Traffic and Transport Report

Great Western Highway Upgrade Program - Medlow Bath
Preferred Concept Design, Detailed Design and REF

May 2021

Confidential

MRB Technical Services is a Joint Venture of Mott MacDonald, RPS and BG&E

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1 Introduction

1.1 Background

Medlow Bath is a town located between Katoomba and Blackheath around 115 kilometres west of the Sydney CBD. The Great Western Highway Upgrade (GWHUP) Program – Medlow Bath Project involves upgrading the existing single lane carriageway to a dual carriageway along the alignment. The purpose of the GWHUP is to reduce congestion and deliver safer, more efficient and reliable journeys for those travelling in, around and through the Blue Mountains, while also better connecting communities in the Central West.

The Study Area for this Traffic and Transport assessment is shown in Figure 1.1. It comprises of a 1.2 kilometre segment of the Great Western Highway (GWH) between the intersection with Railway Parade and a location approximately 330 metres south of the intersection with Bellevue Crescent.

Figure 1.1: Assessment Study Area

1.2 The Proposal

Transport for NSW (TfNSW) proposes to upgrade approximately 1.2 kilometres of the GWH at Medlow Bath between Railway Parade and approximately 330 metres south of Bellevue Crescent (the Proposal). This upgrade is part of the GWH Duplication project between Katoomba and Lithgow which aims to provide a safer and more efficient link between Central West NSW and the Sydney Motorway Network for freight, tourist and general traffic.

In addition to the road modifications, the Proposal will also improve active transport links and public transport accessibility. The Proposal is illustrated in the REF.

Key features of the Proposal would include:

- Construction of a four-lane divided carriageway with consolidated access points at upgraded intersections including:
    - Upgraded Bellevue Crescent intersection to include three-way traffic signals for access/egress
    - Provision of a U-turn bay for traffic turning eastbound to westbound at Bellevue Crescent
    - Right turn bay in eastbound carriageway median for Hydro Majestic Pavilion (no right turn egress)
    - Improvements on Railway Parade to formalise parking provisions, U-turns and commuter parking
- Construction of full depth highway pavement and associated local road, driveway, footpath, kerb and gutter reconstruction work within the Proposal area
- Construction of a new pedestrian bridge that connects Railway Parade, Medlow Bath Station and new indented bus bays on both sides of the Highway in line with Transport Access Program requirements
- Shared use (pedestrian/cyclist) path adjacent to westbound carriageway
- Retaining wall and traffic barrier construction adjacent to existing rail corridor
- Utility relocation and stormwater drainage upgrade as required over length of the project including water quality control measures in Railway Parade
- Provision of a 5 metre raised landscaped median for trees protected with modified redirective kerb

1.3 Proposed Alternative Intersection at Bellevue Crescent

As part of the design for the Proposal, a new alternative signalised intersection is being considered to the GWH with a new road through vacant lots to connect to the existing Bellevue Crescent and around 25 metres south of the United Petrol Station (refer to Figure 1.2).

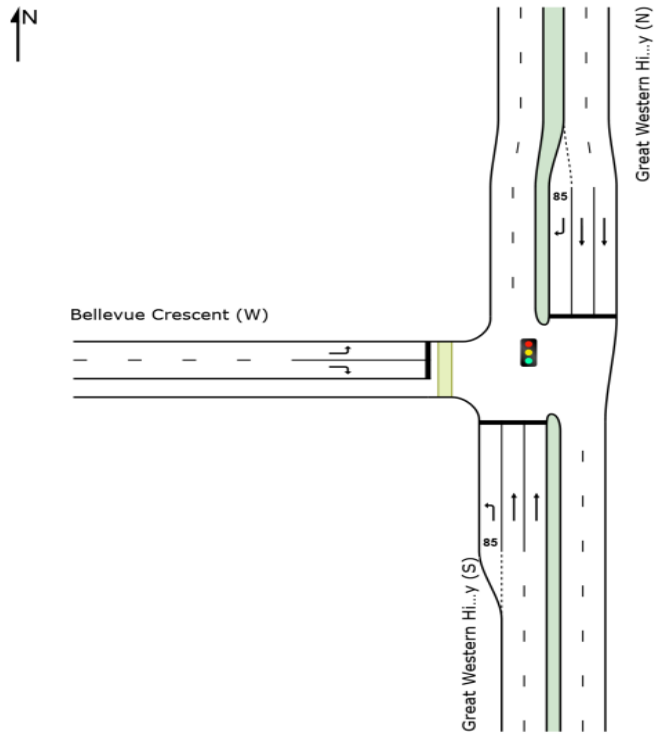


Figure 1.2: Proposed intersection alternative at Bellevue Crescent

At the time of writing of this report, an alternative design was being considered for Bellevue Crescent includes the following key design features:

- A signalised intersection will be built along the southern perimeter of the United Petrol Station in Medlow Bath utilising a corridor (anticipated to be 20 metres) through vacant lots.
- Closing the existing Bellevue Crescent and GWH intersection but still maintaining a service road/shared zone for the properties fronting the highway
- Creating new access options from Bellevue Crescent to the petrol station and Hydro Majestic Pavilion
- Allows left and right turns out of Bellevue Crescent on to the GWH (enabling west and eastbound movement) and left turn into new Bellevue Crescent from GWH westbound

1.4 Transport Accessibility Program

The NSW Government is improving accessibility at Medlow Bath Station. This portion of the project is being delivered as part of the Transport Access Program (TAP), a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

As part of this program, the Medlow Bath Station Upgrade (part of the Proposal) would provide a station precinct that is accessible to people with a disability or limited mobility, parents/carers with prams, and customers with luggage.

The key features of the TAP project included within the proposal are summarised as follows:

- Construction of a new pedestrian footbridge including:
  - Four new lifts to provide access between the footbridge, bus stops on the GWH, Station platforms and Railway Parade
  - Provision of accessible paths between the lifts, stairs and bus stops on the GWH
- Upgrade of the station entrance on Railway Parade including:
  - Modifications to the commuter car park along Railway Parade, and provision of new accessible parking spaces
  - Provision of a new accessible kiss and ride space on Railway Parade adjacent to the new station entry
  - Provision of accessible paths between the footbridge entry, kiss and ride and accessible parking
- Upgrade of the station power supply to provide adequate power for the new footbridge and lifts
- Modifications to overhead wiring and HV at the station to accommodate the construction of the new footbridge
- Internal station building work including:
  - Minor building modifications that may be required to accommodate new or upgraded electrical equipment including a main switchboard, new or upgraded station communications equipment and other station services
- Ancillary work including adjustments to lighting, relocation or replacement of existing customer facilities (platform seating, bins, payphone, Opal card readers, fencing) and improvement to station systems including additional closed circuit television (CCTV) cameras, hearing loops and wayfinding signage.

1.5 Design

The following sections provide a description of the design criteria, major design features and engineering constraints of the proposal. These features are based on the concept design and would be further refined during detailed design.

1.5.1 Design Criteria

The concept design for the proposal was prepared in accordance with the following standards:

- *T HR CI 12030 ST Overbridges and Footbridges Design Standard* (Transport for NSW, 2020)
- Australian Standards: amended by *RMS Supplement* (2012)
- *Austroads Guide to Road Design* (Austroads, 2009) and RMS supplements to the Austroads Guide
- *Austroads Road Safety Audit Manual* (Austroads, 2009)
- *Beyond the Pavement 2020: Urban design approach and procedures for road and maritime infrastructure planning, design and construction* (Transport for NSW Centre for Urban Design, 2020)
- *NSW Speed Zone Guidelines* (Roads and Traffic Authority of NSW, 2011)
- *Road Safety Audit Manual and Checklist* (Roads and Traffic Authority of NSW, 2011)
- *RMS Delineation Manual* (2012)
- *RMS Road Design Guide* (RMS, undated)

- *Soils and Construction – Managing Urban Stormwater,* Volume 1 (Landcom, 2004) and *Volume 2D* (Department of Environment and Climate Change, 2008). *Guide to Road Design – Austroads* (Austroads, 2009).
- *Disability Standards for Accessible Public Transport* 2002 (DSAPT)

Key design criteria for the proposal are summarised in Table 1.1.

Table 1.1: Key design criteria

Design Features	Requirement
Number of lanes	Typical lane arrangement of two lanes in each direction with some turning lanes for access roads off the GWH and to key landmarks.
Lane widths	3.35 metre for through lanes and 3.30 metre for turn lanes (plus lane widening at curves, as required)
Design vehicle for main road alignment	Main road alignment - 26 metre B-double.
Design vehicle at intersections	• Station Street - 12.5 metre 4 axle rigid truck (27 tonnes) • Bellevue Crescent (including U-turn) - Prime mover and semi-trailer (up to 19 metres) • Right hand turn bay into Hydro Majestic Hotel – service vehicle up to 8.8 metres)
Posted Speed Limit	Main road alignment – 60 km/h Side roads – 50 km/h
Design Speed	Main road alignment – 70 km/h Intersection (at Bellevue Crescent) – 60 km/h Turn in to side roads – 60 km/h
Median width	Southern portion (at Bellevue Crescent intersection) – 5.10 metres southern approach and 1.8 metres for northern approach to allow for right hand turn bay at signals Mid portion (at Hydro Majestic Hotel) – typically 5.10 metres raised median and 1.80 metres at right hand turn bay into the hotel Northern portion (between Hydro Majestic Hotel and Railway Parade) – 1.8 metres
Pavement type	Pavement structure which would consist of asphalt over lean mix concrete and consider acoustic requirements.
Footpaths/cycle paths and shared zones	Southern portion (at Bellevue Crescent intersection) – includes a shared zone for local traffic only (to access 100 to 104 GWH) and pedestrians and is typically 6.7 metres wide

Design Features	Requirement
	Mid portion (at Hydro Majestic Hotel) – 2.5 metre shared path on the western side of the road and pedestrian path from footbridge to bus stop on the eastern side Northern portion (between Hydro Majestic Hotel and Railway Parade) – 2.5 metre shared path on the western side of the road
Pedestrian Bridge	To allow safe access to the area, a pedestrian bridge (including stairs and lifts) will be installed to span from Railway Parade to Medlow Bath Station and then across to the western side of GWH (as well as access to the eastern side of GWH to enable use of bus stop serviced by eastbound services).
Flood Considerations	Not considered to be within a flood prone area. One in 100 Average Recurrence Interval (ARI) Minor and Major Tributary flood under current climatic conditions.

1.6 The Problem

1.6.1 The GWHUP Program Need

The GWH is a 201 kilometre highway crossing of the Great Dividing Range through the World Heritage listed Blue Mountains, connecting Bathurst and the surrounding Central West and Orana regions to Sydney.

Crossing the Great Dividing Range, the GWH follows a narrow and difficult alignment constrained by the Blue Mountains National Park, steep topography, a railway line and existing towns for which the highway acts as the main street.

The highway's topography and constrained two lane carriageway design (which in places is almost 200 years old) results in the following constraints:

- Reduces freight efficiency by limiting access for safer and more sustainable high productivity vehicles
- Limits access during incidents and natural disasters
- Slows travel speeds with limited overtaking opportunities and steep gradients (more than double the recommended maximum level)
- Causes delays of up to 80 minutes in peak times
- Has higher than state average crash rates
- Impairs amenity for local communities with high through traffic volumes and congestion

Without the GWHUP Program, the infrastructure along the Katoomba to Lithgow section will continue to face a number of challenges and related impacts.

2 Existing Transport Conditions

2.1 Road Use and Conditions

The Medlow Bath corridor extends 1.2 kilometres east-west between the existing rail overbridge at Railway Parade and a location around 330 metres south of the intersection with Bellevue Crescent. It is a state highway managed by TfNSW in the Blue Mountains City Council area. This section of the GWH is currently a two-lane single carriageway with a posted speed limit of 60 km/h for most of its length. The posted speed limit on the eastbound carriageway changes from 60 to 70 km/h around 75 metres south of the intersection with Bellevue Crescent.

The corridor is accessed via an intersection at Bellevue Crescent (Figure 2.1) and another at Railway Parade (Figure 2.2Figure 2.1). Westbound, the GWH splits into Railway Parade and Station Street. A signalised intersection between GWH and Railway Parade exists within the Study Area around 90 metres north of the alignment. The corridor provides access to a service station, Hydro Majestic Pavilion and Hotel, a Mazda Dealership and Medlow Bath Station.

Figure 2.1: GWH and Bellevue Crescent intersection (Source: Google Maps)

Figure 2.2: GWH and Railway Parade intersection (Source: Google Maps)

2.2 Public Transport

2.2.1 Train Services

The Medlow Bath train station is serviced by The Blue Mountains Line (BMT), running dual directions between Central Station and Bathurst. The train frequencies are on average one service per hour during its service times. There are more Bathurst to Central Station services during 4-7am on the weekday (on average 3 services per hour) and 3-5pm on the weekends (on average 2 services per hour). The train service times and frequencies at Medlow Bath Station are presented in Table 2.1 and Table 2.2. Pedestrian access to the station is detailed in Section 2.4.

Table 2.1: Train service times at Medlow Bath station

Direction	Monday to Friday	Weekends and Public Holidays
Central to Bathurst	6.29-2.17am	6.32-2.32am
Bathurst to Central	2.56am-10.14pm	4.31am-11.01pm

Table 2.2: Train frequencies at Medlow Bath station

Direction	Time	Monday to Friday	Weekends and Public Holidays
Central to Bathurst	6am-7pm	13	16
Bathurst to Central	6am-7pm	13	18

Train usage and all-day patronage between 2016-19 is tabulated in Table 2.3. These values reflect an average day for patronage in dual directions. There has been an increase in train usage in the recent years albeit from a low level.

Table 2.3: Daily train usage and all-day patronage at Medlow Bath Station (Source: TfNSW)

Year	2016	2017	2018	2019
Patronage	77	N/A	81	117

2.2.2 Bus Services

Bus stops within the Study Area are located on both sides of the GWH at the Medlow Bath Station pedestrian level crossing. Photographs of this bus stop pair are shown in Figure 2.3. The westbound stop lacks formal shelter facilities while a shelter is available at the eastbound stop. The westbound stop is serviced by routes 698, 698V, 690K, 8321, 8705 and 8710. The eastbound stop is serviced by routes 698, 698V and 8718.

There is also a sheltered bus stop on Railway Parade on the eastern side of the railway line as depicted in Figure 2.4. This stop is serviced week daily by routes 698 (at 7.57am and 3.38pm) and 8710 (at 3.55pm) to prevent students having to cross the GWH.

Figure 2.3: Existing bus stops on the GWH outside the northern part of the Hydro Majestic Hotel complex (Source: Google Maps)

Figure 2.4: Existing bus stop on Railway Parade (Source: Google Maps)

The Medlow Bath corridor is serviced by the following bus routes:

- 698 – Katoomba to Blackheath (Loop Service) runs across the entire length of the Proposal
- 698V – Katoomba to Mt Victoria (Loop Service) runs across the entire length of the Proposal
- 690K – Springwood to Katoomba
- 8321 – Katoomba to Blackheath Station. This is a school bus that only runs westbound.
- 8705 – Springwood HS to Katoomba. This is a school bus that only runs westbound.
- 8710 – Wentworth Falls PS to Blackheath. This is a school bus that only runs westbound.
- 8718 – Blue Mountains Christian School to Hazelbrook Station. This is a school bus that only runs eastbound.

The routes of these bus services within the Study Area are presented in Figure 2.5. The frequency of the bus services is presented in Table 2.4. The 698 service has an average of one service per hour between 7.30am to 6.30pm for both the eastbound and westbound directions. The 698V service has two services running westbound at 11.25am and 2.31pm and four services running eastbound at 8.16am, 8.44am, 12.19pm and 4.50pm. The average daily bus boarding's and alighting's on weekdays and weekdays at bus stops along this section of the corridor is presented in Table 2.5.

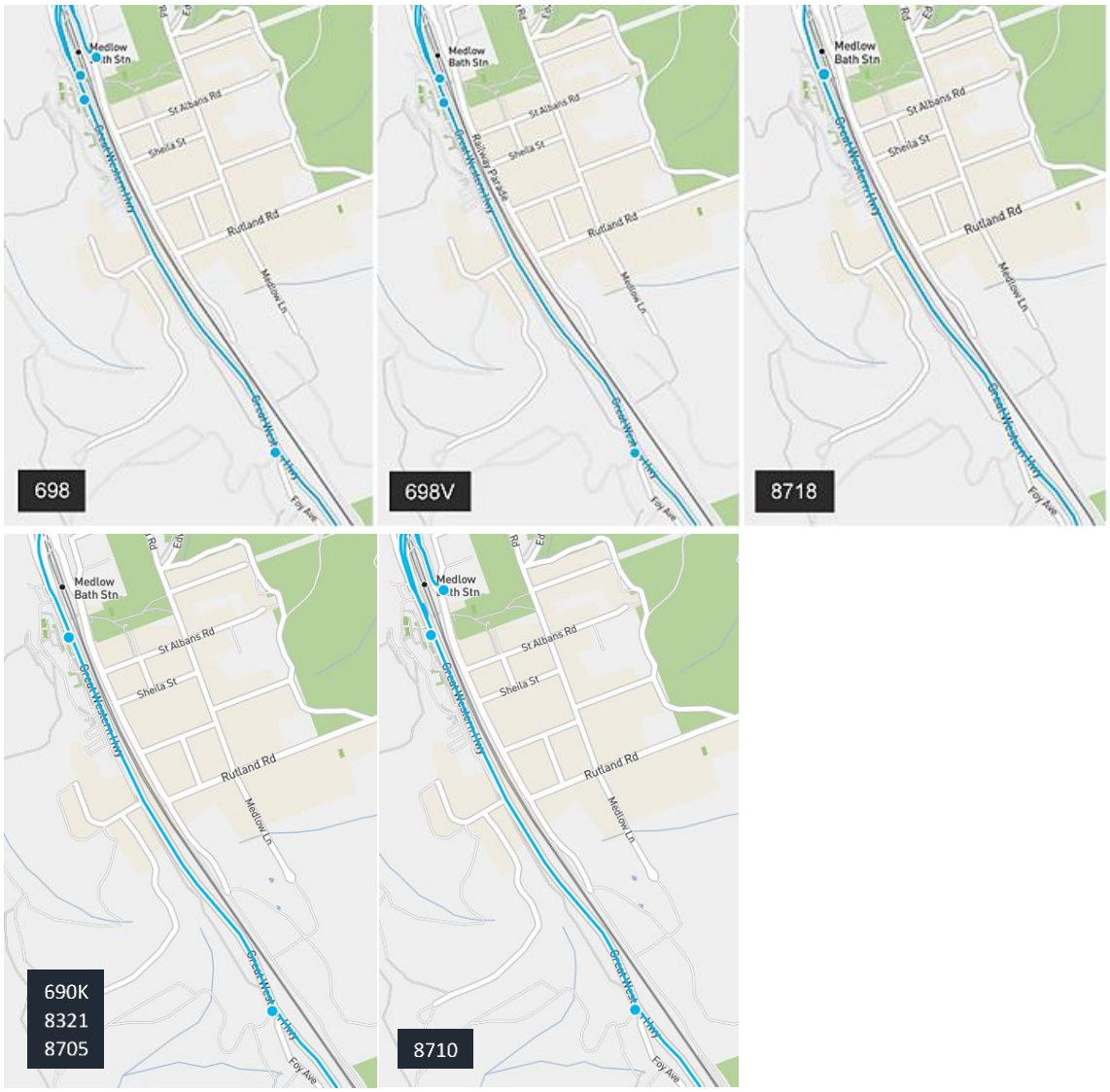


Figure 2.5: Medlow Bath corridor bus stops and bus routes (Source: TfNSW)

Table 2.4: Daily frequency of buses along the Medlow Bath corridor (Source: TfNSW)

Route	Monday to Friday	Saturdays	Sundays and Public Holidays
698	13	4	2
698V	2 (westbound) and 4 (eastbound)	-	-
690K	1 (at 8.46am)	-	-
8321	1 (at 7.51am)	-	-
8705	1 (at 3.52pm)	-	-
8710	1 (at 3.55pm)	-	-
8718	1 (at 3.25pm)	-	-

Table 2.5: Average daily boarding's and alighting's in March 2019 for bus stops along the Medlow Bath corridor (Source: TfNSW)

Bus Stop	Weekday		Weekend	
	Tap On	Tap Off	Tap On	Tap Off
Great Western Highway at Foy Ave	< 1	< 1	< 1	< 1
Great Western Highway opp Medlow Bath Station	< 1	2	1	1
Medlow Bath Station, Great Western Highway	4	1	3	1
Medlow Bath Station, Railway Parade	1	1	1	1

2.3 Freight and Heavy Vehicles

The Medlow Bath corridor forms part of the freight and heavy vehicles network connecting adjacent suburbs along the GWH. It currently accommodates for freight and heavy vehicles up to 19 metre B-Doubles (over 50 tonnes). The routes are depicted in Figure 2.6.

Figure 2.6: Designated 19 metre B-Double routes (over 50 tonnes) along the Medlow Bath Corridor (Source: TfNSW)

2.4 Walking

The following pedestrian infrastructure is located along the corridor:

- A push button activated pedestrian crossing on the westbound approach of the GWH and Railway Parade intersection
- A zebra crossing across the left turn slip lane from Railway Parade to GWH as shown in Figure 2.7. This zebra crossing connects to a footpath that provides access to a pedestrian overbridge.
- A pedestrian overbridge north of the station platform as shown in Figure 2.8. Pedestrian access to this overbridge is possible from:
    - West of the railway line via a footpath that runs along the eastern side of the GWH
    - East of the railway line via footpath that connects to Railway Parade
- A pedestrian/railway level crossing south of the station platform as shown in Figure 2.9. This crossing is accessed from the western side of the GWH via a refuge crossing (Figure 2.10). This refuge island can accommodate around three people at a time. Access to the level crossing from east of the railway line is via a footpath that connects to Railway Parade.
- A paved pedestrian footpath on the west side of the GWH
- A paved pedestrian footpath along the east side of the GWH extending for around 195 metres between the level crossing and the overbridge
- There are also various sealed and unsealed bush walking tracks in the area

Figure 2.7: Pedestrian crossing on the left turn slip lane from Railway Parade to GWH

Figure 2.8: Overbridge which provides access to the station platforms

Figure 2.9: Level crossing to access Medlow Bath Station and bus stops

Figure 2.10: Refuge island on the GWH

Traffic and pedestrian surveys undertaken in December 2020 reveal the following average daily two-way pedestrian flows:

- 13 pedestrians used the signalised pedestrian crossing on the westbound approach at the GWH and Railway Parade intersection
- 19 people on the footpath at the GWH and Bellevue Crescent intersection
- 27 people used the pedestrian overbridge located north of the station platform
- 55 people used the pedestrian/railway level crossing located south of the station platform
- 9 people on the bush walking track near the Belgravia Street and Station Street intersection

A Strava heatmap[1] of pedestrian activity around the Medlow Bath corridor is shown in Figure 2.11. This heatmap indicates that the most heavily used areas are the footpaths on either side of the railway line. It is interesting to note that the heatmap indicates that the pedestrian/railway level crossing appears to be used more than the overbridge. This is consistent with the pedestrian survey data.

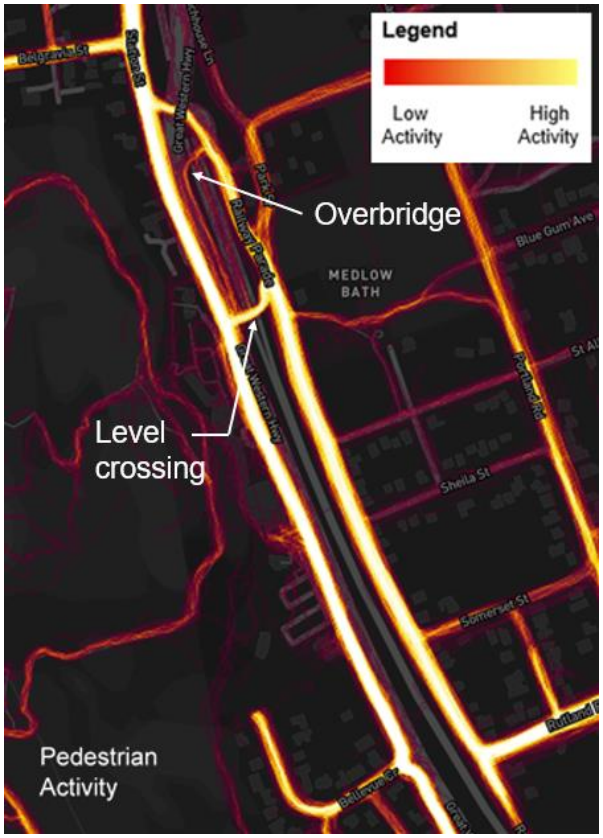


Figure 2.11: Strava heatmap of the Medlow Bath corridor pedestrian activity (Source: Strava)

[1] This heatmap is sourced from STRAVA which uses GPS tracking to measure the "heat" made by aggregated, public activities over the last two years. It represents only a sample of all users (those with the application on their phone) but it is a good proxy for identifying key active pedestrian and cycling routes.

2.5 Cycling

Figure 2.12 presents a map of the cycling infrastructure in the area. No dedicated bicycle facilities exist within the area but the GWH, Railway Parade and Rutland Road are marked as on-road cycle routes. A Strava heatmap[2] of bicycle activity around the Medlow Bath corridor is shown in Figure 2.13.

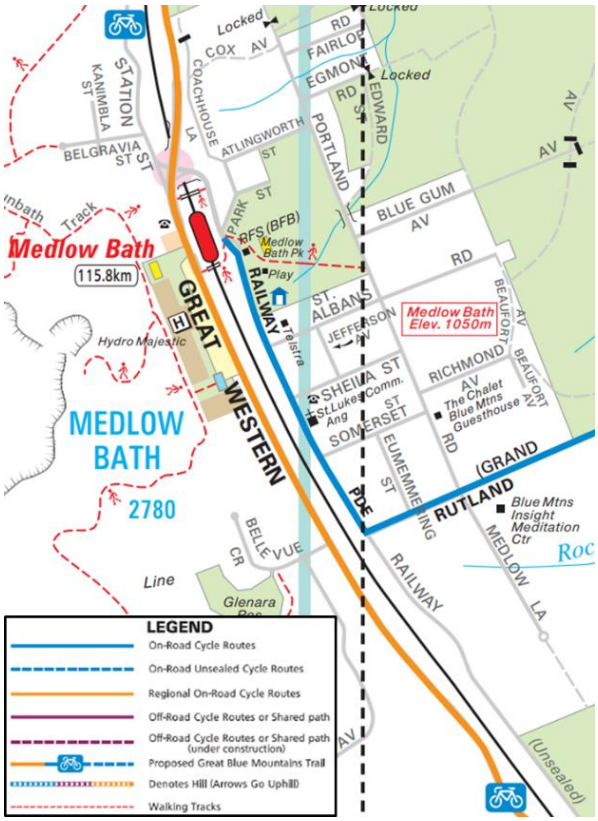


Figure 2.12: Cycle routes along the Medlow Bath corridor (Source: Blue Mountains City Council)

[2] This heatmap is sourced from STRAVA which uses GPS tracking to measure the "heat" made by aggregated, public activities over the last two years. It represents only a sample of all users (those with the application on their phone) but it is a good proxy for identifying key active pedestrian and cycling routes.

Figure 2.13: Strava heatmap of the Medlow Bath corridor cycling activity (Source: Strava)

2.6 Crash Data

Crash data associated with the Medlow Bath alignment over a five-year period ending in 2019 is presented in Figure 2.14.

The review of crash data over the five-year period revealed:

- There were nine crashes recorded along the Medlow Bath corridor
- Nil fatality crashes
- One serious injury crash, at the dividing road westbound
- Five moderate injury crashes
- Three non-casualty towaway crashes

The spatial grouping of crashes suggests that there exists a safety concern at the Bellevue Crescent intersection where 44 per cent of total crashes were present at this location. Despite the lack of formal footpaths and cycling routes, no pedestrian or cyclist crashes occurred during the five-year survey period. However, one pedestrian crash was recorded near the Hydro Majestic entrance at the Medlow Bath train station during the 2009-13 period. The pedestrian refuge is highly susceptible to near miss incidents involving pedestrians and highway traffic due to its geometry and placement.

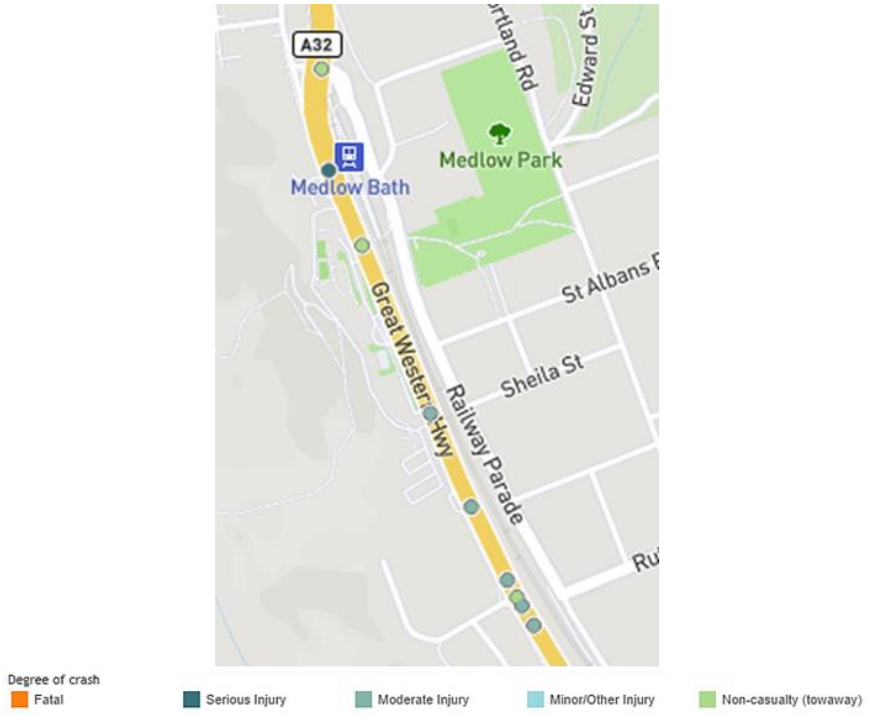


Figure 2.14: Plot of crashes on the Medlow Bath corridor over the five-year period ending 2019 (Source: TfNSW)

2.7 Parking Provisions

A map summarising parking provision in the area is presented in Figure 2.15. Perpendicular parking is available along the western side of the GWH for around 300 metres adjacent to The Hydro Majestic Hotel. Parking bays in this area are unmarked and untimed. This on road parking segment has been identified for relocation into the 90-space carpark to the south as part of the Hydro Majestic redevelopment approval.

Public and hotel guest carparks are located within the Hydro Majestic complex at the northern and southern ends with capacities of around 35 and 90 car spaces respectively. An informal commuter car park exists on Railway Parade with a capacity for around eight parking spaces, identified to service railway station users.

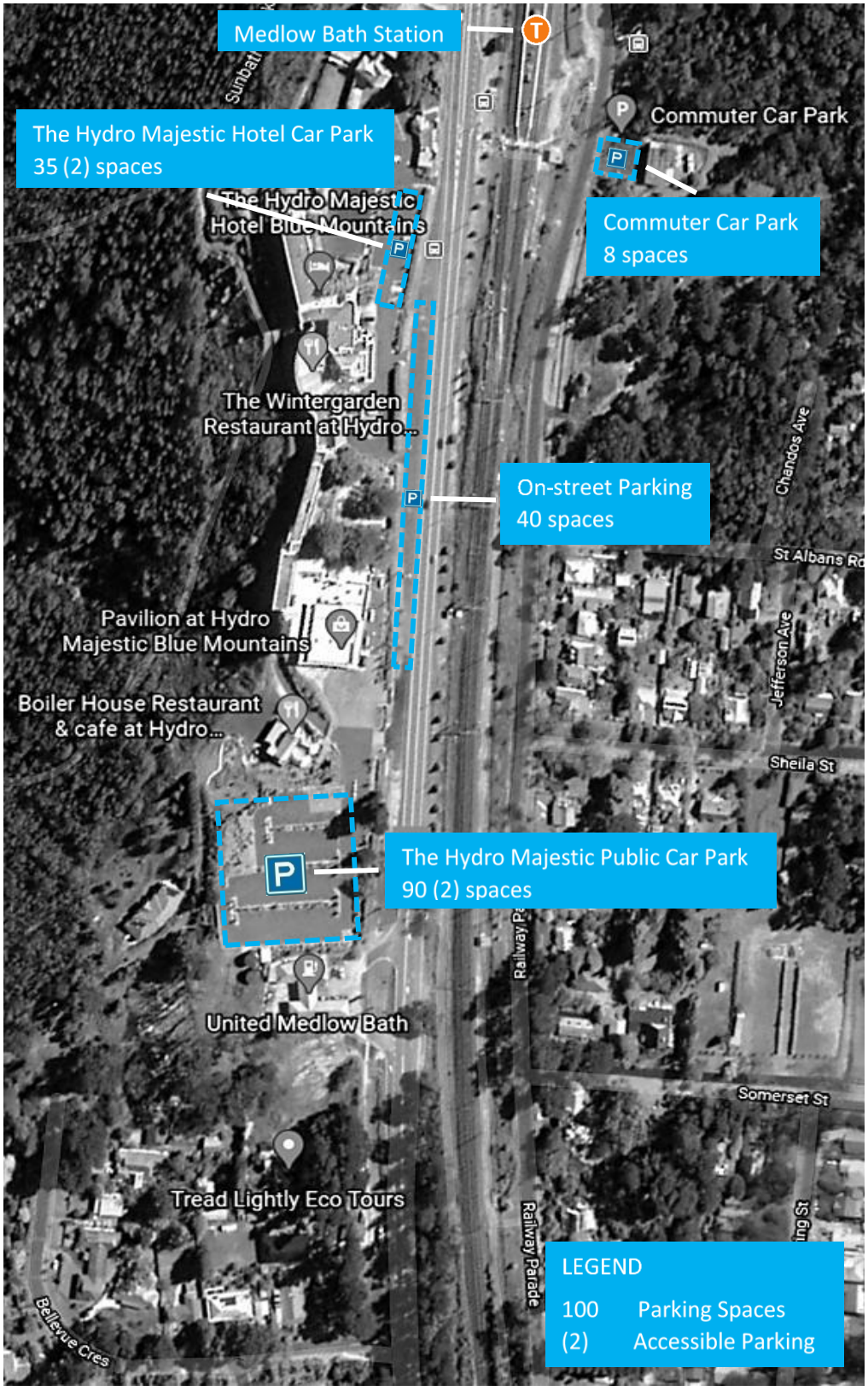


Figure 2.15: Medlow Bath corridor parking provisions

2.8 Observed Traffic Volumes

2.8.1 Medlow Bath Corridor Weekday and Weekend Volumes

The effects of COVID-19 on traffic volumes were observed by comparing March 2019 and March 2020 traffic volume counts at a location 470 metres south of Carawatha Road, Blackheath. This was the closest traffic counter to Medlow Bath around 7 kilometres away. Observed results revealed:

- 13.70% decrease in light vehicles (LV)
- 4.15% decrease in heavy vehicles (HV)
- 13.82% decrease in total

Traffic volumes were undertaken in December 2020 at various locations in the Study Area as listed in Table 2.6. It should be noted that these traffic volumes may have been affected by COVID-19, yielding lower volumes than expected in a normal year.

Table 2.6: Traffic surveys in December 2020

Survey Type	Location	Timings
10-day link count	GWH south of Bellevue Crescent	24 hours over 10 days
Video turning movement survey	GWH and Bellevue Crescent	7-10am and 3-6pm (1 day)
Video turning movement survey	GWH and Petrol Station Entry	7-10am and 3-6pm (1 day)
Video turning movement survey	GWH and Petrol Station Exit	7-10am and 3-6pm (1 day)
Video turning movement survey	GWH and Hydro Majestic Entry 1	7-10am and 3-6pm (1 day)
Video turning movement survey	GWH and Hydro Majestic Exit 1	7-10am and 3-6pm (1 day)
Video turning movement survey	GWH and Hydro Majestic Entry and Exit	7-10am and 3-6pm (1 day)
Video turning movement survey	GWH and Hydro Majestic Entry 2	7-10am and 3-6pm (1 day)
Video turning movement survey	GWH and Hydro Majestic Exit 2	7-10am and 3-6pm (1 day)
7-day link count	Station Street (outside Mazda)	24 hours over 7 days
Video turning movement survey	GWH and Station St	7-10am and 3-6pm (1 day)

Figure 2.16 and Figure 2.17 present the observed average daily traffic volumes travelling westbound and eastbound on the GWH at a location just south of the intersection with Bellevue Crescent. Volumes are disaggregated by LVs and HVs.

The analysis of this data reveals that:

- Average weekday traffic volumes are around 20,000 vehicles in total with daily westbound flows slightly higher than daily eastbound flows
- Average weekend traffic volumes are around 21,000 vehicles in total with daily eastbound flows slightly higher than daily westbound flows
- Heavy vehicles make up around 20% of total traffic on an average weekday. On a weekend, they make up around 10% of total traffic.

Figure 2.18 and Figure 2.19 present the observed average weekday traffic volumes disaggregated by hour and vehicle type. Figure 2.20 and Figure 2.21 present the observed average weekend traffic volumes disaggregated by hour and vehicle type.

The analysis of this data reveals that:

- On an average weekday, eastbound flows are higher than westbound flows during the AM period (6-9am) while westbound flows are higher than eastbound flows during the PM period (4-7pm)
- On an average weekday, two-way traffic volumes are highest in the afternoon between 3-4pm. During this time, 793 vehicles were observed travelling westbound and 789 vehicles eastbound.
- On an average weekend, westbound flows are higher than eastbound flows during the AM (6-9am) while eastbound flows are higher than westbound flows during the PM period (4-7pm)
- On an average weekend, two-way traffic volumes are highest in the afternoon between 12-1pm. During this time, 878 vehicles were observed travelling westbound and 942 vehicles eastbound.

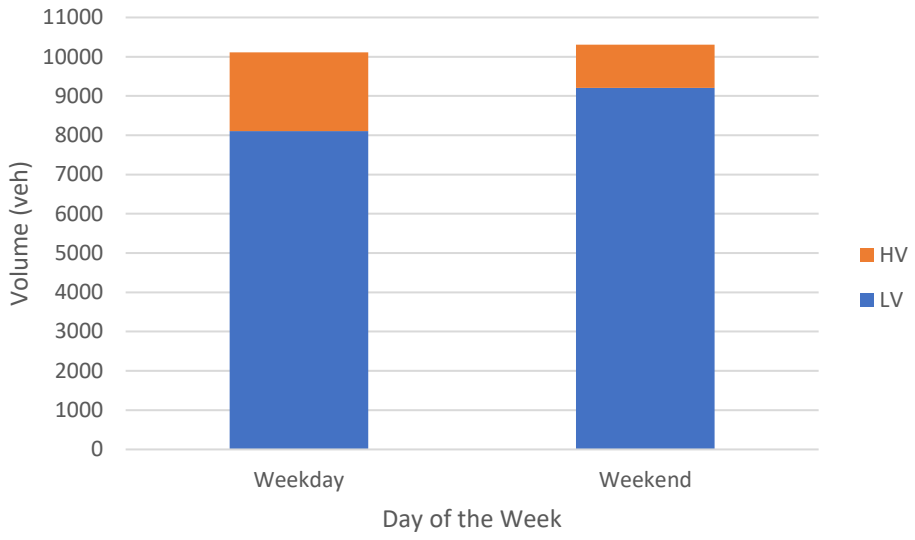


Figure 2.16: Average daily traffic volume westbound GWH

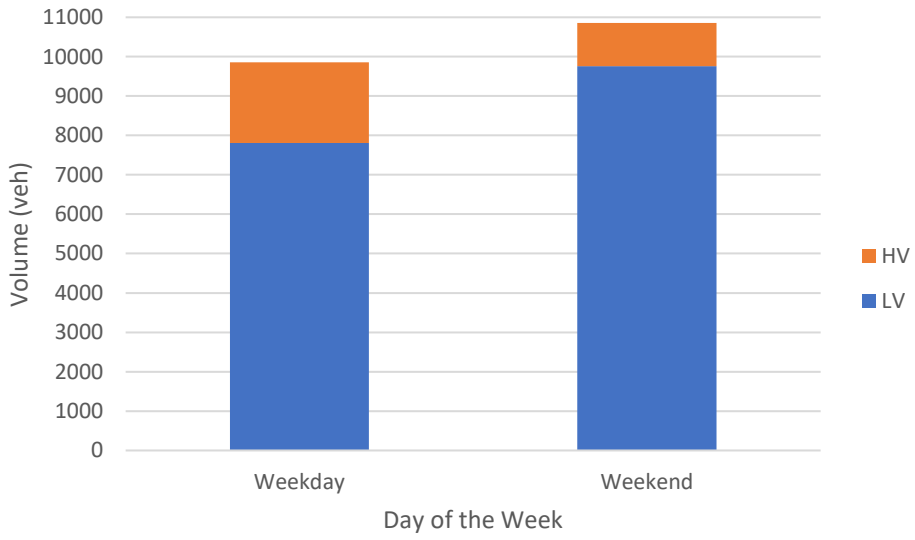


Figure 2.17: Average daily traffic volume eastbound GWH

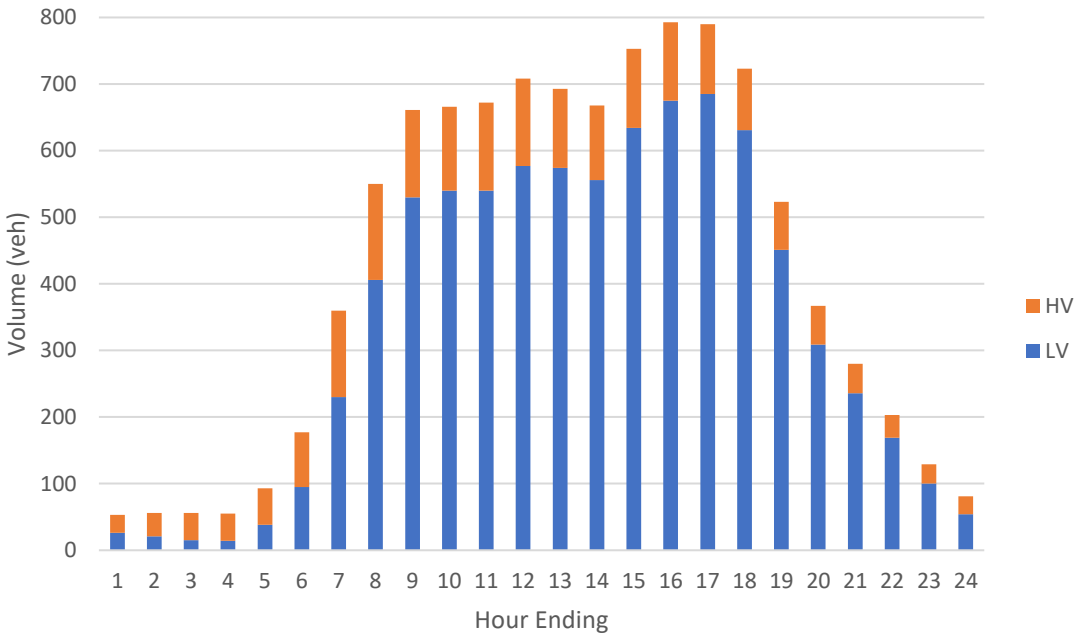


Figure 2.18: Average weekday traffic volumes westbound GWH (south of Bellevue Crescent)

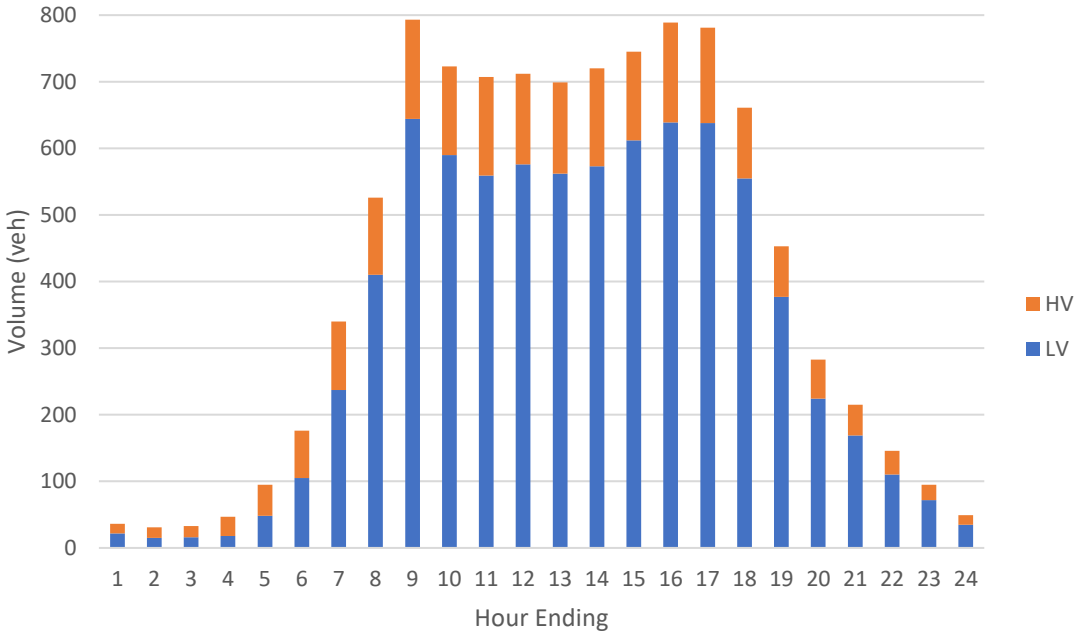


Figure 2.19: Average weekday traffic volumes eastbound GWH (south of Bellevue Crescent)

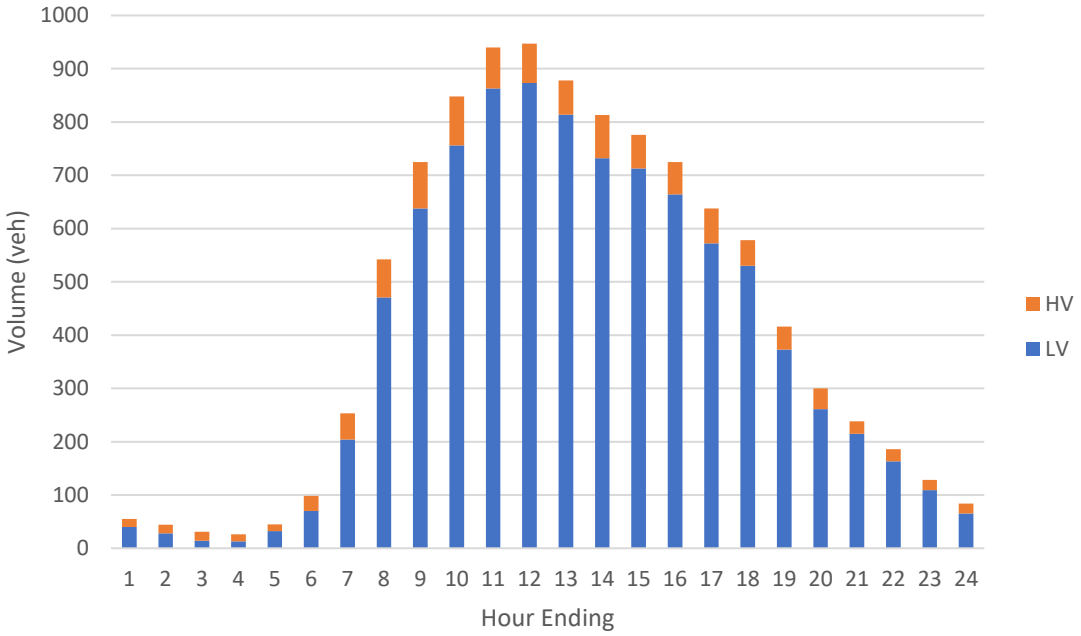


Figure 2.20: Average weekend traffic volumes westbound GWH (south of Bellevue Crescent)

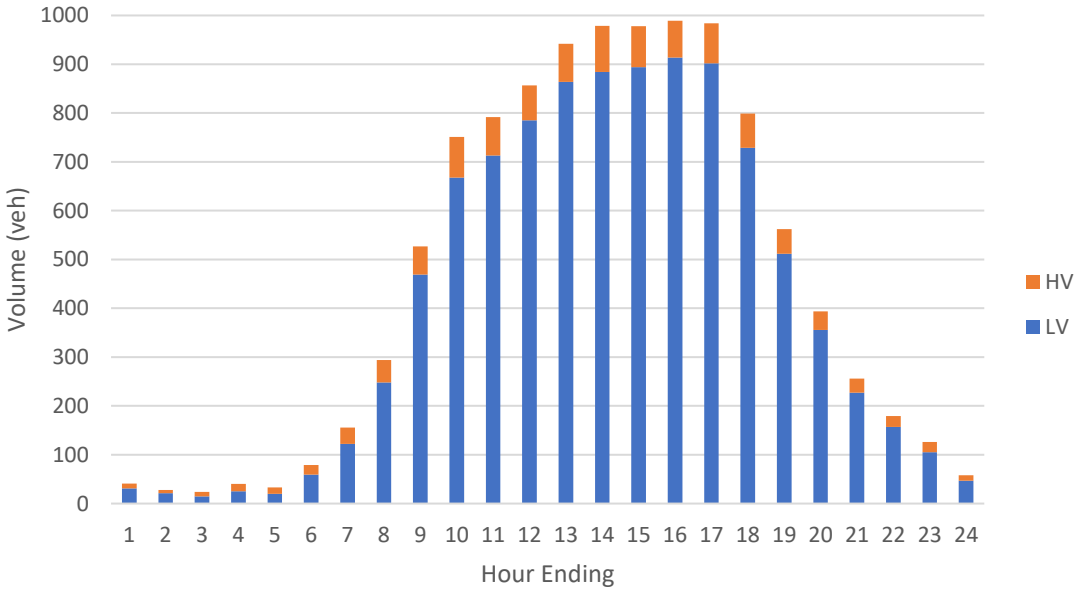


Figure 2.21: Average weekend traffic volumes eastbound GWH (south of Bellevue Crescent)

3 Existing Road Intersection Performance

3.1 Traffic Performance Measures

The performance of the road network was assessed using the modelling software SIDRA Intersection (version 9.0). SIDRA produces intersection and network performance statistics such as:

- Intersection and network level of service based on speed efficiency criteria
- Average vehicle travel speeds
- Average control delay per vehicle which is the combination of stop-line and geometric delays
- Operating costs

The SIDRA network intersection performance summaries for each model scenario are presented in the Appendices.

The key intersection performance indicators extracted from the SIDRA network analysis for this study include:

- Average vehicle delay
- Level of service (LOS)
- Degree of saturation (DOS)
- 95 percentile (95tile) queue lengths

The LOS criteria listed in Table 3.1, was adopted for the analysis. These range from grade A (indicating good intersection operation) to grade F (indicating conditions with long delays and queues).

Table 3.1: TfNSW level of service Criteria

Level of Service	Average Vehicle Delay (seconds)	Traffic Signal and Roundabout	Give-way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity	At capacity, requires other control mode
F	Greater than 71	At signals, incidents will cause excessive delays	Unsatisfactory with excessive queueing, requires other control mode

The maximum practical DOS for different intersection types – as stipulated by TfNSW – is shown in Table 3.2.

Table 3.2: TfNSW maximum practical degree of saturation

Level of Service	Maximum Practical Degree of Saturation
Signals	0.90
Roundabouts	0.85
Sign-controlled	0.80
Continuous lanes	0.98

3.2 Existing Intersection Performance

The two main intersections on the GWH were assessed:

- GWH and Railway Parade
- GWH and Bellevue Crescent

Existing traffic volumes were obtained from classified intersection surveys undertaken in December 2020. Combined analysis of traffic flows at these two intersections showed that the peak hours were:

- AM peak hour (8.30am to 9.30am)
- PM peak hour (3.00pm to 4.00pm)

The GWH and Railway Parade intersection traffic signal phasing plan was provided by TfNSW and cross referenced with available SCATS data.

The modelled intersection layouts are presented in Figure 3.1 and Figure 3.2.

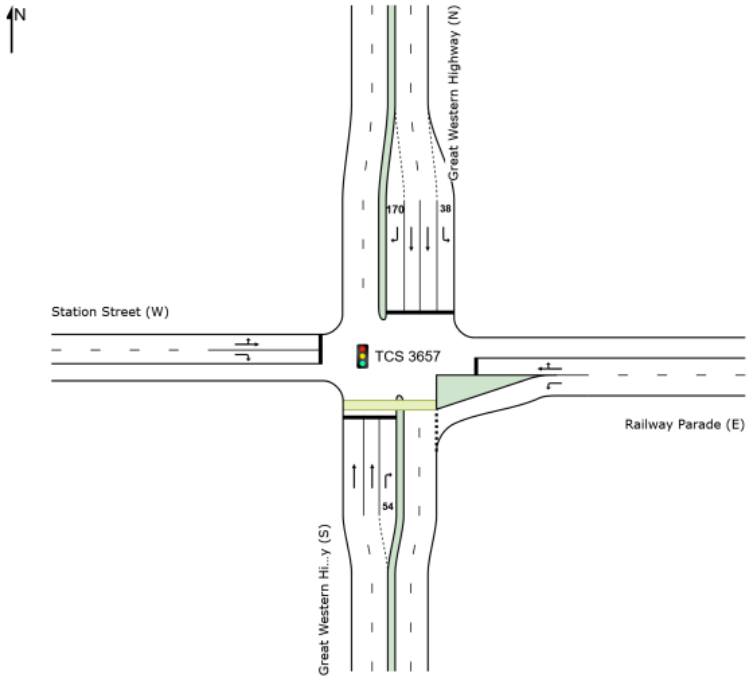


Figure 3.1: Modelled layout of the GWH and Railway Parade intersection

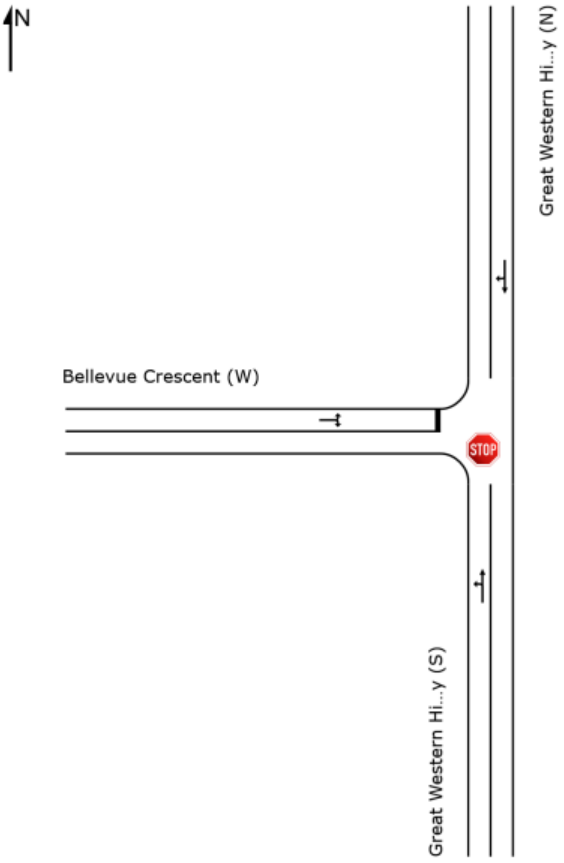


Figure 3.2: Modelled layout of the GWH and Bellevue Crescent intersection

The analysis results are summarised in Table 3.3. The full intersection performance outputs for AM and PM peaks are presented in Appendix A. Both intersections are modelled to operate at excellent LOS. The DOS at both intersections is less than 0.5 indicating that they have reserve capacity.

Table 3.3: Existing 2020 intersection performance

Intersection	Existing Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	AM	1441	6	A	0.3	54 (West Approach)
		PM	1482	6	A	0.3	54 (West Approach)
Great Western Highway & Bellevue Crescent	Stop (unsignalised)	AM	1434	26 (North Approach)	B (North Approach)	0.49	2 (North Approach)
		PM	1476	31 (North Approach)	C (North Approach)	0.48	2 (North Approach)

4 Traffic and Transport Assessment Preferred Design (Operation Phase)

4.1 Impacts on the Road Network

4.1.1 Development of Traffic Growth Forecasts

The traffic growth forecasts for this analysis were obtained from TfNSW and based on traffic modelling undertaken by Veitch Lister Consulting (VLC). These growth rates considered the impacts of the wider upgrades to the GWH between Katoomba and Lithgow and how these would affect route choice for traffic. A key proposal which would affect future traffic flows is the construction of upgrades between Blackheath and Little Hartley. Two sets of growth rates were provided by TfNSW. These are presented in Table 4.1.

Table 4.1: Annual growth rates with and without the GWHUP

Year	Without GWHUP			With GWHUP		
	Light Vehicles	Rigid Vehicles	Articulated Vehicles	Light Vehicles	Rigid Vehicles	Articulated Vehicles
2020-2027	0.53%	1.84%	1.26%	0.53%	1.84%	1.26%
2027-2028				15.71%	-3.06%	-12.53%
2028-2036				0.53%	1.85%	1.27%
2020-2036	0.53%	1.84%	1.26%	1.42%	1.53%	0.34%

Figure 4.1 portrays the total daily traffic volume on the GWH with and without the GWHUP where a linear growth rate applies through to 2036.

Figure 4.2 portrays the total daily traffic volume on the GWH with the opening of upgrades between Blackheath and Little Hartley in 2028. It shows the same linear growth rate each year up to 2028. Upon opening of the section in 2028, there would be a notable increase in the volume of light vehicles (15.71% p.a.) combined with a decrease in rigid and articulated vehicles. The upgrades between Blackheath and Little Hartley would result in the emergence of latent demand which have shifted from minor roads. The decrease in heavy vehicles upon opening is modelled to occur as a result of a shift to longer heavy vehicles that are able to transport more freight per vehicle. While the volume of freight will increase, the number of vehicles required to transport that freight will decrease. Annual traffic growth is assumed to revert back to a linear rate after 2028.

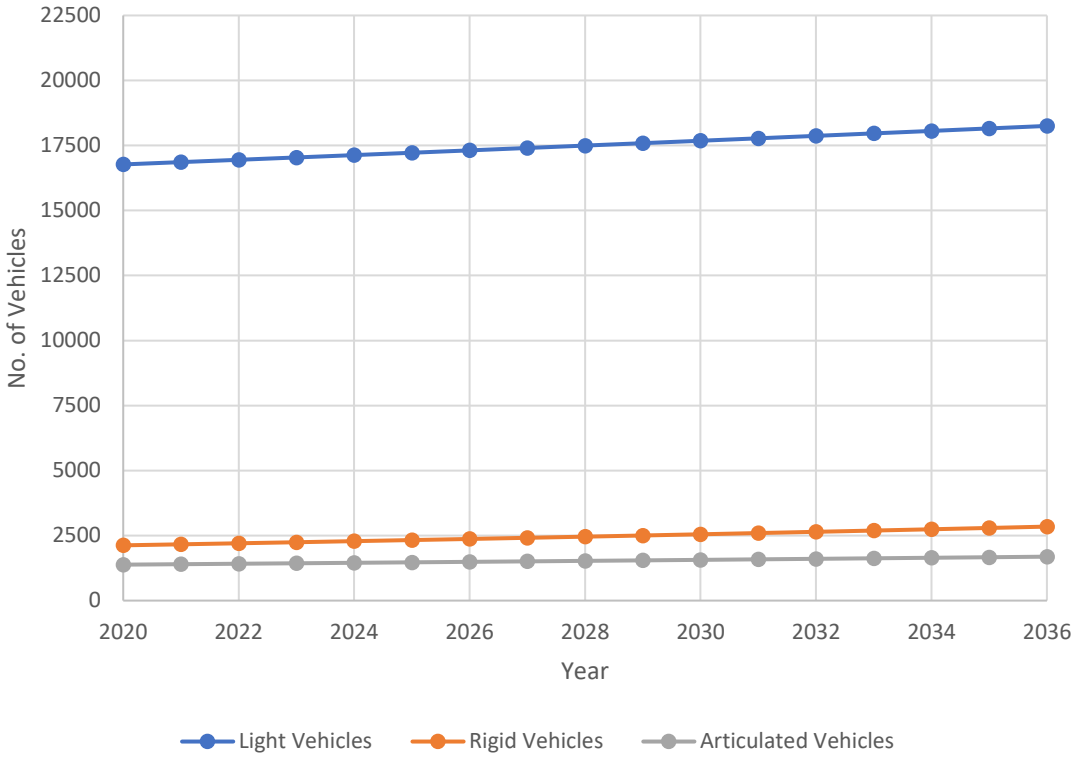


Figure 4.1: Total daily traffic volume on the GWH (without GWHUP)

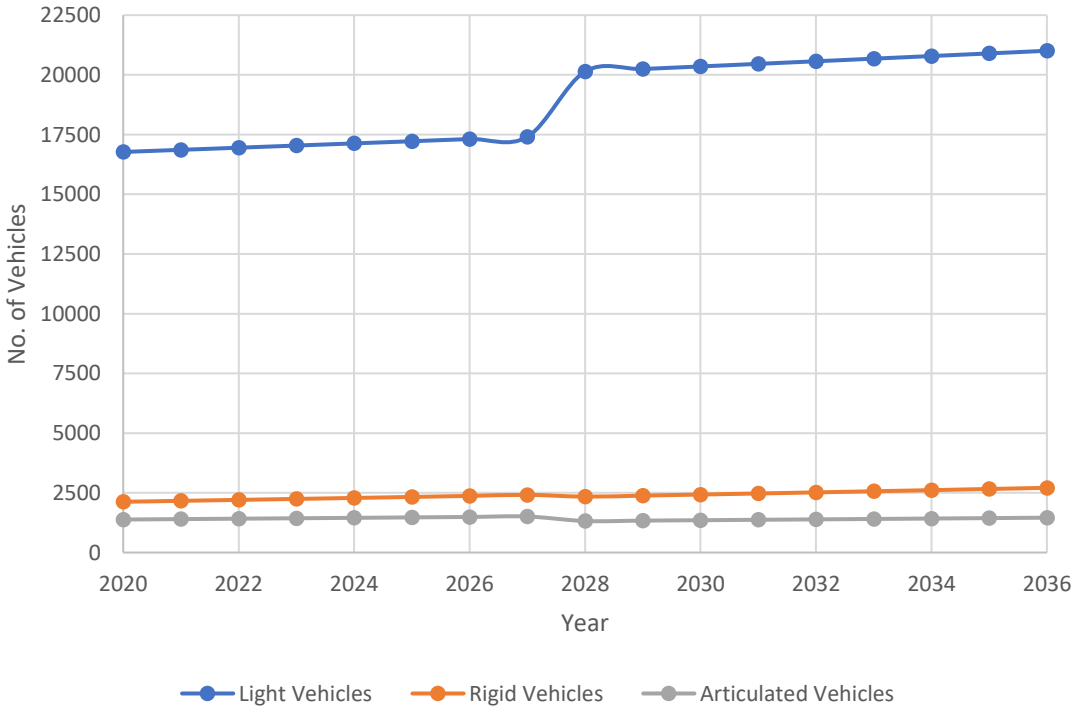


Figure 4.2: Total daily traffic volume on the GWH (with GWHUP)

4.1.2 Modelling Scenarios and Assumptions

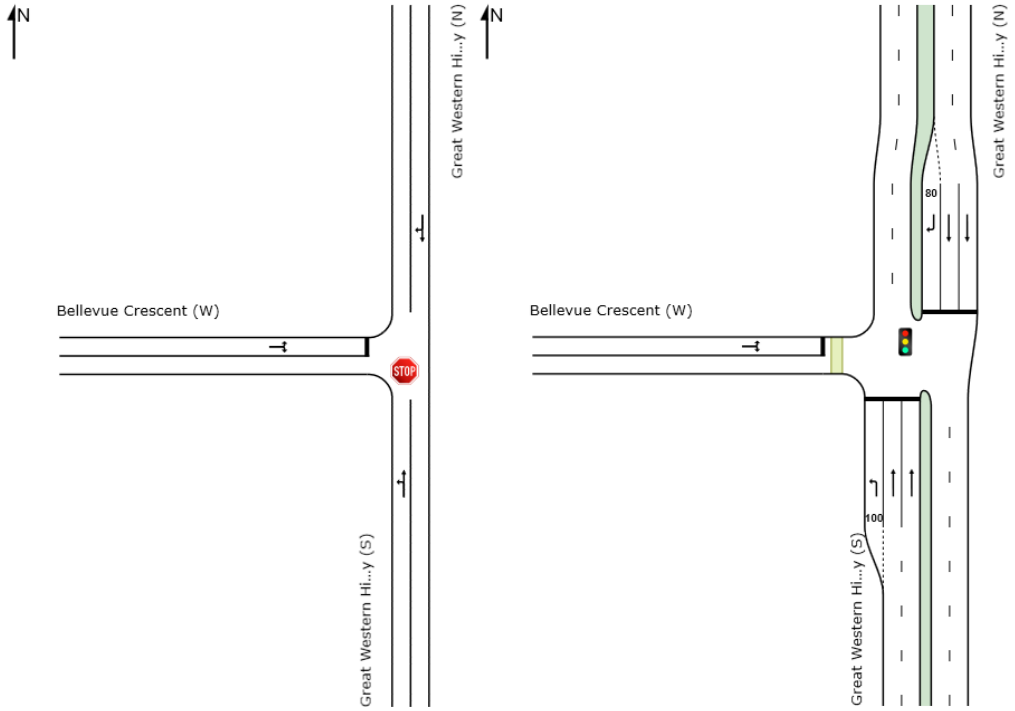
SIDRA models were developed to analyse the following scenarios:

- Weekday 2036 baseline: The existing transport network with projected 2036 weekday peak traffic volumes (without Proposal)
- Weekday 2026 with Proposal: The proposed transport network with projected 2026 weekday peak traffic volumes
- Weekday 2031 with Proposal: The proposed transport network with projected 2031 weekday peak traffic volumes
- Weekday 2036 with Proposal: The proposed transport network with projected 2036 weekday peak traffic volumes
- Weekend 2036 with Proposal: The proposed transport network with projected 2036 weekend peak traffic volumes

The following inputs and assumptions were applied in the modelling of future year scenarios:

- The intersection of GWH and Bellevue Crescent was modelled as per the existing layout for the 'without Proposal' scenario.
- The intersection of GWH and Bellevue Crescent was modelled as a signalised intersection for the 'with Proposal' scenarios in line with the proposed design. This included a pedestrian crossing on the intersection's north approach and turning bays on the GWH on the west and east approaches. The modelled layout of this intersection under baseline and 'with Proposal' scenarios is shown in Figure 4.3.
- A cycle time of 120 seconds was applied to the intersections of GWH and Station Street and GWH and Bellevue Crescent. Both intersections were also modelled as uncoordinated with one another to simulate worse case conditions.
- For the 'with Proposal' scenarios, 2020 traffic volumes were re-distributed to reflect the permissible movements in the proposed network. The following re-distributions were assumed:
    - Eastbound traffic on the GWH currently turning right into the service station would instead turn right into Bellevue Crescent. Vehicles would use the U-turn facility here and then turn left from Bellevue Crescent to travel westbound on the GWH before turning left into the service station.
    - All the eastbound traffic on the GWH currently turning right into the Hydro Majestic Pavilion would use the new dedicated right turn bay
    - All the eastbound traffic on the GWH currently turning right into the Hydro Majestic Hotel would instead turn right into Bellevue Crescent. Vehicles would use the U-turn facility here and then turn left from Bellevue Crescent to travel westbound on the GWH before turning left into the Hydro Majestic Hotel.
    - Traffic currently exiting the Hydro Majestic Hotel and service station and turning right to travel eastbound on the GWH would instead turn left to travel westbound and then make a U-turn at the intersection with Station Street.
        - This movement would not occur in the alternative Bellevue Crescent design. Instead, this traffic would use the new service station and Hydro Majestic Pavilion entry/exits on Bellevue Crescent and turn right onto GWH to travel southbound.
- A Passenger Car Unit (PCU) factor of 2.6 was applied to heavy vehicles.
- All signalised sites were uncoordinated to test for the worst-case scenario. However, it should be noted that coordination of the signals can further minimise delays.

Figure 4.4 shows the modelled transport network for the 'with Proposal' scenarios in 2026, 2031 and 2036.



Without Proposal – 2020 With Proposal – 2026, 2031 & 2036

Figure 4.3: Modelled layout of the GWH and Bellevue Crescent intersection

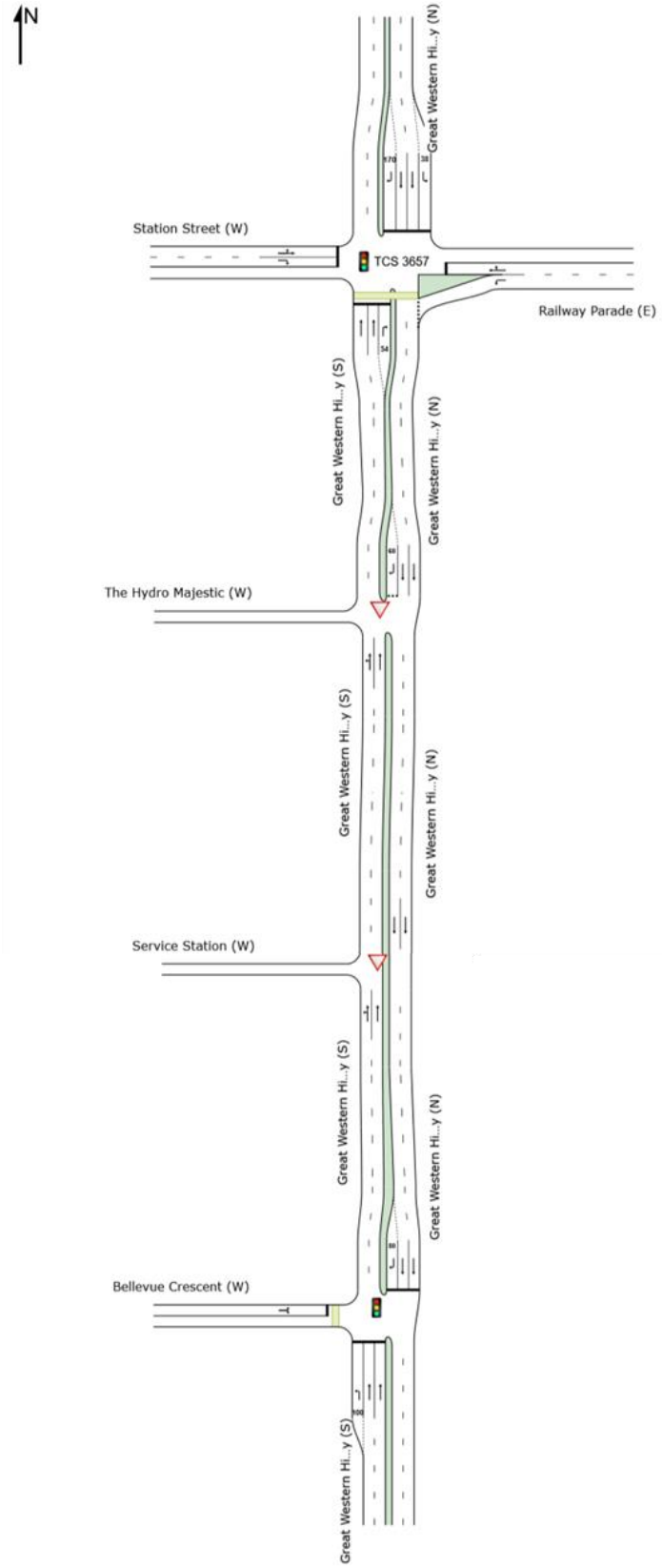


Figure 4.4: Medlow Bath network with Proposal – 2026, 2031 & 2036

4.1.3 2036 Baseline Scenario (Without Proposal)

The 2036 baseline scenario analyses the GWH and Railway Parade and GWH and Bellevue Crescent intersections without the Proposal. The configuration of each intersection replicates the existing configuration. The 2036 traffic volumes were determined by applying the per annum growth rates shown in the 'without GWHUP' column of Table 4.4 to the 2020 surveyed traffic volumes.

Table 4.2 presents the modelling results at each intersection on the network. Further modelling outputs are provided in Appendix B.

Table 4.2: Modelled intersection performance, 2036 baseline scenario (without Proposal)

Intersection	Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	AM	1531	12	A	0.37	81 (West Approach)
		PM	1643	12	A	0.41	94 (West Approach)
Great Western Highway & Bellevue Crescent	Stop (unsignalised)	AM	1591	38 (North Approach)	C (North Approach)	0.56	4 (North Approach)
		PM	1629	39 (North Approach)	C (North Approach)	0.55	4 (North Approach)

The SIDRA modelling reveals the following:

- Both intersections are modelled to perform to an acceptable level in the AM and PM peaks
- The DOS at both intersections is below the maximum practical DOS specified in Table 3.2
- The longest delays are modelled to occur on Bellevue Crescent where average delays would be close to 40 seconds with a LOS of C
- Compared to the existing 2020 model, the intersection at Bellevue Crescent would perform significantly worse in 2036

4.1.4 2026 Scenario (With Proposal)

Table 4.3 presents the modelling results at each intersection on the network for this scenario. Further modelling outputs are provided in Appendix C.

Table 4.3: Modelled intersection performance, 2026 scenario (with Proposal)

Intersection	Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	AM	1480	12	A	0.37	81 (West Approach)
		PM	1544	12	A	0.38	85 (West Approach)
Great Western Highway & The Hydro Majestic	Stop (unsignalised)	AM	1478	4 (West Approach)	A (West and East Approach)	0.25	<1 (West Approach)
		PM	1517	4 (West Approach)	A (West and East Approach)	0.25	<1 (West Approach)
Great Western Highway & Service Station	Stop (unsignalised)	AM	1474	4 (West Approach)	A (West and East Approach)	0.25	0 (West and East Approach)
		PM	1511	4 (West Approach)	A (West and East Approach)	0.25	0 (West and East Approach)
Great Western Highway & Bellevue Crescent	Signalised	AM	1508	6	A	0.30	54 (East Approach)
		PM	1556	5	A	0.30	50 (East Approach)

The SIDRA modelling reveals the following:

- The 2026 ‘with Proposal’ network is modelled to perform with excellent LOS in both the AM and PM peak periods
- The DOS at all intersections is less than the critical thresholds identified in Table 3.2.
- The 95 percentile queue lengths at Railway Parade, The Hydro Majestic and Bellevue Crescent intersections do not exceed the proposed turning bay lengths
- The 95 percentile queue lengths at the east approach of Railway Parade (73 metres) does not exceed the start of the left turn deceleration lane located around 156 metres before the approach
- The modelling demonstrates that the GWH and Bellevue Crescent intersection would perform better as a signalised intersection compared to a stop intersection modelled in the 2036 baseline scenario

4.1.5 2031 Scenario (With Proposal)

Table 4.4 presents the modelling results at each intersection on the network for this scenario. Further modelling outputs are provided in Appendix D.

Table 4.4: Modelled intersection performance, 2031 scenario (with Proposal)

Intersection	Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	AM	1689	12	A	0.37	85 (East Approach)
		PM	1892	12	A	0.43	103 (West Approach)
Great Western Highway & The Hydro Majestic	Stop (unsignalised)	AM	1801	4 (West Approach)	A (West and East Approach)	0.28	<1 (West Approach)
		PM	1860	4 (West Approach)	A (West and East Approach)	0.29	<1 (West Approach)
Great Western Highway & Service Station	Stop (unsignalised)	AM	1796	4 (West Approach)	A (West and East Approach)	0.29	<1 (West and East Approach)
		PM	1853	4 (West Approach)	A (West and East Approach)	0.29	<1 (West and East Approach)
Great Western Highway & Bellevue Crescent	Signalised	AM	1836	6	A	0.34	63 (East Approach)
		PM	1906	5	A	0.34	60 (East Approach)

The SIDRA modelling reveals the following:

- The 2031 'with Proposal' network is modelled to perform with excellent LOS in both the AM and PM peaks
- The DOS at all intersections is less than the critical thresholds identified in Table 3.2.
- The 95 percentile queue lengths at Railway Parade, The Hydro Majestic and Bellevue Crescent intersections are not modelled to exceed the proposed turning bay lengths
- The 95 percentile queue lengths at the east approach of Railway Parade (103 metres) do not exceed the start of the left turn deceleration lane located around 156 metres before the approach.
- The modelling demonstrates that the GWH and Bellevue Crescent intersection would perform better as a signalised intersection compared to a stop intersection modelled in the 2036 baseline scenario

4.1.6 2036 Scenario (With Proposal)

Table 4.5 presents the modelling results at each intersection on the network for this scenario. Further modelling outputs are provided in Appendix E.

Table 4.5: Modelled intersection performance, 2036 scenario (with Proposal)

Intersection	Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	AM	1718	12	A	0.38	89 (East Approach)
		PM	1949	13	A	0.45	108 (West Approach)
Great Western Highway & The Hydro Majestic	Stop (unsignalised)	AM	1856	4 (West Approach)	A (West and East Approach)	0.29	<1 (West Approach)
		PM	1917	4 (West Approach)	A (West and East Approach)	0.30	<1 (West Approach)
Great Western Highway & Service Station	Stop (unsignalised)	AM	1851	4 (West Approach)	A (West and East Approach)	0.30	0 (West and East Approach)
		PM	1908	4 (West Approach)	A (West and East Approach)	0.30	0 (West and East Approach)
Great Western Highway & Bellevue Crescent	Signalised	AM	1894	6	A	0.35	66 (East Approach)
		PM	1966	5	A	0.35	63 (East Approach)

The SIDRA modelling reveals the following:

- The 2036 'with Proposal' network is modelled to perform with excellent LOS in both the AM and PM peaks
- The DOS at all intersections is less than the critical thresholds identified in Table 3.2
- The 95 percentile queue lengths at Railway Parade, The Hydro Majestic and Bellevue Crescent intersections does not exceed the proposed turning bay lengths
- The 95 percentile queue lengths at the east approach of Railway Parade (108 metres) does not exceed the start of the left turn deceleration lane around 156 metres before the approach
- The modelling demonstrates that the GWH and Bellevue Crescent intersection would perform better as a signalised intersection compared to a stop intersection modelled in the 2036 baseline scenario

4.1.7 2036 Weekend Scenario (With Proposal)

Given that various destinations served by the GWH attract significant weekend traffic, it was considered necessary to test a weekend scenario. In the absence of observed turning movement traffic surveys over a weekend, the following method was applied to estimate weekend turning movement volumes:

- A review of the weekend hourly traffic volumes on the GWH south of Bellevue Crescent showed that the peak two-way flows occurred on a Sunday between 2:30-3:30pm. Over this period, 1,943 vehicles were observed (780 westbound and 1,163 eastbound).
- The observed average weekday volumes between 2:30-3:30pm at the same location was 1,569 vehicles (794 westbound and 775 eastbound). Peak weekend traffic volumes were therefore 24% higher than average weekday volumes over the same period.
- A 24% uplift factor was applied to the weekday turning movement volumes that were observed between 2:30-3:30pm to estimate the 2020 weekend turning movement volumes
- The 2036 weekend traffic volumes were determined by applying the per annum growth rates shown in the 'Without GWHUP' column of Table 4.4 to the 2020 estimated weekend turning movement traffic volumes.

Table 4.6 outlines the SIDRA performance outputs. The individual movement summaries are presented in Appendix F.

Table 4.6: Modelled intersection performance, 2036 weekend scenario (with Proposal)

Intersection	Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	2.30-3.30pm	2409	13.7	A	0.56	149 (West Approach)
Great Western Highway & The Hydro Majestic	Stop (unsignalised)	2.30-3.30pm	2372	4.4 (West Approach)	A (West Approach)	0.37	<1 (West Approach)
Great Western Highway & Service Station	Stop (unsignalised)	2.30-3.30pm	2363	4.2 (West Approach)	A (West and East Approach)	0.37	<1 (West and East Approach)
Great Western Highway & Bellevue Crescent	Signalised	2.30-3.30pm	2427	5.3	A	0.43	85 (East Approach)

The SIDRA modelling reveals the following:

- The estimated weekend traffic volumes at each intersection are between 22-42% higher than the weekday volumes under the 2036 'with Proposal' scenario described in Section 4.1.6
- The 2036 'with Proposal' network is modelled to perform with excellent LOS on the weekend

- The DOS at all intersections is less than the critical thresholds identified in Table 3.2
- The 95 percentile queue lengths at Railway Parade, The Hydro Majestic and Bellevue Crescent intersections does not exceed the proposed turning bay lengths
- The 95 percentile queue lengths at the east approach of Railway Parade (130 metres) does not exceed the start of the left turn deceleration lane around 156 metres before the approach

4.1.8 2036 Weekend Scenario (With Proposal) – Sensitivity Test

To safeguard for potential large groups of vehicles exiting Hydro Majestic Pavilion and Hotel during the weekend, a sensitivity test has been conducted at the GWH and Railway Parade intersection. In the Proposal, right turn movements out of Hydro Majestic Pavilion and Hotel are prohibited. Vehicles that want to travel eastbound must turn left and make a U-turn at Station Street. A volume of 100 vehicles were assigned to the right turn movement at Station Street to model vehicles utilising this turn to travel eastbound.

Table 4.7 presents the sensitivity test modelling results for a weekend peak under 2036 with Proposal conditions. Further modelling outputs are provided in Appendix G.

Table 4.7: Sensitivity test modelled intersection performance, 2036 weekend scenario (with Proposal)

Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
2:30-3:30pm	2375	15.1	B	0.56	149 (West Approach)

The SIDRA modelling reveals the following:

- The intersection is modelled to perform to an acceptable level during the weekend peak hour
- The DOS is below the critical threshold identified in Table 3.2
- The longest average delays would be close to 51 seconds (LOS D) and occur on Station Street
- The 95 percentile queue lengths at the east approach of Railway Parade (130 metres) does not exceed the start of the left turn deceleration lane around 156 metres before the approach
- The 95 percentile queue length at the west approach of Station Street (40 metres) will exceed the right turn lane length of around 25 metres. However, vehicles can queue along the diverge lane from the GWH without obstructing through traffic movement.

4.2 Impacts on Active Transport

Active transport along the Study Area would be improved through the following infrastructure:

- A 2.5-metre-wide shared path would be provided alongside the westbound lanes of the GWH between the intersection with Bellevue Crescent and Railway Parade
- The existing pedestrian refuge and level pedestrian/railway crossing (refer to Figure 2.9 and Figure 2.10) would be removed. Pedestrian access across the GWH and railway line would instead be via a pedestrian bridge. This bridge would include stairs and lifts at Railway Parade, the Medlow Bath Station and on both sides of the GWH. The

incorporation of lifts and stairs would significantly improve connectivity of the area for commuters and tourists in line with Transport Accessibility Program (TAP) requirements. This will provide safe all ability access to the public transport services including the Medlow Bath railway station and bus services on both sides of the GWH and Railway Parade.

- Raised pedestrian crossings on Railway Parade that would provide access to the proposed footbridge.

4.3 Impacts on Public Transport

The Proposal includes a minor relocation of existing bus stops and shelters on both sides of the highway to allow safer access.

4.4 Impacts on Parking

The Proposal would result in the following parking impacts:

- The commuter car park at Railway Parade would be formalised and expanded to include 11 parking bays
- Two kiss and ride bays would be provided at Railway Parade
- The loss of around 40 perpendicular car parking spaces along the western side of the GWH which have already been compensated for by the Hydro Majestic southern carpark work

5 Traffic and Transport Assessment Alternative Design (Operation Phase)

5.1 The Alternative Design

As part of the alternative design for the GWHUP at Medlow Bath, a new signalised intersection is being considered on the GWH. The proposed intersection (New Bellevue Crescent) is located around 25 metres south of the service station. The concept also includes truncating Bellevue Crescent at its current intersection with the GWH and providing an access road from New Bellevue Crescent to the service station and Hydro Majestic Pavilion. Figure 5.1 shows the modelled alternative design of the GWH/New Bellevue Crescent for the 'with Proposal' scenario in 2036.

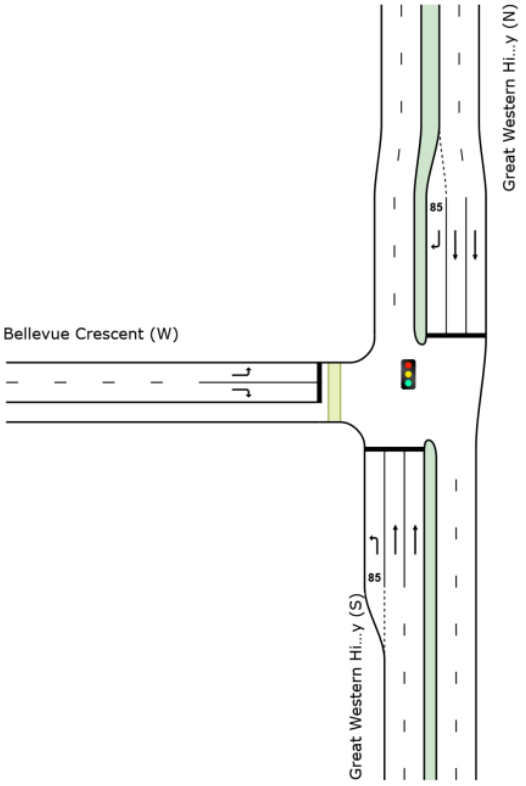


Figure 5.1: Modelled layout of the GWH and New Bellevue Crescent intersection with Proposal in 2036

5.2 Traffic Re-Assignment

The proposed intersection at New Bellevue Crescent would lead to the re-routing of some traffic movements. There would be a direct connection between New Bellevue Crescent and Hydro Majestic Pavilion but no direct connection between the Hydro Majestic Hotel and New Bellevue Crescent. Figure 5.2 presents the locations of New Bellevue Crescent, Hydro Majestic Pavilion and Hydro Majestic Hotel. Figure 5.3 presents a more detailed configuration of New Bellevue

Crescent with the addition of two side roads connecting to the Petrol Station and Hydro Majestic Pavilion. Table 5.1 presents the expected re-routing of traffic that would occur with this alternative design.

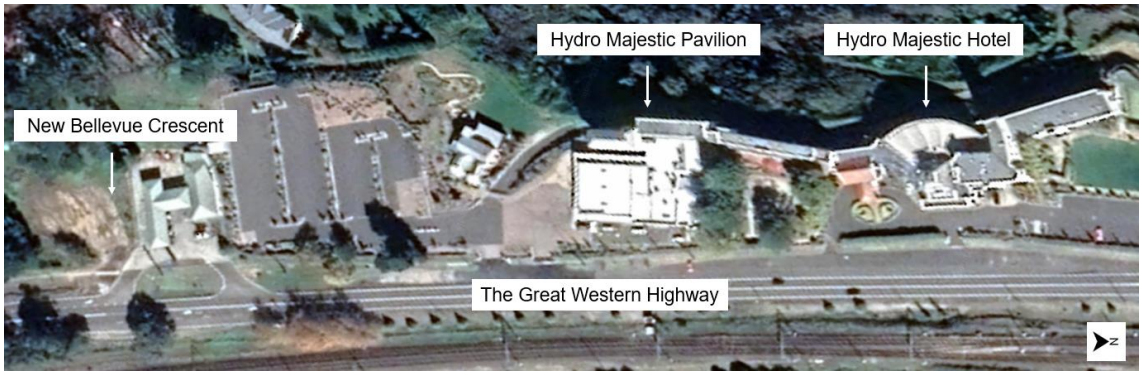


Figure 5.2: Location of New Bellevue Crescent, Hydro Majestic Pavilion and Hotel along the GWH (Source: Google Maps)

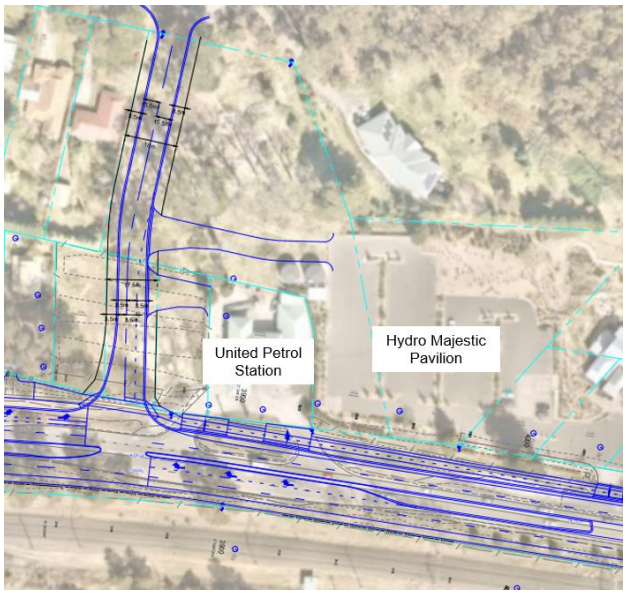


Figure 5.3: New Bellevue Crescent layout (Source: Mott MacDonald)

Table 5.1: Traffic movement re-assignment

Assumption No.	Current Traffic Movement (2020)	Reassigned Movement
1	Traffic turning right from Station St onto GWH eastbound	80% will turn right from New Bellevue Crescent onto GWH eastbound
2	Traffic turning right from the Petrol Station onto GWH eastbound	100% will turn right from New Bellevue Crescent onto GWH eastbound
3	Traffic turning right from Hydro Majestic Pavilion onto GWH eastbound	100% will turn right from New Bellevue Crescent onto GWH eastbound

Assumption No.	Current Traffic Movement (2020)	Reassigned Movement
4	Traffic turning right from GWH eastbound into the Petrol Station	100% will turn right from GWH eastbound into New Bellevue Crescent
5	Traffic turning right from GWH eastbound into Hydro Majestic Pavilion	100% will turn right via the new right turn bay
6	Traffic turning right from Hydro Majestic Hotel onto GWH eastbound	100% will turn left onto GWH westbound and make a U-turn at the GWH/Station St intersection
7	Traffic turning left from Hydro Majestic Pavilion to GWH westbound	No reassignment. Any U-turning vehicles via Station St are accounted for in assumption 1.
8	Traffic turning left from Hydro Majestic Hotel onto GWH westbound	No reassignment. Any U-turning vehicles via Station St are accounted for in assumption 1.
9	Traffic turning right from GWH eastbound into Hydro Majestic Hotel	100% will turn right from GWH eastbound into Hydro Majestic Pavilion, turn left out of the Pavilion, travel westbound then turn left into Hydro Majestic Hotel

5.3 Impacts on the Road Network

5.3.1 2036 Scenario (With Proposal)

Table 5.2 presents the modelling results for a weekday AM and PM peak under 2036 with Proposal conditions. Further modelling outputs are provided in Appendix H.

Table 5.2: Modelled intersection performance, 2036 weekday scenario (without Proposal)

Intersection	Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	AM	1628	12.0	A	0.36	83 (East Approach)
		PM	1844	12.2	A	0.43	101 (West Approach)
Great Western Highway & New Bellevue Crescent	Signalised	AM	1806	5.9	A	0.33	60 (East Approach)
		PM	1881	6.0	A	0.34	63 (East Approach)

The SIDRA modelling reveals the following:

- Both intersections are modelled to perform to excellent LOS in the AM and PM peaks
- The DOS for both intersections are below the maximum practical DOS of 0.80
- The longest average delay at the GWH/New Bellevue Crescent intersection for any movement would be around 68 seconds (LOS of E) and occur on New Bellevue Crescent. The poor LOS is because the demand on this approach is low (around 40 vehicles for both the AM and PM peak) and it is therefore allocated a small proportion of the overall green time in each cycle.
- The length of the turning storage lanes on the west and east approaches of the GWH is greater than the modelled 95 percentile queue lengths. This indicates that turning vehicles would not block the through movements on the GWH.
- Queues on New Bellevue Crescent on the approach to GWH are not modelled to block the new entry/exits of the Petrol Station or Hydro Majestic Pavilion

5.3.2 2036 Weekend Scenario (With Proposal)

Given that various destinations served by the GWH attract significant weekend traffic, it was considered necessary to test a weekend scenario. In the absence of observed weekend turning movement traffic surveys, the method described in Section 4.1.7 was applied to estimate weekend turning movement volumes.

Table 5.3 presents the modelling results for a weekend peak under 2036 with Proposal conditions. Further modelling outputs are provided in Appendix H.

Table 5.3: Modelled intersection performance, 2036 weekend scenario (with Proposal)

Intersection	Control	Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
Great Western Highway & Railway Parade	Signalised	2:30-3:30pm	2278	13.2	A	0.53	137 (West Approach)
Great Western Highway & New Bellevue Crescent	Signalised	2:30-3:30pm	2330	6.7	A	0.42	82 (East Approach)

The SIDRA modelling reveals the following:

- Both intersections are modelled to perform to excellent LOS during the weekend peak hour.
- The DOS for both intersections are below the maximum practical DOS of 0.80
- The longest average delays at the GWH/New Bellevue Crescent intersection would be around 65 seconds (LOS E) and occur on New Bellevue Crescent. The poor LOS is because the demand on this approach is low (around 55 vehicles) and is therefore allocated a small proportion of the overall green time in each cycle.
- The length of the turning storage lanes on the west and east approaches of the GWH is greater than the modelled 95 percentile queue lengths. This indicates that turning vehicles would not block the through movements on the GWH.

- Queues on New Bellevue Crescent on the approach to GWH are not modelled to block the new entry/exits of the Petrol Station or Hydro Majestic Pavilion

5.3.3 2036 Weekend Scenario (With Proposal) – Sensitivity Test

To safeguard for potential large groups of vehicles exiting Hydro Majestic Pavilion during the weekend, a sensitivity test has been conducted at New Bellevue Crescent. A volume of 100 vehicles were assigned to the right turn movement at New Bellevue Crescent to model vehicles utilising the new entry/exit to travel eastbound.

Table 5.4 presents the sensitivity test modelling results for a weekend peak under 2036 with Proposal conditions. Further modelling outputs are provided in Appendix H.

Table 5.4: Sensitivity test at GWH/New Bellevue Crescent. Modelled intersection performance, 2036 weekend scenario (with Proposal)

Peak Hour	Traffic Volume (veh/h)	Average Vehicle Delay (secs)	Level of Service (LOS)	Degree of Saturation (DOS)	95 Percentile Queue Lengths (m)
2:30-3:30pm	2380	9.9	A	0.45	103 (East Approach)

The SIDRA modelling reveals the following:

- The intersection is modelled to perform to an acceptable level during the weekend peak hour
- The DOS is below the maximum practical DOS of 0.80
- The length of the turning storage lanes on the west and east approaches of the GWH is greater than the modelled 95 percentile queue lengths. This indicates that turning vehicles would not block the through movements on the GWH.
- Left turn and right turn queues on New Bellevue Crescent are not expected to block the new entry/exits of the Petrol Station or Hydro Majestic Pavilion

6 Traffic and Transport Assessment (Construction Phase)

6.1 Methodology

Construction of the GWH upgrade works are expected to commence in mid-2022 and take eighteen months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with TfNSW. A Construction Traffic Management Plan (CTMP) would be required specifying how through traffic on the GWH would continue to flow and how access for local residents would be maintained during construction.

The indicative construction activities for the Proposal are identified in Table 6.1. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Table 6.1: Construction activities

Stage	Activities	Duration (Weeks)	Maximum Daily Deliveries (Trucks)	Maximum Daily Workforce
Site preparation	• Utility investigations • Potential removal of redundant utilities and relocation of existing ones	6	3	8
Site establishment	• Clearing and grubbing • Topsoil stripping • Hardstand construction • Utilities services • Material storage areas • Temporary security fencing • Temporary pedestrian fencing • Temporary access road the compound • Installation of water quality and sediment control measures • Temporary traffic control barriers, signage and lighting along the full length of the existing roadway in order to	6	15	35

Stage	Activities	Duration (Weeks)	Maximum Daily Deliveries (Trucks)	Maximum Daily Workforce
	separate the construction site from passing traffic			
Vegetation Clearing	• Clearing trees, mulching	2	3	5
Roadworks	Road works would be required along the entire road alignment. The works would be split into constructing the westbound lanes first and then constructing the eastbound lanes. Road construction would include: • Removal and demolition of existing pavements • Embankment foundation treatments • Construction of the new embankment • Excavation of cuttings • Construction of the larger transverse drainage structurers (box culverts) • Installation of drainage pit and pipe systems • Construction of the open drainage channels and permanent controls • Utility works typically including communications, power, gas, water and sewer (where necessary) along with ITS and TCS networks • Construction of the pavement layers including the subbase and the asphalt • Major and minor sign structures including piling, concrete works	40	20	75

Stage	Activities	Duration (Weeks)	Maximum Daily Deliveries (Trucks)	Maximum Daily Workforce
	and installation of overhead steel structure • Tie-ins to existing pavement at the southern and northern limits			
Finishing works	• Installation of road furniture (i.e. lighting, safety barriers and guideposts) • Pavement marking • Installation of urban design treatments and features • Landscaping works • Removal of all remaining temporary works such as traffic control barriers and lighting	8	15	25

6.2 Plant and Equipment

The plant and equipment likely to be used during construction includes:

- Water trucks, street sweepers, road saws, rollers, road saws, trench compactors, concrete trucks, semi-trailers and spoil trucks (truck and dog)
- Welding equipment, air compressors, concrete saws, generators, concrete vibrators, concrete pumps, jack hammer
- Excavators (8-30 tonnes)
- Concrete pavers
- Asphalting equipment
- Cranes of various sizes up to 250 tonnes

6.3 Working Hours

Most works required for the Proposal would be undertaken during standard NSW Environment Protection Authority (EPA) construction hours, as follows:

- 7am to 6pm Monday to Friday
- 8am to 1pm Saturdays
- No work on Sundays or public holidays

Certain works may need to occur outside standard hours to minimise disruption to customers, pedestrians, road users and nearby sensitive receivers.

Approval from TfNSW would be required for any out of hours work and the affected community would be notified as outlined in TfNSW's *Construction Noise Strategy* (*TfNSW, 2012c*).

6.4 Construction Worker Parking

All staff parking would be accommodated on-site and not on surrounding local streets.

6.5 Construction Site Location and Access

The construction site is located on the GWH in Medlow Bath. Construction vehicles would only be permitted to access the site via the GWH. Other roads in the project area such as Station Street, Railway Parade and Bellevue Crescent would not be accessible to construction vehicles.

6.6 Impacts on Parking

40 perpendicular parking spaces along the western side of the GWH would be removed during the construction phase (refer to Figure 2.15). The railway commuter carpark will not be impacted during the construction phase.

6.7 Impacts on Property Access

Access to private residential properties and the Hydro Majestic Hotel would be maintained throughout the construction period.

6.8 Impacts on the Public Transport Network

Bus and rail services would continue to operate as scheduled. Bus stops may need to be relocated during the construction phase in which case this will be identified in a detailed construction plan.

6.9 Impacts on the Active Transport Network

Pedestrian access to the railway station would be maintained throughout the construction period. A shared path would be constructed to minimise the impacts on cyclists.

6.10 Management and Mitigation Measures

Only one lane in each direction (plus turning lanes) at the GWH and Railway Parade intersection will be kept. Staging of traffic switches and utilities would be implemented to keep the highway open in both directions during construction.

7 Summary and Conclusions

Table 7.1 provides a comparison of the GWH and Railway Parade intersection performance with and without the Proposal in 2036. No changes are proposed to the layout of this intersection under the 'with Proposal' Scenario.

Table 7.1: Comparison of 2036 GWH and Railway Parade intersection performance (with and without Proposal)

Performance Parameter	AM Peak		PM Peak	
	Without	With Proposal	Without	With Proposal
Traffic Volume (veh/hr)	1531	1718	1643	1949
Average Vehicle Delay (secs)	12	12	12	13
Level of Service	A	A	A	A
Degree of Saturation	0.35	0.38	0.39	0.45
95 Percentile Queue Lengths (m)	76 (East Approach)	89 (East Approach)	88 (West Approach)	108 (West Approach)

The modelling indicates that this intersection would perform at excellent LOS both with and without the Proposal. Queue lengths and the DOS in the 'with Proposal' scenario are slightly higher due to the increased traffic volumes that are modelled to travel through this intersection with the opening of the full GWHUP.

Table 7.2 provides a comparison of the GWH and Bellevue Crescent intersection performance with and without the Proposal in 2036.

Table 7.2: Comparison of 2036 GWH and Bellevue Crescent intersection performance (with and without Proposal)

Performance Parameter	AM Peak		PM Peak	
	Without	With Proposal	Without	With Proposal
Traffic Volume (veh/hr)	1591	1894	1629	1966

Average Vehicle Delay (secs)	31 (North Approach)	6	32 (North Approach)	5
Level of Service	C (North Approach)	A	C (North Approach)	A
Degree of Saturation	0.53	0.35	0.53	0.35
95 Percentile Queue Lengths (m)	3 (North Approach)	66 (East Approach)	3 (North Approach)	63 (East Approach)

A comparison of the 2036 intersection performance with and without Proposal at the GWH and Bellevue Crescent intersection reveals that:

- There would be a reduction in average delays and DOS due to controlled gaps for turning traffic
- The LOS would improve from C to A upon signalisation of this intersection
- The conversion of this intersection from a stop sign control system to signalisation would result in increased queuing on the GWH. However, turning bay lengths of 100 metres for westbound left turning vehicles and 80 metres eastbound right turning vehicles have been provided which is sufficient to accommodate the modelled queueing.

Overall, the Proposal improves the existing performance of the GWH even with increases to traffic volumes in 2036. Alterations to the existing alignment, particularly the signalised control system and U-turn bay at Bellevue Crescent and the addition of right turn bays eastbound into key amenities improve the safety of vehicles and the community. The 5-year crash data reveal a 44 per cent of total crashes within Medlow Bath at Bellevue Crescent. The modification to provide dedicated turning movement provisions at this location would improve safety for local traffic accessing the highway. With the completion of the GWHUP, the Station St traffic signals would be the last set on the upgraded highway between Sydney and Lithgow.

The improvement in performance is largely due to increased lane capacity and the co-ordination of flow rates by traffic signals at both ends of the village. Traffic signals at Bellevue Crescent will also assist with managing safe speed of all vehicles on the GWH through the Medlow Bath village. Post completion of the GWHUP, it is expected that the highway upgrade will increase accessibility for locals and tourists, improve travel times for active transport and increase the safety of vehicles, pedestrians and cyclists.

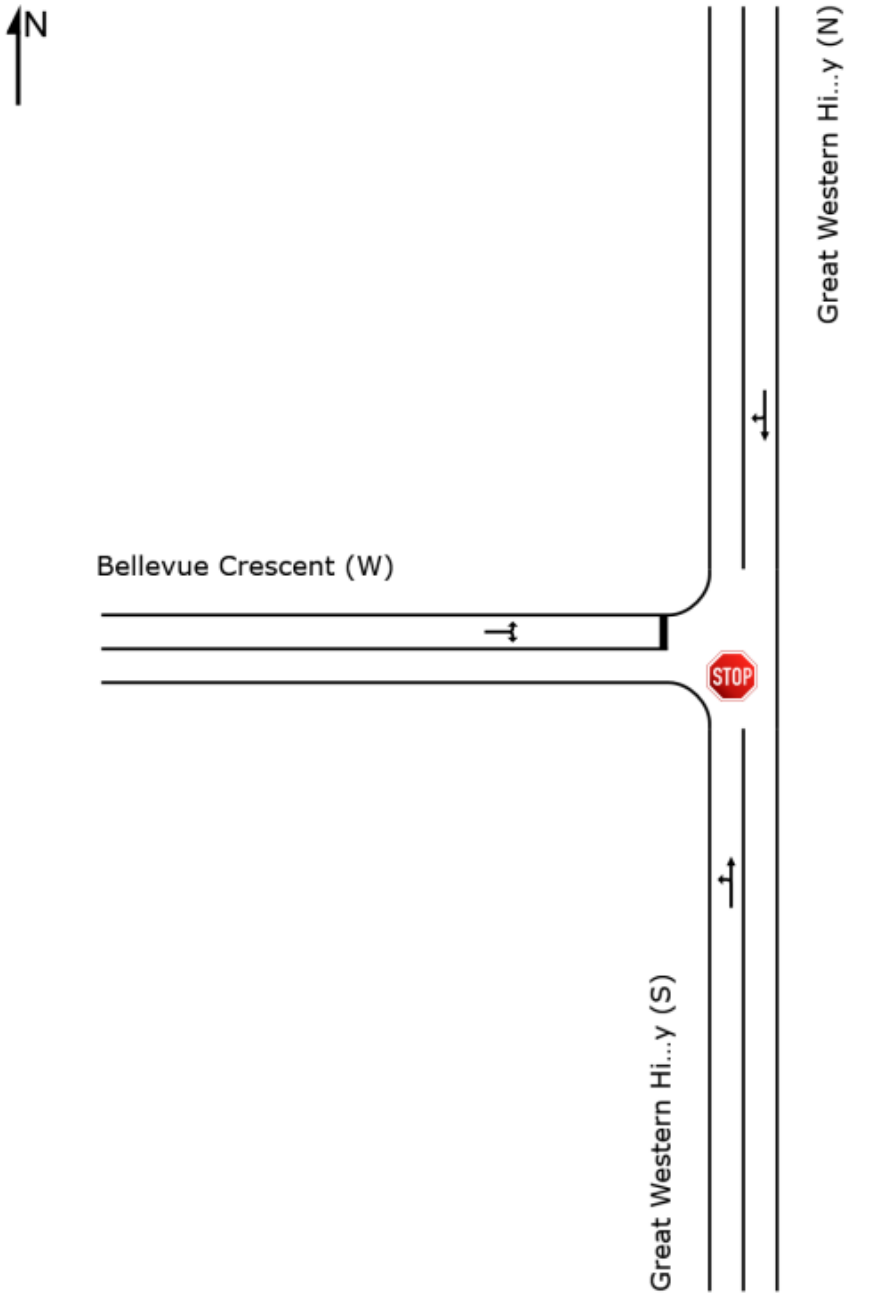
8 Appendices

SITE LAYOUT

Site: [(AM/Existing) GWH | Bellevue Cres (Site Folder: Existing)]

Site Category: Existing Design
Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



A. SIDRA Intersection Performance Summaries (Existing Conditions)

MOVEMENT SUMMARY

Site: TCS 3657 [(AM/Existing) GWH | Railway Pde (Site Folder: Existing)]

TCS 3657
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	607	79	639	13.0	0.261	4.9	LOS A	5.8	45.3	0.33	0.29	0.33	55.5
7, 8	R2	24	0	25	0.0	*0.047	8.0	LOS A	0.2	1.7	0.28	0.62	0.28	46.1
Approach		631	79	664	12.5	0.261	5.0	LOS A	5.8	45.3	0.33	0.31	0.33	55.3
East: Railway Parade (E)														
13	L2	48	2	51	4.2	0.066	4.7	LOS A	0.4	2.7	0.19	0.57	0.19	51.3
9	T1	1	0	1	0.0	*0.186	62.3	LOS E	1.1	7.4	0.99	0.69	0.99	3.8
9	R2	16	0	17	0.0	0.186	65.9	LOS E	1.1	7.4	0.99	0.69	0.99	20.1
Approach		65	2	68	3.1	0.186	20.6	LOS B	1.1	7.4	0.40	0.60	0.40	36.3
North: Great Western Highway (N)														
12	L2	20	1	21	5.0	0.016	9.6	LOS A	0.3	2.2	0.26	0.62	0.26	44.4
1, 2	T1	714	76	752	10.6	*0.300	5.1	LOS A	7.0	53.5	0.35	0.31	0.35	55.4
3, 4	R2	3	0	3	0.0	0.005	7.8	LOS A	0.0	0.2	0.27	0.59	0.27	46.8
Approach		737	77	776	10.4	0.300	5.2	LOS A	7.0	53.5	0.34	0.32	0.34	55.1
West: Station Street (W)														
11	L2	2	0	2	0.0	0.022	58.0	LOS E	0.2	1.2	0.94	0.62	0.94	21.1
11	T1	1	0	1	0.0	0.022	55.5	LOS D	0.2	1.2	0.94	0.62	0.94	4.1
10	R2	5	0	5	0.0	0.053	63.4	LOS E	0.3	2.1	0.98	0.64	0.98	19.8
Approach		8	0	8	0.0	0.053	61.1	LOS E	0.3	2.1	0.96	0.63	0.96	18.8
All Vehicles		1441	158	1517	11.0	0.300	6.1	LOS A	7.0	53.5	0.34	0.33	0.34	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

.

MOVEMENT SUMMARY

Site: TCS 3657 [(PM/Existing) GWH | Railway Pde (Site Folder: Existing)]

TCS 3657
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	640	54	674	8.4	0.258	4.9	LOS A	6.1	45.9	0.33	0.29	0.33	55.5
7, 8	R2	36	2	38	5.6	*0.076	8.2	LOS A	0.4	2.7	0.29	0.62	0.29	46.0
Approach		676	56	712	8.3	0.258	5.1	LOS A	6.1	45.9	0.33	0.31	0.33	55.2
East: Railway Parade (E)														
13	L2	34	3	36	8.8	0.049	4.7	LOS A	0.3	1.9	0.18	0.56	0.18	51.1
9	T1	1	0	1	0.0	*0.135	62.3	LOS E	0.7	5.6	0.98	0.68	0.98	3.8
9	R2	10	2	11	20.0	0.135	65.9	LOS E	0.7	5.6	0.98	0.68	0.98	19.8
Approach		45	5	47	11.1	0.135	19.5	LOS B	0.7	5.6	0.38	0.59	0.38	36.7
North: Great Western Highway (N)														
12	L2	19	2	20	10.5	0.017	9.7	LOS A	0.3	2.2	0.26	0.62	0.26	44.4
1, 2	T1	730	64	768	8.8	*0.299	5.1	LOS A	7.1	53.8	0.35	0.31	0.35	55.4
3, 4	R2	1	0	1	0.0	0.002	7.8	LOS A	0.0	0.1	0.26	0.58	0.26	46.8
Approach		750	66	789	8.8	0.299	5.2	LOS A	7.1	53.8	0.34	0.32	0.34	55.2
West: Station Street (W)														
11	L2	1	0	1	0.0	0.018	59.3	LOS E	0.1	0.8	0.95	0.60	0.95	21.0
11	T1	1	0	1	0.0	0.018	56.8	LOS E	0.1	0.8	0.95	0.60	0.95	4.2
10	R2	9	1	9	11.1	0.102	64.3	LOS E	0.6	4.3	0.98	0.67	0.98	19.5
Approach		11	1	12	9.1	0.102	63.1	LOS E	0.6	4.3	0.97	0.66	0.97	18.7
All Vehicles		1482	128	1560	8.6	0.299	6.0	LOS A	7.1	53.8	0.34	0.32	0.34	54.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(AM/Existing) GWH | Bellevue Cres (Site Folder: Existing)]

Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	4	0	4	0.0	0.417	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	30.9
	T1	642	79	676	12.3	0.417	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach		646	79	680	12.2	0.417	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.4
North: Great Western Highway (N)														
	T1	762	80	802	10.5	0.488	0.1	LOS A	0.2	1.5	0.02	0.00	0.04	59.8
	R2	6	0	6	0.0	0.488	12.7	LOS A	0.2	1.5	0.02	0.00	0.04	30.8
Approach		768	80	808	10.4	0.488	0.2	NA	0.2	1.5	0.02	0.00	0.04	59.5
West: Bellevue Crescent (W)														
	L2	9	0	9	0.0	0.121	12.0	LOS A	0.3	2.4	0.85	1.00	0.85	34.6
	R2	11	0	12	0.0	0.121	37.1	LOS C	0.3	2.4	0.85	1.00	0.85	34.2
Approach		20	0	21	0.0	0.121	25.8	LOS B	0.3	2.4	0.85	1.00	0.85	34.4
All Vehicles		1434	159	1509	11.1	0.488	0.6	NA	0.3	2.4	0.02	0.02	0.03	59.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [(PM/Existing) GWH | Bellevue Cres (Site Folder: Existing)]

Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	13	0	14	0.0	0.418	5.7	LOS A	0.0	0.0	0.00	0.01	0.00	30.9
	T1	671	56	706	8.3	0.418	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach		684	56	720	8.2	0.418	0.3	NA	0.0	0.0	0.00	0.01	0.00	59.0
North: Great Western Highway (N)														
	T1	778	68	819	8.7	0.483	0.1	LOS A	0.1	0.8	0.01	0.00	0.02	59.9
	R2	3	0	3	0.0	0.483	13.2	LOS A	0.1	0.8	0.01	0.00	0.02	30.9
Approach		781	68	822	8.7	0.483	0.1	NA	0.1	0.8	0.01	0.00	0.02	59.8
West: Bellevue Crescent (W)														
	L2	3	0	3	0.0	0.087	12.1	LOS A	0.2	1.7	0.88	1.00	0.88	31.8
	R2	8	0	8	0.0	0.087	38.5	LOS C	0.2	1.7	0.88	1.00	0.88	31.4
Approach		11	0	12	0.0	0.087	31.3	LOS C	0.2	1.7	0.88	1.00	0.88	31.5
All Vehicles		1476	124	1554	8.4	0.483	0.4	NA	0.2	1.7	0.01	0.01	0.02	59.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: MOTT MACDONALD | Licence: NETWORK / 1PC | Processed: Thursday, 18 March 2021 10:42:08 AM
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B. SIDRA Intersection Performance Summaries (2036 Baseline Scenario Without Proposal)

MOVEMENT SUMMARY

Site: TCS 3657 [(AM/2036 Existing) GWH | Railway Pde (Site Folder: Existing)]

TCS 3657
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	675	101	711	15.0	0.357	11.5	LOS A	10.1	80.0	0.52	0.46	0.52	50.5
7, 8	R2	27	0	28	0.0	*0.065	12.6	LOS A	0.5	3.5	0.46	0.65	0.46	41.7
Approach		702	101	739	14.4	0.357	11.5	LOS A	10.1	80.0	0.52	0.46	0.52	50.2
East: Railway Parade (E)														
13	L2	53	3	56	5.7	0.067	5.5	LOS A	0.6	4.1	0.23	0.58	0.23	50.2
9	T1	1	0	1	0.0	0.074	44.9	LOS D	1.0	6.9	0.87	0.69	0.87	5.1
9	R2	18	0	19	0.0	0.074	48.5	LOS D	1.0	6.9	0.87	0.69	0.87	24.3
Approach		72	3	76	4.2	0.074	16.8	LOS B	1.0	6.9	0.40	0.61	0.40	39.1
North: Great Western Highway (N)														
12	L2	23	2	24	8.7	0.024	14.6	LOS B	0.5	3.9	0.40	0.64	0.40	39.9
1, 2	T1	719	78	757	10.8	*0.366	11.6	LOS A	10.6	80.9	0.52	0.46	0.52	50.4
3, 4	R2	4	0	4	0.0	0.009	12.1	LOS A	0.1	0.5	0.44	0.61	0.44	42.3
Approach		746	80	785	10.7	0.366	11.7	LOS A	10.6	80.9	0.52	0.47	0.52	50.2
West: Station Street (W)														
11	L2	3	0	3	0.0	0.015	43.5	LOS D	0.2	1.7	0.82	0.61	0.82	25.2
11	T1	2	0	2	0.0	0.015	41.1	LOS C	0.2	1.7	0.82	0.61	0.82	5.5
10	R2	6	0	6	0.0	0.023	46.7	LOS D	0.3	2.1	0.85	0.65	0.85	23.9
Approach		11	0	12	0.0	0.023	44.8	LOS D	0.3	2.1	0.84	0.63	0.84	22.1
All Vehicles		1531	184	1612	12.0	0.366	12.1	LOS A	10.6	80.9	0.51	0.47	0.51	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: TCS 3657 [(PM/2036 Existing) GWH | Railway Pde (Site Folder: Existing)]

TCS 3657
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	707	70	744	9.9	0.349	11.4	LOS A	10.5	79.9	0.52	0.45	0.52	50.5
7, 8	R2	40	3	42	7.5	*0.115	13.2	LOS A	0.8	5.6	0.49	0.66	0.49	41.1
Approach		747	73	786	9.8	0.349	11.5	LOS A	10.5	79.9	0.51	0.47	0.51	50.2
East: Railway Parade (E)														
13	L2	38	5	40	13.2	0.054	5.9	LOS A	0.4	3.4	0.25	0.58	0.25	49.4
9	T1	1	0	1	0.0	0.057	44.9	LOS D	0.7	5.7	0.86	0.68	0.86	5.1
9	R2	12	3	13	25.0	0.057	48.4	LOS D	0.7	5.7	0.86	0.68	0.86	23.8
Approach		51	8	54	15.7	0.057	16.7	LOS B	0.7	5.7	0.41	0.61	0.41	38.6
North: Great Western Highway (N)														
12	L2	22	3	23	13.6	0.024	14.7	LOS B	0.5	3.9	0.40	0.64	0.40	39.9
1, 2	T1	807	83	849	10.3	*0.408	12.0	LOS A	12.3	94.0	0.54	0.48	0.54	50.2
3, 4	R2	2	0	2	0.0	0.005	12.1	LOS A	0.0	0.2	0.44	0.60	0.44	42.4
Approach		831	86	875	10.3	0.408	12.0	LOS A	12.3	94.0	0.54	0.49	0.54	50.0
West: Station Street (W)														
11	L2	2	0	2	0.0	0.009	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0	1	0.0	0.009	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	11	2	12	18.2	0.047	47.3	LOS D	0.6	4.6	0.86	0.67	0.86	23.6
Approach		14	2	15	14.3	0.047	46.1	LOS D	0.6	4.6	0.85	0.66	0.85	23.1
All Vehicles		1643	169	1729	10.3	0.408	12.2	LOS A	12.3	94.0	0.52	0.48	0.52	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(AM/2036 Existing) GWH | Bellevue Cres (Site Folder: Existing)]

Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	5	0	5	0.0	0.475	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	30.9
	T1	713	101	751	14.2	0.475	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach		718	101	756	14.1	0.475	0.3	NA	0.0	0.0	0.00	0.00	0.00	59.3
North: Great Western Highway (N)														
	T1	844	101	888	12.0	0.553	0.2	LOS A	0.3	2.4	0.03	0.01	0.05	59.7
	R2	7	0	7	0.0	0.553	15.8	LOS B	0.3	2.4	0.03	0.01	0.05	30.8
Approach		851	101	896	11.9	0.553	0.3	NA	0.3	2.4	0.03	0.01	0.05	59.4
West: Bellevue Crescent (W)														
	L2	10	0	11	0.0	0.205	14.9	LOS B	0.6	4.0	0.91	1.01	0.95	28.9
	R2	12	0	13	0.0	0.205	57.0	LOS E	0.6	4.0	0.91	1.01	0.95	28.7
Approach		22	0	23	0.0	0.205	37.9	LOS C	0.6	4.0	0.91	1.01	0.95	28.8
All Vehicles		1591	202	1675	12.7	0.553	0.8	NA	0.6	4.0	0.03	0.02	0.04	58.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\LUO94513\Mott MacDonald\Haluk Camcigil - Medlow Bath\07 Modelling\Great Western Highway Network.sip9

MOVEMENT SUMMARY

Site: [(PM/2036 Existing) GWH | Bellevue Cres (Site Folder: Existing)]

Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	15	0	16	0.0	0.471	5.7	LOS A	0.0	0.0	0.00	0.01	0.00	30.9
	T1	741	72	780	9.7	0.471	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.5
Approach		756	72	796	9.5	0.471	0.3	NA	0.0	0.0	0.00	0.01	0.00	58.8
North: Great Western Highway (N)														
	T1	844	101	888	12.0	0.553	0.2	LOS A	0.3	2.5	0.03	0.01	0.05	59.6
	R2	7	0	7	0.0	0.553	16.5	LOS B	0.3	2.5	0.03	0.01	0.05	30.8
Approach		851	101	896	11.9	0.553	0.4	NA	0.3	2.5	0.03	0.01	0.05	59.4
West: Bellevue Crescent (W)														
	L2	10	0	11	0.0	0.213	15.5	LOS B	0.6	4.1	0.91	1.01	0.96	28.4
	R2	12	0	13	0.0	0.213	59.3	LOS E	0.6	4.1	0.91	1.01	0.96	28.1
Approach		22	0	23	0.0	0.213	39.4	LOS C	0.6	4.1	0.91	1.01	0.96	28.2
All Vehicles		1629	173	1715	10.6	0.553	0.9	NA	0.6	4.1	0.03	0.02	0.04	58.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

C. SIDRA Network Performance Summaries (2026 Scenario with Proposal)

MOVEMENT SUMMARY

Site: [(AM/2026 GWHUP) GWH | The Hydro Majestic (Site Folder: 2026 GWHUP)]

Network: N101 [AM/2026 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	9	22.2	9	22.2	0.222	5.8	LOS A	0.0	0.0	0.00	0.02	0.00	14.0
	T1	706	13.0	706	13.0	0.222	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.4
Approach		716	13.1	716	13.1	0.222	0.1	NA	0.0	0.0	0.00	0.01	0.00	56.6
North: Great Western Highway (N)														
	T1	834	11.0	834	11.0	0.251	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
	R2	6	0.0	6	0.0	0.011	9.6	LOS A	0.0	0.2	0.55	0.72	0.55	45.4
Approach		840	10.9	840	10.9	0.251	4.4	LOS A	0.0	0.2	0.00	0.53	0.00	53.3
All Vehicles		1556	11.9	1556	11.9	0.251	2.4	NA	0.0	0.2	0.00	0.29	0.00	53.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: TCS 3657 [(AM/2026 GWHUP) GWH | Railway Pde (Site Folder: 2026 GWHUP)]

Network: N101 [AM/2026 GWHUP Case (Network Folder: General)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	665	13.8	665	13.8	0.329	11.2	LOS A	9.3	72.5	0.51	0.44	0.51	51.1
7, 8	R2	26	0.0	26	0.0	*0.060	12.5	LOS A	0.5	3.2	0.46	0.65	0.46	43.0
Approach		692	13.2	692	13.2	0.329	11.3	LOS A	9.3	72.5	0.50	0.45	0.50	50.9
East: Railway Parade (E)														
13	L2	53	6.0	53	6.0	0.063	5.5	LOS A	0.5	3.9	0.23	0.58	0.23	23.9
9	T1	1	0.0	1	0.0	0.070	44.9	LOS D	0.9	6.5	0.87	0.69	0.87	5.1
9	R2	18	0.0	18	0.0	0.070	48.4	LOS D	0.9	6.5	0.87	0.69	0.87	24.3
Approach		72	4.4	72	4.4	0.070	16.8	LOS B	0.9	6.5	0.40	0.61	0.40	23.7
North: Great Western Highway (N)														
12	L2	22	9.5	22	9.5	0.022	14.6	LOS B	0.5	3.6	0.40	0.64	0.40	39.9
1, 2	T1	757	10.8	757	10.8	*0.366	11.6	LOS A	10.6	80.9	0.52	0.46	0.52	43.7
3, 4	R2	4	0.0	4	0.0	0.009	11.9	LOS A	0.1	0.5	0.43	0.61	0.43	42.5
Approach		783	10.8	783	10.8	0.366	11.6	LOS A	10.6	80.9	0.52	0.47	0.52	43.5
West: Station Street (W)														
11	L2	3	0.0	3	0.0	0.015	43.5	LOS D	0.2	1.7	0.82	0.61	0.82	25.2
11	T1	2	0.0	2	0.0	0.015	41.1	LOS C	0.2	1.7	0.82	0.61	0.82	5.5
10	R2	6	0.0	6	0.0	0.023	46.7	LOS D	0.3	2.1	0.85	0.65	0.85	2.4
Approach		12	0.0	12	0.0	0.023	44.8	LOS D	0.3	2.1	0.84	0.63	0.84	11.4
All Vehicles		1558	11.5	1558	11.5	0.366	12.0	LOS A	10.6	80.9	0.51	0.47	0.51	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(AM/2026 GWHUP) GWH | Service Station (Site Folder: 2026 GWHUP)]

Network: N101 [AM/2026 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	38	13.9	38	13.9	0.223	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	30.4
	T1	677	13.2	677	13.2	0.223	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.2
Approach		715	13.3	715	13.3	0.223	0.3	NA	0.0	0.0	0.00	0.03	0.00	55.2
North: Great Western Highway (N)														
	T1	837	11.1	837	11.1	0.253	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	41.5
Approach		837	11.1	837	11.1	0.253	4.3	NA	0.0	0.0	0.00	0.53	0.00	41.5
All Vehicles		1552	12.1	1552	12.1	0.253	2.4	NA	0.0	0.0	0.00	0.30	0.00	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [(AM/2026 GWHUP) GWH | Bellevue Cres (Site Folder: 2026 GWHUP)]

Network: N101 [AM/2026 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	5	0.0	5	0.0	0.004	10.8	LOS A	0.1	0.6	0.30	0.61	0.30	43.5
	T1	703	13.0	703	13.0	*0.297	5.8	LOS A	6.9	53.5	0.37	0.32	0.37	50.5
Approach		708	12.9	708	12.9	0.297	5.8	LOS A	6.9	53.5	0.37	0.33	0.37	50.4
North: Great Western Highway (N)														
	T1	834	11.1	834	11.1	0.302	2.3	LOS A	5.3	40.7	0.24	0.21	0.24	56.7
	R2	15	14.3	15	14.3	*0.197	69.1	LOS E	0.9	7.0	0.99	0.69	0.99	10.1
Approach		848	11.2	848	11.2	0.302	3.5	LOS A	5.3	40.7	0.25	0.22	0.25	55.0
West: Bellevue Crescent (W)														
	L2	18	11.8	18	11.8	0.275	65.6	LOS E	1.8	13.3	0.98	0.72	0.98	4.6
	R2	13	0.0	13	0.0	*0.275	65.6	LOS E	1.8	13.3	0.98	0.72	0.98	20.7
Approach		31	6.9	31	6.9	0.275	65.6	LOS E	1.8	13.3	0.98	0.72	0.98	12.7
All Vehicles		1587	11.9	1587	11.9	0.302	5.7	LOS A	6.9	53.5	0.32	0.28	0.32	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: TCS 3657 [(PM/2026 GWHUP) GWH | Railway Pde (Site Folder: 2026 GWHUP)]

Network: N101 [PM/2026 GWHUP Case (Network Folder: General)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	700	9.0	700	9.0	0.324	11.2	LOS A	9.7	73.1	0.50	0.44	0.50	51.1
7, 8	R2	40	7.9	40	7.9	*0.103	12.8	LOS A	0.7	5.3	0.47	0.66	0.47	42.8
Approach		740	9.0	740	9.0	0.324	11.3	LOS A	9.7	73.1	0.50	0.45	0.50	50.8
East: Railway Parade (E)														
13	L2	38	11.1	38	11.1	0.048	5.5	LOS A	0.4	2.9	0.23	0.58	0.23	23.9
9	T1	1	0.0	1	0.0	0.053	44.9	LOS D	0.6	5.3	0.86	0.67	0.86	5.1
9	R2	12	27.3	12	27.3	0.053	48.4	LOS D	0.6	5.3	0.86	0.67	0.86	23.8
Approach		51	14.6	51	14.6	0.053	16.1	LOS B	0.6	5.3	0.39	0.60	0.39	23.1
North: Great Western Highway (N)														
12	L2	21	15.0	21	15.0	0.023	14.7	LOS B	0.5	3.6	0.40	0.64	0.40	39.9
1, 2	T1	798	9.4	798	9.4	*0.378	11.7	LOS A	11.3	85.2	0.53	0.47	0.53	43.6
3, 4	R2	2	0.0	2	0.0	0.004	11.9	LOS A	0.0	0.2	0.43	0.60	0.43	42.5
Approach		821	9.5	821	9.5	0.378	11.7	LOS A	11.3	85.2	0.52	0.47	0.52	43.4
West: Station Street (W)														
11	L2	2	0.0	2	0.0	0.009	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0.0	1	0.0	0.009	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	11	20.0	11	20.0	0.043	47.2	LOS D	0.5	4.2	0.86	0.67	0.86	2.4
Approach		14	15.4	14	15.4	0.043	45.9	LOS D	0.5	4.2	0.85	0.65	0.85	7.7
All Vehicles		1625	9.5	1625	9.5	0.378	12.0	LOS A	11.3	85.2	0.51	0.47	0.51	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(PM/2026 GWHUP) GWH | The Hydro Majestic (Site Folder: 2026 GWHUP)]

Network: N101 [PM/2026 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	4	0.0	4	0.0	0.216	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	14.0
	T1	735	8.7	735	8.7	0.216	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		739	8.7	739	8.7	0.216	0.1	NA	0.0	0.0	0.00	0.00	0.00	58.4
North: Great Western Highway (N)														
	T1	852	9.3	852	9.3	0.251	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
	R2	6	0.0	6	0.0	0.011	9.7	LOS A	0.0	0.2	0.56	0.72	0.56	45.4
Approach		858	9.2	858	9.2	0.251	4.3	LOS A	0.0	0.2	0.00	0.53	0.00	53.4
All Vehicles		1597	9.0	1597	9.0	0.251	2.4	NA	0.0	0.2	0.00	0.29	0.00	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(PM/2026 GWHUP) GWH | Service Station (Site Folder: 2026 GWHUP)]

Network: N101 [PM/2026 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	34	12.5	34	12.5	0.217	5.7	LOS A	0.0	0.0	0.00	0.05	0.00	30.5
	T1	704	8.8	704	8.8	0.217	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.5
Approach		738	9.0	738	9.0	0.217	0.3	NA	0.0	0.0	0.00	0.03	0.00	55.9
North: Great Western Highway (N)														
	T1	853	9.3	853	9.3	0.251	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	41.5
Approach		853	9.3	853	9.3	0.251	4.2	NA	0.0	0.0	0.00	0.53	0.00	41.5
All Vehicles		1591	9.1	1591	9.1	0.251	2.4	NA	0.0	0.0	0.00	0.30	0.00	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(PM/2026 GWHUP) GWH | Bellevue Cres (Site Folder: 2026 GWHUP)]

Network: N101 [PM/2026 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	15	0.0	15	0.0	0.011	10.3	LOS A	0.2	1.6	0.29	0.62	0.29	44.0
	T1	734	8.9	734	8.9	*0.287	5.0	LOS A	6.7	50.4	0.34	0.30	0.34	51.5
Approach		748	8.7	748	8.7	0.287	5.1	LOS A	6.7	50.4	0.34	0.31	0.34	51.3
North: Great Western Highway (N)														
	T1	851	9.3	851	9.3	0.295	1.9	LOS A	4.9	36.7	0.22	0.19	0.22	57.3
	R2	15	0.0	15	0.0	*0.159	67.7	LOS E	0.9	6.1	0.99	0.69	0.99	10.3
Approach		865	9.1	865	9.1	0.295	3.0	LOS A	4.9	36.7	0.23	0.20	0.23	55.7
West: Bellevue Crescent (W)														
	L2	15	0.0	15	0.0	0.261	67.9	LOS E	1.5	10.2	0.99	0.71	0.99	4.5
	R2	9	0.0	9	0.0	*0.261	67.9	LOS E	1.5	10.2	0.99	0.71	0.99	20.3
Approach		24	0.0	24	0.0	0.261	67.9	LOS E	1.5	10.2	0.99	0.71	0.99	12.0
All Vehicles		1638	8.8	1638	8.8	0.295	4.9	LOS A	6.7	50.4	0.29	0.26	0.29	52.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

D. SIDRA Intersection Performance Summaries (2031 Scenario with Proposal)

MOVEMENT SUMMARY

Site: [(AM/2031 GWHUP) GWH | Bellevue Cres (Site Folder: 2031 GWHUP)]

Network: N101 [AM/2031 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	5	0.0	5	0.0	0.004	10.8	LOS A	0.1	0.6	0.30	0.61	0.30	43.5
	T1	813	11.0	813	11.0	*0.334	6.0	LOS A	8.2	63.1	0.38	0.34	0.38	50.2
Approach		818	10.9	818	10.9	0.334	6.0	LOS A	8.2	63.1	0.38	0.34	0.38	50.2
North: Great Western Highway (N)														
	T1	965	9.3	965	9.3	0.341	2.4	LOS A	6.4	48.6	0.25	0.23	0.25	56.5
	R2	17	12.5	17	12.5	*0.220	69.1	LOS E	1.0	7.9	0.99	0.70	0.99	10.1
Approach		982	9.3	982	9.3	0.341	3.6	LOS A	6.4	48.6	0.26	0.23	0.26	54.9
West: Bellevue Crescent (W)														
	L2	21	10.0	21	10.0	0.318	65.8	LOS E	2.1	15.6	0.99	0.73	0.99	4.6
	R2	15	0.0	15	0.0	*0.318	65.8	LOS E	2.1	15.6	0.99	0.73	0.99	20.7
Approach		36	5.9	36	5.9	0.318	65.8	LOS E	2.1	15.6	0.99	0.73	0.99	12.7
All Vehicles		1836	10.0	1836	10.0	0.341	5.9	LOS A	8.2	63.1	0.33	0.29	0.33	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: TCS 3657 [(AM/2031 GWHUP) GWH | Railway Pde (Site Folder: 2031 GWHUP)]

Network: N101 [AM/2031 GWHUP Case (Network Folder: General)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	767	11.7	767	11.7	*0.369	11.6	LOS A	11.0	85.0	0.52	0.46	0.52	50.9
7, 8	R2	32	0.0	32	0.0	*0.073	12.6	LOS A	0.6	3.9	0.46	0.65	0.46	43.0
Approach		799	11.2	799	11.2	0.369	11.6	LOS A	11.0	85.0	0.52	0.47	0.52	50.6
East: Railway Parade (E)														
13	L2	62	5.1	62	5.1	0.075	5.5	LOS A	0.6	4.6	0.24	0.59	0.24	23.8
9	T1	1	0.0	1	0.0	0.082	45.0	LOS D	1.1	7.7	0.87	0.70	0.87	5.1
9	R2	21	0.0	21	0.0	0.082	48.6	LOS D	1.1	7.7	0.87	0.70	0.87	24.3
Approach		84	3.8	84	3.8	0.082	16.8	LOS B	1.1	7.7	0.40	0.62	0.40	23.7
North: Great Western Highway (N)														
12	L2	26	8.0	26	8.0	0.025	14.6	LOS B	0.6	4.3	0.40	0.65	0.40	39.9
1, 2	T1	764	10.6	764	10.6	0.368	11.6	LOS A	10.7	81.8	0.52	0.46	0.52	43.7
3, 4	R2	4	0.0	4	0.0	0.010	12.3	LOS A	0.1	0.5	0.45	0.61	0.45	42.2
Approach		795	10.5	795	10.5	0.368	11.7	LOS A	10.7	81.8	0.52	0.47	0.52	43.5
West: Station Street (W)														
11	L2	3	0.0	3	0.0	0.015	43.5	LOS D	0.2	1.7	0.82	0.61	0.82	25.2
11	T1	2	0.0	2	0.0	0.015	41.1	LOS C	0.2	1.7	0.82	0.61	0.82	5.5
10	R2	6	0.0	6	0.0	0.023	46.7	LOS D	0.3	2.1	0.85	0.65	0.85	2.4
Approach		12	0.0	12	0.0	0.023	44.8	LOS D	0.3	2.1	0.84	0.63	0.84	11.4
All Vehicles		1689	10.4	1689	10.4	0.369	12.1	LOS A	11.0	85.0	0.52	0.48	0.52	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(AM/2031 GWHUP) GWH | The Hydro Majestic (Site Folder: 2031 GWHUP)]

Network: N101 [AM/2031 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	11	20.0	11	20.0	0.250	5.8	LOS A	0.0	0.0	0.00	0.02	0.00	14.0
	T1	817	11.0	817	11.0	0.250	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.4
Approach		827	11.1	827	11.1	0.250	0.1	NA	0.0	0.0	0.00	0.01	0.00	56.7
North: Great Western Highway (N)														
	T1	966	9.2	966	9.2	0.284	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
	R2	7	0.0	7	0.0	0.015	10.7	LOS A	0.0	0.3	0.62	0.77	0.62	44.4
Approach		974	9.1	974	9.1	0.284	4.4	LOS A	0.0	0.3	0.00	0.53	0.00	53.3
All Vehicles		1801	10.0	1801	10.0	0.284	2.4	NA	0.0	0.3	0.00	0.29	0.00	53.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [(AM/2031 GWHUP) GWH | Service Station (Site Folder: 2031 GWHUP)]

Network: N101 [AM/2031 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	44	11.9	44	11.9	0.250	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	30.4
	T1	782	11.0	782	11.0	0.250	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.2
Approach		826	11.1	826	11.1	0.250	0.3	NA	0.0	0.0	0.00	0.03	0.00	55.2
North: Great Western Highway (N)														
	T1	969	9.2	969	9.2	0.285	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	41.5
Approach		969	9.2	969	9.2	0.285	4.2	NA	0.0	0.0	0.00	0.53	0.00	41.5
All Vehicles		1796	10.1	1796	10.1	0.285	2.4	NA	0.0	0.0	0.00	0.30	0.00	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(PM/2031 GWHUP) GWH | Bellevue Cres (Site Folder: 2031 GWHUP)]

Network: N101 [PM/2031 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	17	0.0	17	0.0	0.013	10.3	LOS A	0.3	1.8	0.29	0.62	0.29	44.0
	T1	855	7.5	855	7.5	*0.327	5.2	LOS A	8.1	60.4	0.36	0.32	0.36	51.2
Approach		872	7.4	872	7.4	0.327	5.3	LOS A	8.1	60.4	0.36	0.32	0.36	51.1
North: Great Western Highway (N)														
	T1	991	8.0	991	8.0	0.337	2.0	LOS A	5.9	44.5	0.23	0.20	0.23	57.2
	R2	17	0.0	17	0.0	*0.181	67.9	LOS E	1.0	7.0	0.99	0.69	0.99	10.3
Approach		1007	7.8	1007	7.8	0.337	3.1	LOS A	5.9	44.5	0.24	0.21	0.24	55.6
West: Bellevue Crescent (W)														
	L2	17	0.0	17	0.0	0.295	68.1	LOS E	1.6	11.5	1.00	0.71	1.00	4.5
	R2	11	0.0	11	0.0	*0.295	68.1	LOS E	1.6	11.5	1.00	0.71	1.00	20.2
Approach		27	0.0	27	0.0	0.295	68.1	LOS E	1.6	11.5	1.00	0.71	1.00	11.9
All Vehicles		1906	7.5	1906	7.5	0.337	5.0	LOS A	8.1	60.4	0.30	0.27	0.30	52.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: TCS 3657 [(PM/2031 GWHUP) GWH | Railway Pde (Site Folder: 2031 GWHUP)]

Network: N101 [PM/2031 GWHUP Case (Network Folder: General)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	815	7.6	815	7.6	0.370	11.6	LOS A	11.7	87.3	0.52	0.46	0.52	50.9
7, 8	R2	46	6.8	46	6.8	*0.136	13.5	LOS A	0.8	6.2	0.51	0.67	0.51	42.2
Approach		861	7.6	861	7.6	0.370	11.7	LOS A	11.7	87.3	0.52	0.48	0.52	50.5
East: Railway Parade (E)														
13	L2	44	9.5	44	9.5	0.060	6.1	LOS A	0.5	3.9	0.26	0.59	0.26	22.3
9	T1	1	0.0	1	0.0	0.061	45.0	LOS D	0.7	6.0	0.86	0.68	0.86	5.1
9	R2	14	23.1	14	23.1	0.061	48.5	LOS D	0.7	6.0	0.86	0.68	0.86	23.9
Approach		59	12.5	59	12.5	0.061	16.6	LOS B	0.7	6.0	0.41	0.61	0.41	22.8
North: Great Western Highway (N)														
12	L2	25	12.5	25	12.5	0.026	14.7	LOS B	0.5	4.2	0.40	0.65	0.40	39.9
1, 2	T1	929	7.9	929	7.9	*0.433	12.2	LOS A	13.8	103.2	0.55	0.49	0.55	43.0
3, 4	R2	2	0.0	2	0.0	0.005	12.2	LOS A	0.0	0.2	0.44	0.60	0.44	42.2
Approach		957	8.0	957	8.0	0.433	12.3	LOS A	13.8	103.2	0.55	0.50	0.55	42.9
West: Station Street (W)														
11	L2	2	0.0	2	0.0	0.009	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0.0	1	0.0	0.009	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	12	18.2	12	18.2	0.047	47.3	LOS D	0.6	4.6	0.86	0.67	0.86	2.4
Approach		15	14.3	15	14.3	0.047	46.1	LOS D	0.6	4.6	0.85	0.66	0.85	7.3
All Vehicles		1892	8.0	1892	8.0	0.433	12.4	LOS A	13.8	103.2	0.53	0.49	0.53	46.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(PM/2031 GWHUP) GWH | The Hydro Majestic (Site Folder: 2031 GWHUP)]

Network: N101 [PM/2031 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	4	0.0	4	0.0	0.246	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	14.0
	T1	856	7.4	856	7.4	0.246	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		860	7.3	860	7.3	0.246	0.0	NA	0.0	0.0	0.00	0.00	0.00	58.6
North: Great Western Highway (N)														
	T1	993	8.0	993	8.0	0.287	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
	R2	7	0.0	7	0.0	0.016	10.9	LOS A	0.0	0.3	0.63	0.78	0.63	44.2
Approach		1000	7.9	1000	7.9	0.287	4.4	LOS A	0.0	0.3	0.00	0.53	0.00	53.3
All Vehicles		1860	7.6	1860	7.6	0.287	2.4	NA	0.0	0.3	0.00	0.29	0.00	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(PM/2031 GWHUP) GWH | Service Station (Site Folder: 2031 GWHUP)]

Network: N101 [PM/2031 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	39	10.8	39	10.8	0.247	5.7	LOS A	0.0	0.0	0.00	0.05	0.00	30.5
	T1	820	7.3	820	7.3	0.247	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.5
Approach		859	7.5	859	7.5	0.247	0.3	NA	0.0	0.0	0.00	0.03	0.00	55.9
North: Great Western Highway (N)														
	T1	994	7.9	994	7.9	0.287	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	41.5
Approach		994	7.9	994	7.9	0.287	4.2	NA	0.0	0.0	0.00	0.53	0.00	41.5
All Vehicles		1853	7.7	1853	7.7	0.287	2.4	NA	0.0	0.0	0.00	0.30	0.00	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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E. SIDRA Intersection Performance Summaries (2036 Scenario with Proposal)

MOVEMENT SUMMARY

Site: TCS 3657 [(AM/2036 GWHUP) GWH | Railway Pde (Site Folder: 2036 GWHUP)]

Network: N101 [AM/2036 GWHUP Case (Network Folder: General)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	793	12.1	793	12.1	*0.383	11.7	LOS A	11.5	89.1	0.53	0.47	0.53	50.8
7, 8	R2	33	0.0	33	0.0	*0.075	12.6	LOS A	0.6	4.0	0.46	0.65	0.46	43.0
Approach		825	11.6	825	11.6	0.383	11.8	LOS A	11.5	89.1	0.53	0.48	0.53	50.5
East: Railway Parade (E)														
13	L2	64	4.9	64	4.9	0.077	5.5	LOS A	0.7	4.8	0.24	0.59	0.24	23.8
9	T1	1	0.0	1	0.0	0.086	45.1	LOS D	1.1	8.0	0.87	0.70	0.87	5.1
9	R2	22	0.0	22	0.0	0.086	48.6	LOS D	1.1	8.0	0.87	0.70	0.87	24.3
Approach		87	3.6	87	3.6	0.086	16.9	LOS B	1.1	8.0	0.40	0.62	0.40	23.7
North: Great Western Highway (N)														
12	L2	27	7.7	27	7.7	0.026	14.6	LOS B	0.6	4.4	0.40	0.65	0.40	39.9
1, 2	T1	762	10.6	762	10.6	0.368	11.6	LOS A	10.7	81.6	0.52	0.46	0.52	43.7
3, 4	R2	4	0.0	4	0.0	0.010	12.5	LOS A	0.1	0.5	0.46	0.61	0.46	42.0
Approach		794	10.5	794	10.5	0.368	11.7	LOS A	10.7	81.6	0.52	0.47	0.52	43.5
West: Station Street (W)														
11	L2	3	0.0	3	0.0	0.015	43.5	LOS D	0.2	1.7	0.82	0.61	0.82	25.2
11	T1	2	0.0	2	0.0	0.015	41.1	LOS C	0.2	1.7	0.82	0.61	0.82	5.5
10	R2	6	0.0	6	0.0	0.023	46.7	LOS D	0.3	2.1	0.85	0.65	0.85	2.4
Approach		12	0.0	12	0.0	0.023	44.8	LOS D	0.3	2.1	0.84	0.63	0.84	11.4
All Vehicles		1718	10.6	1718	10.6	0.383	12.2	LOS A	11.5	89.1	0.52	0.48	0.52	47.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(AM/2036 GWHUP) GWH | The Hydro Majestic (Site Folder: 2036 GWHUP)]

Network: N101 [AM/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	12	18.2	12	18.2	0.259	5.8	LOS A	0.0	0.0	0.00	0.02	0.00	14.0
	T1	842	11.4	842	11.4	0.259	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.4
Approach		854	11.5	854	11.5	0.259	0.1	NA	0.0	0.0	0.00	0.01	0.00	56.5
North: Great Western Highway (N)														
	T1	995	9.5	995	9.5	0.294	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
	R2	7	0.0	7	0.0	0.016	11.0	LOS A	0.0	0.3	0.63	0.79	0.63	44.1
Approach		1002	9.5	1002	9.5	0.294	4.4	LOS A	0.0	0.3	0.00	0.53	0.00	53.3
All Vehicles		1856	10.4	1856	10.4	0.294	2.4	NA	0.0	0.3	0.00	0.29	0.00	53.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(AM/2036 GWHUP) GWH | Service Station (Site Folder: 2036 GWHUP)]

Network: N101 [AM/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	45	14.0	45	14.0	0.260	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	30.4
	T1	806	11.5	806	11.5	0.260	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.2
Approach		852	11.6	852	11.6	0.260	0.3	NA	0.0	0.0	0.00	0.03	0.00	55.2
North: Great Western Highway (N)														
	T1	999	9.6	999	9.6	0.295	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	41.5
Approach		999	9.6	999	9.6	0.295	4.2	NA	0.0	0.0	0.00	0.53	0.00	41.5
All Vehicles		1851	10.5	1851	10.5	0.295	2.4	NA	0.0	0.0	0.00	0.30	0.00	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(AM/2036 GWHUP) GWH | Bellevue Cres (Site Folder: 2036 GWHUP)]

Network: N101 [AM/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	6	0.0	6	0.0	0.005	10.8	LOS A	0.1	0.7	0.30	0.61	0.30	43.5
	T1	838	11.4	838	11.4	* 0.347	6.0	LOS A	8.6	66.1	0.39	0.34	0.39	50.1
Approach		844	11.3	844	11.3	0.347	6.1	LOS A	8.6	66.1	0.38	0.35	0.38	50.1
North: Great Western Highway (N)														
	T1	995	9.6	995	9.6	0.353	2.5	LOS A	6.7	50.9	0.26	0.23	0.26	56.5
	R2	18	11.8	18	11.8	* 0.231	69.2	LOS E	1.1	8.4	0.99	0.70	0.99	10.1
Approach		1013	9.7	1013	9.7	0.353	3.7	LOS A	6.7	50.9	0.27	0.24	0.27	54.8
West: Bellevue Crescent (W)														
	L2	22	9.5	22	9.5	0.326	65.9	LOS E	2.2	16.0	0.99	0.73	0.99	4.6
	R2	15	0.0	15	0.0	* 0.326	65.9	LOS E	2.2	16.0	0.99	0.73	0.99	20.7
Approach		37	5.7	37	5.7	0.326	65.9	LOS E	2.2	16.0	0.99	0.73	0.99	12.5
All Vehicles		1894	10.3	1894	10.3	0.353	5.9	LOS A	8.6	66.1	0.33	0.30	0.33	51.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(PM/2036 GWHUP) GWH | Service Station (Site Folder: 2036 GWHUP)]

Network: N101 [PM/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	40	10.5	40	10.5	0.256	5.7	LOS A	0.0	0.0	0.00	0.05	0.00	30.5
	T1	844	7.7	844	7.7	0.256	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.5
Approach		884	7.9	884	7.9	0.256	0.3	NA	0.0	0.0	0.00	0.03	0.00	55.9
North: Great Western Highway (N)														
	T1	1024	8.3	1024	8.3	0.298	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	41.5
Approach		1024	8.3	1024	8.3	0.298	4.2	NA	0.0	0.0	0.00	0.53	0.00	41.5
All Vehicles		1908	8.1	1908	8.1	0.298	2.4	NA	0.0	0.0	0.00	0.30	0.00	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(PM/2036 GWHUP) GWH | Bellevue Cres (Site Folder: 2036 GWHUP)]

Network: N101 [PM/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	18	0.0	18	0.0	0.013	10.3	LOS A	0.3	2.0	0.29	0.62	0.29	44.0
	T1	880	7.9	880	7.9	*0.339	5.3	LOS A	8.4	63.1	0.36	0.32	0.36	51.2
Approach		898	7.7	898	7.7	0.339	5.4	LOS A	8.4	63.1	0.36	0.33	0.36	51.0
North: Great Western Highway (N)														
	T1	1021	8.4	1021	8.4	0.349	2.0	LOS A	6.2	46.7	0.23	0.21	0.23	57.1
	R2	18	0.0	18	0.0	*0.193	68.0	LOS E	1.1	7.5	0.99	0.70	0.99	10.3
Approach		1039	8.2	1039	8.2	0.349	3.2	LOS A	6.2	46.7	0.24	0.22	0.24	55.5
West: Bellevue Crescent (W)														
	L2	18	0.0	18	0.0	0.317	68.2	LOS E	1.8	12.5	1.00	0.72	1.00	4.4
	R2	12	0.0	12	0.0	*0.317	68.2	LOS E	1.8	12.5	1.00	0.72	1.00	20.2
Approach		29	0.0	29	0.0	0.317	68.2	LOS E	1.8	12.5	1.00	0.72	1.00	12.0
All Vehicles		1966	7.9	1966	7.9	0.349	5.2	LOS A	8.4	63.1	0.31	0.28	0.31	52.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: TCS 3657 [(PM/2036 GWHUP) GWH | Railway Pde (Site Folder: 2036 GWHUP)]

Network: N101 [PM/2036 GWHUP Case (Network Folder: General)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	840	7.9	840	7.9	0.383	11.7	LOS A	12.2	91.2	0.53	0.47	0.53	50.8
7, 8	R2	48	6.5	48	6.5	*0.146	13.8	LOS A	0.9	6.4	0.52	0.67	0.52	42.0
Approach		888	7.8	888	7.8	0.383	11.8	LOS A	12.2	91.2	0.53	0.48	0.53	50.4
East: Railway Parade (E)														
13	L2	45	9.3	45	9.3	0.063	6.3	LOS A	0.6	4.2	0.27	0.59	0.27	21.8
9	T1	1	0.0	1	0.0	0.061	45.0	LOS D	0.7	6.0	0.86	0.68	0.86	5.1
9	R2	14	23.1	14	23.1	0.061	48.5	LOS D	0.7	6.0	0.86	0.68	0.86	23.9
Approach		60	12.3	60	12.3	0.063	16.6	LOS B	0.7	6.0	0.42	0.61	0.42	22.7
North: Great Western Highway (N)														
12	L2	25	12.5	25	12.5	0.026	14.7	LOS B	0.5	4.2	0.40	0.65	0.40	39.9
1, 2	T1	958	8.4	958	8.4	*0.449	12.4	LOS A	14.4	108.3	0.56	0.50	0.56	42.9
3, 4	R2	2	0.0	2	0.0	0.005	12.4	LOS A	0.0	0.2	0.45	0.60	0.45	42.1
Approach		985	8.4	985	8.4	0.449	12.4	LOS A	14.4	108.3	0.56	0.50	0.56	42.8
West: Station Street (W)														
11	L2	2	0.0	2	0.0	0.009	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0.0	1	0.0	0.009	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	13	16.7	13	16.7	0.051	47.3	LOS D	0.6	5.0	0.86	0.68	0.86	2.4
Approach		16	13.3	16	13.3	0.051	46.2	LOS D	0.6	5.0	0.85	0.66	0.85	7.0
All Vehicles		1949	8.3	1949	8.3	0.449	12.6	LOS A	14.4	108.3	0.54	0.50	0.54	46.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(PM/2036 GWHUP) GWH | The Hydro Majestic (Site Folder: 2036 GWHUP)]

Network: N101 [PM/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	4	0.0	4	0.0	0.255	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	14.0
	T1	882	7.6	882	7.6	0.255	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		886	7.6	886	7.6	0.255	0.1	NA	0.0	0.0	0.00	0.00	0.00	58.6
North: Great Western Highway (N)														
	T1	1023	8.3	1023	8.3	0.297	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
	R2	7	0.0	7	0.0	0.016	11.2	LOS A	0.0	0.3	0.64	0.79	0.64	43.9
Approach		1031	8.3	1031	8.3	0.297	4.4	LOS A	0.0	0.3	0.00	0.53	0.00	53.3
All Vehicles		1917	8.0	1917	8.0	0.297	2.4	NA	0.0	0.3	0.00	0.29	0.00	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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F. SIDRA Intersection Performance Summaries (2036 Weekend Scenario with Proposal)

MOVEMENT SUMMARY

Site: TCS 3657 [(Wknd/2036 GWHUP) GWH | Railway Pde (Site Folder: Wknd 2036 GWHUP)]

Network: N101 [Wknd/2036 GWHUP Case (Network Folder: General)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	1039	7.9	1039	7.9	0.495	12.7	LOS A	17.4	130.1	0.58	0.52	0.58	50.1
7, 8	R2	59	7.1	59	7.1	* 0.232	16.1	LOS B	1.1	8.0	0.61	0.70	0.61	40.2
Approach		1098	7.9	1098	7.9	0.495	12.9	LOS A	17.4	130.1	0.58	0.53	0.58	49.7
East: Railway Parade (E)														
13	L2	56	9.4	56	9.4	0.090	8.5	LOS A	1.0	7.3	0.36	0.62	0.36	17.9
9	T1	1	0.0	1	0.0	0.074	45.2	LOS D	0.9	7.5	0.87	0.69	0.87	5.1
9	R2	17	25.0	17	25.0	0.074	48.7	LOS D	0.9	7.5	0.87	0.69	0.87	23.7
Approach		74	12.9	74	12.9	0.090	18.2	LOS B	1.0	7.5	0.48	0.64	0.48	21.4
North: Great Western Highway (N)														
12	L2	32	13.3	32	13.3	0.033	14.8	LOS B	0.7	5.4	0.40	0.65	0.40	39.8
1, 2	T1	1186	8.3	1186	8.3	* 0.559	13.6	LOS A	19.9	149.0	0.62	0.56	0.62	41.6
3, 4	R2	2	0.0	2	0.0	0.007	13.7	LOS A	0.0	0.2	0.50	0.61	0.50	40.9
Approach		1220	8.4	1220	8.4	0.559	13.7	LOS A	19.9	149.0	0.61	0.56	0.61	41.6
West: Station Street (W)														
11	L2	2	0.0	2	0.0	0.009	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0.0	1	0.0	0.009	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	15	14.3	15	14.3	0.058	47.4	LOS D	0.7	5.7	0.86	0.68	0.86	2.4
Approach		18	11.8	18	11.8	0.058	46.4	LOS D	0.7	5.7	0.85	0.67	0.85	6.5
All Vehicles		2409	8.3	2409	8.3	0.559	13.7	LOS A	19.9	149.0	0.59	0.55	0.59	45.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(Wknd/2036 GWHUP) GWH | The Hydro Majestic (Site Folder: Wknd 2036 GWHUP)]

Network: N101 [Wknd/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	5	0.0	5	0.0	0.316	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	14.0
	T1	1092	7.7	1092	7.7	0.316	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach		1097	7.7	1097	7.7	0.316	0.1	NA	0.0	0.0	0.00	0.00	0.00	58.5
North: Great Western Highway (N)														
	T1	1266	8.3	1266	8.3	0.368	4.3	LOS A	0.0	0.0	0.00	0.53	0.00	53.4
	R2	8	0.0	8	0.0	0.026	14.5	LOS A	0.1	0.5	0.74	0.90	0.74	41.2
Approach		1275	8.3	1275	8.3	0.368	4.4	LOS A	0.1	0.5	0.00	0.53	0.00	53.2
All Vehicles		2372	8.0	2372	8.0	0.368	2.4	NA	0.1	0.5	0.00	0.29	0.00	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(Wknd/2036 GWHUP) GWH | Service Station (Site Folder: Wknd 2036 GWHUP)]

Network: N101 [Wknd/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	49	10.6	49	10.6	0.317	5.7	LOS A	0.0	0.0	0.00	0.05	0.00	30.5
	T1	1045	7.7	1045	7.7	0.317	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	58.4
Approach		1095	7.8	1095	7.8	0.317	0.3	NA	0.0	0.0	0.00	0.03	0.00	55.8
North: Great Western Highway (N)														
	T1	1268	8.3	1268	8.3	0.368	4.2	LOS A	0.0	0.0	0.00	0.53	0.00	41.5
Approach		1268	8.3	1268	8.3	0.368	4.2	NA	0.0	0.0	0.00	0.53	0.00	41.5
All Vehicles		2363	8.1	2363	8.1	0.368	2.4	NA	0.0	0.0	0.00	0.30	0.00	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: [(Wknd/2036 GWHUP) GWH | Bellevue Cres (Site Folder: Wknd 2036 GWHUP)]

Network: N101 [Wknd/2036 GWHUP Case (Network Folder: General)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	22	0.0	22	0.0	0.016	10.3	LOS A	0.3	2.4	0.29	0.62	0.29	44.0
	T1	1089	7.8	1089	7.8	*0.419	5.8	LOS A	11.4	85.1	0.39	0.36	0.39	50.5
Approach		1112	7.7	1112	7.7	0.419	5.9	LOS A	11.4	85.1	0.39	0.36	0.39	50.3
North: Great Western Highway (N)														
	T1	1264	8.3	1264	8.3	0.432	2.2	LOS A	8.6	64.3	0.26	0.24	0.26	56.8
	R2	19	0.0	19	0.0	*0.204	68.1	LOS E	1.1	7.9	0.99	0.70	0.99	10.2
Approach		1283	8.2	1283	8.2	0.432	3.2	LOS A	8.6	64.3	0.27	0.24	0.27	55.4
West: Bellevue Crescent (W)														
	L2	19	0.0	19	0.0	0.351	68.4	LOS E	2.0	13.8	1.00	0.72	1.00	4.4
	R2	14	0.0	14	0.0	*0.351	68.4	LOS E	2.0	13.8	1.00	0.72	1.00	20.2
Approach		33	0.0	33	0.0	0.351	68.4	LOS E	2.0	13.8	1.00	0.72	1.00	12.4
All Vehicles		2427	7.8	2427	7.8	0.432	5.3	LOS A	11.4	85.1	0.33	0.30	0.33	52.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

G. SIDRA Intersection Performance Summary (2036 Weekend Scenario with Proposal – Sensitivity Test)

MOVEMENT SUMMARY

Site: TCS 3657 [(Sensitivity/Wknd/2036 GWHUP) GWH | Railway Pde (Site Folder: Wknd 2036 GWHUP)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	987	78	1039	7.9	0.495	12.7	LOS A	17.4	130.1	0.58	0.52	0.58	50.1
7, 8	R2	56	4	59	7.1	*0.232	16.1	LOS B	1.1	8.0	0.61	0.70	0.61	40.2
Approach		1043	82	1098	7.9	0.495	12.9	LOS A	17.4	130.1	0.58	0.53	0.58	49.7
East: Railway Parade (E)														
13	L2	53	5	56	9.4	0.104	9.1	LOS A	1.0	7.3	0.42	0.64	0.42	47.0
9	T1	1	0	1	0.0	0.074	45.2	LOS D	0.9	7.5	0.87	0.69	0.87	5.1
9	R2	16	4	17	25.0	0.074	48.7	LOS D	0.9	7.5	0.87	0.69	0.87	23.7
Approach		70	9	74	12.9	0.104	18.7	LOS B	1.0	7.5	0.52	0.65	0.52	38.4
North: Great Western Highway (N)														
12	L2	30	4	32	13.3	0.033	14.8	LOS B	0.7	5.4	0.40	0.65	0.40	39.8
1, 2	T1	1127	93	1186	8.3	*0.559	13.6	LOS A	19.9	149.0	0.62	0.56	0.62	49.5
3, 4	R2	2	0	2	0.0	0.007	13.7	LOS A	0.0	0.2	0.50	0.61	0.50	40.9
Approach		1159	97	1220	8.4	0.559	13.7	LOS A	19.9	149.0	0.61	0.56	0.61	49.4
West: Station Street (W)														
11	L2	2	0	2	0.0	0.009	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0	1	0.0	0.009	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	100	2	105	2.0	*0.390	50.9	LOS D	5.6	39.8	0.93	0.78	0.93	24.3
Approach		103	2	108	1.9	0.390	50.6	LOS D	5.6	39.8	0.93	0.77	0.93	24.2
All Vehicles		2375	190	2500	8.0	0.559	15.1	LOS B	19.9	149.0	0.61	0.56	0.61	48.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

H. SIDRA Intersection Performance Summaries (2036 Scenario with Proposal – Alternative Design)

MOVEMENT SUMMARY

Site: TCS 3657 [(New/AM/2036 GWHUP) GWH | Railway Pde (Site Folder: New 2036 GWHUP)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	753	91	753	12.1	*0.364	11.6	LOS A	10.8	83.3	0.52	0.46	0.52	50.9
7, 8	R2	31	0	31	0.0	*0.068	12.4	LOS A	0.5	3.8	0.45	0.65	0.45	43.1
Approach		784	91	784	11.6	0.364	11.6	LOS A	10.8	83.3	0.52	0.47	0.52	50.7
East: Railway Parade (E)														
13	L2	61	3	61	4.9	0.071	5.3	LOS A	0.6	4.3	0.23	0.58	0.23	51.3
9	T1	1	0	1	0.0	0.081	45.0	LOS D	1.1	7.6	0.87	0.70	0.87	5.1
9	R2	21	0	21	0.0	0.081	48.6	LOS D	1.1	7.6	0.87	0.70	0.87	24.3
Approach		83	3	83	3.6	0.081	16.7	LOS B	1.1	7.6	0.40	0.61	0.40	40.2
North: Great Western Highway (N)														
12	L2	26	2	26	7.7	0.025	14.6	LOS B	0.6	4.2	0.40	0.65	0.40	39.9
1, 2	T1	724	77	724	10.6	0.348	11.4	LOS A	10.0	76.3	0.51	0.45	0.51	51.0
3, 4	R2	4	0	4	0.0	0.009	12.3	LOS A	0.1	0.5	0.45	0.61	0.45	42.2
Approach		754	79	754	10.5	0.348	11.5	LOS A	10.0	76.3	0.51	0.46	0.51	50.7
West: Station Street (W)														
11	L2	3	0	3	0.0	0.014	43.5	LOS D	0.2	1.6	0.82	0.60	0.82	25.2
11	T1	2	0	2	0.0	0.014	41.0	LOS C	0.2	1.6	0.82	0.60	0.82	5.5
10	R2	2	0	2	0.0	0.007	46.2	LOS D	0.1	0.7	0.85	0.61	0.85	25.6
Approach		7	0	7	0.0	0.014	43.6	LOS D	0.2	1.6	0.83	0.61	0.83	21.6
All Vehicles		1628	173	1628	10.6	0.364	12.0	LOS A	10.8	83.3	0.51	0.47	0.51	50.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: TCS 3657 [(New/PM/2036 GWHUP) GWH | Railway Pde (Site Folder: New 2036 GWHUP)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	798	63	798	7.9	0.364	11.5	LOS A	11.4	85.3	0.52	0.46	0.52	50.9
7, 8	R2	46	3	46	6.5	*0.132	13.5	LOS A	0.8	6.1	0.50	0.67	0.50	42.2
Approach		844	66	844	7.8	0.364	11.7	LOS A	11.4	85.3	0.52	0.47	0.52	50.6
East: Railway Parade (E)														
13	L2	43	4	43	9.3	0.058	6.1	LOS A	0.5	3.8	0.26	0.59	0.26	50.2
9	T1	1	0	1	0.0	0.057	44.9	LOS D	0.7	5.7	0.86	0.68	0.86	5.1
9	R2	13	3	13	23.1	0.057	48.4	LOS D	0.7	5.7	0.86	0.68	0.86	23.9
Approach		57	7	57	12.3	0.058	16.4	LOS B	0.7	5.7	0.41	0.61	0.41	40.0
North: Great Western Highway (N)														
12	L2	24	3	24	12.5	0.025	14.7	LOS B	0.5	4.0	0.40	0.64	0.40	39.9
1, 2	T1	910	76	910	8.4	*0.426	12.1	LOS A	13.4	100.7	0.55	0.49	0.55	50.5
3, 4	R2	2	0	2	0.0	0.005	12.2	LOS A	0.0	0.2	0.44	0.60	0.44	42.2
Approach		936	79	936	8.4	0.426	12.2	LOS A	13.4	100.7	0.54	0.49	0.54	50.3
West: Station Street (W)														
11	L2	2	0	2	0.0	0.008	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0	1	0.0	0.008	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	4	2	4	50.0	0.019	47.0	LOS D	0.2	2.0	0.85	0.64	0.85	24.8
Approach		7	2	7	28.6	0.019	44.7	LOS D	0.2	2.0	0.83	0.62	0.83	23.4
All Vehicles		1844	154	1844	8.4	0.426	12.2	LOS A	13.4	100.7	0.53	0.49	0.53	50.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(New/AM/2036 GWHUP) GWH | Bellevue Cres (Site Folder: New 2036 GWHUP)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	6	0	6	0.0	0.005	10.5	LOS A	0.1	0.7	0.29	0.61	0.29	45.5
	T1	796	91	796	11.4	*0.326	5.6	LOS A	7.8	59.8	0.37	0.33	0.37	52.0
Approach		802	91	802	11.3	0.326	5.6	LOS A	7.8	59.8	0.37	0.33	0.37	51.9
North: Great Western Highway (N)														
	T1	945	91	945	9.6	0.332	2.2	LOS A	5.9	45.0	0.24	0.21	0.24	56.6
	R2	19	2	19	10.5	*0.241	69.0	LOS E	1.2	8.8	0.99	0.70	0.99	9.7
Approach		964	93	964	9.6	0.332	3.5	LOS A	5.9	45.0	0.25	0.22	0.25	54.6
West: Bellevue Crescent (W)														
	L2	12	0	12	0.0	0.111	65.9	LOS E	0.7	4.9	0.98	0.68	0.98	10.1
	R2	28	4	28	14.3	*0.321	68.5	LOS E	1.7	13.3	0.99	0.72	0.99	21.1
Approach		40	4	40	10.0	0.321	67.7	LOS E	1.7	13.3	0.99	0.71	0.99	18.4
All Vehicles		1806	188	1806	10.4	0.332	5.9	LOS A	7.8	59.8	0.32	0.28	0.32	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(New/PM/2036 GWHUP) GWH | Bellevue Cres (Site Folder: New 2036 GWHUP)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	17	0	17	0.0	0.013	10.9	LOS A	0.3	2.0	0.31	0.62	0.31	45.2
	T1	836	66	836	7.9	*0.329	5.9	LOS A	8.4	62.9	0.38	0.34	0.38	51.6
Approach		853	66	853	7.7	0.329	6.0	LOS A	8.4	62.9	0.38	0.34	0.38	51.4
North: Great Western Highway (N)														
	T1	970	81	970	8.4	0.338	2.4	LOS A	6.4	48.3	0.25	0.23	0.25	56.2
	R2	18	0	18	0.0	*0.194	68.0	LOS E	1.1	7.5	0.99	0.70	0.99	9.9
Approach		988	81	988	8.2	0.338	3.6	LOS A	6.4	48.3	0.26	0.23	0.26	54.4
West: Bellevue Crescent (W)														
	L2	4	0	4	0.0	0.032	63.5	LOS E	0.2	1.6	0.96	0.64	0.96	10.4
	R2	36	2	36	5.6	*0.318	66.5	LOS E	2.1	15.6	0.99	0.73	0.99	21.6
Approach		40	2	40	5.0	0.318	66.2	LOS E	2.1	15.6	0.99	0.72	0.99	20.8
All Vehicles		1881	149	1881	7.9	0.338	6.0	LOS A	8.4	62.9	0.33	0.29	0.33	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: TCS 3657 [(New/Wknd/2036 GWHUP) GWH | Railway Pde (Site Folder: New Wknd 2036 GWHUP)]

TCS 3657
Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
5, 6	T1	987	78	987	7.9	0.468	12.4	LOS A	16.1	120.1	0.56	0.50	0.56	50.3
7, 8	R2	56	4	56	7.1	*0.207	15.4	LOS B	1.0	7.5	0.58	0.69	0.58	40.8
Approach		1043	82	1043	7.9	0.468	12.6	LOS A	16.1	120.1	0.56	0.51	0.56	49.9
East: Railway Parade (E)														
13	L2	53	5	53	9.4	0.081	7.8	LOS A	0.8	6.3	0.33	0.61	0.33	48.3
9	T1	1	0	1	0.0	0.071	45.1	LOS D	0.8	7.1	0.87	0.69	0.87	5.1
9	R2	16	4	16	25.0	0.071	48.6	LOS D	0.8	7.1	0.87	0.69	0.87	23.8
Approach		70	9	70	12.9	0.081	17.7	LOS B	0.8	7.1	0.46	0.63	0.46	39.1
North: Great Western Highway (N)														
12	L2	30	4	30	13.3	0.031	14.8	LOS B	0.7	5.1	0.40	0.65	0.40	39.9
1, 2	T1	1125	93	1125	8.3	*0.529	13.3	LOS A	18.3	137.3	0.60	0.54	0.60	49.8
3, 4	R2	2	0	2	0.0	0.006	13.2	LOS A	0.0	0.2	0.49	0.60	0.49	41.3
Approach		1157	97	1157	8.4	0.529	13.3	LOS A	18.3	137.3	0.60	0.55	0.60	49.6
West: Station Street (W)														
11	L2	2	0	2	0.0	0.008	42.5	LOS C	0.1	1.0	0.81	0.59	0.81	25.5
11	T1	1	0	1	0.0	0.008	40.0	LOS C	0.1	1.0	0.81	0.59	0.81	5.5
10	R2	5	2	5	40.0	0.022	47.0	LOS D	0.2	2.3	0.85	0.64	0.85	24.9
Approach		8	2	8	25.0	0.022	45.0	LOS D	0.2	2.3	0.84	0.62	0.84	23.6
All Vehicles		2278	190	2278	8.3	0.529	13.2	LOS A	18.3	137.3	0.58	0.53	0.58	49.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(New/Wknd/2036 GWHUP) GWH | Bellevue Cres (Site Folder: New Wknd 2036 GWHUP)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	21	0	21	0.0	0.016	11.2	LOS A	0.4	2.5	0.32	0.63	0.32	44.9
	T1	1035	81	1035	7.8	*0.412	6.8	LOS A	11.6	87.0	0.42	0.38	0.42	50.5
Approach		1056	81	1056	7.7	0.412	6.9	LOS A	11.6	87.0	0.42	0.39	0.42	50.4
North: Great Western Highway (N)														
	T1	1201	100	1201	8.3	0.423	3.0	LOS A	9.2	69.3	0.29	0.27	0.29	55.4
	R2	18	0	18	0.0	*0.194	68.0	LOS E	1.1	7.5	0.99	0.70	0.99	9.9
Approach		1219	100	1219	8.2	0.423	3.9	LOS A	9.2	69.3	0.30	0.27	0.30	54.0
West: Bellevue Crescent (W)														
	L2	5	0	5	0.0	0.036	62.3	LOS E	0.3	1.9	0.95	0.65	0.95	10.5
	R2	50	2	50	4.0	*0.383	65.6	LOS E	2.9	21.3	0.99	0.75	0.99	21.8
Approach		55	2	55	3.6	0.383	65.3	LOS E	2.9	21.3	0.99	0.74	0.99	21.0
All Vehicles		2330	183	2330	7.9	0.423	6.7	LOS A	11.6	87.0	0.37	0.34	0.37	50.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: [(Sensitivity/New/Wknd/2036 GWHUP) GWH | Bellevue Cres (Site Folder: New Wknd 2036 GWHUP)]

Site Category: Proposed Design 1
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Great Western Highway (S)														
	L2	21	0	21	0.0	0.017	13.3	LOS A	0.4	2.9	0.37	0.64	0.37	43.2
	T1	1035	81	1035	7.8	*0.442	9.5	LOS A	13.8	103.0	0.50	0.45	0.50	47.5
Approach		1056	81	1056	7.7	0.442	9.6	LOS A	13.8	103.0	0.50	0.45	0.50	47.4
North: Great Western Highway (N)														
	T1	1201	100	1201	8.3	0.450	4.9	LOS A	11.9	89.2	0.37	0.34	0.37	52.8
	R2	18	0	18	0.0	*0.194	68.0	LOS E	1.1	7.5	0.99	0.70	0.99	9.9
Approach		1219	100	1219	8.2	0.450	5.8	LOS A	11.9	89.2	0.38	0.35	0.38	51.6
West: Bellevue Crescent (W)														
	L2	5	0	5	0.0	0.022	55.3	LOS D	0.3	1.8	0.90	0.65	0.90	11.6
	R2	100	0	100	0.0	*0.431	59.3	LOS E	5.6	39.0	0.97	0.78	0.97	23.2
Approach		105	0	105	0.0	0.431	59.1	LOS E	5.6	39.0	0.97	0.77	0.97	22.8
All Vehicles		2380	181	2380	7.6	0.450	9.9	LOS A	13.8	103.0	0.46	0.41	0.46	47.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)