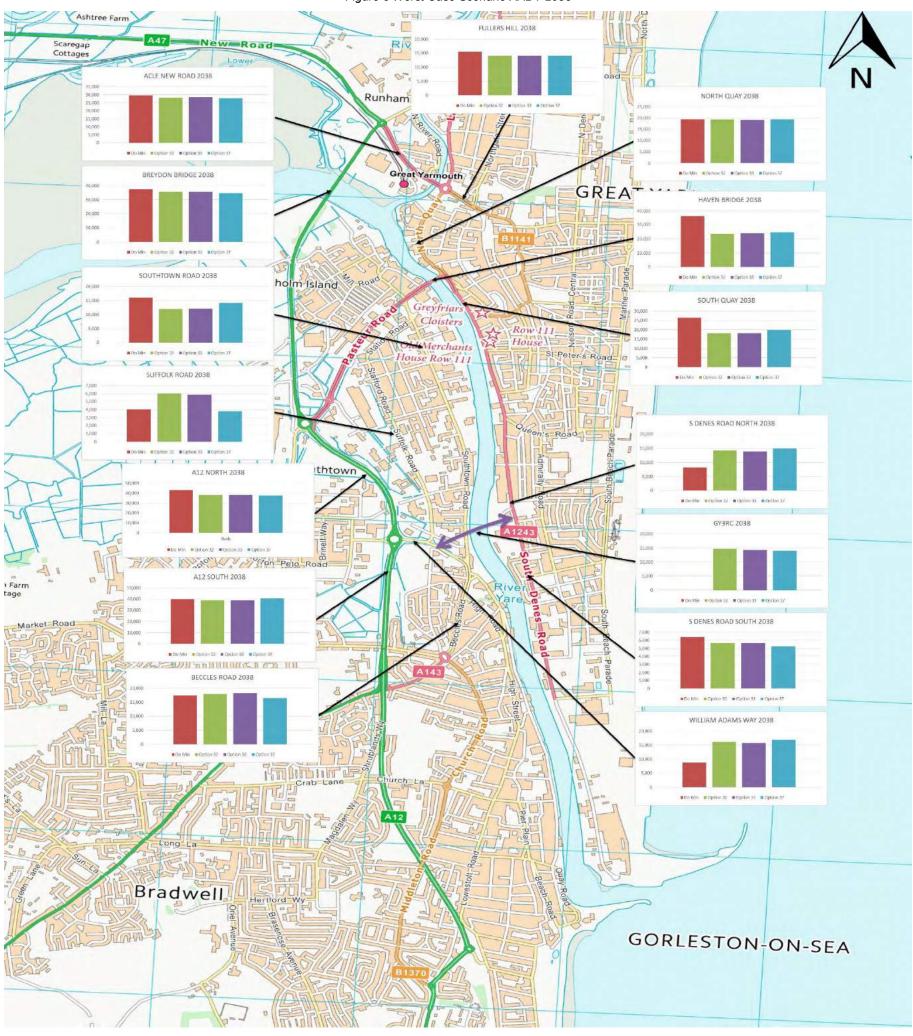


Figure 8 Worst Case Scenario AADT 2038

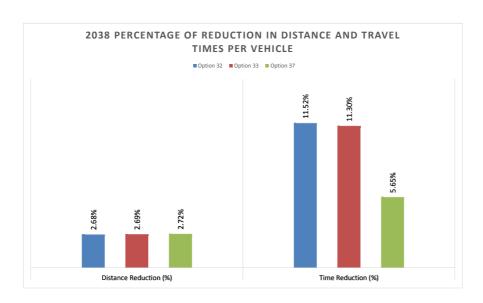


APPENDIX F\_3. Average Case Scenario Time and Distance Benefits.

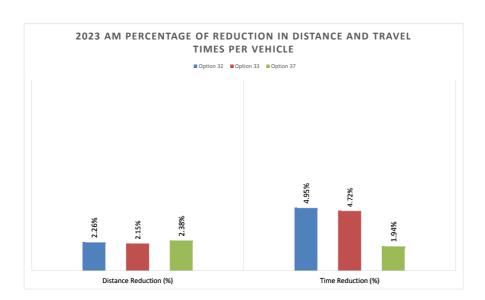
2023	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	109,170	2,603	-	-	281	-	-
Option 32	109,267	2,538	66	2.52%	269	12	4.30%
Option 33	109,281	2,539	64	2.47%	269	12	4.22%
Option 37	109,246	2,533	71	2.72%	277	4	1.48%



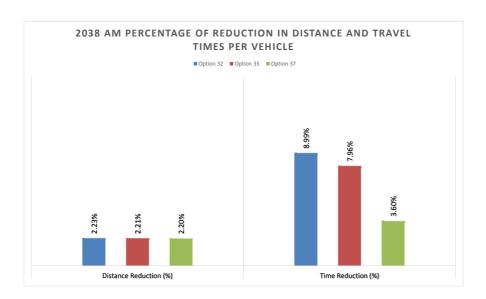
2038	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	121,984	2,622	-	-	329	•	-
Option 32	122,756	2,552	70	2.68%	291	38	11.52%
Option 33	122,738	2,552	71	2.69%	292	37	11.30%
Option 37	122,424	2,551	71	2.72%	311	19	5.65%



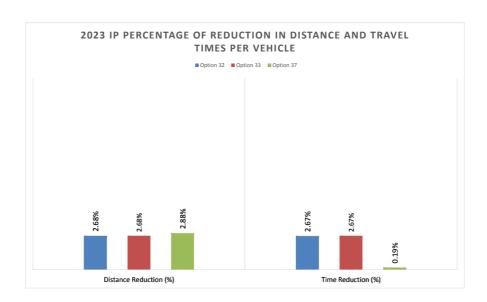
2023 AM	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	33,803	2,604	-	-	275	-	-
Option 32	33,862	2,546	59	2.26%	262	14	4.95%
Option 33	33,863	2,549	56	2.15%	262	13	4.72%
Option 37	33,864	2,542	62	2.38%	270	5	1.94%



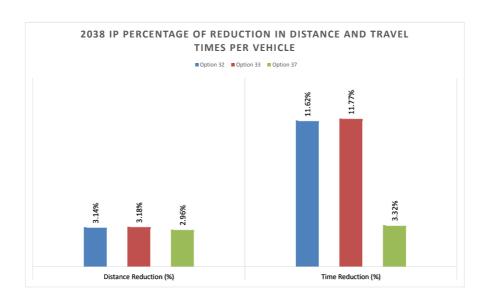
2038 AM	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	37,610	2,612	•	-	304		-
Option 32	37,657	2,554	58	2.23%	279	25	8.99%
Option 33	37,640	2,554	58	2.21%	280	24	7.96%
Option 37	37,649	2,554	57	2.20%	293	11	3.60%



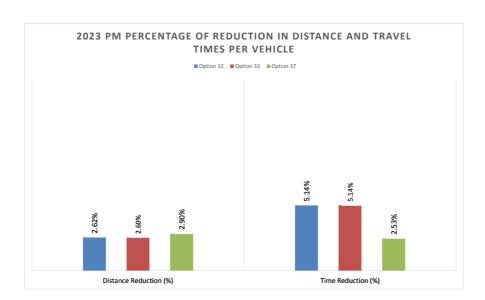
2023 IP	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	38,010	2,502	-	-	266	-	-
Option 32	38,002	2,435	67	2.68%	259	7	2.67%
Option 33	38,018	2,435	67	2.68%	259	7	2.67%
Option 37	37,992	2,430	72	2.88%	266	1	0.19%



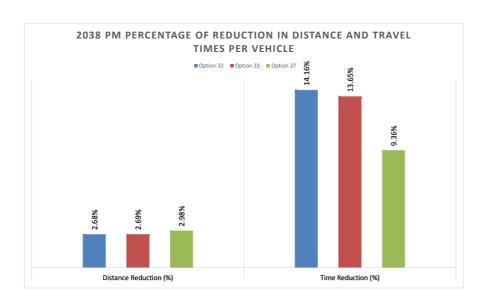
2038 IP	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	43,357	2,532	-	-	317	•	-
Option 32	43,486	2,453	80	3.14%	280	37	11.62%
Option 33	43,460	2,452	81	3.18%	280	37	11.77%
Option 37	43,311	2,457	75	2.96%	307	11	3.32%



PM 2023	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	37,357	2,704	-	-	301	-	-
Option 32	37,404	2,633	71	2.62%	286	15	5.14%
Option 33	37,400	2,634	70	2.60%	286	15	5.14%
Option 37	37,389	2,626	79	2.90%	293	8	2.53%

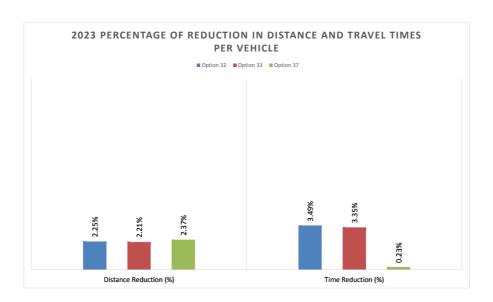


PM 2038	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	41,017	2,722	-	-	366	•	-
Option 32	41,613	2,649	73	2.68%	314	52	14.16%
Option 33	41,639	2,649	73	2.69%	316	50	13.65%
Option 37	41,464	2,641	81	2.98%	332	34	9.36%

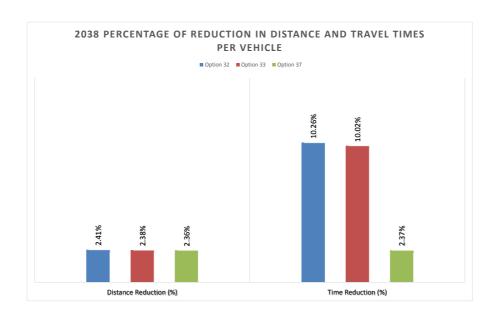


APPENDIX F\_4. Worst Case Scenario Time and Distance Benefits.

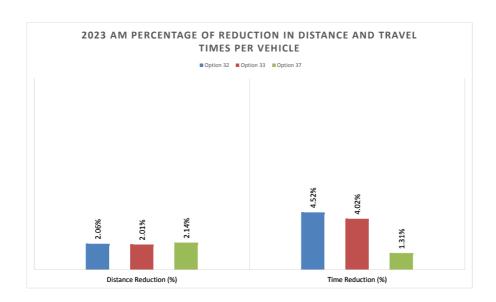
2023	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	109,170	2,603	-	-	281	-	-
Option 32	109,276	2,545	59	2.25%	271	10	3.49%
Option 33	109,294	2,546	58	2.21%	271	9	3.35%
Option 37	109,219	2,542	62	2.37%	280	1	0.23%



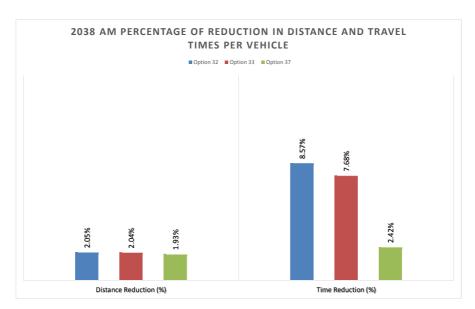
2038	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	121,984	2,622	-	-	329	-	-
Option 32	122,661	2,559	63	2.41%	295	34	10.26%
Option 33	122,591	2,560	62	2.38%	296	33	10.02%
Option 37	122,380	2,560	62	2.36%	321	8	2.37%



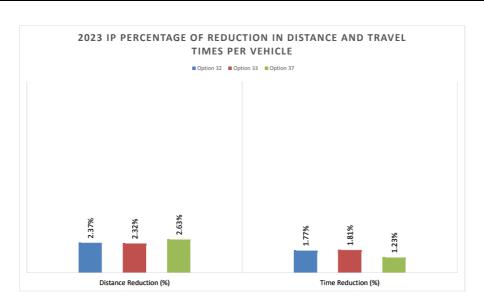
2023 AM	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	33,803	2,604	-	-	275	-	-
Option 32	33,866	2,551	54	2.06%	263	12	4.52%
Option 33	33,870	2,552	52	2.01%	264	11	4.02%
Option 37	33,854	2,549	56	2.14%	272	4	1.31%



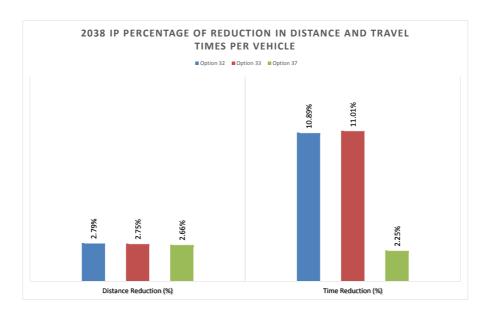
2038 AM	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	37,610	2,612	-	-	304		-
Option 32	37,657	2,558	54	2.05%	280	24	8.57%
Option 33	37,629	2,558	53	2.04%	281	23	7.68%
Option 37	37,626	2,561	50	1.93%	297	7	2.42%



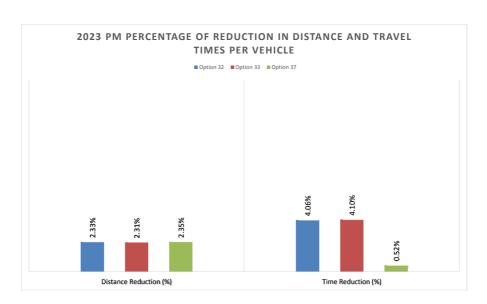
2023 IP	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	38,010	2,502	-	-	266	-	-
Option 32	38,029	2,442	59	2.37%	261	5	1.77%
Option 33	38,029	2,444	58	2.32%	261	5	1.81%
Option 37	37,969	2,436	66	2.63%	269	3	1.23%



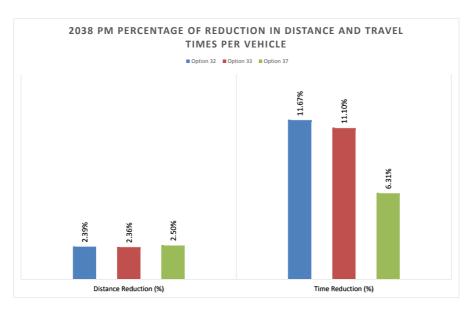
2038 IP	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	43,357	2,532		-	317		-
Option 32	43,457	2,461	71	2.79%	283	35	10.89%
Option 33	43,468	2,463	70	2.75%	282	35	11.01%
Option 37	43,220	2,465	67	2.66%	324	7	2.25%



PM 2023	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	37,357	2,704	-	-	301	-	-
Option 32	37,380	2,641	63	2.33%	289	12	4.06%
Option 33	37,396	2,642	62	2.31%	289	12	4.10%
Option 37	37,396	2,641	64	2.35%	299	2	0.52%



PM 2038	Vehicles	Metres/Vehicle	Reduction (m)	Distance Reduction (%)	Seconds/Vehicle	Reduction (s)	Time Reduction (%)
Do Min	41,017	2,722	-	-	366	•	-
Option 32	41,547	2,657	65	2.39%	324	43	11.67%
Option 33	41,493	2,658	64	2.36%	326	41	11.10%
Option 37	41,534	2,654	68	2.50%	343	23	6.31%

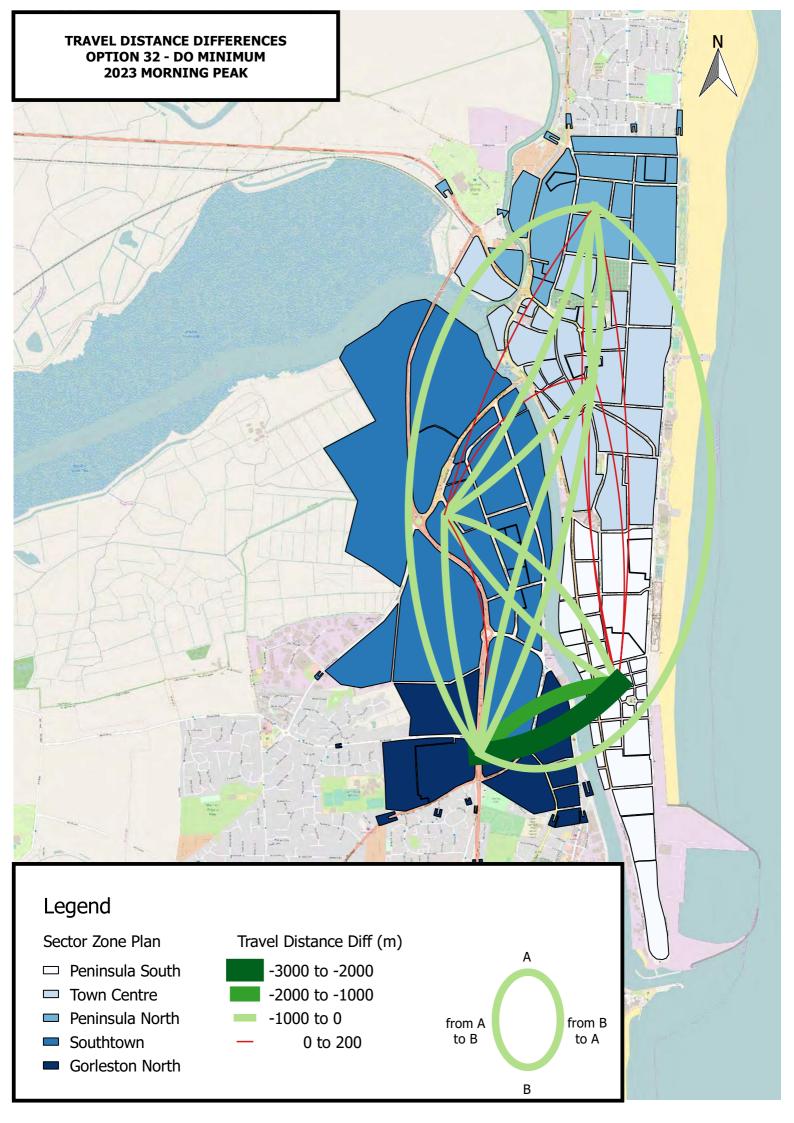


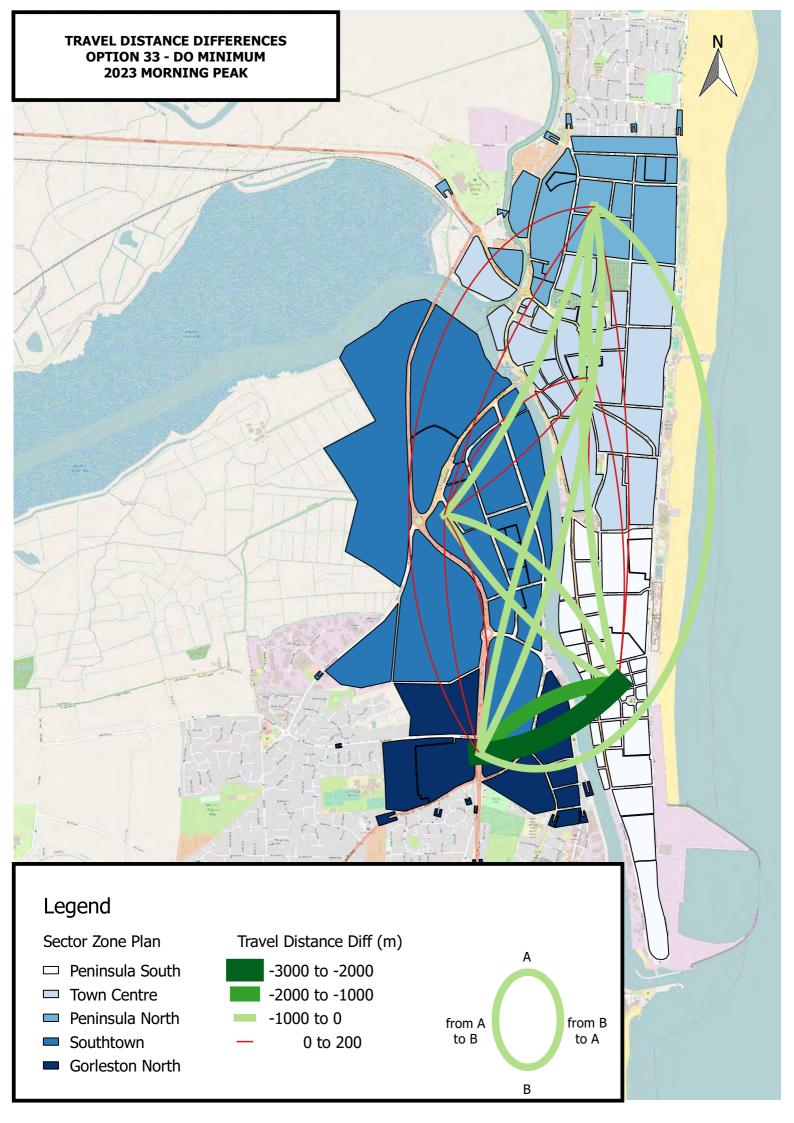
## APPENDIX F\_5. Sectoral Analysis

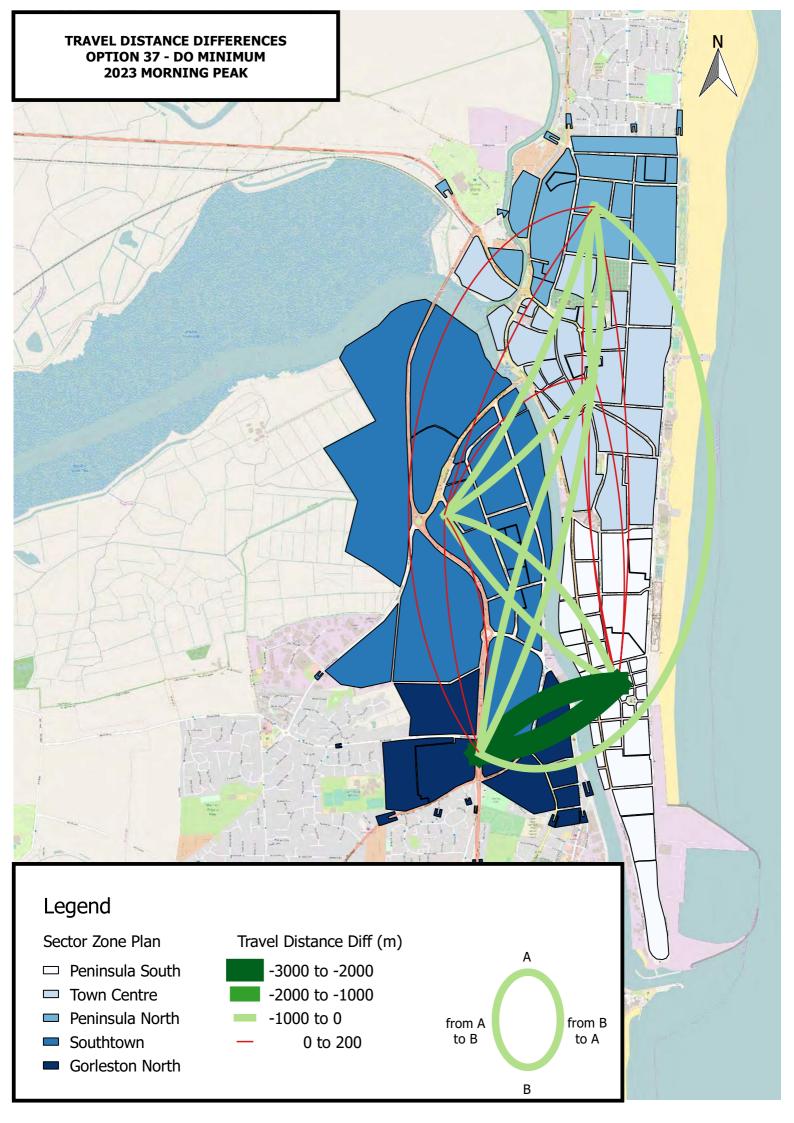
Sectoral Analysis. Average Case Scenario Peak Hour	1
2023 Option 32 Distance	1
2023 Option 33 Distance	2
2023 Option 37 Distance	3
2038 Option 32 Distance	4
2038 Option 33 Distance	5
2038 Option 37 Distance	6
2023 Option 32 Time	7
2023 Option 33 Time	8
2023 Option 37 Time	9
2038 Option 32 Time	10
2038 Option 33 Time	11
2038 Option 37 Time	12
Sectoral Analysis. Average Case Scenario Peak Period	13
2023 Option 32 Distance	13
2023 Option 33 Distance	14
2023 Option 37 Distance	15
2038 Option 32 Distance	16
2038 Option 33 Distance	17
2038 Option 37 Distance	18
2023 Ontion 32 Time	10

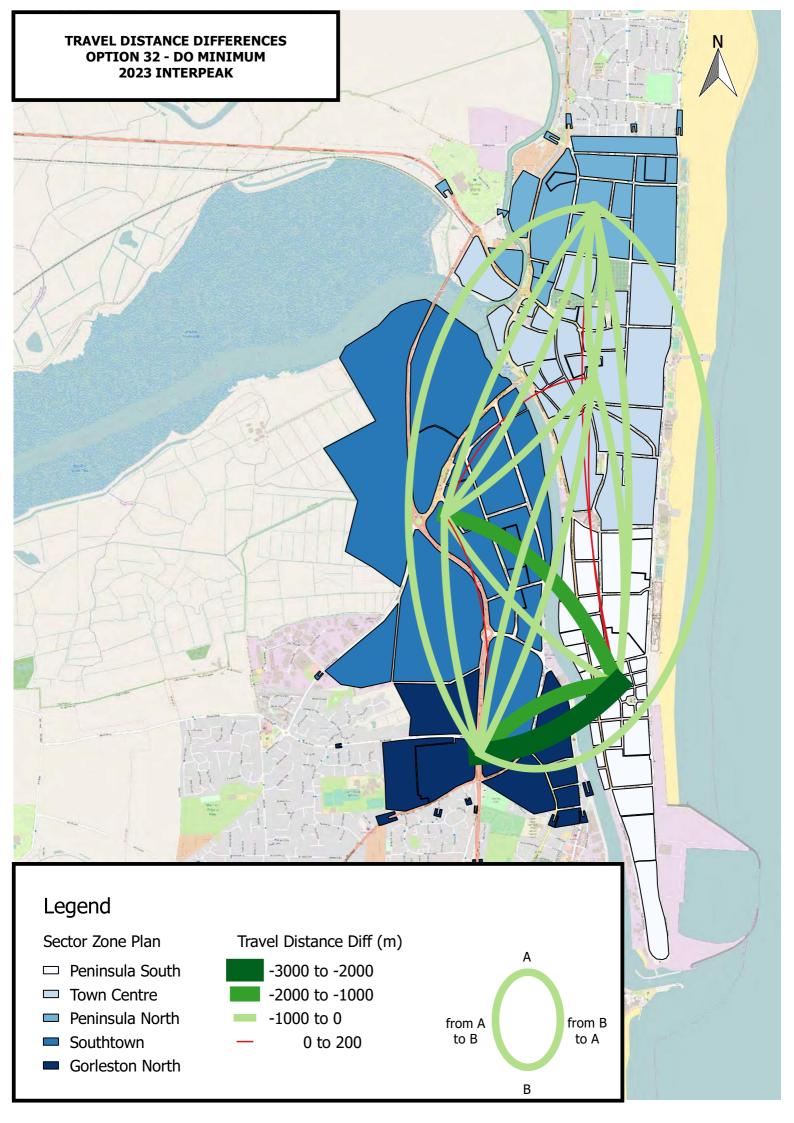
2023 Option 33 Time	20
2023 Option 37 Time	21
2038 Option 32 Time	22
2038 Option 33 Time	23
2038 Option 37 Time	24
Sectoral Analysis. Worst Case Scenario Peak Hour	25
2023 Option 32 Distance	25
2023 Option 33 Distance	26
2023 Option 37 Distance	27
2038 Option 32 Distance	28
2038 Option 33 Distance	29
2038 Option 37 Distance	30
2023 Option 32 Time	31
2023 Option 33 Time	32
2023 Option 37 Time	33
2038 Option 32 Time	34
2038 Option 33 Time	35
2038 Option 37 Time	36
Sectoral Analysis. Worst Case Scenario Peak Period	37
2023 Option 32 Distance	37
2023 Option 33 Distance	38
2023 Option 37 Distance	39

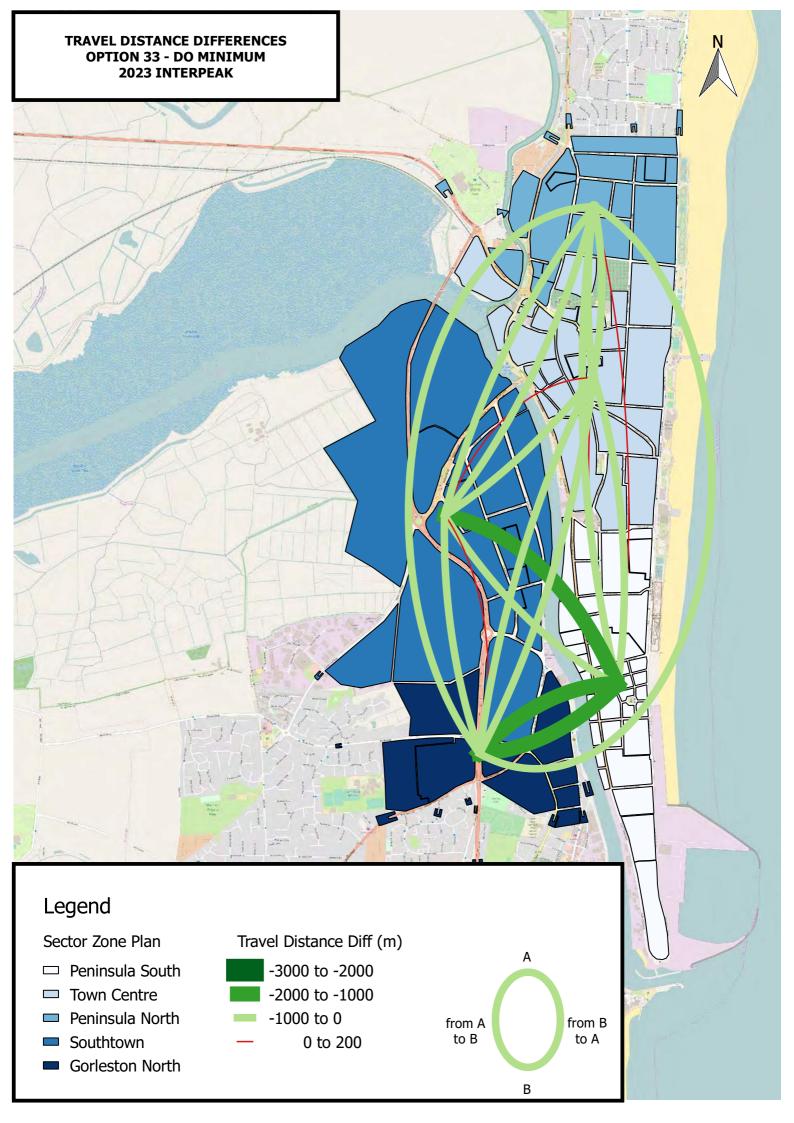
2038 Option 32 Distance	39
2038 Option 33 Distance	40
2038 Option 37 Distance	41
2023 Option 32 Time	42
2023 Option 33 Time	43
2023 Option 37 Time	44
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2038 Option 33 Time	46
2038 Option 37 Time	47

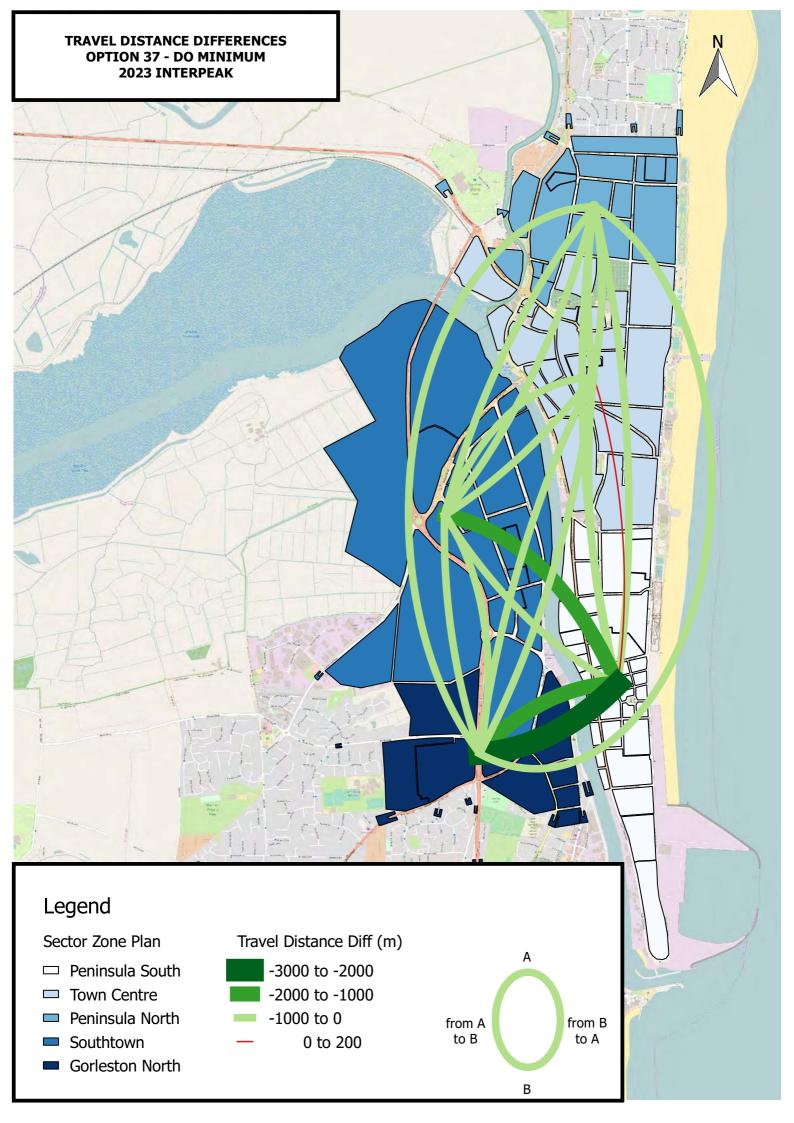


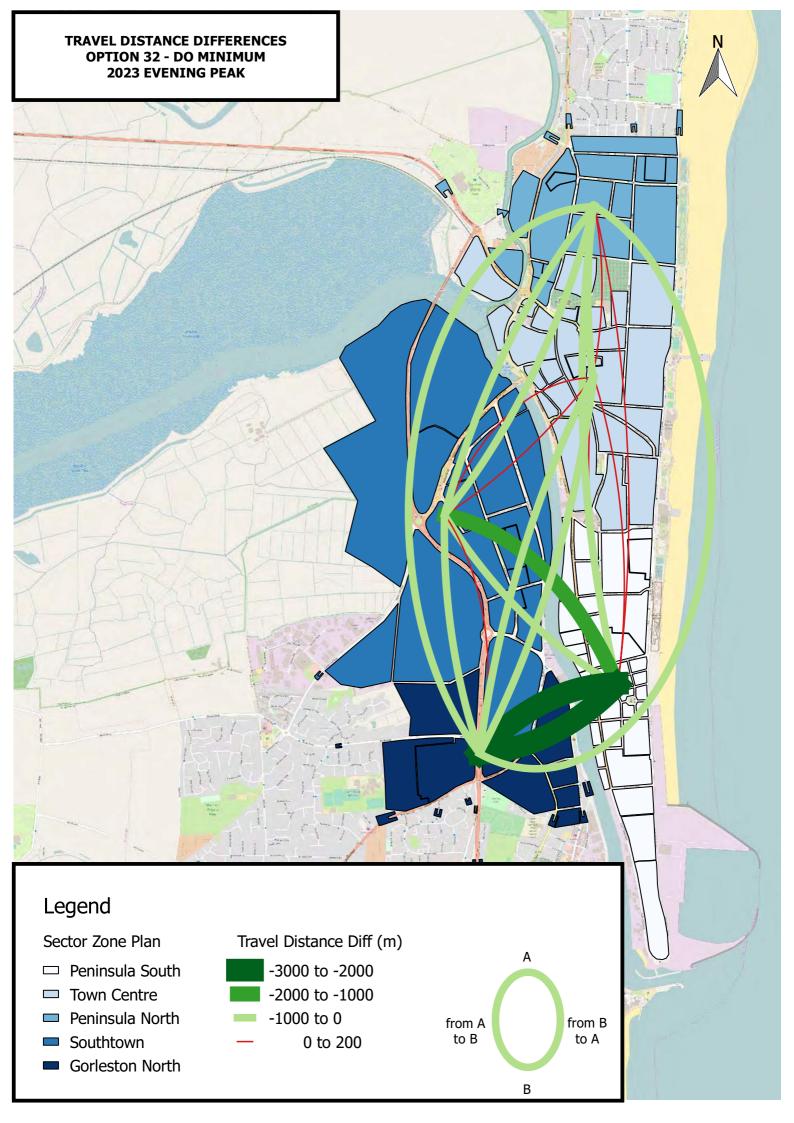


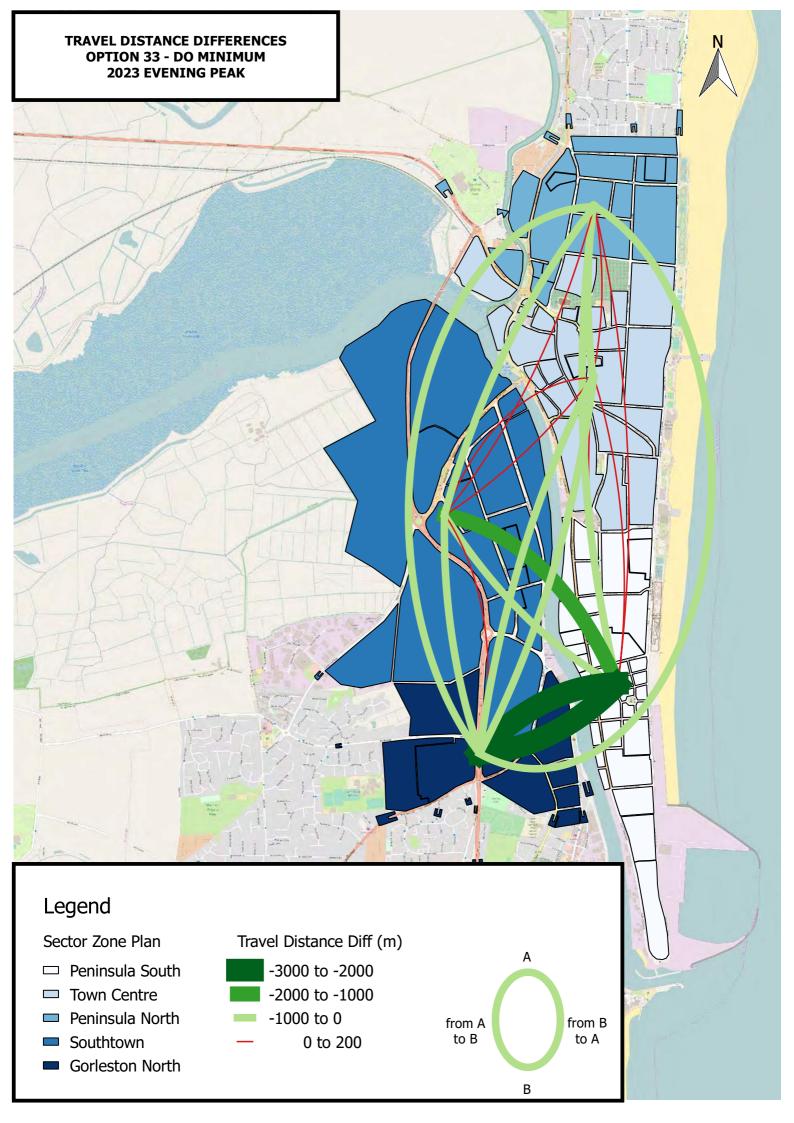


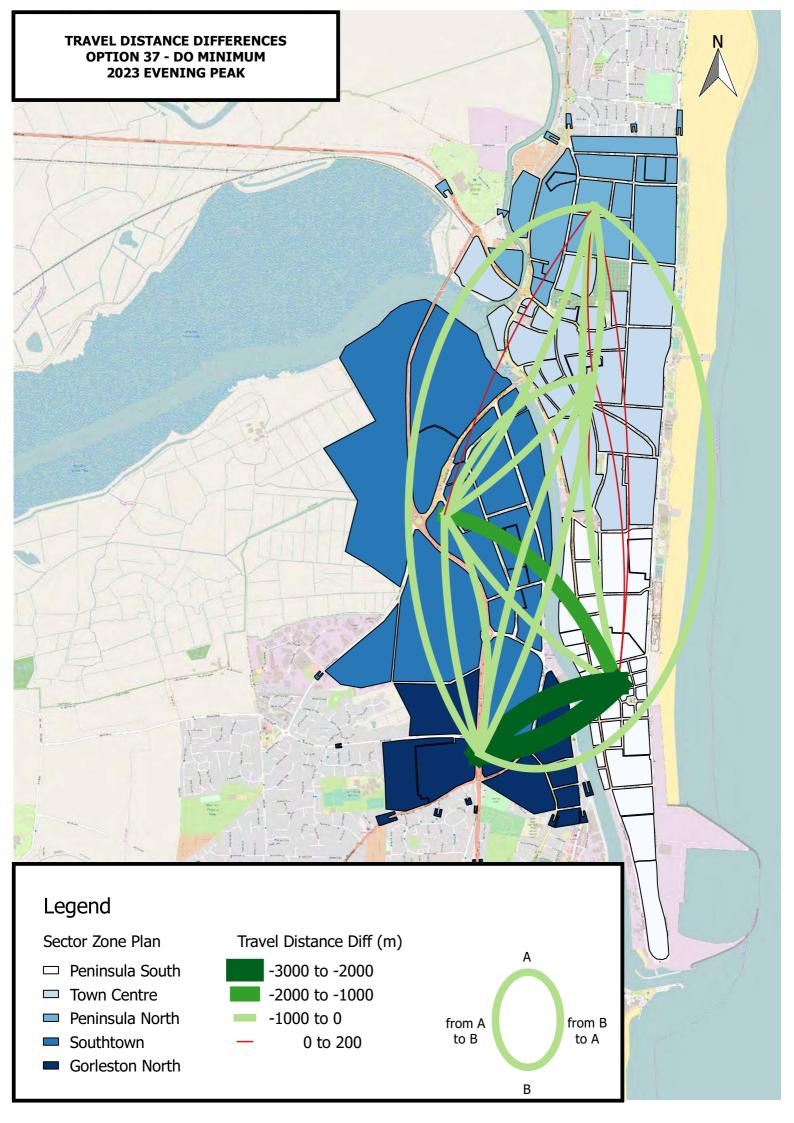


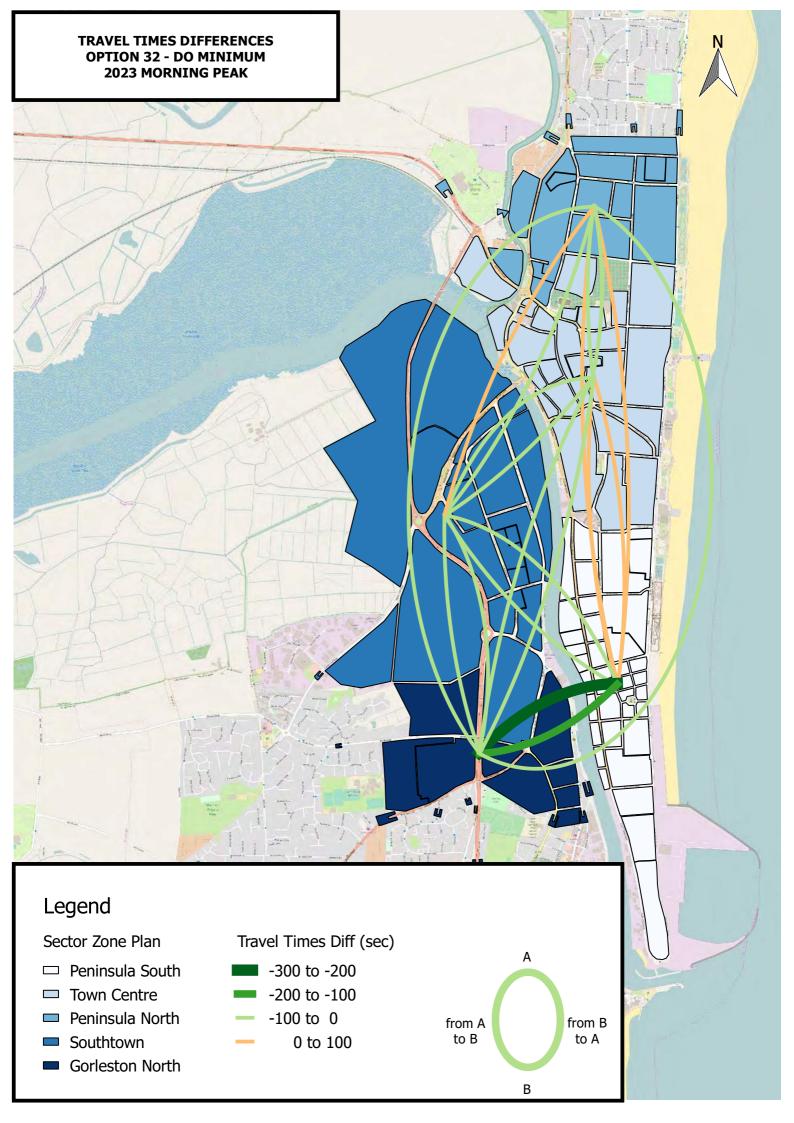


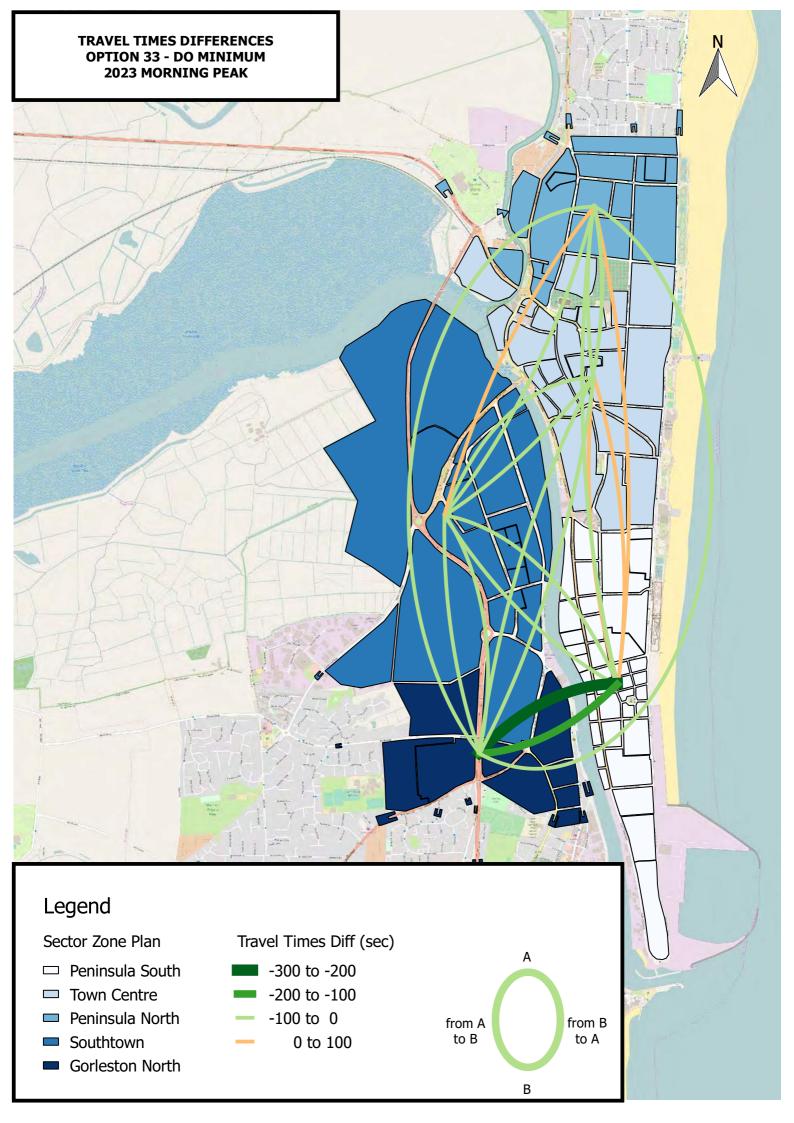


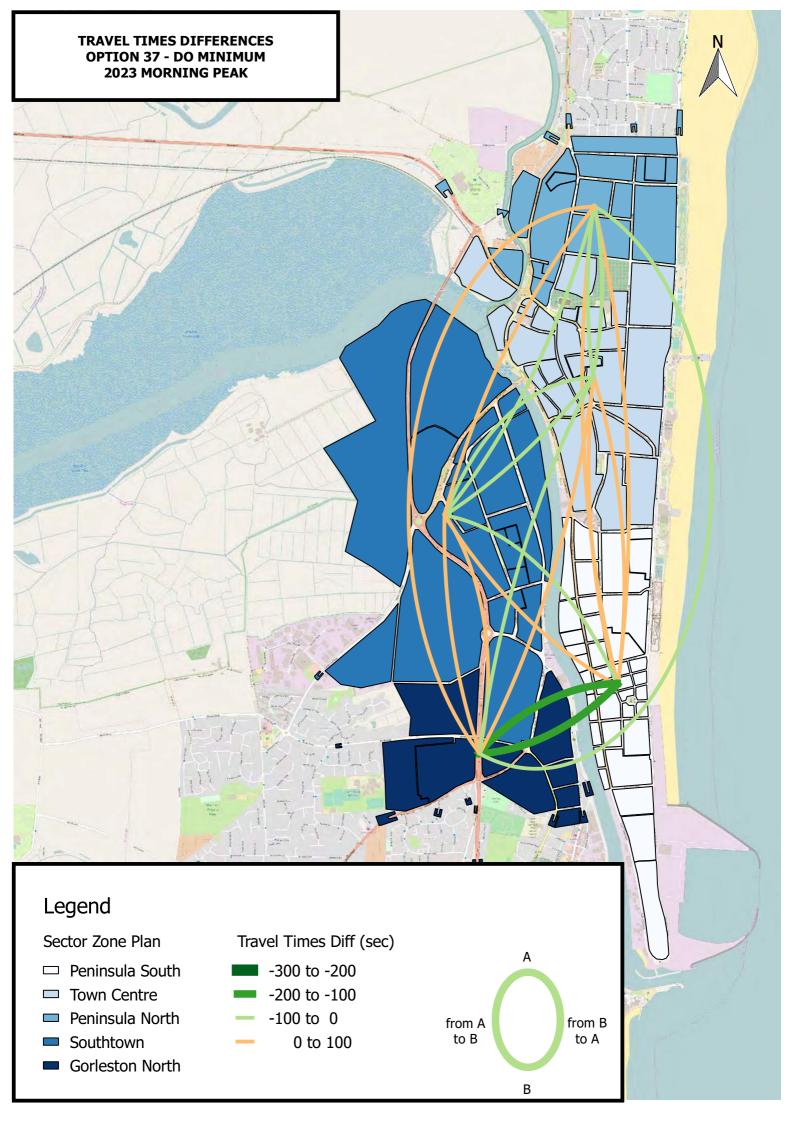


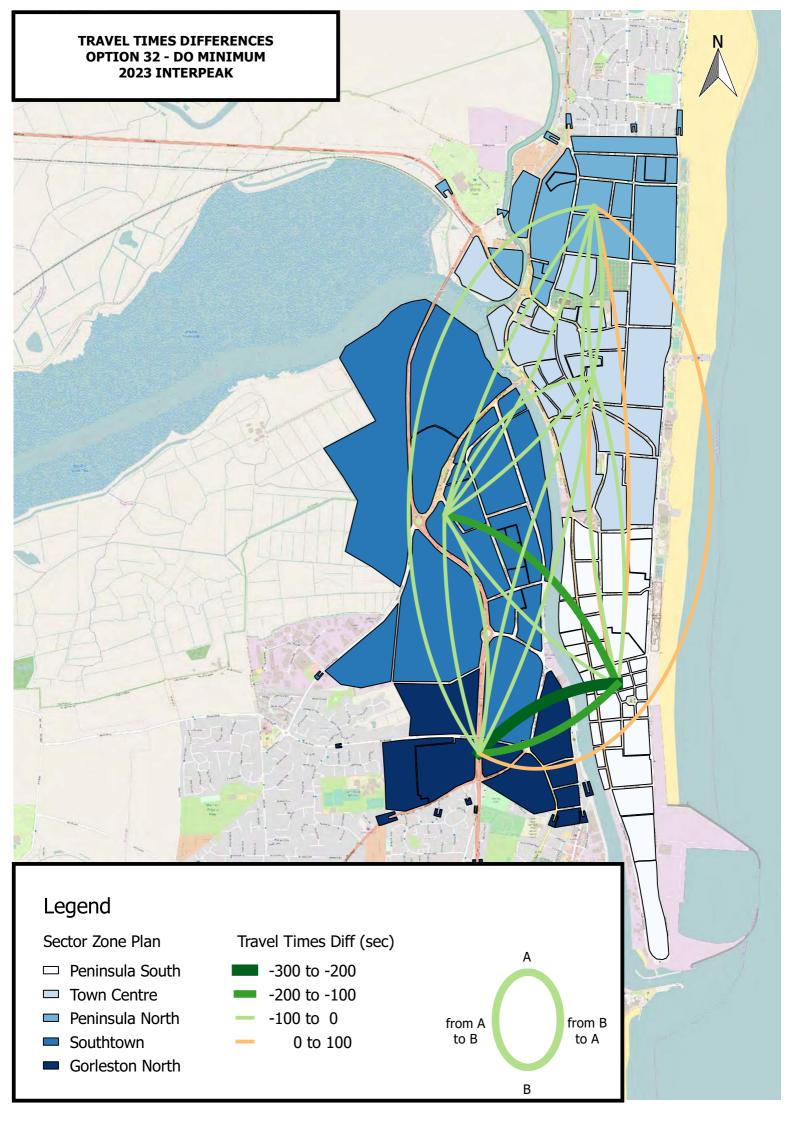


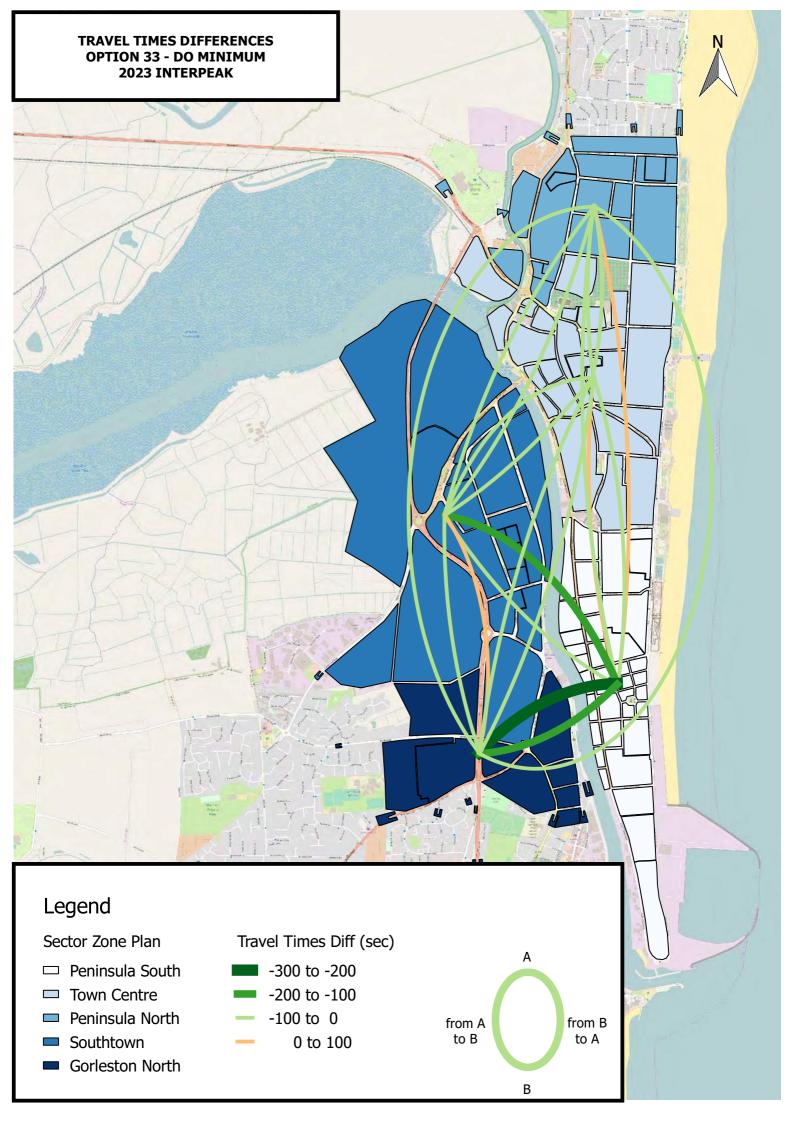


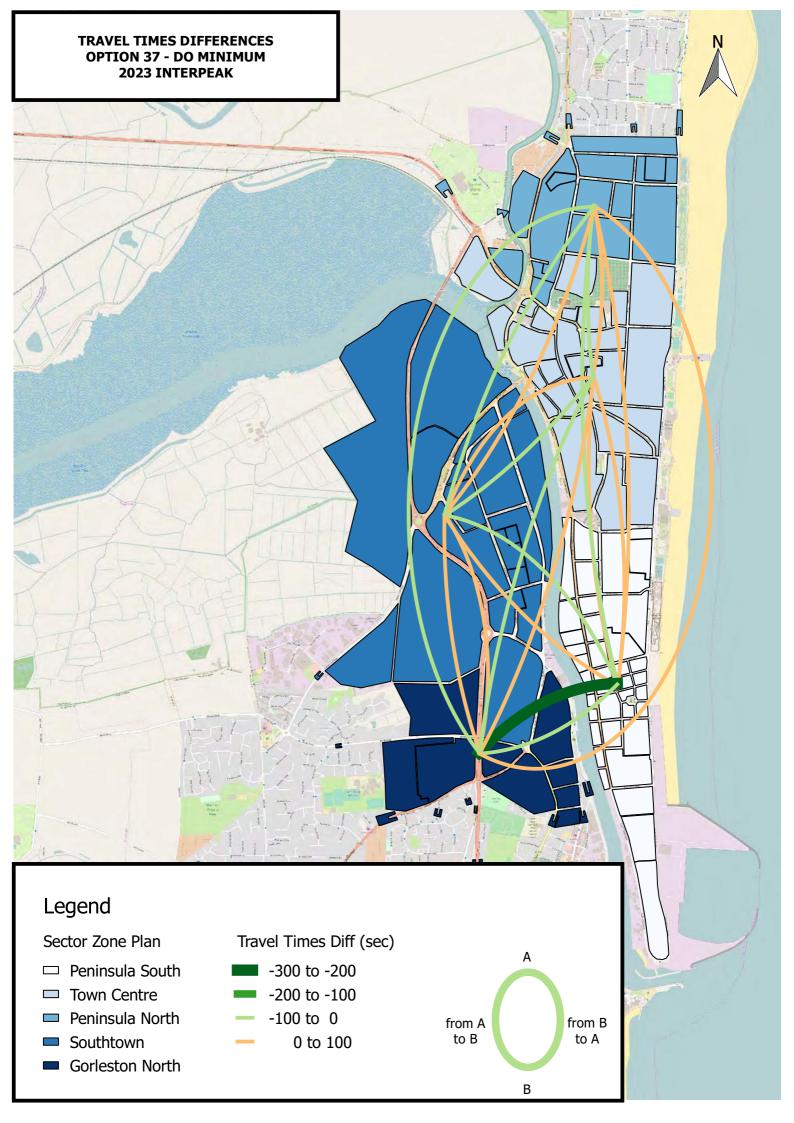


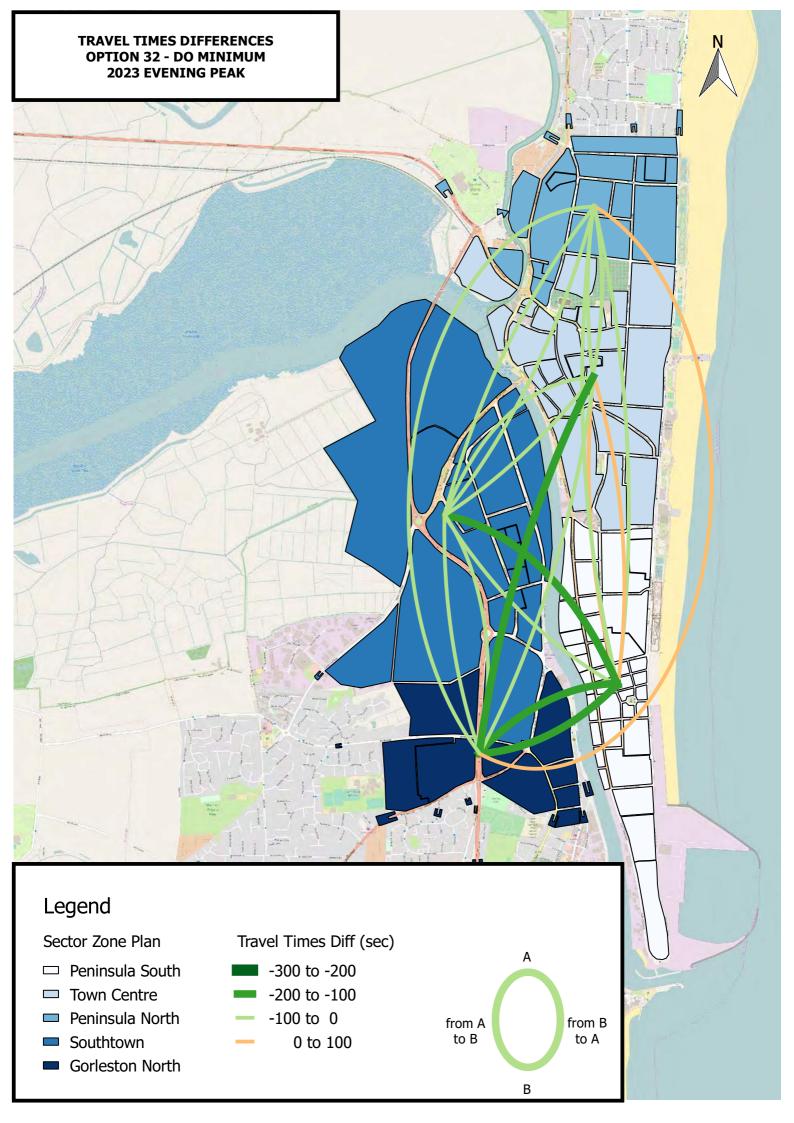


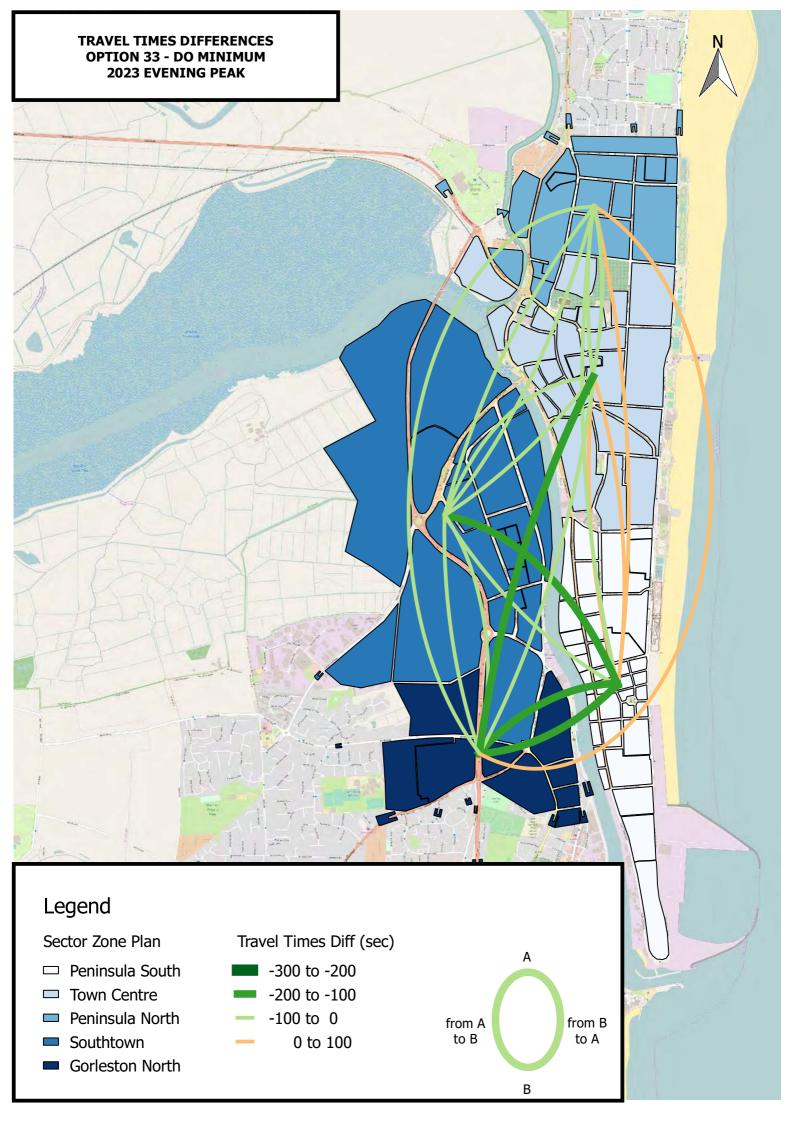


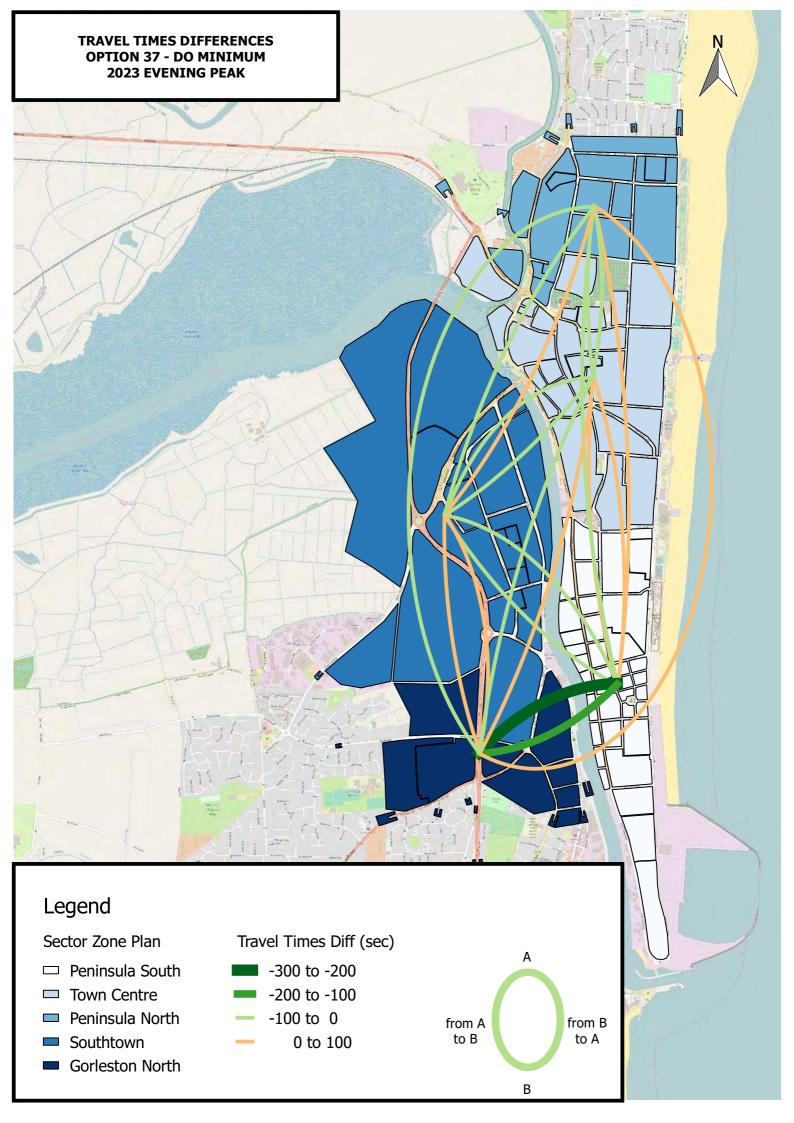


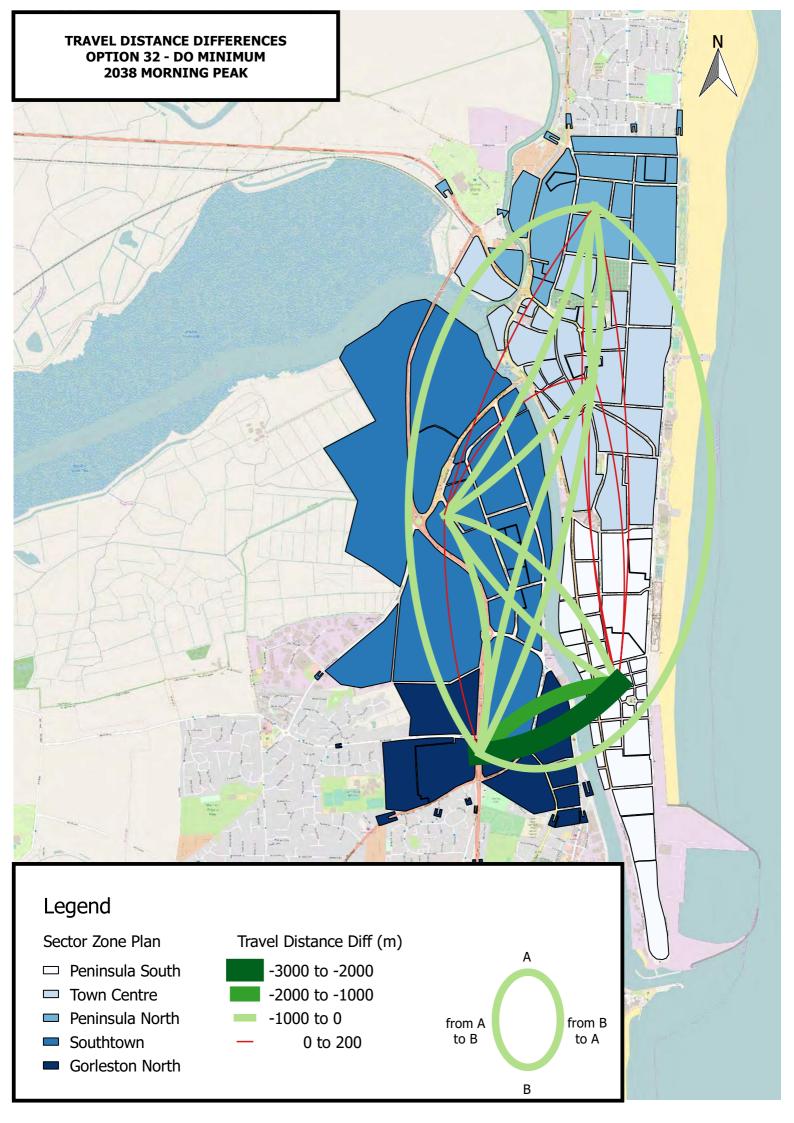


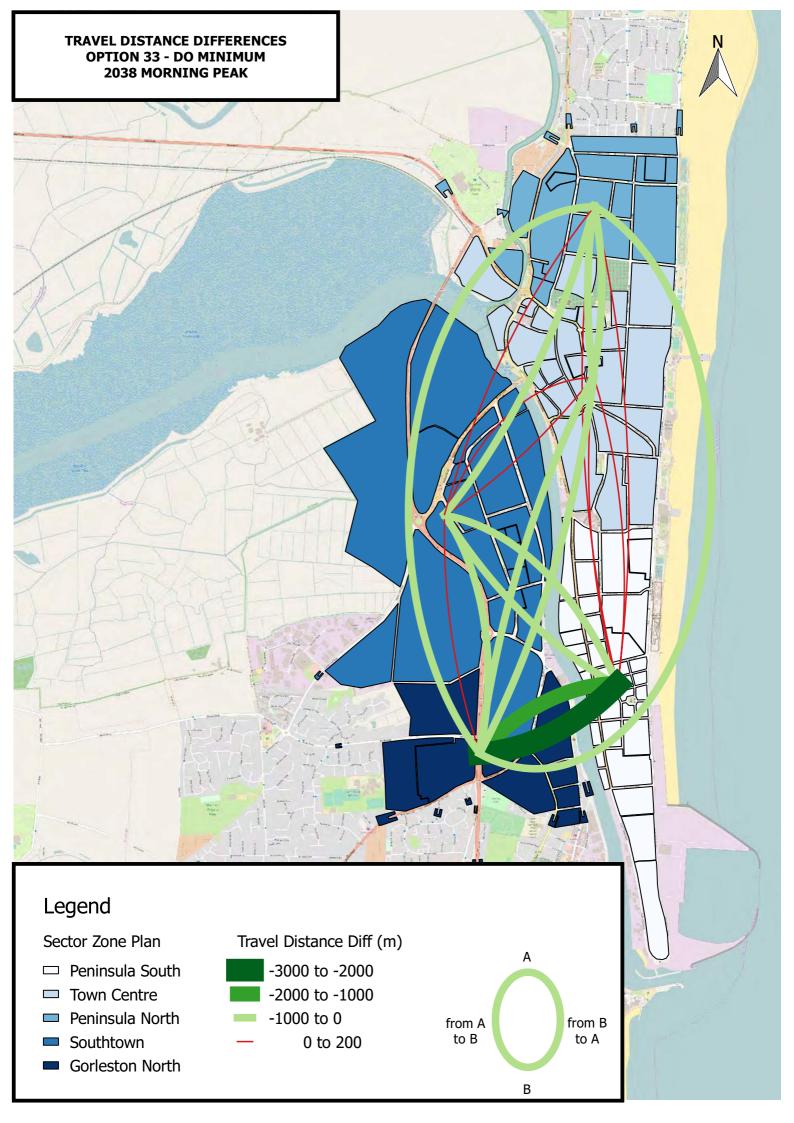


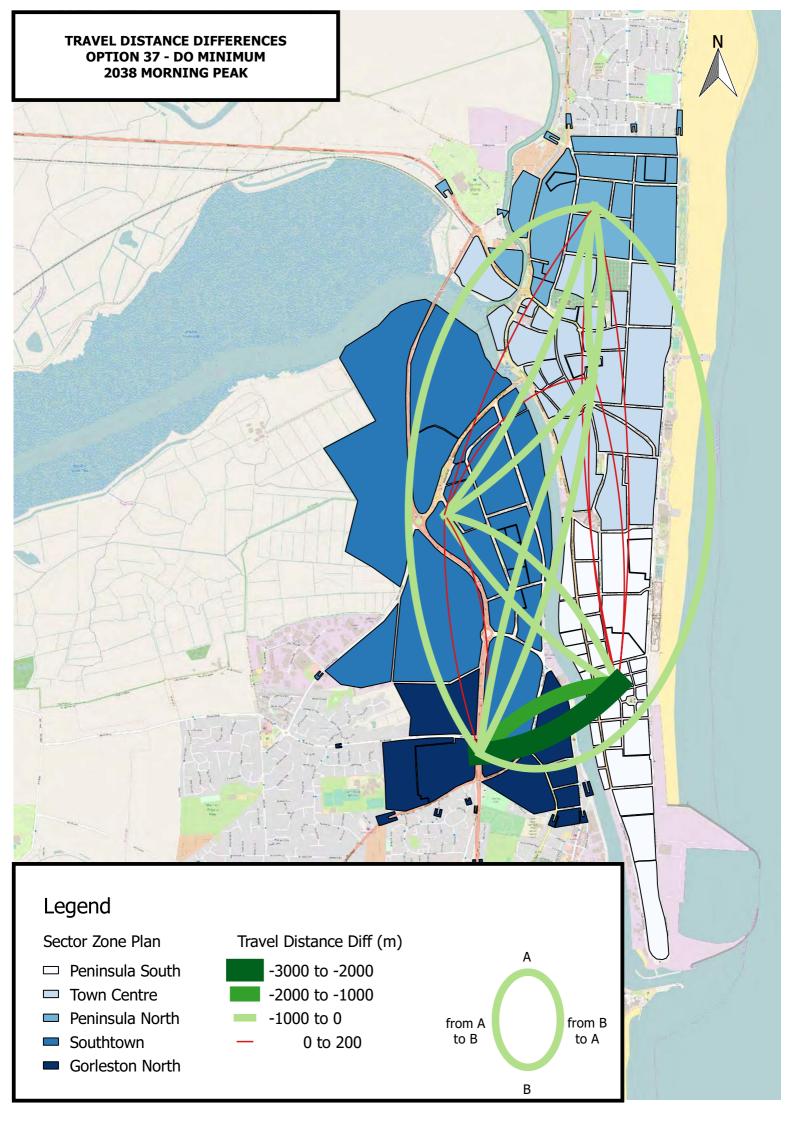


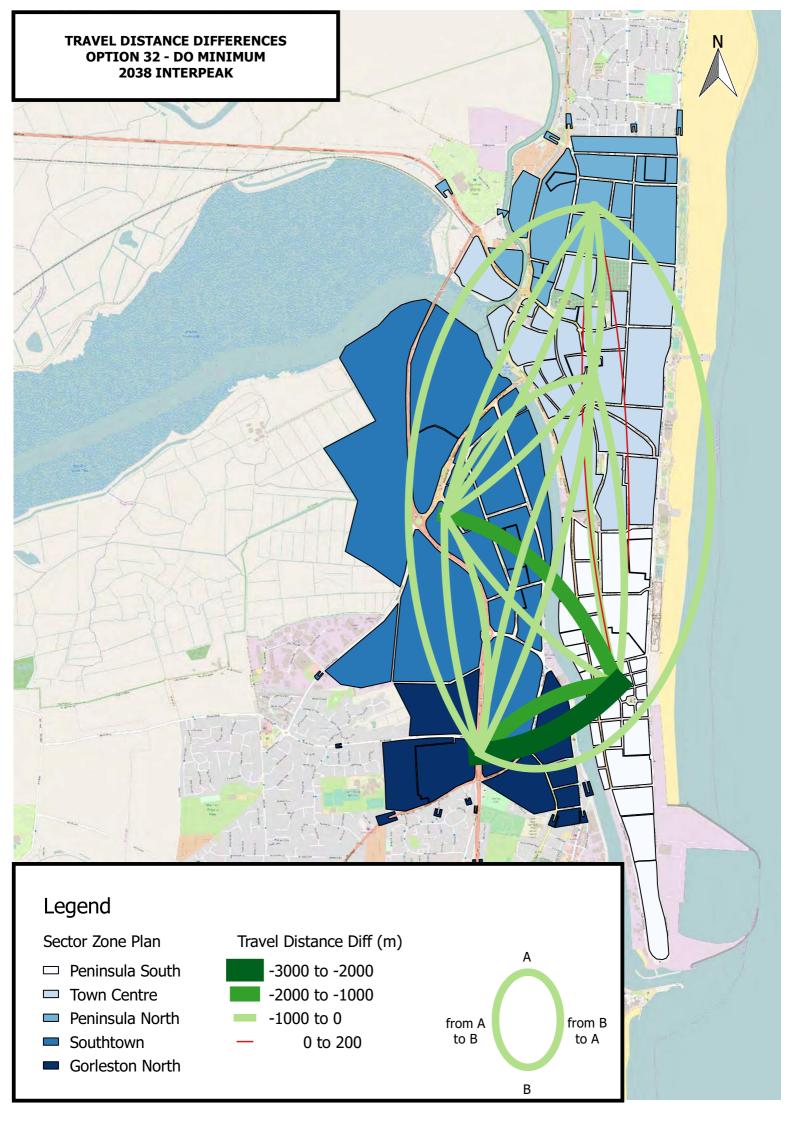


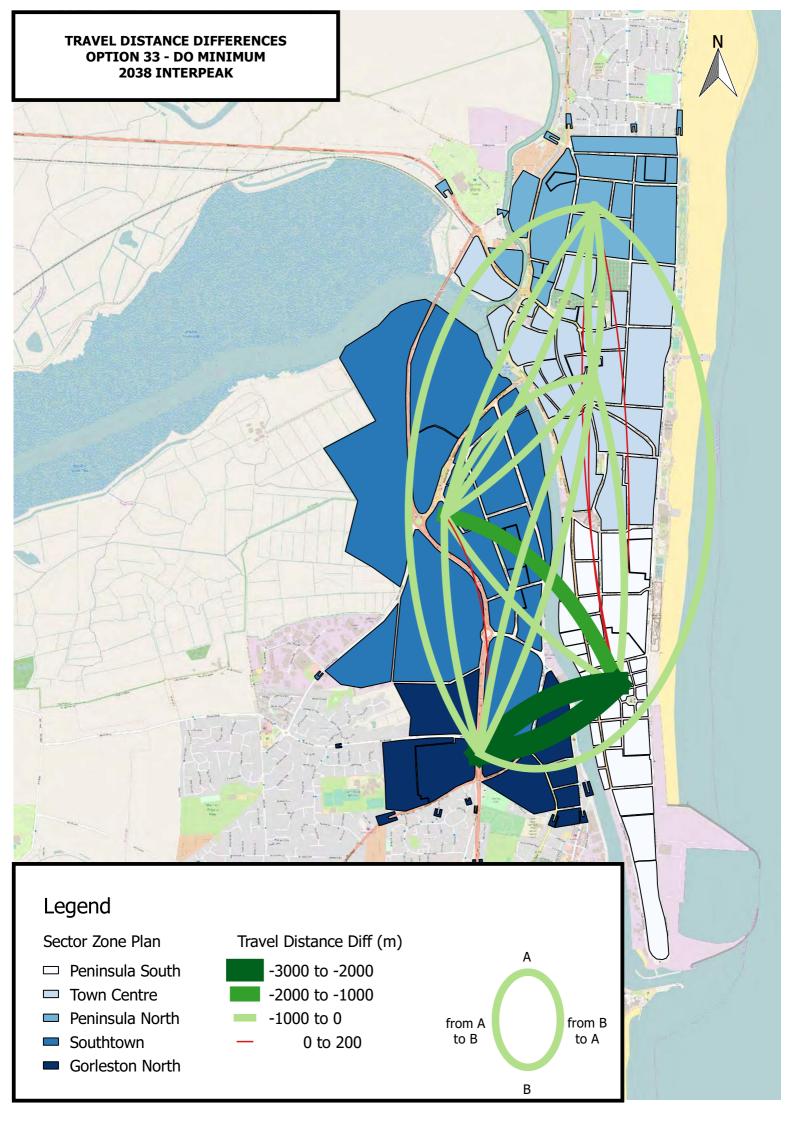


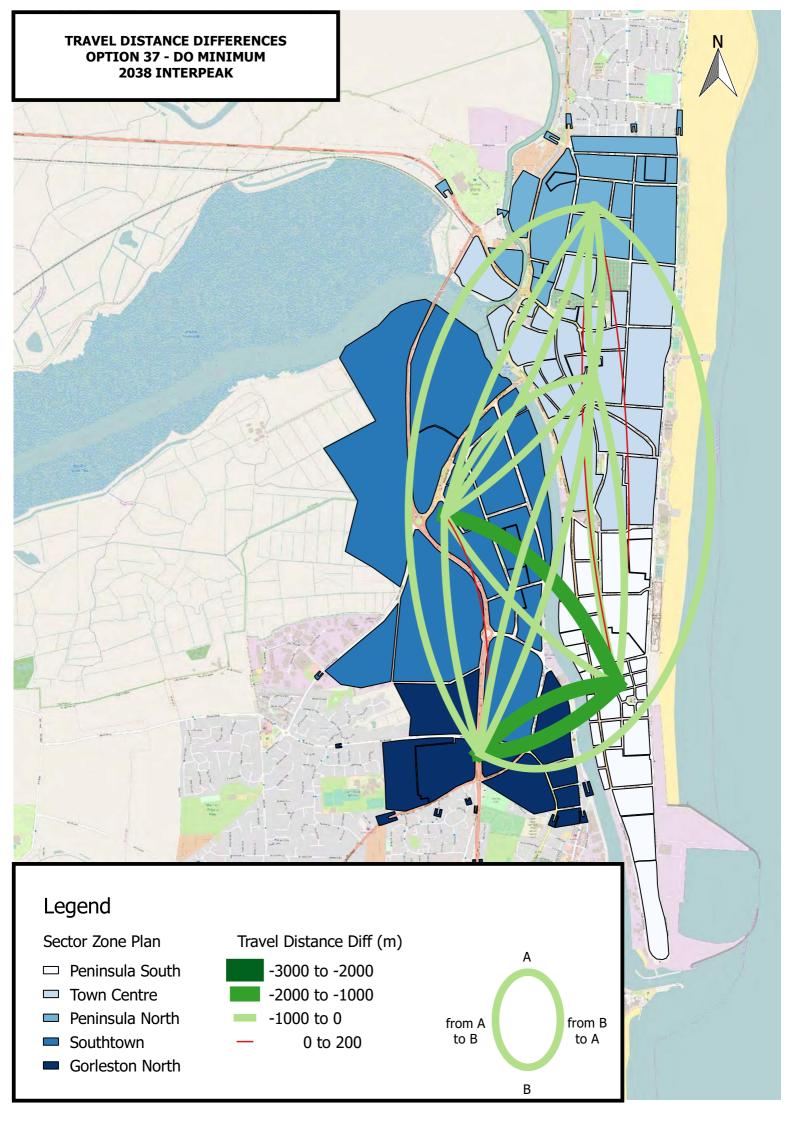


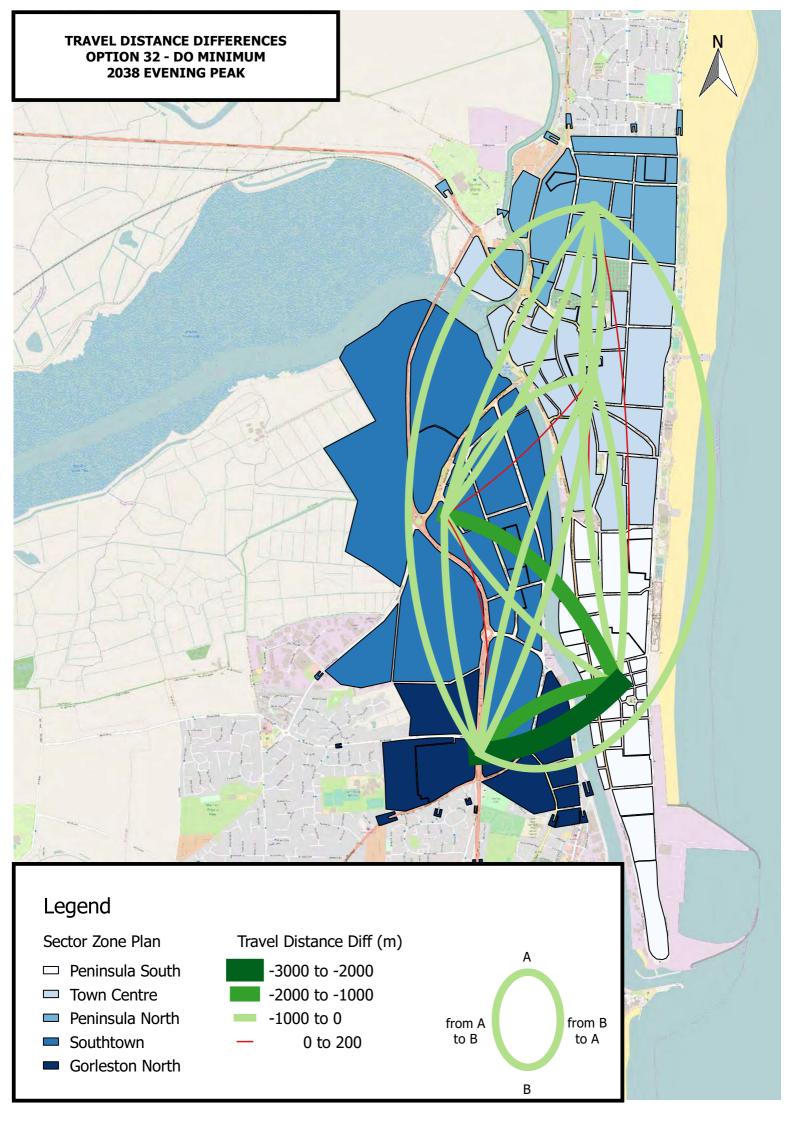


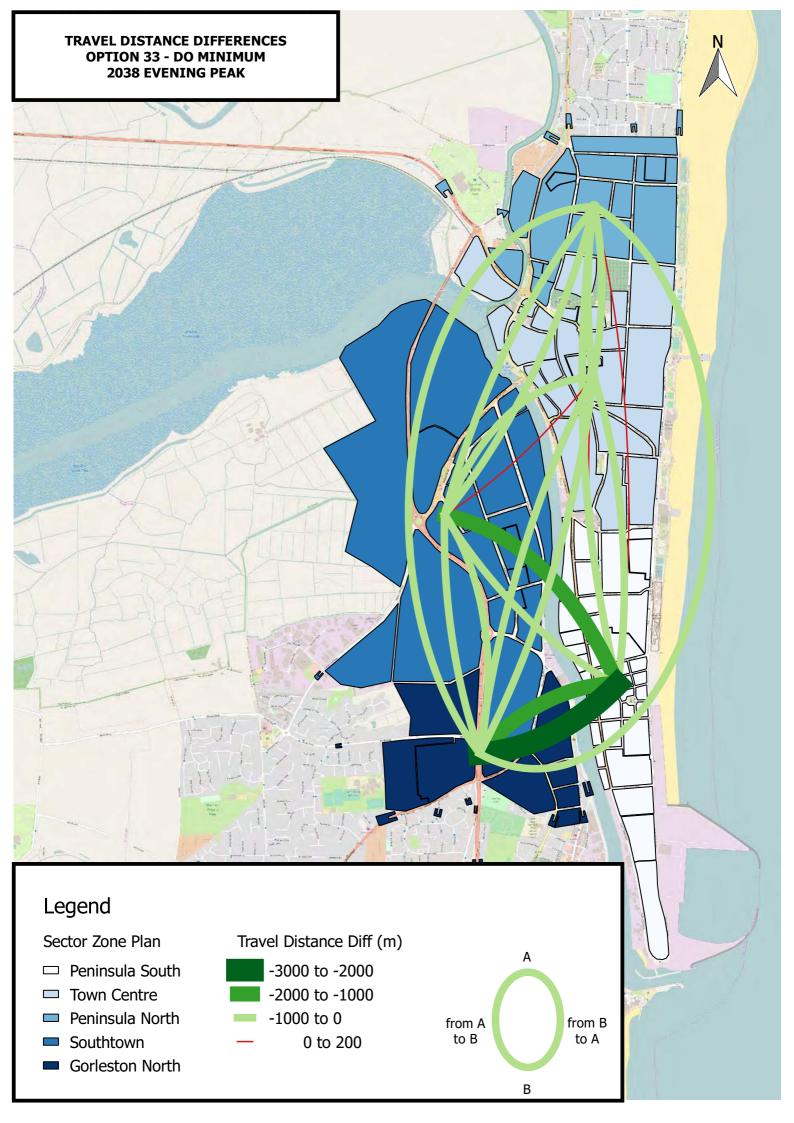


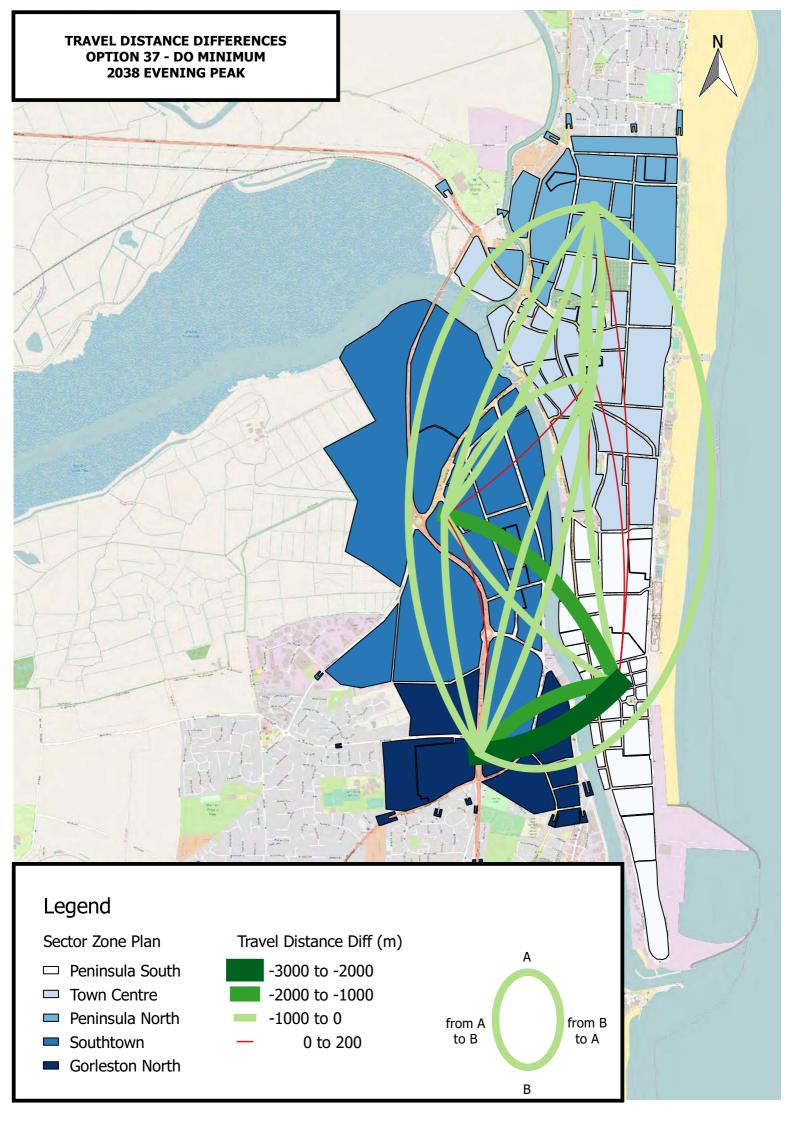


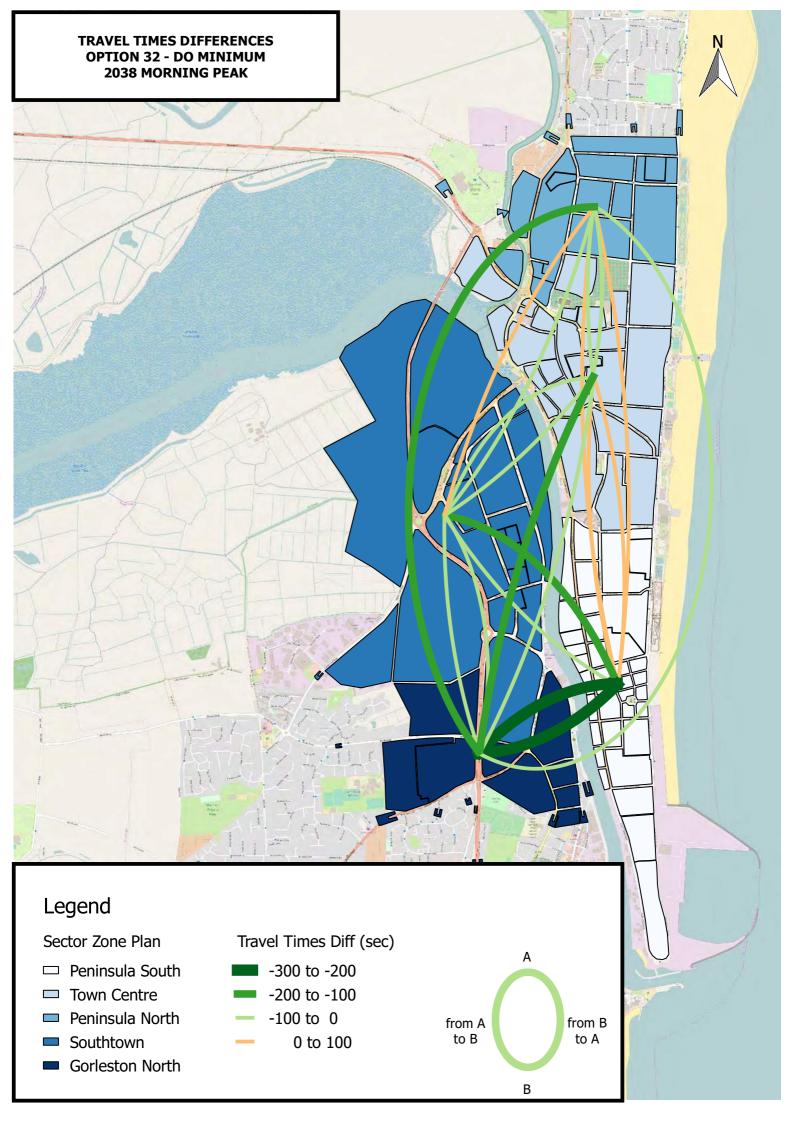


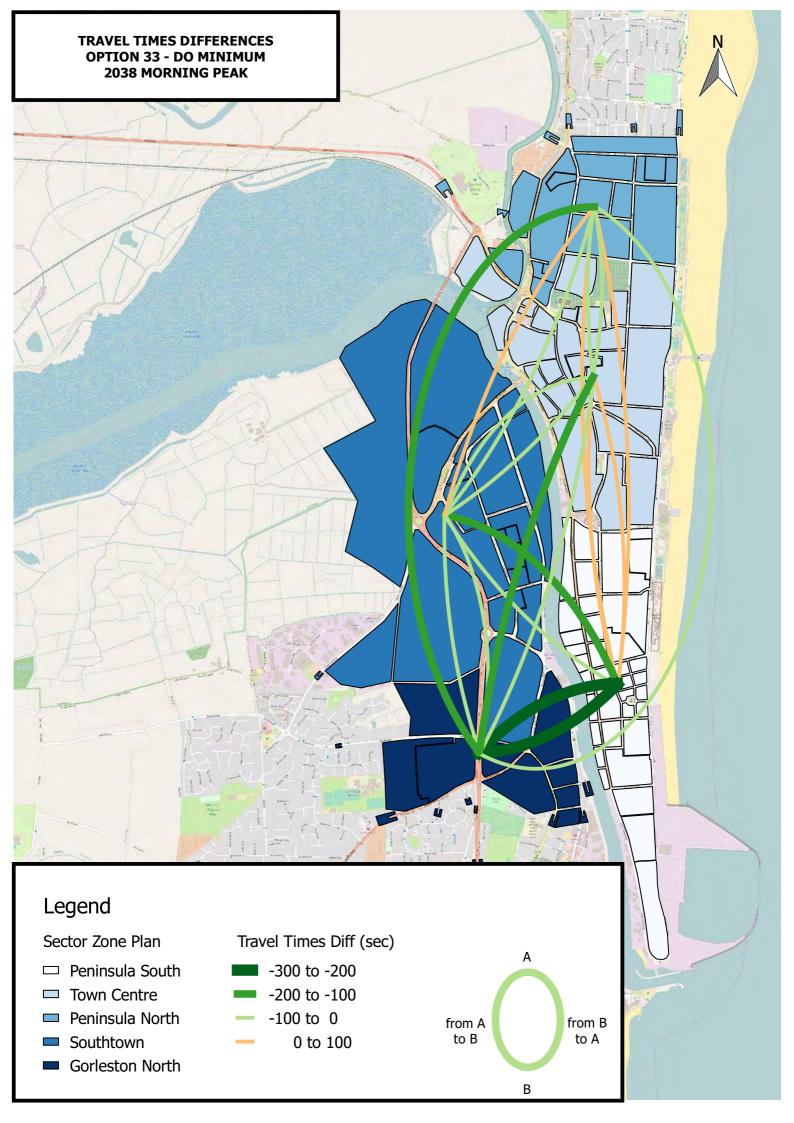


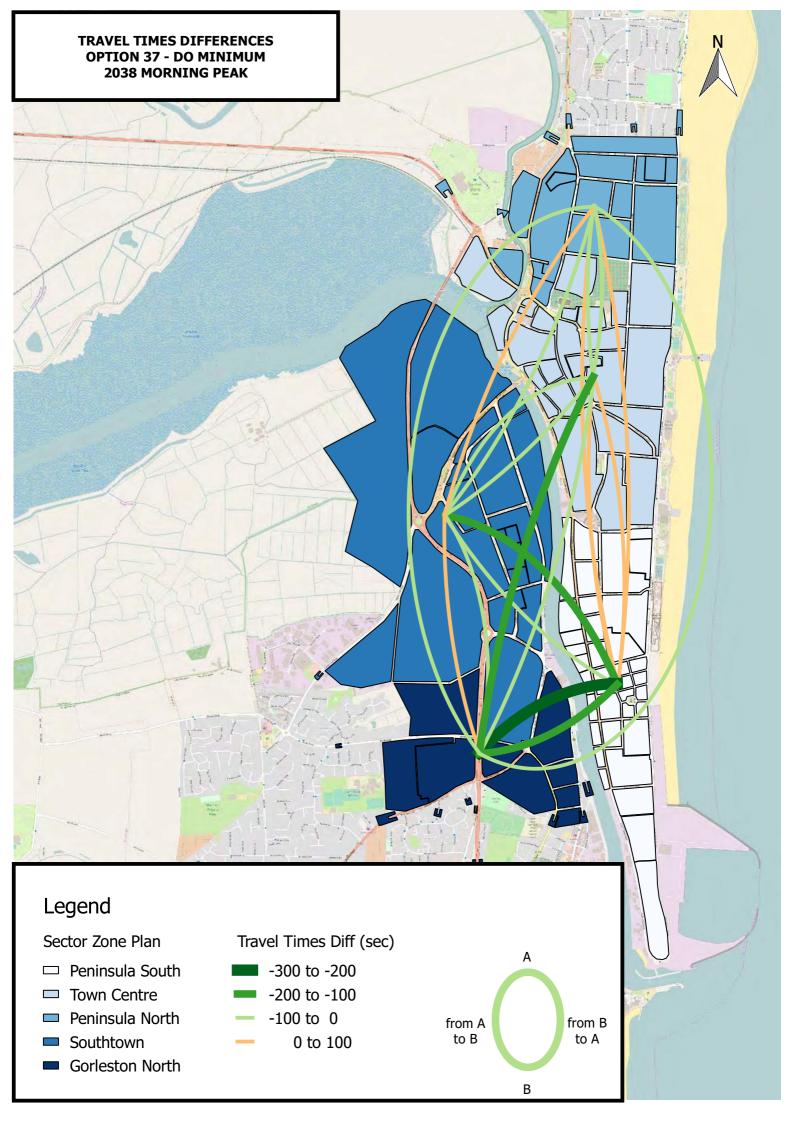


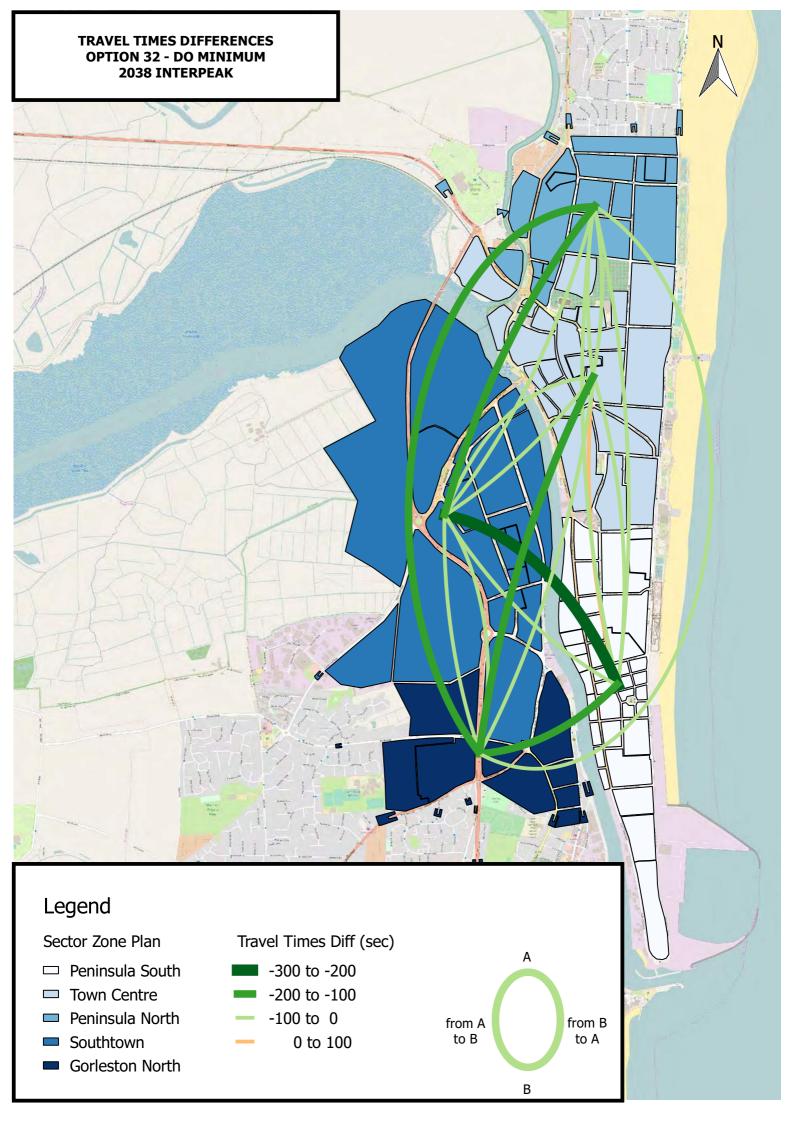


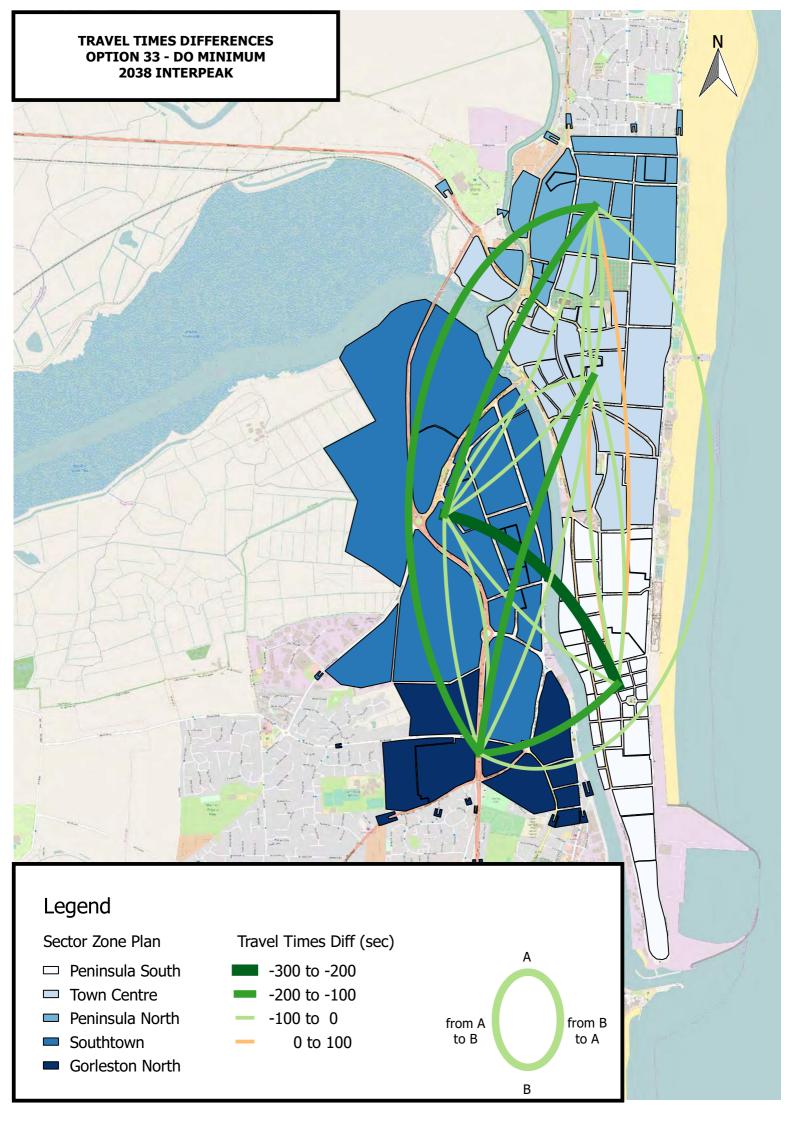


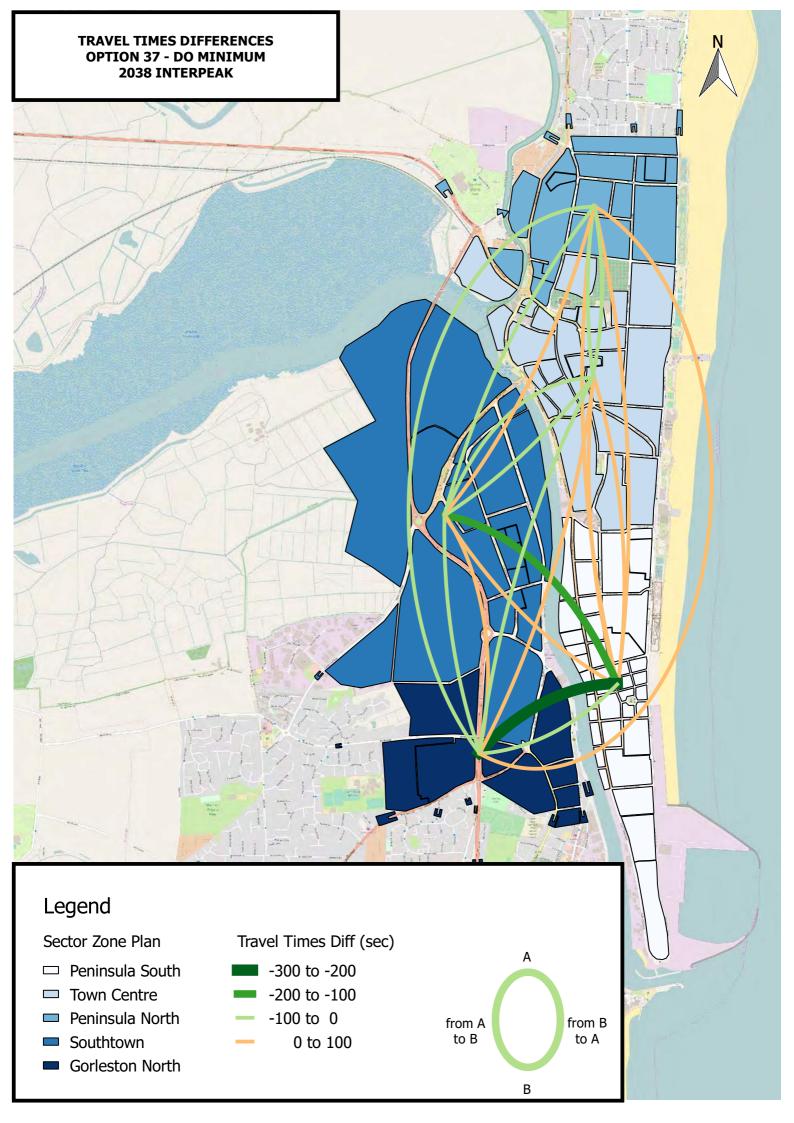


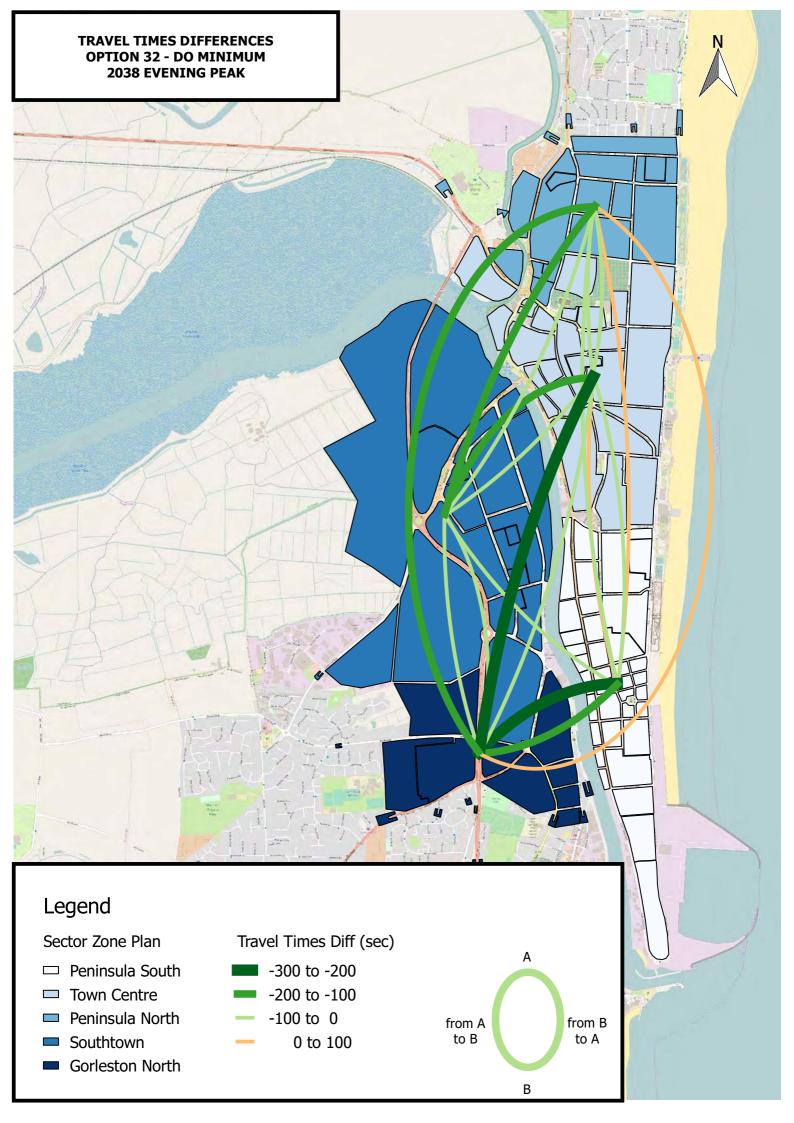


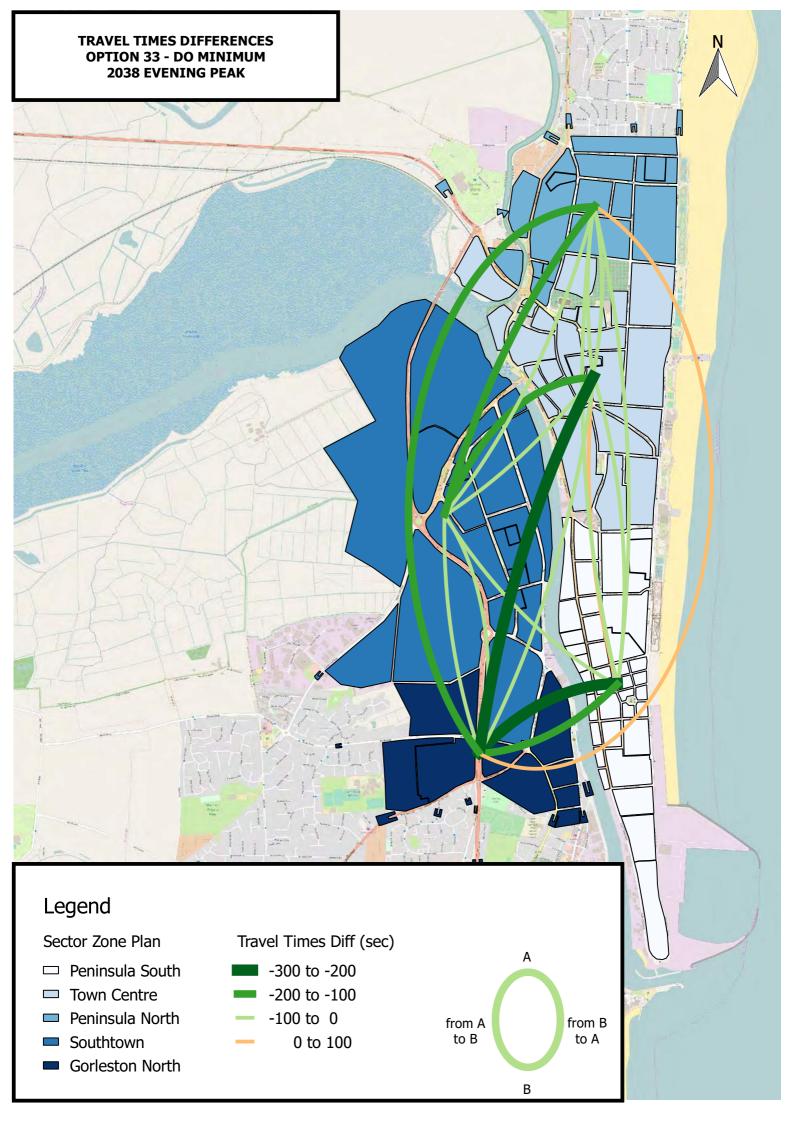


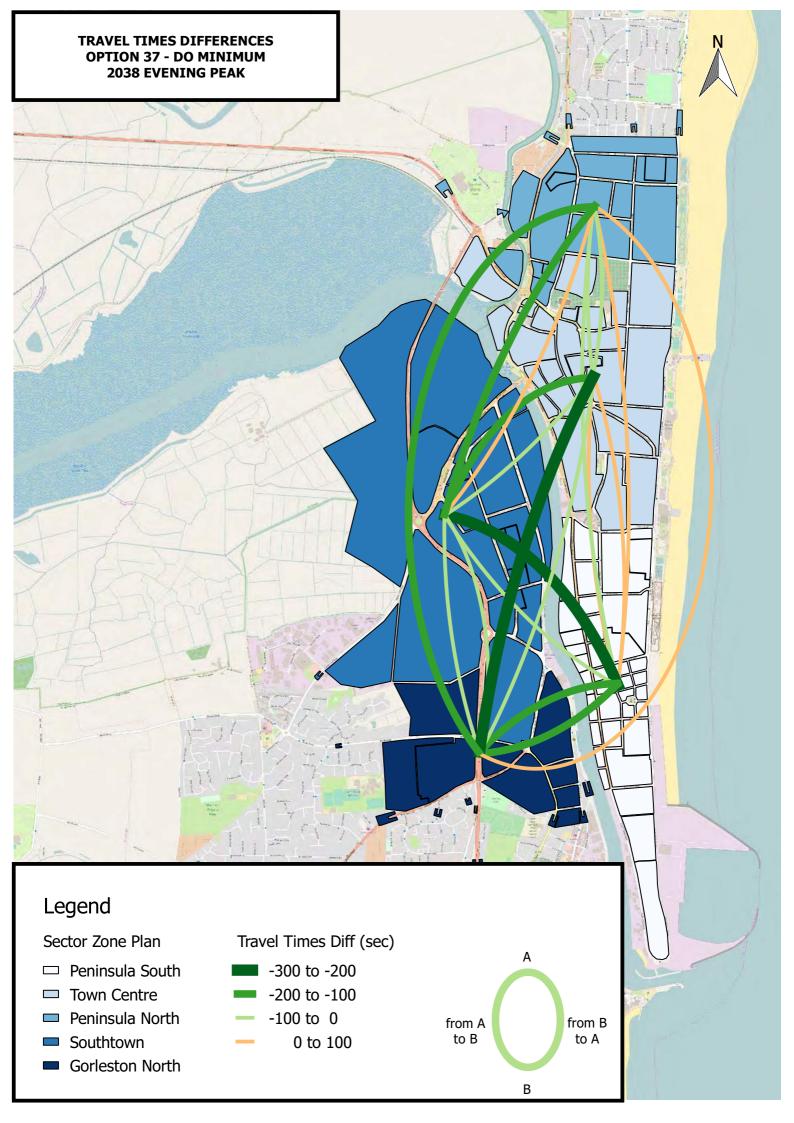


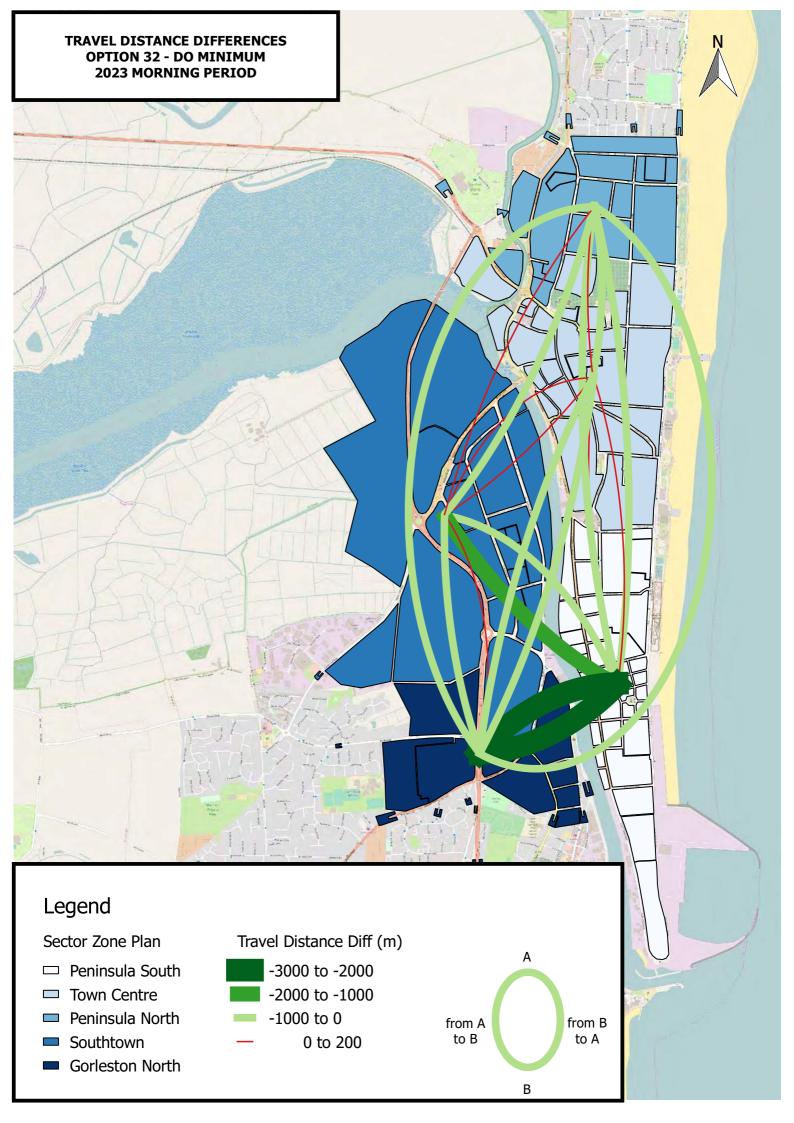


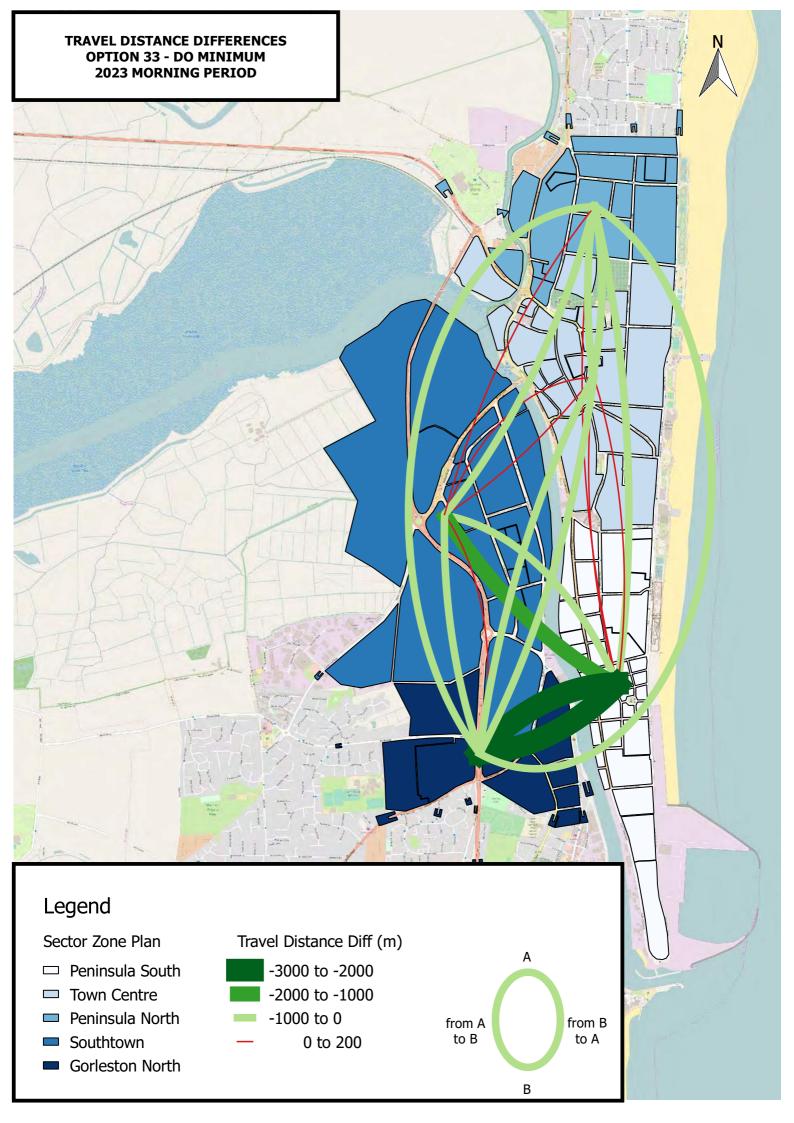


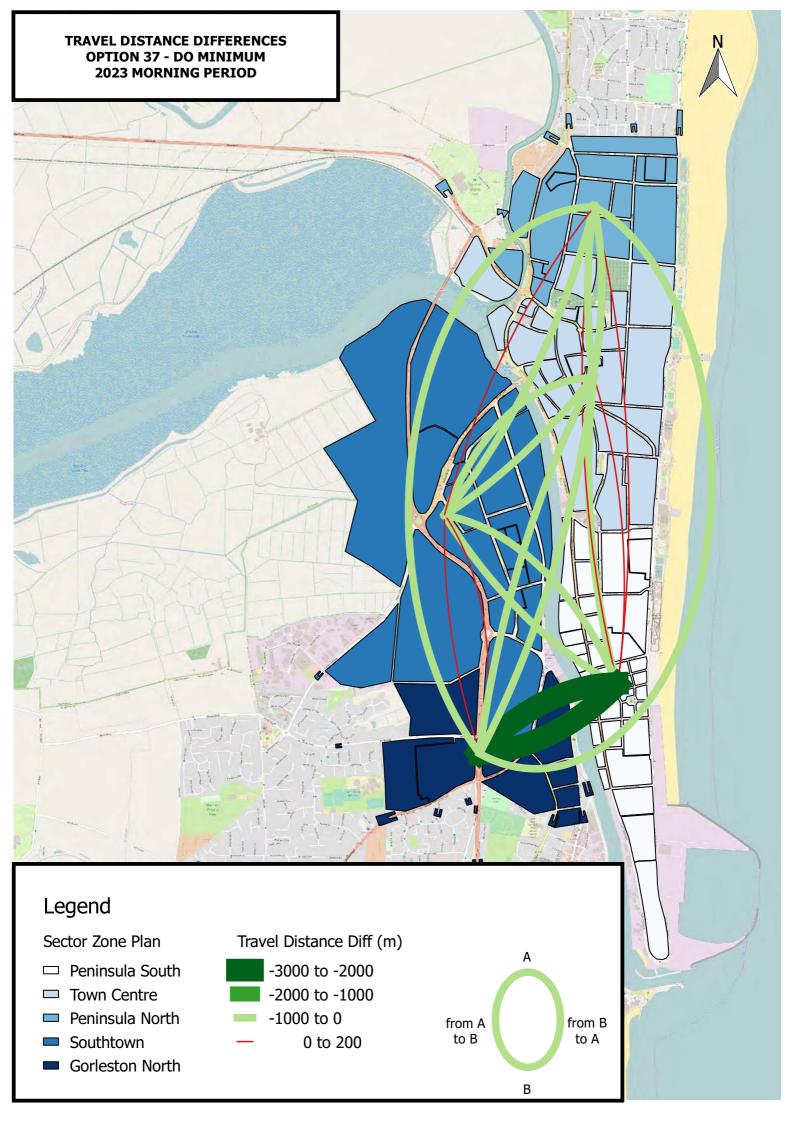


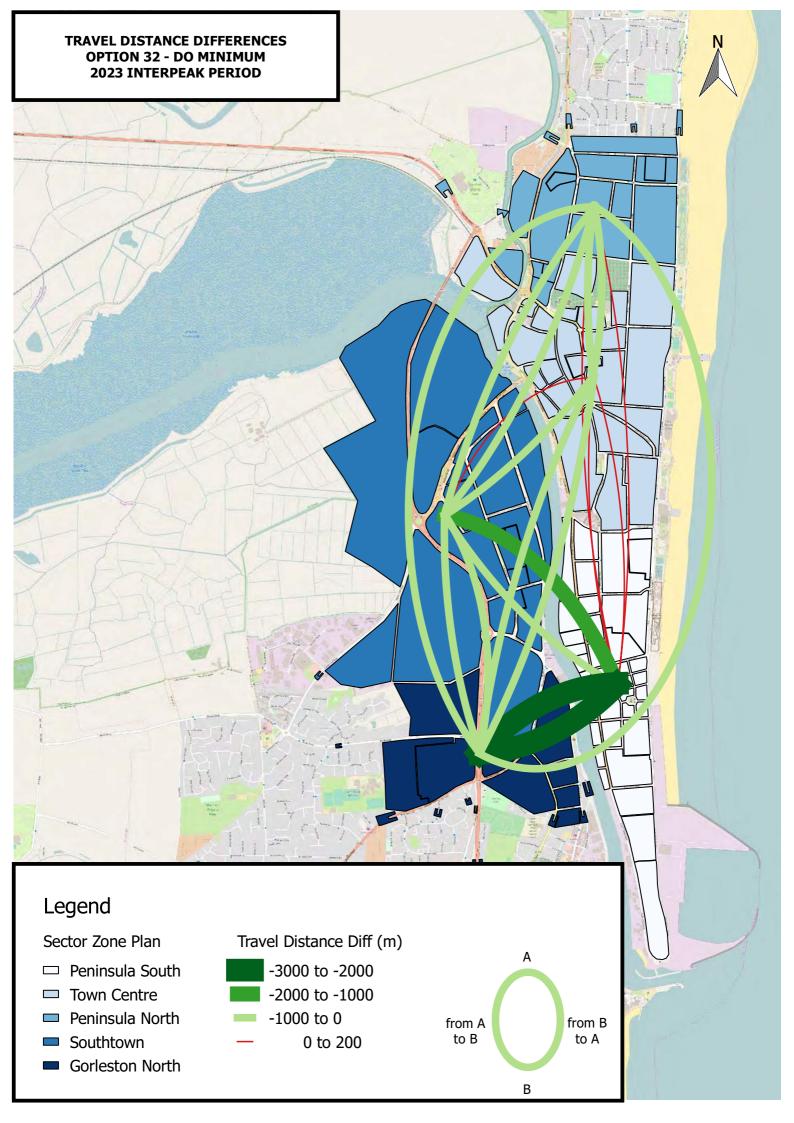


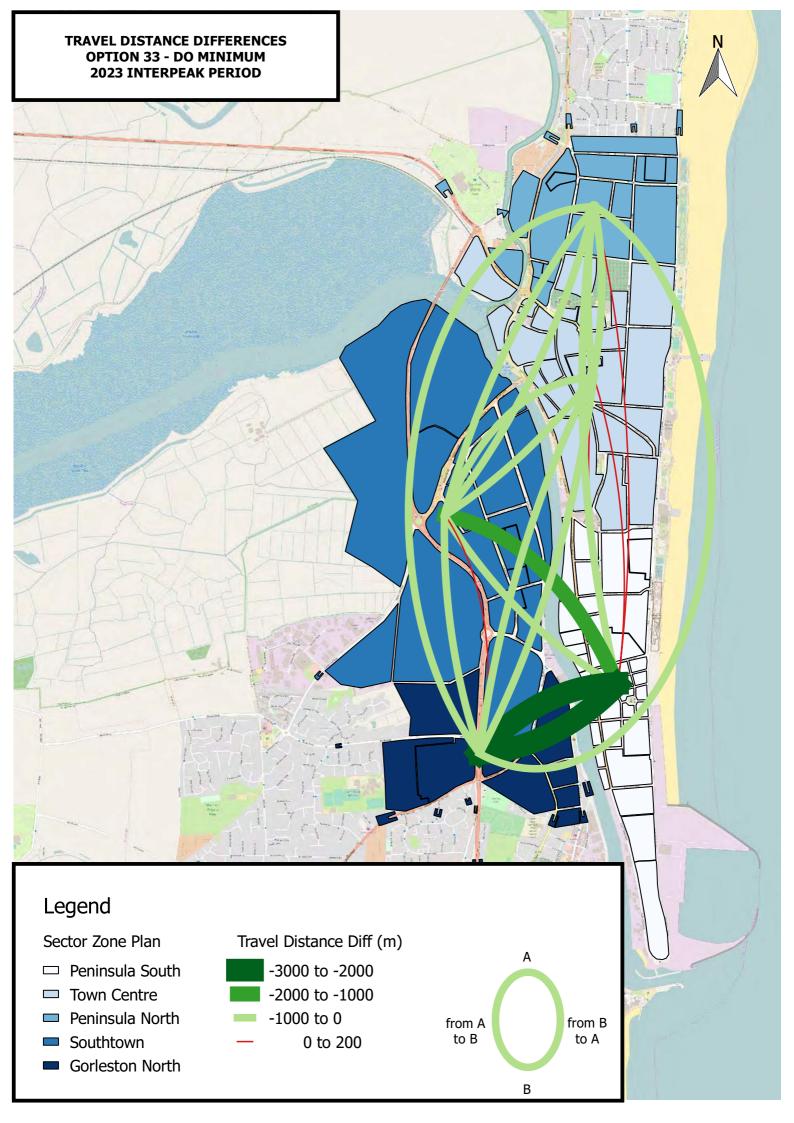


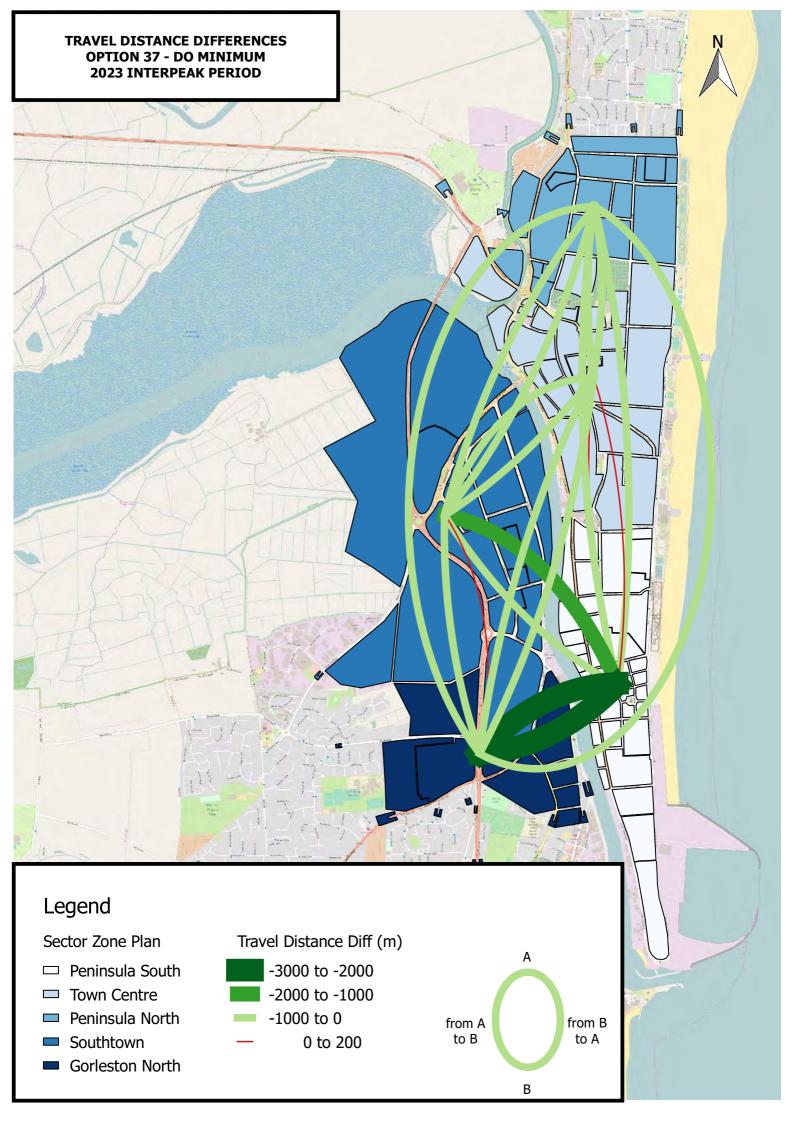


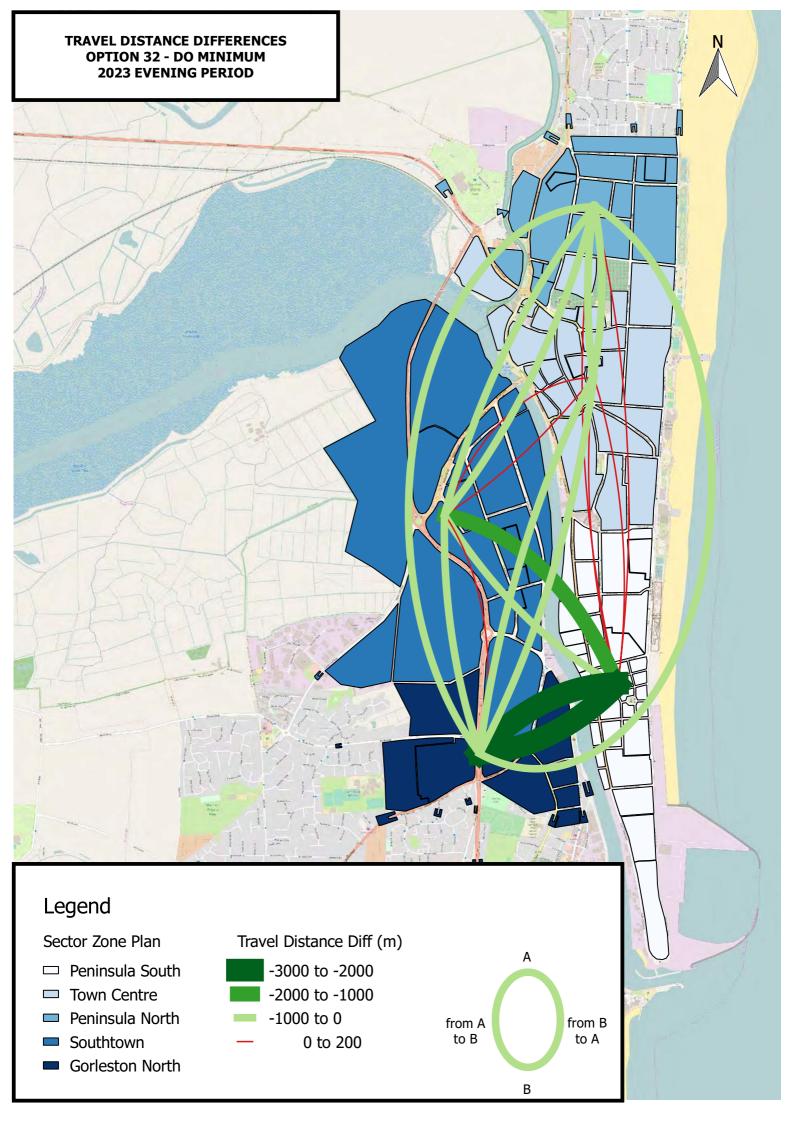


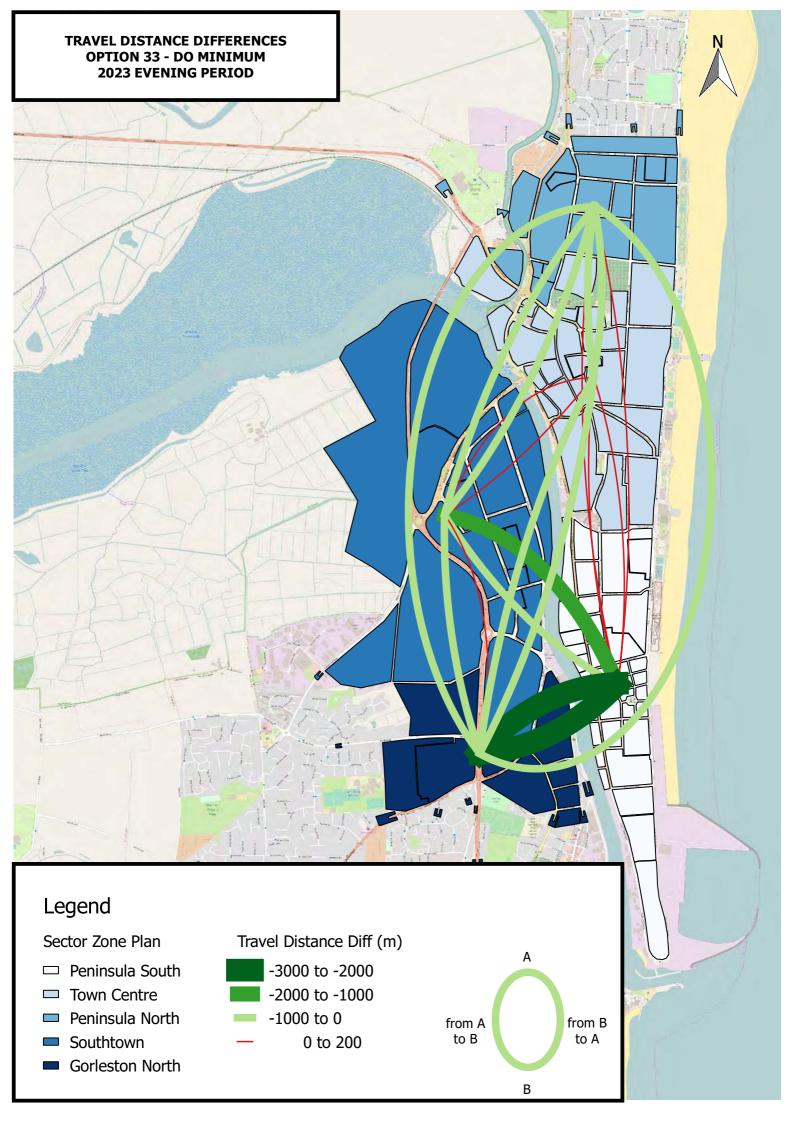


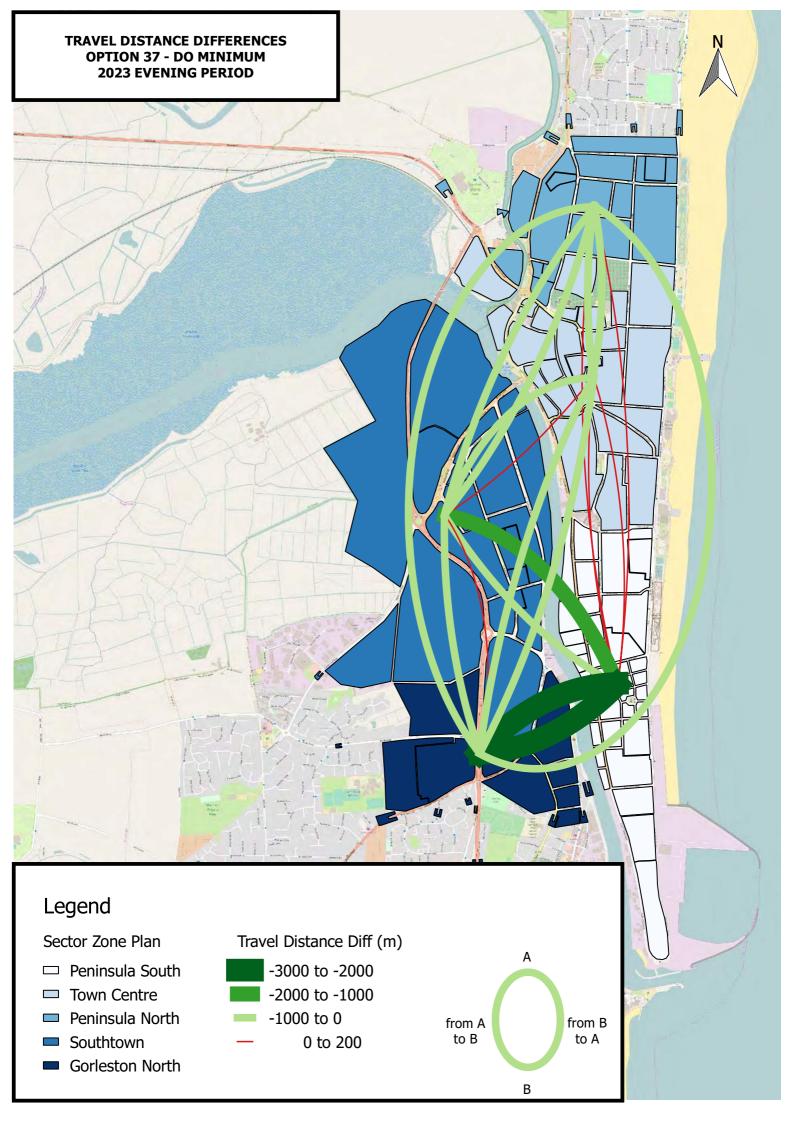


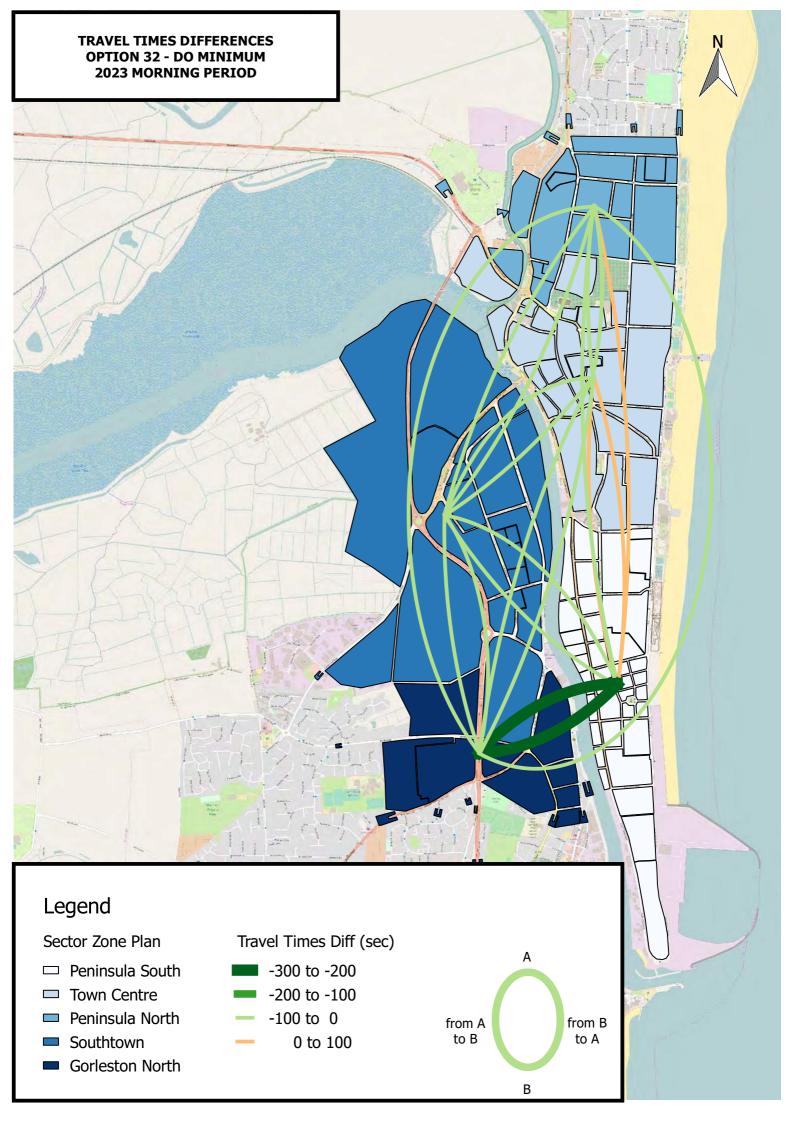


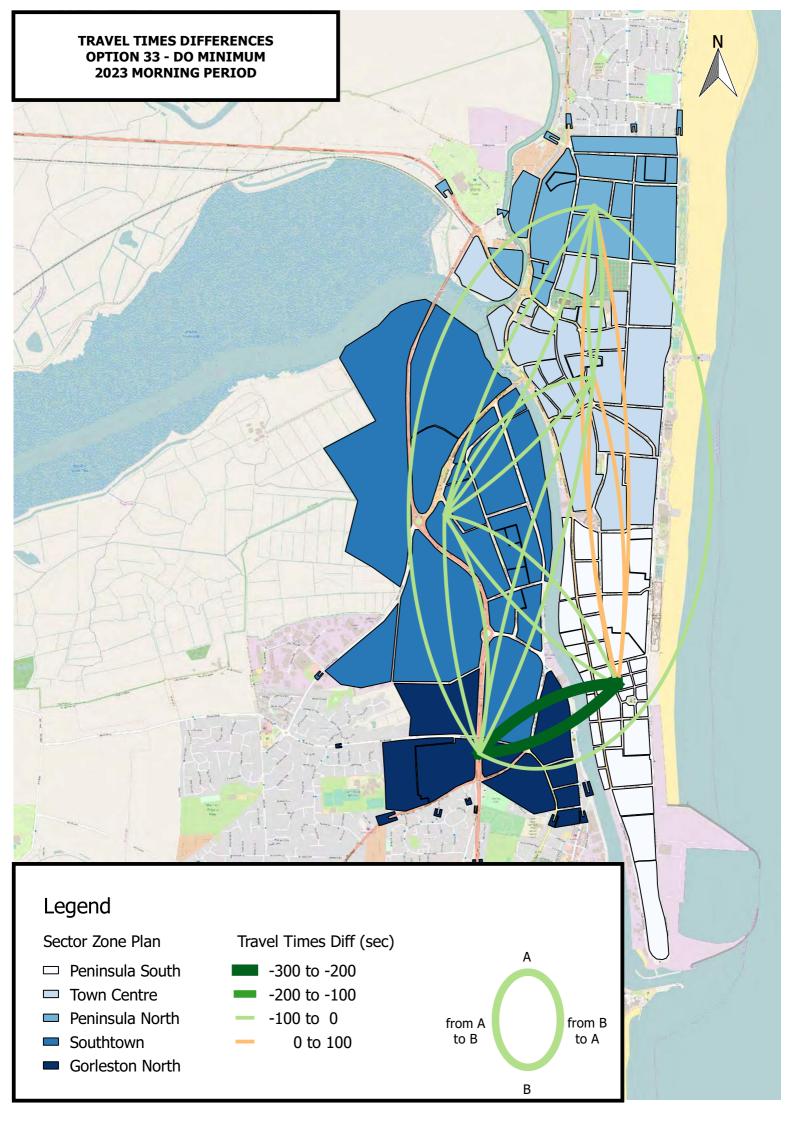


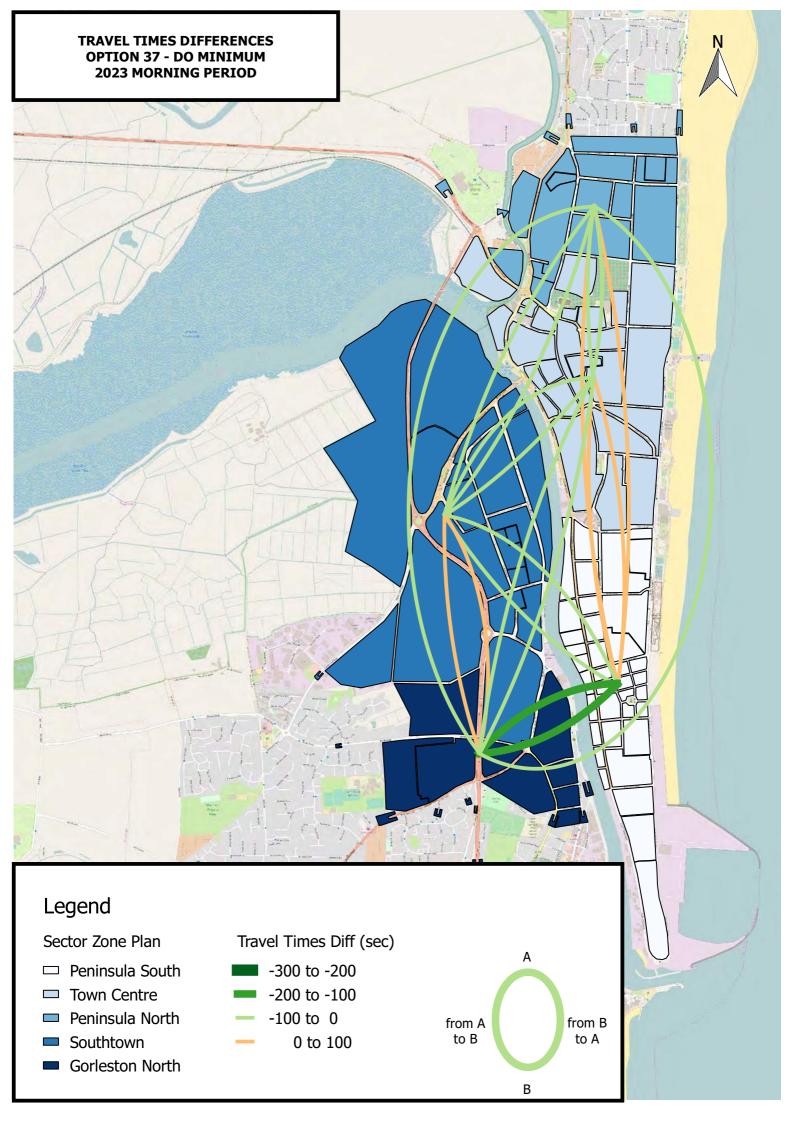


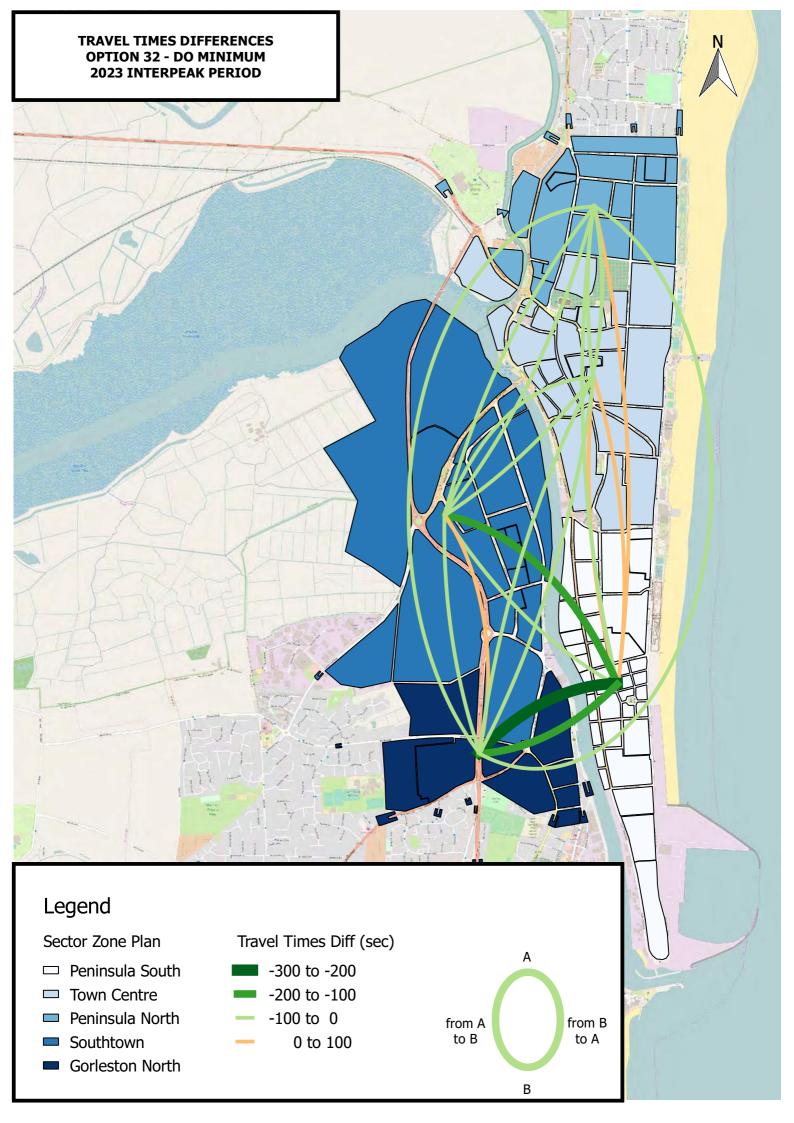


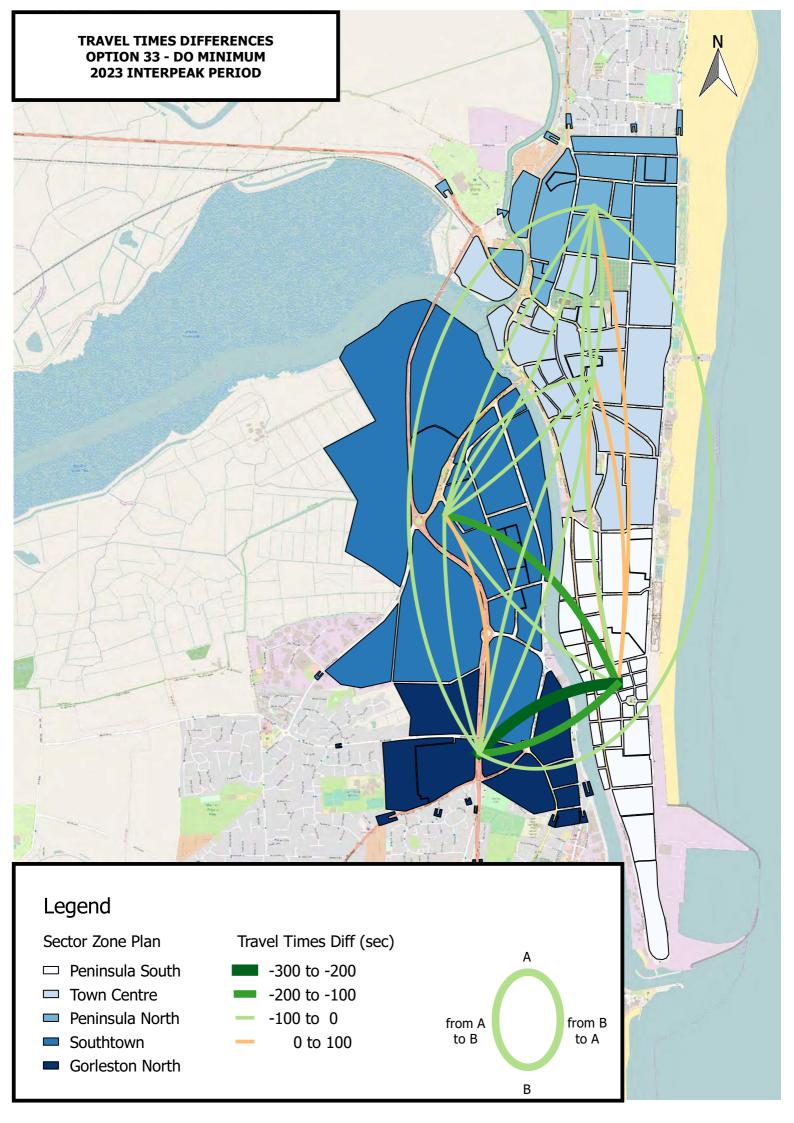


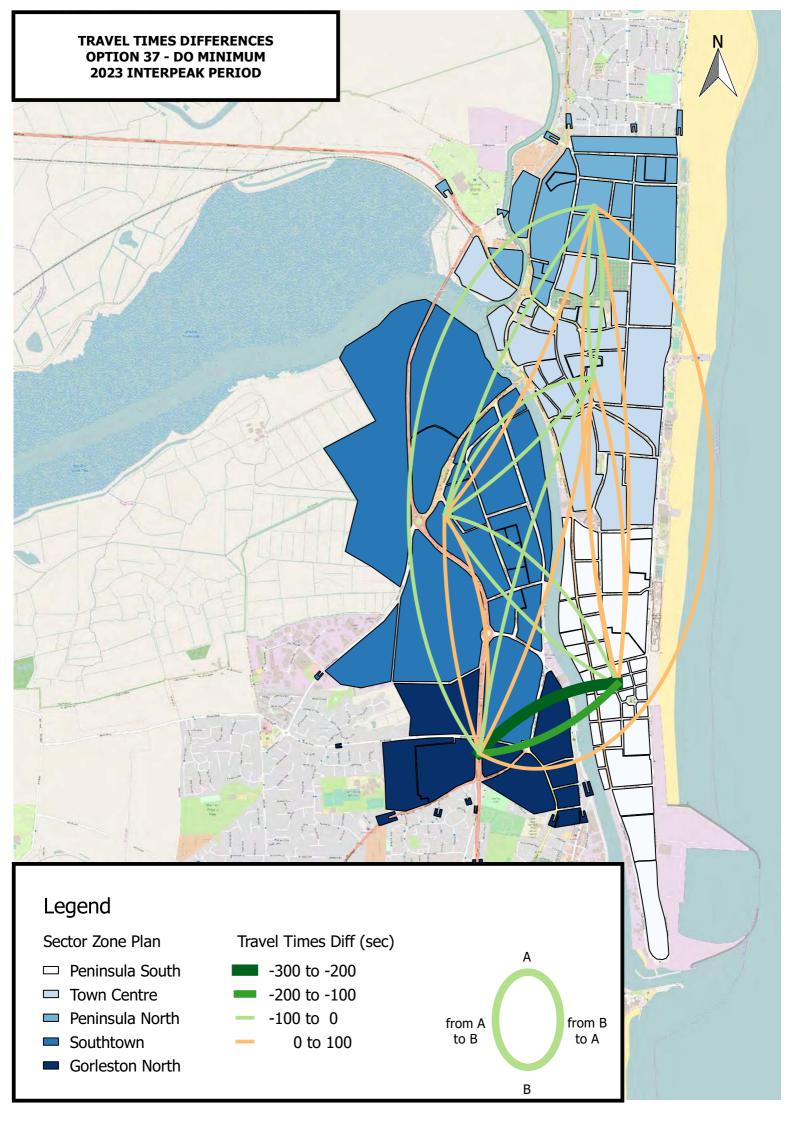


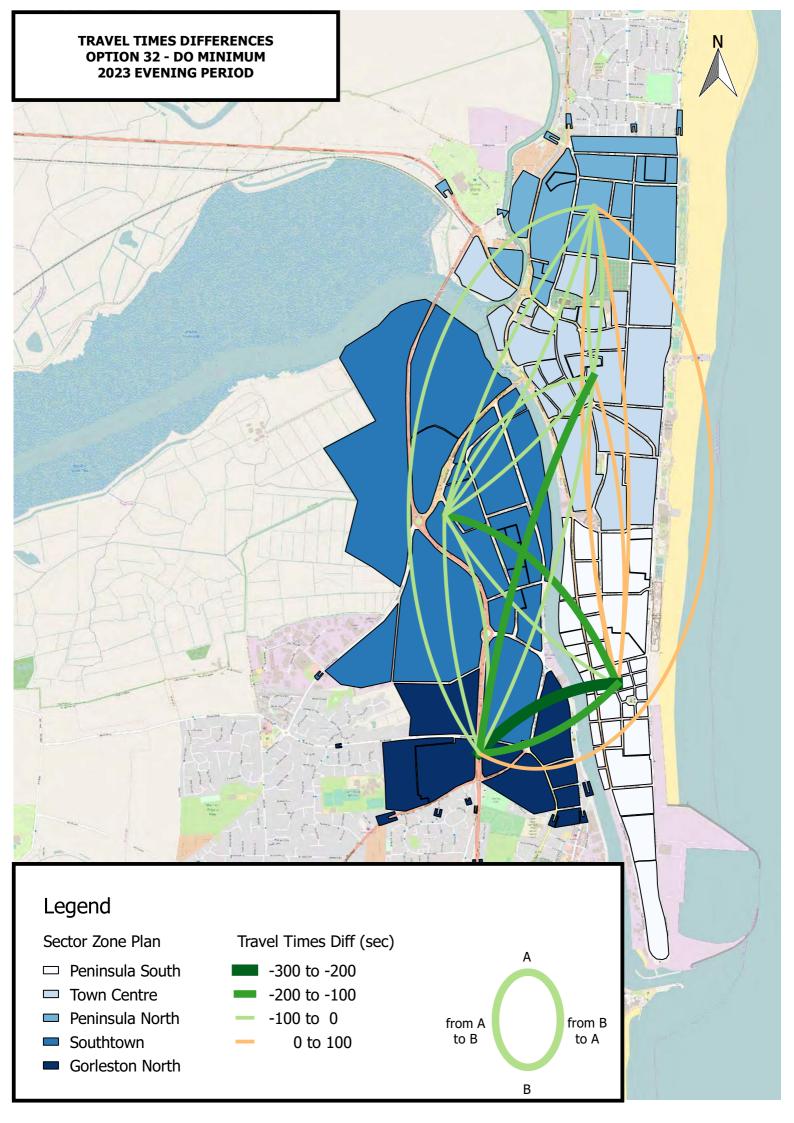


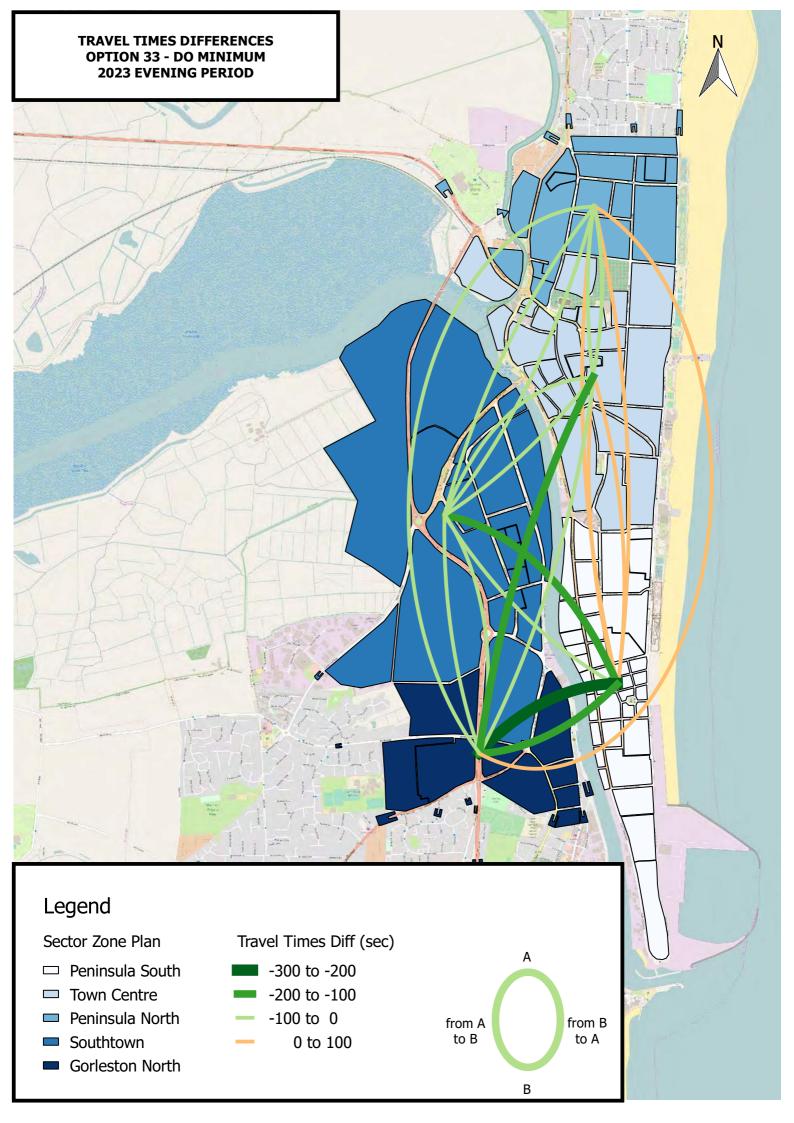


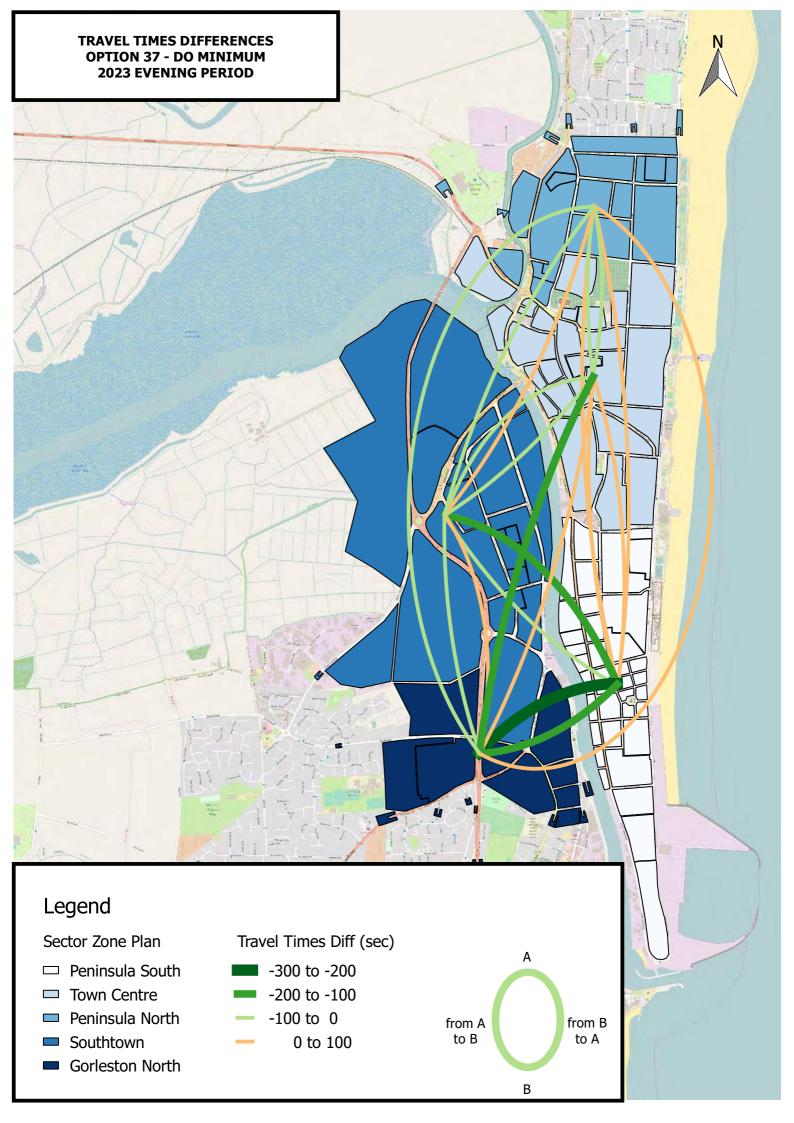


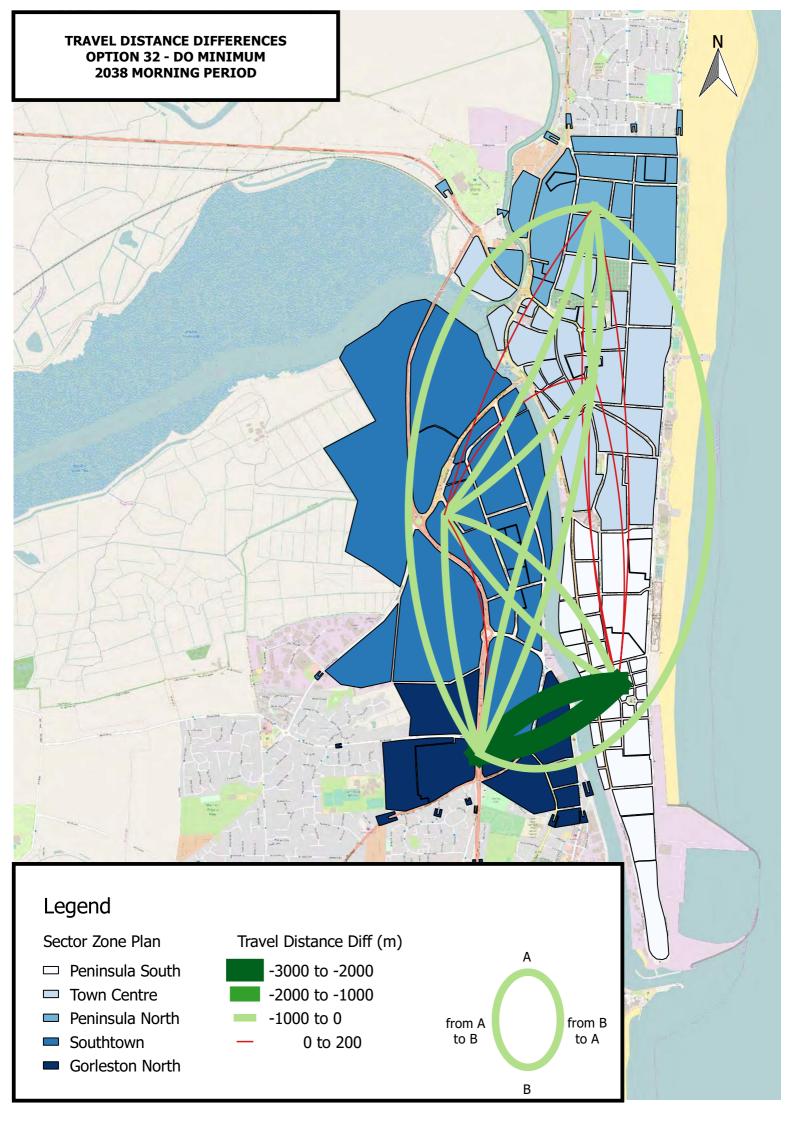


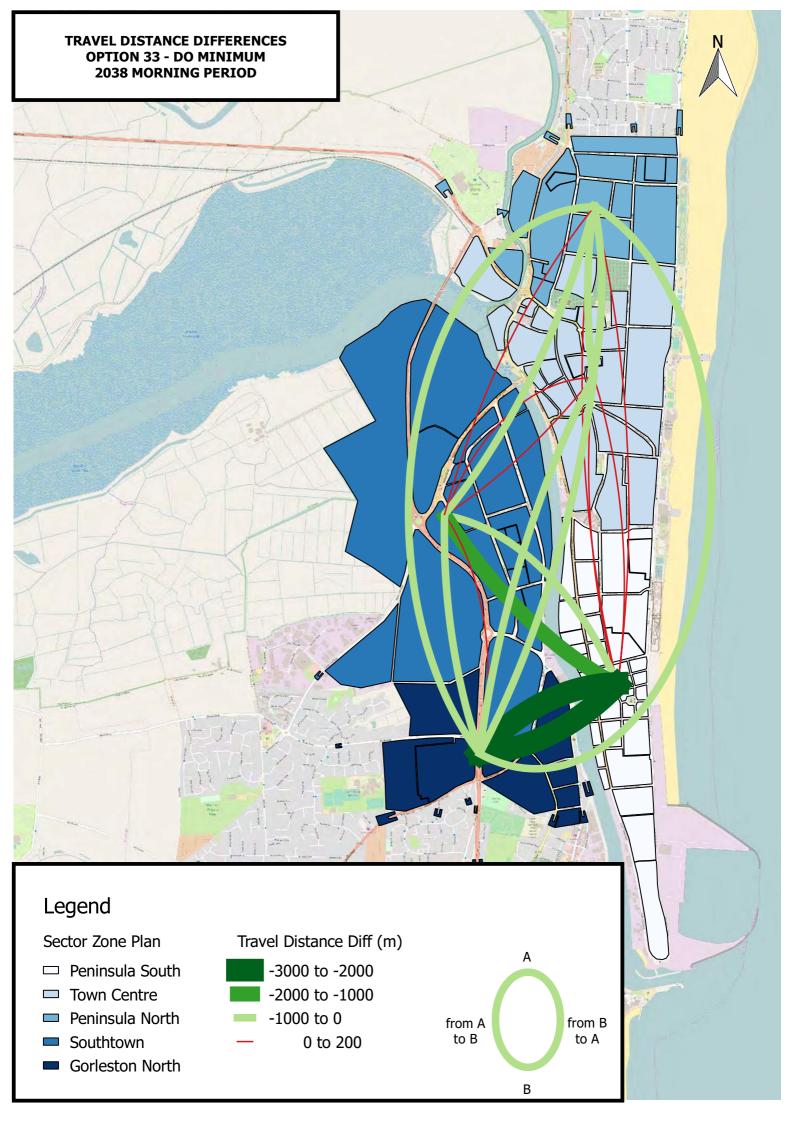


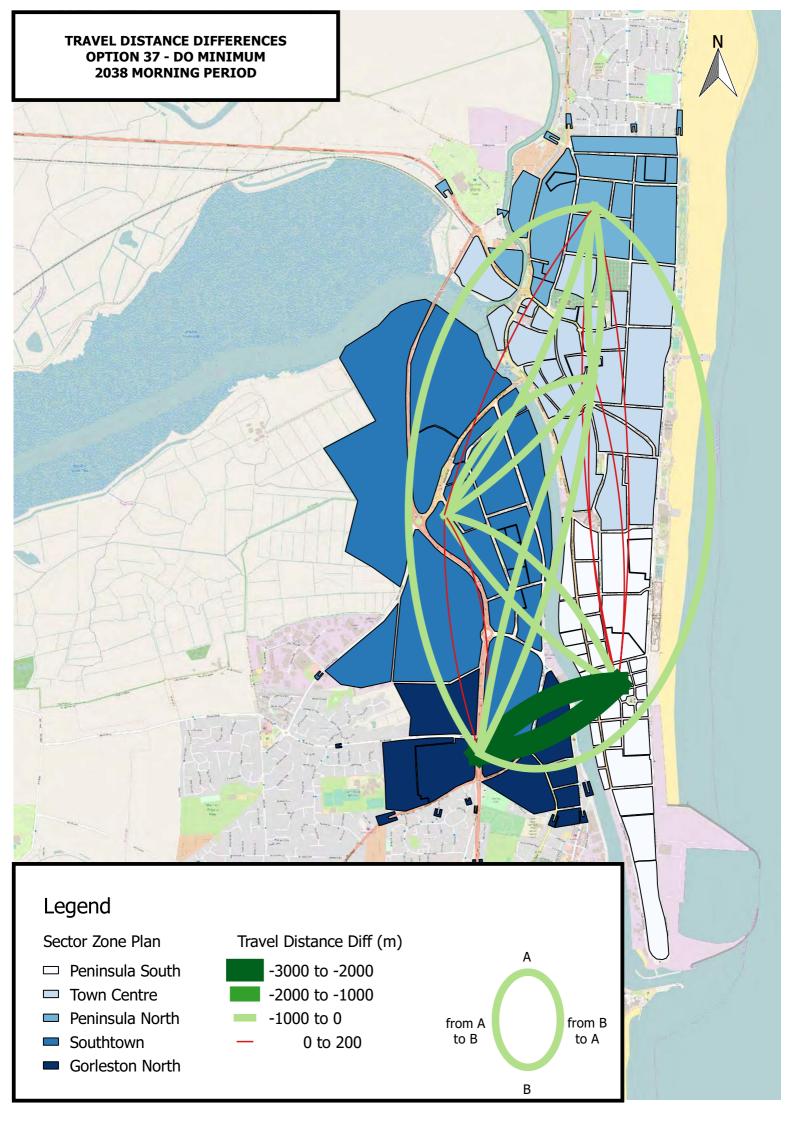


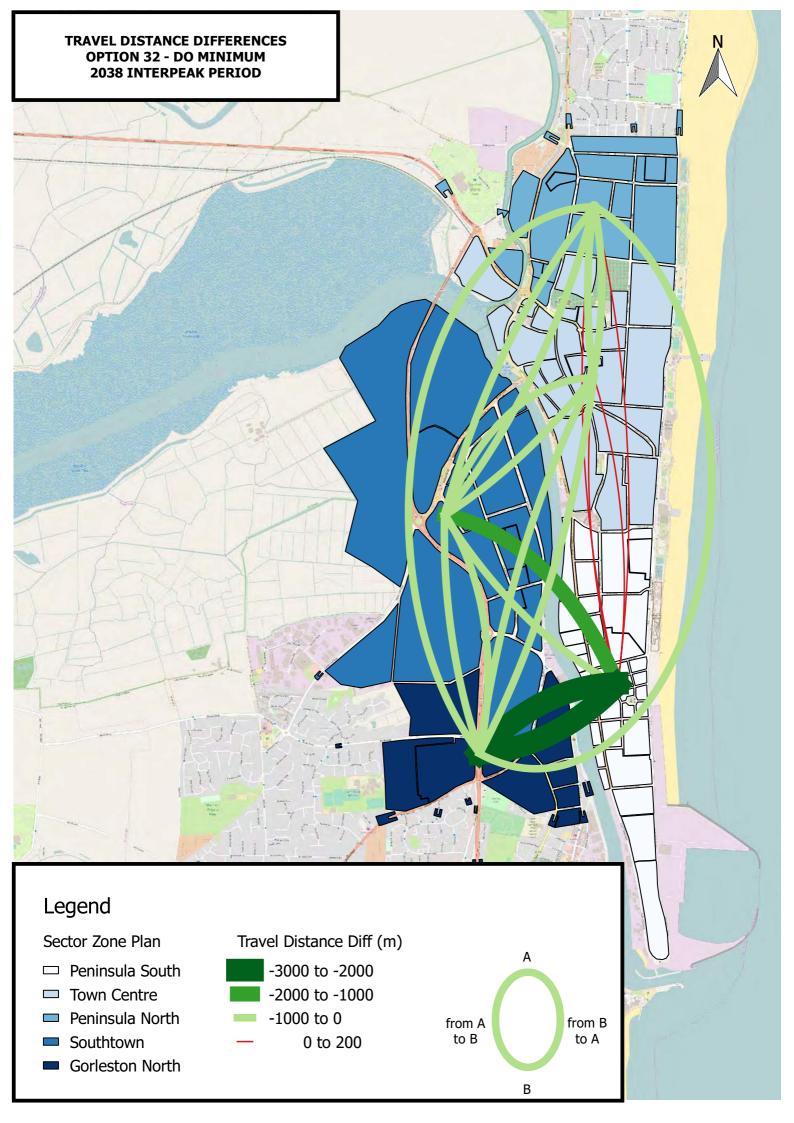


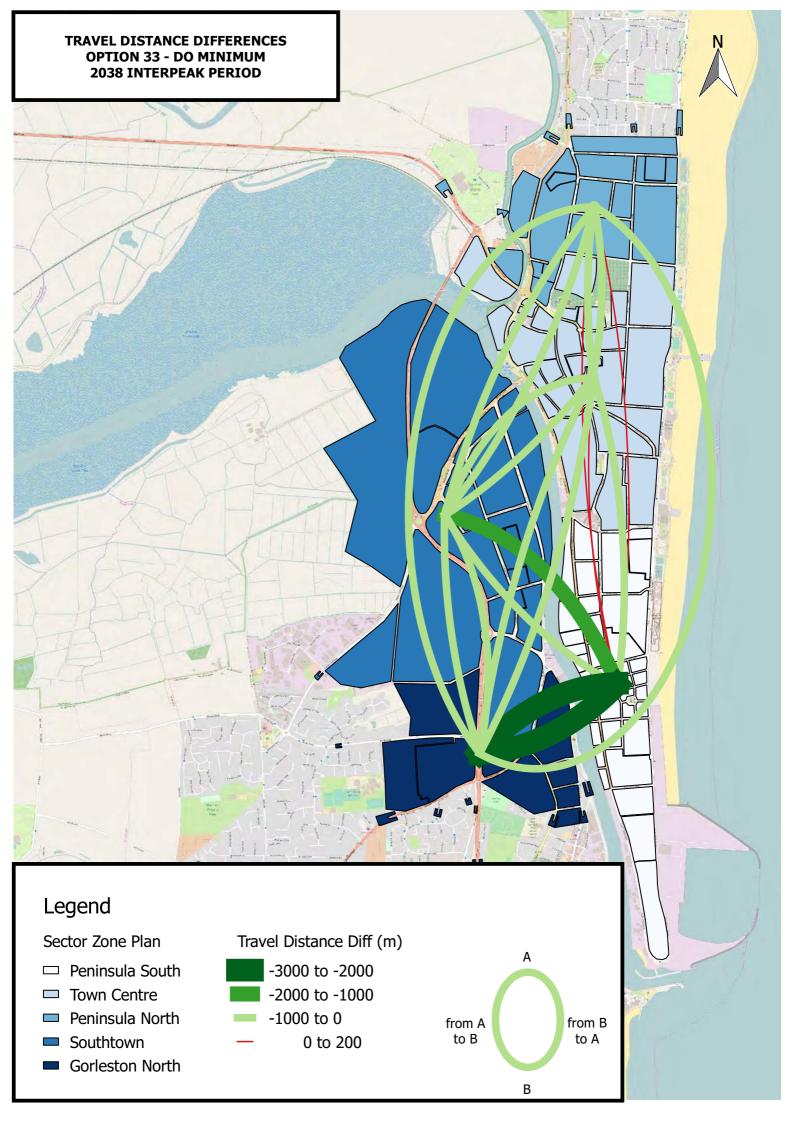


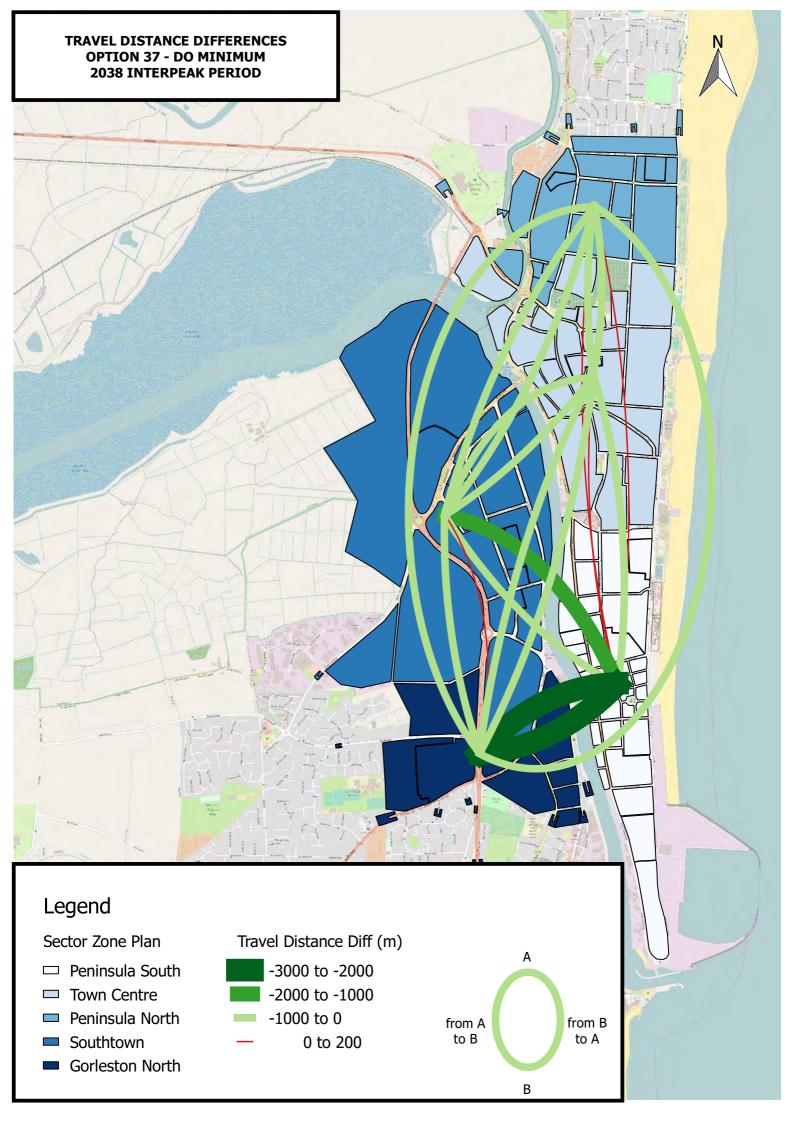


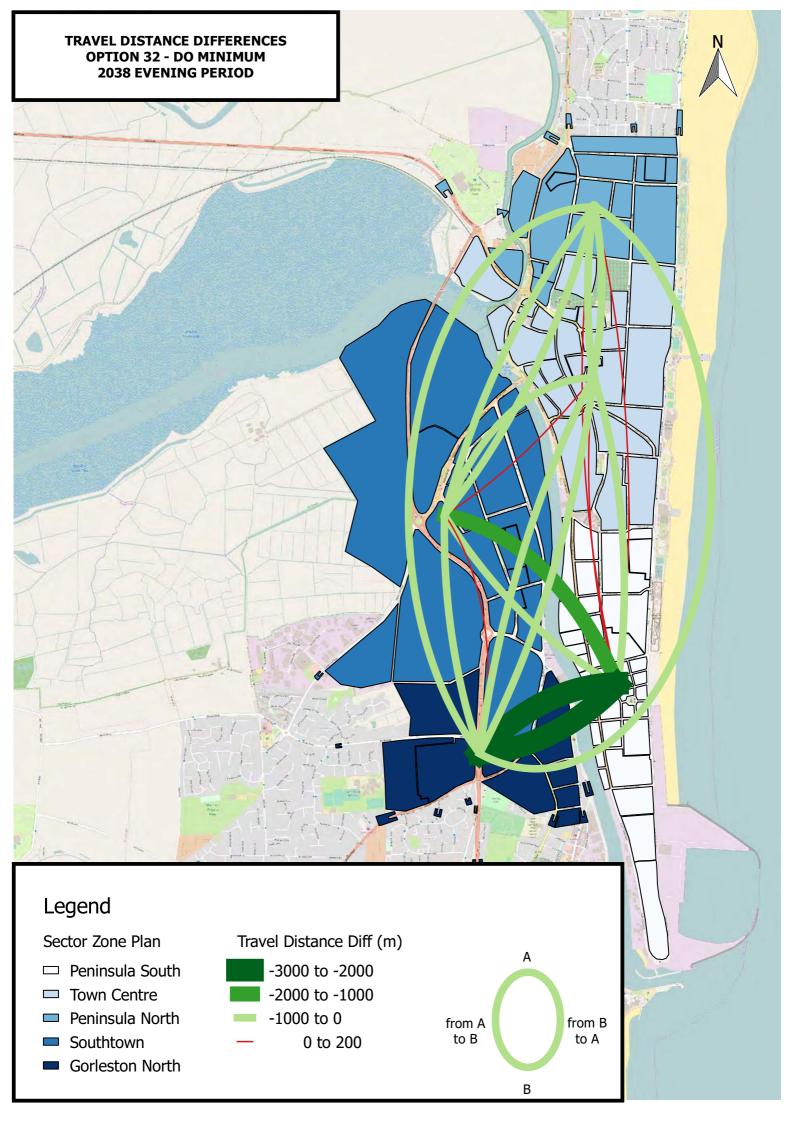


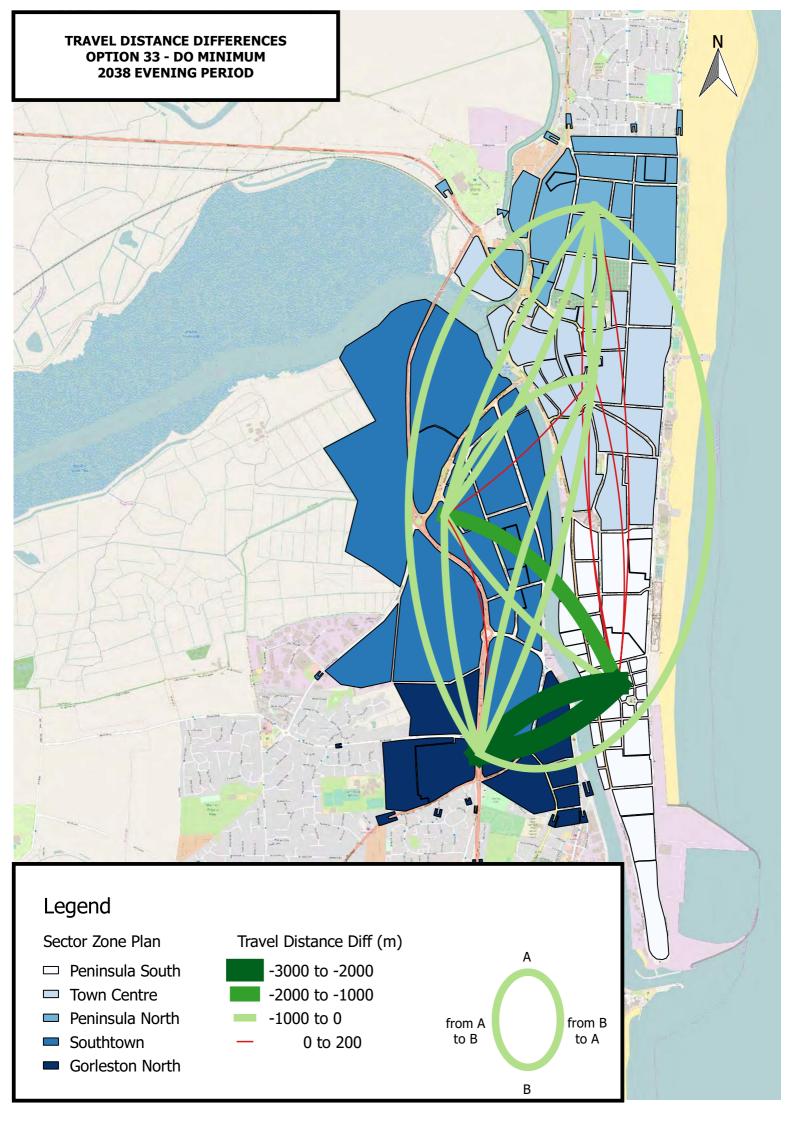


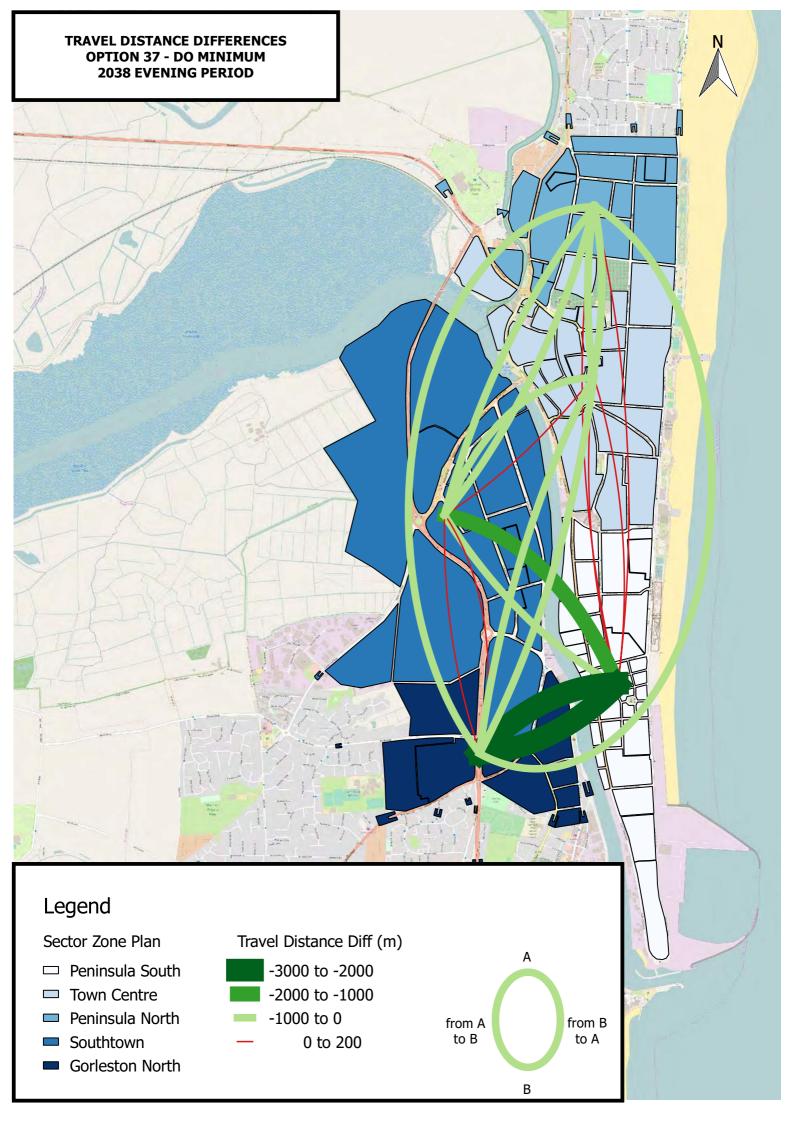


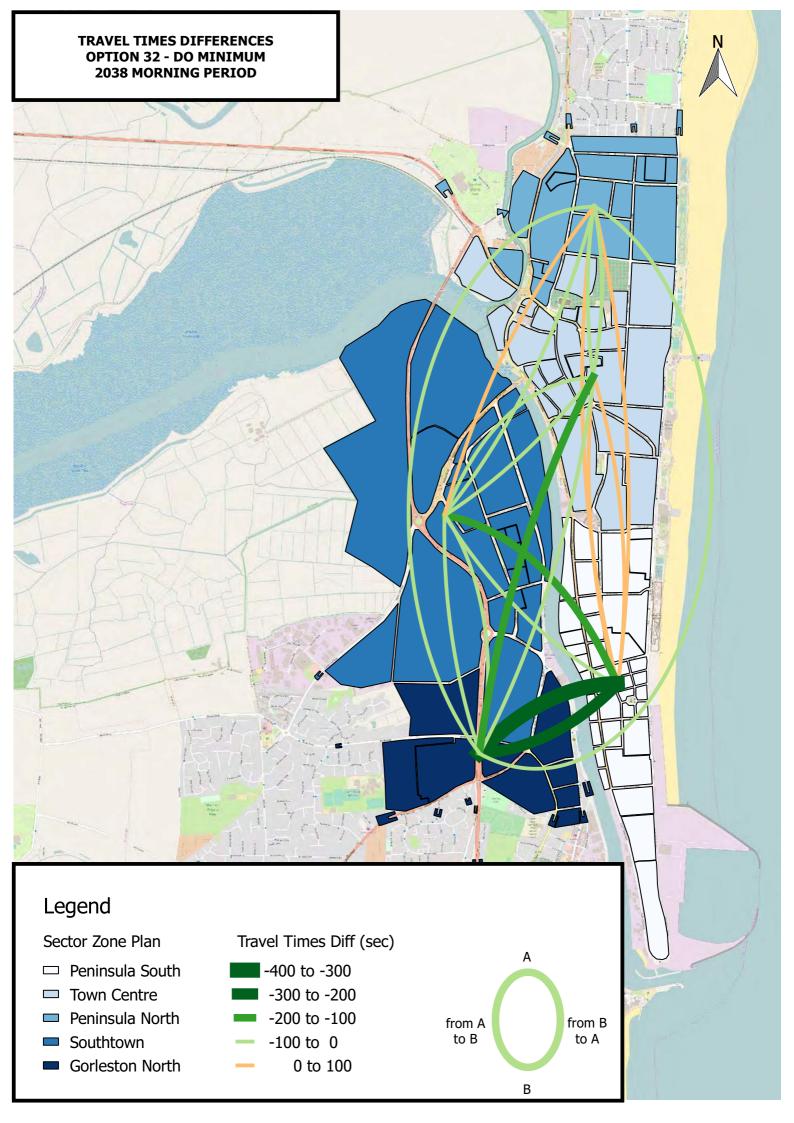


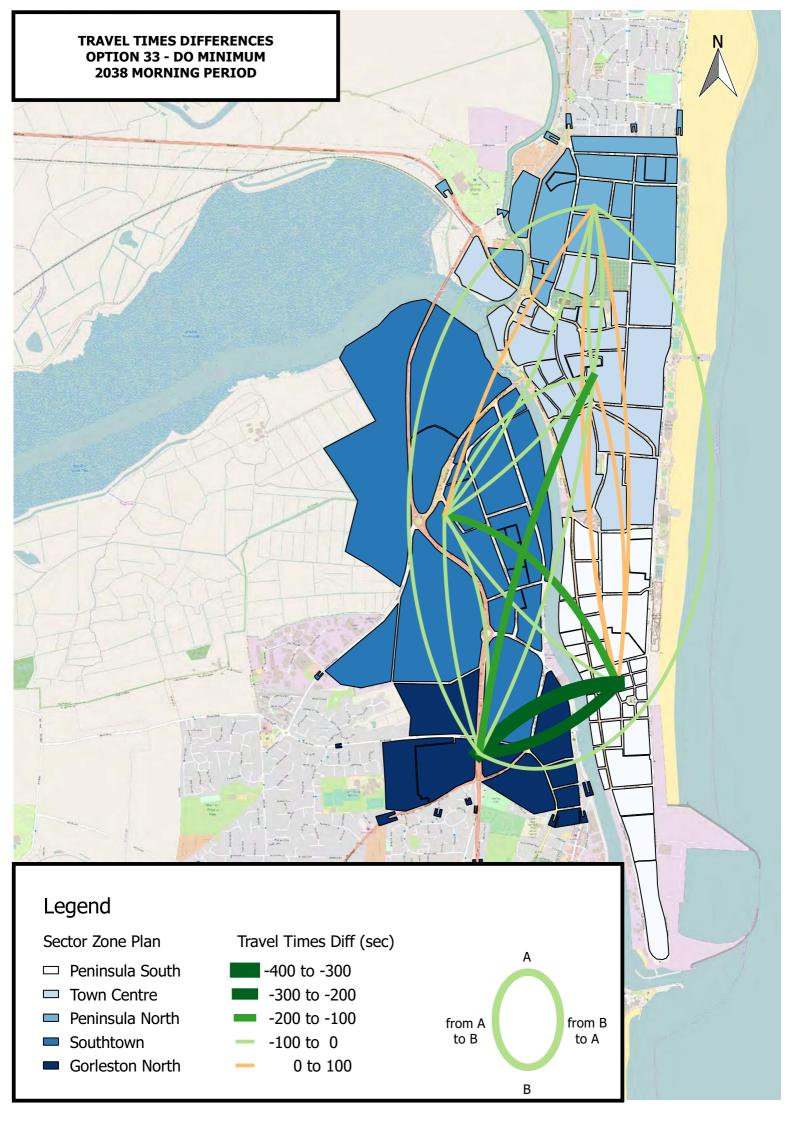


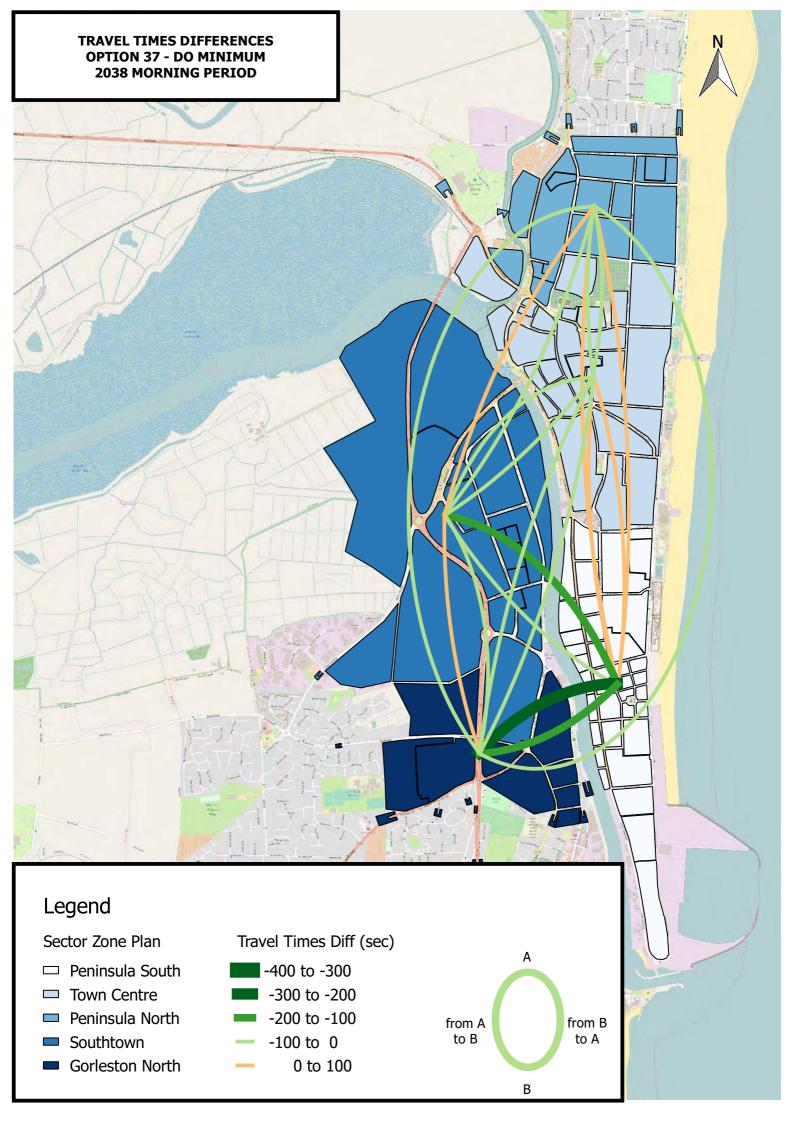


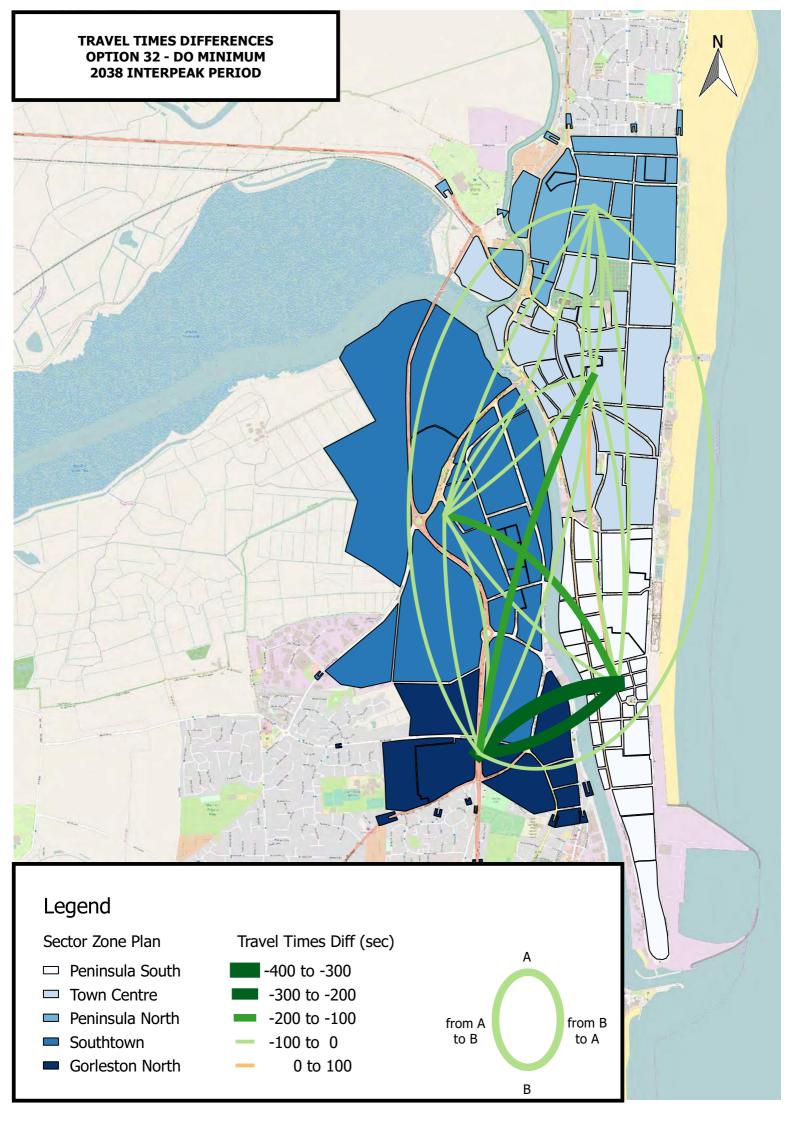


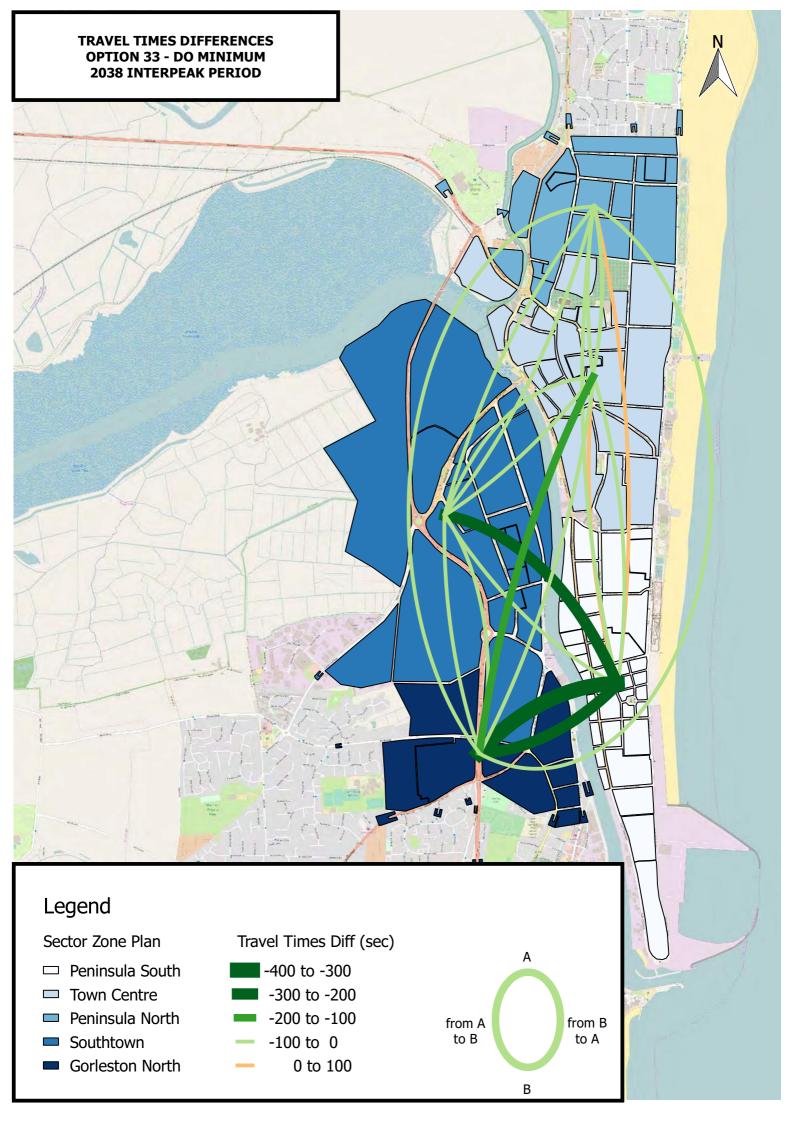


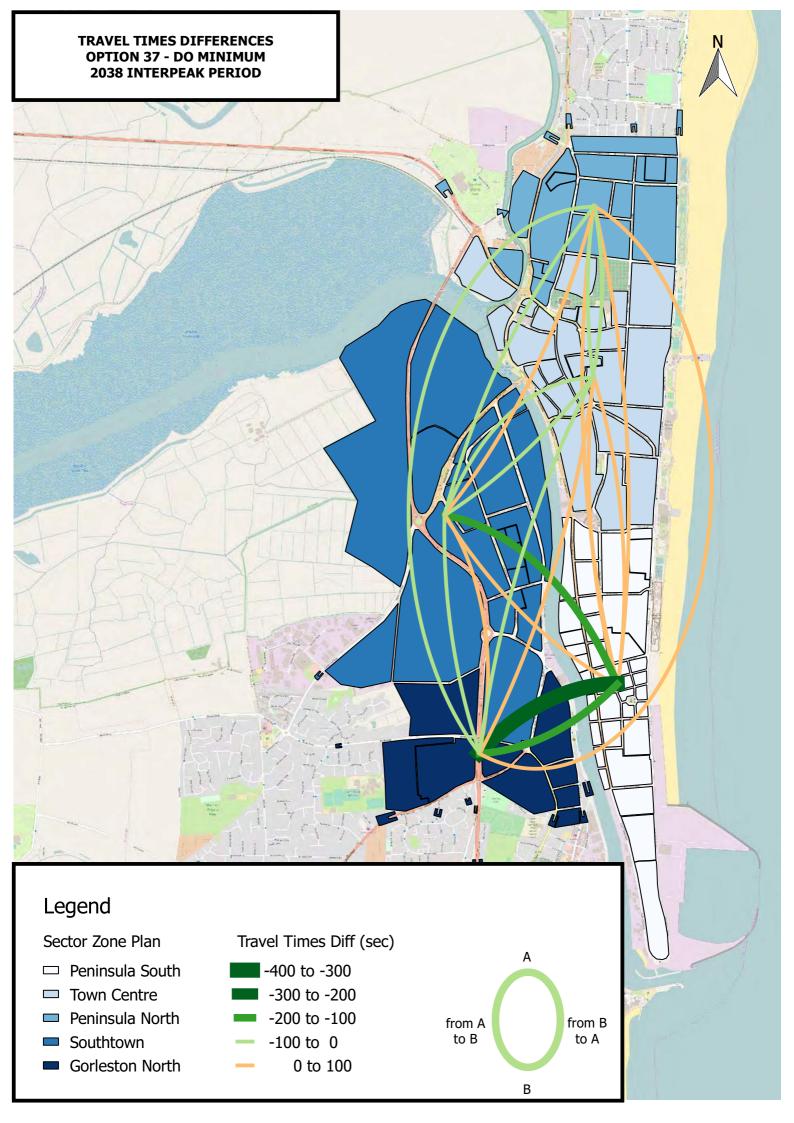


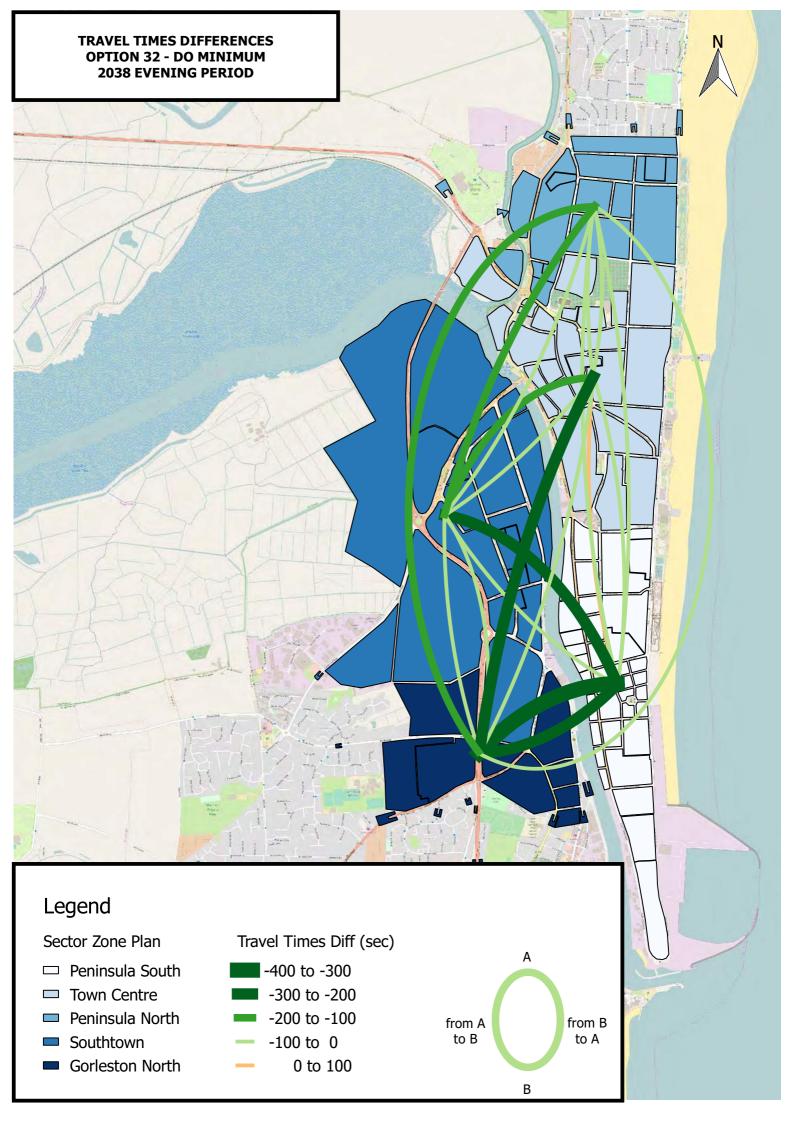


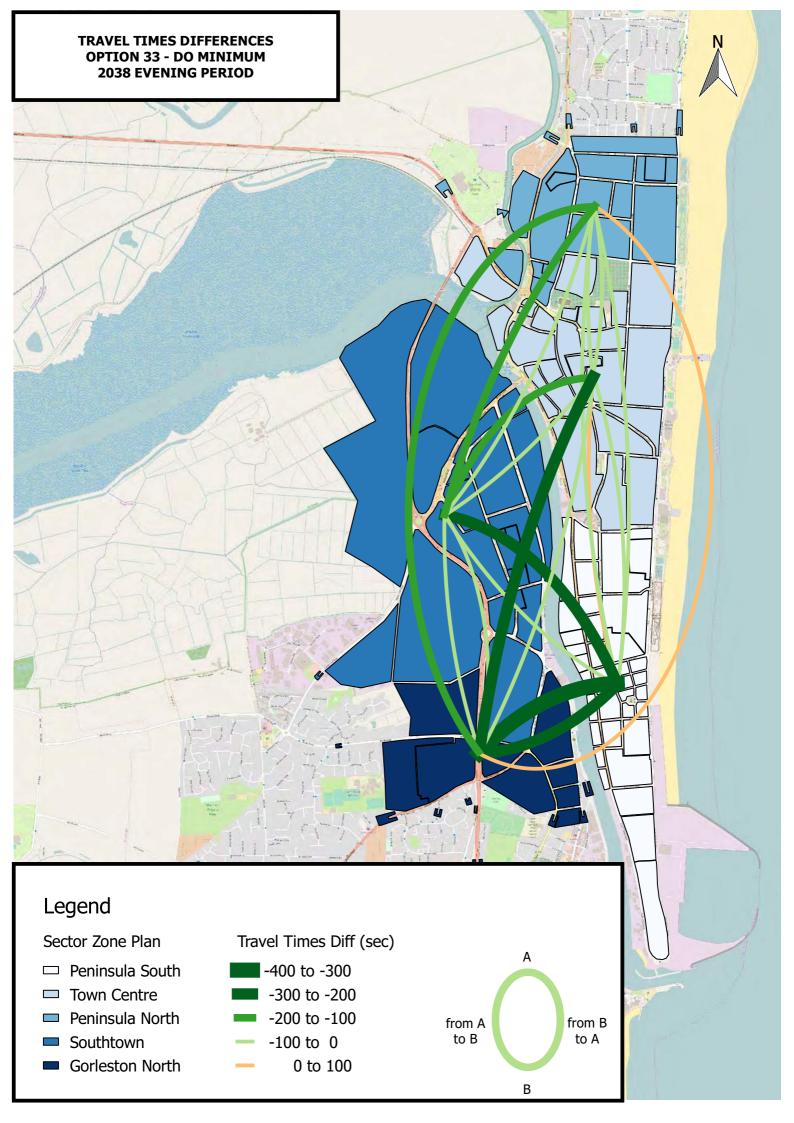


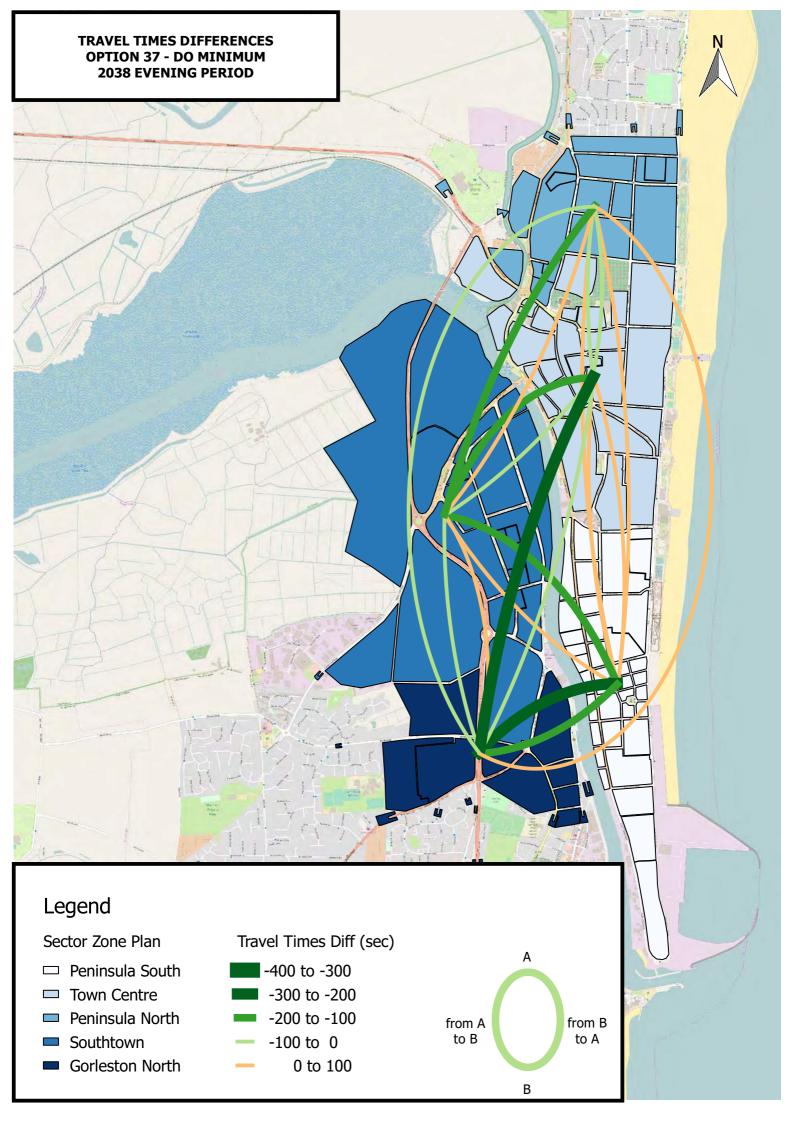


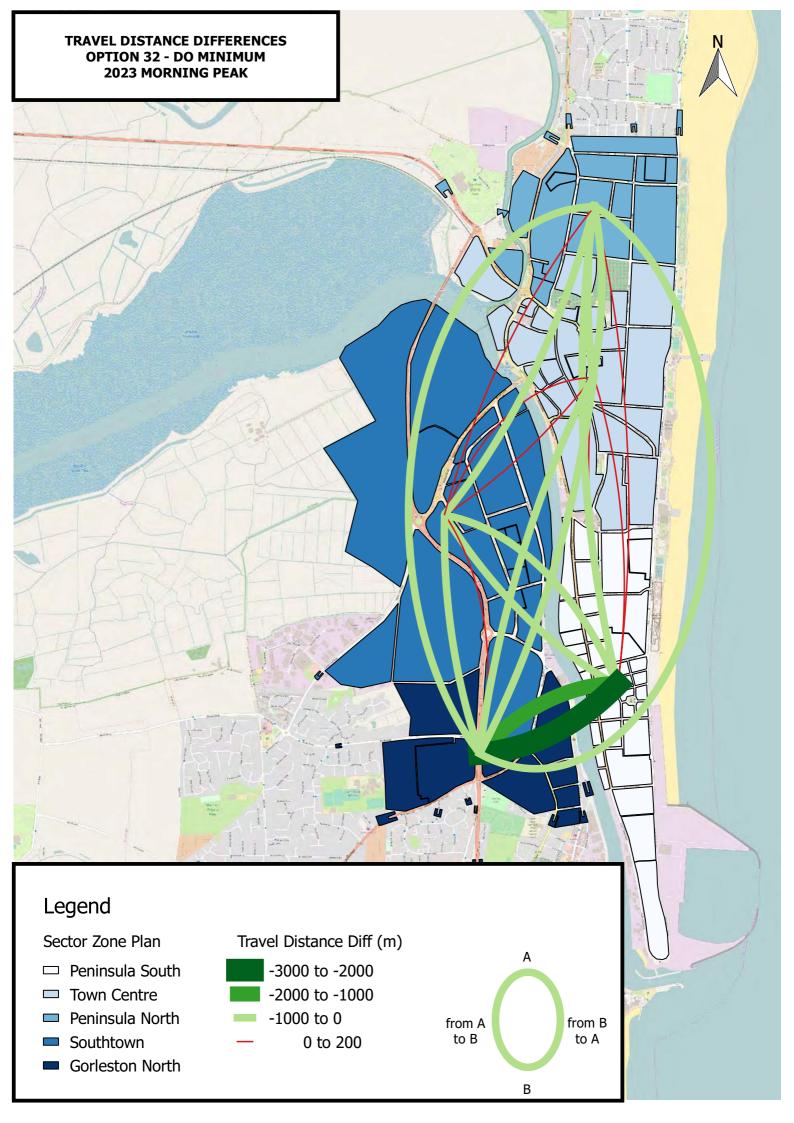


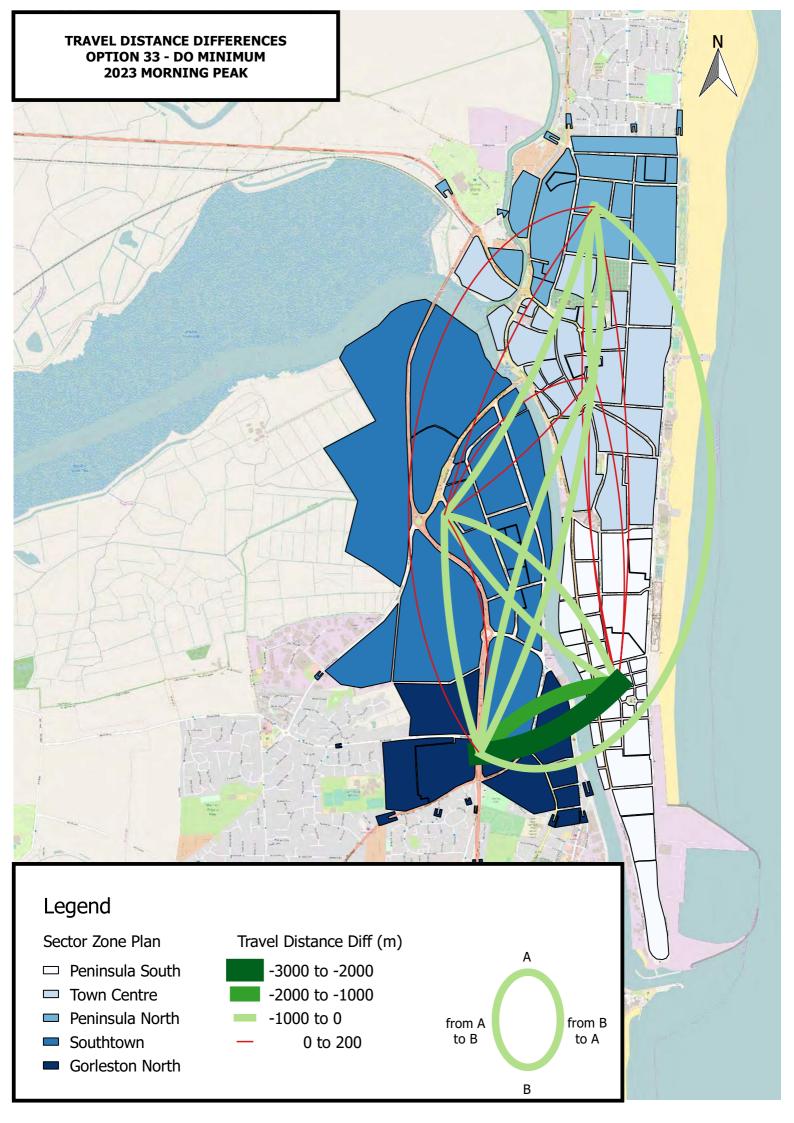


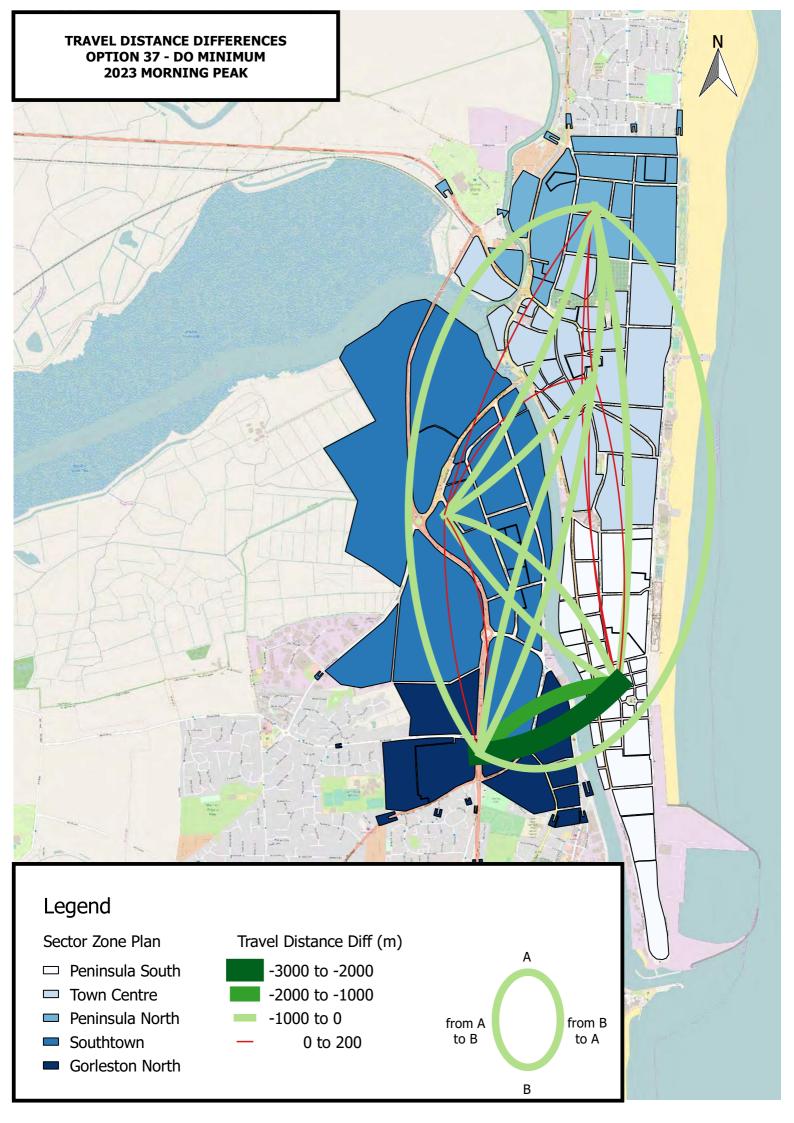


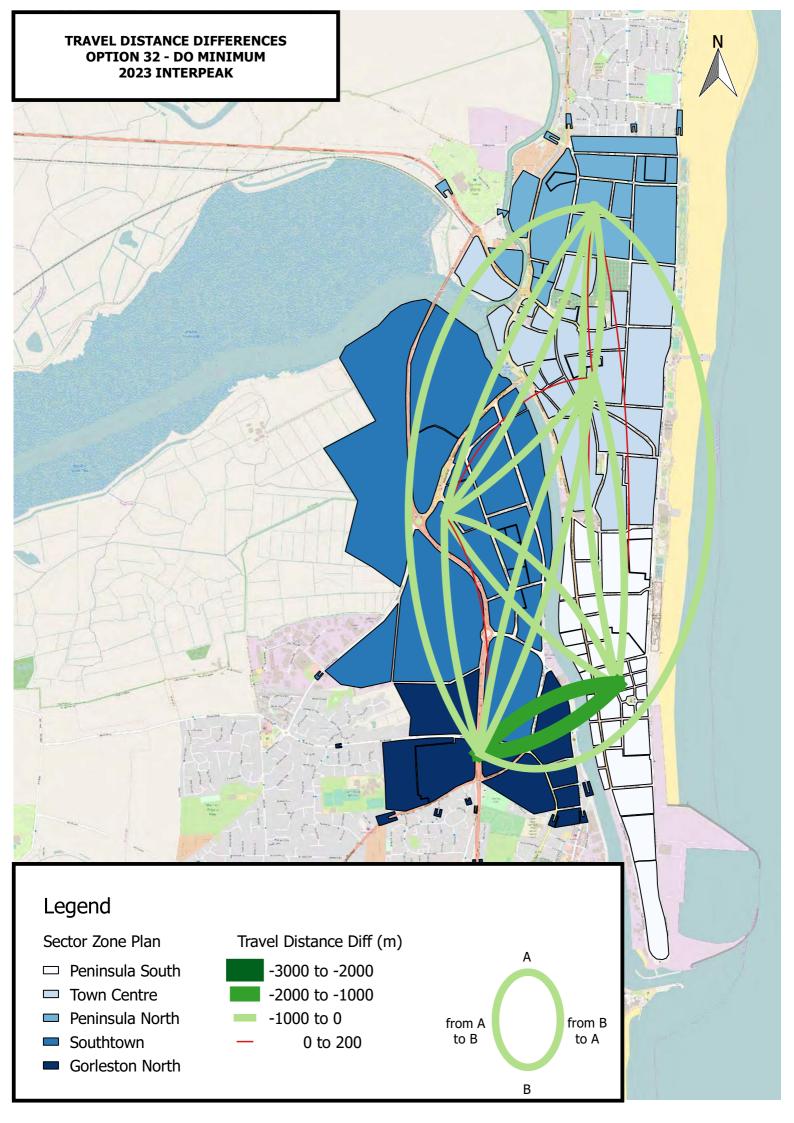


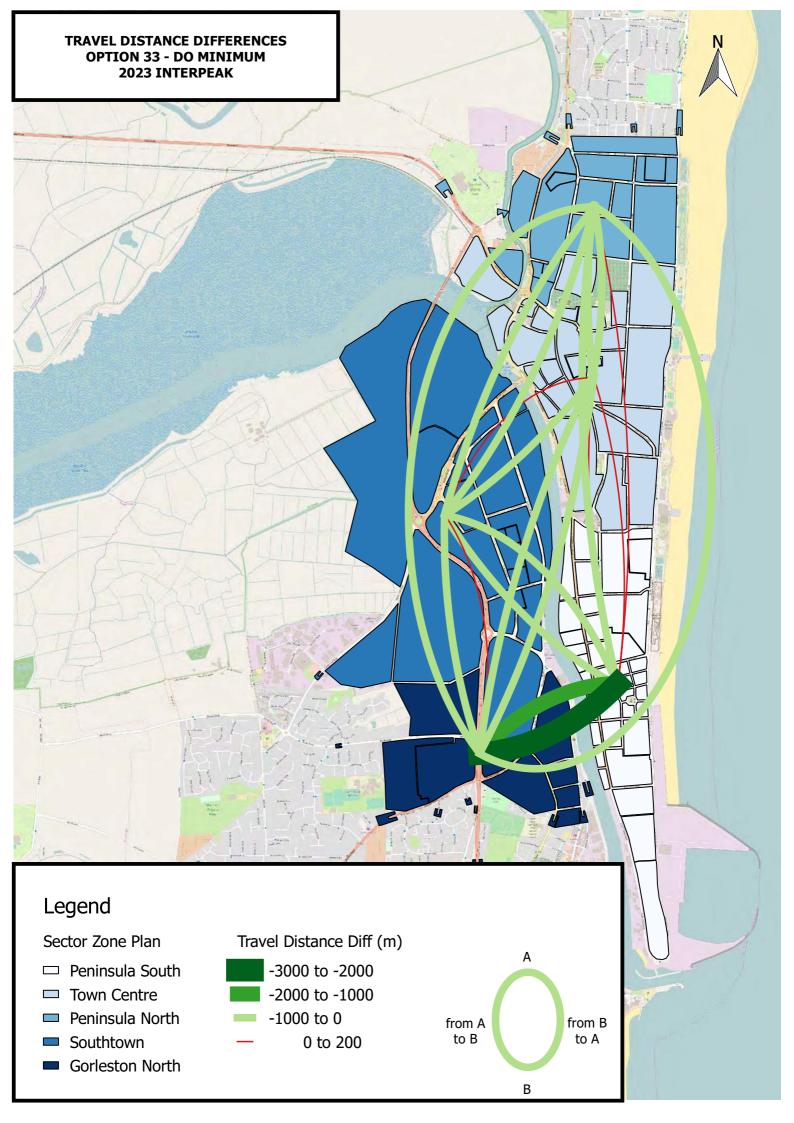


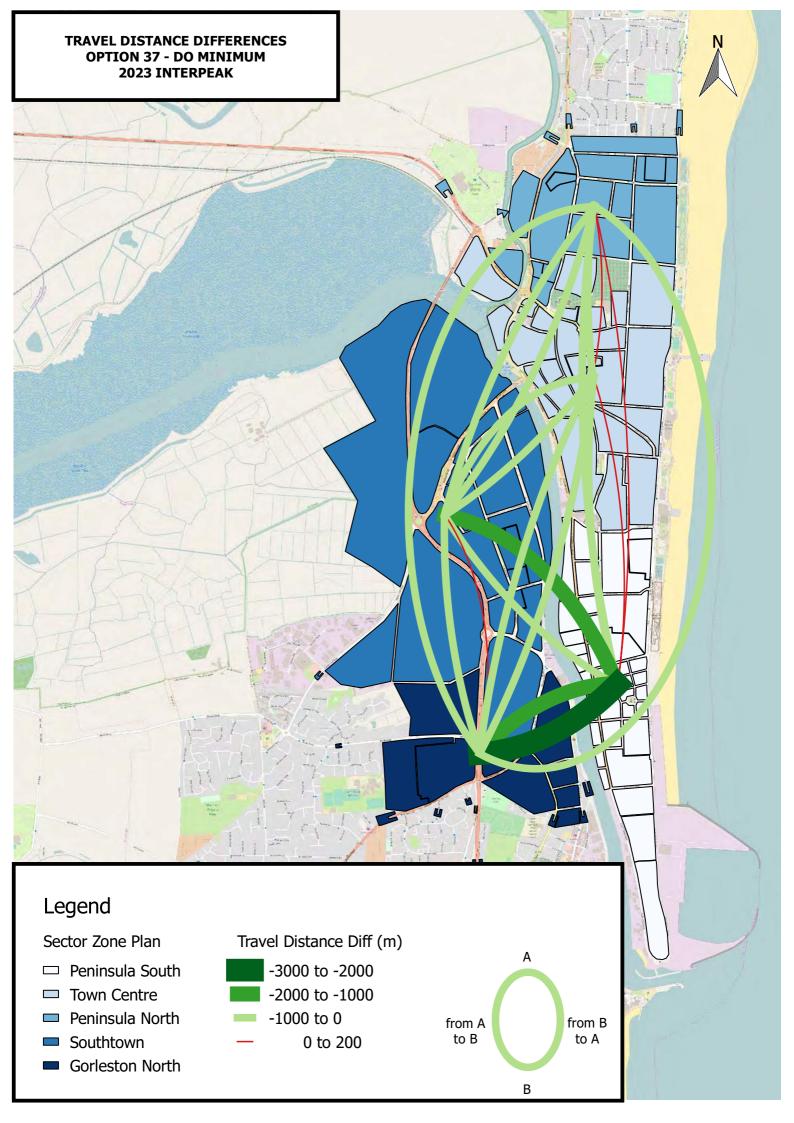


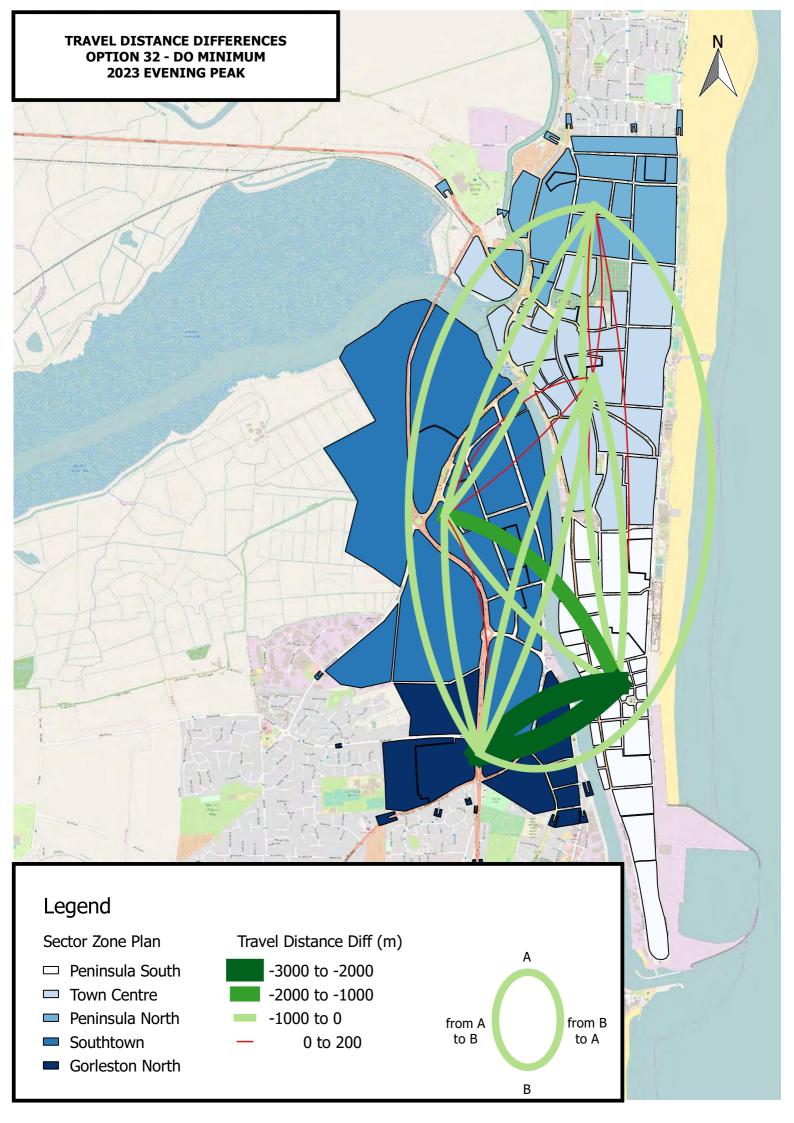


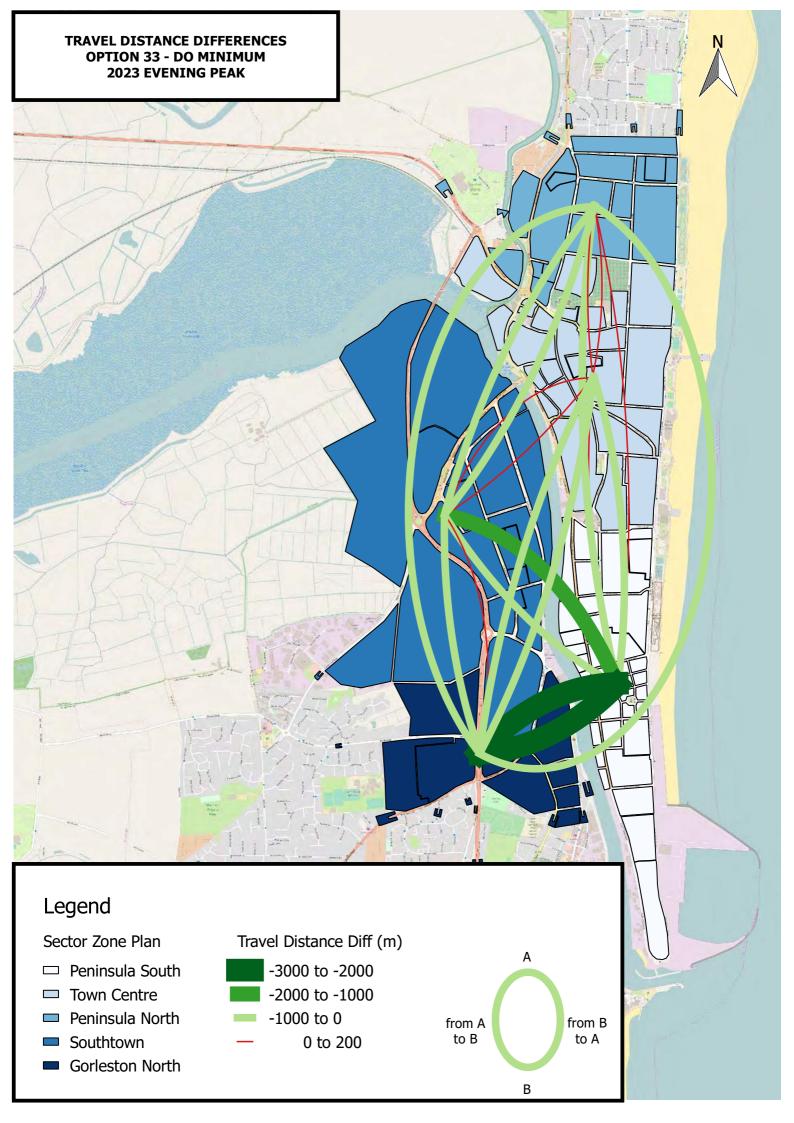


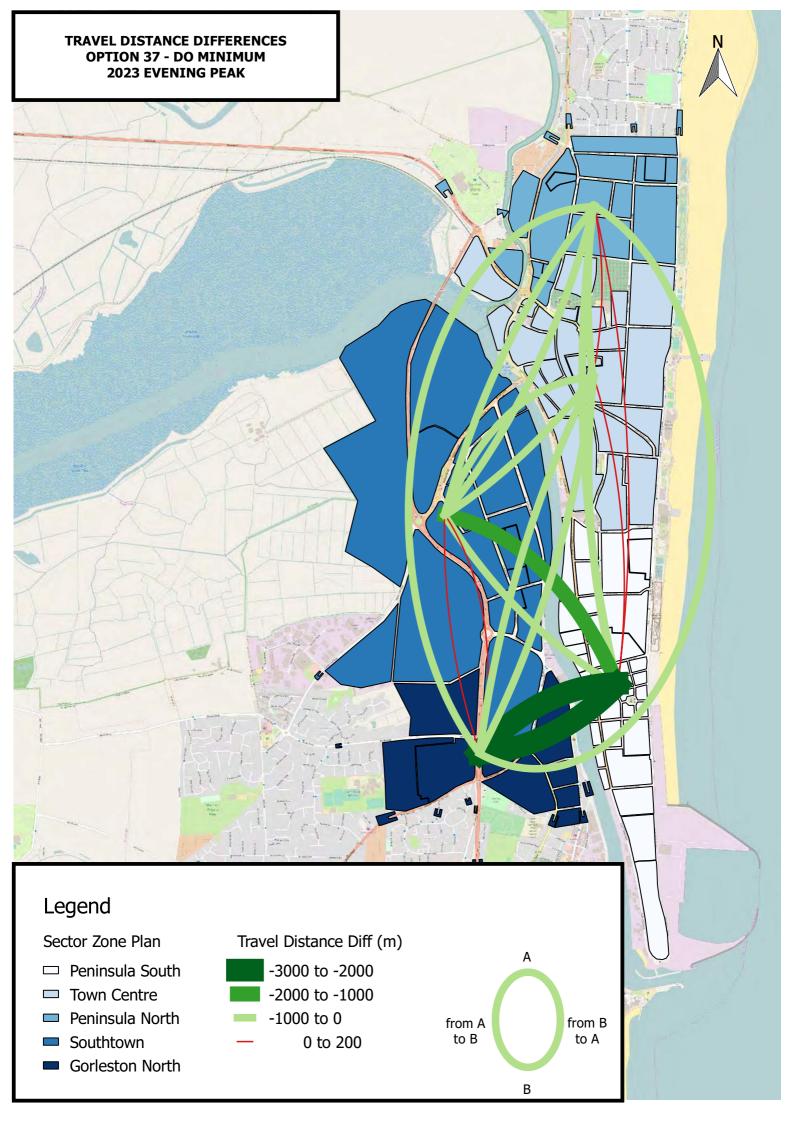


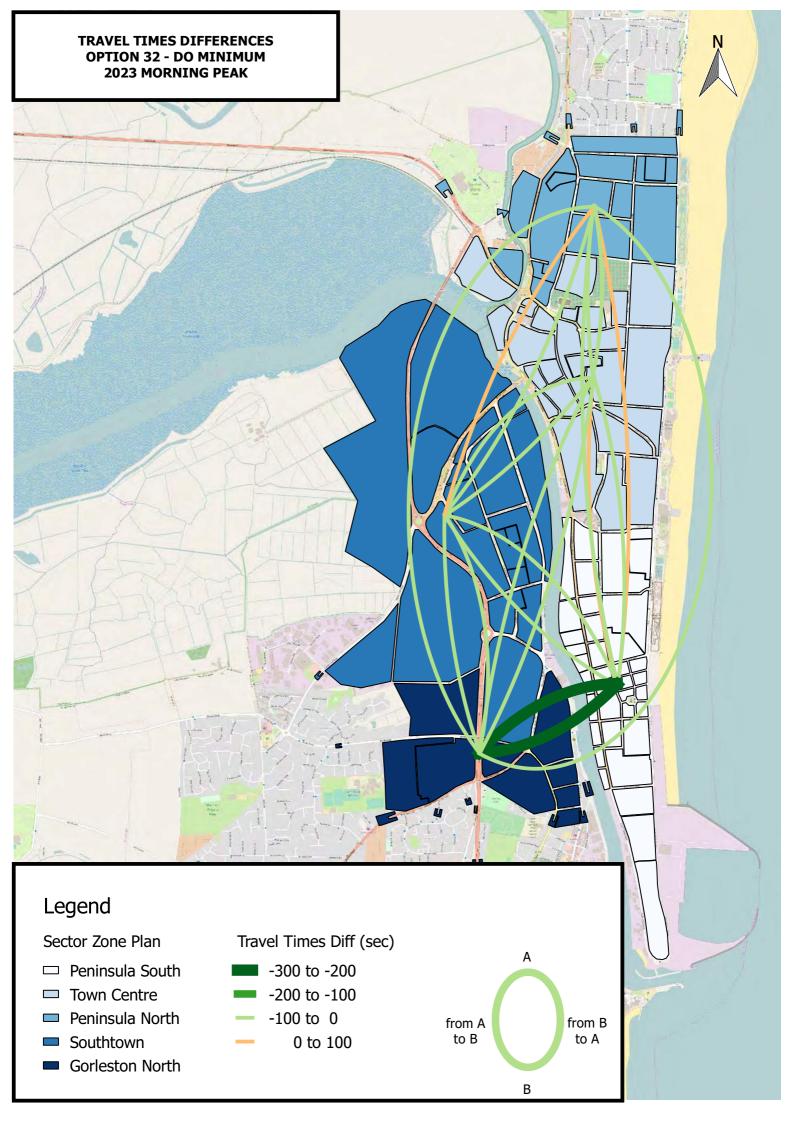


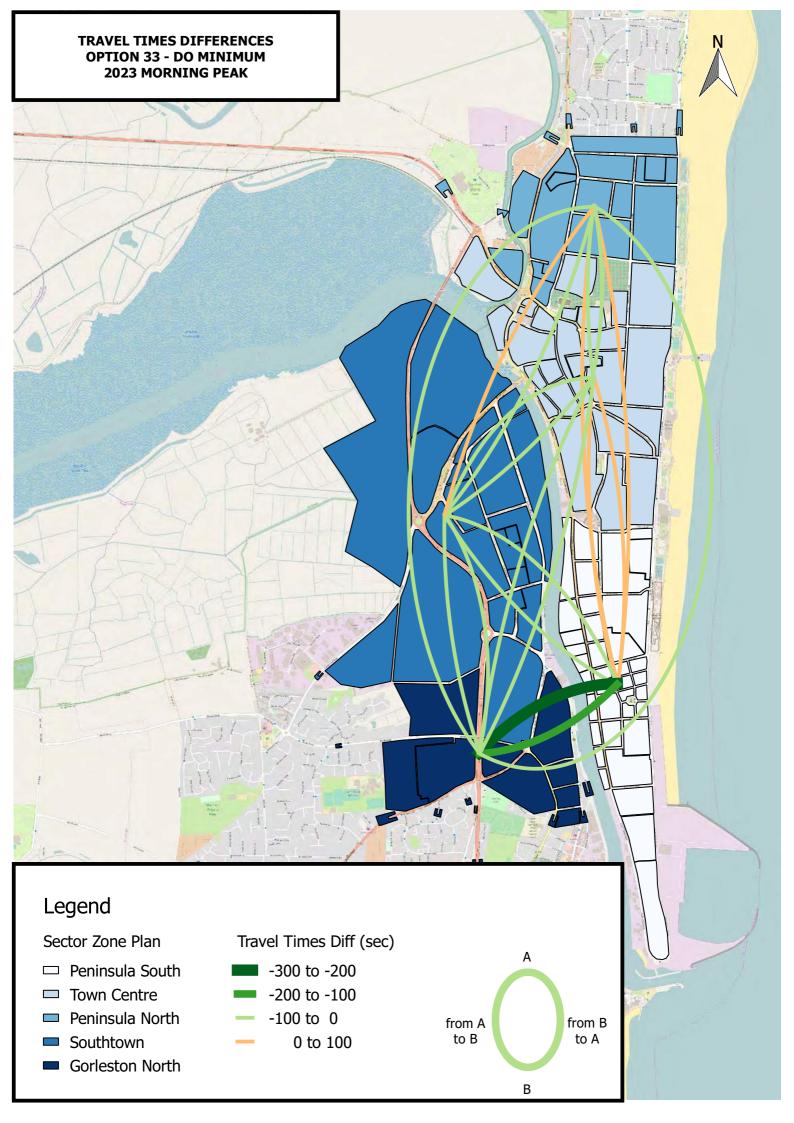


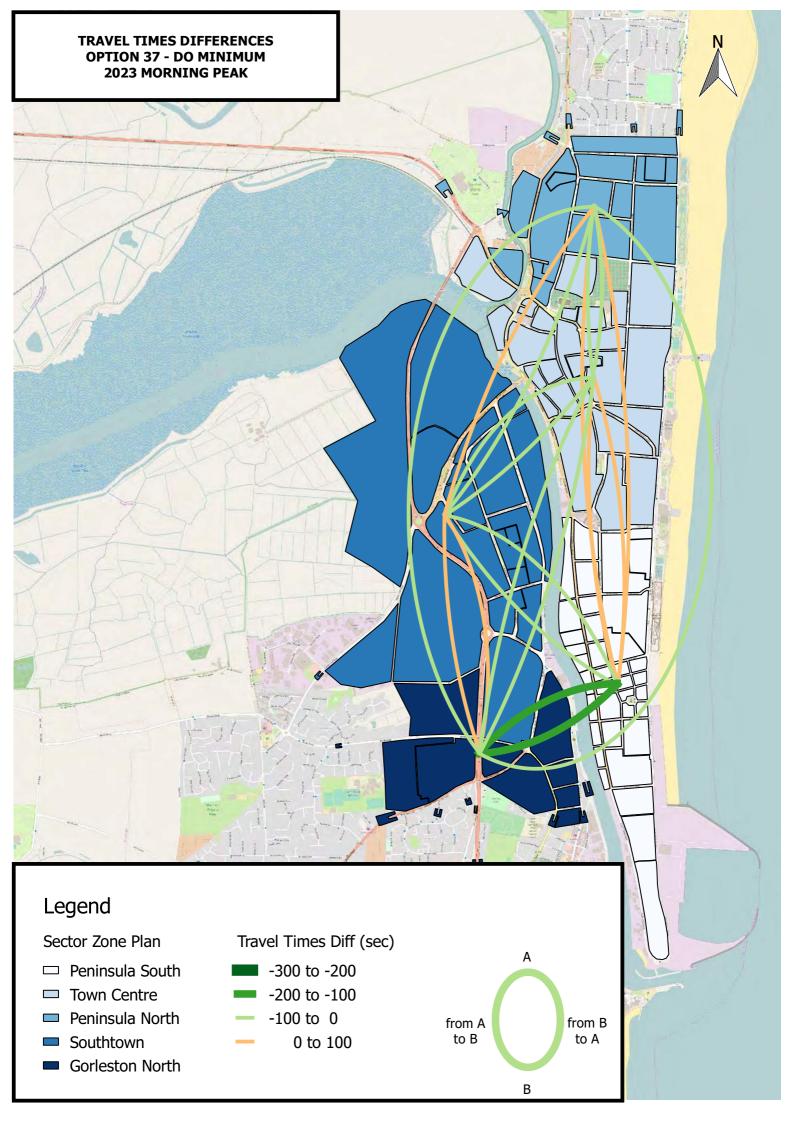


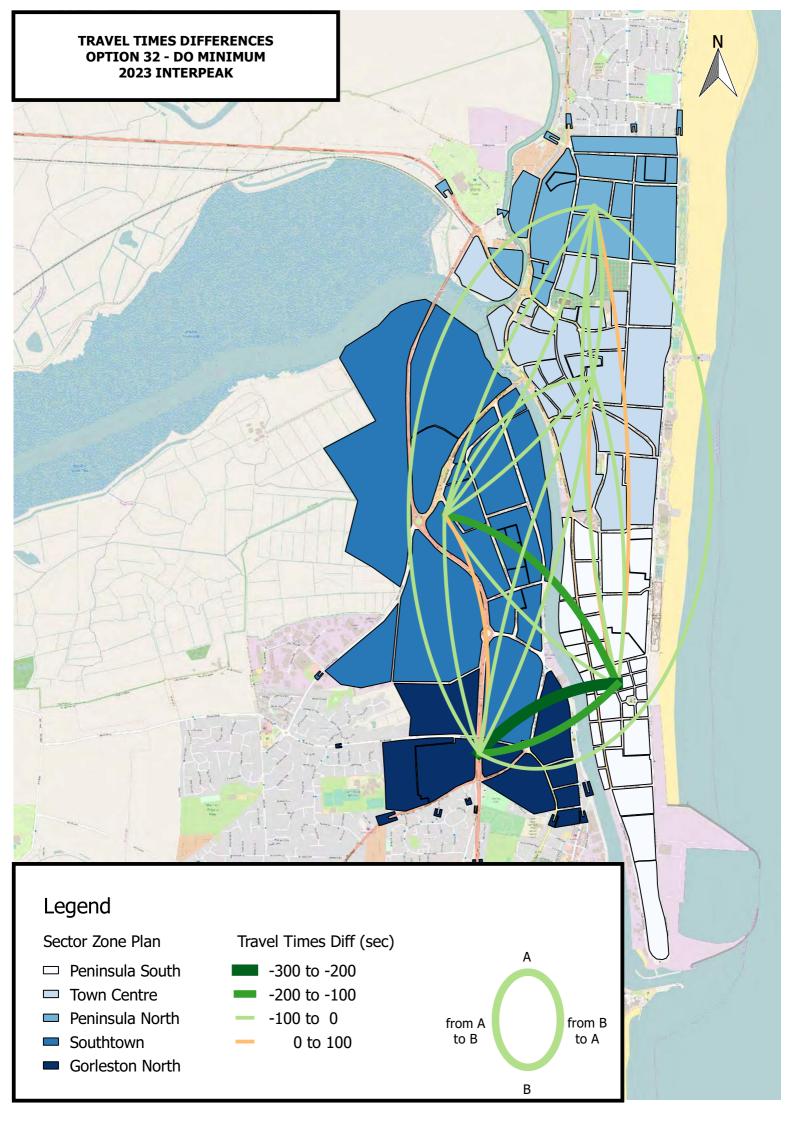


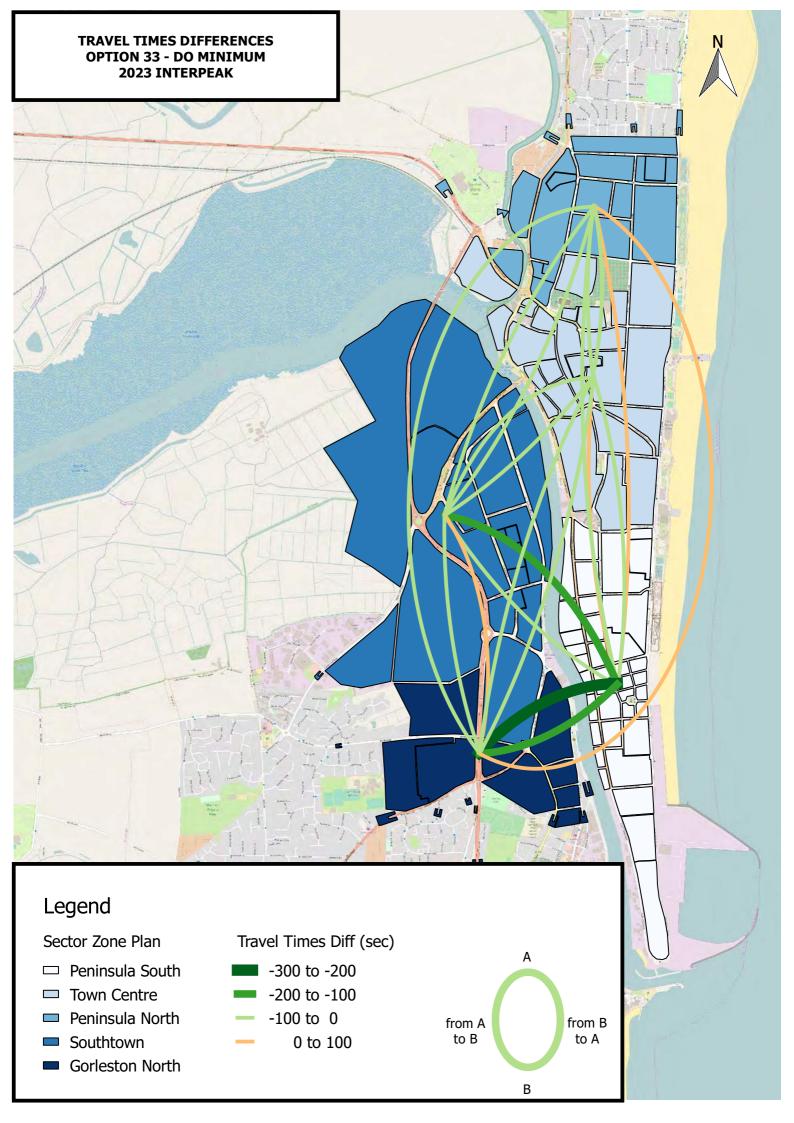


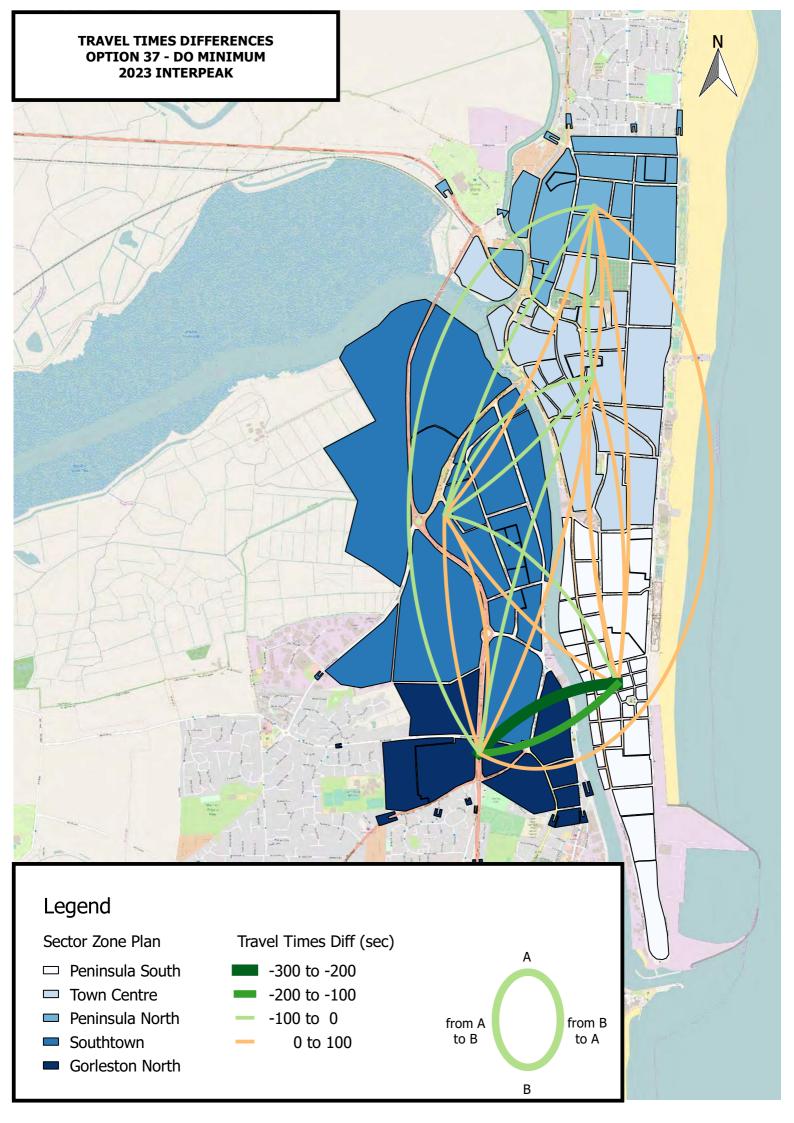


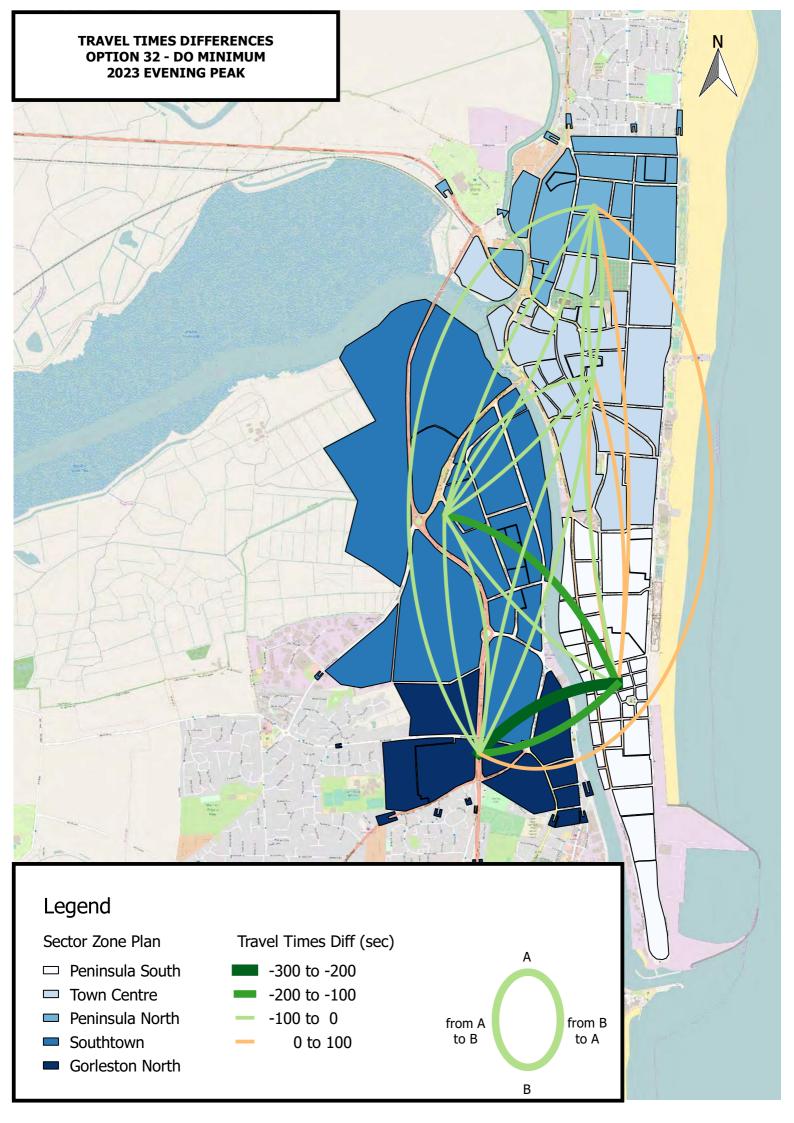


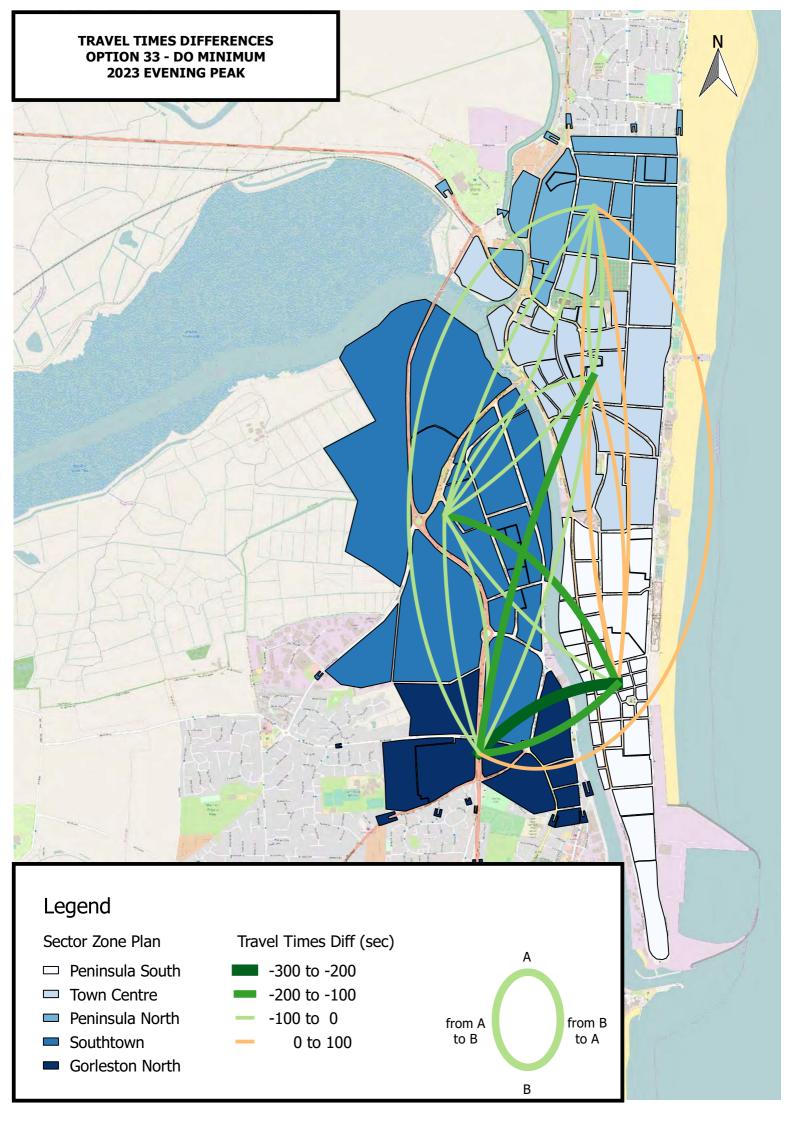


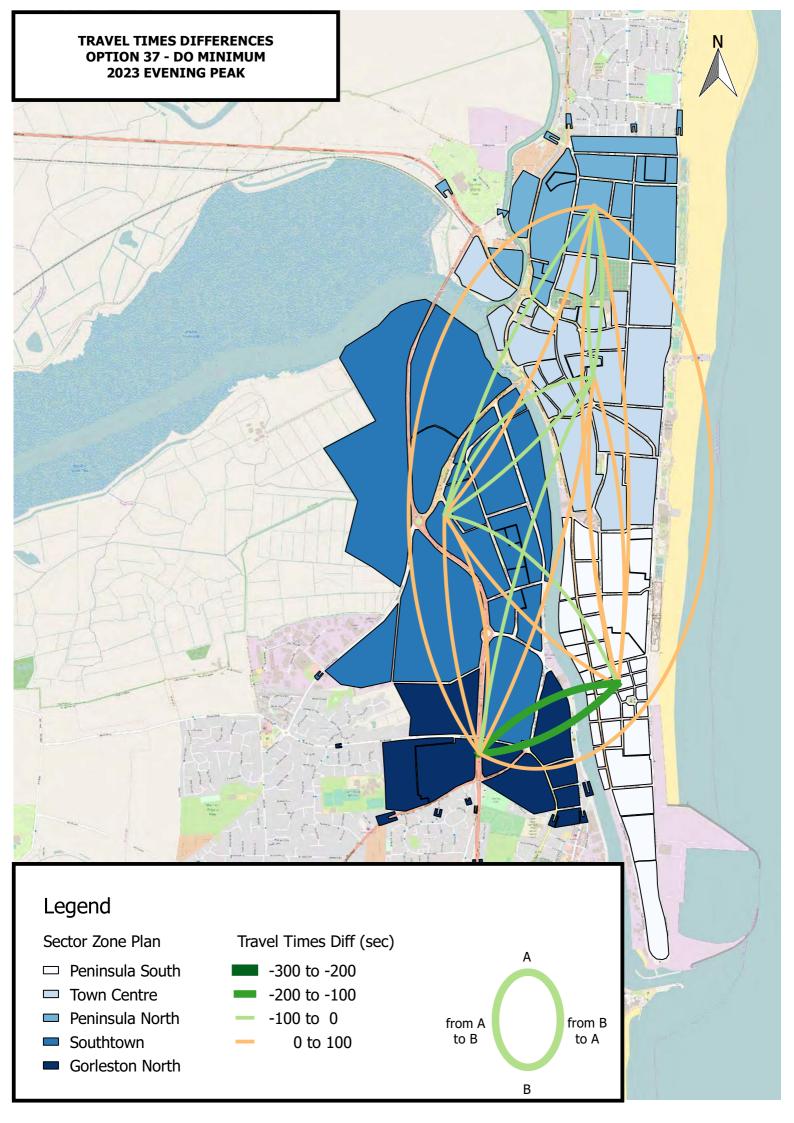


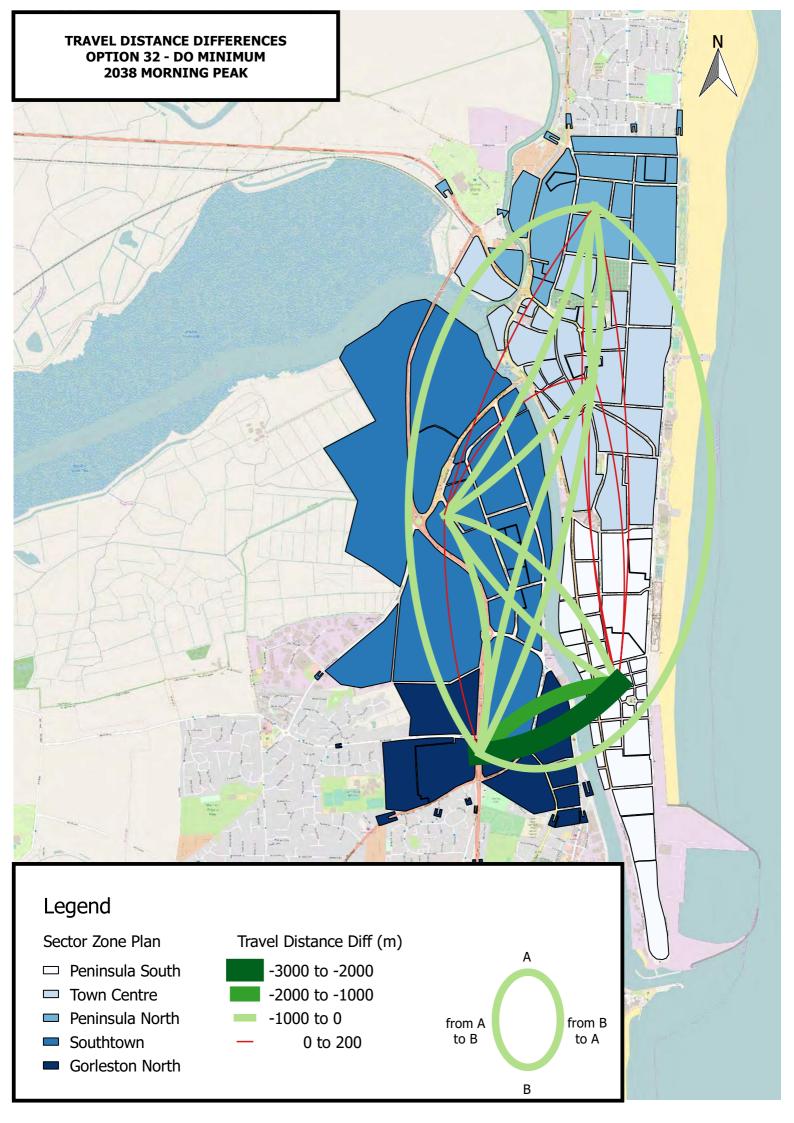


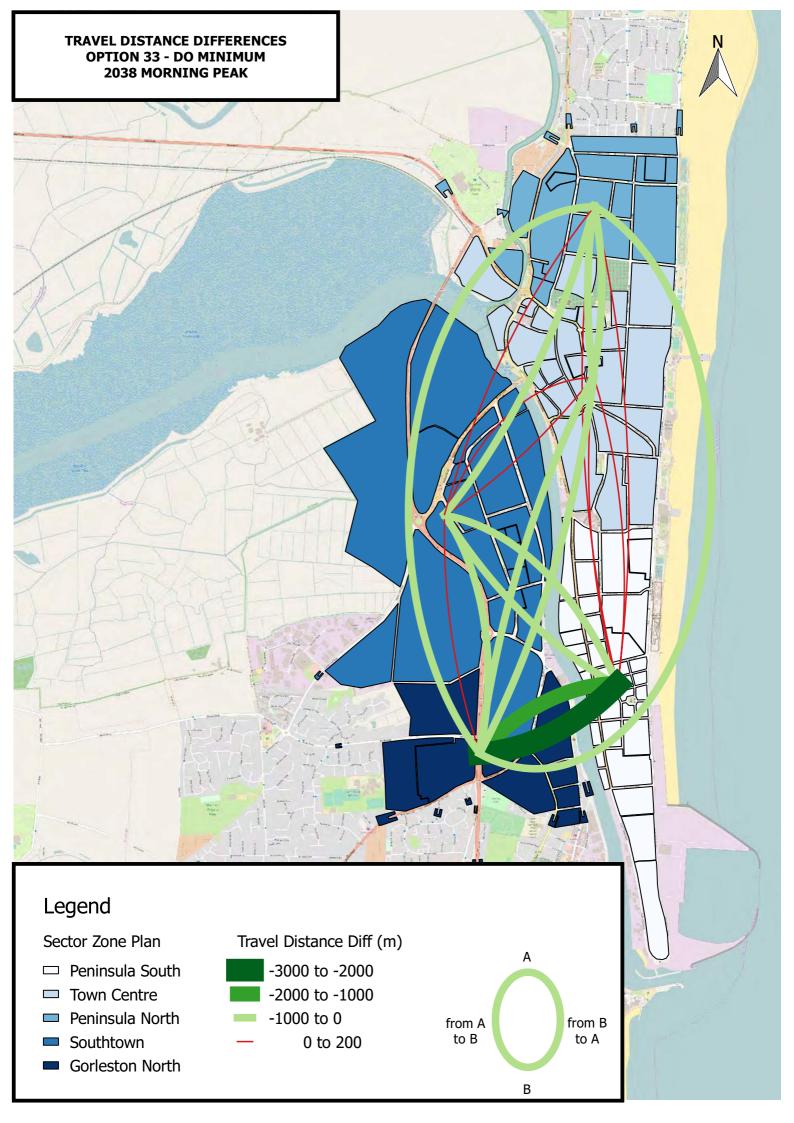


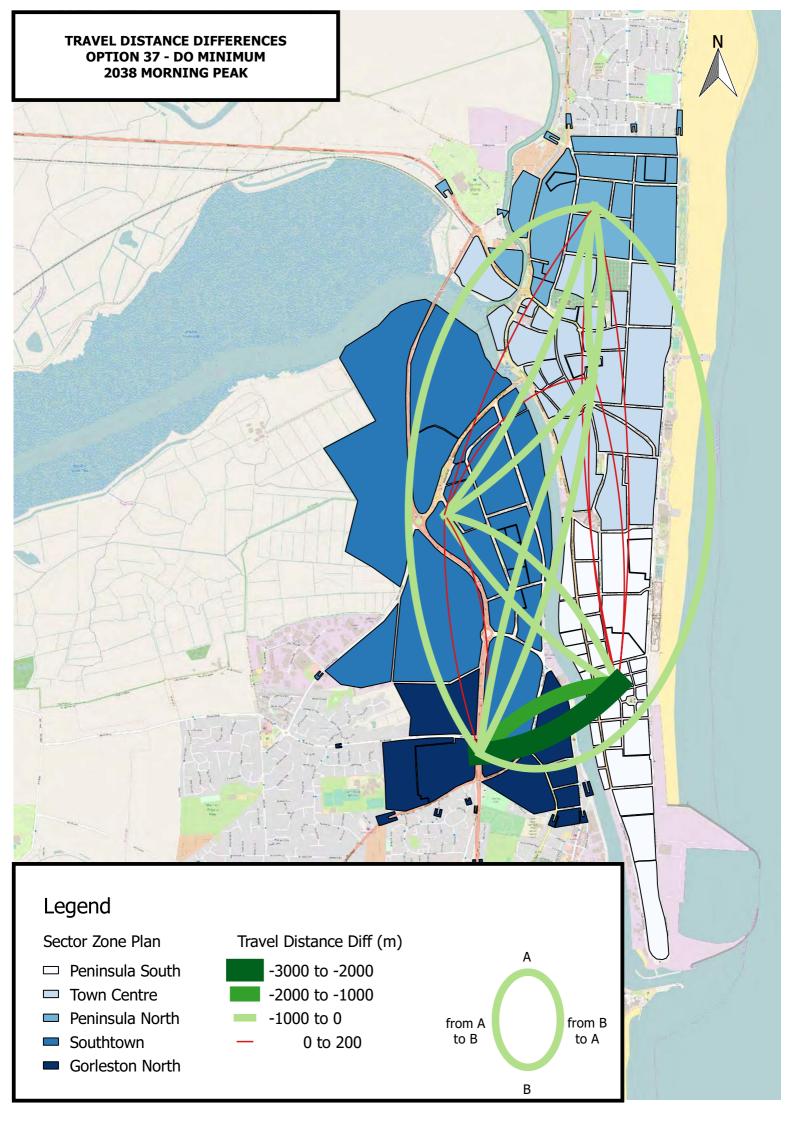


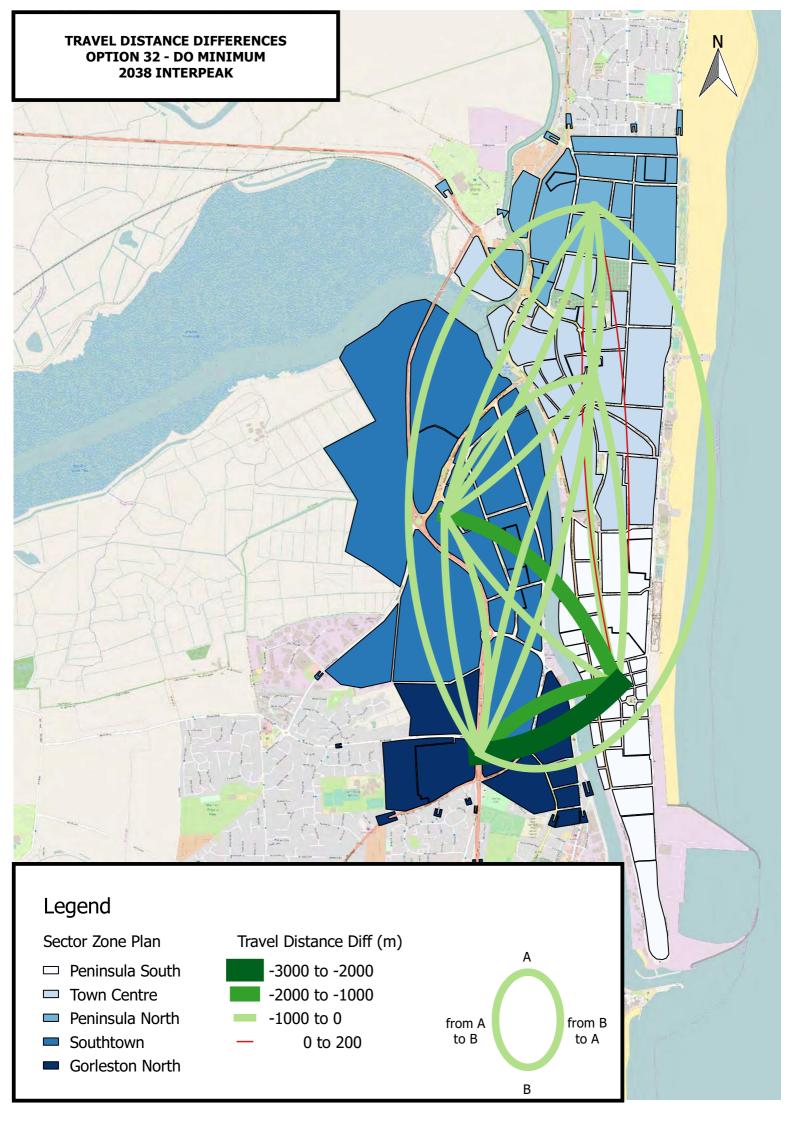


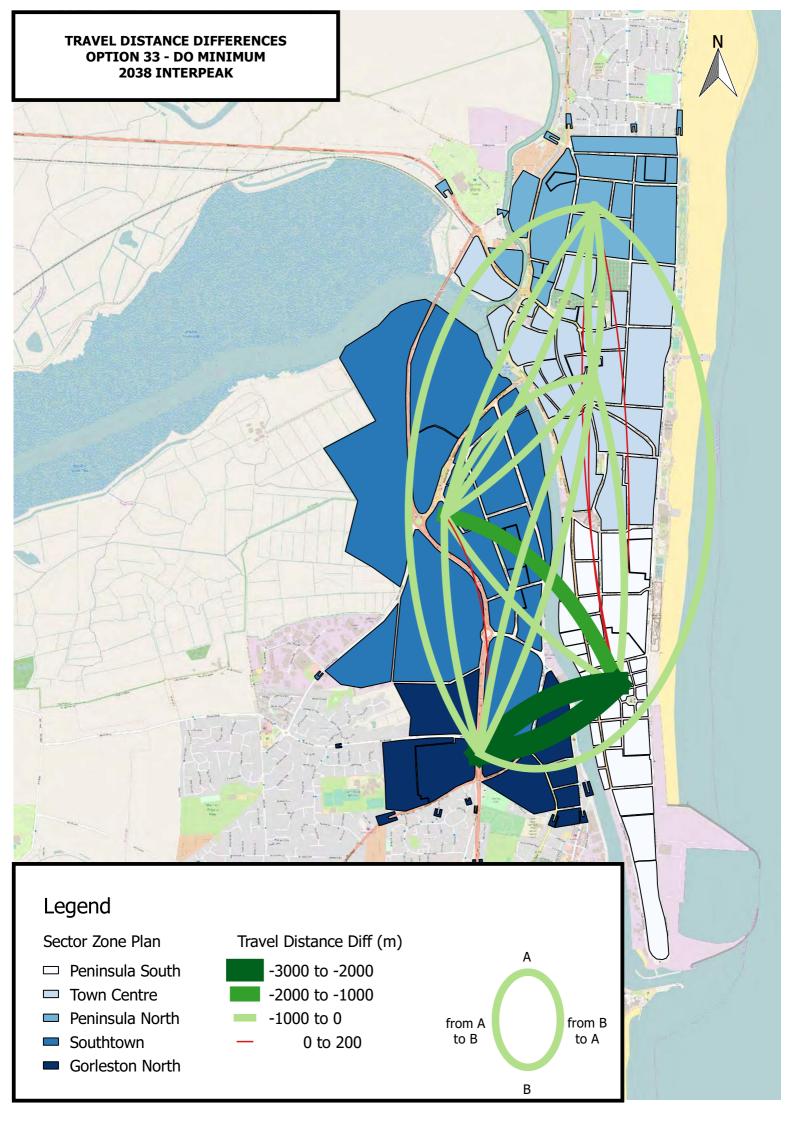


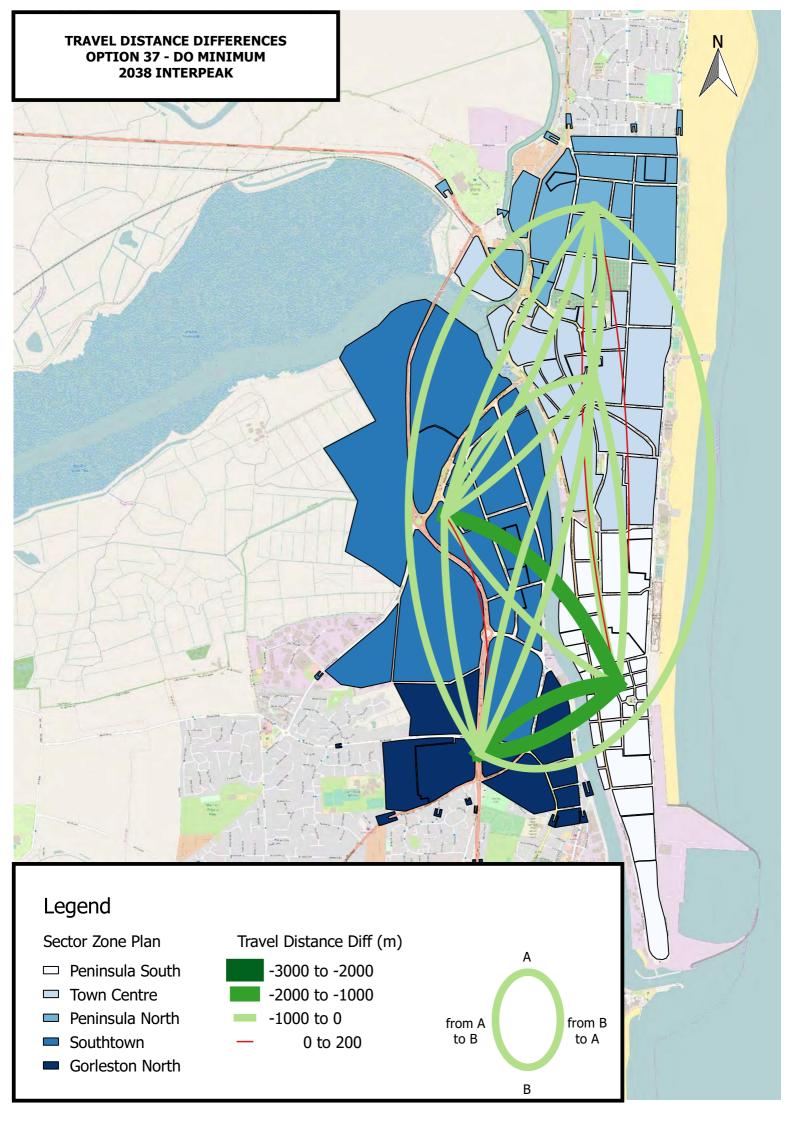


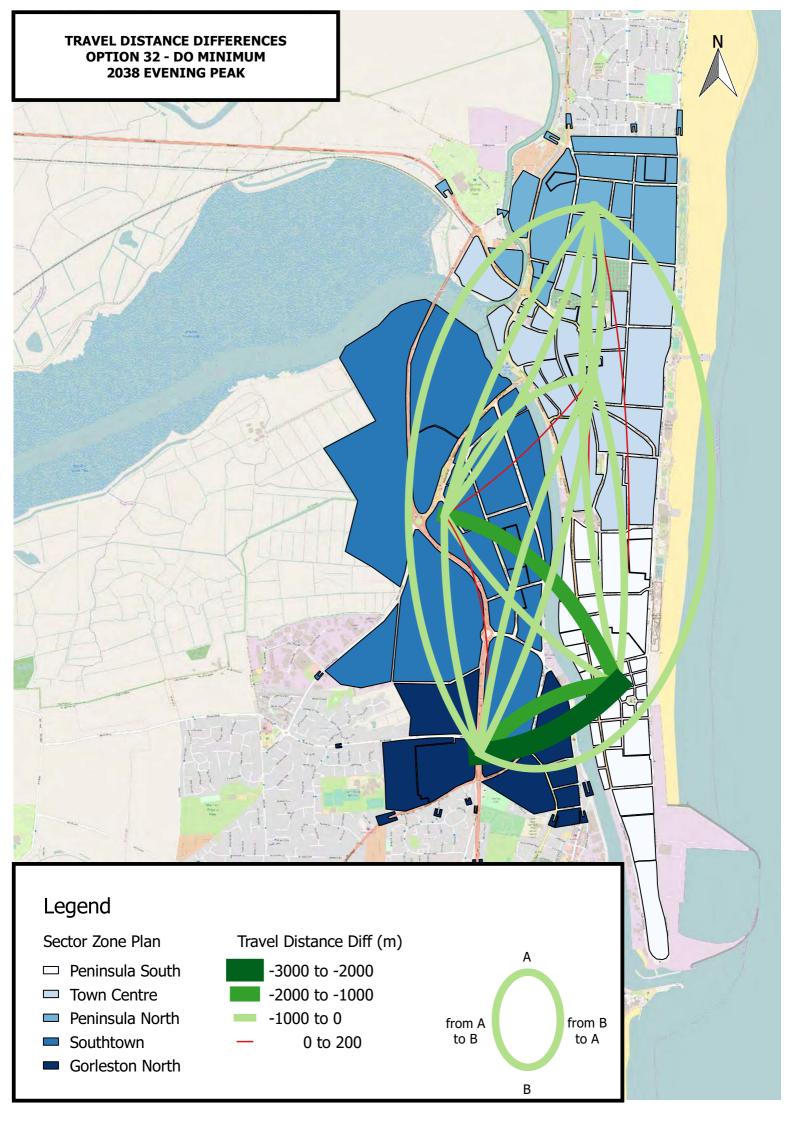


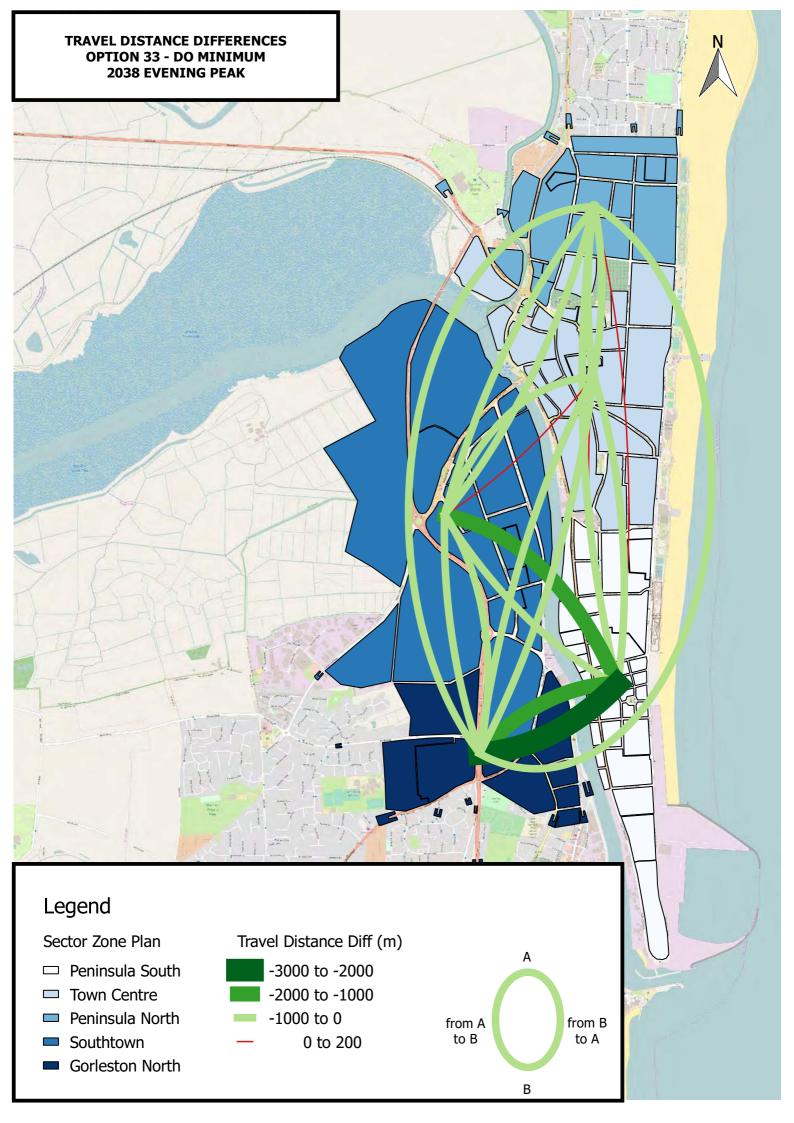


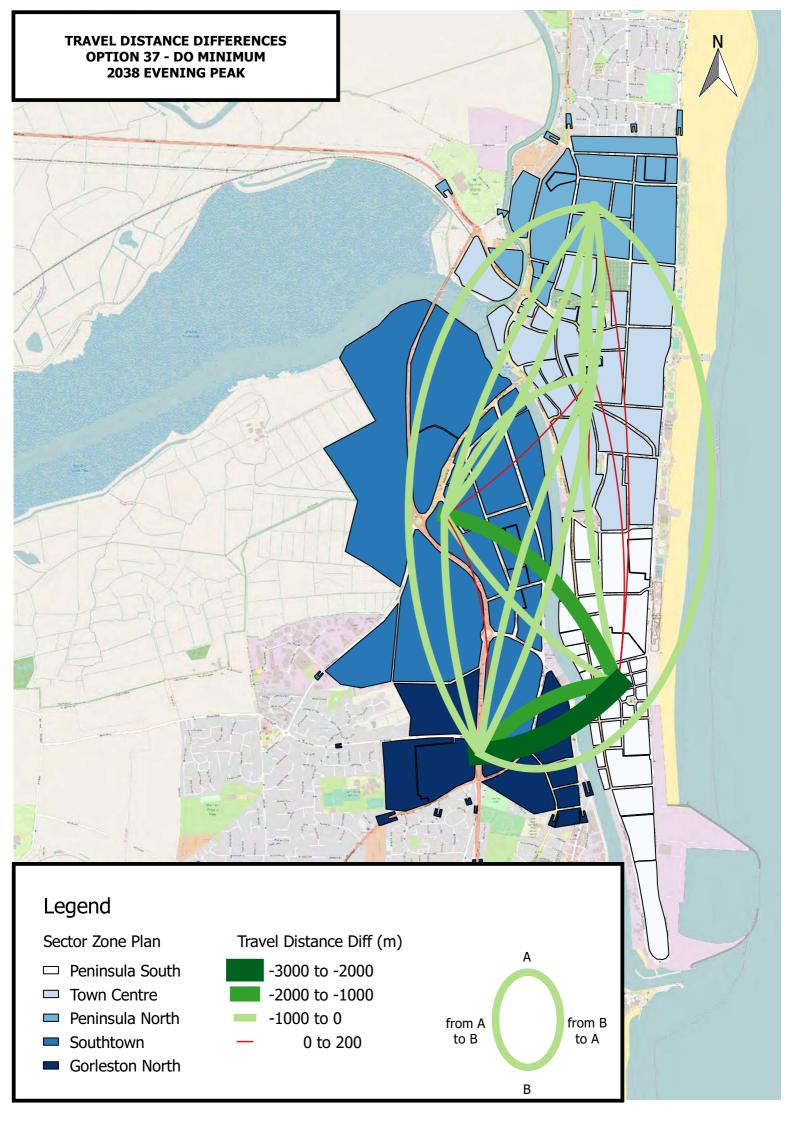


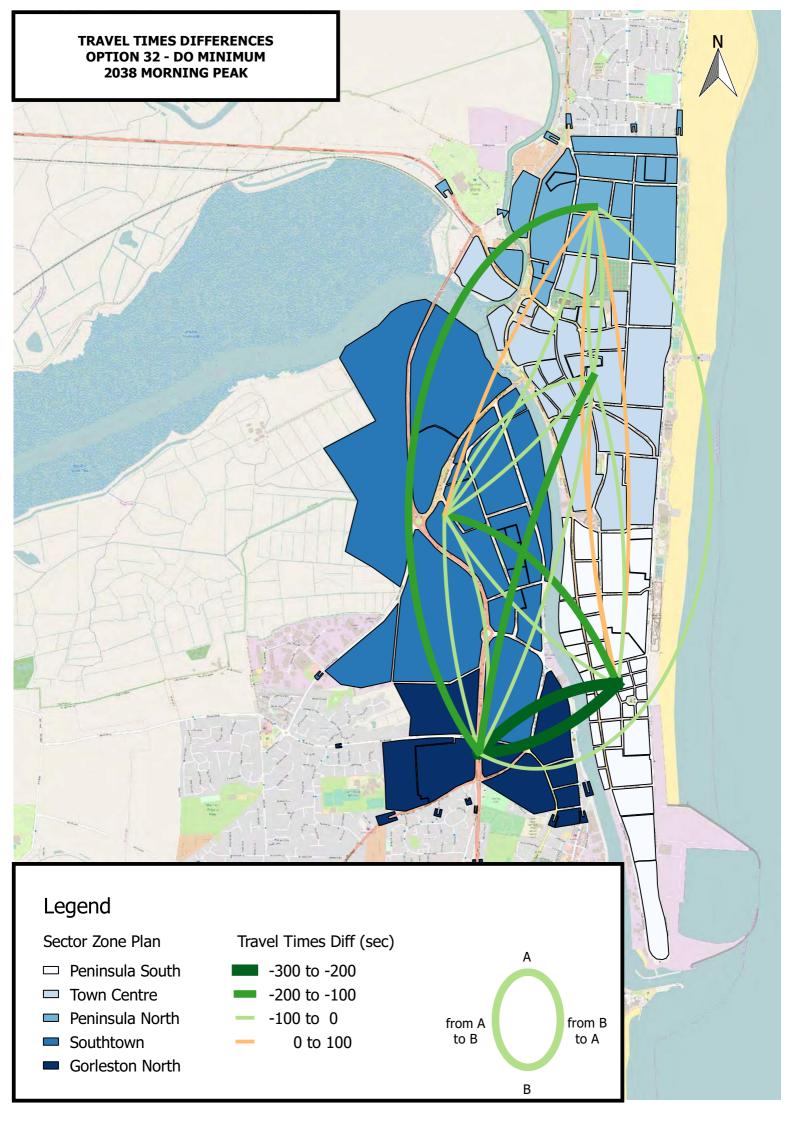


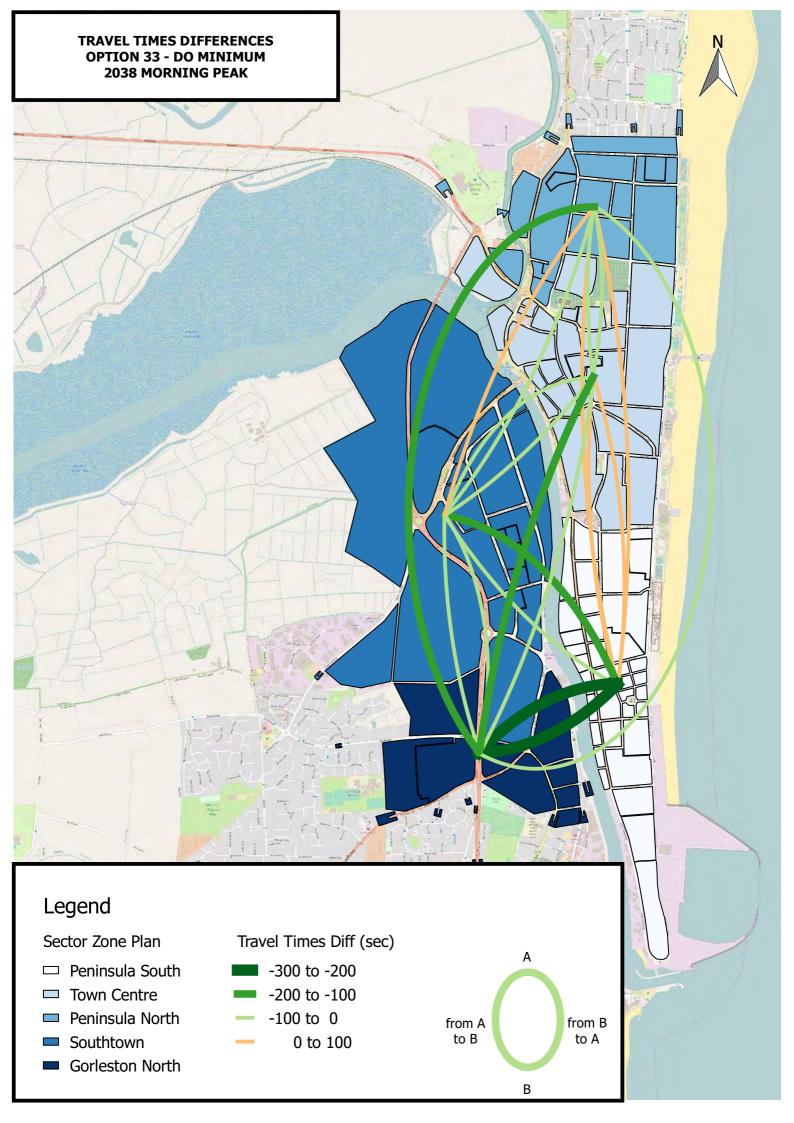


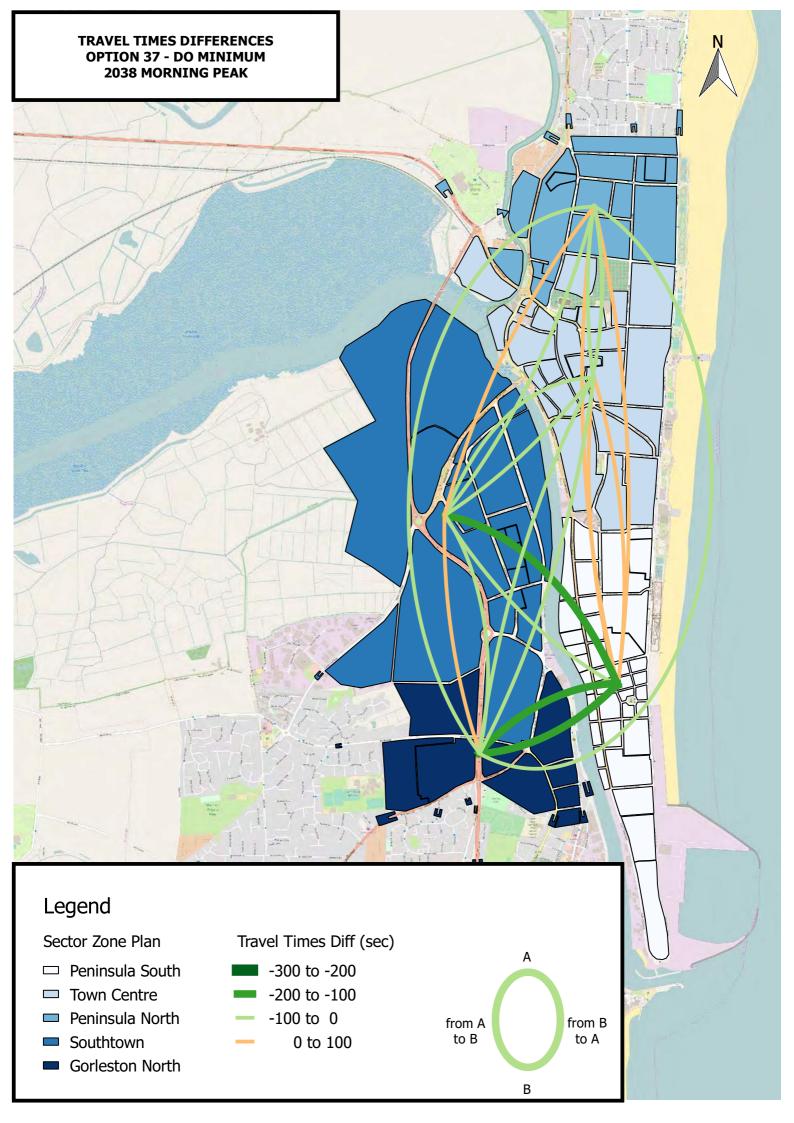


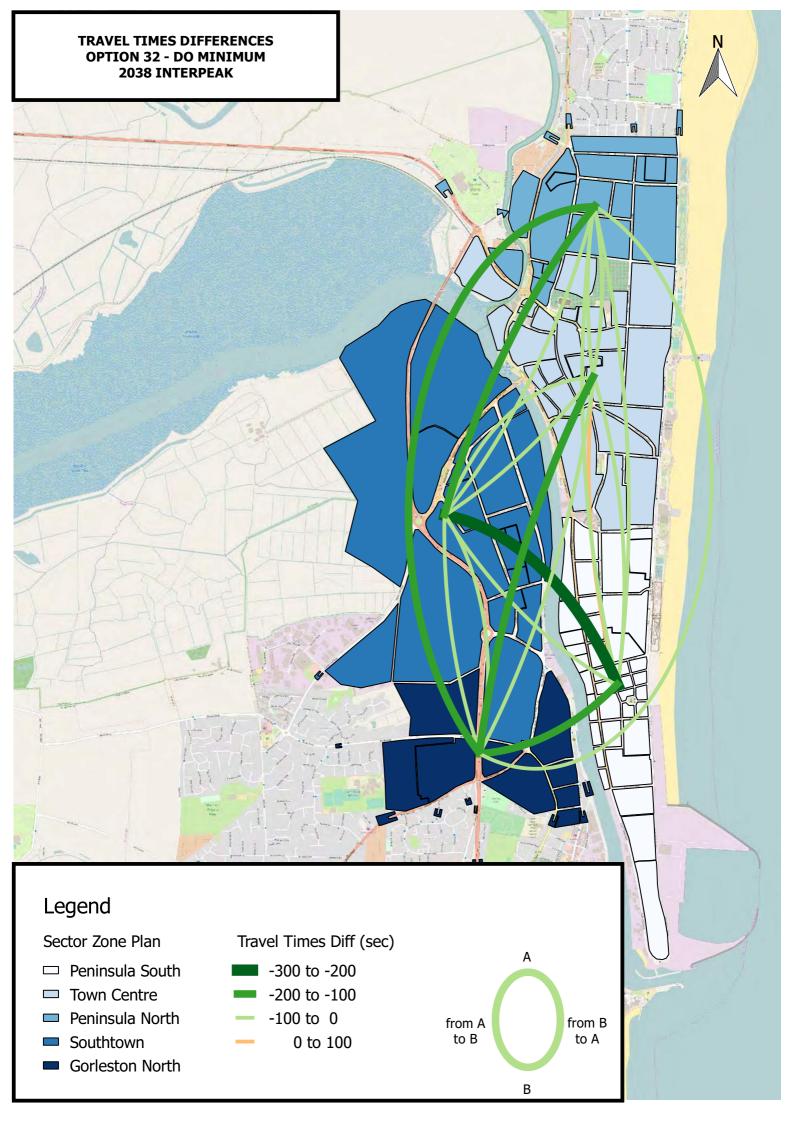


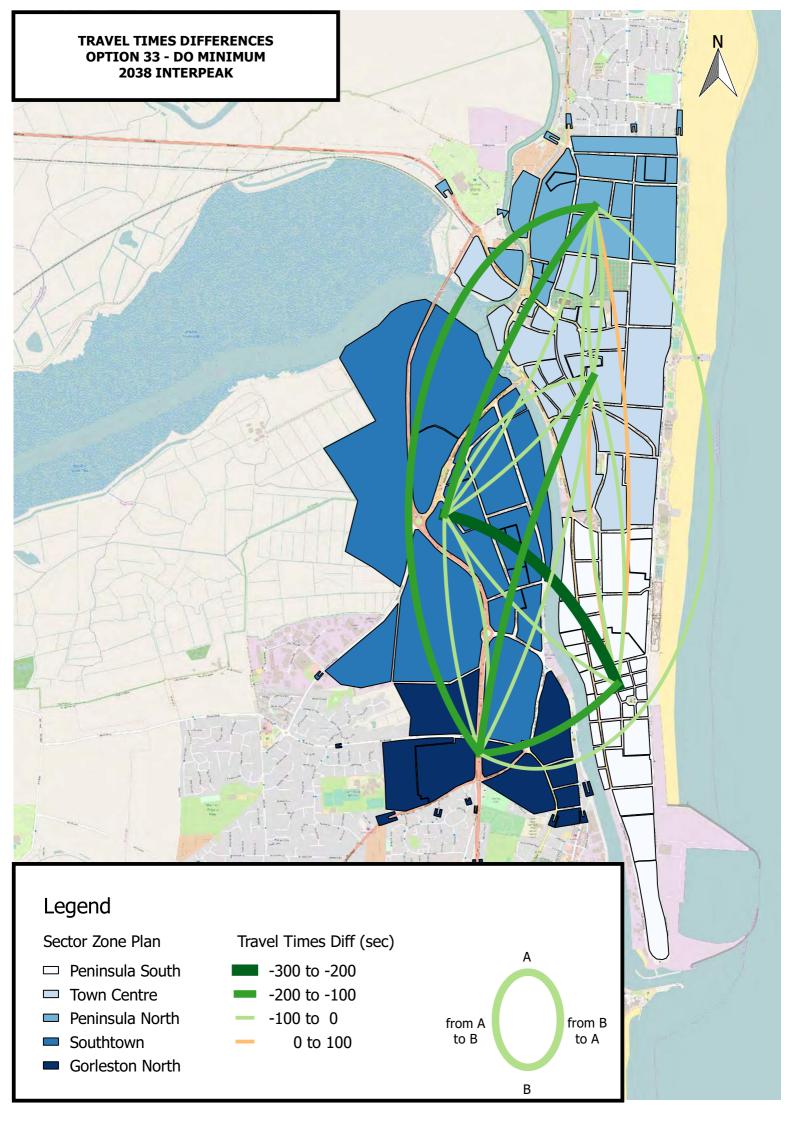


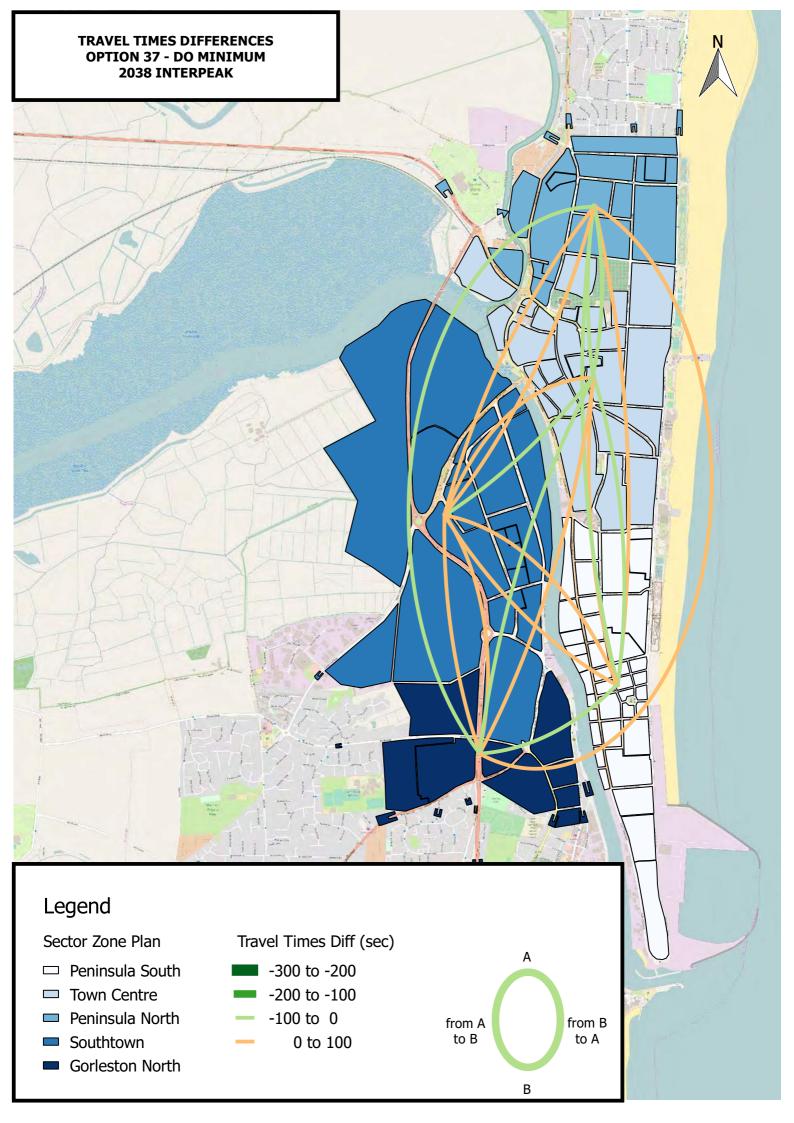


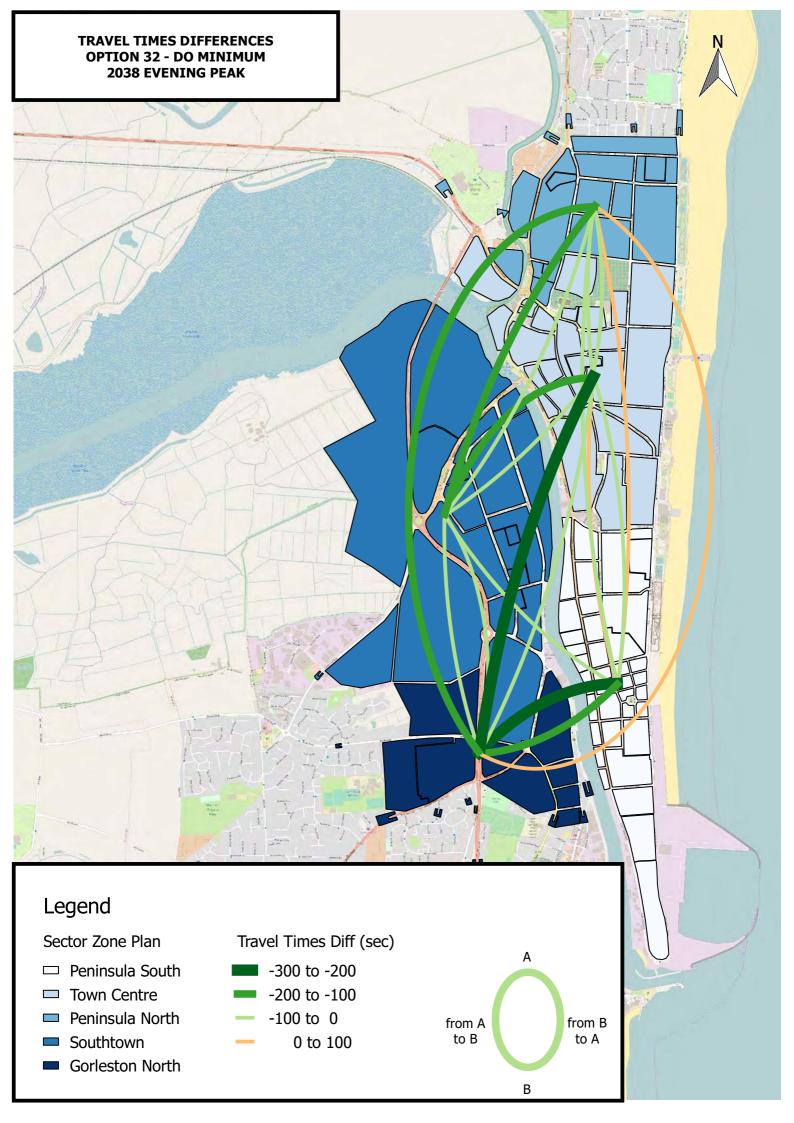


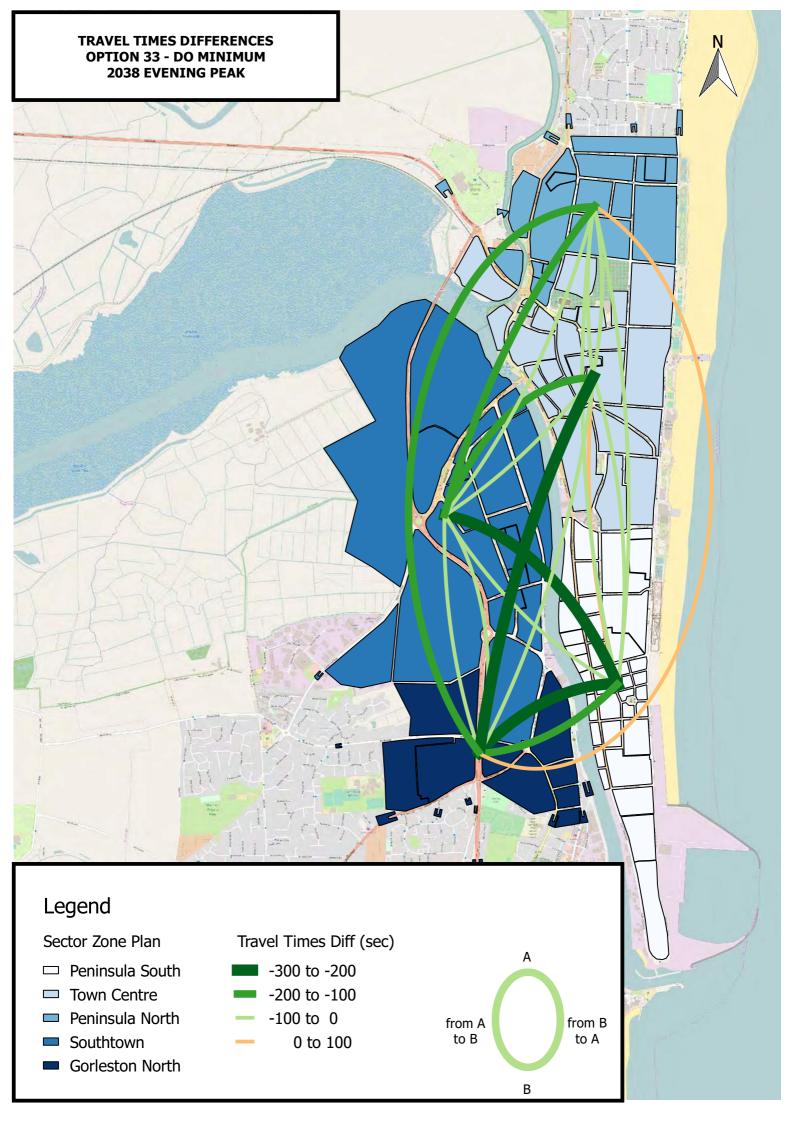


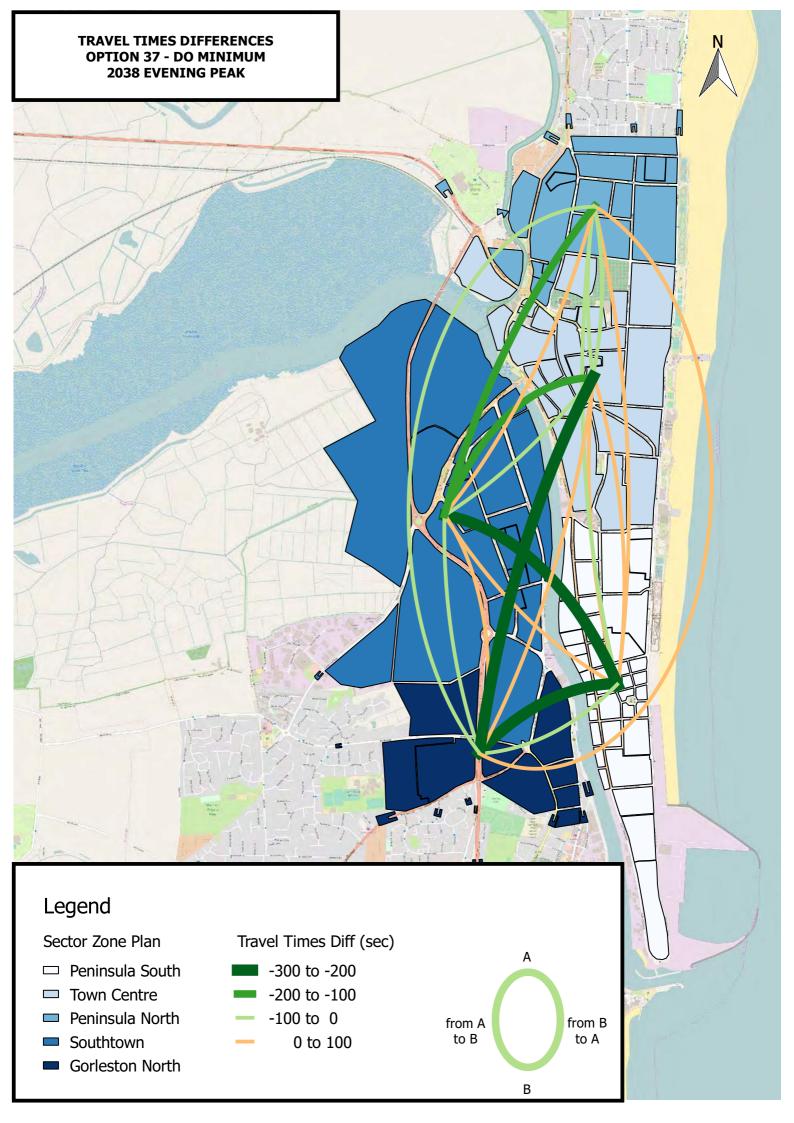


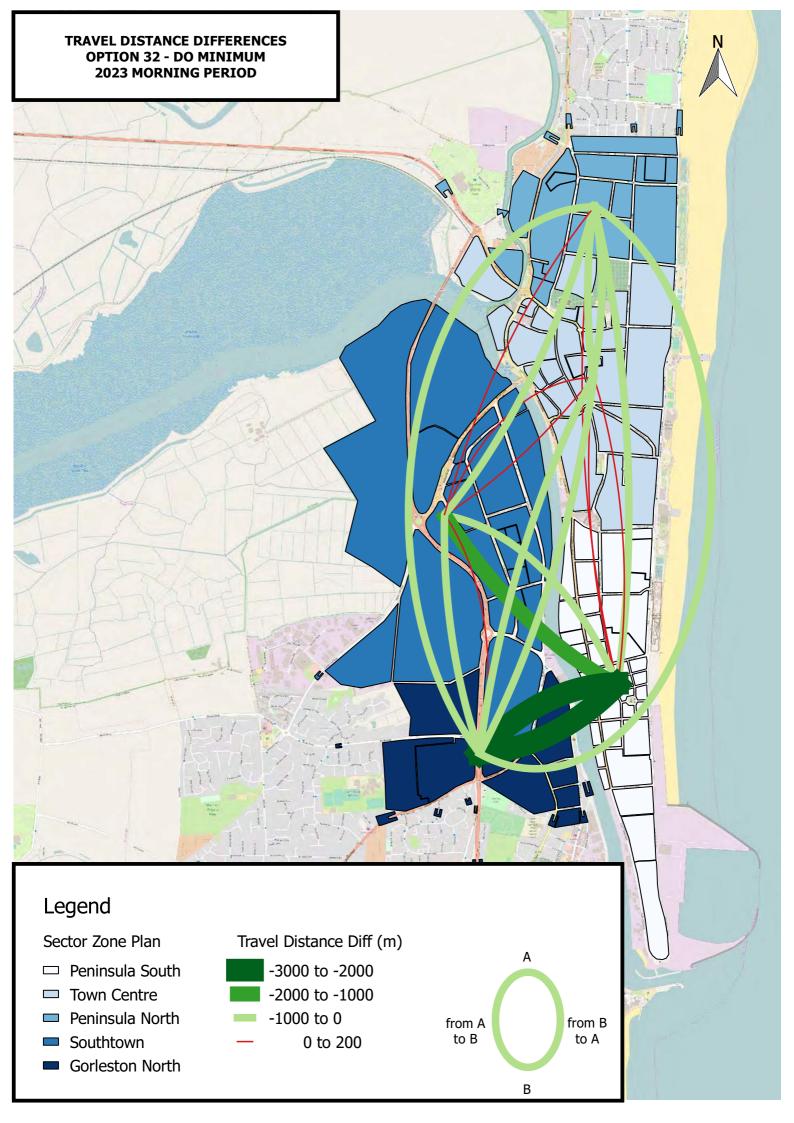


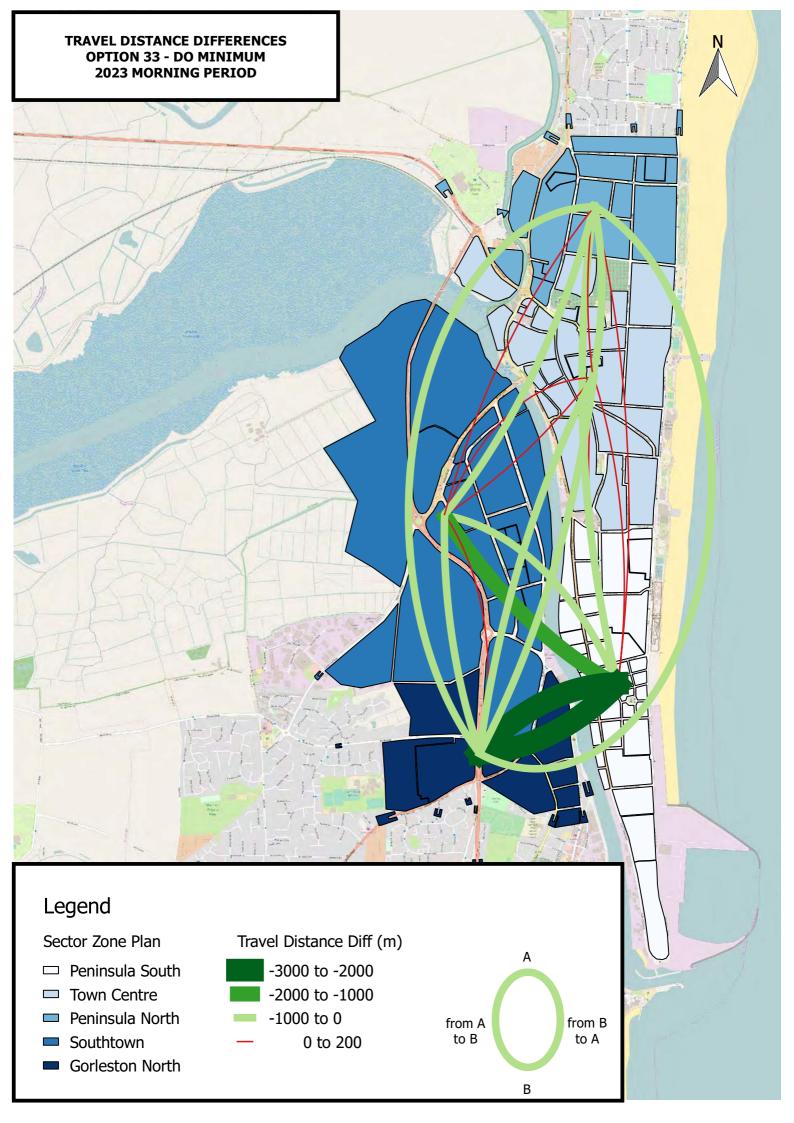


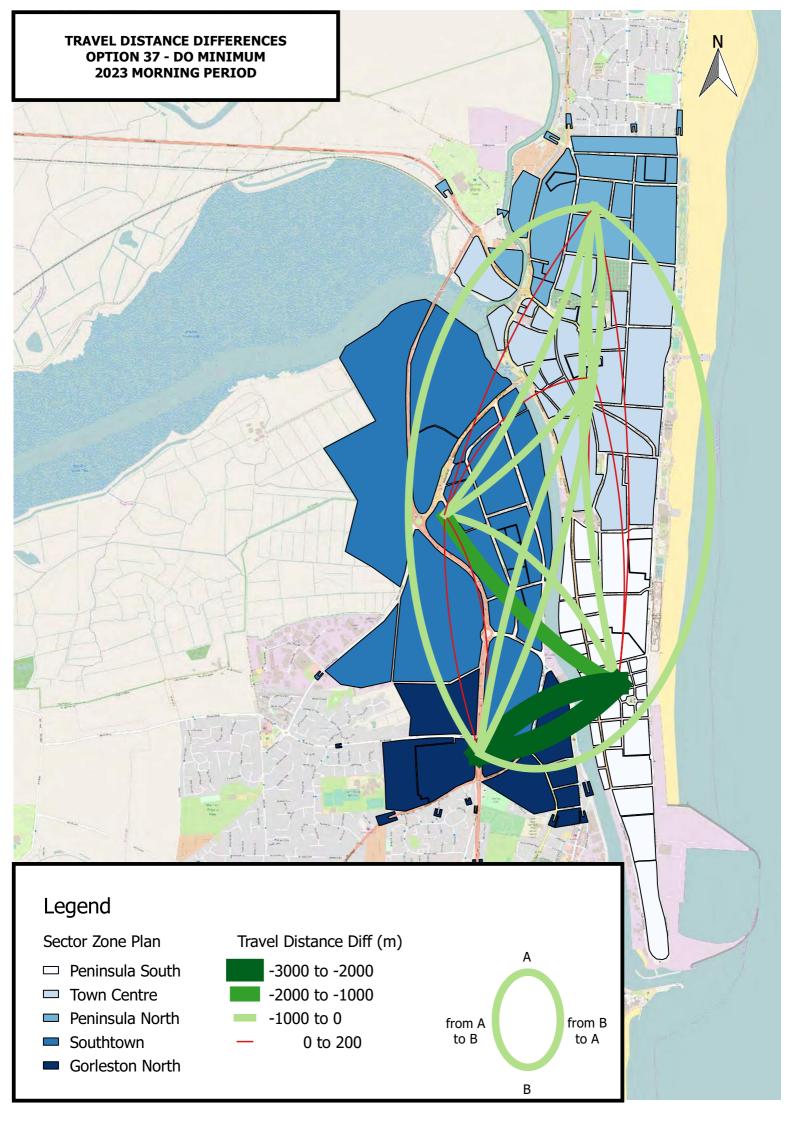


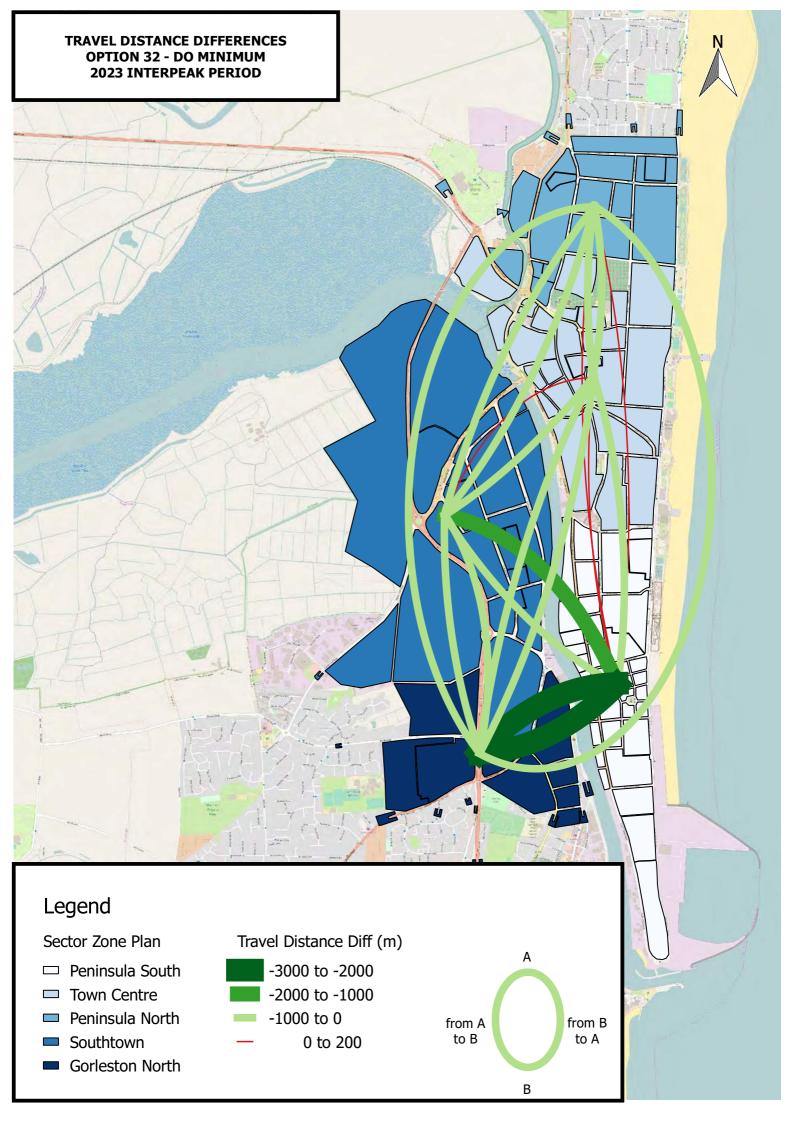


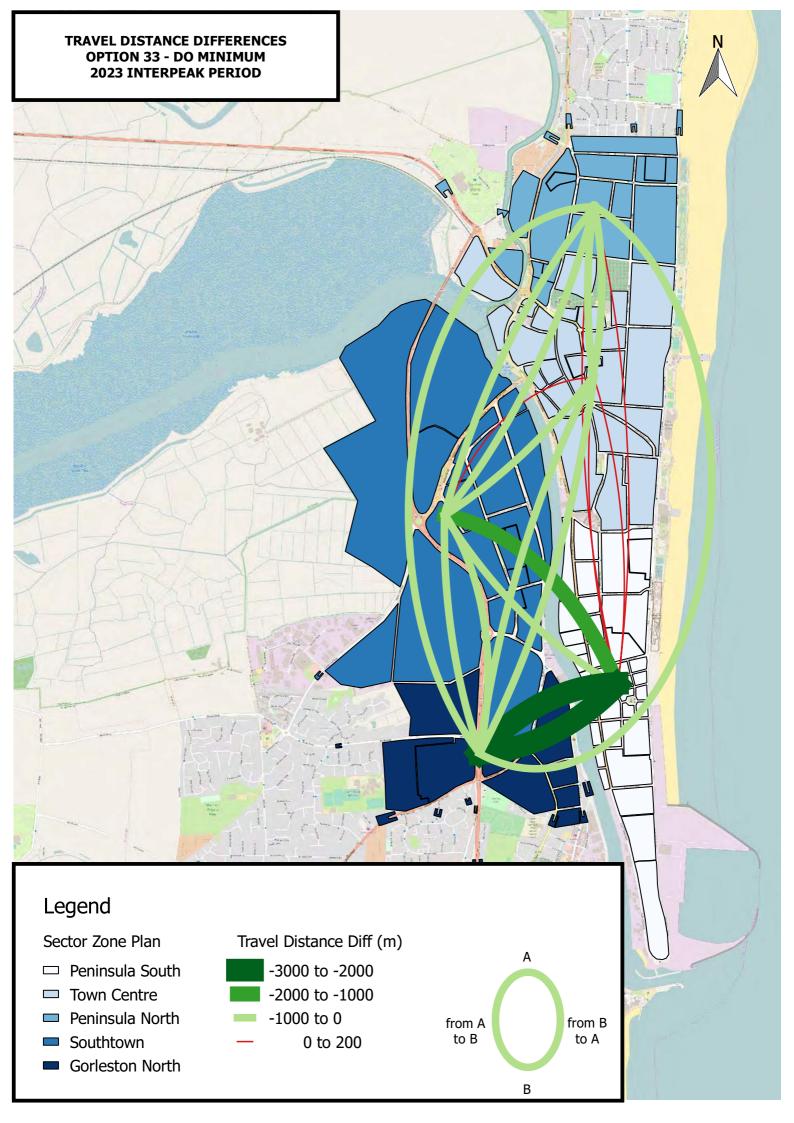


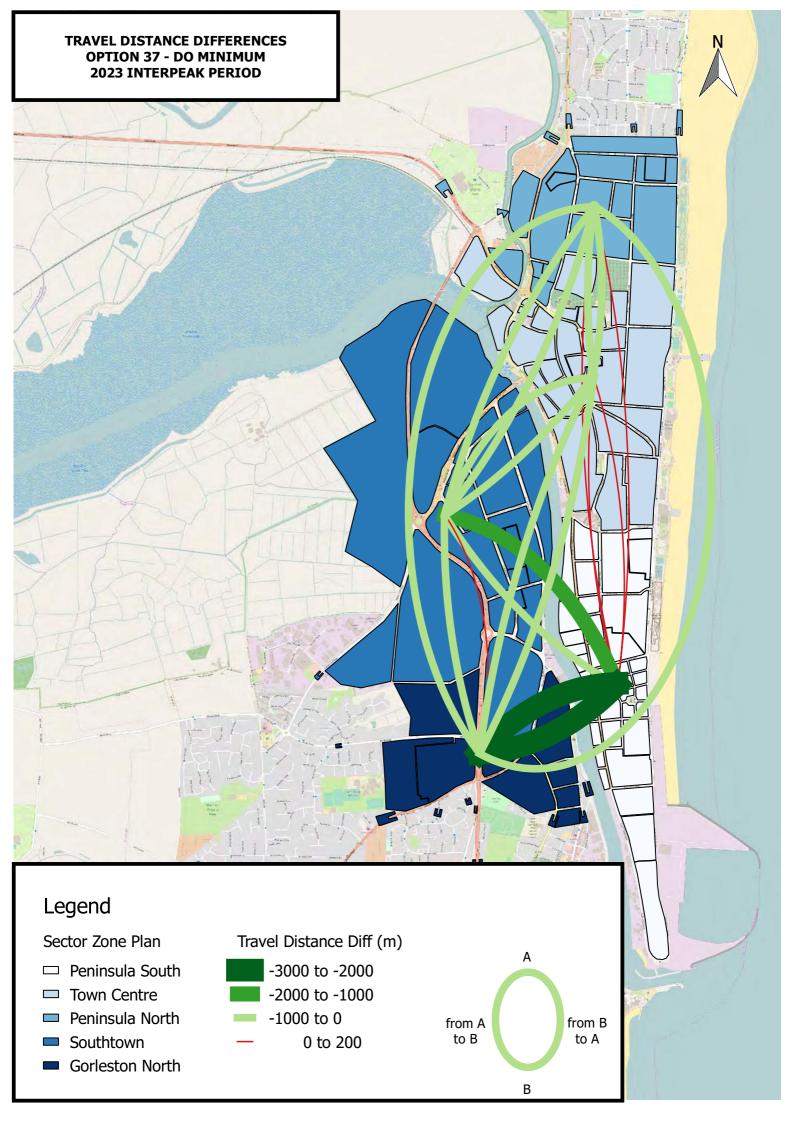


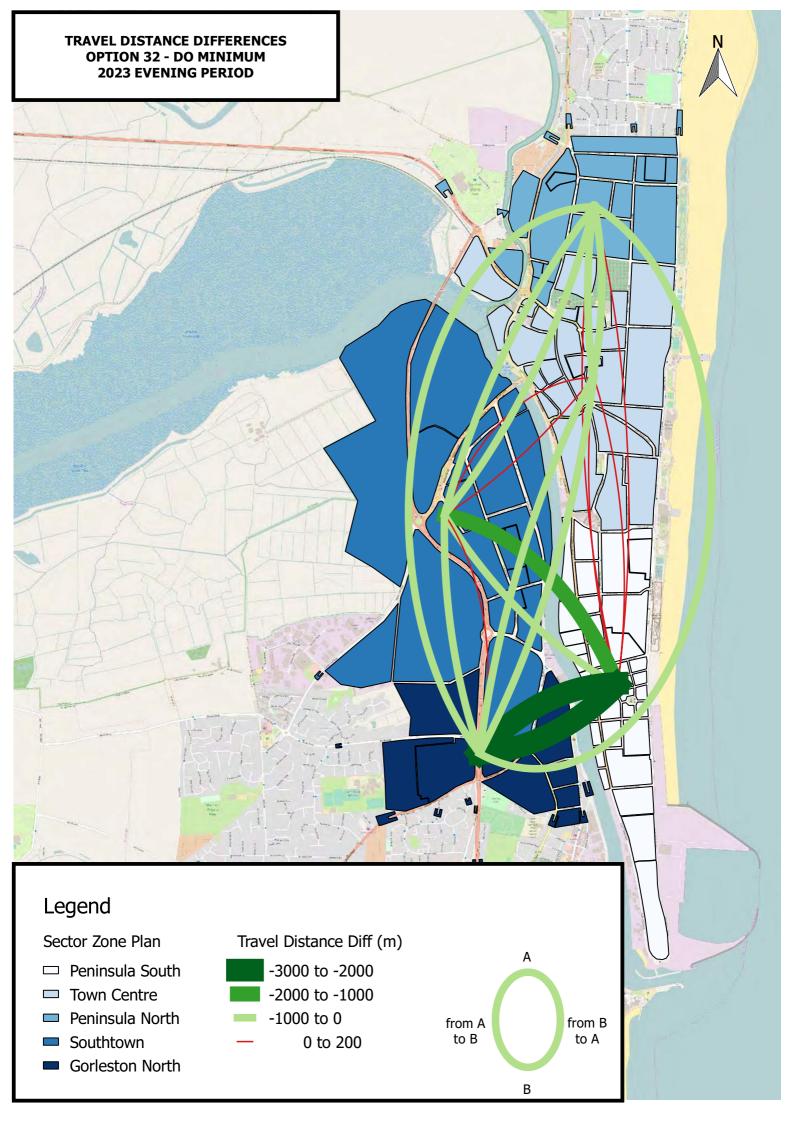


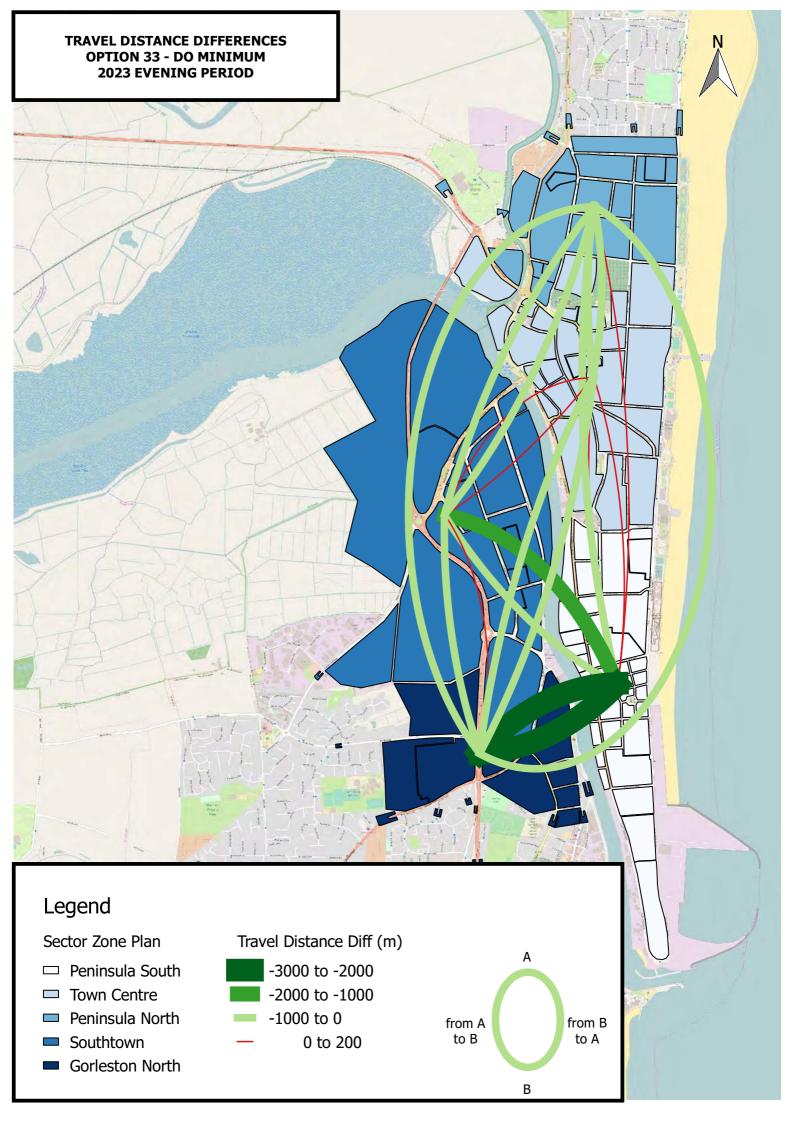


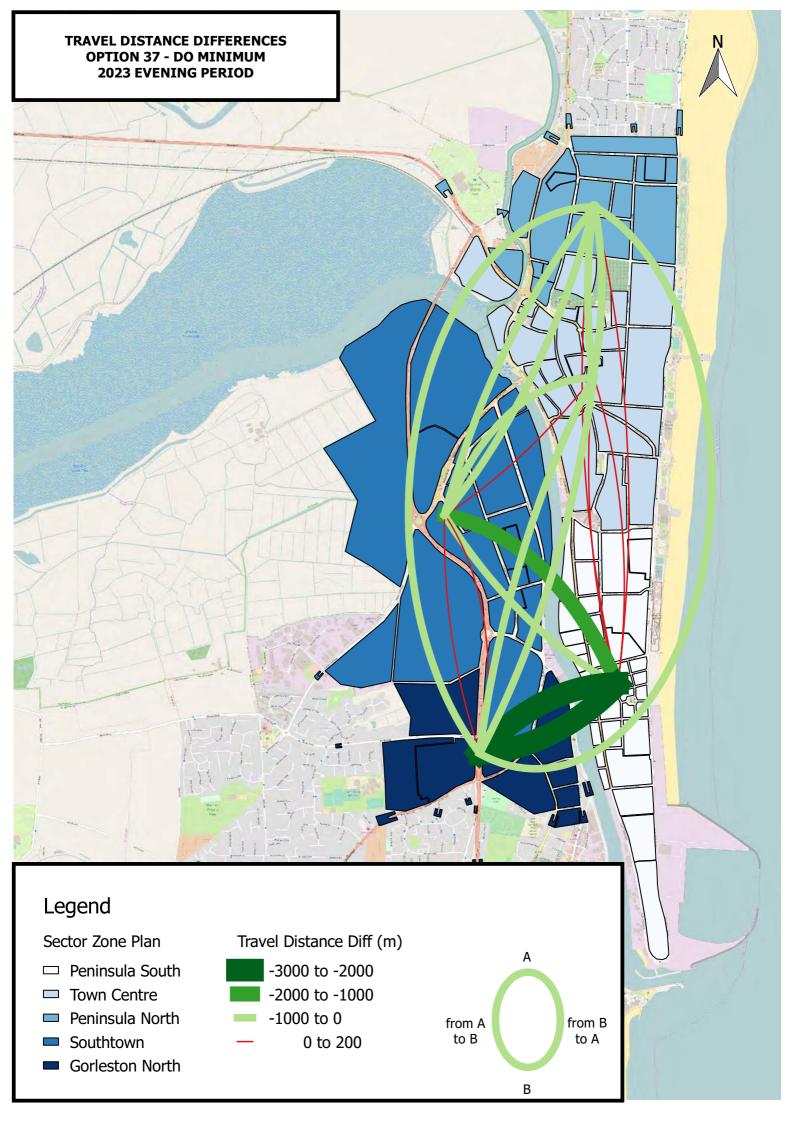


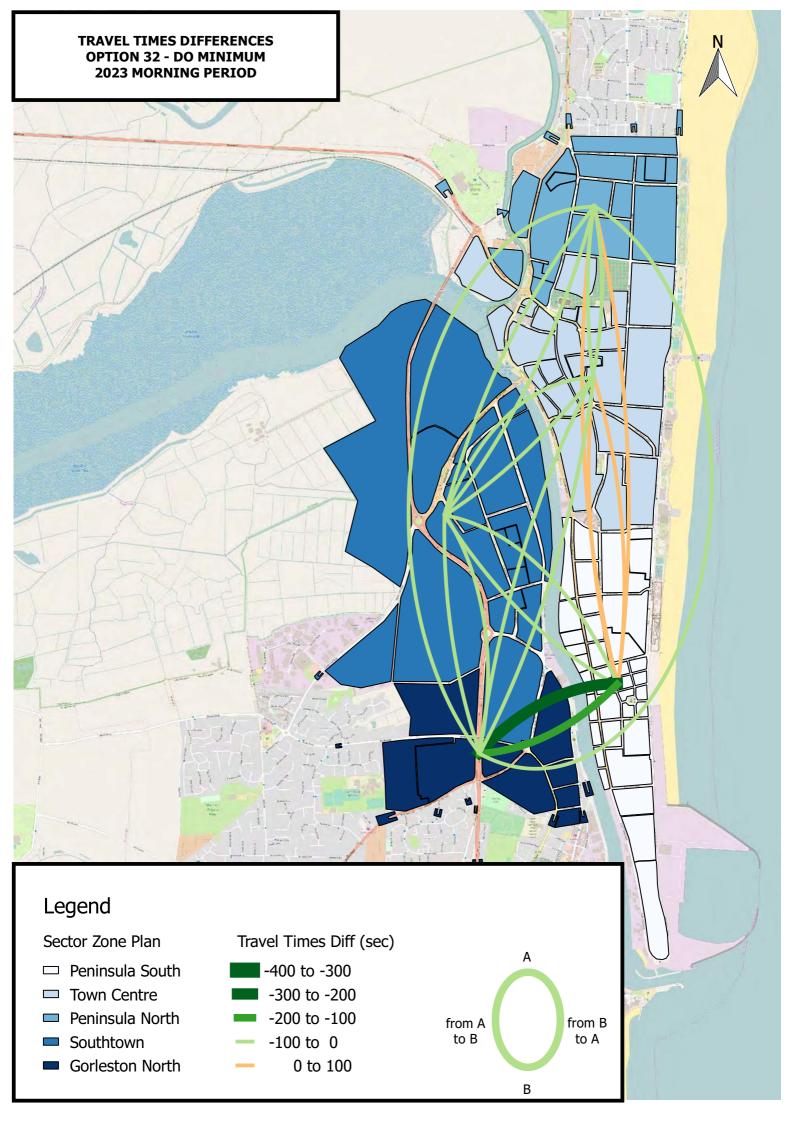


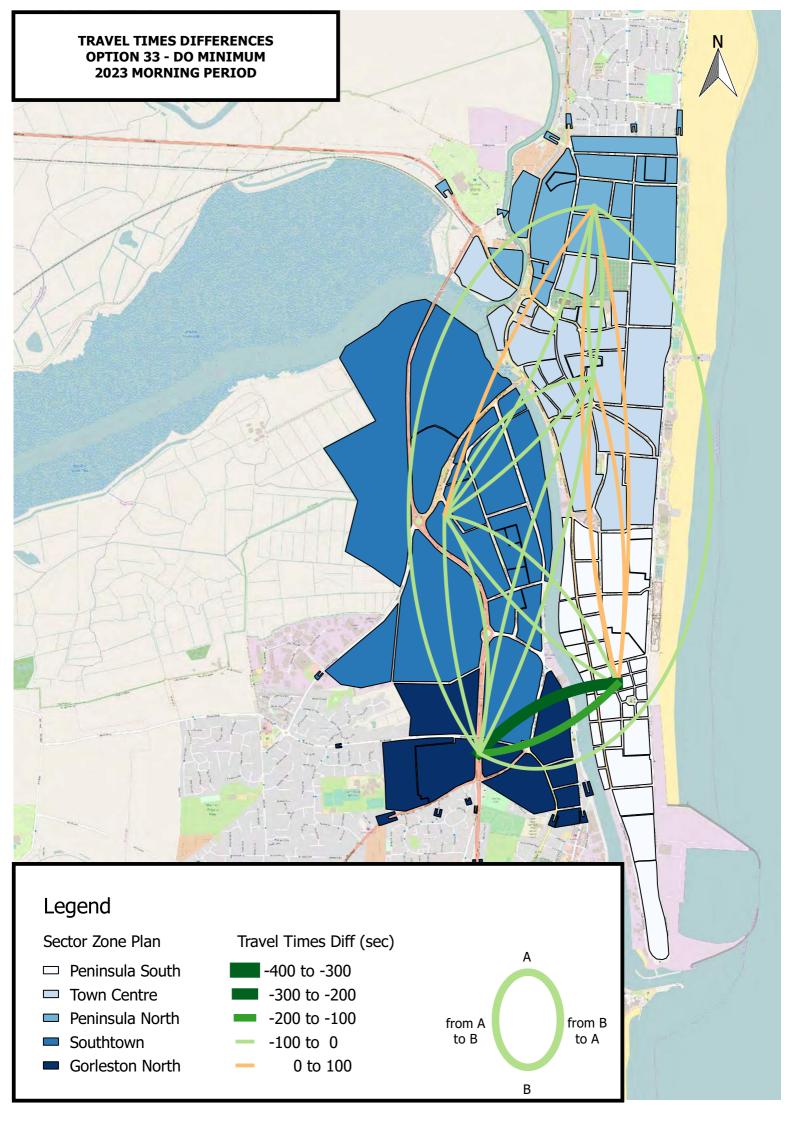


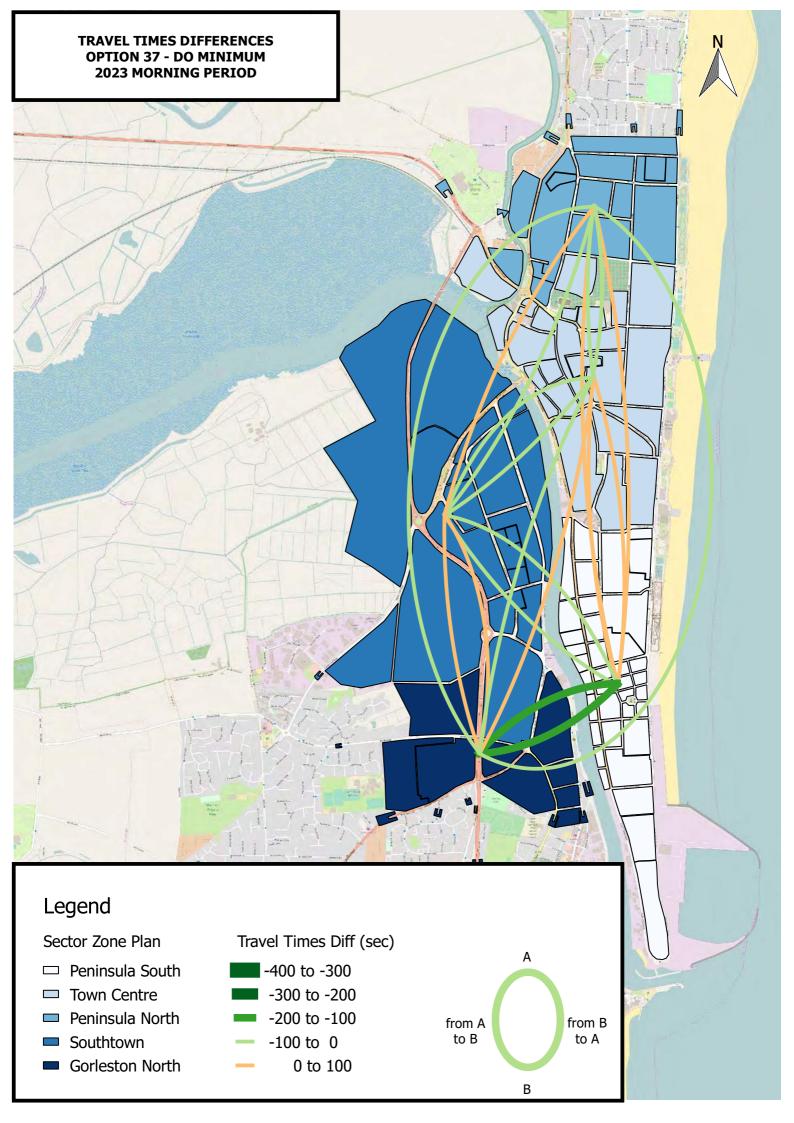


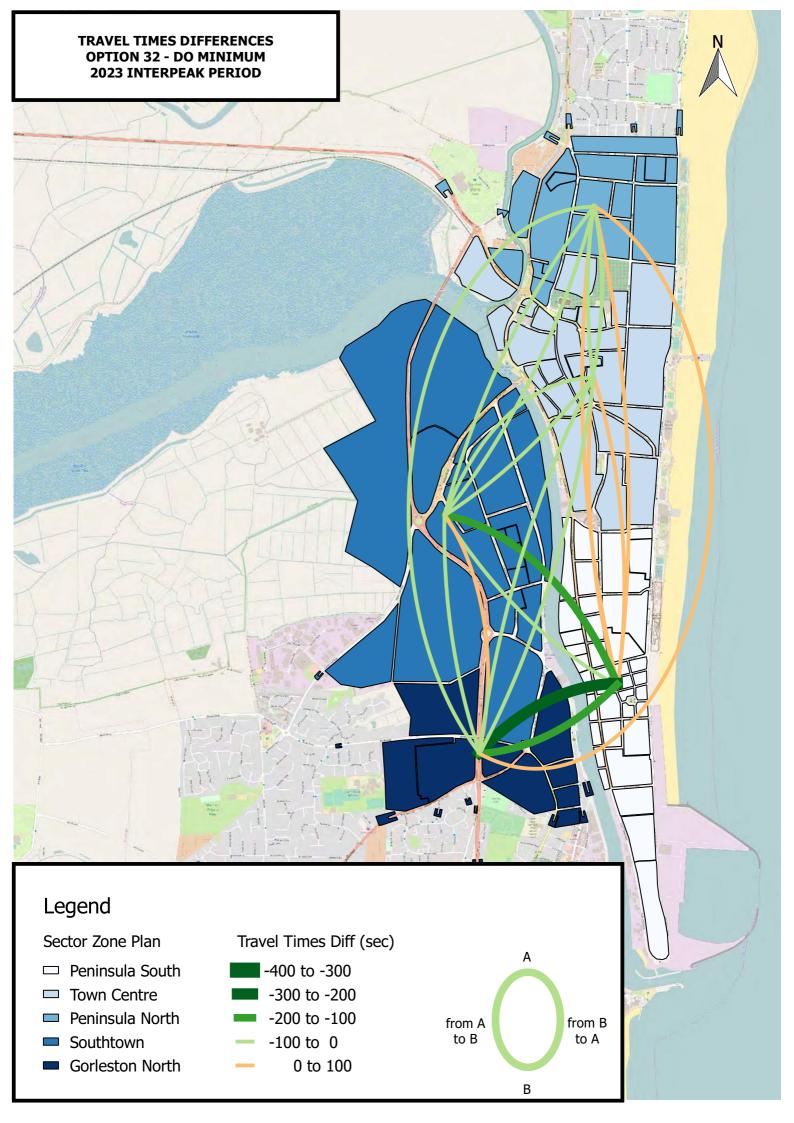


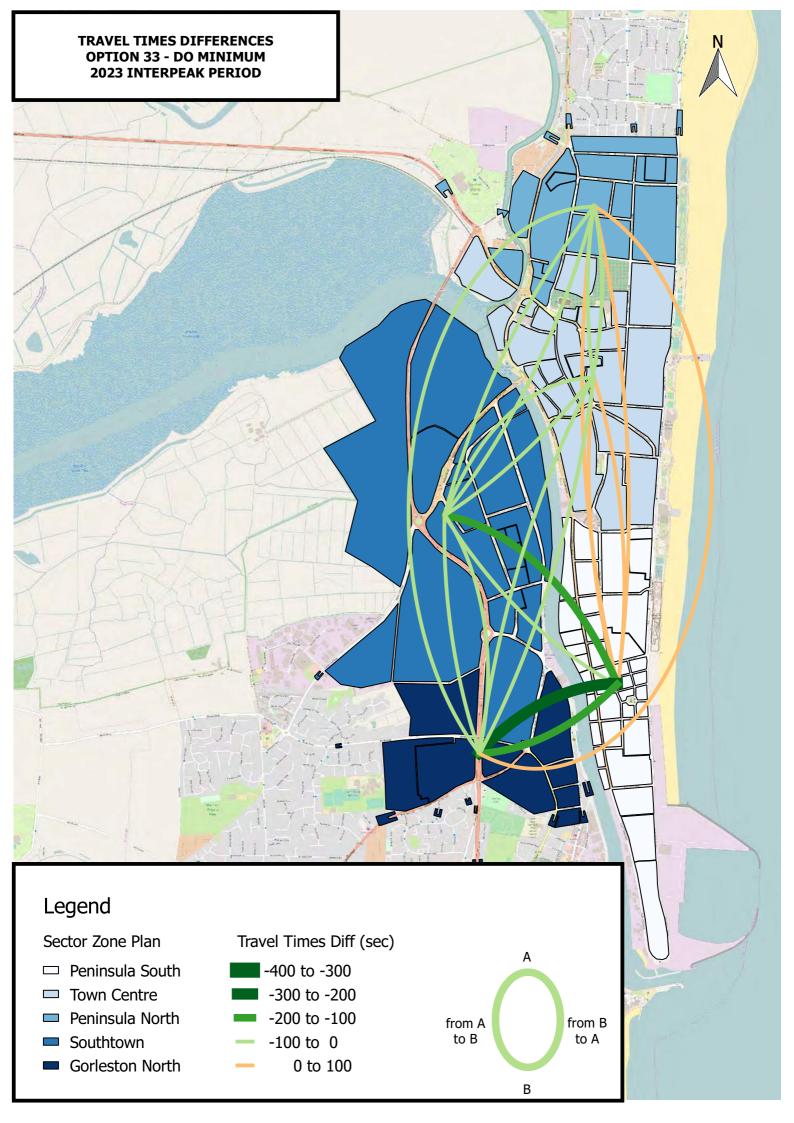


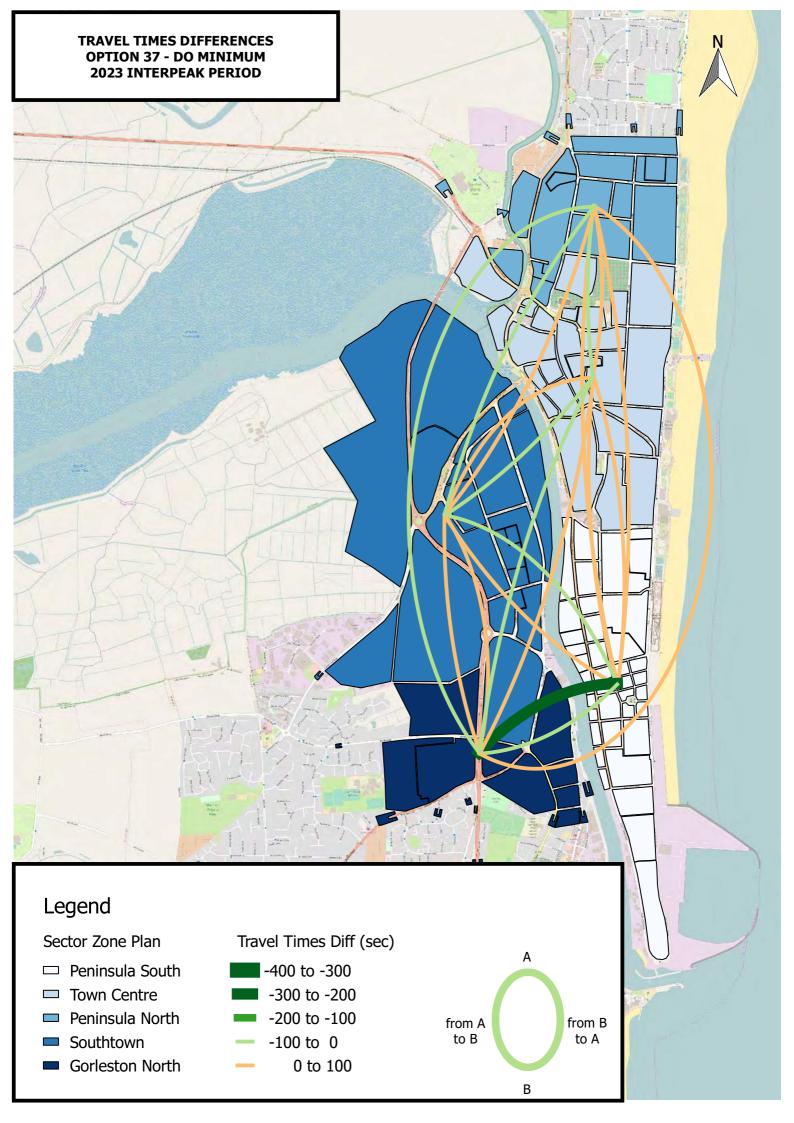


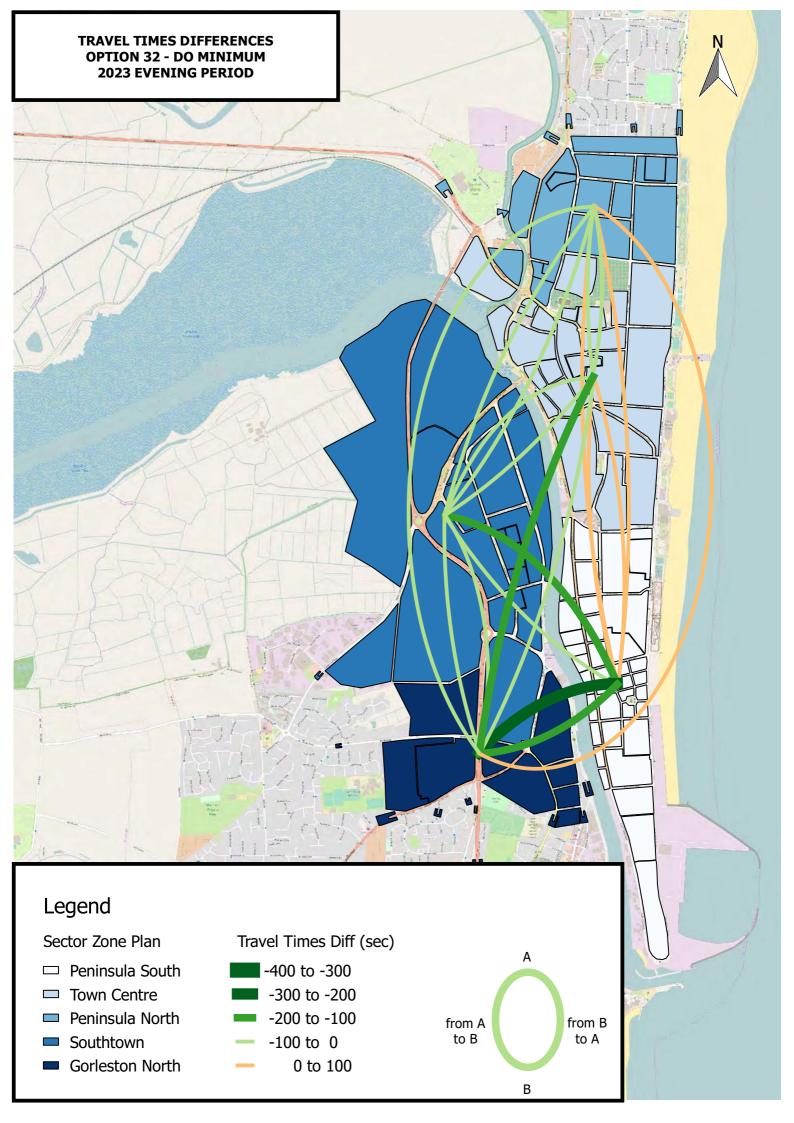


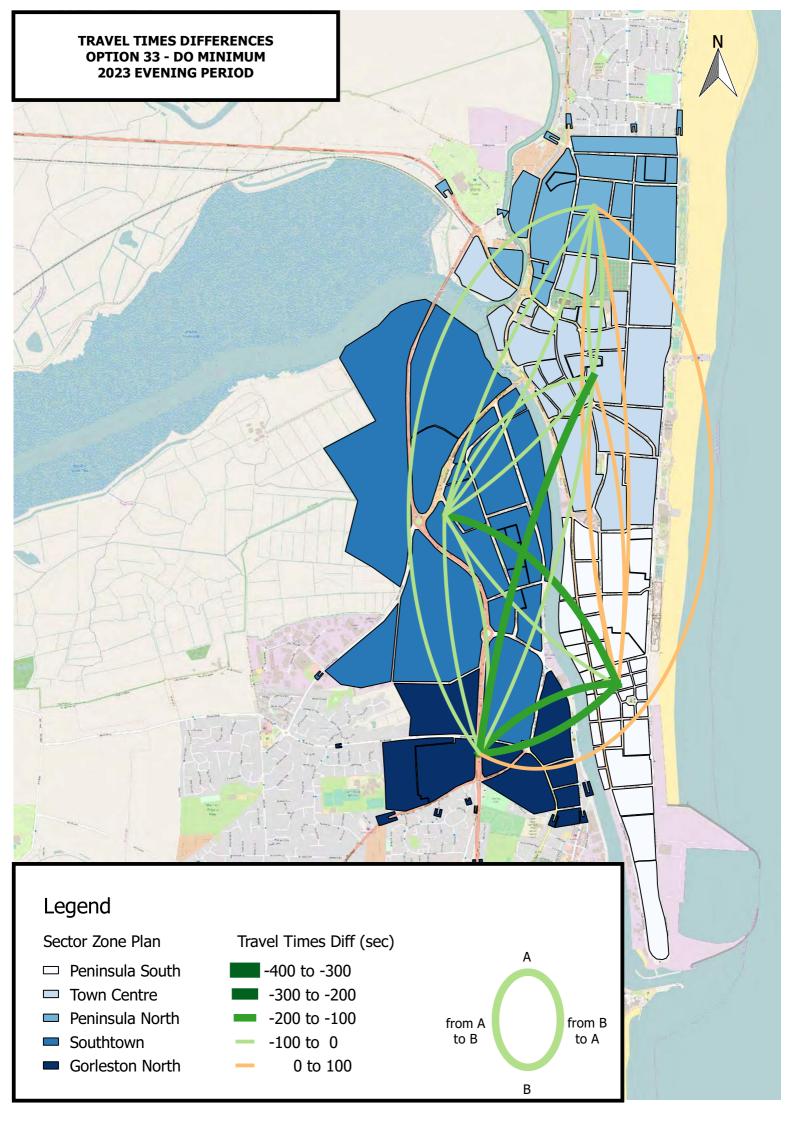


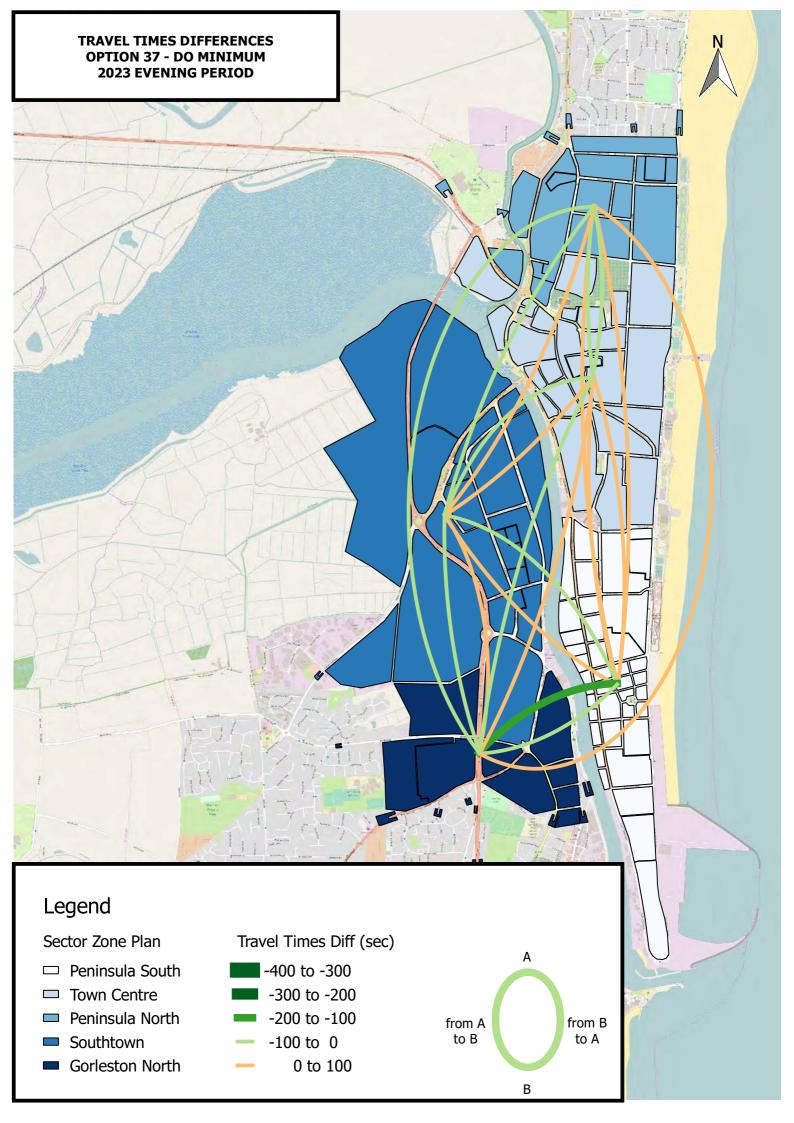


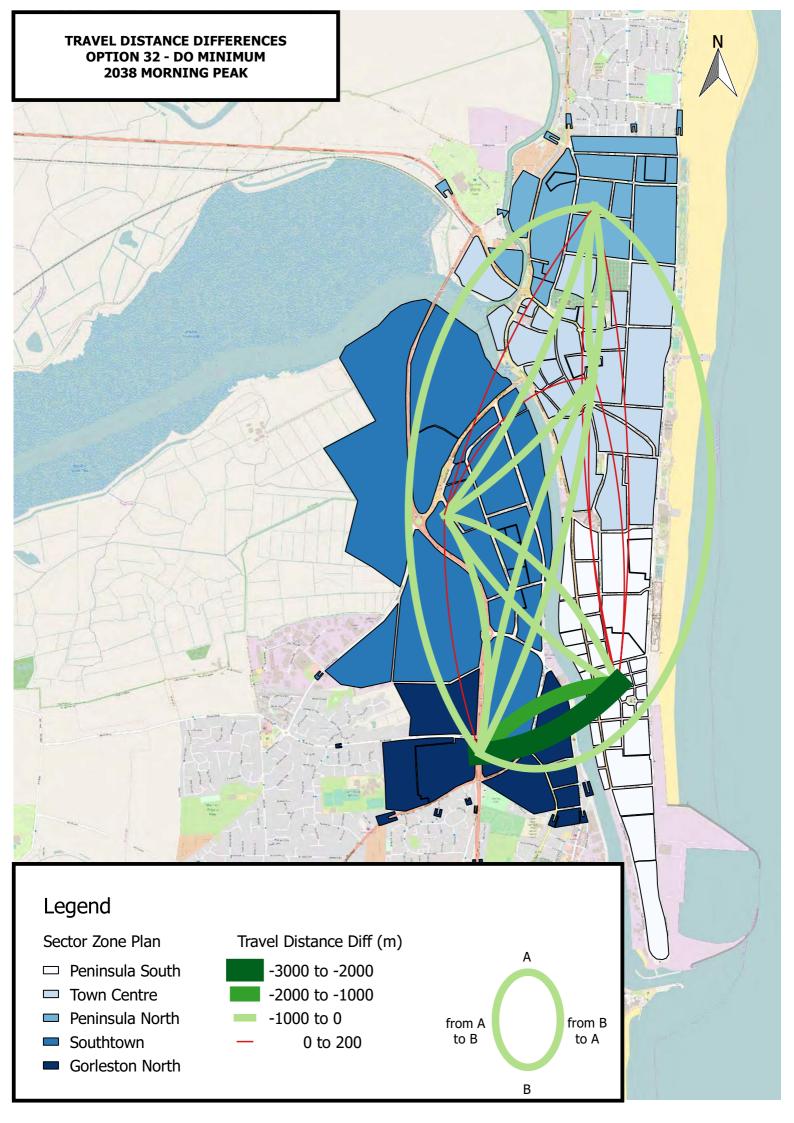


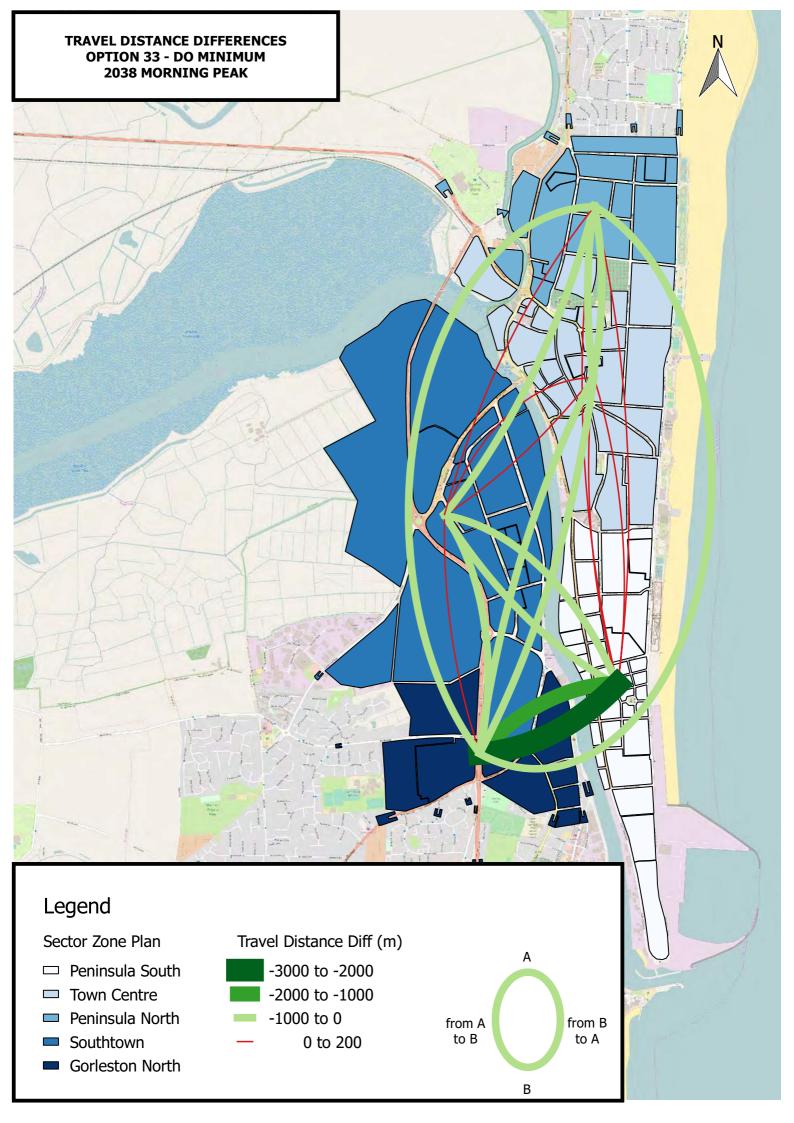


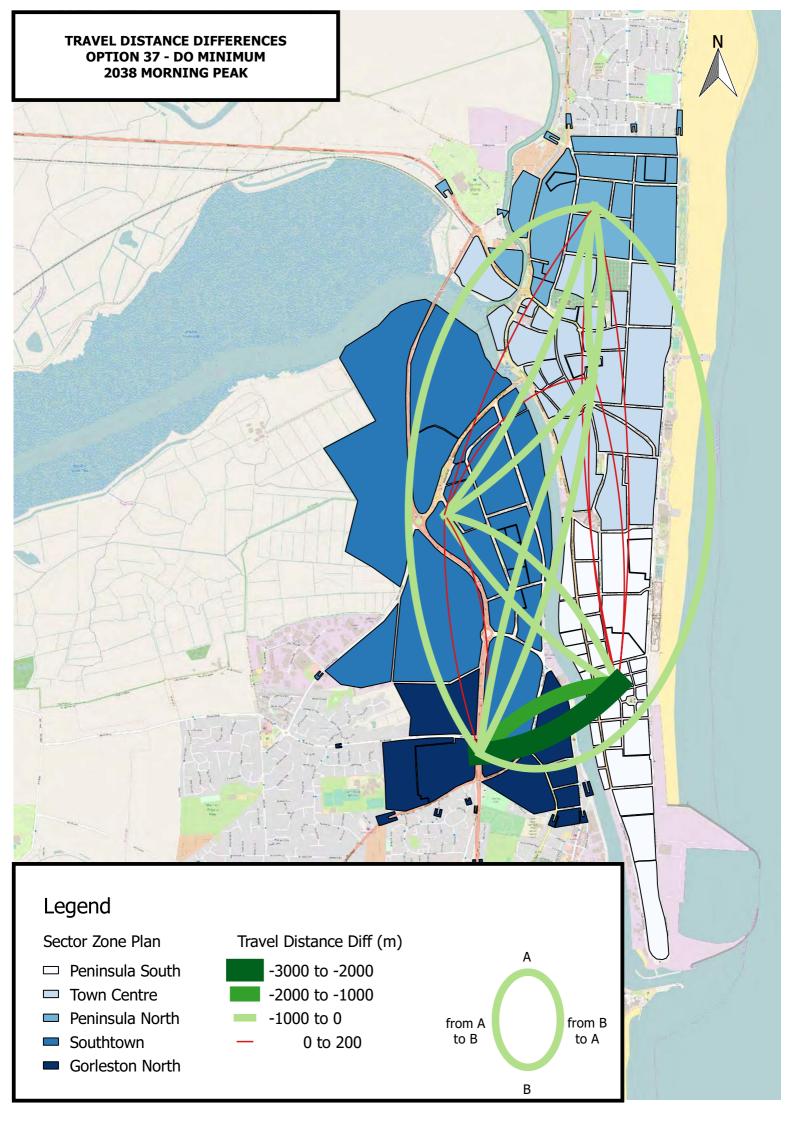


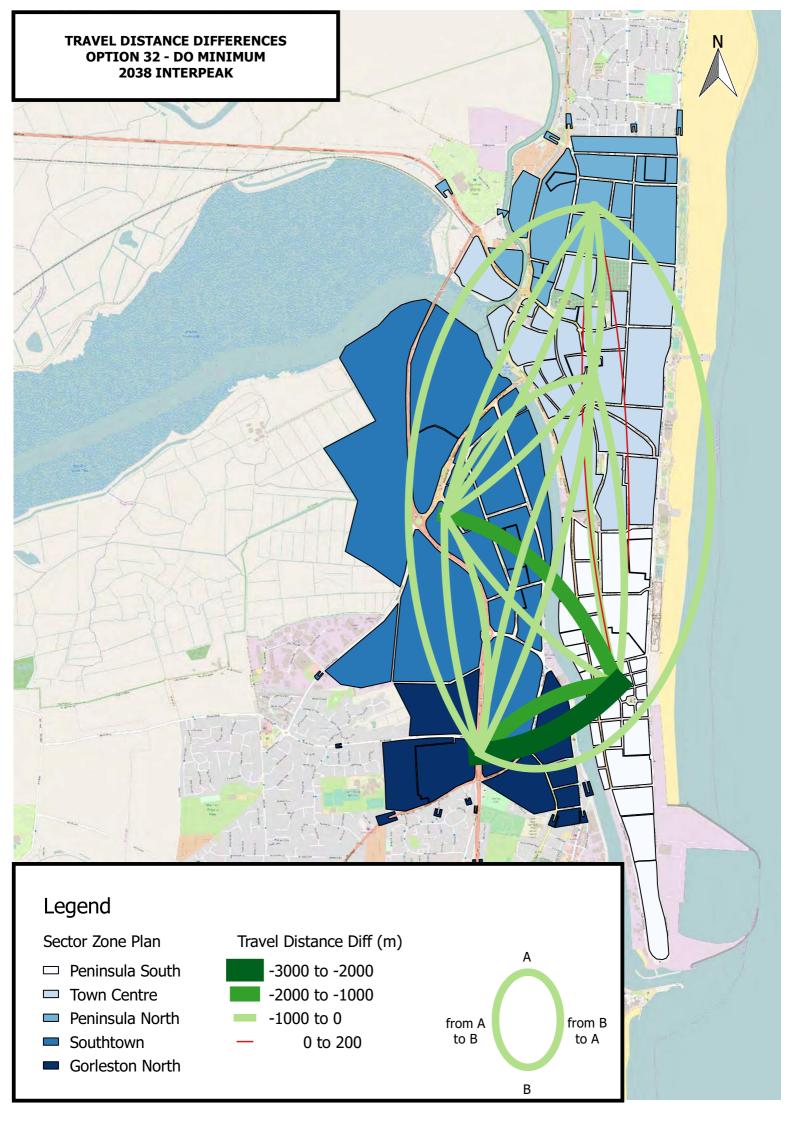


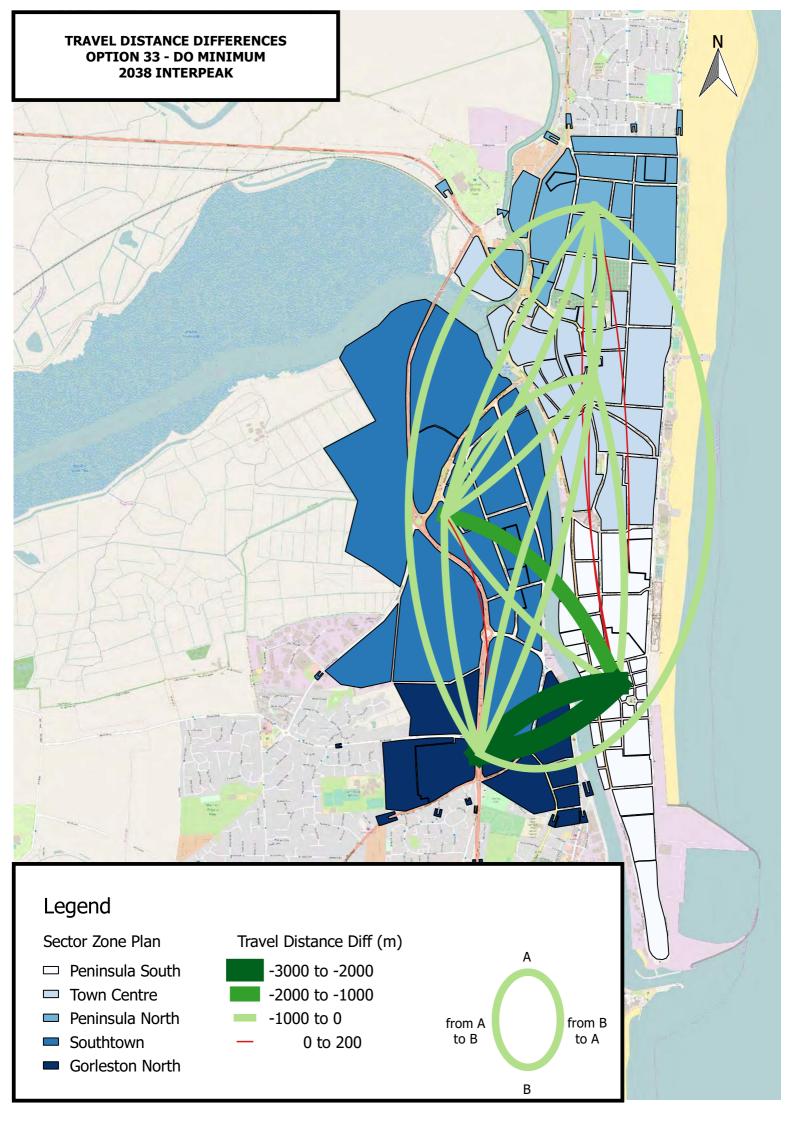


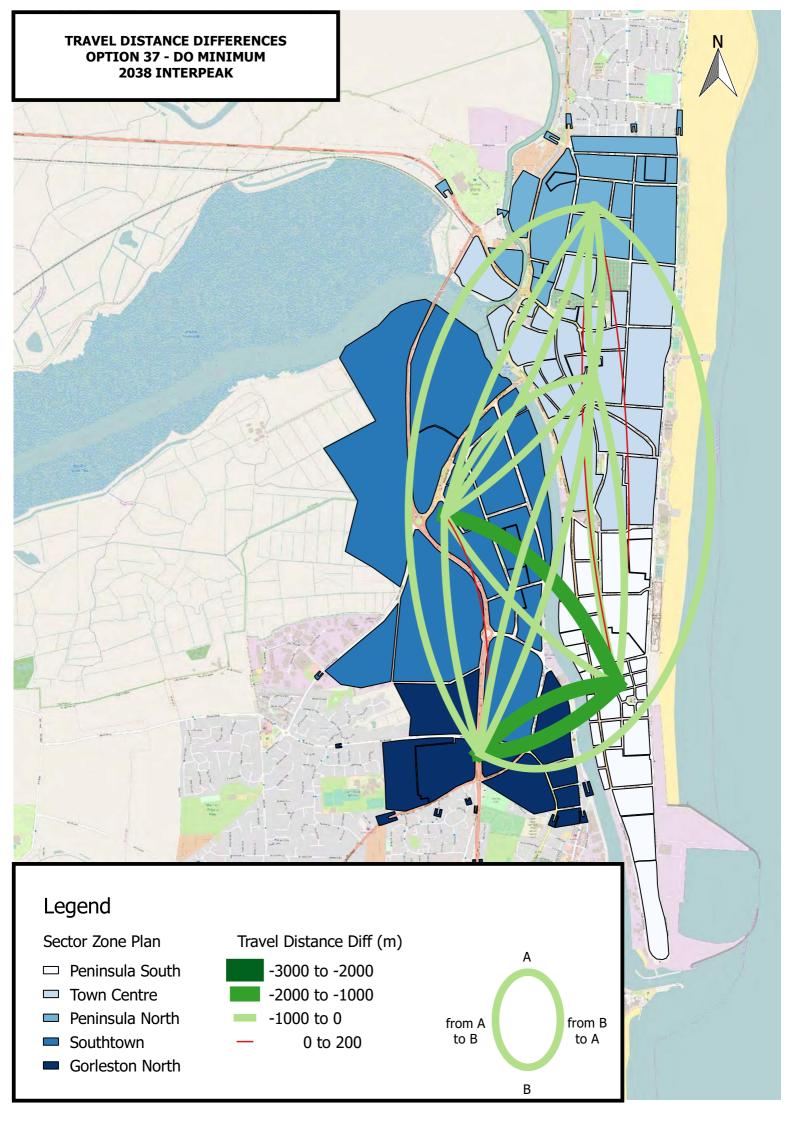


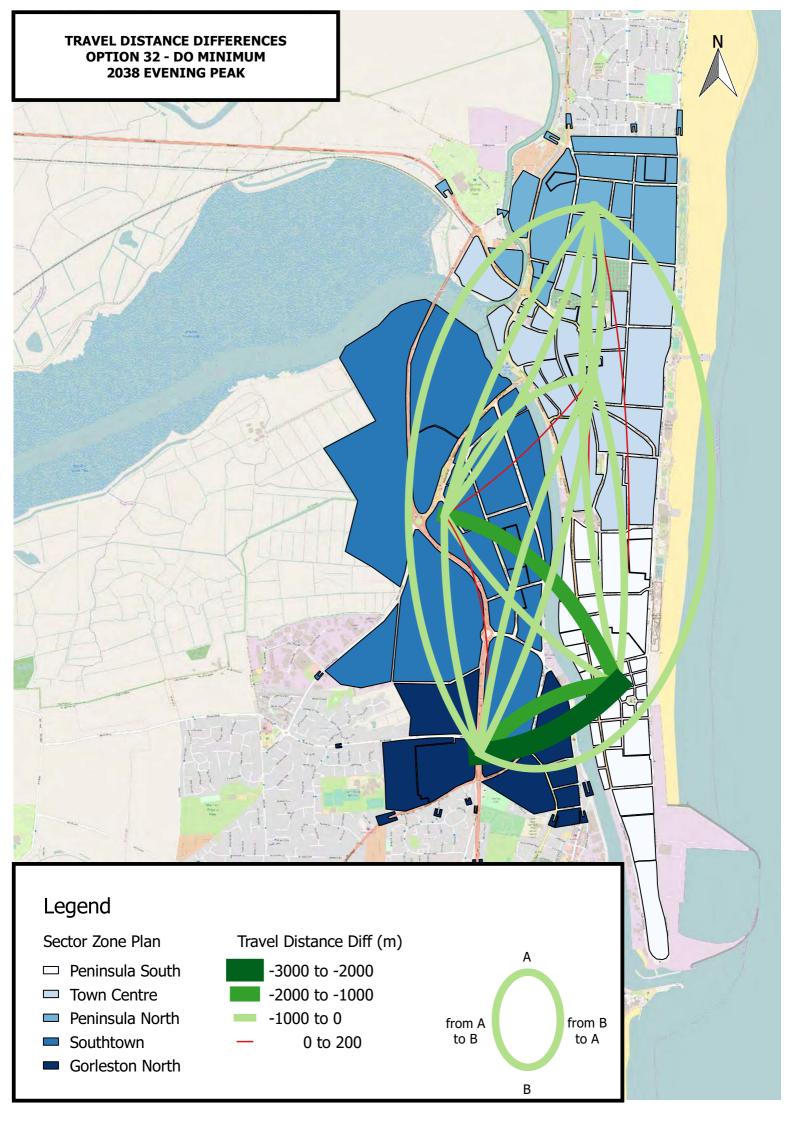


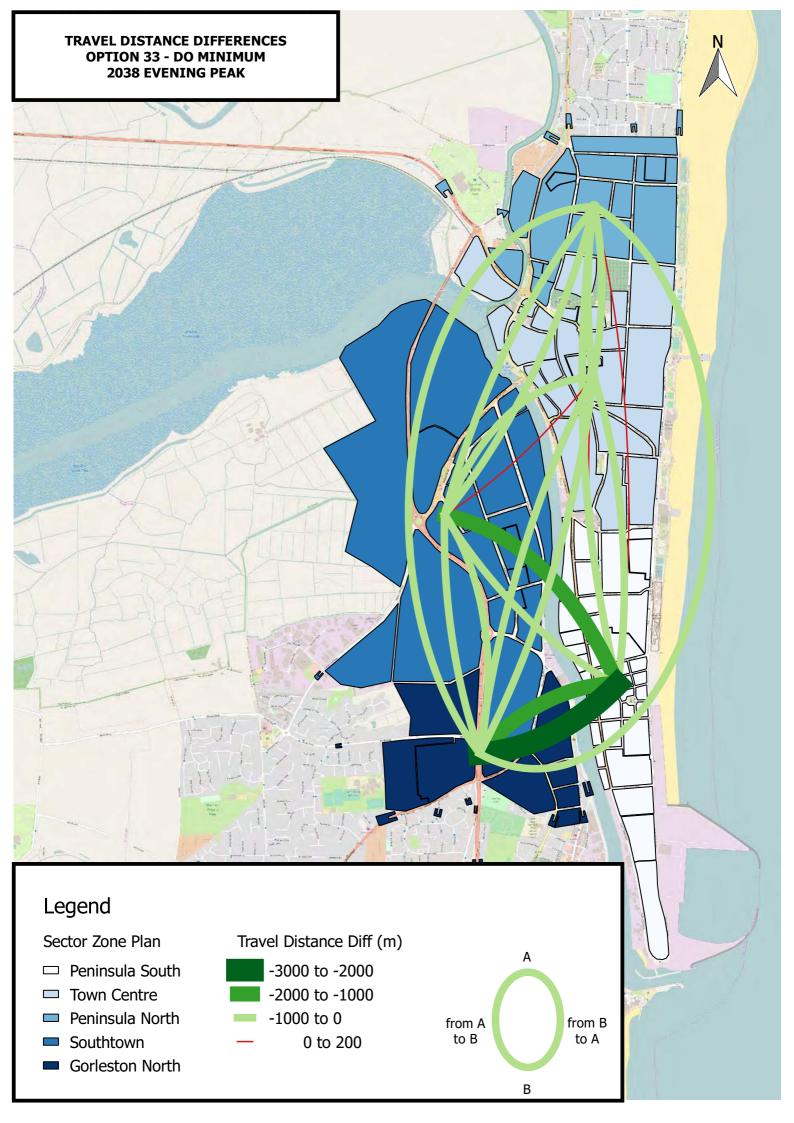


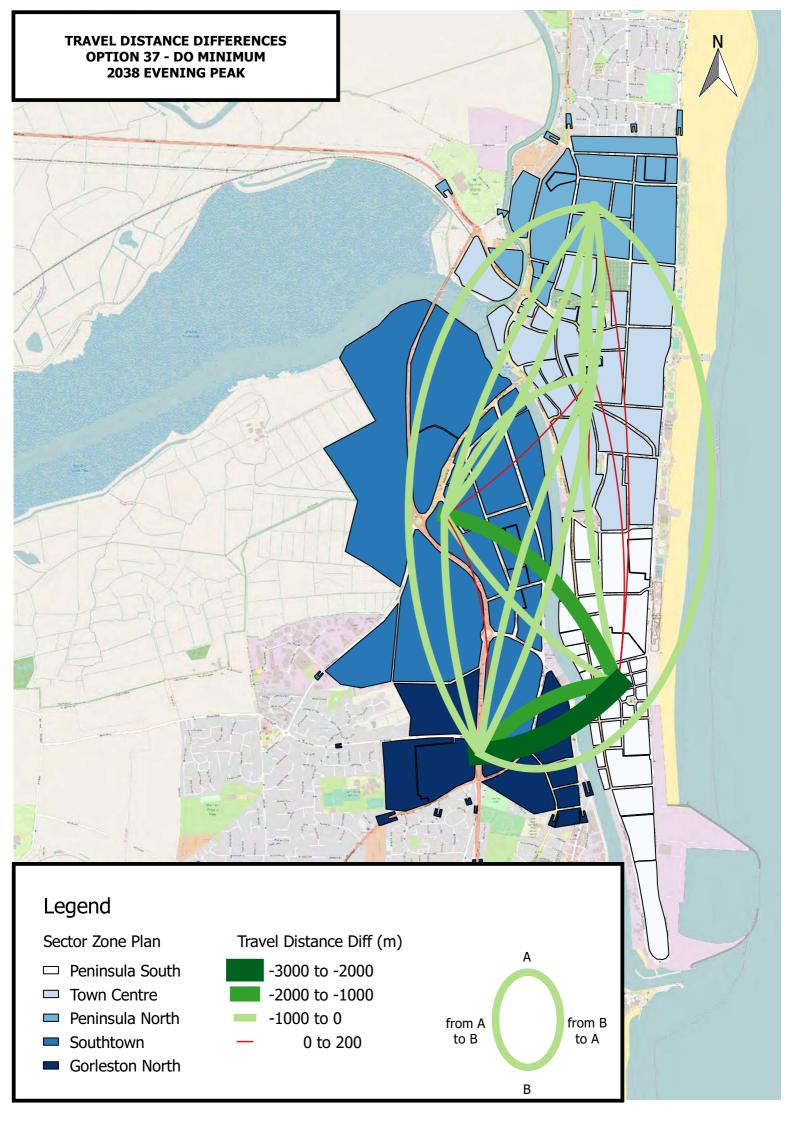


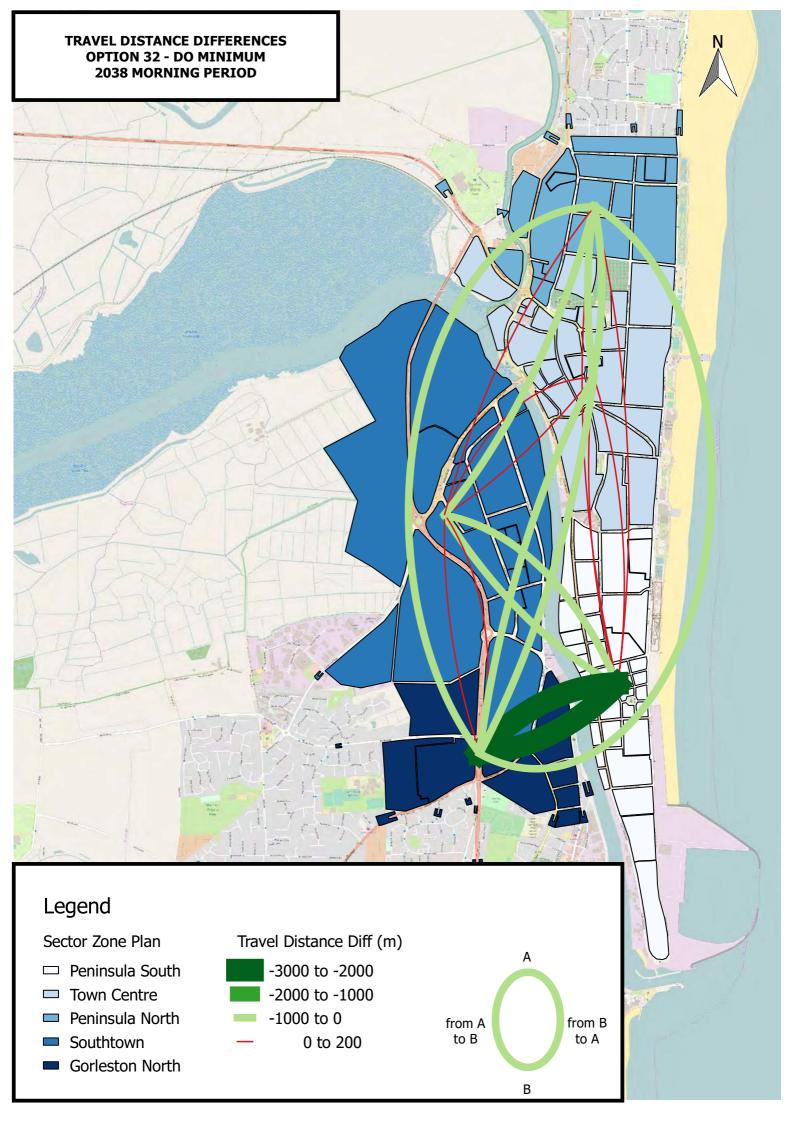


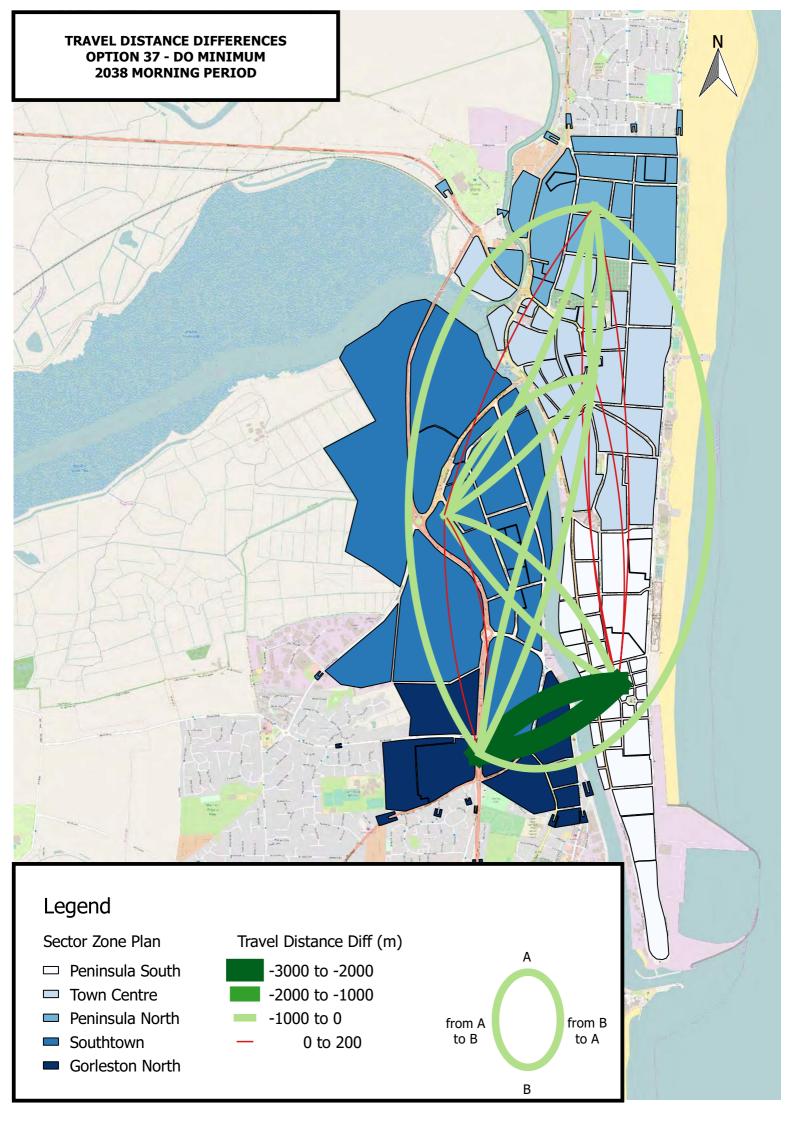


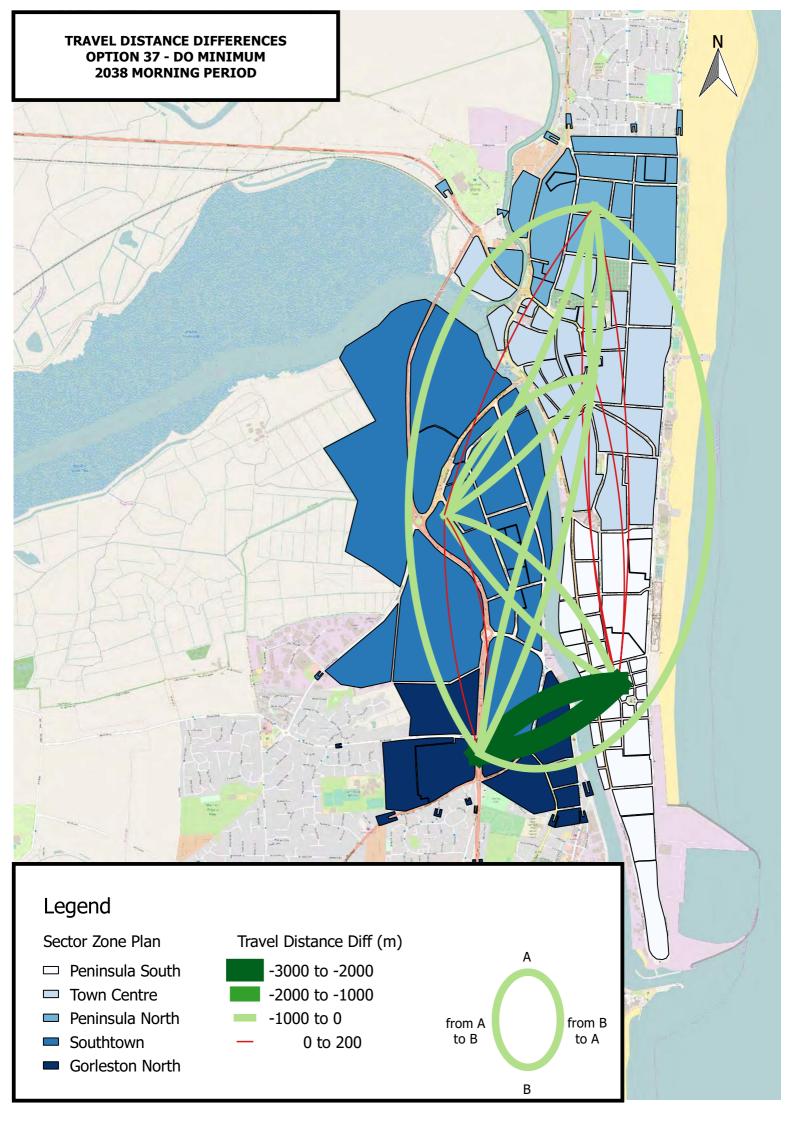


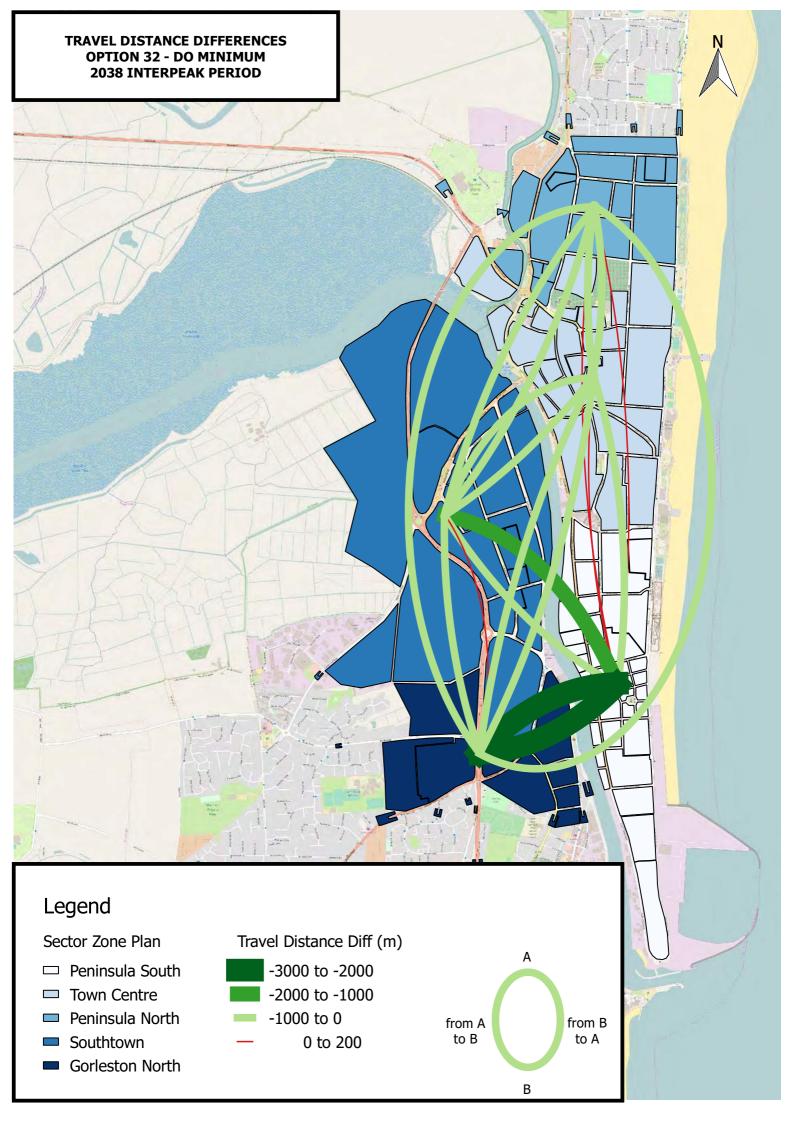


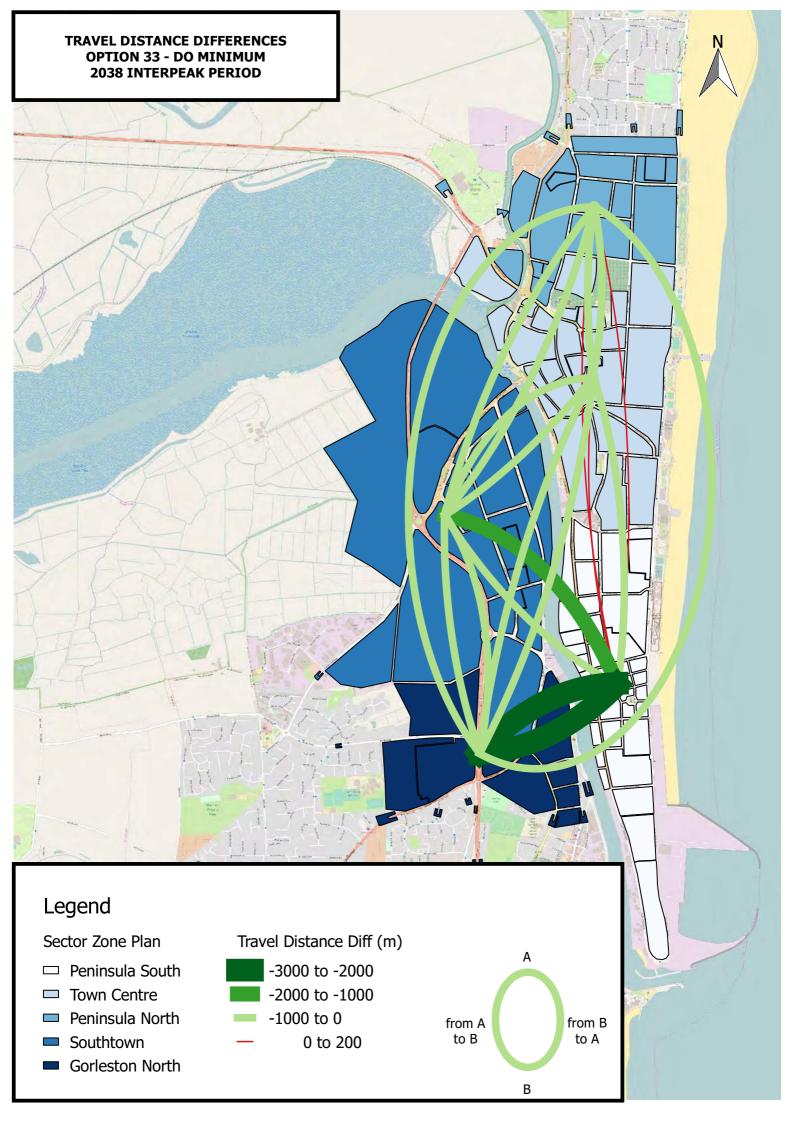


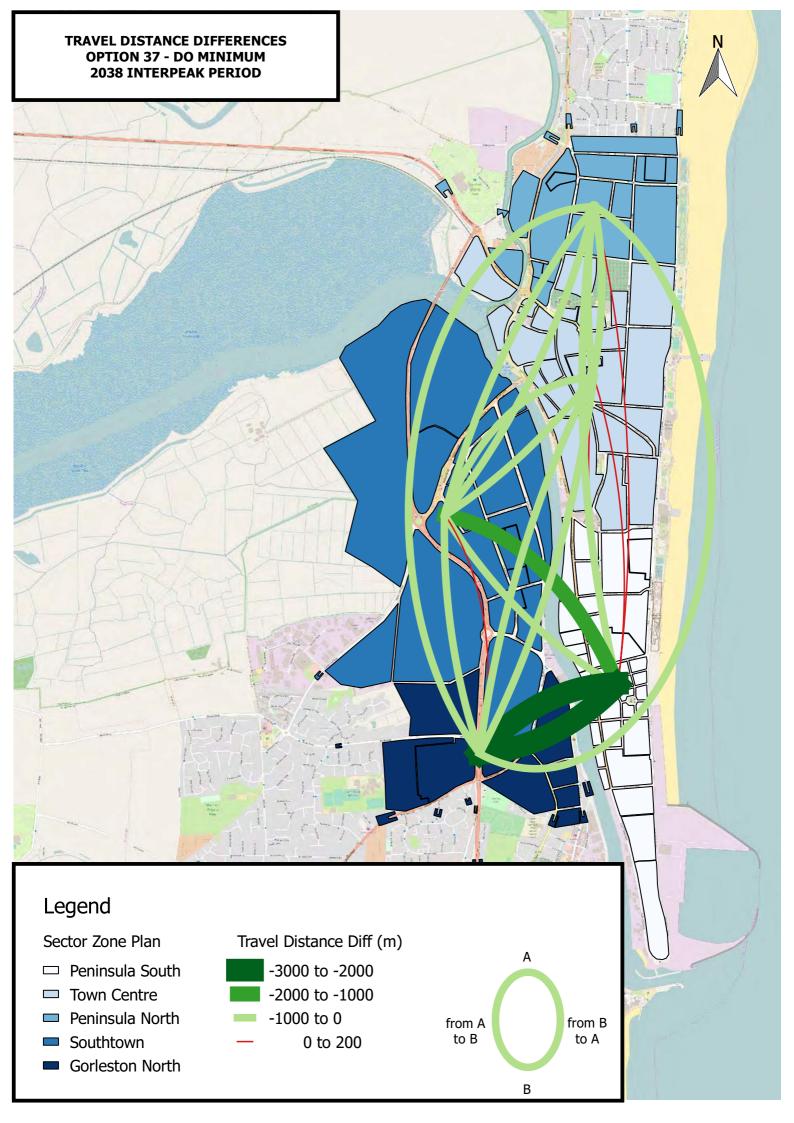


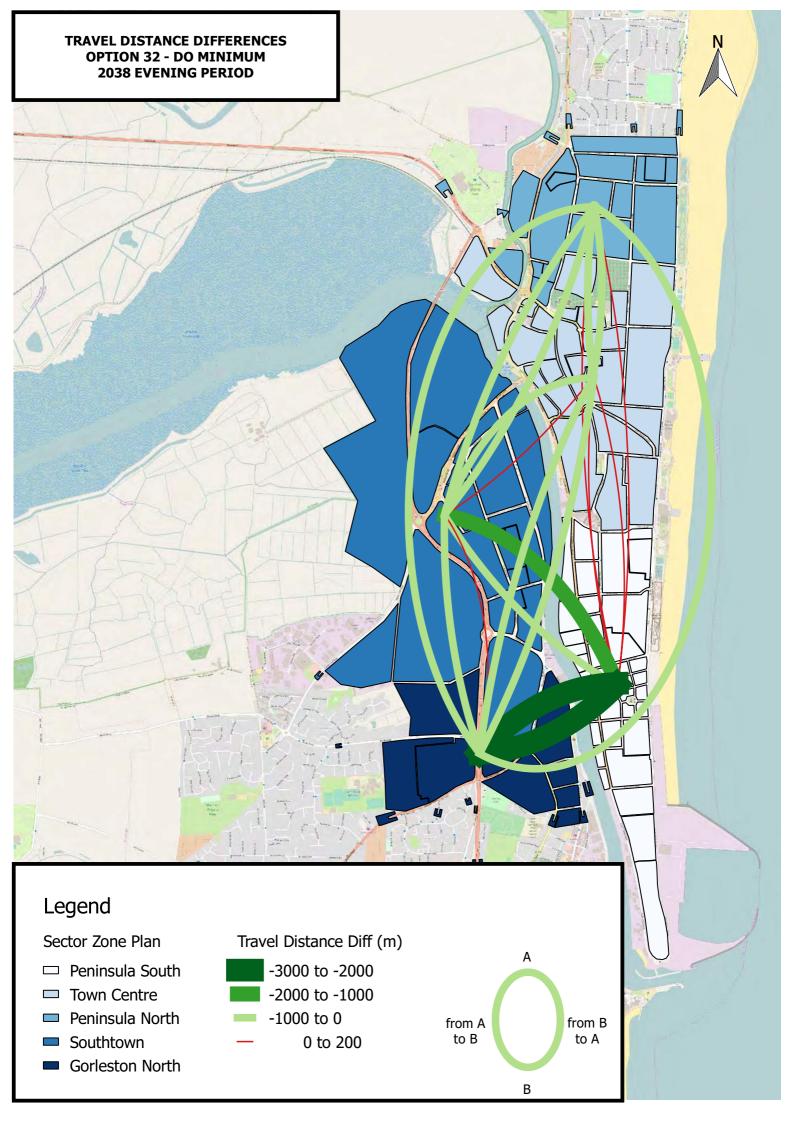


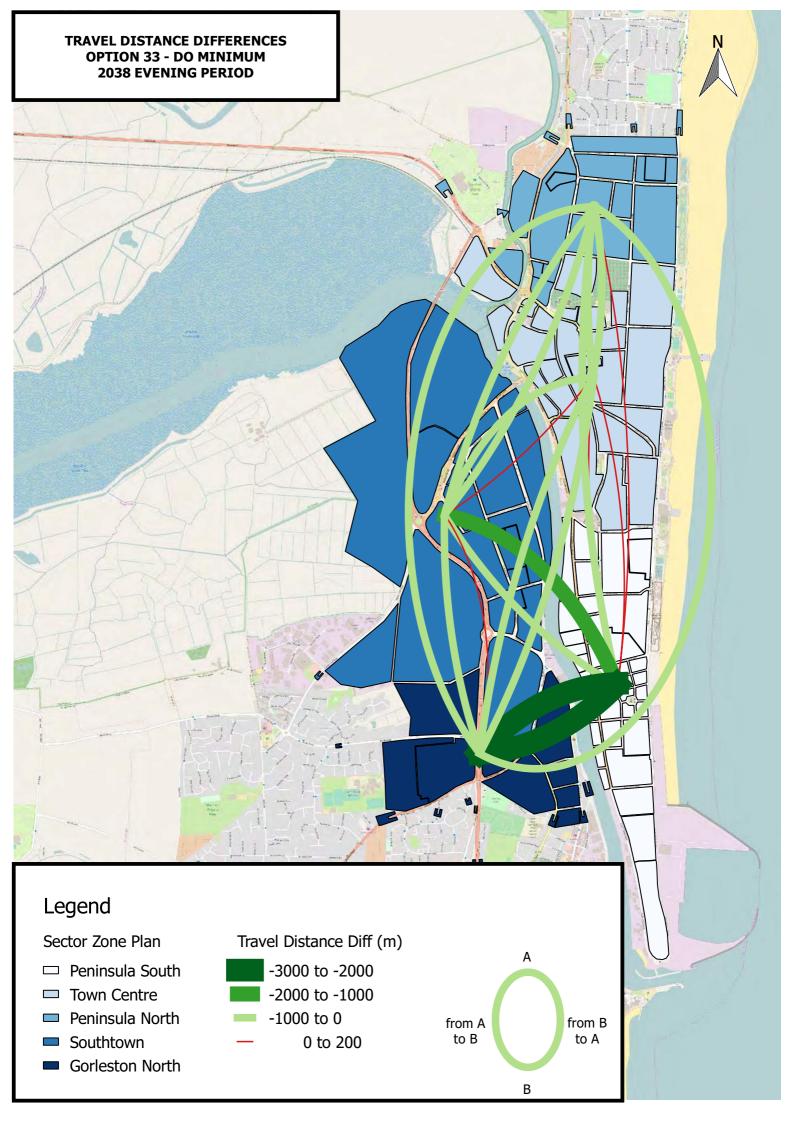


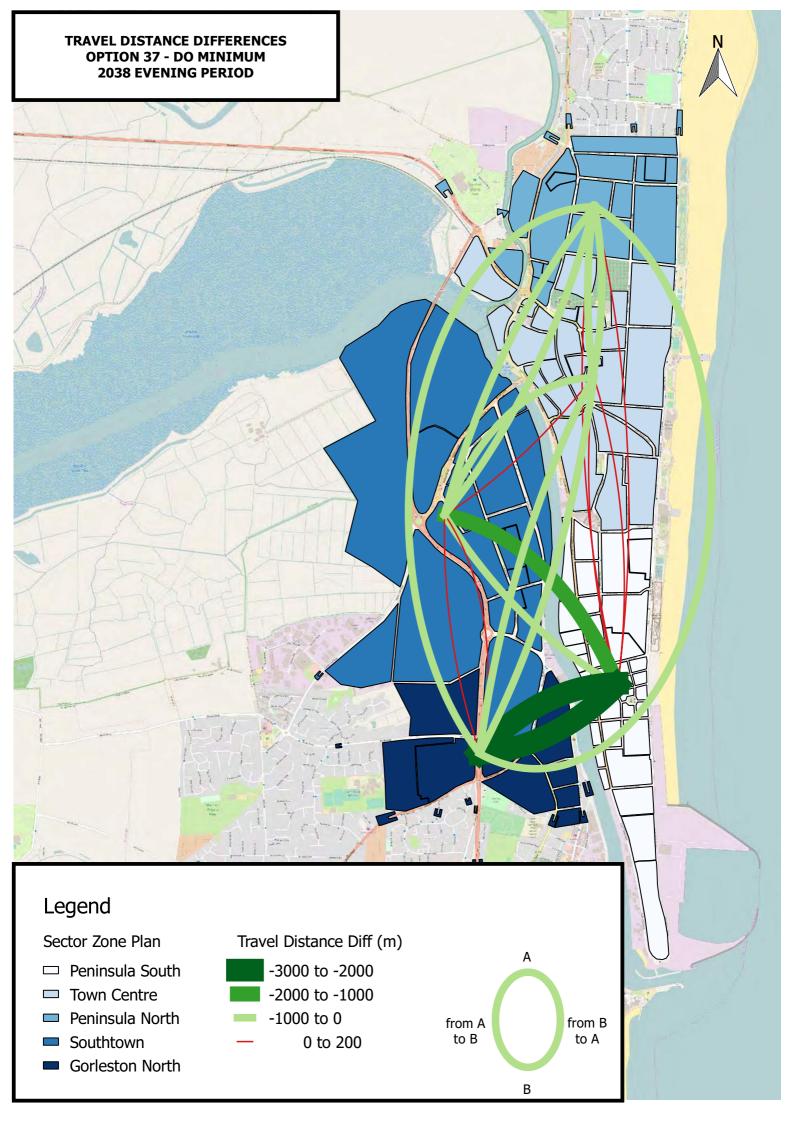












APPENDIX F\_6. Average Case Scenario. Queue Comparison.

Figure 1 ID Queue for Option 32 and 33

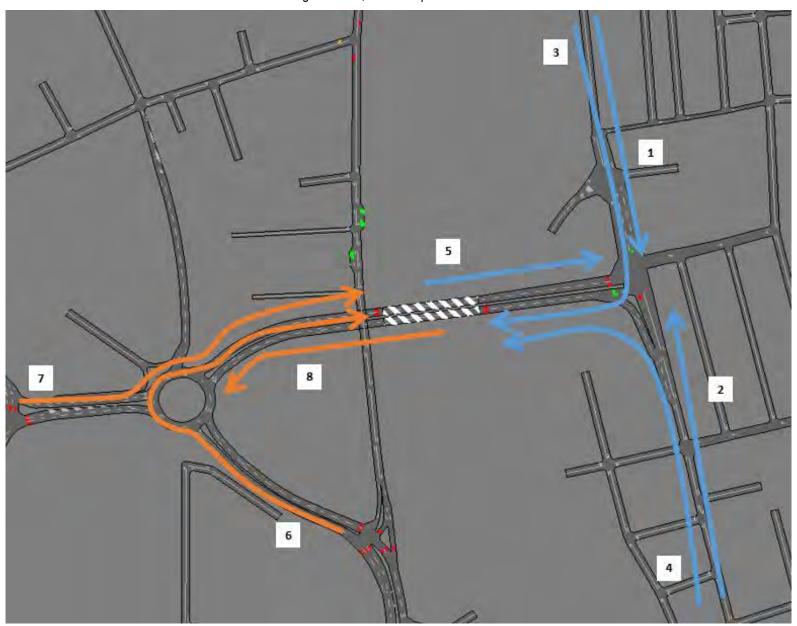


Figure 2 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

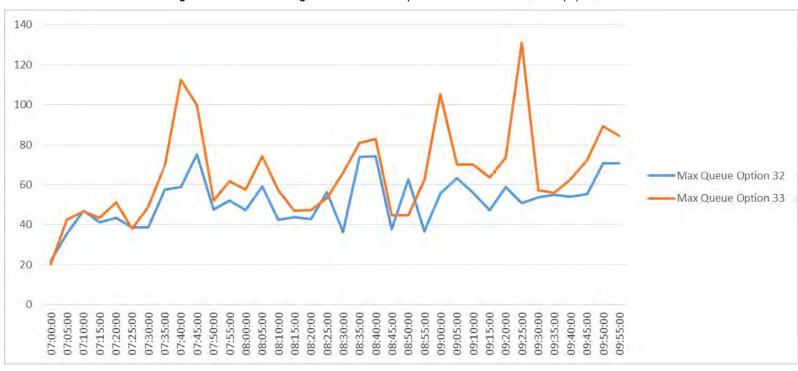


Figure 3 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2



Figure 4 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

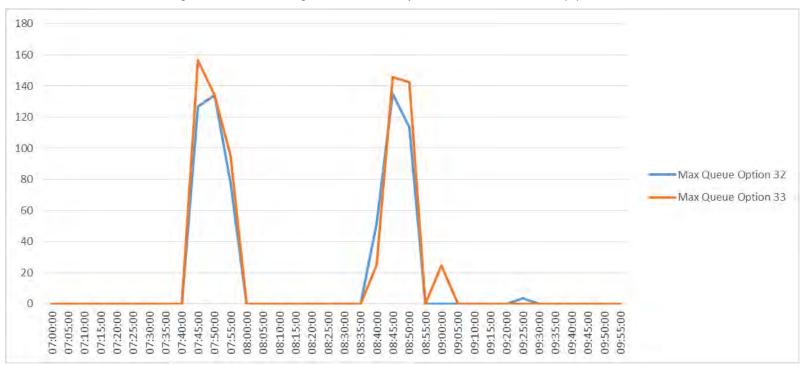


Figure 5 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

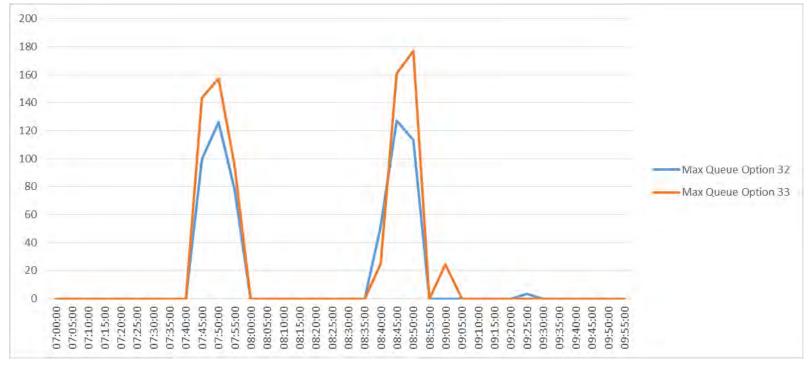


Figure 6 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 7 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

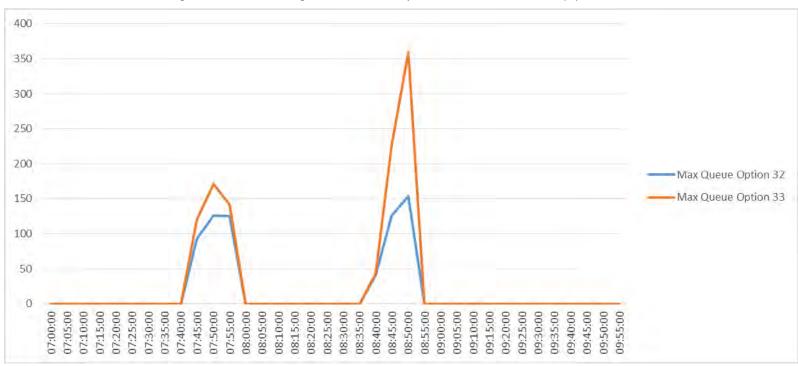


Figure 8 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

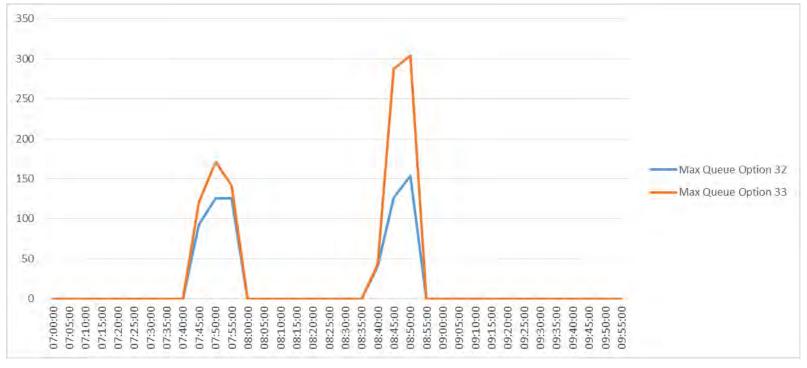


Figure 9 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

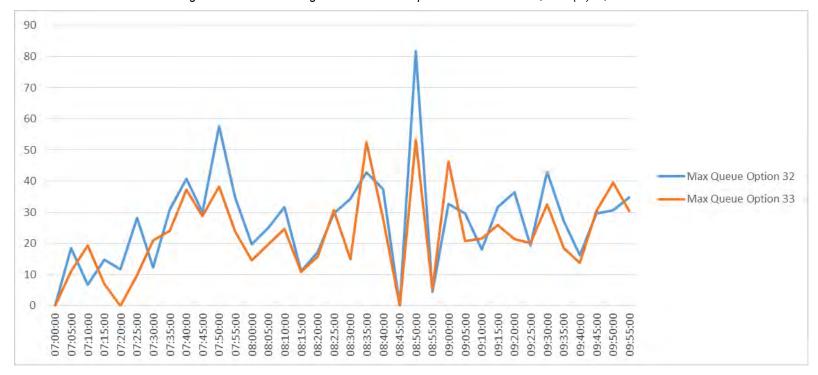


Figure 10 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

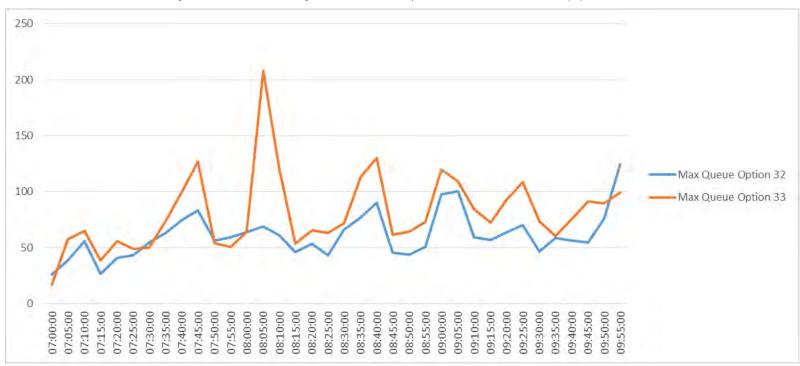


Figure 11 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2



Figure 12 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

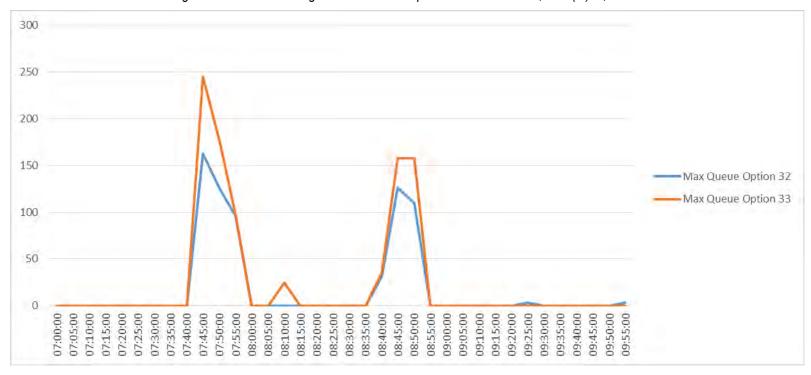


Figure 13 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

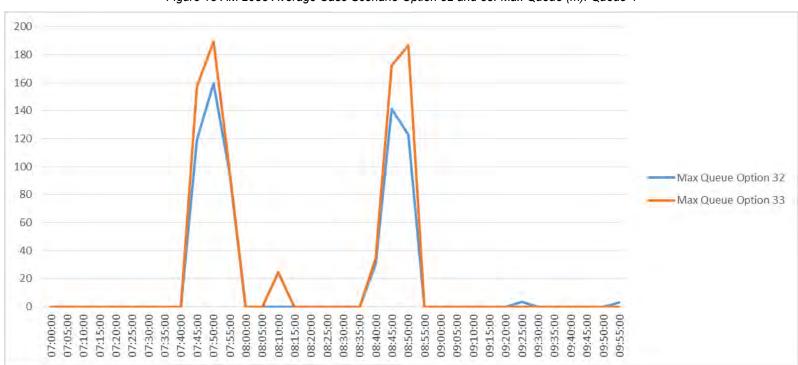


Figure 14 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5

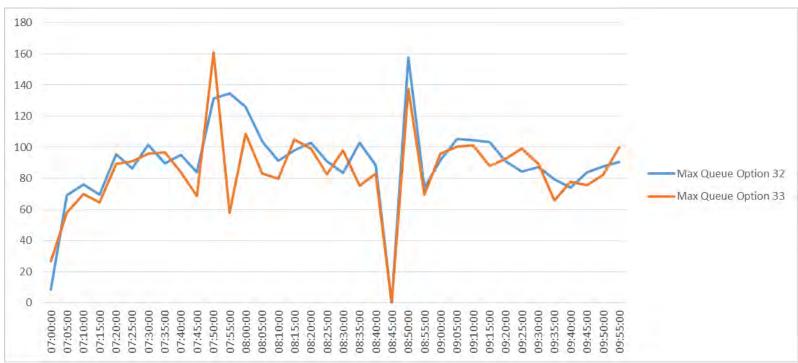


Figure 15 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

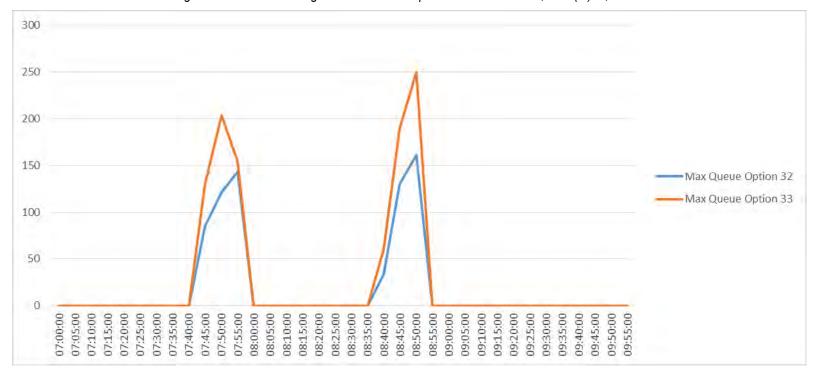


Figure 16 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

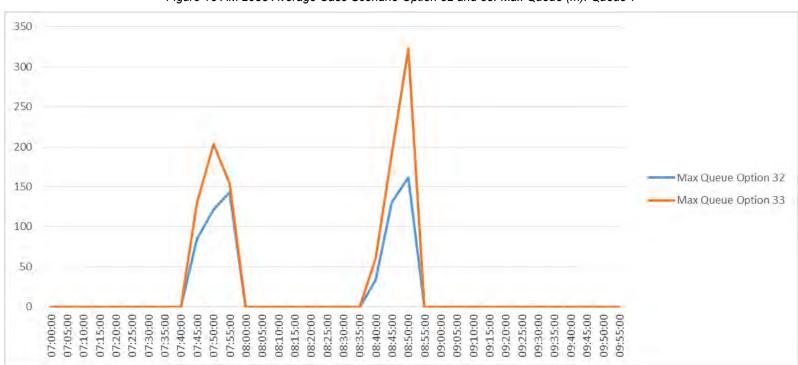


Figure 17 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

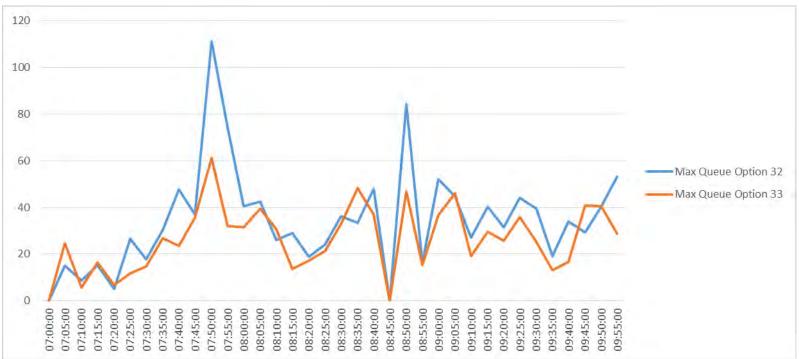


Figure 18 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

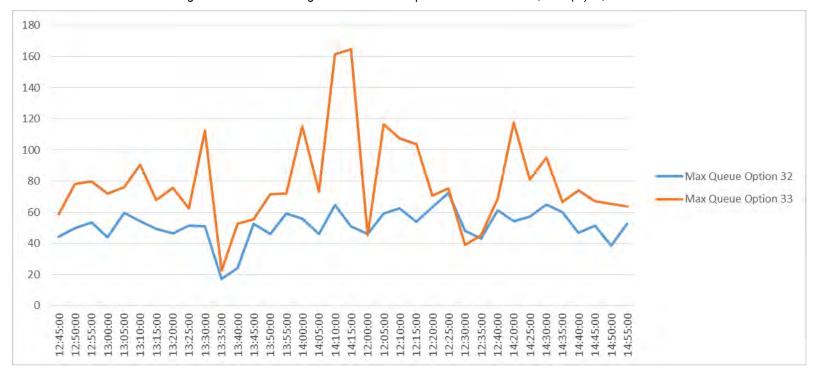


Figure 19 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2

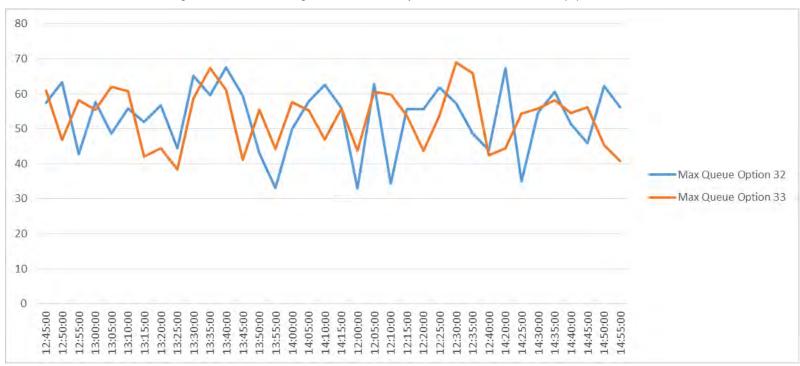


Figure 20 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

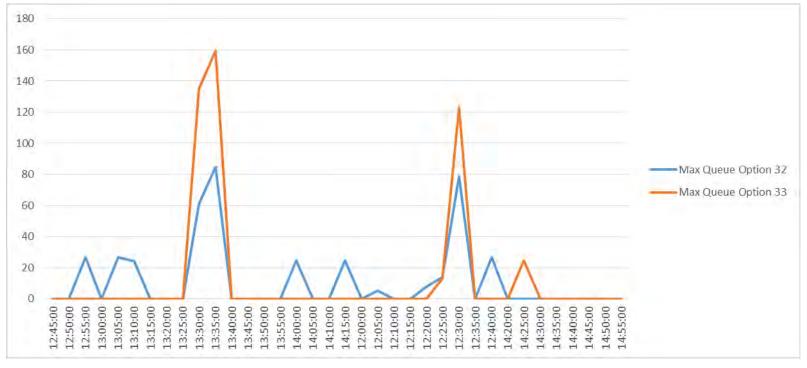


Figure 21 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

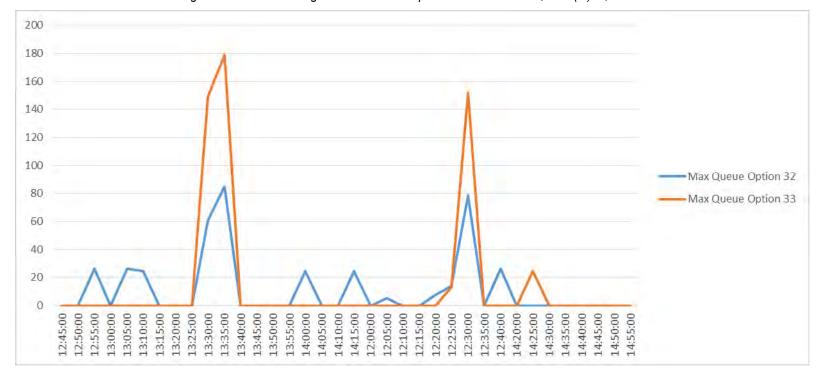


Figure 22 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 23 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6



Figure 24 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

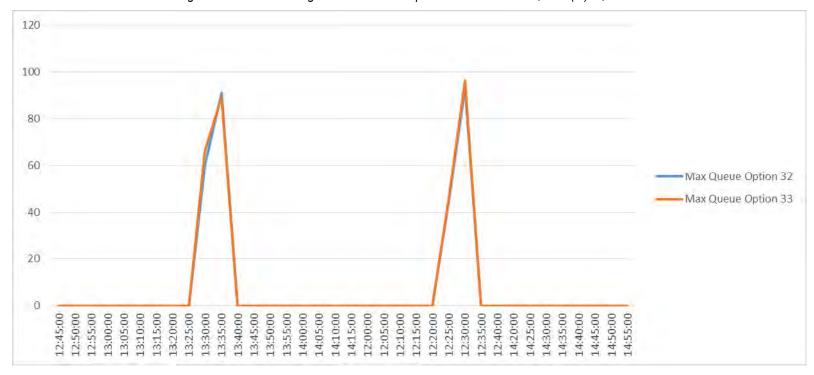


Figure 25 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8



Figure 26 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1



Figure 27 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2

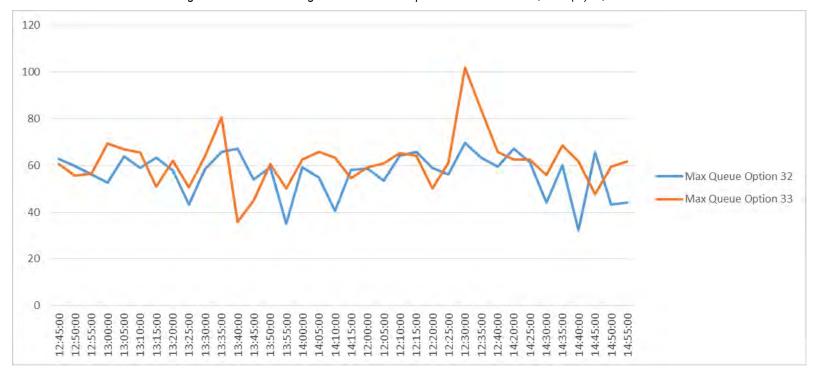


Figure 28 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

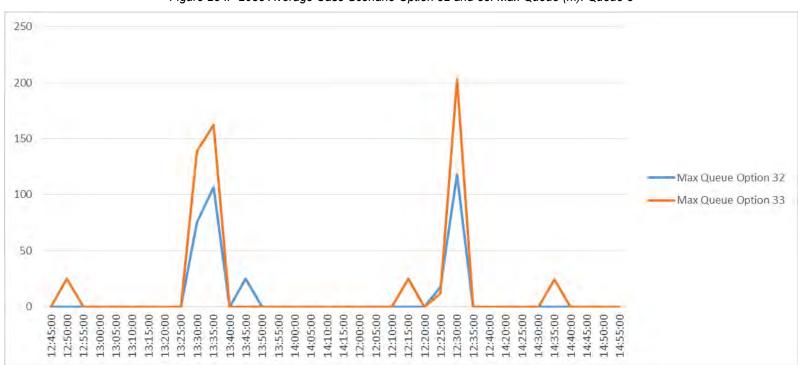


Figure 29 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

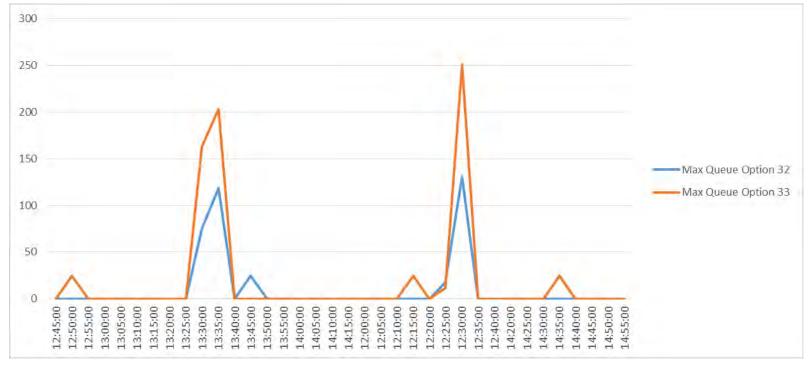


Figure 30 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 31 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

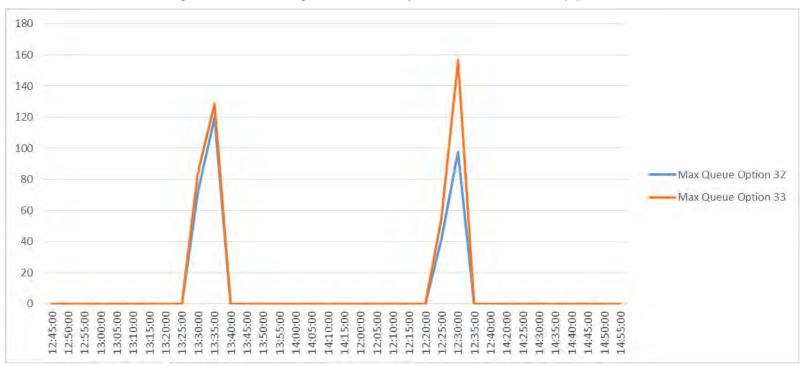


Figure 32 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7



Figure 33 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8



Figure 34 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

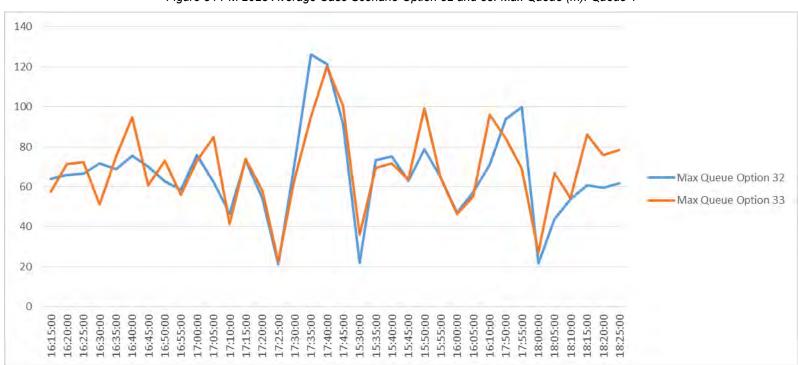


Figure 35 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2



Figure 36 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

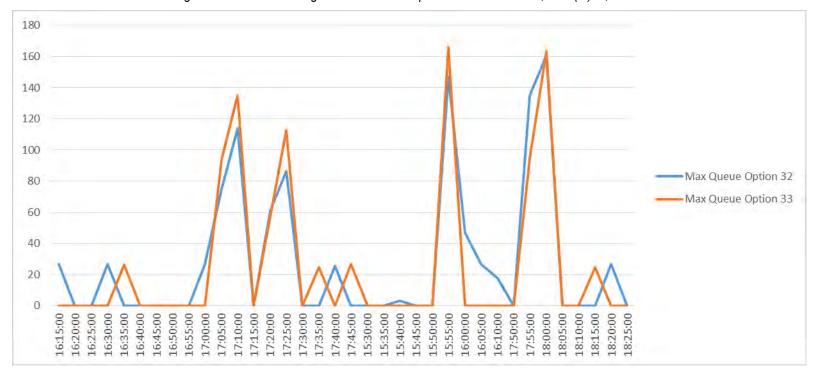


Figure 37 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

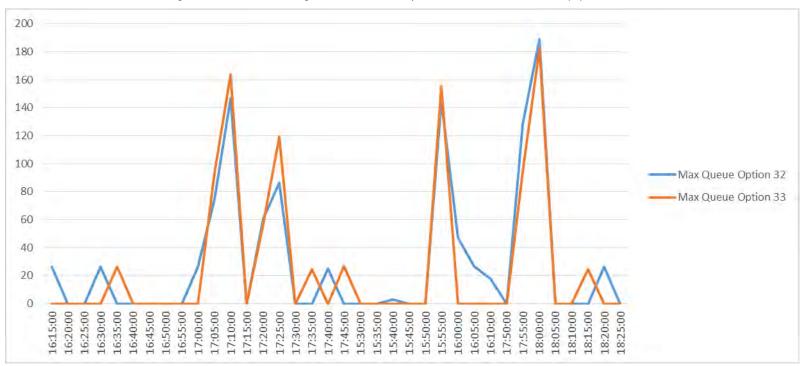


Figure 38 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 39 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

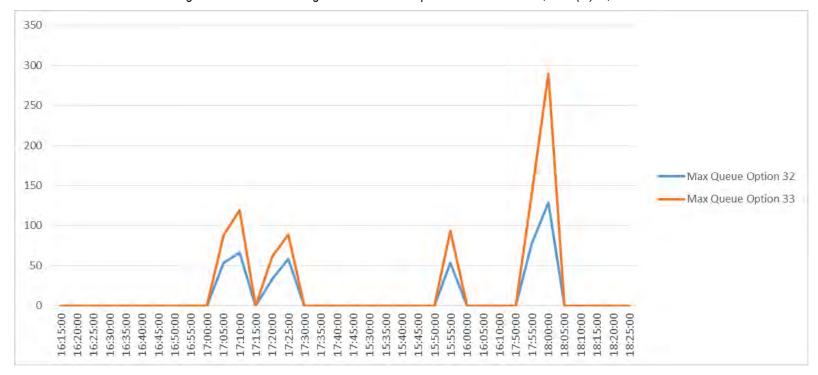


Figure 40 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

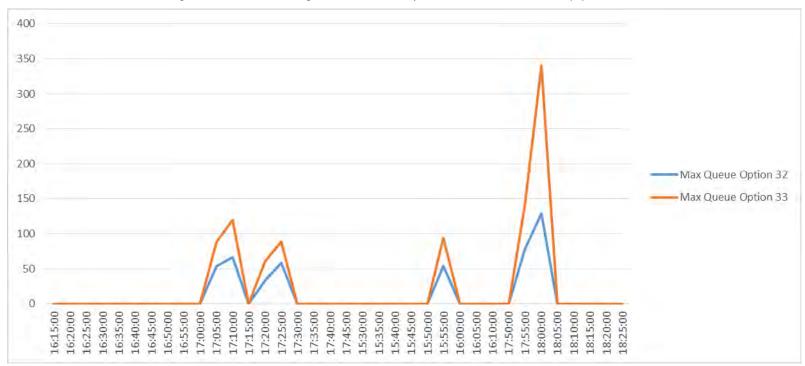


Figure 41 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

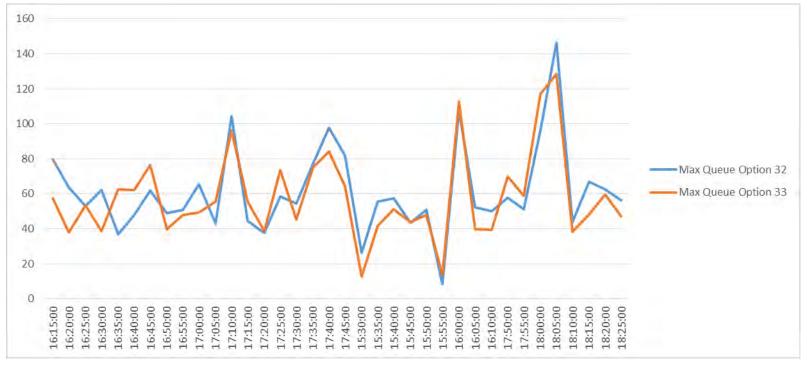


Figure 42 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

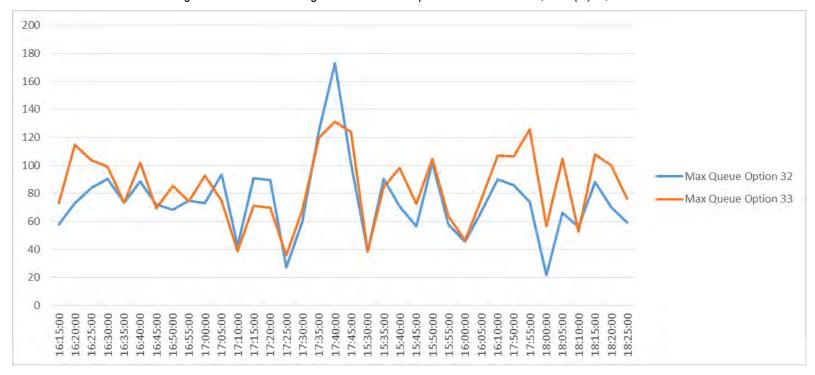


Figure 43 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2

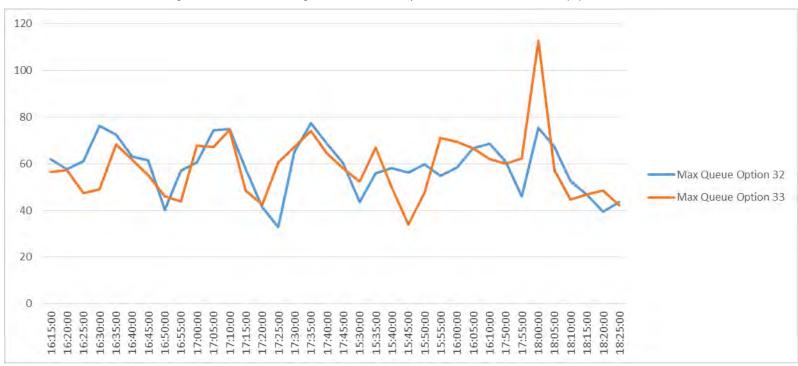


Figure 44 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

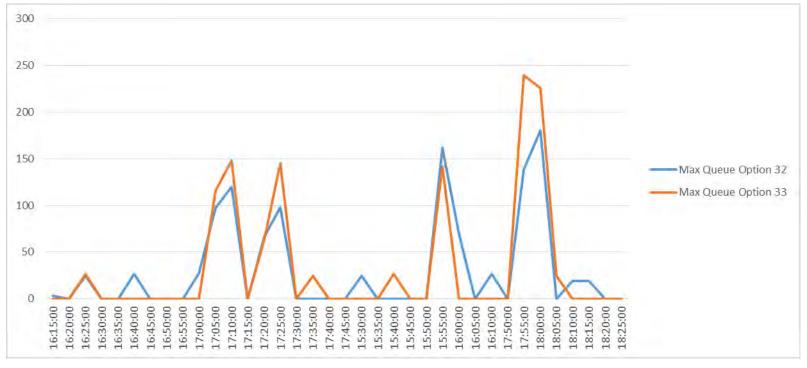


Figure 45 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

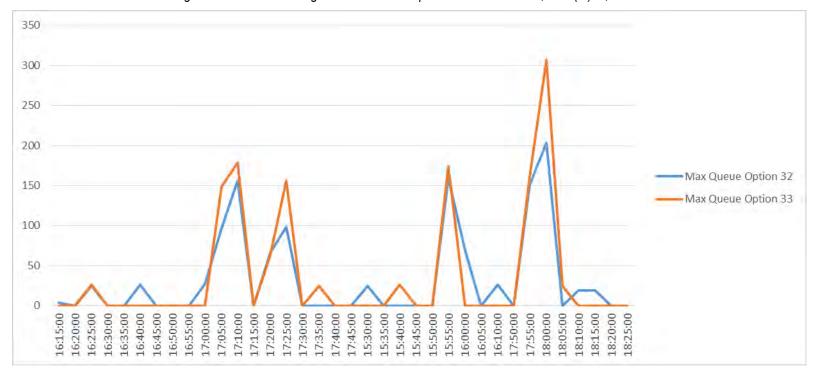


Figure 46 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 47 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

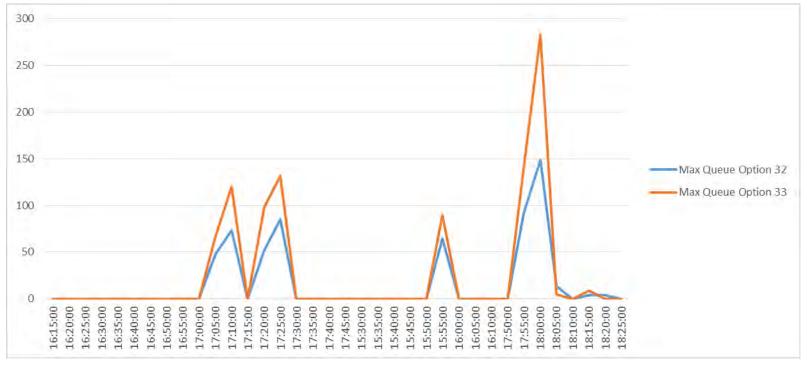


Figure 48 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

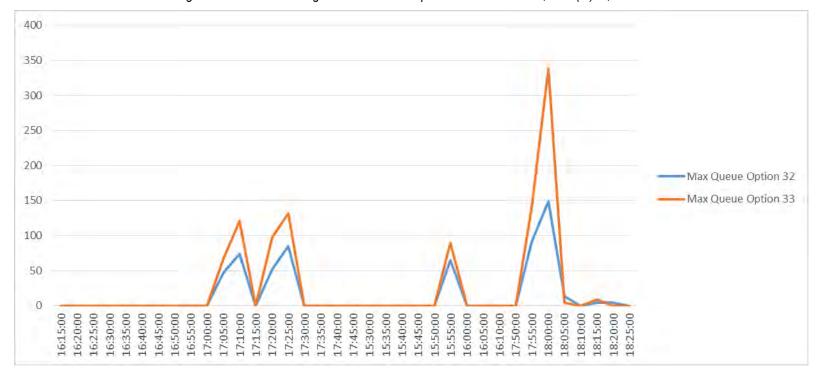


Figure 49 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

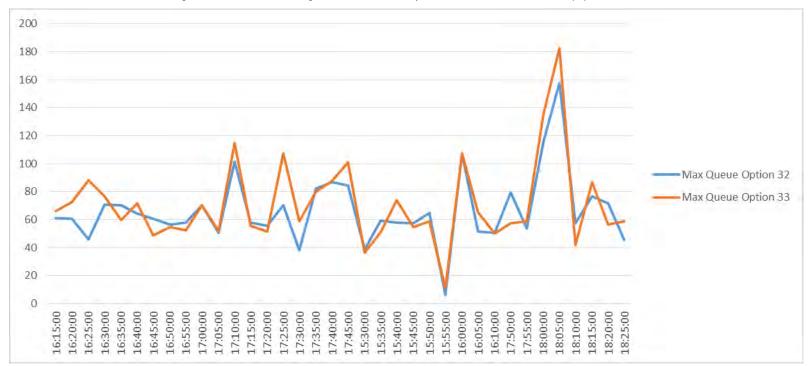


Figure 50 ID Queue for Option 37

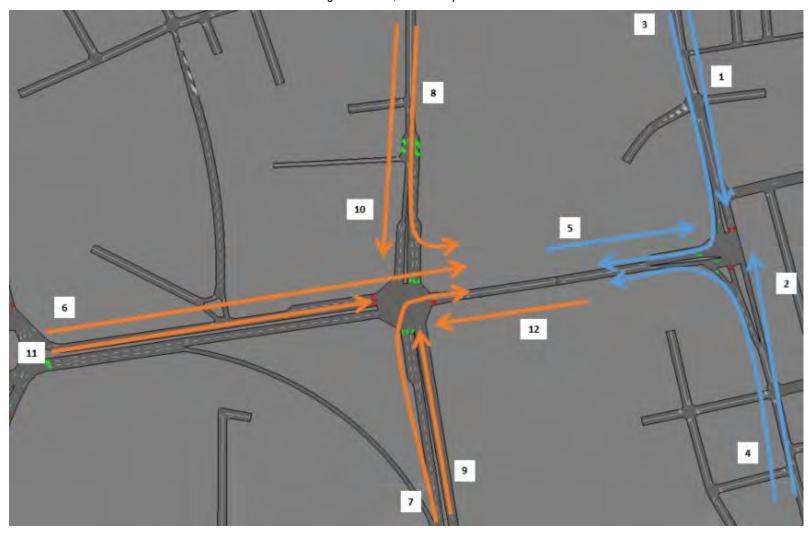


Figure 51 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 1

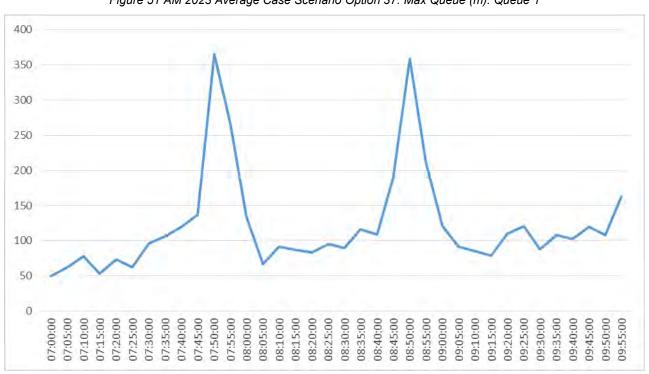


Figure 52 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 2

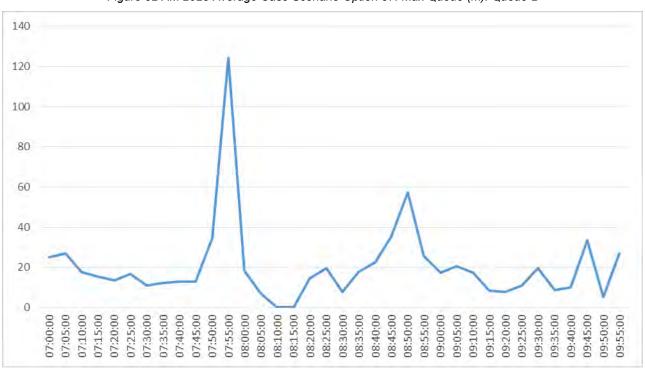


Figure 53 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 3

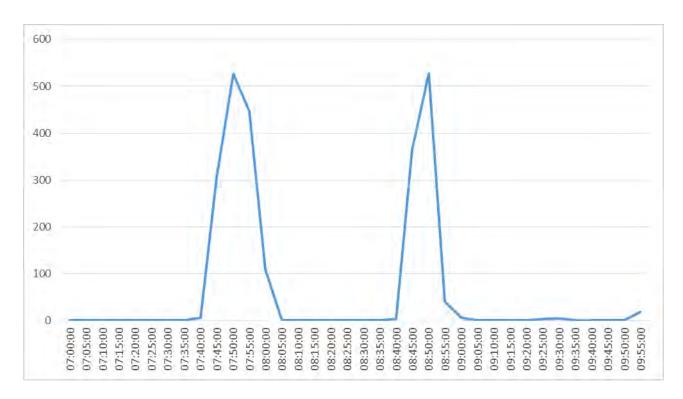


Figure 54 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 4

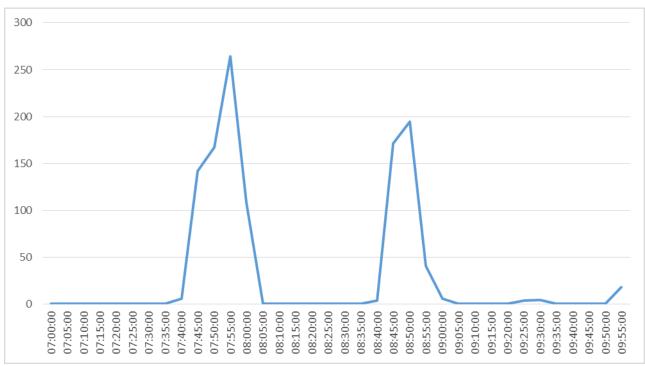


Figure 55 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 5

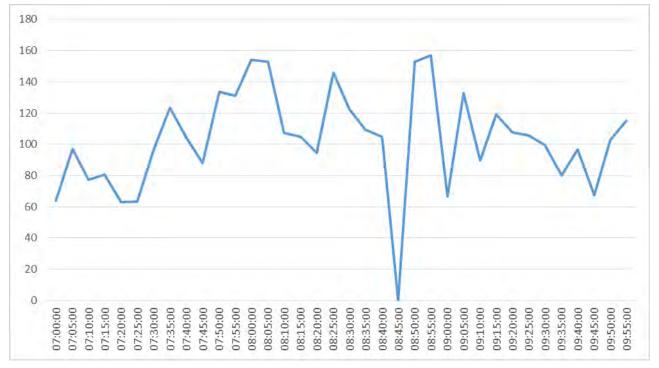


Figure 56 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 6

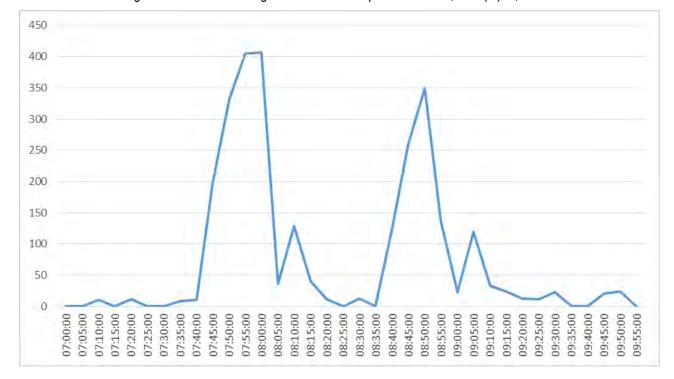


Figure 57 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 7

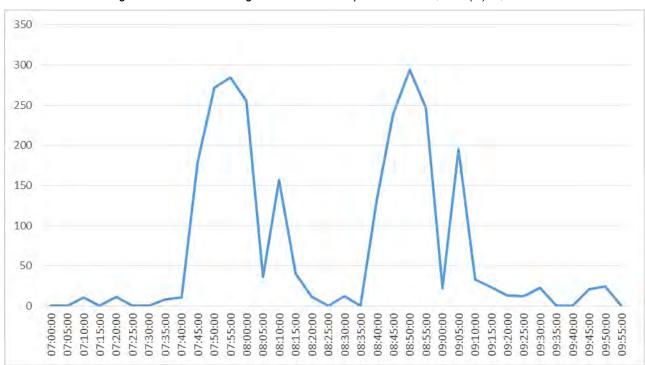


Figure 58 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 8

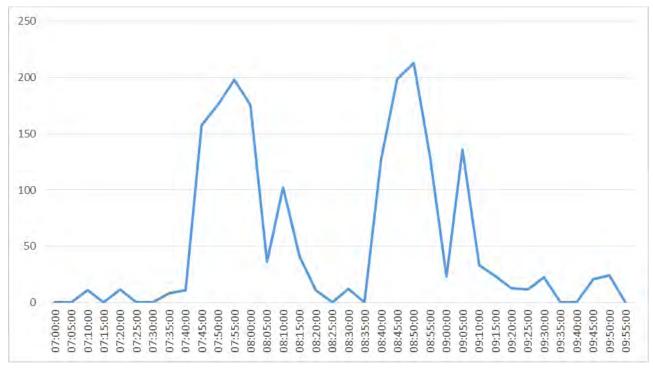


Figure 59 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 9

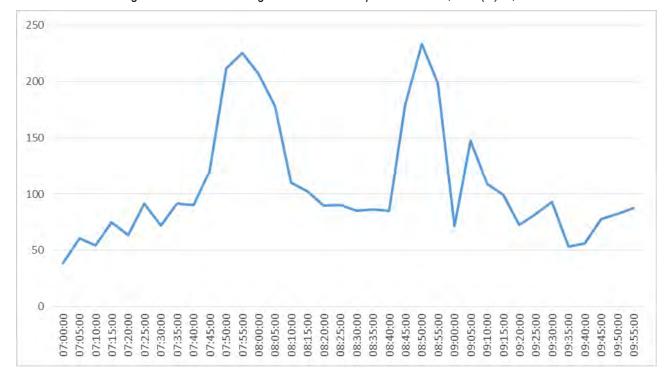


Figure 60 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 10

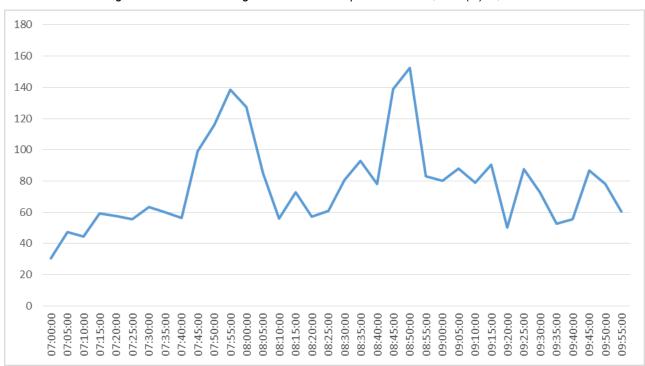


Figure 61 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 11

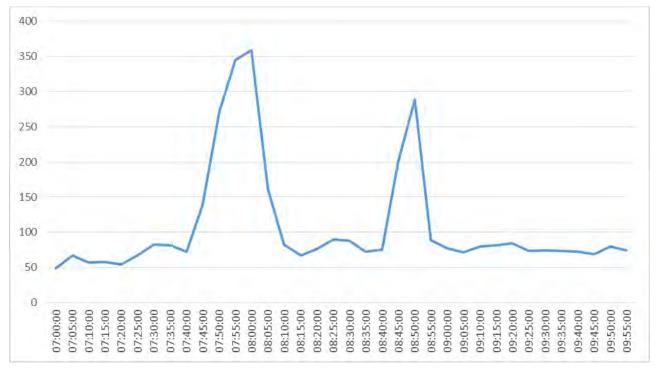


Figure 62 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 12

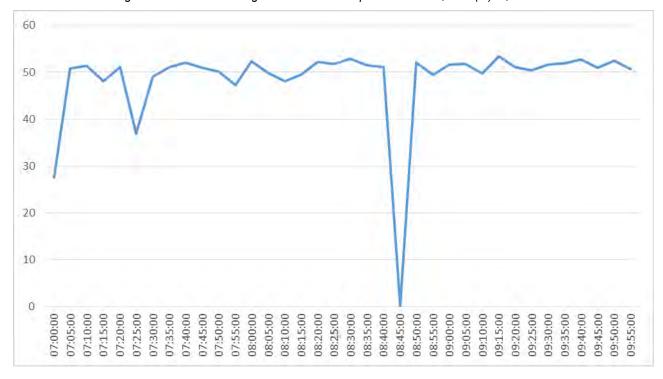


Figure 63 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 1

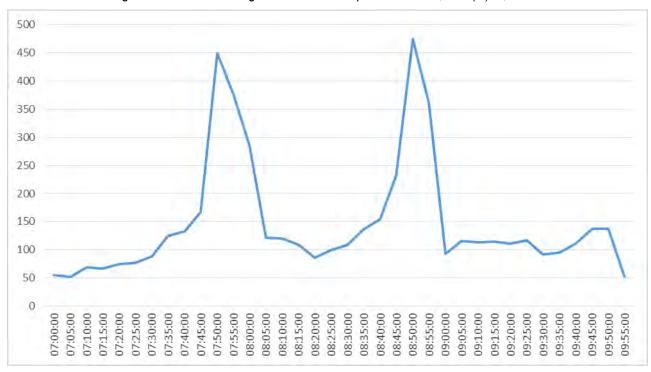


Figure 64 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 2

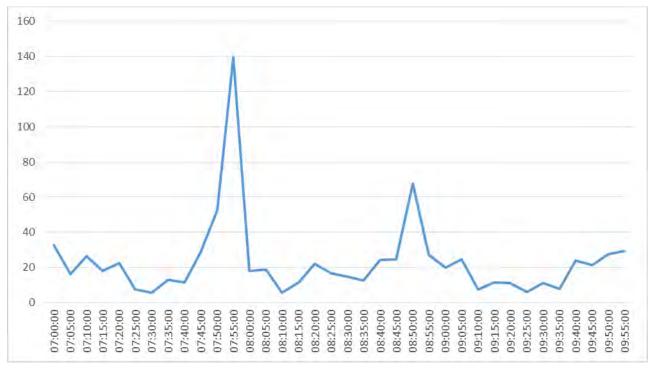


Figure 65 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 3

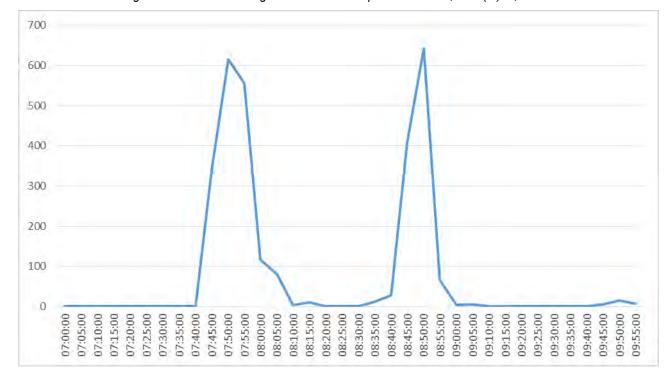


Figure 66 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 4

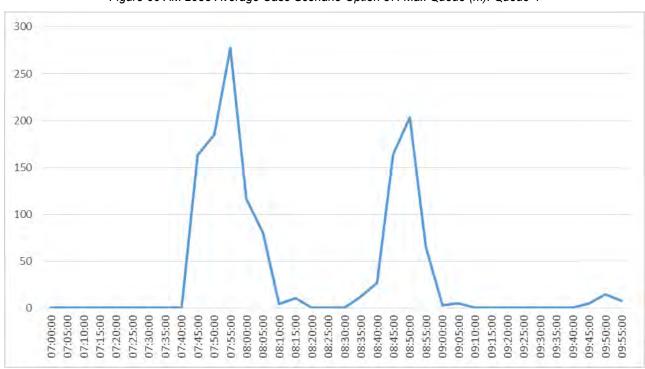


Figure 67 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 5

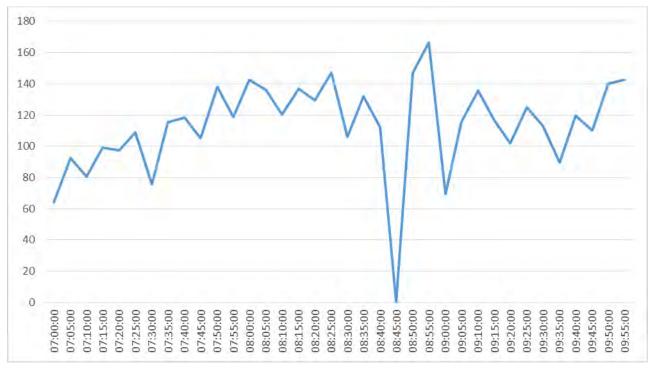


Figure 68 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 6

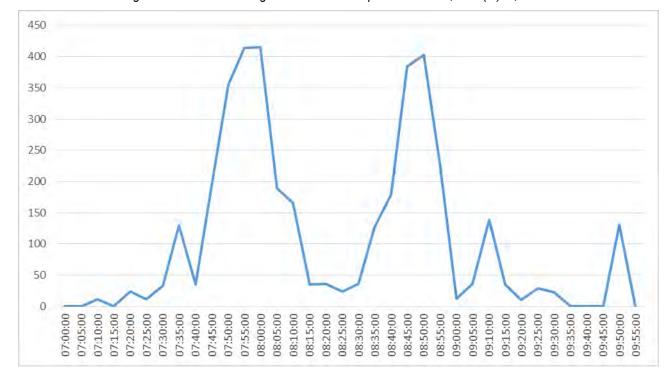


Figure 69 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 7

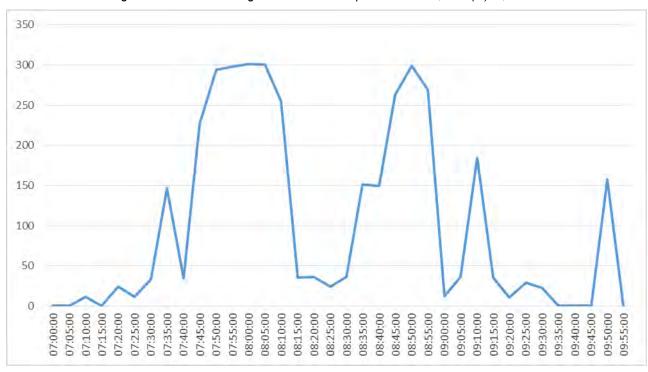


Figure 70 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 8

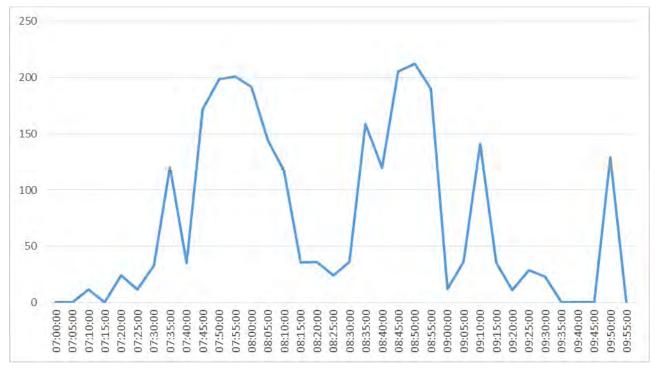


Figure 71 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 9

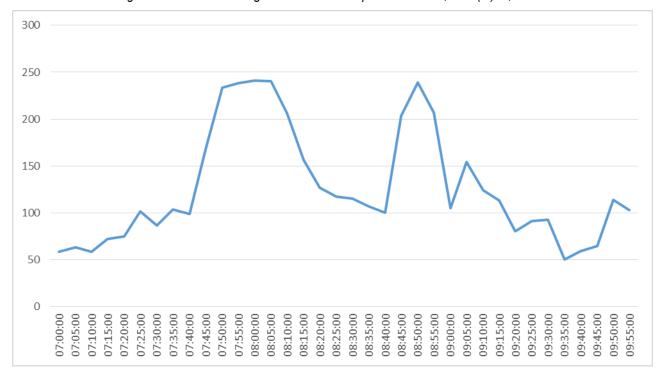


Figure 72 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 10

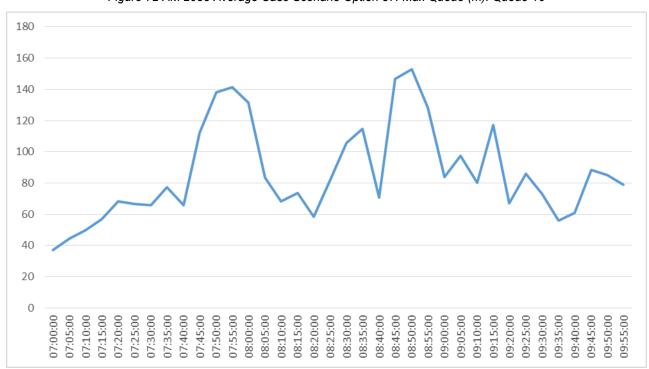


Figure 73 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 11

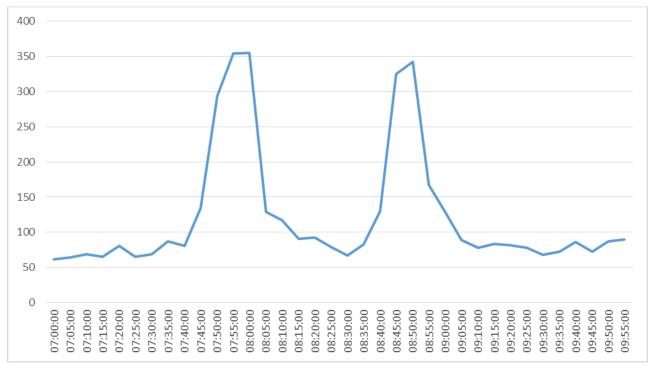


Figure 74 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 12

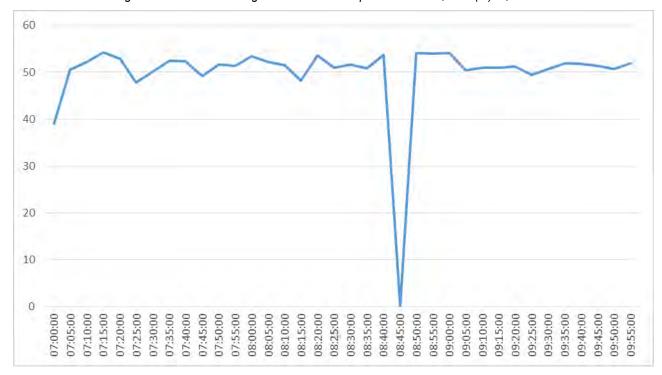


Figure 75 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 1

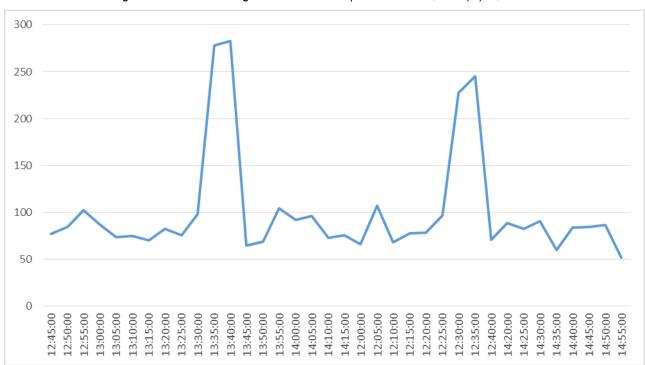


Figure 76 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 2

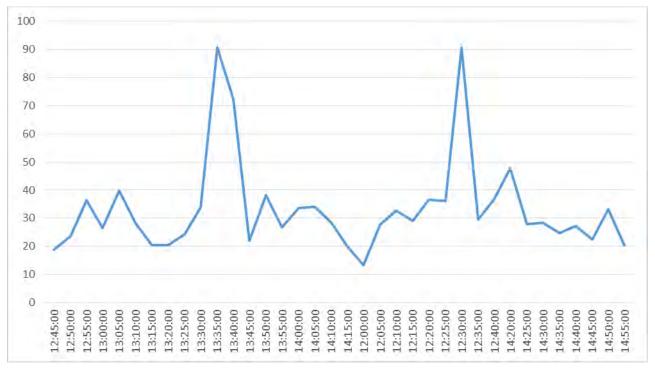


Figure 77 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 3

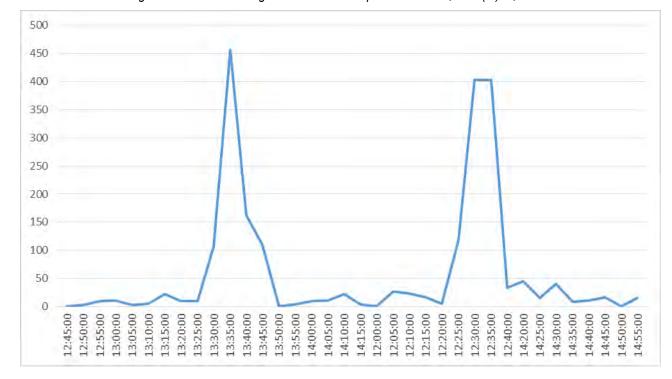


Figure 78 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 4

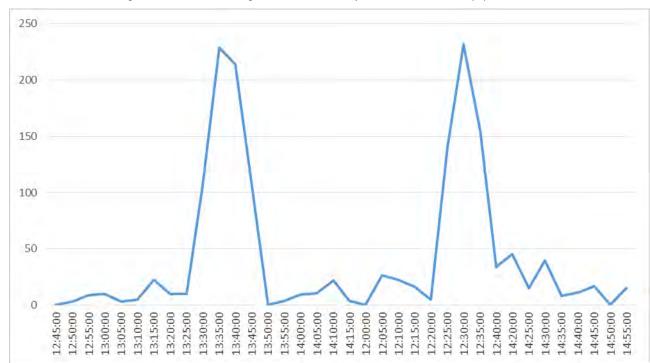


Figure 79 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 5



Figure 80 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 6

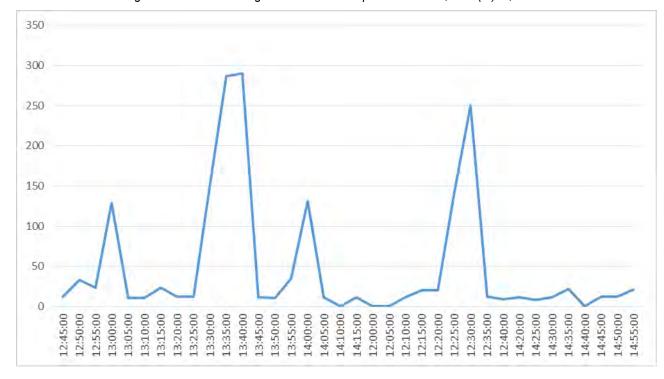


Figure 81 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 7

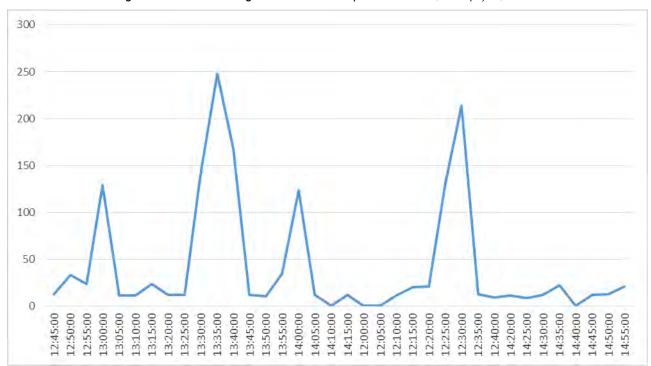


Figure 82 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 8

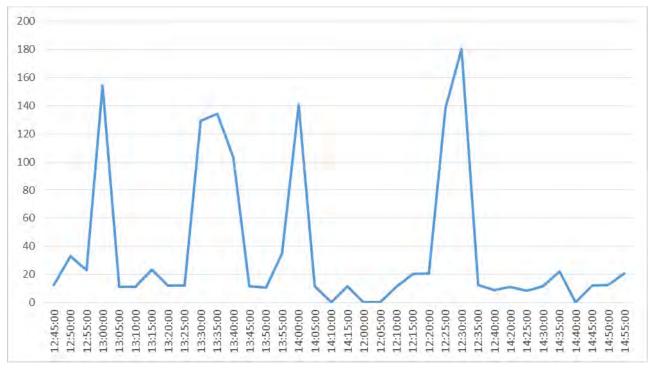


Figure 83 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 9

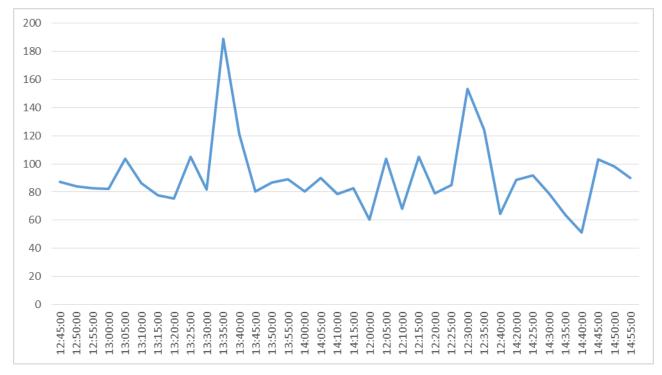


Figure 84 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 10

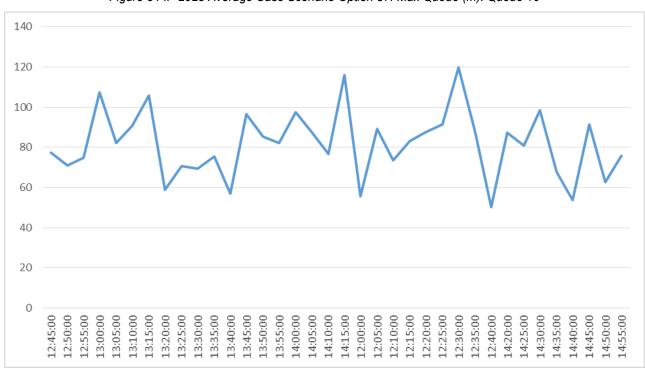


Figure 85 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 11

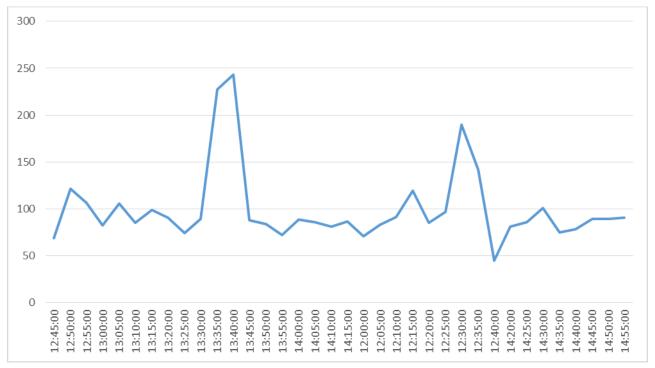


Figure 86 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 12

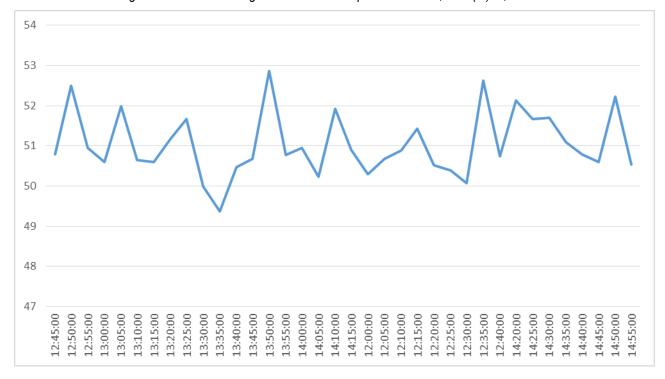


Figure 87 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 1

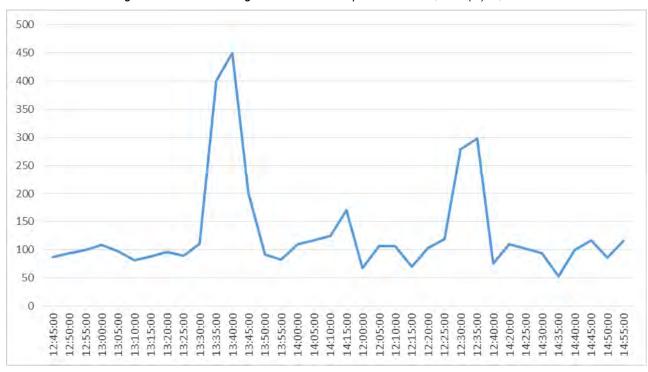


Figure 88 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 2

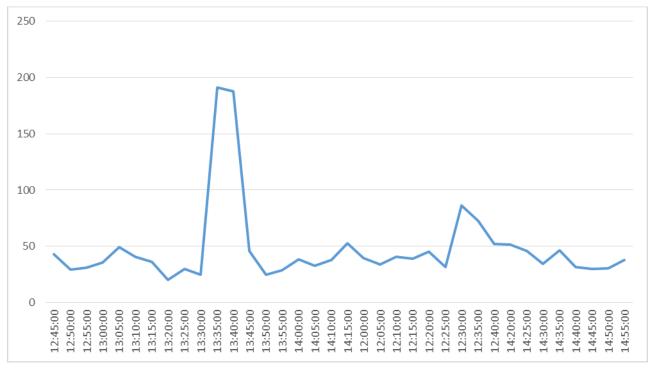


Figure 89 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 3

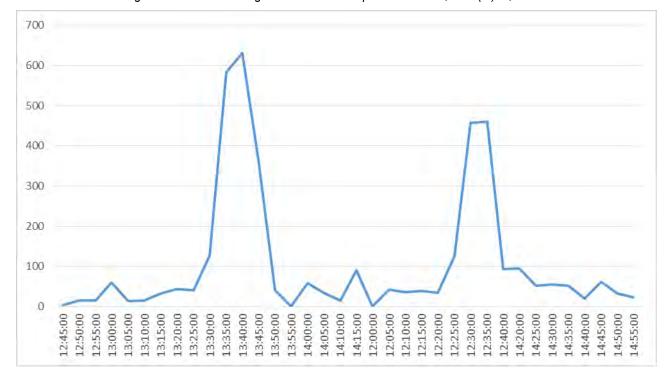


Figure 90 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 4

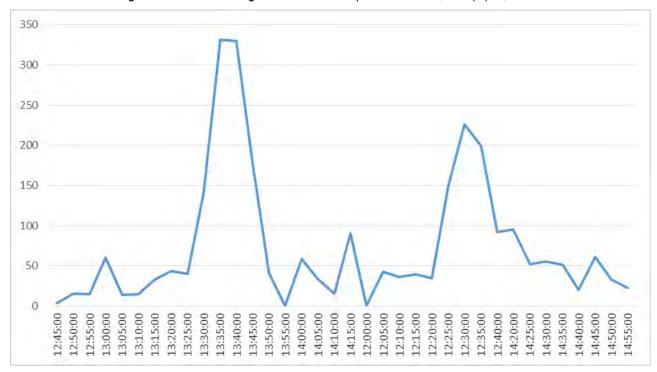


Figure 91 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 5

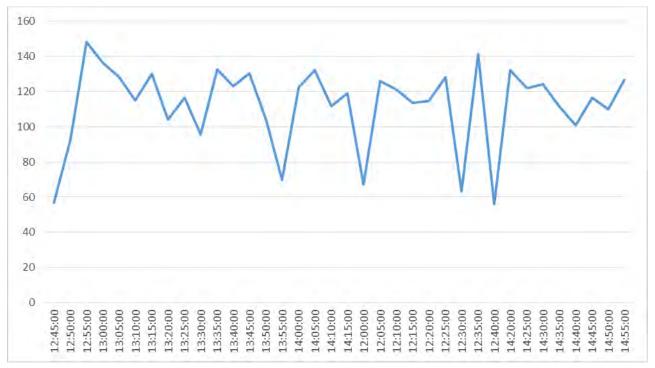


Figure 92 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 6

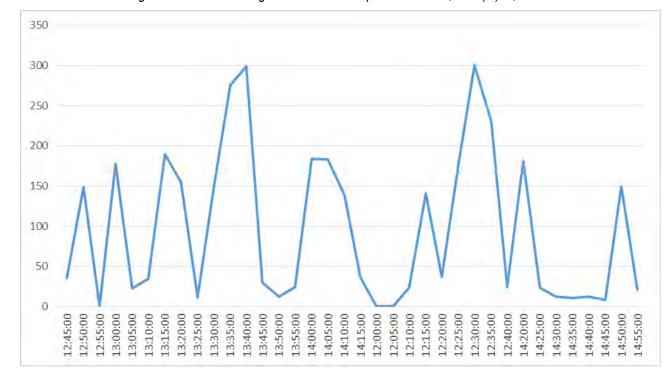


Figure 93 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 7

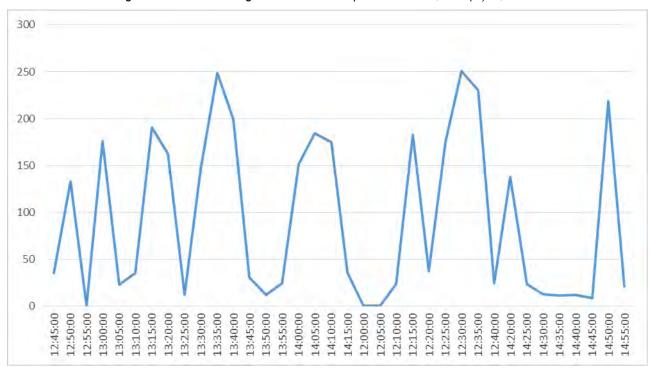


Figure 94 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 8

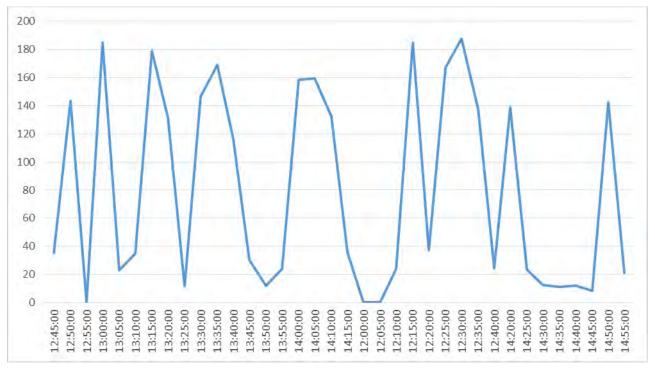


Figure 95 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 9

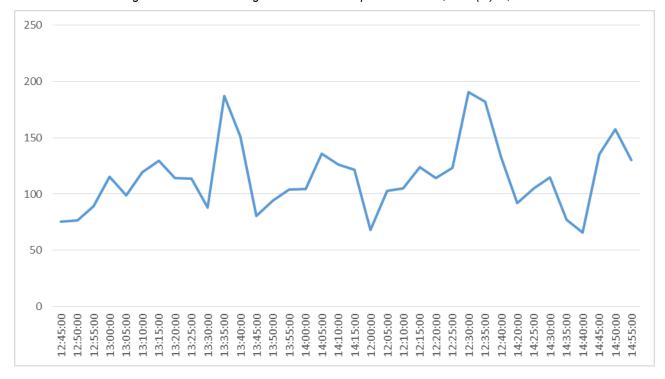


Figure 96 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 10

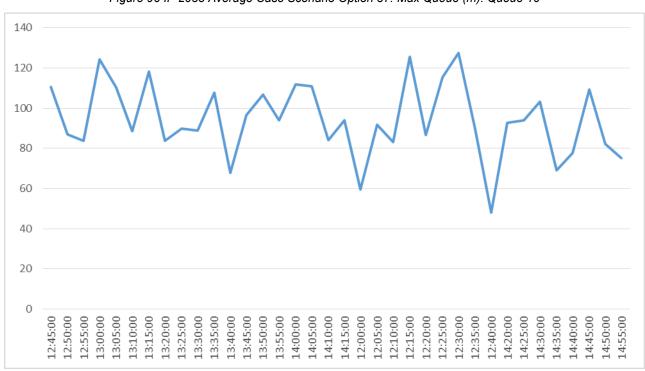


Figure 97 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 11

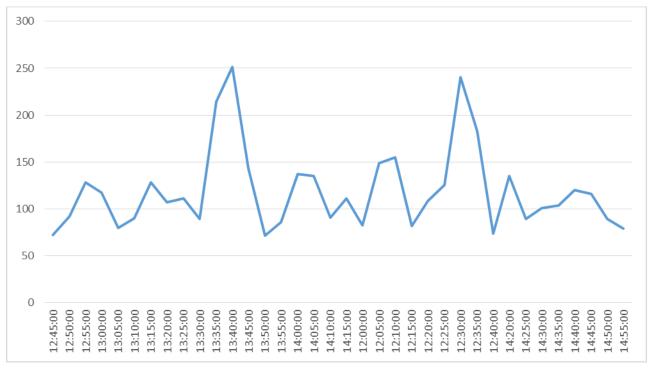


Figure 98 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 12

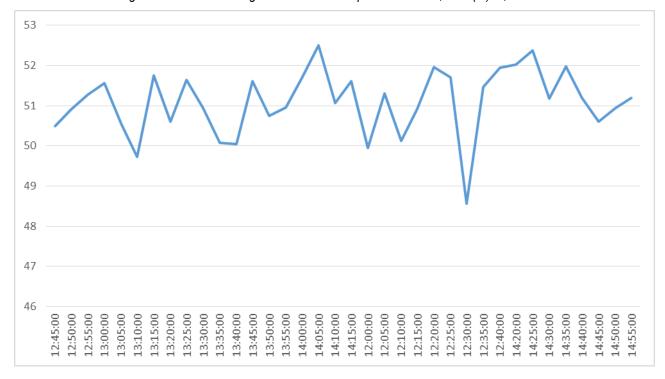


Figure 99 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 1

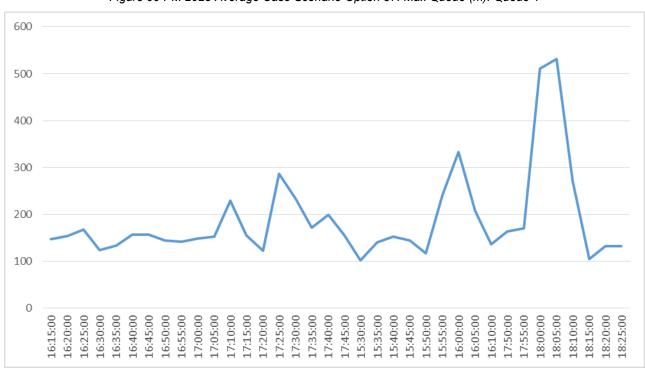


Figure 100 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 2

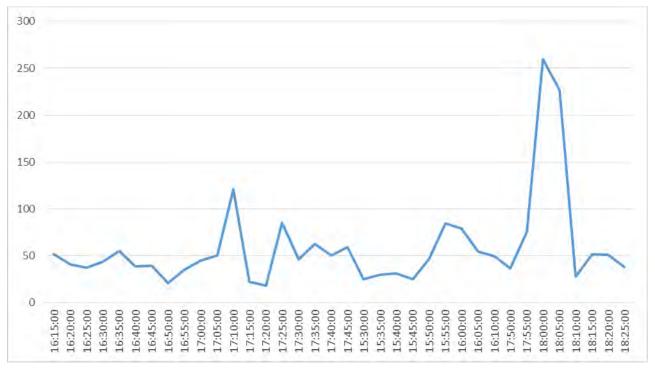


Figure 101 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 3

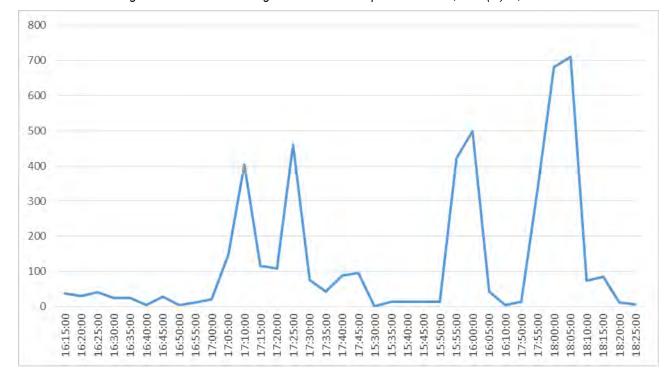


Figure 102 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 4

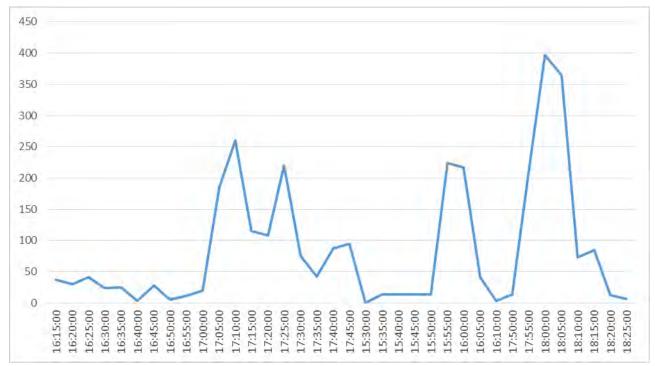


Figure 103 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 5

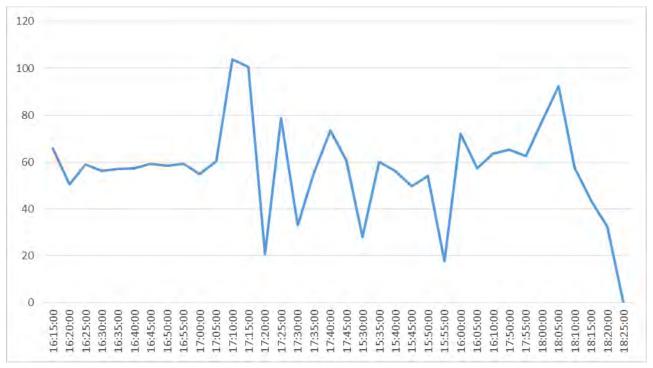


Figure 104 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 6

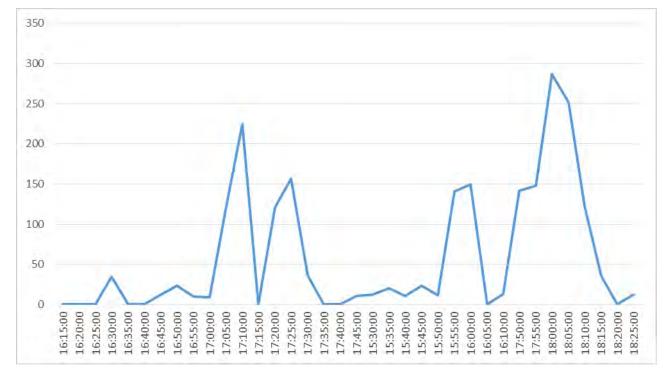


Figure 105 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 7

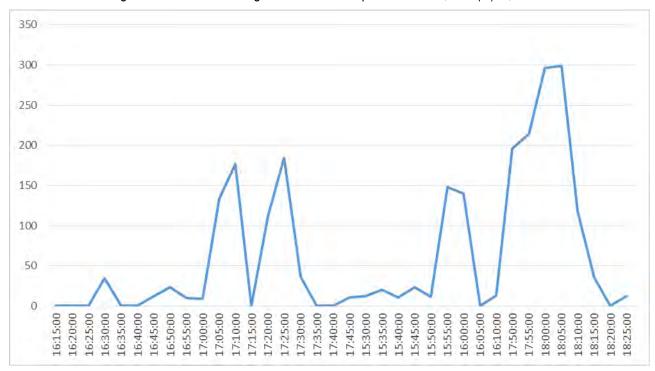


Figure 106 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 8

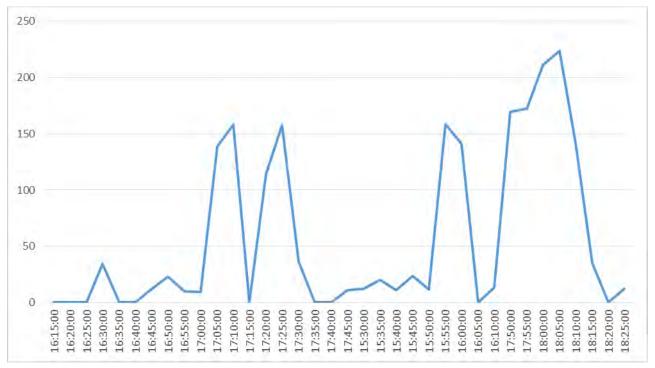


Figure 107 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 9

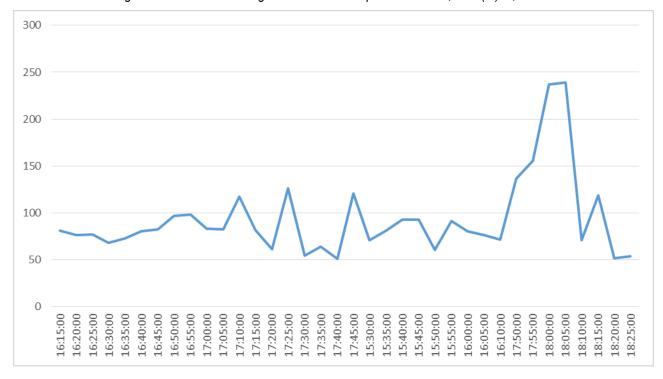


Figure 108 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 10

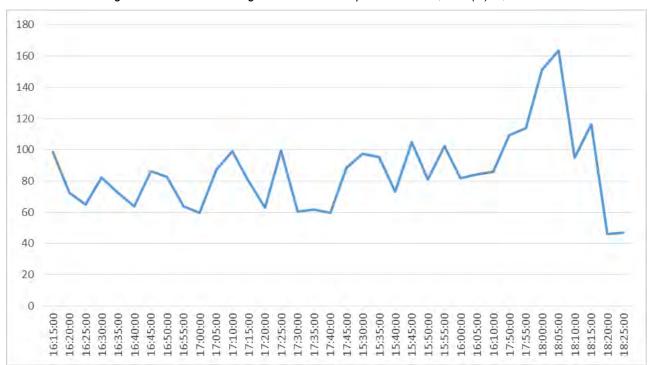


Figure 109 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 11

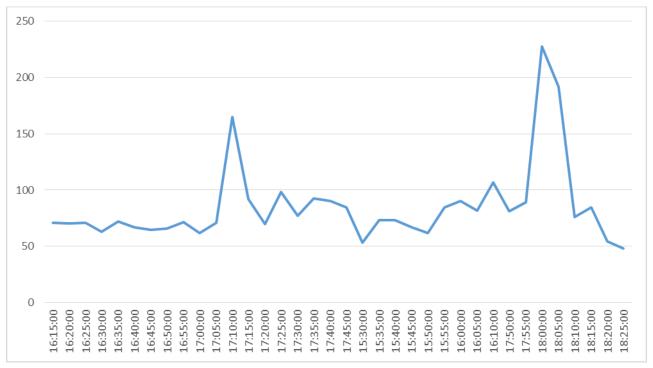


Figure 110 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 12

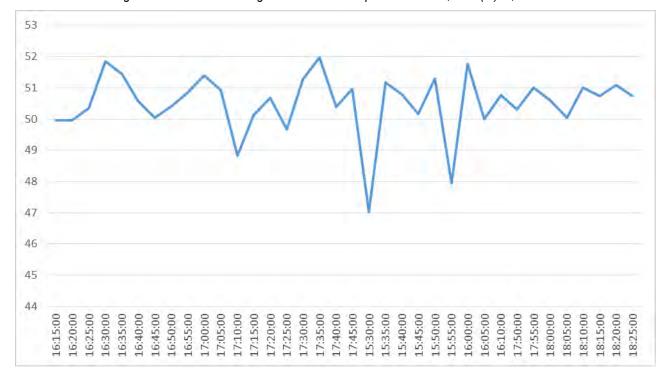


Figure 111 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 1

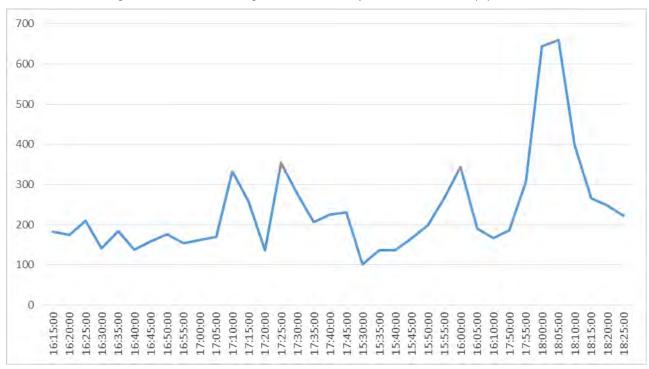


Figure 112 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 2

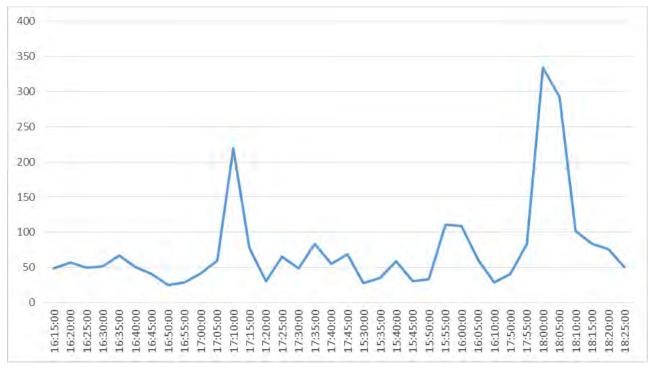


Figure 113 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 3

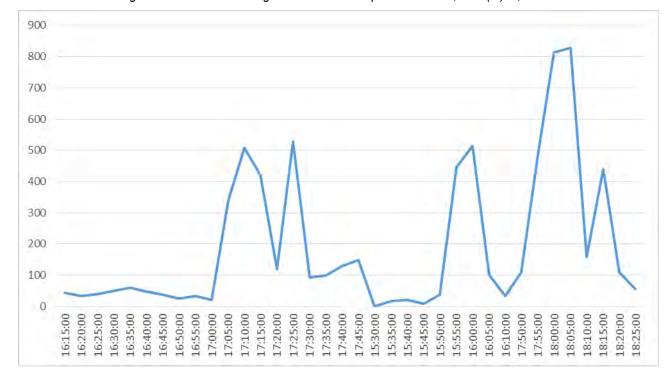


Figure 114 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 4

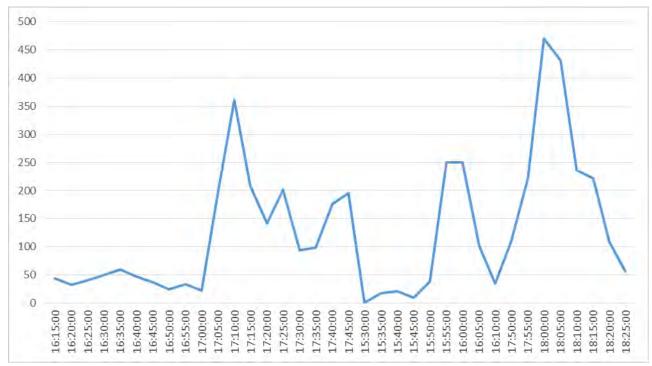


Figure 115 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 5

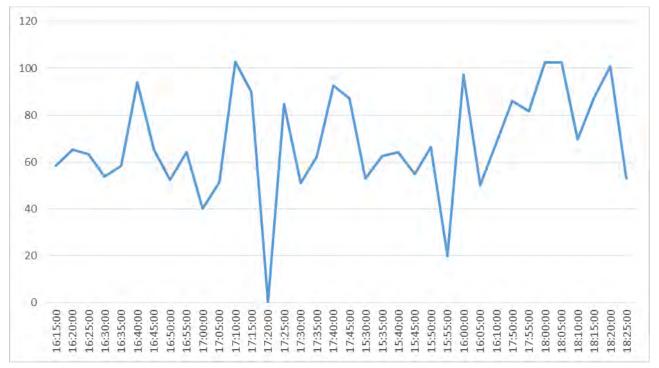


Figure 116 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 6

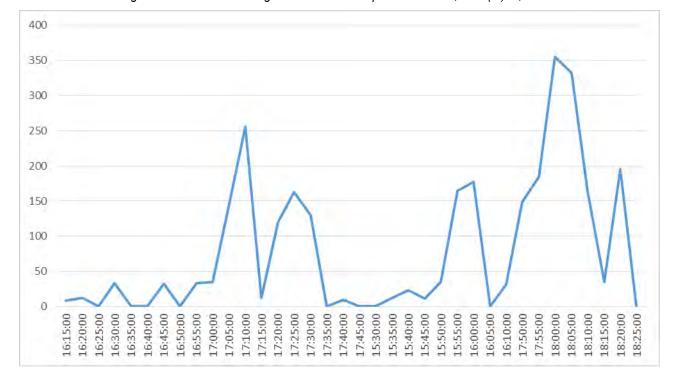


Figure 117 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 7

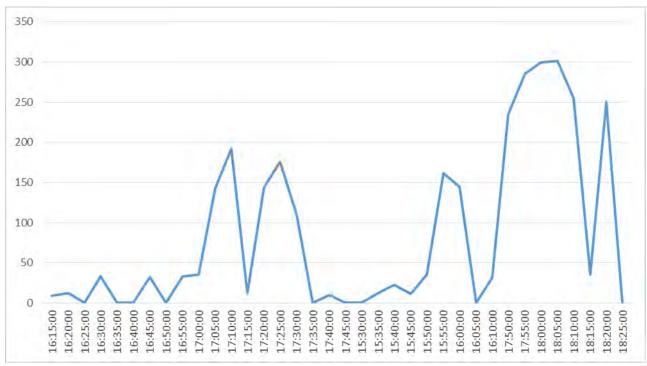


Figure 118 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 8

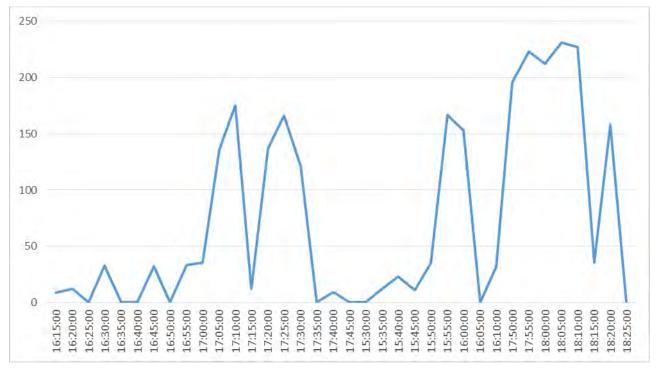


Figure 119 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 9

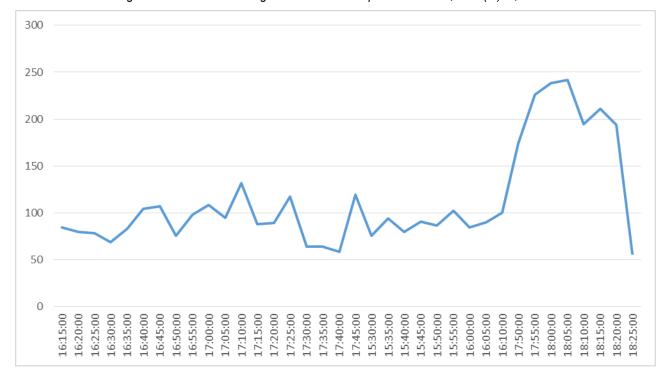


Figure 120 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 10

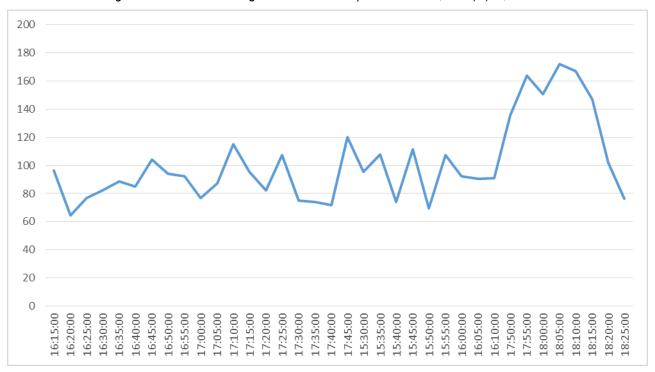


Figure 121 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 11

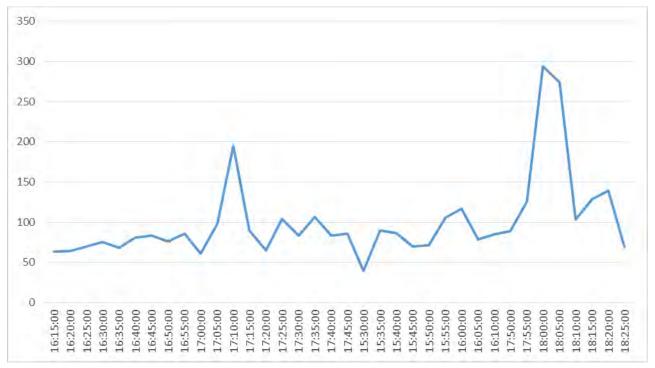


Figure 122 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 12



APPENDIX F\_7. Worst Case Scenario. Queue Comparison.

Figure 1 ID Queue for Option 32 and 33

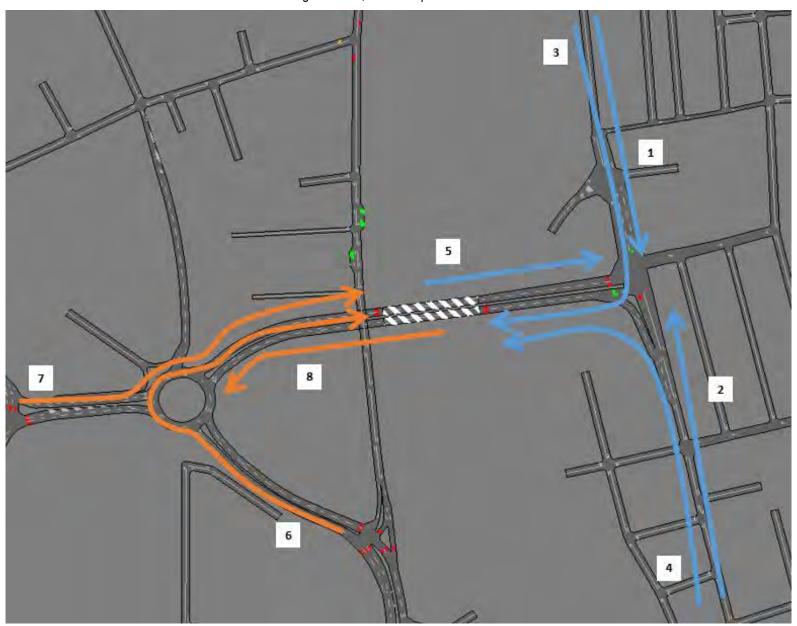


Figure 2 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

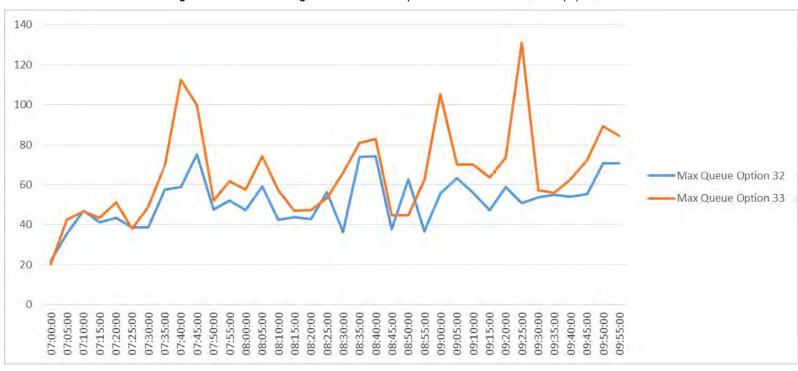


Figure 3 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2



Figure 4 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

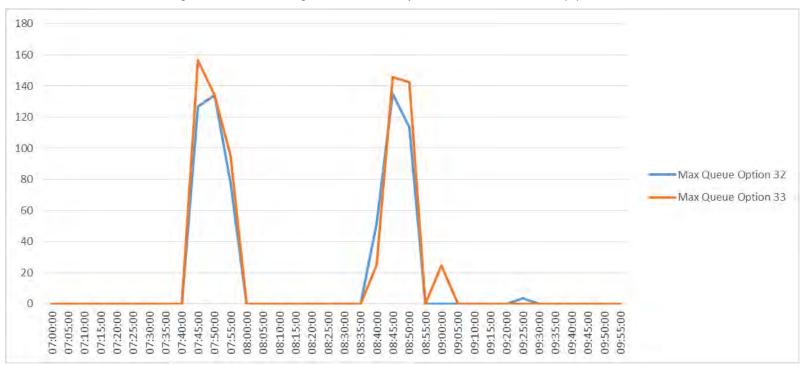


Figure 5 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

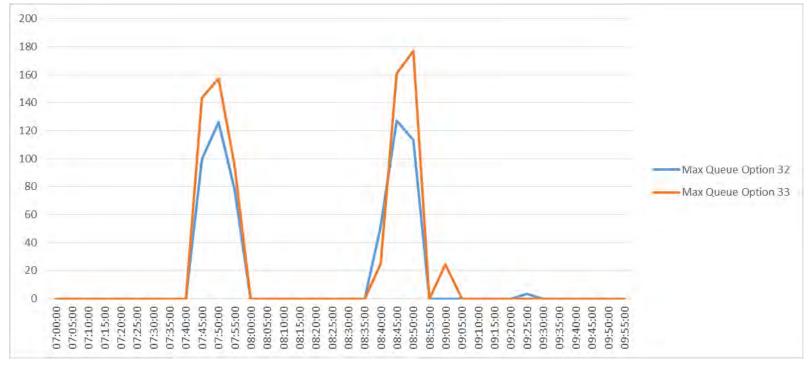


Figure 6 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 7 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

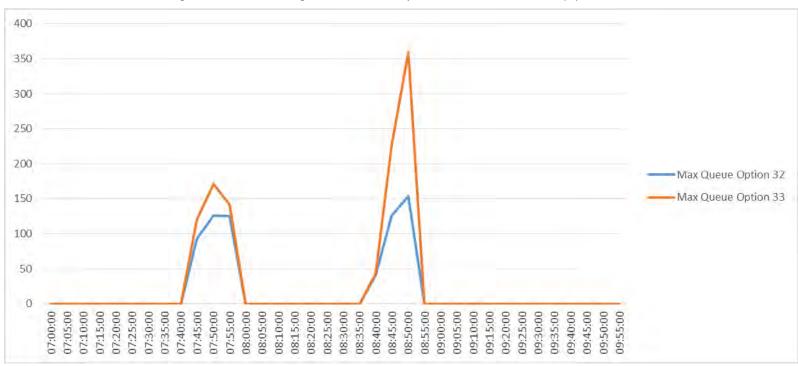


Figure 8 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

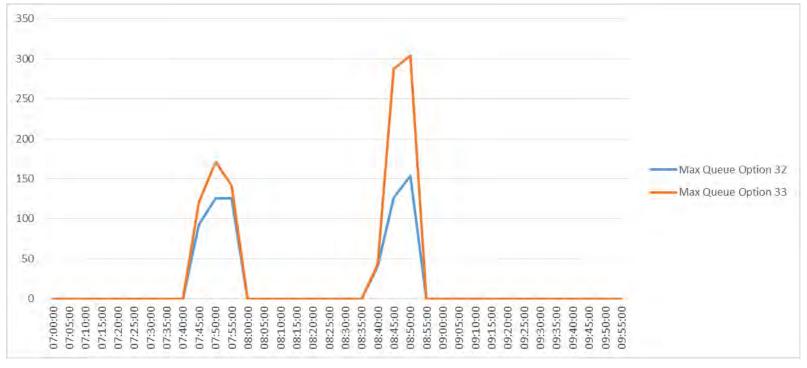


Figure 9 AM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

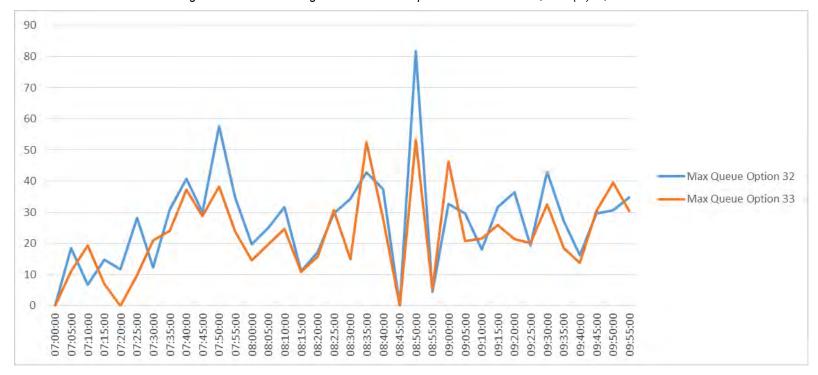


Figure 10 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

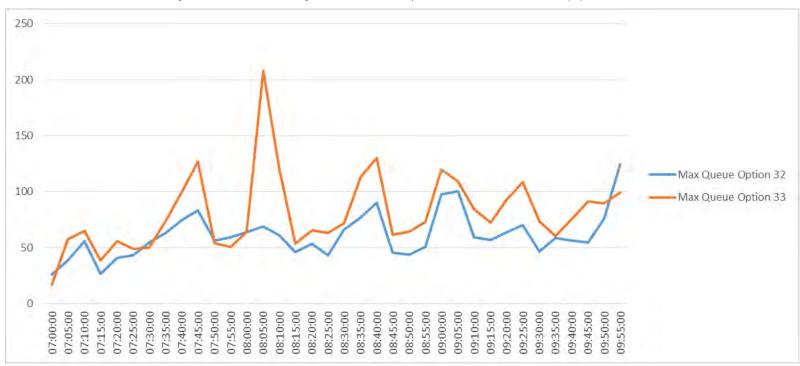


Figure 11 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2



Figure 12 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

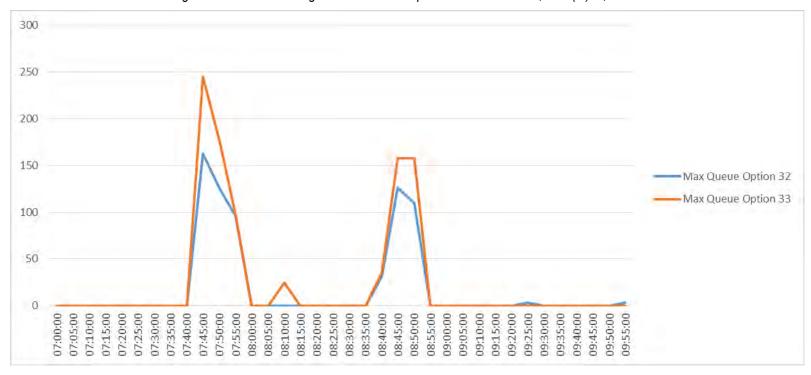


Figure 13 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

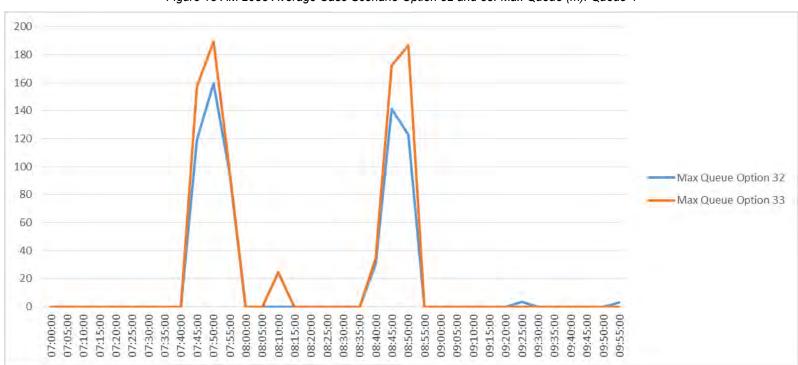


Figure 14 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5

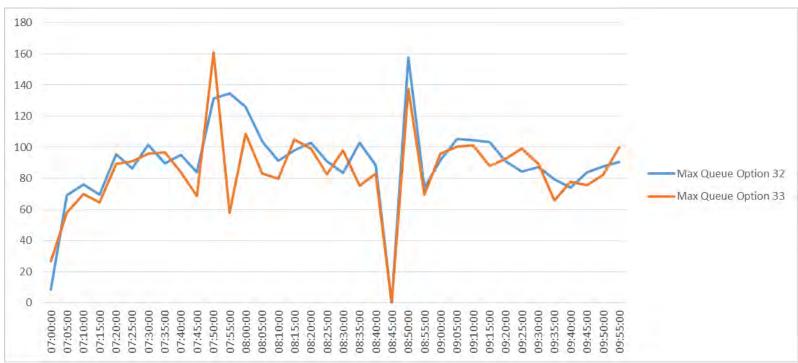


Figure 15 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

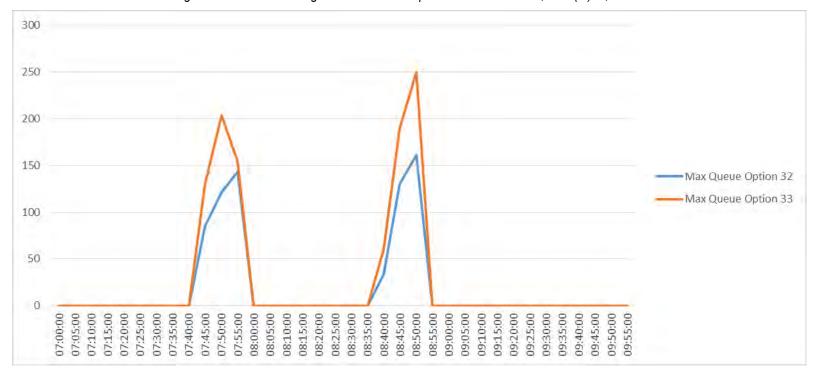


Figure 16 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

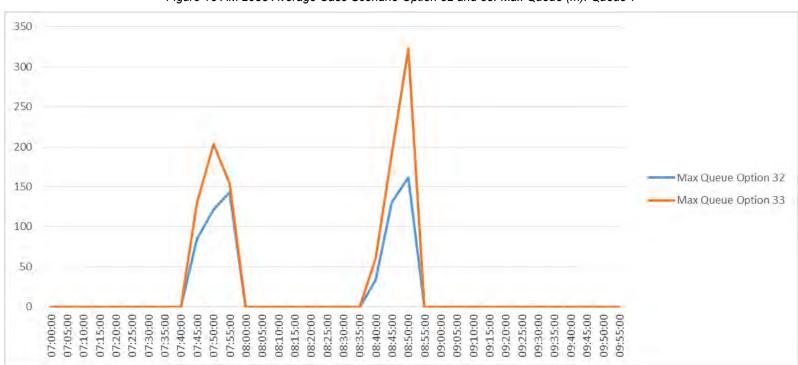


Figure 17 AM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

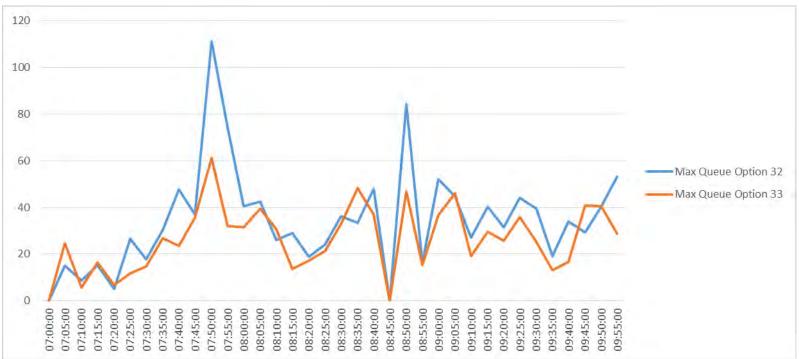


Figure 18 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

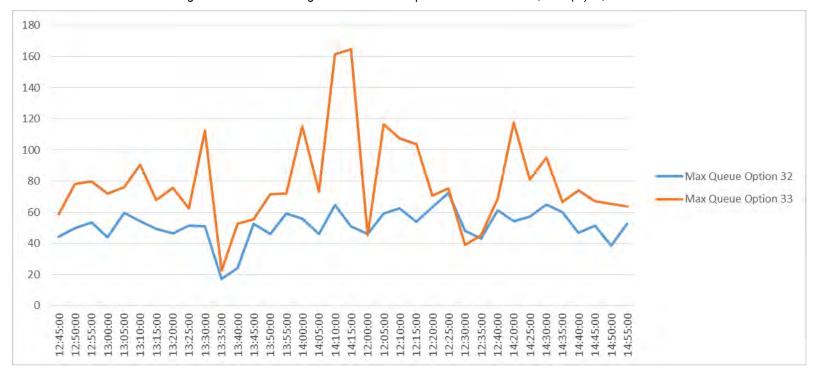


Figure 19 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2



Figure 20 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

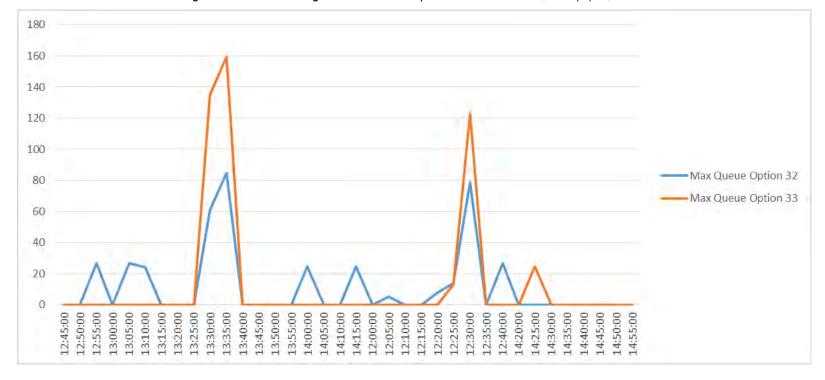


Figure 21 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

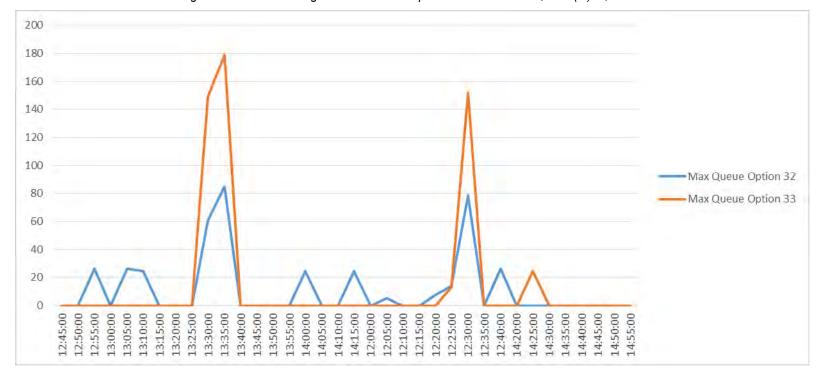


Figure 22 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 23 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6



Figure 24 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

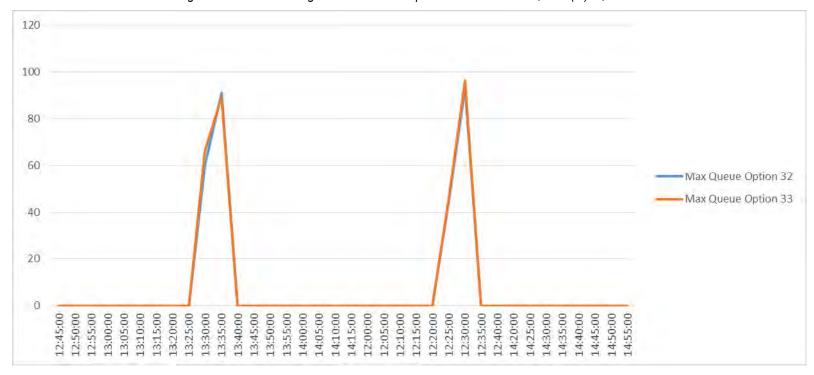


Figure 25 IP 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8



Figure 26 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1



Figure 27 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2

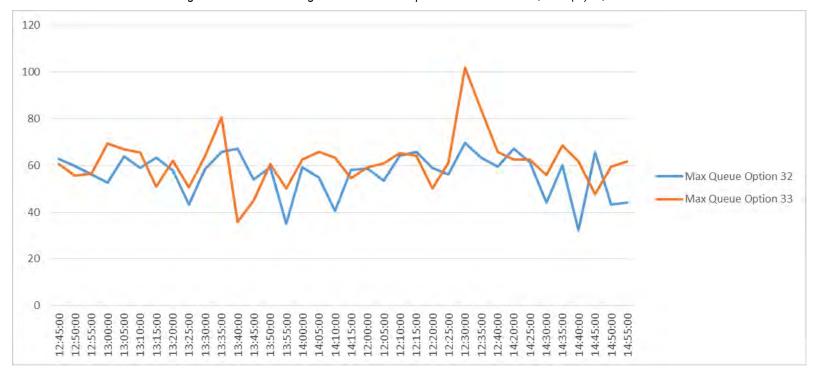


Figure 28 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

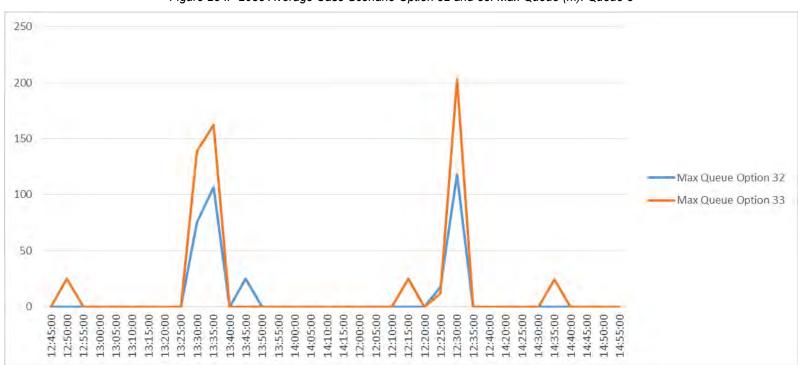


Figure 29 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

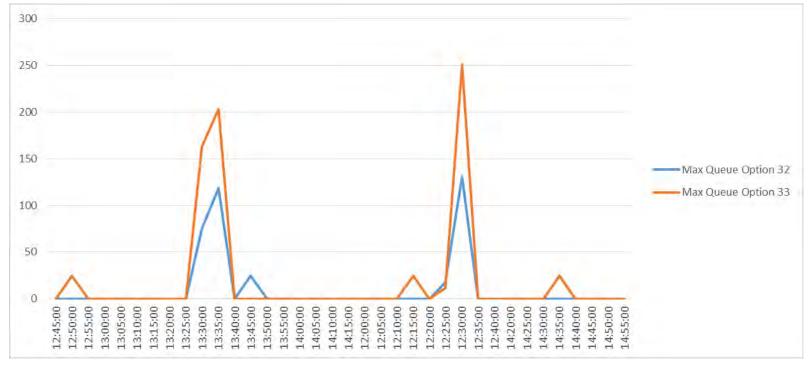


Figure 30 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 31 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

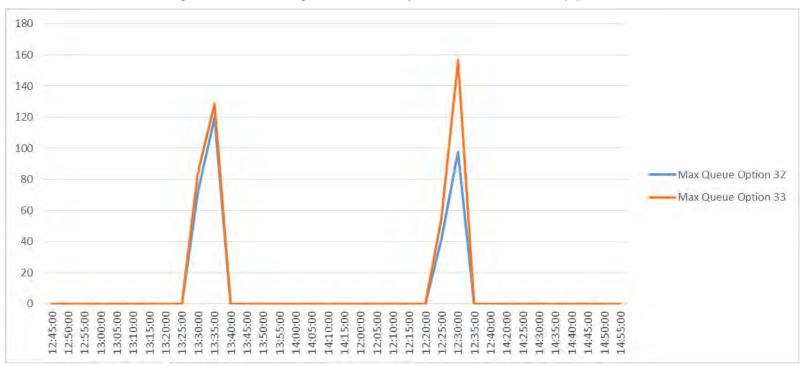


Figure 32 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7



Figure 33 IP 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8



Figure 34 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

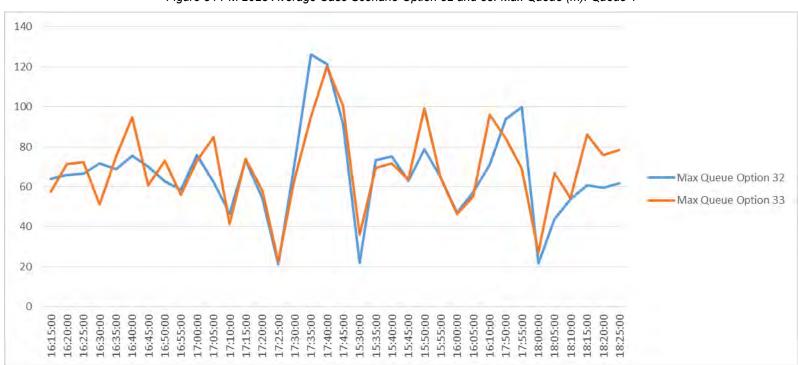


Figure 35 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2



Figure 36 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

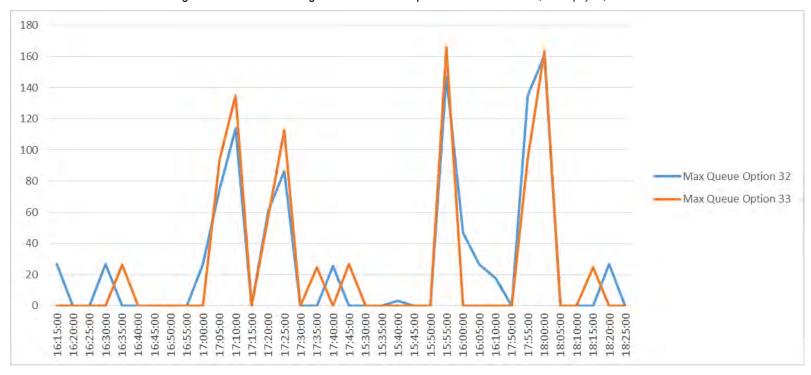


Figure 37 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

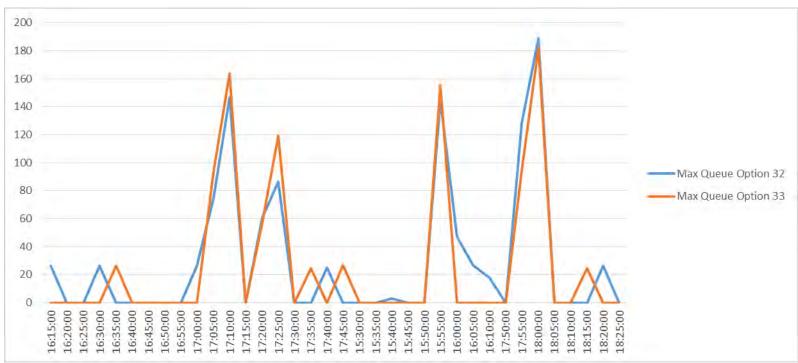


Figure 38 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 39 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

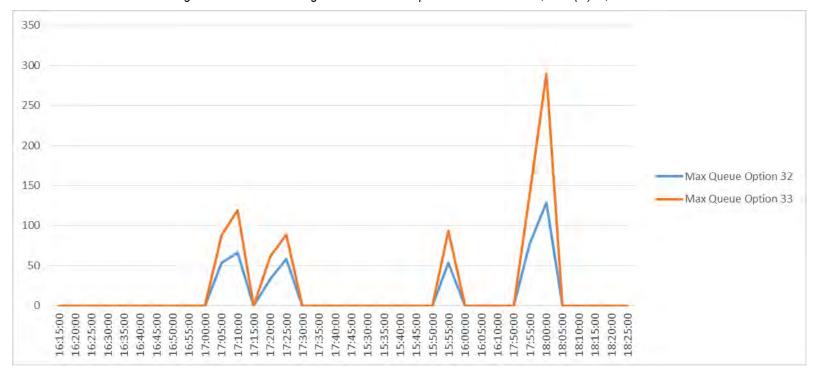


Figure 40 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

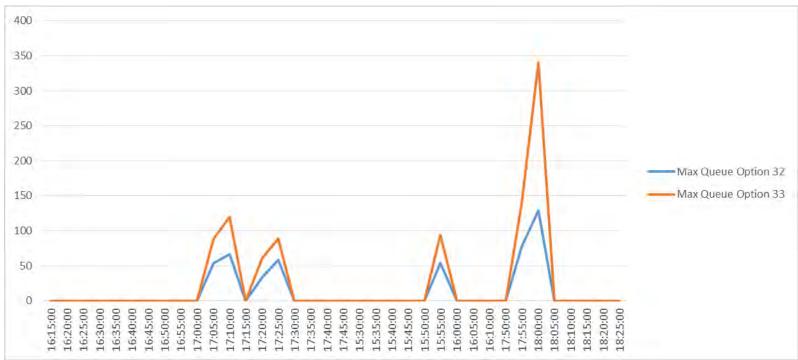


Figure 41 PM 2023 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

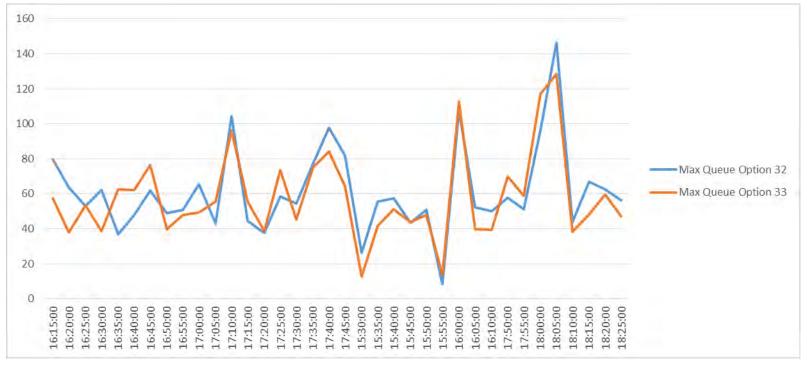


Figure 42 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 1

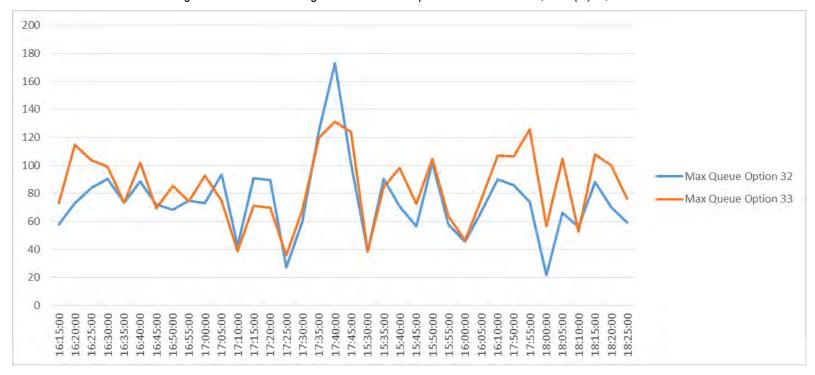


Figure 43 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 2

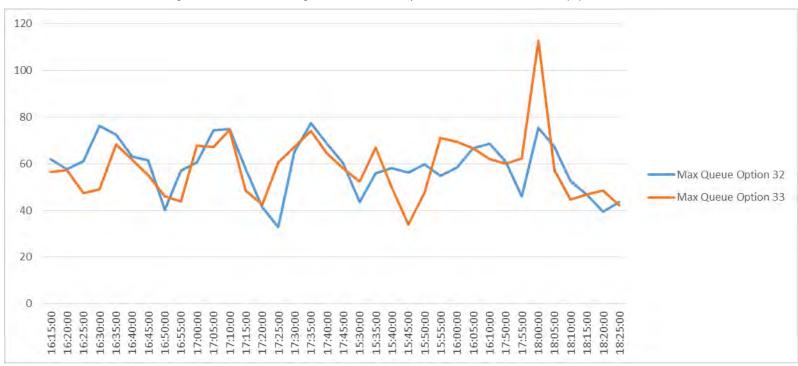


Figure 44 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 3

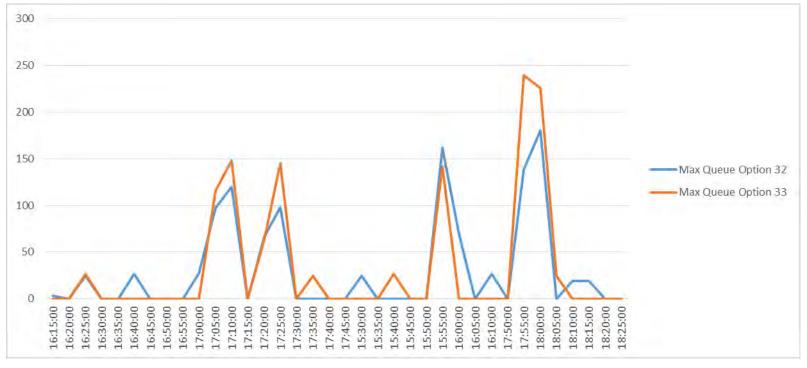


Figure 45 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 4

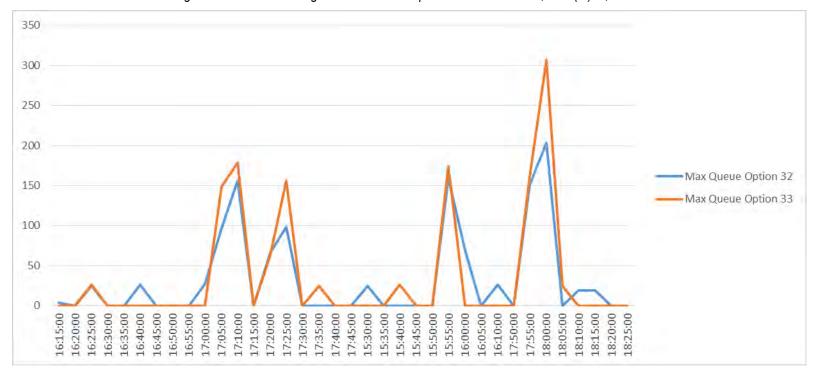


Figure 46 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 5



Figure 47 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 6

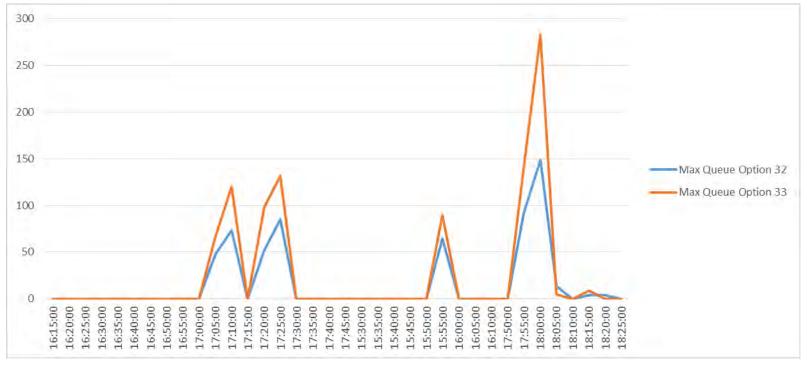


Figure 48 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 7

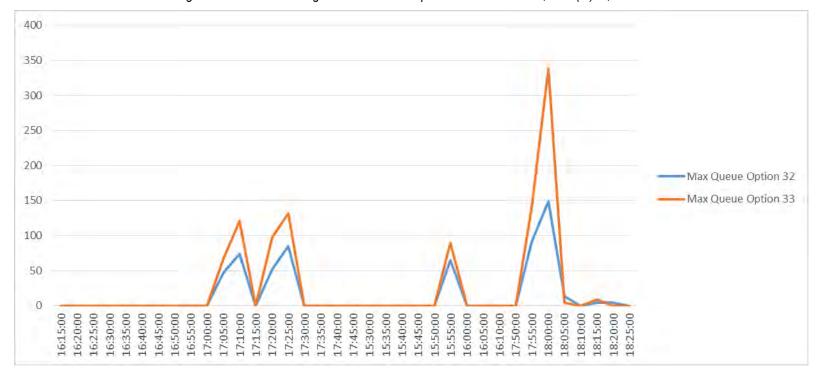


Figure 49 PM 2038 Average Case Scenario Option 32 and 33. Max Queue (m). Queue 8

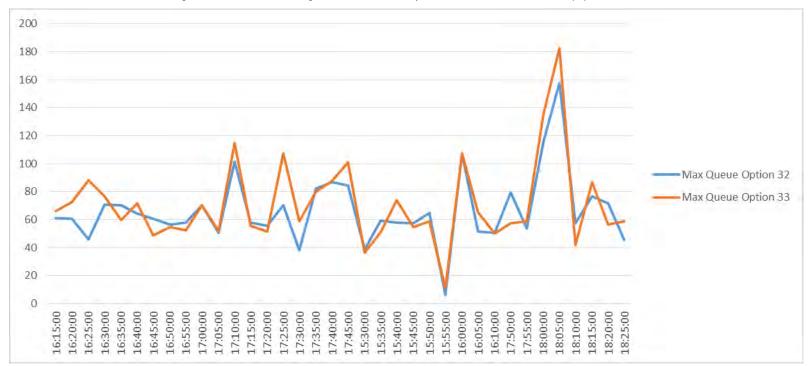


Figure 50 ID Queue for Option 37

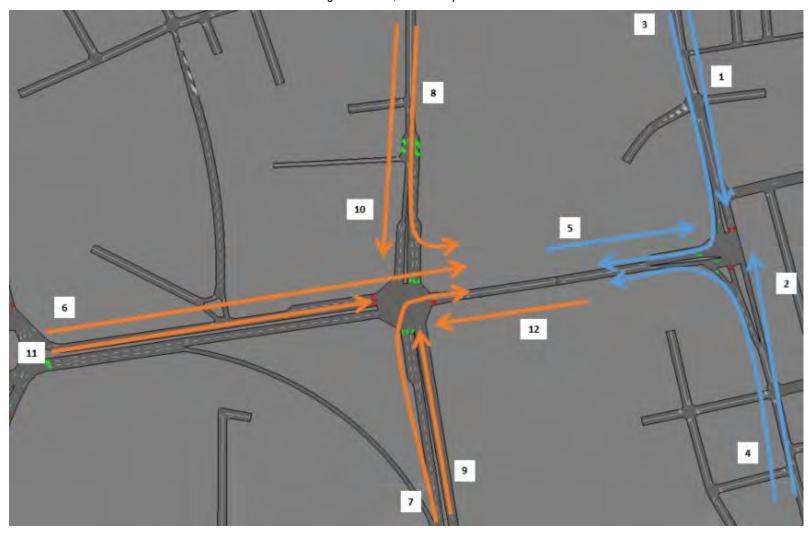


Figure 51 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 1

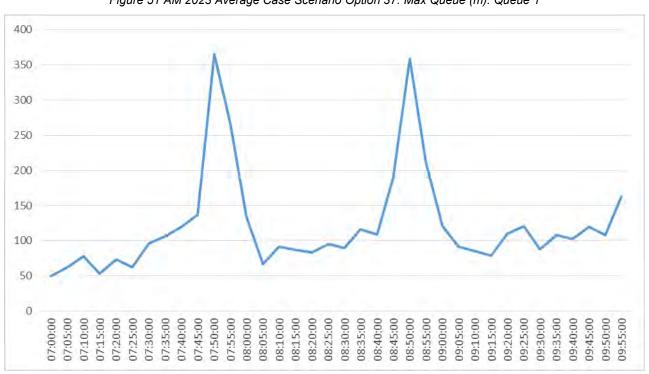


Figure 52 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 2

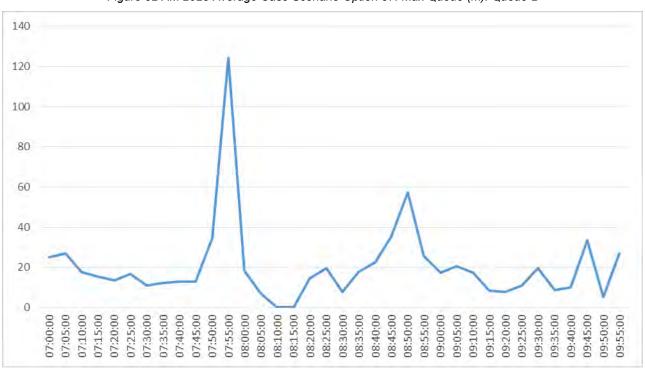


Figure 53 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 3

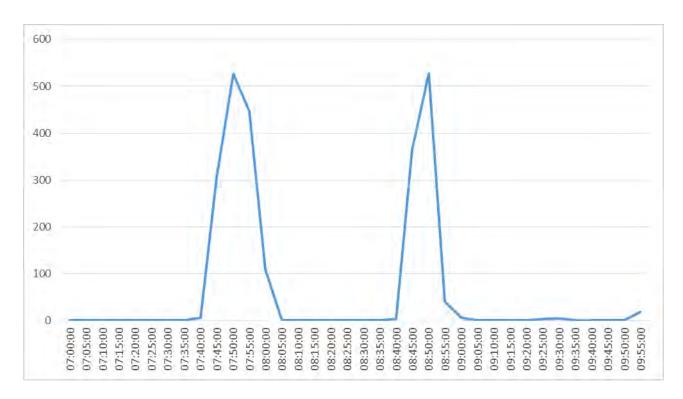


Figure 54 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 4

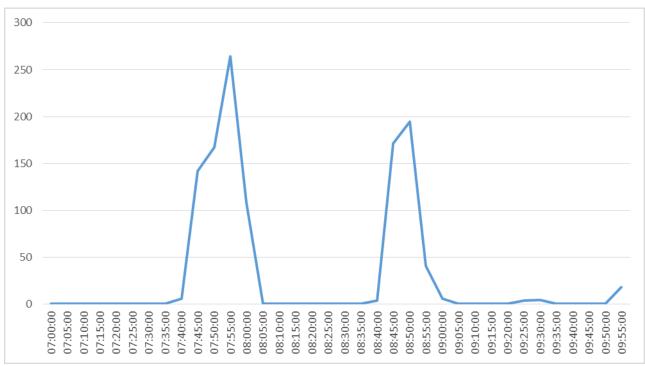


Figure 55 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 5

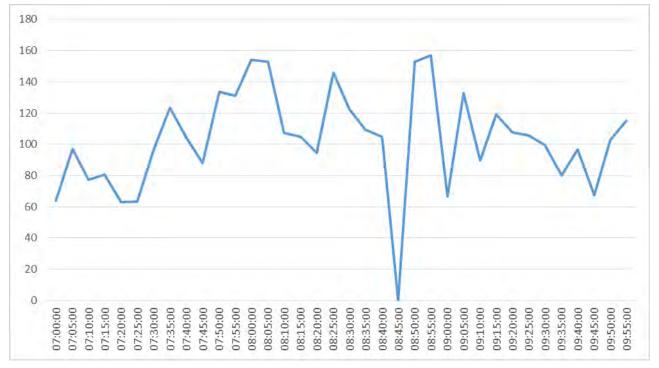


Figure 56 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 6

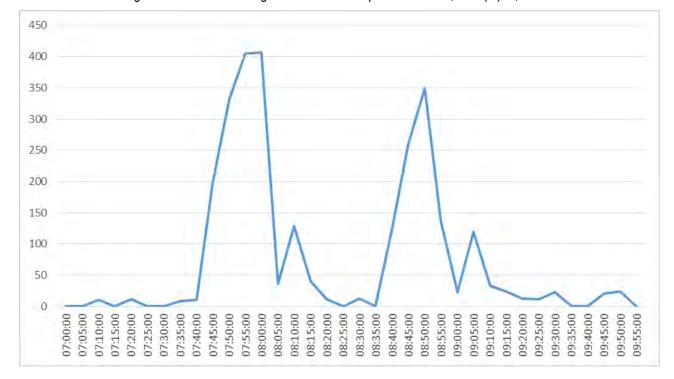


Figure 57 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 7

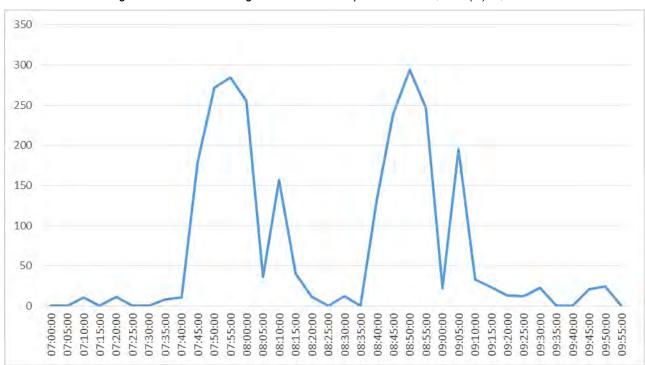


Figure 58 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 8

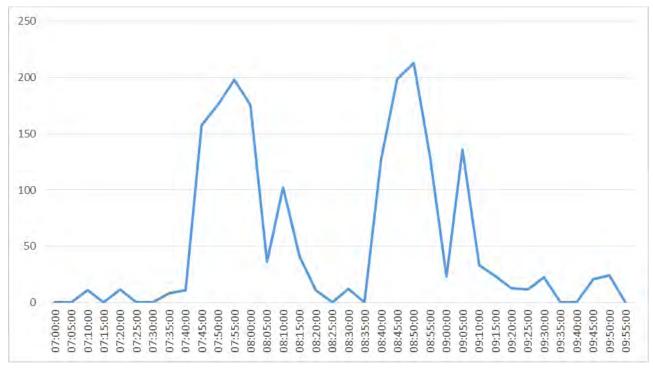


Figure 59 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 9

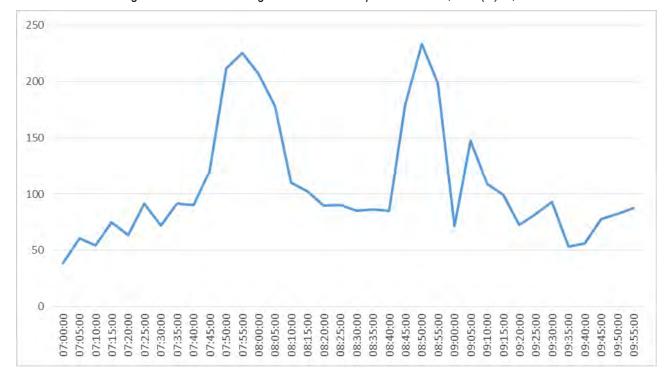


Figure 60 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 10

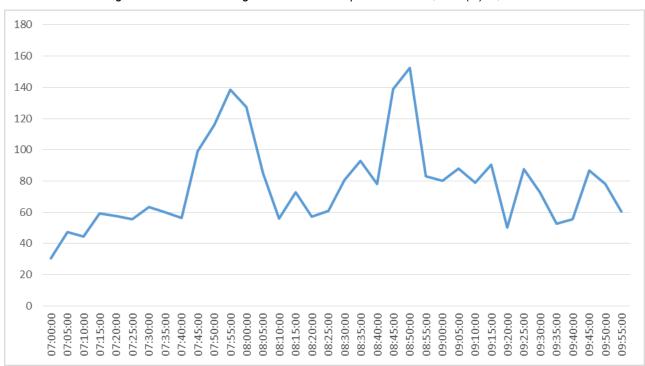


Figure 61 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 11

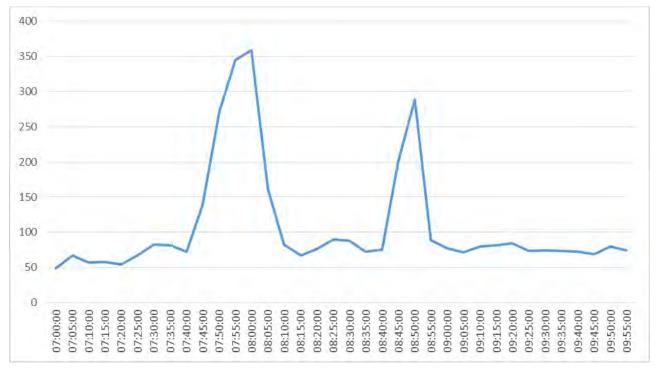


Figure 62 AM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 12

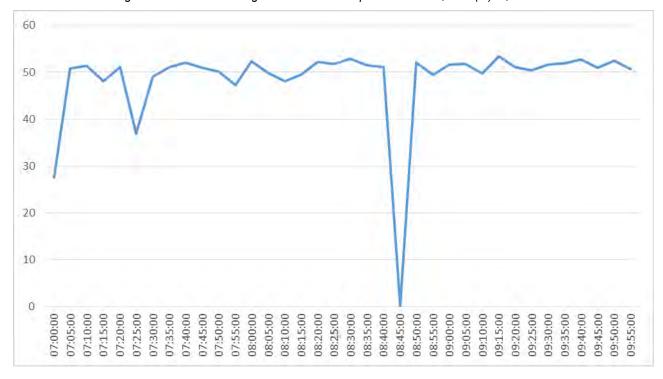


Figure 63 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 1

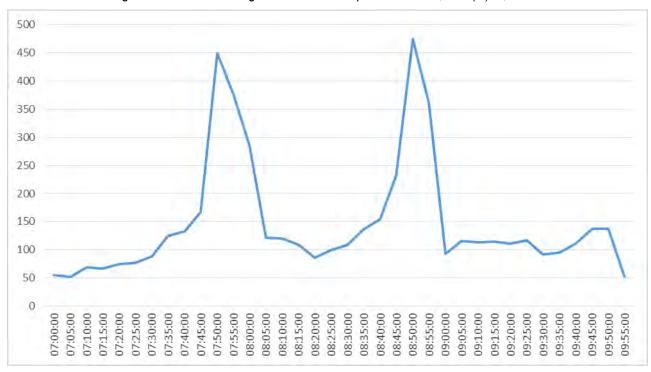


Figure 64 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 2

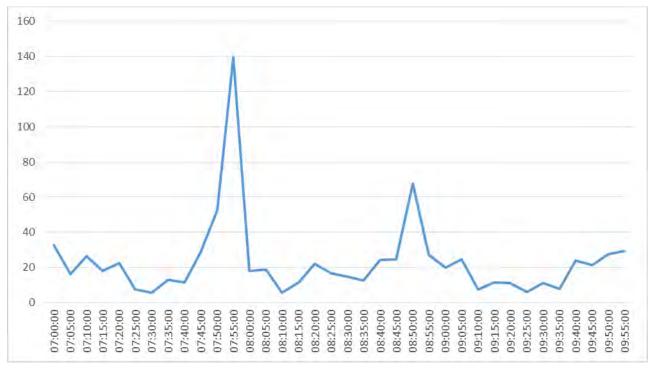


Figure 65 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 3

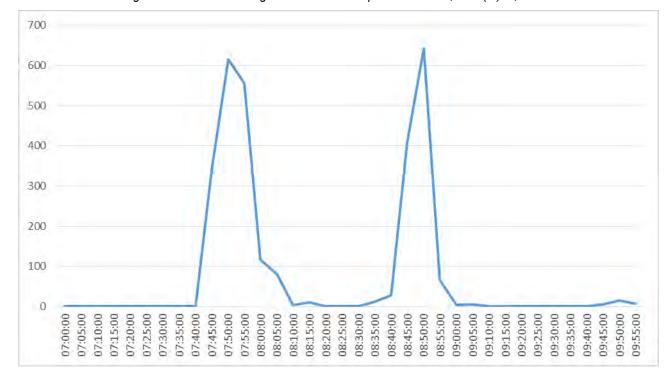


Figure 66 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 4

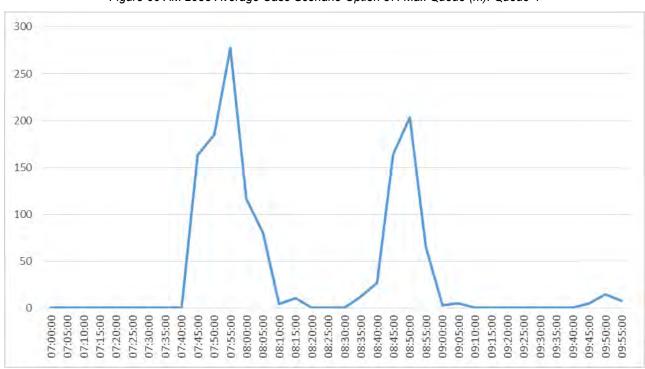


Figure 67 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 5

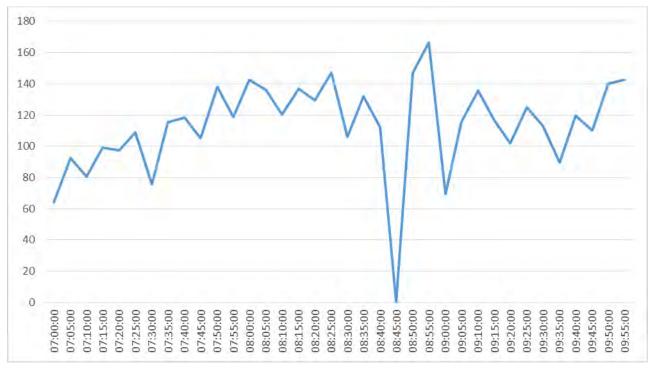


Figure 68 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 6

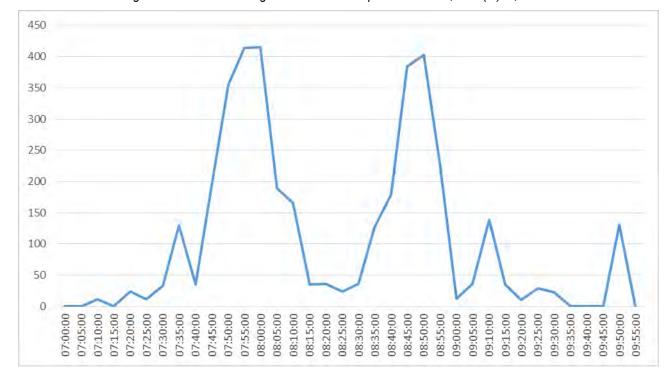


Figure 69 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 7

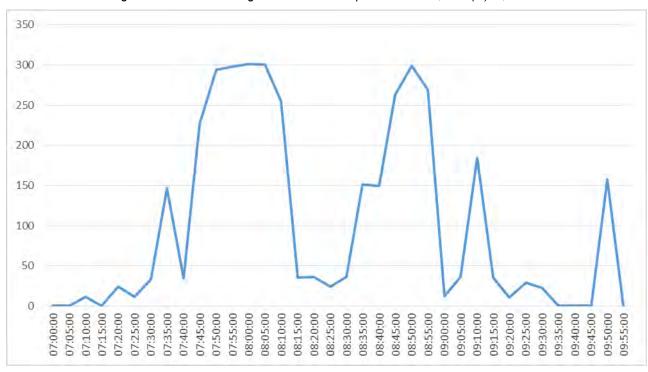


Figure 70 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 8

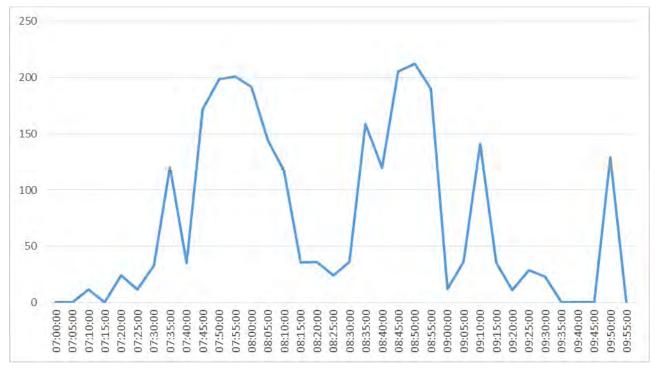


Figure 71 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 9

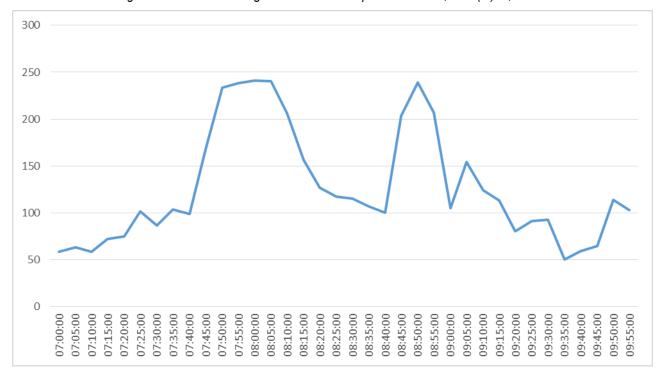


Figure 72 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 10

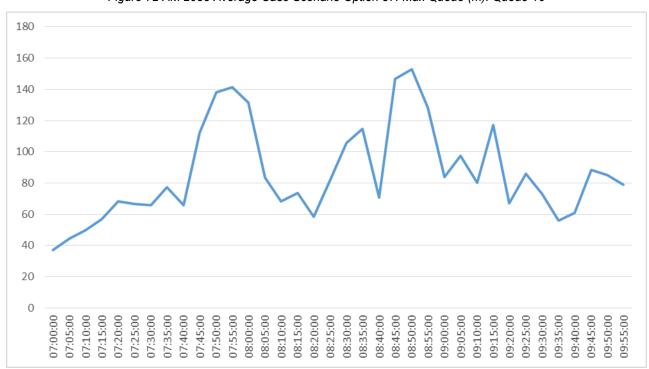


Figure 73 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 11

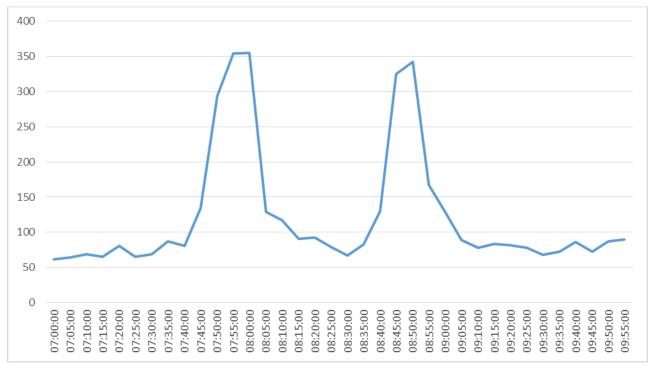


Figure 74 AM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 12

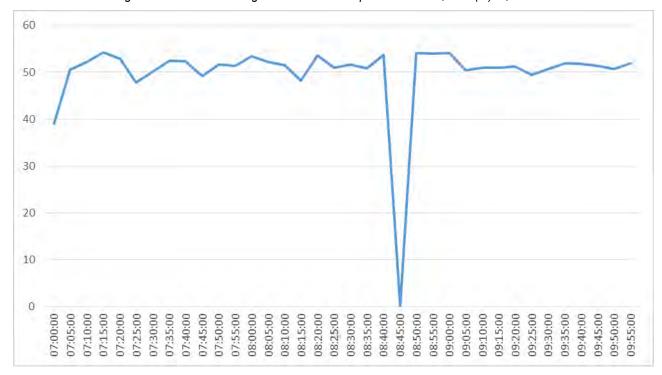


Figure 75 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 1

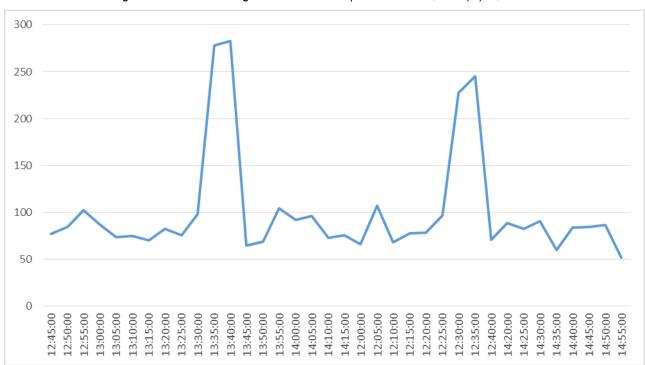


Figure 76 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 2

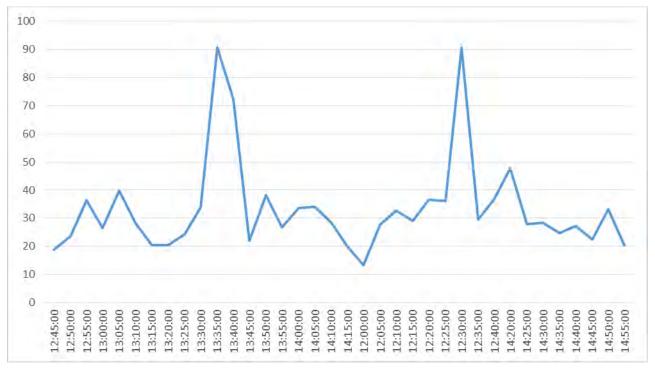


Figure 77 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 3

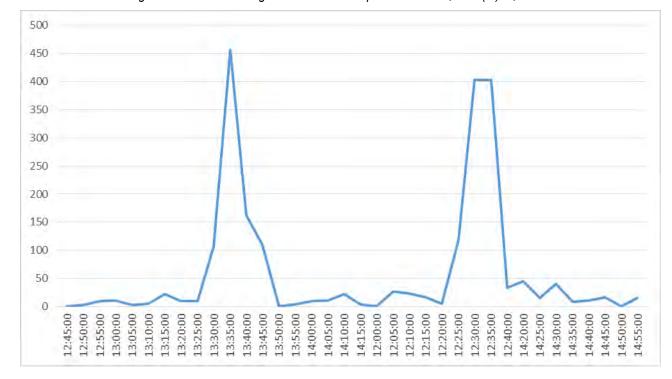


Figure 78 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 4

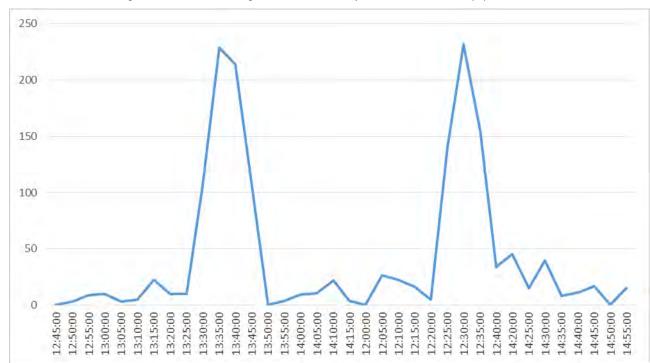


Figure 79 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 5



Figure 80 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 6

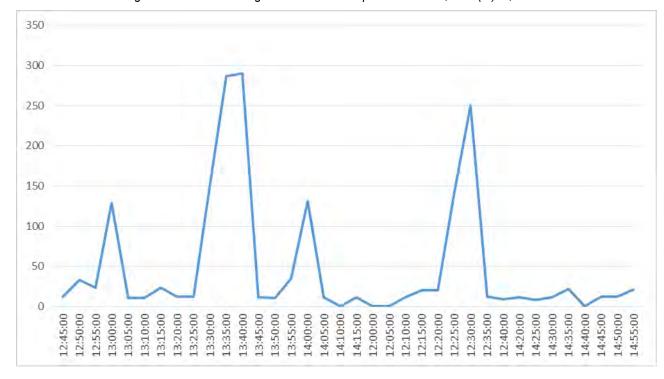


Figure 81 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 7

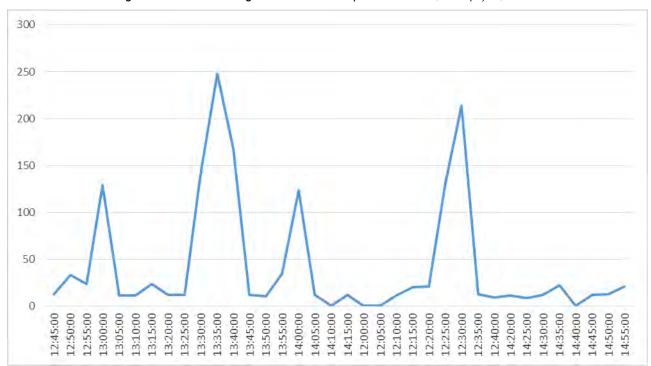


Figure 82 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 8

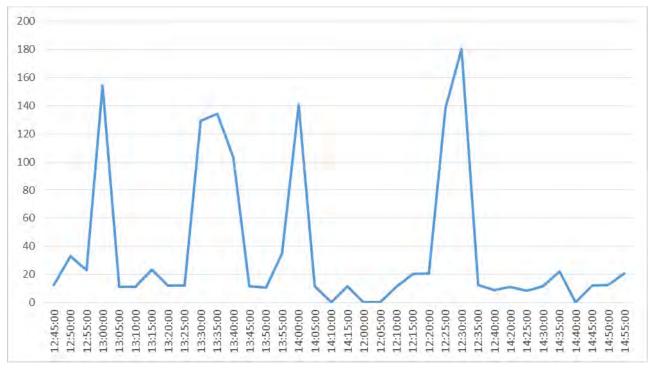


Figure 83 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 9

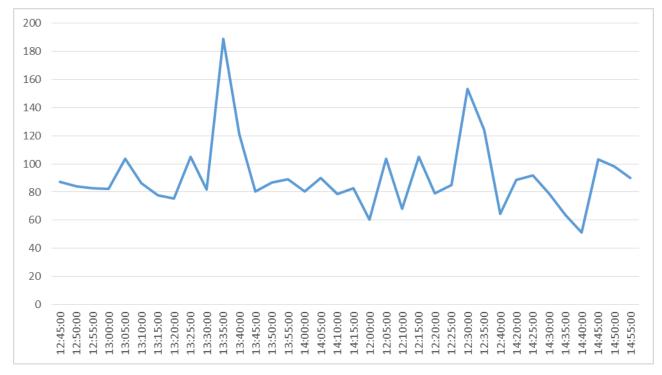


Figure 84 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 10

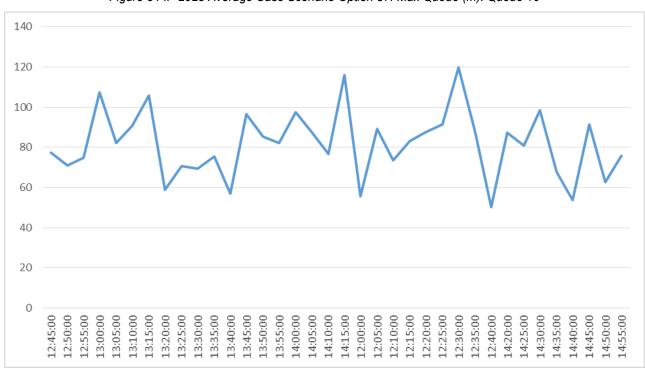


Figure 85 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 11

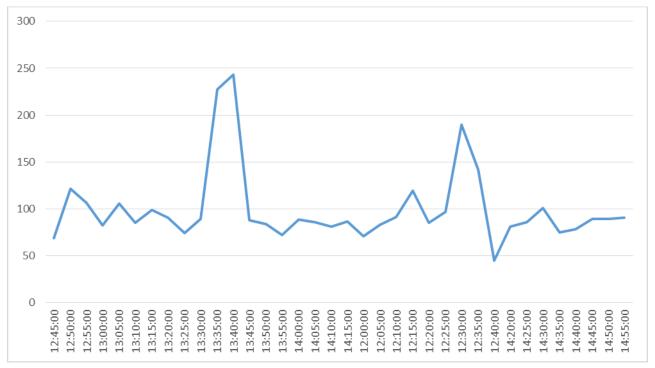


Figure 86 IP 2023 Average Case Scenario Option 37. Max Queue (m). Queue 12

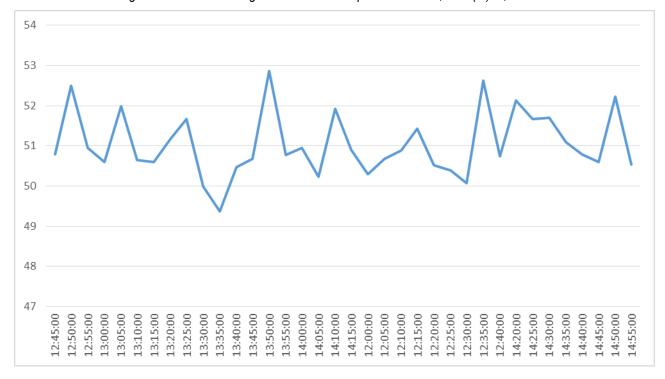


Figure 87 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 1

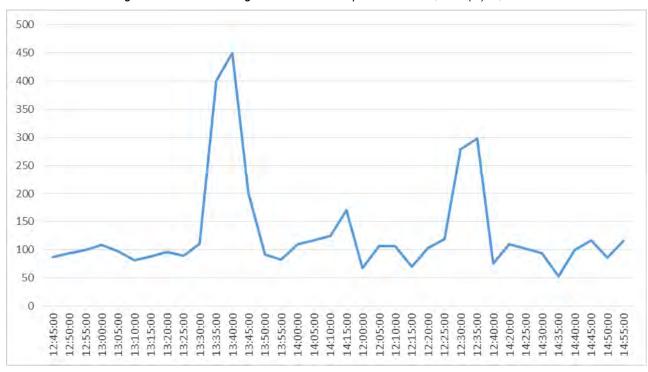


Figure 88 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 2

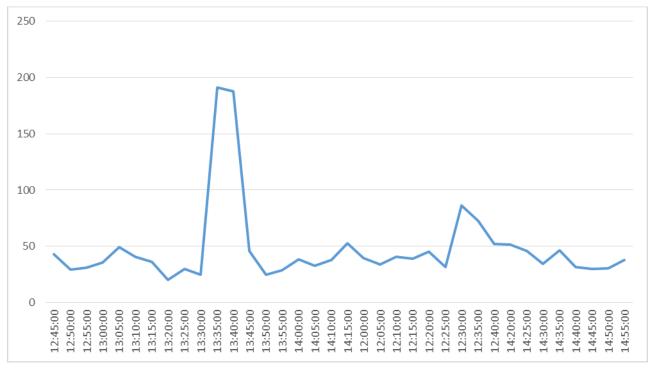


Figure 89 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 3

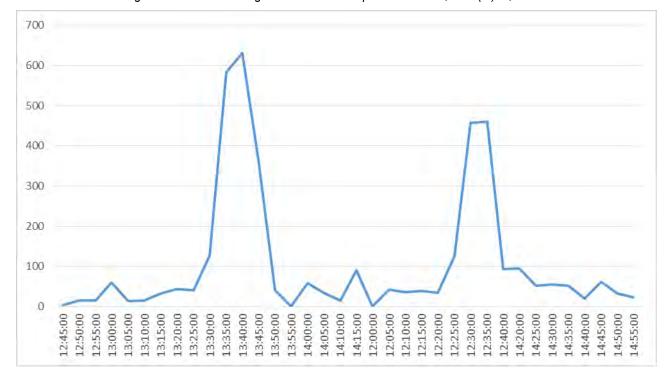


Figure 90 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 4

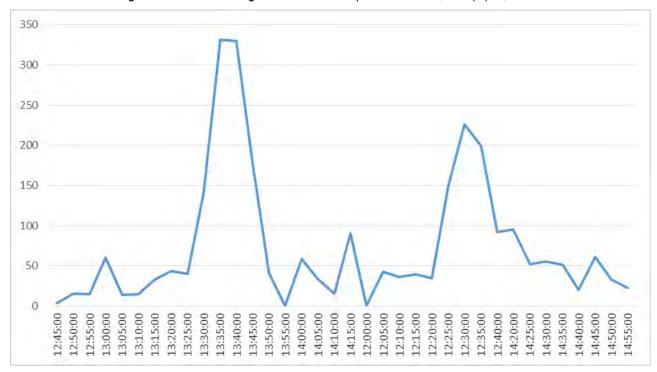


Figure 91 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 5

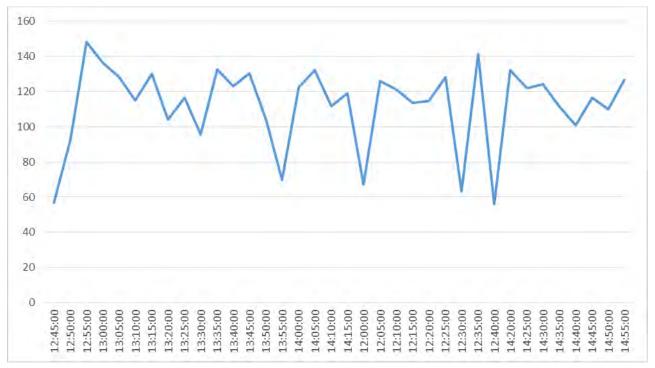


Figure 92 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 6

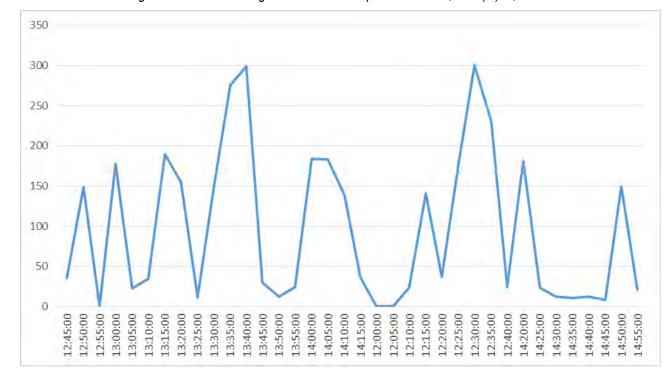


Figure 93 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 7

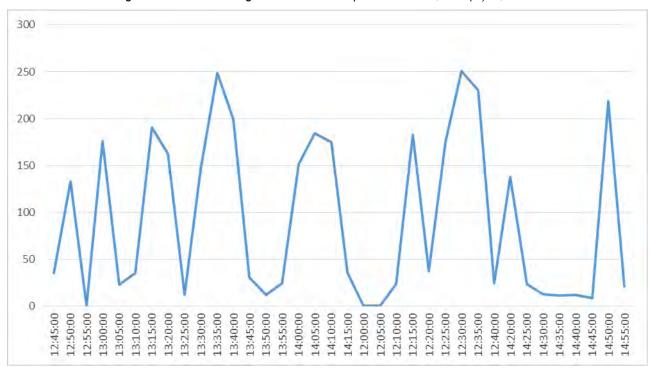


Figure 94 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 8

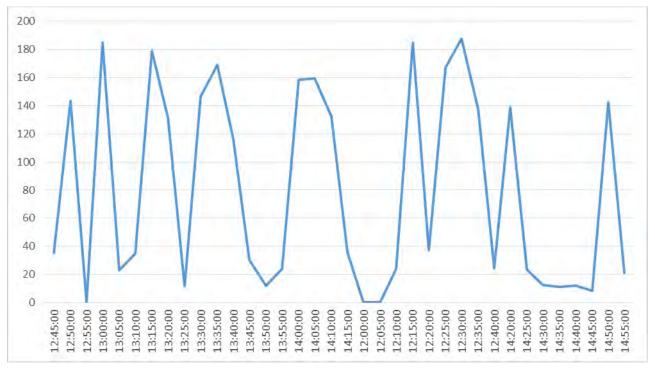


Figure 95 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 9

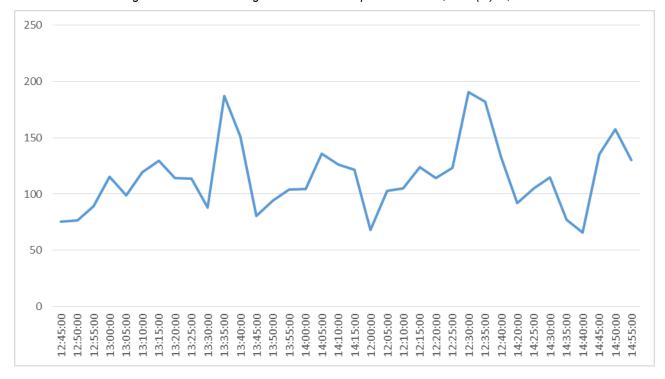


Figure 96 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 10

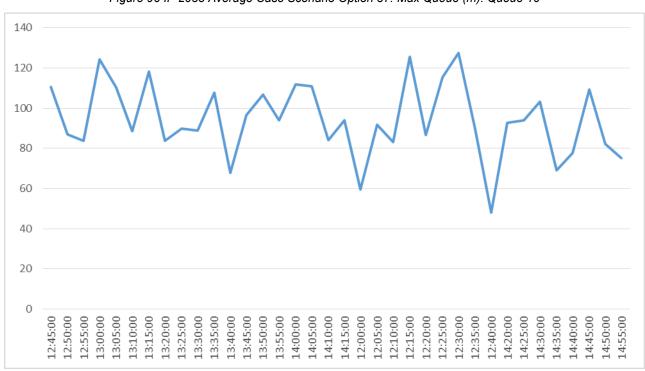


Figure 97 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 11

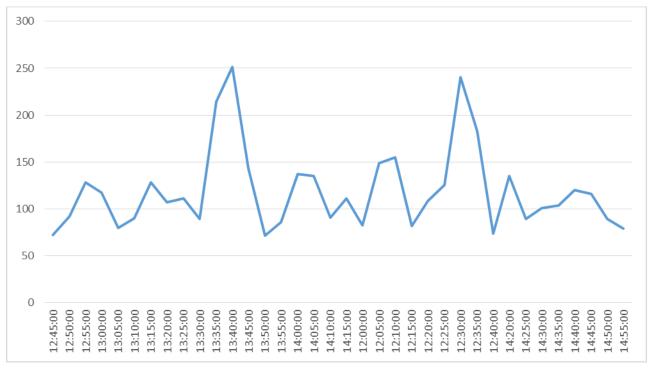


Figure 98 IP 2038 Average Case Scenario Option 37. Max Queue (m). Queue 12

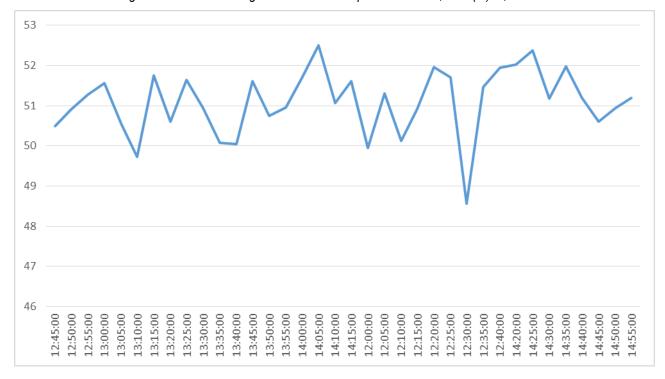


Figure 99 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 1

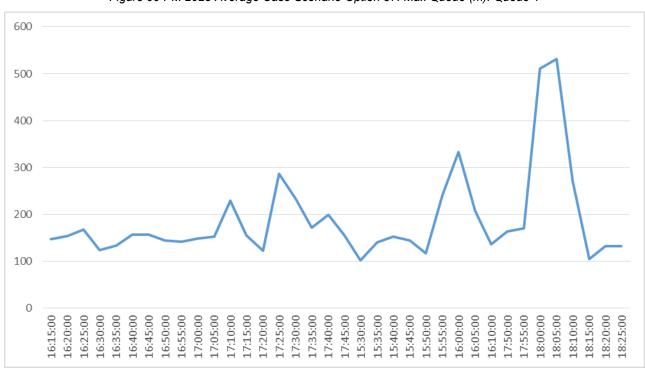


Figure 100 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 2

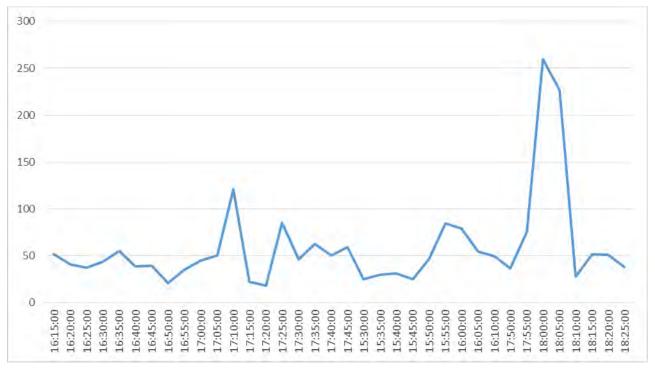


Figure 101 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 3

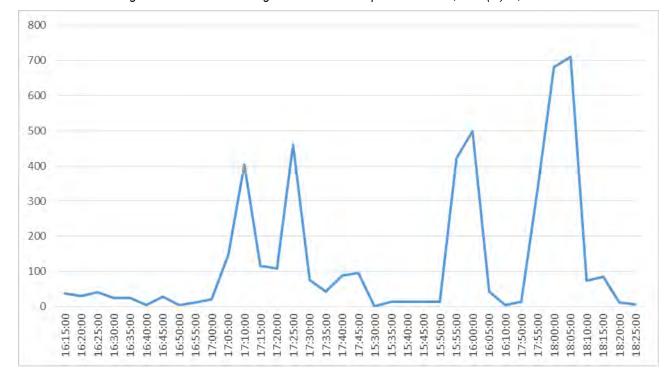


Figure 102 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 4

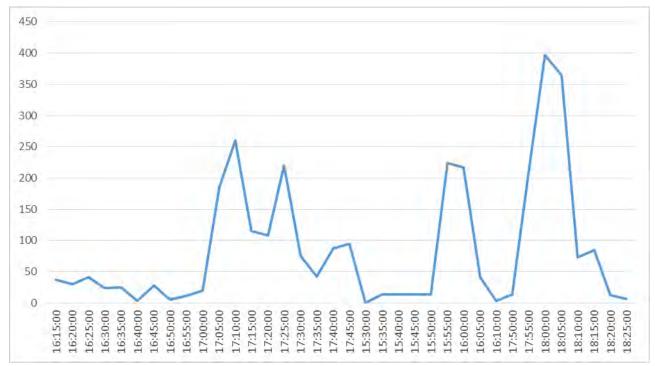


Figure 103 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 5

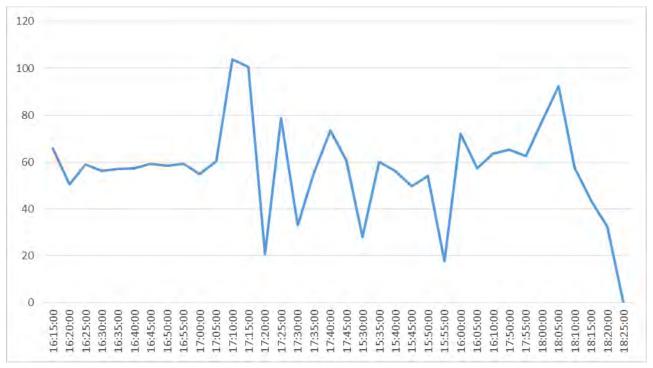


Figure 104 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 6

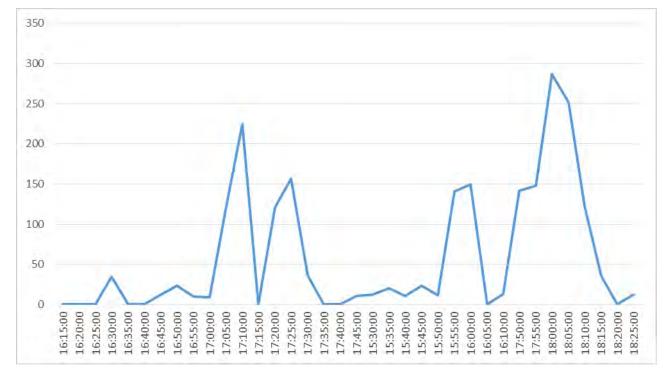


Figure 105 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 7

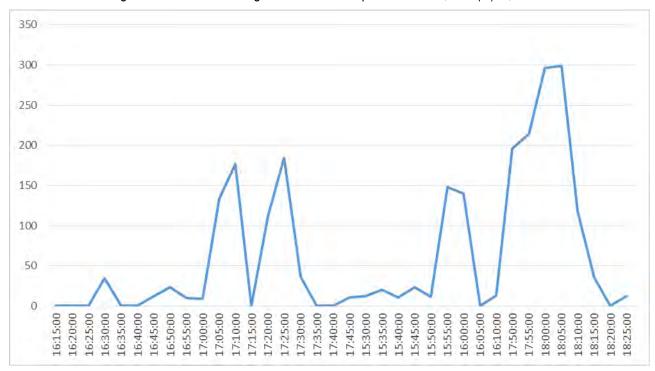


Figure 106 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 8

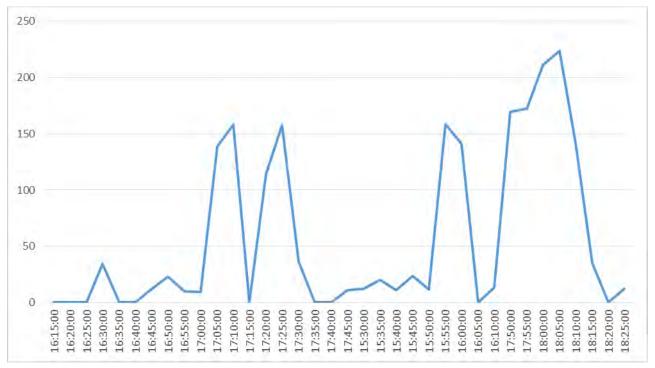


Figure 107 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 9

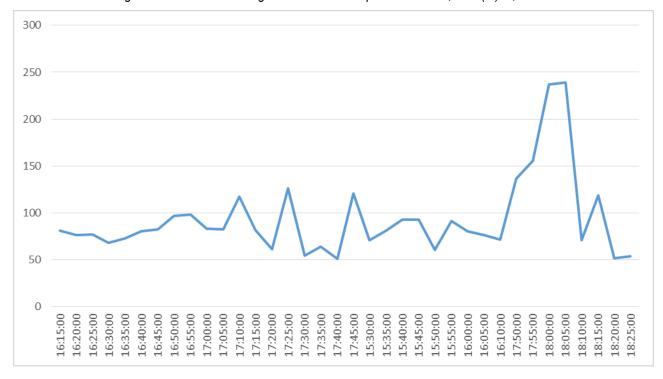


Figure 108 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 10

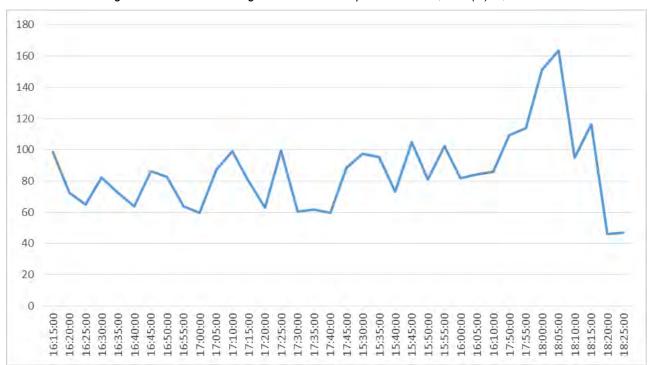


Figure 109 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 11

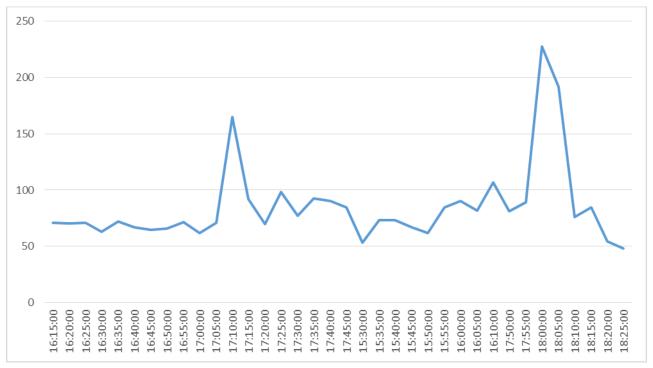


Figure 110 PM 2023 Average Case Scenario Option 37. Max Queue (m). Queue 12

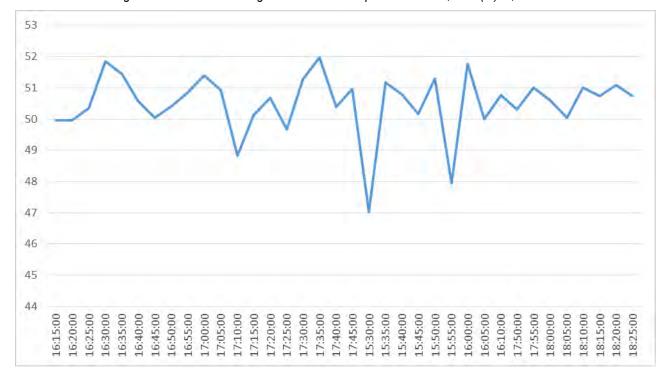


Figure 111 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 1

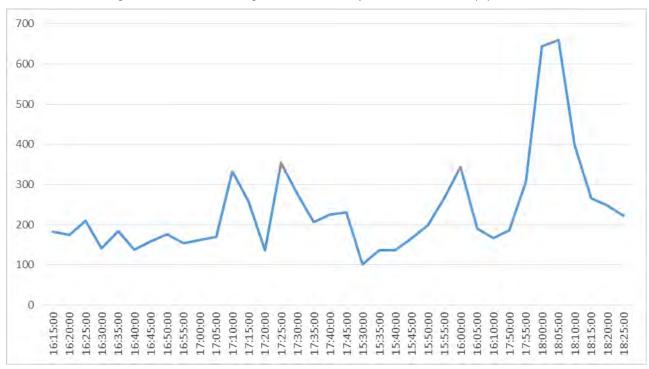


Figure 112 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 2

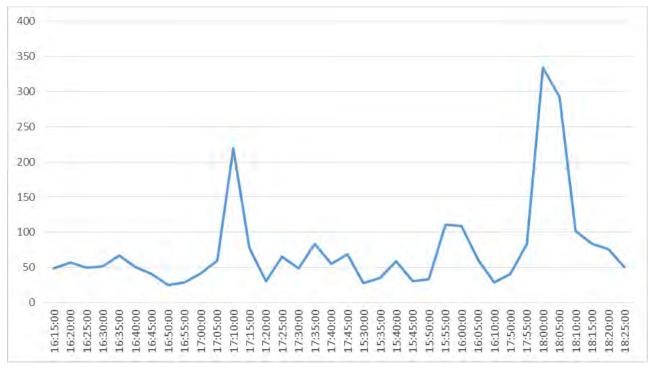


Figure 113 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 3

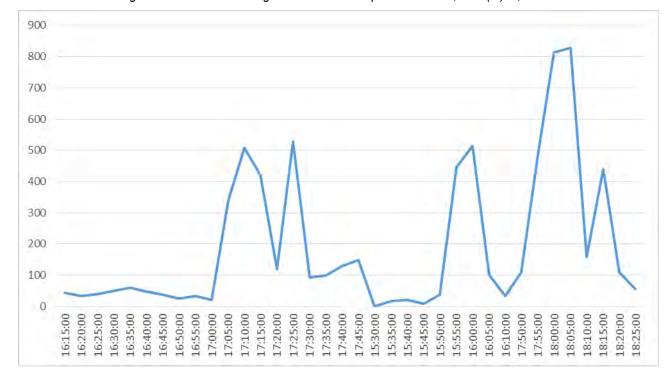


Figure 114 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 4

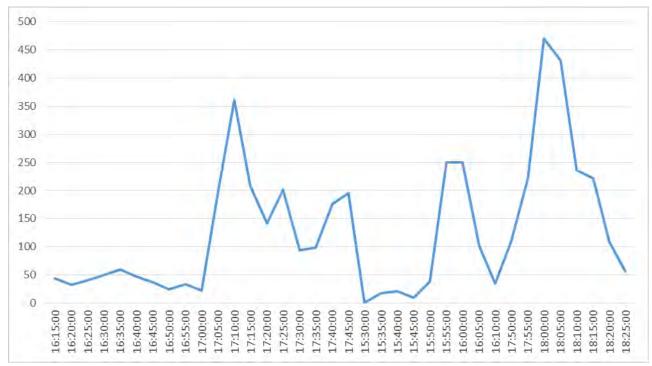


Figure 115 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 5

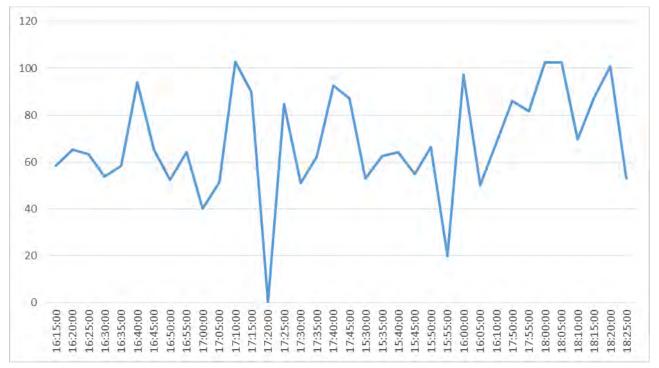


Figure 116 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 6

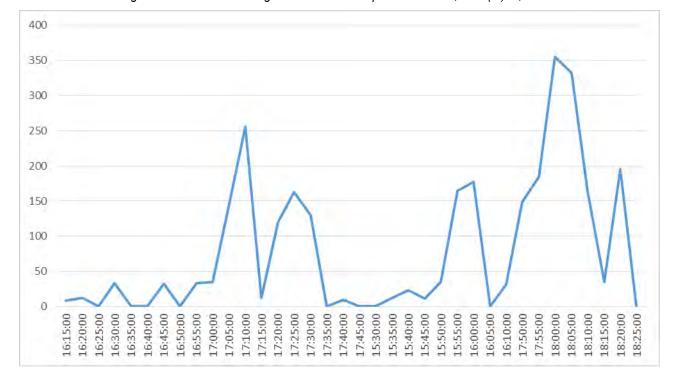


Figure 117 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 7

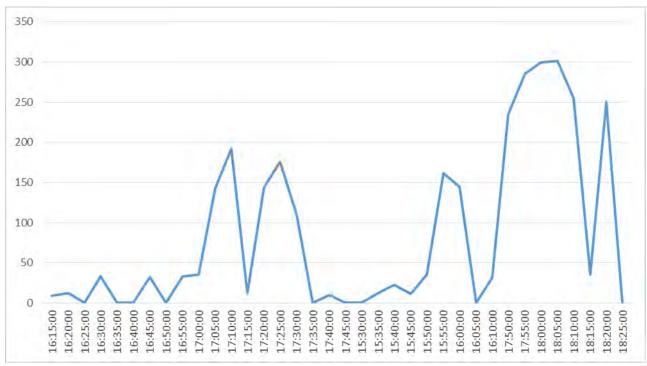


Figure 118 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 8

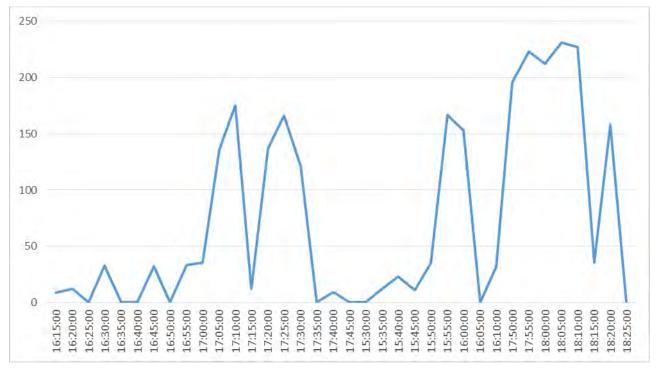


Figure 119 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 9

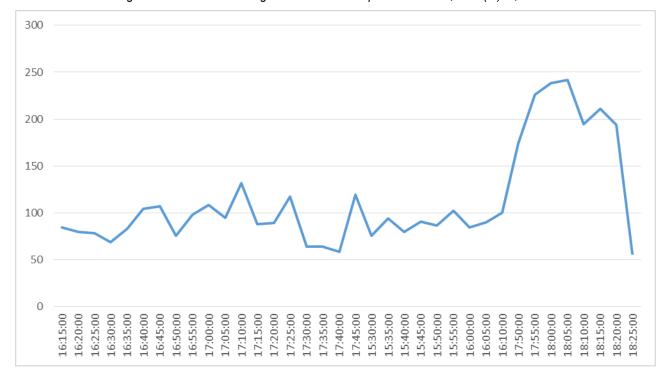


Figure 120 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 10

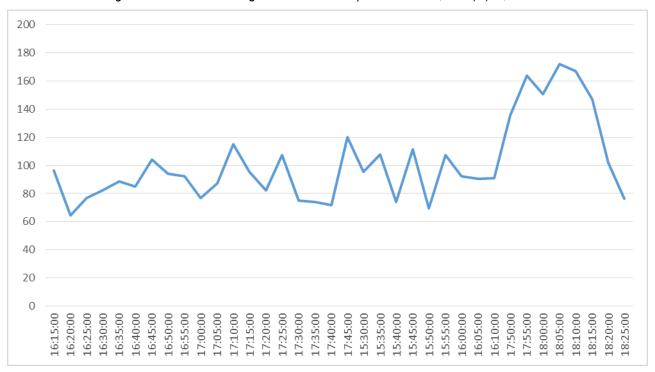


Figure 121 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 11

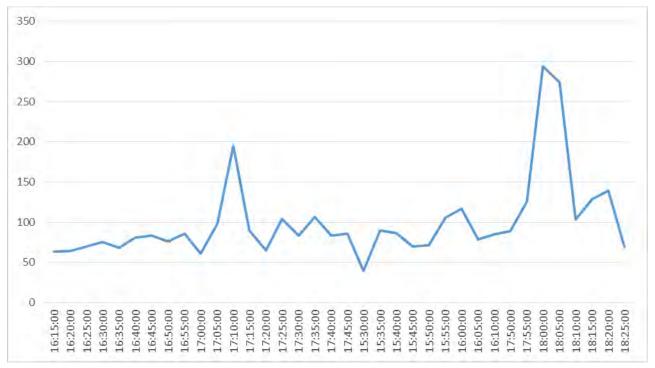


Figure 122 PM 2038 Average Case Scenario Option 37. Max Queue (m). Queue 12

