



ABN: 62 124 492 335

HIGHWAY INTERSECTION REPORT

HOLLINGSWORTH ESTATE, GULGONG NSW

May 21, 2024

Prepared for:

Jason Landers, De Witt Consulting

Prepared by:

Samantha Green

BTrngDev, MEngSc, RPEQ

250 Church Street, Gloucester NSW 2422

Ph: 6558 9429, email: info@roadculture.com.au

Table of Contents

| | |
|--|----|
| 1. PROJECT DESCRIPTION..... | 3 |
| a. Project Scope | 3 |
| b. Locality | 3 |
| 2. TRAFFIC DATA | 4 |
| a. Turning Movements..... | 4 |
| b. Crash Data..... | 4 |
| c. Speed Data | 4 |
| 3. GENERATED TRAFFIC..... | 5 |
| a. Generated Trips | 5 |
| b. Distribution of Generated Trips | 5 |
| c. Total Peak Traffic Volumes | 6 |
| 4. NETWORK ANALYSIS | 7 |
| a. Functional Classification | 7 |
| b. Network Planning..... | 7 |
| 5. PROPOSED INTERSECTION TREATMENTS | 8 |
| a. Fisher Street / Grevillea Street T-Junction..... | 8 |
| b. Medley Street / Guntawang Street T-Junction | 8 |
| 6. SUMMARY..... | 9 |
| 7. REFERENCES..... | 10 |
| APPENDIX A – Peak Turning Movements (Existing with Stages 1 and 2)..... | 11 |
| APPENDIX B – Additional Peak Turning Movements (All Stages of Development Complete)..... | 12 |
| APPENDIX C – Peak Turning Movements (Total Expected) | 13 |
| APPENDIX D – Warrants for Turn Treatments | 14 |

1. PROJECT DESCRIPTION

a. Project Scope

According to development consent requirements of the approved residential development at Hollingsworth Estate, located at 130-144 Medley Street, Gulgong - MA0014/2014 Condition 55 (November 4, 2013) – proposed treatments for two intersections on the Castlereagh Highway must be submitted to council and require a works authorisation deed from Transport for NSW.

This highway intersection report aims to:

- Describe existing traffic conditions at the two highway intersections – Fisher Street / Grevillea Street and Medley Street / Guntawang Street. *Note: existing conditions include development Stages 1 and 2 - 34 occupied Lots (36 dwellings since 2 Lots are duplex)*
- Outline further vehicle volumes likely to be generated after construction of dwellings in the remaining Lots of the approved Hollingsworth Estate development
- Define the functions of Fisher Street, Grevillea Street, Medley Street and Guntawang Street within the Gulgong traffic network, and;
- Propose treatments for the two highway intersections to support total expected traffic.

This report does not intend to provide assessments of traffic impacts of: the development generally, staging of the development, internal road layout, traffic noise, or car parking.

b. Locality

The Castlereagh Highway is a state-controlled road in New South Wales and Queensland. In Gulgong, Fisher Street and Medley Street are part of that highway, shown orange in Figure 1.



Figure 1: Castlereagh Highway near Hollingsworth Estate, Gulgong NSW

2. TRAFFIC DATA

Existing turning movement volumes, crash and speed data were collected for this report.

a. Turning Movements

RoadCulture conducted 2024 turning movement counts at Fisher Street / Grevillea Street on Wednesday, May 8 and Medley Street / Guntawang Street on Thursday, May 9 in fine weather. The counts occurred between 7:45am – 9:15am and 2:45pm – 4:15pm each day, and a summary of the peak hour results is shown in Appendix A – Peak Turning Movements. The results show Fisher Street carries around 150 veh/hr two-way peak traffic, and Medley Street 300 veh/hr.

b. Crash Data

Data was accessed from the Transport for NSW Centre for Road Safety interactive crash statistics on May 13, 2024, as shown in Figure 2. Three crashes were recorded on Castlereagh Highway in the vicinity of the Hollingsworth Estate in the five-year period 2018-2022.

No crashes were recorded at the Fisher Street / Grevillea Street intersection, however, there was one loss of control type crash that resulted in injury at Medley Street / Guntawang Street.

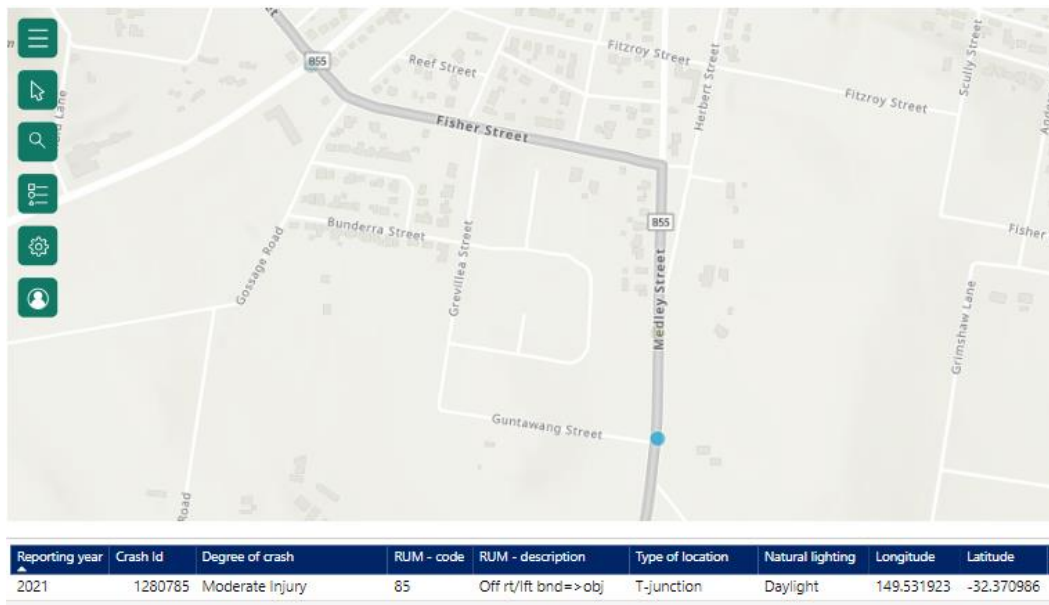


Figure 2: Crashes recorded on Castlereagh Highway, Gulgong NSW

c. Speed Data

Council’s Samantha Cecchini advised by phone May 14, 2024 they have no speed data for the Castlereagh Highway and there are no records on the Transport for NSW traffic volume viewer.

3. GENERATED TRAFFIC

a. Generated Trips

In accordance with weekday average morning and evening peak hour trip rates for low density residential dwellings in regional areas (Roads and Maritime Services, 2013), the generation rate for the subdivision development is 0.71 trips per dwelling in the morning peak, and 0.78 trips per dwelling in the afternoon/evening peak.

b. Distribution of Generated Trips

Traffic generated for the subdivision is assumed to distribute to the Castlereagh Highway in accordance with one of three areas shown bounded by colour in Figure 3. Four Lots (orange) will access Medley Street directly. Thirty-six Lots (green) would use the Fisher Street / Grevillea Street junction to head west, and use the Medley Street / Guntawang Street junction to head north, east or south. The remaining Lots (blue) would use Fisher Street / Grevillea Street to head west, north or east, and use Medley Street / Guntawang Street to head south. The number of dwellings and resulting trips are shown in Table 1 (Existing) and Table 2 (Additional Stages 3+).

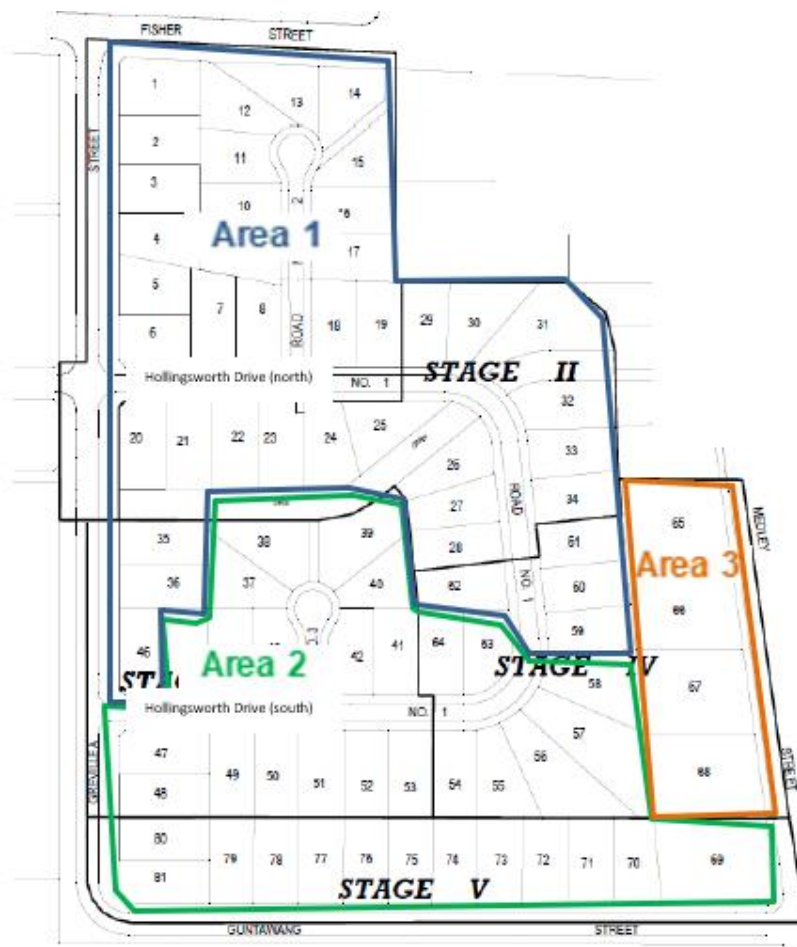


Figure 3: Distribution Areas for Trips Generated by the Development

| | Existing (Stages 1 & 2 complete) | Dwellings | Trips AM Peak | Trips PM Peak |
|---------------|---|-----------|---------------|---------------|
| Area 1 | Accesses Grevillea St directly north of Hollingsworth Dr (south), or, via the Hollingsworth Dr (north) / Bunderra St intersection | 36 | 26 | 28 |
| Area 2 | Accesses Grevillea St directly south of Hollingsworth Dr (south), or via the Hollingsworth Dr (south) junction | 0 | 0 | 0 |
| | Accesses Guntawang St directly | 0 | 0 | 0 |
| Area 3 | Accesses Medley St directly | 0 | 0 | 0 |
| | Total | 36 | 26 | 28 |

Table 1: Trips Generated by the Development (Existing – Stages 1 and 2 Complete)

| | Additional (Stages 3+ complete) | Dwellings | Trips AM Peak | Trips PM Peak |
|---------------|---|-----------|---------------|---------------|
| Area 1 | Accesses Grevillea St directly north of Hollingsworth Dr (south), or, via the Hollingsworth Dr (north) / Bunderra St intersection | 7 | 5 | 5 |
| Area 2 | Accesses Grevillea St directly south of Hollingsworth Dr (south), or, via the Hollingsworth Dr (south) junction | 25 | 18 | 20 |
| | Accesses Guntawang St directly | 11 | 8 | 9 |
| Area 3 | Accesses Medley St directly | 4 | 3 | 3 |
| | Total | 47 | 34 | 37 |

Table 2: Additional Trips Generated by the Development (Stages 3+ Complete)

Since dwellings for Stages 1 and 2 of the development are now occupied, the peak hour trips that were generated (Table 1) will already be included in existing peak turning movement counts for the two highway intersections that were obtained on May 8 and May 9, 2024 (Appendix A).

The additional peak hour trips in Table 2 that are expected to be generated by all further stages of the development are assumed to distribute at the two highway intersections in proportion to the existing volumes of traffic already entering/leaving the intersections to/from Grevillea Street or Guntawang Street. These percentages and vehicle volumes are shown in Appendix B.

c. Total Peak Traffic Volumes

Existing traffic and additional volumes expected to be generated by further development stages are added together to determine expected total peak traffic volumes shown in Appendix C.

4. NETWORK ANALYSIS

a. Functional Classification

According to council's Roads Asset Management Plan (2016, p.44), municipal roads are generally classified as follows:

- Local minor road (rural)
- Local road (urban)
- Local main road
- Collector road (rural/urban)
- CBD road
- Sub-arterial road
- Arterial road

In this classification system, it's expected the Castlereagh Highway (Medley Street) would be considered arterial, and the Castlereagh Highway (Fisher Street) arterial or sub-arterial. Despite carrying relatively low volumes of traffic overall, both of these streets support regional transport movements - for example, between Mudgee and Dubbo - and carry heavy vehicles including semi-trailers and B-doubles.

Grevillea Street and Guntawang Street both provide connection from residential dwellings, Victoria Park and the Gulgong Showground to the Castlereagh Highway (see Figure 1). However, Guntawang Street is currently unsealed and carries very little two-way traffic: 9 veh/hr in the morning peak and 3 veh/hr in the afternoon. A higher volume of two-way traffic (55 veh/hr and 47 veh/hr respectively) including buses were observed to use Grevillea Street between Bunderra Street and Fisher Street. It's therefore expected that Grevillea Street would be considered a collector road, and Guntawang Street a local road.

b. Network Planning

The circumstances of the single loss-of-control type crash at Medley Street / Guntawang Street (Section 2b) are not known. Guntawang Street is currently unsealed and loose gravel could have been a contributing factor. In future, Guntawang Street will be sealed to accommodate later stages of the residential development, and that seal may attract more traffic to the road. From destinations (residential, park and showground) within the bounds of the local area shown in Figure 1, Guntawang Street heads generally to the south and out of town. Grevillea Street will likely remain the more important connection as it links more directly toward the Gulgong CBD and major attractors such as the hospital on the west side of town.

Since the 2013 development consent for Hollingsworth Estate, Mid-Western Regional Council developed the 2016 Pedestrian Access and Mobility Plan (PAMP). In the PAMP, Medley Street is a primary route, and Fisher Street a secondary route. Various lengths of footpath conditioned in the consent will need including in the intersection design, but, is outside the scope of this report.

5. PROPOSED INTERSECTION TREATMENTS

As shown in Appendix A and Appendix C, the two highway intersections carry relatively low volumes of traffic, and after completion of the residential development there is expected to be little increase in turning movements. The volumes indicate formal capacity analysis is not required for either junction, and that uninterrupted traffic flow conditions generally prevail. The following sections detail characteristics and treatment proposals for them.

a. Fisher Street / Grevillea Street T-Junction

Fisher Street and Grevillea Street are each zoned 50km/hr on the approaches to the T-junction which occurs on top of a slight vertical crest. There is a give-way sign and markings on Grevillea Street and from the holding line sight distance is excellent in both directions along Fisher Street. There is sealed footpath on the south-east corner, other footpath areas are unsealed. There are sealed road shoulders on Fisher Street that create manoeuvre space for following vehicles in either direction to get past vehicles that are slowing down to turn into Grevillea Street.

According to the expected total volumes (Appendix C), and the Austroads Guide to Traffic Management Part 6 (2020, p. 56), the intersection warrants only basic turn treatments for both left- and right-turn movements (BAR/BAL). This is shown graphically in Appendix D.

With Grevillea Street considered a collector road and Fisher Street arterial or sub-arterial, Austroads (2013, p. 10) indicates the design vehicle for turning movements would be a 12.5m truck/bus (12.5m radius) and the check vehicle a 19m semi-trailer (15m radius).

b. Medley Street / Guntawang Street T-Junction

Medley Street / Guntawang Street is a T-junction with give way control on the Guntawang Street approach. There is sealed footpath along the east side. All approach roads are zoned 50km/hr, although the transition on the Medley Street (south) approach from 80km/hr to 50km/hr occurs only 100m to the south. This junction is also on top of a slight crest, and sight distance to traffic on Medley Street is excellent in both directions from the Guntawang Street holding line.

According to the expected total volumes (Appendix C), and the Austroads Guide to Traffic Management Part 6 (2020, p. 56), this intersection warrants basic turn treatments for left- and right-turn movements (BAR/BAL). This is shown graphically in Appendix D. The total width of the through lane and shoulder on the Medley Street (north) approach is slightly on the narrow side of the width required for following vehicles to comfortably get around vehicles stopped waiting to turn right. Hence, a little shoulder widening may be required.

With Guntawang Street considered a local road and Medley Street an arterial road, Austroads (2013, p. 10) indicates the design vehicle for turning movements would be an 8.8m service vehicle (12.5m radius) and the check vehicle a 12.5m truck/bus (12.5m radius).

6. SUMMARY

In response to the requirement to propose treatments for the two highway intersections to cater for the approved Hollingsworth Estate development, the following are recommended:

- Basic left- and right-turn treatments at Medley Street / Guntawang Street, designed for an 8.8m service vehicle and checked for a 12.5m truck/bus.
- Basic left- and right-turn treatments at Fisher Street / Grevillea Street, designed for a 12.5m truck/bus and checked for a 19m semi-trailer.

RoadCulture has not made any cultural heritage or environmental assessments at this stage of proposing treatments for the two highway intersections. These matters will need to be checked and the management of any impacts included in the final design decisions for the project.

Once developed, detailed design plans should be audited by an experienced road designer, preferably one who is independent of the initial design. The design audit should consider the proposal from the point of view of various road users, in different weather and lighting conditions, and make any recommendations required to ensure safety.

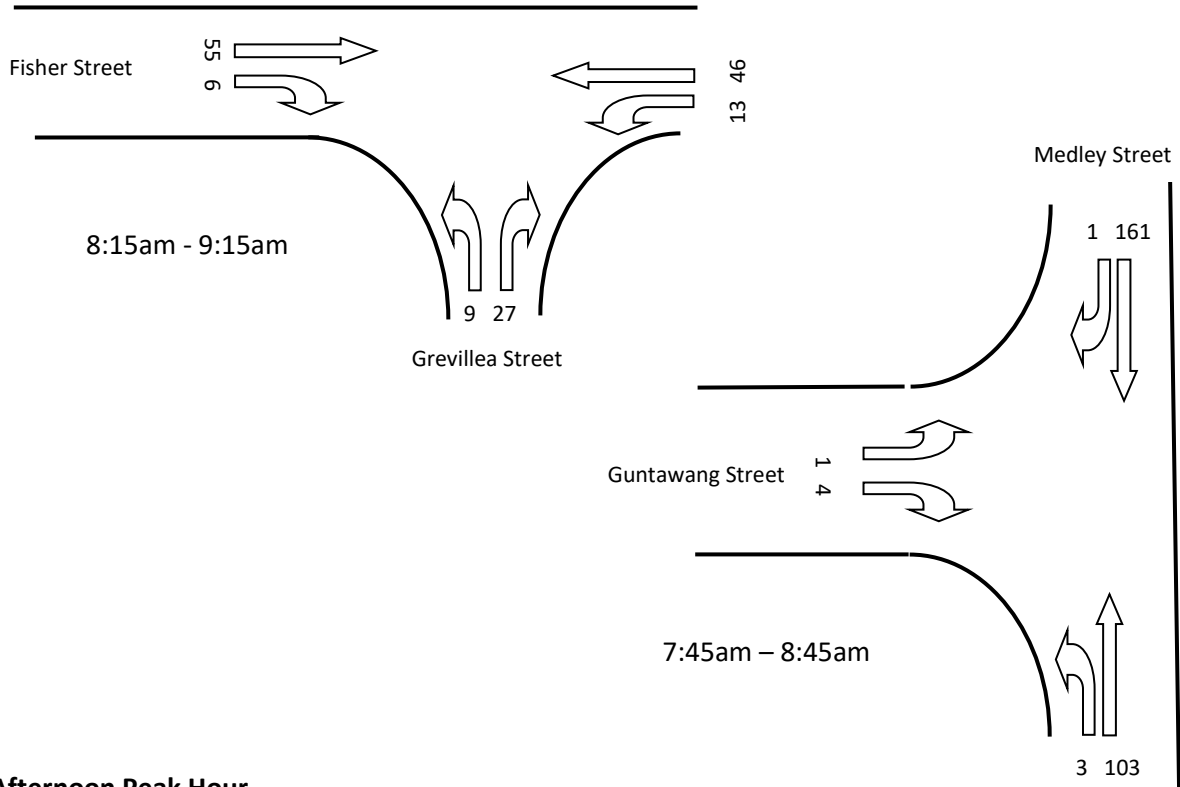
A risk assessment undertaken at design stage will provide insight into other matters and risks to be managed during the final design and construction stages of the project.

7. REFERENCES

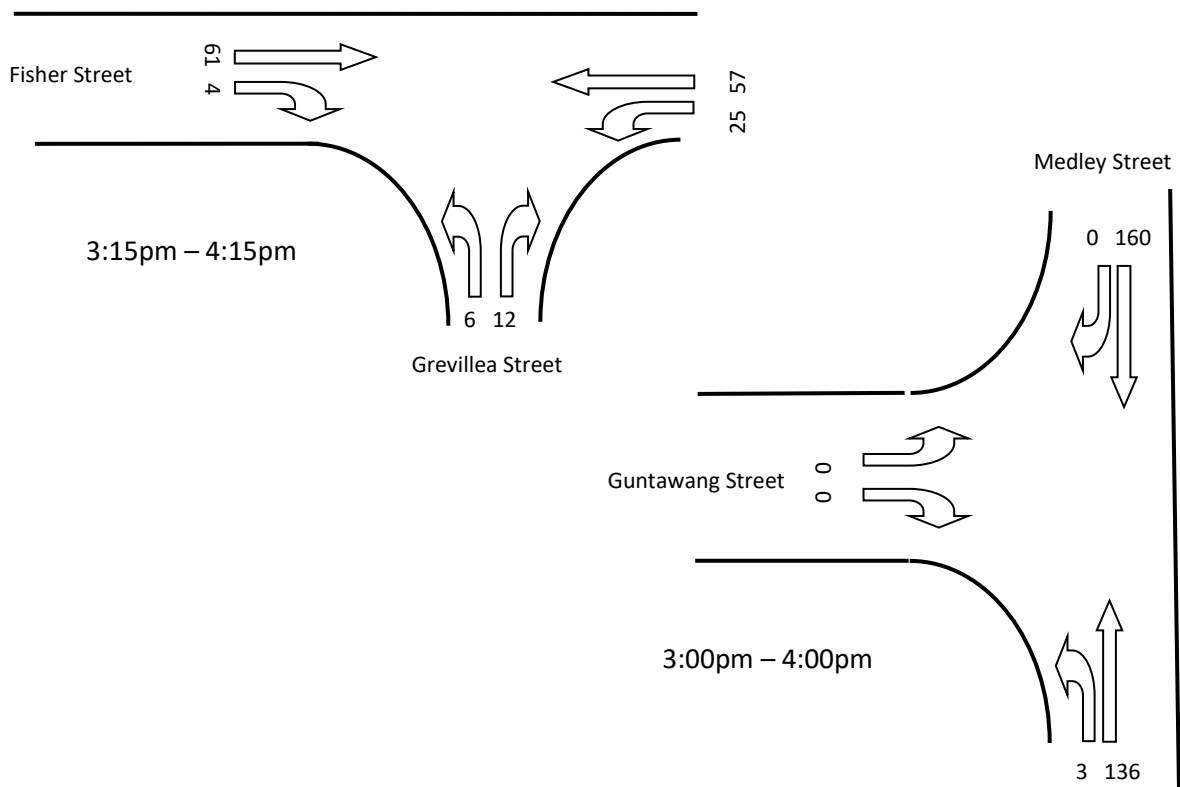
1. Austroads. (2013). *Austroads Design Vehicles and Turning Path Templates Guide* (3rd ed.). Retrieved from <https://austroads.com.au/>
2. Austroads. (2020). *Guide to traffic management part 6: Intersections, interchanges and crossings management* (4th ed.). Retrieved from <https://austroads.com.au/>
3. Mid-Western Regional Council. (2016). *Roads Asset Management Plan*. Retrieved from <https://www.midwestern.nsw.gov.au/Services/Roads/Our-roads-network>
4. Roads and Maritime Services. (2013). *Guide to traffic generating developments: Updated traffic surveys*. Australia: NSW Department of Transport. Retrieved from <https://standards.transport.nsw.gov.au/>

APPENDIX A – Peak Turning Movements (Existing with Stages 1 and 2)

Morning Peak Hour



Afternoon Peak Hour

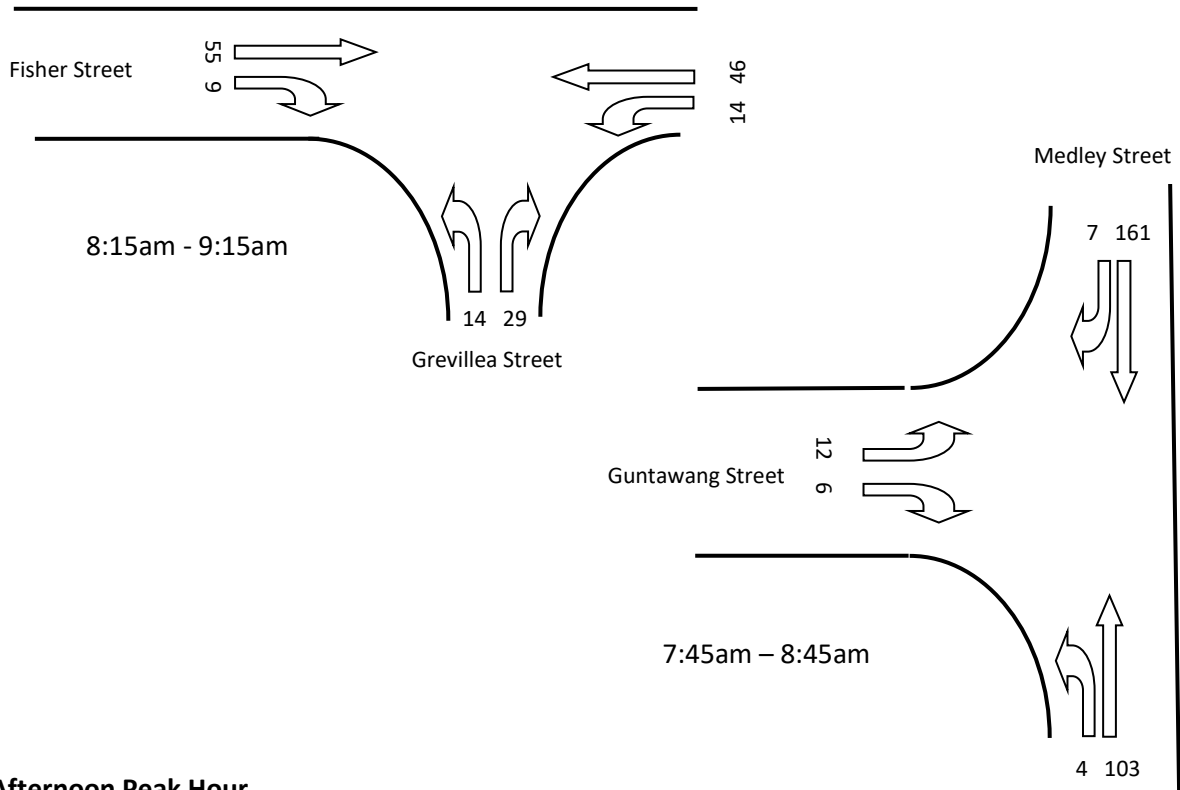


APPENDIX B – Additional Peak Turning Movements (All Stages of Development Complete)

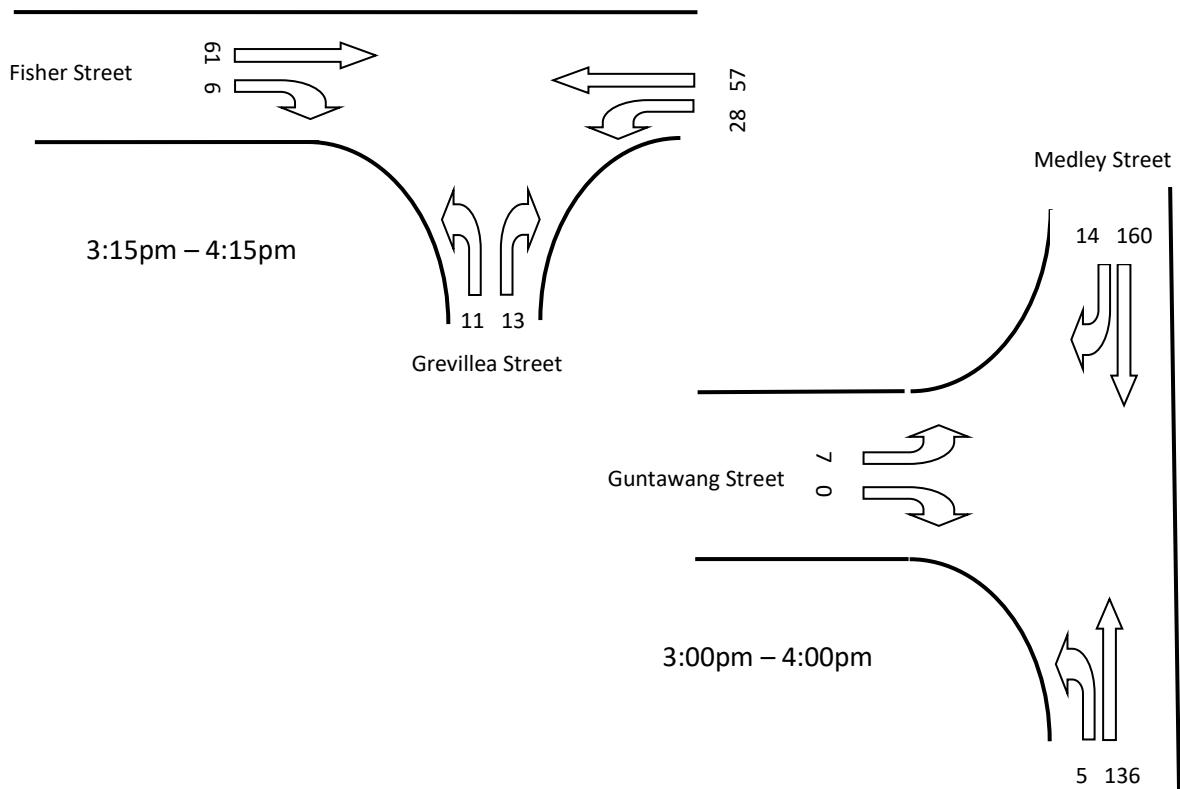
| | In (from west) | Out (to west) | In (from north or east) | Out (to north or east) | In (from south) | Out (to south) | Total |
|---|----------------|---------------|-------------------------|------------------------|-----------------|----------------|-------|
| Existing Traffic Entering/Leaving Grevillea St or Guntawang St through Fisher St or Medley St | | | | | | | |
| AM Peak | 6 | 9 | 14 | 28 | 3 | 4 | 64 |
| PM Peak | 4 | 6 | 25 | 12 | 3 | 0 | 50 |
| Movements as a percentage of total | | | | | | | |
| AM Peak | 9% | 14% | 22% | 44% | 5% | 6% | |
| PM Peak | 8% | 12% | 50% | 24% | 6% | 0% | |
| | In (from west) | Out (to west) | In (from north or east) | Out (to north or east) | In (from south) | Out (to south) | Total |
| Additional Trips Area 1 (veh/hr) - 7 Additional Dwellings | | | | | | | |
| AM Peak | 1 | 1 | 1 | 2 | 0 | 0 | 5 |
| PM Peak | 0 | 1 | 3 | 1 | 0 | 0 | 5 |
| Additional Trips Area 2 (veh/hr) - 36 Additional Dwellings | | | | | | | |
| AM Peak | 2 | 4 | 6 | 11 | 1 | 2 | 26 |
| PM Peak | 2 | 4 | 14 | 7 | 2 | 0 | 29 |
| Additional Trips Area 3 (veh/hr) - 4 Additional Dwellings | | | | | | | |
| AM Peak | 0 | 1 | 1 | 1 | 0 | 0 | 3 |
| PM Peak | 0 | 0 | 2 | 1 | 0 | 0 | 3 |

APPENDIX C – Peak Turning Movements (Total Expected)

Morning Peak Hour

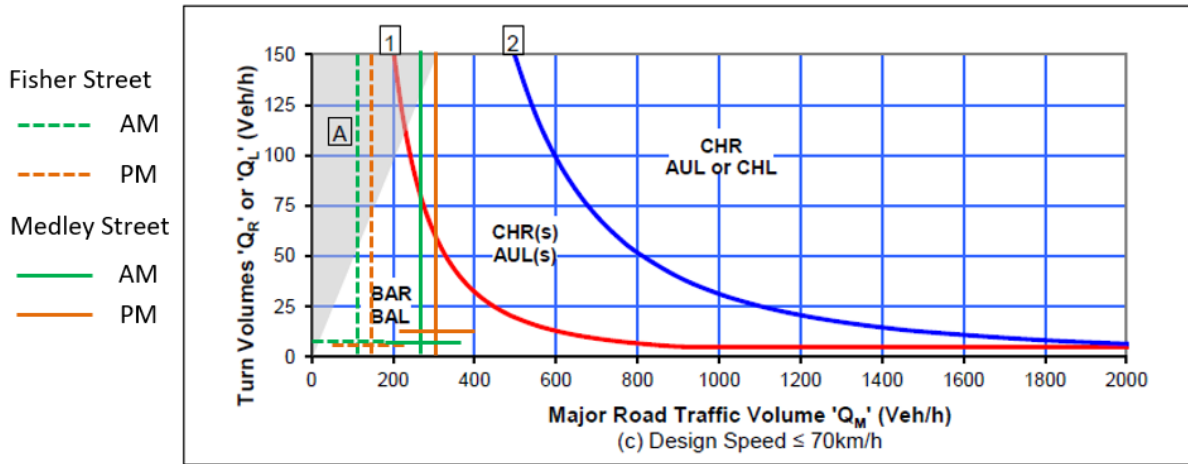


Afternoon Peak Hour



APPENDIX D – Warrants for Turn Treatments

Right-turn warrants



Left-turn warrants

