East Sussex
County Council

TRAFFIC MODELLING OUTPUTS

October 2024

INTRODUCTION

This technical note provides a brief overview of the Vissim microsimulation modelling undertaken for the A259 Seaside Road corridor bus priority proposals.

The base model was satisfactorily validated and used to test the summer 2024 feasibility design proposals plus additional option scenarios.

CONTEXT

WSP previously prepared the feasibility design for East Sussex County Council (ESCC)'s Bus Service improvement Plan (BSIP) proposals for the A259 Seaside Road/St Anthony's Avenue corridor, extending from Langney Roundabout to Hanover Road, a distance of approximately 2.5km. The feasibility design drawings were shared for public consultation during summer 2023, with some residents and businesses indicating strong opposition to the proposals.

In response to the Lead Member for Transport and Environment's decision on the BSIP consultation proposals in January 2024, ESCC requested that WSP develop a revised and reduced bus priority scheme for Seaside Road/St Anthony's Avenue. The objective was of address the feedback received during the public consultation and ensuring the scheme still remained affordable, deliverable and meet the aims of the East Sussex BSIP.

Following review of the revised design, ESCC requested that WSP produce a further revision to the scheme to cover only the four sections of A259 Seaside Road and St Anthony's Avenue ranked as priority scheme areas that would bring the highest benefits to bus users. Further updates to the feasibility designs resulted in a scheme with bus lanes being proposed only where parking currently exists rather than converting running lanes, i.e. there would be no reduction in lane capacity for general traffic.

The revised scheme was subject to public consultation between 15th July and 18th August 2024. A Consultation Report was produced by WSP which indicated, from the 2,788 consultation responses received, the proportion of supportive responses was greater than opposing responses (56% overall support vs 37% overall oppose). However, some respondents cited concerns regarding the proposed removal of right turn pockets and expressed the view that vehicles waiting to turn right would cause more congestion. Some respondents also cited concerns regarding the proposed removal of pedestrian crossing islands, often in relation to the existing staggered signal-controlled crossings. It was noted that the proposed single stage pedestrian crossings would mean one set of traffic signals rather than two, i.e. stopping traffic in both directions.

To verify respondents' concerns regarding increased traffic congestion with the bus priority proposals in place, in August 2024 ESCC requested WSP to proceed with detailed modelling using the Vissim microsimulation software tool. Microsimulation modelling (as opposed to localised junction modelling using Junctions 10 software) is best for simulating the effects of exit blocking and driver behaviour but is a higher cost approach as model building and validation takes time to complete. It was agreed that the model would exclude the corridor section north of Seaside Roundabout, because on this section the carriageway is generally wider and the residual lane width following the proposed removal of right turn pockets (i.e. at

Lidl and Leeds Avenue) would be approximately 5.0m, enabling vehicles to undertake waiting right turners without needing to cross into the bus lane.

The modelled network is shown in **Figure 1** below, covering Seaside Road from Roselands Avenue eastwards to Seaside Roundabout together with the roundabout approaches.

Figure 1: Vissim model network

DATA COLLECTION

Classified vehicle turning counts, pedestrian/cycle crossing counts and bus stop dwell time surveys were undertaken by ESCC on Wednesday 4th September 2024 covering the periods 0700 to 1000 and 1500 to 1800. Vehicle journey time data was supplied from the INRIX database.

Vehicle turning counts covered the following junctions:

- A259/Romney Street/Windermere Crescent;
- A259/Channel View Road/Churchdale Road;
- A259/Churchdale Road/Wartling Road;
- A259/Sandwich Street;
- A259/Rye Street;
- A259/Southbourne Road/Winchelsea Road;
- A259/Finmere Road/Vine Square;
- A259/Allfrey Road;
- A259/Northbourne Road/Myrtle Road;
- A259/Fort Road; and
- A259/A2290 Lottbridge Drove roundabout (Seaside Roundabout).

The AM peak hour was identified as 07:45 to 08:45 and the PM peak hour as 17:00 to 18:00.

Pedestrian/cycle crossing counts were undertaken for the following locations:

- Staggered signalised crossing between the Romney Street and Channel View Road junctions;
- Zebra crossing between the Southbourne Road and Finmere Road junctions; and
- Staggered signalised crossing between the Northbourne Road and Fort Road junctions.

The above data was used in the building of the base Vissim model. The model validated satisfactorily and can therefore be considered a robust tool to test the impacts of the bus priority proposals on general traffic.

MODELLED SCENARIOS

The following scenarios were modelled initially:

- **Base** – existing layout (using September 2024 traffic data); and
- **Option 1** – the summer 2024 feasibility design proposals

Following the Option 1 test, three further refinements were considered to explore additional potential enhancements to the road network:

- **Option 2** – as Option 1 except that the zebra crossing between the Southbourne Road and Finmere Road junctions is replaced by a signalised crossing;
- **Option 3** – as Option 2 except that a right turn pocket to Southbourne Road is reintroduced (1 car length); and
- **Option 4** – as Option 3 except that a right turn pocket to Northbourne Road is reintroduced (1 car length). This would necessitate a small reduction in the bus lane length and on-street parking capacity (potentially up to three car lengths) on the eastbound side compared with Options 1 to 3.

It is recognised that replacement of the zebra crossing with a signalised crossing between the junctions of Southbourne Road and Finmere Road may increase pedestrian crossing wait times but conversely may improve crossing safety by removing the “give way” element to general traffic. A signalised crossing can also be configured to allow free flow buses through the area.

SUMMARY OF RESULTS

General traffic journey times

AM Peak (0745 – 0845)

AM peak period modelled journey times on the A259 between Roselands Avenue and Queen's Crescent (South) for general traffic (EB = eastbound, WB = westbound) are illustrated in **Figure 2** and tabulated in **Table 1** below.

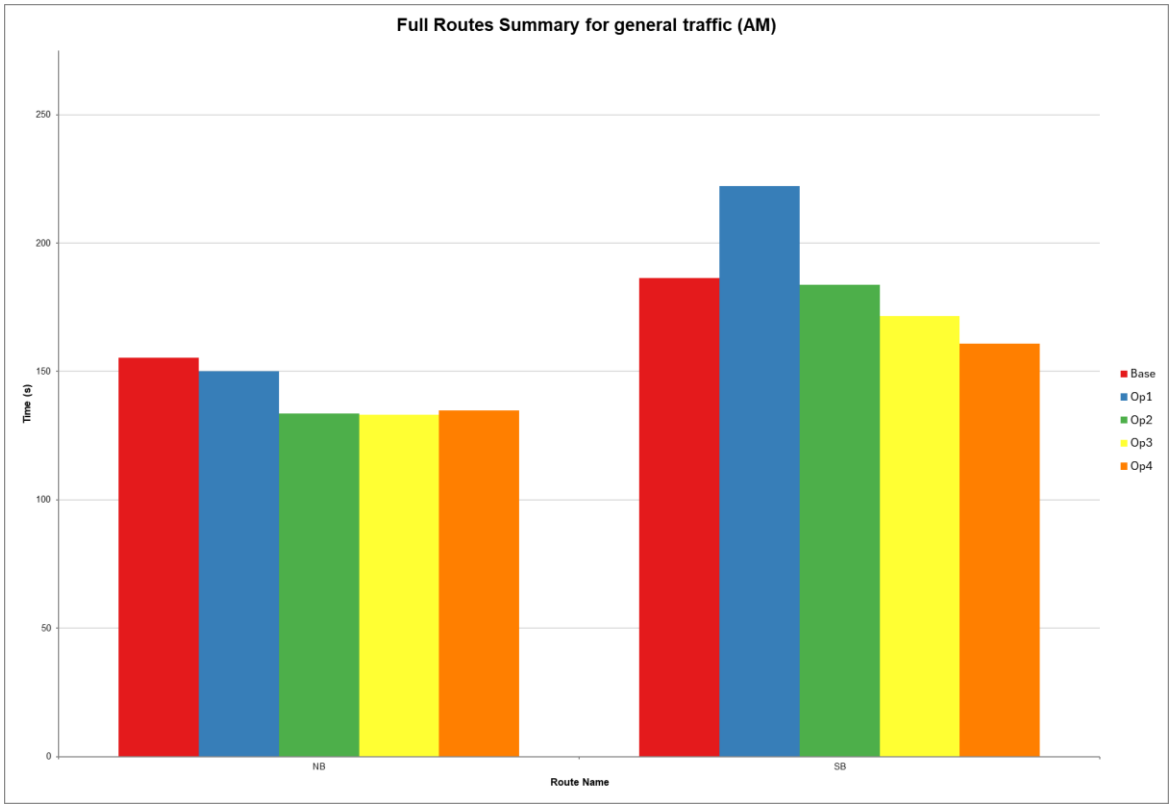

Figure 2: AM peak modelled journey times for general traffic (seconds)

Route Names	Base	Op1	Op2	Op3	Op4
Eastbound	155	150	134	133	135
Westbound	186	222	184	172	161

Table 1: AM peak modelled journey times for general traffic (seconds)

It can be seen from the above that Option 1 results in a small reduction in eastbound AM peak journey times for general traffic. This is considered sensible because in the base scenario, eastbound buses are stopping in road space used by general traffic and vehicles may have to cross into the opposing lane to overtake them, whereas in Option 1 buses would be stopping within the bus lane.

However, in the westbound direction there is a moderate increase (36 seconds) in AM peak journey times with Option 1, with the introduction of single stage signalised crossings and removal of right turn pockets likely to be contributory factors.

Options 2, 3 and 4 provide progressively greater journey time reductions in comparison with the base scenario. In both eastbound and westbound directions, there is nil detriment and a slight betterment in Options 2, 3 and 4 compared to the current situation in the eastbound direction, and nil detriment and a slight betterment in the westbound direction in Options 3 and 4.

PM Peak (1700 – 1800)

PM peak period modelled journey times for general traffic are illustrated in **Figure 3** and tabulated in **Table 2** below. These indicate that, as with the AM peak, Option 1 results in a reduction in general traffic journey times in the eastbound direction. The replacement of the zebra crossing with a signalised crossing between Southbourne Road and Finmere Road is predicted to have a slight diWBenefit (as opposed to a benefit during the AM peak) because there are fewer crossing movements in the PM peak.

In the westbound direction, there is a moderate increase in journey time (15-16 seconds) under Options 1 and 2 in comparison with the base, but the introduction of a 1 car right turn pocket to Southbourne Road is predicted to nullify this increase.

In summary, the predicted changes in journey time for general traffic in both the AM and PM peak periods are small and likely within actual day to day journey time variability. The small increases in westbound journey times predicted for Options 1 and 2 can be fully mitigated, as demonstrated by the outputs for Options 3 and 4. It can therefore be concluded that with minor amendments to the summer 2024 bus priority proposals that nil detriment to general traffic movements is likely to be achieved.

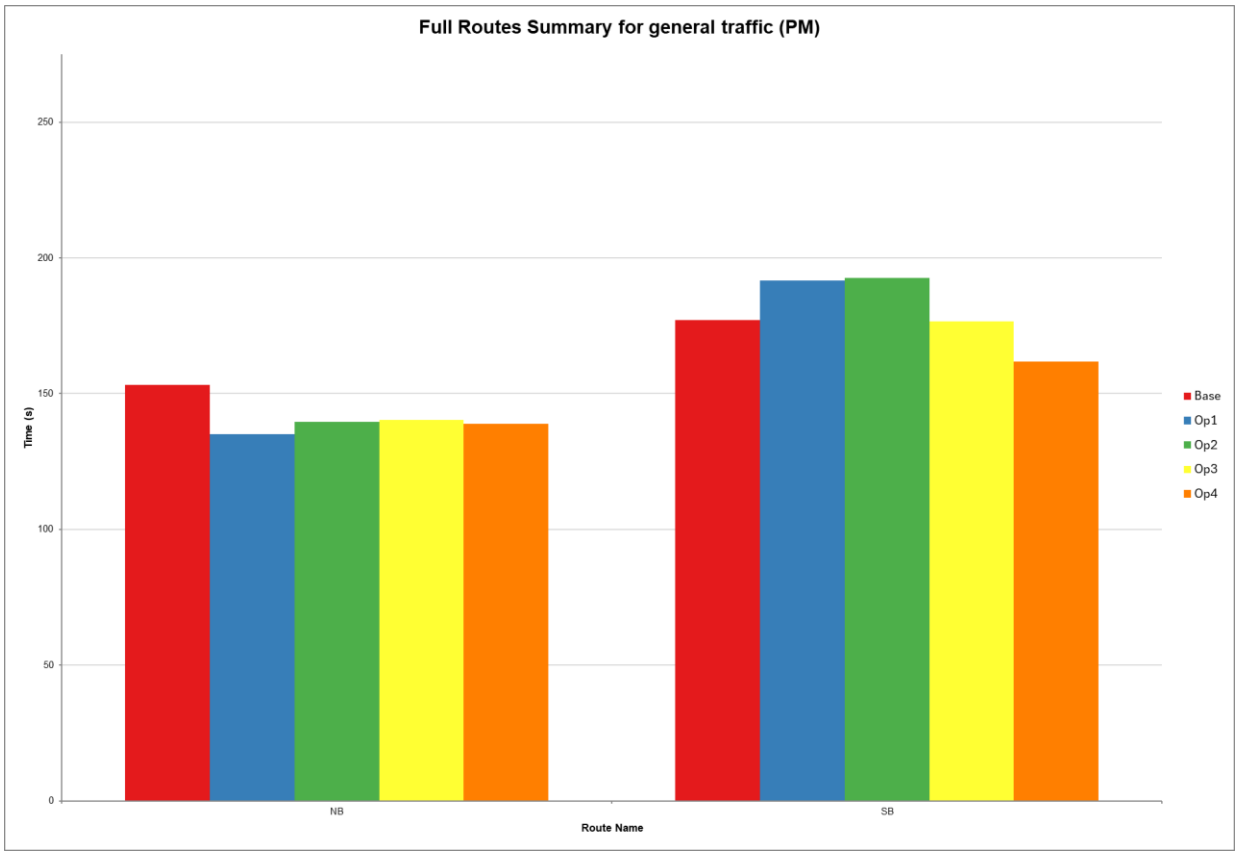

Figure 3: PM peak modelled journey times for general traffic (seconds)

Route Names	Base	Op1	Op2	Op3	Op4
Eastbound	153	135	140	140	139
Westbound	177	192	193	177	162

Table 2: PM peak modelled journey times for general traffic (seconds)

CONCLUSIONS AND NEXT STEPS

The results of the Vissim microsimulation modelling indicate that the summer 2024 bus priority feasibility design proposals (Option 1) are predicted to deliver a small reduction in eastbound journey times for general traffic in both the AM and PM peak periods, with a larger reduction in eastbound journey times for buses. However, in the westbound direction Option 1 is predicted to result in a small increase in journey time for both general traffic.

Further refinements to the bus priority proposals were therefore tested to explore the potential to mitigate the negative journey time impacts and deliver enhancements where possible. These refinements comprised:

- the replacement of the zebra crossing between the Southbourne Road and Finmere Road junctions with a signalised crossing (Option 2);
- the zebra crossing replacement plus the provision of a 1 car length right turn lane at Southbourne Road (Option 3); and
- the zebra crossing replacement, 1 car length right turn lane at Southbourne Road and 1 car length right turn lane at Northbourne Road (Option 4).

Option 2 mitigates the negative impacts of the proposals on westbound journey times during the AM peak period but results in a slight diWBenefit to journey times in both directions relative to Option 1 during the PM peak period, when pedestrian crossing movements are fewer.

Options 3 is predicted to fully mitigate the negative impacts of the proposals on westbound journey times for general traffic and buses in both the AM and PM peak periods.

Option 4 is predicted to not only mitigate the negative impacts on westbound journey times during both peak periods but to reduce journey times relative to the base situation. However, Option 4 would necessitate a reduction in on-street parking capacity (potentially up to three car lengths).

To date the proposed scheme amendments in Options 2, 3 and 4 have not been subject to full feasibility design but would be considered at the scheme's detailed design stage.

In conclusion, Options 3 and 4 are predicted to have nil detriment to general traffic journey times in both the AM and PM peak periods, whilst delivering significant benefits to bus reliability and journey times.