London Road, Burpham Active Travel Scheme

Modelling report

October 2023

Transport Studies

SURREY COUNTY COUNCIL

Executive Summary

Introduction

The London Road Burpham Active Travel Scheme includes the installation of dedicated cycle paths on both sides of London Road, upgrading the existing roundabouts to provide safer crossings for pedestrians and cyclists, creating new crossing points, making improvements to existing junctions, speed limit reductions and upgrading bus stops.

The aim of the scheme is to ensure that the roads are safer and more accessible for children, pedestrians and cyclists travelling around Guildford, now and in the future.

This assessment focuses solely on vehicle impact in terms of travel times and delay. Other potential scheme benefits, particularly for those who walk and cycle, are not assessed and include safety, air quality, noise, carbon and health.

Scheme Impact Summary

The scheme as modelled reduces vehicle capacity along the corridor by reflecting the proposed changes in the scheme designs. Additional crossing points for pedestrians and cyclists increase delay to vehicles. As a result, fewer vehicles travel along the A3100 corridor. This creates a more pleasant environment for pedestrians and cyclists which would likely lead to increased usage of active modes.

Because traffic chooses to avoid the A3100, flow increases on alternative routes including the A3, A320, A322, A246 and B2234. There are also some impacts on residential streets such as Nightingale Road which sees an increase in flow due to the banned right turn from A3100 London Road to York Road.

There are some increases in delay at junctions on these alternative routes indicating that there are impacts away from the A3100 corridor itself.

Looking at journey times, the A3100 itself experiences an increase in travel times as a result of the scheme which is expected given the increased usage of crossings and reduced capacity of the route. Increased journey times here reflect reduced speeds along the corridor which are intended as part of the design and will improve safety for all road users.

Although there are some changes to journey times on alternative routes, both positive and negative, the largest increase was 1 minute on the A320 southbound during the PM peak.

A further high active travel scenario was assessed to see if the findings would alter if there were higher level of crossing activations due to increased numbers of pedestrians and cyclists. Broadly the pattern of changes was the same as in the low active travel scenario, but to a slightly larger degree as would be expected.

A sensitivity test was undertaken to determine what the impact of the scheme would be if there were an additional 1800 dwellings in the Burpham area. This showed that there would be further rerouting away from the A3100 on to alternative routes including the A3 and A320. The largest difference in travel time compared to the high active travel scenario without the additional development was just 11 seconds along the A3 southbound. Overall, the additional development trips appear to have displaced other trips which re-routed to find alternative routes through the wider area.

Conclusions

Modelling showed that the scheme reduced vehicle speeds and traffic flow levels along the A3100 in line with its objectives to create a safer and more pleasant corridor for pedestrians and cyclists. In practice this enhanced active travel corridor would likely lead to reduced vehicle demand as travelling on foot or cycling would be more attractive to the public than currently and travelling by car less so.

Although flow increased on alternative routes, these vehicle impacts appear to be to be relatively slight and is likely to be offset by the benefits to other road users who benefit from the A3100 London Road – Active Travel Scheme. These were not assessed as part of this report and include social and environmental impacts such as air quality, safety, noise, carbon and health benefits.

It is recommended that monitoring is undertaken on alternative routes such as Nightingale Road which may be unsuitable for additional traffic would be required to determine whether mitigation measures may be needed to reduce rat-running.

Introduction

This report describes the strategic transport model assessment of the **London Road, Burpham – Active Travel Scheme** design being presented in the autumn 2023 public consultation.

The scheme includes the installation of dedicated cycle paths on both sides of London Road, upgrading the existing roundabouts to provide safer crossings for pedestrians and cyclists, creating new crossing points, making improvements to existing junctions, speed limit reductions and upgrading bus stops.

The aim of the scheme is to ensure that the roads are safer and more accessible for children, pedestrians and cyclists travelling around Guildford, now and in the future. The route from Burpham to Guildford has been prioritised because of current demand and the potential to encourage residents in Burpham and the surrounding area to cycle or walk to key destinations in Guildford.

The assessment aims to establish the potential impact on drivers of the scheme. It does not assess the benefits for pedestrians and cyclists.

The Transport Model

The county council's strategic transport model SINTRAM73 has been used for this assessment. It is a multi-modal transport model with a base year of 2019 and was developed following the Department for Transport's (DfT) Transport Analysis Guidance. It uses OmniTRANS modelling software developed by Dat Mobility.

Forecast Year

The scheme has been assessed for a forecast year of 2024, to reflect its opening year.

Core Model Scenarios

Three core model scenarios have been created for the assessment as follows:

- 2024 Do Minimum. This reflects the transport network with committed or built schemes since 2019, but importantly the London Road corridor in Burpham remains as it is today (i.e., no active travel scheme).

- 2024 Do Something low active travel uptake. This is a copy of the 2024 Do Minimum network and demand matrices plus the London Road, Burpham Active Travel Scheme whereby use of pedestrian and cycle crossings is low.
- 2024 Do Something high active travel uptake. This is a copy of the 2024 Do Minimum network and demand matrices plus the London Road, Burpham Active Travel Scheme whereby use of pedestrian and cycle crossings is high.

Both low and high active travel uptake Do Something scenarios will be compared with the Do Minimum scenario to ascertain the potential vehicle impact of the scheme.

The difference between the low and high active travel scenarios is the level of vehicle delay applied where pedestrians and cyclists cross the road at the proposed parallel and signal-

controlled crossings. The vehicle delay is higher in the high active uptake scenario, compared to the low active uptake scenario reflecting increased use of the crossings.

Housing Development Sensitivity Test

Further to the three scenarios above (Do Minimum, Do Something low active travel and Do Something high active travel), an additional high active travel uptake scenario has been assessed, which involved increasing the number of residential units in the Burpham area by 1,800 units. This sensitivity test has been undertaken to assess the vehicle operation along the A3100 corridor should nearby land be developed, as set out in Guildford Borough's Local Plan. It is, however, a purely hypothetical scenario as this number of residential units will not be built out in 2024, nor would it be built without supporting infrastructure and amenities which are not considered in this assessment.

Time Periods

The following weekday time periods have been assessed in the model:

- Average AM peak hour (0700 – 1000)
- Average PM peak hour (1600 – 1900)

Assessment Caveats

When evaluating the results presented in this report, it is important to note this assessment is considered to represent a worst case. The vehicle demand and thus impact on drivers is an overestimate due to the following reasons:

- As the forecasting process in the model used was already established, the 2024 Do Minimum demand matrices were developed with DfT TEMPro 7.2 equivalent growth, which is no longer current and is higher than the current version.

- The Do Minimum demand matrices were calculated using Variable Demand Modelling. However, the core Do Something scenarios have been developed without the use of the Variable Demand Model and use the same demand matrices as the no scheme Do Minimum scenario. This means that the vehicle demand does not respond to the scheme design. In this case, the vehicle demand is likely to reduce with the scheme, as alternative travel options, particularly by foot and cycle, could be more attractive to the public than they are currently, and travelling by car less so.

- The sensitivity test also uses the fixed demand of the Do Minimum scenario but has the development trips added. These trips have been coarsely generated using historic trip rates for similarly located sites, and without mitigation which would need to accompany a development of that size.

- The trip generation and distribution developed for the Sensitivity Test are initial estimates to assist in the modelling work being carried out by Surrey County Council and should not be taken as agreed or finalised information for any potential developments as part of the planning application process. The findings of this sensitivity test do not in any way reduce the need for individual developments to have detailed, local transport assessments carried out which may identify specific impacts on the network that require mitigation.

Furthermore, the model results represent the situation when the scheme has been in place for some time and local drivers are familiar with the infrastructure changes and have adapted their travel behaviour accordingly.

This assessment focuses solely on the impact on drivers in terms of travel times and delay. Other potential scheme benefits, particularly for those that walk and cycle are not assessed and include safety, air quality, noise, carbon and health.

Low Active Travel Scenario

The 2024 Do Something low active travel scenario is the proposed Burpham Active Travel Scheme whereby the use of pedestrian and cycle crossings is relatively low. A comparison of these model results against the 2024 Do Minimum scenario is presented below.

Vehicle Flow Difference

The colouring in the plots below is proportional to the changes in vehicles per hour on each section of road, with red denoting an increase and blue denoting a decrease. For each area two plots are shown, the first for the AM peak and the second for the PM peak.

Scheme changes to the A3100, including reduced speed limits, reduced carriageway widths, and additional crossing facilities, have been reflected in the modelled Do Something network. These measures aim to create a safe and friendly corridor for those choosing to travel via active modes. As a result, existing usage of the A3100 is displaced to other corridors in the Guildford area, including the A3, A246, A320, and A322. Routeing that takes place further away from the A3100 corridor will be due to secondary and tertiary routeing impacts as drivers changing to alternative routes as a direct consequence of the scheme encourage other drivers to seek new routes through the network. These changes in vehicle flows in response to the proposed scheme are explored in more detail below.

Boxgrove Roundabout

The most notable changes in flow are on the A3100 approaches to and exits from the Boxgrove Roundabout. Flow changes on the A25 Parkway and A25 Boxgrove Road are less pronounced.

- Two-way flow decreases by approximately 345 vehicles (-18%) on the A3100 north of the roundabout during the AM peak hour, and 160 vehicles (-10%) during the PM peak hour.

- Two-way flow decreases by approximately 290 vehicles (-28%) on the A3100 south of the roundabout during the AM peak hour, and 210 vehicles (-20%) during the PM peak hour.

- Vehicle flow along the A3100 is tidal with more people travelling to Guildford town centre in the AM peak. This is reversed in the PM peak. The change in flow mirrors this in the figures below.

Figure 1: AM Peak Low Active Travel vs Do Minimum flow difference for the Boxgrove Roundabout.

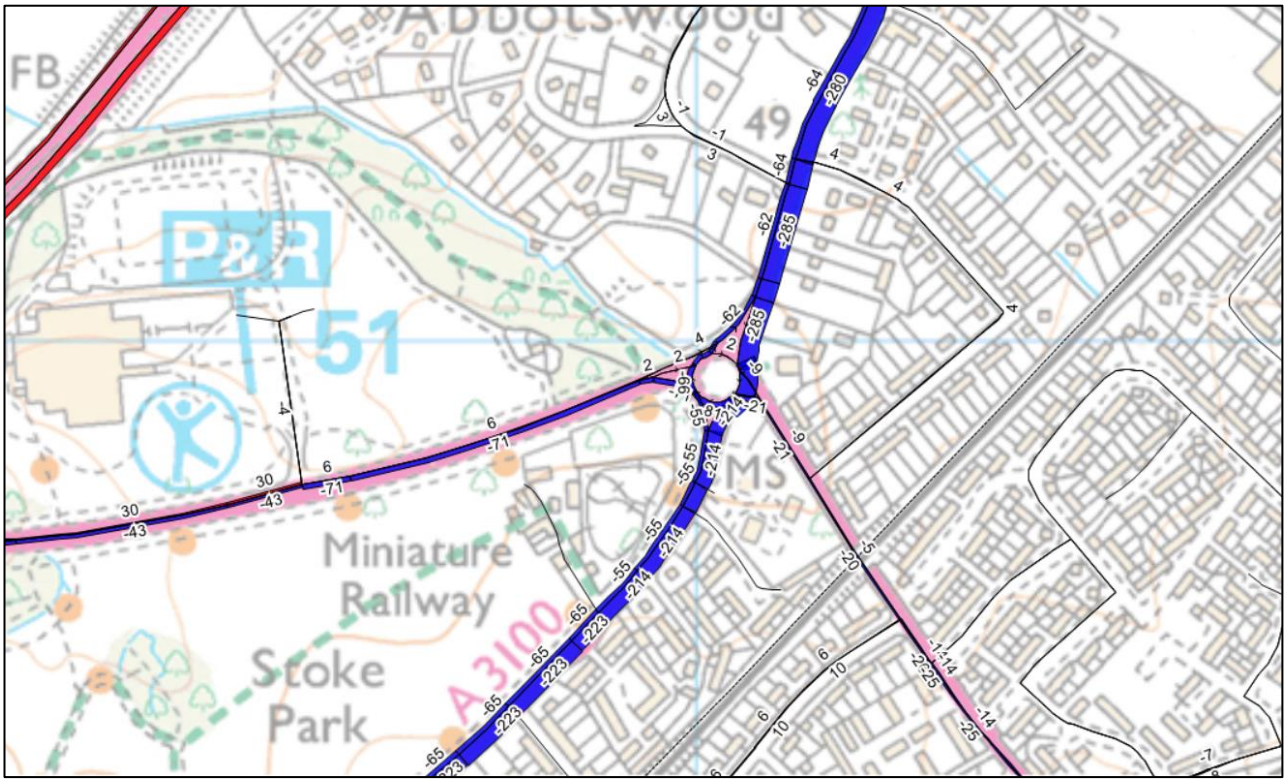
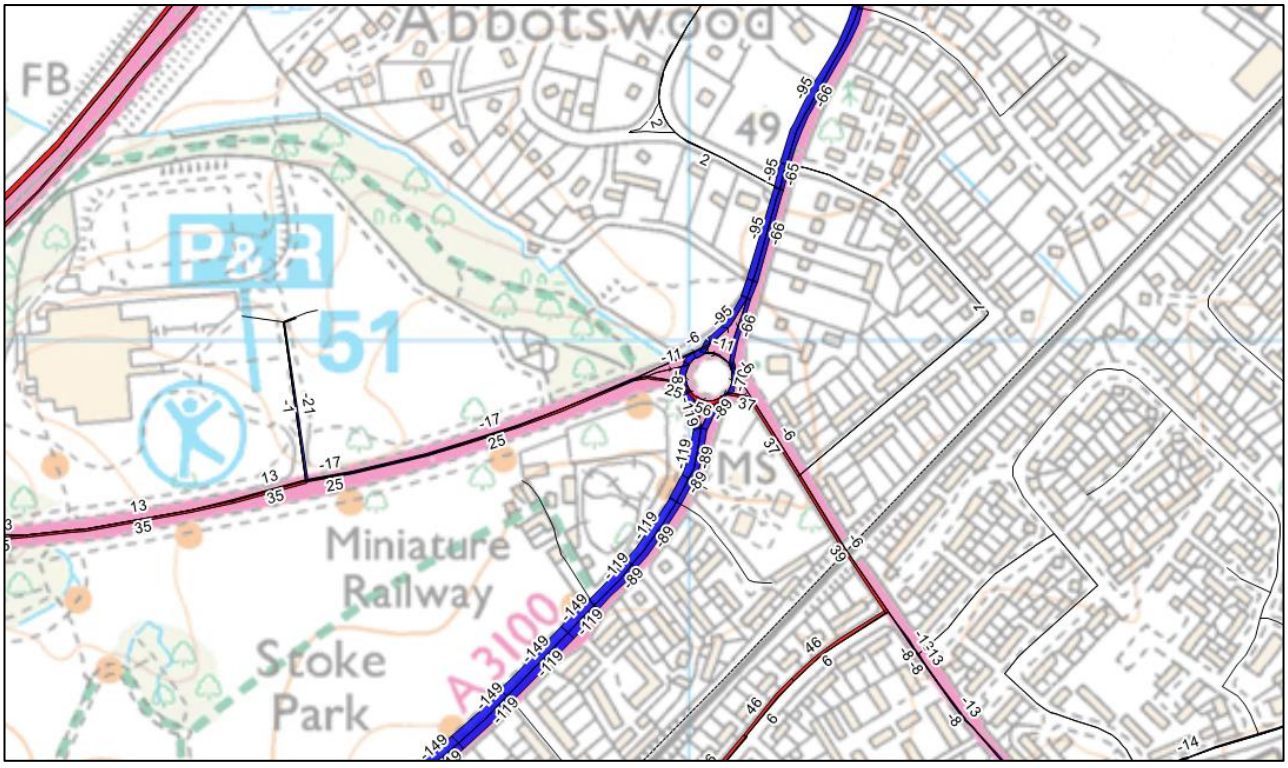


Figure 2: PM Peak Low Active Travel vs Do Minimum flow difference for the Boxgrove Roundabout.



A320 Stoke Road / A25 Parkway

- An increase in flow of 67 vehicles (5%) on the A320 Woking Road southbound approach to the junction during the AM peak hour, and 42 vehicles (3%) during the PM peak hour.

- An increase in flow of 42 vehicles (4%) on the A320 Woking Road northbound exit from the junction during the PM peak hour.

- A decrease in flow of 49 vehicles on the A25 Parkway westbound approach to the junction during the AM peak hour.

- A decrease in flow of 67 vehicles on the A25 Ladymead westbound exit from the junction during the PM peak hour.

Figure 3: AM Peak Low Active Travel vs Do Minimum flow difference for the A320 Stoke Road / A25 Parkway junction.

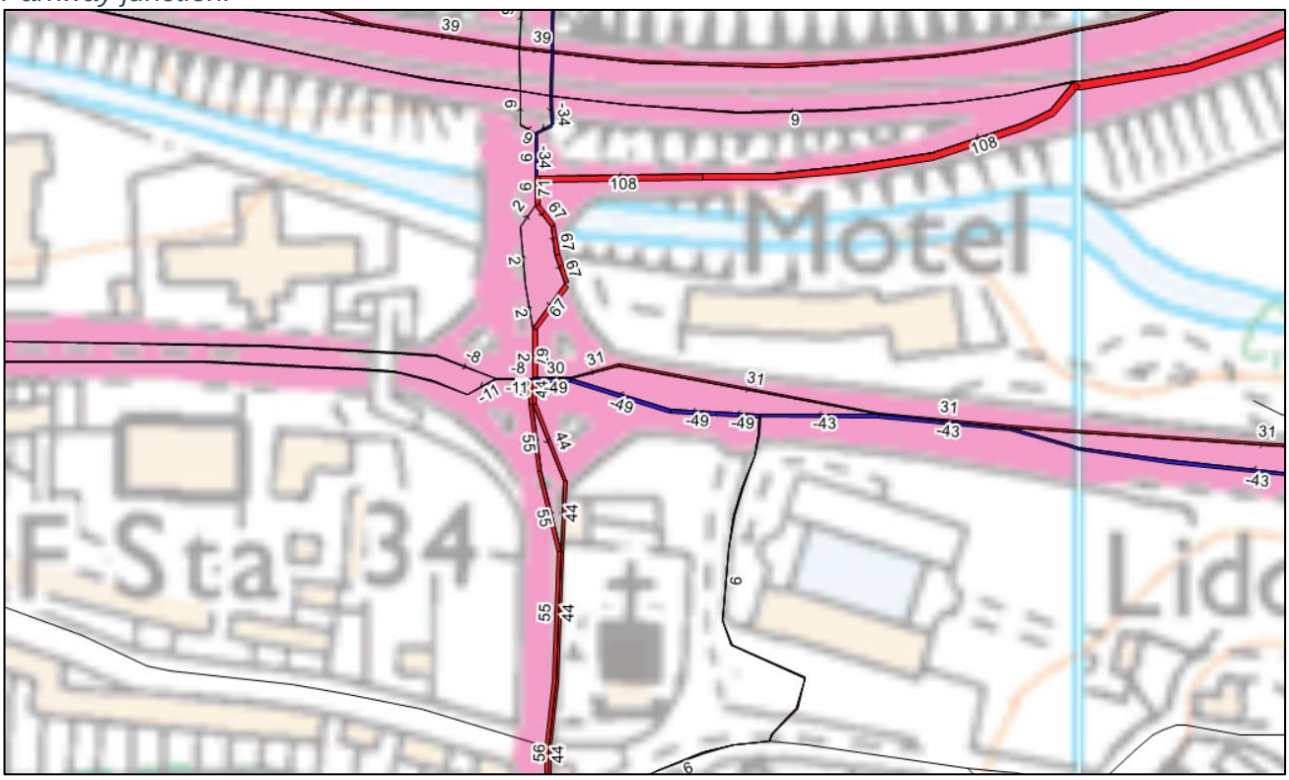
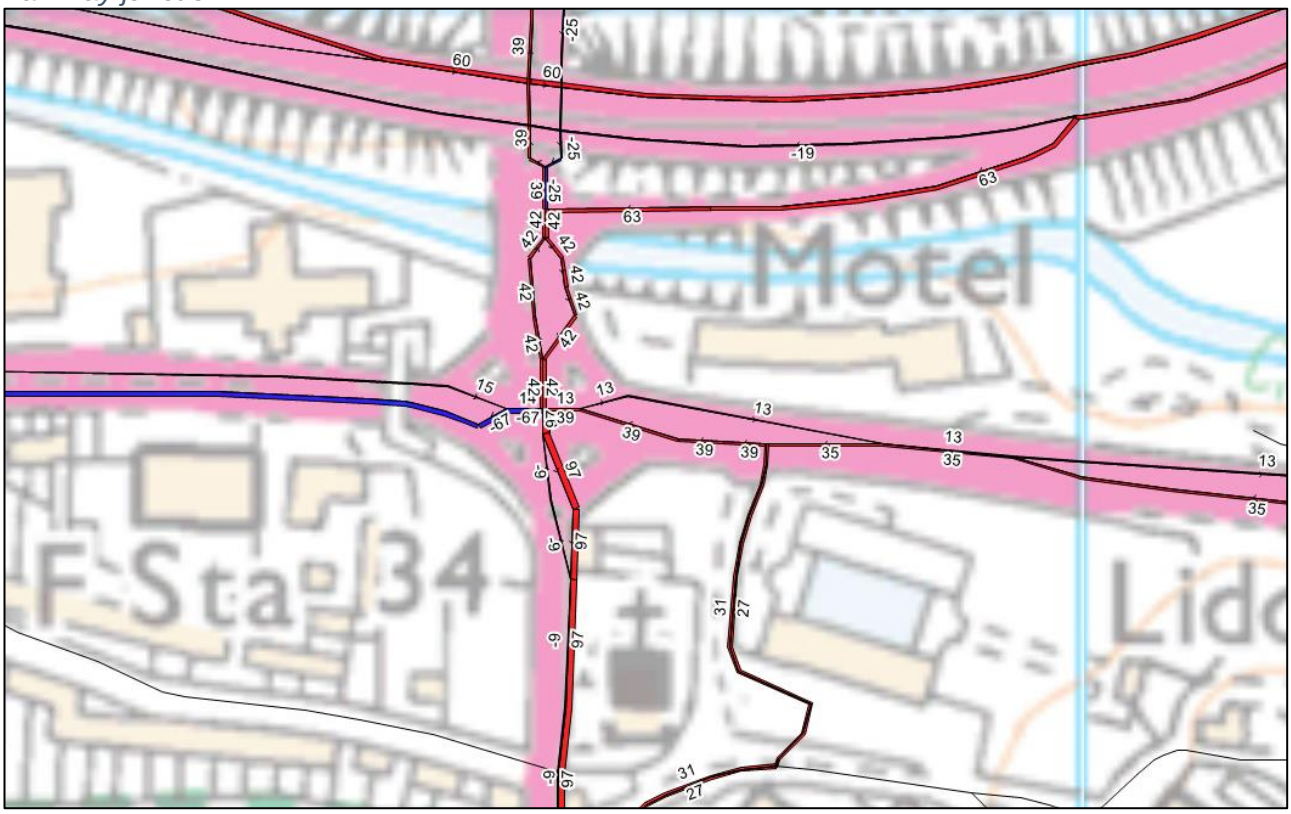


Figure 4: PM Peak Low Active Travel vs Do Minimum flow difference for the A320 Stoke Road / A25 Parkway junction.



The A3

- An increase in flow of 117 vehicles (3%) on the A3 southbound from the Burpham exit to the A320 Woking Road exit during the AM peak hour, and 44 vehicles (1%) during the PM peak hour.

- An increase in flow of 39 vehicles (1%) on the A3 northbound from the A320 Woking Road Entry during the AM peak hour, and 60 vehicles (2%) during the PM peak hour.

- It seems a large proportion of vehicles rerouting away from the A3100 are staying on the mainline A3 for slightly longer to avoid any additional delay associated with the proposed scheme. This in turn makes the A3100 safer and more accessible for children, pedestrians and cyclists which in practice would likely lead to a greater shift towards active modes.

Figure 5: AM Peak Low Active Travel vs Do Minimum flow difference for the A3.

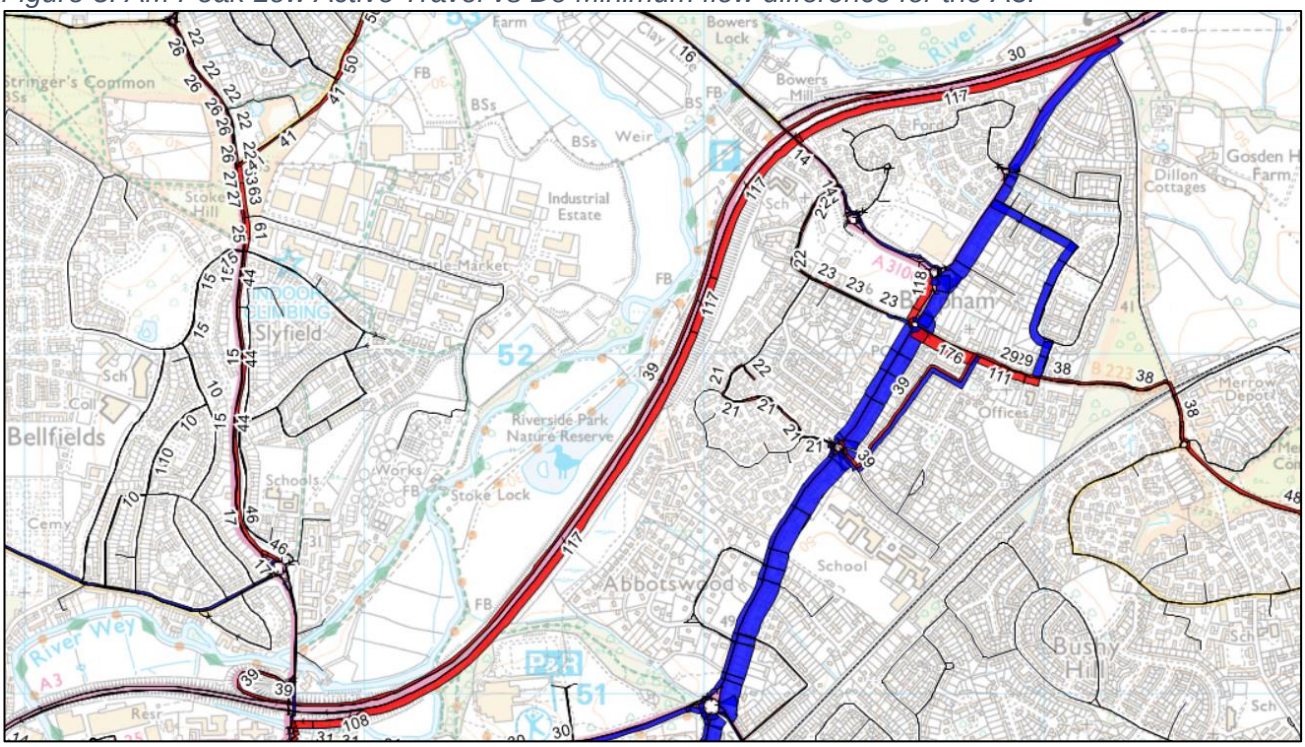
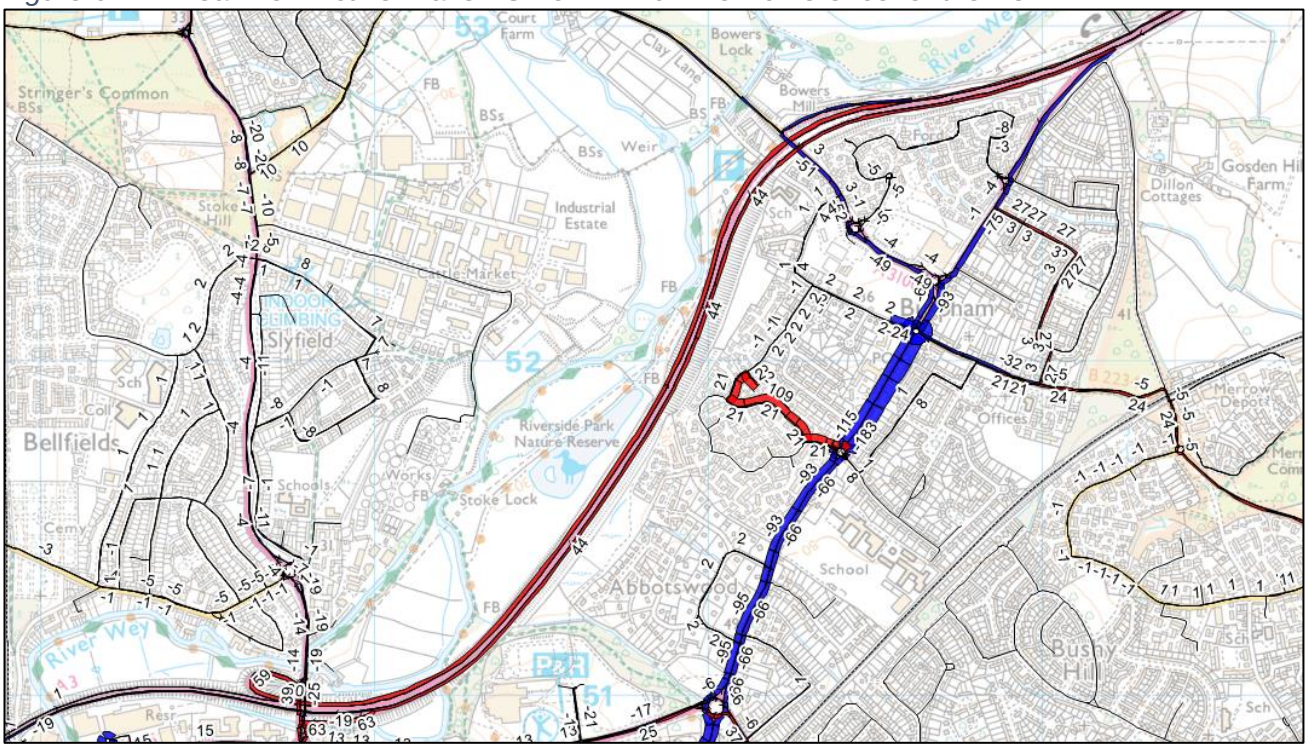


Figure 6: PM Peak Low Active Travel vs Do Minimum flow difference for the A3.



Guildford North

- During the AM peak hour the most notable increase in two-way flow is an additional 107 vehicles on Nightingale Road. This may be a response to additional delay on the A3100 and the banned right turn from London Road to York Road. Nightingale Road is largely residential and it is recommended that it is monitored for additional through trips to determine whether mitigation options need to be considered to prevent rat-running.

- There is an increase in two-way flow of approximately 105 vehicles (8%) on the A320 Stoke Road during the AM peak hour, and approximately 142 vehicles (11%) during the PM peak hour. This appears to be associated with trips avoiding the A3100 by using the A3 and the A320 as a means of accessing and egressing Guildford town centre.

- There is an increase in northbound flow of approximately 92 vehicles (15%) on the A322 Woodbridge Road during the PM peak hour. It would appear these trips are mostly heading towards the A3 southbound on-slip at the Dennis Roundabout.

- There is an increase in two-way flow of 146 vehicles on the A246 Waterden Road during the AM peak hour, and 92 vehicles during the PM peak hour. This appears to be associated with an increase in flow on the A246 Epsom Road during both peak periods due to some drivers electing to use the A246 instead of the A3100.

- There are increases in gyratory flow during both the AM and PM peak hours.

Figure 7: AM Peak Low Active Travel vs Do Minimum flow difference for Guildford North.

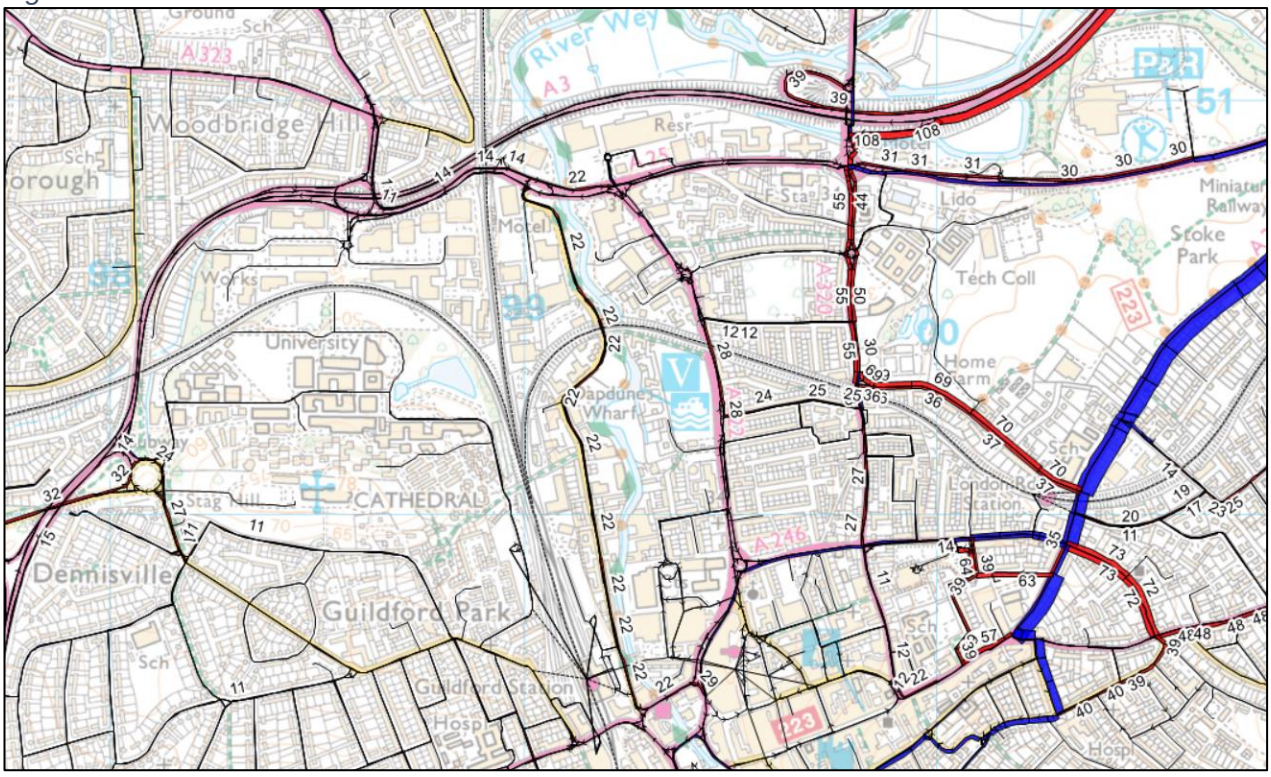
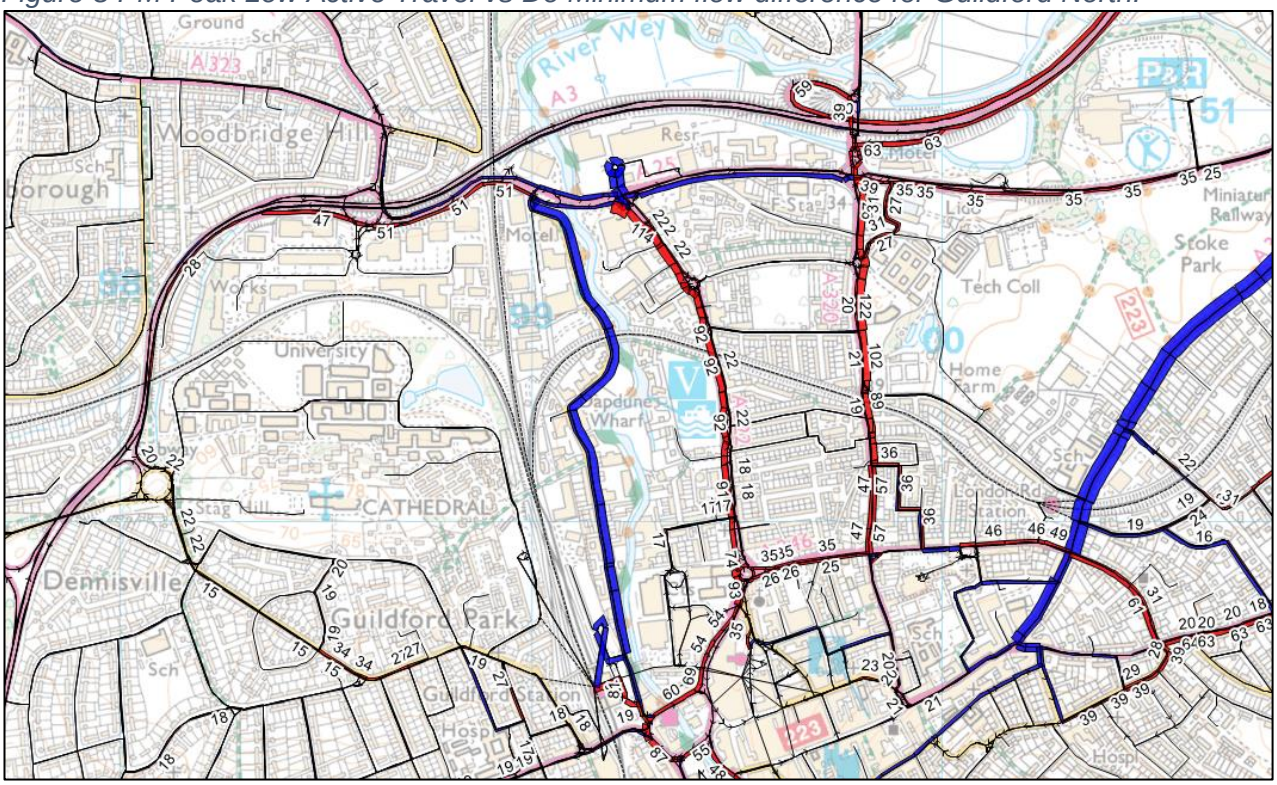


Figure 8 PM Peak Low Active Travel vs Do Minimum flow difference for Guildford North.



A3100 North

- There is a decrease in two-way flow of approximately 340 vehicles on the A3100 London Road during the AM peak hour, and 300 vehicles during the PM peak hour.

- There is an increase in westbound flow of 111 vehicles on the B2234 New Inn Lane approach to the roundabout with the A3100 London Road during the AM peak hour. This coincides with a decrease in northbound flow of 122 vehicles on Glendale Drive and 65 vehicles on Burnet Avenue. In the Do Minimum scenario vehicles were using Glendale Drive as a rat-run to avoid delay at the New Inn Lane roundabout, but the overall displacement of traffic on the A3100 during the Do Something reduces delay at this roundabout and encourages trips to stick to main corridors rather than rat-running through the nearby residential streets.

- There is an increase in southbound flow on the B2234 Park Lane. These additional trips could be vehicles rerouting away from the A3100 and instead electing to use the A246 Epsom Road to access Guildford town centre.

- Although Weylea Avenue appears to have substantial changes, this is due to the model composition of zones and connections to the modelled highway network. In this instance vehicle trips from this geographical area are choosing to access the highway network at a slightly different location, and in reality these trips will be more evenly distributed.

Figure 9 AM Peak Low Active Travel vs Do Minimum flow difference for A3100 North.

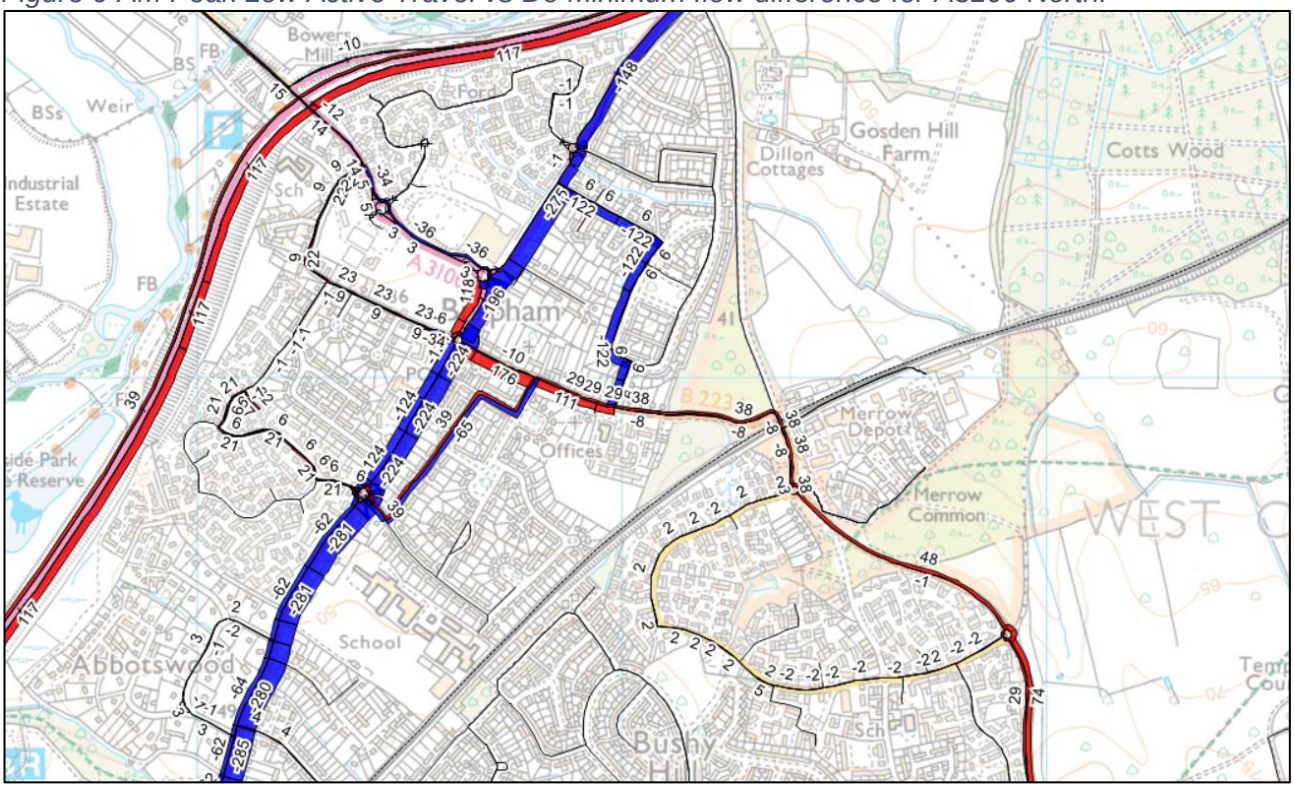
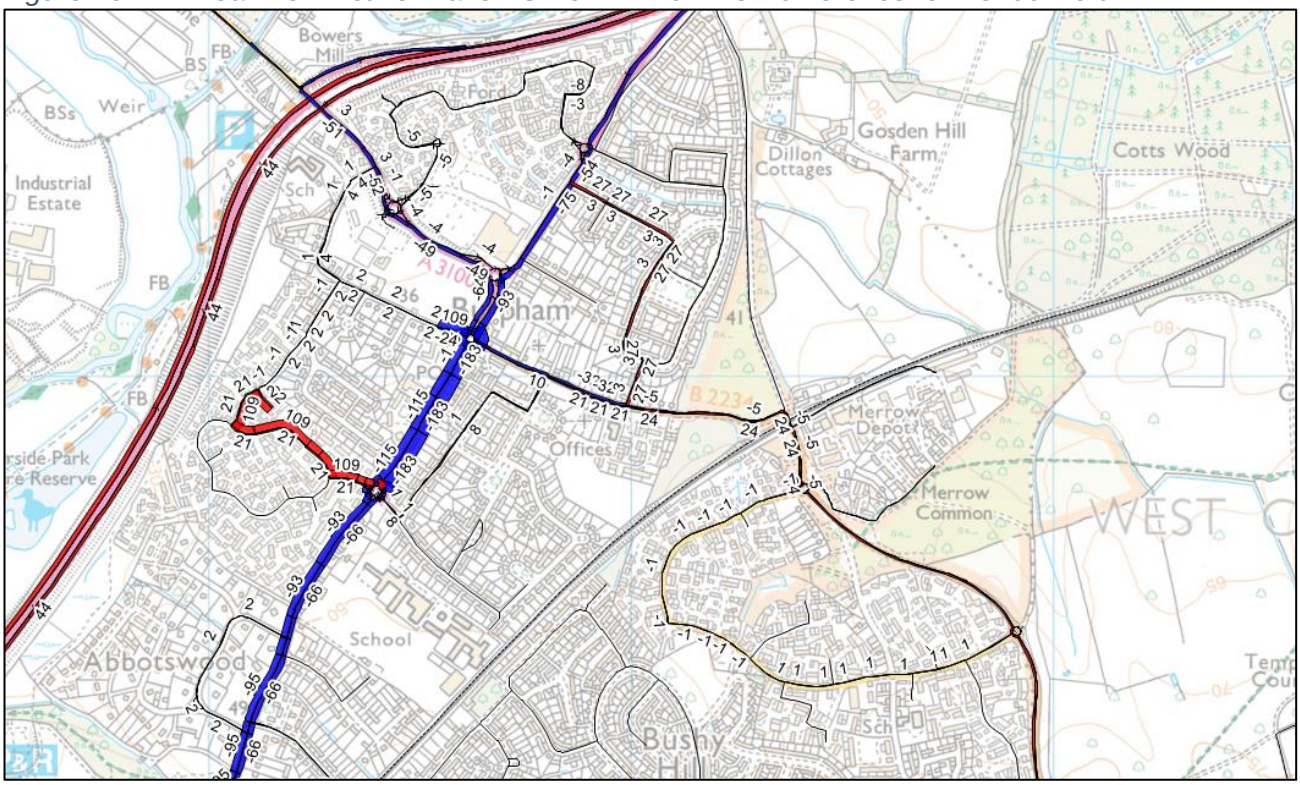


Figure 10 PM Peak Low Active Travel vs Do Minimum flow difference for A3100 North.



A3100 South

- There is a decrease in two-way flow of approximately 288 vehicles on the A3100 London Road during the AM peak hour, and 269 vehicles during the PM peak hour.

- Tormead Road experiences increased through trips in this scenario, particularly during the PM peak hour.
- The below plots also show an increase in trips on the A246 Epsom Road during both peak hours.

Figure 11 AM Peak Low Active Travel vs Do Minimum flow difference for A3100 South.

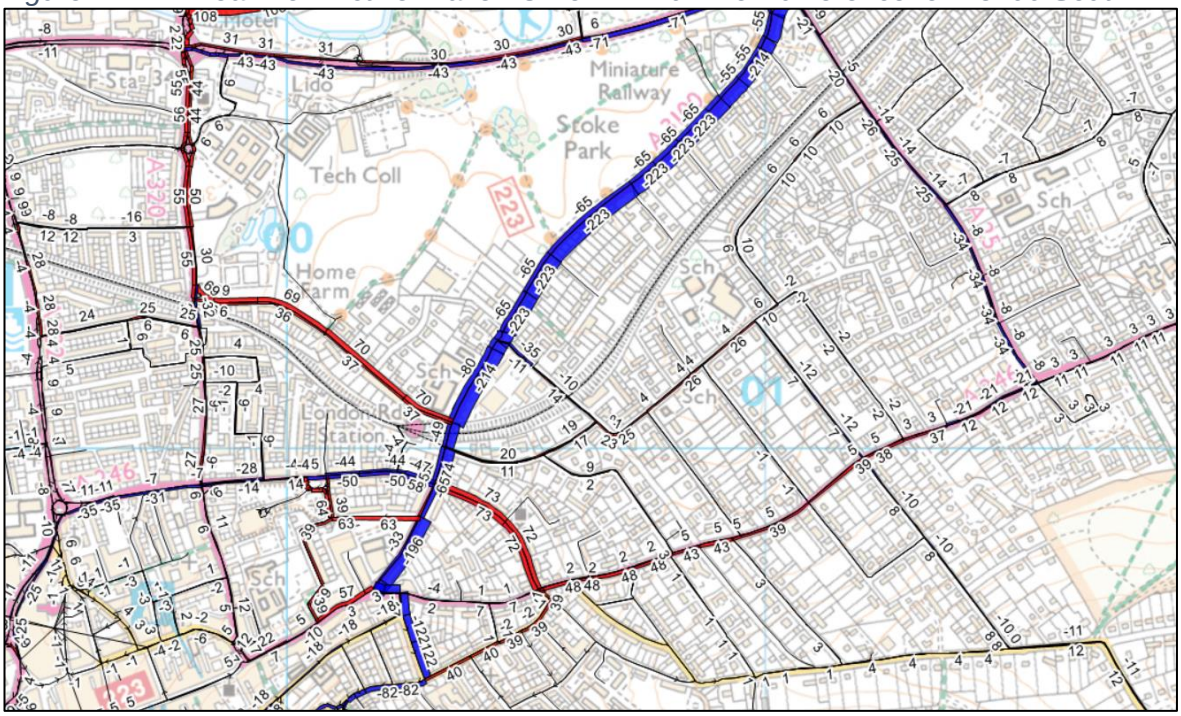
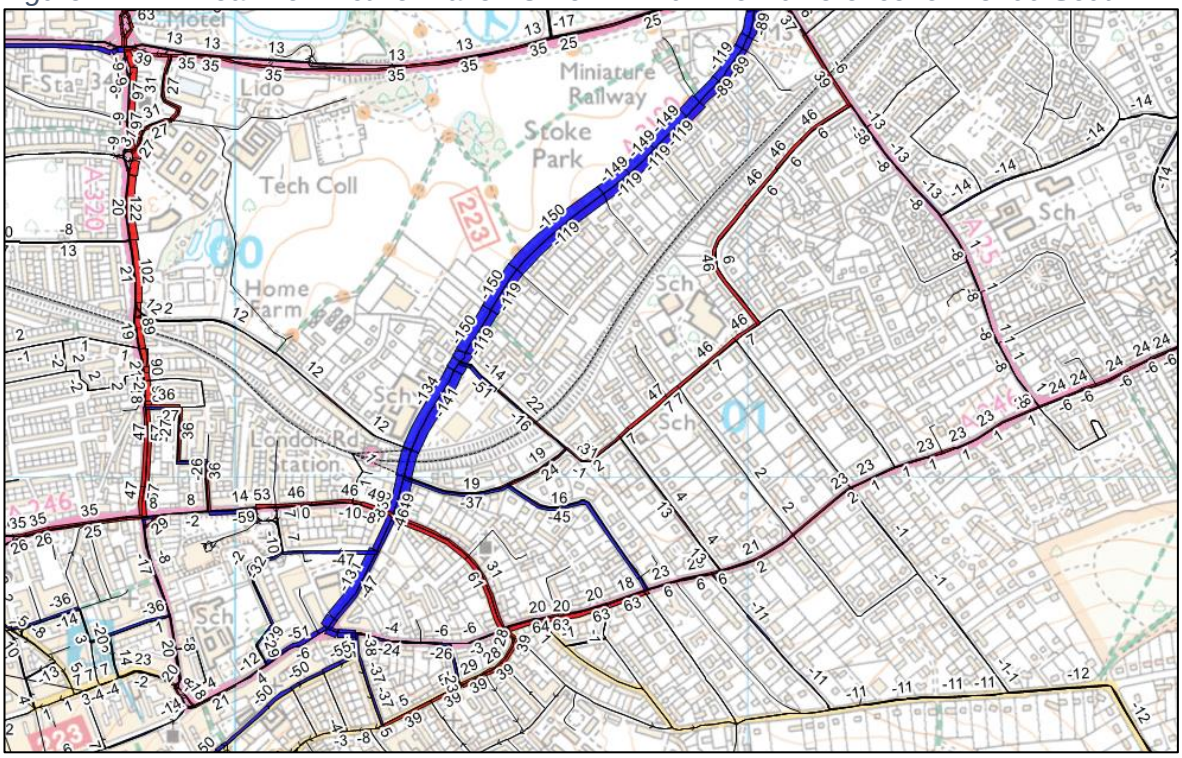


Figure 12 PM Peak Low Active Travel vs Do Minimum flow difference for A3100 South.



Junction Delay

Due to the way that the scheme has been reflected in the model, comparison of journey times is the best way of reviewing the impact of the scheme on the A3100 corridor itself. Away from the A3100, junction delay has been reviewed to determine if redistribution of traffic results in any changes in average delay per vehicle in the wider area. Overall, the low active travel scenario shows similar levels of junction delay across the area when compared to the Do Minimum. This is particularly true in the AM peak which displays fewer notable changes in delay when compared to the PM. Key changes to junction delay as a result of the scheme include:

- During the AM peak, junction delay at Stoke Crossroads increases by 17% in the low active travel scenario compared to the Do Minimum. In the PM peak, delay at this junction increases by 24% reflecting the increase in vehicles using the A320 to avoid the A3100 and accessing the A3 northbound here. Delay also increases by 15% at the junction of A246 York Road and A320 Stoke Road during the PM peak due to higher flows.

- During the PM peak, on the Surrey Way approach to A3 Dennis' Roundabout delay increases by 38% in the low active travel scenario as more vehicles route through the junction to access the A3 southbound.

- Figure 7 and Figure 8 above illustrate that flow on the A322 increases as a result of the scheme whilst flow on A25 Parkway reduces. Consequently, traffic flow patterns through the junction of the A25 with Ladymead Retail Park and A322 Woodbridge Road alter, resulting in average delay per vehicle reducing by 23% in the low active travel scenario during the PM peak. Conversely, the delay for left turning vehicles from A322 Woodbridge Road to A25 westbound increases by 9%.

- The junction of Walnut Tree Close and the gyratory experiences an increase in junction delay of 18 seconds per vehicle in the PM peak when compared against the Do Minimum. Circulatory flow on the gyratory increases during this time period as a result of the scheme which makes it more difficult for vehicles to enter the gyratory from Walnut Tree Close.

- In both the AM and PM peaks, junction delay reduces at the junction of A3100 London Road with A246 York/ Waterden Road by 42 – 44%. This can be attributed to lower flow through the junction as a result of the scheme as well as the banning of the right turn into York Road from A3100 London Road which reduces the number of phases at the junction. It should be noted that the SINTRAM model does not reflect specific details of signal stages and times and as such it is recommended that further detailed modelling of the junction would enable a full assessment of the impact in this location.

Vehicle Journey Times

Figure 13 shows the journey time routes which have been assessed. They comprise routes which are near the scheme and/or experience a notable change in vehicle flow as noted above.

Figure 13: Journey time routes.

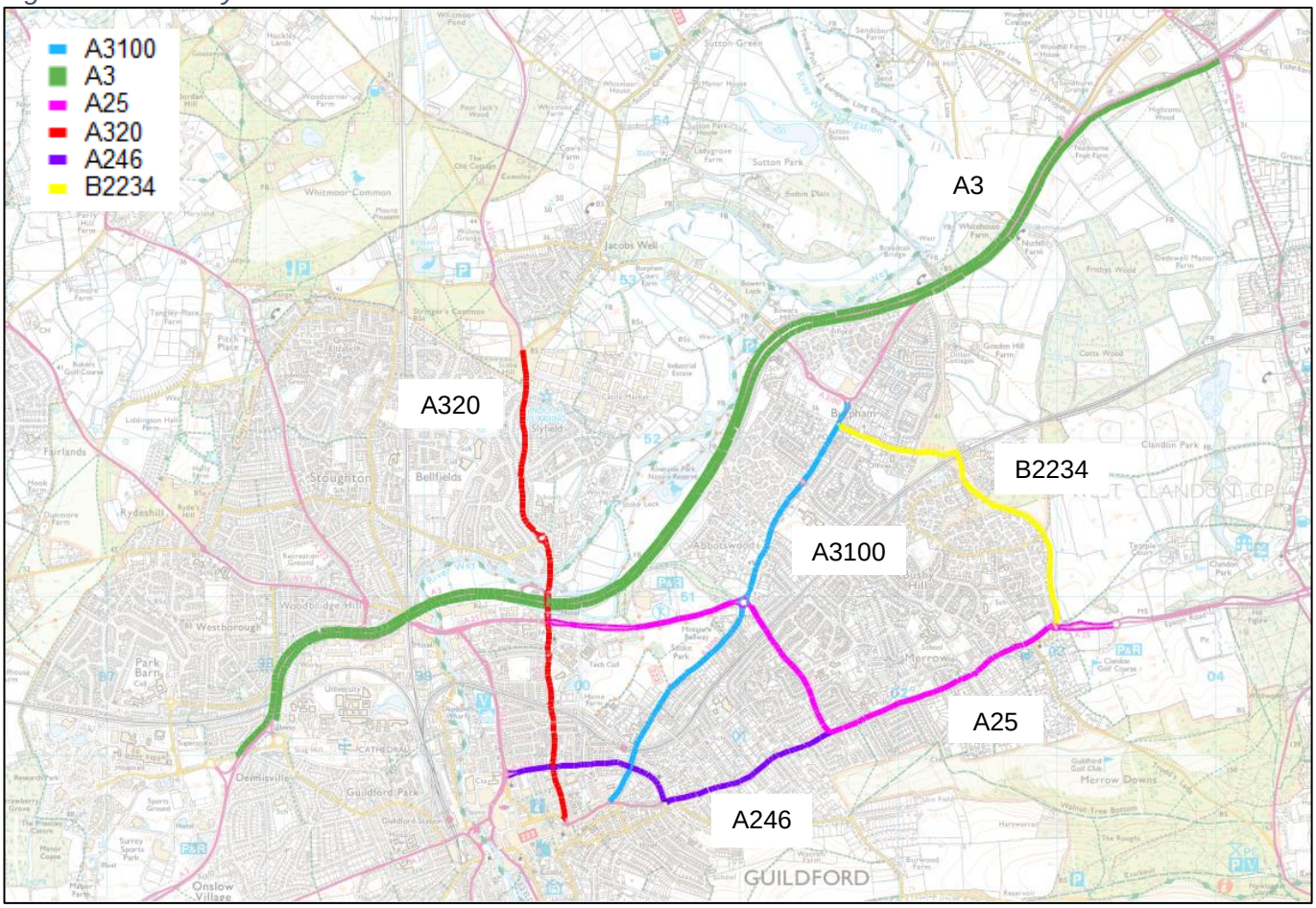


Table 1 shows the journey times for the Do Minimum and Do Something low active travel scenarios.

As can be expected, the A3100 experiences the greatest change in journey time, with an increase of 1.1 minutes in the northbound direction, and 1.7 minutes in the southbound direction of travel, during the AM peak. In the PM peak, the change is reversed with an increase of 1.1 minutes in the northbound direction and 1.7 minutes in the southbound direction. Overall, this is an increase of between 19% and 27% in travel time along the entire route and will affect those drivers making short journeys the most. However, the scheme is successfully reducing travel speeds along the active travel corridor, making using the route a more attractive choice for current and potential cyclists and pedestrians.

Moreover, apart from the A320 southbound, which sees an increase of 0.6 minutes in the AM peak and 1 minute in the PM peak due to increases in vehicle flow as discussed above, the remaining routes show no or very little change in average vehicle journey time.

There are even reductions in journey time with the scheme along the A246 and B2234, particularly during the AM peak.

Despite increases in flow along the A246, the impact on journey times along this route is negated due to the right turn from A3100 London Road to A246 York Road being banned at the signalised junction with Waterden Road. This reduces the number of phases at the junction, and as a result the delay as noted in the previous section on Junction Delay.

Junction DelayAlong the B2234 northbound, the journey times are similar apart from the end of the route where vehicles give way to circulating traffic at the roundabout junction with A3100 London Road. Here there is a reduction in the low active travel scenario of 0.9 minutes in the AM peak and 0.1 minutes in the PM peak, despite the marked increase in flow along the B2234. This reduction is due to fewer vehicles circulating the roundabout, and thus opposing those travelling from the B3224 New Inn Lane approach, which gives less delay for on the New Inn Lane arm of the junction.

Table 1: Do Something low active travel versus Do Minimum average vehicle journey times in minutes.

Route	2024 Do Minimum (mins)	2024 Do Something Low Active Travel (mins)	Difference (mins)
Average AM Peak Hour (0700 – 1000)			
A3100 Northbound	5.9	7.0	1.1
A3100 Southbound	7.3	8.9	1.7
A3 Northbound	5.5	5.5	0.0
A3 Southbound	9.4	9.4	0.0
A320 Northbound	9.8	9.9	0.0
A320 Southbound	10.5	11.1	0.6
A25 Eastbound	7.1	7.2	0.1
A25 Westbound	12.9	12.9	0.1
A246 Eastbound	6.2	6.0	-0.3
A246 Westbound	6.5	6.3	-0.2
B2234 Northbound	4.4	3.5	-0.9
B2234 Southbound	2.9	2.9	0.0
Average PM Peak Hour (1600 – 1900)			
A3100 Northbound	6.5	8.2	1.7
A3100 Southbound	5.9	7.1	1.1
A3 Northbound	5.3	5.3	0.0
A3 Southbound	8.0	8.0	0.0
A320 Northbound	11.3	11.7	0.4
A320 Southbound	8.3	9.3	1.0
A25 Eastbound	7.2	7.3	0.1
A25 Westbound	8.7	8.8	0.1
A246 Eastbound	7.1	6.9	-0.2
A246 Westbound	7.4	7.5	0.0
B2234 Northbound	3.1	3.0	-0.1
B2234 Southbound	3.0	3.0	0.0

Looking more closely at the changes in travel time along the A3100, Figure 14 presents the change in travel time along the route in the northbound direction, and Figure 15 presents the same for the southbound direction of travel.

In the northbound direction in the AM peak, the active travel scheme reduces the delay by 0.3 minutes on the A3100 London Road south arm of its signalised junction with A246 York Road, due to there being fewer signal phases as discussed above. There is only a reduction of less than 0.1 minutes in the PM peak.

Travelling along the route, the journey time gradually increases above that of the 2024 Do Minimum scenario. The new 20mph section of road between the A246 traffic signals and Cross Lanes increases journey times by 0.4 minutes in the AM peak and 0.5 minutes in the PM peak. There is just a slight increase of vehicle delay of 0.1 minutes during both time periods at Boxgrove Roundabout despite the changes, and north of Boxgrove Roundabout the reduced carriageway width causes an additional 0.4 minutes of travel time in the AM peak and 0.6

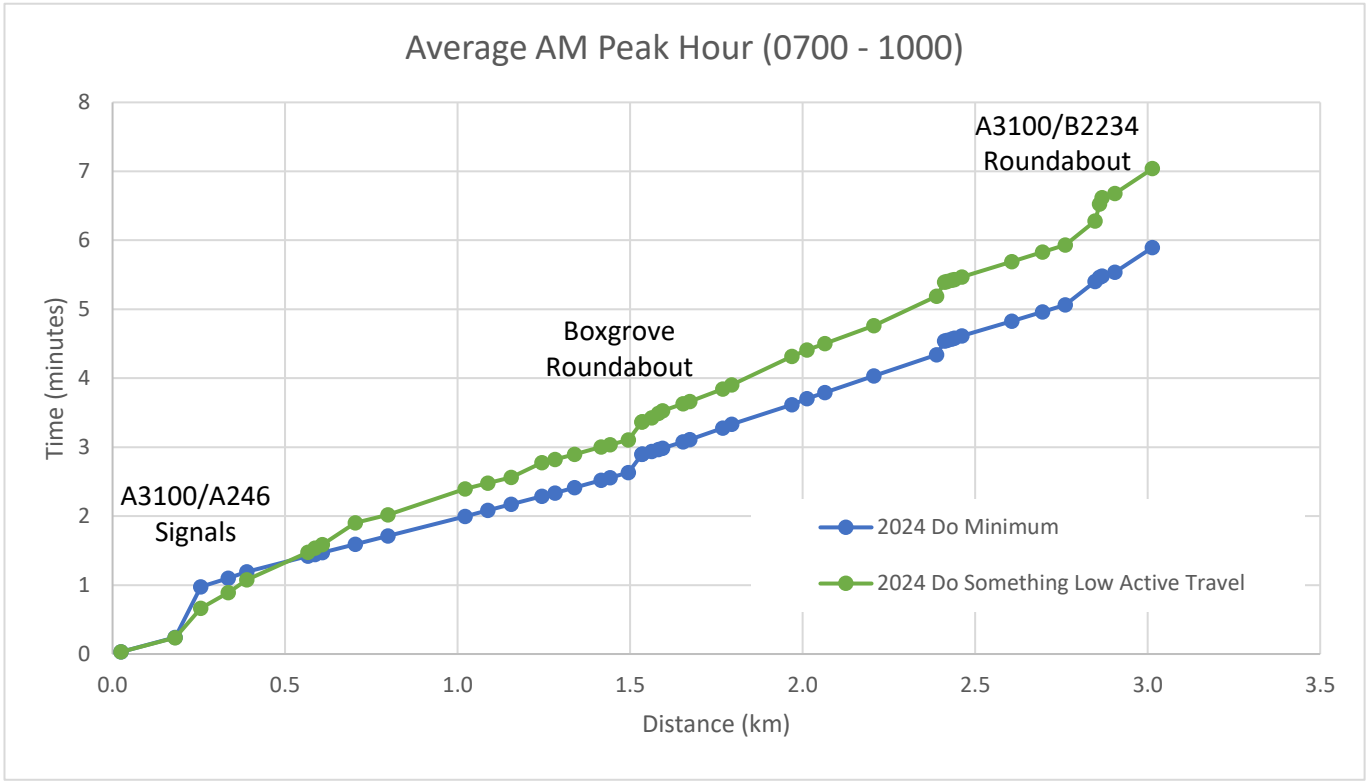
minutes in the PM peak. Finally, the new crossings along the entire route attribute an increase of 0.5 minutes in the AM peak and 0.6 minutes in the PM peak.

In the southbound direction, the reduced carriageway width north of Boxgrove Roundabout produces an increase in travel time of 0.5 minutes in the AM peak and 0.3 minutes in the PM peak, Boxgrove Roundabout an increase of 0.2 minutes in the AM peak and 0.1 minutes in the PM peak, and the 20mph section between Cross Lanes and the A246 signals an increase of 0.3 minutes during both time periods. The new crossings attribute an increase of 0.6 minutes in the AM peak and 0.5 minutes in the PM peak.

These increases in travel time are relatively modest due to the reduced number of vehicles travelling along the route.

As there are no bus priority measures, buses will see an increase in their journeys along the A3100. However, removing bus lay-bys means that bus drivers will no longer have to negotiate re-joining the main carriageway. It is hoped as well that the improved pedestrian environment will encourage more people to use the bus along this corridor.

Figure 14: A3100 Northbound average vehicle journey time by distance for the 2024 Do Something low active travel and 2024 Do Minimum scenarios.



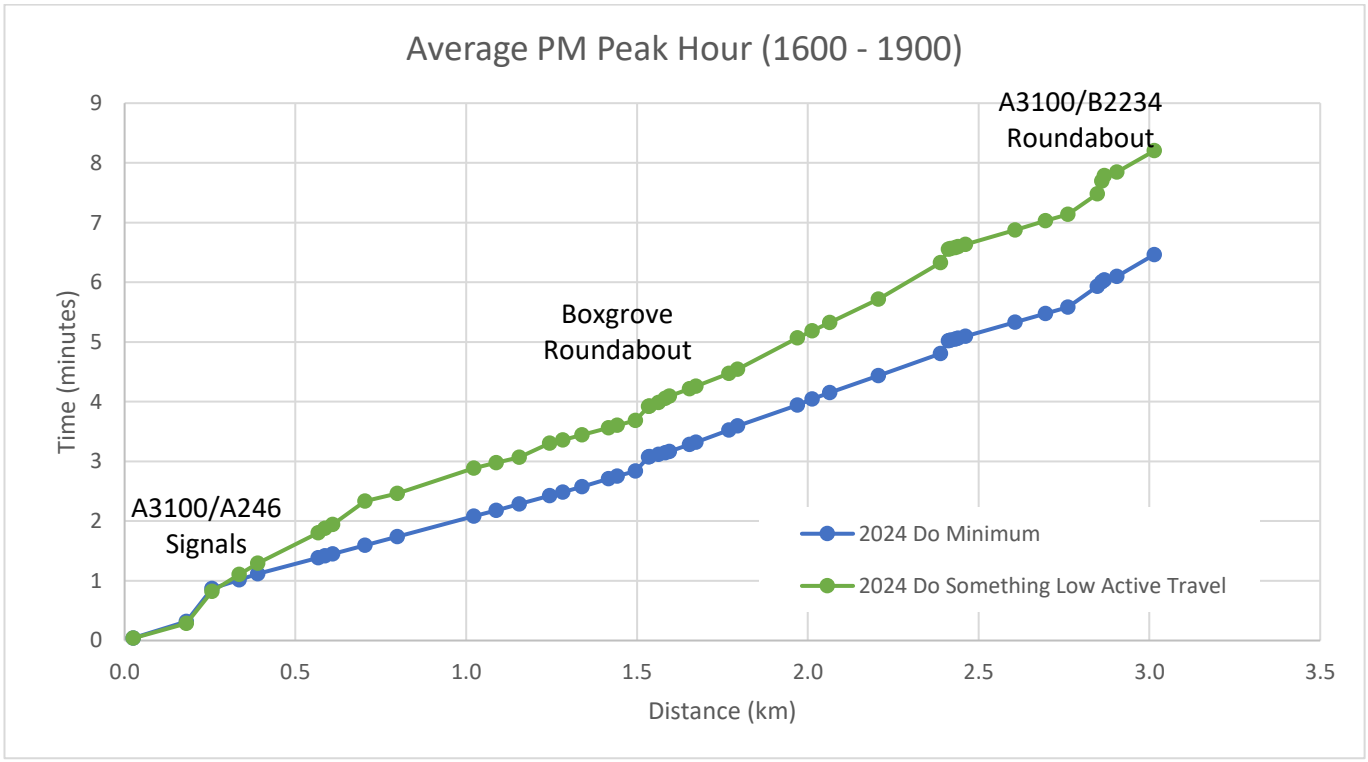
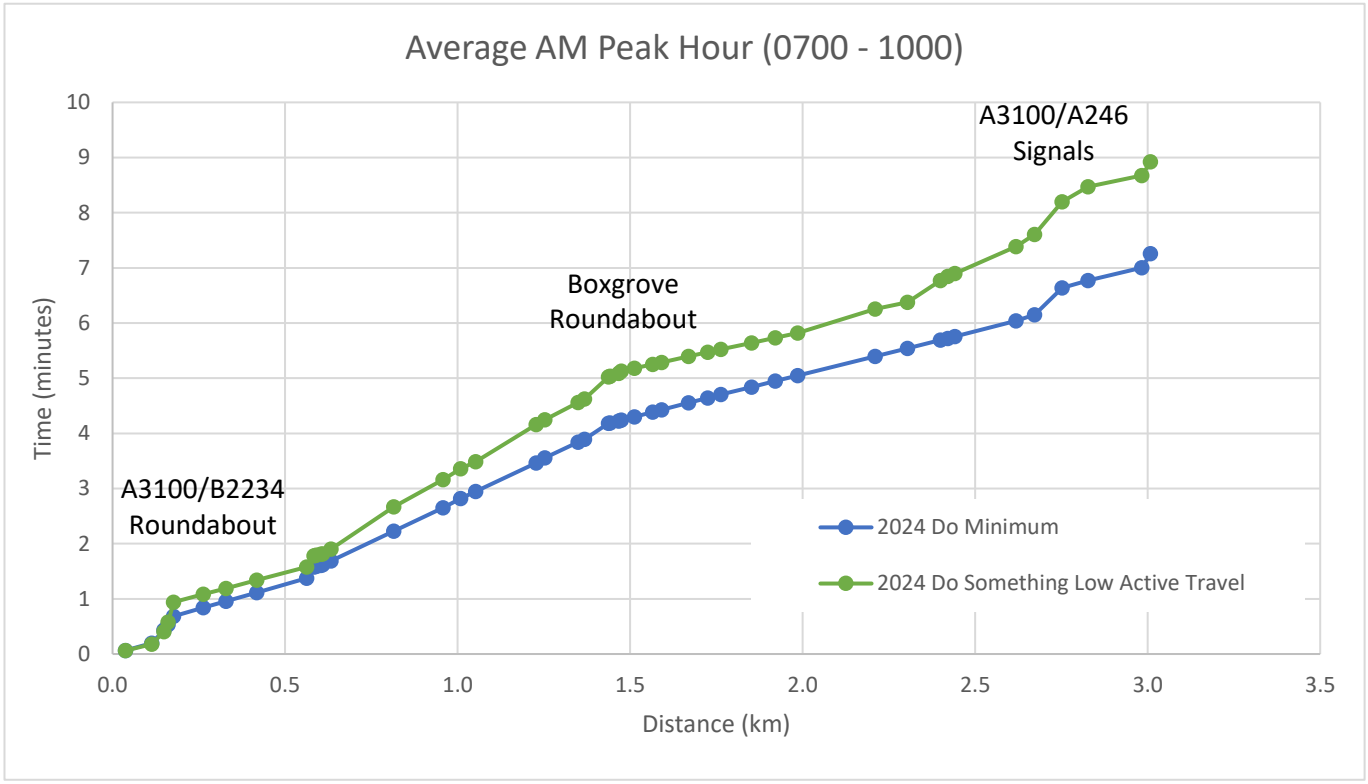
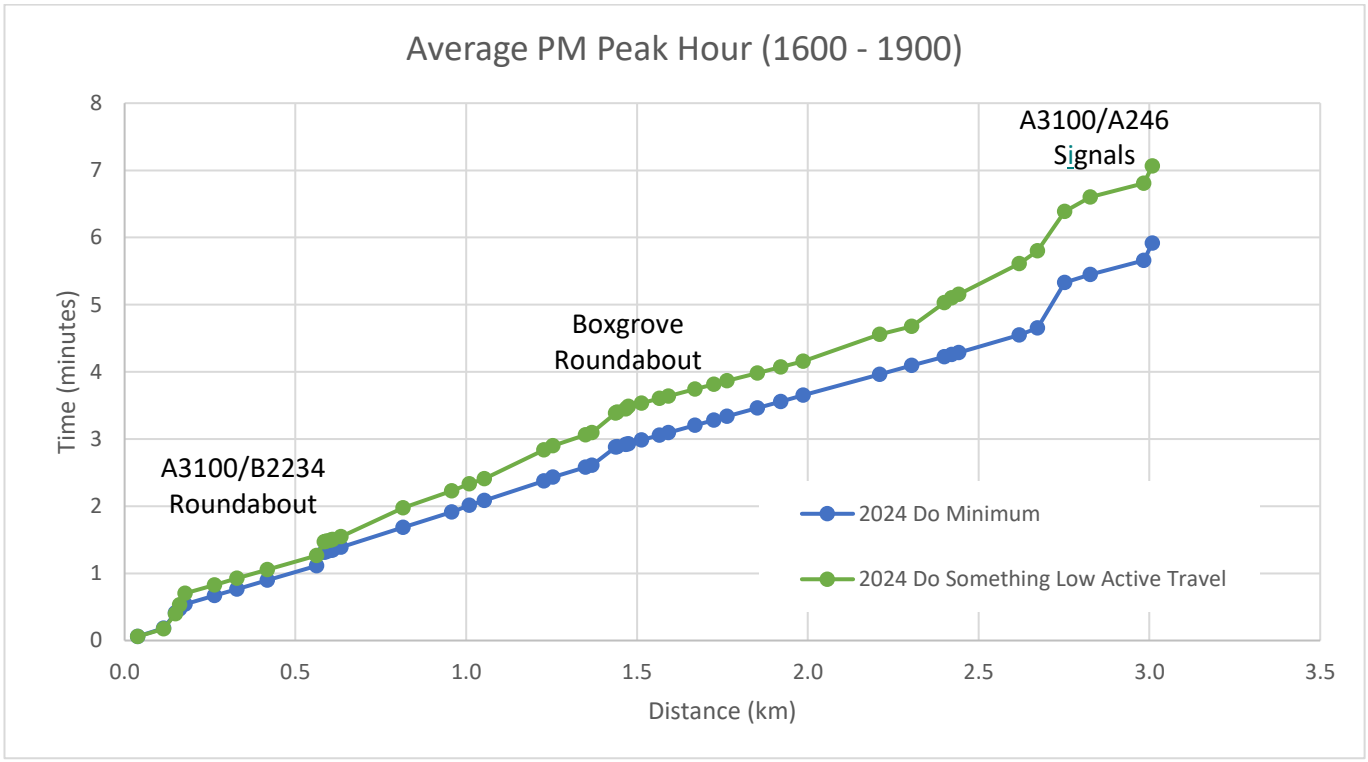


Figure 15: A3100 Southbound average vehicle journey time by distance for the 2024 Do Something low active travel and 2024 Do Minimum scenarios.





High Active Travel Scenario

The 2024 Do Something high active travel scenario is the proposed Burpham Active Travel Scheme whereby the use of pedestrian and cycle crossings is increased compared to the low active travel scenario. The intention is to illustrate a range of outcomes depending on the level of trips by active modes. A comparison of these model results against the 2024 Do Minimum scenario is presented below.

Vehicle Flow Difference

The colouring in the below plots is proportional to the changes in vehicles per hour on each modelled link, with red denoting an increase and blue denoting a decrease. For each area two plots are shown, the first for the AM peak and the second for the PM peak.

Scheme changes to the A3100, including reduced speed limits, reduced carriageway widths, and additional parallel and signal controlled crossings, have been reflected in the modelled Do Something network. These measures aim to create a safe and friendly corridor for those choosing to travel via active modes. As a result, existing usage of the A3100 is displaced to other corridors in the Guildford area, including the A3, A246, A320, and A322. Routeing that takes place further away from the A3100 corridor will be due to secondary and tertiary routeing impacts. These changes in vehicle flows in response to the proposed scheme are explored in more detail below.

Boxgrove Roundabout

The most notable changes in flow are on the A3100 approaches and exits at the Boxgrove Roundabout. Flow changes on the A25 Parkway and A25 Boxgrove Road are less pronounced.

- Two-way flow decreases by approximately 410 vehicles (-22%) on the A3100 north of the roundabout during the AM peak hour, and 244 vehicles (-15%) during the PM peak hour.

- Two-way flow decreases by approximately 422 vehicles (-44%) on the A3100 south of the roundabout during the AM peak hour, and 360 vehicles (-35%) during the PM peak hour.

Figure 16 AM Peak High Active Travel vs Do Minimum flow difference for Boxgrove Roundabout.

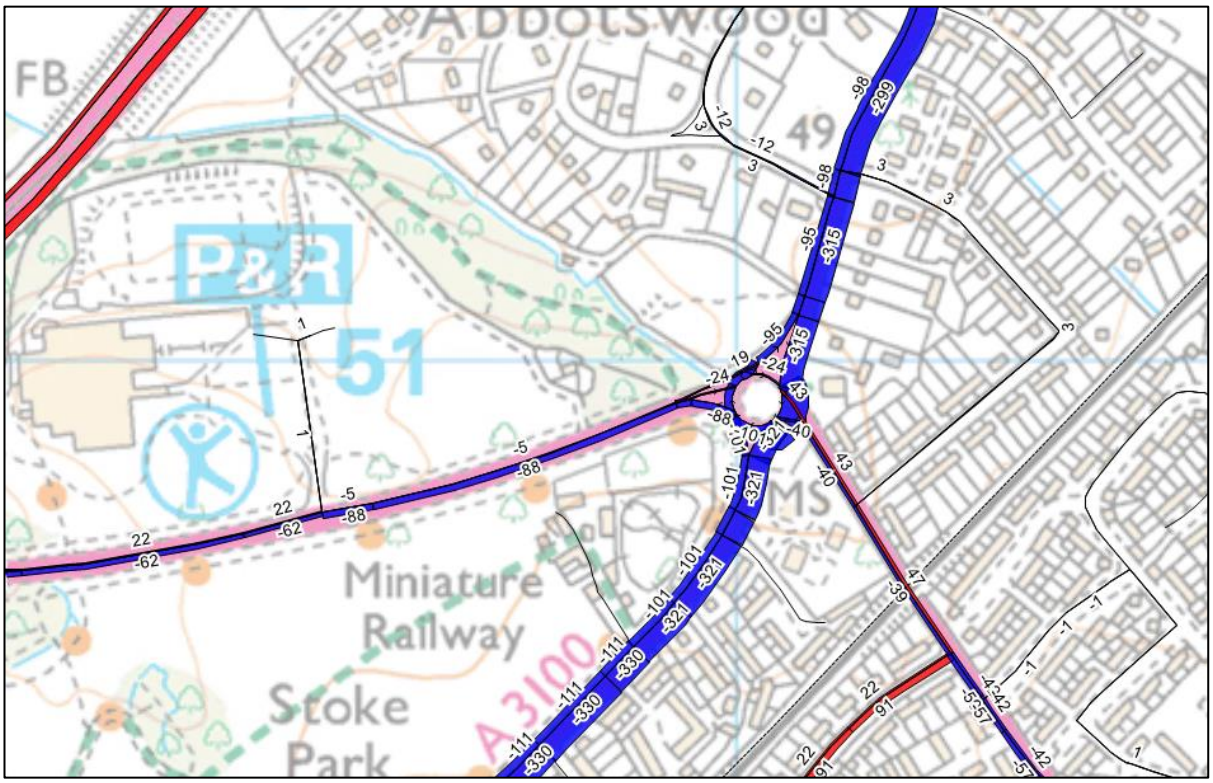
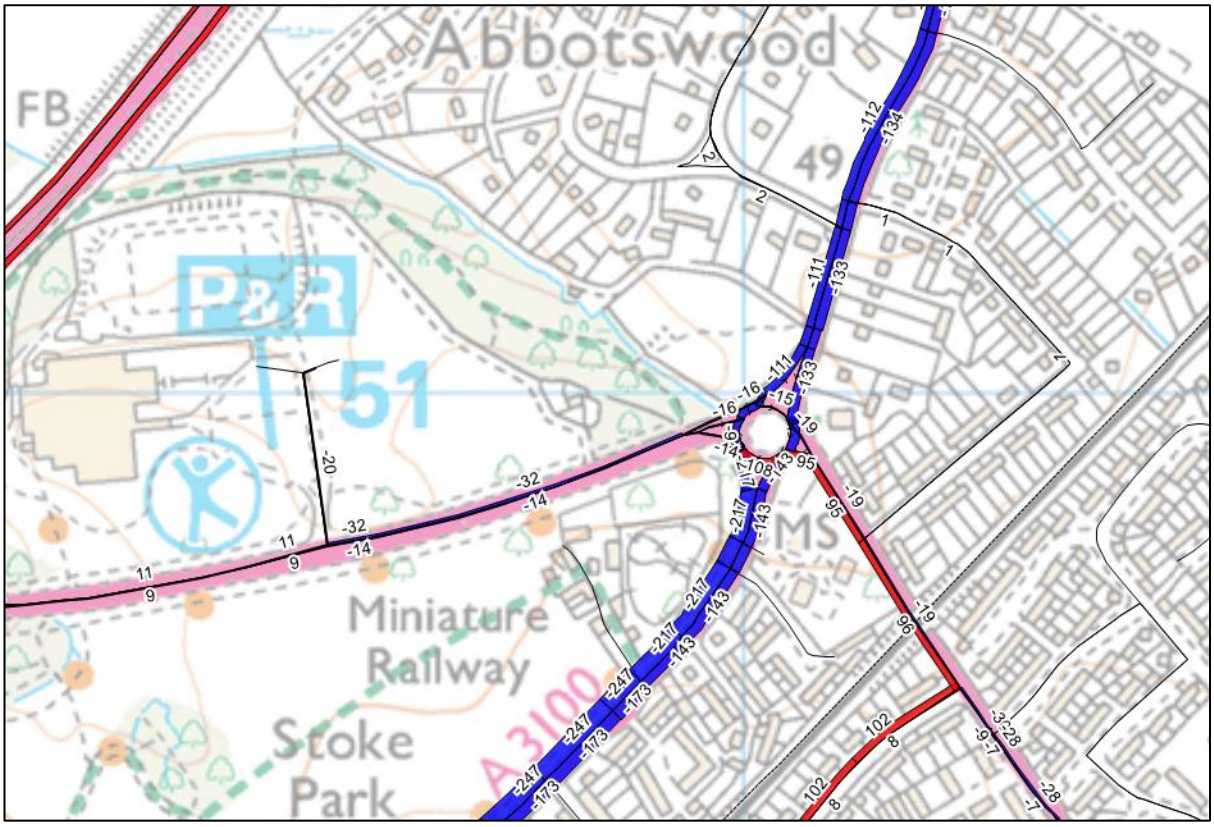


Figure 17 PM Peak High Active Travel vs Do Minimum flow difference for Boxgrove Roundabout.



A320 Stoke Road / A25 Parkway

- An increase in flow of 70 vehicles (5%) on the A320 Woking Road southbound approach to the junction during the AM peak hour, and 52 vehicles (4%) during the PM peak hour.

- An increase in flow of 25 vehicles (3%) on the A320 Woking Road northbound exit from the junction during the PM peak hour.

- A decrease in flow of 67 vehicles on the A25 Parkway westbound approach to the junction during the AM peak hour.

- A decrease in flow of 69 vehicles on the A25 Ladymead westbound exit from the junction during the PM peak hour.

Figure 18 AM Peak High Active Travel vs Do Minimum flow difference for the A320 Stoke Road / A25 Parkway junction.

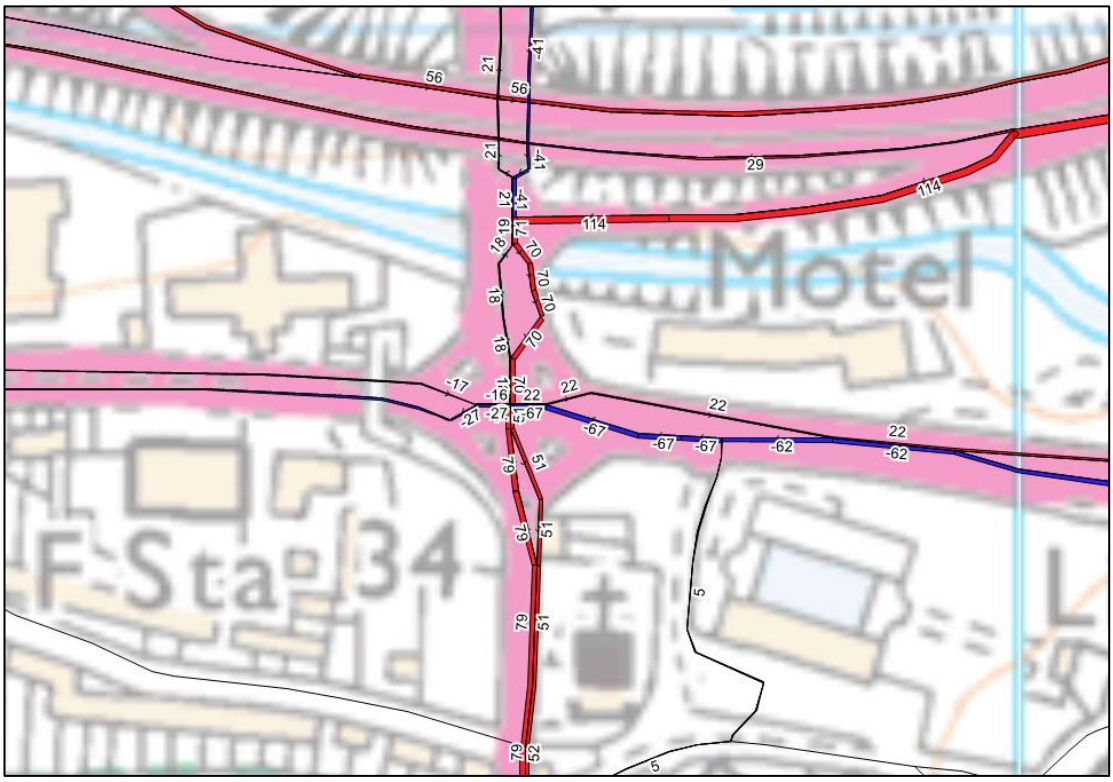
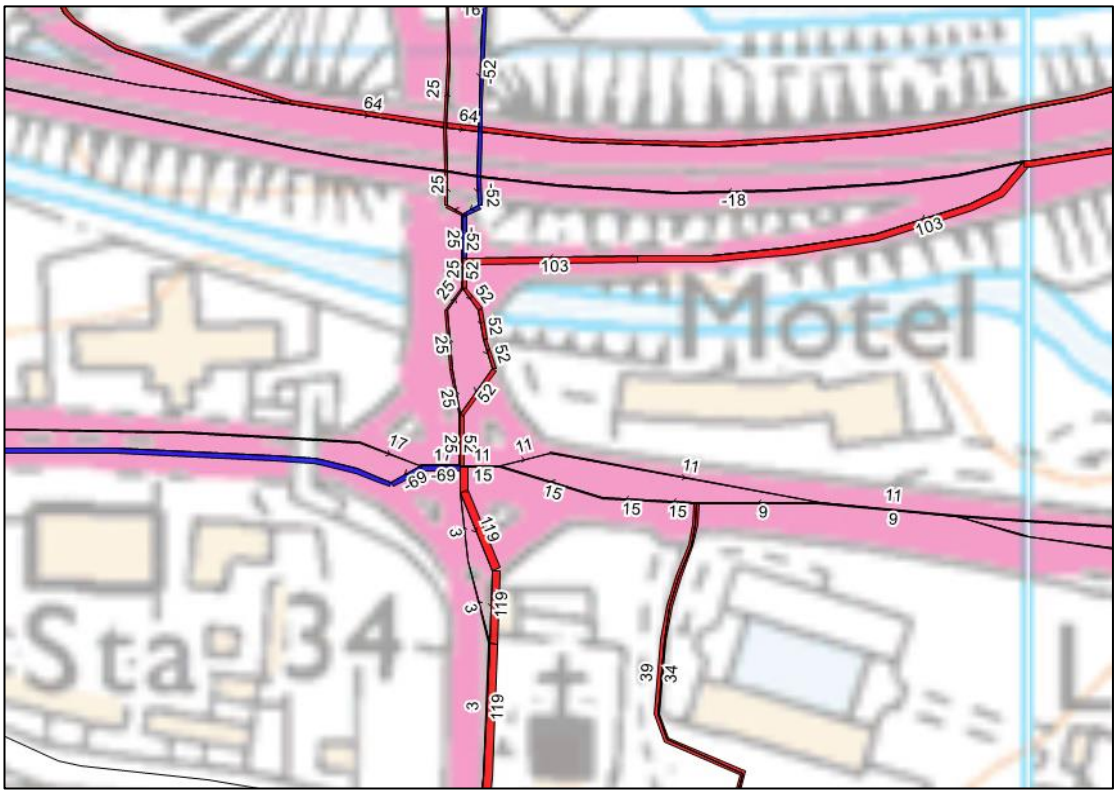


Figure 19 PM Peak High Active Travel vs Do Minimum flow difference for the A320 Stoke Road / A25 Parkway junction.



The A3

- An increase in flow of 142 vehicles (4%) on the A3 southbound from the Burpham exit to the A320 Woking Road exit during the AM peak hour, and 85 vehicles (2%) during the PM peak hour.

- An increase in flow of 56 vehicles (2%) on the A3 northbound from the A320 Woking Road Entry during the AM peak hour, and 64 vehicles (2%) during the PM peak hour.

- It seems a large proportion of vehicles rerouting away from the A3100 are staying on the mainline A3 for slightly longer to avoid any additional delay associated with the proposed scheme. This in turn enhances the attractiveness of the A3100 for users of active modes of transport.

Figure 20 AM Peak High Active Travel vs Do Minimum flow difference for the A3.

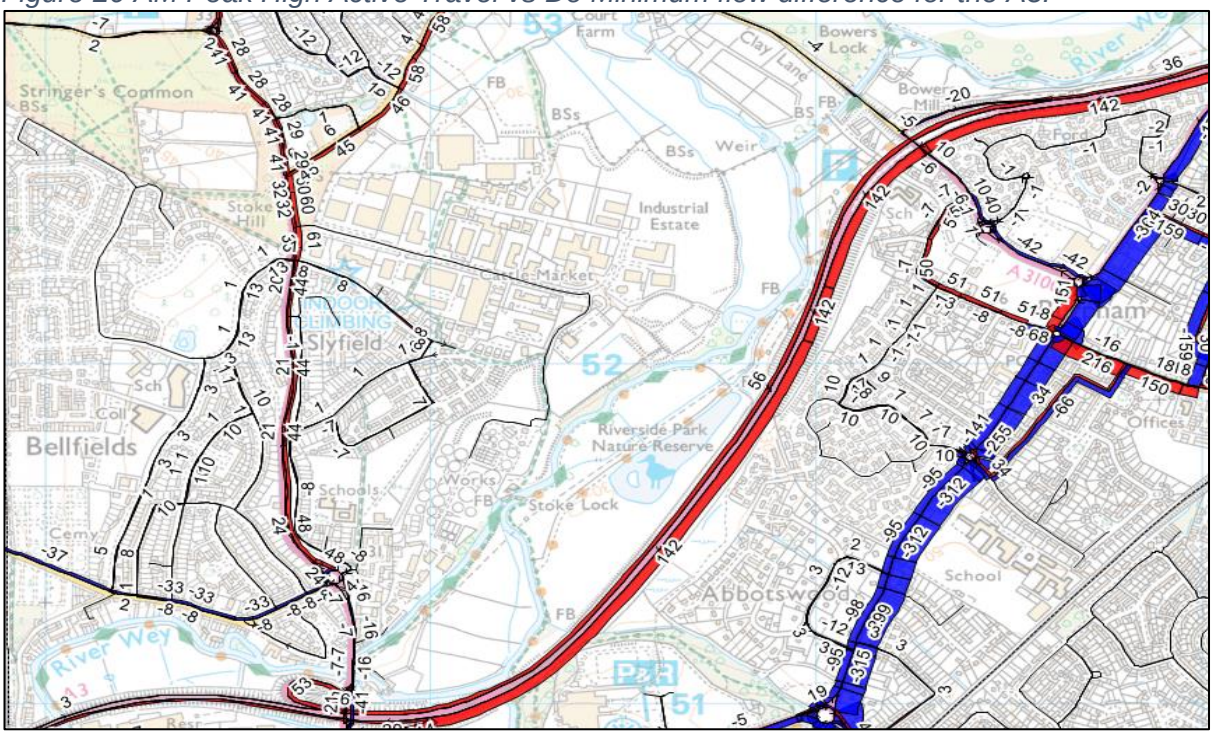
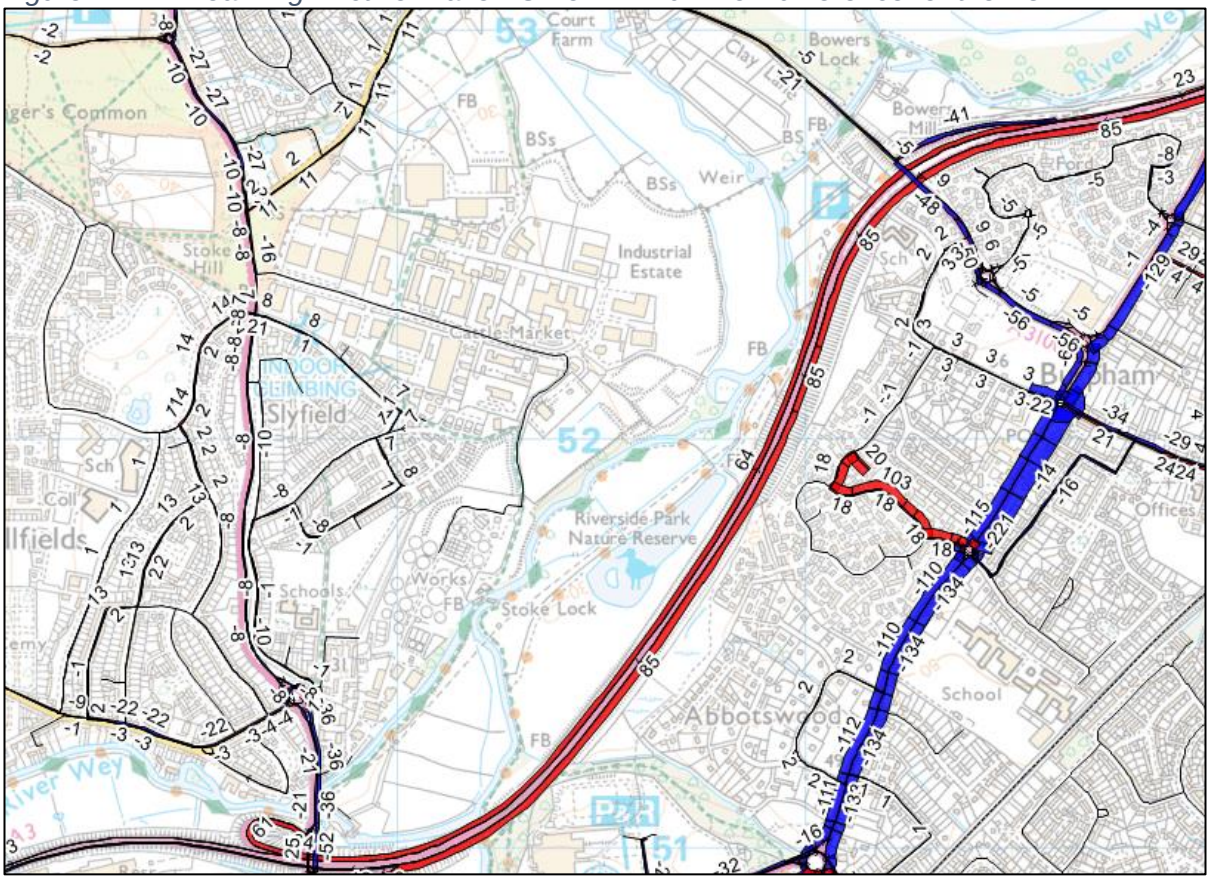


Figure 21 PM Peak High Active Travel vs Do Minimum flow difference for the A3.



Guildford North

- During the AM peak hour the most notable increase in two-way flow is an additional 128 vehicles on Nightingale Road. Nightingale Road is largely residential and may need to be monitored for additional through trips to determine whether mitigation options need to be considered to prevent rat-running.

- There is an increase in two-way flow of approximately 138 vehicles (10%) on the A320 Stoke Road during the AM peak hour, and approximately 182 vehicles (15%) during the PM peak hour. This appears to be associated with trips avoiding the A3100 by using the A3 and the A320 as a means of accessing and egressing Guildford town centre.

- There is an increase in northbound flow of approximately 94 vehicles (15%) on the A322 Woodbridge Road during the PM peak hour. These trips are mostly heading towards the A3 southbound on-slip at the Dennis Roundabout.

- There is an increase in two-way flow of 127 vehicles on the A246 Waterden Road during the AM peak hour, and 81 vehicles during the PM peak hour. This is associated with an increase in flow on the A246 Epsom Road during both peak periods.

- There are increases in gyratory flow during both the AM and PM peak hours.

Figure 22 AM Peak High Active Travel vs Do Minimum flow difference for Guildford North.

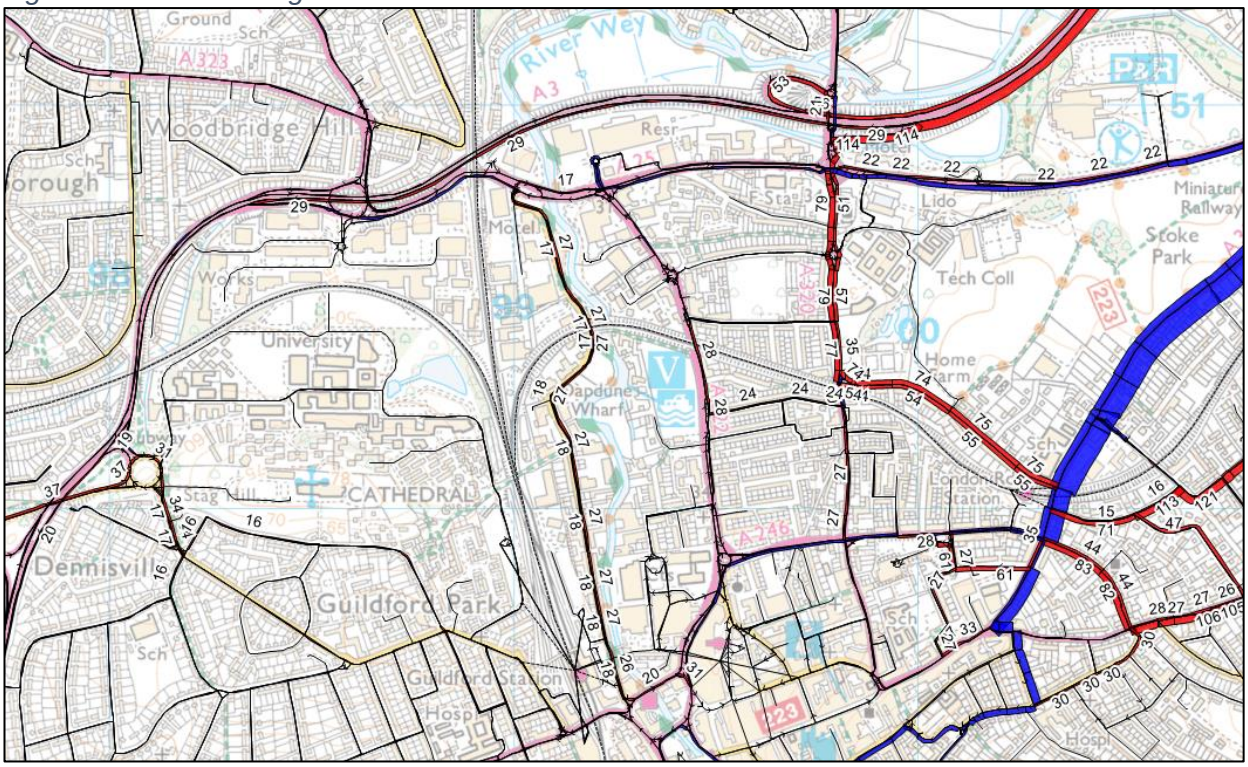
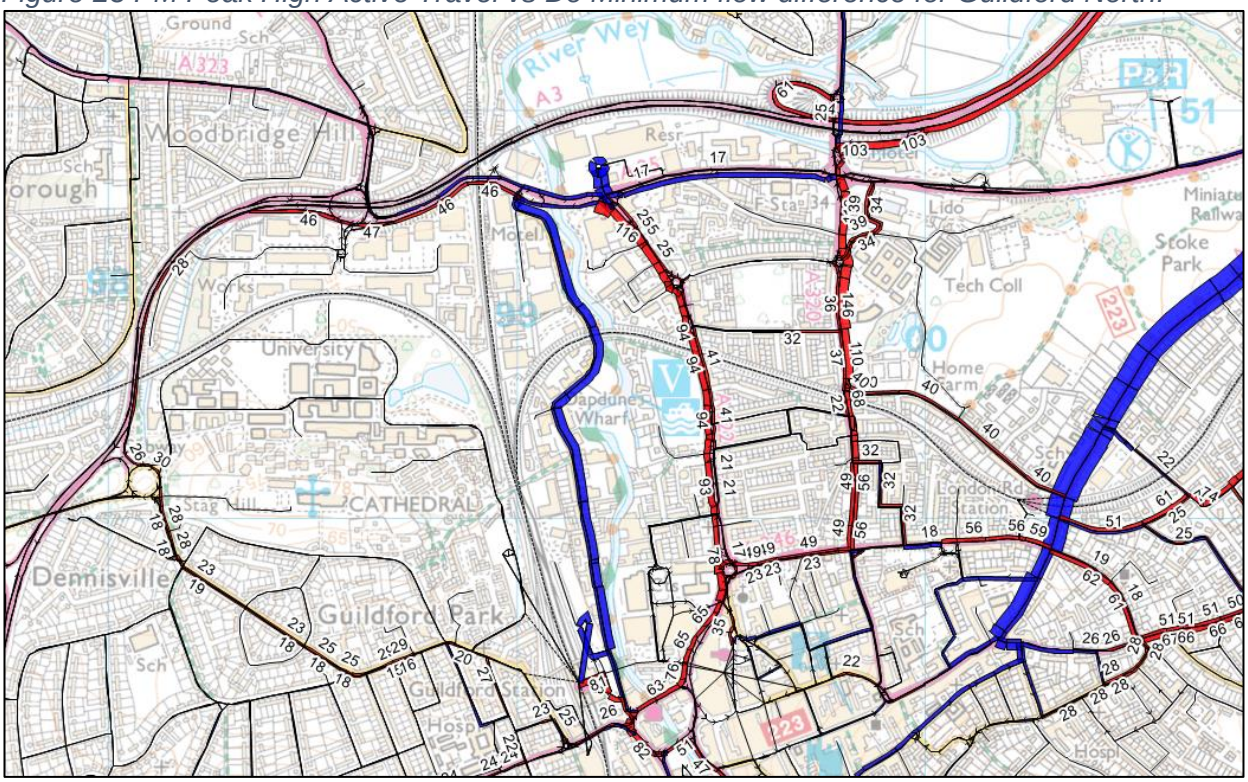


Figure 23 PM Peak High Active Travel vs Do Minimum flow difference for Guildford North.



A3100 North

- There is a decrease in two-way flow of approximately 407 vehicles on the A3100 London Road during the AM peak hour, and 336 vehicles during the PM peak hour.

- There is an increase in westbound flow of 216 vehicles on the B2234 New Inn Lane approach to the roundabout with the A3100 London Road during the AM peak hour. This coincides with a decrease in northbound flow of 122 vehicles on Glendale Drive and 66 vehicles on Burnet Avenue. In the Do Minimum scenario vehicles were using Glendale Drive as a rat-run to avoid delay at the New Inn Lane roundabout. As is the case in the low active travel scenario, the overall displacement of traffic on the A3100 reduces delay at this roundabout and encouraged trips to stick to main corridors rather than rat-running through the nearby residential streets.

- There is an increase in southbound flow on the B2234 Park Lane. These additional trips could be vehicles rerouting away from the A3100 and instead electing to use the A246 Epsom Road to access Guildford town centre.

- Although Weylea Avenue appears to have substantial changes, this is due to the model composition of zones and connections to the modelled highway network. In this instance vehicle trips from this geographical area are choosing to access the highway network at a slightly different location, and in reality these trips will be more evenly distributed.

Figure 24 AM Peak High Active Travel vs Do Minimum flow difference for the A3100 North.

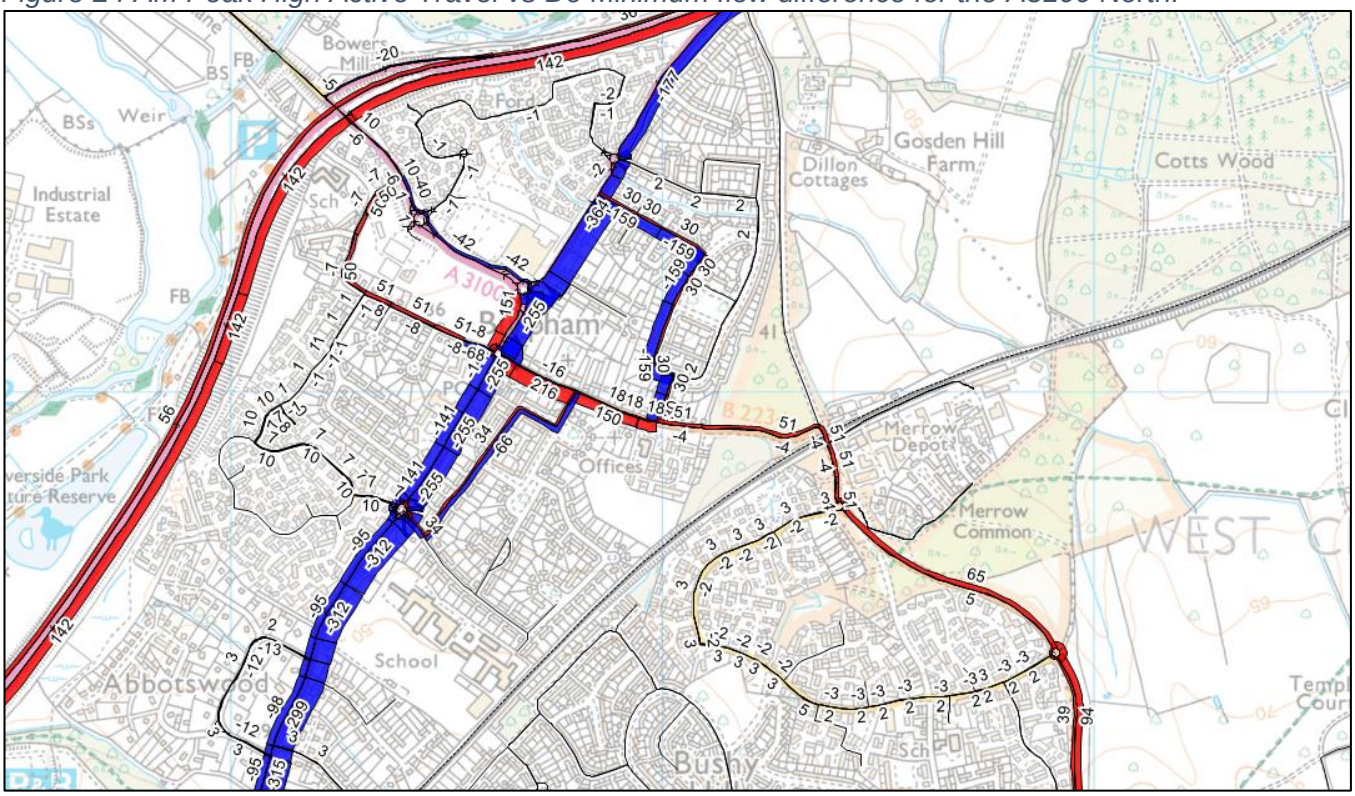
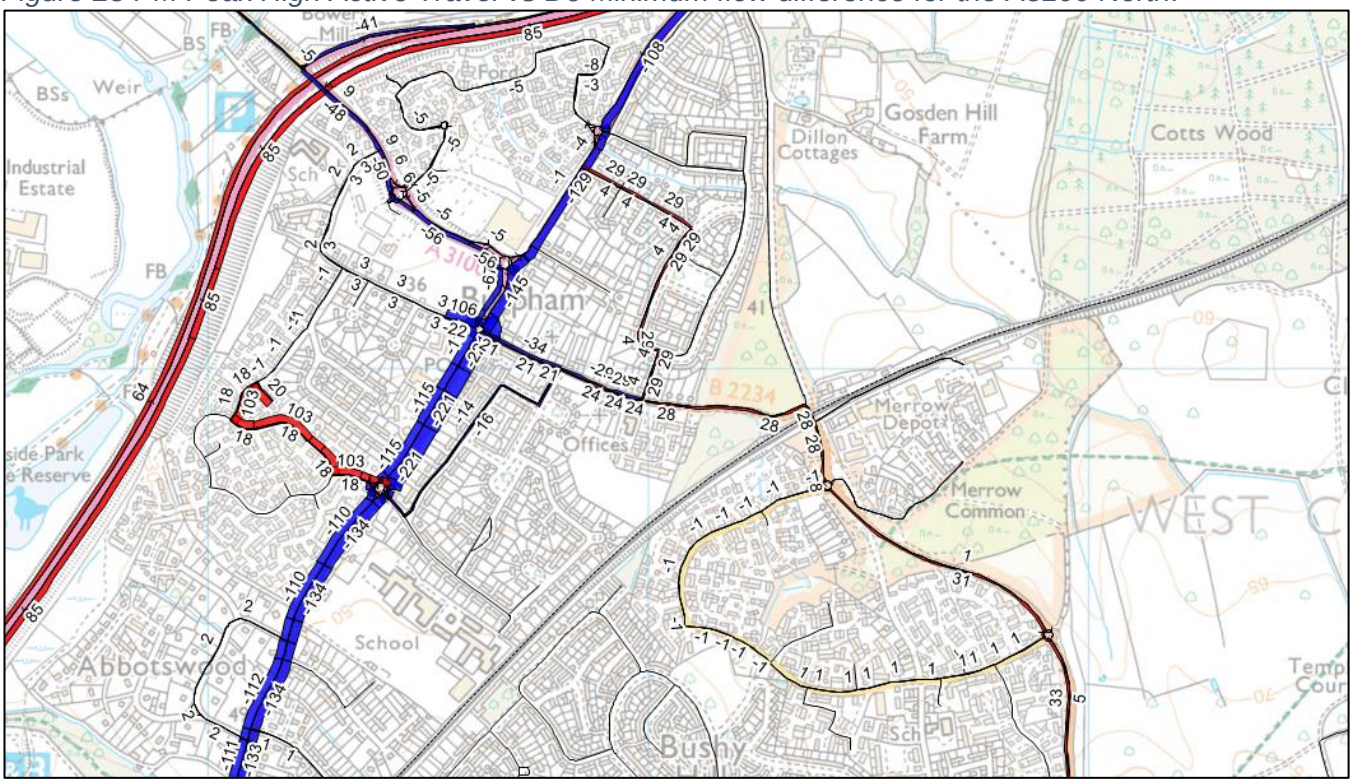


Figure 25 PM Peak High Active Travel vs Do Minimum flow difference for the A3100 North.



A3100 South

- There is a decrease in two-way flow of approximately 441 vehicles on the A3100 London Road during the AM peak hour, and 420 vehicles during the PM peak hour.

- There are increased through trips on Tormead Road, particularly during the PM peak hour where two-way flows increase by approximately 110 vehicles.

- The below plots also show an increase in trips on the A246 Epsom Road during both peak hours.

Figure 26 AM Peak High Active Travel vs Do Minimum flow difference for the A3100 South.

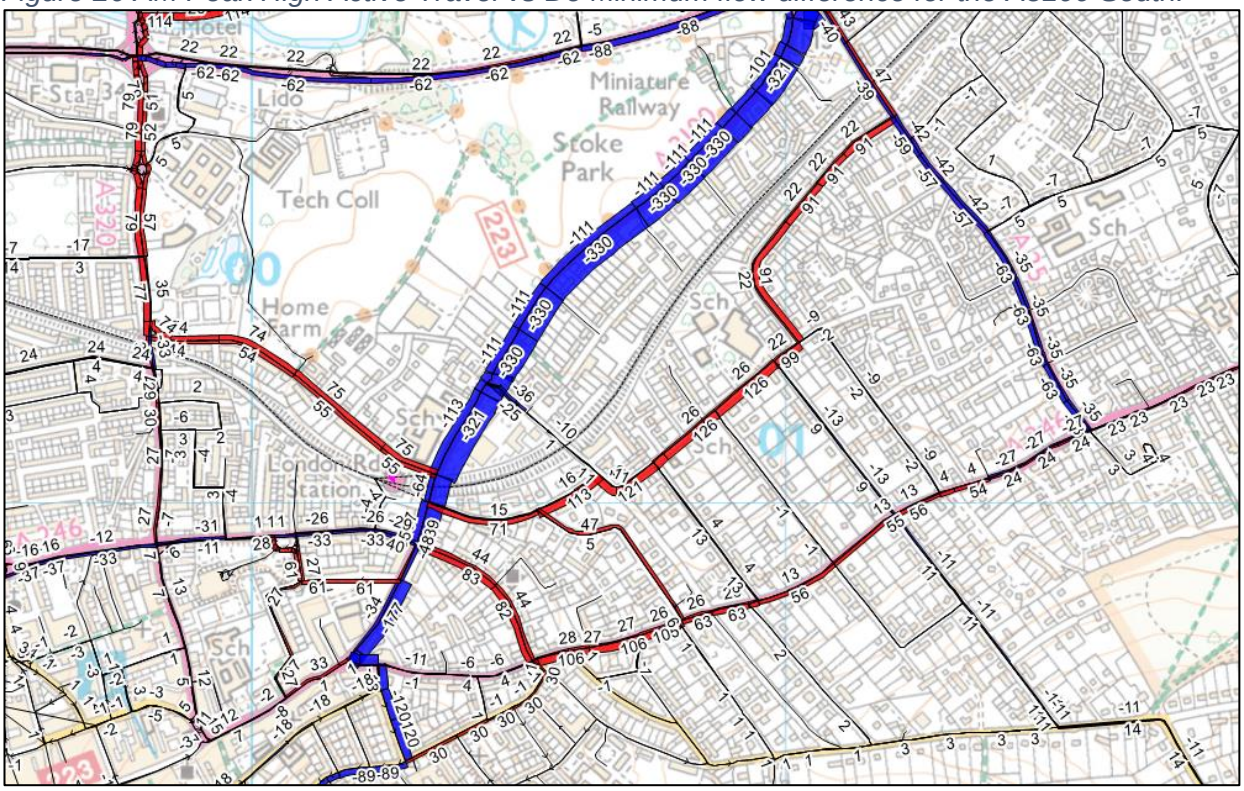
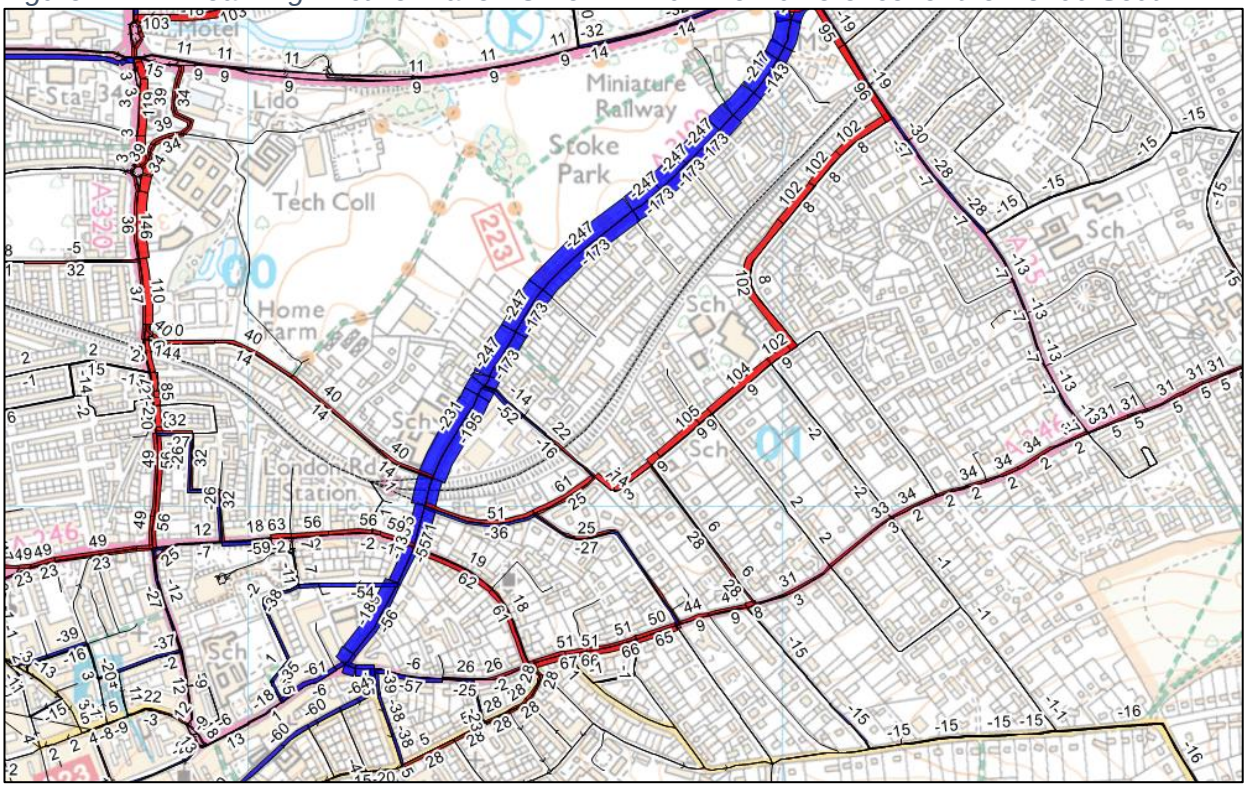


Figure 27 PM Peak High Active Travel vs Do Minimum flow difference for the A3100 South.



Junction Delay

A comparison of junction delay in the Do Minimum scenario against the Do Something scenario with high active travel uptake identified a number of junctions in the wider Guildford area which experience changes in delay as a result of vehicles rerouting in response to the scheme.

- During the AM peak, as illustrated in Figure 26 and Figure 27 there is more traffic on the A246 Epsom Road and Waterden Road approaches to the junction with Harvey Road. As a result junction delay here increases by 18%.

- The junction of A246 Epsom Road with A25 Boxgrove Road experience a reduction in delay of 9% during the AM peak. Flow on Boxgrove Road reduces as vehicles route via Tormead Road and Cranley Road to avoid the A3100 resulting in lower volumes of traffic through this junction.

- As with the Do Something low active travel scenario, delay increases at the junction of Walnut Tree Close and the gyratory. During the AM peak the increase is 5 seconds per vehicle whilst during the PM peak it is 21 seconds per vehicle. This is as a result of higher levels of trips on the gyratory preventing vehicles from pulling out at the junction.

- In both the AM and PM peaks delay at the junction of A3100 Clay Lane with the A3 on slip reduces- by 10% in the AM peak and 21% in the PM peak. Figure 20 and Figure 21 show that there are lower numbers of vehicles using the Clay Lane on slip to access the A3 northbound and corresponding higher levels of trips accessing the A3 from the A320 Woking Road northbound on slip to avoid using the A3100. The impact of this on Stoke Crossroads is an increase in junction delay of 17% during the AM peak and 29% during seethe PM peak.

- Changes in flow through Dennis' Roundabout result in a reduction in delay of 16% during the AM peak and an increase in delay in of 31% during the PM peak at the Surrey Way arm of the roundabout. Just to the north of the roundabout, at the junction of A322 Worplesdon Road and A323 Aldershot Road, delay increases by 7% during the PM peak whilst during the AM peak the junction of A322 Worplesdon Road with Stoughton Road and Shepherds Lane is affected with an increase in delay of 9%.

- At the A25 Ladymead /A322 Woodbridge Road junction more vehicles are approaching the junction from Woodbridge Road during the PM peak whilst flow on other arms reduces. Consequently, the main junction experiences a reduction in delay of 23% whilst the delay for left turning vehicles from A322 Woodbridge Road to A25 westbound increases by 12 %.

- Increases in trips routeing via the A320 and A322 rather than the A3100 result in flow increases through the A320 Stoke Road junction with York Road. During the PM peak this results in a 15% increase in delay at this junction.

- As in the low active travel scenario, delay at the junction of A3100 London Road with A246 York / Waterden Road reduces by 44-45% in the high active travel scenario. As previously stated, this is due to lower flow through the junction as a result of the scheme as well as the banned right turn into York Road from A3100 London Road reducing the number of signal phases required. Further retailed modelling of this junction would aid understanding of the implications of the scheme.

Vehicle Journey Times

Table 2 shows the average journey times for the Do Something high active travel scenario compared with the Do Minimum. For reference, the analysed routes are shown above in Figure 13.

Similar to the low active travel scenario, the A3100 experiences the greatest change in journey time of between 28% and 33%. The model suggests an increase of 1.7 minutes in the northbound direction, and 2.1 minutes in the southbound direction of travel, during the AM peak. In the PM peak, the change is reversed with an increase of 2.1 minutes in the northbound direction and 1.6 minutes in the southbound direction. Comparing against the low active travel scenario on page 15, this is a further increase of 0.6 minutes in both directions of travel in the AM peak, and 0.4 minutes in the northbound direction and 0.5 minutes in the southbound direction during the PM peak. Again, the scheme is successfully reducing travel speeds along the active travel corridor to encourage active travel use.

Also like the low active travel scenario, the only other route which displays a marked increase in travel time is the A320 southbound due to more vehicles routeing this way instead of the A3100, as discussed above. There is an increase of 0.7 minutes in the AM peak and 1.2 minutes in the PM peak. This is between 0.1 and 0.2 minutes higher than the low active travel scenario.

No other routes are notably impacted by the proposed scheme in terms of journey times. The A246 and B2234 show reductions, particularly in the AM peak, for the same reasons as the low active travel scenario.

Despite increases in flow along the A246, the impact on journey times along this route is negated due to the right turn from A3100 London Road to A246 York Road being banned at the signalised junction with Waterden Road. This reduces the number of phases at the junction, and as a result the delay as noted in the previous section on

Junction Delay.

Along the B2234 northbound, the journey times are similar apart from the end of the route where vehicles give way to circulating traffic at the roundabout junction with A3100 London Road. Here there is a reduction in the low active travel scenario of 0.9 minutes in the AM peak and no difference in the PM peak, despite the marked increase in flow along the B2234. This reduction is due to fewer vehicles circulating the roundabout, which gives greater opportunity and thus less delay for those approaching the roundabout on the New Inn Lane arm of the junction.

Table 2: Do Something high active travel versus Do Minimum average vehicle journey times in minutes.

Route	2024 Do Minimum (mins)	2024 Do Something High Active Travel (mins)	Difference (mins)
Average AM Peak Hour (0700 – 1000)			
A3100 Northbound	5.9	7.6	1.7
A3100 Southbound	7.3	9.5	2.2
A3 Northbound	5.5	5.5	0.0
A3 Southbound	9.4	9.4	0.1
A320 Northbound	9.8	10.0	0.1
A320 Southbound	10.5	11.2	0.7
A25 Eastbound	7.1	7.3	0.2
A25 Westbound	12.9	13.1	0.2
A246 Eastbound	6.2	5.9	-0.3
A246 Westbound	6.5	6.4	-0.1
B2234 Northbound	4.4	3.5	-0.9
B2234 Southbound	2.9	3.0	0.1
Average PM Peak Hour (1600 – 1900)			
A3100 Northbound	6.5	8.6	2.1
A3100 Southbound	5.9	7.6	1.6
A3 Northbound	5.3	5.3	0.0
A3 Southbound	8.0	8.0	0.0
A320 Northbound	11.3	11.7	0.4
A320 Southbound	8.3	9.5	1.2
A25 Eastbound	7.2	7.4	0.2
A25 Westbound	8.7	9.0	0.3
A246 Eastbound	7.1	7.0	-0.1
A246 Westbound	7.4	7.5	0.0
B2234 Northbound	3.1	3.1	0.0
B2234 Southbound	3.0	3.1	0.1

Looking more closely at the changes in travel time along the A3100, Figure 28 presents the change in travel time along the route in the northbound direction, and Figure 29 presents the same for the southbound direction of travel. The results are broadly similar to the low active travel scenario apart from much higher contribution of journey time due to more frequent use of the crossings by the higher level of active travel uptake in this scenario.

In the northbound direction in the AM peak, the active travel scheme reduces the delay by 0.3 minutes on the A3100 London Road south arm of its signalised junction with A246 York Road, due to there being fewer signal phases as discussed above. There is only a reduction of less than 0.1 minutes in the PM peak.

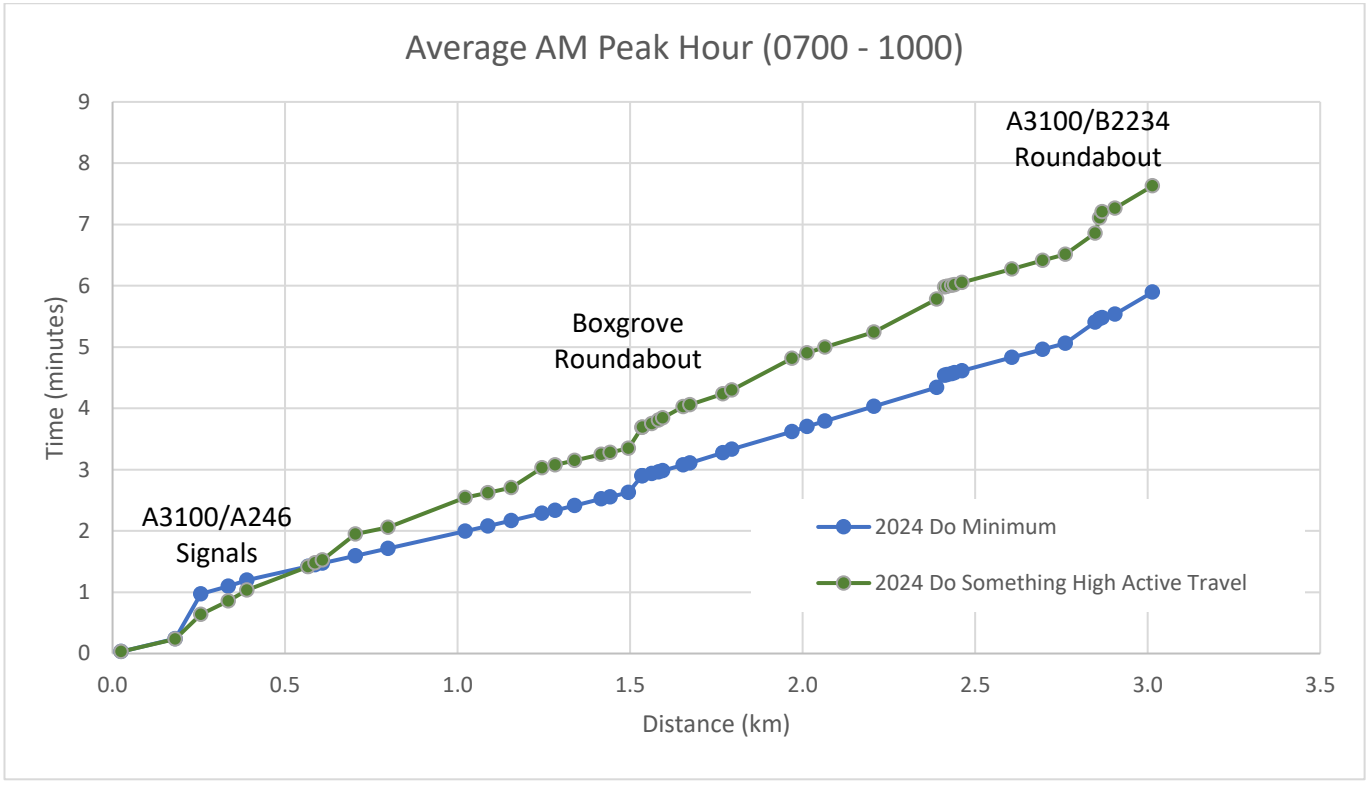
Travelling along the route, the journey time again gradually increases above that of the 2024 Do Minimum scenario. The new 20mph section of road between the A246 traffic signals and Cross Lanes increases journey times by 0.3 minutes in the AM peak and 0.4 minutes in the PM peak. During both time periods, there is a just an increase of vehicle delay of 0.2 minutes at Boxgrove Roundabout despite the changes. North of Boxgrove Roundabout, the reduced carriageway width causes an additional 0.4 minutes of travel in the AM peak and 0.2 minutes in the PM peak. Finally, the new crossings along the entire route attribute an increase of 1.3 minutes in the AM peak and 1.5 minutes in the PM peak.

In the southbound direction, the reduced carriageway width north of Boxgrove Roundabout only produces an increase in travel time during the PM peak of 0.1 minutes. At Boxgrove

Roundabout there is an increase of 0.1 minutes during both time periods, and the 20mph section between Cross Lanes and the A246 signals gives an increase of 0.3 minutes during the AM peak and 0.2 minutes during the PM peak. The new crossings along the entire route attribute an increase of 2.2 minutes in the AM peak and 1.2 minutes in the PM peak.

As previously, these increases in travel time are relatively modest due to the reduced number of vehicles travelling along the route.

Figure 28 A3100 Northbound average vehicle journey time by distance for the 2024 Do Something high active travel and 2024 Do Minimum scenarios.



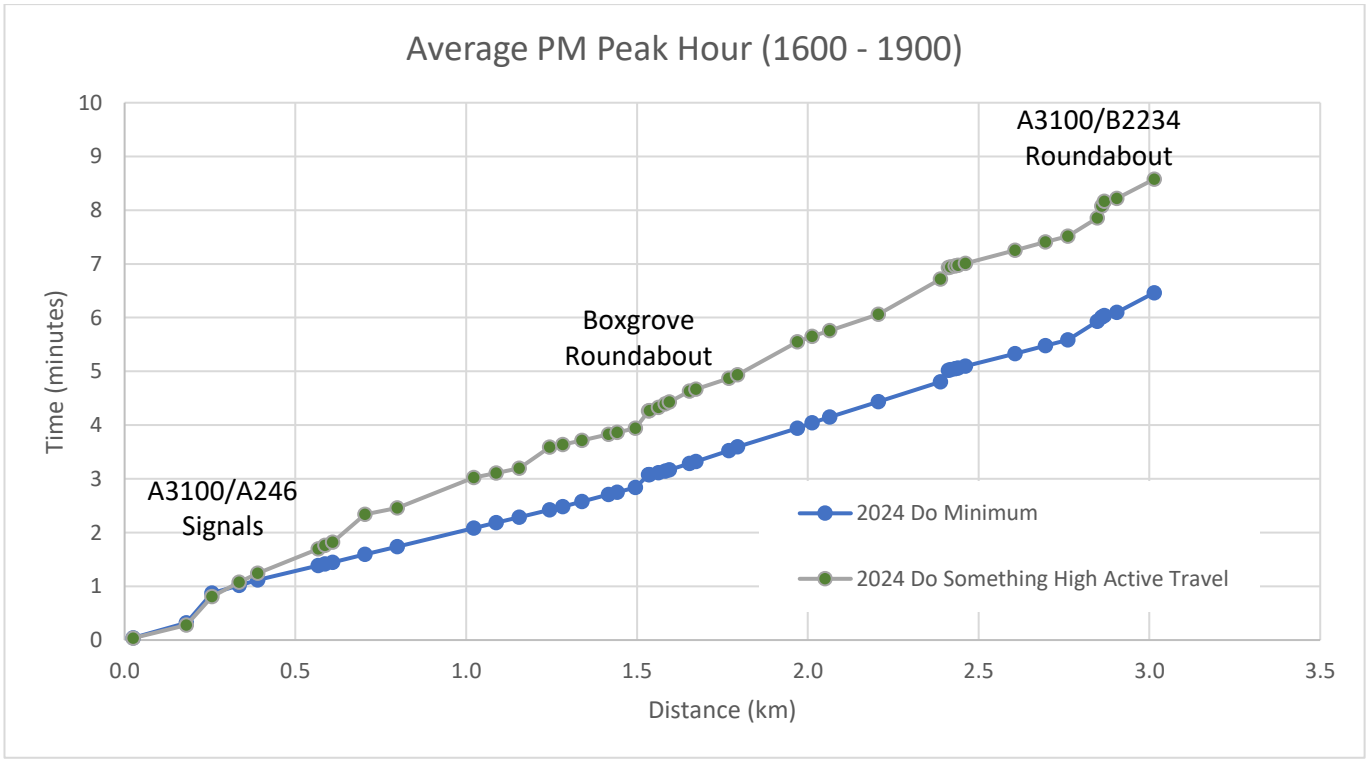
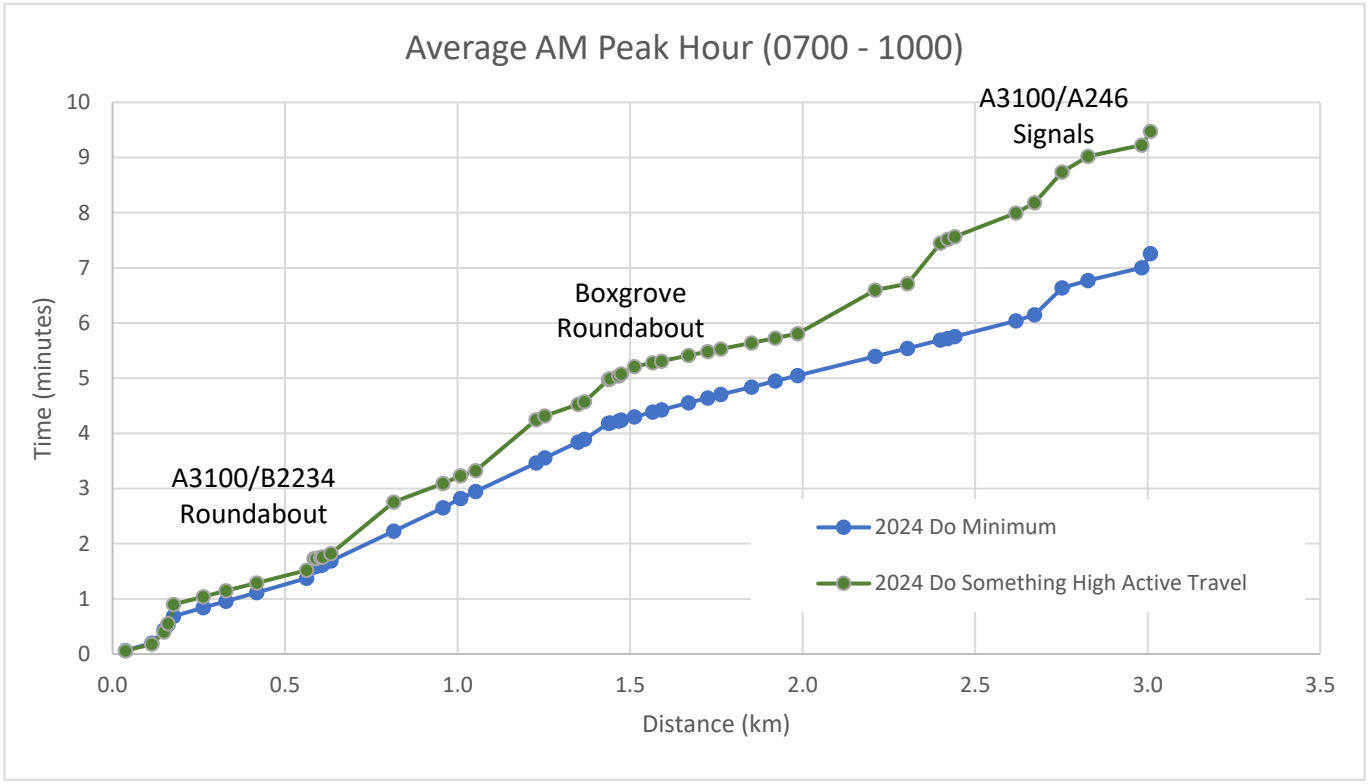
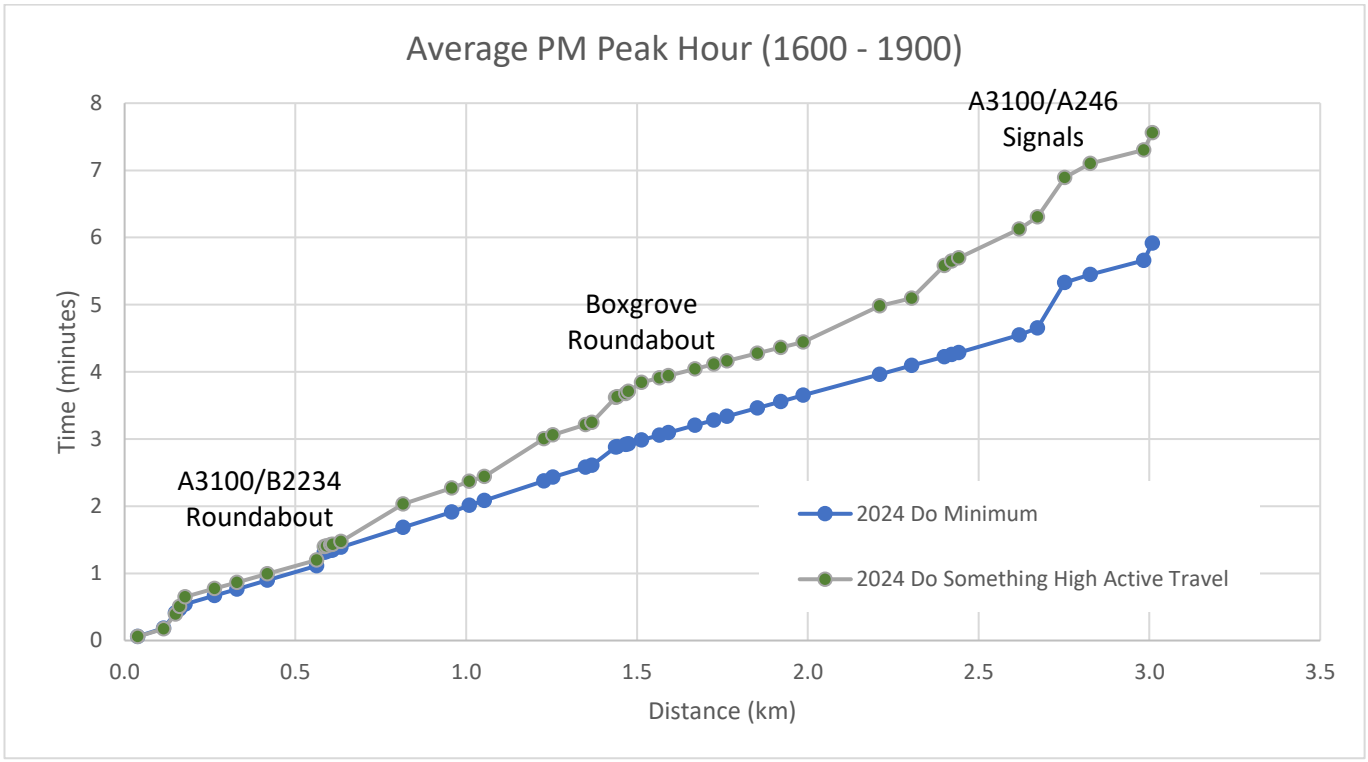


Figure 29 A3100 Southbound average vehicle journey time by distance for the 2024 Do Something high active travel and 2024 Do Minimum scenarios.





Sensitivity Test

The Sensitivity Test scenario is a copy of the 2024 Do Something high active travel uptake scenario with the addition of 1,800 residential units in the Burpham area. This has been compared to the 2024 Do Something high active travel uptake scenario to determine the potential impact should nearby land be developed. The results are summarised below:

- A comparison of junction delay shows very little change in the sensitivity scenario. The largest increase is 7 seconds per vehicle during the PM peak at the junction of A3100 Clay Lane with the A3 northbound on-slip. The majority of junctions show no change in delay.

- There are further reductions in two-way flow on the A3100 London Road (between Boxgrove Roundabout and New Inn Lane Roundabout) of approximately 50 vehicles in the AM peak.

- There are an additional 46 vehicles on the A3 northbound mainline immediately downstream of the A320 Woking Road on-slip during the AM peak, and 42 during the PM peak.

- There is very little difference in journey time along the analysed routes shown in Figure 13 in the Sensitivity Test scenario. The maximum increase is 7 seconds during the AM peak along the A25 eastbound route, and 11 seconds along the A3 in a southbound direction during the PM peak.

- Overall, the additional development trips appear to have displaced other trips which have rerouted to find alternative routes through the area. This is because the network during peak times is at or near vehicle capacity.

Should this scheme be taken forward any potential development site of relevance would need to take account of the scheme.

Conclusion

An assessment of the **London Road, Burpham – Active Travel Scheme** design being presented in the autumn 2023 public consultation has been undertaken using the county council's strategic transport model. The assessment focused solely on the vehicle impact and included the evaluation of a low and high active travel uptake scenarios, as well a high active travel sensitivity test which assesses the impact of an additional 1,800 residential units in the Burpham area.

There are a number of caveats associated with this modelling assessment which are outlined earlier in the document in the **Assessment Caveats** section and should be considered when reviewing the findings of the study. In particular, the model results represent the situation when the scheme has been in place for some time and local drivers are familiar with the infrastructure changes and have adapted their travel behaviour accordingly.

To summarise, the key points from this assessment are as follows:

- The scheme as modelled reduces vehicle capacity along the corridor by reflecting the proposed changes in the scheme designs. Additional crossing points for pedestrians and cyclists increase delay to vehicles. As a result, fewer vehicles travel along the A3100 corridor. This creates a more pleasant environment for pedestrians and cyclists which would likely lead to increased usage of active modes.

- Because traffic chooses to avoid the A3100, flow increases on alternative routes including the A3, A320, A322, A246 and B2234. There are also some impacts on residential streets such as Nightingale Road which sees an increase in flow due to the banned right turn from A3100 London Road to York Road.

- There are some increases in delay at junctions on these alternative routes indicating that there are impacts away from the A3100 corridor itself.

- Looking at journey times, the A3100 itself experiences an increase in travel times as a result of the scheme which is expected given the increased usage of crossings and reduced capacity of the route. Increased journey times here reflect reduced speeds along the corridor which are intended as part of the design and will improve safety for all road users.

- Although there are some changes to journey times on alternative routes, both positive and negative, the largest increase was 1 minute on the A320 southbound during the PM peak.

- A further high active travel scenarios was assessed to see if the findings would alter if there were higher level of crossing activations due to increased numbers of pedestrians and cyclists. Broadly the pattern of changes was the same as in the low active travel scenario but to a slightly larger degree as would be expected.

- A sensitivity test was undertaken to determine what the impact of the scheme would be if there were an additional 1800 dwellings in the Burpham area. This showed that there would be further rerouting away from the A3100 on to alternative routes including the A3 and A320. The largest difference in travel time compared to the high active travel scenario without the additional development was just 11 seconds along the A3 southbound. Overall, the additional development trips appear to have displaced other trips which re-routed to find alternative routes through the wider area.

Modelling showed that the scheme reduced vehicle speeds and traffic flow levels along the A3100 in line with its objectives to create a safer and more pleasant corridor for pedestrians and cyclists. In practice this enhanced active travel corridor would likely lead to reduced vehicle demand as travelling on foot or cycling would be more attractive to the public than currently and travelling by car less so.

Although flow increased on alternative routes, these vehicle impacts appear to be to be relatively slight and is likely to be offset by the benefits to other road users who benefit from the A3100 London Road – Active Travel Scheme. These were not assessed as part of this report and include social and environmental impacts such as air quality, safety, noise, carbon and health benefits.

It is recommended that monitoring is undertaken on alternative routes such as Nightingale Road which may be unsuitable for additional traffic would be required to determine whether mitigation measures may be needed to reduce rat running.