Table 6-6 Weekday PM Period Traffic Forecasts

Year	Scenario	M5 South West Motorway			Alternative Route		
		West of Hume Highway	Hammondville Toll Plaza	West of King Georges Road	Hume Highway[1]	Newbridge Road[2]	Canterbury Road[3]
PM Peak Eastbound							
2006	Existing	2,920	3,060	2,930	2,050	2,020	1,380
2016	Base	3,380	3,510	3,230	2,240	2,200	1,440
2026	Base	3,780	3,930	3,520	2,430	2,560	1,510
PM Peak Westbound							
2006	Existing	3,760	3,740	2,860	2,840	2,720	1,710
2016	Base	4,080	4,090	3,240	3,300	3,040	1,790
2026	Base	4,280	4,530	3,790	3,610	3,710	1,960

Note: 1 – West of Terminus St
2 – West of Henry Lawson Drive
3 – West of King Georges Rd

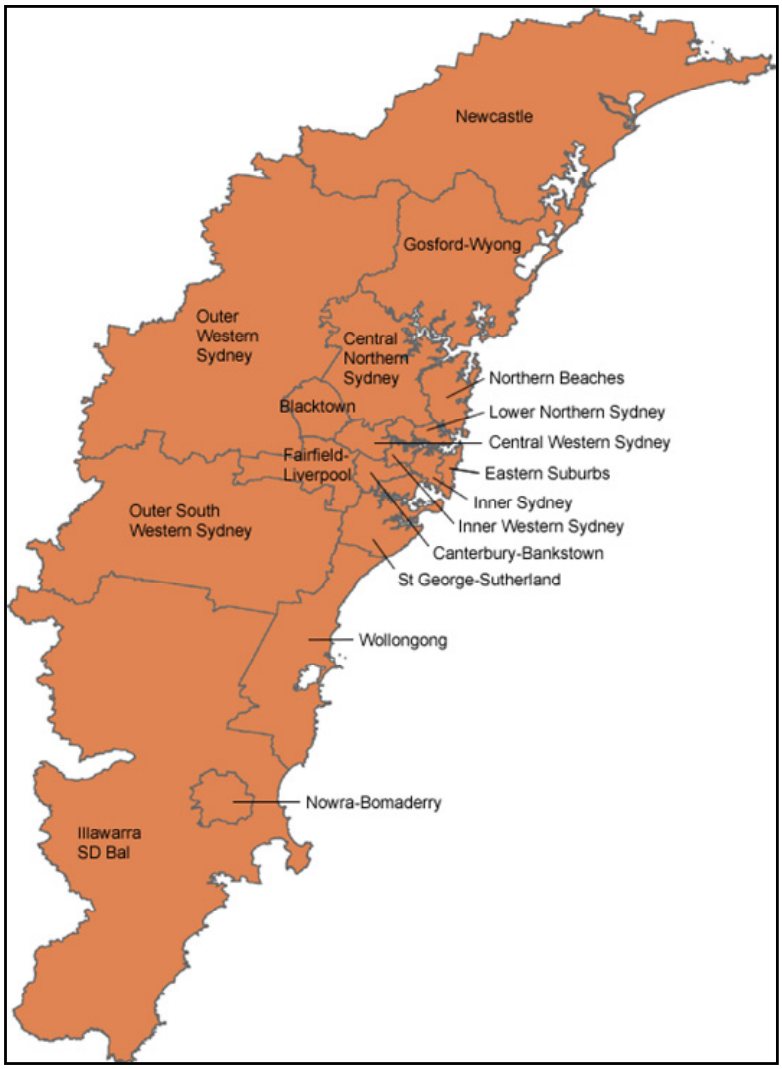
Traffic growth in the PM peak period is less pronounced, averaging 11% for the M5 South West Motorway and 10% for the Alternative Route between 2016 and 2026. This is more consistent with the forecast average growth for Sydney.

In general terms, the forecasting indicates strong growth in daily traffic with the most growth being experienced during the AM peak period.

6.4 Travel Pattern - Select Link Analysis

A select link analysis has been undertaken to better understand the origin and destination patterns of traffic using the M5 South West Motorway. This gives an indication on whether the trip orientation is closely aligned with the M5 South West Motorway or whether users travelling out of their way to use the motorway. The role of this analysis is to determine if the Project is the optimal solution to cater for growth or whether resources should be diverted elsewhere.

The results are presented by Statistical Sub-Division, which are described below.



Source: TDC

Figure 6-4 Greater Metropolitan Area with Statistical Sub-Divisions (SSD)

Key areas within each of the Statistical Sub-Divisions are summarised as follows:

- Fairfield – Liverpool –Liverpool, Fairfield
- Outer South Western Sydney – Campbelltown, Penrith, Camden, Wollondilly
- Canterbury-Bankstown – Bankstown, Canterbury
- Inner Sydney – Botany Bay, Marrickville, Leichhardt, Sydney CBD including Port Botany
- Eastern Suburbs – Randwick, Waverly, Woollahra
- St George-Sutherland – Hurstville, Kogarah, Rockdale, Sutherland, including Sydney Airport
- Inner Western Sydney – Burwood, Strathfield, Canada Bay, Ashfield
- Central Western Sydney – Auburn, Parramatta, Holroyd,

The results are summarised in the following sections for car and truck trips.

6.4.1 Cars

As shown in Table 6-7 to Table 6-8 and Figure 6-5 to Figure 6-6, the majority of the M5 West users are travelling between Outer South Western Sydney/Fairford-Liverpool and Canterbury-Bankstown/ St George-Sutherland /Inner Sydney through F5, M5 West and M5 East. Newbridge Road users are mainly local traffic connecting Fairford-Liverpool area and Canterbury-Bankstown/Inner Western Sydney areas through Liverpool Road, Punchbowl Road and Canterbury Road.

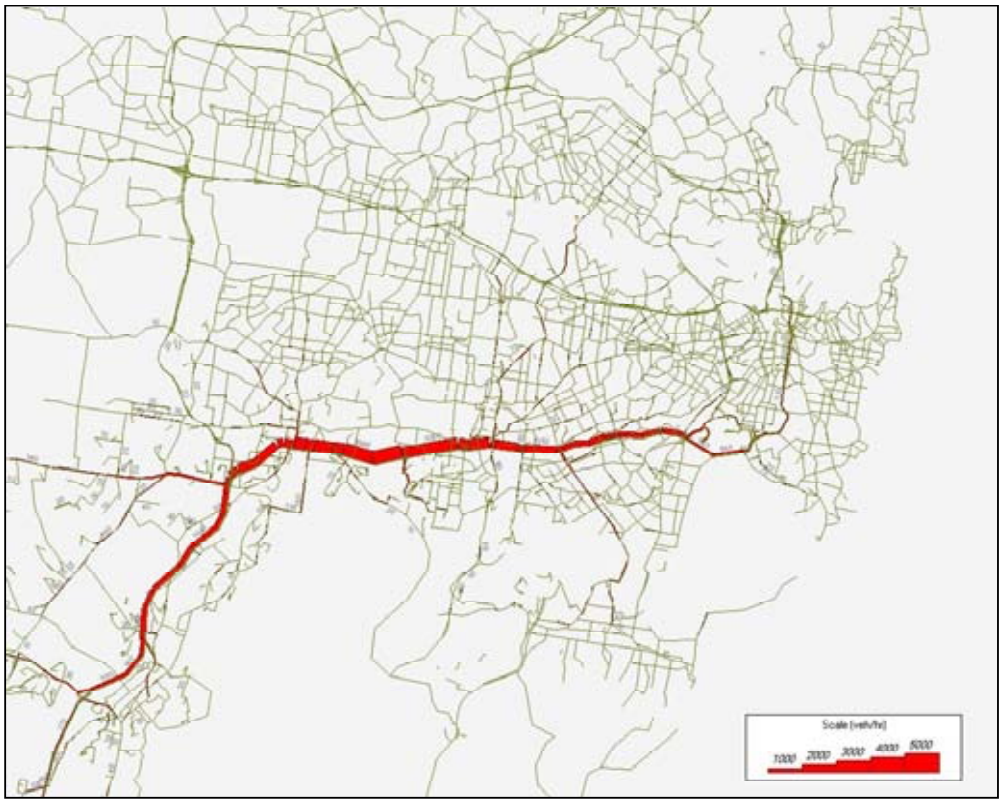


Figure 6-5 2026 AM Car Driver Travel Pattern - M5 West Hammondville Toll Plaza eastbound User

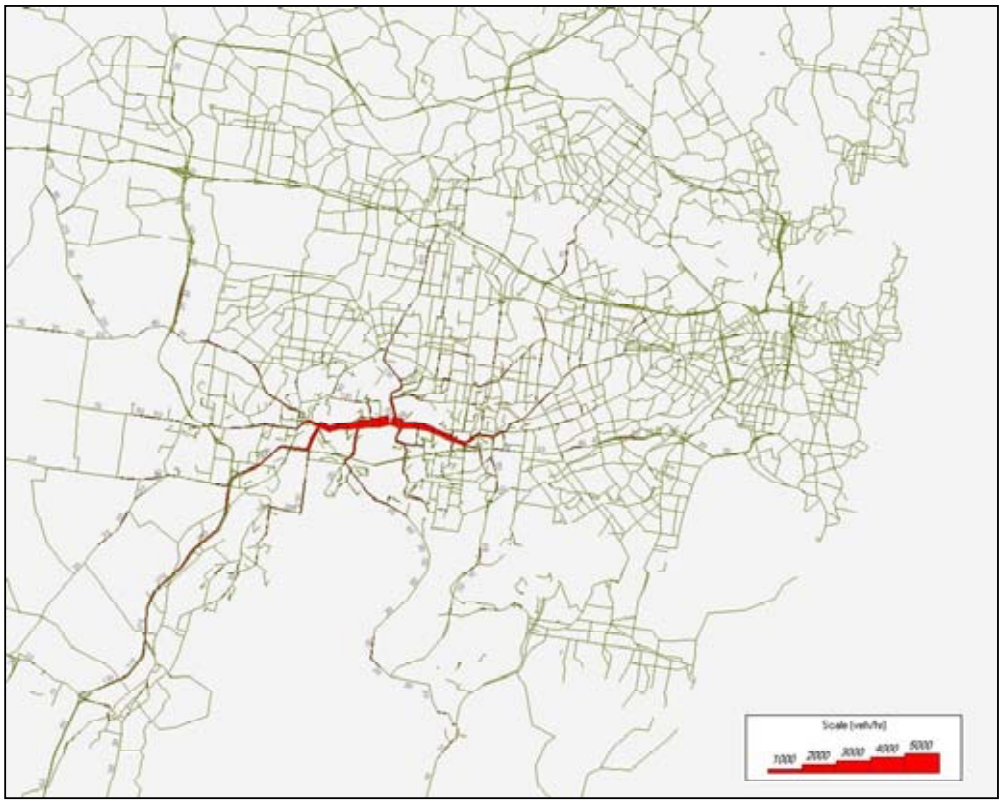


Figure 6-6 2026 AM Car Driver Travel Pattern – Newbridge Road Eastbound User

Table 6-7 2026 AM Origin of Eastbound Car Driver Trips

Area	M5 Toll Plaza	Newbridge Rd
Fairfield-Liverpool	43%	76%
Outer South Western Sydney	49%	18%
Other	8%	6%

Table 6-8 2026 AM Destination of Eastbound Car Driver Trips

Area	M5 Toll Plaza	Newbridge Rd
Canterbury-Bankstown	28%	73%
Inner Sydney	22%	2%
Eastern Suburbs	4%	0%
St George-Sutherland	29%	5%
Inner Western Sydney	5%	5%
Central Western Sydney	5%	11%
Other	8%	4%

In general terms, the select link analyses shows that trips with origins and destinations in the corridor tend to use the Alternative Route while the long distance trips, with origins/destinations outside of the corridor, are generally captured by the motorway.

This demonstrates that the motorway will continue to capture longer distance trips through the study area by comparison to the Alternative Route. Nevertheless there is also scope for the M5 South West Motorway to attract some trips away from the Alternative Route, particularly those trips with an origin in Outer South Western Sydney and a destination to the east of the M5 South West Motorway.

6.4.2 Freight Vehicles

The M5 South West and Newbridge Road freight vehicle (truck) movements are shown in Figure 6-7 to Figure 6-8 and the trip origins and destinations are summarised in Table 6-9 and Table 6-10. The majority of the M5 South West users are travelling between Outer South Western Sydney/Fairford-Liverpool and the Inner Sydney/Eastern Suburbs through M7, F5, M5 West and M5 East. High proportions of the M5 South West users are travelling to/from the Port Botany area. Newbridge Road users are largely travelling between Blacktown/Outer South West/Fairfield-Liverpool areas and Canterbury-Bankstown areas through F5/M7, Liverpool Road, Punchbowl Road, Canterbury Road, and M5 East.

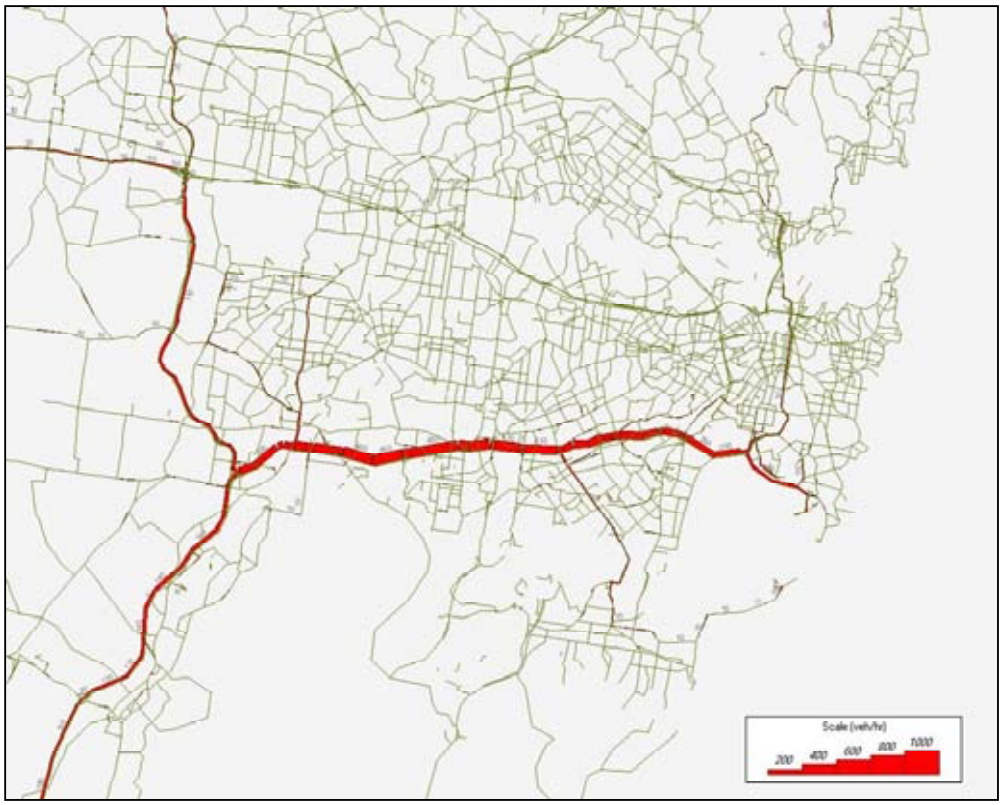


Figure 6-7 – 2026 AM Truck Travel Pattern - M5 West Hammondville Toll Plaza Eastbound User

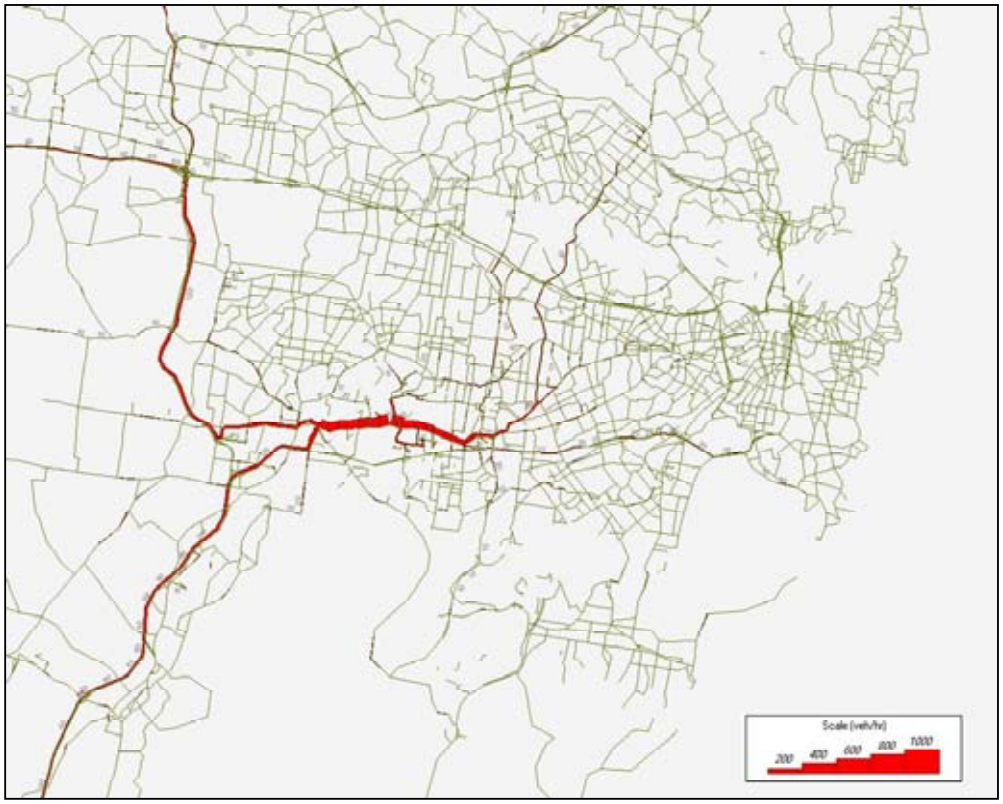


Figure 6-8 – 2026 AM Truck Travel Pattern – Newbridge Road Eastbound User

Table 6-9 2026 AM Origin of Eastbound Truck Trips

Area	M5 Toll Plaza	Newbridge Rd
Fairfield-Liverpool	27%	51%
Outer South Western Sydney	16%	15%
Central Western Sydney	5%	0%
Outer Western Sydney	16%	14%
Blacktown	15%	8%
Other	21%	12%

Table 6-10 2026 AM Destination of Eastbound Truck Trips

Area	M5 Toll Plaza	Newbridge Rd
Canterbury-Bankstown	17%	63%
Inner Sydney	32%	4%
Eastern Suburbs	18%	2%
St George-Sutherland	21%	4%
Inner Western Sydney	3%	9%
Central Western Sydney	2%	8%
Other	7%	10%

Similar to the trip pattern observed for cars, commercial vehicles are using the network in a direct manner. However, there would appear to be scope for diverting those trucks that originate or are destined for Metroad 3 (extending from King Georges Road / Princes Highway in the south to Mona Vale Road / Pittwater Road in the north) to the north to switch from the Alternative Route to M5 South West Motorway.

This suggests that due to congestion a proportion of heavy vehicle movements elect to use the Alternative Route as a substitute for the M5 South West Motorway. Widening of the motorway in this section would therefore make the motorway a viable alternative and will likely attract heavy vehicles back to the motorway away from the local road network, which is less well disposed to accommodate such traffic.

6.5 Trip Length Distribution

Trip length data is useful for corroborating the foregoing observations on the types of users on the M5 South West Motorway, i.e. short or long distance trips.

Figure 6-9 and Figure 6-10 present trip length distribution curves for the 2026 AM peak period. The data analysed has been has been extracted from model for two key locations:

1. M5 South West Motorway – Hammondville Toll Plaza
2. Alternative Route – Newbridge Road, west of Henry Lawson Drive

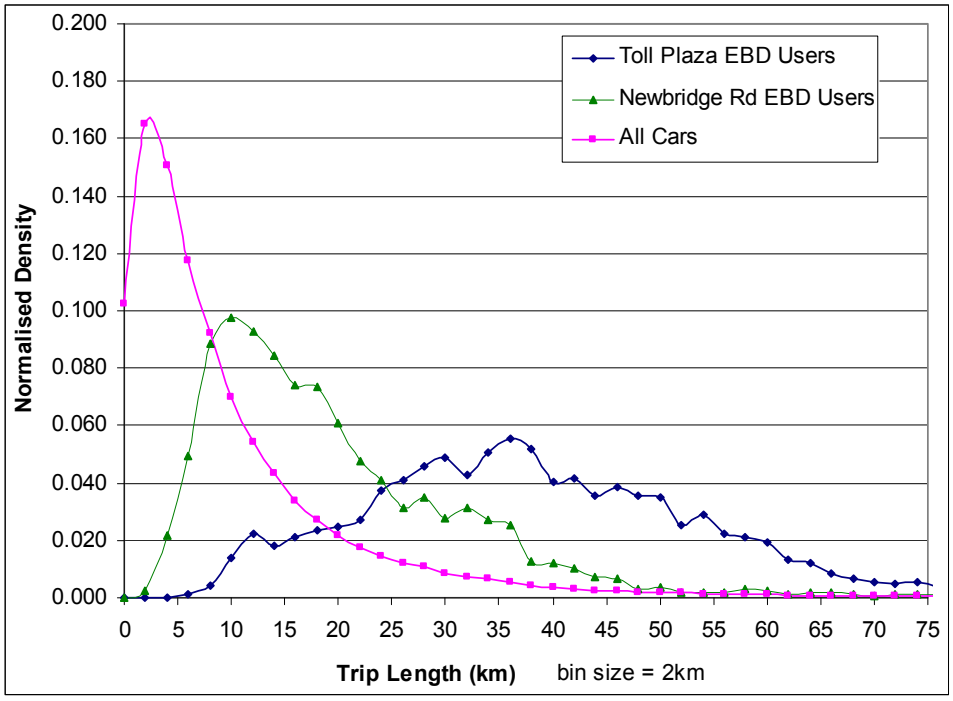


Figure 6-9 Trip Length Distribution (2026 AM, Car)

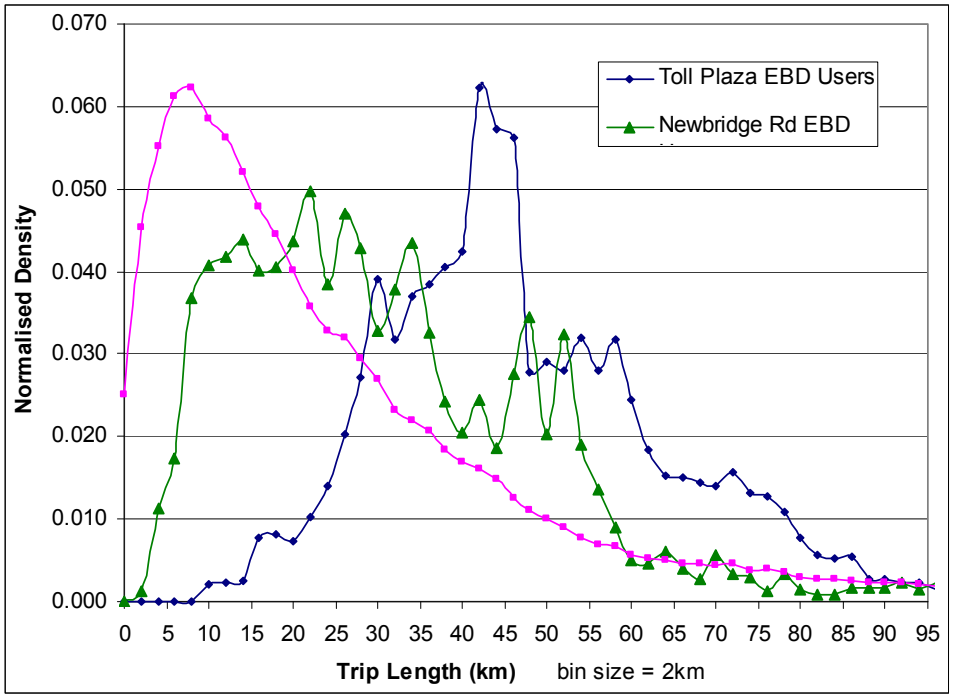


Figure 6-10 Trip Length Distribution (2026 AM, Truck)

The trip length distribution curves for cars show that higher proportion of medium to long distance (25 - 45 km) trips would use the M5 South West Motorway while a majority of Newbridge Road users are short to medium distance (5 -30 km) trips. Table 6-11 shows the average trip length the cars and trucks for each of these locations.

Table 6-11 Comparison of Average Trip Length

Vehicle Type	Description	Average trip length (km)
Car	All Cars	11.3
	M5 West Toll Plaza Eastbound Users	44.9
	Newbridge Road Eastbound Users	21.6
Truck	All Trucks	28.1
	M5 West Toll Plaza Eastbound User	64.0
	Newbridge Road Eastbound Users	39.6

The results confirm the role of M5 South West Motorway in conveying the longer distance trips.

6.6 Network Performance

6.6.1 Operational Statistics

The study area operational statistics, vehicle kilometres of travel (VKT) and vehicle hours of travel (VHT), are summarised in Table 6-12.

Table 6-12 Study Area Operational Statistics

Scenario	VKT (vehicle km)		VHT (vehicle hours)		Speed (km per hour)	
	2016	2026	2016	2026	2016	2026
AM Peak	1,136,700	1,257,000	37,200	46,100	30.6	27.3
PM Peak	1,180,800	1,319,700	38,100	49,700	31.0	26.6

6.6.2 M5 Motorway (Camden Valley Way to Marsh Street)

Operational statistics for the M5 corridor, between Camden Valley Way and Marsh Street, are summarised in Table 6-13. The extent of the corridor is shown in Figure 6-11.

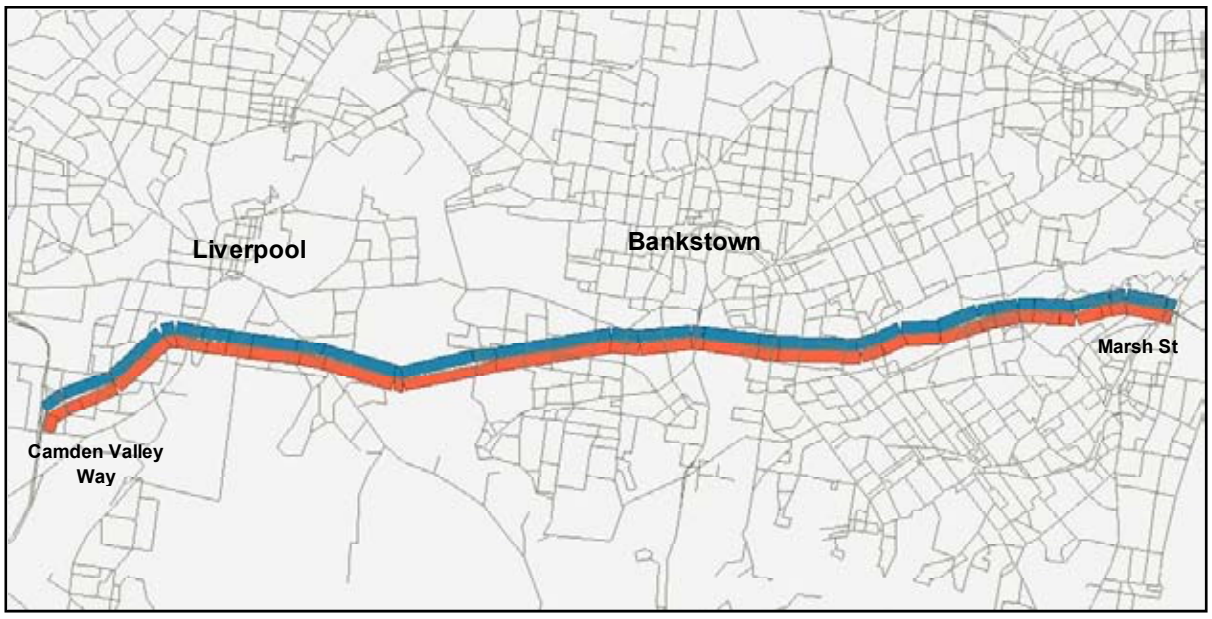


Figure 6-11 VKT and VHT – M5 Motorway

Table 6-13 M5 Motorway Operational Statistics

Scenario	VKT (vehicle km)		VHT (vehicle hours)		Average Speed (km/h)	
	2016	2026	2016	2026	2016	2026
AM Peak	179,780	195,960	3,800	5,160	47.3	38.0
Inter Peak	146,740	170,730	2,580	3,570	56.9	47.9
PM Peak	190,530	208,070	4,040	5,690	47.2	36.6

The forecasts indicate that traffic conditions on the motorway will continue to deteriorate.

6.6.3 Levels of Service in M5 Corridor

Table 6-14 summarises mid-block levels of service along the M5 motorway and the alternative route for years 2016 and 2026.

Table 6-14 Mid-Block Levels of Service (2016 and 2026)

Location	AM		PM	
	2016	2026	2016	2026
M5 Motorway, EBD				
Between Camden Valley Way and Hume Highway	F	F	D	F
Between Hume Highway and Moorebank Avenue	D	D	C	C
Between Moorebank Avenue and Heathcote Road	D	D	C	D
Between Heathcote Road and Henry Lawson Drive	E	F	D	E
Between Henry Lawson Drive and The River Road	D	E	E	E
Between The River Road and Fairford Road	D	F	E	F
Between Fairford Road and Belmore Road	D	E	E	E
Between Belmore Road and King Georges Road	D	D	D	E
M5 Motorway, WBD				
Between King Georges Road and Belmore Road	D	D	D	E
Between Belmore Road and Fairford Road	D	E	E	F
Between Fairford Road and The River Road	E	F	F	F
Between The River Road and Henry Lawson Drive	E	F	E	F
Between Henry Lawson Drive and Heathcote Road	E	F	F	F
Between Heathcote Road and Moorebank Avenue	D	D	D	D
Between Moorebank Avenue and Hume Highway	C	C	D	D
Between Hume Highway and Camden Valley Way	E	E	F	F

Location	AM		PM	
	2016	2026	2016	2026
Alternative Routes				
Hume Highway, NBD - Between Campbelltown Road and Hoxton Park Road	C	D	B	C
Hume Highway, WBD - Between Hoxton Park Road and Campbelltown Road	B	B	C	D
Terminus Street, EBD - Between Hume Highway and Speed Street	D	D	C	C
Terminus Street, WBD - Between Speed Street and Hume Highway	B	B	C	C
Newbridge Road, EBD - Between Speed Street and Henry Lawson Drive	C	D	C	C
Newbridge Road, WBD - Between Henry Lawson Drive and Speed Street	C	D	C	D
Milperra Road, EBD - Between Henry Lawson Drive and The River Road	C	C	B	C
Milperra Road, WBD - Between The River Road and Henry Lawson Drive	C	C	C	C
Canterbury Road, EBD - Between The River Road and King Georges Road	D	D	D	D
Canterbury Road, WBD - Between King Georges Road and The River Road	C	C	D	D

The levels of service forecast for M5 South West Motorway indicate operating conditions will deteriorate to very poor levels for both directions of travel in the AM and PM peak periods. These forecast low levels of service indicate severe congestion and delays.

Similarly the Alternative Route experiences degradation in traffic conditions when compared to the existing situation. This may indicate that future traffic growth pressures could be absorbed, at least in part, by the Alternate Route as opposed to the Motorway which would be operating under congested conditions.

6.7 Travel Times

The peak direction (AM eastbound and PM westbound) travel times between Camden Valley Way and King Georges Road on M5 South West Motorway (M5SWM) and the Alternative Route are summarised in
Table 6-15 Table 6-15 and Table 6-16

Table 6-16. The location of the travel time routes is shown in Figure 6-12.

Figure 6-12 Travel Time Routes

Table 6-15 Base Case AM Peak Average Travel Times (minutes)

Year	Eastbound		Westbound	
	M5SWM[1]	Alternative Route	M5SWM[1]	Alternative Route
2016	21.8	37.7	20.3	31.1
2026	31.6	43.6	24.5	34.0
% increase	45.0%	15.6%	20.7%	9.3%

Note: 1 M5SWM – M5 South West Motorway

Table 6-16 Base Case PM Peak Average Travel Times (minutes)

Year	Eastbound		Westbound	
	M5SWM[1]	Alternative Route	M5SWM[1]	Alternative Route
2016	19.4	31.9	27.0	36.9
2026	24.7	34.8	36.6	43.0
% increase	27.3%	9.1%	35.6%	16.5%

Note: 1 M5SWM – M5 South West Motorway

The results further demonstrate a significant increase in travel time between 2016 and 2026, particularly peak directions (AM peak eastbound and PM peak westbound). Increase in journey times on the Alternative Route is significant but somewhat less pronounced, although the absolute increase in journey times for both routes is more comparable.

6.8 Summary

A summary of traffic forecasts in Table 6-17 show that the traffic volumes on the M5 South West Motorway would increase constantly between 2009 and 2026.

Table 6-17 M5 South West Motorway Traffic Forecast (Base Case)

Scenario	Eastbound		Westbound	
	Hammondville Toll Plaza	West of Marsh St	Hammondville Toll Plaza	West of Marsh St
2016 AM	3,420	3,510	3,690	3,280
2016 IP	2,690	2,920	2,810	3,080
2016 PM	3,510	2,950	4,090	3,290
2026 AM	4,000	3,500	3,960	3,190
2026 IP	3,300	3,010	3,420	3,220
2026 PM	3,930	3,020	4,530	3,510

During the morning peak period, the travel time on M5 South West Motorway eastbound would increase from 22 minutes in 2016 to 32 minutes in 2026 and the travel time on the Alternative Route would also increase from 38 minutes in 2016 to 44 minutes between in 2026.

Levels of service on the motorway are forecast to worsen to the point where queues and congestion would be expected almost the full length of the motorway, in both directions during AM and PM peak periods.

The analysis indicates that the motorway is catering for longer distance trips and commercial traffic and thus fulfils an important role in the road network.

The Alternative Route of Newbridge Road, Milperra Road, and Canterbury Road plays an important function in conveying short distance trips to destinations within the corridor. There is limited scope for this route to cater for any excess growth from the motorway.

7 The M5 West Widening Project

7.1 Overview of the Proposals

The M5 South West Motorway is 21km in length running between King Georges Road at its eastern end to Camden Valley Way at its western end. The current motorway configuration is predominantly two lanes in each direction separated by a central grassed median.

7.1.1 The Project

The NSW Roads and Traffic Authority (RTA) proposes to widen around 20 kilometres of the M5 South West Motorway between King Georges Road, Beverly Hills and Camden Valley Way, Casula (the project).

The project would include:

- Providing additional lanes on the M5 South West Motorway for the majority of its length by pavement widening, asphalt overlays and new line-marking.
- An operations management control system on and in the vicinity of the M5 South West Motorway including a new control building at Hammondville and variable message signs on the motorway and surrounding arterial roads.
- Bridge widening by placing new infill decking in the central median between existing bridges over Queen Street and Nuwarra Road. The underpass structures at De Meyrick Avenue would be upgraded. All other bridges can accommodate the proposed widening works without structural modification.
- Noise attenuation measures at various locations along the M5 South West Motorway between King Georges Road and Camden Valley Way.

As the motorway is already four lanes in each direction between the Hume Highway and Moorebank Avenue, no widening is required in this section. The additional lanes elsewhere can generally to be accommodated within the central grassed median as envisaged in the original design of the Motorway.

In order to achieve a balance in the system capacity with respect to the eastbound flow, the M5 West widening is proposed to terminate at Fairford Road in that direction. The

Fairford Road interchange is located on a strategic north-south corridor that provides good access to Bankstown to the north and Sutherland Shire to the south. Hence the eastbound widening to Fairford Road provides improved access to these areas via M5 South West Motorway instead of Newbridge/Milperra Roads.

Analysis has shown that a significant number of trips travelling eastbound on the M5 South West Motorway exit at the Fairford Road intersection.

To continue three lanes to King Georges Road would precipitate increased congestion levels for eastbound flows as the three lanes would need to merge down to two as it joins the M5 East at the King Georges Road interchange. Already at this point in time there is significant congestion for eastbound traffic during the morning peak period and to add another lane would exacerbate this situation.

The same issue does not apply in the westbound direction as the capacity increase is being provided in the downstream section.

An additional eastbound lane east of Fairford Road would form part of the M5 East expansion project.

A schematic of the proposed scheme is presented in Figure 7-1 followed by a summary of the key components of the project.

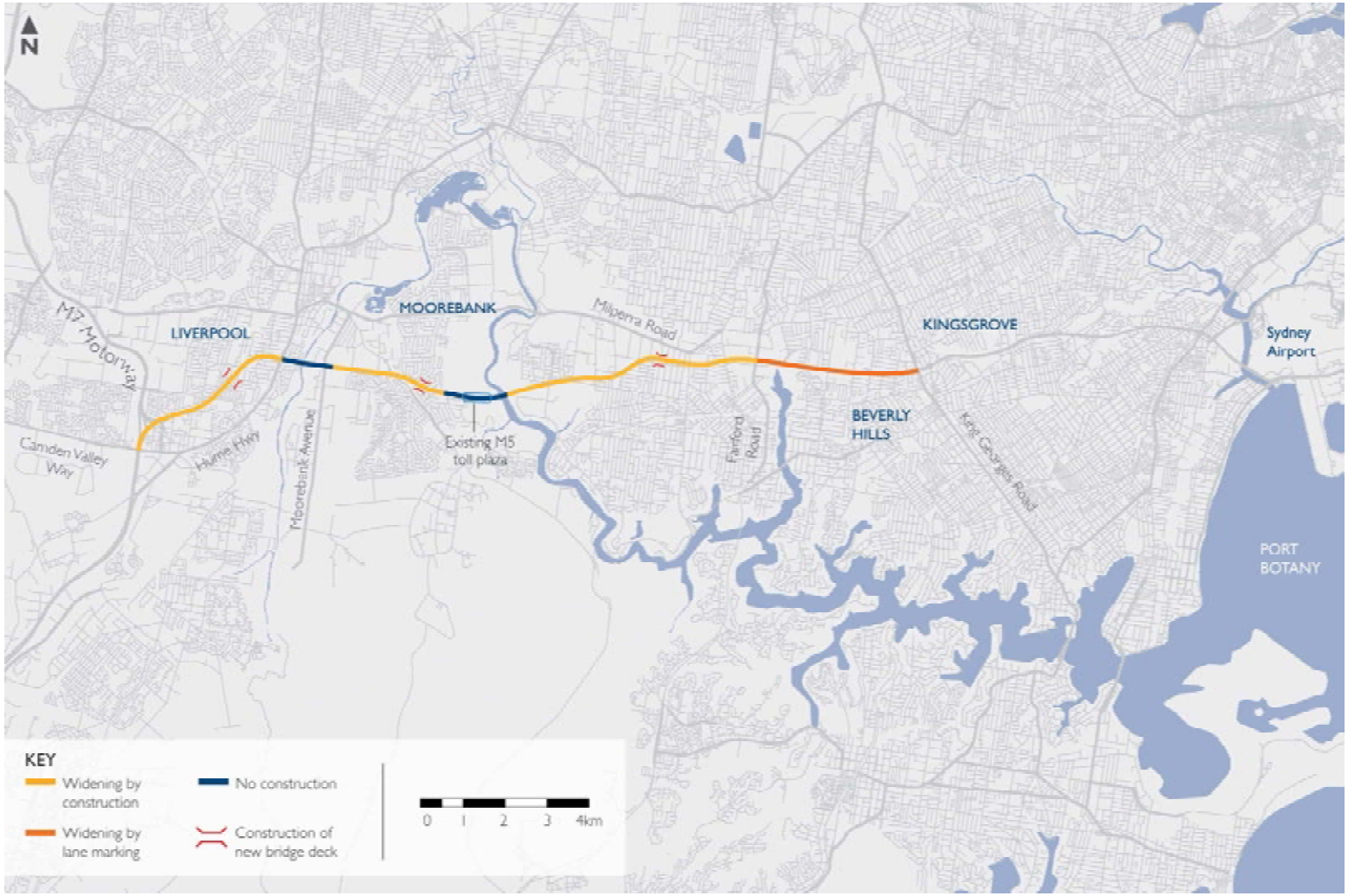


Figure 7-1 Overview of the M5 West Widening Project

7.2 Surface Road Works

7.2.1 Intersections

No modifications to the existing grade separated intersections are currently proposed as part of the proposal. Minor realignment of various motorway on and off ramps through linemarking and in some locations pavement widening would also be required to achieve geometric compliance.

7.2.2 Bridges and structures

To accommodate the proposed carriageway widening works, new bridge decking to provide for an additional lane on each carriageway would be introduced at the existing bridges that cross over Nuwarra Road and Queen Street. The DeMeyrick Avenue underpass would be upgraded.

7.3 Bus Facilities

There are no bus facilities on the motorway carriageway areas and further on-motorway provisions for buses would not be provided as part of the proposal.

7.4 Pedestrian and Cyclist Facilities

Pedestrian crossings of the motorway are currently provided at the following overbridges and underbridges:

Table 7-1 Pedestrian Crossing Facilities

Location	Description
King Georges Road	Signalised crossing across interchange ramps
Penshurst Road	Footpath on underpass
Karne Street	Pedestrian Underpass
Bonds Road	Footpath on road underpass
Belmore Road	Signalised crossing across interchange ramps
Bell Street	Pedestrian overbridge
Salt Pan Reserve	Pedestrian underpass
Fairford Road	Signalised crossing across interchange ramps
Gibson Avenue	Footpath on road overbridge
Mackenzie Street	Pedestrian overbridge
The River Road	Signalised crossing across interchange ramps
Queen Street	Footpath on road underpass

Location	Description
Beaconsfield Street	Footpath on road overbridge
Horsley Road	Footpath on road overbridge
Henry Lawson Drive	Signalised crossing across interchange ramps (eastern side only)
Nuwarra Road	Footpath on road underpass
Heathcote Road	Signalised crossing across interchange ramps (eastern side only)
Moorebank Avenue	Signalised crossing across interchange ramps (eastern side only)
Georges River	Helles/Rifle Range Parks
Lakewood Crescent	Footpath on road underpass
Hume Highway	Signalised crossing across interchange ramps
De Meyrick Avenue	Footpath on road underpass
Kurrajong Road	Footpath on road overbridge
Box Road (footbridge)	Pedestrian overbridge
Beech Road	Footpath on road overbridge

Aside from emergency telephones, there are no pedestrian facilities on the motorway carriageway areas and further on-motorway provisions for pedestrians would not be provided as part of the proposal.

Cyclists currently use the 2.5m outside shoulder and marked cyclist crossovers are provided at ramps. Further on-motorway provisions for cyclists would not be provided as part of the proposal.

7.5 Operational Management Control System

The proposal includes the provision of an operations management and control system (OMCS). OMCS elements include:

- Electronic vehicle detection equipment
- Closed Circuit Television (CCTV) to identify incidents
- Variable Message Signs (VMS), to provide information to motorists
- Emergency telephones
- Infrastructure for RTA speed detection equipment

VMS would be provided both on the motorway and on surrounding arterial roads where required. The VMS along the motorway would be Type C which have a display

board approximately 8.6 metres long and 1.8 metres high and are generally supported a minimum of 5.5 metres above the carriageway.

The purpose of VMS is to provide opportunities to advise motorists of incidents on the road network and to provide motorists with an opportunity to take an alternative route.

The off-motorway roads identified to require VMS are Hume Highway, Moorebank Avenue, Heathcote Road, Henry Lawson Drive, The River Road, Milperra Road, Canterbury Road, Fairford Road, and Belmore Road. The off-motorway VMS would be Type B which are smaller and have a display board approximately 7 metres long and 1.7 metres high. Identified localities where VMS would be installed as part of the Project and an assessment of issues and constraints to be considered in determining the exact location of VMS will be provided in a separate report.

Overall, it has been assessed that the VMS would have a long term cumulative traffic benefit through minimising congestion and travel times and improving travel time reliability. These traffic benefits would have wider economic and social benefits including increasing accessibility and reducing transport costs. Full details are provided in a separate report *M5 West Widening: Variable Message Sign Report* (Interlink Roads, 2010).

Traffic optimisation facilities such as Variable Speed Limit Signs and on-ramp traffic control may be incorporated, depending on feasibility and value-for-money reviews.

8 Effects of the M5 West Widening Project

8.1 Overview

This section addresses the impact of the M5 West Widening Project, which demonstrates an overall improvement in travel conditions for traffic using the M5 South West Motorway and the primary Alternative Route.

The table below summarises the key features of the Project Case in comparison to the Base Case.

Table 8-1 Base Case and Project Case Model Features

Scenario	M5 West Widening	M5 Cashback	M5E Duplication	M5E Tolling
Base Case	No	Yes	No	No
Project Case	Yes	Yes	No	No

The key difference between the Base Case and the Project Case lies in the assumption with regard to widening of the M5 South West Motorway. The model forecasts assume widening of the existing 2-lane sections to 3-lanes between Camden Valley Way and Fairford Road in the eastbound direction and between King Georges Road and Camden Valley Way in the westbound direction as per the project description detailed in Section 7.

8.1.1 Strategic Impacts on Road Network Performance

Compared with the Base Case, there are significant increases in peak direction (AM eastbound and PM westbound) traffic volumes on the M5 South West between Camden Valley Way and King Georges Road. The modelling results show that traffic volumes at Hammondville Toll Plaza would increase by between 23% and 29% in the peak directions in 2026.

The traffic model results also show traffic reduction on the Alternative Route (Hume Highway, Newbridge Road, Milperra Road and Canterbury Road). However, the M5 West Widening Project is found to have a relatively insignificant impact on the M5 East

since a majority of the increased demand will exit the motorway in advance of the M5 East in the eastbound direction and vice versa. This is illustrated in the volume comparison plot in Figure 8-1.

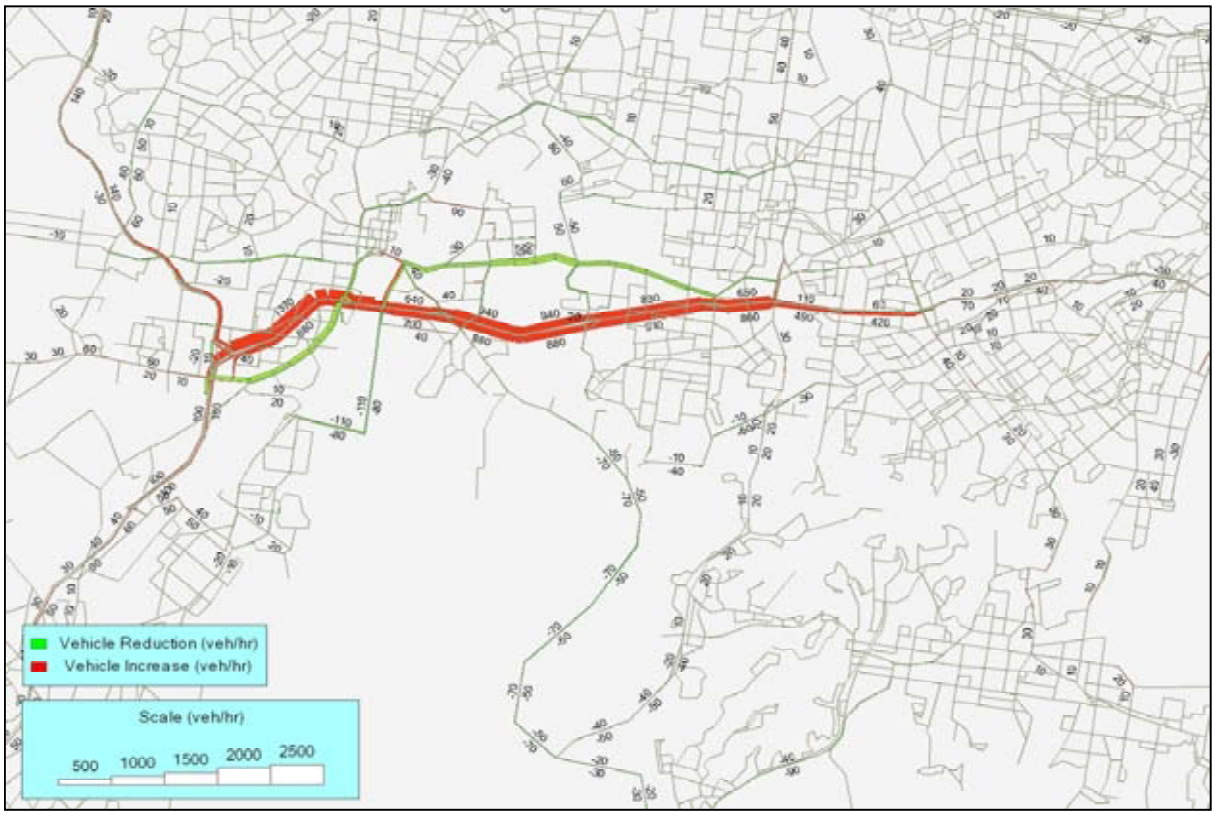


Figure 8-1 - Link Volume Difference Plot (2026 AM) – Project Case vs Base Case

The Annual Average Daily Traffic (AADT) forecasts from the traffic model, for the M5 Hammondville Toll Plaza, are shown in Table 8-2 and Figure 8-2.

Table 8-2 AADT Forecast on M5 Hammondville Toll Plaza (Two-way Total)

Scenario	2006 Modelled	2016 Modelled	2026 Modelled
Base	85,300	99,300	113,700
Project		111,200	136,100
Difference		11,900	22,400

These model forecasts demonstrate a 12% increase in AADT in the Project Case above the Base Case in 2016. By 2026, a 20% increase is experienced. This elevated growth is perceived to be as a result of congestion constraints in other parts of the network by

2026, thus making the M5 South West Motorway a more attractive route choice option due to its additional capacity.

Thus outcomes from the modelling show that improvements to the motorway will encourage a transfer of traffic from competing arterial roads to the benefits of other users.

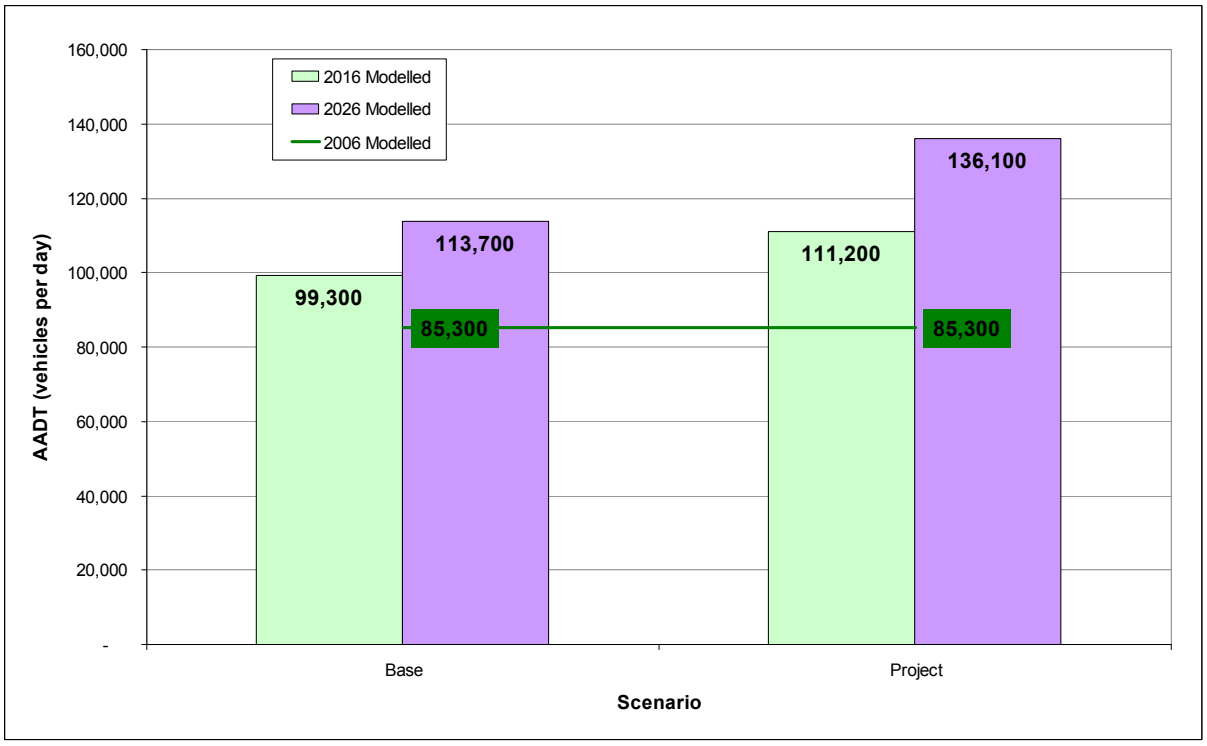


Figure 8-2 – M5 Hammondville Toll Plaza Traffic Forecast (AADT)

8.2 Traffic Volumes Changes – Base Case and Project Case

8.2.1 M5 South West Motorway and Alternative Route

Table 8-3 provides a summary of the forecast increases in traffic volumes between the Base Case and Project Case.

Table 8-3 M5 Hammondville Toll Plaza Volume Comparison

Scenario	Eastbound				Westbound			
	Base	Project	Diff	% Diff	Base	Project	Diff	% Diff
2016 AM	3,420	3,960	540	16%	3,690	4,170	480	13%
2016 IP	2,690	2,800	110	4%	2,810	2,960	150	5%
2016 PM	3,510	3,850	340	10%	4,090	4,970	880	22%
2026 AM	4,000	4,930	930	23%	3,960	4,840	880	22%
2026 IP	3,300	3,680	380	12%	3,420	3,950	530	15%
2026 PM	3,930	4,620	690	18%	4,530	5,840	1,310	29%

As expected, the Project results in significant growth in traffic in the peak directions (AM peak eastbound and PM peak westbound). The growth, however, is more significant in the westbound direction (29% compared with 23% in the eastbound direction in 2026). This is a clear reflection of capacity constraints in the eastbound direction (i.e. two lanes in each direction on M5 East) constraining demand in the AM peak.

Table 8-4 to

Table 8-7 present traffic impacts of the Project Case, compared with the Base Case, on key sections of the M5 South West Motorway and Alternative Route.

Table 8-4 Weekday AM Period Traffic Forecasts (Eastbound)

Year	Scenario	M5 South West Motorway			Alternative Route		
		West of Hume Highway	Hammondville Toll Plaza	West of King Georges Road	Hume Highway[1]	Newbridge Road[2]	Canterbury Road[3]
2006	Modelled	3,690	3,020	2,280	3,100	2,810	1,370
2016	Base	4,020	3,420	2,610	3,350	2,940	1,410
	Project	5,200	3,960	2,780	3,300	2,790	1,430
	Difference	1,180	540	170	-50	-150	20
2026	Base	4,470	4,000	3,240	3,860	3,370	1,570
	Project	5,840	4,930	3,300	3,650	3,030	1,630
	Difference	1,370	930	60	-210	-340	60

Note: 1 – West of Terminus St
2 – West of Henry Lawson Drive
3 – West of King Georges Rd

Table 8-5 Weekday AM Period Traffic Forecasts (Westbound)

Year	Scenario	M5 South West Motorway			Alternative Route		
		West of Hume Highway	Hammondville Toll Plaza	West of King Georges Road	Hume Highway[1]	Newbridge Road[2]	Canterbury Road[3]
2006	Modelled	2,940	3,170	2,590	1,590	1,920	1,240
2016	Base	3,430	3,690	3,040	1,780	2,130	1,280
	Project	3,690	4,170	3,240	1,590	1,860	1,280
	Difference	260	480	200	-190	-270	0
2026	Base	3,590	3,960	3,300	1,920	2,500	1,360
	Project	4,270	4,840	3,730	1,740	2,050	1,350
	Difference	680	880	430	-180	-450	-10

Note: 1 – West of Terminus St
2 – West of Henry Lawson Drive
3 – West of King Georges Rd

Table 8-6 Weekday PM Period Traffic Forecasts (Eastbound)

Year	Scenario	M5 South West Motorway	Alternative Route

		West of Hume Highway	Hammondville Toll Plaza	West of King Georges Road	Hume Highway[1]	Newbridge Road[2]	Canterbury Road[3]
2006	Modelled	2,920	3,060	2,930	2,050	2,020	1,380
2016	Base	3,380	3,510	3,230	2,240	2,200	1,440
	Project	3,720	3,850	3,340	2,110	2,040	1,440
	Difference	340	340	110	-130	-160	0
2026	Base	3,780	3,930	3,520	2,430	2,560	1,510
	Project	4,370	4,620	3,660	2,210	2,220	1,530
	Difference	590	690	140	-220	-340	20

Note: 1 – West of Terminus St
2 – West of Henry Lawson Drive
3 – West of King Georges Rd

Table 8-7 Weekday PM Period Traffic Forecasts (Westbound)

Year	Scenario	M5 South West Motorway			Alternative Route		
		West of Hume Highway	Hammondville Toll Plaza	West of King Georges Road	Hume Highway[1]	Newbridge Road[2]	Canterbury Road[3]
2006	Modelled	3,760	3,740	2,860	2,840	2,720	1,710
2016	Base	4,080	4,090	3,240	3,300	3,040	1,790
	Project	5,240	4,970	3,610	3,070	2,670	1,800
	Difference	1,160	880	370	-230	-370	10
2026	Base	4,280	4,530	3,790	3,610	3,710	1,960
	Project	5,740	5,840	4,460	3,430	3,120	2,030
	Difference	1,460	1,310	670	-180	-590	70

Note: 1 – West of Terminus St
2 – West of Henry Lawson Drive
3 – West of King Georges Rd

The forecasts show that the widening of the M5 South West Motorway will make it a more attractive option for those vehicles that would otherwise use the Alternative Route. As a result, on average, the modelled traffic volumes on the Alternative Route are found to decrease by 5.6% in the AM peak eastbound direction and 11.1% in the westbound direction (PM peak 8.3% decrease eastbound, 7.5% decrease westbound) in 2026.

Conversely, significant forecast increases in traffic volumes are observed on the M5 South West Motorway. Notably, the increase in traffic declines relatively as the M5 South West Motorway progresses east from the toll plaza. In the AM peak eastbound direction (2026) the percentage increase in traffic volumes is 31% west of Hume Highway, to 23% at the toll plaza, and 2% west of King George's Road.

Overall the Project is predicted to be successful in diverting traffic away from the primary Alternate Route in comparison to the base case. In comparison, the congested conditions experienced on the motorway without the M5 West Widening Project result in traffic diverting away from the motorway.

8.2.2 Feeder Routes

Table 8-8 to Table 8-10 provide a comparison of predicted traffic volumes on M5 South West Motorway feeder/cross routes between the Base Case and the Project Case. The results illustrate a mixture of increases and decreases in traffic volumes on the north/south routes intersecting the motorway. The combined impact across all links, and in both directions, is of a slight (around 1% in the AM peak) decrease in traffic on the feeder routes assessed, demonstrating that the M5 West Widening Project does not have an adverse effect on these routes overall.

Total traffic flows through the point where these routes intersect with the M5 South West Motorway remain relatively unchanged despite some variation in directional flow volumes.

A number of roads on the northern side of the motorway, including Moorebank Avenue, Heathcote Road, Henry Lawson Drive and River Road, are found to experience an increase in traffic volumes travelling northbound during the AM peak. This indicates that a significant proportion of the additional traffic using the motorway in the Project Case will exit the motorway in advance of the M5 East in order to reach their destinations. For example, on King Georges Road there is an increase in traffic flow both northbound and southbound leading towards the M5 South West Motorway in all time periods in 2026. This pattern of travel suggests that the M5 Widening Project will service a substantial number of trips that do not utilise the M5 East and provides further justification of the project independent of M5 East duplication.

The results also illustrate that traffic adapts to the improved efficiency of the M5 South West Motorway, by diverting traffic from feeder routes onto motorway within their route, indicating a preference to travel further on the M5 South West Motorway prior to continuing south.

There is an observed reduction in traffic on the Hume Highway in all time periods, which reflects the improved operational conditions on the M5 South West Motorway between the M7 and Hume Highway interchanges. That is, in the Project Case trips that had previously avoided this section of congested motorway are joining the motorway either at the Camden Valley Way or the M7 interchanges.

Table 8-8 M5 West Feeder Route Volume Comparison - Weekday AM

Road	Direction	2016			2026		
		Base	Project	Diff	Base	Project	Diff
Camden Valley Way – West of M5	EBD	1,520	1,600	80	1,950	2,080	130
Camden Valley Way – West of M5	WBD	1,170	1,190	20	1,300	1,320	20
Camden Valley Way – East of M5	EBD	2,340	2,060	-280	2,790	2,350	-440
Camden Valley Way – East of M5	WBD	1,180	1,320	140	1,370	1,460	90
Hume Hway – North of M5	NBD	3,200	3,180	-20	3,560	3,420	-140
Hume Hway – North of M5	SBD	1,870	1,680	-190	1,990	1,830	-160
Hume Hway – South of M5	NBD	3,250	2,860	-390	3,820	3,350	-470
Hume Hway – South of M5	SBD	1,480	1,470	-10	1,810	1,550	-260
Moorebank Ave – North of M5	NBD	2,110	2,230	120	2,500	2,780	280
Moorebank Ave – North of M5	SBD	790	690	-100	1,110	900	-210
Moorebank Ave – South of M5	NBD	1,010	900	-110	1,280	1,190	-90
Moorebank Ave – South of M5	SBD	740	750	10	800	710	-90
Heathcote Rd – North of M5	NBD	1,170	1,190	20	1,210	1,160	-50
Heathcote Rd – North of M5	SBD	290	370	80	300	420	120
Heathcote Rd – South of M5	NBD	1,750	1,730	-20	1,640	1,660	20
Heathcote Rd – South of M5	SBD	1,110	1,140	30	1,110	1,190	80
Henry Lawson Dr – North of M5	NBD	850	970	120	850	920	70
Henry Lawson Dr – North of M5	SBD	700	720	20	750	720	-30
Henry Lawson Dr – South of M5	NBD	770	750	-20	850	810	-40
Henry Lawson Dr – South of M5	SBD	1,000	1,000	0	1,010	1,020	10
The River Rd – North of M5	NBD	1,190	1,230	40	1,230	1,350	120
The River Rd – North of M5	SBD	500	520	20	490	510	20
The River Rd – South of M5	NBD	1,130	1,110	-20	1,210	1,220	10
The River Rd – South of M5	SBD	460	500	40	480	520	40
Fairford Rd – North of M5	NBD	2,940	2,960	20	3,030	3,240	210
Fairford Rd – North of M5	SBD	1,790	1,880	90	1,890	1,970	80
Fairford Rd – South of M5	NBD	2,890	2,900	10	2,990	2,950	-40
Fairford Rd – South of M5	SBD	1,630	1,610	-20	1,760	1,750	-10
Belmore Rd – North of M5	NBD	1,230	1,230	0	1,280	1,280	0
Belmore Rd – North of M5	SBD	840	840	0	850	870	20
Belmore Rd – South of M5	NBD	1,490	1,500	10	1,520	1,520	0
Belmore Rd – South of M5	SBD	970	960	-10	990	1,010	20
King Georges Rd – North of M5	NBD	2,970	2,940	-30	2,900	2,780	-120
King Georges Rd – North of M5	SBD	2,170	2,130	-40	1,980	2,040	60
King Georges Rd – South of M5	NBD	2,430	2,480	50	2,710	2,780	70
King Georges Rd – South of M5	SBD	1,920	1,920	0	2,250	2,200	-50

Table 8-9 M5 West Feeder Route Volume Comparison - Weekday IP

Road	Direction	2016			2026		
		Base	Project	Diff	Base	Project	Diff
Camden Valley Way – West of M5	EBD	1,160	1,170	10	1,390	1,420	30
Camden Valley Way – West of M5	WBD	1,010	1,020	10	1,180	1,200	20
Camden Valley Way – East of M5	EBD	1,170	1,150	-20	1,420	1,290	-130
Camden Valley Way – East of M5	WBD	1,040	1,040	0	1,190	1,270	80
Hume Hway – North of M5	NBD	1,700	1,690	-10	1,920	1,850	-70
Hume Hway – North of M5	SBD	1,890	1,870	-20	2,090	2,000	-90
Hume Hway – South of M5	NBD	1,510	1,480	-30	1,730	1,570	-160
Hume Hway – South of M5	SBD	1,680	1,610	-70	1,980	1,790	-190
Moorebank Ave – North of M5	NBD	870	890	20	1,150	1,220	70
Moorebank Ave – North of M5	SBD	770	790	20	980	1,060	80
Moorebank Ave – South of M5	NBD	630	620	-10	710	700	-10
Moorebank Ave – South of M5	SBD	580	580	0	660	630	-30
Heathcote Rd – North of M5	NBD	500	510	10	510	580	70
Heathcote Rd – North of M5	SBD	380	380	0	410	410	0
Heathcote Rd – South of M5	NBD	970	970	0	1,060	1,060	0
Heathcote Rd – South of M5	SBD	900	910	10	930	970	40
Henry Lawson Dr – North of M5	NBD	550	560	10	590	610	20
Henry Lawson Dr – North of M5	SBD	540	540	0	560	580	20
Henry Lawson Dr – South of M5	NBD	550	550	0	620	590	-30
Henry Lawson Dr – South of M5	SBD	530	540	10	570	570	0
The River Rd – North of M5	NBD	700	700	0	770	790	20
The River Rd – North of M5	SBD	530	550	20	560	550	-10
The River Rd – South of M5	NBD	750	750	0	850	860	10
The River Rd – South of M5	SBD	580	590	10	630	650	20
Fairford Rd – North of M5	NBD	1,820	1,860	40	1,990	2,120	130
Fairford Rd – North of M5	SBD	1,990	2,010	20	2,170	2,240	70
Fairford Rd – South of M5	NBD	2,000	2,020	20	2,100	2,070	-30
Fairford Rd – South of M5	SBD	2,020	2,010	-10	2,140	2,100	-40
Belmore Rd – North of M5	NBD	930	930	0	1,020	1,020	0
Belmore Rd – North of M5	SBD	900	900	0	930	950	20
Belmore Rd – South of M5	NBD	1,030	1,030	0	1,090	1,080	-10
Belmore Rd – South of M5	SBD	970	970	0	1,000	1,010	10
King Georges Rd – North of M5	NBD	2,280	2,260	-20	2,440	2,360	-80
King Georges Rd – North of M5	SBD	2,160	2,160	0	2,290	2,300	10
King Georges Rd – South of M5	NBD	1,840	1,860	20	2,130	2,220	90
King Georges Rd – South of M5	SBD	1,640	1,630	-10	1,930	1,890	-40

Table 8-10 M5 West Feeder Route Volume Comparison - Weekday PM

Road	Direction	2016			2026		
		Base	Project	Diff	Base	Project	Diff
Camden Valley Way – West of M5	EBD	1,540	1,570	30	1,670	1,770	100
Camden Valley Way – West of M5	WBD	1,500	1,570	70	1,860	1,890	30
Camden Valley Way – East of M5	EBD	1,890	1,860	-30	2,070	1,970	-100
Camden Valley Way – East of M5	WBD	1,390	1,560	170	1,810	1,920	110
Hume Hway – North of M5	NBD	2,100	1,980	-120	2,210	2,010	-200
Hume Hway – North of M5	SBD	3,050	2,900	-150	3,230	3,090	-140
Hume Hway – South of M5	NBD	1,820	1,700	-120	2,050	1,850	-200
Hume Hway – South of M5	SBD	3,340	2,840	-500	4,070	3,460	-610
Moorebank Ave – North of M5	NBD	830	830	0	1,140	1,050	-90
Moorebank Ave – North of M5	SBD	1,910	2,080	170	2,590	2,540	-50
Moorebank Ave – South of M5	NBD	730	750	20	840	790	-50
Moorebank Ave – South of M5	SBD	1,360	1,330	-30	1,630	1,490	-140
Heathcote Rd – North of M5	NBD	520	620	100	520	750	230
Heathcote Rd – North of M5	SBD	840	740	-100	800	760	-40
Heathcote Rd – South of M5	NBD	1,500	1,480	-20	1,480	1,460	-20
Heathcote Rd – South of M5	SBD	1,590	1,660	70	1,530	1,590	60
Henry Lawson Dr – North of M5	NBD	520	530	10	580	590	10
Henry Lawson Dr – North of M5	SBD	880	900	20	920	910	-10
Henry Lawson Dr – South of M5	NBD	740	720	-20	860	770	-90
Henry Lawson Dr – South of M5	SBD	790	800	10	880	890	10
The River Rd – North of M5	NBD	940	970	30	1,050	1,040	-10
The River Rd – North of M5	SBD	970	1,020	50	930	960	30
The River Rd – South of M5	NBD	950	1,000	50	990	1,040	50
The River Rd – South of M5	SBD	860	870	10	900	940	40
Fairford Rd – North of M5	NBD	2,350	2,410	60	2,360	2,590	230
Fairford Rd – North of M5	SBD	3,320	3,510	190	3,390	3,580	190
Fairford Rd – South of M5	NBD	2,250	2,260	10	2,340	2,290	-50
Fairford Rd – South of M5	SBD	3,020	2,950	-70	3,250	3,210	-40
Belmore Rd – North of M5	NBD	1,030	1,040	10	1,080	1,080	0
Belmore Rd – North of M5	SBD	1,300	1,360	60	1,310	1,500	190
Belmore Rd – South of M5	NBD	1,090	1,080	-10	1,130	1,120	-10
Belmore Rd – South of M5	SBD	1,420	1,410	-10	1,430	1,400	-30
King Georges Rd – North of M5	NBD	2,580	2,500	-80	2,530	2,290	-240
King Georges Rd – North of M5	SBD	2,700	2,750	50	2,810	2,870	60
King Georges Rd – South of M5	NBD	2,310	2,370	60	2,610	2,740	130
King Georges Rd – South of M5	SBD	2,430	2,390	-40	2,650	2,610	-40

8.3 Travel Pattern - Select Link Analysis

8.3.1 Cars

The origins and destinations of the M5 South West users in the Project Case are similar to the Base Case.

The majority of the M5 South West Motorway users in the AM Peak; as shown in Figure 8-3, Figure 8-4, Table 8-11 and Table 8-12, are travelling between Outer South Western Sydney/Fairford-Liverpool and Canterbury-Bankstown/ St George-Sutherland /Inner Sydney through F5, M5 South West and M5 East.

AM Peak car users of Newbridge Road users mainly consist of local traffic connecting Fairford-Liverpool area and Canterbury-Bankstown/Inner Western Sydney areas through Liverpool Road, Punchbowl Road and Canterbury Road.

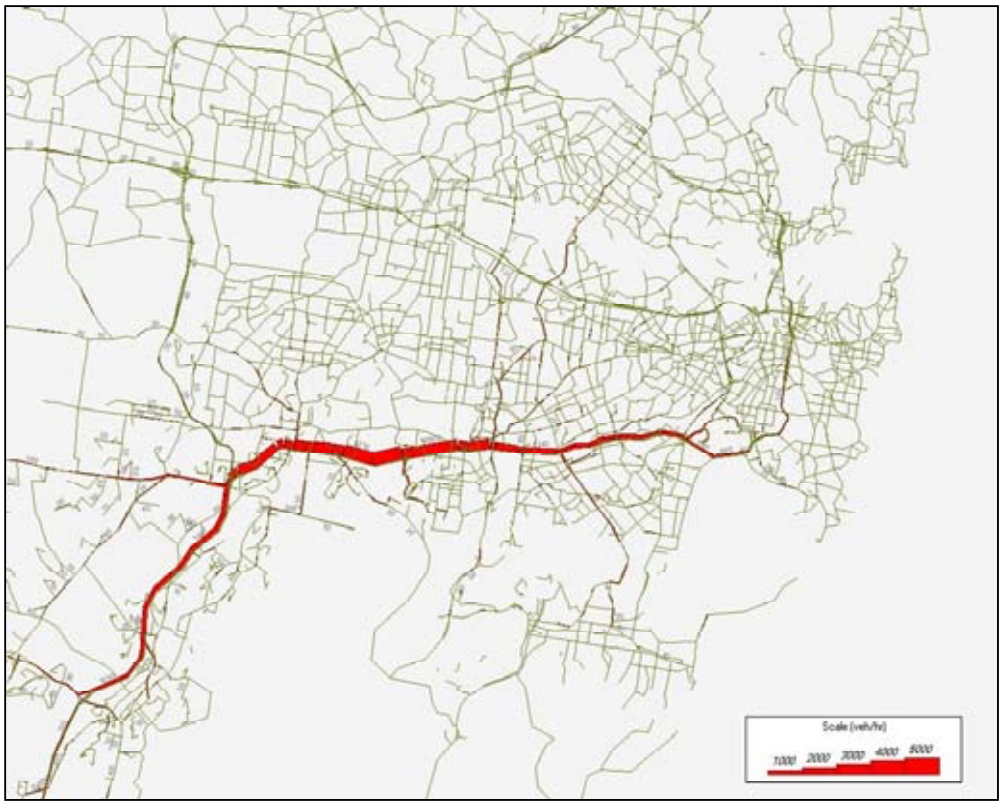


Figure 8-3 – 2026 AM Car Driver Travel Pattern - M5 West Hammondville Toll Plaza eastbound User

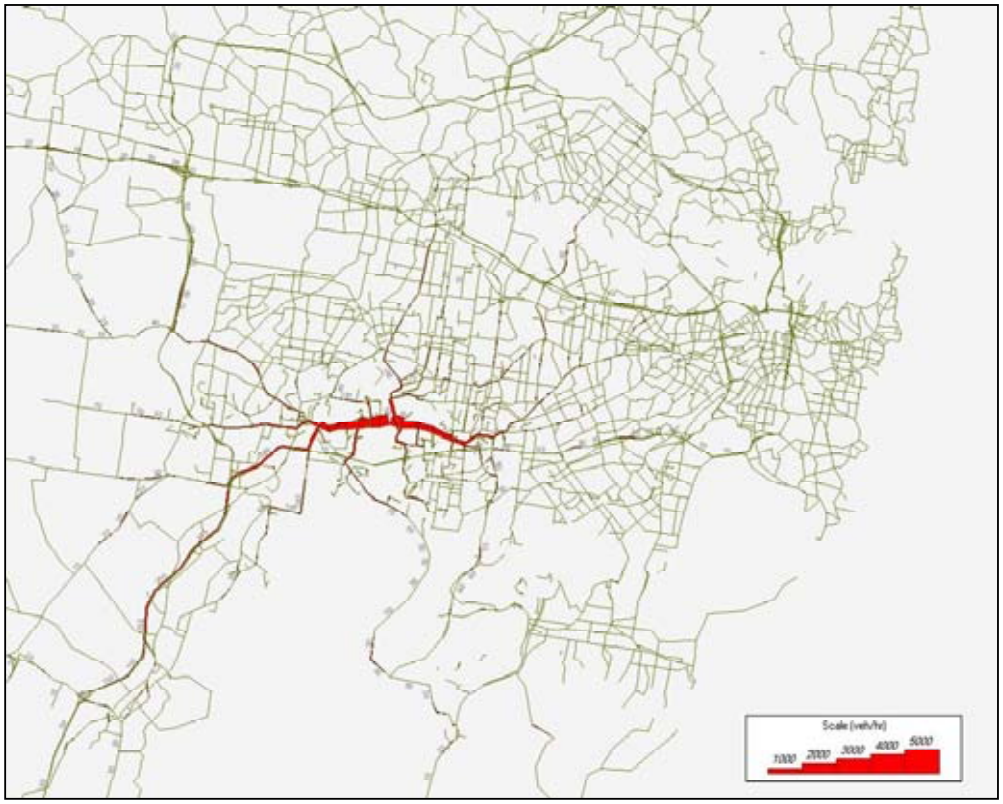


Figure 8-4 – 2026 AM Car Driver Travel Pattern – Newbridge Road Eastbound User

Table 8-11 2026 AM Origin of Eastbound Car Driver Trips

Area	M5 Toll Plaza	Newbridge Rd
Fairfield-Liverpool	43%	76%
Outer South Western Sydney	51%	16%
Other	7%	7%

Table 8-12 2026 AM Destination of Eastbound Car Driver Trips

Area	M5 Toll Plaza	Newbridge Rd
Canterbury-Bankstown	29%	73%
Inner Sydney	21%	2%
Eastern Suburbs	4%	0%
St George-Sutherland	28%	5%
Inner Western Sydney	5%	4%
Central Western Sydney	5%	12%
Other	8%	4%

Table 8-13 and Table 8-14 present the exit and entry points for the traffic gaining access to the M5 and travelling through the M5 Hammondville Toll Plaza. These tables show that, with the M5 West Widening Project, a higher percentage of Toll Plaza users use the Fairford Road ramps to enter/exit the M5 South West Motorway.

Of note, is that the modelling shows that in the Base Case approximately 40 percent of M5 South West Users (defined as having travelled through the Hammondville Toll Plaza) in the peak direction also use the M5 East, with the remaining 60 percent using of the western part of the M5 motorway only. In the Project Case, the number of vehicles using the M5 South West Motorway only increases as a proportion of total trips. This indicates that the additional traffic attracted to M5 South West has more local destinations, and therefore underlines the importance of the M5 South West Motorway as distinct from the M5 East, strengthening the justification for the widening project.

Table 8-13 Exit Points of M5 Toll Plaza Eastbound Users (2026 AM Cars)

Location	Base	Base	Project	Project
M5 Toll Plaza (entry point)	3537	100%	4213	100%
Henry Lawson Drive	482	14%	615	15%
The River Road	227	6%	340	8%
Fairford Road	494	14%	803	19%
Belmore Road	280	8%	314	7%
King Georges Road	451	13%	486	12%
Kingsgrove Road	195	6%	219	5%
M5 East	1409	40%	1436	34%

Table 8-14 Entry Points of M5 Toll Plaza Westbound Users (2026 PM Cars)

Location	Base	Base	Project	Project
M5 Toll Plaza (exit point)	4215	100%	5271	100%
Henry Lawson Drive	414	10%	378	7%
The River Road	86	2%	323	6%
Fairford Road	478	11%	869	16%
Belmore Road	297	7%	516	10%
King Georges Road	737	17%	884	17%
Kingsgrove Road	488	12%	529	10%
M5 East	1716	41%	1773	34%

8.3.2 Freight Vehicles

The M5 South West and Newbridge Road truck movements for the AM peak are shown in Figure 8-5 and Figure 8-6, with the associated trip origins and destinations summarised in Table 8-15 and Table 8-16.

In contrast to the private vehicle movements, the majority of the M5 South West Motorway commercial users in the AM Peak travel between Outer South Western Sydney/Fairford-Liverpool and the Inner Sydney/Eastern Suburbs through M7, F5, M5 South West and M5 East.

High proportions of the M5 South West commercial users are travelling to/from Port Botany area. Commercial vehicles travelling in the AM Peak along Newbridge Road users are travelling between Blacktown/Outer South West/Fairfield-Liverpool areas and Canterbury-Bankstown areas through F5/M7, Liverpool Road, Punchbowl Road, Canterbury Road, and the M5 East.

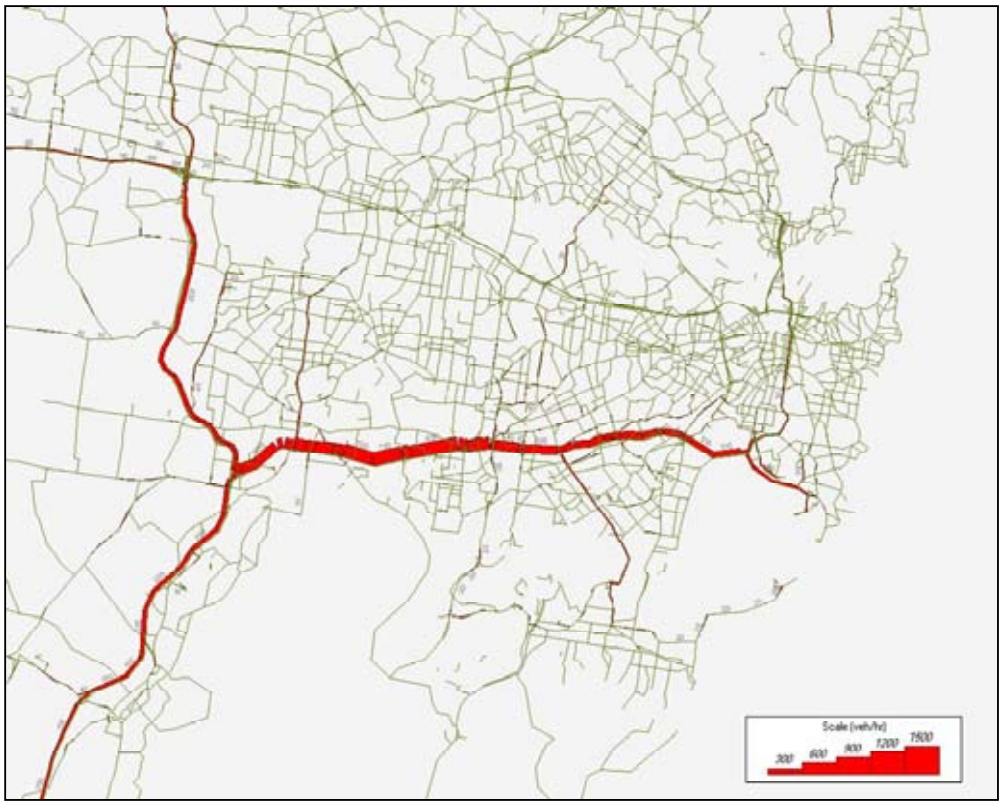


Figure 8-5 – 2026 AM Truck Travel Pattern - M5 West Hammondville Toll Plaza Eastbound User

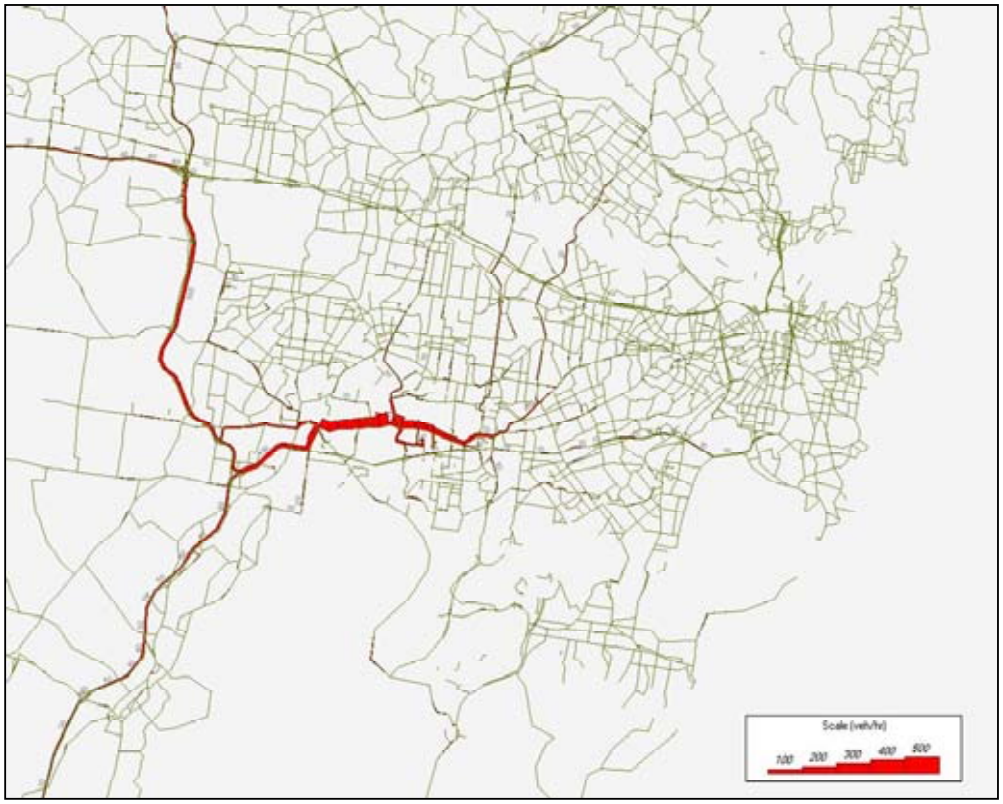


Figure 8-6 – 2026 AM Truck Travel Pattern – Newbridge Road Eastbound User

Table 8-15 2026 AM Origin of Eastbound Truck Trips

Area	M5 Toll Plaza	Newbridge Rd
Fairfield-Liverpool	27%	51%
Outer South Western Sydney	16%	15%
Central Western Sydney	5%	0%
Outer Western Sydney	16%	14%
Blacktown	15%	8%
Other	21%	11%

Table 8-16 2026 AM Destination of Eastbound Truck Trips

Area	M5 Toll Plaza	Newbridge Rd
Canterbury-Bankstown	17%	63%
Inner Sydney	32%	4%
Eastern Suburbs	18%	2%
St George-Sutherland	21%	4%
Inner Western Sydney	3%	9%
Central Western Sydney	2%	8%
Other	8%	11%

Table 8-17 and Table 8-18 summarise the number of M5 Hammondville Toll Plaza users entering/exiting M5. These show that, with the M5 West Widening Project, the proportion of trucks entering or exiting the M5 Southwest Motorway to/from the west increases.

Table 8-17 Exit Points of M5 Toll Plaza Eastbound Users (2026 AM Trucks)

Location	Base	Base	Project	Project
M5 Toll Plaza (entry point)	461	100%	721	100%
Henry Lawson Drive	9	2%	30	4%
The River Road	4	1%	49	7%
Fairford Road	17	4%	104	14%
Belmore Road	24	5%	35	5%
King Georges Road	77	17%	110	15%
Kingsgrove Road	36	8%	40	6%
M5 East	294	64%	354	49%

Table 8-18 Entry Points of M5 Toll Plaza Westbound User (2026 PM Trucks)

Location	Base	Base	Project	Project
M5 Toll Plaza (exit point)	381	100%	571	100%
Henry Lawson Drive	0	0%	4	1%
The River Road	0	0%	0	0%
Fairford Road	1	0%	38	7%
Belmore Road	5	1%	27	5%
King Georges Road	23	6%	103	18%
Kingsgrove Road	35	9%	71	12%
M5 East	253	66%	330	58%

Similar to the pattern noted for private vehicles, the proportion of trucks originating from the M5 East declines under the Project Case, again indicating that additional commercial traffic attracted to M5 South West have a more local orientation.

8.4 Network Performance

8.4.1 Operational Statistics

The operational statistics for the study area are presented in Table 8-19 and

Table 8-20.

Table 8-19 Study Area Operational Statistics (AM Peak)

Scenario	VKT (vehicle km)		VHT (vehicle hours)		Speed (km per hour)	
	2016	2026	2016	2016	2026	2026
Base	1,136,700	1,257,000	37,200	46,100	30.6	27.3
Project	1,148,700	1,274,500	36,700	45,100	31.3	28.3
Difference	12,000	17,500	-500	-1,000	0.7	1.0

Table 8-20 Study Area Operational Statistics (PM Peak)

Scenario	VKT (vehicle km)		VHT (vehicle hours)		Speed (km per hour)	
	2016	2026	2016	2016	2026	2026
Base	1,180,800	1,319,700	38,100	49,700	31.0	26.6
Project	1,193,900	1,337,000	37,400	48,500	31.9	27.6
Difference	13,100	17,300	-700	-1,200	0.9	1.0

The results show that across the whole network the implementation of the Project provides an overall marginal increase in vehicle kilometres travelled (VKT) along with an observed reduction in vehicle hours travelled (VHT), indicating improvements in Sydney wide journey times. This is confirmed by the traffic speed forecasts, which show some improvements in average travel speeds following the widening of the M5 South West Motorway.

In general terms, the modelling shows that the Project Case attracts vehicles from other routes as a result of improved journey times along the M5 Southwest Motorway.

Table 8-21 to Table 8-23 present the operational statistics for the M5 motorway in its entirety, including the M5 South West and M5 East, for each of the modelled time periods. The extent of the corridor is illustrated in Figure 6-11.

Table 8-21 M5 Motorway Operational Statistics (AM Peak)

Scenario	VKT (vehicle km)		VHT (vehicle hours)		Average Speed (km/h)	
	2016	2026	2016	2026	2016	2026
Base	179,780	195,960	3,800	5,160	47.3	38.0
Project	197,510	224,470	3,650	4,830	54.1	46.5
Difference	17,730	28,510	-150	-330	0.1	0.1

Table 8-22 M5 Motorway Operational Statistics (Inter Peak)

Scenario	VKT (vehicle km)		VHT (vehicle hours)		Average Speed (km/h)	
	2016	2026	2016	2026	2016	2026
Base	146,740	170,730	2,580	3,570	56.9	47.9
Project	150,920	185,850	2,540	3,430	59.5	54.2
Difference	4,180	15,120	-40	-140	3	6

Table 8-23 M5 Motorway Operational Statistics (PM Peak)

Scenario	VKT (vehicle km)		VHT (vehicle hours)		Average Speed (km/h)	
	2016	2026	2016	2026	2016	2026
Base	190,530	208,070	4,040	5,690	47.2	36.6
Project	211,290	240,170	3,800	5,340	55.6	45.0
Difference	20,760	32,100	-240	-350	8	8

The results follow the same trend as the study area network statistics but, as might be expected, the impacts observed along the M5 corridor are more pronounced. In 2026 the Project results in an increase in VKT of 15% in both the AM and PM peak periods (9% in the Inter peak) with corresponding reductions in VHT of 6% (4% in the inter peak). Notably, travel speeds increase more significantly in the PM peak time period.

8.5 Travel Speeds and Travel Times

Table 8-24 to
Table 8-27 report summary journey time information for the M5 South West Motorway and the Alternative Route for the AM and PM peak periods.

Table 8-24 2016 AM Peak Average Travel Times

Scenario	Eastbound		Westbound	
	M5SWM[1]	Alternative Route	M5SWM[1]	Alternative Route
Base	21.8	37.7	20.3	31.1
Project	18.3	36.2	17.0	30.0
% change	-16.1%	-4.0%	-16.3%	-3.5%

Note: 1 M5SWM – M5 South West Motorway

Table 8-25 2016 PM Peak Average Travel Times

Year	Eastbound		Westbound	
	M5SWM[1]	Alternative Route	M5SWM[1]	Alternative Route
Base	19.4	31.9	27.0	36.9
Project	17.5	31.1	20.5	34.4
% change	-9.8%	-2.5%	-24.1%	-6.8%

Note: 1 M5SWM – M5 South West Motorway

Table 8-26 2026 AM Peak Average Travel Times

Scenario	Eastbound		Westbound	
	M5SWM[1]	Alternative Route	M5SWM[1]	Alternative Route
Base	31.6	43.6	24.5	34.0
Project	24.5	40.7	18.9	31.8
% change	-22.5%	-6.7%	-22.9%	-6.5%

Note: 1 M5SWM – M5 South West Motorway

Table 8-27 2026 PM Peak Average Travel Times

Year	Eastbound		Westbound	
	M5SWM[1]	Alternative Route	M5SWM[1]	Alternative Route
Base	24.7	34.8	36.6	43.0
Project	20.0	33.2	27.2	39.0
% change	-19.0%	-4.6%	-25.7%	-9.3%

Note: 1 M5SWM – M5 South West Motorway

During the morning peak period, the travel time on M5 South West Motorway eastbound between Camden Valley Way and King Georges Road is forecast to reduce from 22 to 18 minutes in 2016 and from 32 to 25 minutes in 2026. Additionally, given the diversion of traffic from the Alternative Routes onto the widened M5, the modelling results show the morning peak eastbound travel time on the Alternative Route reduce from 38 to 36 minutes in 2016 and from 44 to 41 minutes in 2026.

The M5 South West Motorway eastbound travel speeds between Camden Valley Way and King Georges Road are forecast to increase from 56 km/hr to 67 km/hr in 2016 and from 39km/hr to 50 km/hr in 2026. The modelling results indicate that the M5 West Widening Project would not only reduce congestion on the M5 South West Motorway, but also reduce congestion on the arterial/local roads at the south western and inner south-west suburbs. This is illustrated by improved travel speeds experienced in the Project Case as derived through the modelling.

8.6 Impacts on Pedestrians and Cyclists

The proposed widening of the M5 South West Motorway is not envisaged to have any significant impacts on pedestrian and cyclist amenity or access. The motorway shoulder is the primary bicycle facility in both directions and this will remain unchanged following the widening project.

Existing connections to the motorway are sufficient for those cyclists who are comfortable cycling in close proximity to high speed and with high volumes of traffic (rather than family groups or unfamiliar recreational cyclists, for example).

The Local Councils in the vicinity of the M5 South West Motorway maintain their own bicycle plans catering for non-regular cyclists, and are focused on providing recreational cycling and access to town centres, public transport and education for other bicycle riders.

The final configuration of the motorway will maintain existing levels of access for bicycles along the corridor and for pedestrians and bicycles across the corridor. As such, the Project will not significantly impact on pedestrian and bicycle safety and amenity.

The impact of construction on pedestrian and cyclist amenity is assessed in Section 10.

Opportunities to improve integration and connectivity with the surrounding network have been assessed and are reported separately.

8.7 Freight Vehicle Impacts

Table 8-28 presents a summary of modelled impacts of the Project on freight vehicle (truck) traffic volumes for both the M5 South West Motorway and for the main Alternative Route.

Table 8-28 Modelled Impacts of the Project on Freight Vehicle

Year	Scenario	M5 - Hammondville Toll Plaza			Newbridge Road - West of Henry Lawson Drive		
		Total	Truck	% Truck	Total	Truck	% Truck
2016	Base Case	99,300	8,100	8%	68,700	7,100	10%
2016	Project	111,200	10,500	9%	63,50	6,500	10%
2026	Base Case	113,700	9,600	8%	79,900	10,500	13%
2026	Project	136,100	14,500	11%	69,500	9,300	13%

The model forecasts show that the proportion of trucks increases steadily on both the M5 South West Motorway and the Alternative Route – by 3% in both cases (when comparing the 2016 Base Case and 2026 Project Case). However, the actual truck

volumes are forecast to increase by 79% on the motorway and 31% on the Alternative Route, demonstrating the attractiveness of the motorway to commercial vehicle operators, despite the toll payment, and thus achieving one of the primary strategic objectives for the corridor - to aid the movement of freight.

A comparison of the Project Case to Base Case in 2026 shows that the increase in truck volumes on the M5 South West Motorway is forecast to be in the order of 51% as a direct result of the Project, brought about as the improved motorway offers a more efficient route choice option for existing and future freight demand.

Furthermore, it is also understood that for some producers the benefit to the entire production system can be greater than the direct change in travel costs[17]. Cumulatively this can result in wider economic benefits through stimulating productivity and industry competition.

8.8 Induced Traffic Assessment

A potential undesirable outcome of any road project is to generate additional traffic on the road network at the expense of other travel modes and the environment. There are two sources of possible additional traffic:

- Mode shift – people switching from public transport to private car
- New trips – newly created trip opportunities

To determine the level of mode shift and new trips, the Bureau of Transport Statistics (BTS) undertook two model runs using the Sydney Travel Model (STM), with and without the Project. Table 8-29 to Table 8-32 summarise the resulting estimates of generated trips from and to South Western Sydney, where South Western Sydney includes Bankstown, Fairfield, Liverpool, Campbelltown and Camden.

[17] Mackie P J and Tweddle G, 1993, Measuring the Benefits Gained by Industry from Road Network Improvements, ITS University of Leeds, Working Paper 391.

Table 8-29 Change in Trip Production of South Western Sydney in 2016

Time Period	Mode	Person Trips Produced *		% Difference
		No M5W Widening	M5W Widening	
AM	Public Transport	60,500	60,300	-0.3%
	Private Vehicle	370,900	371,400	0.1%
IP	Public Transport	51,400	51,200	-0.4%
	Private Vehicle	718,900	720,200	0.2%
PM	Public Transport	42,800	42,700	-0.2%
	Private Vehicle	607,300	608,300	0.2%

* 2-hr average trips generated from SLAs in Bankstown, Fairfield, Liverpool, Campbelltown and Camden to all SLAs in the model

Table 8-30 Change in Trip Attraction of South Western Sydney in 2016

Time Period	Mode	Person Trips Attracted *		% Difference
		No M5W Widening	M5W Widening	
AM	Public Transport	38,900	38,800	-0.3%
	Private Vehicle	367,200	367,800	0.2%
IP	Public Transport	45,300	45,100	-0.4%
	Private Vehicle	718,400	719,800	0.2%
PM	Public Transport	61,300	61,100	-0.3%
	Private Vehicle	610,500	611,500	0.2%

* 2-hr average trips attracted to SLAs in Bankstown, Fairfield, Liverpool, Campbelltown and Camden from all SLAs in the model

Table 8-31 Change in Trip Production of South Western Sydney in 2026

Time Period	Mode	Person Trips Produced *		% Difference
		No M5W Widening	M5W Widening†	
AM	Public Transport	78,100	77,500	-0.8%
	Private Vehicle	449,500	450,900	0.3%
IP	Public Transport	64,200	63,900	-0.5%
	Private Vehicle	880,900	882,000	0.1%
PM	Public Transport	52,300	52,200	-0.2%
	Private Vehicle	737,400	737,800	0.1%

* 2-hr average trips generated from SLAs in Bankstown, Fairfield, Liverpool, Campbelltown and Camden to all SLAs in the model

† With M5 East Duplication (no toll) in 2026

Table 8-32 Change in Trip Attraction of South Western Sydney in 2026

Time Period	Mode	Person Trips Attracted *		% Difference
		No M5W Widening	M5W Widening†	
AM	Public Transport	47,500	47,400	-0.2%
	Private Vehicle	443,000	443,100	0.0%
IP	Public Transport	56,000	55,800	-0.4%
	Private Vehicle	880,300	881,200	0.1%
PM	Public Transport	78,200	77,700	-0.6%
	Private Vehicle	743,600	745,200	0.2%

* 2-hr average trips attracted to SLAs in Bankstown, Fairfield, Liverpool, Campbelltown and Camden from all SLAs in the model

† With M5 East Duplication (no toll) in 2026

Analysis of the STM model results, at a strategic level, shows that the M5 West Widening Project produces a forecast increase in private vehicle trips of between 0.1% and 0.3% from South Western Sydney areas including Bankstown, Fairfield, Liverpool, Campbelltown, and Camden. This is greatest in the PM peak two hour period whereby there is an additional 1,600 person trips made by car in 2026. Given average car occupancy of 1.2 (BTS rate), this represents approximately 1,300 additional vehicle trips on the regional road network. Some of this is attributable to diversion (mode shift) from public transport, which is estimated to drop between 0.2% and 0.8%, depending on year and time period. However, given the strategic nature of the model and the acutely small changes in demand reported above, such precise results cannot be relied upon for a high degree of accuracy and the overall impact is considered to be negligible.

The assessment of the impacts of the widening project included induced traffic effects.

With respect to the freight task and resultant commercial trip making, the demand is driven by entirely different factors than for private travel. It is widely perceived that commercial travel is relatively inelastic with respect to the generalised cost of travel - where this constitutes a relatively small part of the overall production system costs and the associated need for transport. Subsequently, the M5 Widening Project is not expected to alter the demand for commercial travel.

8.9 Public Transport Impacts

8.9.1 Existing Bus Services in the Study Area

With the improved travel speeds on the M5 South West Motorway and the subsequent attraction of some of the traffic away from the Alternative Route, the reduced demand on that route, coupled with its own improved travel speeds, are expected to improve conditions for buses using or crossing that route.

It is anticipated that reduction in traffic volumes of 5.6% in the AM peak eastbound direction in 2026 on the Alternative Route will provide a reduction in travel time on that route (forecast to reduce by 6.7%).

Improved travel conditions on the Alternative Route will benefit Strategic Bus Corridors (SBCs) 25, 28 and 33. SBC 31, which runs along the Hume Highway, will benefit from reduced traffic demand along this link as a result of the Project.

SCBs 23 and 25 cover Fairford Road and King Georges Road respectively. The intersections with both of these roads and the M5 South West Motorway will experience some reduction in traffic volumes in the direction travelling away from the motorway, i.e. northbound traffic north of the motorway and southbound traffic south of the motorway, which will benefit bus journey times. However, there are also forecast increases in volumes for traffic travelling towards the motorway which will result in disbenefits to bus journey times in those directions.

It is noted that improvements in the road network will make travel by car through the study area a relatively more attractive travel choice thus providing an impetus for modal shift. However, given the routes taken by buses in the corridor there is thought to be limited scope for direct competition between existing bus services and the M5 South West Motorway, rather the parallel rail service is considered a better substitute for travel by car. Notwithstanding, the forecast level of induced demand as described above has been assessed as negligible.

8.9.2 Improved Public Transport Provision

Reduced car volumes and travel times on the Alternative Route present an opportunity to implement bus priority measures that exploit this increased capacity.

There are a number of existing bus priority measures within the study area that have been implemented with varying degrees of success, although all are claimed to have made improvements to operating journey times for buses. These measures include:

- Heathcote Road and Moorebank Avenue – bus "B" priority installed at the traffic signals
- Chapel Road South and New Canterbury Road northern approach – bus "B" priority and associated intersection improvements, when installed resulted in significant reduction in delays at the intersection for buses
- Milperra Road and Edgar St eastbound – bus "B" priority at the traffic signals
- Milperra Rd westbound at Henry Lawson Dr – bus "B" priority at the traffic signals
- Bus lane on Fairford Road, northbound between Gow Street and Stacey Street – marked bus lane which makes use of the former breakdown lane on the overpass, allowing buses to bypass existing queues

Experience suggests that all bus "B" priority measures perform well when implemented properly, although this does require appropriate training for bus drivers.

Suitable locations for bus priority measures within the study area might include:

- The River Road northbound at Canterbury Road (4 Bankstown bound bus routes), AM peak period queuing
- Gibbon Ave northbound at Canterbury Road 2 northbound bus routes, AM peak period queuing
- Newbridge Rd & George St Liverpool (westbound, southbound) AM and PM congestion
- Kurrajong Rd and Hume Hwy (eastbound) AM and PM high cycle time
- Glenfield Rd and Hume Hwy (westbound) AM and PM high cycle time

The opportunity to introduce a dedicated bus lane along the M5 South West Motorway has also been considered and subsequently discounted by the RTA.

Unlike the Hills M2 Motorway, which is an important strategic bus corridor for services from Sydney's North West, there are currently no bus services utilising the carriageway of the M5 South West Motorway.

With the exception of SBC route 33, the existing bus services in the M5 South West Motorway study area generally run parallel to the motorway for short sections servicing demand for north south movements. Route 33 forms part of an established major bus service between Liverpool and Bankstown that runs parallel to the M5 South West Motorway along Newbridge Road / Milperra Road and provides important connections to industrial areas along the route and the University of Western Sydney at Milperra.

These bus routes service existing areas, situated predominantly along the parallel corridors to the M5. A service routing along the motorway could potentially provide a high speed bus linkage but it would not necessarily be well disposed to service the trip generating/attracting areas within the study area, which would be served better via the Alternative Route.

It is also considered that the railway line running parallel to the M5 South West Motorway to the south would negate the demand for any potential high speed bus service provided on the motorway mainline. That is, there will be little utility in providing express bus services along the motorway as the existing heavy rail service is faster and provides greater reliability in travel time.

For the reasons outlined above it is considered that the implementation of a bus lane on the M5 South West Motorway would not at the present time result in the cost-effect use of the additional capacity.

It is noted that this assessment would need to be verified through further modelling and analysis.

8.10 Summary

The impact assessment of the M5 West Widening Project has been undertaken for the future years 2016 and 2026. The assessment concludes that the Project will have the following effects:

- M5 West widening will make the motorway a relatively more attractive route resulting in increased traffic demand over and above the Base Case
- Travel times along the motorway will improve by around 7 minutes in 2026
- Traffic flows on the Alternative Route will decrease as vehicles divert to the M5 South West Motorway and associated travel times will improve
- Existing bus services on the surrounding network will experience improved travel times with an opportunity for bus priority measures to be implemented to further improve services
- Existing and forecast freight movements will experience improved travel conditions as a results of the Project, which is a primary strategic objective of the corridor
- Induced demand resulting from the Project will be negligible

Overall this assessment has shown that the M5 West Widening Project will improve journey times for users of the M5 South West Motorway and the Alternative Route, improving conditions for both strategic motorway and local traffic. The Project provides a necessary increase in capacity required to accommodate projected growth in travel demand up to 2026 and offers a significant improvement in travel conditions when compared to the Base Case, do minimum, scenario.

9 Effects of M5 East Duplication Proposal

9.1 Introduction

The M5 East duplication is in a preliminary stage of planning and has had some community consultation completed. While this project is not a funded or committed to by government at this point in time, there is the likelihood the project will proceed at some future date given the government's policies and strategies for the corridor, as outlined in Section 1. Accordingly, the effects of the M5 South West Motorway Project in combination with the possible M5 East duplication have been evaluated to determine any implications that might reduce the effectiveness of either project in terms of road network efficiency.

9.2 M5 East Duplication Preferred Option Description

In 2009 the RTA undertook the M5 Transport Corridor Study[18], which identified a preferred option for the M5 East duplication. This preferred option has been assumed for the purposes of the traffic modelling assessment reported in this section. The main elements of the scheme are:

- Widening of the eastbound M5 motorway between Fairford Road and King Georges Road from 2-lane to 3-lane.
- Duplication from King Georges Road, Beverly Hills to Cooks River, Mascot:
  - A new four lane westbound tunnel, provided as either a single four lane tunnel or twin two lane tunnels, with entry and exit portals in the vicinity of the existing tunnel portals;
  - four lanes in the eastbound direction by maintaining the existing eastbound tunnel and converting the existing westbound tunnel to eastbound;
  - retain two lanes in each direction from the Marsh Street portals to General Holmes Drive;
  - widening to four lanes in each direction the existing M5 East Freeway from the Bexley Road portals to the King Georges Road entry and exit ramps.

[18] M5 Transport Corridor Study Preliminary overview report, RTA, November 2009.

- A new southern Sydney connection from the M5 East Freeway, Arncliffe to Euston Road, Qantas Drive and Gardeners Road, Mascot, comprising:
  - New surface and elevated road with two lanes in each direction along the proposed F6 corridor;
  - Single lane ramps to provide access between the southern Sydney connection and Airport Drive;
  - A signalised intersection at the junction of southern Sydney connection and Campbell Road to access Gardeners Road via Bourke Road.
- Tolling – because the project involves construction of a new tunnel, the consequent cost is likely to require supplementary 'user pay' funding. A tolling option canvassed in the RTA study was assumed in this analysis and consists of a distance based toll between King Georges Road and Marsh Street at the rate of:
  - 33 cents/km for cars
  - 82.5 cents/km for trucks
  - Toll free at Southern Sydney connection

9.3 Modelling Analysis

For the purposes of the evaluation, the M5 East Duplication Project was modelled in combination with the M5 West Widening Project (the Project Case). The modelled scenarios discussed in the remainder of this section are summarised as follows:

- Base Case – do minimum future year network including committed schemes as agreed with the RTA
- Project Case – Base Case plus M5 West Widening Project
- Test Case – Project Case plus M5 East Duplication Project

Forecast traffic flows are summarised in Table 9-1 and Table 9-2 comparing a scenario with both M5 West widening plus M5 East duplication (Test Case) to the Base Case at two locations. Traffic volume changes across the network are illustrated in Figure 9-1.

Table 9-1 M5 Hammondville Toll Plaza Volume – Test Case vs Base

Scenario	Eastbound				Westbound			
	Base	Test	Diff	% Diff	Base	Test	Diff	% Diff
2016 AM	3,420	4,010	590	17%	3,690	4,150	460	12%
2016 IP	2,690	2,790	100	4%	2,810	2,930	120	4%
2016 PM	3,510	3,860	350	10%	4,090	4,980	890	22%
2026 AM	4,000	4,980	980	25%	3,960	4,830	870	22%
2026 IP	3,300	3,760	460	14%	3,420	3,980	560	16%
2026 PM	3,930	4,690	760	19%	4,530	5,850	1,320	29%

Table 9-2 M5 West of Marsh Street Volume Comparison – Test Case vs Base Case

Scenario	Eastbound				Westbound			
	Base	E+W	Diff	% Diff	Base	E+W	Diff	% Diff
2016 AM	3,510	4,670	1,160	33%	3,280	3,290	10	0%
2016 IP	2,920	3,100	180	6%	3,080	2,920	-160	-5%
2016 PM	2,950	3,200	250	8%	3,290	3,770	480	15%
2026 AM	3,500	5,400	1,900	54%	3,190	3,460	270	8%
2026 IP	3,010	3,810	800	27%	3,220	3,810	590	18%
2026 PM	3,020	3,600	580	19%	3,510	4,890	1,380	39%