

Warwick Farm Station Commuter Car Park Extension

Traffic and Transport Report

Prepared for Transport for NSW

Prepared by Beca Pty Ltd

ABN: 85 004 974 341

26 August 2020

Revision History

Revision N°	Prepared By	Description	Date
1	Norman Hu	Draft	03/08/2020
2	Norman Hu	Final	26/08/2020
2.1	Norman Hu	Updated cover page & revision details	12/10/2020

Document Acceptance

Action	Name	Signed	Date
Prepared by	Norman Hu		12/10/2020
Reviewed by	Carla Bradley		12/10/2020
Approved by	Chris Morley		12/10/2020

on behalf of Beca Pty Ltd

Contents

1. Environmental Impact Assessment	3
1.1. Traffic and Transport	3
1.1.1. Existing environment	3
1.1.2. Operational impacts	7
1.1.3. Operational mitigation measures	12
1.1.4. Construction impacts	12
1.1.5. Construction mitigation measures	14

1. Environmental Impact Assessment

1.1. Traffic and Transport

The Warwick Farm Commuter Car Park Extension proposal is to construct an additional two floors over the existing multi-storey car park (MSCP) near Warwick Farm Station, providing approximately 250 additional commuter car parking spaces to reach a total of 732 spaces. The MSCP structure is located on the western side of the station on Remembrance Avenue.

A Traffic, Transport and Access Impact Assessment (TTAIA) was prepared for the proposal (FutureRail, 2020) which identified traffic and transport issues and mitigations. This section of the Review of Environmental Factors (REF) includes a summary of the findings of that assessment and additional analysis undertaken subsequent to the TTAIA.

1.1.1. Existing environment

Warwick Farm Station

Warwick Farm Station is located in south-western Sydney in the Liverpool City Council LGA, approximately 30 kilometres away from Central station. The station serves the suburb of Warwick Farm, and is less than two kilometres away from the Liverpool health and education precinct to the south. The station provides people with the opportunity to access and transfer between transport modes including train, bus, bicycle and private vehicle.

Parking

Warwick Farm Station currently provides 805 formal commuter car park spaces as follows:

- 482 spaces at the existing MSCP west of the station
- 212 spaces at the at-grade car park (AGCP) west of the station
- 111 spaces at the AGCP east of the station

The location of these car parks is shown in Figure 1-1.

The TTAIA indicates that a typical weekday most of the formal car parking spaces are full by 8.00am, leading to parking overspill onto adjacent roads. This was observed on nearby Warwick Street, Manning Street, Munday Street and Hart Street.



Figure 1-1 Warwick Farm Station commuter car parks

Local road network

Vehicular access to the car parks west of Warwick Farm station is provided via entrances from Remembrance Avenue. The MSCP has two access points, one off Remembrance Avenue, north of the structure, and the second from the AGCP at the south east of the structure. The primary access routes to Remembrance Avenue are from its intersection with the Hume Highway signalled intersection or via the Hart Street roundabout.

Vehicles exiting the MSCP have two options; a north exit onto Remembrance Avenue and a south exit via an access lane on to Hart Street. These exit points are also utilised by vehicles parked in the AGCP.

Access and egress for the car parks east of Warwick Farm Station is provided via Warwick Street.

Rail services

Warwick Farm Station is served by the T2 Inner West & Leppington, T3 Bankstown and T5 Cumberland lines, providing train services between Richmond, Parramatta, Leppington and the Sydney CBD. The number of these services during the AM and PM Peak is shown in Table 1-1 and Table 1-2.

Table 1-1 Warwick Farm Station AM Peak rail services

Hour	T2 Leppington Line		T3 Bankstown Line		T5 Cumberland Line		Total
	To city	From city	To city	From city	To Parramatta	From Parramatta	
5am	4	2	3	1	0	0	4
6am	5	4	4	2	1	1	8
7am	8	4	6	2	3	2	13
8am	4	4	3	3	2	2	10
AM Peak Total	21	14	16	8	6	5	35

Table 1-2 Warwick Farm Station PM Peak rail services

Hour	T2 Leppington Line		T3 Bankstown Line		T5 Cumberland Line		Total
	To city	From city	To city	From city	To Parramatta	From Parramatta	
3pm	4	5	4	2	2	2	10
4pm	4	5	2	2	2	2	8
5pm	4	7	2	3	2	2	9
6pm	5	8	1	4	2	2	9
PM Peak Total	17	25	9	11	8	8	36

Bus services

Bus stops are located north of the station on Hume Highway, served by bus routes 904 and N50.

The 904 provides a 30-minute service during peak periods and a 60-minute service outside of peak periods in both directions, connecting Liverpool city centre and the suburbs of Lansvale, Cabramatta and Carramar to Warwick Farm station.

The N50 is an hourly Night Ride service connecting the Sydney CBD to Liverpool city centre via Warwick Farm station.

Taxi and kiss and ride facilities

On Remembrance Avenue to the west of the station is a taxi rank with spaces for two vehicles, with features for accessible passenger drop off and pick-up.

To the west of the station 10 formal kiss and ride spaces are provided on the northern side of Remembrance Avenue. Additional kiss and ride spaces are provided on Warwick Street to the east of the station.

Bicycle network and facilities

Cycle access from the east of the station is provided by a shared path running from the station along Warwick Street, Manning Street and then eastwards along Munday Street.

A regional bike north-south bike route runs west of the station, connecting the station to Liverpool, Cabramatta and Fairfield via Station Street, the Hume Highway underpass, and along Remembrance Avenue and Hart Street.

Bicycle racks are provided on both sides of the station, and bicycle lockers are located at the pedestrian entrance to the existing MSCP west of the station.



Figure 1-2 Cycle network and facilities

Pedestrian access

Pedestrian access to the station is provided via Remembrance Avenue from the west of Warwick Street from the east. A pedestrian underpass allows people to cross Hume Highway to access the station from Station Street north west of the station. Stairs are also provided to allow pedestrian access from Hume Highway to the station. The station structure also serves as a fully accessible pedestrian overpass over the rail line that is open to the public.

1.1.2. Operational impacts

Parking

The proposed project would provide an additional 250 spaces, increasing the capacity of the MSCP to 732 spaces and of all commuter car parking provided at Warwick Farm Station to 1050 spaces.

Variable messaging signs that show the number of spaces available within the carpark would be located at car park entrances, providing drivers with real-time information on parking availability, reducing unnecessary circulation within and between commuter car parks as cars look for an empty parking space.

The MSCP is to be future proofed for the installation of electric vehicle (EV) charging equipment to accommodate the expected increase in electric vehicle usage. The overall electrical installation (maximum demand calculations) will provision for the necessary power supply to five percent of the additional spaces (13 spaces). Additionally, provisions would be made to have sufficient cable containment to accommodate the installation of EV charging stations for 15% of the additional spaces (38 spaces).

The MSCP and AGCP would be equipped with Opal Card controlled boom gates to discourage their use by non-commuters. This would help reduce private vehicle usage, as only those using public transport would be allowed free access to commuter car parks. Other car park users would be charged a fee.

Car parks usually require two per cent of spaces be reserved for accessible parking. Therefore, the proposed additional parking spaces at the MSCP should include five additional accessible parking spaces. The provisioning of these spaces within the new MSCP spaces would not be ideal, as they would be located some distance away from Warwick Farm Station and on the upper levels of the structure. The five additional accessible parking spaces would be provided closer to the station lifts and overpass, by converting nine existing parking spaces., as shown in Figure 1-3.



Figure 1-3 Proposed location for additional accessible parking spaces

Local road network

The proposed project would not change access to and from the commuter car parking sites and the surrounding road network, with primary access being via Remembrance Drive, as currently.

The AGCP exit route onto Hart Street located immediately south of the MSCP structure will be reopened after construction has finished, providing a secondary egress route.

The road network is shown in Figure 1-4. The intersections where modelling was carried out are also indicated.

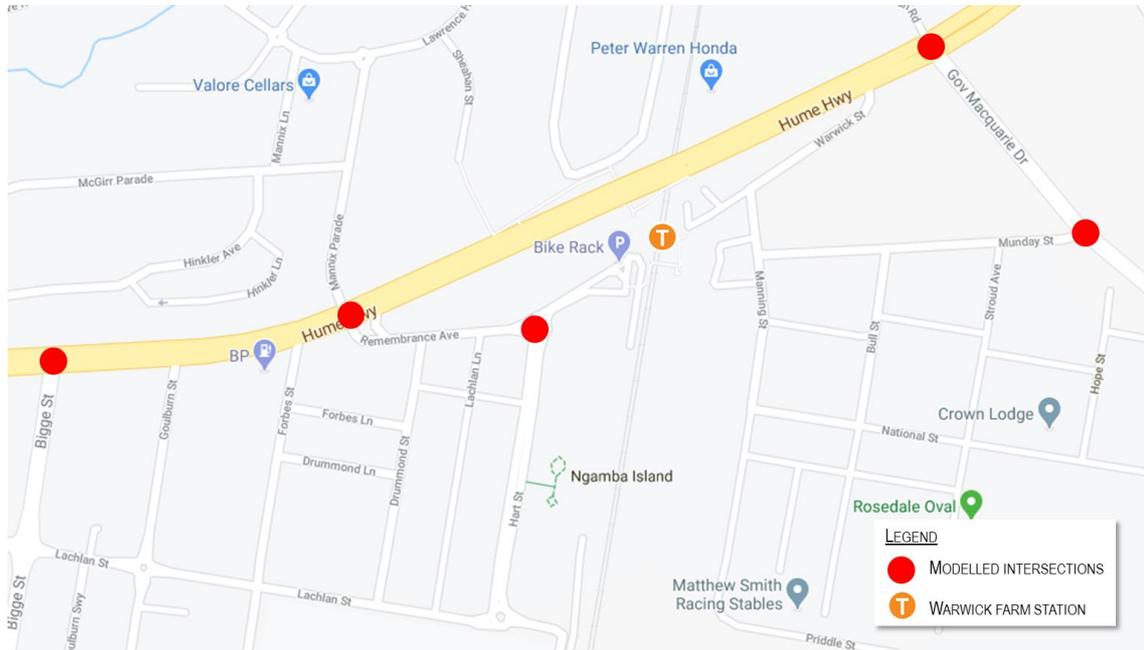


Figure 1-4 Warwick Farm Station local road network

Traffic performance

The TTAIA indicates that the worst-case scenario assumes that there would be 250 additional trips to the site in the AM peak period from 5.00 am to 9.00 am and 250 additional trips from the site in the PM peak period from 3.00 pm to 7.00 pm. Opal data from Warwick Farm Station in 2019 revealed that:

- The AM peak hour for station entries occurred from 7.00am to 8.00am, accounting for 40 per cent of total station entries of the four-hour AM peak period
- The PM peak hour for station exits occurred from 6.00pm to 7.00pm, accounting for 32 per cent of total station exits of the four-hour PM peak period

Therefore, the proposed increased capacity of 250 spaces on the MSCP would generate:

- 99 additional inbound trips during the AM peak hour
- 81 additional outbound trips during the PM peak hour

The TTAIA assumes that traffic from the commuter car parks would be distributed as shown in Figure 1-5.



Figure 1-5 Traffic distribution of commuter car park users

The performance of key intersections providing access to Warwick Farm Station was assessed using SIDRA Intersection 8.0 modelling software. This was done for both the AM peak hour (7.15am to 8.15am for the Remembrance Ave / Hart Street intersection and 7.45am to 8.45am for the other intersections) and PM peak hour (4.30pm to 5.30pm for the Remembrance Ave / Hart Street intersection and 5pm to 6pm for the other intersections).

The effect of the proposed project on the performance of key intersections providing access to Warwick Farm Station was assessed using SIDRA Intersection 8.0 modelling software. The results are presented in Table 1-3.

Table 1-3 Existing intersection performance before and after MSCP extension

Intersection	Scenario	AM Peak			PM Peak		
		Delay (s)	LoS	DoS	Delay (s)	LoS	DoS
Hume Hwy/Bigge Street ¹	Before	20.7	B	0.8	27.2	B	0.8
Hume Hwy/Bigge Street ¹	After	20.7	B	0.8	27.6	B	0.8
Hume Hwy/Remembrance Ave ¹	Before	79.6	F	1.1	30.9	C	0.8
Hume Hwy/Remembrance Ave ¹	After	92.8	F	1.1	30.7	C	0.8
Remembrance Ave/Hart Street ²	Before	5.9	A	0.2	4.9	A	0.2
Remembrance Ave/Hart Street ²	After	5.8	A	0.3	5.1	A	0.2
Hume Hwy/ Governor Macquarie Dr ¹	Before	168.2	F	1.2	243.5	F	1.2

Hume Hwy/ Governor Macquarie Dr ¹	After	171.8	F	1.2	246.9	F	1.3
Governor Macquarie Dr/ Munday St ¹	Before	43.5	D	1	26.9	B	0.8
Governor Macquarie Dr/ Munday St ¹	After	43.5	D	1	26.9	B	0.8

¹ Assessment from TTAIA

² Assessment conducted by Beca

Under the current conditions, the intersections of Hume Highway/Bigge Street and Remembrance Avenue/Hart Street currently perform satisfactorily, with Levels of Service (LoS) of B or better. There is reserve capacity to accommodate future growth. The Governor Macquarie Drive/Munday Street also performs satisfactorily at LoS D in the AM Peak.

Hume Highway/Remembrance Avenue and Hume Highway/Governor Macquarie Drive intersections are performing unsatisfactorily, due to high traffic flows on Hume Highway during both AM and PM peak hours resulting in a LoS F and high delay including delay of over 4 minutes in the PM peak at Governor Macquarie Drive.

After the MSPC extension, the analysis indicates that the intersection of Hume Highway/Remembrance Avenue would worsen current performance slightly in the AM Peak, with an increase in intersection delay of around 13.2 seconds. The intersection performs at LOS F both before and after the MSCP extension.

No other significant operational impacts on local traffic performance were identified.

Rail and bus services

The proposed project is unlikely to impact on rail and bus services, as the larger MSCP will not impact on Warwick Farm Station, the rail corridor, any bus stops or bus routes.

Taxi and kiss and ride facilities

The proposed project is unlikely to impact on taxi and kiss and ride facilities.

Bicycle network and facilities

The proposed project is unlikely to affect bicycle network or facilities, as the proposed changes will not affect any existing bike routes, bike racks or bicycle lockers.

Pedestrian access

The proposal is unlikely to have a significant impact on pedestrian access through the precinct. The widening of the AGCP access opposite Hart Lane may require the construction of an alternate east-west footpath access across Hart Park to replace the existing facility.

Property access

The proposed project is unlikely to affect property access, as the proposed changes occur only within the commuter car park lands owned by Transport for NSW.

1.1.3. Operational mitigation measures

Mitigation measures to be considered to reduce the impacts during the operation of the extended MSCP include:

- Variable messaging signs that show the number of spaces available within the carpark to reduce the need for unnecessary circulation between car parks as commuters look for a parking spot
- Future proofing the installation of electric vehicle charging stations by provisioning the power supply for 13 charging stations, and cable containment to 38 spaces within the additional spaces
- Installing Opal Card controlled boom gates to discourage the use of commuter carparking spaces by non-commuters, freeing up more spaces for commuters to use. These gates would cover both the existing AGCP and the extended MSCP.

1.1.4. Construction impacts

Parking

The existing roof level of the MSCP will be temporarily unavailable during construction, reducing car parking capacity by 129 spaces. In addition, there will be further temporary short-term losses. Parking on level 2 will be lost for a period of up to two weeks and 5-10 spaces within the AGCP will be intermittently lost for 1-2 days.

The intention is that the lost parking spaces are offset by providing temporary parking. Two possible sites are being investigated for temporary parking, the oval at Liverpool High School and the vacant block of land on the corner of Munday Street and Manning Street (east of Warwick Farm Station). These sites are shown in Figure 1-6.

The TTAIA indicates that up to 80 construction site workers per day are expected to commute to the MSCP during construction. Since there is good public transport access to the site via the nearby Warwick Farm Station and bus stops with services to/from Liverpool, an estimated 60 per cent of workers are expected to commute via public transport.

The remaining 40 per cent of workers, assuming a car occupancy rate of 1.5 workers, would require 21 car parking spaces. Workers will not be permitted to park in designated commuter spaces within the station precinct to minimise disruption for commuters. It is anticipated that workers will utilise on street parking in the surrounding local road network..



Figure 1-6 Potential alternative parking facilities during construction

Local road network and traffic performance

The exit route onto Hart Street, located immediately south of the MSCP structure, will be temporarily closed to allow construction traffic to access the site. Vehicles exiting the car parks will have to exit via Remembrance Avenue. This increase in traffic flows could potentially impact traffic performance on the roundabout at Remembrance Avenue/Hart Street, however it is currently performing at LOS A and the impact is not expected to result in unsatisfactory performance.

The TTAIA indicates that up to 48 trucks per day would require access to the site during the concrete pours, spread evenly throughout the working day resulting in an average of six trucks per hour. This would occur for the duration of construction of the MSCP structure, over a 19-week period. The low number of truck movements suggests that the impact of these truck movements on local traffic performance would be minimal.

The access lane onto Hart Street south of the MSCP is approximately 3.25m, which is only wide enough for one-way traffic movement. If this lane is to be used for construction access, it would have to be widened to 7m to enable two-way traffic movement. This would impact on the adjacent Hart Park and require the removal of 2 to 3 on-street parking spaces. This option is still under investigation, it is recommended to address in detail the proposed construction site access in the Construction Traffic Management Plan (CTMP).

Rail and bus services

Construction of the proposed MSCP extension is unlikely to affect rail services, as Warwick Farm Station and the rail corridor are located away from the proposed construction site.

It is also unlikely to impact on bus services, as construction activities will not have a material impact on Hume Highway road corridor (where bus routes 904 and N50 run). The proposed construction site is also located away from any bus stops.

Taxi and kiss and ride facilities

Construction of the proposed MSCP extension is unlikely to affect taxi and kiss and ride facilities, as they are provided away from the proposed construction site.

Bicycle network and facilities

Construction of the proposed MSCP extension is unlikely to affect bicycle network, as the construction site does not block any existing bike routes and is located away from the bike racks. Access to the existing bicycle locker at the MSCP will be maintained.

Pedestrian access

Construction of the proposed MSCP extension is unlikely to have a significant impact on pedestrian access through the precinct. The widening of the CCP access opposite Hart Lane may require the construction of an alternate east-west footpath access across Hart Park to replace the existing facility.

Property access

Construction of the proposed MSCP extension is unlikely to affect property access, as the proposed activity will be located on the existing commuter car park lands owned by Transport for NSW.

1.1.5. Construction mitigation measures

- Development of a Construction Traffic & Pedestrian Management Plan (CTPMP) to manage traffic impacts during construction, including how construction site access will be provided.
- Procedures for preparing and implementing Traffic Control Plans (TCPs), providing details for signage, traffic controls and detours (if required) to management temporary road disruptions
- A temporary car park could be provided in the grassy area south of the existing eastern AGCP to replace parking spaces that would be lost during construction.
- Scheduling roadworks that will affect the existing local road network outside of peak periods or during the night to minimise the impact on local traffic.

- Scheduling the movement of construction vehicles and deliveries outside of peak periods to minimise the impact on local traffic.
- Identification of final construction traffic access routes, site compound, loading zones, and worker and construction vehicle parking.
- These activities may be confined to within the construction site to minimise disruption to the local area
- Workers will not be permitted to park in designated commuter spaces within the station precinct to minimise disruption for commuters.