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Revised Traffic and Transport Impact Assessment

BYLONG COAL PROJECT
Environmental Impact Statement

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

Hansen Bailey

Bylong Coal Project – Response to Submissions Revised Traffic and Transport Impact Assessment

21 March 2016

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Author, Reviewer and Approver details			
Prepared by:	Ravi Kaberwal, Sharmin Choudhury, Claire Rusin	Date: 21/03/2016	Signature:
Reviewed by:	Ryan Miller	Date: 21/03/2016	Signature: R. Miller
Approved by:	Ryan Miller	Date: 21/03/2016	Signature: R. Miller

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Document owner
Parsons Brinckerhoff Australia Pty Limited *ABN 80 078 004 798* Level 27 Ernst & Young Centre 680 George Street Sydney NSW 2000 GPO Box 5394 Sydney NSW 2001 Australia Tel: +61 2 9272 5100 Fax: +61 2 9272 5101 www.pbworld.com *Certified to ISO 9001, ISO 14001, OHSAS 18001*

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Glossary

A	Authorisation
AADT	Average Annual Daily Traffic
ARTC	Australian Rail Track Corporation
AS	Australian Standard
CHPP	Coal Handling and Preparation Plant
DoS	Degree of Saturation
EIS	Environmental Impact Statement
EP&A	Environmental Planning and Assessment
HV	Heavy Vehicle
km	kilometres
Km/h	Kilometres per hour
LGA	Local Government Area
LoS	Level of Service
LV	Light Vehicle
m	metres
MIA	Mine infrastructure area
Mtpa	Million tonnes per annum
MSC	Muswellbrook Shire Council
MWRC	Mid-Western Regional Council
OEA	Overburden Emplacement Area
PWCS	Port Waratah Coal Service
Q_L	Volume of left turn in vehicles at an unsignalised intersection
Q_M	Volume of through vehicles at an unsignalised intersection
Q_R	Volume of right turn in vehicles at an unsignalised intersection
Q_{T1}	Volume of through vehicles adjacent to the right turn in at an unsignalised intersection

Q_{T2}	Volume of through vehicles adjacent to the left turn in at an unsignalised intersection
RAV	Restricted Access Vehicle
ROM	Run of Mine
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements
SIA	Social Impact Assessment
SISD	Safe Intersection Sight Distance
t	tonnes
TfNSW	Transport for NSW
TMP	Traffic Management Plan
vph	Vehicles per hour
vpd	Vehicles per day
WAF	Workers Accommodation Facility

1. Introduction

Parsons Brinckerhoff was commissioned by Hansen Bailey to prepare a Traffic and Transport Impact Assessment to be included as part of an Environmental Impact Statement (EIS) for the Bylong Coal Project (the Project). The EIS for the Project was placed on public exhibition from 23 September 2015 to 6 November 2015 from which a number of submissions have been received from various stakeholders.

This report has been prepared as a revised Traffic and Transport Impact Assessment included within the EIS to assist in the response to submissions received during the public exhibition of the EIS. In response to the submissions received during the public exhibition process, this report has considered a much wider study area for assessment, cumulative traffic impacts from three neighbouring mines, looks at additional employee housing scenarios and provides further detail on the road network, traffic volumes and intersection operation for the widened assessment area.

1.1 Background

In December 2010 KEPCO Bylong Australia Pty Ltd (KEPCO) acquired Authorisations (A) 287 and 342. Since this time, extensive exploration and mine planning work has been undertaken to determine the most environmentally sound, socially responsible and economically viable mine plan to recover the known coal resources within the two Authorisations.

In August 2014 KEPCO commissioned WorleyParsons Services Pty Ltd (WorleyParsons) to manage the Project exploration activities, mine feasibility study planning, environmental approvals and ongoing environmental monitoring for the Project.

The Project is located wholly within A287 and A342 which are located within the Mid-Western Regional Council (MWRC) Local Government Area (LGA). The closest regional centre is Mudgee, located approximately 55 km south-west of the Project Boundary. The Project is approximately 230 km by rail from the Port of Newcastle. Figure 1.1 illustrates the locality of the Project within New South Wales (NSW). Figure 1.2 shows the regional locality of the Project in relation to the neighbouring town centres, mining authorities, major transport routes and reserves.

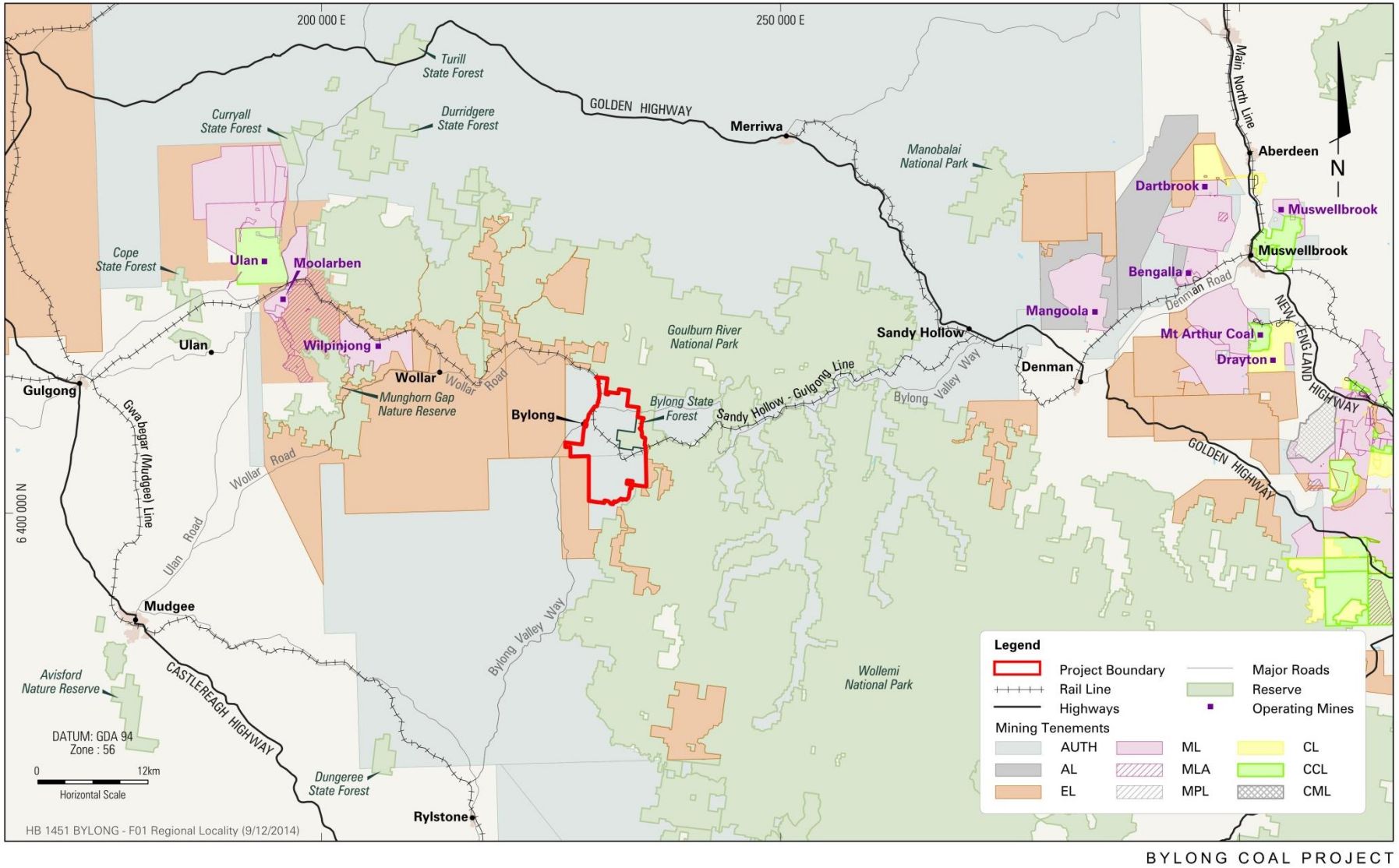
KEPCO is seeking State Significant Development Consent under Division 4.1 of Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) for the development and operation of the Project. The State Significant Development Application is supported by an Environmental Impact Statement (EIS) which has been prepared by Hansen Bailey.

The EIS went on public exhibition between September and November 2015 with responses received from several government agencies, local groups, individuals and mining companies. This report addresses the submissions received in relation to the traffic and transport issues via way of further assessment and will be included as part of the Response to Submissions (RTS) report being prepared by Hansen Bailey.

It is noted that a late submission was received from Muswellbrook Shire Council (MSC) on 15 March 2016 which will be addressed at a later date.

Source: Hansen Bailey (2015)

Figure 1.1 Locality plan



Source: Hansen Bailey (2015)

Figure 1.2 Regional locality plan

1.2 Project overview

The Project life is anticipated to be approximately 25 years, comprising a two year construction period and a 23 year operational period, with underground mining operations commencing in Year 7. Various rehabilitation and decommissioning activities will be undertaken during both the course of, and following the 25 years of the Project. It is noted that further minable coal resources exist within both A287 and A342.

The Project is to be developed on land within the Project Boundary as illustrated on Figure 3.1. Key features of the Project are conceptually shown on Figure 3.1 and include:

- The initial development of two open cut mining areas with associated haul roads and Overburden Emplacement Areas (OEAs), utilising a mining fleet of excavators and trucks and supporting ancillary equipment;
- The two open cut mining areas will be developed and operated 24 hours a day, 7 days a week over an approximate 10 year period and will ultimately provide for the storage of coal processing reject materials from the longer term underground mining activities;
- Construction and operation of administration, workshop, bathhouse, explosives magazine and other open cut mining related facilities;
- Construction and operation of an underground coal mine operating 24 hours a day, 7 days a week for a 20 year period, commencing mining in around year 7 of the Project;
- A combined maximum extraction rate of up to 6.5 Million tonnes per annum (Mtpa) Run of Mine (ROM) coal;
- A workforce of up to approximately 665 during the initial construction phase and a peak of 470 full-time equivalent operations employees at full production;
- Underground mining operations utilising longwall mining techniques with primary access provided via drifts constructed adjacent to the rail loop and Coal Handling and Preparation Plant (CHPP);
- The construction and operation of facilities to support underground mining operations including personnel and material access to the underground mining area, ventilation shafts, workshop, offices and employee amenities, fuel and gas management facilities;
- Construction and operation of a CHPP with a designed throughput of approximately 6 Mtpa of ROM coal, with capacity for peak fluctuations beyond this;
- The dewatering of fine reject materials through belt press filters within the CHPP and the co-disposal of dewatered fine and coarse reject materials within OEAs and final open cut voids (avoiding the need for a tailings dam);
- Construction and operation of a rail loop and associated rail load out facility and connection to the Sandy Hollow to Gulgong Railway Line to facilitate the transport of product coal;
- The construction and operation of surface and groundwater management and water reticulation infrastructure including diversion drains, dams (clean, dirty and raw water), pipelines and pumping stations;
- The installation of communications and electricity reticulation infrastructure;
- Construction and operation of a Workforce Accommodation Facility (WAF) and associated access road from Bylong Valley Way;
- The upgrade of Upper Bylong Road and the construction and operation of a Mine Access Road to provide access to the site facilities;
- Relocation of sections of some existing public roads to enable alternate access routes for private landholders surrounding the Project; and

- Infilling of mining voids, progressive rehabilitation of disturbed areas, decommissioning of Project infrastructure and rehabilitation of the land progressively following mining operations.

1.3 Assessment study area

The study area for this assessment is shown in Figures 1.3 and 1.4 and includes a refined study area when compared to the Traffic and Transport Impact Assessment presented within the EIS, comprising local and regional study areas.

The local study area (refer to Figure 1.3) includes the roads within the vicinity of the Project such as Bylong Valley Way, Upper Bylong Road, Lee Creek Road, Budden Gap Road, Woolleys Road and Wollar Road. The key intersections within the local study area include Bylong Valley Way/Upper Bylong Road and Bylong Valley Way/Wollar Road.

The regional study area (refer to Figure 1.4) includes roads more distant from the Project on a regional scale such as Wollar Road, Ulan Road, Ulan-Wollar Road, Lue Road, the Golden Highway and Castlereagh Highway. The key intersections within the regional study area include Wollar Road/Ulan-Wollar Road, Wollar Road/Ulan Road, Ulan Road/Golden Highway, Bylong Valley Way/Golden Highway and Bylong Valley Way/Castlereagh Highway.

It should be noted that some of the intersections within the regional study area are located in excess of 60 km from the Project site itself.

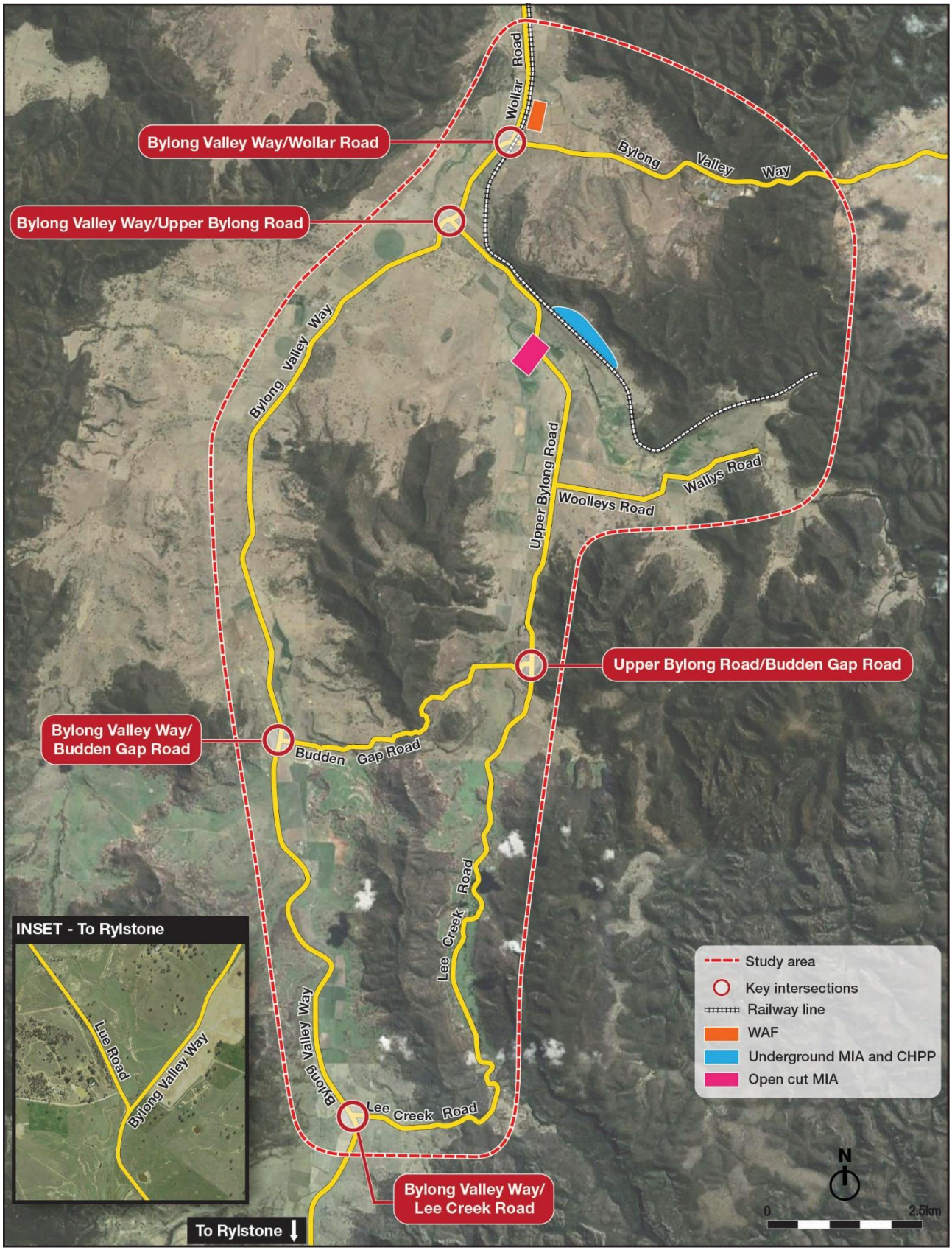


Figure 1.3 Local study area

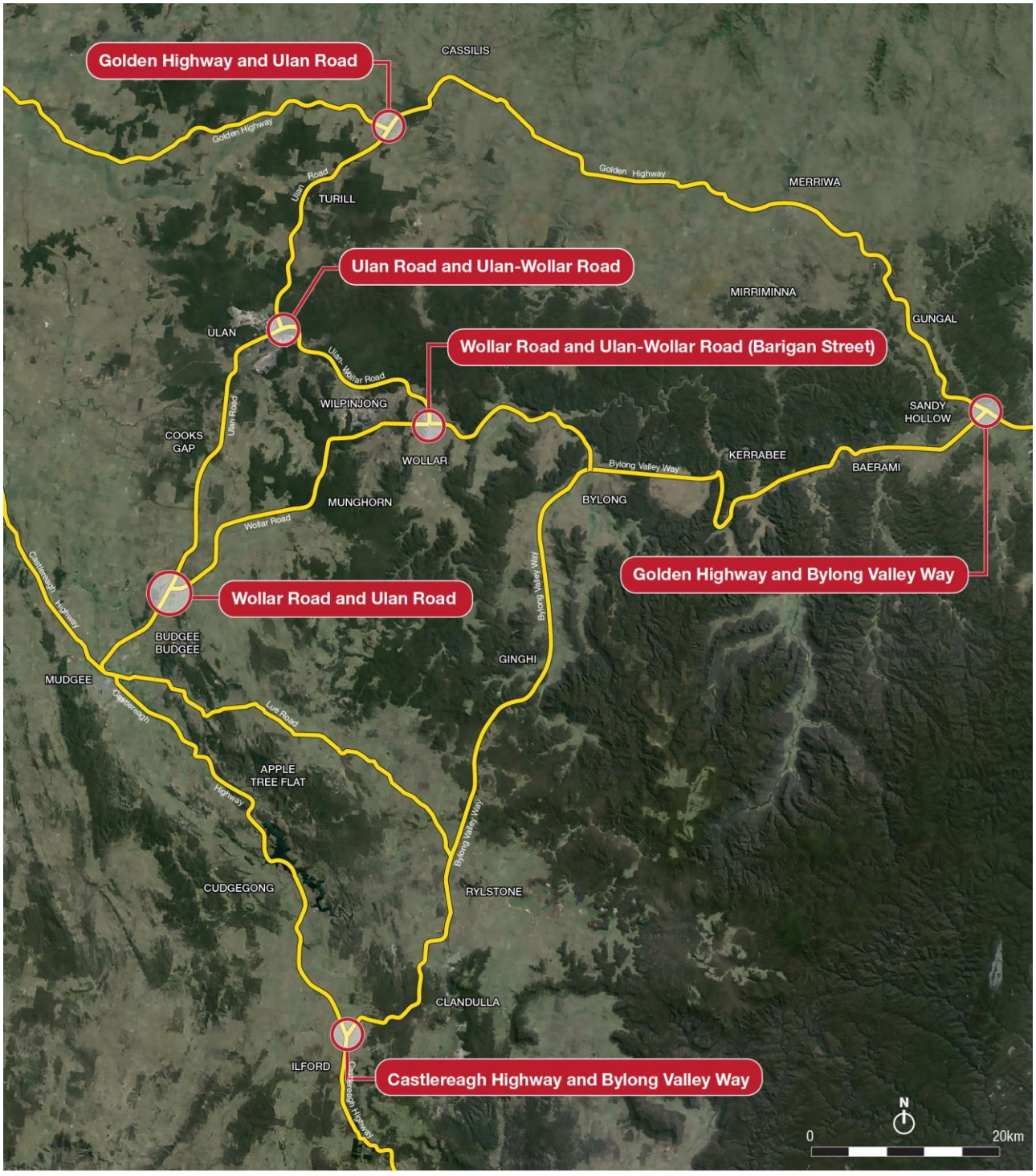


Figure 1.4 Regional study area

1.4 Study scope

The scope of this study is as follows:

- Review and assess existing road and traffic conditions in the assessment study area;
- Determine the traffic generation and distribution of the Project traffic during construction and operation;
- Forecast traffic generation and distribution during Project decommissioning;
- Review and assess future road and traffic conditions (with the inclusion of Project traffic) including intersection performance at key intersections within the assessment study area;
- Identify any potential traffic or road safety issues along the likely Project haulage routes and at access points;
- Identify any impacts to all road users;
- Identify any impacts to the local community including property access;
- Identify and review traffic diversions as a result of road closures;
- Review and identify any cumulative traffic impacts from neighbouring three mines and local quarry, and
- Identify relevant mitigation measures to minimise or remove likely impacts.

1.5 Surrounding developments

A review of several developments surrounding the proposed Project were undertaken to determine any cumulative traffic impacts on the regional road network including Bylong Valley Way, Upper Bylong Road, Wollar Road, Ulan-Wollar Road and Ulan Road. The findings from the several documents reviewed and planning websites are described below.

1.5.1 Bylong Quarry

The Bylong Quarry and Batching Plant expansion (approved in February 2014) will create an additional 94 heavy vehicles and 20 light vehicles on the adjacent road network on a daily basis. This additional volume of traffic generated has been included in the future year traffic assessments.

1.5.2 Wilpinjong Mine

The Wilpinjong Mine is located approximately 14 km north west of the Project. Wilpinjong Coal is proposing to extend its mining operations in the region. Currently, the traffic generated by this mine is already accounted for in the existing background traffic counts undertaken, however for future year scenarios additional traffic is anticipated.

On review of the *Wilpinjong Extension Project Road Transport Assessment* prepared by GTA Consultants in October 2015, the traffic generation related to the mine is expected to peak in 2017 due to construction traffic. By 2024, the report indicates that the mine extension becomes partially operational. At this time construction related traffic is expected to reduce, however there is a subsequent increase in operational workforce related trips, resulting a new peak which is slightly lower than 2017.

Given the distance of the Wilpinjong mine from the Project, the anticipated increase in traffic is not likely to have an impact in the immediate vicinity of the Project, however cumulative volumes have been considered in the assessment of the regional study area, in particular along Ulan Road and Ulan-Wollar Road and their associated intersections.

1.5.3 Moolarben Mine

The Moolarben Mine is located approximately 24 km north west of the Project. The Moolarben Mine was constructed in 2009/2010 and is in operation at present and therefore traffic generated by this mine is already accounted for in the existing background traffic counts undertaken.

The Stage 2 future expansion of this mine has recently been approved in February 2015. On review of the *Moolarben Coal Project Stage 2 Traffic Impact Assessment* prepared by SKM in November 2008 and *Wilpinjong Extension Project Road Transport Assessment* prepared by GTA Consultants in October 2015, the latter was used to estimate traffic in future year scenarios. The GTA report indicated peak traffic generation from the mine would occur in 2017, with the final stages of construction and increase in operational workforce occurring during that year.

As with Wilpinjong mine, the anticipated increase in traffic is not likely to have an impact in the immediate vicinity of the Project, however cumulative volumes have been considered in the assessment of the regional study area, in particular along Ulan Road and Ulan-Wollar Road and their associated intersections

1.5.4 Ulan Mine

The Ulan Mine is located approximately 34 km to the north west of the Project. Ulan is at peak operation (2015) and traffic generation will start to decline in future years to the end of the project life. Traffic generated by this mine is already accounted for in the existing background traffic counts undertaken.

Given the distance of the Ulan mine from the Project, the anticipated increase in traffic is not likely to have an impact in the immediate vicinity of the Project, however cumulative volumes have been considered in the assessment of the regional study area, in particular along Ulan Road and Ulan-Wollar Road and their associated intersections.

1.6 Traffic surveys

Intersection traffic surveys were undertaken by TTM Consulting on Wednesday 9 April 2014 between 5.00 am and 8.00 pm in fine and dry weather conditions at the following intersections:

- Bylong Valley Way and Upper Bylong Road, Bylong
- Bylong Valley Way and Wollar Road, Bylong.

Parsons Brinckerhoff has also referenced traffic surveys conducted for the Bylong Quarry project. Weekly traffic count data was collected over a 24 hour 7 day period in October 2011 on both Bylong Valley Way and Wollar Road.

Origin destination surveys were also undertaken by Northern Transport Planning and Engineering Pty Ltd in November 2015 along Upper Bylong Road and Lee Creek Road for 24 hours over 7 days at the following locations:

Vehicle Counts

- Upper Bylong Road, 100 m south of Bylong Valley Way
- Upper Bylong Road, 100 m north of Woolleys Road
- Upper Bylong Road, 100 m south of Woolleys Road
- Lee Creek Road, 900 m east of Bylong Valley Way.

Intersection Counts

- Upper Bylong Road and Bylong Valley Way
- Upper Bylong Road, Woolleys Road and Lee Creek Road
- Lee Creek Road east of Bylong Valley Way.

Further intersection traffic and mid-block tube surveys were undertaken by Austraffic for the regional study area assessment. The intersection traffic surveys were undertaken on 14 December 2015 at the following intersections:

- Golden Highway and Bylong Valley Way
- Golden Highway and Ulan Road
- Wollar Road and Ulan-Wollar Road (Barigan Street)
- Wollar Road and Ulan Road
- Castlereagh Highway and Bylong Valley
- Ulan Road and Ulan-Wollar Road.

Mid-block tube counts were also undertaken by Austraffic between 12 and 18 December 2015 for 24 hours over 7 days at the following locations:

- Wollar Road west of Ulan-Wollar Road
- Wollar Road north of Bylong Valley Way
- Ulan-Wollar Road (Barigan Street)
- Ulan Road north of Wollar Road
- Ulan Road south of Wollar Road.

1.7 Site inspection

An initial site inspection was undertaken by Parsons Brinckerhoff staff on Thursday 10 April 2014 in fine and dry weather conditions. The purpose of the site inspection was to view the existing road network, intersection layouts, traffic conditions, access locations, road conditions, road restrictions, level railway crossings and general road safety. The inspection included travel on Bylong Valley Way, Upper Bylong Road, Lee Creek Road and Wollar Road.

A second site inspection was undertaken by Parsons Brinckerhoff staff on 20 January 2016 in fine and dry weather conditions. The purpose of this site inspection was to observe road and traffic conditions as well as intersection layouts and performance for the regional study area and main travel routes. The inspection included travel on Bylong Valley Way, Wollar Road, Ulan-Wollar Road, Ulan Road and the Golden Highway.

Observations from the site inspection and from traffic surveys undertaken show that heavy vehicles regularly use these roads. Semi-trailers were observed using Bylong Valley Way (with a number to and from Bylong Quarry), Wollar and Ulan Roads.

1.8 Consultation

The following stakeholders were consulted by the Project team and Parsons Brinckerhoff in preparation of the Environmental Impact Assessment (EIS) and this Traffic and Transport Impact Assessment:

- Mid-Western Regional Council (MWRC)
- Roads and Maritime Services (RMS) including phone conversations with Andrew McIntyre from the Traffic and Road Safety section of RMS Western Region
- Australian Rail Track Corporation (ARTC).

1.9 Structure of the report

This report has the following structure:

- Section 2 describes the existing conditions of the road network in the assessment study area
- Section 3 describes the Project in detail
- Section 4 discusses the future background traffic conditions including adjacent mine traffic
- Section 5 discusses the Projects traffic generation and distribution
- Section 6 details the traffic impacts on all road and rail users
- Section 7 discusses the mitigation measures recommended
- Section 8 provides discussion on road dilapidation
- Section 9 provides discussion on the subsidence impact assessment, particularly in relation to Bylong Valley Way
- Section 10 describes the measures to be considered during the construction traffic phase
- Section 11 provides a conclusion to the study
- Section 12 lists the study references.

2. Existing conditions

The existing road network, intersection layouts, pedestrians and cyclists, public transport services and crash history within the assessment study area are discussed further below.

2.1 Road network

Key roads that have been identified as part of this study are described as follows:

Bylong Valley Way – is a two lane two-way sealed main road with an approximate width of 7 m. Bylong Valley Way links Bylong to the Golden Highway to the north and the Castlereagh Highway to the south. Bylong Valley Way is the main access into the Bylong Valley. Closer to the Project site, it intersects with Wollar Road, Upper Bylong Road, Budden Gap Road and Lee Creek Road. The posted speed limit is generally 100 km/h, 80 km/h outside of villages/towns and 50 km/h within Bylong, Rylstone and Kandos. A level railway crossing is located on Bylong Valley Way just to the east of the Wollar Road intersection. At present this level crossing is passively controlled with signs and flashing lights similar to other level crossings within rural settings. An additional level railway crossing is located further north in close proximity to the Golden Highway. The Annual Average Daily Traffic (AADT) on Bylong Valley Way based on October 2011 counts was 398 vehicles in Bylong, and 418 vehicles with 13% heavy vehicles between Bylong and Sandy Hollow.

Bylong Valley Way to the north-east of the Project site is currently being upgraded to improve road safety with new safety barrier installation (guardrail), fencing and rock wall protection being installed as shown in Figure 2.1.

Figure 2.1 Bylong Valley Way upgrade works

Further additional road widening upgrades are also being undertaken on curved sections of Bylong Valley Way for improved safety.

Bylong Valley Way approaching Upper Bylong Road intersection and the Bylong Village is shown in Figure 2.2

Figure 2.2 Bylong Valley Way looking south towards Bylong Village

Figure 2.3 and 2,4 show the intersection of Bylong Valley Way and Wollar Road looking along Bylong Valley Way in either direction.

Figure 2.3 Bylong Valley Way and Wollar Road intersection looking north-east

Figure 2.4 Bylong Valley Way Level Railway Crossing east of Wollar Road looking west

Wollar Road – is a two lane two-way main road which is unsealed for approximately 17 km from the Bylong Valley Way intersection, where it becomes sealed towards Wollar (refer to Figures 2.5 to 2.7). It is approximately 8 m wide and connects Bylong Valley Way north of Bylong to Wollar and other communities to the north and west of the assessment area where it intersects Ulan Road. There are two locations where Wollar Road is sealed for short sections between Bylong Valley Way and Wollar. There is no posted speed limit on this road, so a general speed limit of 100 km/h will apply on both sealed and unsealed sections of this road. Site inspections indicate a safe travel speed of up to 80 km/h for drivers unfamiliar of the road and its conditions. The Annual Average Daily Traffic (AADT) on Wollar Road based on 2011 counts was 161 vehicles with 20% heavy vehicles between Bylong and Wollar. Further traffic counts undertaken in 2015 indicate 104 vehicles with 17% heavy vehicles between Bylong and Wollar, and 150 vehicles with 16% heavy vehicles between Wollar and Mudgee.

Figure 2.5 Wollar Road looking north from the Bylong Valley Way intersection

Figure 2.6 Sealed and unsealed sections of Wollar Road (screenshot from video footage)

Figure 2.7 Unsealed section of Wollar Road (screenshot from video footage)

Upper Bylong Road – is a local road which connects Bylong Valley Way to properties on the eastern side of the Growee Ranges which traverse through the middle of the Bylong Valley. Upper Bylong Road becomes Lee Creek Road to the south of the intersection with Budden Gap Road (refer to Figures 2.8 to 2.11). Upper Bylong Road is sealed for approximately 7.7 km from its intersection with Bylong Valley Way and has been built to around 5 m wide on both the sealed and unsealed sections. The unsealed road is used primarily for property access, passing through private property paddocks. The posted speed limit is generally 100 km/h, 40 km/h at Bylong Upper Public School and 10 km/h through cattle grazing area. Upper Bylong Road provides connection between private properties and the Bylong Valley Way with other access roads such as Lee Creek Road available.

Figure 2.8 Upper Bylong Road looking south east from the Bylong Valley Way intersection

Figure 2.9 Upper Bylong Road looking south east adjacent to the Sandy Hollow to Gulgong Railway line (train in background left)

Figure 2.10 Upper Bylong Road and Bylong Valley Way intersection looking north east

Figure 2.11 Upper Bylong Road and Woolleys Road intersection looking south

Woolleys Road – is a local road which connects Upper Bylong Road to some remaining private properties to the east of Project. Woolleys Road is an unsealed road around 4 to 5 m wide.

Lee Creek Road – is an unsealed local road connecting Upper Bylong Road to the north with Bylong Valley Way to the south (refer to Figure 2.12). The width of the road varies; however is around 4 m wide. This is a Council road with a posted speed limit of 100 km/h however there are several locations where this speed limit is not appropriate, with several crossings through privately owned paddocks and cattle grazing areas. A four wheel drive vehicle is recommended for travel on Lee Creek Road.

Figure 2.12 Lee Creek Road looking south

Budden Gap Road – is an unsealed and generally unused local road, approximately 4 m in width and aligned in a general east-west direction. It is currently gated through private properties and it is used intermittently however provides a connection between Upper Bylong Road and the Bylong Valley Way. A four wheel drive vehicle is recommended for travel on Budden Gap Road.

Ulan Road – is a two lane two-way sealed main road with an approximate width of 8 m. Ulan Road connects Mudgee with Ulan and Ulan with the Golden Highway. Ulan Road speed limit varies from 50 km/h within town areas, 80 km/h outside of towns and 100 km/h elsewhere. Traffic counts undertaken in 2015 indicate that Ulan Road carries in excess of 3,000 vehicles daily.

Ulan – Wollar Road – is a two lane two-way local road with both sealed and unsealed sections. Ulan–Wollar Road is utilised by both Moolarben and Wilpinjong coal mines for access to Ulan Road and provides a connection between villages of Ulan and Wollar.

Lue Road – is a two lane two-way sealed road with an approximate width of 7 m. Lue Road links Mudgee with the Bylong Valley Way. Travel between Bylong and Mudgee via this route is in excess of 90 km and over one hour in travel time.

2.2 Intersections

The following key intersections in the study area include:

- Bylong Valley Way and Upper Bylong Road – this is a priority controlled T junction (rural Type Basic BA intersection) located in a 50 km/h speed zone. The width of Bylong Valley Way at this intersection is 6.5 m and Upper Bylong Road 7 m with no shoulders provided. The required Safe Intersection Sight Distance (SISD) of 97 m is achieved for the intersection with approximately 150 m sight distance achieved in both directions on the Bylong Valley Way when viewing from Upper Bylong Road.
- Bylong Valley Way and Wollar Road – this is a priority controlled T junction (rural Type BA Basic intersection) located in a 100 km/h speed zone with a level railway crossing approximately 15 m to the east of the intersection. The minimum required SISD of 248 m for this intersection is currently achieved with approximately 240 m of sight distance on the western approach and 360 m on the eastern approach of Bylong Valley Way. Although this is a 100 km/h speed zone, the majority of vehicles will be travelling at a lower speed limit on Bylong Valley Way through the intersection due to the horizontal curve on the western approach and the level railway crossing facility, and therefore a reduced sight distance could also be applied. This is an existing intersection and on review of the latest crash data provided by RMS, no crashes have been recorded at this intersection.
- Wollar Road and Ulan-Wollar Road – this is a priority controlled T junction (rural Type Basic BA intersection) located in a 50 km/h speed zone in the Wollar township. Refer to Figure 2.13.

Figure 2.13 Wollar Road and Ulan-Wollar Road intersection

- Wollar Road and Ulan Road – this is a rural channelised right turn Type CHR intersection located approximately 10 km north of Mudgee with an approximately 80 m long right turn bay on Ulan Road and 50m right turn bay on Wollar Road. Refer to Figures 2.14 and 2.15.

Figure 2.14 Wollar Road and Ulan Road intersection looking north along Ulan Road

Figure 2.15 Wollar Road and Ulan Road intersection looking west along Wollar Road

- Golden Highway and Ulan Road – this is a priority controlled T junction with left turn auxiliary lane (Type AUL intersection) located in a 100 km/h zone with 1-1.5m shoulders provided.
- Golden Highway and Bylong Valley Way – this is a priority controlled T junction (Type BA intersection) located in a 100 km/h zone east of Sandy Hollow.

Figure 2.16 Golden Highway looking west towards the Bylong Valley Way intersection

- Castlereagh Highway and Bylong Valley Way – this is a channelised right turn (Type CHR) intersection with auxiliary left turn lane.
- Ulan Road and Ulan-Wollar Road – this is a channelised right turn (Type CHR) intersection.

2.3 Intersection traffic counts

Intersection traffic counts undertaken in April 2014 show the following:

- The intersection of Bylong Valley Way and Upper Bylong Road has a weekday AM peak between 10.45 am and 11.45 am and a weekday PM peak between 2.30 pm and 3.30 pm.
- The intersection of Bylong Valley Way and Wollar Road has a weekday AM peak between 10.45 am and 11.45 am and a weekday midday/PM peak between 12.15 pm and 1.15 pm.

Additional intersection traffic counts undertaken in December 2015 show the following:

- The intersection of Wollar Road and Ulan-Wollar Road has a weekday AM peak between 8.15 am and 9.15 am and a weekday PM peak between 3.45 pm and 4.45 pm.
- The intersection of Wollar Road and Ulan Road has a weekday AM peak between 5.15 am and 6.15 am and a weekday PM peak between 4.45 pm and 5.45 pm.

- The intersection of Ulan Road and Ulan-Wollar Road has a weekday AM peak between 5.45 am and 6.45 am and a weekday PM peak between 4.30 pm and 5.30 pm.
- The intersection of the Golden Highway and Ulan Road has a weekday AM peak between 10.00 am and 11.00 am and a weekday PM peak between 12.30 pm and 1.30 pm.
- The intersection of the Golden Highway and Bylong Valley Way has a weekday AM peak between 11.00 am and 12.00 pm and a weekday PM peak between 12.00 pm and 1.00 pm.
- The intersection of Bylong Valley Way and Castlereagh Highway has a weekday AM peak between 9.15 am and 10.15 am and a weekday PM peak between 1.45 pm and 2.45 pm.

For the purposes of this assessment, the AM (6.00 am to 7.00 am) and PM (6.00 pm to 7.00 pm) peak hours have been used to assess peak hour traffic impacts due to Project start and finish times and for consistency with other adjacent mine cumulative traffic assessments.

Figure 2.17 and 2.18 show the 2015 morning and afternoon peak hour traffic volumes at the study intersections. The traffic volumes in the figure are in vehicles per hour (vph) and include a breakdown of light vehicles (LV), heavy vehicles (HV) and buses.

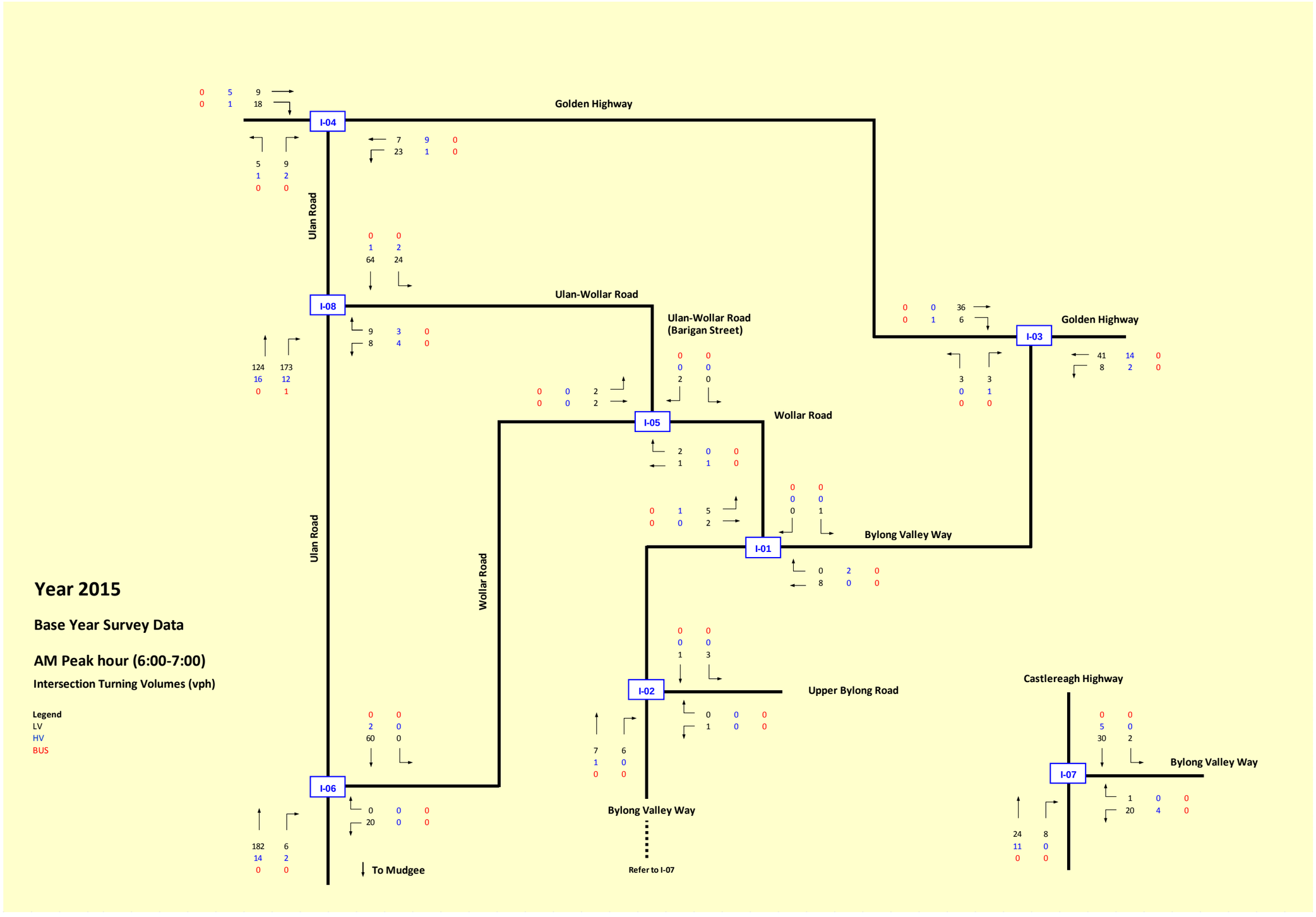


Figure 2.17 2015 weekday AM peak hour traffic volumes at the assessed intersections (vph)

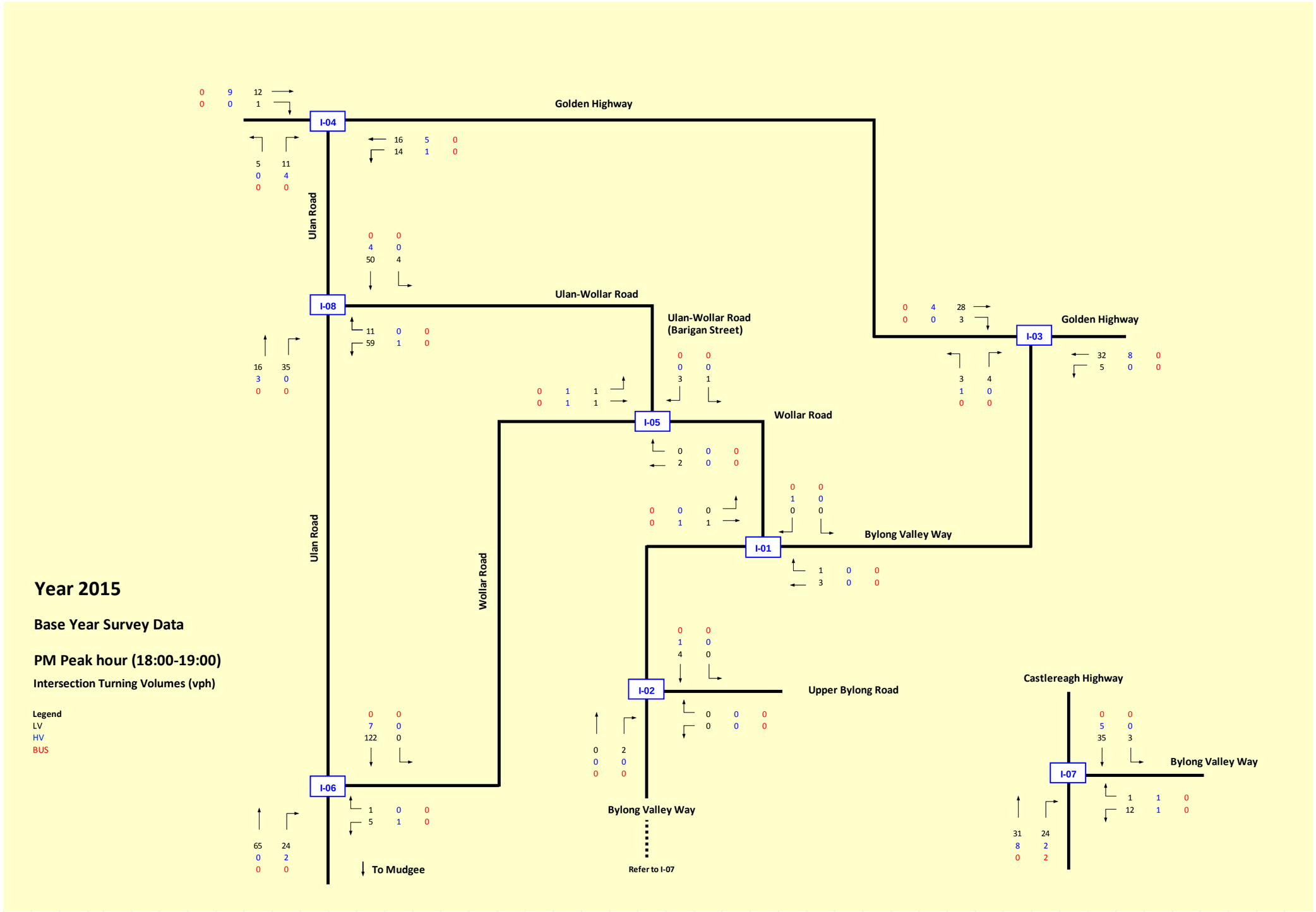


Figure 2.18 2015 weekday PM peak hour traffic volumes at the assessed intersections (vph)

2.4 Intersection performance parameters

The ability of each of the assessed intersections to cater for existing and future traffic forecasts were investigated using the SIDRA intersection modelling software package. This package provides several useful parameters to determine the level of intersection performance.

2.4.1 Level of service (LoS)

Level of Service (Los) is a basic performance parameter used to describe the operation of an intersection. Levels of service range from A (indicating good intersection operation) to F (indicating over-saturated conditions with long delays and queues). At signalised intersections, the LoS criteria are related to average intersection delay (seconds per vehicle). At priority controlled (give-way and stop controlled) and roundabout intersections, the LoS is based on the modelled delay (seconds per vehicle) for the most delayed movement (refer to Table 2.1).

Table 2.1 Level of Service Criteria for Intersections

Level of service	Average delay (seconds per vehicle)	Traffic signals, 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 signals, incidents would cause excessive delays. Roundabouts require other control mode	At capacity; requires other control mode
F	Greater than 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; requires other control mode

Source: RMS *Guide to Traffic Generating Developments*, 2002

2.4.2 Degree of saturation (DoS)

The Degree of Saturation (DoS) is the ratio of demand flow to capacity, and therefore has no unit. As it approaches 1.0, extensive queues and delays could be expected. For a satisfactory situation, DoS should be less than the nominated practical degree of saturation, usually 0.9. The intersection DoS is based on the movement with the highest value.

2.4.3 Average vehicle delay

This is the difference between interrupted and uninterrupted travel times through the intersection and is measured in seconds per vehicle. At signalised intersections, the average intersection delay is usually reported. At roundabouts and priority controlled intersections, the average delay for the most delayed movement is usually reported.

2.4.4 Queue length

Queue length is measured in metres reflecting the number of vehicles waiting at the stop line and is usually quoted as the 95th percentile back of queue, which is the value below which 95% of all observed queue lengths fall. It reflects the number of vehicles per traffic lane at the start of the green period, when traffic starts moving again after a red signal. The intersection queue length is usually taken from the movement with the longest queue length.

Typically acceptable intersection performance is defined as follows:

- LoS D or better (the worst case scenario of vehicle delay was less than or equal to 56 seconds)
- Degree of saturation (DoS) less than or equal to 0.8 at priority controlled intersection, and 0.90 at a signalised controlled intersection
- 95th percentile worst back of queue length not interfering with adjacent intersections.

2.5 Intersection performance

SIDRA Intersection 6 software was used to model and analyse the performance of the intersections assessed. The results of this analysis are shown in Table 2.2.

Table 2.2 Existing Weekday 2015 Peak Intersection Performance

Intersection	Peak hour	Degree of Saturation	Average Delay (sec)	Level of Service	95th percentile queue (m)
1. Bylong Valley Way and Wollar Road	AM (6.00–7.00)	0.007	9.0	A	0.2
	PM (6.00–7.00)	0.002	8.8	A	0
2. Bylong Valley Way and Upper Bylong Road	AM (6.00–7.00)	0.008	4.7	A	0.2
	PM (6.00–7.00)	0.004	4.7	A	0.1
3. Golden Highway and Bylong Valley Way	AM (6.00–7.00)	0.041	8.4	A	0.3
	PM (6.00–7.00)	0.027	7.8	A	0.1
4. Golden Highway and Ulan Road	AM (6.00–7.00)	0.024	8.5	A	0.8
	PM (6.00–7.00)	0.016	8.7	A	0.5
5. Wollar Road and Ulan-Wollar Road	AM (6.00–7.00)	0.002	4.6	A	0.1
	PM (6.00–7.00)	0.003	5.0	A	0.1
6. Wollar Road and Ulan Road	AM (6.00–7.00)	0.111	8.5	A	0.4
	PM (6.00–7.00)	0.073	8.3	A	0.6
7. Bylong Valley Way and Castlereagh Highway	AM (6.00–7.00)	0.023	8.4	A	0.6
	PM (6.00–7.00)	0.024	10.1	B	0.7
8. Ulan Road and Ulan-Wollar Road	AM (6.00–7.00)	0.155	10.1	B	5.0
	PM (6.00–7.00)	0.050	7.9	A	1.3

The results shown in Table 2.2, show that all of intersections currently operate at good levels of service (LoS A or B) during the weekday AM and PM peak hours.

2.6 Mid-block tube counts

As explained in Section 1.7, mid-block tube counts were undertaken at the following locations:

- Wollar Road west of Ulan–Wollar Road
- Wollar Road north of Bylong Valley Way
- Ulan-Wollar Road (Barigan Street) north of Wollar Road
- Ulan Road north of Wollar Road
- Ulan Road south of Wollar Road.

Figure 2.19 shows the 2015 daily traffic volumes at the assessed locations within the regional study area. The traffic volumes in the figure are in vehicles per day (vpd) at the location in both directions and include a breakdown of light vehicles (LV) and heavy vehicles (HV).

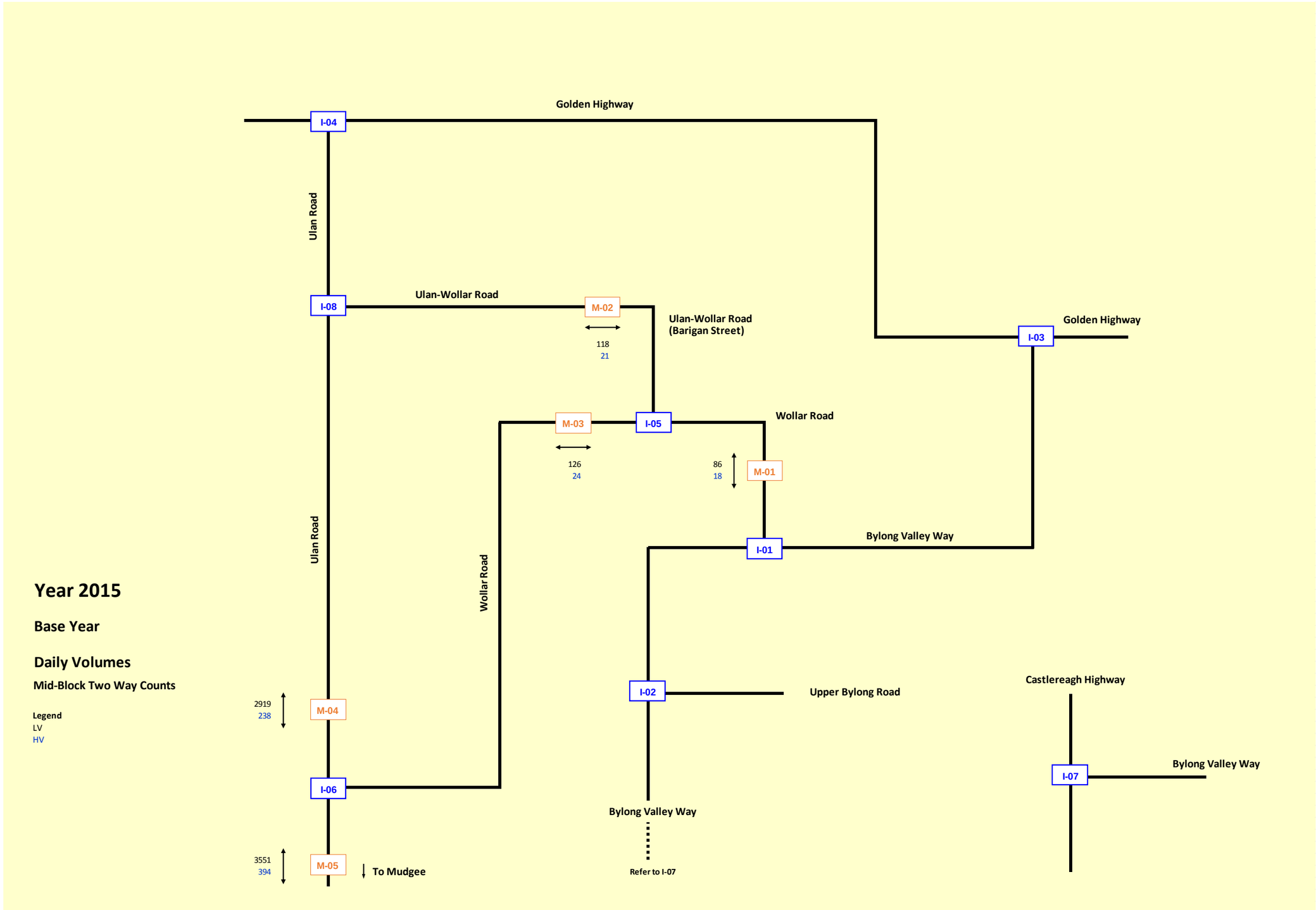


Figure 2.19 2015 daily traffic volumes at the assessed locations (vpd in both directions)

2.7 Crash data review

A review of crash data for the latest five year period (between 2010 and 2014, except for on Upper Bylong Road between 2008 and 2013) as provided by the RMS was undertaken for the following roads:

- Bylong Valley Way between Golden Highway and Castlereagh Highway
- Upper Bylong Road between Bylong Valley Way and Lee Creek Road
- Wollar Road between Bylong Valley Way and Ulan Road
- Ulan-Wollar Road between Wollar Road and Ulan Road
- Ulan Road between Golden Highway and Lue Road.

Full crash data reporting is provided in Appendix A.

The road safety history of the various roads has been reviewed with regard to each road's crash exposure, which considers the rate at which crashes occur in crashes per vehicle kilometres travelling (VKT). The crash exposure increases as the length of trip increases, and as traffic volumes increase.

RMS (2004) indicates that based on a review of data on 36 classified roads in NSW, undivided two lane rural roads have an average crash rate of 32.8 crashes per 100 million VKT, of which 28.6 were non-intersection crashes, and 4.2 were intersection crashes. The overall crash rate was higher where sealed shoulders of less than 1.0m width were provided, at 38.1 crashes per 100 million VKT, and lower where sealed shoulders greater than 1.0m width were provided, at 28.5 crashes per million VKT.

The following assumptions were made when estimating the MVKT and the number of crashes per 100 MVKT.

- Average Daily Traffic (ADT) was used to estimate the annual VKT from 2010 to 2014 on the five assessed roads.
- The ADT for the crash data analysis on Wollar Road, Ulan–Wollar Road and Ulan Road were estimated based on a seven-day midblock traffic surveys in December 2015.
- The ADT on Bylong Valley Way and Upper Bylong Roads were estimated based on the intersection counts undertaken in April 2014.

Table 2.3 provides the estimated MVKT and crash rates for the various sections of road.

Table 2.3 Summary of traffic volumes and reported crashes (2010-2014)

Road Section	Distance (km)	Estimated ADT 2010-2014 (vpd)	MVKT 2010-2014	Number of Crashes 2010-2014	Crashes per 100 MVKT
Bylong Valley Way between Golden Highway and Wollar Road	60	432	47	20	42
Bylong Valley Way between Wollar Road and Lue Road	50	327	30	55	184
Bylong Valley Way between Lue Road and Castlereagh Highway	30	766	42	36	86
Upper Bylong Road between Bylong Valley Way and Lee Creek Road	12	79	2	2	115

Road Section	Distance (km)	Estimated ADT 2010-2014 (vpd)	MVKT 2010-2014	Number of Crashes 2010-2014	Crashes per 100 MVKT
Wollar Road between Bylong Valley Way and Ulan–Wollar Road	26	96	5	2	44
Wollar Road between Ulan–Wollar Road and Ulan Road	38	137	10	19	200
Ulan–Wollar Road between Wollar Road and Ulan Road	24	121	5	2	38
Ulan Road between Golden Highway and Lue Road.	72	2,764 (north of Wollar Road); 3,504 (south of Wollar Road)	377	81	22

A detailed breakdown of crash characteristics has been summarised below for each assessed road section.

Bylong Valley Way

There were a total of 111 reported incidents along Bylong Valley Way between Golden Highway and Castlereagh Highway, between 2010 and 2014.

Analysis of the crash data showed that:

- Of the 111 incidents, 4 (4%) involved a fatality, and 107 (96%) involved 87 people who were injured.
- The most common type of incidents with 42 (38%) within this category were those due to hitting an object, off road on a curve. 19 (17%) incidents occurred when the driver drove off road on a curve.
- Speed was a contributing factor in 65 (59%) of incidents.
- Eighty four (76%) incidents occurred during the day and 27 (24%) at night. Of the daytime incidents, 76 were in suitable day light with 4 each in the dawn or dusk hours.
- Eight eight (79%) incidents occurred in fine weather conditions, 22 (21%) in rainy, overcast or fog conditions.
- 53% of accidents took place on weekdays.
- Forty eight (43%) incidents involve cars, whilst 24 (21%) and 45 (41%) incidents involve trucks or motorcycles respectively.

The crash data indicates the majority of crashes occur during the day with the majority off road hitting object. Interestingly, approximately 50% of crashes occurred on weekends with motorcycle accounting for a high proportion of these crashes. Bylong Valley Way road safety works are currently in progress by the Muswellbrook Shire Council in line with Resources for Regions funding received to improve the safety on this road.

Upper Bylong Road

There were a total of 2 reported incidents along Upper Bylong Road between Bylong Valley Way and Lee Creek Road, within a 5-year period between 2008 and 2013. Analysis of the crash data showed that both incidents happened on weekdays, with one in daylight and another in night time conditions. One was due to hitting an object, off road on a curve, whilst another was due to undertaking a U-turn; both occurred in fine weather conditions. A total of 4 injuries were caused in those 2 incidents, involving 2 cars and 1 truck.

Wollar Road

There were a total of 21 reported incidents along Wollar Road between Bylong Valley Way and Ulan Road, within a five-year period between 2010 and 2014.

Analysis of the crash data showed that:

- Of the 21 incidents, 1 (5%) involved a fatality, and 20 (95%) involved 12 people being injured.
- The most common type of incidents with 12 (57%) within this category were those due to hitting an object, off road on a curve. 3 (14%) incidents occurred when the driver hit an object, off road on a straight section.
- Speed was a contributing factor in 13 (62%) of the incidents.
- Fourteen (67%) incidents occurred during the day and 7 (33%) at night. Of the daytime incidents, 12 were in suitable day light with 1 each in the dawn or dusk hours.
- Seventeen (81%) incidents occurred in fine weather conditions, 4 (19%) in rainy, overcast or fog conditions.
- 81% of accidents took place on weekdays.
- Fourteen (67%) incidents involve cars, whilst 7 (33%) incidents involve trucks.

Wollar Road upgrades are currently planned by Mid Western Regional Council in line with Resources for Regions funding to improve safety and road conditions. The proposed upgrades will include rehabilitation and widening, increasing pavement strength, wider and safer travel lanes. The upgrade will also include improved storm water drainage, new safety barriers and signage, full line marking, removal of roadside vegetation to improve visibility and bridge improvements.

Ulan–Wollar Road

There were a total of 2 reported incidents along Ulan–Wollar Road between Wollar Road and Ulan Road, within a 5-year period between 2010 and 2014. Analysis of the crash data showed that both incidents happened on weekdays, under daylight conditions. Both incidents were due to hitting an object, whilst the drivers drove off road on a curve; one occurred in fine weather condition and another in rainy. Each incident had one injury.

Ulan Road

There were a total of 81 reported incidents along Ulan Road between Golden Highway and Lue Road, within a 5-year period between 2010 and 2014.

Analysis of the crash data showed that:

- Of the 81 incidents, 3 (4%) involved a fatality, and 78 (96%) involved 40 people being injured.
- The most common type of incidents with 16 (20%) within this category were rear-end crashes. 14 (17%) incidents occurred when the driver hit an object, off road on a straight section.
- Fifty three (65%) incidents occurred during the day and 28 (35%) at night. Of the daytime incidents, 39 were in suitable day light with 14 in the dawn or dusk hours.
- Fifty eight (72%) incidents occurred in fine weather conditions, 22 (27%) in rainy, overcast or fog conditions.
- 80% of accidents took place on weekdays.
- Fifty eight (72%) incidents involve cars, whilst 38 (47%) incidents involve trucks.

2.8 Buses

There are no regional or local bus services that currently operate in the Bylong or Wollar areas.

Regular bus services are operated by Ogden's Coaches in the Mudgee area including Route 563 which travels along Ulan Road between Mudgee and Mudgee TAFE.

2.8.1 School bus services

School buses were operating to Bylong Upper Public School. The NSW Department of Education and Communities has made the decision to close the school permanently as a result of decreasing enrolments over a number of years.

School buses do not currently operate to Wollar Public School (less than 10 students enrolled) and Lue Public School (less than 25 students enrolled).

Ogden's' Coaches provides a school bus service from Wollar, leaving the town at 7.35 am for travel to schools within Mudgee and returning to Wollar at 4.40 pm.

Ogden's' Coaches provides a school bus service from Lue, leaving the town at 7.55 am for travel to schools within Mudgee and returning to Lue at 4.20 pm.

The timing of these two school bus routes do not coincide with staff travel prior to or post shift start (7.00 am or 7.00 pm) or end times (7.00 am or 7.00 pm).

2.9 Pedestrian and cyclist activity

There is limited or negligible pedestrian and cycle activity or facility along roads within the assessment study areas.

2.10 Restricted access vehicles

The following roads are restricted to 19 m B-double vehicles (50 tonne limit):

- Bylong Valley Way between Castlereagh Highway and the Muswellbrook Shire Council LGA boundary – Approved under escort only. Travel outside of school bus operation times.
- Upper Bylong Road between Bylong Valley Way and the Unsealed Section – 80 km/h B-double speed limit on sealed section. Travel outside of school bus operation times.
- Wollar Road between Bylong Valley Way and Ulan Road – 80 km/h B-double speed limit. Travel outside of school bus operation times.
- Ulan Road between Golden Highway and Mudgee
- Ulan–Wollar Road between Ulan Road and Wollar Road.

A bridge load limit of 39 tonnes gross exists on timber bridges in the area.

2.11 Rail network

The Australian Rail Track Corporation's (ARTC) *2015–2024 Hunter Valley Corridor Capacity Strategy* has been has been referenced to describe the existing rail network, rail operation, mine operations and rail capacity.

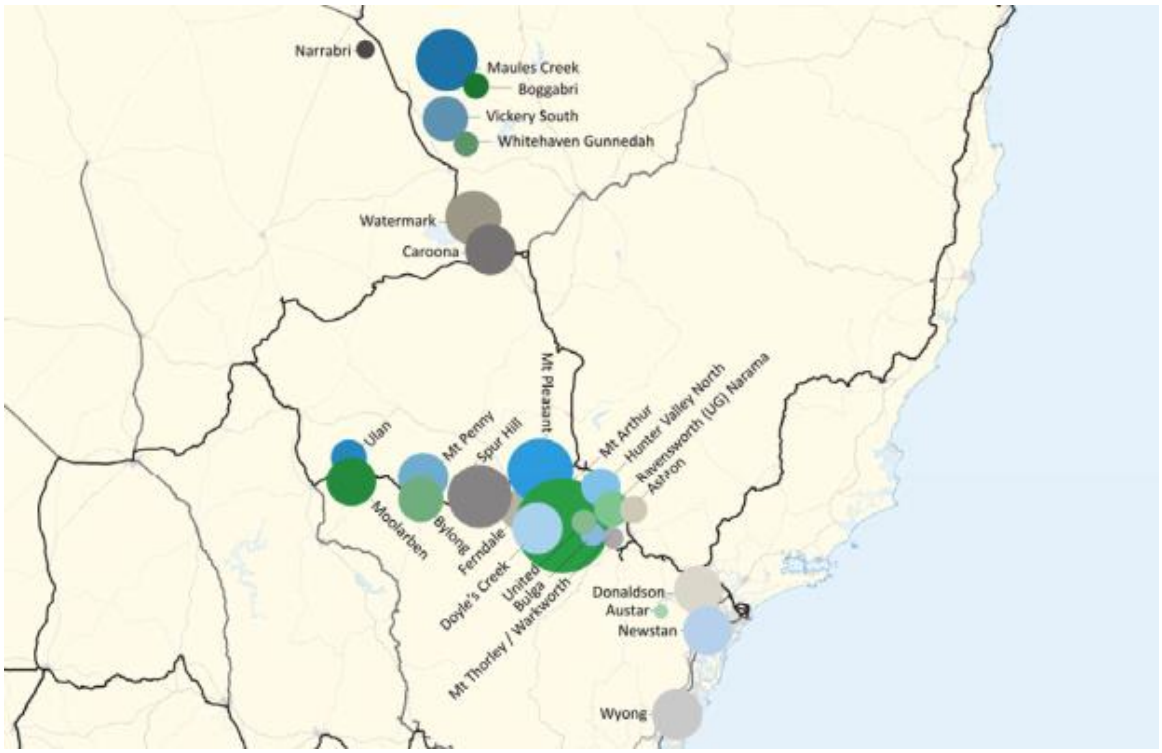
The existing rail line in the Bylong area which will be utilised by the Project is the Sandy Hollow to Gulgong Railway Line. This rail line runs between Ulan and Muswellbrook, is a single track and has several passing loops along its 170 km length.

The Sandy Hollow to Gulgong Railway line is part of the ARTC's Hunter Valley Coal transport network and rail is therefore the logical choice for transport of all coal from the mine to market. The mine is located approximately 230 km from Port Waratah Coal Service (PWCS) Kooragang Coal Terminal, the main coal export facility in the Port of Newcastle. This line is mainly utilised by coal trains, one or two country ore and grain trains per day and occasionally by interstate freight trains that are bypassing Sydney during possessions.

2.11.1 Capacity and volume forecasts by mine

Capacity constraints currently exist due to ventilation in the Bylong tunnel, with train spacing and track maintenance limited by the 'purge times' for air in the tunnel. Minimum operating frequency of 20 minutes between trains is required to address this ventilation issue. At this time there is adequate capacity for all contracted volume.

The following Figure 2.20 shows the volume forecasts by mine in the Sydney – Gunnedah Basin, with growth in volumes indicated by circle width. The Mount Penny Mine which is shown to the west of the Bylong Mine in the figure below has now been cancelled. The Wilpinjong Mine appears to be excluded from Figure 2.20 although is included elsewhere within the ARTC strategy.

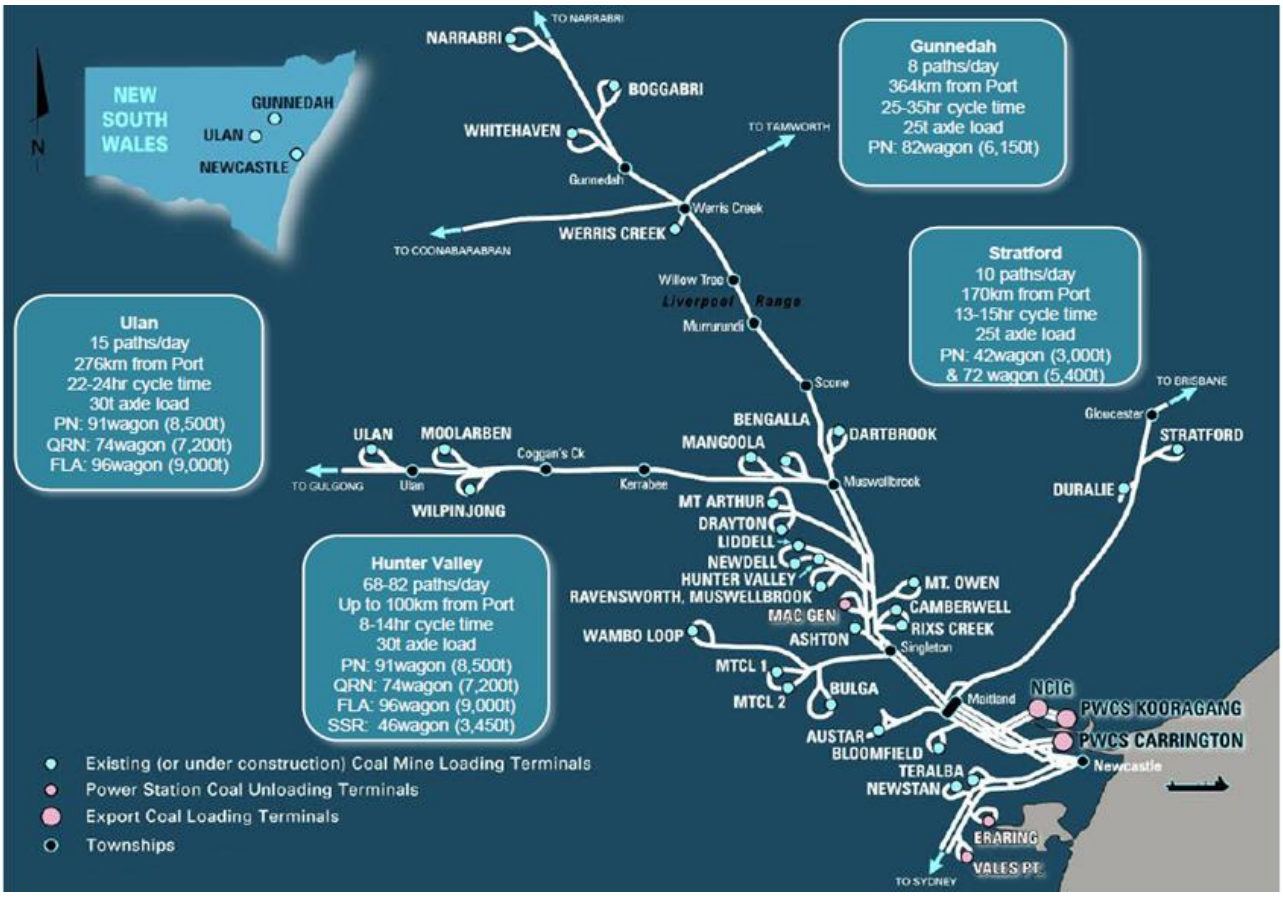


Source: ARTC 2015–2024 HV Corridor capacity strategy. Note the Mount Penny mine has now been cancelled.

Note: Growth in mine volumes is indicated by circle width between 2015 and 2024

Figure 2.20 Existing and prospective coal mines

Figure 2.21 indicates the existing coal chain network, mines and port locations. It also provides a basic overview of the capacity that is flowing from the Gunnedah, Western and Hunter Valley coal fields.



Source: HVCCC 2012 overview presentation

Figure 2.21 Existing coal chain network and infrastructure

In order to keep capacity ahead of demand specifically for the Hunter region, a number of projects have directly improved capacity between Ulan and Muswellbrook and to the Port of Newcastle. To date, ARTC has generally met the coal industries' expectation for delivering its investment program in line with producer's forecasts.

Upon review of the current contracted tonnages from the *2015–2024 Hunter Valley Corridor Capacity Strategy* (ARTC 2015), taking into account works currently completed, there still appears to be ample rail capacity on the Ulan section based on the Project production rates provided. When comparing saleable rail capacity for prospective volumes and works to be undertaken as part of the ARTC strategy, it is demonstrating that prospective volumes are in line with recommended projects for keeping rail capacity ahead of demand.

Discussions with ARTC confirmed that there is sufficient capacity on the rail network to accommodate the Project with little potential to influence the use of the rail line by other users (which is strictly managed by ARTC). Correspondence received from ARTC confirmed that there is sufficient capacity on the existing network to accommodate the movements anticipated for the Project. Further the capacity assessment has been completed based on the smaller train sizes, which is considered to be conservative. KEPCO will continue to consult with ARTC in regard to the proposed rail movements for the Project.

2.11.2 Train size

The ARTC's aspirational train consist of 96 x 120 t (gross) wagons and three locomotives with a total net payload of 9,200 t of coal and overall length of 1,610 m. It should be noted that the current maximum train used on the Ulan line is 91 x 120 t (gross) wagons with a total net payload of around 8,800 t and maximum overall length of 1,543 m. ARTC's 2015–2024 Hunter Valley Corridor Capacity Strategy acknowledges that the aspirational 1,610 m train length is not required for current contracted volumes and will require extension of two existing passing loops on the Sandy Hollow to Gulgong Railway line. It is unlikely that this train length will be instituted within the Project development period, and accordingly the design of the Bylong coal project balloon loop is based on ARTC's published guideline length of 1,543 m, with sufficient room to hold an empty train prior to the loader, and a full train after the loader, off the main line.

2.12 Schools

Bylong Upper Public School is currently located on Upper Bylong Road approximately 5.4 km from the intersection of Bylong Valley Way (to the north). A 40 km/h school zone currently operates at this location. The NSW Department of Education and Communities has made the decision to close the school permanently as a result of decreasing enrolments over a number of years.

Wollar Public School is currently located on Barigan Street (Ulan-Wollar Road) within Wollar village approximately 0.5 km from the intersection of Wollar Road. . A 40 km/h school zone currently operates at this location.

Lue Public School is currently located on Swanston Street (Lue Road) with Lue village. A 40 km/h school zone currently operates at this location.

2.13 Existing road safety deficiencies

The following road safety deficiencies were identified during the site inspections:

- Narrow road width on Upper Bylong Road adjacent to the rail line (retainment wall) and the Bylong River on the opposite side.
- Narrow and load restricted bridges on Wollar Road.
- Several unsealed sections of road on Upper Bylong Road, Wollar Road, Ulan-Wollar Road and Lee Creek Road.
- Lack of signage and line marking at the intersection of Bylong Valley Way with Wollar Road and Upper Bylong Road.
- Low level concrete bridge crossing of Bylong River on Upper Bylong Road.
- Low lying culvert crossings on Bylong Valley Way and Wollar Road
- Bridge repairs on Wollar Road at Stoney Creek Bridge which requires heavy vehicle side track detour
- General narrow road widths with no shoulder provision.
- Insufficient delineation due to the deficiencies in signage, line markings, edge lines and guideposts and reflectors.
- Road edge drop offs and damaged edge of pavement.
- Poor quality of road pavement including several patched sections on Bylong Valley Way, Upper Bylong Road and Wollar Road.
- Poor quality of pavement adjacent to the level railway crossing on Bylong Valley Way including pot holes and gravel tracking.

- Roadside hazards including large trees and culverts within the clear zone.
- Narrow road width under the rail bridge on Bylong Valley Way approximately 16 km east of the Wollar Road intersection.
- Steep sections of road on Bylong Valley Way between Bylong and Sandy Hollow, Wollar Road east of Wollar and through Munghorn Gap Nature Reserve.
- Minimal queue storage area for vehicles on roadway between the rail line and Upper Bylong Road (where the proposed underground mine access is to be located).
- Unfenced livestock on Lee Creek Road, Woolleys Road and Budden Gap Road.

2.14 Local weather conditions

Bylong Valley Way is steep and mountainous in several locations and given its high elevation may be more susceptible to fog, heavy rain and icy conditions than lower lying roads.

Lower lying roads within in the assessment study areas will be prone to localised flooding especially at low lying bridges or causeways.

Sun glare is also experienced during sun rise and sun set when travelling in an east-west direction and vice versa. Travelling from Mudgee to Bylong in the morning you have sun in your eyes and vice versa in the afternoon.

3. Project description

This section describes the Project including its facilities, years of construction and operation, on-site parking provision and proposed access and internal roads. The conceptual Project layout is shown in Figure 3.1.

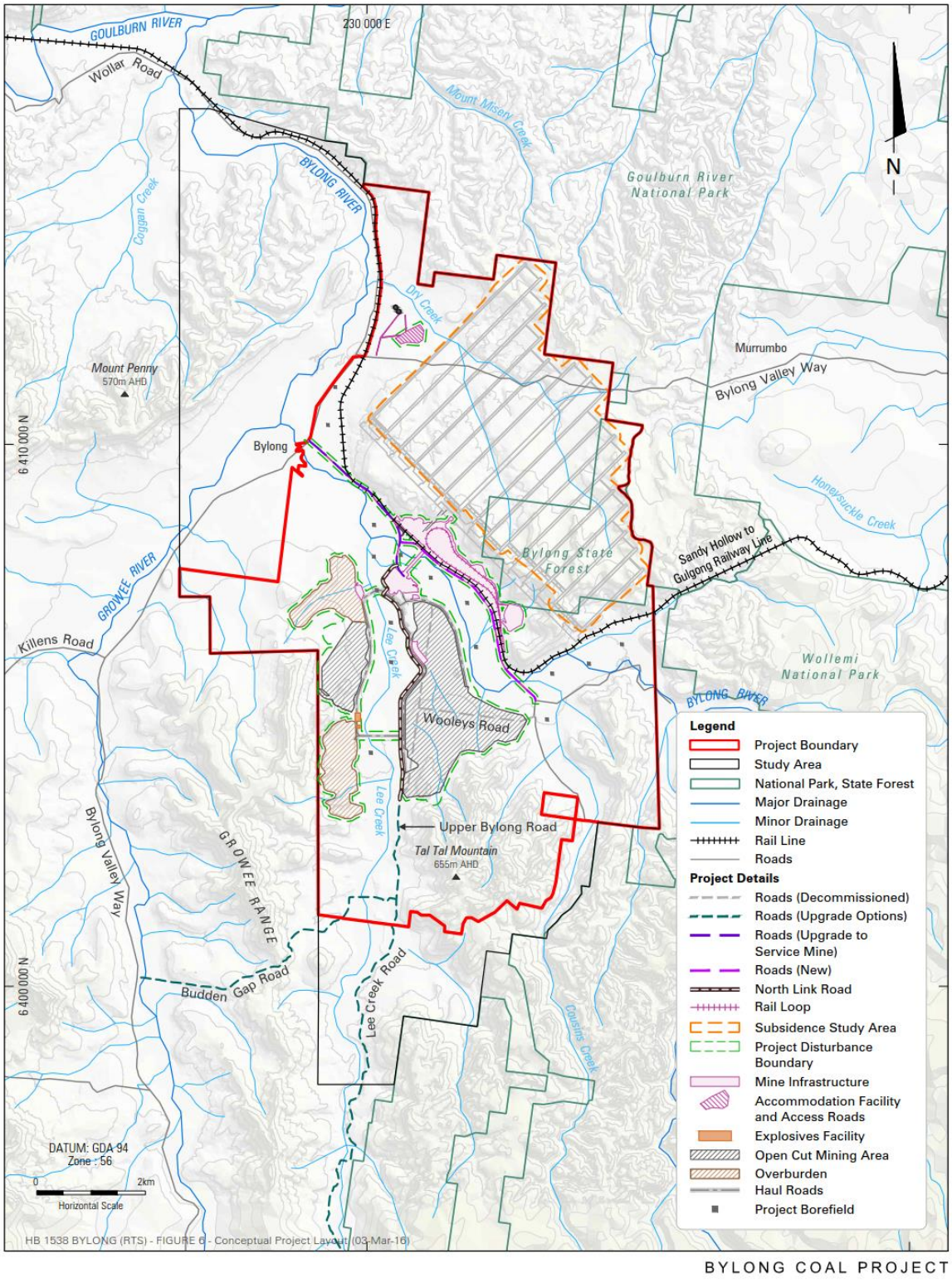


Figure 3.1 Conceptual project layout

3.1 Project facilities

The Project will require the construction of various items of surface infrastructure to enable the operation of the mine. The main facilities generally include two mine infrastructure areas (MIA's) (utilising existing and new infrastructure), a rail loop, CHPP and other associated facilities along with a WAF.

Mine sites

There will be two MIAs constructed for the Project including an Open Cut MIA and the Underground MIA.

The Open Cut MIA is proposed to contain internal mine access roads, light vehicle parking, associated power reticulation and communication infrastructure, administration and bathhouse facilities; fuel and lubrication station and refuel facility, water management infrastructure and other ancillary equipment and plant. The Open Cut MIA and associated infrastructure will be decommissioned and removed on a progressive basis following the completion of open cut mining operations. A portion of the hard stand area for the Open Cut MIA will be retained for use as a laydown area.

The Underground MIA will contain (at least) internal mine access road, light vehicle parking, power reticulation infrastructure, mine office, administration and bathhouse facilities, sewerage treatment systems; communication facilities, mine workshop, store and laydown facilities, water management infrastructure, mining area and portals, a ventilation plant and other ancillary equipment and plant.

The CHPP will be constructed with a throughput of approximately 6 Mtpa of ROM coal. The CHPP and associated facilities are proposed to be centrally located. ROM coal from the underground mine will be delivered by way of conveyor drift to a ROM coal stockpile at the CHPP. The open cut mine will deliver ROM coal by haul trucks to a ROM pad located approximately 1 km south-west of the CHPP. Open cut coal will be primarily crushed and conveyed directly to the CHPP.

Accommodation facility

A WAF facility is proposed to minimise impacts of accommodation demands as a result of the short-term peak in employees required during the construction activities of both the open cut and underground mine facilities. The EIS proposed for the WAF to accommodate construction workers and a small proportion of operations staff for approximately 6 years until the end of construction associated with the underground mine in order to prevent an oversupply/undersupply effect on local accommodation industries in Mudgee and other surrounding towns. Mudgee has accommodation provisions to accommodate part of the construction workforce and then the operations workforce post the WAF based on plans for the potential upgrade and sealing of Wollar Road.

This facility was proposed to accommodate up to 650 workers in the first year second year of the Project, and between 15 and 100 construction workers between year 3 and year 6 (end of underground construction).

The EIS also anticipated that a small proportion of the open-cut workforce may use the WAF for transitional accommodation purposes.

MWRC suggested within their submission that the WAF was not required and the towns within the MWRC LGA have accommodation and services available for the construction workforce. The MWRC also questioned the size of the construction workforce was not consistent with other mines that have been developed within the region. Further the MWRC questioned there being no 'no WAF' scenario assessed within the various impact assessments. These comments from MWRC have resulted in further studies which have resulted in a reduction in construction Phase 1 workforce from 800 to 665 employees and has also justified the need for a WAF for the Project. However in light of MWRC's concerns, KEPCO has committed to reducing the size and time of operation of the WAF for the Project. This is further discussed in the Response to Submissions.

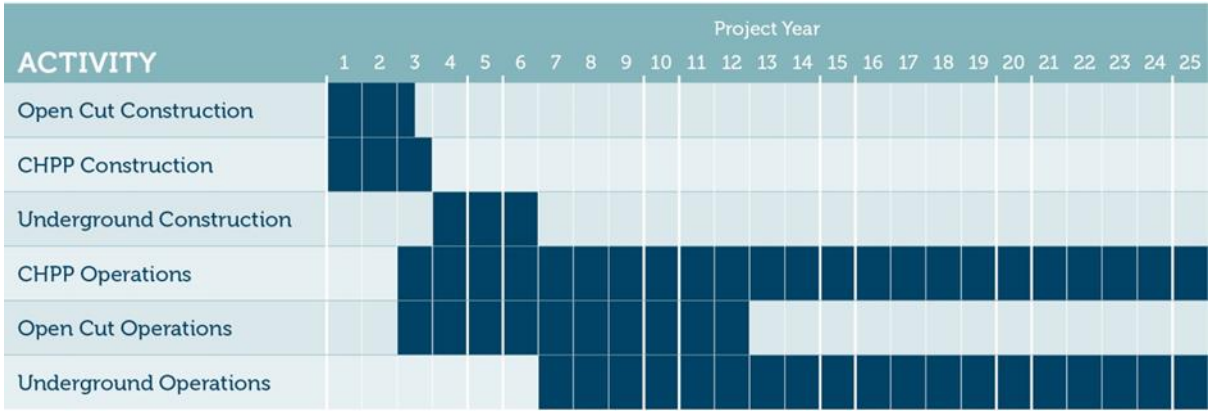
Rail loop

The Project will require the construction of a rail loop that connects to the Sandy Hollow to Gulgong Railway Line. The Sandy Hollow to Gulgong Railway Line connects with the Main Northern Railway Line at Muswellbrook, where it continues to the Port of Newcastle.

3.2 Project staging

The Project is anticipated for a period of 25 years, including the construction and operational activities. The Project involves initial construction followed by the operation of an open cut mine, with construction followed by the operation of an underground mine, and site decommissioning at the end of the 25 years.

The staging of the construction and operation of the mines is shown in Figure 3.2.



Source: Hansen Bailey (2015) Bylong Coal Project – Social Impact Assessment

Figure 3.2 Project staging

The traffic-related details of each stage of the Project are discussed in sections 3.2.1 to 3.2.5.

3.2.1 Stage 1: Construction Years 1–2

Construction of the open cut mine will begin in year 1 of the Project, and be completed within two years during which, the open cut mine will commence. This phase of construction will consist of traffic-related activities including:

- Construction and upgrades of relevant roads and intersections;
- Closure of roads including sections of Upper Bylong Road and Woolley's Road;
- Construction of associated haul roads;
- Construction of the essential site structures, i.e. the WAF, a temporary MIA, Open Cut MIA and the CHPP;
- Use of hydraulic excavators, haul trucks, other heavy construction vehicles (e.g. flatbed articulated trucks), pile drivers and supporting equipment, and
- A peak workforce of approximately 665 associated with site activity.

3.2.2 Stage 2: Construction Years 3–6

Operation of the open cut mine will begin during the later stages of the construction activities at the end of Year 2 of the Project. The open cut mining activities are anticipated to be completed by around the end of Year 10 of the Project. Traffic-related operation of the open cut mine will include:

- Internal haulage of materials using haul trucks;
- Utilisation of a fleet of excavators, dozers and/or graders and other supporting equipment;
- Maintenance of haul roads;
- Rail operations to transport product coal from site;
- Heavy truck movements associated with the operation of the CHPP;
- Open cut mine workforce varying between approximately 190 in year 3 of the Project and 230 in year 6 of the Project. and
- CHPP workforce of approximately 35 staff.

Construction activities associated with the underground mine will commence in year 4 of the Project, and is estimated to be completed by the end of year 6. Underground mining operations will then commence. This phase of construction will consist of traffic-related activities, including:

- Excavation and construction associated with the underground mine;
- Construction of mine access roadways;
- Construction vehicles including excavators, haul trucks and a continuous miner, and
- A highly specialised and short term construction workforce of approximately 15 in year 4 and 100 in years 5 and 6 of the Project.

3.2.3 Stage 3: Dual operations

An open cut mine workforce of approximately 195 in years 7 to 9 of the Project and 100 in year 10 of the Project (final year of operation) is anticipated.

There will be an underground mine workforce of approximately 190 in year 7 and 220 in year 8 prior to peak of operations during stage 4.

There will be regular traffic activity association with the operation of both mine sites, including:

- Onsite haulage of materials and use of specialised vehicle fleet as mentioned in Section 3.2.2 associated with both mine sites.
- Regular heavy vehicle access to the site
- Other commercial deliveries and visitors

3.2.4 Stage 4: Underground mine operation

The underground mine will have a workforce of approximately 275 in years 17 to 25 of the Project.

There will be regular traffic activity association with the operation of the underground mine, including:

- Regular heavy vehicle access to the site.
- Other commercial deliveries and visitors.

3.2.5 Stage 5: Decommissioning

It is expected that the site will be decommissioned following the completion of all mining operations at the end of the Project life. This will involve the capping of mining voids, rehabilitation of disturbed areas, and decommissioning of Project infrastructure.

3.3 Project operation

The mine will be in operational for a period of 23 years including a:

- 8 year period of operation for the open cut mine (commencement following construction year 2 and continuing to around year 10). The open cut mine will operate 24 hours a day, 7 days a week.
- 19 year period operation for underground mine (underground mining commencing in year 7 and continue to for the remainder of the Project mine life). The underground mine will operate 24 hours a day, 7 days a week.

3.4 Project site access

3.4.1 Mine site

Access to the Project will generally be via the existing Upper Bylong Road from Bylong Valley Way. Access to the Open Cut MIA will be via Upper Bylong Road. The Underground MIA will be accessed via an access road (private road) to be constructed over the Sandy Hollow to Gulgong Railway Line from the Upper Bylong Road. The existing level railway crossing infrastructure will be incorporated into the new Underground MIA access road with only one level railway crossing point at this location.

3.4.2 Accommodation facility

Access to the WAF will be via an upgraded T junction (rural Type Basic BA intersection) off Bylong Valley Way into an existing access to a residence located on the Bylong Station property. Two access tracks will be constructed from the current access along existing fence lines to the WAF with the throat of the intersection widened to accommodate turning vehicle movements. The minimum required SISD of 248 m for this driveway intersection (T junction) is currently provided in both directions to and from Bylong Valley Way.

3.5 Proposed road and intersection upgrades

Road and intersection upgrades are envisaged to occur during the initial construction of the Project, potentially prior to construction activities in consultation with and to the approval of MWRC as the roads authority.

3.5.1 Upper Bylong Road and adjoining roads

Upper Bylong Road will be widened from Bylong Valley Way to the mine sites to accommodate a two lane two-way road with 3.5 m wide travel lanes and 1.5 m shoulders with a total road formation of 10 m.

The open cut MIA will be accessed directly from Upper Bylong Road. Refer to Figure 3.1.

The southern reaches of Upper Bylong Road after the Open Cut MIA will be formerly closed and decommissioned to facilitate mining operations with the Eastern Open Cut. It is proposed that a realignment of the Upper Bylong Road will occur along the southern side of the Sandy Hollow to Gulgong Railway Line to connect with an existing public road to the east, providing continued access for private landholders to the east of the Project via Woolleys Road.

The western portion of Woolleys Road will be closed by the Project. Access to the realigned Upper Bylong Road to those properties in the east will be via Woolleys Road to the east.

For the southern portion of Upper Bylong Road, three options are being considered in relation to providing access for neighbouring landholders. Upper Bylong Road continues to the south as Lee Creek Road, which connects with Bylong Valley Way further to the south of the Project. Budden Gap Road intersects Lee Creek Road in the southern part of the Project Boundary and is more direct but elevated access track to Bylong Valley Way. The third and preferred option being introduced within the response to submission is the construction of the North Link Road from Upper Bylong Road, to the north of the Open Cut MIA, down the western side of the Eastern Open Cut, to Lee Creek Road to the south of the Project.

The North Link Road is currently the preferred option for the Project as it provides the most direct route which is similar to the existing Upper Bylong Road. The decision on the option to proceed with has not been determined, however will be determined in consultation with the MWRC and the community. The required road upgrades will be undertaken following the approval of the MWRC as the relevant roads authority for these roads. The North Link Road (if constructed) will be constructed initially as a private road and ultimately handed over to the MWRC as a public road at the appropriate time.

3.5.2 New access road (private road) to the underground mine

A newly built access road (private road) is to be constructed over the Sandy Hollow to Gulgong Railway Line to access the underground mine site incorporating the existing level railway crossing facility. This newly built access road will form a priority controlled T junction (rural Type Channelised CH intersection) with Upper Bylong Road with dedicated left and right turn lanes on Upper Bylong Road and will allow a 300 m length on the southern side between the level railway crossing and Upper Bylong Road. A T junction will be formed with this new access road for entry to the underground mine. Once built the road access to the existing level railway crossing will be closed.

3.5.3 Internal roads

Various other internal access roads will be constructed to provide routes to access various mining infrastructure, including CHPP, underground mine drifts, ventilation facilities and mine water management system.

3.5.4 Wollar Road

MWRC is in the process of upgrading the 17 km section of Wollar Road between Bylong Valley Way and the Wollar village that is currently unsealed to be sealed. This will enable the Project employees to travel to Mudgee as a suitable place of residence (i.e. within 1 hours commute). The upgrade of Wollar Road is being supported by $14 million which has been allocated to the upgrade under the Resources for Regions initiative. Mudgee also has the infrastructure to support the workforce post Year 6 and to the completion of the Project. This assessment has assumed that this road will be sealed prior to the commencement of the Project. The upgrade of Wollar Road is integrally linked to the requirement for the WAF for the various stages of the Project.

The upgrade will include upgrade of the road to include two 3.25 m travel lanes, 1 m sealed shoulders and 0.5 m unsealed shoulders, road sealing, bridge widening and cutting re-alignment, a new culvert, guard rails, as well as the upgrade of the level railway crossing and intersection of Wollar Road at Bylong Valley Way. This intersection is proposed to be channelised to safely meet the requirements for the estimated future daily traffic.

The upgrade of Wollar Road will also induce both Project related traffic and other traffic towards Bylong. Whether this be passing traffic (those heading towards either Ulan, Sandy Hollow or Rylstone and onwards to Hunter Valley destinations) or Project traffic.

3.5.5 Workers accommodation facility

The existing driveway access to the proposed WAF will be upgraded to accommodate increased vehicle volumes and turning movements by being widened at the throat of the intersection with Bylong Valley Way.

3.6 Proposed rail related upgrades

The following rail related upgrades are proposed as part of the Project.

3.6.1 Bylong Valley Way Level Railway Crossing

The existing level railway crossing on Bylong Valley Way will be upgraded as part of the Bylong Valley Way and Wollar Road intersection works proposed by MWRC. As the landholder in the vicinity of the intersection, KEPCO is supportive of MWRC realigning the Wollar Road and Bylong Valley Way intersection further west of the existing level railway crossing location.

3.6.2 Bylong Mine Access Level Railway Crossing

A new access road will be built connecting the underground mine with Upper Bylong Road incorporating the existing level railway crossing facility.

3.6.3 Bylong Rail Loop

The Bylong tunnel is currently a constraint on mainline operation in the vicinity of the Project, as it is located on a steep grade which causes loaded trains heading east to lose speed. From the proposed bifurcation to the Bylong mine loop, the mainline is in a single bi-directional configuration; therefore slow trains heading east cause delays in both directions.

The proposed Bylong Rail Loop will be constructed into the topography, generally at a higher elevation than the main line. This enables stationary trains on the rail loop to the use the potential energy available to commence towards the mainline and reach speeds similar to other trains utilising this section of the Sandy Hollow to Gulgong Railway Line.

In the empty direction, a train arriving at Bylong mine loop will occupy the section for about 40 seconds longer than a train running from Murrumbo to Bylong. This is due to the low speed limit of 25 km/h within the mine loop. The difference in occupation time is considered negligible.

The proposed bifurcation location of the Bylong mine loop spur on the mainline was carefully chosen. The recent Bylong passing loop, and western extension, was avoided to eliminate impacts on the operational efficiency of the passing loop. The bifurcation was located just east of the passing loop; however this location was within the length proposed by ARTC for the Bylong East passing loop upgrade.

The concept design for the Bylong East passing loop upgrade effectively extended the existing Bylong passing loop up to the Bylong tunnel with a flatter grade. This upgrade will therefore increase the efficiency by increasing train approach speeds toward the tunnel, reducing the occupation times on the section, particularly within the single track tunnel itself.

The Bylong mine loop spur (single track section, before bifurcation to the mine loading loop) was designed in vertical and horizontal alignment to intersect with the concept design of the Bylong East passing loop. Provided the concept design for the passing loop is carried forward in similar arrangement, this will enable future connection of the Bylong mine spur directly into the Bylong East passing loop, thereby gaining the efficiencies for trains departing from the Bylong mine loop.

3.7 Internal road layout and parking provision

The open cut MIA will provide the following:

- a two lane two-way internal road network
- an external clean car park containing approximately 50 car spaces plus two disabled spaces
- an external bus set down area
- an internal dirty car park containing approximately 20 car spaces and light vehicle wash area
- additional five car parking spaces adjacent to the workshop area
- a vehicle laybys on both sides of the road on approach to the boom gate entry.

The underground MIA will provide the following:

- a two lane two-way internal road network
- an external staff and visitor car park containing approximately 61 car spaces plus two disable spaces
- an external bus set down area
- additional five car parking spaces for CHPP light vehicle parking adjacent to the administration building
- two spaces for ambulance parking adjacent to the administration building
- three spaces adjacent to the internal store
- a helipad and emergency vehicle shed.

The WAF will provide the following:

- a two lane two-way internal road network
- car parking to accommodate employees and staff staying at the WAF and visitors and delivery/service vehicles to the WAF in accordance with MWRC's *Development Control Plan* (DCP).
  Note: It is possible that the WAF staff car parking could remain for the life of the Project, as required, to offset private vehicle parking within the mine site, and would reduce the volume of vehicles directly accessing the mine site. This has not been assessed as part of this Project as it is a possible improvement to planned operations, and has been discussed in section 6 (Mitigation Measures)
- six spaces for bus parking (standard 12.5 m bus spaces).

4. Future background traffic generation

To quantify the impact of the Project in future years, the background traffic was determined for future years through a combination of the traffic surveys undertaken in December 2015 and volumes documented in the *Wilpinjong Extension Project Road Transport Assessment* prepared by GTA Consultants in October 2015.

For the Project three future scenarios are of relevance,

- Peak construction activity year (2017/PY 2)
- Peak of dual mine operations (2024/PY 9)
- Peak of underground mine operation only (2028/PY 13).

For each scenario, background traffic volumes were developed for the weekday AM and PM peak period at intersections and daily volumes at several mid-block locations.

4.1 Other mines in region

The *Wilpinjong Extension Project Road Transport Assessment* documents the generation of mine related traffic for each of the three operating mines at up to 12 locations in the region, as noted in Tables 4.1 to 4.4. The mine traffic for all three mines (Wilpinjong, Moolarben and Ulan) include existing mine traffic, approved forecast mine traffic and more recently approved modification/expansion traffic during both construction and operation stages.

Table 4.1 Wilpinjong Coal Mine (WCM) traffic in road network

Site	Location	6.00 am (veh/hour)			6.00 pm (veh/hour)			Weekday (veh/day)		
		2015	2017	2024	2015	2017	2024	2015	2017	2024
1	Ulan Road (north of Hollyoak Bridge)	56	115	94	29	91	67	336	594	542
2	Ulan Road (south of Wollar Road)	56	115	94	29	91	67	336	594	542
3	Ulan Road (south of Cope Road)	71	144	119	36	115	97	408	701	645
4	Ulan Road (south of Ulan-Wollar Road)	99	195	161	51	158	130	532	889	827
5	Ulan Road (north of Ulan-Wollar Road)	11	23	19	5	18	14	62	100	93
6	Cope Road (west of Ulan Road)	26	51	42	13	43	33	126	188	181
7	Ulan-Wollar Road (west of WCM Access Road)	108	218	180	56	176	145	592	988	920
8A	Ulan-Wollar Road (at WCM Access Road)	108	218	180	56	176	145	592	988	920
9	Ulan-Wollar Road (east of WCM Access Road)	13	25	21	6	21	16	60	90	87

Site	Location	6.00 am (veh/hour)			6.00 pm (veh/hour)			Weekday (veh/day)		
		2015	2017	2024	2015	2017	2024	2015	2017	2024
10	Ulan-Wollar Road (east of State Gully Road)	13	25	21	6	21	16	60	90	87
11	WCM Access Roads (south of Ulan-Wollar Road)	121	243	200	62	197	149	652	1,078	1,007
12	Wollar-Bylong Road (east of Wollar Road)	4	8	7	2	4	3	20	30	29

Source: Wilpinjong Extension Project Road Transport Assessment, GTA Consultants October 2015

Table 4.2 Moolarben Coal Mine traffic in road network

Site	Location	6.00 am (veh/hour)			6.00 pm (veh/hour)			Weekday (veh/day)		
		2015	2017	2024	2015	2017	2024	2015	2017	2024
1	Ulan Road (north of Hollyoak Bridge)	77	227	149	19	160	88	477	855	600
2	Ulan Road (south of Wollar Road)	77	227	149	19	160	88	477	855	600
3	Ulan Road (south of Cope Road)	96	294	194	25	207	114	600	1,083	774
4	Ulan Road (south of Ulan-Wollar Road)	114	352	232	29	248	137	713	1,289	927
5	Ulan Road (north of Ulan-Wollar Road)	62	148	112	18	108	75	570	502	400
6	Cope Road (west of Ulan Road)	18	55	39	5	38	23	107	200	152

Source: Wilpinjong Extension Project Road Transport Assessment, GTA Consultants October 2015

Table 4.3 Ulan Coal Mine traffic in road network

Site	Location	6.00 am (veh/hour)			6.00 pm (veh/hour)			Weekday (veh/day)		
		2015	2017	2024	2015	2017	2024	2015	2017	2024
1	Ulan Road (north of Hollyoak Bridge)	56	44	4	18	15	4	804	742	339
2	Ulan Road (south of Wollar Road)	56	44	4	18	15	4	804	742	339
3	Ulan Road (south of Cope Road)	71	55	4	21	18	4	1,001	922	414
4	Ulan Road (south of Ulan-Wollar Road)	105	82	9	35	30	9	1,533	1,416	654
5	Ulan Road (north of Ulan-Wollar Road)	105	82	9	35	30	9	1,533	1,416	654
6	Cope Road (west of Ulan Road)	31	25	4	12	11	4	473	440	212

Source: Wilpinjong Extension Project Road Transport Assessment, GTA Consultants October 2015

In order to correlate the volumes documented in the Wilpinjong Coal Mine (WCM) assessment to the Project assessment, several assumptions were made, including:

- Direction of flow was not specified during peak periods in the WCM assessment for each site, as such the mine traffic was assumed to be heading towards the respective mines (from Mudgee) during the AM peak, and away from the respective mines (to Mudgee) during the PM peak
- The WCM assessment included data for the base year (2015), PY2 (2017) and PY9 (2024), however no volumes were included for PY13 (2028). Consequently, it was assumed that mine traffic in 2028 from the three mines would be the same as the 2024 volumes.
- Locations:
  - Site 2 of the WCM assessment is the midblock located immediately south of I-06 for this assessment, and as such, used for the analysis of I-06. Since all the coal mines (WCM, Moolarben and Ulan) are located north of the intersection, it was assumed all traffic related to these mines would use Ulan Road during the weekday AM and PM peaks.
  - Sites 3, 4, 5 and 6 of the WCM are located either side of I-08 for this assessment, a ratio of these sites was used to determine the traffic volumes on Ulan Road and Ulan-Wollar Road.
  - Site 12 of WCM assessment is the midblock located immediately east of I-05 for this assessment, and as such, has been used to determine the flows between Wollar Road and Ulan-Wollar Road (Barigan Street).
- Heavy Vehicle (HV) distribution was provided in the WCM assessment for WCM, as shown in Table 4.4. For both Ulan and Moolarben Coal Mines, a HV ratio of 10% was used.

Table 4.4 Wilpinjong Coal Mine Light and Heavy Vehicle distribution

Year	6.00 am (veh/hour)		6.00 pm (veh/hour)		Weekday (veh/day)	
	Light	Heavy	Light	Heavy	Light	Heavy
2015	111	10	57	5	558	94
2017	226	17	186	11	878	200
2024	184	16	142	7	843	164

Source: Wilpinjong Extension Project Road Transport Assessment, GTA Consultants October 2015

4.2 Non-mine traffic

In addition to the mining traffic discussed previously, within the region there is general background traffic related to the community living and working within the region.

In order to determine the general background traffic, the 2015 traffic volumes from the three mines was subtracted from the survey data, with the remaining traffic volumes designated as general (non-mine) background traffic. This general traffic was assumed to increase at a growth rate of 2% per year.

4.3 Cumulative background traffic

For the each of the three future scenarios, PY2 (2017), PY9 (2024) and PY13 (2028), the general background traffic from section 4.2 was grown by 2% per year and added to the respective mine generated traffic from section 4.1.

5. Project Traffic Generation

The future road network conditions, intersection operation and proposed road upgrades and road closures are discussed further below for the construction and operational stage of the Project. Three sensitivity options have been analysed consistent with the Social Impact Assessment (SIA) competed for the Project (Hansen Bailey, 2015) to test the sensitivity of the road network to varied workforce accommodation assumptions. These three sensitivity options – Option 1, 2 and 3, relate to different length of periods of WAF operation. An additional sensitivity scenario with no WAF (Option 4) has also been tested in response to a submission by the MWRC.

5.1 Future year scenarios assessed

Traffic volumes associated with the Project relate to employees' vehicles, visitors and heavy vehicle movements and vary between the construction phase and the mining operations phase.

The Preferred Operation scenario is for the WAF to operate up to the end of underground construction activities in approximately Year 6 of the Project with Wollar Road being upgraded by the end of Project Year (PY) 1 in 2016.

The future year scenarios consider the peak construction activity year (2017/PY 2), the peak of dual mine operations (2024/PY 9) and peak of underground mine operation only (2028/PY 13).

To determine the impact of the mine's construction and operation, a set of 'no-Project' scenarios have been analysed to determine what the comparable case would be if the Project did not proceed. The 'no-Project' scenarios take into consideration both the background traffic growth and the operation of future identified developments.

A conservative estimate of 2% per year traffic growth could be adopted for traffic within the Bylong Valley, which is considered a typical trend for main roads in rural areas.

Traffic volumes in these areas may fluctuate dramatically due to changes in local land uses such as the construction or decommissioning of mines and quarries, or where road maintenance and upgrade occur.

Employee travel (light vehicles) to and from the WAF for local and non-local hires at the start and end of the Project is unlikely to occur during the Project's peak traffic periods (at the start or end of each shift). The same can be said for rostered days off when staff are likely to travel home or elsewhere. These vehicle movements will be sporadic in nature dependant on each individual travel movement and their place of residence.

As discussed in Section 1.5, neighbouring developments have been assessed and included in the future year cumulative traffic scenarios.

The following scenarios were analysed:

- Scenario 1a: peak construction phase (PY 2 2017) with Project traffic only.
- Scenario 1b: peak construction phase (PY 2 2017) with background traffic growth and the inclusion of other surrounding developments.
- Scenario 2a dual mine operation only (PY 9 2024) with Project traffic only.
- Scenario 2b: dual mine operation phase (PY 9 2024) with background traffic growth and the inclusion of other surrounding developments.

- Scenario 3a: underground mine operation only (PY 13 2028) with Project traffic only.
- Scenario 3b: underground mine operation only (PY 13 2028) with background traffic growth and the inclusion of other surrounding developments.

5.2 Sensitivity option testing

The following four sensitivity options have been assessed for this study. The first three options are as referenced from the *Traffic and Transport Impact Assessment* (Parsons Brinckerhoff, 2015) and the *Social Impact Assessment* (Hansen Bailey 2015):

- Sensitivity Option 1 – Wollar Road Upgrade by end of PY 1, WAF operational for PY 1 and 2 only followed by the entire workforce being required to reside within the 'Local Area'. The Local Area being defined as areas within one hour drive of the Project (i.e. Mudgee, Wollar, Ulan, Rylstone, Kandos, Sandy Hollow and Denman).
- Sensitivity Option 2 – Wollar Road Upgrade by end of PY 1, WAF operational for PY 1 to 10 followed by the entire workforce being required to reside within the 'Local Area'.
- Sensitivity Option 3 – No upgrade of Wollar Road is completed and therefore Mudgee is outside the safe commute time and the WAF is required for the full Project life (PY 1 to 25).
- Sensitivity Option 4 – No WAF is provided throughout Project life and the entire workforce is required to reside in the Local Area.

Accommodation of the workforce within the Local Area has been allocated as follows:

- 10–15% of the workforce are local hires and will commute on a daily basis from their place of residence
- 20 staff are accommodated in the 16 dwellings owned by KEPCO, located near the Project Boundary
- 20% of the remainder of the workforce outside Mudgee and 80% inside Mudgee. Outside Mudgee, staff will be accommodated in Denman/Sandy Hollow, Kandos/Rylstone and within the MWRC LGA.

5.3 Trip generation during construction

This section discusses the trip generation during construction activities for both the open cut and underground mines including the WAF.

In general, the assumptions around traffic generation are based on regular delivery and heavy vehicle activity anticipated for the site and the staff accommodation arrangements, as shown in the *Social Impact Assessment* (Hansen Bailey 2015).

Project Year 2 is considered the peak construction phase with a total workforce of 665. It is predicted that 560 will be accommodated in the WAF during this stage, which will be consistent for sensitivity testing in sensitivity options 1, 2 and 3. Sensitivity option 4, however, does not provide for WAF and the 560 staff are accommodated in the locality. In all sensitivity options, 20 staff will be accommodated in the 16 dwellings owned by KEPCO and 65 staff will be local hires who commute daily from their place of residence.

5.3.1 Daily traffic generation

5.3.1.1 Sensitivity Options 1, 2 and 3

The Project will generate traffic from two different locations, the WAF and the mine site.

Typical traffic generated by the WAF is expected to be as follows (though there may be other irregular light vehicle activity some days of the week):

- Twelve return bus trips per day (from the site), as 280 workers are transported to and from the site, each shift, on 50-seater buses.
- In WAF construction, it is expected there will be total 40 veh/day or 80 trips per day categorised as follows:
  - Twenty five veh/day by construction personnel or 50 return trips over the day – 6.00 am to 3.00 pm
  - Fifteen deliveries/day or 30 return trips over the day – 6.00 am to 3.00 pm.

It is also expected there will be one heavy vehicle per day or 2 return trips at the WAF during construction.

- During WAF operation, in sensitivity Options 2 and 3:
  - Three heavy vehicles are expected to access the WAF per day
  - Four light vehicles are expected to access the WAF per day.

Typical daily traffic generated by the mine site during this phase is expected to consist of:

- Twelve return bus trips per day (from the WAF)
- Seventy eight construction heavy vehicles return trips
- One hundred and eighty return light vehicle trips:
  - eighty staff not residing at the WAF
  - 50% of staff on shift = 43 staff
  - 25% on day shift and 25% on night shift = 21 staff on day shift and 21 staff on night shift
  - approx. 70% of staff are drivers (30% carpool) = 30 staff or 15 drivers per shift
  - each shift expects to have 15 trips to site and 15 trips from site due to staff shift change over. Therefore 30 return trips in AM and 30 return trips in PM ~ 60 return trips
  - in addition there are 30 office staff (60 return trips)
- Twenty five light vehicles (visitors/deliveries) = 50 light vehicles return trips across 12 hour day.

5.3.1.2 Sensitivity Option 4

In this option, the Project will generate traffic from one location, the mine site on Upper Bylong Road. As per the sensitivity options 1, 2 and 3, the following trips generated will remain the same:

- There are 85 staff assumed to live locally and travel by light vehicle to/from the site – 50% make trips on any one day:
  - 50% of 85 staff making trips on any one day = 43 workers per day
  - 70% of staff will be drivers. Therefore 70% of 43 = 30 drivers or 15 drivers per shift
  - Therefore, at any Project peak period, there are 15 one-way trips or 30 two way trips per shift or 60 return trips per day

- thirty office staff per day or 60 light vehicle return trips
- twenty five light vehicles (visitors/deliveries) = 50 light vehicles return trips across 12 hour day
- seventy eight construction heavy vehicles return trips.

The 280 workers allocated to reside in the WAF in previous sensitivity options, will reside in the local area and commute to the site by light vehicles. Therefore, per shift, the bus trips will be replaced with approximately 98 one-way trips or 196 two-way trips [98 day-shift travelling towards one direction + 98 night-shift travelling opposite direction]. This will equate to 392 light vehicle return trips per day.

A summary of the daily construction traffic generated by the WAF and site operations across all testing scenarios is shown in Table 5.1.

Table 5.1 Estimated construction vehicle trips per day at the WAF and the open cut mine sites (PY 2)

Site	Vehicle type	Preferred operations and Option 1		Option 2/Option 3		Option 4	
		Vehicles/ day	Vehicle trips/day (two-way)	Vehicles/ day	Vehicle trips/day (two-way)	Vehicles/ day	Vehicle trips/day (two-way)
WAF	Light vehicles (employees)	25	50	25	50	0	0
	Light vehicles (deliveries)	15	30	19	38	0	0
	Buses (50 seater)	6	12	6	12	0	0
	Heavy vehicles (construction)	1	2	4	8	0	0
	Total	**47**	**94**	**54**	**108**	**0**	**0**
Site operations	Light vehicles (employees)	60	120	60	120	256	512
	Light vehicles (deliveries)	25	50	25	50	25	50
	Buses (50 seater) – from the WAF	6	12	6	12	0	0
	Heavy vehicles (construction)	39	78	39	78	39	78
	Total	**130**	**260**	**130**	**260**	**320**	**640**

5.3.2 Hourly traffic generation

Working hours for the construction of the WAF and mine sites is assumed to be two 12 hours shifts seven days a week. The construction working hours and the assumed construction employees' arrival/departure times are shown below:

- Assumed shift hours between 7.00 am to 7.00 pm, and 7.00 pm to 7.00 am. Day-time construction employees are assumed to arrive at the site between 6.30 am and 7.30 am and depart between 6.30 pm and 7.30 pm. Night shift construction employees will travel in the reverse direction during these hours.

- Light deliveries are assumed to be made throughout the day and will be equally distributed between 7.00 am and 7.00 pm.
- The delivery of construction materials by trucks were also assumed to be made throughout the day and will be equally distributed between 7.00 am and 7.00 pm.

It was assumed that 30% of construction staff (not in the WAF) will carpool with other staff (i.e. travel as a vehicle passenger) in order to convert construction employee numbers to the number of light vehicles.

Table 5.2 shows a summary of the hourly vehicle trips during construction phase.

Table 5.2 Estimated hourly construction vehicle trips at the WAF and the open cut mine sites (PY 2)

Working hours	Direction of traffic	Trip type	Time	Preferred Operations Contributors & Option 1	Option 2/3 Contributors	Option 4 Contributors
Between 7.00 am and 7.00 pm	Inbound	Construction employee trip (light vehicles)	6.30 am to 7.30 am	15	15	113
	Inbound	Day shift mine operation (buses)	6.30 am to 7.30 am	3	3	0
	Outbound	Night shift mine operation (buses)		3	3	0
	Inbound	Office workers (8.00 am to 4.00 pm shift)	7.00 am to 8.00 am	30	30	30
	Outbound		4.00 pm to 5.00 pm	30	30	30
	Inbound and outbound	Construction vehicle trip (heavy vehicles)	Throughout the day between 7.00 am and 7.00 pm	78	78	78
		Visitors and deliveries	Throughout the day between 7.00 am and 7.00 pm	50	50	50
	Outbound	Construction employee trip (light vehicles)	6.30 pm to 7.30 pm	15	15	113
	Inbound	In WAF construction, employee trips (light vehicles)	6.00 am to 7.00 am	25	25	0
	Outbound	In WAF construction, employee trips (light vehicles)	3.00 pm to 4.00 pm	25	25	0
	Inbound and Outbound	WAF construction vehicle trip (heavy vehicles)	Throughout the day between 7.00 am and 7.00 pm	2	2	0

Working hours	Direction of traffic	Trip type	Time	Preferred Operations Contributors & Option 1	Option 2/3 Contributors	Option 4 Contributors
		WAF construction Visitors and deliveries	Throughout the day between 7.00 am and 7.00 pm	30	30	0
	Inbound and Outbound	WAF operation vehicle trip (heavy vehicles)	6.00 am to 7.00 am	0	6	0
		WAF operation Visitors and deliveries	Throughout the day between 7.00 am and 7.00 pm	0	8	0
Between 7.00 pm and 7.00 am	Inbound	Construction employee trip (light vehicles)	6.30 pm to 7.00 pm	15	15	113
		Night shift mine operation (buses)		3	3	0
	Outbound	Construction employee trip (light vehicles)	7.00 pm to 7.30 pm	15	15	113
		Day shift mine operation (buses)		3	3	0

5.4 Trip generation during dual mine scenarios

This section discusses the trip generation during operation for both the open cut and underground mines including the WAF.

A total of 470 mine workers are involved with the operation of the mine at this dual operations stage of the Project. None of these workers are assumed to be accommodated within the WAF during preferred operations, with the WAF decommissioned for the preferred option and Option 1 of sensitivity testing, and holding up to 148 workers for Option 2 and 380 workers for Option 3. In all sensitivity options, 20 staff will be accommodated in the 16 dwellings owned by KEPCO and 70 staff will be local hires who commute daily from their place of residence.

Workers travelling from accommodation outside of Bylong were assumed to carpool when driving to and from shifts. This assumes there will be a 30% reduction in the vehicle trips which will result from single-occupant journeys.

5.4.1 Employees

There will be three shifts for employees during operation of the mine site, daytime office hours, daytime mining and night-time mining, as shown in Table 5.3.

Table 5.3 Predicted number of employees during dual mine operation in PY 9 (daily)

Employment type	Working hours	Number of employees at sites			
		WAF*	Open cut	Underground	CHPP
Daytime office	8.00 am to 4.00 pm	0	8	8	4
Mine operation day	7.00 am to 7.00 pm	61/62	44	60	9
Mine operation night	7.00 pm to 7.00 am	61/62	44	60	9
Total			**96**	**128**	**22**

* employees located at the WAF while off shift, applicable for sensitivity scenarios 2/3. It is assumed that office staff will travel from the local area.

For the purposes of the traffic assessment, we have conservatively assumed staff will travel during the hour at shift changeover (mine staff), i.e. 6.30 am to 7.30 am and 6.30 pm to 7.30 pm, or the hour before and after office hours (office staff), i.e. 7.00 am to 8.00 am and 4.00 pm to 5.00 pm. It is assumed that approximately half the staff will be on site overnight and half on site during the day, thus, staff trips at shift changeover have been split evenly between the two peak hours.

5.4.2 Service and delivery vehicles

It is conservatively assumed that there will be approximately 7 heavy vehicles expected to access the site on a daily basis (14 trips). These heavy vehicle volumes include mine related deliveries for fuel, water, maintenance and service purposes.

In sensitivity options 2 and 3, four light vehicles and three heavy vehicles are expected at the WAF during operation phase.

5.4.3 Hourly traffic generation

A summary of the hourly traffic generated by the site during dual operations is shown in Table 5.4.

Table 5.4 Inbound and outbound vehicle trips at the WAF, the open cut and underground mine sites (PY 9)

Time	Employee type	Direction of traffic	Preferred Operations/ Option 1/ Option4	Option 2 Contributors	Option 3 Contributors
6.30 am to 7.00 am	Day shift mine operation (light vehicles)	Inbound	83	57	16
	Day shift mine operation (buses)	Inbound	0	1	2

Time	Employee type	Direction of traffic	Preferred Operations/ Option 1/ Option4	Option 2 Contributors	Option 3 Contributors
7.00 am to 7.30 am	Night shift mine operation (light vehicles)	Outbound	83	57	16
	Night shift mine operation (buses)	Outbound	0	1	2
7.00 am to 8.00 am	Day-time office (light vehicles)	Inbound	14	14	14
Throughout the day between 7.00 am and 7.00 pm	Contractors for delivery of materials and services (heavy vehicles)	Inbound and outbound	14	14	14
Throughout the day between 7.00 am and 7.00 pm	WAF operation – for delivery of materials and services (heavy vehicles)	Inbound and outbound	0	6	6
	WAF operation – for delivery of materials and services (light vehicles)	Inbound and outbound	0	8	8
4.00 pm to 5.00 pm	Day-time office (light vehicles)	Outbound	14	14	14
6.30 pm to 7.00 pm	Night shift mine operation (light vehicles)	Inbound	83	57	16
	Night shift mine operation (buses)	Inbound	0	1	2
7.00 pm to 7.30 pm	Day shift mine operation (light vehicles)	Outbound	83	57	16
	Day shift mine operation (buses)	Outbound	0	1	2

5.5 Trip generation during underground mine operation only (Scenario 3b)

This section discusses the trip generation during operation of the underground mine only including the WAF.

A total of 275 mine workers are involved with the operation of the mine at this stage of the Project. No workers will be accommodated within the WAF during preferred operations, with the WAF decommissioned for the preferred Option, Option 1 and Option 2 of sensitivity testing. The WAF will house 214 workers for Option 3. In all sensitivity options, 20 staff will be accommodated in the 16 dwellings owned by KEPCO and 41 staff will be local hires who commute daily from their place of residence.

As with dual operations, it is expected that staff travelling to and from shifts by car will carpool, with a 30% reduction in light vehicle trip numbers.

5.5.1 Employee movements

There will be three shifts for employees during operation of the mine site, daytime office hours, daytime mining and night mining, as shown in Table 5.5. Please note that this information shows the number of people on shift during the day (e.g. 240 underground mine staff translates to 120 on shift in a 24-hour period, and 60 on shift during the day or night shift). Also shown is Sensitivity Scenario 3 where a proportion of the staff will reside in the WAF.

Table 5.5 Predicted number of employees during underground mine operation only in PY 13 (weekdays)

Employment type	Working hours	Number of employees at sites		
		WAF (Sensitivity scenario 3)*	Underground	CHPP
Daytime office	8.00 am to 4.00 pm	0	15	5
Mine operation day	7.00 am to 7.00 pm	96	60	9
Mine operation night	7.00 pm to 7.00 am	96	60	9
Total			**135**	**23**

* This is employees located at the WAF while off shift, applicable for sensitivity scenario 3. It is assumed that office staff will travel from the local area. All other scenarios, there will be no employees at the WAF.

5.5.2 Service and delivery vehicles

It is conservatively assumed that there will be approximately 7 heavy vehicles expected to access the site on a daily basis (14 trips). These heavy vehicle volumes include mine related deliveries for fuel, water, maintenance and service purposes.

In sensitivity Option 3, four light vehicles and three heavy vehicles are expected at the WAF during the operation phase.

5.5.3 Hourly traffic generation

A summary of the hourly traffic generated by the site during underground mine operation is shown in Table 5.6.

Table 5.6 Inbound and outbound vehicle trips at the WAF and the underground mine sites (PY 13)

Time	Employee type	Direction of traffic	Preferred Operations/ Option 1/Option 2/ Option 4 Contributors	Option 3 Contributors
6.30 am to 7.00 am	Day shift mine operation (light vehicles)	Inbound	49	11
	Day shift mine operation (buses)	Inbound	0	2
7.00 am to 7.30 am	Night shift mine operation (light vehicles)	Outbound	49	11
	Night shift mine operation (buses)	Outbound	0	2
7.00 am to 8.00 am	Day-time office (light vehicles)	Inbound	14	14

Time	Employee type	Direction of traffic	Preferred Operations/ Option 1/Option 2/ Option 4 Contributors	Option 3 Contributors
Throughout the day between 7.00 am and 7.00 pm	Contractors for delivery of materials and services (heavy vehicles)	Inbound and outbound	14	14
Throughout the day between 7.00 am and 7.00 pm	WAF operation – for delivery of materials and services (heavy vehicles)	Inbound and outbound	0	6
	WAF operation – for delivery of materials and services (light vehicles)	Inbound and outbound	0	8
4.00 pm to 5.00 pm	Day-time office (light vehicles)	Outbound	14	14
6.30 pm to 7.00 pm	Night shift mine operation (light vehicles)	Inbound	49	11
	Night shift mine operation (buses)	Inbound	0	2
7.00 pm to 7.30 pm	Day shift mine operation (light vehicles)	Outbound	49	11
	Day shift mine operation (buses)	Outbound	0	2

5.6 Heavy vehicle types, volumes and tonnages

The following heavy vehicle types, volumes and tonnages are envisaged for the Project for both the construction and operation stages as shown in Table 5.7.

Table 5.7 Heavy vehicle types, volumes and tonnages during construction and operation

Site	Equipment/Material	Truck type	Truck tonnage	Truck volumes daily	Truck volumes peak hourly
WAF construction	Housing, equipment and furniture	Heavy rigid vehicle	10–12 tonne	2	0*
WAF operation	Linen, food, service, water and maintenance	Heavy rigid vehicle	10–12 tonne	5	0*
Mine construction	Concrete and other building materials	Single rigid vehicle, medium rigid vehicle, heavy rigid vehicle	10 tonne	78**	7**
	Pipe, structural and other building materials	Semi-trailer	9 tonne		
Mine operation	Bulk material, fuel, CPP consumables	B-Double	26 tonne	13***	2***

Note:

* - no vehicles expected during the Project AM and PM peak hours

** - total vehicles during construction in Year 2 of the Project

*** - total vehicles during dual mine operation in Year 9 of the Project.

5.7 Decommissioning

The mine site is expected to be decommissioned in completion of the Project from PY 26 in 2041. Traffic generated during this phase will generally be light vehicles with some heavy vehicles associated with decommissioning works and final rehabilitation.

5.8 Trip distribution

Project related vehicle routes and their distributions during different phases (construction and operation) and stages of the Project are explained as follows:

- Staff trips were distributed on the road network according to the location of accommodation, as estimated in the Social Impact Assessment (*Hansen Bailey 2015*) according to employment profiling in the local area and availability of accommodation.
- Service and delivery vehicle trips were distributed according to the most accessible routes and direction from which the vehicles will likely travel, i.e. service and delivery vehicles are most likely to travel from Sydney, Newcastle and Muswellbrook (either on Golden Highway and Ulan Road and Wollar Road or along Bylong Valley Way to the east) then from Mudgee (along Wollar Road to the north-west). A small proportion of these trips will occur along Bylong Valley Way to the south. For the purpose of this assessment, it is assumed that there will be no heavy vehicles utilising the Bylong Valley Way, generally due to road constraints. However, there may be some occasions when heavy vehicles are able to travel these routes. These trips are consistent for both sensitivity options.

The estimates for light vehicle trips distribution (excluding bus trips, since all originate from the WAF) are shown in Figure 5.1. Note that staff light vehicle trip distributions are for the preferred operational case.

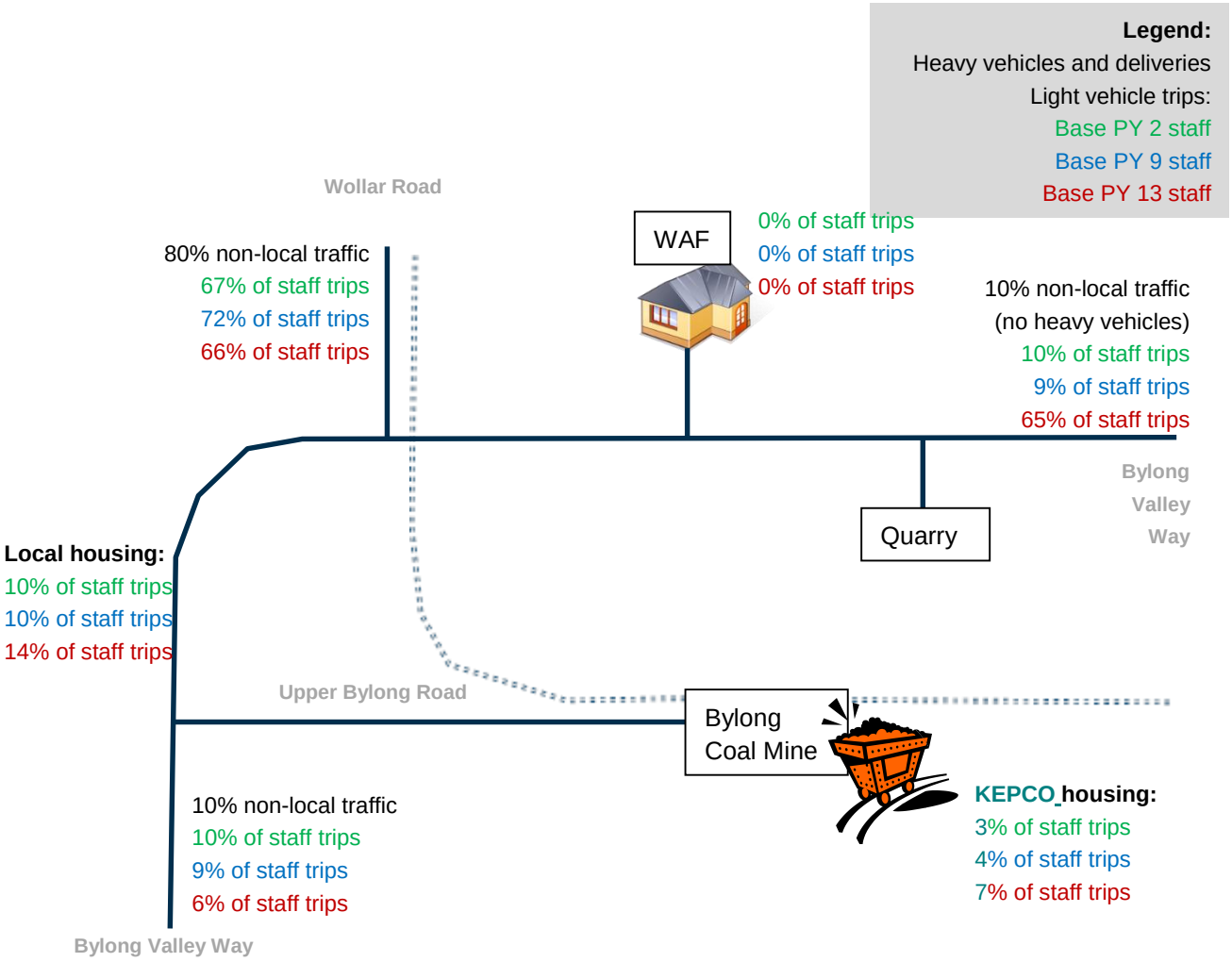


Figure 5.1 Light and heavy vehicle traffic distribution

In general, the majority of light vehicle trips generated by staff movements during the operational years are expected to come from Wollar Road from Mudgee and surrounds. Negligible light vehicle trips are assumed to originate at the WAF as staff will be travelling by bus from this site.

5.8.1 Access routes

The anticipated access routes taken by construction vehicles, employee traffic and delivery and service vehicles travelling to the sites, during construction and operation are shown in Figure 5.2 and Table 5.8.

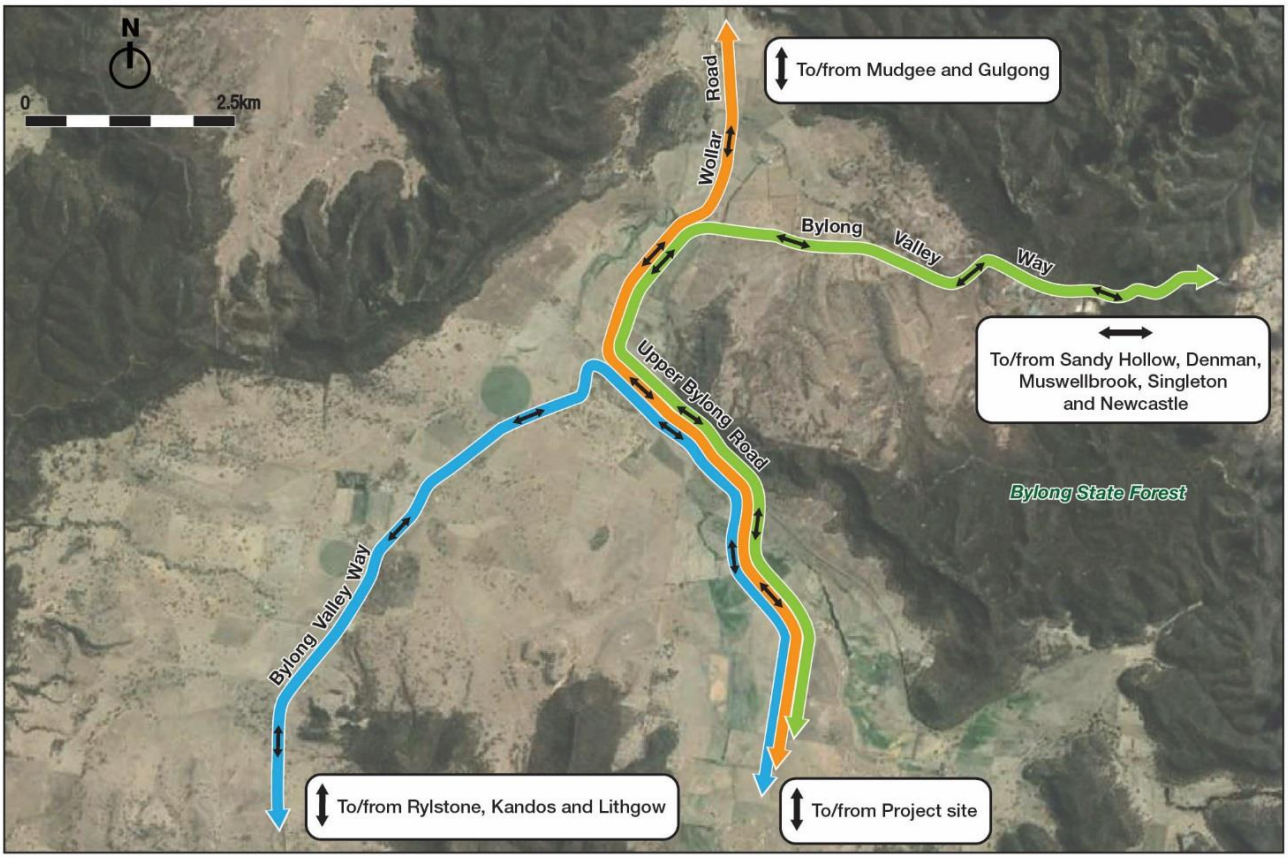


Figure 5.2 Vehicle access routes to and from the Project

Table 5.8 Site access points and access routes

Site	Access point location	Access to/from via			
		North	South	East	West
WAF	Off Bylong Valley Way	Bylong Valley Way, Wollar Road, Ulan Wollar Road, Ulan Road, Golden Highway	Bylong Valley Way, Castlereagh Highway (to Kandos, Rylstone)	Bylong Valley Way, Golden Highway (to Sandy Hollow, Denman)	Bylong Valley Way, Wollar Road, Ulan Road (to Mudgee)
Open cut	Off Upper Bylong Road	Upper Bylong Road, Bylong Valley Way, Wollar Road, Ulan Wollar Road, Ulan Road, Golden Highway	Upper Bylong Road, Bylong Valley Way, Castlereagh Highway (to Kandos, Rylstone)	Upper Bylong Road, Bylong Valley Way, Golden Highway (to Sandy Hollow, Denman)	Upper Bylong Road, Bylong Valley Way, Wollar Road, Ulan Road (to Mudgee)
Underground	Off Upper Bylong Road	Upper Bylong Road, Bylong Valley Way, Wollar Road, Ulan Wollar Road, Ulan Road, Golden Highway	Upper Bylong Road, Bylong Valley Way, Castlereagh Highway (to Kandos, Rylstone)	Upper Bylong Road, Bylong Valley Way, Golden Highway (to Sandy Hollow, Denman)	Upper Bylong Road, Bylong Valley Way, Wollar Road, Ulan Road (to Mudgee)

5.8.2 Construction phase

The construction employee workforce light vehicle trips of the open cut and underground mine sites will be made up of:

Project Year 2

- 10% to/from the east (Sandy Hollow, Denman)
- 67% to/from the west (Mudgee and MWRC suburbs)
- 10% to/from the south (Rylstone, Kandos)
- 0% to/from WAF (negligible light vehicle trips expected)
- 13% to/from local & KEPCO housing.

The construction and service vehicle trips of the open cut and underground mine sites will be made up of:

- 10% to/from the east (Sandy Hollow, Denman)
- 80% to/from the west (Mudgee and MWRC suburbs)
- 10% to/from the south (Rylstone, Kandos).

5.8.3 Operational phase

The operational employee workforce light vehicle trips of the open cut and underground mine sites will be made up of:

Project Years 9 & 13 (assuming no employees residing at WAF)

- 6–7% to/from the east (Sandy Hollow, Denman)
- 66–72% to/from the west (Mudgee and MWRC suburbs)
- 6–7% to/from the south (Rylstone, Kandos)
- 0% to/from WAF (unless WAF is in use)
- 14–21% to/from local and KEPCO housing.

The operational contractor and service vehicle trips of the open cut and underground mine sites will be made up of:

- 10% to/from the east (Sandy Hollow, Denman)
- 80% to/from the west (Mudgee and MWRC suburbs)
- 10% to/from the south (Rylstone, Kandos).

5.9 Distribution by time of day

Future intersection and road network operation has been assessed based upon the Project traffic peak hours. This is the identified hour associated with the maximum traffic generation volumes in the weekday morning and afternoon peaks associated with the Project's employee trips and delivery trips.

The selection of the peak hours for this assessment was in one-hour intervals at individual key intersections.

5.10 Forecast traffic demand

The forecast traffic demand on the road network for future years including Project related traffic is shown in Appendix B.

5.11 Rail capacity and upgrades

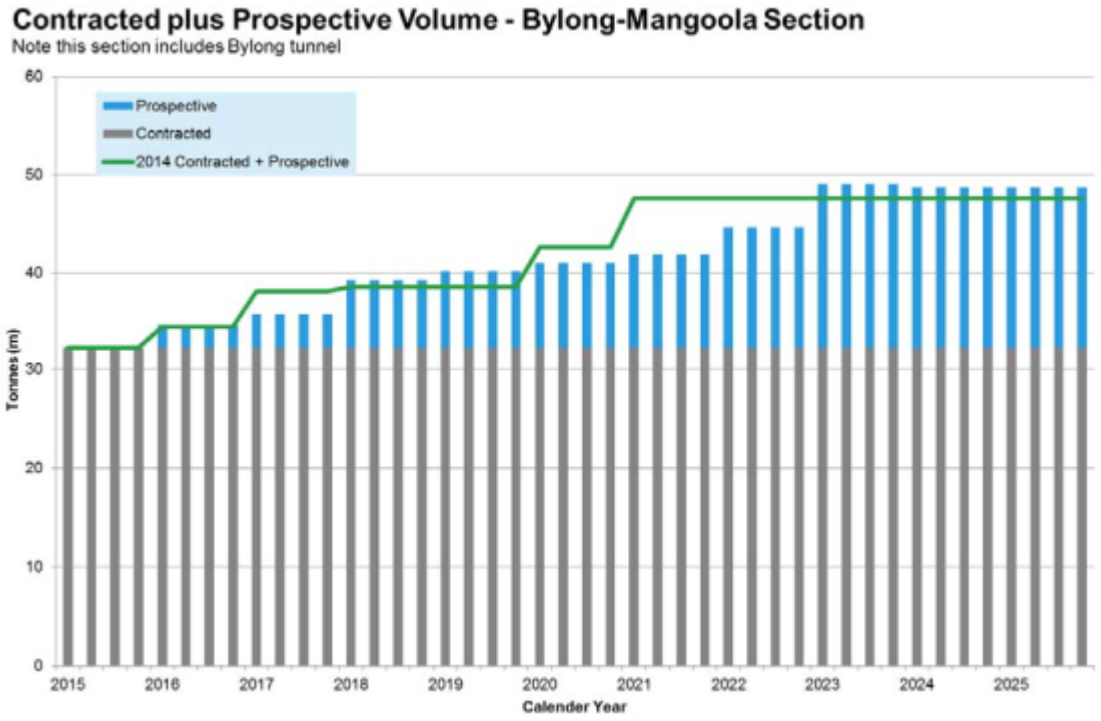
As discussed in Section 2.10.1, there is adequate capacity for all contracted volumes on the Sandy Hollow to Gulgong Railway Line. Additional passing loops, or where necessary passing lanes, represent the main mechanism to deliver further incremental increases in the capacity of the line. Currently identified upgrades are shown in Table 5.9 below.

Table 5.9 Ulan–Muswellbrook Loops, timing under contracted and prospective volume scenarios

Project Name	Contracted Volumes	Prospective Volumes
Mt Pleasant loop (previously Bengalla west extension)	-	Q1 2022
Widden Creek loop	-	Q1 2023

Source: ARTC 2015 HV Strategy

Figure 5.7 below presents the future contracted and prospective mine outputs. This figure shows that there is adequate capacity of the Sandy Hollow to Gulgong Railway line to accommodate Bylong Mine and other proposed mines or expanded mines in the area. It should be noted that the Mount Penny Mine to the west of the Project has now been cancelled. It should also be noted that the planned Cobbora Mine has also been postponed and therefore increased train paths and rail capacity will be available for the Project.



Source: ARTC 2015–2024 HV Corridor capacity strategy

Figure 5.3 Current volume forecasts vs 2014–2024 volume forecast, Bylong–Mangoola (Mtpa)

5.12 Rail movements

Based on the proposed product coal tonnages and a conservative 80% utilisation of the network (292 days of 365), the Project will require up to 2.1 trains per day at peak operation, averaging 1.4 trains per day over the period of 2017 to 2027. This assumes the standard 96 wagon (9,200t payload) trains are used. However, it is noted that KEPCO was in discussions with ARTC in December 2014 regarding a possible increase in train vehicle length to 100 cars and a gross payload of 9750 t. Use of this sized train is subject to further assessment.

Analysis undertaken by ARTC using an assumed 8,428 net tonne train, with a current 88 wagon train at 98% loading, which is the smallest of the units servicing the Ulan Line and would have the greatest impact on the lines capacity, equates to 1.1 round trips per day, or 2.2 trains per day.

5.13 Oversize and overmass vehicle movements

The use of an oversize or overmass vehicle will be subject to the grant of a permit from the relevant roads authority that these vehicles will be travelling (i.e. either RMS and/or the relevant Council). A separate Traffic Management Plan (TMP) will also be required for any of these oversize traffic movements.

Oversize and overmass permits as well as pilot vehicles and police escorts may be required for the transportation of larger equipment or infrastructure. Vehicles over 19 m long, 2.5 m wide or 4.3 m high are considered oversize and vehicles with a gross vehicle mass over 42.5 tonnes are considered overmass.

Oversized vehicles will need to travel to the Project site via Wollar Road due to an overhead rail bridge on Bylong Valley Way east of Wollar Road and the general steep terrain and tight horizontal curves on Bylong Valley Way.

Oversized vehicles are restricted to travel on public roads at certain times of the day only.

5.14 Transportation of dangerous goods

Dangerous goods will be required to be transported to the Project site. Some of these dangerous goods will include explosives, emulsions, diesel, various gases and other hydrocarbons.

The transportation of dangerous goods by road and rail transport is to comply with the *NSW Dangerous Goods (Road and Rail Transport) Regulation 2009* under the Dangerous Goods (Road and Rail Transport) Act 2008.

Persons involved in the transportation of dangerous goods must be properly qualified, trained and the vehicles transporting the goods meet the necessary licensing requirements.

In accordance with this regulation, a risk assessment is to be prepared by those involved in the transport of dangerous goods.

6. Traffic and transport impacts

This section describes the forecast traffic and transport related impacts of the Project.

6.1 Intersection performance

Intersection traffic modelling was undertaken using the SIDRA software package, the results of which are summaries in the following sections.

6.1.1 2017 (PY2) Preferred Option and Sensitivities 1, 2, 3 with WAF

Intersection performance results are provided in Table 6.1 for PY2 in 2017 with WAF scenarios. The results indicate that all intersections assessed perform at good levels of service with ample spare capacity.

Table 6.1 2017 with WAF Intersection Performance Summary

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
1. Bylong Valley Way/ Wollar Road	Priority	AM peak	6.00–7.00	0.025	9.6	A	0.6
		PM peak	6.00–7.00	0.016	9.6	A	0.5
2. Bylong Valley Way/ Upper Bylong Road	Priority	AM peak	6.00–7.00	0.024	5.1	A	0.6
		PM peak	6.00–7.00	0.019	5.0	A	0.5
3. Golden Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.046	8.4	A	0.4
		PM peak	6.00–7.00	0.029	8.2	A	0.1
4. Golden Highway and Ulan Road	Priority	AM peak	6.00–7.00	0.024	8.5	A	0.8
		PM peak	6.00–7.00	0.016	8.7	A	0.5
5. Wollar Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.021	4.8	A	0.4
		PM peak	6.00–7.00	0.015	5.0	A	0.2
6. Wollar Road and Ulan Road	Priority	AM peak	6.00–7.00	0.227	10.3	B	1.0
		PM peak	6.00–7.00	0.188	9.7	A	1.5
7. Castlereagh Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.024	8.5	A	0.7
		PM peak	6.00–7.00	0.026	9.5	A	0.8
8. Ulan Road and Ulan Wollar Road	Priority	AM peak	6.00–7.00	0.408	18.3	C	17.8
		PM peak	6.00–7.00	0.320	6.7	A	11.2

6.1.2 2017 (PY2) Sensitivity 4 without WAF

Intersection performance results are provided in Table 6.2 for PY2 in 2017 without WAF scenario. The results indicate that all intersections assessed perform at good levels of service with ample spare capacity.

Table 6.2 2017 without WAF Intersection Performance Summary

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
1. Bylong Valley Way/ Wollar Road	Priority	AM peak	6.00–7.00	0.007	7.9	A	1.8
		PM peak	6.00–7.00	0.088	9.7	A	2.1
2. Bylong Valley Way/ Upper Bylong Road	Priority	AM peak	6.00–7.00	0.098	5.0	A	2.4
		PM peak	6.00–7.00	0.102	5.0	A	2.5
3. Golden Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.032	7.8	A	0.2
		PM peak	6.00–7.00	0.048	8.2	A	0.4
4. Golden Highway and Ulan Road	Priority	AM peak	6.00–7.00	0.016	8.7	A	0.5
		PM peak	6.00–7.00	0.024	5.5	A	0.8
5. Wollar Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.049	5.2	A	0.2
		PM peak	6.00–7.00	0.056	5.2	A	0.7
6. Wollar Road and Ulan Road	Priority	AM peak	6.00–7.00	0.188	10.2	B	2.9
		PM peak	6.00–7.00	0.227	10.9	B	2.2
7. Castlereagh Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.027	9.0	A	0.8
		PM peak	6.00–7.00	0.025	8.4	A	0.7
8. Ulan Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.321	8.0	A	11.3
		PM peak	6.00–7.00	0.408	18.0	C	17.8

6.1.3 2024 (PY9) Preferred Option and Sensitivities 1 & 4 without WAF

Intersection performance results are provided in Table 6.3 for PY9 in 2024 with preferred option and sensitivities 1 & 4. The results indicate that all intersections assessed perform at good levels of service with ample spare capacity.

Table 6.3 2024 Sensitivity 1 & 4 Intersection Performance Summary

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
1. Bylong Valley Way/ Wollar Road	Priority	AM peak	6.00–7.00	0.0059	7.9	A	1.4
		PM peak	6.00–7.00	0.055	7.9	A	1.3
2. Bylong Valley Way/ Upper Bylong Road	Priority	AM peak	6.00–7.00	0.071	4.9	A	1.7
		PM peak	6.00–7.00	0.07	5.0	A	1.6
3. Golden Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.052	8.2	A	0.4
		PM peak	6.00–7.00	0.036	7.8	A	0.2
4. Golden Highway and Ulan Road	Priority	AM peak	6.00–7.00	0.029	8.5	A	0.9
		PM peak	6.00–7.00	0.020	8.8	A	0.7
	Priority	AM peak	6.00–7.00	0.041	5.0	A	0.5

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
5. Wollar Road and Ulan-Wollar Road		PM peak	6.00–7.00	0.036	5.0	A	0.2
6. Wollar Road and Ulan Road	Priority	AM peak	6.00–7.00	0.148	9.2	A	1.7
		PM peak	6.00–7.00	0.131	9.1	A	2.2
7. Castlereagh Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.029	8.4	A	0.98
		PM peak	6.00–7.00	0.031	9.3	A	0.9
8. Ulan Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.300	13.2	B	11.5
		PM peak	6.00–7.00	0.202	7.9	A	6.2

6.1.4 2024 (PY9) Sensitivity 2 with WAF

Intersection performance results are provided in Table 6.4 for PY9 in 2024 sensitivity 2 with the WAF. The results indicate that all intersections assessed perform at good levels of service with ample spare capacity.

Table 6.4 2024 Sensitivity 2 Intersection Performance Summary

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
1. Bylong Valley Way/ Wollar Road	Priority	AM peak	6.00–7.00	0.039	9.2	A	0.9
		PM peak	6.00–7.00	0.036	9.2	A	0.9
2. Bylong Valley Way/ Upper Bylong Road	Priority	AM peak	6.00–7.00	0.050	9.0	A	1.2
		PM peak	6.00–7.00	0.049	8.0	A	1.2
3. Golden Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.053	8.3	A	0.4
		PM peak	6.00–7.00	0.036	7.8	A	0.2
4. Golden Highway and Ulan Road	Priority	AM peak	6.00–7.00	0.029	8.5	A	0.9
		PM peak	6.00–7.00	0.020	8.8	A	0.7
5. Wollar Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.029	4.9	A	0.4
		PM peak	6.00–7.00	0.025	5.0	A	0.1
6. Wollar Road and Ulan Road	Priority	AM peak	6.00–7.00	0.148	9.1	A	1.3
		PM peak	6.00–7.00	0.131	9.0	A	1.8
7. Castlereagh Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.029	8.4	A	0.8
		PM peak	6.00–7.00	0.031	9.3	A	0.9
8. Ulan Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.299	13.2	B	11.5
		PM peak	6.00–7.00	0.202	7.9	A	6.2

6.1.5 2024 (PY9) Sensitivity 3 with WAF

Intersection performance results are provided in Table 6.5 for PY9 in 2024 sensitivity 3 with the WAF. The results indicate that all intersections assessed perform at good levels of service with ample spare capacity.

Table 6.5 2024 Sensitivity 3 Intersection Performance Summary

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
1. Bylong Valley Way/ Wollar Road	Priority	AM peak	6.00–7.00	0.016	9.6	A	0.4
		PM peak	6.00–7.00	0.014	8.2	A	0.4
2. Bylong Valley Way/ Upper Bylong Road	Priority	AM peak	6.00–7.00	0.018	5.0	A	0.4
		PM peak	6.00–7.00	0.017	4.9	A	0.4
3. Golden Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.051	8.4	A	0.4
		PM peak	6.00–7.00	0.033	7.8	A	0.2
4. Golden Highway and Ulan Road	Priority	AM peak	6.00–7.00	0.029	8.5	A	0.9
		PM peak	6.00–7.00	0.020	8.8	A	0.7
5. Wollar Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.016	4.8	A	0.4
		PM peak	6.00–7.00	0.011	5.0	A	0.1
6. Wollar Road and Ulan Road	Priority	AM peak	6.00–7.00	0.148	8.9	A	0.8
		PM peak	6.00–7.00	0.131	8.8	A	1.2
7. Castlereagh Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.027	8.5	A	0.8
		PM peak	6.00–7.00	0.029	9.7	A	0.9
8. Ulan Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.299	13.2	B	11.5
		PM peak	6.00–7.00	0.201	7.9	A	6.2

6.1.6 2028 (PY13) Preferred Option and Sensitivities 1, 2, 4 without WAF

Intersection performance results are provided in Table 6.6 for PY13 in 2028 with preferred option and sensitivities 1, 2 & 4 without the WAF. The results indicate that all intersections assessed perform at good levels of service with ample spare capacity.

Table 6.6 2028 No WAF Intersection Performance Summary

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
1. Bylong Valley Way/ Wollar Road	Priority	AM peak	6.00–7.00	0.033	9.3	A	0.7
		PM peak	6.00–7.00	0.029	7.9	A	0.7
2. Bylong Valley Way/ Upper Bylong Road	Priority	AM peak	6.00–7.00	0.040	4.9	A	0.9
		PM peak	6.00–7.00	0.039	4.8	A	0.9
3. Golden Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.055	8.3	A	0.4
		PM peak	6.00–7.00	0.036	7.8	A	0.2

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
4. Golden Highway and Ulan Road	Priority	AM peak	6.00–7.00	0.032	8.7	A	1.0
		PM peak	6.00–7.00	0.021	8.8	A	0.7
5. Wollar Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.025	4.8	A	0.4
		PM peak	6.00–7.00	0.021	5.0	A	0.2
6. Wollar Road and Ulan Road	Priority	AM peak	6.00–7.00	0.149	9.1	A	1.1
		PM peak	6.00–7.00	0.135	9.0	A	1.6
7. Castlereagh Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.029	8.4	A	0.8
		PM peak	6.00–7.00	0.031	9.5	A	1.0
8. Ulan Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.306	13.2	B	11.7
		PM peak	6.00–7.00	0.204	7.9	A	6.3

6.1.7 2028 (PY13) Sensitivity 3 with WAF

Intersection performance results are provided in Table 6.7 for PY13 in 2028 with sensitivity 3. The results indicate that all intersections assessed perform at good levels of service with ample spare capacity.

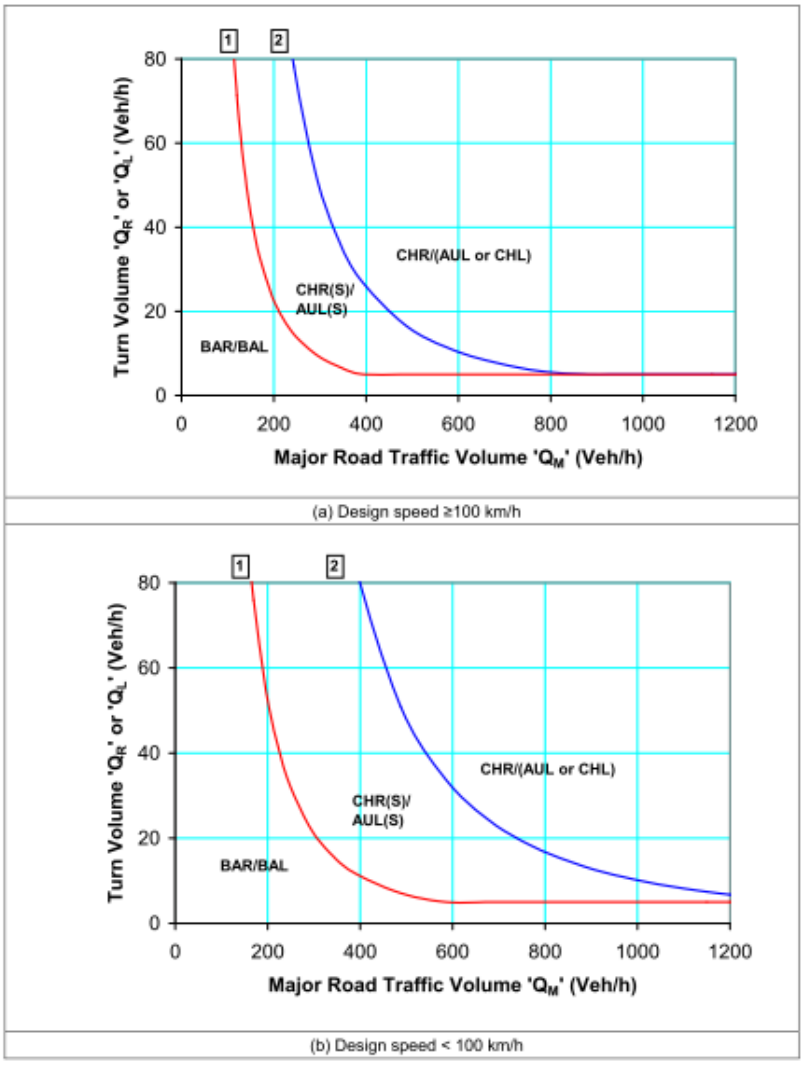
Table 6.7 2028 with WAF Intersection Performance Summary

Intersection	Control type	Peak hour	Peak hour time	DoS	Average Delay (seconds)	LoS	Queue (m)
1. Bylong Valley Way/ Wollar Road	Priority	AM peak	6.00–7.00	0.013	9.6	A	0.3
		PM peak	6.00–7.00	0.010	9.6	A	0.3
2. Bylong Valley Way/ Upper Bylong Road	Priority	AM peak	6.00–7.00	0.014	5.0	A	0.3
		PM peak	6.00–7.00	0.012	5.0	A	0.3
3. Golden Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.054	8.4	A	0.4
		PM peak	6.00–7.00	0.035	7.8	A	0.2
4. Golden Highway and Ulan Road	Priority	AM peak	6.00–7.00	0.030	8.7	A	1.0
		PM peak	6.00–7.00	0.020	8.0	A	0.7
5. Wollar Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.014	4.7	A	0.4
		PM peak	6.00–7.00	0.010	4.7	A	0.1
6. Wollar Road and Ulan Road	Priority	AM peak	6.00–7.00	0.149	8.9	A	0.8
		PM peak	6.00–7.00	0.135	9.0	A	1.2
7. Castlereagh Highway and Bylong Valley Way	Priority	AM peak	6.00–7.00	0.029	8.5	A	0.8
		PM peak	6.00–7.00	0.031	10.4	B	0.9
8. Ulan Road and Ulan-Wollar Road	Priority	AM peak	6.00–7.00	0.302	13.3	B	11.6
		PM peak	6.00–7.00	0.202	8.6	A	6.3

6.2 Intersection impacts and warrants

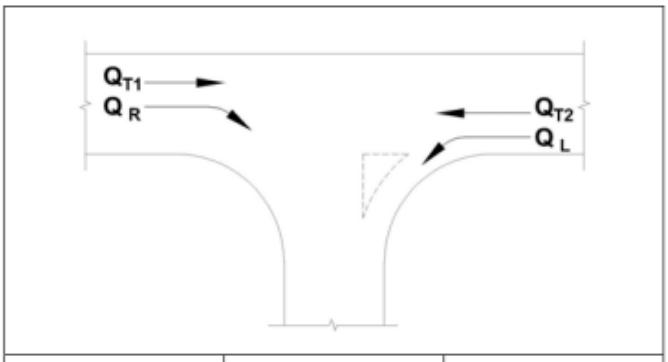
Increased traffic volumes are anticipated at intersections due to Project traffic. Dependant on the whether the WAF is in place for a few years or for the life of the Project, the Project traffic generation by employees and their origin and destinations will be quite different. For example, should employees travel from the Mudgee direction, increased vehicle movements are anticipated along Ulan Road and Wollar Road and intersections along these roads. However, should employees reside in the WAF, increased vehicle movements are only anticipated along Bylong Valley Way and Upper Bylong Road and intersections along these roads.

A review of intersection types and warrants for turn treatments at intersections based on future intersection traffic volumes with Project traffic has been undertaken. Figure 6.1 presents the warrants for turn treatments on major roads at unsignalised intersections for design speeds greater or equal to 100 km/h (a) and design speeds less than 100 km/h (b). Figure 6.2 presents the calculation of Q_M, the major road traffic volume.



Source: Austroads *Guide to Road Design, Part 4A Unsignalised and Signalised Intersections*, Figure 4.9

Figure 6.1 Warrants for turn treatments on the major road at unsignalised intersections



Turn type	Splitter island	Q_M (veh/h)
Right	No	$= Q_{T1} + Q_{T2} + Q_L$
Right	Yes	$= Q_{T1} + Q_{T2}$
Left	No/Yes	$= Q_{T2}$

Source: *Austroads Guide to Road Design, Part 4A Unsignalised and Signalised Intersections*, Figure 4.10

Figure 6.2 Calculation of the major road traffic volume parameter Q_M

6.2.1 Existing intersection future year operation

Bylong Valley Way and Wollar Road – this is an existing rural Type BA intersection. This intersection is proposed to be upgraded. Bylong Valley Way is the major road with a design speed assumed to be 100 km/h (posted 100 km/h speed limit at this location).

Warrant for left turn

Peak Project traffic is identified during construction in PY 2 (2017). The major road traffic volume Q_M (veh/h) for a left turn warrant is equal to Q_{T2}. Q_{T2} is a maximum 20 vehicles per hour. The maximum left turn volume Q_L (veh/h) is 95 vehicles per hour. Based on the very low through traffic volumes on Bylong Valley Way, a Type BA intersection would suffice.

Bylong Valley Way and Upper Bylong Road – this is an existing rural Type BA intersection. This intersection is proposed to be upgraded. Bylong Valley Way is the major road with a design speed assumed to be less than100 km/h (posted 50 km/h speed limit at this location).

Warrant for left turn

Peak Project traffic is identified during construction in PY 2 (2017). The major road traffic volume Q_M (veh/h) for a left turn warrant is equal to Q_{T2}. Q_{T2} is a maximum 10 vehicles per hour. The maximum turn volume Q_L (veh/h) is 125 vehicles per hour. Based on the very low through traffic volumes on Bylong Valley Way, a Type BA intersection would suffice.

Warrant for right turn

Peak Project traffic is identified during construction in PY 2 (2017). The major road traffic volume Q_M (veh/h) for a right turn warrant is equal to the addition of Q_{T1}, Q_{T2} and Q_L. Q_M is a maximum 105 vehicles per hour. The maximum turn volume Q_R (veh/h) is 12 vehicles per hour. Based on the very low through traffic volumes on Bylong Valley Way, a Type BA intersection would suffice.

6.2.2 Proposed intersection future year operation

Underground MIA Access Road and Upper Bylong Road – a rural Type CH intersection is proposed for this intersection with dedicated left and right turn lanes on Upper Bylong Road which would comfortable accommodate future intersection traffic volumes.

6.3 Mid-block road capacity and level of service

The impacts of the Project on the routes utilised on the surrounding road network have been assessed to determine the percentage increases in daily mid-block traffic volumes when compared to base daily traffic flows.

A mid-block capacity assessment has also been completed at several locations to determine mid-block levels of service based on two-way hourly vehicle flows and the percent of heavy vehicles. The mid-block capacity has been based on the RMS G*uide to Traffic Generating Developments* and Austroads *Guide to Traffic Management Part 3: Traffic Studies and Analysis* guidelines.

Mid-block capacities and Levels of Service based on two-lane rural roads are shown in Table 6.8.

Table 6.8 Peak hour flow on two-lane rural roads (veh/h)

Terrain	Level of Service	Percent of heavy vehicles			
		0%	5%	10%	15%
Level	B*	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290

Note: * vehicles per hour less than those documented in the row assigned for Level of Service B indicate a Level of Service A performance

Source: RMS *Guide to Traffic Generating Developments, 2002*

The mid-block road capacity and level of service assessment has been completed for both the construction (PY 2) and dual mine operation under preferred operations (PY 9) as shown in Table 6.9. It should be noted, the worst case scenario (No WAF) has been used for the mid-block assessment, and as such a conservative estimate of impact as this is not the preferred option for the Project.

The daily heavy vehicle (HV) percentage is approximately 16% along Wollar Road and Ulan-Wollar Road and around 9% along Ulan Road. This percentage stays relatively consistent during construction (PY2), however represents a greater increase in the number of HV within the region. The HV percentage drops in PY9, as construction ceases and the mine is fully operational.

Table 6.9 Daily mid-block traffic volumes

ID	Location	Daily Base two-way flow (%HV)	Construction (PY 2)		Dual Mine Operation (PY 9)	
			Daily Project two-way flow (%HV)	Daily traffic increase (%)	Daily Project two-way flow (%HV)	Daily traffic increase (%)
M-01	Wollar Road north of Bylong Valley Way	104 (17%)	478 (13%)	461%	276 (4%)	266%
M-02	Ulan-Wollar Road (Barigan Street) within Village	138 (15%)	26 (15%)	19%	15 (5%)	11%
M-03	Wollar Road west of Ulan-Wollar Road	150 (16%)	452 (13%)	302%	261 (4%)	174%
M-05	Ulan Road south of Wollar Road	3945 (10%)	452 (13%)	11%	261 (4%)	7%

Table 6.9 shows that although there is a large percentage increase in daily traffic due to the Project traffic (Table 6.10), the mid-block road capacity continues to operate at good levels of service, with ample spare capacity. The mid-block Level of Service (LoS) is based on the Cumulative weekday AM peak hour volumes, which represent the highest number of vehicles in a one hour period, including vehicles from background community traffic, other coal mines, quarry and the Project.

Table 6.10 Weekday AM peak mid-block Level of Service

ID	Location	Base Case		Cumulative (PY 2)		Cumulative (PY 9)	
		AM (vph)	LoS	AM (vph)	LoS	AM (vph)	LoS
M-01	Wollar Road north of Bylong Valley Way	3	A	196	A	137	A
M-02	Ulan-Wollar Road (Barigan Street) within Village	5	A	35	A	28	A
M-03	Wollar Road west of Ulan-Wollar Road	8	A	194	A	137	A
M-05	Ulan Road south of Wollar Road	338	A	718	B	548	A

6.4 Road impacts

Given the low amount of traffic generated by the Project over a daily and peak hourly period, and given the existing low volumes of traffic, only minimal impacts are foreseen on the surrounding road network. Road mid-block capacities and intersection performance on Bylong Valley Way, Upper Bylong Road and Wollar Road will continue to perform well within capacity with the introduction of Project traffic.

The closure of Upper Bylong Road may impact on property accesses to the east and south of the Project. As discussed in Section 3.5.1, KEPCO has proposed the construction of the Realignment of Upper Bylong Road to the east and the North Link Road to provide access to southern neighbours. The closure of Upper Bylong Road in the absence of the North Link Road will increase travel times for residents to the south of the Project by up to 30 minutes, if they utilised Lee Creek Road to access Bylong Valley Way (and Bylong Village) in its current state.

6.5 Pavement impacts

Pavement deterioration is expected due to increased vehicle movements and particularly increased truck traffic. It is suggested that road dilapidation inspections be undertaken where the Project is likely to result in additional heavy vehicles traffic usage of the MWRC's maintained road network on a sustained basis. Further information is provided in section 8 of the report.

6.6 Public transport impacts

No public transport impacts are envisaged. School bus operation between Wollar and schools located within Mudgee will not coincide with work shifts for construction or during mine operation nor coincide with school start or finish times. Project related traffic throughout the course of the day and likely to travel during peak school periods is anticipated to be negligible and will not impact on school bus route safety.

6.7 Pedestrian and cyclist impacts

The Project is likely to generate minimal to no pedestrian or cyclist activity, therefore no additional facilities are considered for these users.

6.8 Rail impacts

Trains to and from the Project will not travel across the level railway crossing on either Bylong Valley Way (east of Wollar Road) or the Projects underground mine access road. Trains will enter and exit the Project's rail loop to the east and prior to both these level railway crossings. Vehicle delays for Project related traffic are anticipated at the existing level railway crossings (due to train movements to and from other mines further west); however these delays will be insignificant due to infrequent and the low volume of train movements throughout the day.

7. Mitigation measures

This section discusses the recommended mitigation measures to remove or ameliorate any Project related impacts.

7.1 Provision of shuttle bus

Shuttle buses are proposed to transport workers between the WAF and the mine sites. These shuttle buses are anticipated to operate at the start and end of both the construction shift and mining operation shifts. The shuttle buses are assumed to have a capacity of 50 persons per bus. The provision of shuttle buses will reduce and limit the number of light vehicle movements to and from the mine sites and reduce the staff parking requirements on site. The use of shuttle buses has been included in the assessment to further minimise traffic impacts.

There is potential to continue the operation of all or part of the car park at the WAF site after the closedown of the WAF and for the life of the Project, as required. This would reduce the volume of private vehicles parked at the mine site and shuttle buses would continue to transport staff between the car park and the mine site, reducing vehicle volumes on Bylong Valley Way and via mine accesses as well as the Bylong Valley Way intersections with Upper Bylong Road and Wollar Road.

7.2 Speed and fatigue management

Speed and fatigue are common crash risk factors across NSW and are possible factors in the crash data assessed. This is particularly true for miners who tend to work long (12 hour) shifts and many travel up to an hour from home to attend their shift, where private vehicle travel is the only viable mode.

Speed and fatigue management strategies are a key part of minimising the risk of crashes and thus the impact of mine traffic on the local road network. For example as a crash mitigation measure, a shuttle bus will be provided for staff travelling from the WAF (as discussed in section 7.1). This will eliminate the risk altogether for those mine workers, particularly as they will be residing at the WAF during the earlier years of the Project.

Further to this and subject to future assessment, there is potential to provide Mudgee to Bylong mine bus services which would transport mine staff. This would remove additional traffic from Wollar Road and Bylong Valley Way and reduce the hazards associated with speed and/or fatigued mine staff.

For other workers living within one hour of the site, road safety improvements and intersection upgrades are proposed for several roads and intersections surrounding the site. These are discussed in section 3.6 and section 7.3 of this report. Improvements which relate to speed and fatigue management include improved road alignment (particularly reduction of long straight segments), improved sight distances and tactile road markings, and clear zones on either side of the roadway in addition to other road upgrades.

7.3 Road safety improvements

Several measures are recommended to improve general road safety for travel to and from the Project sites. Some of the road safety improvements include:

- Road widening and upgrade of Upper Bylong Road including realignment by MWRC with monetary funding by KEPCO.
- Improved intersection layout and intersection throat widening to assist vehicle turning movements for the intersections of Bylong Valley Way/Upper Bylong Road and Bylong Valley Way/Wollar Road by MWRC with support of regional funding from MWRC and the NSW State Government (Resources for Regions Grants Program).
- Improved intersection layout and intersection throat widening to assist vehicle turning movements for the intersection of Bylong Valley Way/WAF access by MWRC with monetary funding by KEPCO.
- Improved level rail crossing access road alignment and storage area for vehicle queuing on Bylong Valley Way by MWRC with monetary funded by a $14m grant which has been secured for the upgrade under the NSW Resources for Regions Grants Program.
- Sealing of Wollar Road for approximately 17 km with shoulders either side by MRWC with monetary funded by a $14m grant which has been secured for the upgrade under the NSW Resources for Regions Grants Program.
- improved signage (sight boards, give way) and linemarking (centre linemarking, yield line marking, tactile markings)
- trim tree branches and remove kerbside overgrown vegetation
- schedule vehicle movements outside of school drop and pick up periods
- potential for bus services between Mudgee and Bylong mine subject to future assessment
- potential for train freight carrying bulk materials, subject to future assessment and discussions surrounding rail line capacity.

It is suggested that a formal road safety audit be completed on the existing road conditions, in order to confirm the most appropriate road upgrade measures.

7.4 Management and maintenance of Bylong Valley Way

KEPCO have been in ongoing discussion with MWRC about the management and maintenance of Bylong Valley Way. This management and maintenance strategy will be finalised between KEPCO and MWRC before the commencement of mining operations.

7.5 Rail safety improvements

Several measures are recommended to improve rail safety for vehicles crossing the railway line to and from the Project sites. Some of the potential rail safety improvements include:

- boom gates and flashing lights (particularly for fog and wet weather conditions)
- signs (rail crossing, stop) and lines (stop lines)
- staff induction and awareness

- timetable vehicle movements, deliveries, shift start and end times outside of when rail line in use
- sight distance and vehicle storage improvements (increased length of access road between rail line and Upper Bylong Road)
- street lighting.

7.6 Project site accesses

New roads and intersections will be built for vehicle access to the mine sites.

The upgraded Upper Bylong Road will provide direct entry to the open cut MIA and also the underground MIA. A new road will be built between the upgraded Upper Bylong Road and the existing level railway line and the proposed underground MIA. This road will provide adequate storage area for queued vehicles, improved sight distance for drivers due to the roadway being built perpendicular to the railway line and a T-junction with the underground MIA access road.

The existing driveway to the proposed WAF will be upgraded to allow two lane two-way vehicle travel on the access road connecting with Bylong Valley Way. The throat of the intersections will be widened to accommodate heavy vehicle turning vehicle movements.

7.7 Permit and pilot vehicle requirements

All oversize and overmass loads will be accompanied by escort vehicles in accordance with the relevant roads authority requirements to ensure the safety of all road users. The transportation contractor is to obtain the necessary permits and notify Council and the RMS on behalf of the contractor when transportation movements are proposed to commence.

7.7.1 Specific permits

The oversize transport vehicles will be regarded as Restricted Access Vehicles (RAVs). In accordance with RMS's *Operating Conditions: Specific permits for oversize and overmass vehicles and loads, 2008*, the operators of oversize and overmass must carry the relevant General Class 1 Oversize Notice and also be required to apply to the RMS for a specific permit to allow them to travel in NSW when the height, width or length of a vehicle exceeds any of the maximum dimension limits specified in Table 7.1.

Table 7.1 Statutory dimension limits for oversize load-carrying vehicle

Vehicle type	Height (m)	Width (m)	Length (m)
Loaded rigid motor vehicle	4.3	3.5	12.5
Loaded combination consisting of prime mover and a semi-trailer	4.3	3.5	19.0
Loaded rigid vehicle and trailer combination	4.3	3.5	19.0
Unloaded articulated low loader	4.3	2.5	19.0
Unloaded articulated low loader with eight tyres per axle	4.3	2.7	25.0

Source: Operating Conditions: Specific permits for oversize and overmass vehicles and loads, RMS, 2008

The overmass permit is also required when the gross weight of a vehicle exceeds 42.5 tonnes.

7.7.2 Pilot vehicles

The responsibilities of a pilot vehicle are to provide advance warning to approaching traffic and to be positioned to give adequate warning to other road users.

Based on RMS's *Operating Conditions*, pilot vehicles are required when delivery vehicle travel in NSW during the night time if:

- a vehicle's width is less than or equal to 3.5 m and its length is less than or equal to 25 m, two pilot vehicles are required on restricted roads
- a vehicle is wider than 3.5 m or longer than 25 m, two pilot vehicles are required for travel on all roads
- a vehicle is wider than 5.5 m or longer than 35 m, two pilot vehicles are required and the vehicle operator must notify police prior to travel.

7.8 School bus route safety

It is proposed that Project related vehicle movements during both construction and operation be limited to travel during school drop off and pick up periods. Bylong Upper School closed in 2015. Project related travel impacts on Wollar Public School are negligible. School bus travel between Wollar and Mudgee would not coincide with shift start or end times and therefore no impacts to this bus service are envisaged.

7.9 General Project requirements

The objectives of the Project will be to:

- ensure public safety
- ensure that affected local residents are advised of any disruption to traffic flows, parking and public transport services
- ensure that disruptions to traffic flows on public streets are minimised and, where unavoidable, managed in consultation with the relevant road authority
- provide alternative access routes to local residents that may be impacted by road closures
- ensure that disruptions to road users as a result of blasting activities are minimised
- provide ample notice to local residents advising them of the temporary road closures required for the realignment of Upper Bylong Road and minimise the disruption where possible
- minimise the exposure of the community to heavy construction vehicle traffic impacts and associated noise and vibration
- ensure safe access to work site including sight distance
- ensure that road damage from construction traffic is monitored and addressed in consultation with the relevant road authority.

To ensure the key objectives are achieved, the following mitigation actions will be undertaken during the construction phase:

- signs will be provided at each access point to assist in deliveries to each work site
- traffic controllers will be located at Project access points where increased vehicle movements are anticipated

- traffic control measures such as portable traffic signals or traffic controllers will be positioned at either end of sections of road where two way traffic is not feasible by heavy vehicles simultaneously with a one lane one way traffic system operating between traffic control on Upper Bylong Road
- an emergency response plan will be developed for construction traffic incidents
- a pre and post construction assessment of road pavement assets will be conducted in areas likely to be used by construction traffic
- consideration of flooding on access roads and the use of alternative access roads
- implement measures so that mud or gravel is not tracked onto the road network from the access roads by construction vehicles
- public communications will be conducted to warn the community and local residents of vehicle movements and anticipated effects on the local road network relating to the site works
- access to all private properties adjacent to the works will be maintained during construction
- during Project inductions all heavy vehicle drivers will be provided with the emergency response plan for construction traffic incidents as well as safety measures for the level railway crossings
- undertake road safety audits where required or deemed necessary
- coordination of project staging, vehicle movement and scheduling, equipment and resourcing.

7.10 Construction methods

Construction methods will seek to manage the construction traffic impacts for the following:

- traffic management and vehicle queueing on the narrow sections of Upper Bylong Road where two lane two-way traffic for heavy vehicles simultaneously is not feasible during the construction stage
  - use traffic controllers or temporary traffic signals to manage traffic flows
  - limit simultaneous two way heavy vehicle use of Upper Bylong Road during construction
  - provide necessary warning signage and linemarking of the changed traffic conditions
- heavy vehicle traffic:
  - minimise the number of heavy vehicle trips on road
  - minimise the distance travelled by heavy vehicles by encouraging multi-drop delivery trips
  - minimise disruption on the local road network by using nominated haulage routes, which aim to avoid sensitive areas such as schools (wherever possible)
  - minimise the running of empty trucks
- construction worker traffic:
  - encourage the use of alternative travel modes to the work sites. Encourage car ‘pooling’ where possible
  - potential introduction of bus service between Mudgee and Bylong mine site subject to future investigation and upgrade of Wollar Road
  - provide emergency vehicle parking within worksites
- temporary worksite access:
  - use existing accesses wherever possible
  - use traffic controllers to manage site access
  - close and lock site access points/gates after construction hours
  - minimise construction traffic during school start and end times near schools.

7.11 Subsidence and extraction management plan

The impacts of subsidence will be managed according to the Extraction Plans to be developed for respective longwall panels. The subsidence impacts to the existing Bylong Valley Way structure will be managed by carrying out various monitoring and mitigation works on the road structure. KEPCO will conduct a range of visual inspections and monitoring over the area subject to underground mine subsidence to identify the impacts as they are occurring and confirming any mitigation measures that need to be implemented to ensure road safety issues are appropriately managed. These are discussed further within the response to submissions document.

7.12 Property access

KEPCO will work in close collaboration with the MWRC, Forests NSW, DPI Water and various local residents within the study area affected by the Project to make sure that property access is maintained and that adequate roadway is provided for servicing properties. This will include consultation in relation to the various road closures, road upgrades and realigned existing roads.

8. Road dilapidation

Road dilapidation inspections should be undertaken where the Project is likely to result in additional heavy vehicles traffic usage of the MWRC's maintained road network on a sustained basis. The inspections should consider the pavement and drainage structure in consultation with the RMS and MWRC prior to the commencement of construction and after construction is complete. Any damage resulting from construction of the Project, beyond normal wear and tear, should be repaired unless alternative arrangements are made with the relevant road authority.

9. Subsidence assessment

The effects of underground mining on roads will result in ground movement. This could include vertical subsidence, horizontal strains, ground curvature and tilt. Subsidence may impact on road geometry, structures and water courses.

The subsidence effects associated with the underground mining operations for the Project are anticipated to result in impacts to the local road network in the vicinity of the Subsidence Impact Limit. Subsidence effects will likely result in modified drainage characteristics on the road surface and surrounds (including additional ponding) and may cause road surfaces to crack and potentially experience heaving effects.

KEPCO is committed to ensuring that any impacts on the local road network due directly to subsidence are remediated to ensure the ongoing safety of the road network. Ongoing visual inspections of the public road network (referring to Bylong Valley Way) within the Subsidence Study Area will be undertaken during the active subsidence period to identify any areas on the network requiring immediate attention by KEPCO in consultation with and to the approval of MWRC.

10. Construction traffic management

Prior to any construction commencing, a Construction Traffic Management Plan should be prepared as part of the pre-construction planning. The construction traffic management plan should detail how the traffic associated with the construction will be managed in accordance with the Roads and Traffic Authority 2010, *Traffic Control at Work Sites*, as well as relevant Australian Standards including AS1742.

The Construction Traffic Management Plans should be developed for the narrow section of Upper Bylong Road during the construction period where two-way simultaneous heavy vehicle traffic movements are not considered feasible. Plans should also be developed for the road upgrades, road widening and new intersections with particular attention to those locations in close proximity of the railway line and level railway crossings.

The Construction Traffic Management Plan should also be used to develop site-specific traffic management measures once the construction methods and haulage routes are finalised. These measures should be developed as part of the site-specific management plans to indicate how traffic should be controlled and managed during each stage of the construction.

The Construction Traffic Management Plan should contain the following information:

- The proposed works and construction traffic impacts:
  - Proposed construction activities.
  - Estimated duration of the works.
  - Increased traffic volume by vehicle type.
  - Anticipated or designated routes for the delivery of materials and equipment.
  - Summary of the potential construction impacts on the road network and any feasible measures to reduce the forecast impacts.
- Considerations:
  - Retention of local property and emergency access where practicable.
  - Provide a swept path analysis to ascertain that sufficient manoeuvring space is provided for all vehicles at intersections along the haulage routes.
  - Warning signs to advise road users in advance of work zones and surrounding intersections.
  - Safety signage to be installed to warn construction vehicle drivers of the presence of cyclists and pedestrians.
  - U-turn facilities for construction vehicles where necessary.
  - Emphasis on the school bus routes.
  - Repair damaged road pavement and pavement shoulder.
- Stakeholders:
  - The main stakeholders in the Construction Traffic Management Plan.
  - Roles and responsibilities of all stakeholders.
  - Contact details for all stakeholders.

- The person responsible for developing, updating and implementing the plan.
- Any required approvals and licenses.

- Community consultation:
  - Direct consultation with affected residents who are directly impacted by road closures are involved and informed of KEPCO plans to minimise transport impacts
  - Letterbox drops to local residents advising of potential property access restrictions (if required).
  - Signposting and advertising to warn motorists of proposed road closures and traffic diversions and other temporary traffic arrangements.
  - Advertisements in local newspapers.

Traffic control plans should be prepared as part of the Construction Traffic Management Plan for specific stages of work or locations as required. A review of temporary road work traffic control measures, signage and speed limits in areas of potential risk will also be undertaken.

The construction traffic management plan should also outline procedures to audit implementation of the plan and particularly to ensure safety aspects are being observed.

The Construction Traffic Management Plan should be prepared in consultation with and to the approval of the MWRC as the relevant roads authority.

11. Conclusions

The Project is remotely located within the Bylong Valley, which is primarily accessed by the Bylong Valley Way which links the Golden Highway to the north-east with the Castlereagh Highway to the south-east.

KEPCO has held discussions with the MWRC in relation to the upgrades to Wollar Road. The upgrade of the Wollar Road will place Mudgee within less than a 1 hour drive from the Project and make it an attractive and suitable place of residence for the Project employees and support local MWRC community. KEPCO will continue to consult with the Muswellbrook Shire Council (MSC) following the receipt of their late submission following the public exhibition of the EIS with queries relating to Project-related traffic use of Bylong Valley Way to the east of the Project.

The Project's impacts on the existing road and rail network have been assessed utilising the various environmental planning instruments, policies, guidelines and plans including the RMS Guide to Traffic Generating Developments, Austroads Guides to Road Design and Traffic Studies and RMS Supplements.

This report provides an updated Traffic and Transport Impact Assessment to address various stakeholder comments on the EIS. This report now considers the regional and local study areas, as opposed to a more localised study area.

The assessment has shown that the Project will have a minimal impact on the surrounding road network in terms of road traffic, including the cumulative impacts with neighbouring mines. The Bylong Valley Way, Upper Bylong Road and Wollar Road will continue to operate within plenty of spare capacity and at more than reasonable levels of service throughout the life of the Project.

Only small impacts to the operation of the Wollar Road/Ulan–Wollar Road and Wollar Road/Ulan Road intersections are anticipated during peak Project traffic periods.

The assessment of the potential implications of the Project on the capacity of the rail network has determined that ARTC is well prepared for the additional capacity required for the Project. Accordingly, minimal impacts are anticipated to the capacity of the Sandy Hollow to Gulgong Railway Line.

The Project proposes to upgrade existing roads and intersections and build new roads and intersections as required. Road upgrades include the widening of Upper Bylong Road between Bylong Valley Way and the open cut MIA, the realignment of Upper Bylong Road to the east, a new access road from Upper Bylong Road to the underground MIA and the improvements to the existing driveway access from Bylong Valley Way to the proposed WAF.

The closure of Upper Bylong Road south of the open cut mine area may potentially impact residents to the south. However, as part of the response to submissions, KEPCO has identified the proposal to construct the North Link Road to provide an alternate access for these landholders in the event compensation or acquisition is not received. Other alternative routes considered within the EIS were to include Lee Creek Road or Budden Gap Road; however due to the state of these roads being unsealed, these would be undesirable alternatives.

KEPCO is in discussions with the affected landholders regarding acquisition or compensation for the potential impacts associated with the proposed decommissioning of Upper Bylong Road.

Subsidence related impacts will be managed according to relevant mine planning protocols, and will endeavour to manage and maintain any impacts to the road surface.

Several mitigation measures have been proposed to manage the Project related impacts as identified within this assessment.

The Projects impacts on the road network is minor and the surrounding road network and access intersections to the Project site have ample spare capacity to accommodate Project related traffic movements.

The Projects impacts on the rail network are minor with ample spare capacity provided on the Sandy Hollow to Gulgong Railway line. The Projects rail loop has also been designed not to impact or interfere with train movements on the main line (Sandy Hollow to Gulgong Railway line).

12. References

The following documents were referenced in preparation of this study:

- *Bylong Coal Project, Gateway Certificate Application Supporting Document* – Hansen Bailey (January 2014).
- *Bylong Coal Project – Feasibility Study Chapter 13* – Parsons Brinckerhoff (August 2014).
- *Bylong Coal Project – Pit to Port Logistics Study* – Hatch (July 2014).
- *Bylong Quarry Project, Traffic Assessment* – Wells Environmental (January 2012).
- *Development Control Plan 2013* – Mid-Western Regional Council (December 2013).
- G*uide to Traffic Generating Developments* – Roads and Maritime Services (2002).
- *Guide to Traffic Management Part 3: Traffic Studies and Analysis* – Austroads (2009).
- *Guide to Road Design Part4A: Unsignalised and Signalised Intersections* – Austroads (2010).
- *Moolarben Coal Project Stage 2, Traffic Impact Assessment Final, Appendix 12* – SKM (November 2008).
- *Mount Penny Coal Project, Traffic Impact Assessment* – SKM (February 2012).
- *Operating Conditions: Specific permits for oversize and overmass vehicles and loads* – Roads and Maritime Services (2008).
- *NSW Dangerous Goods (Roads and Rail Transport) Regulation* – NSW Government (2009).
- *Social Impact Assessment Assumptions* – Hansen Bailey (2014).
- *The Ulan Coal Continued Operations Project at Ulan, Appendix 13* – Transport & Urban Planning (August 2009).
- *Wilpinjong Coal Project, Road Transport Assessment, Appendix K* – Traffix (April 2005).
- *Wilpinjong Extension Project Road Transport Assessment* - GTA Consultants (October 2015).
- *2015–2024 Hunter Valley Corridor Capacity Strategy* – ARTC (July 2015).

Appendix A

RMS crash data

Detailed Crash Report

Transport for NSW — Centre for Road Safety

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
Hunter Region																										
Muswellbrook LGA																										
Baerami																										
Bylong Valley Way																										
780098	P	30/12/2011	Fri	12:05	6 km	W	BAERAMI CREEK RD	2WY	CRV	Fine	Dry	100	1	UTE	M41	W in BYLONG VALLEY WAY	60	Proceeding in lane	NC	0	0	0	0	0	S	
E46604512								RUM	87	Off lft/lft bnd=>obj				Embankment												
1036657	P	31/05/2014	Sat	11:10	20 km	W	GOLDEN HWY	2WY	STR	Fine	Dry	100	1	M/C	M49	E in BYLONG VALLEY WAY	90	Proceeding in lane	UC	0	0	0	0	1		
E54781913								RUM	70	Off road to left																
1032945	P	11/07/2014	Fri	15:00	2 km	E	YARRAWA RD	2WY	STR	Fine	Dry	100	1	TRK	M19	E in BYLONG VALLEY WAY	100	Proceeding in lane	NC	0	0	0	0	0		
E219090895								RUM	72	Off road to right																
769962	P	26/08/2011	Fri	03:30	11.4 km	W	YARRAWA RD	2WY	CRV	Fine	Dry	100	1	SEM	M37	E in BYLONG VALLEY WAY	60	Proceeding in lane	NC	0	0	0	0	0	S	
E48017481								RUM	81	Off left/rt bnd=>obj				Fence (prior to 2014)												
Golden Hwy																										
734490	P	30/11/2010	Tue	17:20	10 km	W	BYLONG VALLEY WAY	2WY	STR	Overcast	Wet	100	2	TRK	F18	W in GOLDEN HWY	90	Pull out opposite	MC	0	0	1	1	0		
E43160071								RUM	50	Head on (overtake)				4WD	M62	E in GOLDEN HWY	95	Proceeding in lane								
Kerrabee																										
Bylong Valley Way																										
754600	P	02/04/2011	Sat	17:23	30.4 km	W	GOLDEN HWY	2WY	CRV	Fine	Wet	Unk	1	M/C	M60	W in BYLONG VALLEY WAY	100	Proceeding in lane	SC	0	1	0	0	0		
E44264019								RUM	81	Off left/rt bnd=>obj				Tree/bush												
800446	P	15/06/2012	Fri	06:10	38 km	W	GOLDEN HWY	2WY	CRV	Fog or mist	Dry	Unk	1	LOR	M29	W in BYLONG VALLEY WAY	30	Proceeding in lane	MC	0	0	1	0	0	S	
E48808563								RUM	85	Off rt/lft bnd=>obj				Fence (prior to 2014)												
742504	P	17/02/2011	Thu	05:30	50 m	W	KERRABEE PARK GTE	2WY	CRV	Fog or mist	Dry	100	1	LOR	M38	W in BYLONG VALLEY WAY	90	Proceeding in lane	NC	0	0	0	0	0		
E44434353								RUM	80	Off left/right bend																
742498	P	17/02/2011	Thu	05:15	70 m	W	KERRABEE PARK GTE	2WY	CRV	Fog or mist	Dry	100	1	TRK	M34	W in BYLONG VALLEY WAY	100	Proceeding in lane	OC	0	0	0	1	0	S	
E43929058								RUM	81	Off left/rt bnd=>obj				Fence (prior to 2014)												
815925	P	21/10/2012	Sun	15:30	?2.333 km	E	UPPER BYLONG RD	2WY	CRV	Fine	Dry	100	1	M/C	M45	N in BYLONG VALLEY WAY	50	Proceeding in lane	SC	0	1	1	0	0	S	
E95364601								RUM	88	Out of cont on bend																
844913	P	20/07/2013	Sat	06:30	1.3 km	W	WIDDEN VALLEY RD	2WY	CRV	Raining	Wet	80	1	CAR	M32	W in BYLONG VALLEY WAY	75	Proceeding in lane	NC	0	0	0	0	0	S	
E52001647								RUM	81	Off left/rt bnd=>obj				Tree/bush												
1039524	P	28/08/2014	Thu	11:30	21 km	E	WOLLAR RD	2WY	STR	Fine	Dry	40	1	TRK	M28	E in BYLONG VALLEY WAY	25	Proceeding in lane	NC	0	0	0	0	0		F
E55288624								RUM	70	Off road to left																
842381	P	23/06/2013	Sun	14:10	22 km	N	WOLLAR RD	2WY	CRV	Raining	Wet	100	1	TRK	M60	N in BYLONG VALLEY WAY	25	Proceeding in lane	OC	0	0	0	1	0	S	
E52391951								RUM	84	Off right/left bend																

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
1023143	P	09/03/2014	Sun	14:00	22.8 km	N	WOLLAR RD	2WY	CRV	Fine	Dry	40	1	M/C	M49	N in BYLONG VALLEY WAY	50	Proceeding in lane	UC	0	0	0	0	1	S
E55010639								RUM	88	Out of cont on bend															
Sandy Hollow																									
Bylong Valley Way																									
810729	P	15/09/2012	Sat	00:50	5 km	S	GOLDEN HWY	2WY	STR	Fine	Dry	100	1	UTE	M48	S in BYLONG VALLEY WAY	85	Proceeding in lane	OC	0	0	0	1	0	F
E49188903								RUM	73	Off rd rght => obj				Utility pole											
837422	P	18/05/2013	Sat	22:30	1 km	N	YARRAWA RD	2WY	CRV	Fine	Dry	100	1	TRK	F20	S in BYLONG VALLEY WAY	90	Proceeding in lane	OC	0	0	0	1	0	S
E51237052								RUM	81	Off left/rt bnd=>obj				Fence (prior to 2014)											
Widden																									
Bylong Valley Rd																									
788940	P	24/03/2012	Sat	11:35	26 km	W	GOLDEN HWY	2WY	CRV	Fine	Dry	100	1	M/C	M51	W in BYLONG VALLEY RD	Unk	Proceeding in lane	SC	0	1	0	0	0	S
E48270653								RUM	80	Off left/right bend															
Bylong Valley Way																									
1040408	P	05/09/2014	Fri	06:30	26 km	S	GOLDEN HWY	2WY	CRV	Fine	Dry	40	1	TRK	M48	E in BYLONG VALLEY WAY	100	Proceeding in lane	NC	0	0	0	0	0	S F
E55832048								RUM	85	Off rt/lft bnd=>obj				Tree/bush											
707388	P	24/04/2010	Sat	22:00		at	WIDDEN VALLEY RD	TJN	CRV	Raining	Wet	80	1	CAR	M20	W in BYLONG VALLEY WAY	80	Proceeding in lane	NC	0	0	0	0	0	
E42526085								RUM	84	Off right/left bend															
821119	P	21/12/2012	Fri	14:00		at	WIDDEN VALLEY RD	TJN	CRV	Fine	Dry	80	1	M/C	M58	W in BYLONG VALLEY WAY	60	Proceeding in lane	MC	0	0	1	0	0	S
E168768197								RUM	88	Out of cont on bend															
714065	P	18/04/2010	Sun	16:45	1 km	W	WIDDEN VALLEY RD	2WY	CRV	Fine	Dry	100	1	CAR	F32	W in BYLONG VALLEY WAY	60	Proceeding in lane	OC	0	0	0	1	0	S
E41171374								RUM	86	Off left/left bend															
Western Region																									
Mid-Western Regional LGA																									
Breakfast Cree																									
Bylong Valley Way																									
796964	P	27/07/2012	Fri	12:00	10 km	N	BREAKFAST CREE RD	2WY	CRV	Fine	Dry	100	1	4WD	M67	N in BYLONG VALLEY WAY	100	Proceeding in lane	FC	1	0	0	0	0	S
E49183567								RUM	85	Off rt/lft bnd=>obj				Signpost											
708933	P	12/05/2010	Wed	14:30	6.6 km	N	BREAKFAST CREE TN	2WY	CRV	Fine	Dry	100	1	M/C	M U	E in BYLONG VALLEY WAY	50	Proceeding in lane	OC	0	0	0	1	0	S
E41239528								RUM	88	Out of cont on bend															
781054	P	29/12/2011	Thu	16:00	10.5 km	N	LUE RD	2WY	CRV	Fine	Dry	80	1	M/C	M50	S in BYLONG VALLEY WAY	80	Proceeding in lane	MC	0	0	1	0	0	S F
E46952946								RUM	80	Off left/right bend															
Budden																									
Bylong Valley Way																									

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
1034040	P	29/05/2014	Thu	20:00		at	NUMBER 6280 HN	2WY	STR	Fine	Dry	100	1	CAR	F18	S in BYLONG VALLEY WAY	80	Proceeding in lane	UC	0	0	0	0	1			F
E55536574								RUM	70	Off road to left																	
Bylong																											
Bylong Valley Way																											
791954	P	26/11/2011	Sat	10:00	225 m	S	BYLONG RIVER BDGE	2WY	CRV	Fine	Dry	100	1	M/C	M53	W in BYLONG VALLEY WAY	80	Proceeding in lane	MC	0	0	1	0	0	S		
E47463005								RUM	88	Out of cont on bend																	
783110	P	27/01/2012	Fri	18:55	8 km	E	BYLONG TN	2WY	CRV	Overcast	Dry	100	1	M/C	M56	E in BYLONG VALLEY WAY	80	Proceeding in lane	SC	0	1	0	0	0			
E47243029								RUM	85	Off rt/lft bnd=>obj				Drain/culvert													
742325	P	11/02/2011	Fri	17:30	4.8 km	S	BYLONG TN	2WY	CRV	Fine	Dry	100	1	CAR	F23	S in BYLONG VALLEY WAY	90	Proceeding in lane	SC	0	1	0	0	0	S		
E44367065								RUM	83	Off rt/rt bnd=>obj				Fence (prior to 2014)													
810285	P	22/11/2012	Thu	18:15	5 km	S	BYLONG TN	2WY	CRV	Fine	Dry	100	1	M/C	M57	N in BYLONG VALLEY WAY	Unk	Proceeding in lane	FC	1	0	0	0	0	S	F	
E237157593								RUM	81	Off left/rt bnd=>obj				Tree/bush													
845307	P	04/07/2013	Thu	14:00	6.25 km	S	BYLONG TN	2WY	STR	Fine	Dry	80	1	CAR	F19	N in BYLONG VALLEY WAY	75	Proceeding in lane	NC	0	0	0	0	0		F	
E51585617								RUM	70	Off road to left																	
829374	P	09/03/2013	Sat	13:20	5.62 km	N	KILLENS RD	2WY	CRV	Fine	Dry	100	2	M/C	M41	N in BYLONG VALLEY WAY	90	Incorrect side	SC	0	1	0	0	0	S		
E50347370								RUM	20	Head on				WAG	M68	S in BYLONG VALLEY WAY	40	Proceeding in lane									
816751	P	08/11/2012	Thu	07:35	800 m	N	LEE CREEK RD	2WY	CRV	Overcast	Dry	100	1	4WD	M51	N in BYLONG VALLEY WAY	90	Proceeding in lane	NC	0	0	0	0	0	S		
E49948279								RUM	81	Off left/rt bnd=>obj				Fence (prior to 2014)													
769616	P	11/09/2011	Sun	04:40	3.155 km	N	LEE CREEK RD	2WY	CRV	Fine	Dry	100	1	4WD	M30	S in BYLONG VALLEY WAY	70	Proceeding in lane	NC	0	0	0	0	0	S		
E48174181								RUM	82	Off right/right bend																	
844910	P	19/07/2013	Fri	12:20	30 km	N	LUE RD	2WY	CRV	Unk	Wet	100	1	CAR	M23	N in BYLONG VALLEY WAY	Unk	Proceeding in lane	NC	0	0	0	0	0			
E219093494								RUM	85	Off rt/lft bnd=>obj				Guide Post													
805107	P	19/05/2012	Sat	14:30	3.63 km	S	LUE RD	2WY	CRV	Fine	Dry	80	1	M/C	M33	S in BYLONG VALLEY WAY	80	Proceeding in lane	SC	0	1	0	0	0			
E47947211								RUM	86	Off left/left bend																	
800474	P	17/06/2012	Sun	19:20		at	MURRUMBO CK	2WY	CRV	Fine	Wet	80	1	CAR	M27	W in BYLONG VALLEY WAY	80	Proceeding in lane	MC	0	0	1	0	0	S		
E49028778								RUM	86	Off left/left bend																	
777871	P	14/12/2011	Wed	18:45	2.9 km	W	MURRUMBO GTE	2WY	CRV	Fine	Dry	100	2	OMV	U U	E in BYLONG VALLEY WAY	Unk	Incorrect side	NC	0	0	0	0	0			
E46298527								RUM	20	Head on				4WD	F53	W in BYLONG VALLEY WAY	80	Proceeding in lane									
698582	P	06/02/2010	Sat	16:45	45 km	N	RYLSTONE TN	2WY	STR	Raining	Wet	100	1	M/C	M70	S in BYLONG VALLEY WAY	Unk	Proceeding in lane	SC	0	1	0	0	0		F	
E42326888								RUM	74	On road-out of cont.																	
722183	P	02/07/2010	Fri	18:00		at	SERVICE SN	2WY	STR	Raining	Wet	50	2	TRK	M33	S in BYLONG VALLEY WAY	Unk	Proceeding in lane	NC	0	0	0	0	0			
E190058093								RUM	73	Off rd rght => obj				TRK		N in BYLONG VALLEY WAY	0	Parked									
769008	P	04/09/2011	Sun	09:50	5 km	E	UPPER BYLONG RD	2WY	CRV	Fine	Dry	100	1	M/C	F48	E in BYLONG VALLEY WAY	80	Proceeding in lane	SC	0	1	0	0	0			
E45771866								RUM	67	Struck animal				Kangaroo													

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
795099	P	07/05/2012	Mon	13:30	5 km	E	UPPER BYLONG RD	2WY	CRV	Fine	Dry	100	1	CAR	M60	W in BYLONG VALLEY WAY	80	Proceeding in lane	OC	0	0	0	1	0	S		
E49896889								RUM	83	Off rt/rt bnd=>obj				Embankment												
726797	P	01/10/2010	Fri	15:00	15 m	N	UPPER BYLONG RD	2WY	CRV	Fine	Dry	50	2	WAG	M55	W in BYLONG VALLEY WAY	15	Perform U-turn	OC	0	0	0	3	0			
E42305818								RUM	40	U turn				LOR	M U	W in BYLONG VALLEY WAY	45	Proceeding in lane								
1051594	P	21/10/2014	Tue	14:20	1.79 km	N	UPPER BYLONG RD	2WY	CRV	Fine	Dry	100	1	M/C	M54	N in BYLONG VALLEY WAY	95	Proceeding in lane	UC	0	0	0	0	1	S		
E56050072								RUM	88	Out of cont on bend																
779065	P	22/12/2011	Thu	16:00	40 m	S	UPPER BYLONG RD	2WY	CRV	Raining	Wet	50	1	4WD	F20	S in BYLONG VALLEY WAY	50	Proceeding in lane	NC	0	0	0	0	0			
E46937728								RUM	85	Off rt/lft bnd=>obj				Utility pole												
831727	P	13/01/2013	Sun	13:00	3 km	E	WOLLAR RD	2WY	CRV	Fine	Dry	100	1	M/C	M49	E in BYLONG VALLEY WAY	60	Proceeding in lane	MC	0	0	1	0	0	S		
E51154807								RUM	86	Off left/left bend																
1049173	P	09/11/2014	Sun	14:11	4 km	E	WOLLAR RD	2WY	CRV	Fine	Dry	100	1	CAR	M78	W in BYLONG VALLEY WAY	60	Proceeding in lane	UC	0	0	0	0	2	S		
E57162553								RUM	83	Off rt/rt bnd=>obj				Embankment												
Clandulla																											
Bylong Valley Way																											
842719	P	11/05/2013	Sat	15:15		at	COOPER DR	TJN	STR	Fine	Dry	100	1	M/C	F56	W in COOPER DR	20	Proceeding in lane	SC	0	1	0	0	0			
E52313278								RUM	75	Off end of road				Tree/bush												
1035240	P	31/07/2014	Thu	10:00		at	COOPER DR	TJN	STR	Fine	Dry	100	1	SEM	M66	N in BYLONG VALLEY WAY	30	Turning right	NC	0	0	0	0	0	S		
E220498795								RUM	80	Off left/right bend																
780948	P	11/11/2011	Fri	11:50	1.5 km	N	COOPER DR	2WY	CRV	Fine	Dry	100	2	M/C	M22	N in BYLONG VALLEY WAY	100	Pull out opposite	OC	0	0	0	1	0			
E45845637								RUM	53	Overtake turning				M/C	M36	N in BYLONG VALLEY WAY	100	Turning right								
856467	P	23/10/2013	Wed	09:57	1.54 km	N	COOPER DR	2WY	CRV	Fine	Dry	100	1	CAR	F73	N in BYLONG VALLEY WAY	90	Proceeding in lane	OC	0	0	0	1	0			
E52612944								RUM	81	Off left/rt bnd=>obj				Tree/bush												
1006323	P	25/12/2013	Wed	22:45	1.3 km	S	COOPER DR	2WY	CRV	Raining	Wet	100	1	CAR	M25	N in BYLONG VALLEY WAY	90	Proceeding in lane	NC	0	0	0	0	0	S		
E53282723								RUM	85	Off rt/lft bnd=>obj				Tree/bush												
804858	P	24/07/2012	Tue	17:30	2 km	S	COOPER DR	2WY	STR	Fine	Dry	100	1	CAR	F67	N in BYLONG VALLEY WAY	80	Proceeding in lane	NC	0	0	0	0	0			
E49361141								RUM	67	Struck animal				Kangaroo												
1000950	P	07/12/2013	Sat	20:45	3 km	S	COOPER DR	2WY	STR	Fine	Dry	100	1	4WD	M21	N in BYLONG VALLEY WAY	50	Proceeding in lane	NC	0	0	0	0	0			
E53416003								RUM	71	Off rd left => obj				Tree/bush												
773005	P	22/10/2011	Sat	04:21	4.45 km	W	ILFORD RD	2WY	CRV	Fine	Dry	100	1	TRK	M35	E in BYLONG VALLEY WAY	80	Proceeding in lane	OC	0	0	0	1	0	S		
E45963372								RUM	83	Off rt/rt bnd=>obj				Tree/bush												
710655	P	02/05/2010	Sun	15:30	20 km	S	LUE RD	2WY	STR	Fine	Dry	80	1	M/C	M35	N in BYLONG VALLEY WAY	40	Proceeding in lane	SC	0	1	0	0	0		F	
E40766456								RUM	74	On road-out of cont.																
Growee																											
Bylong Valley Way																											

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
716405	P	13/06/2010	Sun	13:30	6.05 km	N	BREAKFAST CREE RD	2WY	CRV	Fine	Dry	100	1	M/C	M45	E in BYLONG VALLEY WAY	60	Proceeding in lane	MC	0	0	1	0	0	S	F
E79391902								RUM	81	Off left/rt bnd=>obj				Fence (prior to 2014)												
717041	P	04/07/2010	Sun	14:00	10 km	N	BREAKFAST CREE TN	2WY	CRV	Fine	Dry	100	1	M/C	M24	N in BYLONG VALLEY WAY	50	Proceeding in lane	SC	0	1	0	0	0	S		
E41622450								RUM	81	Off left/rt bnd=>obj				Fence (prior to 2014)												
1031911	P	05/07/2014	Sat	17:30	7.8 km	N	BREAKFAST CREEK RD	2WY	CRV	Fine	Dry	80	1	TRK	M42	E in BYLONG VALLEY WAY	80	Proceeding in lane	NC	0	0	0	0	0	S		
E194086397								RUM	83	Off rt/rt bnd=>obj				Embankment												
1019326	P	21/02/2014	Fri	12:30	5.95 km	N	BREAKFAST CREEK RD	2WY	CRV	Fine	Dry	80	1	M/C	M35	N in BYLONG VALLEY WAY	35	Proceeding in lane	UC	0	0	0	0	1	S		
E54495768								RUM	88	Out of cont on bend																
1052021	P	29/11/2014	Sat	11:30	10 km	N	BREAKFAST CREEK RD	2WY	CRV	Fine	Dry	80	1	M/C	M58	E in BYLONG VALLEY WAY	80	Proceeding in lane	UC	0	0	0	0	1	S	F	
E241652094								RUM	81	Off left/rt bnd=>obj				Embankment												
1056502	P	20/12/2014	Sat	13:20	10 km	N	BREAKFAST CREEK RD	2WY	CRV	Fine	Dry	80	1	M/C	F27	N in BYLONG VALLEY WAY	80	Proceeding in lane	UC	0	0	0	0	1	S		
E57146268								RUM	81	Off left/rt bnd=>obj				S/Barrier - Guardrail												
1005298	P	06/12/2013	Fri	16:00	1.2 km	N	GROWEE RD	2WY	CRV	Fine	Dry	100	1	4WD	F56	S in BYLONG VALLEY WAY	80	Proceeding in lane	SC	0	1	0	0	0			
E53371756								RUM	67	Struck animal				Kangaroo												
784810	P	18/02/2012	Sat	12:19	16 km	N	LUE RD	2WY	CRV	Fine	Dry	100	1	M/C	M56	N in BYLONG VALLEY WAY	100	Proceeding in lane	SC	0	1	0	0	0	S		
E281197592								RUM	81	Off left/rt bnd=>obj				Fence (prior to 2014)												
1035766	P	02/08/2014	Sat	14:00	8.825 km	N	LUE RD	2WY	CRV	Fine	Dry	80	1	M/C	M68	S in BYLONG VALLEY WAY	80	Proceeding in lane	UC	0	0	0	0	1	S	F	
E55681566								RUM	80	Off left/right bend																
Growee Gulf																										
Bulong Valley Way																										
789556	P	11/02/2012	Sat	13:30	25 km	N	LUE RD	2WY	CRV	Fine	Dry	100	1	M/C	M22	S in BULONG VALLEY WAY	80	Proceeding in lane	SC	0	1	0	0	0	S		
E90799201								RUM	88	Out of cont on bend																
Bylong Rd																										
748506	P	10/04/2011	Sun	17:30	26 km	S	BYLONG TN	2WY	CRV	Raining	Wet	100	1	CAR	F27	N in BYLONG RD	60	Proceeding in lane	OC	0	0	0	1	0			
E44908641								RUM	66	Object on road				Other non fixed object												
Bylong Valley Way																										
765038	P	08/08/2011	Mon	16:00	6.03 km	N	BREAKFAST CREE RD	2WY	CRV	Raining	Wet	80	1	CAR	F19	N in BYLONG VALLEY WAY	50	Proceeding in lane	OC	0	0	0	1	0	S		
E47186285								RUM	80	Off left/right bend																
743112	P	22/02/2011	Tue	14:00	6.27 km	N	BREAKFAST CREE RD	2WY	CRV	Fine	Dry	100	1	M/C	M56	S in BYLONG VALLEY WAY	50	Proceeding in lane	SC	0	1	0	0	0	S		
E43783621								RUM	80	Off left/right bend																
726191	P	15/09/2010	Wed	14:40	3 km	S	GROWEE RD	2WY	CRV	Fine	Dry	100	1	CAR	F63	N in BYLONG VALLEY WAY	50	Proceeding in lane	NC	0	0	0	0	0	S	F	
E44101289								RUM	83	Off rt/rt bnd=>obj				Embankment												

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
706856	P	18/04/2010	Sun	16:00	2 km	W	GROWEE RD	2WY	CRV	Fine	Dry	100	1	M/C	M68	W in BYLONG VALLEY WAY	80	Proceeding in lane	SC	0	1	0	0	0	S		
E241822992								RUM:	80	Off left/right bend																	
807987	P	22/08/2012	Wed	12:30	4.6 km	W	GROWEE RD	2WY	CRV	Fine	Dry	100	1	M/C	M59	E in BYLONG VALLEY WAY	60	Proceeding in lane	OC	0	0	0	1	0	S	F	
E49429474								RUM:	81	Off left/rt bnd=>obj				Fence (prior to 2014)													
769829	P	28/09/2011	Wed	07:30	16.3 km	N	LUE RD	2WY	CRV	Overcast	Wet	Unk	1	M/C	M37	N in BYLONG VALLEY WAY	30	Proceeding in lane	SC	0	1	0	0	0	S		
E46123149								RUM:	83	Off rt/rt bnd=>obj				Fence (prior to 2014)													
826783	P	13/09/2012	Thu	19:30	17 km	N	LUE RD	2WY	CRV	Fine	Dry	80	1	TRK	M22	S in BYLONG VALLEY WAY	60	Pull out opposite	NC	0	0	0	0	0			
E48839923								RUM:	51	Out of control otake																	
840015	P	04/06/2013	Tue	11:45	20 km	N	LUE RD	2WY	CRV	Fine	Dry	100	1	UTE	M20	N in BYLONG VALLEY WAY	80	Proceeding in lane	NC	0	0	0	0	0	S		
E54272781								RUM:	82	Off right/right bend																	
774451	P	23/10/2011	Sun	14:03	24.22 km	N	RYLESTONE TN	2WY	CRV	Fine	Dry	100	1	M/C	M63	N in BYLONG VALLEY WAY	45	Proceeding in lane	SC	0	1	0	0	0	S		
E47914085								RUM:	80	Off left/right bend																	
796474	P	06/05/2012	Sun	12:55	20 km	N	RYLSTONE TN	2WY	CRV	Fine	Dry	100	1	M/C	M17	N in BYLONG VALLEY WAY	40	Proceeding in lane	SC	0	1	0	0	0	S		
E47125620								RUM:	81	Off left/rt bnd=>obj				Fence (prior to 2014)													
817761	P	09/09/2012	Sun	10:00	21 km	N	RYLSTONE TN	2WY	CRV	Fine	Dry	100	1	M/C	M50	N in BYLONG VALLEY WAY	Unk	Proceeding in lane	SC	0	1	0	0	0	S		
E717132490								RUM:	81	Off left/rt bnd=>obj				Fence (prior to 2014)													
784648	P	14/02/2012	Tue	14:30	30 km	N	RYLSTONE TN	2WY	CRV	Fine	Dry	100	1	CAR	F18	S in BYLONG VALLEY WAY	90	Proceeding in lane	OC	0	0	0	1	0	S		
E46789414								RUM:	85	Off rt/lft bnd=>obj				Fence (prior to 2014)													

Ilford

Bylong Valley Way

851003	P	17/08/2013	Sat	14:10	180 m	E	CASTLEREAGH HWY	2WY	CRV	Fine	Dry	100	1	M/C	M49	W in BYLONG VALLEY WAY	100	Proceeding in lane	MC	0	0	1	0	0	S	F	
E52510038								RUM:	80	Off left/right bend																	
1027808	P	01/06/2014	Sun	04:50	200 m	E	CASTLEREAGH HWY	2WY	CRV	Overcast	Wet	100	1	TRK	M23	W in BYLONG VALLEY WAY	100	Proceeding in lane	UC	0	0	0	0	1	S		
E56653080								RUM:	83	Off rt/rt bnd=>obj				Embankment													
1011276	P	14/02/2014	Fri	20:00	5 km	E	CASTLEREAGH HWY	2WY	STR	Overcast	Wet	100	1	CAR	M23	W in BYLONG VALLEY WAY	90	Proceeding in lane	UC	0	0	0	0	2			
E53657652								RUM:	67	Struck animal				Kangaroo													
805277	P	31/07/2012	Tue	22:30	6 km	E	CASTLEREAGH HWY	2WY	CRV	Fine	Dry	100	1	CAR	M22	E in BYLONG VALLEY WAY	100	Proceeding in lane	NC	0	0	0	0	0			
E48650576								RUM:	81	Off left/rt bnd=>obj				Tree/bush													
746484	P	24/03/2011	Thu	18:05	4.2 km	S	COOPER DR	2WY	CRV	Fine	Dry	100	1	CAR	F21	N in BYLONG VALLEY WAY	100	Proceeding in lane	SC	0	2	0	1	0	S	F	
E43860906								RUM:	85	Off rt/lft bnd=>obj				Tree/bush													

Kandos

Bylong Valley Way

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
853519	P	28/09/2013	Sat	13:29		at	CROWN ST	XJN	STR	Fine	Dry	50	1	M/C	M17	S in CROWN ST	Unk	Turning left	SC	0	1	0	0	0	S
E52351117								RUM: 88	Out of cont on bend																
1056565	P	15/12/2014	Mon	09:50	705 m	N	HENDBURY ST	2WY	STR	Fine	Dry	80	2	CAR	M83	S in BYLONG VALLEY WAY	40	Turning right	NC	0	0	0	0	0	
E56167635								RUM: 21	Right through					CAR	M22	N in BYLONG VALLEY WAY	80	Proceeding in lane							
750426	P	22/04/2011	Fri	16:15		at	ILFORD RD	TJN	STR	Fine	Dry	50	1	4WD	M34	E in BYLONG VALLEY WAY	5	Proceeding in lane	NC	0	0	0	0	0	
E43545210								RUM: 75	Off end of road					Other fixed object											
809226	P	01/09/2012	Sat	16:10		at	ILFORD RD	TJN	STR	Fine	Dry	50	2	CAR	F77	S in ILFORD RD	40	Proceeding in lane	NC	0	0	0	0	0	
E49088040								RUM: 30	Rear end					TRK	M18	S in ILFORD RD	30	Proceeding in lane							
857544	P	08/11/2013	Fri	20:25	800 m	W	ILFORD RD	2WY	CRV	Raining	Wet	100	1	M/C	M18	W in BYLONG VALLEY WAY	100	Proceeding in lane	OC	0	0	0	1	0	
E53897339								RUM: 67	Struck animal					Wombat											
836859	P	19/02/2013	Tue	11:45	3.5 km	W	KANDOS TN	2WY	CRV	Fine	Dry	100	1	M/C	M56	W in BYLONG VALLEY WAY	90	Proceeding in lane	SC	0	1	0	0	0	S
E50627312								RUM: 80	Off left/right bend																
1047061	P	15/11/2014	Sat	04:45	50 m	S	LARGES LANE	2WY	STR	Fine	Dry	80	1	CAR	M17	N in BYLONG VALLEY WAY	140	Proceeding in lane	FC	1	0	0	0	1	S
E56030852								RUM: 73	Off rd rght => obj					Tree/bush											
812369	P	22/09/2012	Sat	15:30	300 m	E	QUARRY RD	2WY	CRV	Fine	Dry	100	1	M/C	M35	W in BYLONG VALLEY WAY	80	Proceeding in lane	SC	0	1	0	0	0	S
E49326519								RUM: 80	Off left/right bend																
1050356	P	29/11/2014	Sat	15:00	330 m	S	QUARRY RD	2WY	CRV	Fine	Dry	100	1	M/C	F44	S in BYLONG VALLEY WAY	80	Proceeding in lane	UC	0	0	0	0	1	S
E56787846								RUM: 88	Out of cont on bend																
Ilford Rd																									
814567	P	21/09/2012	Fri	12:25	3 km	N	HENBURY AVE	2WY	STR	Fine	Dry	100	2	CAR	F17	N in ILFORD RD	1	Perform U-turn	MC	0	0	1	0	0	
E49163256								RUM: 40	U turn					TRK	M63	N in ILFORD RD	85	Proceeding in lane							
Murrumbo																									
Bylong Valley Way																									
774050	P	06/11/2011	Sun	10:30	40 km	S	GOLDEN HWY	2WY	CRV	Fine	Dry	80	1	M/C	M28	N in BYLONG VALLEY WAY	40	Proceeding in lane	NC	0	0	0	0	0	S
E46311221								RUM: 88	Out of cont on bend																
792785	P	18/04/2012	Wed	09:55	4 km	E	MURRUMBO CREEK BDGE	2WY	CRV	Overcast	Dry	100	1	LOR	M37	E in BYLONG VALLEY WAY	55	Proceeding in lane	NC	0	0	0	0	0	
E47642656								RUM: 69	Other on path																
Rylstone																									
Bylong Rd																									
852795	P	27/09/2013	Fri	11:55	200 m	N	COXS CREEK RD	2WY	STR	Fine	Dry	100	1	4WD	M53	S in BYLONG RD	80	Proceeding in lane	OC	0	0	0	1	0	
E101667301								RUM: 71	Off rd left => obj					Embankment											
Bylong Valley Way																									
1049138	P	24/09/2014	Wed	23:00		at	ACACIA DR	TJN	CRV	Fine	Dry	100	2	4WD	F56	W in ACACIA DR	60	Proceeding in lane	UC	0	0	0	0	2	
E56729539								RUM: 30	Rear end					CAR	M80	W in ACACIA DR	60	Proceeding in lane							

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
818861	P	17/02/2013	Sun	13:45	1 km	S	ACACIA DR	2WY	STR	Fine	Dry	100	2	WAG	M71	N in BYLONG VALLEY WAY	80	Incorrect side	FC	1	0	0	1	0	F		
E50948649								RUM	20	Head on				TRK	F36	S in BYLONG VALLEY WAY	90	Proceeding in lane								
705364	P	26/03/2010	Fri	01:15	2 km	S	ANZAC AVE	2WY	CRV	Fine	Dry	100	1	UTE	M24	N in BYLONG VALLEY WAY	80	Proceeding in lane	SC	0	2	0	0	0	S		
E167624294								RUM	87	Off lft/lft bnd=>obj				Tree/bush												
737515	P	27/12/2010	Mon	12:45	4 km	N	BREAKFAST CREE RD	2WY	STR	Fine	Wet	100	1	CAR	F16	S in BYLONG VALLEY WAY	80	Proceeding in lane	NC	0	0	0	0	0			
E42778144								RUM	71	Off rd left => obj				Tree/bush												
1046108	P	25/10/2014	Sat	17:45	100 m	S	COOMBER ST	2WY	CRV	Fine	Dry	80	1	CAR	M55	N in BYLONG VALLEY WAY	80	Proceeding in lane	UC	0	0	0	0	1	S	F	
E58787288								RUM	85	Off rt/lft bnd=>obj				Tree/bush												
854414	P	07/10/2013	Mon	20:20	4 km	N	COXS CREEK RD	2WY	STR	Fine	Dry	100	1	WAG	M24	S in BYLONG VALLEY WAY	90	Proceeding in lane	NC	0	0	0	0	0			
E53164977								RUM	67	Struck animal				Kangaroo												
824046	P	19/01/2013	Sat	12:38	2.85 km	S	GROWEE RD	2WY	CRV	Fine	Dry	100	1	M/C	M30	S in BYLONG VALLEY WAY	80	Proceeding in lane	MC	0	0	1	0	0	S		
E50466457								RUM	87	Off lft/lft bnd=>obj				Fence (prior to 2014)												
828995	P	16/02/2013	Sat	15:05	4.6 km	S	GROWEE RD	2WY	CRV	Fine	Dry	100	1	M/C	M55	N in BYLONG VALLEY WAY	50	Proceeding in lane	SC	0	1	1	0	0	S		
E50676348								RUM	88	Out of cont on bend																
1048490	P	13/10/2014	Mon	11:55	5.6 km	N	LUE RD	2WY	CRV	Raining	Wet	100	1	M/C	M36	N in BYLONG VALLEY WAY	20	Proceeding in lane	NC	0	0	0	0	0			
E55741252								RUM	81	Off left/rt bnd=>obj				S/Barrier - Guardrail												
1025723	P	24/05/2014	Sat	23:30	6 km	N	LUE RD	2WY	CRV	Fine	Dry	100	1	CAR	F47	S in BYLONG VALLEY WAY	60	Proceeding in lane	NC	0	0	0	0	0			
E54899650								RUM	67	Struck animal				Kangaroo												
1023797	P	17/03/2014	Mon	05:00	330 m	S	LUE RD	2WY	CRV	Fine	Dry	100	1	TRK	M U	N in BYLONG VALLEY WAY	90	Proceeding in lane	UC	0	0	0	0	1	S		
E53848235								RUM	83	Off rt/rt bnd=>obj				Fence												
797120	P	22/04/2012	Sun	03:00	1.3 km	S	RYLSTONE TN	2WY	CRV	Fog or mist	Dry	100	1	TRK	M22	S in BYLONG VALLEY WAY	70	Proceeding in lane	OC	0	0	0	1	0	S		
E47809603								RUM	81	Off left/rt bnd=>obj				Tree/bush												
1006292	P	17/12/2013	Tue	11:45	2 km	S	SHORT ST	2WY	CRV	Fine	Dry	100	1	TRK	F26	N in BYLONG VALLEY WAY	100	Proceeding in lane	SC	0	1	0	0	0			
E55337585								RUM	87	Off lft/lft bnd=>obj				Guide Post												
825578	P	30/01/2013	Wed	18:55	300 m	N	TONGBONG ST	2WY	STR	Fine	Dry	50	1	CAR	F17	N in BYLONG VALLEY WAY	40	Proceeding in lane	NC	0	0	0	0	0	F		
E50922268								RUM	71	Off rd left => obj				Bridge												
Ilford Rd																										
752702	P	23/04/2011	Sat	14:50	25 m	S	FITZGERALD ST	2WY	STR	Fine	Dry	50	1	VAN	F38	S in ILFORD RD	50	Proceeding in lane	SC	0	1	0	1	0			
E43552410								RUM	71	Off rd left => obj				Utility pole												

Report Totals: Crashes: 111 Fatal Crashes(FC): 4 Serious Injury Crashes(SC): 29 Moderate Injury Crashes(MC): 11 Minor/Other Injury Crashes(OC): 18 Uncategorised Injury Crashes(UC): 15 Non-Casualty Crashes(NC): 34

Killed(K): 4 Seriously Injured(S): 31 Moderately Injured(M): 13 Minor/Other Injured(O): 24 Uncategorised Injured(U): 19

Crashid dataset

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.
Reporting years 2014 onwards contain uncategorised injury crashes.

Summary Crash Report

# Crash Type		
Car Crash	48	43.2%
Light Truck Crash	18	16.2%
Rigid Truck Crash	4	3.6%
Articulated Truck Crash	2	1.8%
'Heavy Truck Crash	*(6)*	*(5.4%)*
Bus Crash	0	0.0%
"Heavy Vehicle Crash	*(6)*	*(5.4%)*
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	45	40.5%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	8	7.2%
Non intersection	103	92.8%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	100	90.1%
Multi Vehicle	11	9.9%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	111	100.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	65	58.6%
Fatigue	19	17.1%

Weather		
Fine	88	79.3%
Rain	11	9.9%
Overcast	7	6.3%
Fog or mist	4	3.6%
Other	0	0.0%

Road Surface Condition		
Wet	19	17.1%
Dry	92	82.9%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	4	3.6%
Daylight	76	68.5%
Dusk	4	3.6%
Darkness	27	24.3%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	3	2.7%
Opposing vehicles; turning	1	0.9%
U-turn	2	1.8%
Rear-end	2	1.8%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	1	0.9%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	7	6.3%
Off road, on straight	5	4.5%
Off road on straight, hit object	8	7.2%
Out of control on straight	2	1.8%
Off road, on curve	19	17.1%
Off road on curve, hit object	42	37.8%
Out of control on curve	11	9.9%
Other crash type	8	7.2%

Speed Limit				
40 km/h or less	3	2.8%	80 km/h zone	19	17.6%
50 km/h zone	8	7.4%	90 km/h zone	0	0.0%
60 km/h zone	0	0.0%	100 km/h zone	78	72.2%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less	0	0.0%	~ School Travel Time Involvement	6	5.4%

Day of the Week												
Monday	7	6.3%	Wednesday	10	9.0%	Friday	21	18.9%	Sunday	21	18.9%	WEEKEND	52	46.8%
Tuesday	9	8.1%	Thursday	12	10.8%	Saturday	31	27.9%	WEEKDAY	59	53.2%			

CRASHES	111	
Fatal	4	3.6%
Serious inj.	29	26.1%
Moderate inj.	11	9.9%
Minor/Other inj.	18	16.2%
Uncategorised inj.	15	13.5%
Non-casualty	34	30.6%

Self Reported Crash	0	0%

Time Group		% of Day	
00:01 - 02:59	2	1.8%	12.5%
03:00 - 04:59	6	5.4%	8.3%
05:00 - 05:59	3	2.7%	4.2%
06:00 - 06:59	3	2.7%	4.2%
07:00 - 07:59	2	1.8%	4.2%
08:00 - 08:59	0	0.0%	4.2%
09:00 - 09:59	4	3.6%	4.2%
10:00 - 10:59	4	3.6%	4.2%
11:00 - 11:59	10	9.0%	4.2%
12:00 - 12:59	10	9.0%	4.2%
13:00 - 13:59	8	7.2%	4.2%
14:00 - 14:59	16	14.4%	4.2%
15:00 - 15:59	8	7.2%	4.2%
16:00 - 16:59	9	8.1%	4.2%
17:00 - 17:59	7	6.3%	4.2%
18:00 - 18:59	6	5.4%	4.2%
19:00 - 19:59	2	1.8%	4.2%
20:00 - 21:59	5	4.5%	8.3%
22:00 - 24:00	6	5.4%	8.3%

Street Lighting Off/Nil		% of Dark
26	of 27	in Dark 96.3%

CASUALTIES	91	
Killed	4	4.4%
Seriously inj.	31	34.1%
Moderately inj.	13	14.3%
Minor/Other inj.	24	26.4%
Uncategorised inj.	19	20.9%
^ Unrestrained	2	2.2%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Crashes		Casualties
24	2014	20
24	2013	18
26	2012	21
23	2011	18
14	2010	14

McLean Periods		% Week	
A	8	7.2%	17.9%
B	6	5.4%	7.1%
C	26	23.4%	17.9%
D	14	12.6%	3.5%
E	12	10.8%	3.6%
F	6	5.4%	10.7%
G	15	13.5%	7.1%
H	16	14.4%	7.1%
I	3	2.7%	12.5%
J	5	4.5%	10.7%

#Holiday Periods																			
New Year	0	0.0%	Easter	2	1.8%	Queen's BD	1	0.9%	Christmas	4	3.6%	Easter SH	7	6.3%	Sept./Oct. SH	7	6.3%		
Aust. Day	0	0.0%	Anzac Day	1	0.9%	Labour Day	2	1.8%	January SH	2	1.8%	June/July SH	4	3.6%	December SH	6	5.4%		

Crashid dataset

Note: Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data. Reporting years 2014 onwards contain uncategorised injury crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
Hunter Region																									
Upper Hunter LGA																									
Turill																									
Ulan Rd																									
759282	P	02/07/2011	Sat	09:48	4 km	S	GOLDEN HWY	2WY	STR	Fine	Dry	100	1	WAG	F29	N in ULAN RD	100	Proceeding in lane	SC	0	1	0	0	0	S F
E45488251								RUM:	73	Off rd rght => obj				Tree/bush											
Western Region																									
Mid-Western Regional LGA																									
Bombira																									
Ulan Rd																									
1009012	P	06/02/2014	Thu	10:30	250 m	S	HENRY LAWSON DR	2WY	STR	Fine	Dry	80	1	P/C	M74	S in ULAN RD		Proceeding in lane	FC	1	0	0	0	0	
E53993661								RUM:	74	On road-out of cont.															
1018647	P	28/03/2014	Fri	16:35		at	HENRY LAWSON DR	TJN	STR	Raining	Wet	80	2	TRK	M20	W in ULAN RD	20	Turning right	UC	0	0	0	0	1	
E229776994								RUM:	21	Right through				4WD	F62	E in ULAN RD	80	Proceeding in lane							
1019317	P	11/04/2014	Fri	15:00	50 m	W	HENRY LAWSON DR	2WY	CRV	Raining	Wet	80	1	TRK	M48	S in ULAN RD	60	Proceeding in lane	NC	0	0	0	0	0	
E56946083								RUM:	87	Off lft/lft bnd=>obj				Fence											
Buckaroo																									
Ulan Rd																									
813659	P	27/12/2012	Thu	09:20	70 m	S	BUCKAROO LANE	2WY	STR	Fine	Dry	100	3	WAG	F38	N in ULAN RD	100	Proceeding in lane	FC	1	0	1	0	0	
E50366031								RUM:	3	Ped on carriageway				PED	M50	ULAN RD		Stand on carriageway							
														4WD		S in ULAN RD	0	Parked							
841602	P	07/06/2013	Fri	05:34		at	EURUNDEREE LANE	TJN	STR	Raining	Wet	100	2	CAR	F50	S in ULAN RD	95	Proceeding in lane	SC	0	1	0	0	0	
E53975884								RUM:	30	Rear end				TRK	M48	S in ULAN RD	0	Stationary							
1035443	P	22/07/2014	Tue	15:10	10 m	N	EURUNDEREE LANE	TJN	STR	Fine	Dry	100	4	CAR	F21	S in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0	
E55238845								RUM:	30	Rear end				CAR	F48	S in ULAN RD	0	Stationary							
														TRK	M41	S in ULAN RD	60	Proceeding in lane							
														CAR	M28	S in ULAN RD	0	Stationary							
Budgee Budgee																									
Ulan Rd																									
783091	P	26/01/2012	Thu	06:50	3.38 km	N	BOTOBOLAR RD	2WY	CRV	Raining	Wet	100	1	UTE	M18	N in ULAN RD	120	Proceeding in lane	NC	0	0	0	0	0	S
E90631802								RUM:	81	Off left/rt bnd=>obj				Tree/bush											
796375	P	05/04/2012	Thu	20:40	600 m	N	BOXS LANE	2WY	STR	Fine	Dry	100	1	4WD	F53	S in ULAN RD	100	Proceeding in lane	MC	0	0	1	0	0	
E48096242								RUM:	66	Object on road				Other non fixed object											

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
719467	P	17/07/2010	Sat	02:55	8 km	N	MUDGEE TN	2WY	STR	Fine	Dry	60	1	CAR	M68	N in ULAN RD	50	Proceeding in lane	SC	0	1	0	0	0			F
E41764640								RUM	70	Off road to left																	
787915	P	08/03/2012	Thu	07:00	15 km	N	MUDGEE TN	2WY	STR	Fine	Dry	100	1	CAR	F49	N in ULAN RD	90	Proceeding in lane	NC	0	0	0	0	0			
E48115853								RUM	72	Off road to right																	
1013863	P	05/03/2014	Wed	07:20	420 m	N	SCHOOL LANE	2WY	CRV	Fine	Dry	100	1	CAR	M27	N in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0			
E54143754								RUM	81	Off left/rt bnd=>obj				Tree/bush													
1034615	P	08/07/2014	Tue	06:25	40 m	S	SCHOOL LANE	2WY	STR	Fog or mist	Dry	100	1	TRK	M43	N in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0			
E56067439								RUM	67	Struck animal				Straying stock													
793206	P	03/04/2012	Tue	16:50		at	WOLLAR RD	TJN	STR	Fine	Dry	100	2	CAR	M18	N in ULAN RD	Unk	Proceeding in lane	MC	0	0	1	1	0			
E47505156								RUM	32	Right rear				TRK	M36	N in ULAN RD	0	Wait turn right									
1023104	P	13/05/2014	Tue	21:02	50 m	S	WOLLAR RD	2WY	STR	Fine	Dry	100	1	CAR	M25	S in ULAN RD	90	Proceeding in lane	NC	0	0	0	0	0			
E56513082								RUM	67	Struck animal				Small animal													
1003795	P	29/11/2013	Fri	20:55	465 m	S	WOLLAR RD	2WY	STR	Fine	Dry	100	2	LOR	M21	S in ULAN RD	100	Incorrect side	NC	0	0	0	0	0			
E52962252								RUM	20	Head on				4WD	F29	N in ULAN RD	80	Proceeding in lane									
Cassilis																											
Ulan Rd																											
769101	P	14/09/2011	Wed	19:30	1 km	N	BOBADEEN RD	2WY	STR	Fine	Dry	100	1	CAR	F19	S in ULAN RD	100	Proceeding in lane	SC	0	1	0	0	0			
E45577113								RUM	73	Off rd rght => obj				Tree/bush													
Cooks Gap																											
Ulan Rd																											
806168	P	01/07/2012	Sun	04:13		at	NUMBER 2807 HN	2WY	STR	Fine	Dry	100	1	CAR	M49	N in ULAN RD	80	Proceeding in lane	NC	0	0	0	0	0			
E48490507								RUM	67	Struck animal				Straying stock													
1032967	P	19/06/2014	Thu	12:55	1 km	S	RIDGE RD	2WY	CRV	Fine	Dry	100	1	TRK	M35	S in ULAN RD	Unk	Proceeding in lane	UC	0	0	0	0	1	S		
E55236464								RUM	82	Off right/right bend																	
769743	P	23/09/2011	Fri	18:45	1 km	N	WATTLEGROVE LANE	2WY	STR	Fine	Dry	100	1	CAR	F17	S in ULAN RD	80	Proceeding in lane	MC	0	0	1	0	0			
E46301151								RUM	72	Off road to right																	
1000747	P	16/10/2013	Wed	00:15	50 m	N	WINCHESTER CRES	2WY	STR	Fine	Dry	100	1	CAR	M30	N in ULAN RD	100	Proceeding in lane	MC	0	0	1	0	0			
E222608994								RUM	71	Off rd left => obj				Embankment													
Eurunderee																											
Ulan Rd																											
728947	P	15/10/2010	Fri	18:45		at	BLACK SPRING RD	XJN	STR	Raining	Wet	100	1	CAR	M38	N in ULAN RD	70	Proceeding in lane	NC	0	0	0	0	0			
E195293793								RUM	71	Off rd left => obj				Fence (prior to 2014)													

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
791035	P	09/04/2012	Mon	13:55	10 m	N	BUCKAROO LANE	TJN	STR	Fine	Dry	100	1	CAR	M48	N in ULAN RD	80	Proceeding in lane	MC	0	0	2	0	0	F
E47346222								RUM	70	Off road to left															
704950	P	02/03/2010	Tue	09:25	100 m	N	CROWLEYS LANE	2WY	CRV	Fine	Dry	100	1	TRK	M18	S in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0	
E77341602								RUM	85	Off rt/lft bnd=>obj				Fence (prior to 2014)											
815938	P	27/10/2012	Sat	23:52	100 m	N	EURUNDEREE LANE	2WY	STR	Fine	Dry	100	1	CAR	M18	N in ULAN RD	90	Proceeding in lane	MC	0	0	1	0	0	
E49552921								RUM	66	Object on road				Other non fixed object											
766608	P	19/08/2011	Fri	12:56	50 m	S	EURUNDEREE LANE	2WY	STR	Raining	Wet	100	1	LOR	M63	N in ULAN RD	Unk	Proceeding in lane	SC	0	1	0	0	0	F
E87825802								RUM	71	Off rd left => obj				Tree/bush											
775622	P	19/11/2011	Sat	09:15	118 m	N	FROG ROCK RD	2WY	STR	Fine	Dry	100	1	4WD	F40	N in ULAN RD	100	Proceeding in lane	OC	0	0	0	1	0	
E48143180								RUM	70	Off road to left															
710698	P	06/05/2010	Thu	07:30		at	GEORGE CAMPBEL DR	TJN	STR	Fine	Dry	100	2	CAR	M23	S in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0	
E40950926								RUM	32	Right rear				TRK	M53	S in ULAN RD	10	Turning right							
820319	P	06/12/2012	Thu	18:05	7.9 km	N	MUDGEE TN	2WY	CRV	Fine	Dry	100	2	4WD	M62	S in ULAN RD	70	Pull out opposite	NC	0	0	0	0	0	S
E50857616								RUM	50	Head on (overtake)				TRK	M42	N in ULAN RD	100	Proceeding in lane							
849592	P	15/08/2013	Thu	09:47	2 km	S	MUDHUT CREEK RD	2WY	STR	Fine	Dry	100	1	TRK	M19	S in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0	F
E51489820								RUM	73	Off rd rght => obj				Fence (prior to 2014)											
735201	P	12/12/2010	Sun	07:31	520 m	S	PIPECLAY LANE	2WY	CRV	Fine	Dry	100	1	4WD	M71	N in ULAN RD	90	Proceeding in lane	SC	0	1	0	0	0	S
E42377530								RUM	85	Off rt/lft bnd=>obj				Tree/bush											
1031540	P	10/07/2014	Thu	18:00	5 km	N	SHORT ST	2WY	STR	Fine	Dry	100	1	TRK	M24	N in ULAN RD	90	Proceeding in lane	NC	0	0	0	0	0	
E55489166								RUM	67	Struck animal				Kangaroo											
771940	P	21/10/2011	Fri	05:25	600 m	S	WINCHESTER CRES	2WY	STR	Fine	Dry	100	1	TRK	M37	N in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0	
E46095704								RUM	67	Struck animal				Straying stock											
771936	P	21/10/2011	Fri	05:30	600 m	S	WINCHESTER CRES	2WY	STR	Fine	Dry	100	1	CAR	M25	N in ULAN RD	Unk	Proceeding in lane	NC	0	0	0	0	0	
E46095704								RUM	66	Object on road				Other non fixed object											
Frog Rock Ulan Rd																									
821111	P	21/12/2012	Fri	11:10	970 m	S	FROG ROCK RD	2WY	STR	Fine	Dry	100	2	TRK	M29	S in ULAN RD	10	Incorrect side	NC	0	0	0	0	0	
E50188807								RUM	20	Head on				LOR	M51	N in ULAN RD	25	Proceeding in lane							
769315	P	25/09/2011	Sun	19:35	1 km	S	FROG ROCK RD	2WY	STR	Overcast	Dry	100	1	CAR	F23	S in ULAN RD	90	Proceeding in lane	SC	0	2	0	0	0	
E46162329								RUM	71	Off rd left => obj				Tree/bush											
850326	P	16/08/2013	Fri	19:30	3 km	S	FROG ROCK RD	2WY	STR	Fine	Dry	100	2	TRK	M30	S in ULAN RD	90	Proceeding in lane	NC	0	0	0	0	0	
E52351034								RUM	30	Rear end				TRK	M36	S in ULAN RD	90	Proceeding in lane							
822874	P	13/12/2012	Thu	01:10	40 m	S	LINBURN LANE	2WY	STR	Fine	Dry	100	1	CAR	M26	S in ULAN RD	100	Proceeding in lane	MC	0	0	1	0	0	
E50015018								RUM	67	Struck animal				Kangaroo											

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
760125	P	11/07/2011	Mon	10:45	1 km	N	LINBURN RD	2WY	CRV	Fine	Dry	100	1	WAG	F71	N in ULAN RD	80	Proceeding in lane	NC	0	0	0	0	0	S		
E45456471								RUM	85	Off rt/lft bnd=>obj				Tree/bush													
766620	P	21/08/2011	Sun	06:50	1.5 km	N	MUDGEE TN	2WY	STR	Fine	Dry	100	1	TRK	M23	S in ULAN RD	Unk	Proceeding in lane	NC	0	0	0	0	0			
E45587821								RUM	70	Off road to left																	
786438	P	28/02/2012	Tue	06:59	13.9 km	N	MUDGEE TN	2WY	CRV	Raining	Wet	100	2	TRK	M43	S in ULAN RD	70	Proceeding in lane	NC	0	0	0	0	0	S		
E47217304								RUM	30	Rear end				CAR	F20	S in ULAN RD	60	Proceeding in lane									
817240	P	12/11/2012	Mon	09:25	1 km	N	SCHOOL LANE	2WY	STR	Fine	Dry	100	2	CAR	M45	S in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0			
E49277137								RUM	30	Rear end				TRK	M66	S in ULAN RD	100	Proceeding in lane									
800485	P	20/06/2012	Wed	18:20	2.1 km	N	SPRING VIEW LANE	2WY	STR	Fine	Dry	100	1	CAR	F49	S in ULAN RD	90	Proceeding in lane	NC	0	0	0	0	0			
E47892824								RUM	67	Struck animal				Kangaroo													
Lawsons Creek																											
Ulan Rd																											
842253	P	17/06/2013	Mon	11:25		at	HENRY LAWSON DR	TJN	CRV	Fine	Dry	80	2	4WD	M79	S in HENRY LAWSON DR	20	Proceeding in lane	NC	0	0	0	0	0			
E52076162								RUM	10	Cross traffic				LOR	M52	E in ULAN RD	80	Proceeding in lane									
Linburn																											
Ulan Rd																											
1008828	P	08/01/2014	Wed	17:30	2 km	N	FROG ROCK RD	2WY	STR	Fine	Dry	100	2	TRK	M28	N in ULAN RD	100	Proceeding in lane	UC	0	0	0	0	1			
E54222167								RUM	30	Rear end				UTE	F46	N in ULAN RD	0	Stationary									
1021359	P	30/04/2014	Wed	06:30	400 m	N	MUD HUT CREEK RD	2WY	CRV	Raining	Wet	80	1	CAR	M21	S in ULAN RD	80	Proceeding in lane	NC	0	0	0	0	0	S		
E105394601								RUM	80	Off left/right bend																	
1022167	P	04/05/2014	Sun	22:43	300 m	S	MUDHUT CREEK RD	2WY	STR	Overcast	Wet	80	1	4WD	F24	S in ULAN RD	85	Proceeding in lane	UC	0	0	0	0	1	S		
E54269135								RUM	70	Off road to left																	
Lindburn																											
Ulan Rd																											
722614	P	26/08/2010	Thu	17:10		at	MUDHUT CREEK RD	TJN	CRV	Raining	Wet	100	2	TRK	M18	S in ULAN RD	95	Proceeding in lane	NC	0	0	0	0	0	S		
E42232858								RUM	32	Right rear				VAN	F28	S in ULAN RD	90	Turning right									
804077	P	14/07/2012	Sat	06:55	3 km	N	MUDHUT CREEK RD	2WY	STR	Fog or mist	Wet	100	2	TRK	M27	S in ULAN RD	100	Incorrect side	MC	0	0	1	0	0		F	
E48894828								RUM	20	Head on				CAR	F21	N in ULAN RD	80	Proceeding in lane									
852595	P	19/09/2013	Thu	06:15	1.1 km	S	WATTLEGROVE LANE	2WY	STR	Fine	Dry	100	2	TRK	M52	N in ULAN RD	95	Proceeding in lane	NC	0	0	0	0	0			
E52076670								RUM	30	Rear end				TRK	M36	N in ULAN RD	90	Proceeding in lane									
Moolarben																											
Ulan Rd																											

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
768406	P	22/09/2011	Thu	21:20	500 m	S	WINCHESTER CRES	2WY	STR	Fine	Dry	100	1	TRK	M22	S in ULAN RD	Unk	Proceeding in lane	SC	0	1	0	0	0	
E45793434								RUM	71	Off rd left => obj				Tree/bush											
Mudgee																									
Cassilis Rd																									
754661	P	24/04/2011	Sun	16:00	Unk	Unk	UNKNOWN UK	2WY	STR	Fine	Dry	60	1	M/C	M35	E in CASSILIS RD	20	Proceeding in lane	SC	0	1	0	0	0	
E47042588								RUM	74	On road-out of cont.															
Ulan Rd																									
757807	P	23/06/2011	Thu	09:10		at	HENRY LAWSON DR	TJN	CRV	Overcast	Wet	80	2	WAG	F74	S in HENRY LAWSON DR	10	Turning right	SC	0	1	0	0	0	
E44952264								RUM	13	Right near				VAN	F40	E in ULAN RD	70	Proceeding in lane							
850514	P	13/09/2013	Fri	15:35		at	HENRY LAWSON DR	TJN	STR	Fine	Dry	80	2	UTE	M21	S in HENRY LAWSON DR	10	Turning right	NC	0	0	0	0	0	
E55174481								RUM	13	Right near				TRK	M33	E in ULAN RD	75	Proceeding in lane							
791955	P	02/12/2011	Fri	18:20	20 m	E	HENRY LAWSON DR	2WY	CRV	Fine	Dry	80	3	TRK	M27	W in ULAN RD	65	Proceeding in lane	NC	0	0	0	0	0	
E46570066								RUM	30	Rear end				UTE	M48	W in ULAN RD	0	Stationary							
														WAG	F32	W in ULAN RD	0	Stationary							
730670	P	28/07/2010	Wed	17:45		at	LUE RD	TJN	STR	Raining	Wet	50	2	CAR	M42	W in LUE RD	20	Turning right	NC	0	0	0	0	0	
E44040181								RUM	11	Right far				CAR	F18	N in ULAN RD	40	Proceeding in lane							
795101	P	08/05/2012	Tue	06:00		at	LUE RD	RDB	STR	Fine	Dry	50	1	M/C	M42	S in ULAN RD	50	Proceeding in lane	SC	0	1	0	0	0	F
E47658032								RUM	73	Off rd rght => obj				Signpost											
1021724	P	11/05/2014	Sun	07:45	70 m	N	LUE RD	2WY	STR	Overcast	Wet	50	2	TRK	M33	S in ULAN RD	80	Proceeding in lane	FC	1	0	0	0	0	S F
E54320235								RUM	30	Rear end				P/C	F57	S in ULAN RD		Proceeding in lane							
773562	P	05/11/2011	Sat	22:44	100 m	N	LUE RD	2WY	STR	Fine	Dry	80	2	TRK	M57	S in ULAN RD	60	Proceeding in lane	OC	0	0	0	1	0	
E48362484								RUM	0	Ped nearside				PED	M18	W in ULAN RD		Walk across carriageway							
790659	P	26/03/2012	Mon	16:30	127 m	N	LUE RD	2WY	STR	Fine	Wet	80	3	CAR	M18	S in ULAN RD	55	Proceeding in lane	MC	0	0	1	1	0	
E152784598								RUM	30	Rear end				4WD	M18	S in ULAN RD	0	Stationary							
														CAR	M17	S in ULAN RD	0	Stationary							
817621	P	08/11/2012	Thu	04:15	200 m	N	LUE RD	2WY	STR	Fog or mist	Wet	50	1	4WD	M58	S in ULAN RD	60	Proceeding in lane	NC	0	0	0	0	0	S F
E159826898								RUM	73	Off rd rght => obj				Fence (prior to 2014)											
790405	P	26/03/2012	Mon	16:40	300 m	N	LUE RD	2WY	STR	Fine	Dry	60	2	CAR	M17	S in ULAN RD	30	Proceeding in lane	NC	0	0	0	0	0	
E47330133								RUM	30	Rear end				UTE	M36	S in ULAN RD	0	Stationary							
751848	P	11/04/2011	Mon	06:40	5 km	N	MUDGEE TN	2WY	STR	Fog or mist	Dry	100	1	4WD	M26	N in ULAN RD	100	Pull out opposite	NC	0	0	0	0	0	
E46283384								RUM	51	Out of control otake															
810782	P	18/09/2012	Tue	18:30		at	PARKLANDS RESO ENT	2WY	STR	Raining	Wet	80	2	CAR	F33	E in ULAN RD	10	Forward from drive	NC	0	0	0	0	0	
E48804817								RUM	47	Emerging from drive				UTE	M18	N in ULAN RD	65	Proceeding in lane							

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
778680	P	02/12/2011	Fri	17:45		at	RACECOURSE ENT	2WY	STR	Fine	Dry	80	2	CAR	F40	N in ULAN RD	65	Proceeding in lane	SC	0	1	2	0	0	
E46272433								RUM	32	Right rear				TRK	F39	N in ULAN RD	0	Wait turn right							
Pipe Clay Cree																									
Ulan Rd																									
792788	P	18/04/2012	Wed	08:55	15 m	N	EURUNDEREE LANE	2WY	STR	Fine	Dry	100	2	CAR	M20	S in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0	
E47804150								RUM	67	Struck animal				TRK	M51	N in ULAN RD	100	Proceeding in lane							
														Kangaroo											
														Falling object											
Putta Bucca																									
Henry Lawson Dr																									
824310	P	20/01/2013	Sun	00:40	1 m	N	ULAN RD	TJN	STR	Fine	Dry	80	1	CAR	M28	S in HENRY LAWSON DR	Unk	Proceeding in lane	NC	0	0	0	0	0	
E50147811								RUM	73	Off rd rght => obj				Signpost											
Ulan Rd																									
818654	P	26/11/2012	Mon	08:25		at	HENRY LAWSON DR	TJN	CRV	Fine	Dry	80	2	CAR	F43	S in HENRY LAWSON DR	Unk	Proceeding in lane	NC	0	0	0	0	0	
E49844804								RUM	10	Cross traffic				TRK	M52	E in ULAN RD	70	Proceeding in lane							
Turill																									
Durridgere Rd																									
836893	P	28/03/2013	Thu	17:25	100 m	E	ULAN RD	2WY	STR	Fine	Dry	100	1	TRK	M37	W in DURRIDGERE RD	Unk	Proceeding in lane	NC	0	0	0	0	0	
E50567470								RUM	72	Off road to right															
Ulan Rd																									
1038946	P	26/08/2014	Tue	17:40	1 km	N	BOBADEEN RD	2WY	CRV	Raining	Wet	100	1	TRK	M48	S in ULAN RD	100	Proceeding in lane	NC	0	0	0	0	0	
E58258181								RUM	81	Off left/rt bnd=>obj				Embankment											
841777	P	12/06/2013	Wed	03:30	1.5 km	S	CLIFFDALE RD	2WY	CRV	Fine	Wet	100	1	CAR	M45	N in ULAN RD	100	Proceeding in lane	SC	0	1	0	0	0	
E52663116								RUM	85	Off rt/lft bnd=>obj				Fence (prior to 2014)											
1022244	P	21/04/2014	Mon	13:25	3.25 km	N	DURRIDGERE RD	2WY	CRV	Fine	Dry	100	1	CAR	F19	N in ULAN RD	95	Proceeding in lane	NC	0	0	0	0	0	S
E54160735								RUM	82	Off right/right bend															
775096	P	03/11/2011	Thu	06:20	1 km	S	GREENHILLS RD	2WY	STR	Fine	Dry	100	1	TRK	M33	N in ULAN RD	100	Proceeding in lane	MC	0	0	1	0	0	
E46297246								RUM	71	Off rd left => obj				Tree/bush											
854651	P	13/10/2013	Sun	12:00	1 km	E	TURILL RD	2WY	CRV	Unk	Dry	100	1	WAG	M30	E in ULAN RD	95	Proceeding in lane	NC	0	0	0	0	0	
E53167149								RUM	87	Off lft/lft bnd=>obj				Guide Post											
1020012	P	18/04/2014	Fri	13:30	10 km	N	WOLLAR RD	2WY	STR	Fine	Dry	100	1	CAR	F18	S in ULAN RD	90	Proceeding in lane	NC	0	0	0	0	0	
E54131835								RUM	70	Off road to left															
Ulan																									

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
Ulan Rd																									
825363	P	25/12/2012	Tue	19:30	300 m	S	BOBADEEN RD	2WY	STR	Raining	Wet	100	1	CAR	F19	S in ULAN RD	85	Proceeding in lane	MC	0	0	1	0	0	
E50004633								RUM	73	Off rd rght => obj				Tree/bush											
844531	P	15/07/2013	Mon	06:00	5 km	N	COPE RD	2WY	STR	Fog or mist	Wet	40	2	CAR	M40	N in ULAN RD	25	Proceeding in lane	NC	0	0	0	0	0	
E54169189								RUM	30	Rear end				OMV	U U	N in ULAN RD	Unk	Proceeding in lane							
722475	P	20/08/2010	Fri	07:45	50 m	N	LAGOONS RD	2WY	STR	Fine	Dry	100	2	BUS	M46	S in ULAN RD	Unk	Proceeding in lane	OC	0	0	0	1	0	
E41918312								RUM	91	Object struck veh				OMV	U U	N in ULAN RD	Unk	Proceeding in lane							
														Falling object											
845962	P	29/07/2013	Mon	03:05		at	MAIN ST	TJN	STR	Fine	Dry	100	1	CAR	F38	S in ULAN RD	100	Proceeding in lane	OC	0	0	0	1	0	
E51586509								RUM	67	Struck animal				Kangaroo											
756110	P	11/06/2011	Sat	07:10	1 km	N	MUDHUT CREEK RD	2WY	STR	Fine	Dry	100	1	TRK	M28	S in ULAN RD	100	Proceeding in lane	OC	0	0	0	1	0	F
E86485802								RUM	71	Off rd left => obj				Drain/culvert											
757606	P	17/06/2011	Fri	23:15	12 km	S	ULAN TN	2WY	STR	Fine	Dry	100	1	VAN	M43	N in ULAN RD	83	Proceeding in lane	NC	0	0	0	0	0	
E44830276								RUM	67	Struck animal				Kangaroo											

Report Totals: Crashes: 81 Fatal Crashes(FC): 3 Serious Injury Crashes(SC): 13 Moderate Injury Crashes(MC): 11 Minor/Other Injury Crashes(OC): 5 Uncategorised Injury Crashes(UC): 4 Non-Casualty Crashes(NC): 45

Killed(K): 3 Seriously Injured(S): 14 Moderately Injured(M): 15 Minor/Other Injured(O): 7 Uncategorised Injured(U): 4

Crashid dataset Ulan Rd (Lue Rd to Golden Hwy) - 01.01.10 to 31.12.14

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.
Reporting years 2014 onwards contain uncategorised injury crashes.

Summary Crash Report

# Crash Type		
Car Crash	58	71.6%
Light Truck Crash	34	42.0%
Rigid Truck Crash	4	4.9%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	*(4)*	*(4.9%)*
Bus Crash	1	1.2%
"Heavy Vehicle Crash	*(5)*	*(6.2%)*
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	2	2.5%
Pedal Cycle Crash	2	2.5%
Pedestrian Crash	2	2.5%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	16	19.8%
Non intersection	65	80.2%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	50	61.7%
Multi Vehicle	31	38.3%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	80	98.8%
Unclassified Road	1	1.2%

Contributing Factors		
Speeding	13	16.0%
Fatigue	10	12.3%

Weather		
Fine	58	71.6%
Rain	13	16.0%
Overcast	4	4.9%
Fog or mist	5	6.2%
Other	0	0.0%

Road Surface Condition		
Wet	21	25.9%
Dry	60	74.1%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	6	7.4%
Daylight	39	48.1%
Dusk	8	9.9%
Darkness	28	34.6%

Crash Movement		
Intersection, adjacent approaches	5	6.2%
Head-on (not overtaking)	3	3.7%
Opposing vehicles; turning	1	1.2%
U-turn	0	0.0%
Rear-end	16	19.8%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	1	1.2%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	1	1.2%
Permanent obstruction on road	0	0.0%
Hit animal	10	12.3%
Off road, on straight	9	11.1%
Off road on straight, hit object	14	17.3%
Out of control on straight	2	2.5%
Off road, on curve	3	3.7%
Off road on curve, hit object	9	11.1%
Out of control on curve	0	0.0%
Other crash type	7	8.6%

Speed Limit					
40 km/h or less	1	1.2%	80 km/h zone	15	18.5%
50 km/h zone	4	4.9%	90 km/h zone	0	0.0%
60 km/h zone	3	3.7%	100 km/h zone	58	71.6%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

CRASHES	81	
Fatal	3	3.7%
Serious inj.	13	16.0%
Moderate inj.	11	13.6%
Minor/Other inj.	5	6.2%
Uncategorised inj.	4	4.9%
Non-casualty	45	55.6%

CASUALTIES	43	
Killed	3	7.0%
Seriously inj.	14	32.6%
Moderately inj.	15	34.9%
Minor/Other inj.	7	16.3%
Uncategorised inj.	4	9.3%
^ Unrestrained	1	2.3%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Self Reported Crash	0	0%

Time Group		% of Day	
00:01 - 02:59	4	4.9%	12.5%
03:00 - 04:59	4	4.9%	8.3%
05:00 - 05:59	3	3.7%	4.2%
06:00 - 06:59	11	13.6%	4.2%
07:00 - 07:59	7	8.6%	4.2%
08:00 - 08:59	2	2.5%	4.2%
09:00 - 09:59	7	8.6%	4.2%
10:00 - 10:59	2	2.5%	4.2%
11:00 - 11:59	2	2.5%	4.2%
12:00 - 12:59	3	3.7%	4.2%
13:00 - 13:59	3	3.7%	4.2%
14:00 - 14:59	0	0.0%	4.2%
15:00 - 15:59	3	3.7%	4.2%
16:00 - 16:59	5	6.2%	4.2%
17:00 - 17:59	6	7.4%	4.2%
18:00 - 18:59	7	8.6%	4.2%
19:00 - 19:59	4	4.9%	4.2%
20:00 - 21:59	4	4.9%	8.3%
22:00 - 24:00	4	4.9%	8.3%

Crashes		Casualties
16	2014	6
14	2013	4
23	2012	14
20	2011	16
8	2010	3

McLean Periods		% Week	
A	21	25.9%	17.9%
B	6	7.4%	7.1%
C	14	17.3%	17.9%
D	2	2.5%	3.5%
E	1	1.2%	3.6%
F	11	13.6%	10.7%
G	14	17.3%	7.1%
H	2	2.5%	7.1%
I	4	4.9%	12.5%
J	6	7.4%	10.7%

Street Lighting Off/Nil		% of Dark
25	of 28	in Dark 89.3%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less	0	0.0%	~ School Travel Time Involvement	13	16.0%

Day of the Week												
Monday	11	13.6%	Wednesday	9	11.1%	Friday	17	21.0%	Sunday	9	11.1%	WEEKEND	16	19.8%
Tuesday	10	12.3%	Thursday	18	22.2%	Saturday	7	8.6%	WEEKDAY	65	80.2%			

#Holiday Periods																				
New Year	0	0.0%	Easter	6	7.4%	Queen's BD	2	2.5%	Christmas	2	2.5%	Easter SH	7	8.6%	Sept./Oct. SH	1	1.2%			
Aust. Day	1	1.2%	Anzac Day	0	0.0%	Labour Day	0	0.0%	January SH	3	3.7%	June/July SH	7	8.6%	December SH	2	2.5%			

Crashid dataset Ulan Rd (Lue Rd to Golden Hwy) - 01.01.10 to 31.12.14

Note: Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data. Reporting years 2014 onwards contain uncategorised injury crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Detailed Crash Report

Transport for NSW
Centre for Road Safety

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F
Western Region																											
Mid-Western Regional LGA																											
Budgee Budgee																											
Wollar Rd																											
739251	P	15/01/2011	Sat	21:20		at	BOTOBOLAR RD	TJN	CRV	Overcast	Dry	100	1	CAR	M17	N in WOLLAR RD	90	Proceeding in lane	MC	0	0	1	0	0			
E83508502								RUM	86	Off left/left bend																	
771678	P	10/10/2011	Mon	09:20	800 m	E	ULAN RD	2WY	CRV	Fine	Dry	100	1	TRK	M51	W in WOLLAR RD	100	Proceeding in lane	OC	0	0	0	1	0		F	
E45500570								RUM	85	Off rt/lft bnd=>obj				Embankment													
706054	P	04/06/2010	Fri	23:45	3.3 km	E	ULAN RD	2WY	CRV	Fine	Dry	100	1	CAR	F44	W in WOLLAR RD	Unk	Proceeding in lane	FC	1	0	0	0	0	S		
E42856487								RUM	83	Off rt/rt bnd=>obj				Guide Post													
Cooyal																											
Wollar Rd																											
762628	P	14/07/2011	Thu	22:40	5 km	E	KAINS FLAT RD	2WY	STR	Fine	Dry	100	1	TRK	M22	W in WOLLAR RD	100	Proceeding in lane	NC	0	0	0	0	0	S		
E44794344								RUM	73	Off rd rght => obj				Tree/bush													
783563	P	23/01/2012	Mon	14:30	600 m	N	KAINS FLAT RD	2WY	CRV	Fine	Dry	100	1	CAR	M23	N in WOLLAR RD	90	Proceeding in lane	NC	0	0	0	0	0			
E46959557								RUM	67	Struck animal				Kangaroo													
768758	P	20/09/2011	Tue	07:10	5.6 km	N	KAINS FLAT RD	2WY	CRV	Raining	Wet	100	1	WAG	F31	N in WOLLAR RD	80	Proceeding in lane	MC	0	0	1	0	0	S		
E46063373								RUM	83	Off rt/rt bnd=>obj				Tree/bush													
747630	P	18/03/2011	Fri	17:00	5 km	E	ULAN RD	2WY	STR	Fine	Dry	100	1	CAR	F52	E in WOLLAR RD	95	Proceeding in lane	OC	0	0	0	1	0			
E44134031								RUM	73	Off rd rght => obj				Tree/bush													
837355	P	16/05/2013	Thu	16:40	8 km	E	ULAN RD	2WY	STR	Fine	Dry	100	1	CAR	F17	W in WOLLAR RD	Unk	Proceeding in lane	NC	0	0	0	0	0			
E51211552								RUM	72	Off road to right																	
750395	P	21/04/2011	Thu	15:45	24 km	N	ULAN RD	2WY	CRV	Fine	Dry	100	1	CAR	F20	S in WOLLAR RD	90	Proceeding in lane	OC	0	0	0	1	0	S		
E43677230								RUM	87	Off lft/lft bnd=>obj				Tree/bush													
849682	P	26/08/2013	Mon	15:35	14 km	W	ULAN RD	2WY	CRV	Fine	Dry	100	1	TRK	M26	E in WOLLAR RD	Unk	Proceeding in lane	SC	0	2	0	0	0	S		
E52490903								RUM	83	Off rt/rt bnd=>obj				Tree/bush													
Cumbo																											
Wollar Rd																											
1038771	P	16/08/2014	Sat	04:50	400 m	S	CUMBO CK	2WY	CRV	Fine	Dry	100	1	TRK	M21	S in WOLLAR RD	80	Proceeding in lane	NC	0	0	0	0	0			
E55719819								RUM	81	Off left/rt bnd=>obj				Tree/bush													
Moolarben																											
Wollar Rd																											
818245	P	25/11/2012	Sun	13:00	200 m	N	MOOLARBEN RD	2WY	STR	Fine	Dry	100	1	TRK	F25	N in WOLLAR RD	95	Proceeding in lane	NC	0	0	0	0	0			
E48913510								RUM	67	Struck animal				Kangaroo													

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors
																									S F
Mudgee																									
Wollar Rd																									
722656	P	27/08/2010	Fri	22:30	3.34 km	E	ULAN RD	2WY	CRV	Overcast	Dry	100	1	CAR	M43	W in WOLLAR RD	90	Proceeding in lane	NC	0	0	0	0	0	S
E43752985								RUM	81	Off left/rt bnd=>obj				Tree/bush											
Munghorn																									
Wollar Rd																									
1032075	P	14/05/2014	Wed	04:30	6.035 km	E	KAINS FLAT RD	2WY	CRV	Fine	Dry	100	1	4WD	M36	W in WOLLAR RD	40	Proceeding in lane	NC	0	0	0	0	0	S
E54879961								RUM	81	Off left/rt bnd=>obj				Tree/bush											
1025645	P	15/05/2014	Thu	14:30	24 km	E	ULAN RD	2WY	CRV	Fine	Dry	100	1	CAR	F40	E in WOLLAR RD	40	Proceeding in lane	NC	0	0	0	0	0	S
E55411574								RUM	81	Off left/rt bnd=>obj				Tree/bush											
Stony Creek																									
Wollar Rd																									
1022693	P	02/05/2014	Fri	14:00	3 km	N	BOTOBOLAR RD	2WY	STR	Overcast	Dry	100	1	CAR	F U	N in WOLLAR RD	102	Proceeding in lane	UC	0	0	0	0	1	S
E54822146								RUM	71	Off rd left => obj				Tree/bush											
Ulan																									
Wollar Rd																									
726539	P	31/08/2010	Tue	18:00	2 km	E	ULAN RD	2WY	STR	Fine	Dry	100	2	UTE	F22	E in WOLLAR RD	80	Proceeding in lane	NC	0	0	0	0	0	
E41495809								RUM	30	Rear end				UTE	M48	E in WOLLAR RD	60	Proceeding in lane							
739124	P	21/01/2011	Fri	12:00	3.7 km	E	ULAN RD	2WY	CRV	Fine	Dry	100	1	TRK	M27	W in WOLLAR RD	90	Proceeding in lane	NC	0	0	0	0	0	S
E43544240								RUM	85	Off rt/lft bnd=>obj				Tree/bush											
Wollar																									
Bylong Rd																									
791414	P	15/04/2012	Sun	08:00	90 m	W	RINGWOOD RD	2WY	CRV	Fine	Dry	100	1	CAR	F40	W in BYLONG RD	Unk	Proceeding in lane	MC	0	0	1	0	0	S
E48184667								RUM	86	Off left/left bend															
Wollar Rd																									
812637	P	01/10/2012	Mon	19:48	35 m	E	RINGWOOD RD	2WY	CRV	Fine	Dry	100	1	TRK	M22	E in WOLLAR RD	75	Proceeding in lane	MC	0	0	2	0	0	S
E49428338								RUM	83	Off rt/rt bnd=>obj				Drain/culvert											
768457	P	23/09/2011	Fri	15:50	3.6 km	E	WILPINJONG MTN ENT	2WY	CRV	Fine	Dry	100	1	CAR	F18	W in WOLLAR RD	50	Proceeding in lane	NC	0	0	0	0	0	S
E47649680								RUM	83	Off rt/rt bnd=>obj				Fence (prior to 2014)											

Report Totals: Crashes: 21 Fatal Crashes(FC): 1 Serious Injury Crashes(SC): 1 Moderate Injury Crashes(MC): 4 Minor/Other Injury Crashes(OC): 3 Uncategorised Injury Crashes(UC): 1 Non-Casualty Crashes(NC): 11

Killed(K): 1 Seriously Injured(S): 2 Moderately Injured(M): 5 Minor/Other Injured(O): 3 Uncategorised Injured(U): 1

Crashid dataset Wollar Rd - 01.01.10 to 31.12.14

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.
Reporting years 2014 onwards contain uncategorised injury crashes.

Summary Crash Report

# Crash Type		
Car Crash	14	66.7%
Light Truck Crash	7	33.3%
Rigid Truck Crash	0	0.0%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	*(0)*	*(0.0%)*
Bus Crash	0	0.0%
"Heavy Vehicle Crash	*(0)*	*(0.0%)*
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	0	0.0%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	1	4.8%
Non intersection	20	95.2%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	20	95.2%
Multi Vehicle	1	4.8%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	21	100.0%
Unclassified Road	0	0.0%

Contributing Factors		
Speeding	13	61.9%
Fatigue	1	4.8%

Weather		
Fine	17	81.0%
Rain	1	4.8%
Overcast	3	14.3%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	1	4.8%
Dry	20	95.2%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	1	4.8%
Daylight	12	57.1%
Dusk	1	4.8%
Darkness	7	33.3%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	0	0.0%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	1	4.8%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	2	9.5%
Off road, on straight	1	4.8%
Off road on straight, hit object	3	14.3%
Out of control on straight	0	0.0%
Off road, on curve	2	9.5%
Off road on curve, hit object	12	57.1%
Out of control on curve	0	0.0%
Other crash type	0	0.0%

Speed Limit					
40 km/h or less	0	0.0%	80 km/h zone	0	0.0%
50 km/h zone	0	0.0%	90 km/h zone	0	0.0%
60 km/h zone	0	0.0%	100 km/h zone	21	100.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less	0	0.0%	~ School Travel Time Involvement	6	28.6%

Day of the Week												
Monday	4	19.0%	Wednesday	1	4.8%	Friday	6	28.6%	Sunday	2	9.5%	WEEKEND	4	19.0%
Tuesday	2	9.5%	Thursday	4	19.0%	Saturday	2	9.5%	WEEKDAY	17	81.0%			

CRASHES	21	
Fatal	1	4.8%
Serious inj.	1	4.8%
Moderate inj.	4	19.0%
Minor/Other inj.	3	14.3%
Uncategorised inj.	1	4.8%
Non-casualty	11	52.4%

CASUALTIES	12	
Killed	1	8.3%
Seriously inj.	2	16.7%
Moderately inj.	5	41.7%
Minor/Other inj.	3	25.0%
Uncategorised inj.	1	8.3%
^ Unrestrained	1	8.3%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Self Reported Crash	0	0%

Time Group		% of Day	
00:01 - 02:59	0	0.0%	12.5%
03:00 - 04:59	2	9.5%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	1	4.8%	4.2%
08:00 - 08:59	1	4.8%	4.2%
09:00 - 09:59	1	4.8%	4.2%
10:00 - 10:59	0	0.0%	4.2%
11:00 - 11:59	0	0.0%	4.2%
12:00 - 12:59	1	4.8%	4.2%
13:00 - 13:59	1	4.8%	4.2%
14:00 - 14:59	3	14.3%	4.2%
15:00 - 15:59	3	14.3%	4.2%
16:00 - 16:59	1	4.8%	4.2%
17:00 - 17:59	1	4.8%	4.2%
18:00 - 18:59	1	4.8%	4.2%
19:00 - 19:59	1	4.8%	4.2%
20:00 - 21:59	1	4.8%	8.3%
22:00 - 24:00	3	14.3%	8.3%

Street Lighting Off/Nil		% of Dark
7	of 7	in Dark **********

Crashes		Casualties
4	2014	1
2	2013	2
4	2012	3
8	2011	5
3	2010	1

McLean Periods		% Week	
A	2	9.5%	17.9%
B	2	9.5%	7.1%
C	5	23.8%	17.9%
D	0	0.0%	3.5%
E	1	4.8%	3.6%
F	3	14.3%	10.7%
G	4	19.0%	7.1%
H	0	0.0%	7.1%
I	0	0.0%	12.5%
J	4	19.0%	10.7%

#Holiday Periods																		
New Year	0	0.0%	Easter	1	4.8%	Queen's BD	0	0.0%	Christmas	0	0.0%	Easter SH	2	9.5%	Sept./Oct. SH	1	4.8%	
Aust. Day	0	0.0%	Anzac Day	0	0.0%	Labour Day	1	4.8%	January SH	3	14.3%	June/July SH	1	4.8%	December SH	0	0.0%	

Crashid dataset Wollar Rd - 01.01.10 to 31.12.14

Note: Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data. Reporting years 2014 onwards contain uncategorised injury crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature		Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	
																										S F
Western Region																										
Mid-Western Regional LGA																										
Ulan																										
Wollar Rd																										
748985	P	18/02/2011	Fri	10:15	6 km	E	ULAN RD		2WY	CRV	Fine	Dry	100	1	LOR	M58	W in WOLLAR RD	90	Proceeding in lane	MC	0	0	1	0	0		
E84220002									RUM	83	Off rt/rt bnd=>obj				Embankment											
Woolar Rd																										
818084	P	16/11/2012	Fri	16:00	2.75 km	E	ULAN RD		2WY	CRV	Raining	Wet	100	1	CAR	F19	W in WOOLAR RD	80	Proceeding in lane	OC	0	0	0	1	0	S	
E50121677									RUM	85	Off rt/lft bnd=>obj				Tree/bush											

Report Totals: Crashes: 2 Fatal Crashes(FC): 0 Serious Injury Crashes(SC): 0 Moderate Injury Crashes(MC): 1 Minor/Other Injury Crashes(OC): 1 Uncategorised Injury Crashes(UC): 0 Non-Casualty Crashes(NC): 0

Killed(K): 0 Seriously Injured(S): 0 Moderately Injured(M): 1 Minor/Other Injured(O): 1 Uncategorised Injured(U): 0

Crashid dataset Ulan_Wollar Rd - 01.01.10 to 31.12.14

Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data.
Reporting years 2014 onwards contain uncategorised injury crashes.

Summary Crash Report

# Crash Type		
Car Crash	1	50.0%
Light Truck Crash	0	0.0%
Rigid Truck Crash	1	50.0%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	*(1)*	*(50.0%)*
Bus Crash	0	0.0%
"Heavy Vehicle Crash	*(1)*	*(50.0%)*
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	0	0.0%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	0	0.0%
Non intersection	2	100.0%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	2	100.0%
Multi Vehicle	0	0.0%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	0	0.0%
Unclassified Road	2	100.0%

Contributing Factors		
Speeding	1	50.0%
Fatigue	0	0.0%

Weather		
Fine	1	50.0%
Rain	1	50.0%
Overcast	0	0.0%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	1	50.0%
Dry	1	50.0%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	2	**********
Dusk	0	0.0%
Darkness	0	0.0%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	0	0.0%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	0	0.0%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	0	0.0%
Off road on straight, hit object	0	0.0%
Out of control on straight	0	0.0%
Off road, on curve	0	0.0%
Off road on curve, hit object	2	100.0%
Out of control on curve	0	0.0%
Other crash type	0	0.0%

Speed Limit					
40 km/h or less	0	0.0%	80 km/h zone	0	0.0%
50 km/h zone	0	0.0%	90 km/h zone	0	0.0%
60 km/h zone	0	0.0%	100 km/h zone	2	100.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less	0	0.0%	~ School Travel Time Involvement	1	50.0%

Day of the Week												
Monday	0	0.0%	Wednesday	0	0.0%	Friday	2	**********	Sunday	0	0.0%	WEEKEND	0	0.0%
Tuesday	0	0.0%	Thursday	0	0.0%	Saturday	0	0.0%	WEEKDAY	2	**********			

CRASHES	2	
Fatal	0	0.0%
Serious inj.	0	0.0%
Moderate inj.	1	50.0%
Minor/Other inj.	1	50.0%
Uncategorised inj.	0	0.0%
Non-casualty	0	0.0%

CASUALTIES	2	
Killed	0	0.0%
Seriously inj.	0	0.0%
Moderately inj.	1	50.0%
Minor/Other inj.	1	50.0%
Uncategorised inj.	0	0.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Self Reported Crash	0	0%

Time Group		% of Day	
00:01 - 02:59	0	0.0%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	0	0.0%	4.2%
08:00 - 08:59	0	0.0%	4.2%
09:00 - 09:59	0	0.0%	4.2%
10:00 - 10:59	1	50.0%	4.2%
11:00 - 11:59	0	0.0%	4.2%
12:00 - 12:59	0	0.0%	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	0	0.0%	4.2%
15:00 - 15:59	0	0.0%	4.2%
16:00 - 16:59	1	50.0%	4.2%
17:00 - 17:59	0	0.0%	4.2%
18:00 - 18:59	0	0.0%	4.2%
19:00 - 19:59	0	0.0%	4.2%
20:00 - 21:59	0	0.0%	8.3%
22:00 - 24:00	0	0.0%	8.3%

Street Lighting Off/Nil		% of Dark
0	of 0	in Dark 0.0%

Crashes		Casualties
1	2012	1
1	2011	1

McLean Periods		% Week	
A	0	0.0%	17.9%
B	0	0.0%	7.1%
C	1	50.0%	17.9%
D	0	0.0%	3.5%
E	0	0.0%	3.6%
F	0	0.0%	10.7%
G	1	50.0%	7.1%
H	0	0.0%	7.1%
I	0	0.0%	12.5%
J	0	0.0%	10.7%

#Holiday Periods																			
New Year	0	0.0%	Easter	0	0.0%	Queen's BD	0	0.0%	Christmas	0	0.0%	Easter SH	0	0.0%	Sept./Oct. SH	0	0.0%		
Aust. Day	0	0.0%	Anzac Day	0	0.0%	Labour Day	0	0.0%	January SH	0	0.0%	June/July SH	0	0.0%	December SH	0	0.0%		

Crashid dataset Ulan_Wollar Rd - 01.01.10 to 31.12.14

Note: Crash self reporting, including self reported injuries began in Oct 2014. Trends from 2014 are expected to vary from previous years. More unknowns are expected in self reported data. Reporting years 2014 onwards contain uncategorised injury crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Appendix B

Traffic demand diagrams

B1. PY2 (2017) Traffic

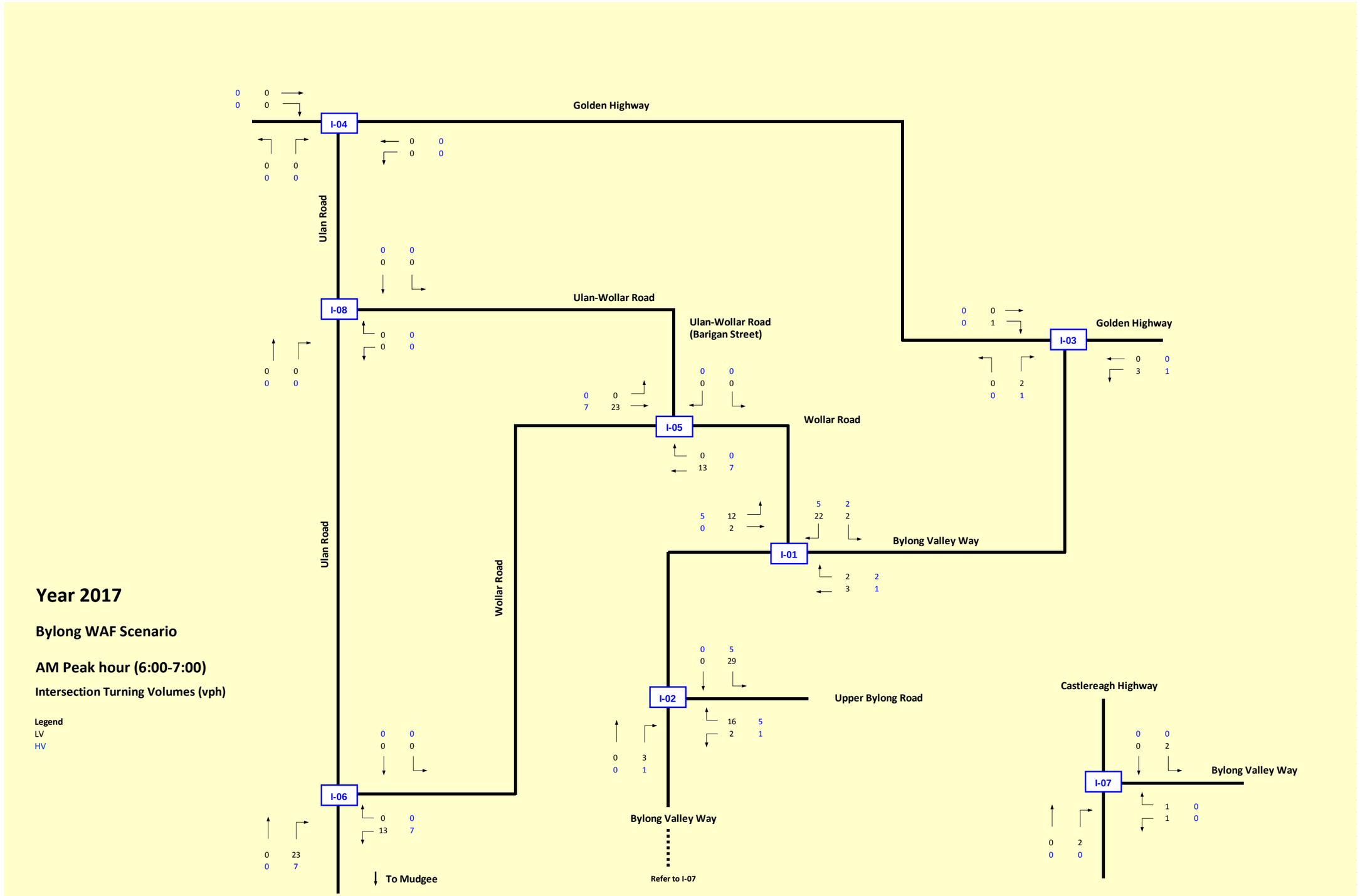


Figure B1.1 PY2, 2017 AM project peak hour traffic volumes (vph) – Scenario 1a – with WAF

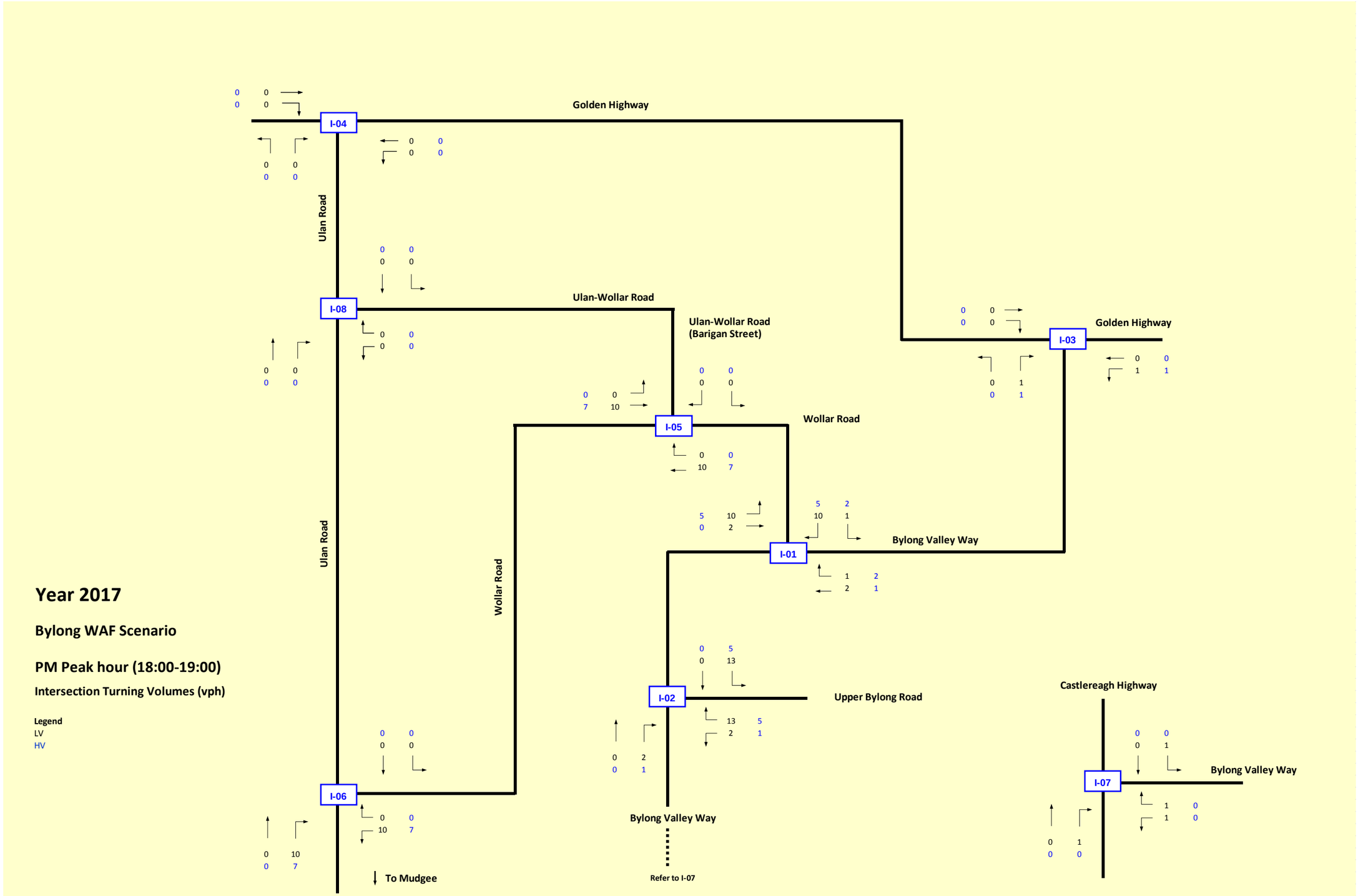


Figure B1.2 PY2, 2017 PM project peak hour traffic volumes (vph) – Scenario 1a – with WAF

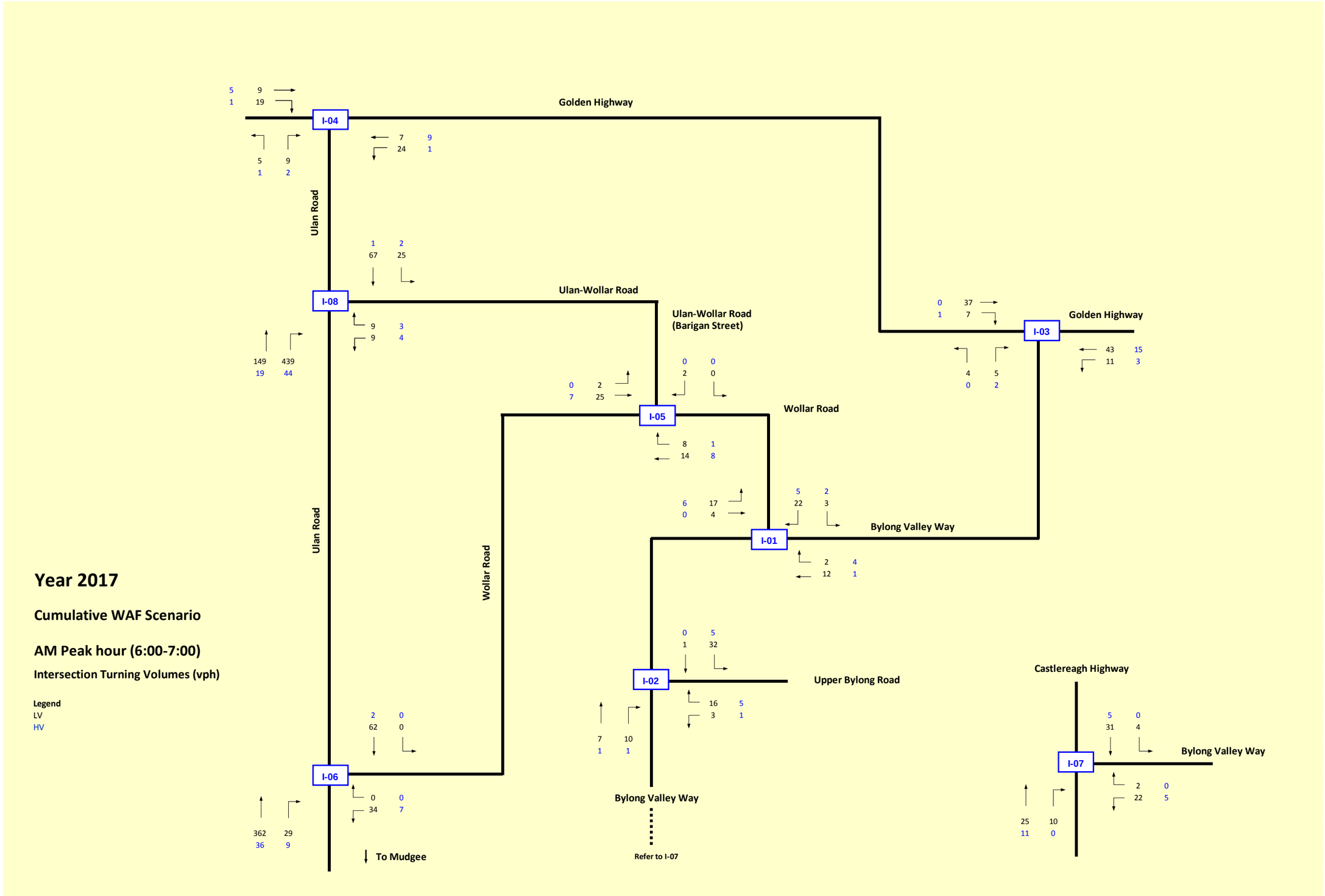


Figure B1.3 PY2, 2017 AM cumulative peak hour traffic volumes (vph) – Scenario 1b – with WAF

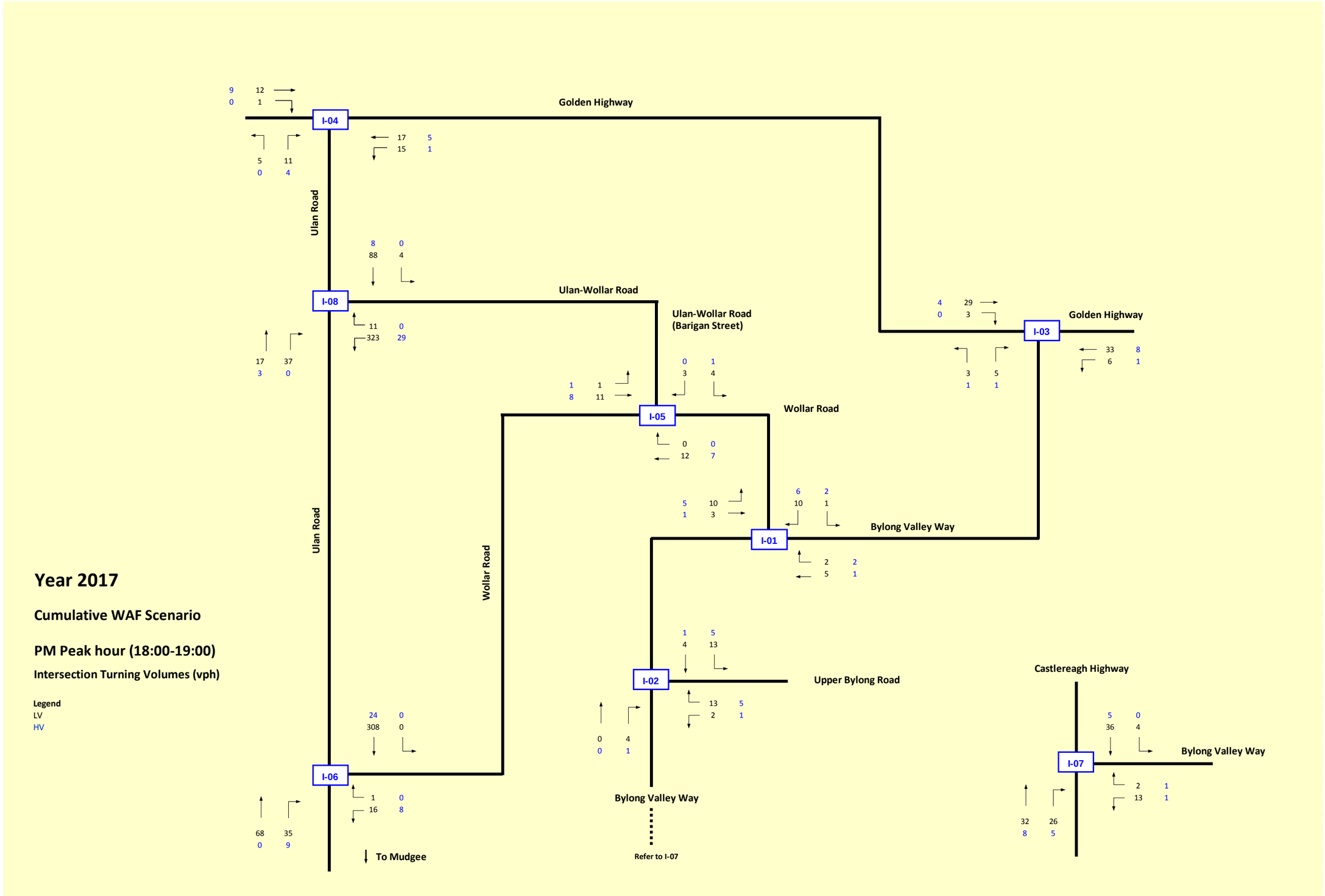


Figure B1.4 PY2, 2017 PM cumulative peak hour traffic volumes (vph) – Scenario 1b – with WAF

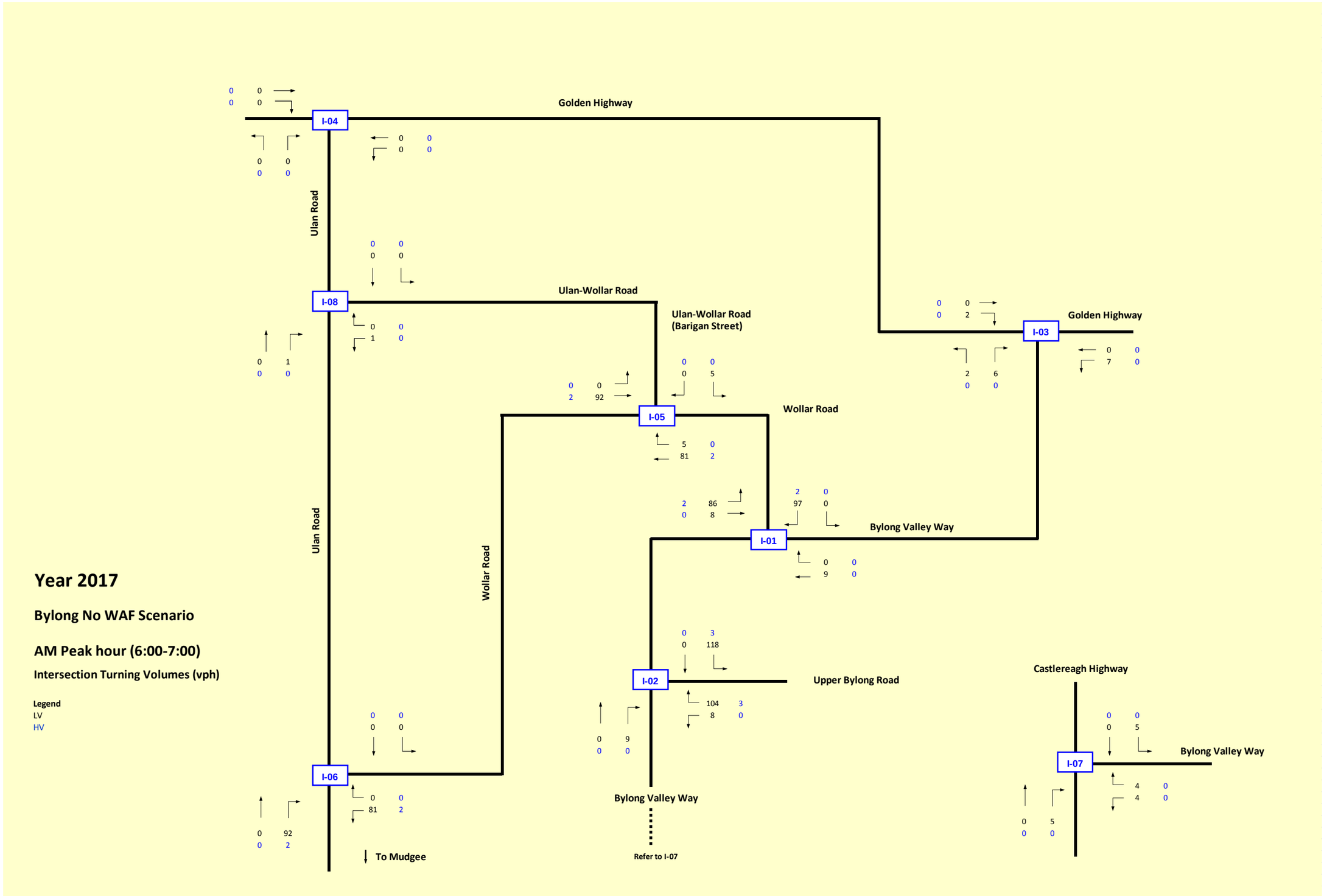


Figure B1.5 PY2, 2017 AM project peak hour traffic volumes (vph) – Scenario 1a – without WAF

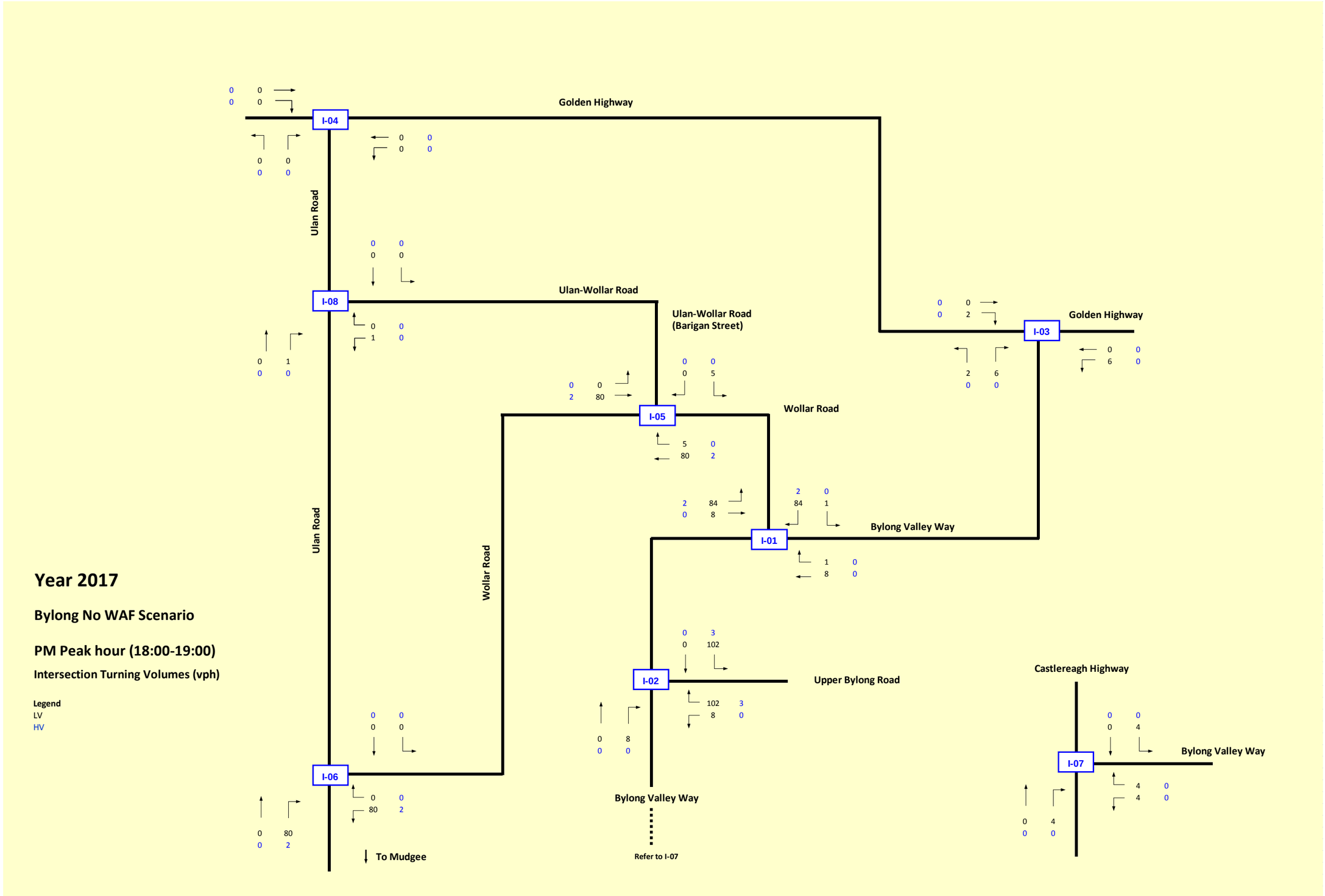


Figure B1.6 PY2, 2017 PM project peak hour traffic volumes (vph) – Scenario 1a – without WAF

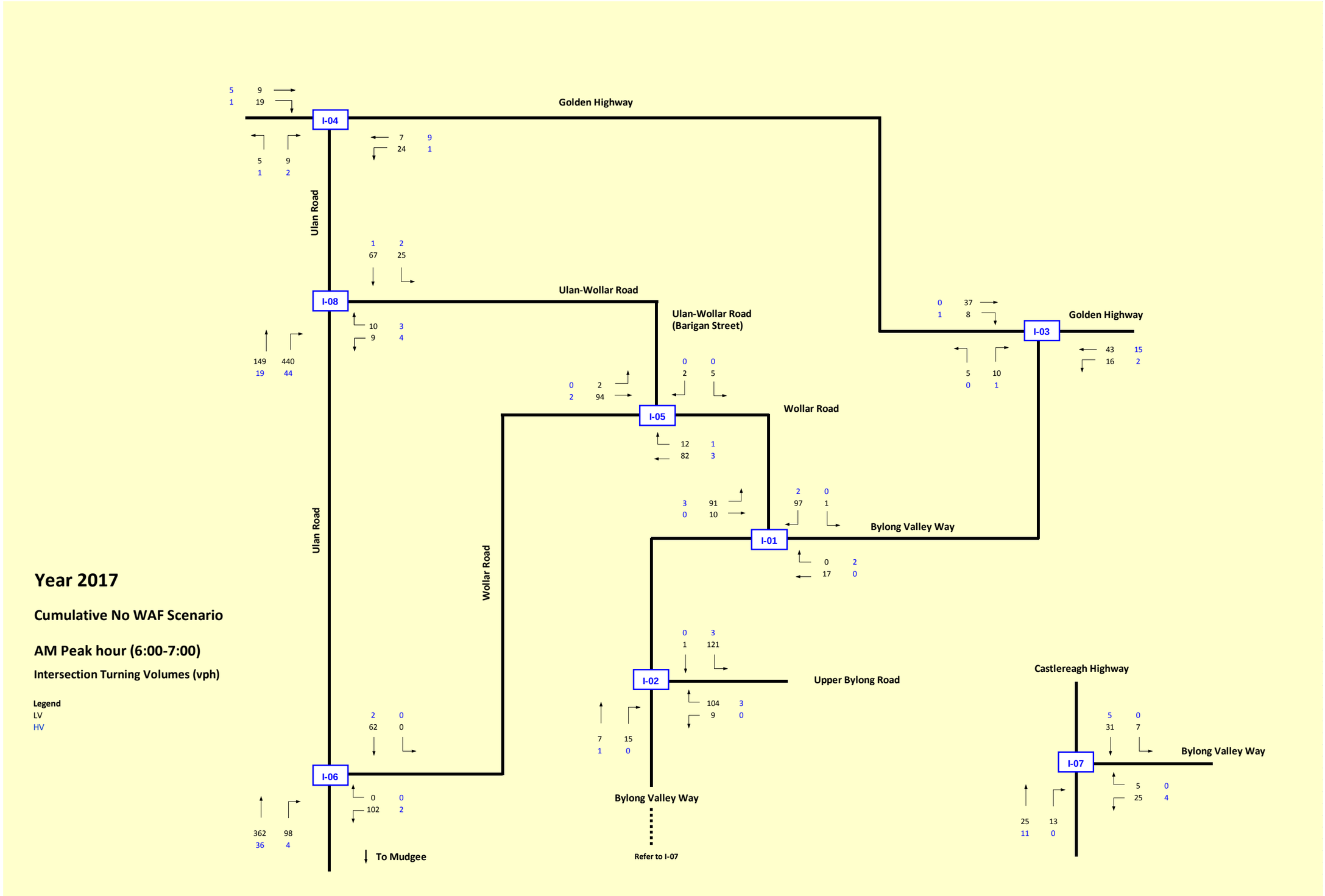


Figure B1.7 PY2, 2017 AM cumulative peak hour traffic volumes (vph) – Scenario 1b – without WAF

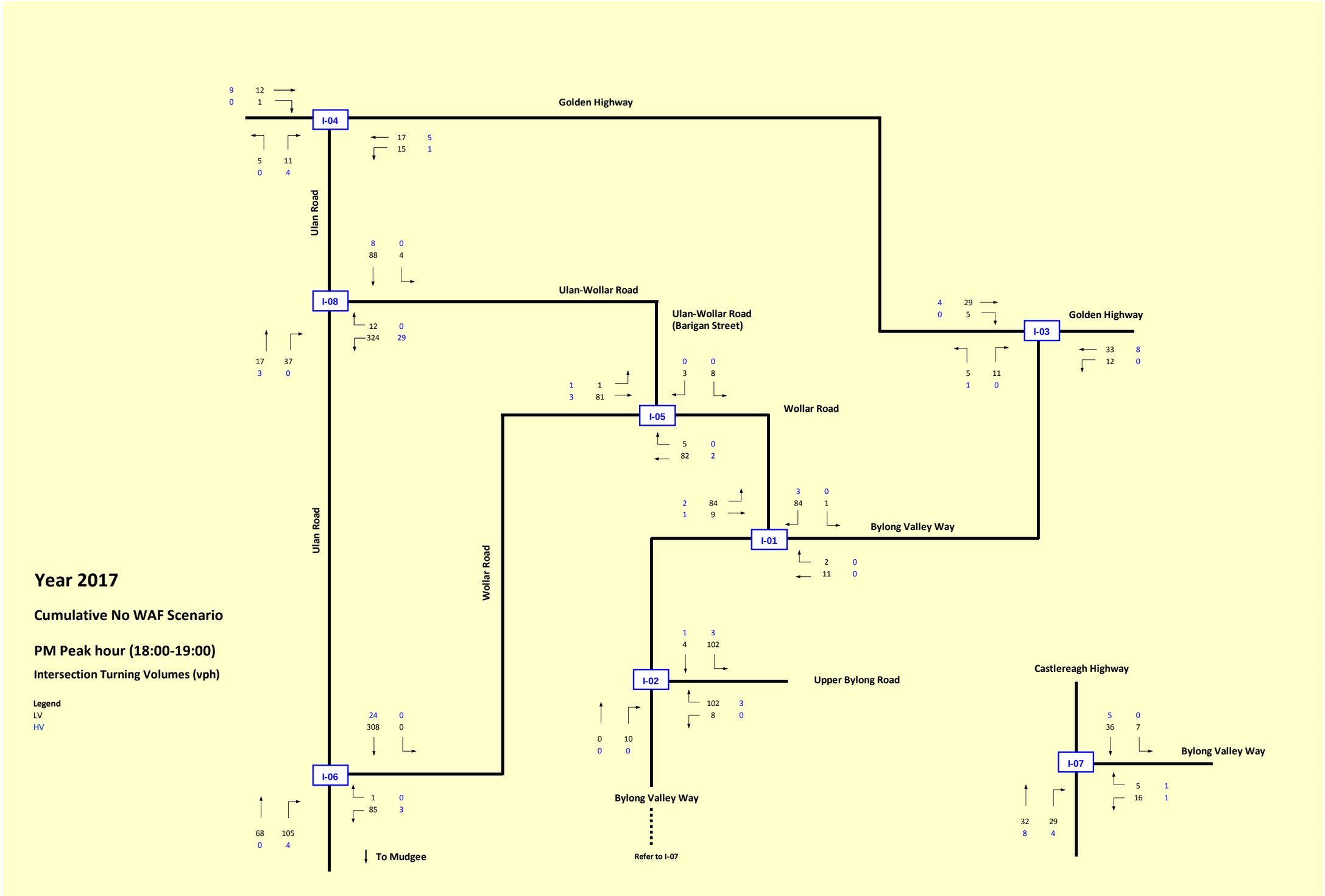


Figure B1.8 PY2, 2017 PM cumulative peak hour traffic volumes (vph) – Scenario 1b – without WAF

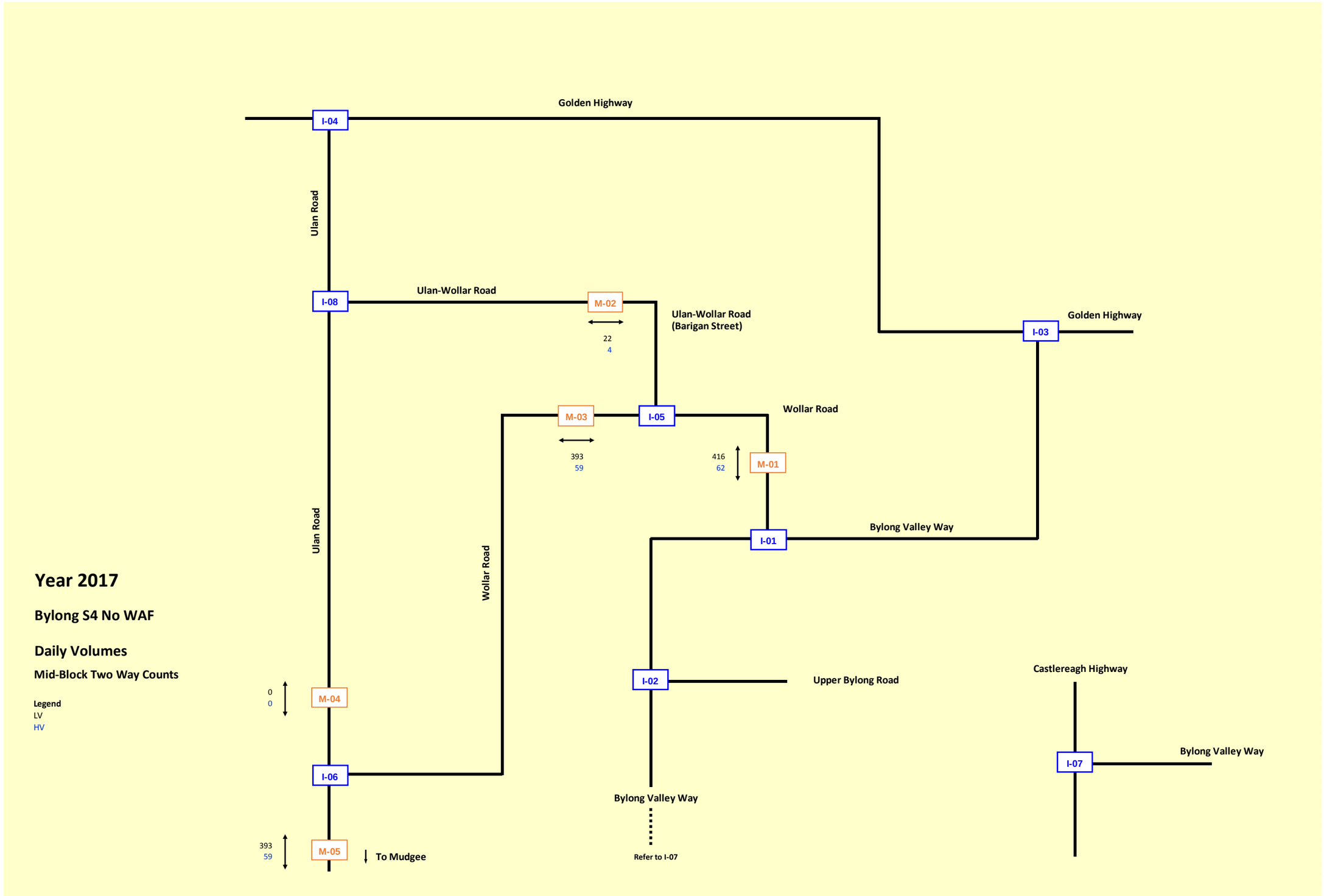


Figure B1.9 PY2, 2017 Daily mid-block project traffic volumes (vpd) – worst case scenario

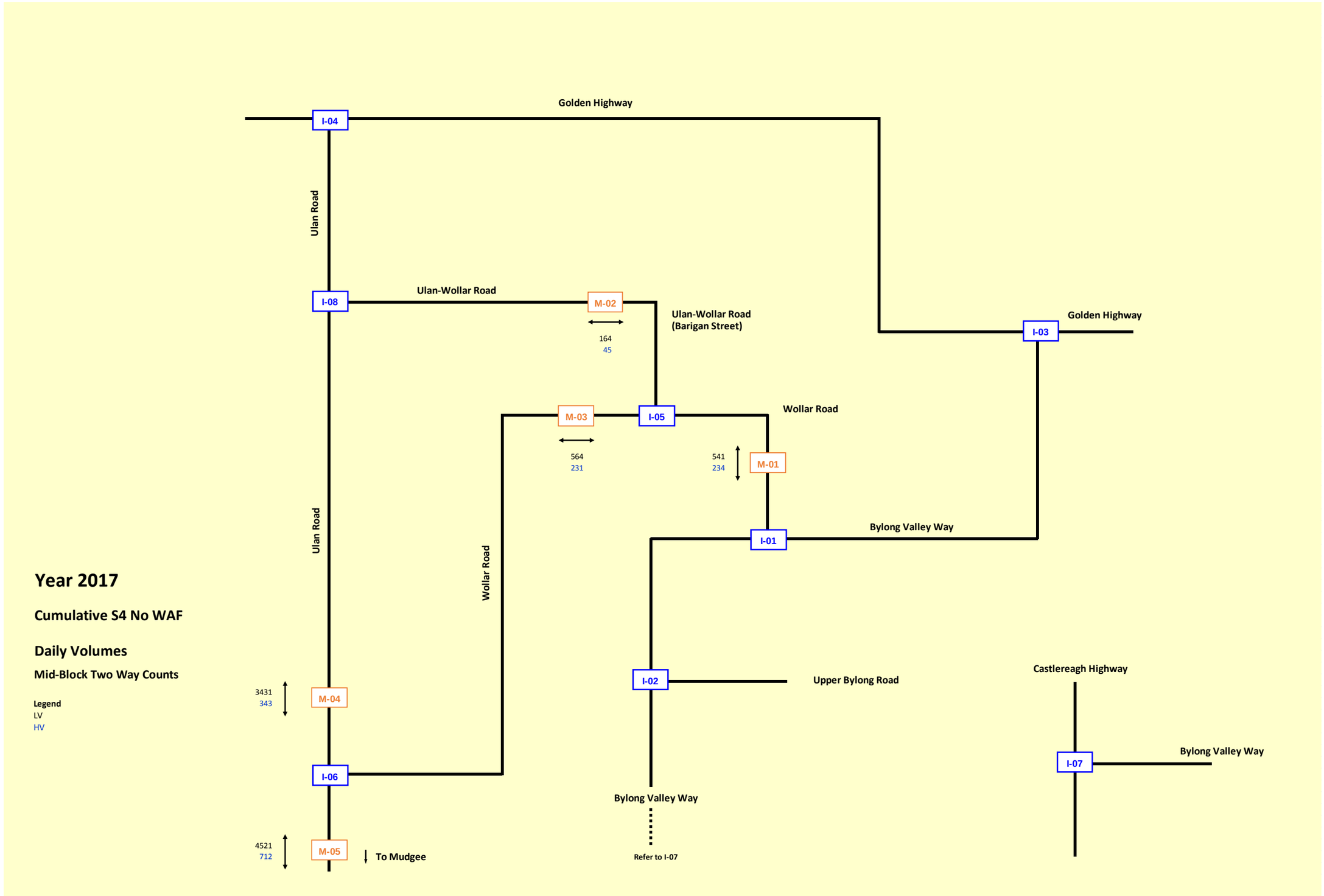


Figure B1.10 PY2, 2017 Daily mid-block cumulative traffic volumes (vpd) – worst case scenario

B2. PY9 (2024) Traffic

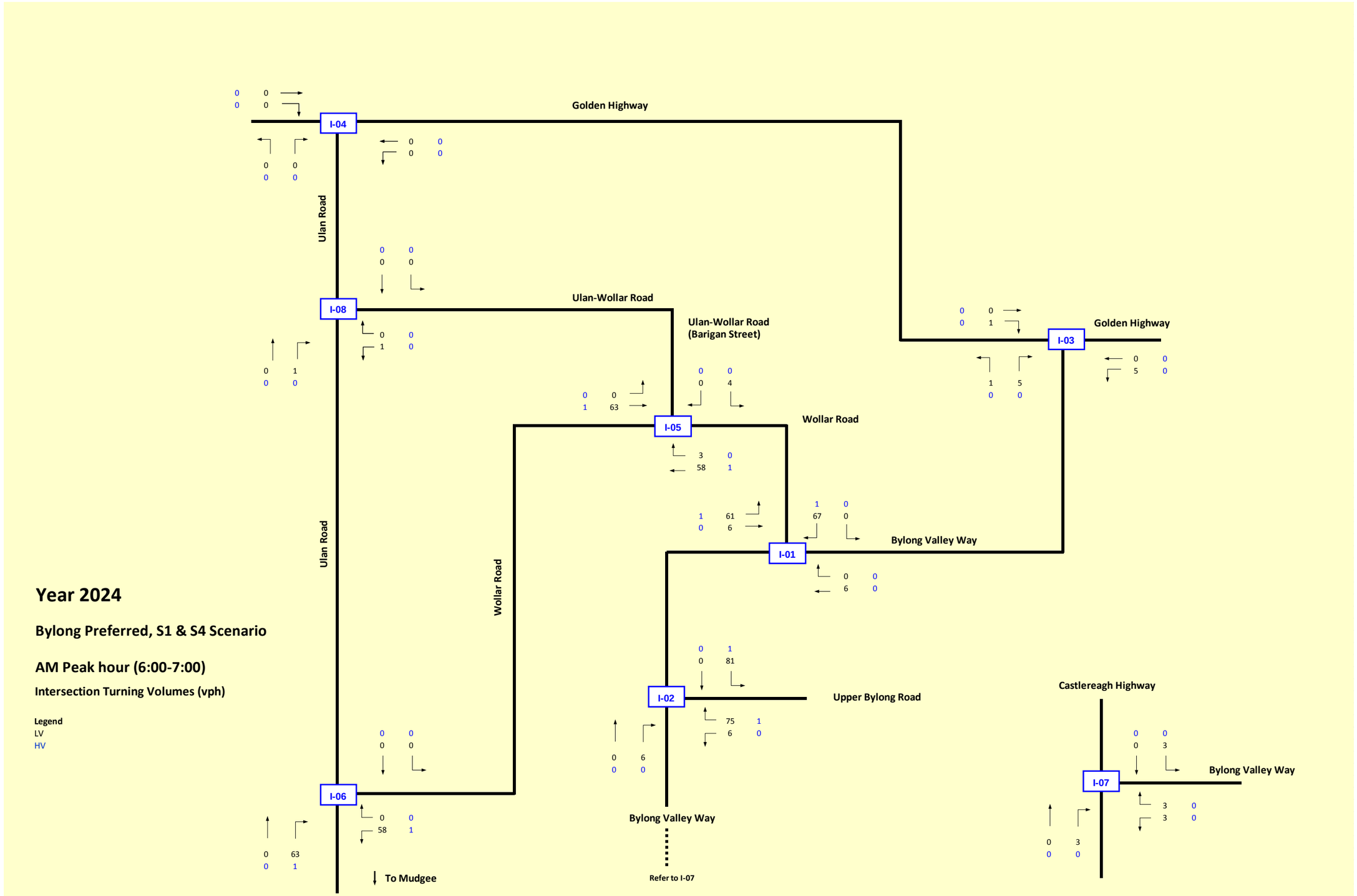


Figure B2.1 PY9, 2024 AM project peak hour traffic volumes (vph) – Scenario 2a – without WAF

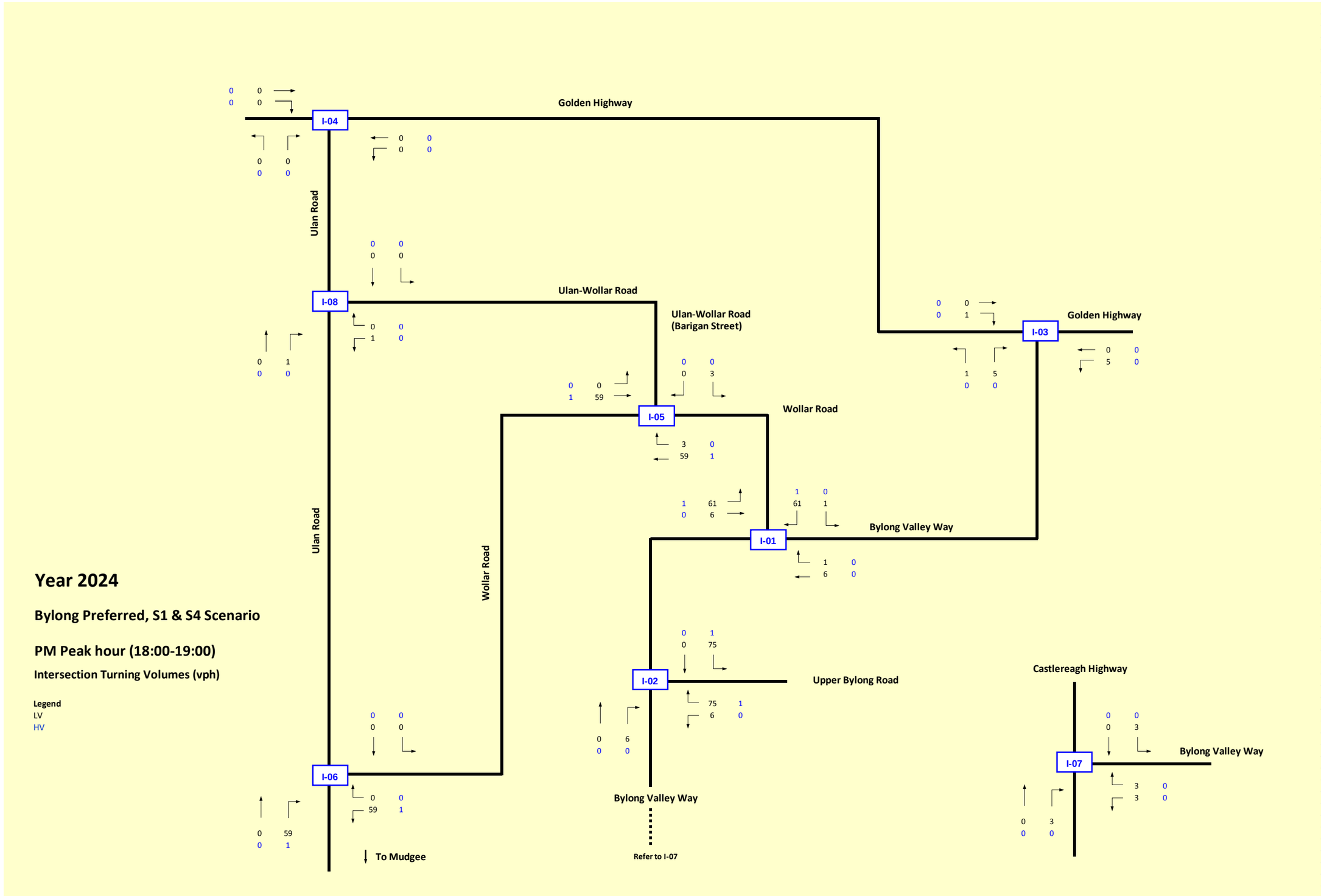


Figure B2.2 PY9, 2024 PM project peak hour traffic volumes (vph) – Scenario 2a – without WAF

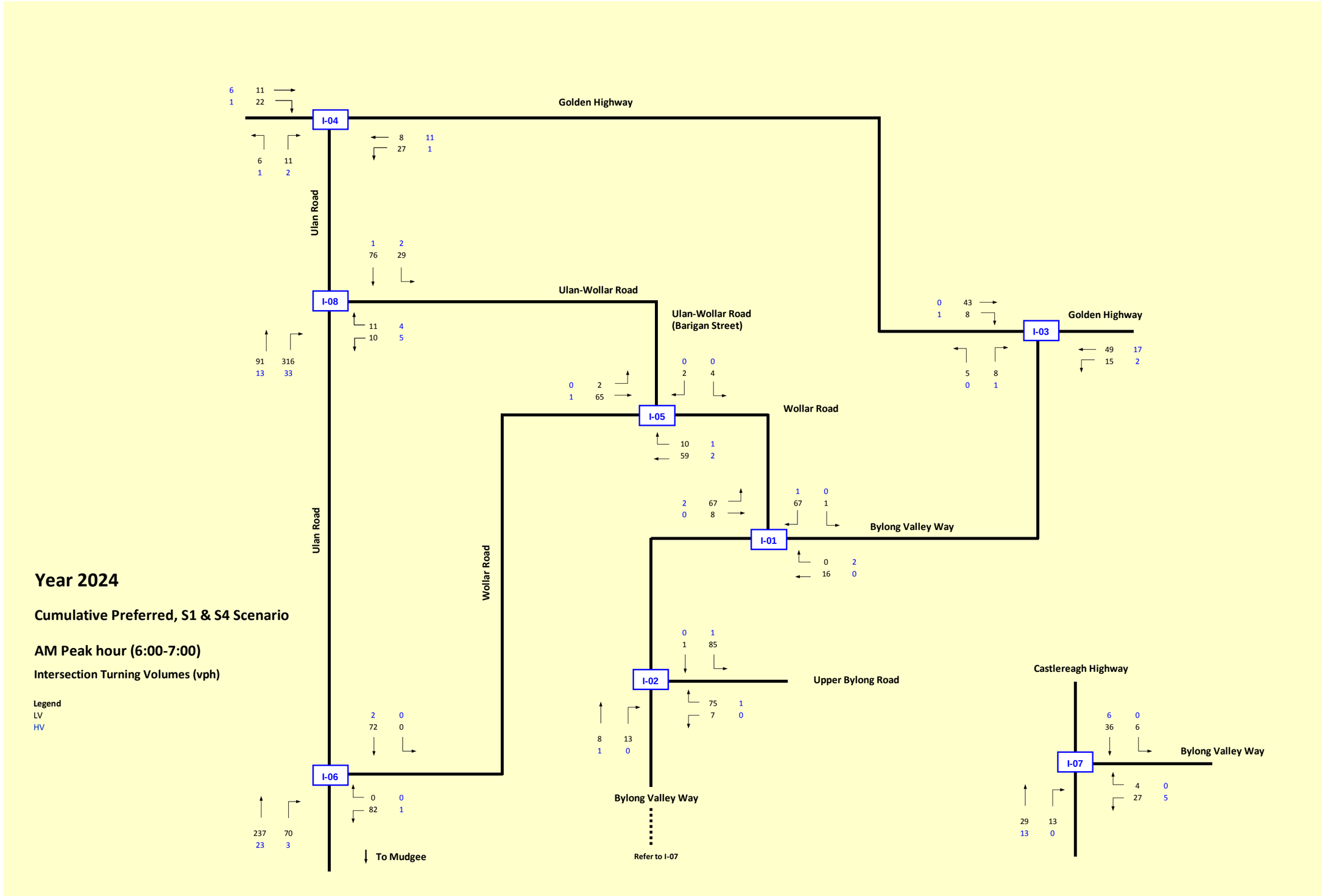


Figure B2.3 PY9, 2024 AM cumulative peak hour traffic volumes (vph) – Scenario 2b – without WAF

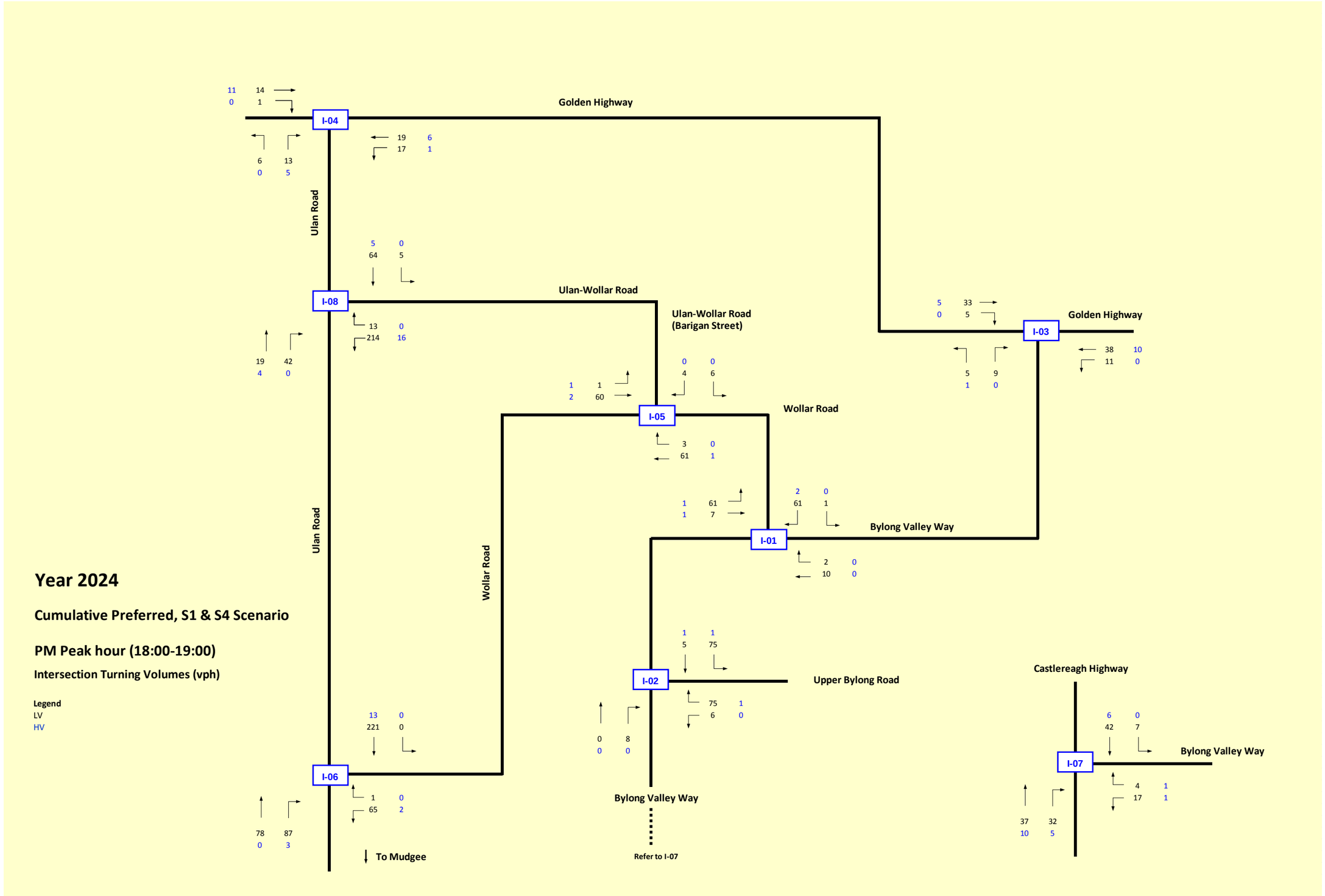


Figure B2.4 PY9, 2024 PM cumulative peak hour traffic volumes (vph) – Scenario 2b – without WAF

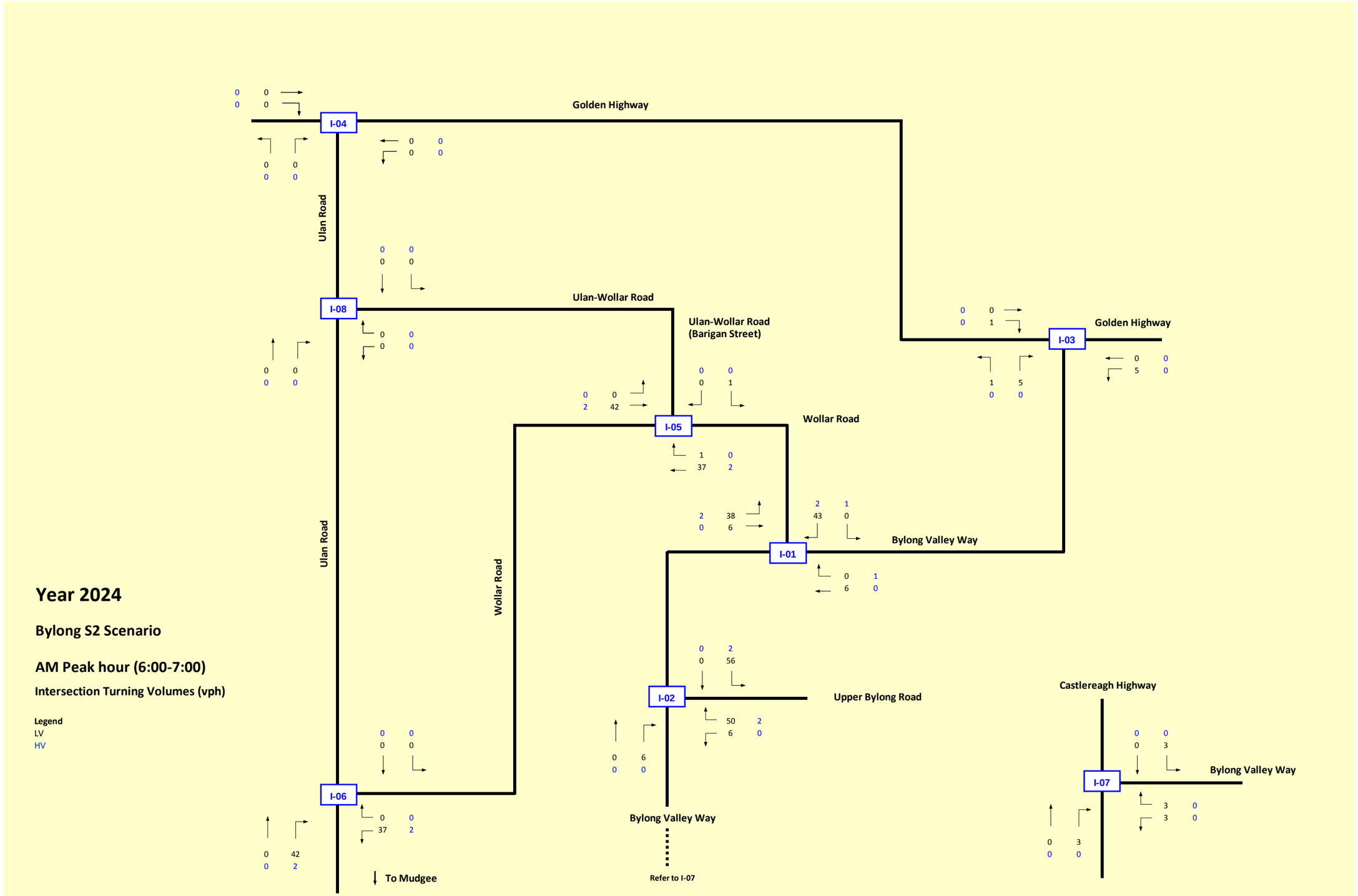


Figure B2.5 PY9, 2024 AM project peak hour traffic volumes (vph) – Scenario 2a - with WAF

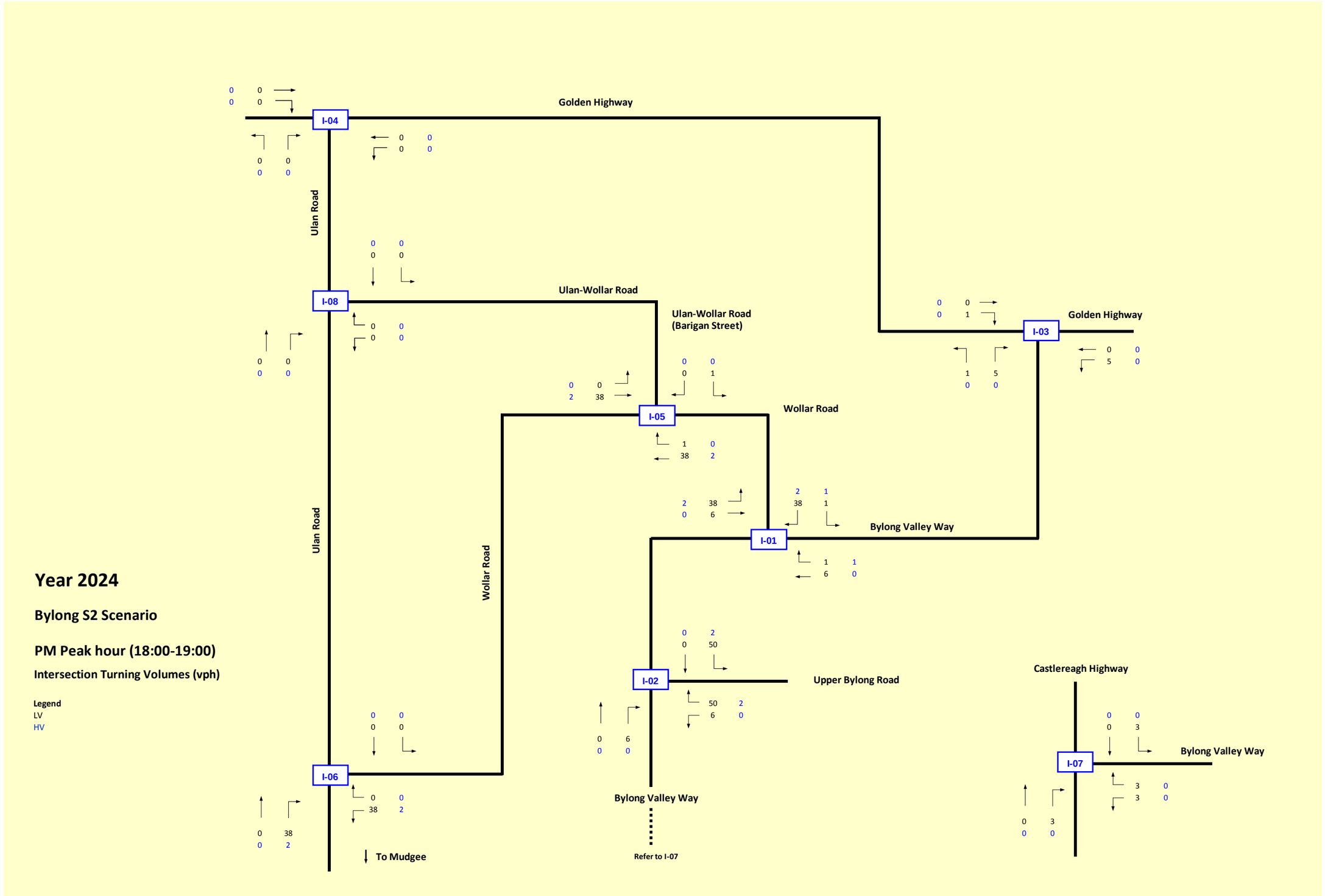


Figure B2.6 PY9, 2024 PM project peak hour traffic volumes (vph) – Scenario 2a – with WAF

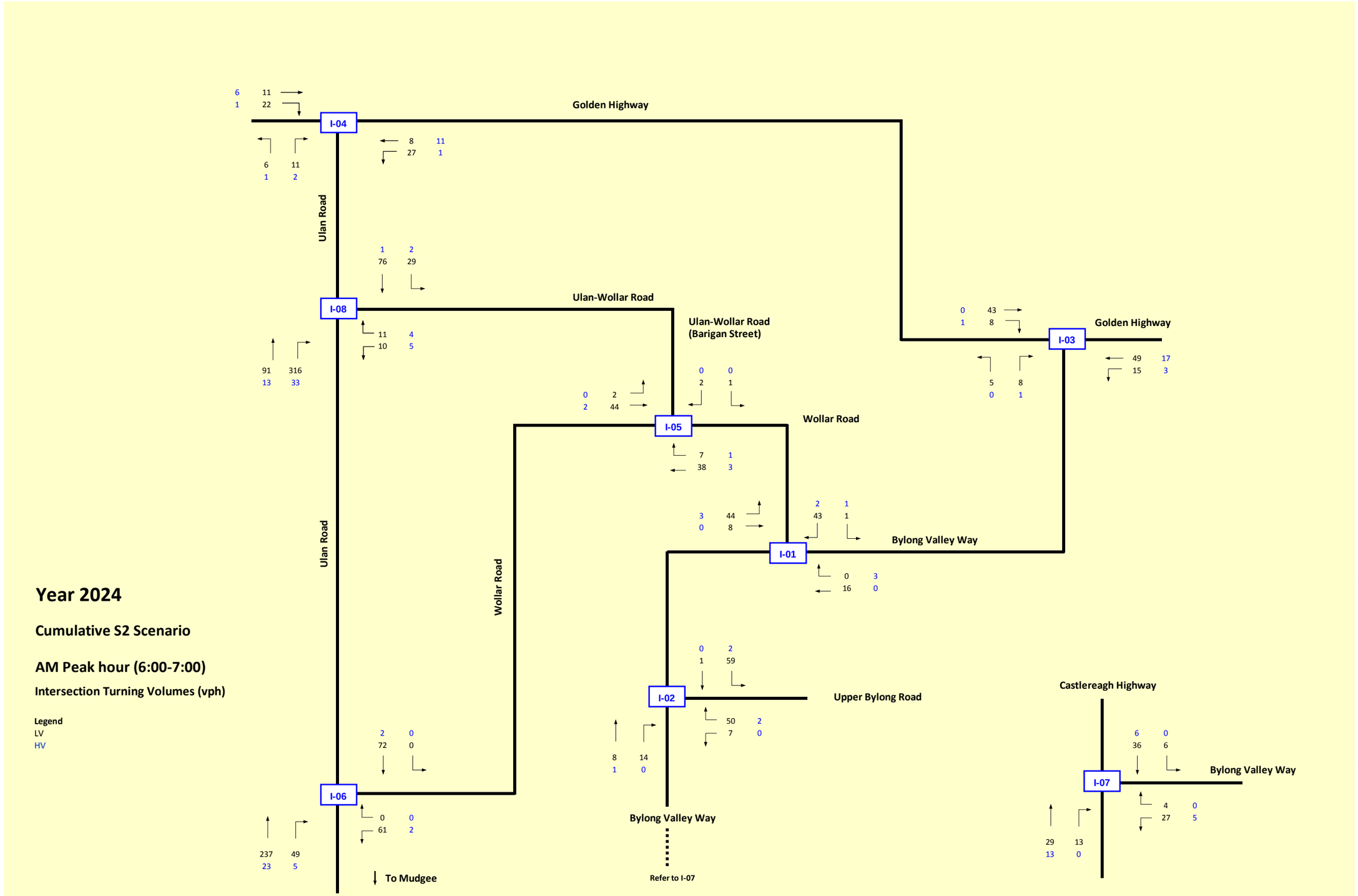


Figure B2.7 PY9, 2024 AM cumulative peak hour traffic volumes (vph) – Scenario 2b – with WAF

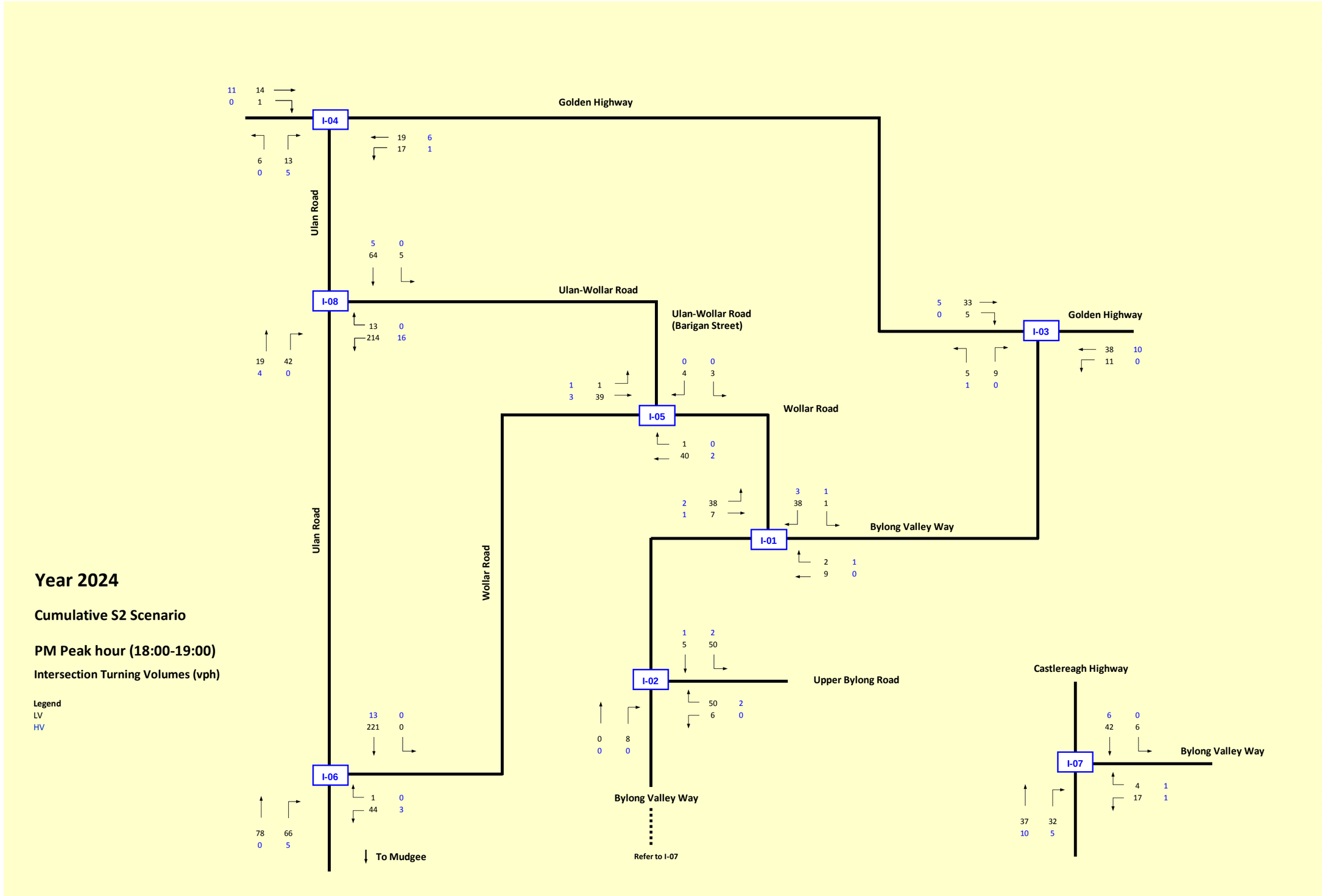


Figure B2.8 PY9, 2024 PM cumulative peak hour traffic volumes (vph) – Scenario 2b – with WAF

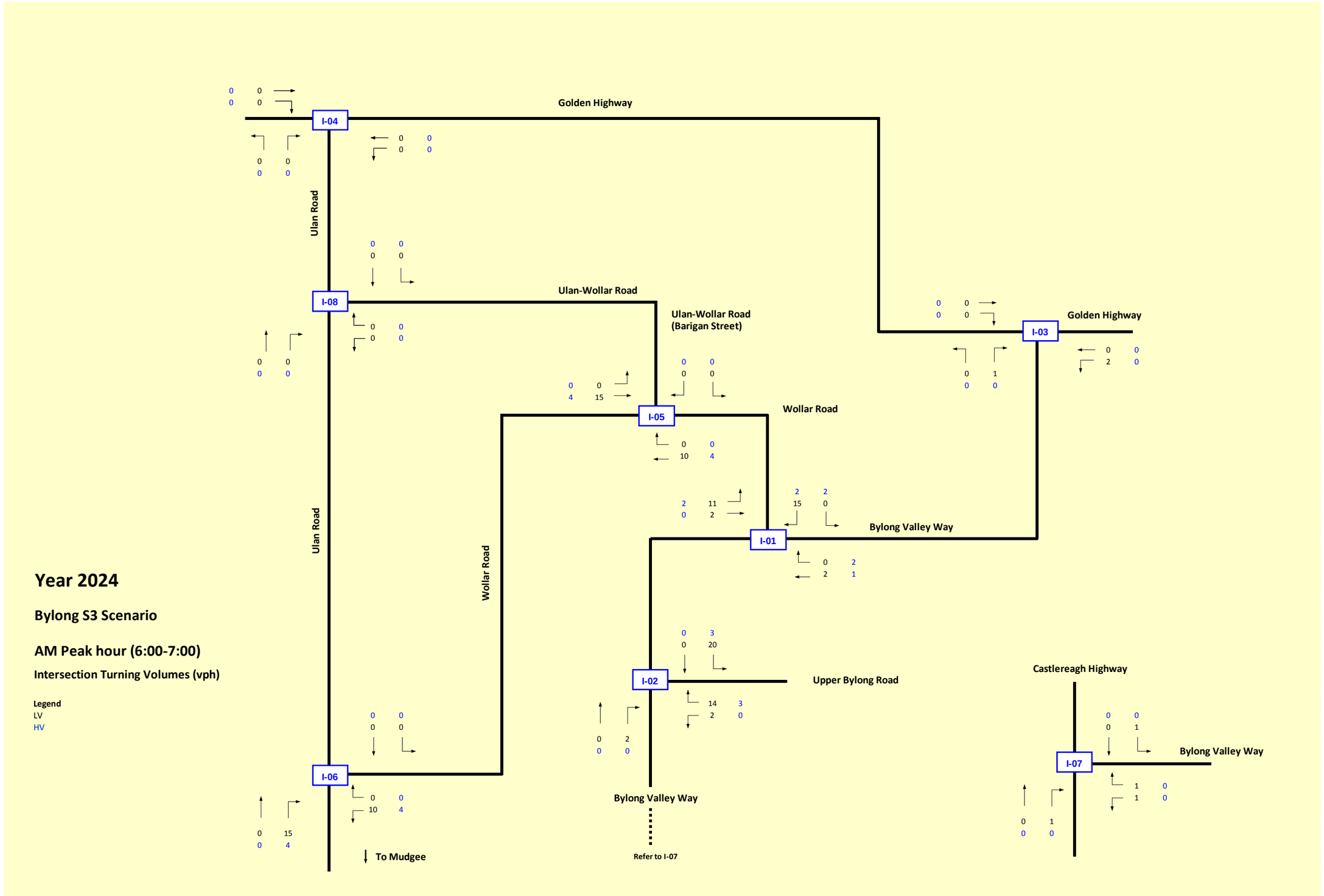


Figure B2.9 PY9, 2024 AM project peak hour traffic volumes (vph) – Scenario 2a – with WAF

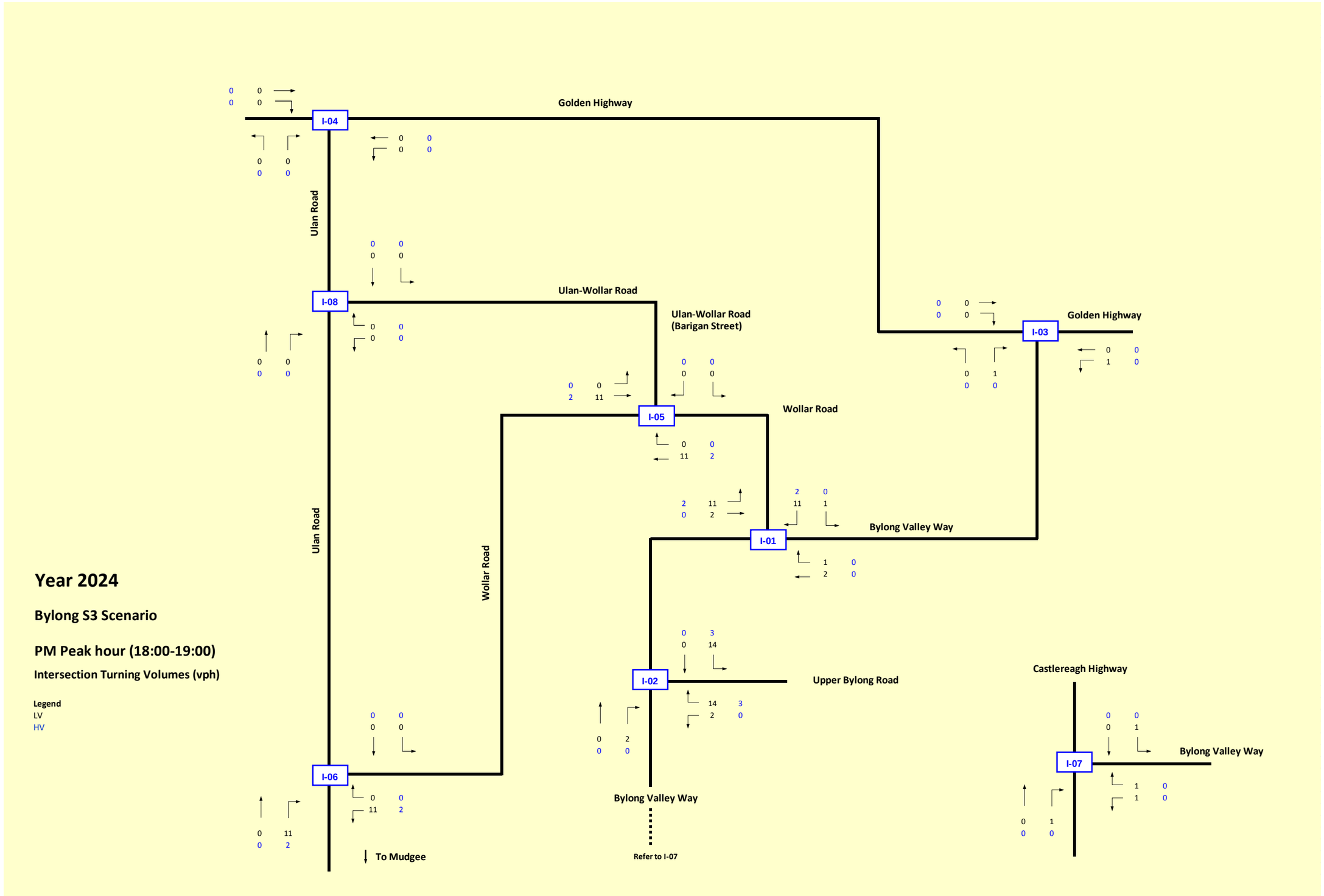


Figure B2.10 PY9, 2024 PM project peak hour traffic volumes (vph) – Scenario 2a – with WAF

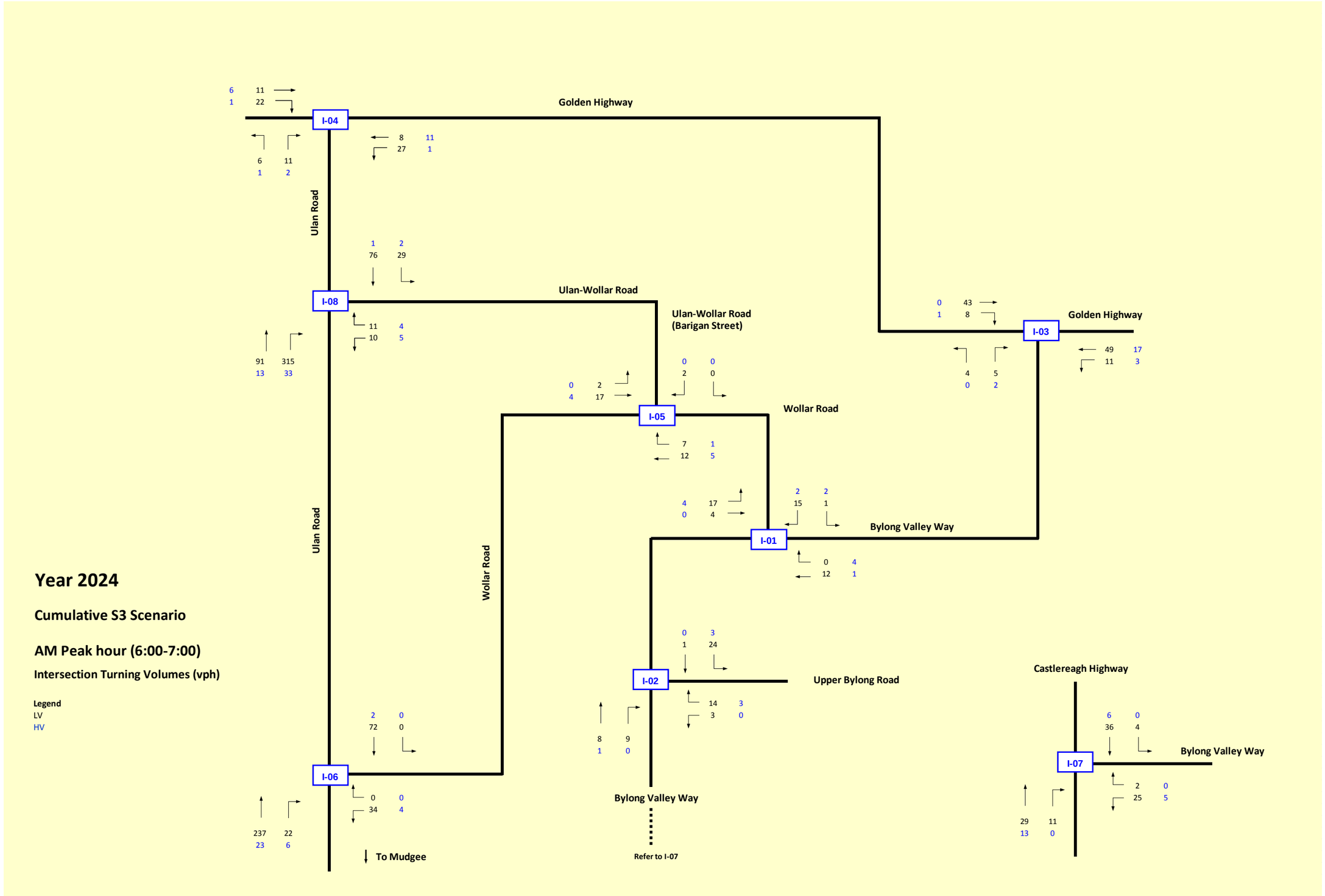


Figure B2.11 PY9, 2024 AM cumulative peak hour traffic volumes (vph) – Scenario 2b – with WAF

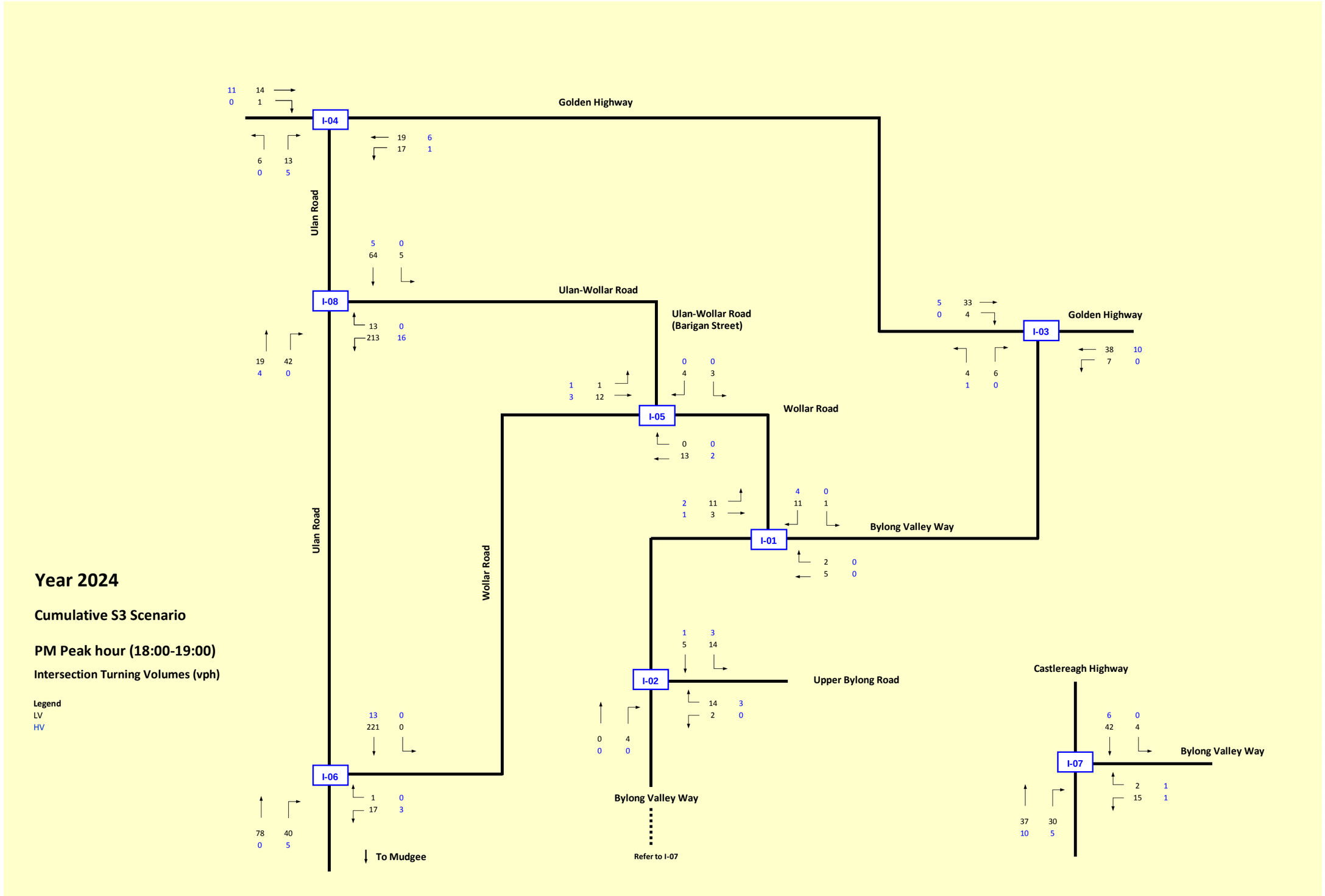


Figure B2.12 PY9, 2024 PM cumulative peak hour traffic volumes (vph) – Scenario 2b – with WAF

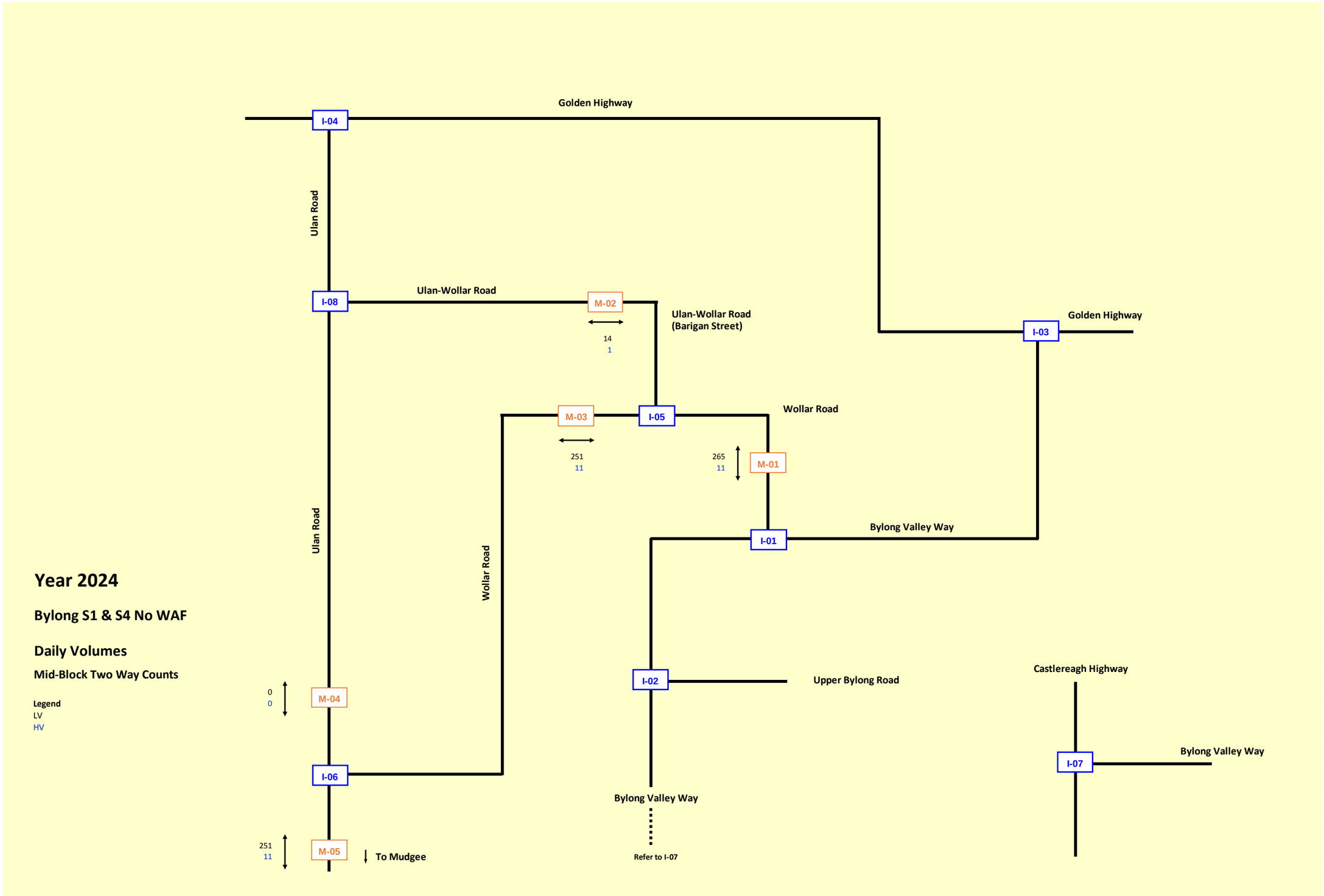


Figure B2.13 PY9, 2024 Daily mid-block project traffic volumes (vpd) – worst case scenario

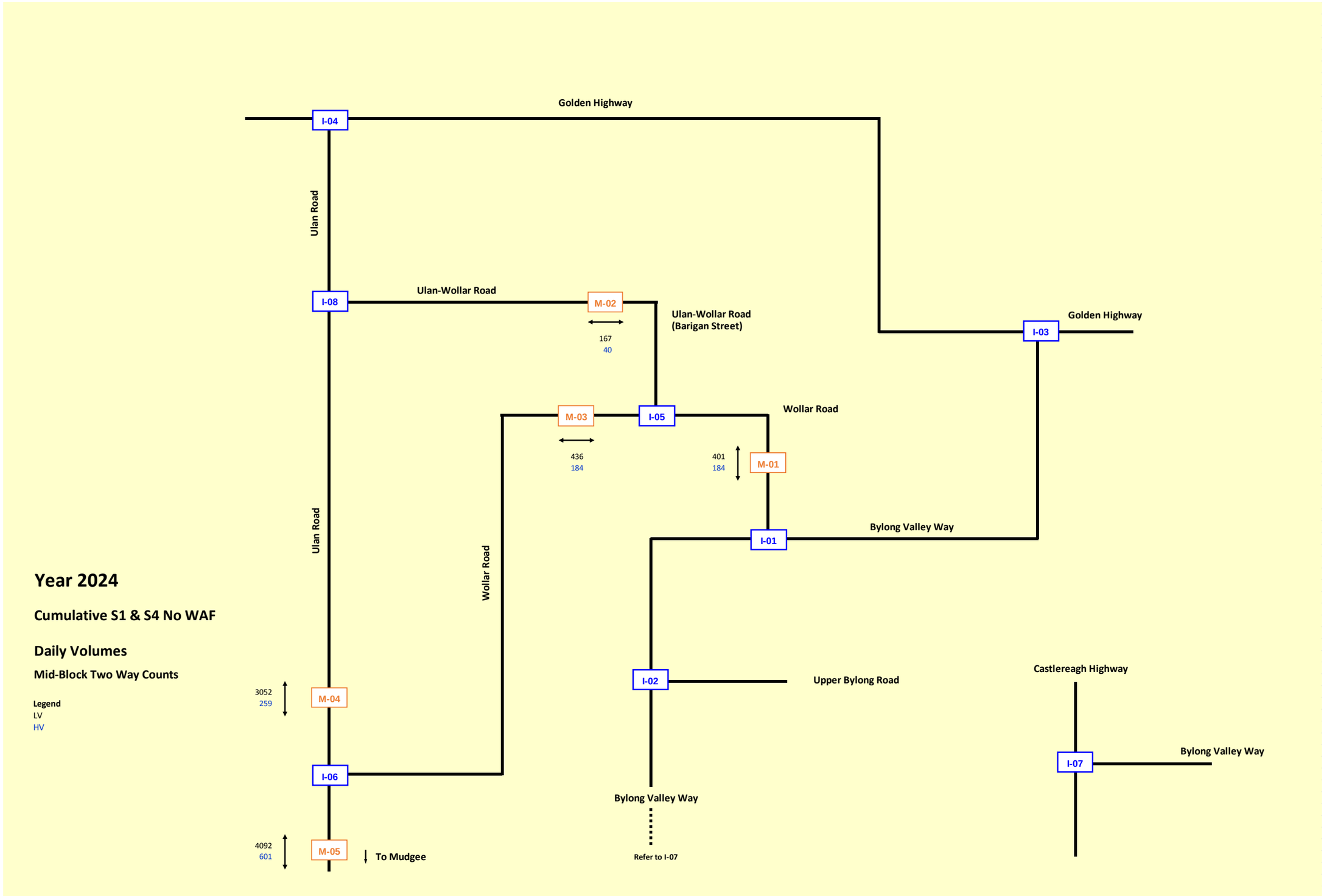


Figure B2.14 PY9, 2024 Daily mid-block cumulative traffic volumes (vpd) – worst case scenario

B3. PY13 (2028) Traffic

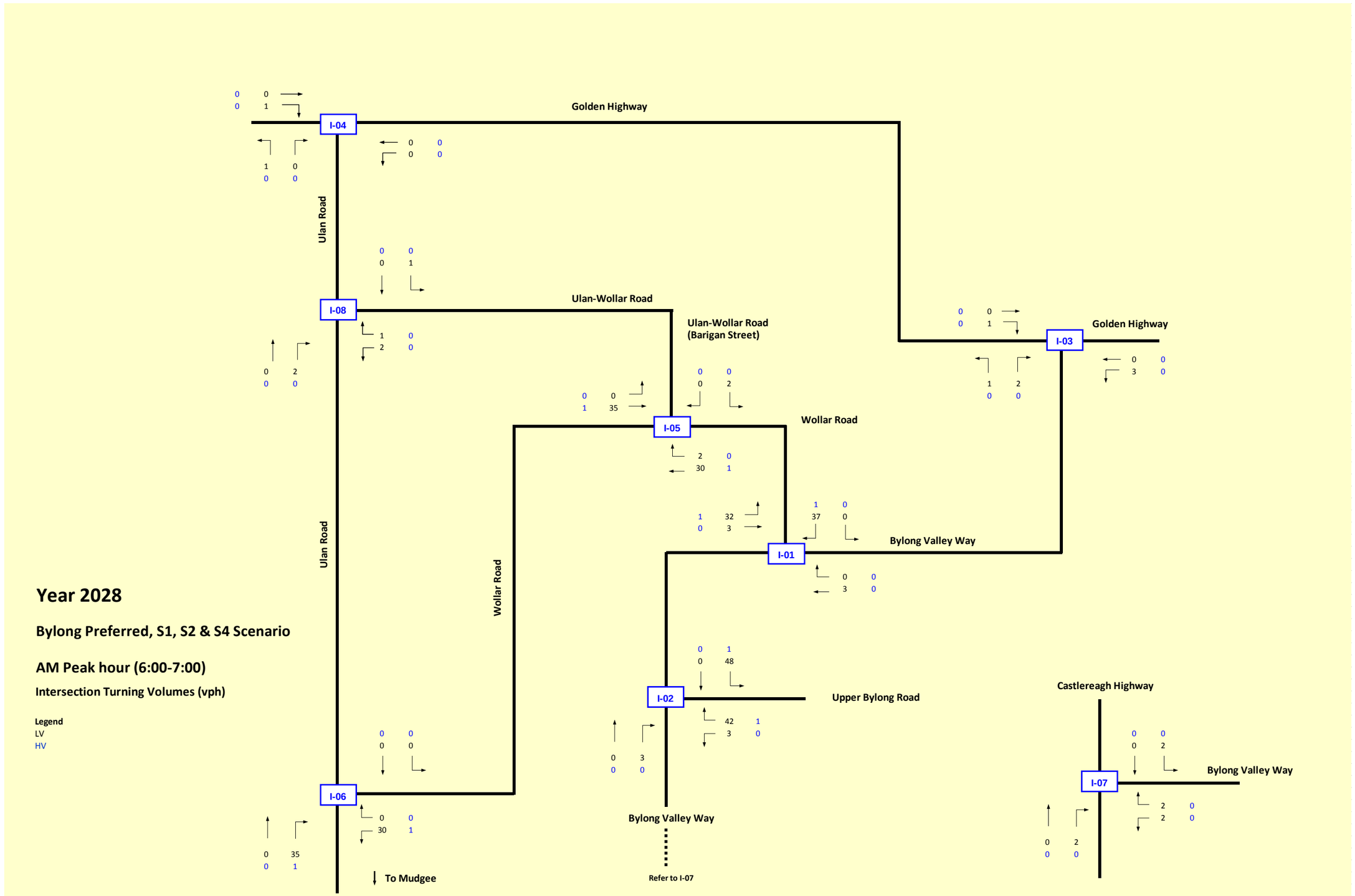


Figure B3.1 PY13, 2028 AM project peak hour traffic volumes (vph) – Scenario 3a – without WAF

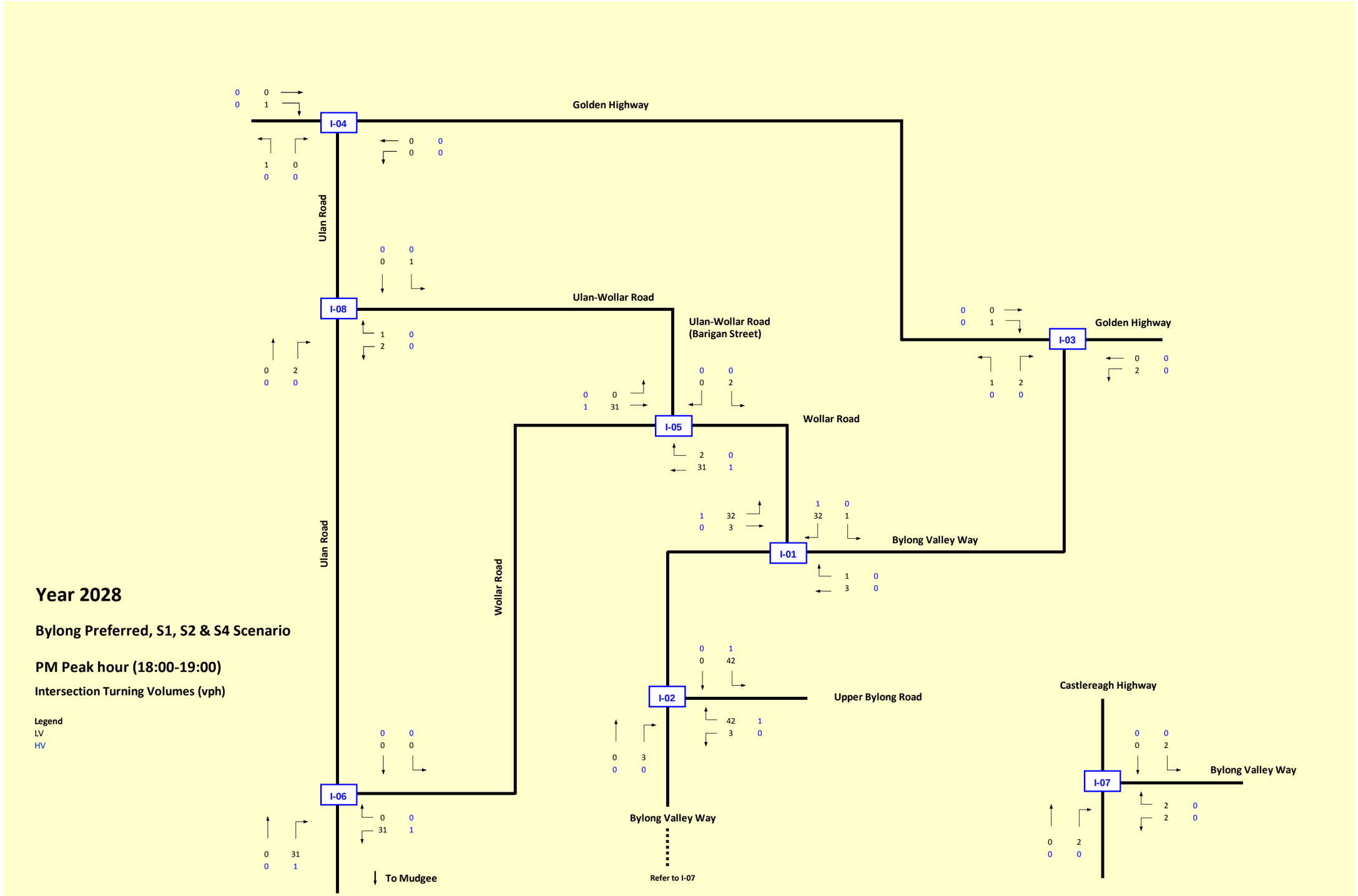


Figure B3.2 PY13, 2028 PM project peak hour traffic volumes (vph) – Scenario 3a – without WAF

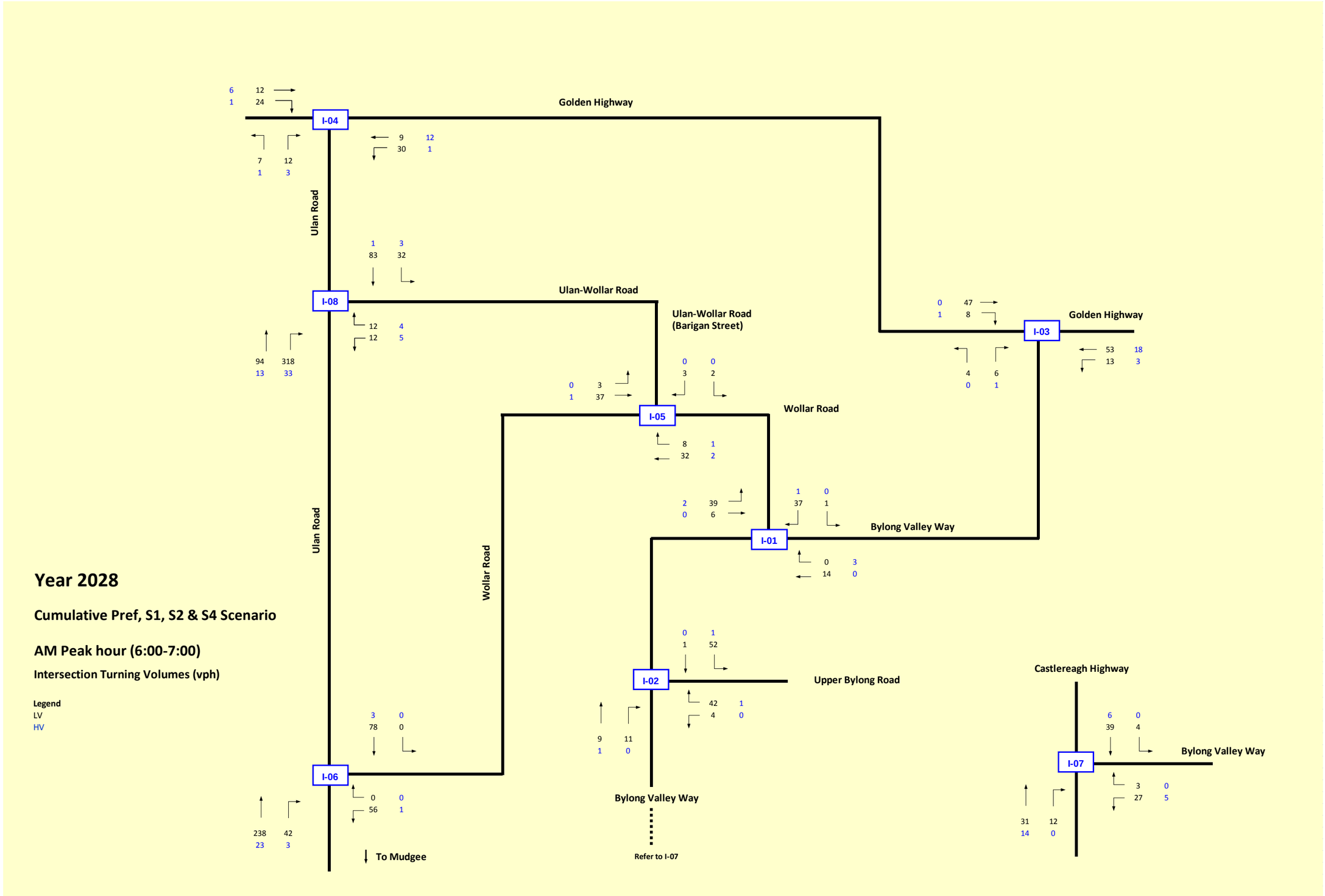


Figure B3.3 PY13, 2028 AM cumulative peak hour traffic volumes (vph) – Scenario 3b – without WAF

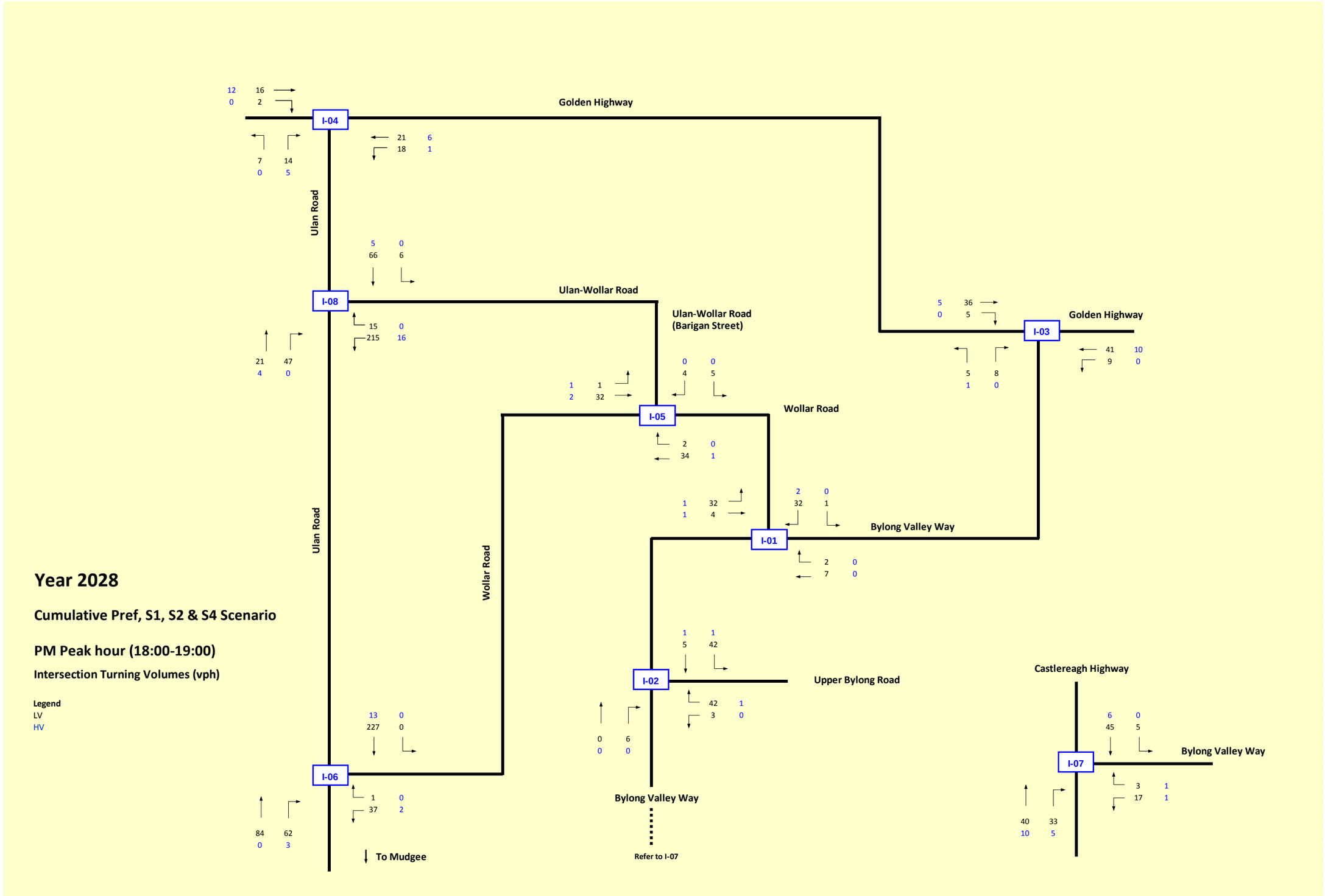


Figure B3.4 PY13, 2028 PM cumulative peak hour traffic volumes (vph) – Scenario 3b – without WAF

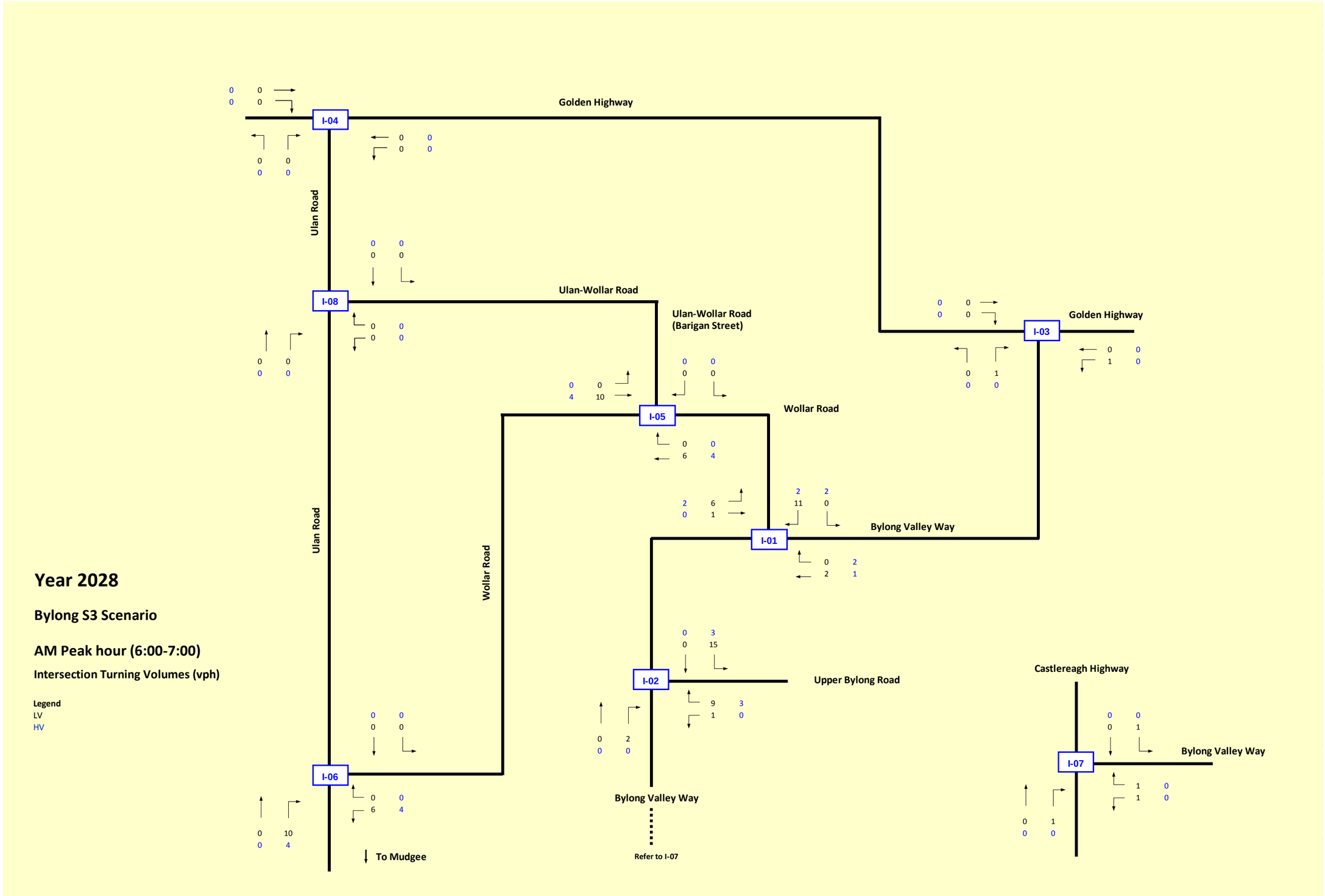


Figure B3.5 PY13, 2028 AM project peak hour traffic volumes (vph) – Scenario 3a – with WAF

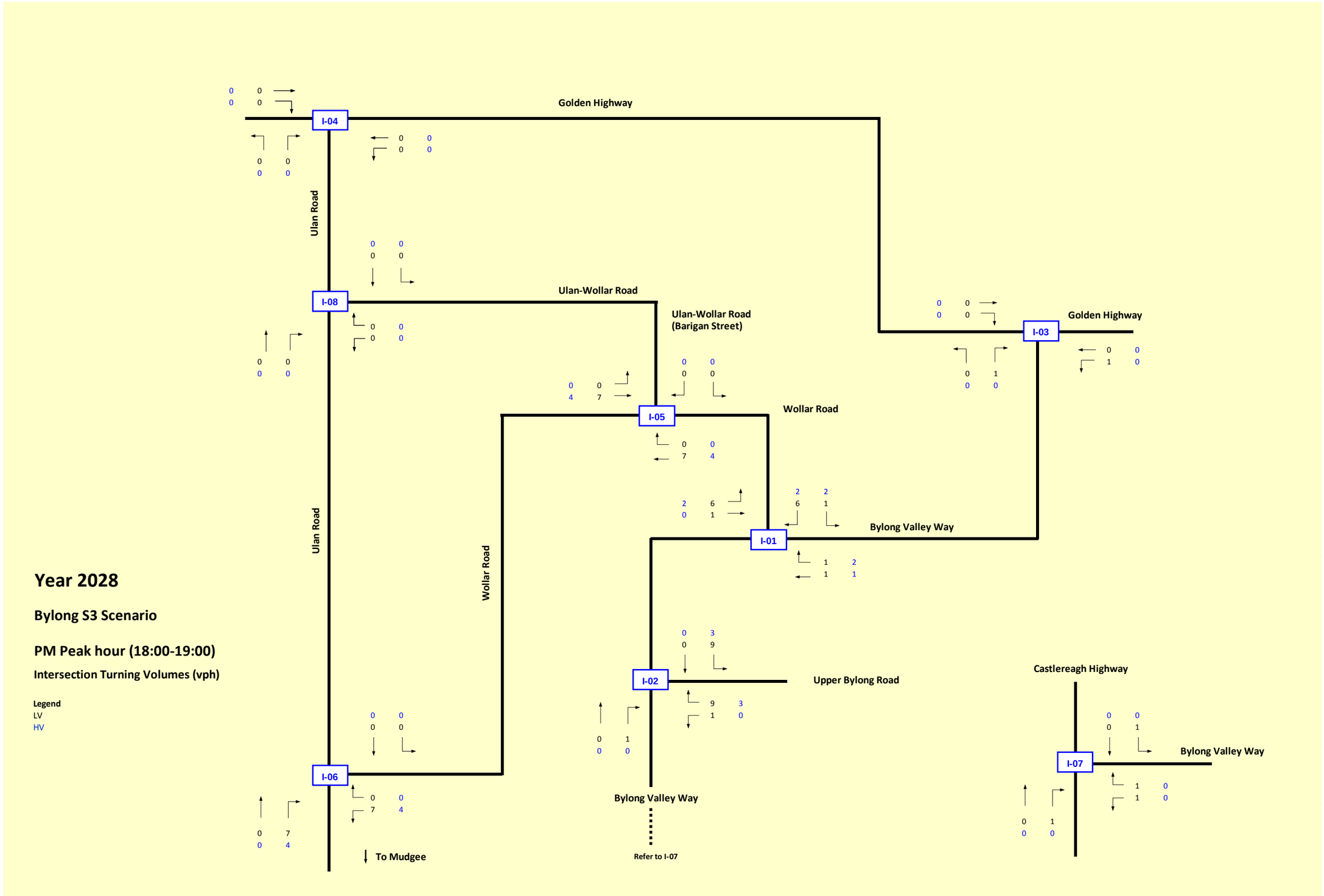


Figure B3.6 PY13, 2028 PM project peak hour traffic volumes (vph) – Scenario 3a – with WAF

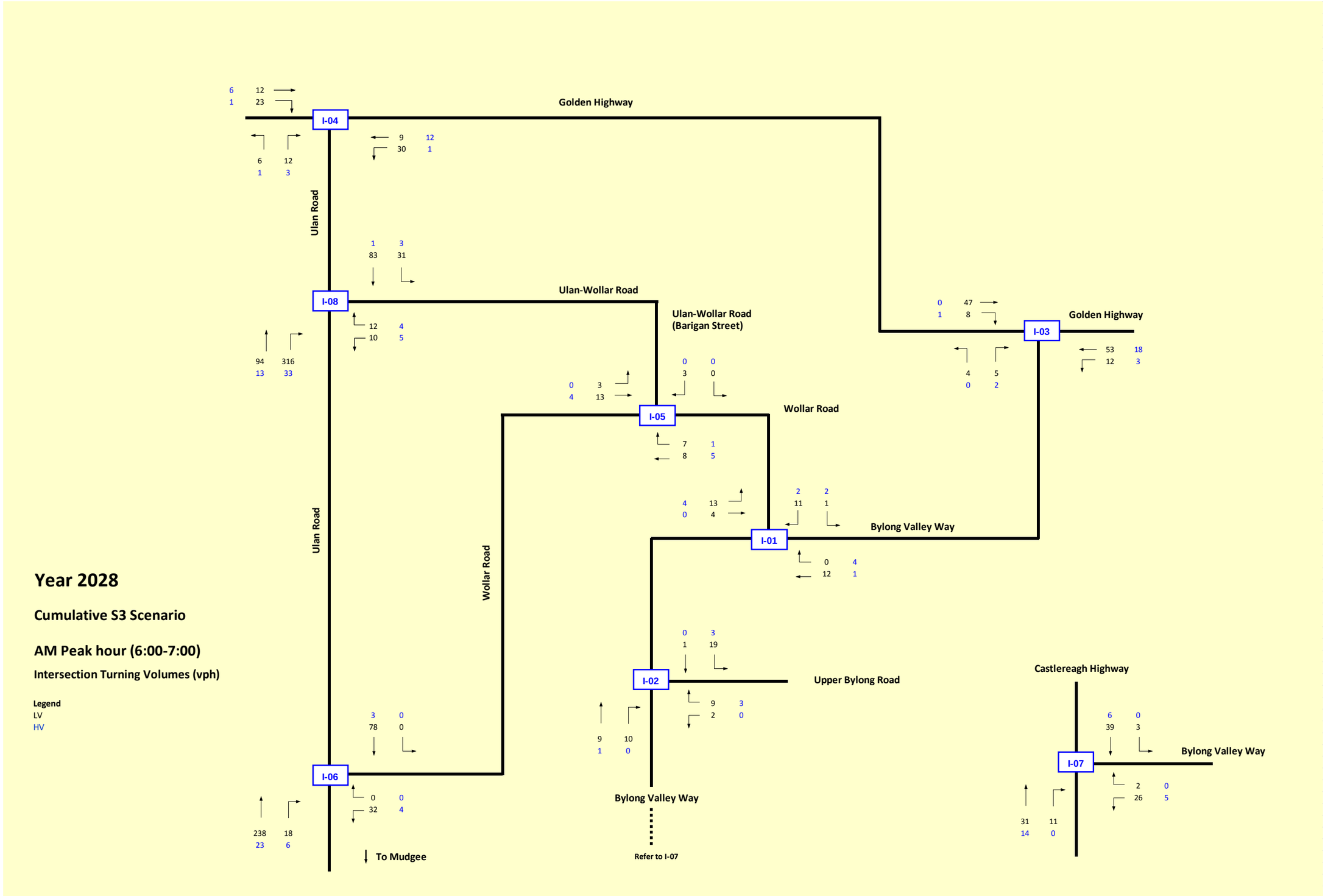


Figure B3.7 PY13, 2028 AM cumulative peak hour traffic volumes (vph) – Scenario 3b – with WAF

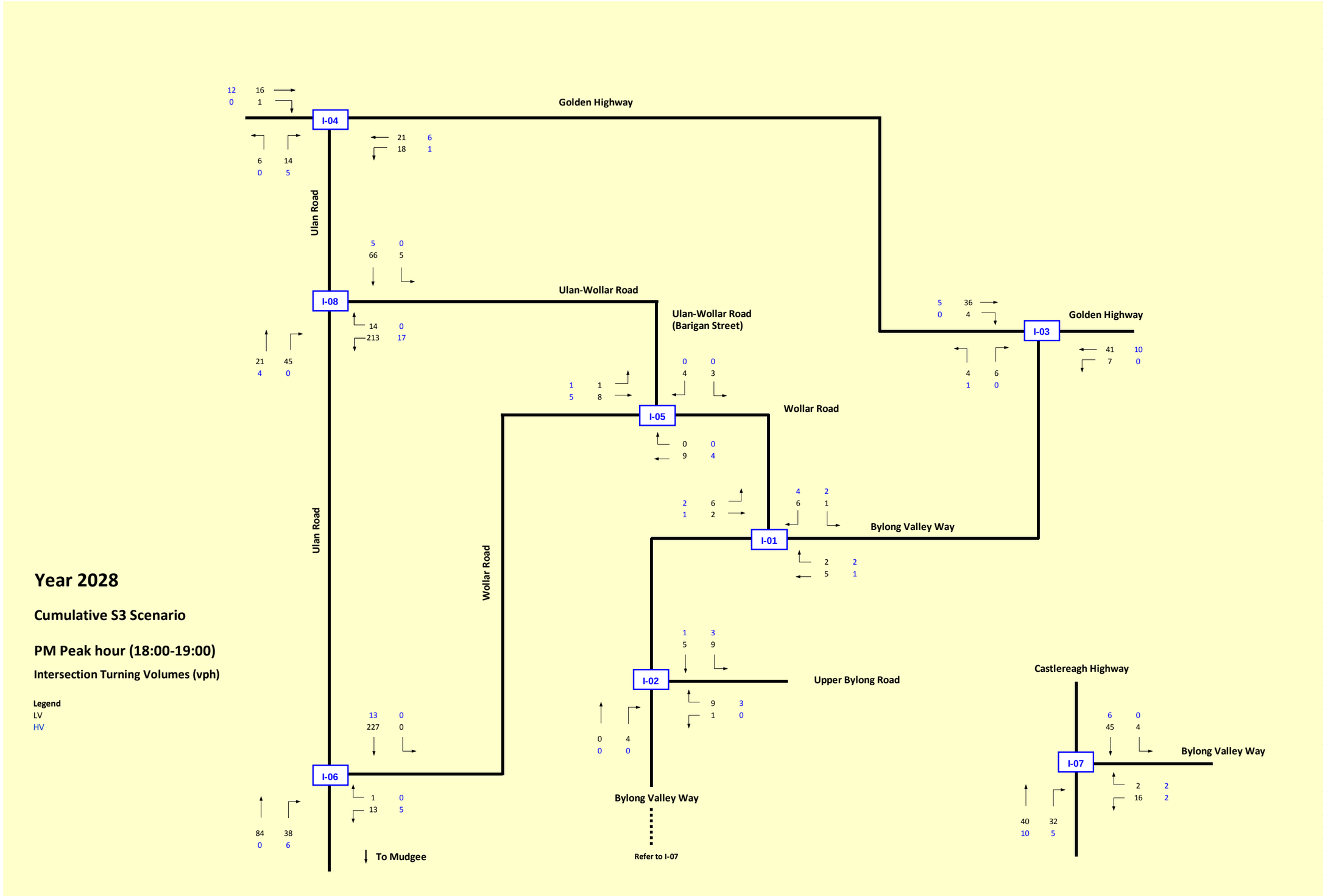


Figure B3.8 PY13, 2028 PM cumulative peak hour traffic volumes (vph) – Scenario 3b – with WAF

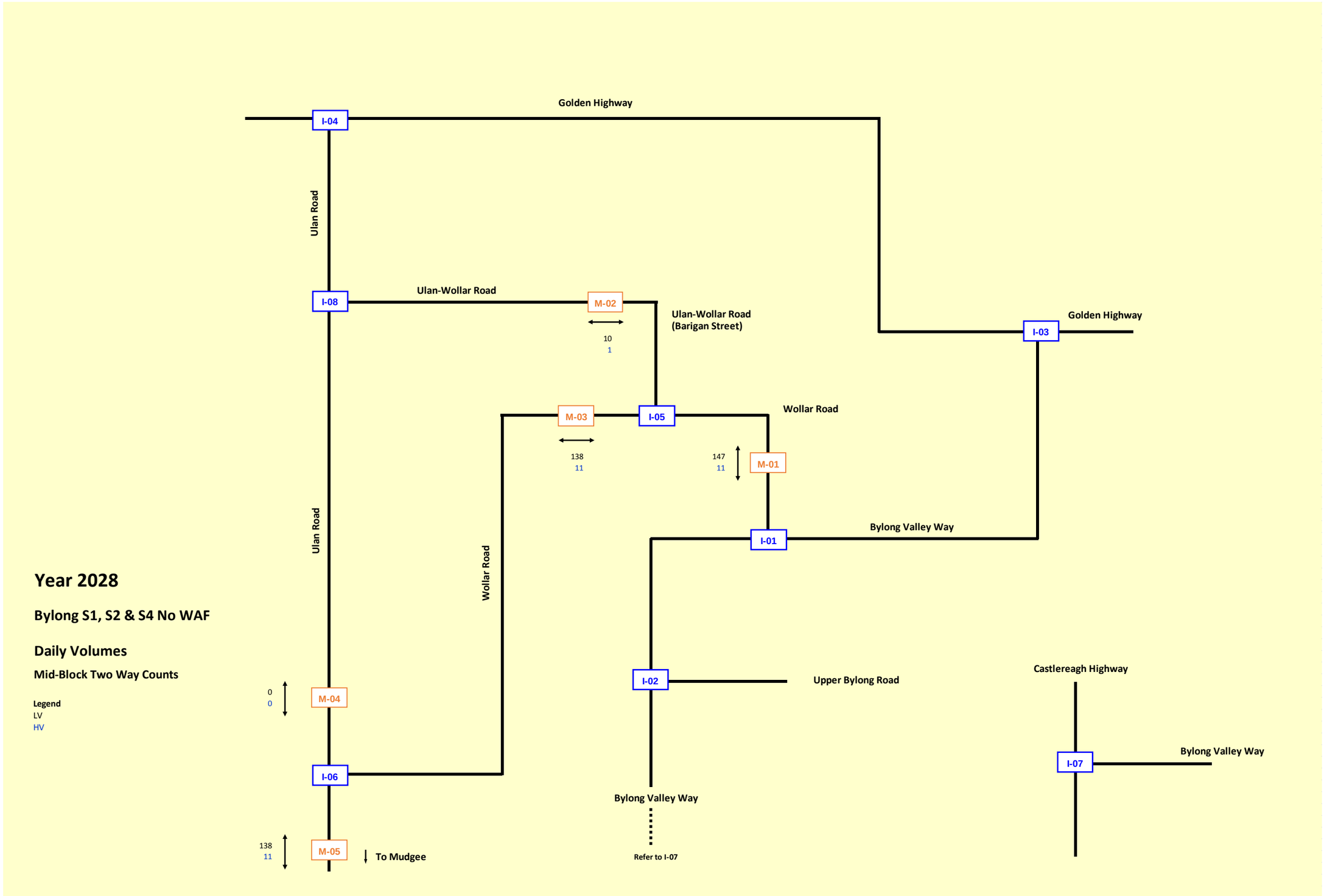


Figure B3.9 PY13, 2028 Daily mid-block project traffic volumes (vpd) – worst case scenario

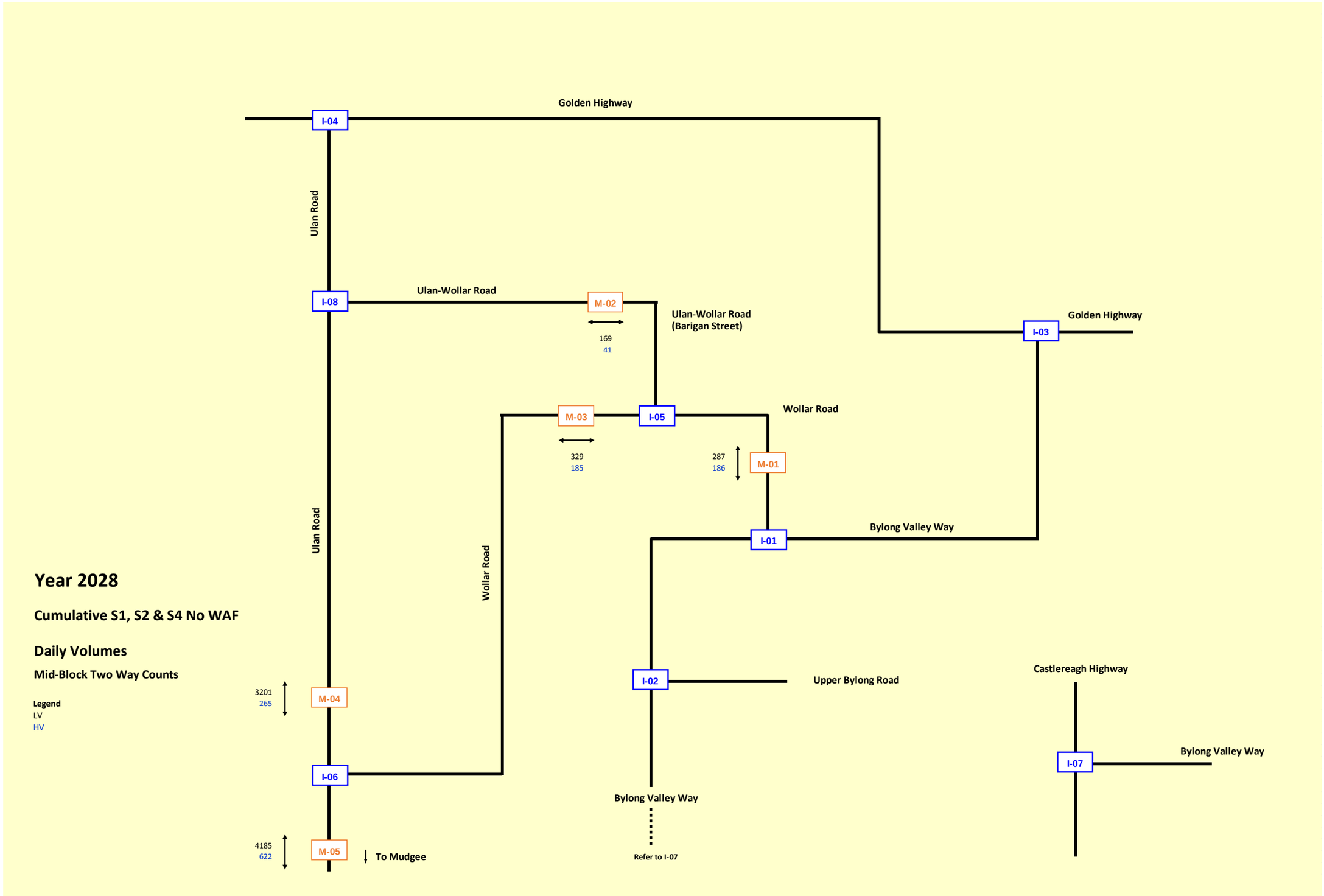


Figure B3.10 PY13, 2028 Daily mid-block cumulative traffic volumes (vpd) – worst case scenario

Appendix C

SIDRA reports