

26 MAR 2014

MEDQ

Technical Memorandum

Title	AMEX Ripley – ARP West Traffic Impact Assessment	Project No	790147/027
Client	AMEX	Status	Final
Date	18 March 2014	Discipline	Traffic and Transport
Author	Anette Morse	Office	Brisbane
Reviewer	Brett McClurg		

Background

The ULDA has issued a series of letters requesting further information in regard to the UDA Development Application for the proposed Material Change of Use at Ripley Road and Watson Road, South Ripley (Lot 196 on SP157517 and Lot 370 on SP198119).

The Further Issues Notice dated 17 January 2013, includes the following traffic related items:

"Provide a Traffic Impact Assessment (TIA) referencing the Ripley Valley Saturn Model that gives consideration to the potential impacts on the existing and future road network including, but not limited to, the following:

- > Impacts upon the Watson Road and Ripley Road intersection*
- > Potential Impacts upon the Centenary Highway and the Wensley Road/Ripley Road interchanges*
- > The separation distance of Watson Road and the East West Inter-Suburban link from Ripley Road*
- > The number of intersections at the western end of the East West Inter-Suburban Link."*

Subsequent to the Further Issues Notice dated 17 January 2013, another Further Issues Notice was prepared on 13 February 2013. That letter includes the following traffic related matter:

- > The proposed 17.00 metre wide road that intersects the site from east to west must be upgraded to a 'Neighbourhood Connector' as per the ULDA 'Movement Network' Guideline No. 6, with a minimum road reserve width of 19.50 metres.*

This Technical Memorandum addresses the five items listed above. It also addresses the form of road (number of lanes) ultimately required for the East West Inter-Suburban Link. In doing so, it gives consideration to the road hierarchy needs of the area and makes use of the limited information provided from the DTMR Saturn model.

Consideration has been given to recently released draft guidelines prepared by Department of Transport and Main Roads (version 3.0 January 2014) for "Separated Cycleways Guidelines". It is noted that the latter is not a mandatory standard.

The Further Issues Notices are included at Appendix A.

The most recent plan of development proposed for the site is included at Appendix F.

SATURN Model

The Ripley Valley Saturn Model has been prepared by the Department of Transport and Main Roads (DTMR) in association with Ipswich City Council (ICC). At the time of undertaking analysis for the response herein, the model and relevant documentation had not been provided by the Department of Transport and Main Roads or Ipswich City Council and assessment herein is based on the limited 2031 traffic volume plots provided (in December 2012) by the Department of Transport and Main Roads, as extracted from the model. For the purpose of this report the model is assumed to represent an ultimate scenario with full development. The volume plots for 2031 are reproduced at Appendix B.

The Saturn model has since been provided by DTMR and ICC and it is understood that the model represents an interim development scenario (approximately 75% of Ripley Valley is developed). Such information does not supersede the information (from the model) that has been utilised herein.

It should be noted that the Saturn model provides a high order assessment of the greater road network and therefore only includes major links. The detailed intersection analysis herein therefore redistributes traffic volumes at some locations to provide a better representation of the more detailed planning of lower order links. Complementary spread sheet analysis has been undertaken to determine the traffic volumes on the internal road network.

Item 1 - Watson Road/East West Road and Ripley Road/East West Road Intersections

The Saturn model connects the East West Road (East West Inter-Suburban Link) and Watson Road as two discrete intersections along Ripley Road. The current master plan proposes an arrangement where Watson Road connects to the East West Road approximately 240m west of the Ripley Road/East West Road intersection, as shown on Drawing No 794017-SK01 Issue A at Appendix C. Access to the residential area north of the East West Road would be provided as a fourth, northern leg to the Watson Road/East West Road intersection.

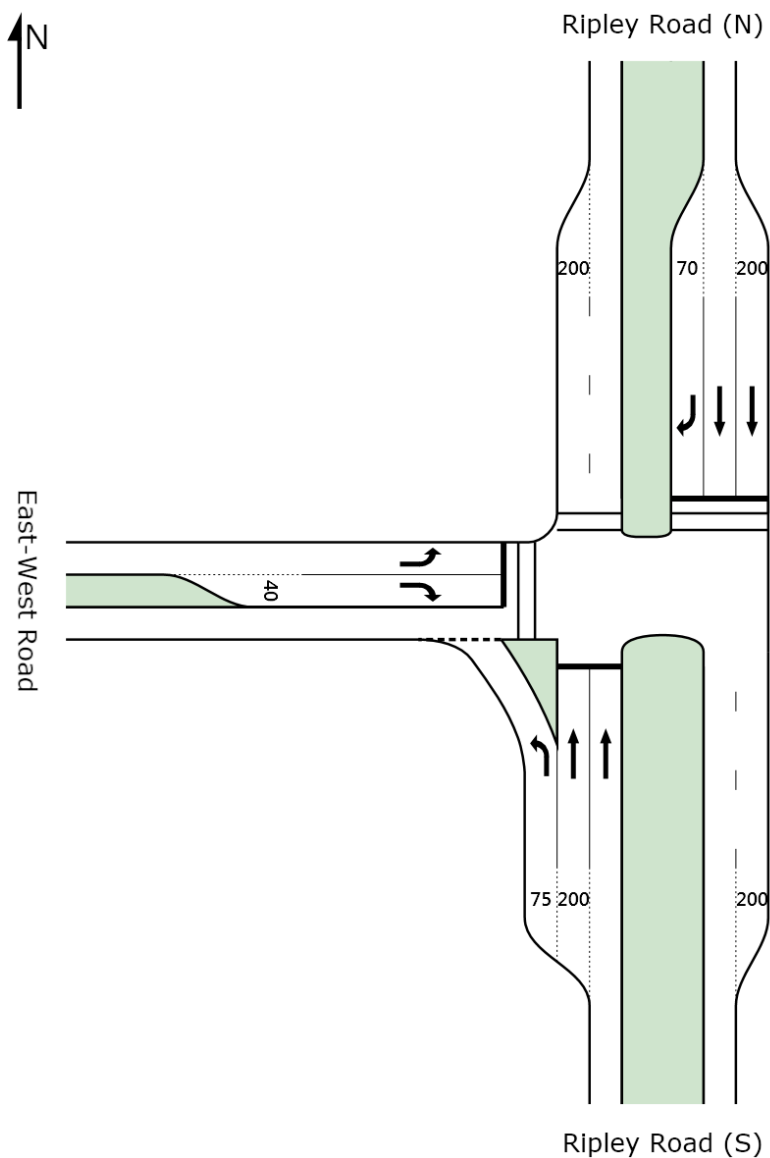
Saturn traffic volumes have therefore been redistributed to represent this current planning. Appendix D includes traffic volume plots of the Saturn and redistributed turn volumes.

SIDRA Intersection was used to model the operation of the two intersections at the 2031 design horizon (AM and PM peak hours). The assessment herein indicates a minimum intersection form at either location. Detailed analysis results are available at Appendix E.

It is important to note that whilst the assessment herein identifies the minimum intersection from required to accommodate the 2031 Saturn volumes, a lesser standard intersection may be acceptable for the early stages of development.

Ripley Road/East West Road Intersection

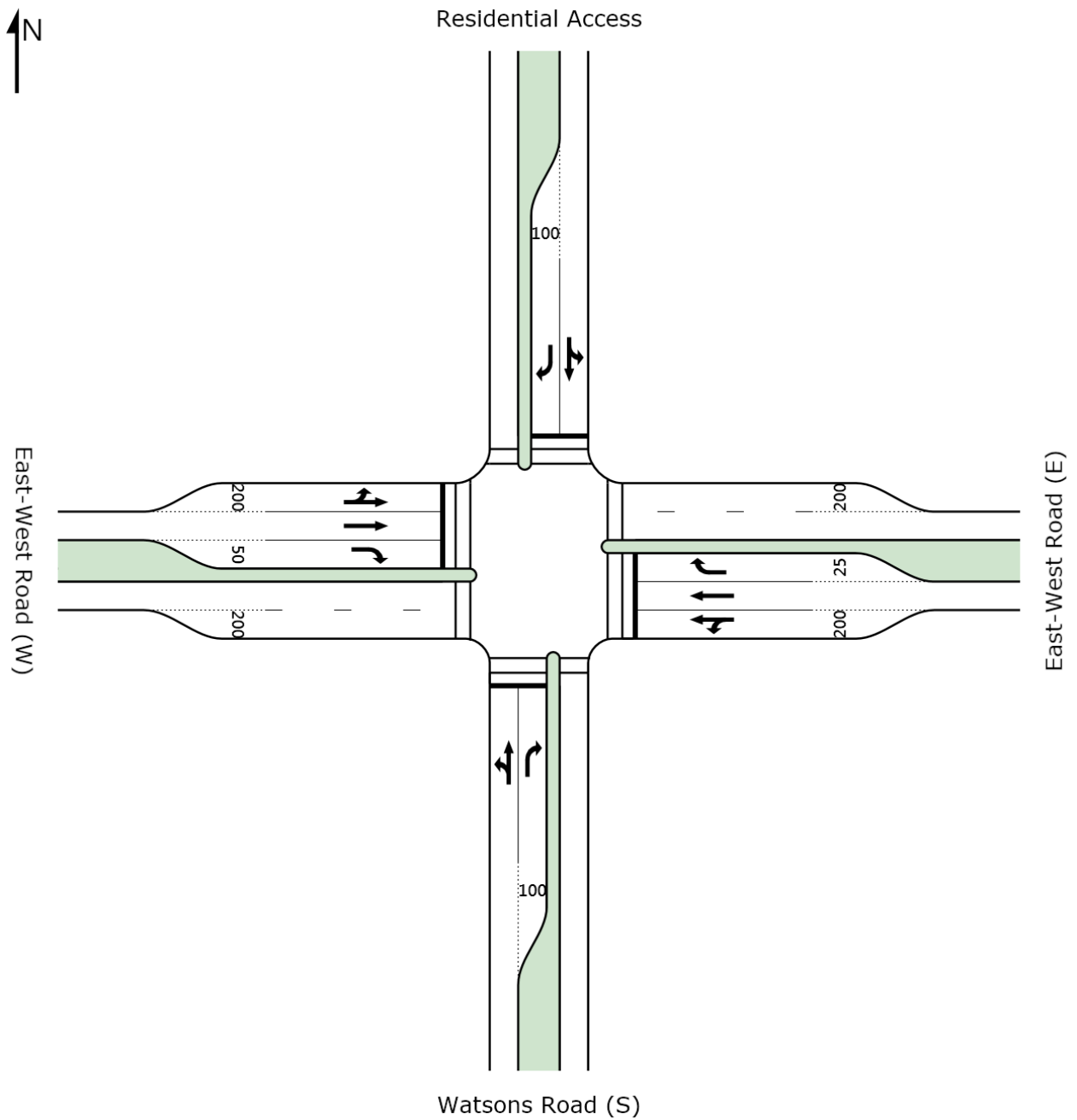
The Ripley Road/East West Road intersection was modelled as a signalised intersection. Figure 1 below indicates the minimum design required for capacity at this location. The intersection form would operate with a maximum Degree of Saturation (DOS) of 0.84 in the 2031 AM peak and 0.64 in the 2031 PM peak.

Figure 1 Ripley Road/East West Road Intersection – Signalised Layout

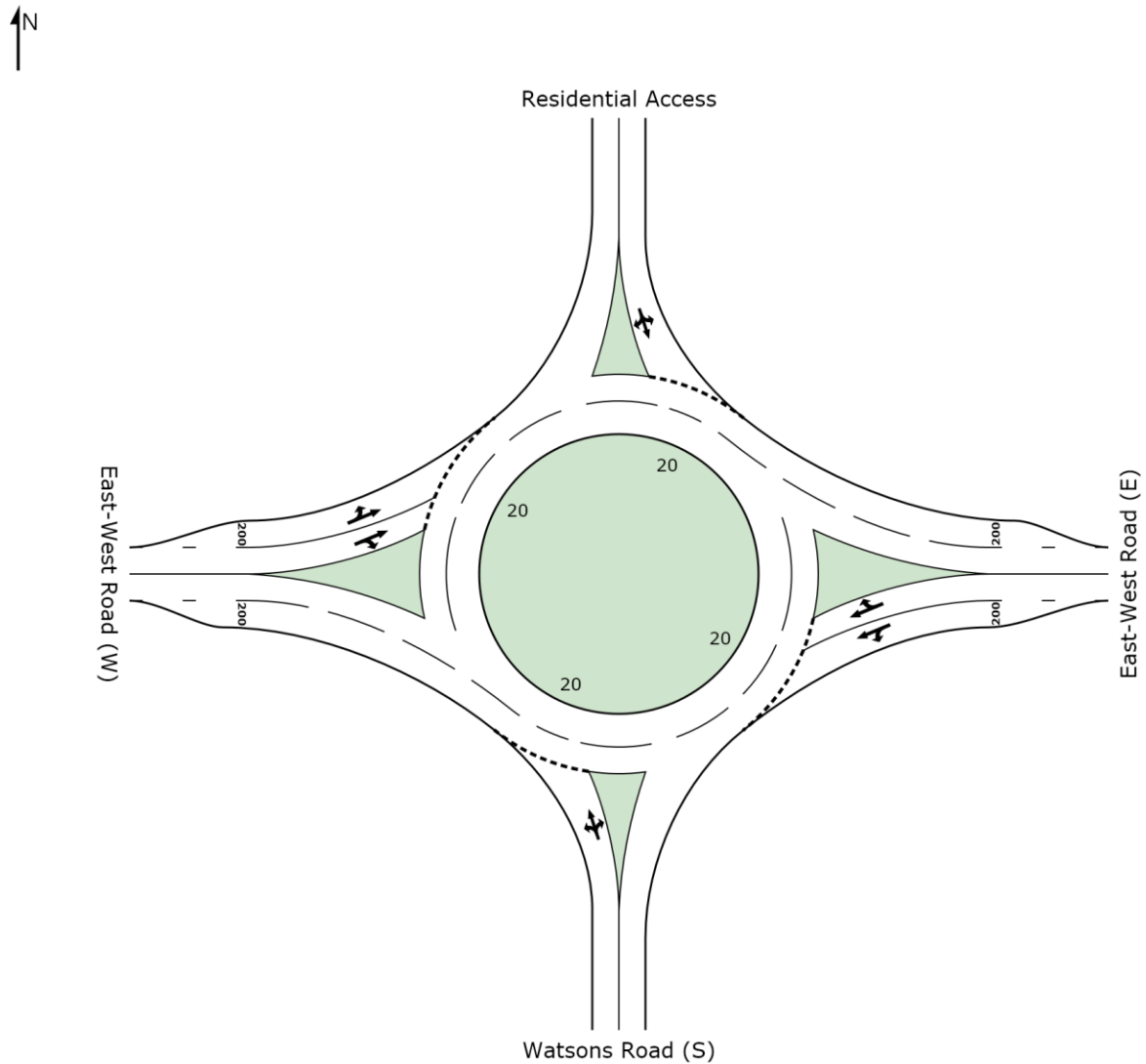
Watson Road/East West Road Intersection

The Watson Road/East West Road intersection has been modelled as a signalised intersection. Figure 2 details the lane requirements for this location. This form would operate with a maximum DOS of 0.80 in the 2031 AM peak and 0.88 in the 2031 PM peak.

Figure 2 Watson Road/East West Road Intersection – Signalised Layout



For capacity purposes, an alternative roundabout configuration has been considered at this location. See Figure 3 for this alternative layout. This form would operate with a DOS of 0.45 in the AM peak and 0.50 in the PM peak.

Figure 3 Watson Road/East West Road Intersection – Roundabout Layout

Conclusion

Given the results of the analysis presented herein it is clear that adequate intersection capacity can be provided by the identified forms of signalised intersections at Ripley Road/East West Road (Figure 1) and Watson Road/East West Road (Figure 2). At the latter intersection, a dual lane roundabout could also provide adequate capacity, however the signalised form is recommended as it would be more appropriate for the road hierarchy of the area (i.e. the traffic signals retain priority along the East West Inter-Suburban Link).

Item 2 – Centenary Highway Interchanges

The Ripley Road Interchange Planning document includes an ultimate interchange layout at the Wensley Road interchange. Figures 4 and 5 show the northern and southern intersections respectively. These intersections have been assessed herein and detailed results are included at Appendix E.

Note that the planning document shows an overpass only where Ripley Road crosses Centenary Highway (no interchange) and this is what has been reflected in the SATURN model. Therefore no analysis of the Ripley Road/Centenary Highway intersection/interchange has been undertaken.

Figure 4 Wensley Road Interchange – Northern Intersection

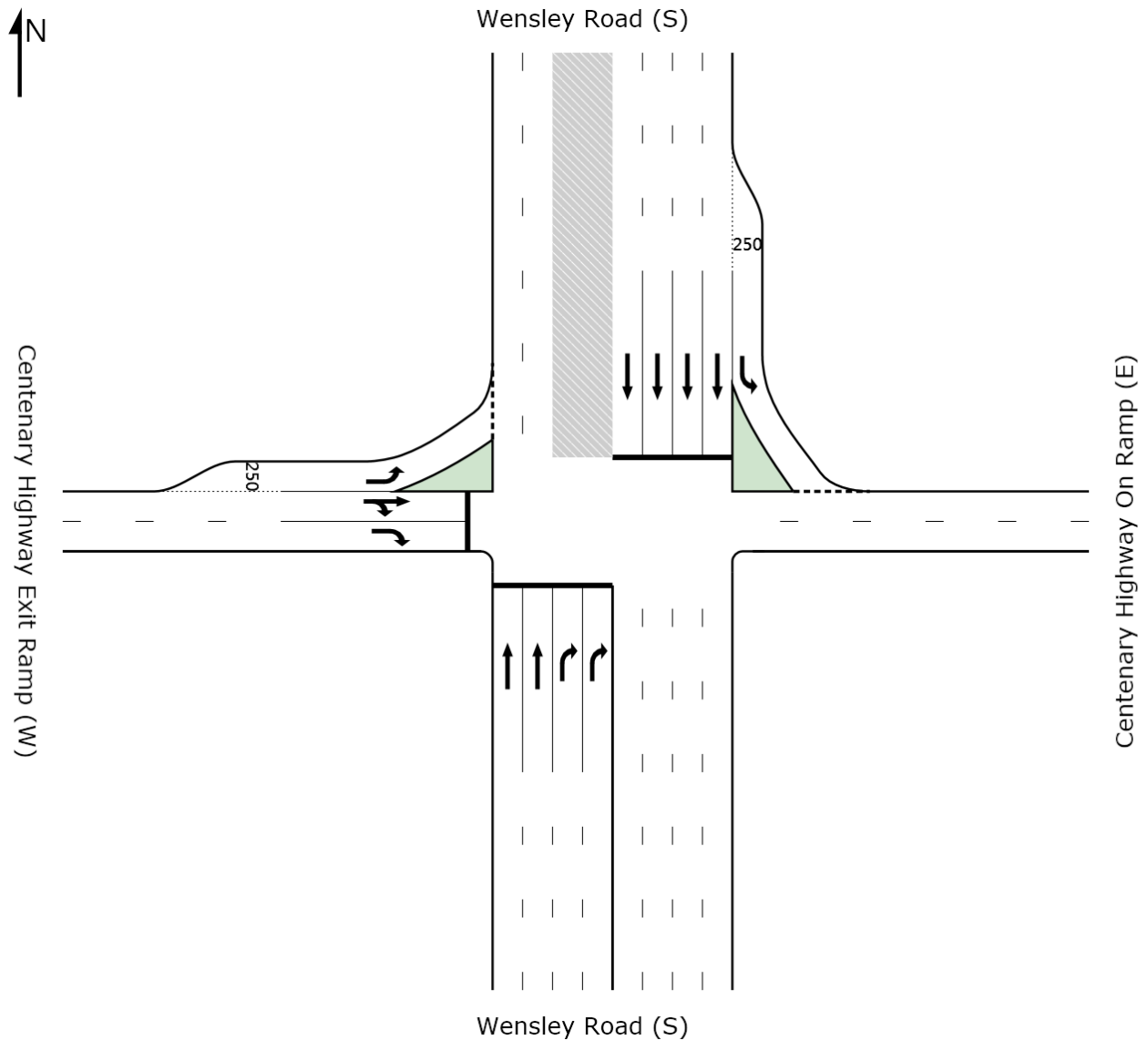
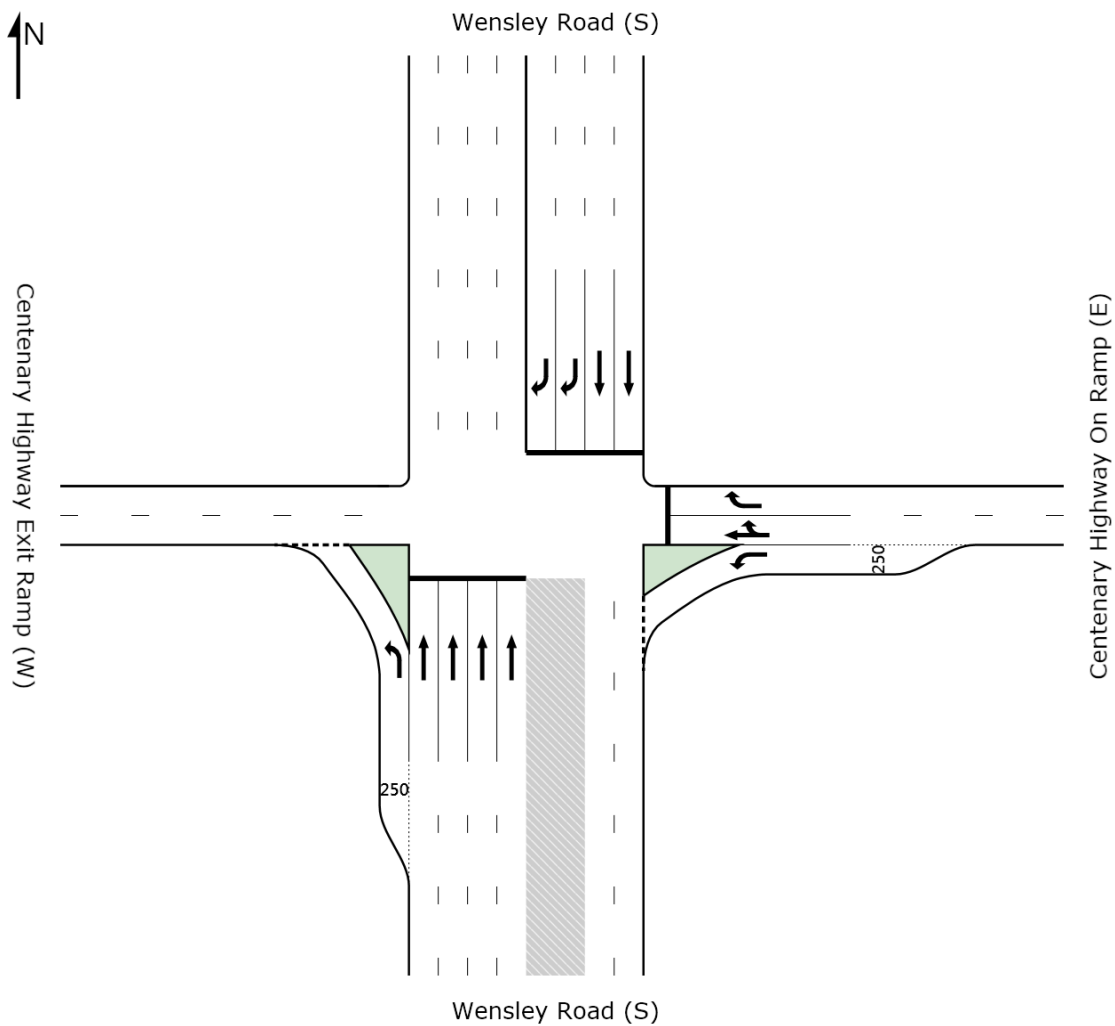


Figure 5 Wensley Road Interchange – Southern Intersection

Both of the Wensley Road interchange intersections operate well with spare capacity at the 2031 horizon (northern intersection has a maximum DOS of 0.57 in the AM peak and 0.38 in the PM peak and southern intersection has a maximum DOS of 0.43 in the AM peak and 0.33 in the PM peak). Therefore there is more than adequate capacity in the ultimate form and a lesser form would be adequate.

Further analysis was undertaken to identify a reduced form, as depicted on Figures 6 and 7, showing the northern and southern intersections respectively.

Figure 6 Wensley Road Interchange – Northern Intersection Reduced Form

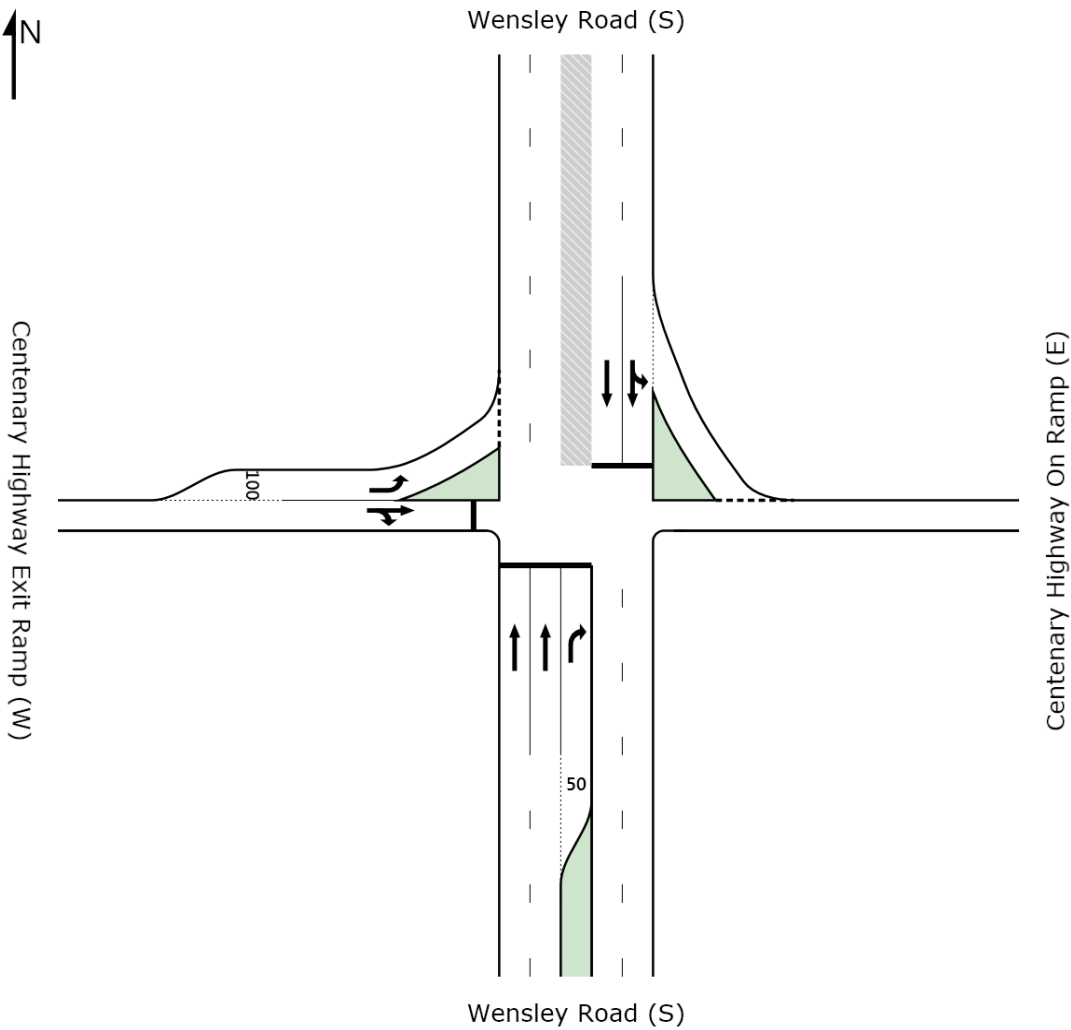
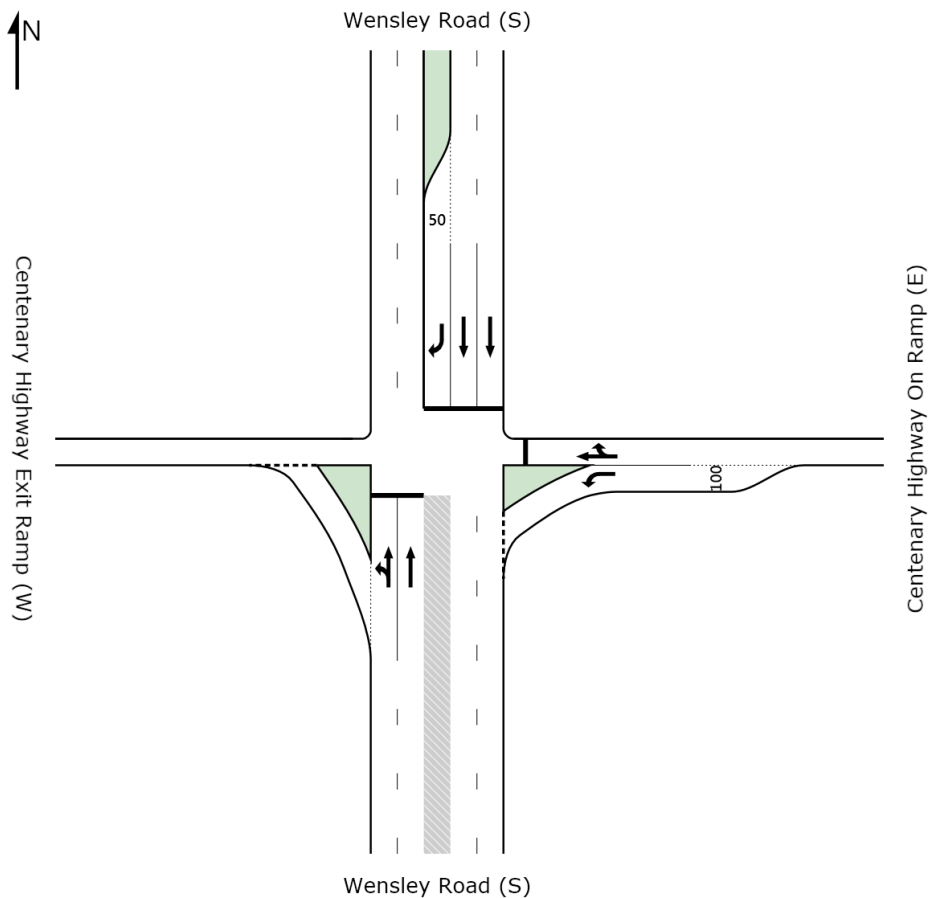


Figure 7 Wensley Road Interchange – Southern Intersection Reduced Form

At the northern intersection, this reduced form operates with a DOS of 0.75 in the AM peak and 0.56 in the PM peak. Adequate operation, with a DOS of 0.83 in the AM peak and 0.63 in the PM peak, can also be achieved at the southern intersection with the reduced form. Both locations operate well in the proposed reduced lane form with spare capacity below the maximum DOS of 0.90-0.95 for a signalised intersection.

An interchange option with two roundabout intersections has also been considered at this location. Figures 8 and 9 depict the northern and southern intersection in the layout configurations required to provide adequate capacity.

Figure 8 Wensley Road Interchange – Northern Intersection Roundabout Layout

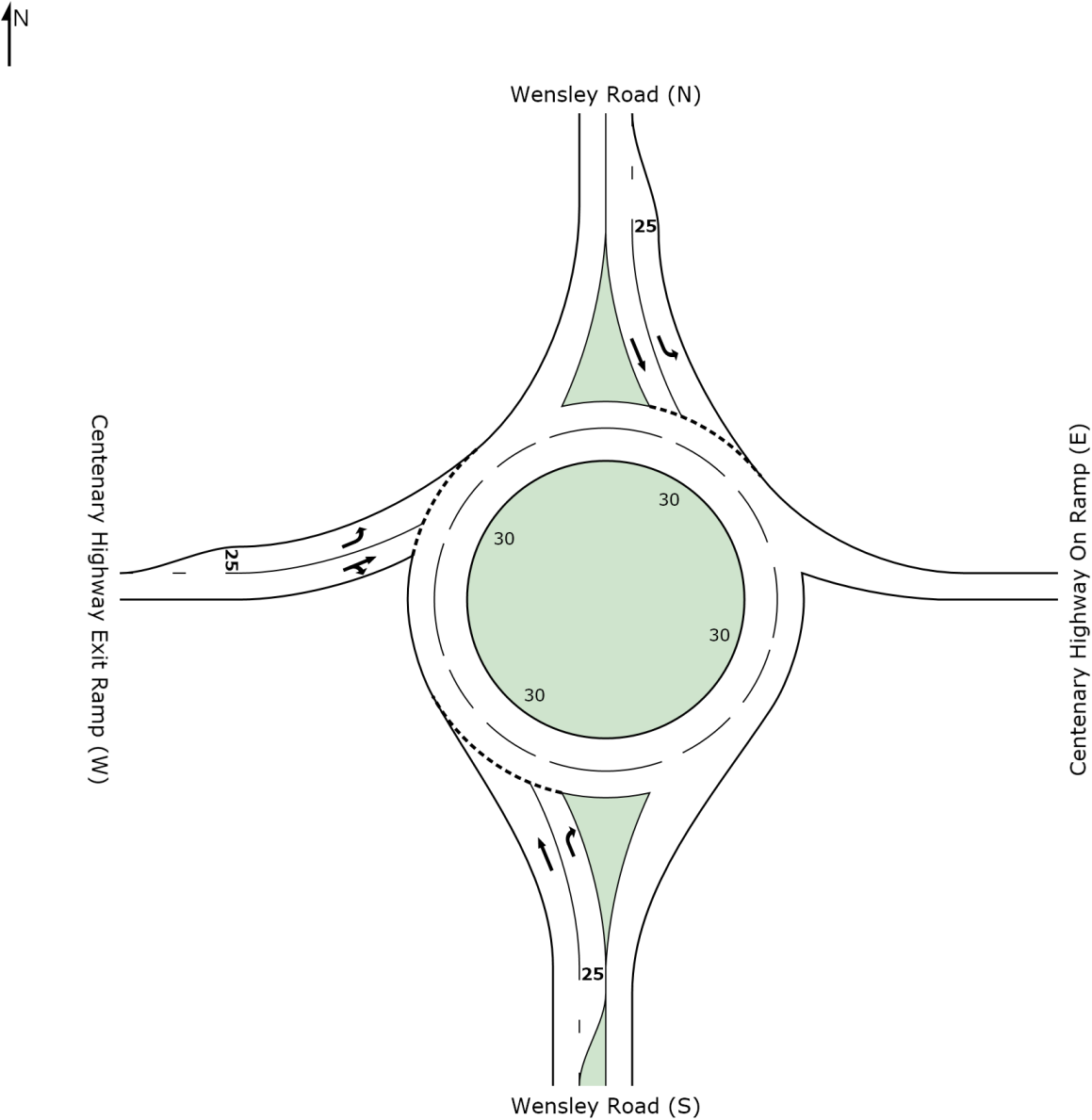
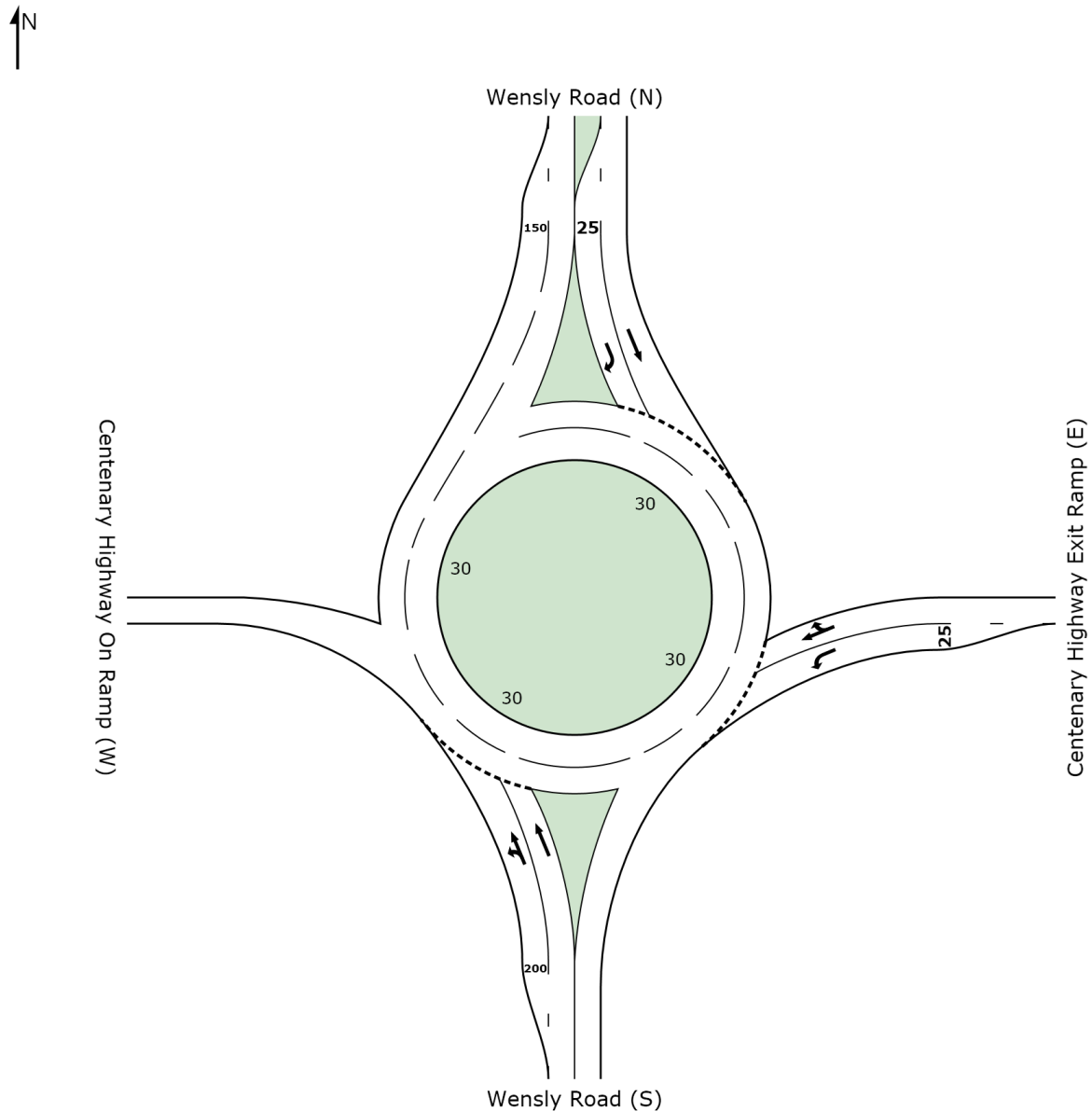


Figure 9 Wensley Road Interchange – Southern Intersection Roundabout Layout

The dual roundabout interchange configuration results in a DOS of 0.65 in the AM peak and 0.42 in the PM peak at the northern intersection and a DOS of 0.78 in the AM peak and 0.40 in the PM peak at the southern intersection. This option provides adequate capacity below the desirable maximum DOS of 0.85 for a roundabout.

A test was also undertaken for the proposed short term single roundabout layout (i.e. an at grade roundabout instead of an interchange), however this option did not have sufficient capacity for the 2031 design horizon.

Item 3 - Intersection Separation at Eastern End of East West Road

The East West Road is described as an Inter-Suburban link. Under conventional road hierarchy definition this represents an Arterial Road. Based on the function of the road it is desirable to provide a minimum intersection spacing of 200m to ensure adequate intersection operation (larger spacing is desirable for planning reasons). The proposed separation between Ripley Road and Watsons Road is 240m.

Detailed analysis of queues indicates that this separation distance should be adequate to contain queues along the East West Road. In the worst case scenario for queues, 95%ile queues in the order of 140m extend west from Ripley Road and 95%ile queues in the order of 170m extend east from Watsons Road for the worst case signalised configuration.

With consideration of the above, it is concluded that the proposed intersection spacing is acceptable.

Item 4 - Intersection Spacing at Western End of East West Road

As an Inter-Suburban Link the East West Road proposes a high standard traffic carrying function. It is therefore recommended to maintain a minimum intersection spacing of major intersections at 200m to ensure adequate intersection operation (larger spacing is desirable for planning reasons). The proposed minimum spacing of intersections within the development site at the western end of the East West Inter-Suburban Link is 250m with other key intersections spaced further apart.

The proposed approximate intersection spacing, as illustrated on Drawing Number 79017-SK01 (at Appendix C), is considered to be appropriate and acceptable. Note that some details on the latter drawing have since been updated but the road network remains the same as shown.

Item 5 – Width of Internal East West Link

The internal road that runs parallel to the East West Road was initially proposed with a 17m wide road reserve. The Further Issues Notice dated 13 February 2013 requests that this be designed to a Neighbourhood Connector with a 19.5m cross section, including:

- > 7.0m carriageway
- > 2.5m parking lanes
- > 3.75m verges.

The most recent layout at Appendix F has been modified to accommodate the requested cross section. The latter is shown on drawing 7901-47-027-SK005 at Appendix G

Item 6 – Form of East West Road

A broad level review has also been undertaken to determine approximate traffic volumes and midblock lane requirements on the future road network within the site. The assessment considers development in AMEX West and some fringe development that would make use of the major roads. It should be noted that these volume estimates are very preliminary in nature.

The volume estimates are based on a development yield of 15 dwellings per hectare as outlined in the Ripley Valley UDA Development Scheme and an approximate development yield which includes:

- > 1,300 residential dwellings in Area C1
- > 450 residential dwellings in Area C2
- > 400 residential dwellings in Area E
- > 100 residential dwellings in Area Z.

Fringe area development within the local area has also been considered, including:

- > 100 residential dwellings west of Area C1 (north of the East West Road)
- > 200 residential dwellings west of Area C1 (south of the East West Road)
- > 300 residential dwellings north of Area C2
- > 300 residential dwellings west of Watsons Road (south of the East West Road)
- > 300 residential dwellings south of Area E
- > 400 residential dwellings south and east along Watsons Road.

Again, it is noted that the fringe development estimates are very preliminary as the extent of development and access arrangements (i.e. street network) are uncertain at this point.

The traffic generation from residential dwellings has been estimated very conservatively at 10 trips per day per dwelling. This assumption is deliberately conservative given the preliminary nature of the volume estimates. The school (Area C1) is expected to have a predominantly local function with the majority of trips having an origin or destination within the local area. Traffic generation for the potential retail nodes has been ignored as these will be small in size and will only serve the immediate local catchment.

External trips are distributed as follows:

- | | |
|---------------------------------------|------|
| > SUCE (East of Ripley Road) | 15% |
| > Ripley (North of Centenary Highway) | 20% |
| > Centenary Highway | 60%. |

Based on the above, the East West Road will have a traffic volume of around 10,500 – 11,500vpd at the eastern end and approximately 22,500vpd at the western end (note that these represent volumes only generated by the identified catchments described above and therefore exclude any through traffic. These volumes will require provision of two lanes at the eastern end with local widening to four lanes at intersections and four lanes at the western end. It may be opportune to consider four lanes along the entire length of road to accommodate a scenario where future year volumes exceed the ballpark figures used herein.

The traffic volumes extracted from the 2031 Saturn model indicate daily volumes on the East West Road of approximately 19,000vpd at the eastern end and 25,700vpd at the western end. Based on these volumes a four lane cross section is recommended for the East West Road.

Note that whilst the above recommends a four lane cross section, a two lane cross section would be adequate for interim development stages.

Cross Sections

The typical cross sections for roadways within this development are shown on drawings 7901-47-027-SK-003 Revision 1, 7901-47-027-SK-004 Revision 1 and 7901-47-027-SK-005 Revision 2. These drawings are included at Appendix G. Note that only some of these cross sections may be necessary within this part of the development.

It is recognised that for East West Road (arterial road) the drawing number 7901-47-027-SK-006 revision 1 includes an alternative road cross section. The latter alternative uses a two way separated cycle track on one side of the road as an alternative to cycle lanes on both sides of the road. The alternative addresses the TMR “Separated Cycleways Guideline”. Both cross sections use the same road reserve width, therefore the adopted cross section can be confirmed at the ROL application/approval stage.

Conclusion

Detailed intersection analysis herein is based on volume plots from the Ripley Valley Saturn Model which are assumed to represent a scenario with partial (approximately 75%) development at the 2031 design horizon. The assessment suggests that:

- > Signalised layouts, as illustrated on Figure 1 & 2 can provide adequate capacity at the Ripley Road/East West Road and Watsons Road/East West Road intersections. A roundabout form, as illustrated on Figure 3 at the Watsons Road/ East West Road intersection provides improved capacity and queuing characteristics but this would be less consistent with the arterial function of the East West Road.
- > The proposed DTMR interchange configuration at Wensley Road/Centenary Highway has more than adequate capacity for the design year and a reduced form, as illustrated on Figures 6 & 7, would be adequate to provide operating capacity at the 2031 horizon. The interchange can also be provided as two roundabout intersections north and south of the Centenary Highway. The minimum layout required to provide adequate capacity for the 2031 design year is illustrated on Figures 8 & 9.
- > The 17m cross section for the internal link running parallel to the East West Road has been revised to a 19.5m cross section consistent with the ULDA guidelines.
- > The currently proposed network layout proposes a minimum intersection spacing of 240m along the East West Road, between Ripley Road and Watsons Road, with other key intersection spaced further apart. Detailed assessment of the Ripley Road/East West Road and Watsons Road/East West Road intersections confirms that the minimum spacing would not need to be extended to suit the expected queuing characteristics on the East West Road between Watsons Road and Ripley Road. Intersection spacing is therefore considered to be acceptable.
- > Based on preliminary estimates of the future year traffic volumes on the East West Road, the link will require a four lane configuration, at least at its western end.

AMEX Ripley – ARP West

APPENDIX A

FURTHER ISSUES NOTICE

15 February 2013

Amex Corporation Pty Ltd
C/- Julian Kemp
RPS Australia East Pty Ltd
PO Box 1559
FORTITUDE VALLEY QLD 4006

Dear Julian,

RE: FURTHER ISSUES FOR RIPLEY VALLEY PRIORITY DEVELOPMENT AREA (PDA) DEVELOPMENT APPLICATION DEV2012/409 FOR A PDA DEVELOPMENT PERMIT FOR RECONFIGURATION OF A LOT (1 LOT INTO 313 LOTS) ACCOMPANIED BY A PLAN OF DEVELOPMENT AT RIPLEY ROAD AND WATSONS ROAD, SOUTH RIPLEY, DESCRIBED AS LOT 196 ON SP157517 AND LOT 370 ON SP198119.

After undertaking an assessment of the above mentioned PDA development application, we outline the following further issues to be addressed.

- It is noted that no decision has been issued for Material Change of Use application (DEV2012/283), including Context Plan.
- Given the scale of the proposal, it is requested that separate plans of each stage of the development are provided, including 1 metre contours, road widths and lot dimensions.
- Accessible housing should be provided in accordance with ULDA 'Accessible Housing' Guideline No. 2.
- Provide further detail illustrating that the development interfaces appropriately with the Urban Core to the north of the site boundary. A seamless and connected community must be achieved.
- Site coverage should not exceed 60% of the lot area, except in the case of terrace style dwellings, where the total site coverage can be up to 75% of the lot area.
- Investigate a greater mix of dwelling types in order to increase the density from the proposed 13.5dw/ha to the minimum 15dw/ha as per Table 1 of the Ripley Valley UDA Development Scheme.

- Mid-block breaks providing a pedestrian link should be included when blocks are over 130 metres in accordance with ULDA 'Neighbourhood Planning and Design' Guideline No. 5.
- The Plan of Development (PoD) should demonstrate how the development complies with the relevant design standards detailed within ULDA 'Low Rise Buildings' Guideline No. 7. Provide a revised PoD in accordance with the following comments:
 - Rear boundaries should be in accordance with the relevant standards table.
 - Built-to-boundary wall lengths and locations should be in accordance with the relevant standards table.
 - On-site parking and driveways should be in accordance with the relevant standards table:
 - The number of car parking spaces provided should be specified in terms of bedrooms rather than lot types.
 - Double garages should not be permitted on any lot less than 10 metres in width.
 - Driveway, parking and garage provision and design should be in accordance with the relevant standards table.
 - The PoD should state that private open space must be provided in accordance with the standards table and is accessible from a living room.
 - Street address details in accordance with the relevant standards table.
 - Building articulation details in accordance with the relevant standards table.
 - Screened rubbish bin areas behind the main face of the dwelling for loft and small dwellings.
- The Neighbourhood Park must be embellished as per Table 7 of ULDA 'Park Planning and Design' Guideline No. 12. Bicycle parking, lighting, uncovered and covered tables and seating, and a half-court/rebound wall or similar, should be included.
- Provide further detail on the Open Space Plan regarding pedestrian/bicycle path widths and links to off-site activity nodes, stormwater management areas, interface with streets and general layout of active and passive components.
- Provide pedestrian/bicycle path locations and links to off-site activity nodes (as per the Open Space Plan) on the PoD.
- Provide clarification of the status of the parks shown on the PoD as it appears that they are not included as part of this proposal.

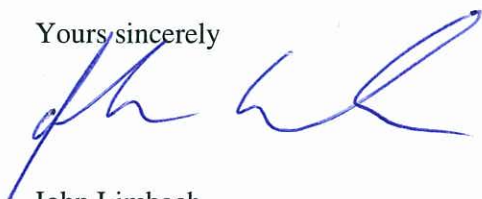
- The proposed 17.00 metre wide road that intersects the site from east to west must be upgraded to a 'Neighbourhood Connector' as per ULDA 'Movement Network' Guideline No. 6, with a minimum road reserve width of 19.50 metres.
- The slope analysis plan shows lots affected by slope of over 15%; provide further detail demonstrating how lots affected by slope can be developed.
- It is acknowledged that relevant technical reports have been provided as part of the MCU application, however, copies of these reports should be submitted as part of the RoL application, including the following as referenced in the planning report:
 - Site Based Stormwater Quality Management Report
 - Sewer Servicing Report
 - Water Servicing Report
 - Traffic Noise Impact Assessment
 - Bushfire Hazard Assessment Report
 - Broadscale Geotechnical Investigation
 - Flood Study
 - Open Space Concept
 - Ecological Assessment Report
- Provide updated versions of the following reports that are specific to stages 1-5:
 - Stormwater management report
 - Bushfire management report
 - Noise impact assessment

QUU

- The proposal should address QUU's comments dated 3 January 2013, which are enclosed for your reference.

Please do not hesitate to contact John Limbach on 07 3024 4120 or john.limbach@sdip.qld.gov.au if you have any questions with respect to the progress of your PDA development application.

Yours sincerely



John Limbach
SENIOR PLANNER – DEVELOPMENT ASSESSMENT

17 January 2013

ULDA Ref. No: DEV2012/283

Amex Corporation P/L
C/- Julian Kemp
RPS Australia East P/L
PO Box 1559
FORTITUDE VALLEY QLD 4006

Dear Julian

RE: FURTHER ISSUES NOTICE FOR UDA DEVELOPMENT APPLICATION - MATERIAL CHANGE OF USE RESIDENTIAL USES (DISPLAY HOME, HOME BASED BUSINESS, HOUSE, MULTIPLE RESIDENTIAL, OTHER RESIDENTIAL AND SHORT TERM ACCOMMODATION); COMMERCIAL USES (BUSINESS, HEALTH CARE SERVICES AND SALES OFFICE); RETAIL USES (FAST FOOD PREMISES, FOOD PREMISES, GARDEN CENTRE, MARKET, SERVICE STATION, SHOP, SHOPPING CENTRE AND SHOWROOM); SERVICE, COMMUNITY AND OTHER USES (CHILD CARE CENTRE, COMMUNITY FACILITY, EDUCATIONAL ESTABLISHMENT, EMERGENCY SERVICES, PLACE OF ASSEMBLY, TELECOMMUNICATIONS FACILITY AND UTILITY INSTALLATION); SPORT, RECREATION AND ENTERTAINMENT USES (INDOOR ENTERTAINMENT, INDOOR SPORT AND RECREATION, OUTDOOR SPORT AND RECREATION AND PARK); TOURISM USES (TOURIST ATTRACTION); AND RURAL USES (AGRICULTURE, ANIMAL KEEPING AND HUSBANDRY, WHOLESALE NURSERY) AT RIPLEY ROAD AND WATSONS ROAD, SOUTH RIPLEY DESCRIBED AS LOT 196 ON SP157517 AND LOT 370 ON SP198119.

After undertaking an assessment of the above mentioned UDA development applications, the ULDA has determined that there are further issues with the application that are required to be resolved prior to the ULDA making a decision. The issues to be addressed are detailed below.

1. Traffic

Provide a Traffic Impact Assessment (TIA) referencing the Ripley Valley Saturn Model that gives consideration to potential impacts on the existing and future road network including, but not limited to, the following:

- Impacts upon the Watson Road and Ripley Road intersection.
- Potential impacts upon the Centenary Highway and the Wensley Road/Ripley Road interchanges.
- The separation distance of Watsons Road and the East West Inter-Suburban link from Ripley Road.
- The number of intersections at western end of the East West Inter-Suburban Link.

2. Centres

Two local neighbourhood centres are nominated on the Context Plan and no major neighbourhood centre. Figure 15-12 'Centres and Employment' at Appendix 2 of the Ripley Valley UDA Development Scheme incorporates a major neighbourhood centre, a neighbourhood centre and village centre. Provide detail of the intended function of each proposed centre and clarify why a major neighbourhood centre is not required.

The local neighbourhood centre at the eastern edge of Neighbourhood 1 should be relocated to the west. The alternative location of the centre should be proximate to the education use, medium density residential land, district sports fields and recreational areas, creating a community hub.

3. Medium Density Residential

The nominated medium density residential locations do not appear appropriate as they are not proximate to bus stops or centres.

4. Dwelling Numbers

Provide clarification of dwelling numbers as there is a conflict between the Master Plan and Context Plan.

5. Education

Provide details that demonstrate the school land allocation is in accordance with the requirements of the Department of Education, Training and Employment (DETE).

6. Community Facilities

The Ripley Valley UDA Development Scheme identifies a Major Neighbourhood Facility (Community Facility) within the site. Consideration should be given to the potential location of this facility and the opportunity for such a facility to service the intended population.

7. Environmental Protection Zone

Provide a zoning overlay plan that illustrates the extent of incursion within the EP Zone.

Provide a Visual Impact Assessment that addresses the impact of the proposed low intensity uses located within the Environmental Protection (EP) Zone. The Visual Impact Assessment should demonstrate that the scenic value and visual amenity significance of the area is not detrimentally affected by the low intensity uses. Please see Appendix 2 *Visual Impact Assessment Process* of ULDA 'Development Interfaces' Guideline No. 18 for guidance.

8. Plans

Provide an Active Transport Network Plan detailing the location and width of proposed pedestrian and cycle pathways and bus stop locations within the Context Plan area.

Only major roads should be shown on the master land use and transport infrastructure plans.

9. Open Space

A green buffer should be provided to the Wensley Road interchange to create a green entry and along the Centenary Highway to improve residential amenity.

Parks should include embellishments as per Table 7 of ULDA 'Park Planning and Design' Guideline No. 12.

Please don't hesitate to contact John Limbach on 07 3024 4154 or john.limbach@ulda.qld.gov.au if you have any questions.

Yours faithfully



John Limbach

SENIOR PLANNER – DEVELOPMENT ASSESSMENT

AMEX Ripley – ARP West

APPENDIX B

SATURN VOLUME PLOTS

SATURN

Atkins Ltd /
DW / ITS

ULTIMATE-AM_T
MRV6_Op1.UFS

Scale 8402

Turn Data:

Exit flow

5- 7-12
CARLSIE CON



SATURN

Atkins Ltd /
DW / ITS

ULTIMATE-PM_T
MRV6_Op1.UFS

Scale 8402

Turn Data:

Exit flow

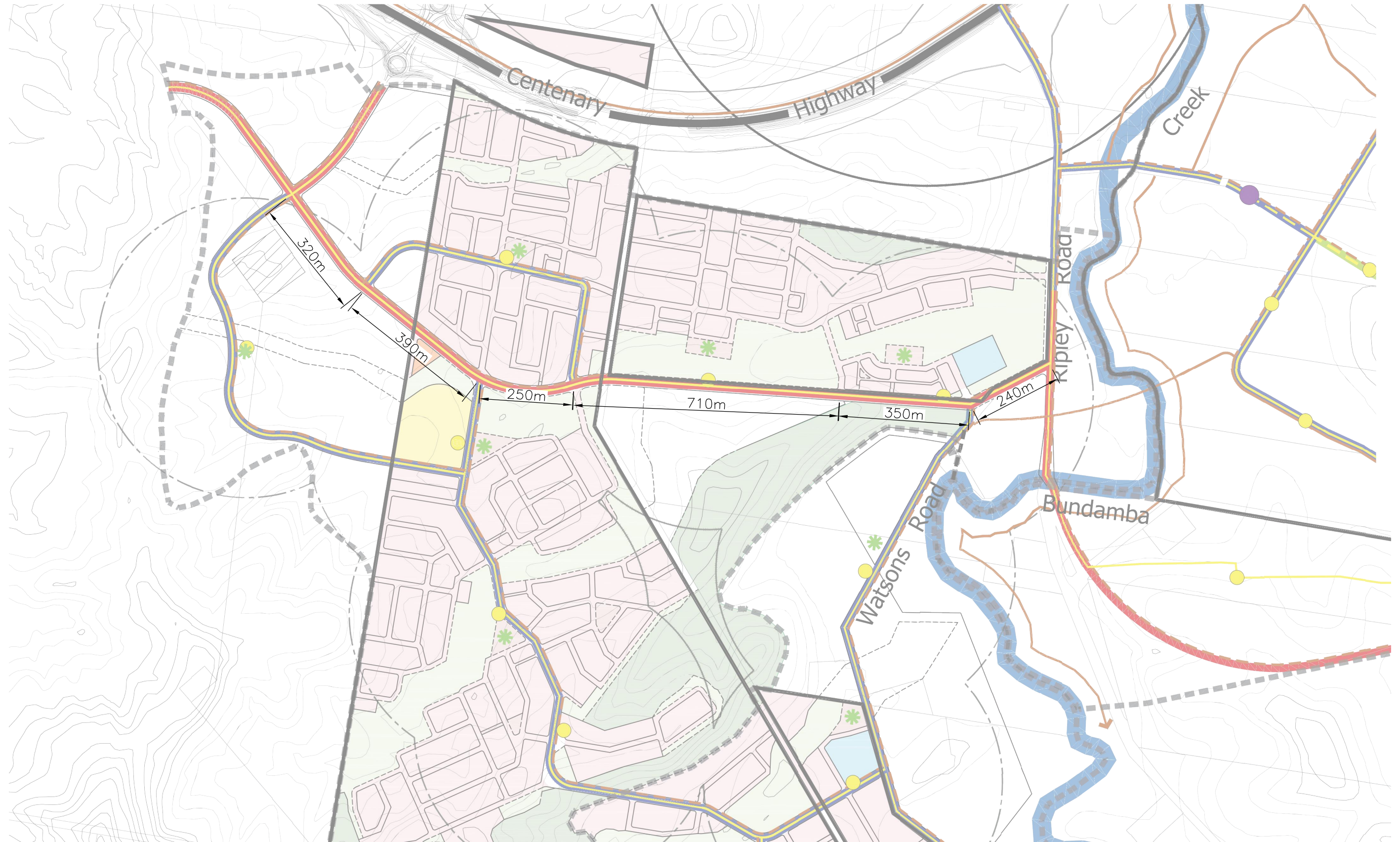
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AMEX Ripley – ARP West

APPENDIX C

INTERSECTION SPACING



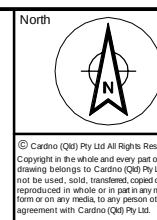
TRAFFIC AND TRANSPORT
Brisbane (07) 3310 2401
Level 11 Green Square North Tower
515 St Paul's Terrace
Locked Bag 4006
Fortitude Valley Qld 4006
transport@cardno.com.au www.cardno.com.au/leo

Melbourne (03) 8415 7777
Perth (08) 9273 3888
Sydney (02) 9496 7700

Issue	Description	Date	By
A	Initial Sketch	12/02/13	RW

PRELIMINARY PRINT
NOT FOR CONSTRUCTION

100 0 100 200 300 400 500 METRES
SCALE 1 : 10000 @ A3



Base Information Supplied By		
RPS Brisbane		
Design	Drawn	Checked
AM	RW	AM
Certified		
RPEQ No.		

Project Title
Ripley West
Client
AMEX

Drawing Title
Ripley West Development Approximate Intersection Spacing

Drawing No.
794017-SK01
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Master transport infrastructure.pdf
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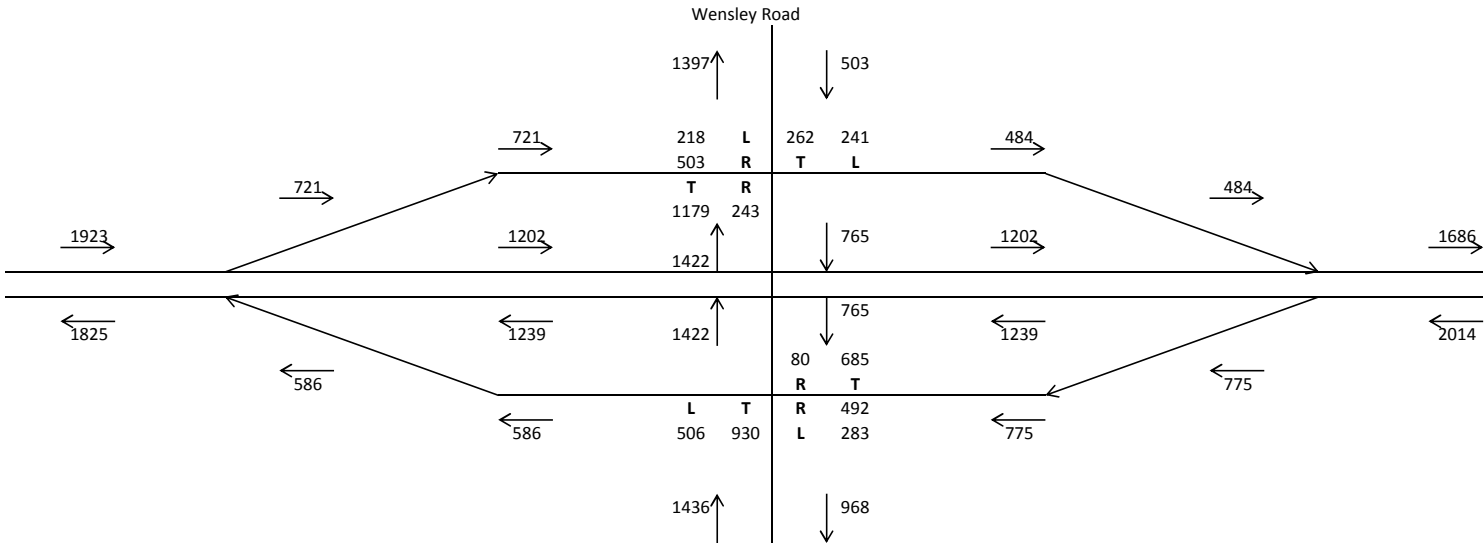
AMEX Ripley – ARP West

APPENDIX D

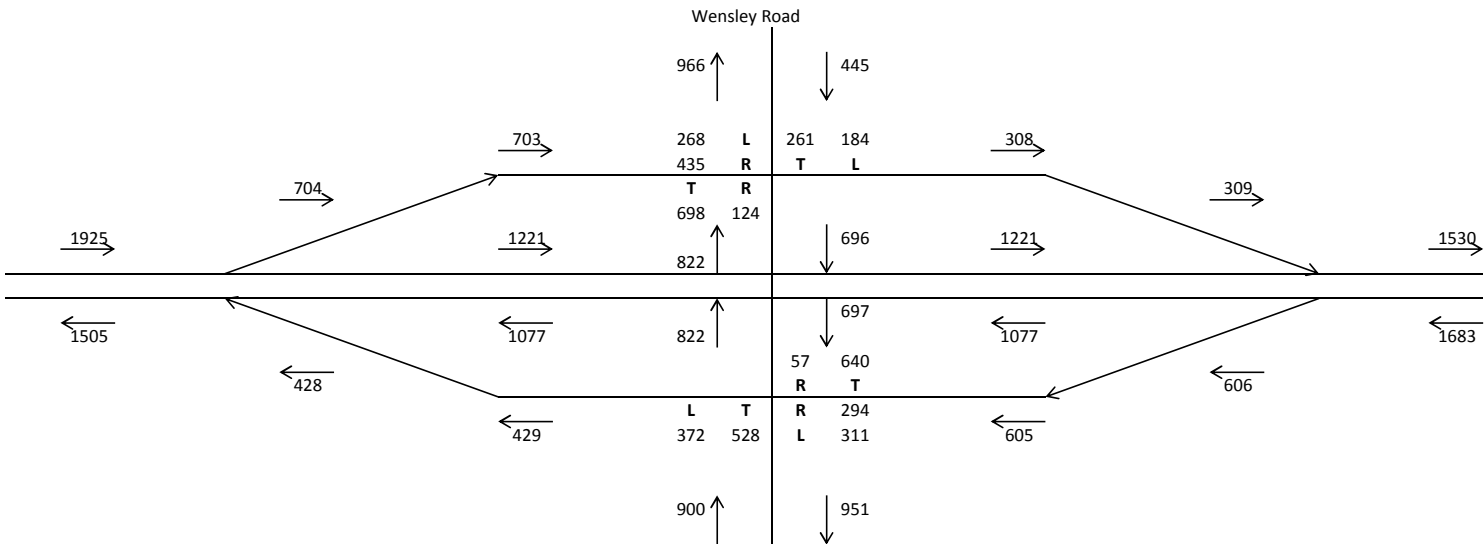
TRAFFIC VOLUMES

Wensley Road Interchange - Long Term Grade Separated Layout

2031 AM Peak SATURN Volumes

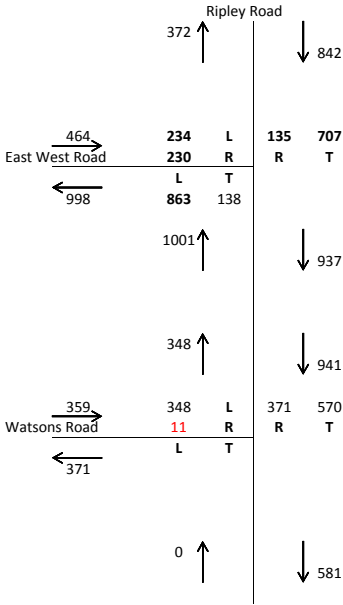


2031 PM Peak SATURN Volumes

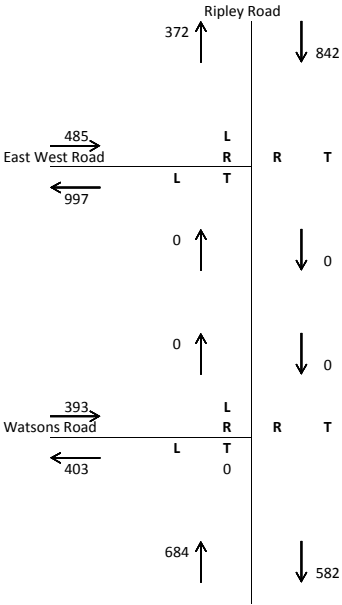


2031 PM Peak SATURN Volumes
 NOTE: Saturn volume plots provided are difficult to read and numbers are unclear/missing. Saturn intersection volumes have been estimated using a combination of turn and link volumes.

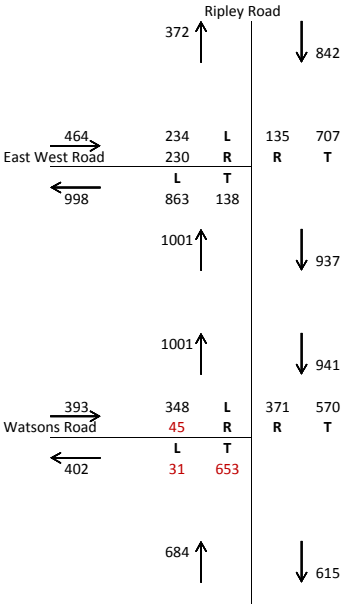
Best Read Saturn Turning Volumes
 (calculated link volumes)



Link Volumes



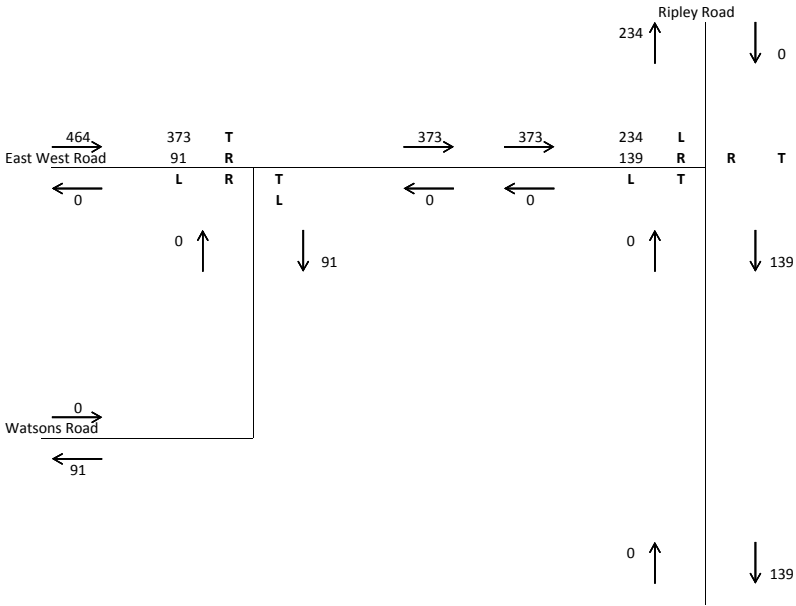
Estimated Saturn Turn Volumes



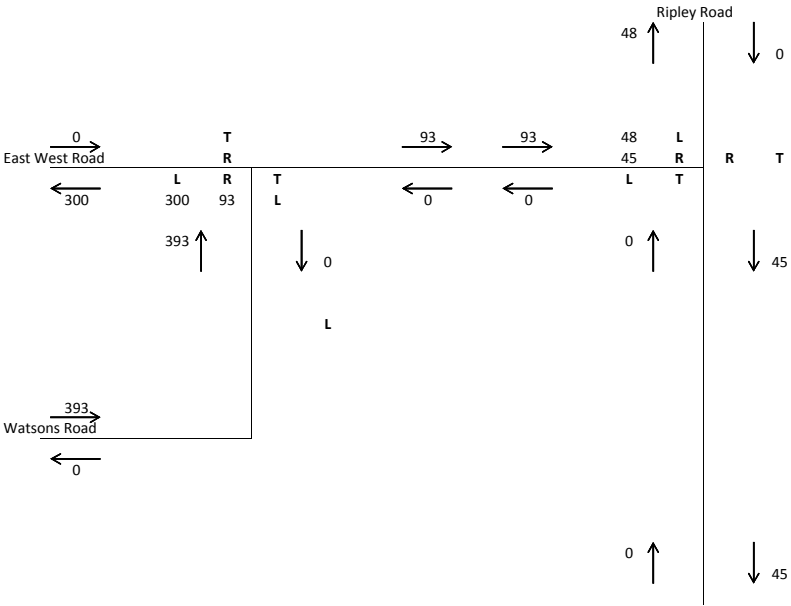
2031 PM Peak Redistributed Turn Volumes - East West Road

NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
East West Road

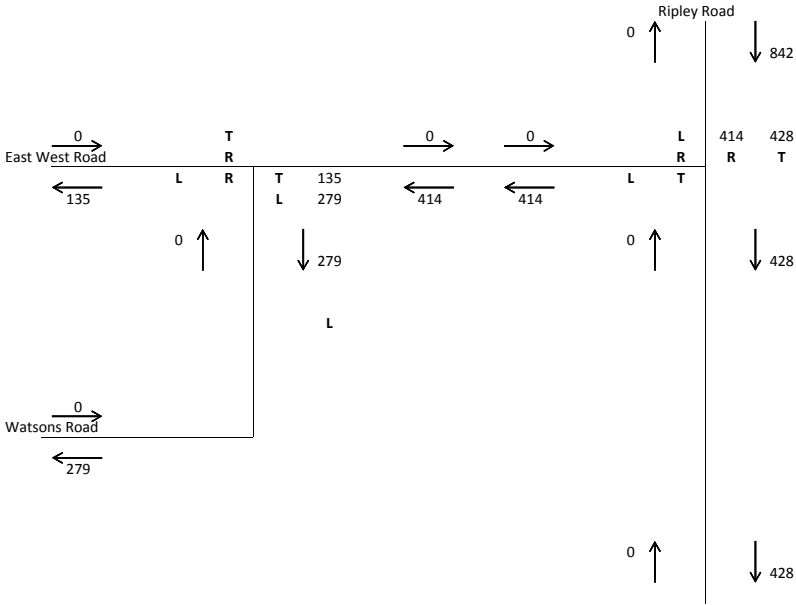


Redistributed Turn Volumes
Watsons Road

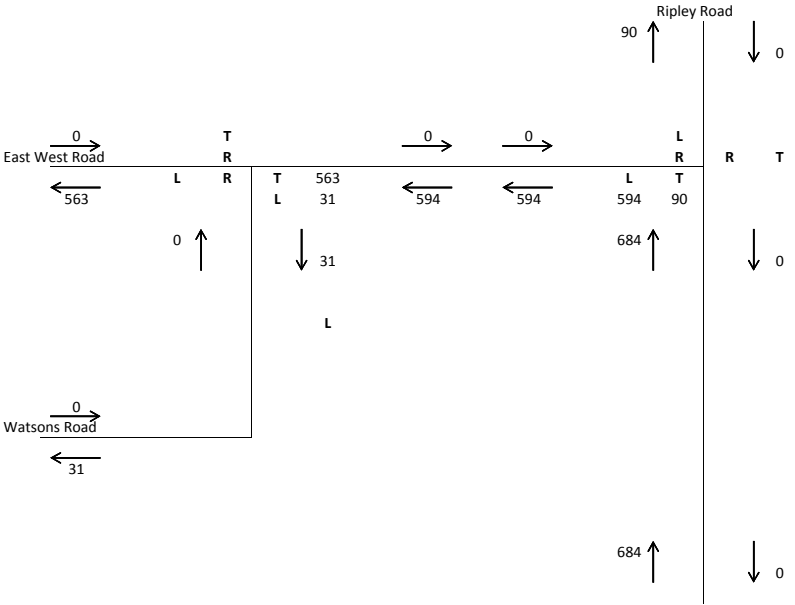


2031 PM Peak Redistributed Turn Volumes - East West Road (cont.,
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
 Ripley Road (North)

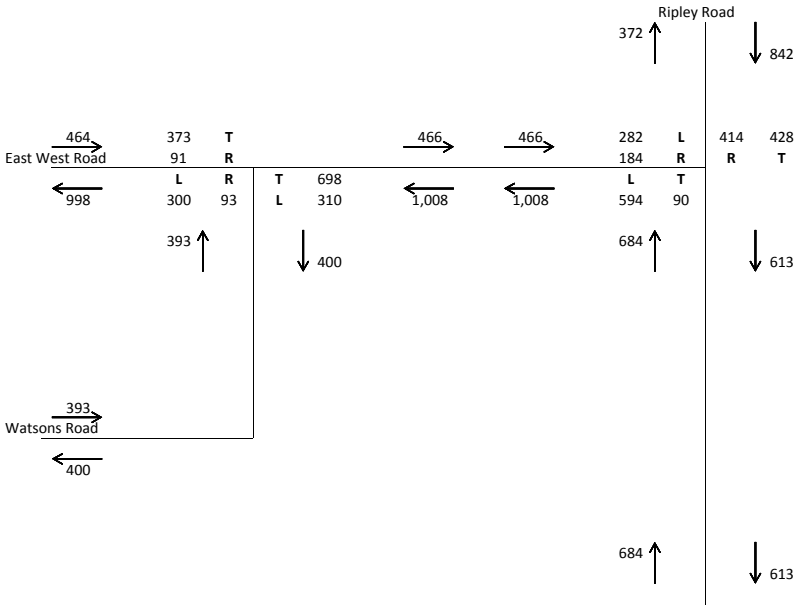


Redistributed Turn Volumes
 Ripley Road (South)



2031 PM Peak Redistributed Turn Volumes - East West Road (cont.)
 NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

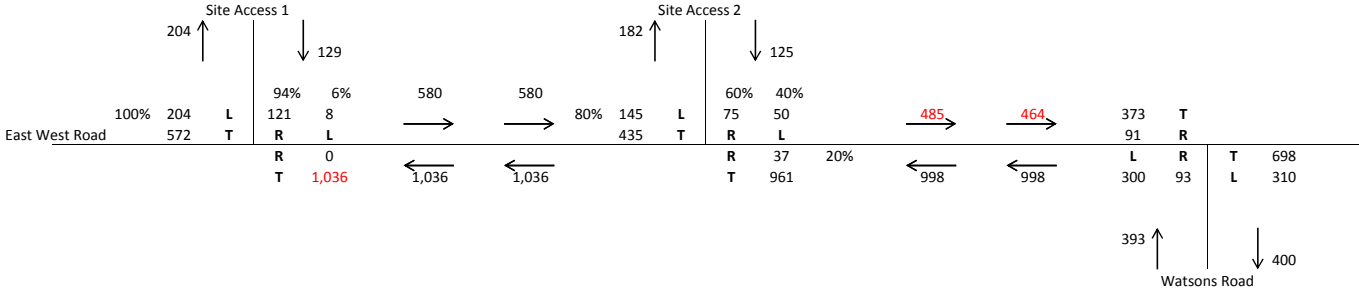
Redistributed Turn Volumes
 Total



2031 PM Peak Redistributed Turn Volumes - Residential Access

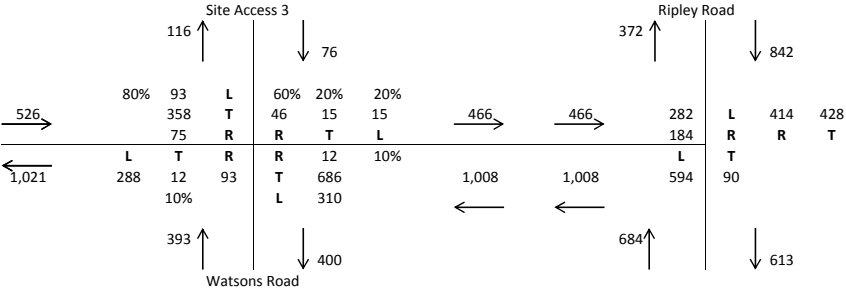
NOTE: Saturn plots two access points from the residential area north of the East West Road. Traffic Volumes have been redistributed to identify the expected traffic at the northern leg (residential access) of the East West Road

Best Read Saturn Turning Volumes



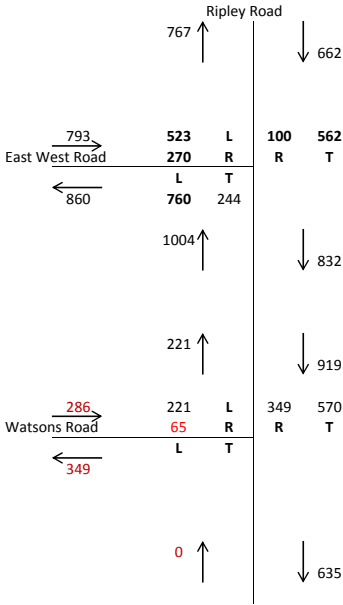
Redistributed Turning Volumes

Assumed to provide access to 30% of lots

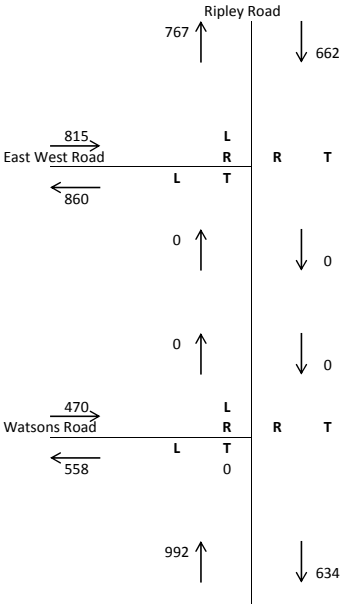


2031 AM Peak SATURN Volumes
 NOTE: Saturn volume plots provided are difficult to read and numbers are unclear/missing. Saturn intersection volumes have been estimated using a combination of turn and link volumes.

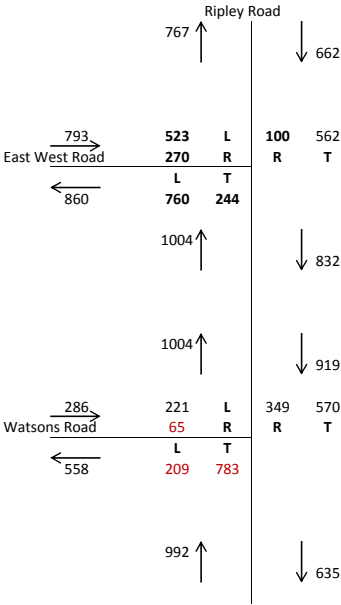
Best Read Saturn Turning Volumes
 (calculated link volumes)



Link Volumes



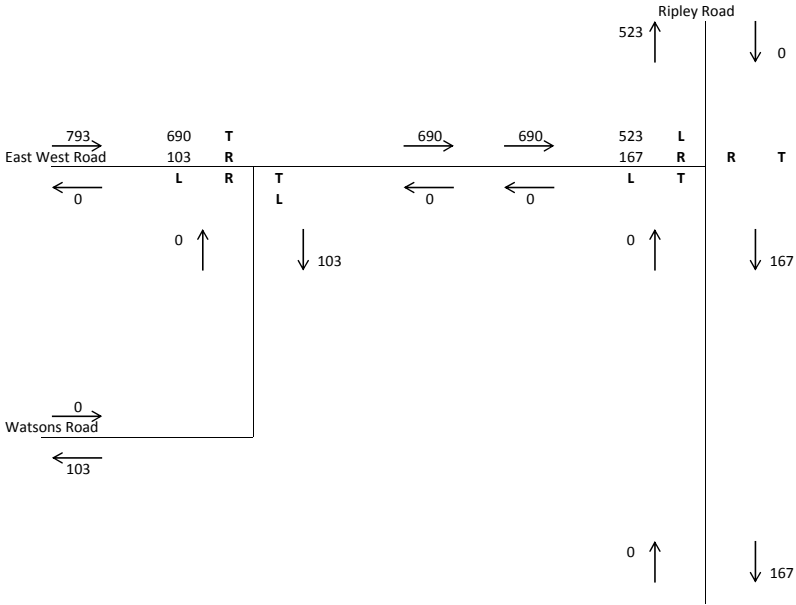
Estimated Saturn Turn Volumes



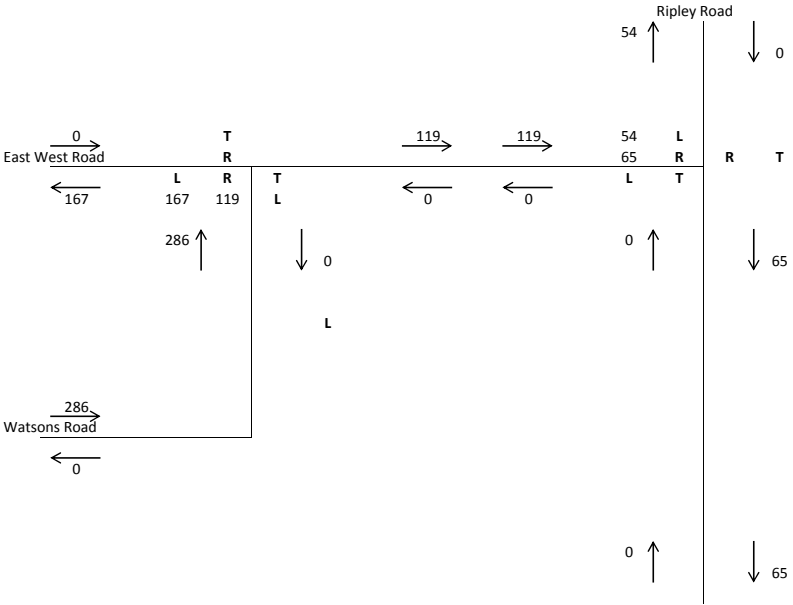
2031 AM Peak Redistributed Turn Volumes - East West Road

NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
East West Road

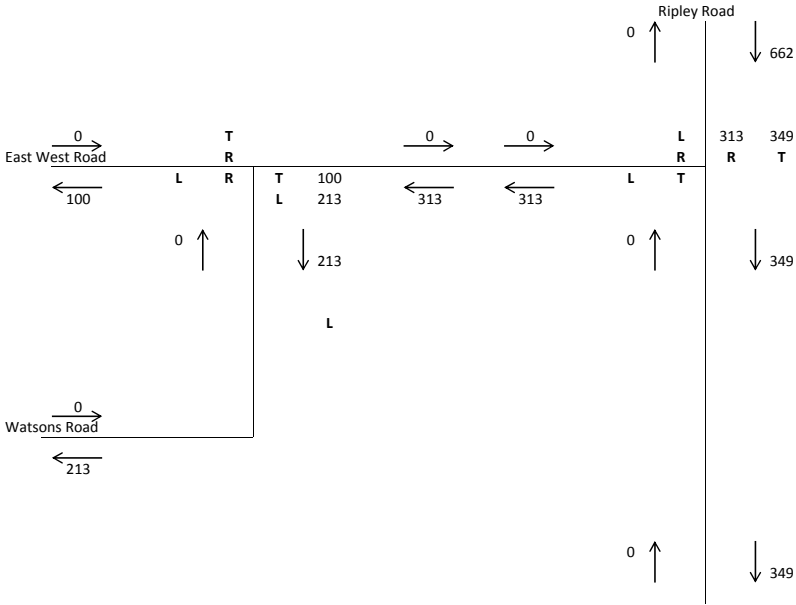


Redistributed Turn Volumes
Watsons Road

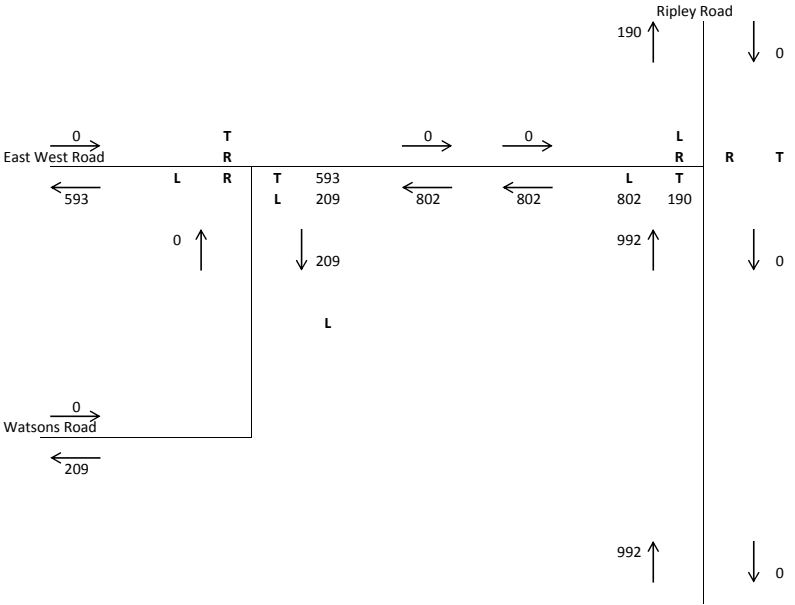


2031 AM Peak Redistributed Turn Volumes - East West Road (cont.,
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
Ripley Road (North)

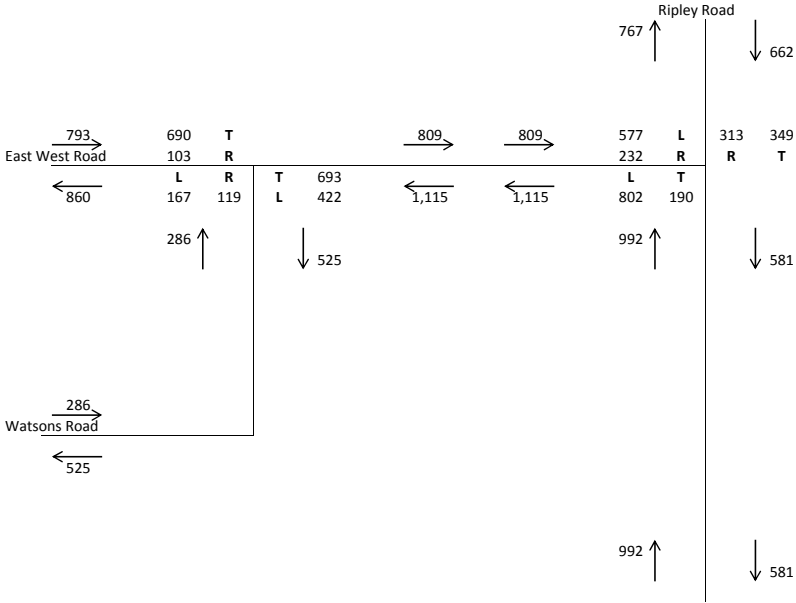


Redistributed Turn Volumes
Ripley Road (South)



2031 AM Peak Redistributed Turn Volumes - East West Road (cont.,
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

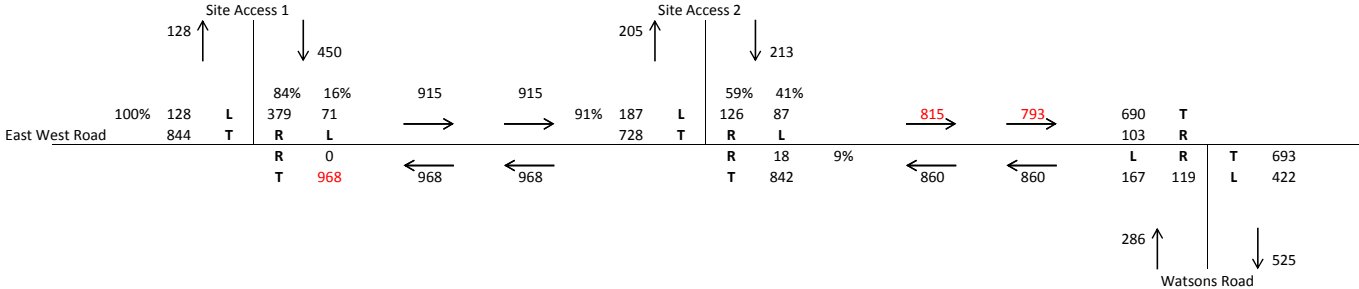
Redistributed Turn Volumes
Total



2031 AM Peak Redistributed Turn Volumes - Residential Access

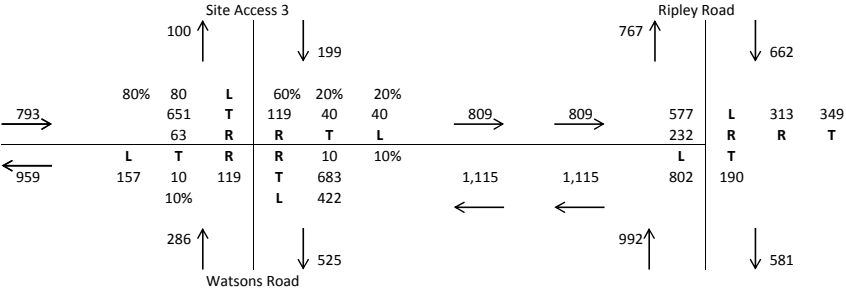
NOTE: Saturn plots two access points from the residential area north of the East West Road. Traffic Volumes have been redistributed to identify the expected traffic at the northern leg (residential access) of the East West Road

Best Read Saturn Turning Volumes



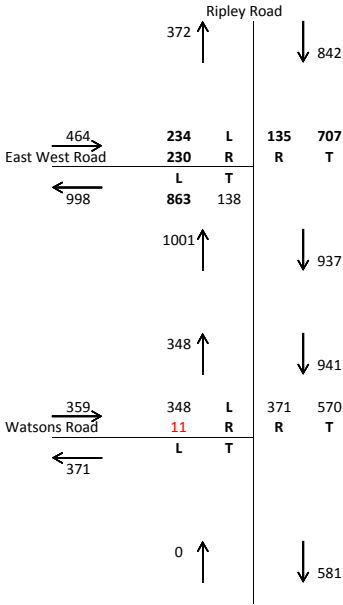
Redistributed Turning Volumes

Assumed to provide access to 30% of lots

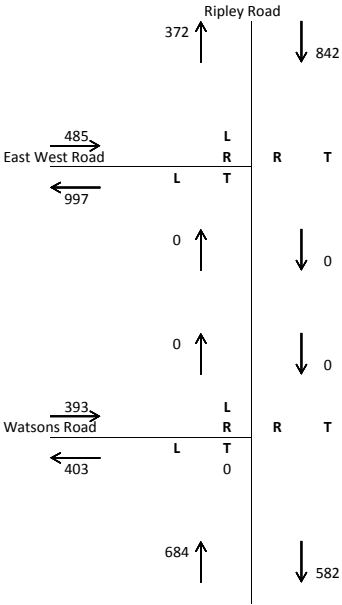


2031 PM Peak SATURN Volumes
 NOTE: Saturn volume plots provided are difficult to read and numbers are unclear/missing. Saturn intersection volumes have been estimated using a combination of turn and link volumes.

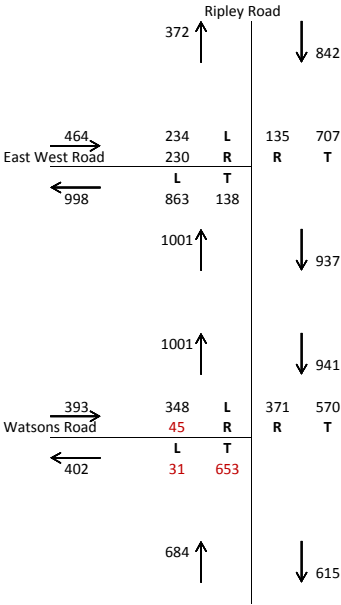
Best Read Saturn Turning Volumes
 (calculated link volumes)



Link Volumes



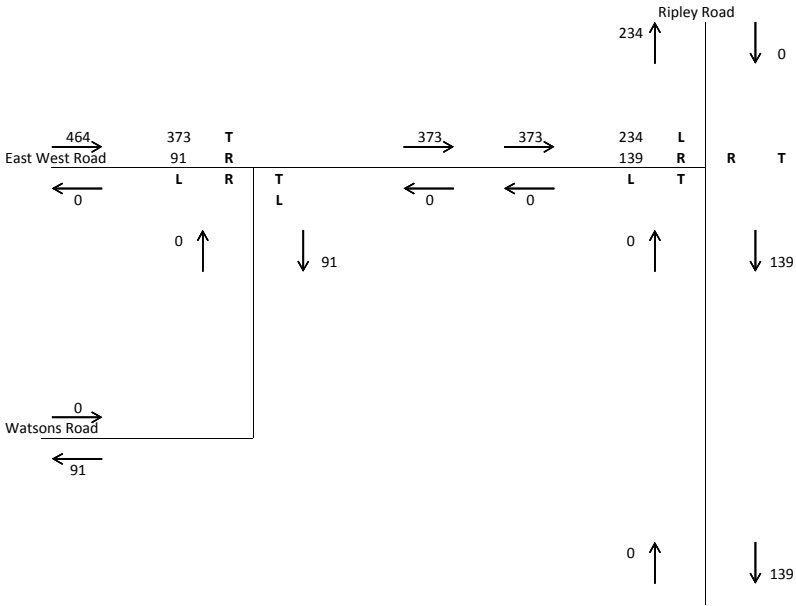
Estimated Saturn Turn Volumes



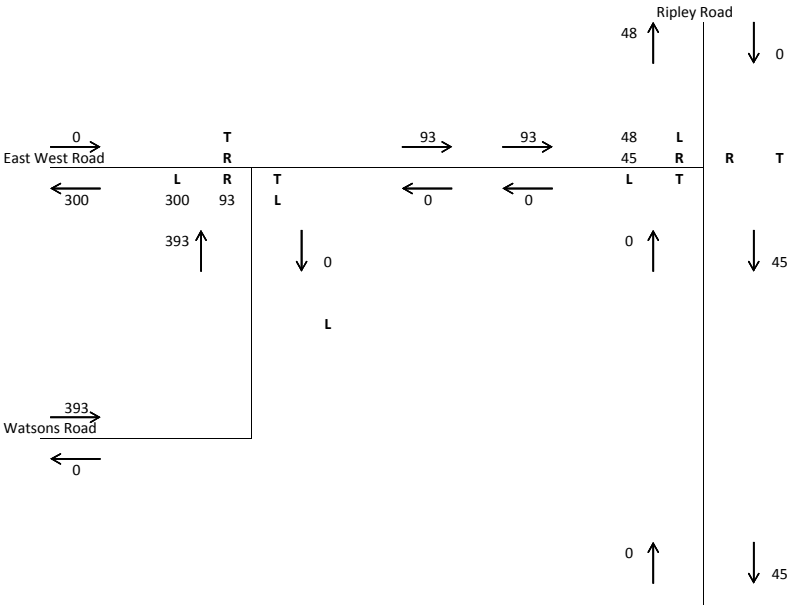
2031 PM Peak Redistributed Turn Volumes - East West Road

NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
East West Road

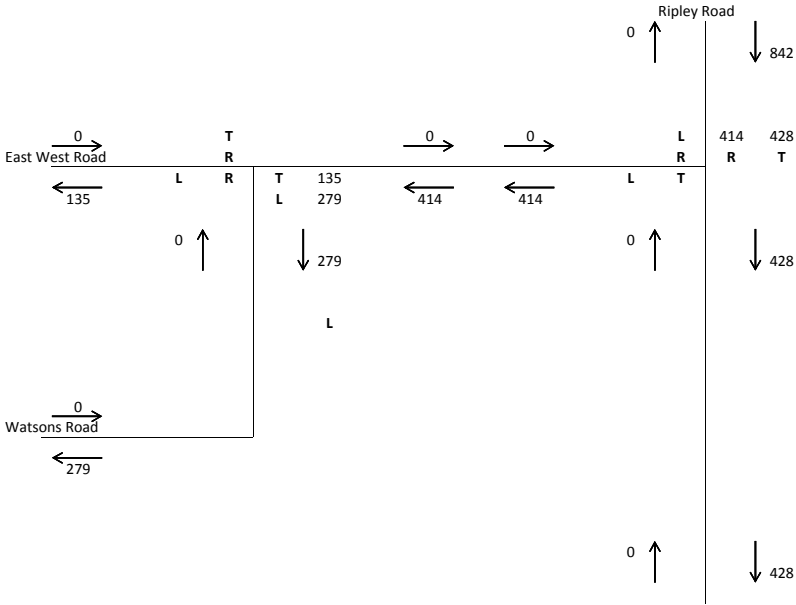


Redistributed Turn Volumes
Watsons Road

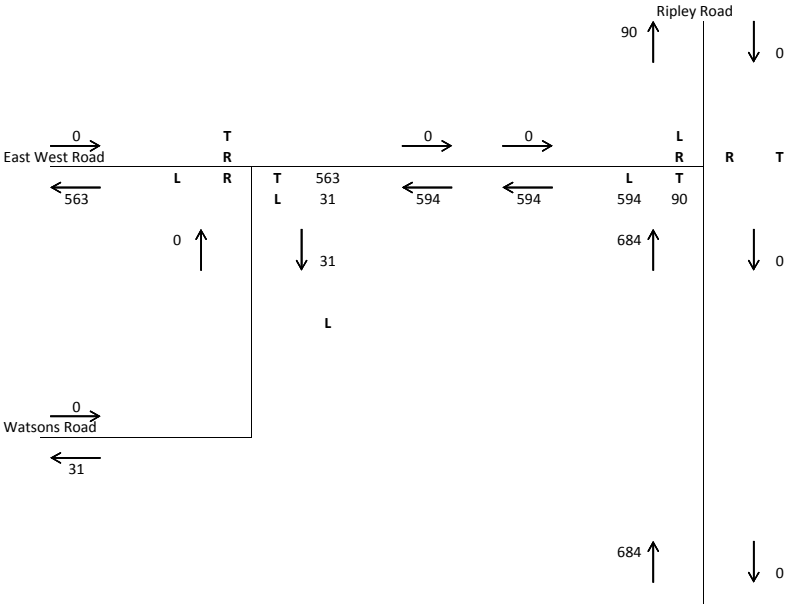


2031 PM Peak Redistributed Turn Volumes - East West Road (cont.,
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
 Ripley Road (North)

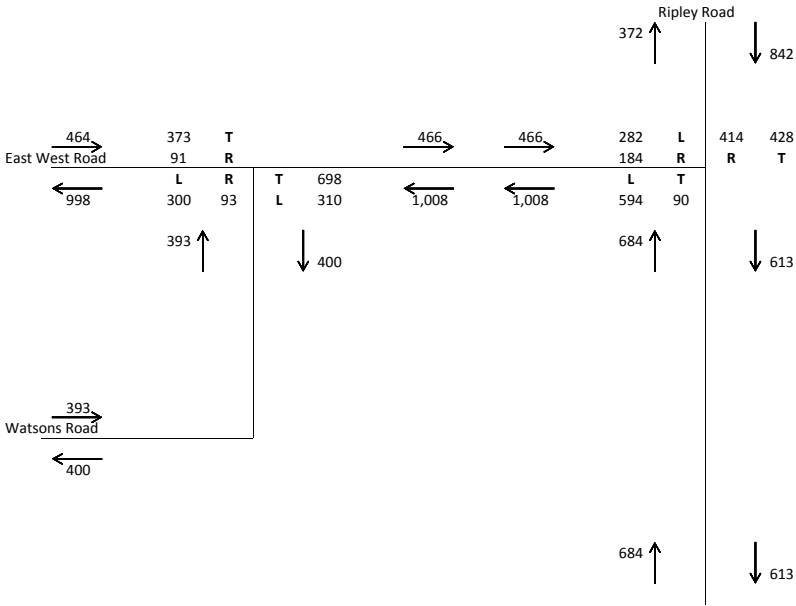


Redistributed Turn Volumes
 Ripley Road (South)



2031 PM Peak Redistributed Turn Volumes - East West Road (cont.)
 NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

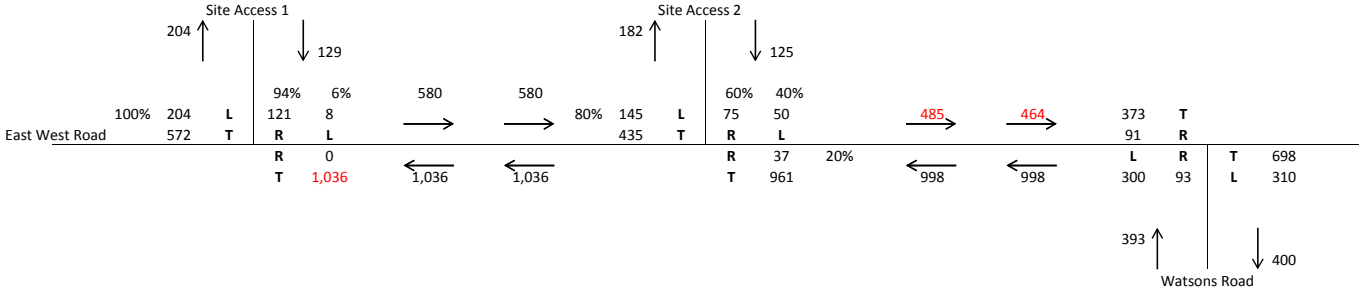
Redistributed Turn Volumes
 Total



2031 PM Peak Redistributed Turn Volumes - Residential Access

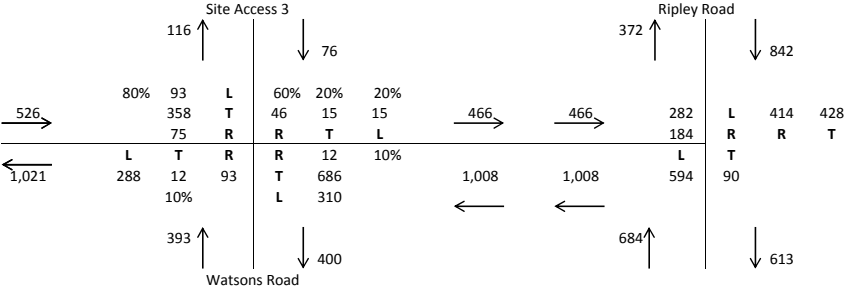
NOTE: Saturn plots two access points from the residential area north of the East West Road. Traffic Volumes have been redistributed to identify the expected traffic at the northern leg (residential access) of the East West Road

Best Read Saturn Turning Volumes



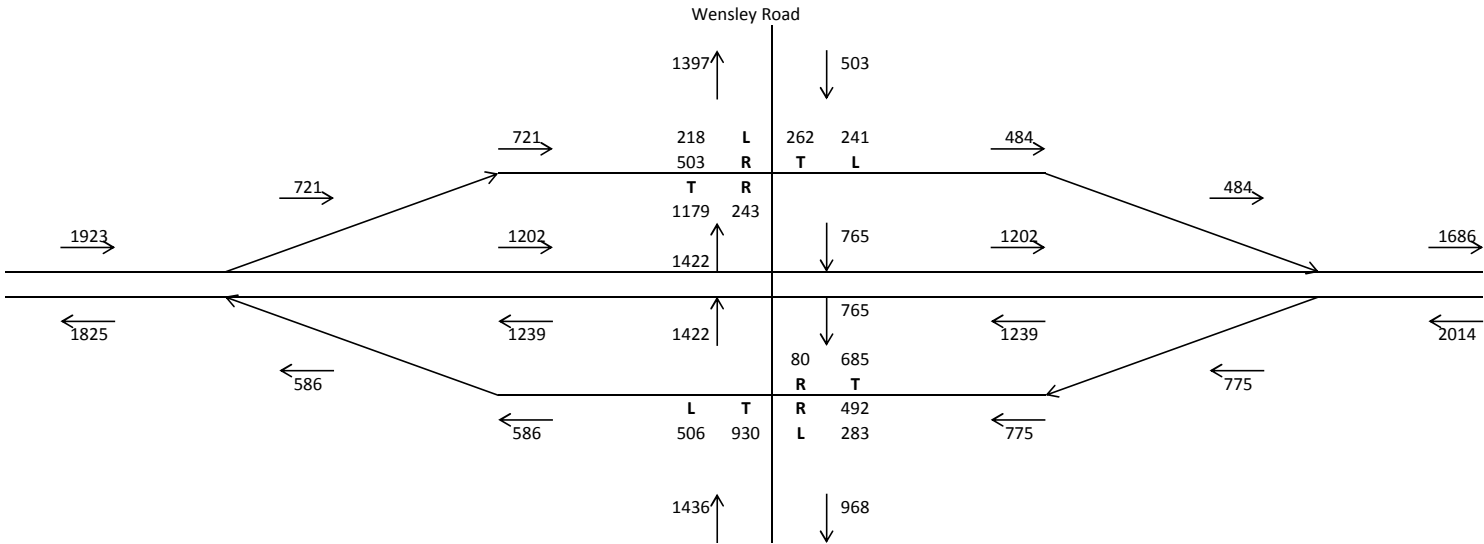
Redistributed Turning Volumes

Assumed to provide access to 30% of lots

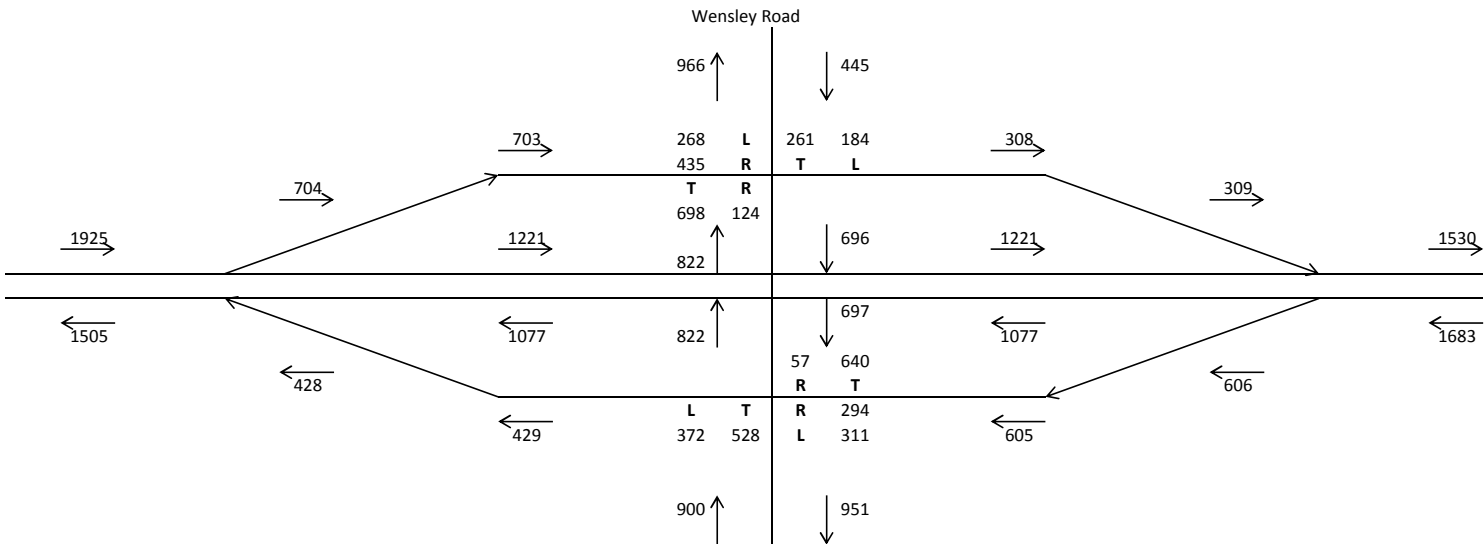


Wensley Road Interchange - Long Term Grade Separated Layout

2031 AM Peak SATURN Volumes



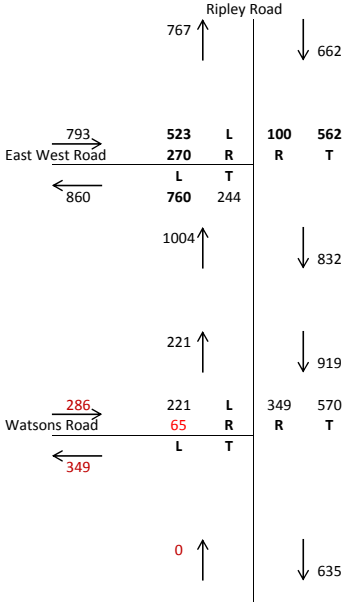
2031 PM Peak SATURN Volumes



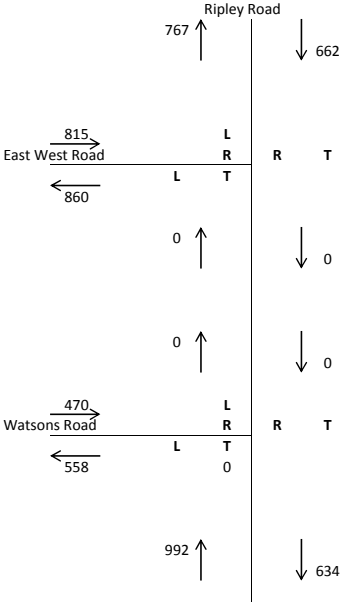
2031 AM Peak SATURN Volumes

NOTE: Saturn volume plots provided are difficult to read and numbers are unclear/missing. Saturn intersection volumes have been estimated using a combination of turn and link volumes.

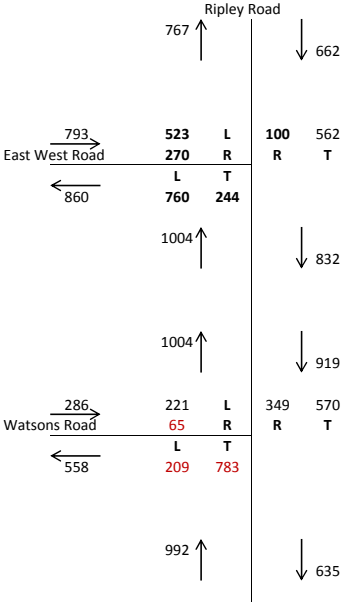
Best Read Saturn Turning Volumes
(calculated link volumes)



Link Volumes



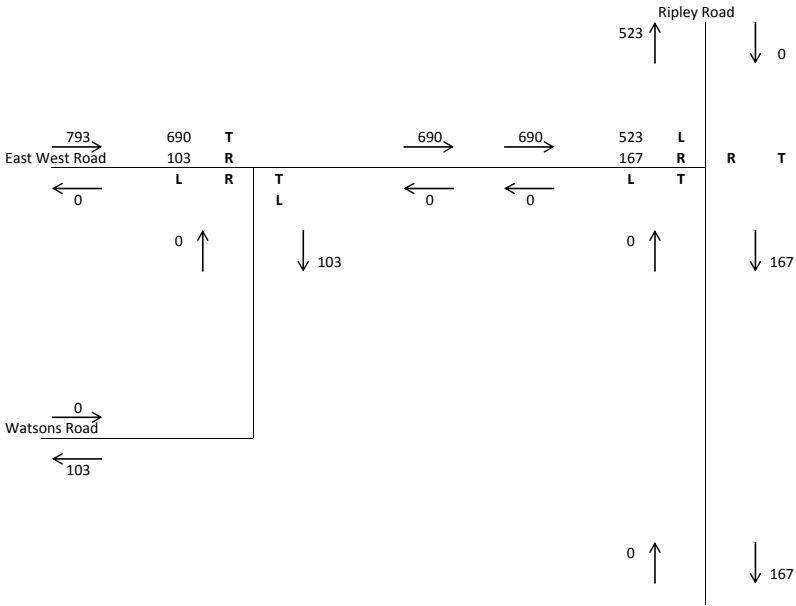
Estimated Saturn Turn Volumes



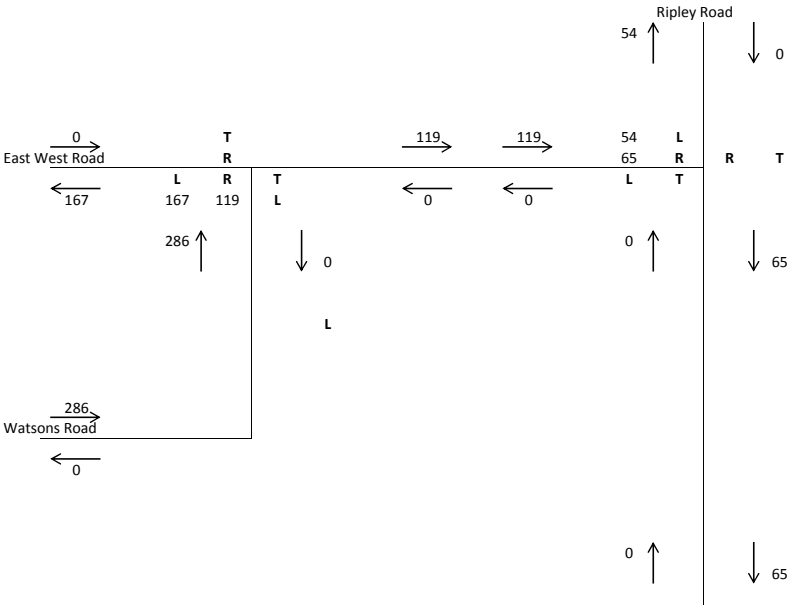
2031 AM Peak Redistributed Turn Volumes - East West Road

NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
East West Road

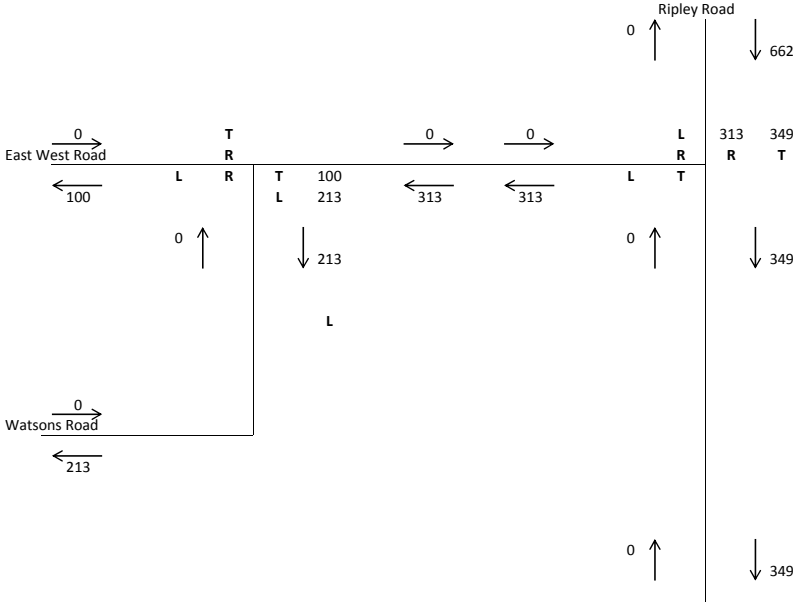


Redistributed Turn Volumes
Watsons Road

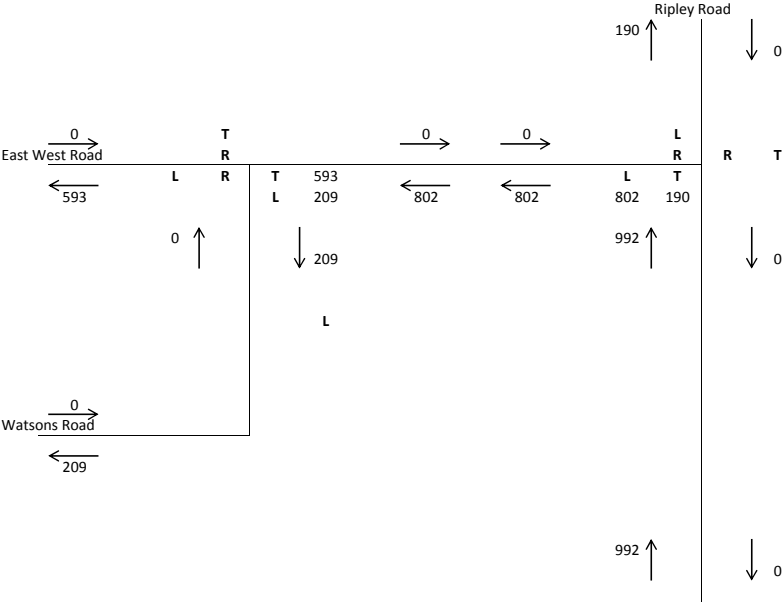


2031 AM Peak Redistributed Turn Volumes - East West Road (cont.,
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
Ripley Road (North)

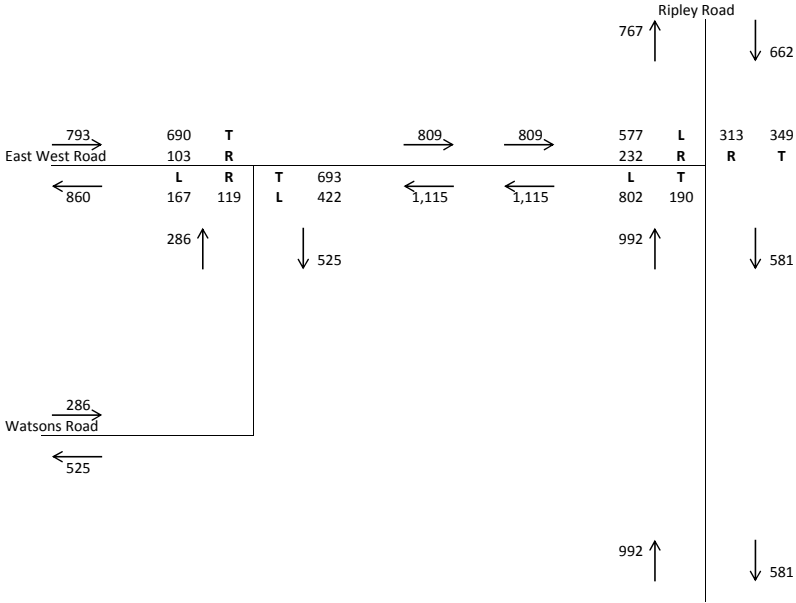


Redistributed Turn Volumes
Ripley Road (South)



2031 AM Peak Redistributed Turn Volumes - East West Road (cont.,
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

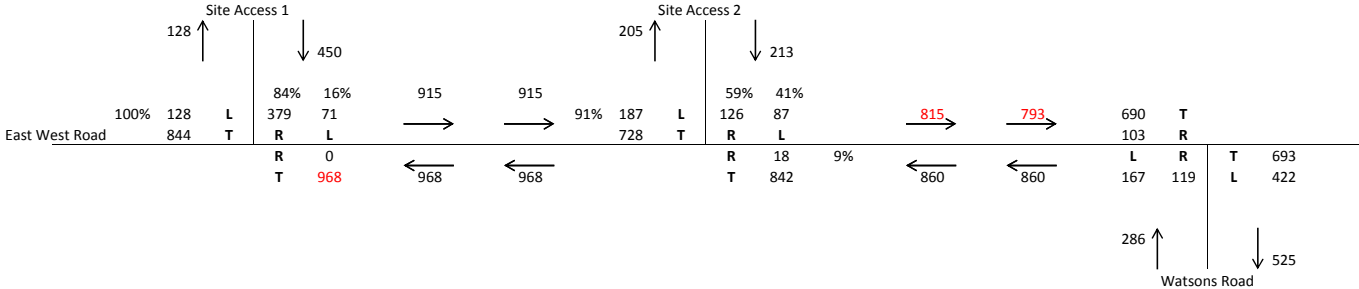
Redistributed Turn Volumes
Total



2031 AM Peak Redistributed Turn Volumes - Residential Access

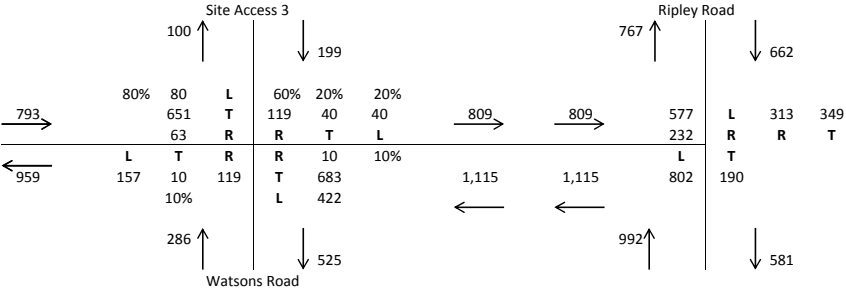
NOTE: Saturn plots two access points from the residential area north of the East West Road. Traffic Volumes have been redistributed to identify the expected traffic at the northern leg (residential access) of the East West Road

Best Read Saturn Turning Volumes



Redistributed Turning Volumes

Assumed to provide access to 30% of lots

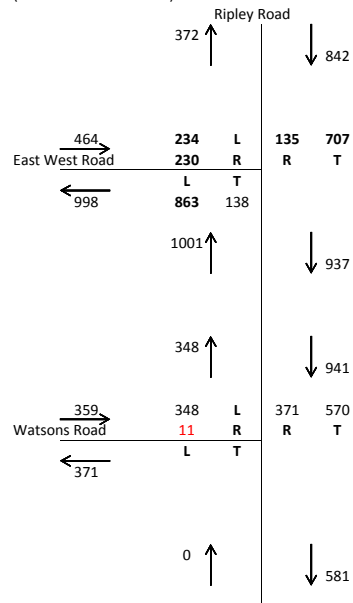


2031 PM Peak SATURN Volumes

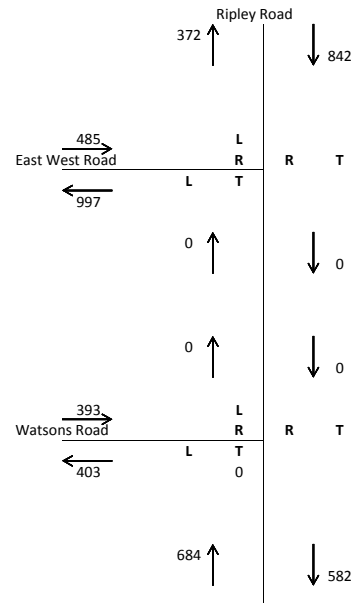
NOTE: Saturn volume plots provided are difficult to read and numbers are unclear/missing. Saturn intersection volumes have been estimated using a combination of turn and link volumes.

Best Read Saturn Turning Volumes

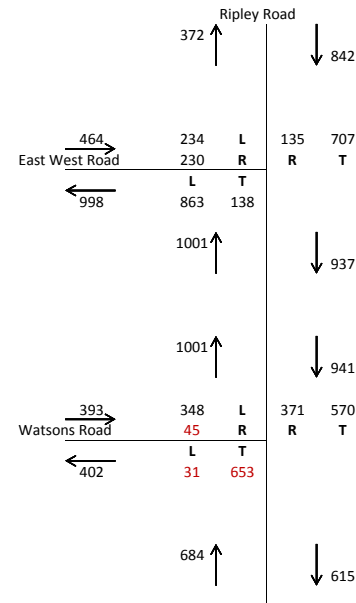
(calculated link volumes)



Link Volumes



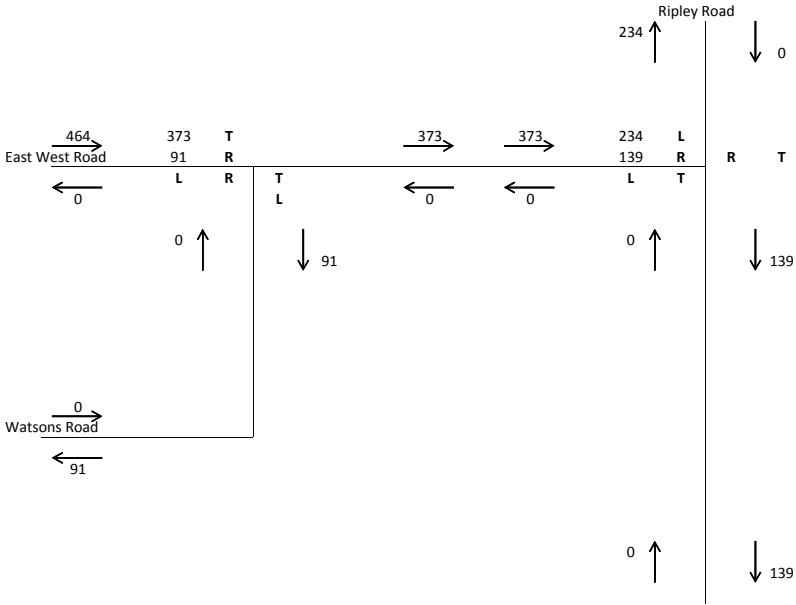
Estimated Saturn Turn Volumes



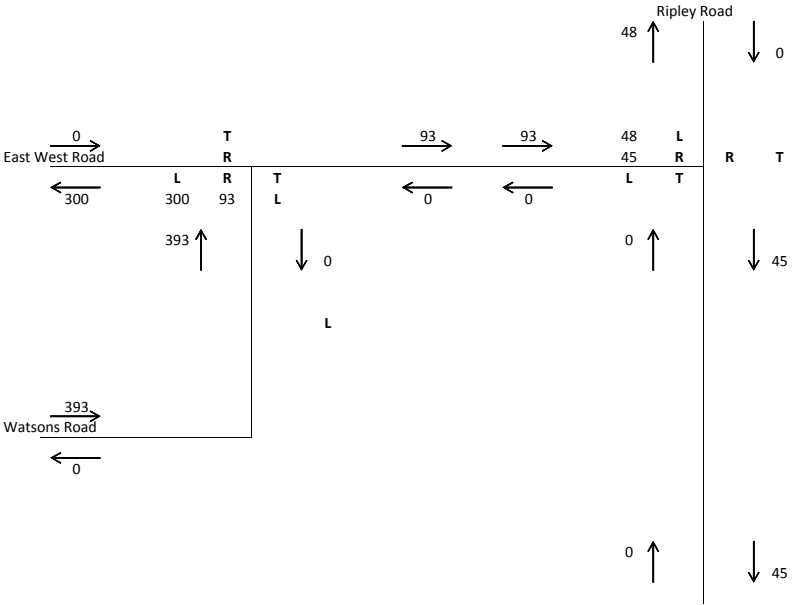
2031 PM Peak Redistributed Turn Volumes - East West Road

NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
East West Road

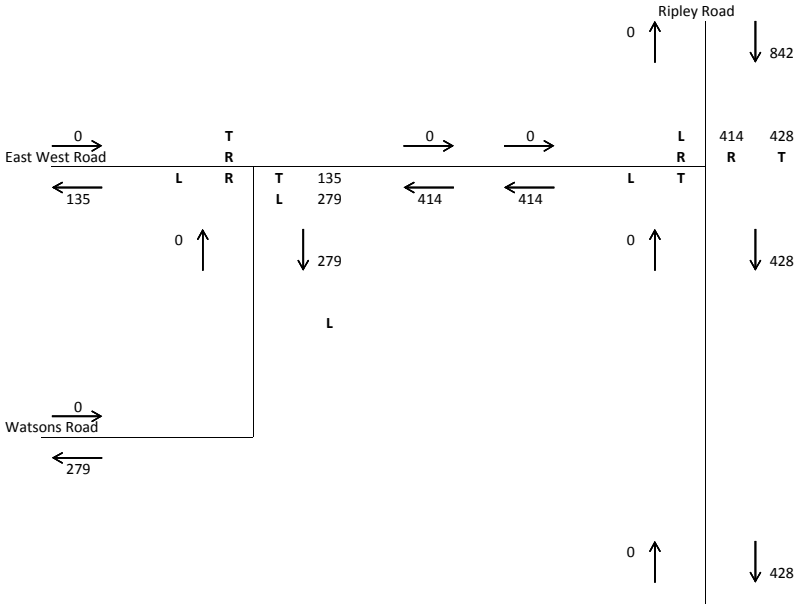


Redistributed Turn Volumes
Watsons Road

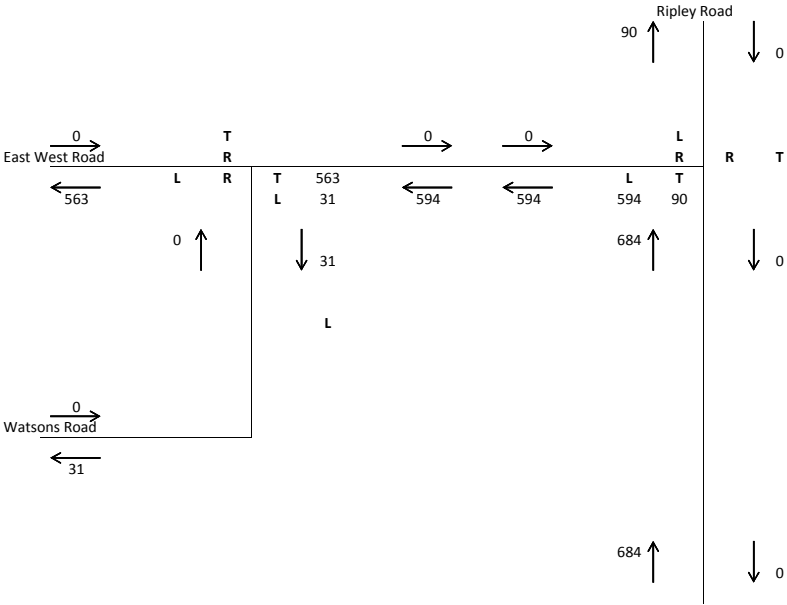


2031 PM Peak Redistributed Turn Volumes - East West Road (cont.,
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

Redistributed Turn Volumes
 Ripley Road (North)

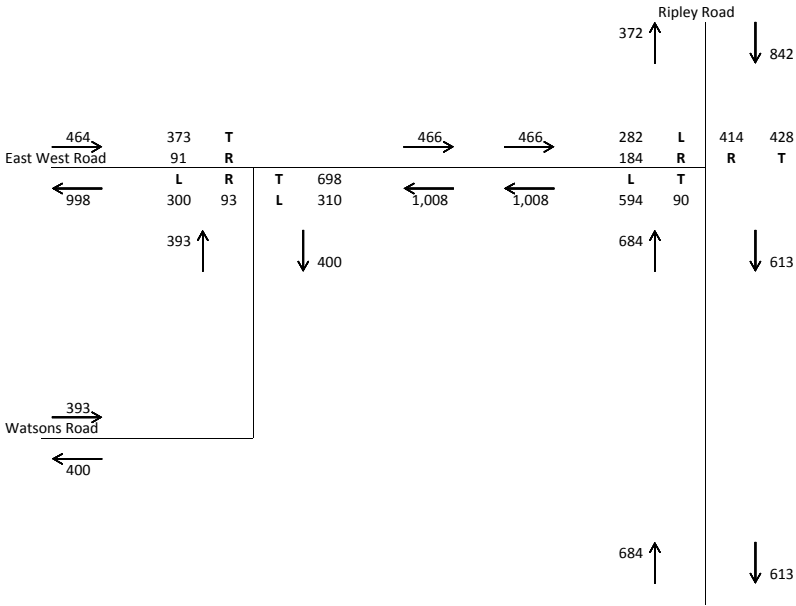


Redistributed Turn Volumes
 Ripley Road (South)



2031 PM Peak Redistributed Turn Volumes - East West Road (cont.)
NOTE: Saturn plots the East West Road and Watsons Road as two discrete intersections along Ripley Road. Traffic volumes has be redistributed to connect Watsons Road to the East West Road west of Ripley Road.

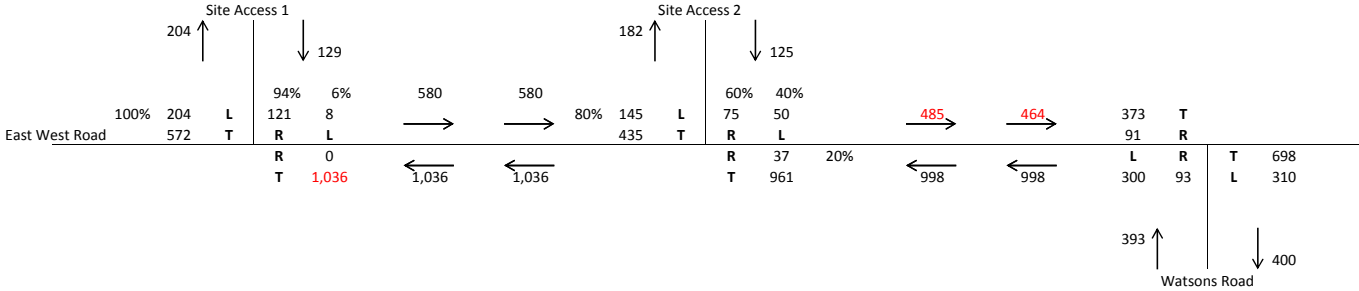
Redistributed Turn Volumes
Total



2031 PM Peak Redistributed Turn Volumes - Residential Access

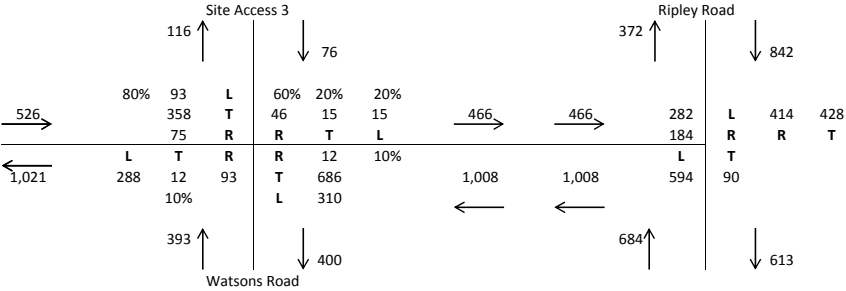
NOTE: Saturn plots two access points from the residential area north of the East West Road. Traffic Volumes have been redistributed to identify the expected traffic at the northern leg (residential access) of the East West Road

Best Read Saturn Turning Volumes



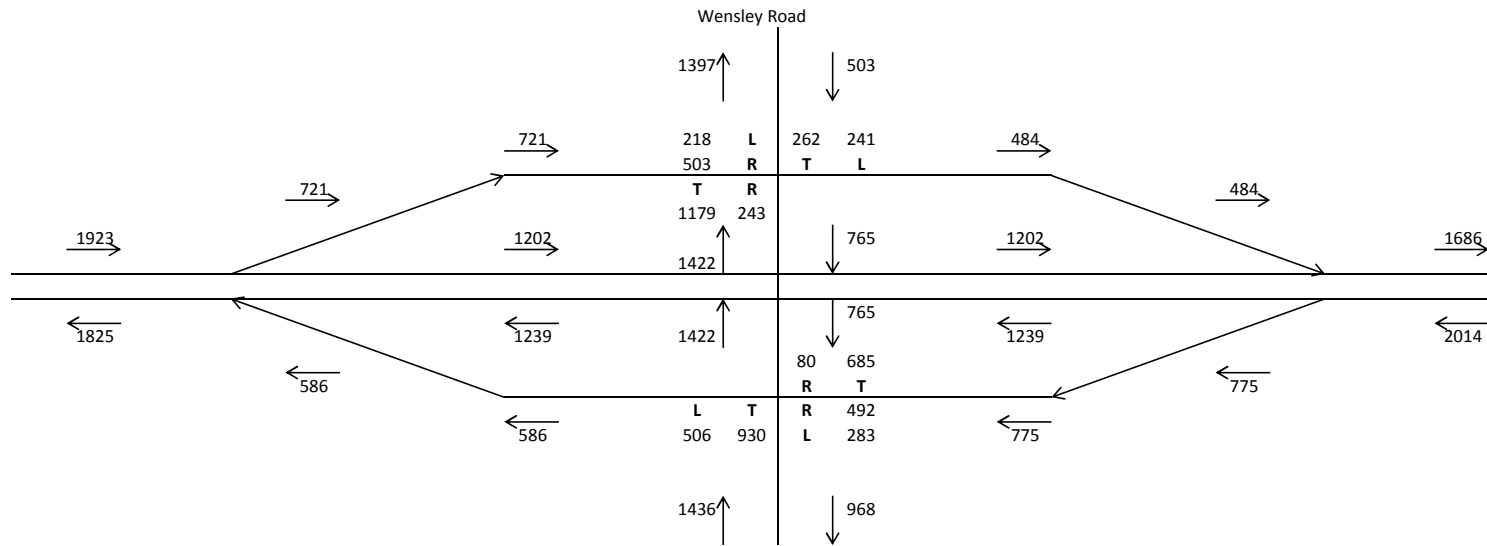
Redistributed Turning Volumes

Assumed to provide access to 30% of lots

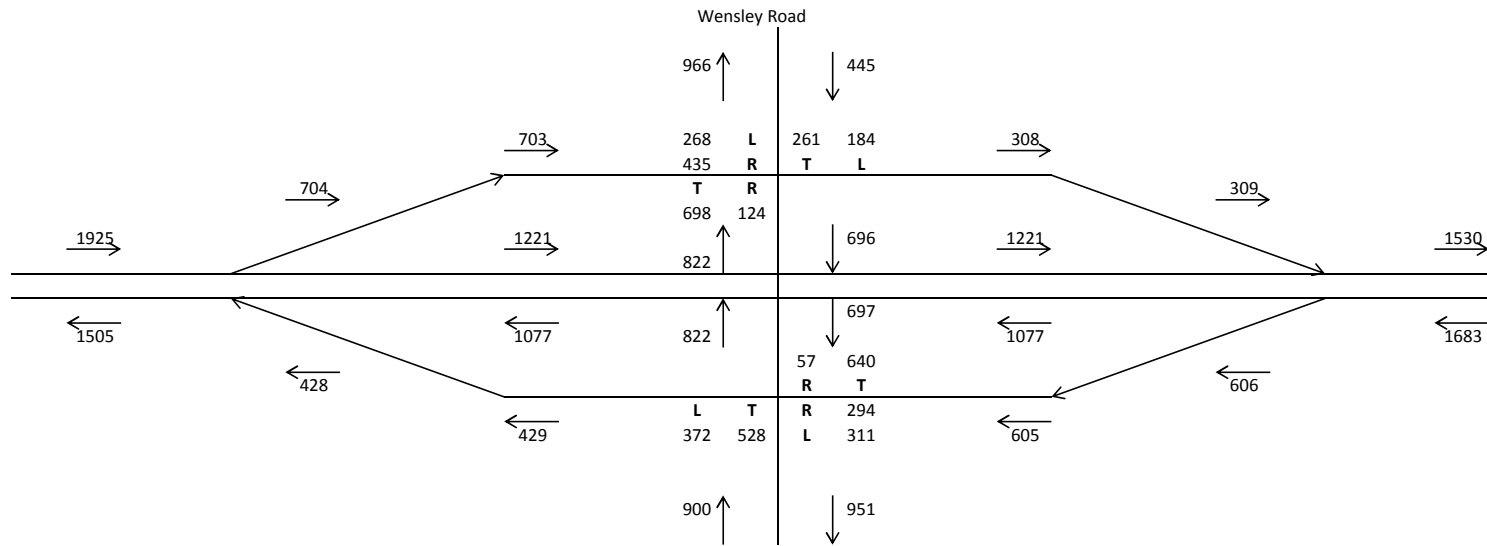


Wensley Road Interchange - Long Term Grade Separated Layout

2031 AM Peak SATURN Volumes



2031 PM Peak SATURN Volumes



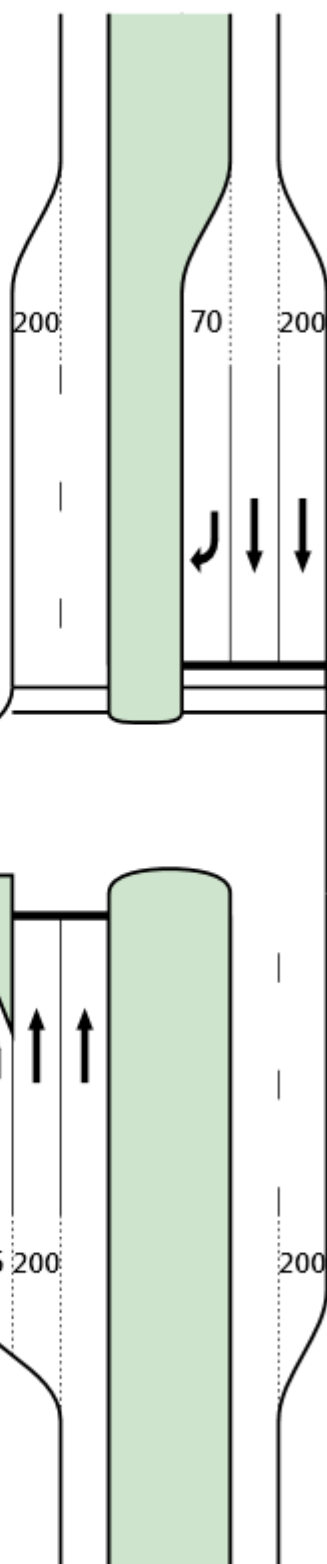
AMEX Ripley – ARP
West

APPENDIX E

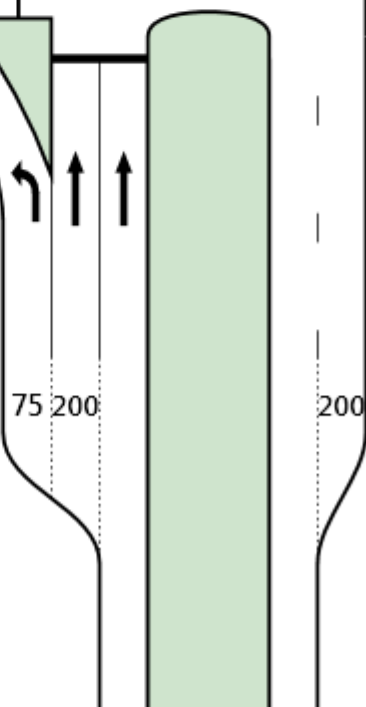
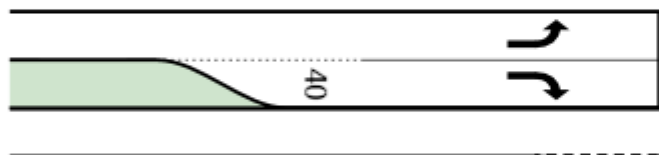
SIDRA RESULTS



Ripley Road (N)



East-West Road



Ripley Road (S)

PHASING SUMMARY

Site: 2031 AM

Ripley Road/East-West Road
2031 AM Volumes

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

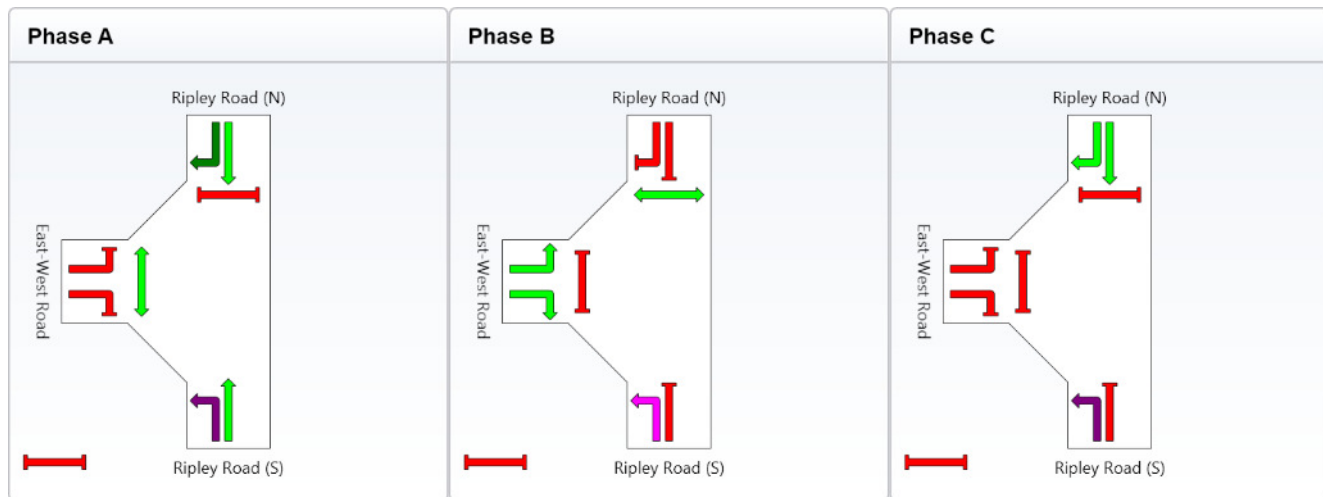
Sequence: Split Phasing

Input Sequence: A, B, C

Output Sequence: A, B, C

Phase Timing Results

Phase	A	B	C
Green Time (sec)	13	23	6
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	19	29	12
Phase Split	32 %	48 %	20 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Processed: Thursday, 14 February 2013 4:07:29 PM
SIDRA INTERSECTION 5.1.9.2068
Project: G:\790147 AMEX\790147_027 AMEX\SIDRA\RipleyRoad EastWestRoad.sip
8000955, CARDNO, ENTERPRISE

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www.sidrasolutions.com

SIDRA
INTERSECTION

LANE SUMMARY

Site: 2031 AM

Ripley Road/East-West Road
2031 AM Volumes

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Ripley Road (S)																
Lane 1	802	0	0	802	5.0	1105 ¹	0.726	100	10.1	LOS B	6.1	44.2	75	Turn Bay	0.0	0.0
Lane 2	0	95	0	95	5.0	409	0.232	100	21.6	LOS C	2.4	17.3	200	Turn Bay	0.0	0.0
Lane 3	0	95	0	95	5.0	409	0.232	100	21.6	LOS C	2.4	17.3	500	–	0.0	0.0
Approach	802	190	0	992	5.0		0.726		12.3	LOS B	6.1	44.2				
North: Ripley Road (N)																
Lane 1	0	175	0	175	5.0	787	0.222	100	12.2	LOS B	3.3	24.2	200	Turn Bay	0.0	0.0
Lane 2	0	175	0	175	5.0	787	0.222	100	12.2	LOS B	3.3	24.2	500	–	0.0	0.0
Lane 3	0	0	313	313	5.0	461	0.679	100	25.9	LOS C	7.2	52.6	70	Turn Bay	0.0	0.0
Approach	0	349	313	662	5.0		0.679		18.7	LOS B	7.2	52.6				
West: East-West Road																
Lane 1	577	0	0	577	5.0	687	0.839	100	33.5	LOS C	18.7	136.6	500	–	0.0	0.0
Lane 2	0	0	232	232	5.0	383 ¹	0.606	100	22.8	LOS C	5.0	36.3	40	Turn Bay	0.0	0.0
Approach	577	0	232	809	5.0		0.839		30.4	LOS C	18.7	136.6				
Intersection				2463	5.0		0.839		20.0	LOS B	18.7	136.6				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

¹ Reduced capacity due to a short lane effect

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PHASING SUMMARY

Site: 2031 PM

Ripley Road/East-West Road
2031 PM Volumes

Signals - Fixed Time Cycle Time = 70 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

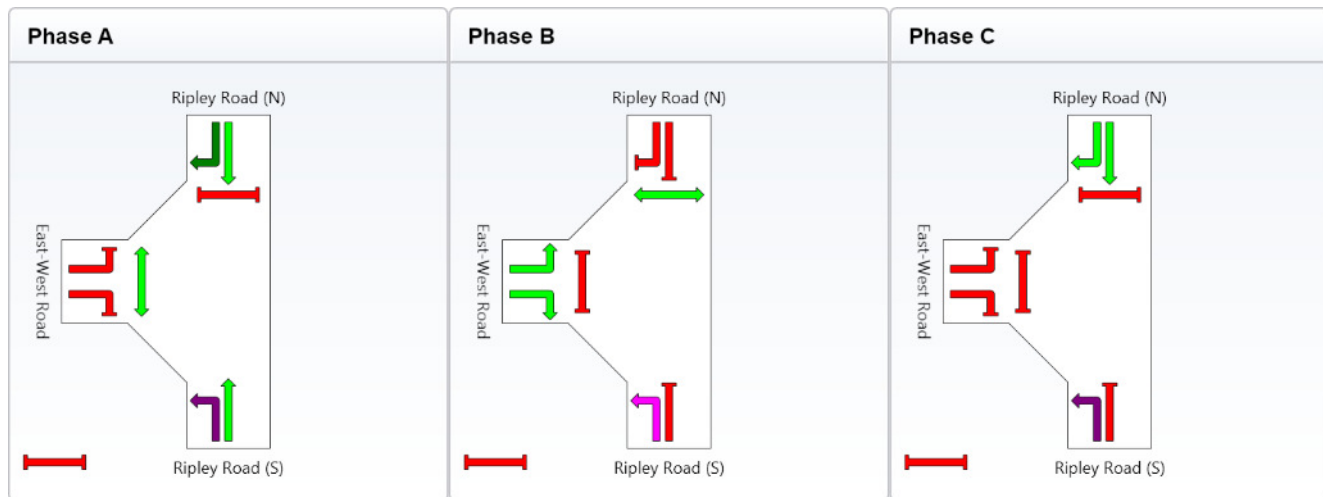
Sequence: Split Phasing

Input Sequence: A, B, C

Output Sequence: A, B, C

Phase Timing Results

Phase	A	B	C
Green Time (sec)	13	23	16
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	19	29	22
Phase Split	27 %	41 %	31 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

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LANE SUMMARY

Site: 2031 PM

Ripley Road/East-West Road
2031 PM Volumes

Signals - Fixed Time Cycle Time = 70 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	SL	Cap.	Prob.		
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Ripley Road (S)																
Lane 1	594	0	0	594	5.0	924 ¹	0.643	100	11.9	LOS B	7.1	51.9	75 Turn Bay	0.0	0.0	
Lane 2	0	45	0	45	5.0	351	0.128	100	26.3	LOS C	1.3	9.6	200 Turn Bay	0.0	0.0	
Lane 3	0	45	0	45	5.0	351	0.128	100	26.3	LOS C	1.3	9.6	500 –	0.0	0.0	
Approach	594	90	0	684	5.0		0.643		13.8	LOS B	7.1	51.9				
North: Ripley Road (N)																
Lane 1	0	214	0	214	5.0	944	0.227	100	10.6	LOS B	4.1	30.1	200 –	0.0	0.0	
Lane 2	0	214	0	214	5.0	944	0.227	100	10.6	LOS B	4.1	30.1	500 –	0.0	0.0	
Lane 3	0	0	414	414	5.0	685	0.604	100	21.4	LOS C	9.6	70.0	70 Turn Bay	0.0	5.0	
Approach	0	428	414	842	5.0		0.604		15.9	LOS B	9.6	70.0				
West: East-West Road																
Lane 1	282	0	0	282	5.0	589	0.479	100	28.9	LOS C	7.8	57.2	500 –	0.0	0.0	
Lane 2	0	0	184	184	5.0	316 ¹	0.582	100	27.4	LOS C	4.8	35.0	40 Turn Bay	0.0	0.0	
Approach	282	0	184	466	5.0		0.582		28.3	LOS C	7.8	57.2				
Intersection				1992	5.0		0.643		18.1	LOS B	9.6	70.0				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

¹ Reduced capacity due to a short lane effect

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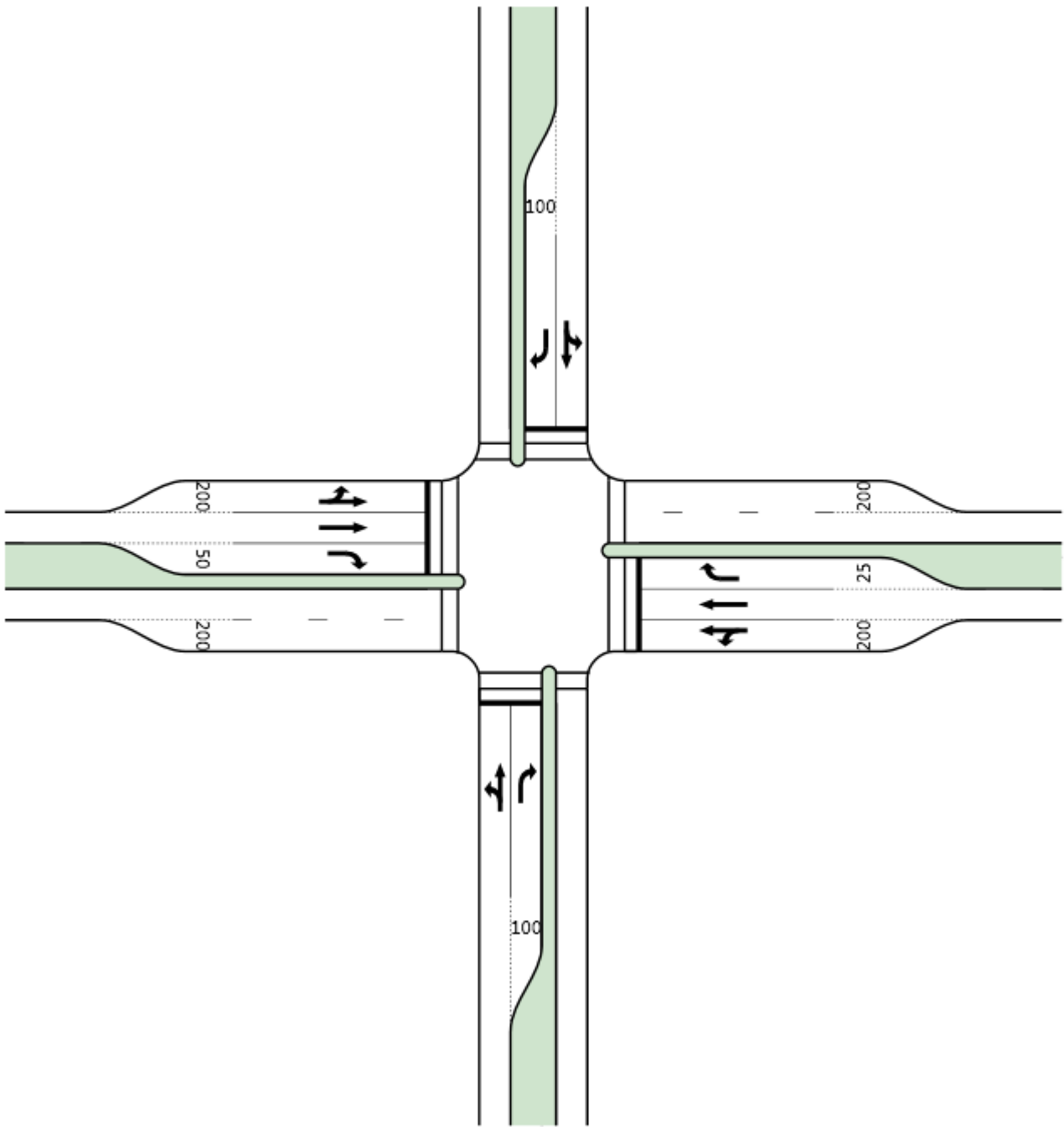


Residential Access

East-West Road (W)

East-West Road (E)

Watsons Road (S)



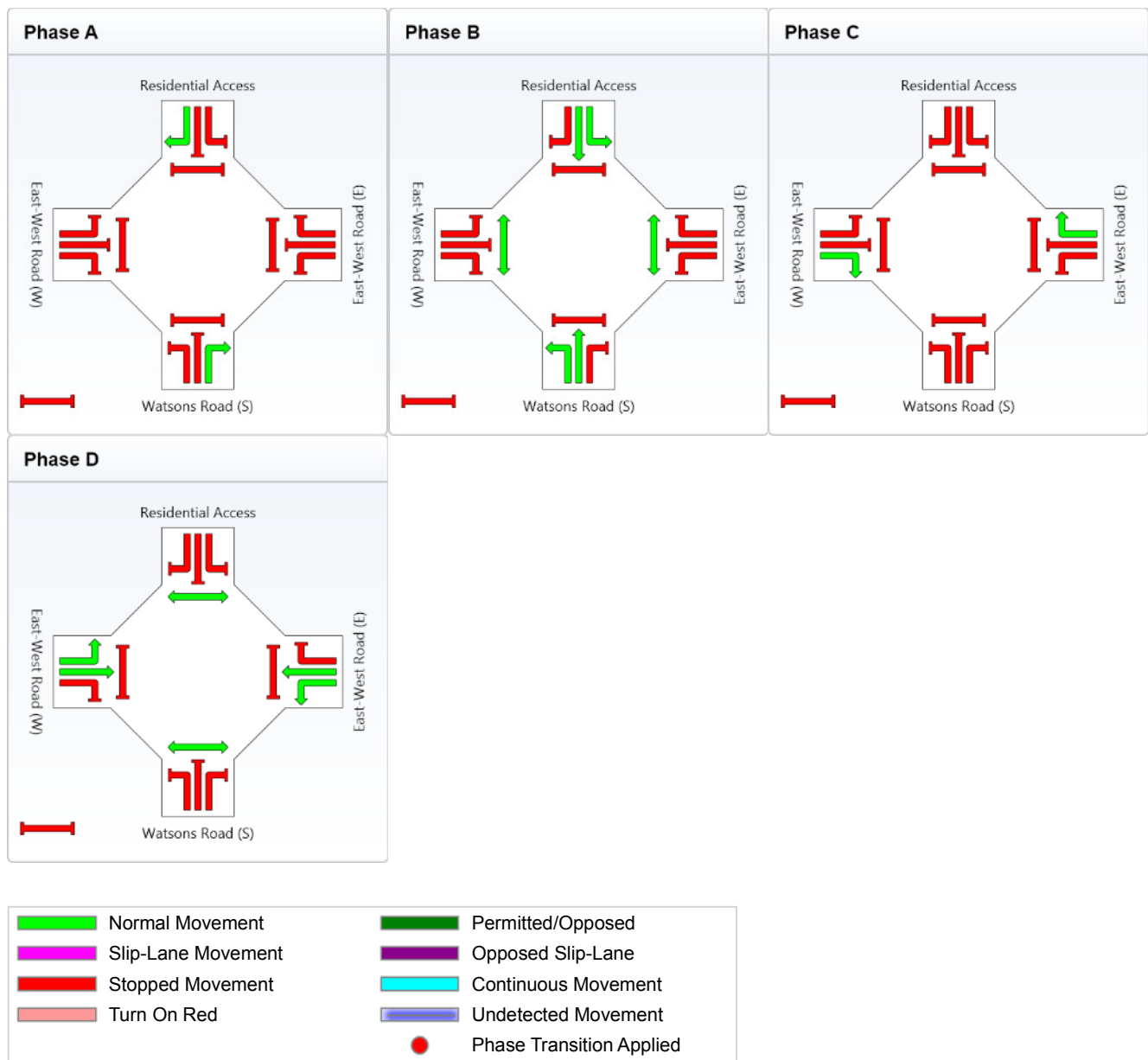
PHASING SUMMARY

Site: 2031 AM Peak - Signalled Layout

Watsons Road/East-West Road Intersection
 Signalised Layout
 2031 AM Peak
 Signals - Fixed Time Cycle Time = 90 seconds (Practical Cycle Time)

Phase times determined by the program
 Sequence: Diamond 1
 Input Sequence: A, B, C, D
 Output Sequence: A, B, C, D

Phase Timing Results				
Phase	A	B	C	D
Green Time (sec)	8	20	6	32
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	14	26	12	38
Phase Split	16 %	29 %	13 %	42 %



LANE SUMMARY

Site: 2031 AM Peak - Signalled
Layout

Watsons Road/East-West Road Intersection

Signalised Layout

2031 AM Peak

Signals - Fixed Time Cycle Time = 90 seconds (Practical Cycle Time)

Lane Use and Performance																
	Demand Flows			Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
	L veh/h	T veh/h	R veh/h													
South: Watsons Road (S)																
Lane 1	157	10	0	167	3.0	385	0.434	100	41.8	LOS D	6.5	46.8	500	–	0.0	0.0
Lane 2	0	0	119	119	3.0	162	0.736	100	56.1	LOS E	5.6	40.3	100	Turn Bay	0.0	0.0
Approach	157	10	119	286	3.0		0.736		47.7	LOS D	6.5	46.8				
East: East-West Road (E)																
Lane 1	422	120	0	542	3.0	674	0.803	100	37.9	LOS D	23.2	166.8	200	Turn Bay	0.0	0.0
Lane 2	0	563	0	563	3.0	701	0.803	100	31.1	LOS C	24.0	172.5	500	–	0.0	0.0
Lane 3	0	0	10	10	3.0	121	0.083	100	53.1	LOS D	0.4	3.1	25	Turn Bay	0.0	0.0
Approach	422	683	10	1115	3.0		0.803		34.6	LOS C	24.0	172.5				
North: Residential Access																
Lane 1	40	40	0	80	3.0	394	0.203	100	36.1	LOS D	2.9	21.1	500	–	0.0	0.0
Lane 2	0	0	119	119	3.0	162	0.736	100	56.1	LOS E	5.6	40.3	100	Turn Bay	0.0	0.0
Approach	40	40	119	199	3.0		0.736		48.1	LOS D	5.6	40.3				
West: East-West Road (W)																
Lane 1	80	283	0	363	3.0	693	0.524	100	26.0	LOS C	12.6	90.3	200	Turn Bay	0.0	0.0
Lane 2	0	368	0	368	3.0	701	0.524	100	24.2	LOS C	12.7	91.3	500	–	0.0	0.0
Lane 3	0	0	63	63	3.0	121	0.520	100	55.6	LOS E	2.9	20.8	50	Turn Bay	0.0	0.0
Approach	80	651	63	794	3.0		0.524		27.5	LOS C	12.7	91.3				
Intersection				2394	3.0		0.803		34.9	LOS C	24.0	172.5				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

PHASING SUMMARY

Site: 2031 PM Peak - Signalised Layout

Watsons Road/East-West Road Intersection
Signalised Layout
2031 PM Peak
Signals - Fixed Time Cycle Time = 80 seconds (Practical Cycle Time)

Phase times determined by the program

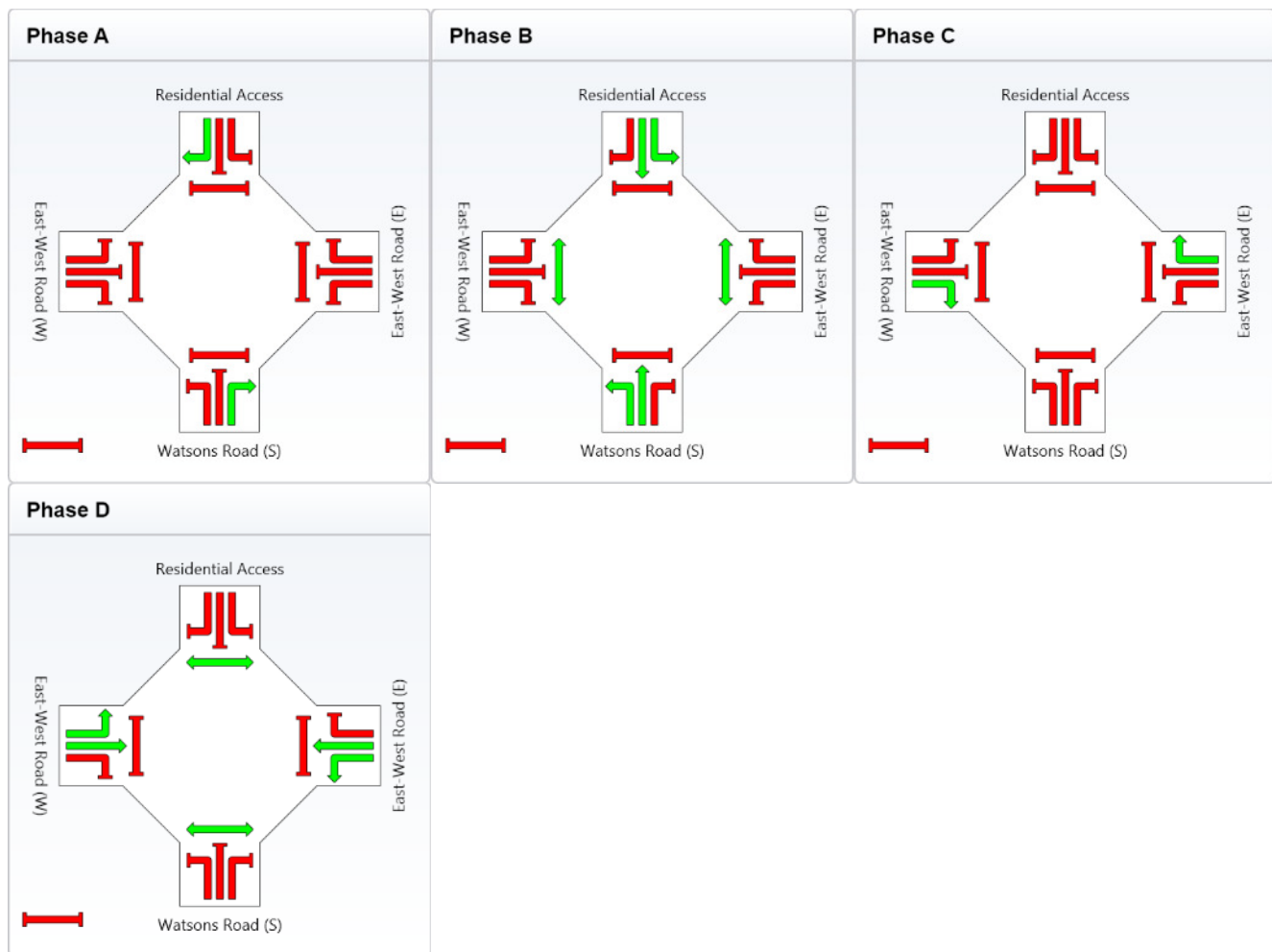
Sequence: Diamond 1

Input Sequence: A, B, C, D

Output Sequence: A, B, C, D

Phase Timing Results

Phase	A	B	C	D
Green Time (sec)	6	20	6	24
Yellow Time (sec)	4	4	4	4
All-Red Time (sec)	2	2	2	2
Phase Time (sec)	12	26	12	30
Phase Split	15 %	33 %	15 %	38 %



Normal Movement	Permitted/Opposed
Slip-Lane Movement	Opposed Slip-Lane
Stopped Movement	Continuous Movement
Turn On Red	Undetected Movement
	Phase Transition Applied

LANE SUMMARY

Site: 2031 PM Peak - Signalised Layout

Watsons Road/East-West Road Intersection

Signalised Layout

2031 PM Peak

Signals - Fixed Time Cycle Time = 80 seconds (Practical Cycle Time)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	SL	Cap.	Prob.		
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Watsons Road (S)																
Lane 1	288	12	0	300	3.0	455	0.659	100	38.0	LOS D	10.9	78.1	500	–	0.0	0.0
Lane 2	0	0	93	93	3.0	136	0.682	100	51.4	LOS D	3.9	28.1	100	Turn Bay	0.0	0.0
Approach	288	12	93	393	3.0		0.682		41.2	LOS D	10.9	78.1				
East: East-West Road (E)																
Lane 1	310	180	0	490	3.0	556	0.882	100	45.6	LOS D	22.6	162.0	200	Turn Bay	0.0	0.0
Lane 2	0	506	0	506	3.0	574	0.882	100	40.0	LOS D	23.2	166.5	500	–	0.0	0.0
Lane 3	0	0	12	12	3.0	136	0.088	100	47.4	LOS D	0.5	3.3	25	Turn Bay	0.0	0.0
Approach	310	686	12	1008	3.0		0.882		42.8	LOS D	23.2	166.5				
North: Residential Access																
Lane 1	15	15	0	30	3.0	466	0.064	100	28.9	LOS C	0.9	6.4	500	–	0.0	0.0
Lane 2	0	0	46	46	3.0	136	0.337	100	48.9	LOS D	1.8	13.2	100	Turn Bay	0.0	0.0
Approach	15	15	46	76	3.0		0.337		41.0	LOS D	1.8	13.2				
West: East-West Road (W)																
Lane 1	93	130	0	223	3.0	562	0.397	100	27.7	LOS C	7.0	50.4	200	Turn Bay	0.0	0.0
Lane 2	0	228	0	228	3.0	574	0.397	100	24.3	LOS C	7.2	51.4	500	–	0.0	0.0
Lane 3	0	0	75	75	3.0	136	0.550	100	50.0	LOS D	3.1	22.1	50	Turn Bay	0.0	0.0
Approach	93	358	75	526	3.0		0.550		29.4	LOS C	7.2	51.4				
Intersection				2003	3.0		0.882		38.9	LOS D	23.2	166.5				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

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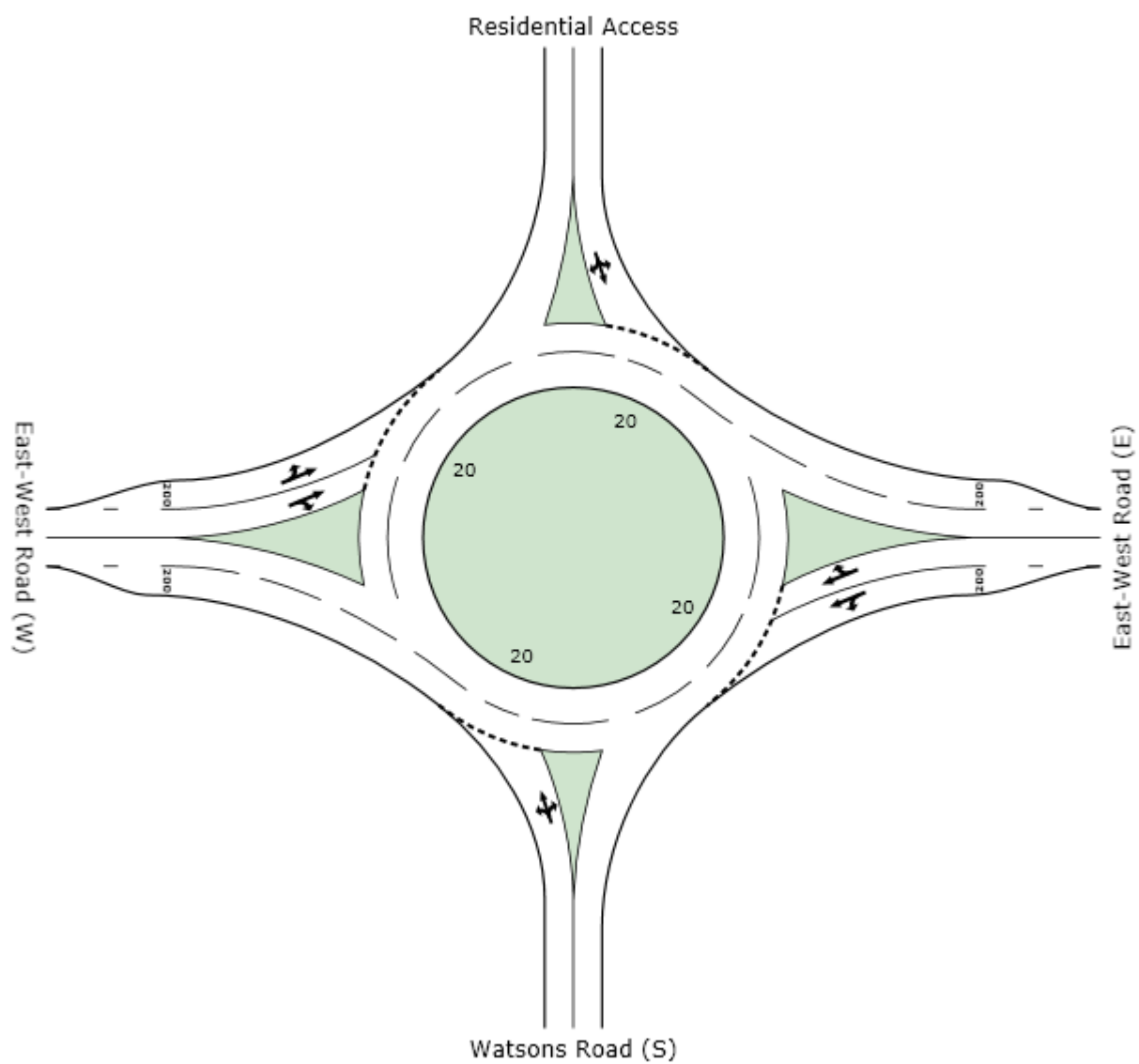
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LANE SUMMARY

Site: 2031 AM Peak - Roundabout
Layout

Watsons Road/East-West Road Intersection
Roundabout Layout
2031 AM Peak
Roundabout

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Watsons Road (S)																
Lane 1	157	10	119	286	3.0	724	0.395	100	12.5	LOS B	2.1	15.4	500	–	0.0	0.0
Approach	157	10	119	286	3.0		0.395		12.5	LOS B	2.1	15.4				
East: East-West Road (E)																
Lane 1	422	158	0	580	3.0	1279	0.454	100	7.3	LOS A	2.9	21.1	200 Turn Bay		0.0	0.0
Lane 2	0	525	10	535	3.0	1179	0.454	100	6.8	LOS A	2.9	20.8	500	–	0.0	0.0
Approach	422	683	10	1115	3.0		0.454		7.1	LOS A	2.9	21.1				
North: Residential Access																
Lane 1	40	40	119	199	3.0	761	0.262	100	12.2	LOS B	1.1	8.1	500	–	0.0	0.0
Approach	40	40	119	199	3.0		0.262		12.2	LOS B	1.1	8.1				
West: East-West Road (W)																
Lane 1	80	332	0	412	3.0	1352	0.305	100	6.2	LOS A	1.8	12.8	200 Turn Bay		0.0	0.0
Lane 2	0	319	63	382	3.0	1255	0.305	100	7.0	LOS A	1.8	12.6	500	–	0.0	0.0
Approach	80	651	63	794	3.0		0.305		6.6	LOS A	1.8	12.8				
Intersection				2394	3.0		0.454		8.0	LOS A	2.9	21.1				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

LANE SUMMARY

Site: 2031 PM Peak - Roundabout
Layout

Watsons Road/East-West Road Intersection
Roundabout Layout
2031 PM Peak
Roundabout

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	SL	Cap.	Prob.		
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Lane	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Watsons Road (S)																
Lane 1	288	12	93	393	3.0	785	0.501	100	11.9	LOS B	3.0	21.4	500	–	0.0	0.0
Approach	288	12	93	393	3.0		0.501		11.9	LOS B	3.0	21.4				
East: East-West Road (E)																
Lane 1	310	214	0	524	3.0	1392	0.377	100	6.7	LOS A	2.1	15.3	200 Turn Bay		0.0	0.0
Lane 2	0	472	12	484	3.0	1284	0.377	100	6.3	LOS A	2.1	15.1	500	–	0.0	0.0
Approach	310	686	12	1008	3.0		0.377		6.5	LOS A	2.1	15.3				
North: Residential Access																
Lane 1	15	15	46	76	3.0	889	0.085	100	10.9	LOS B	0.3	2.4	500	–	0.0	0.0
Approach	15	15	46	76	3.0		0.085		10.9	LOS B	0.3	2.4				
West: East-West Road (W)																
Lane 1	93	179	0	272	3.0	1360	0.200	100	6.2	LOS A	1.0	7.5	200 Turn Bay		0.0	0.0
Lane 2	0	179	75	254	3.0	1274	0.200	100	7.6	LOS A	1.0	7.4	500	–	0.0	0.0
Approach	93	358	75	526	3.0		0.200		6.9	LOS A	1.0	7.5				
Intersection				2003	3.0		0.501		7.8	LOS A	3.0	21.4				

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.



Wensley Road (N)

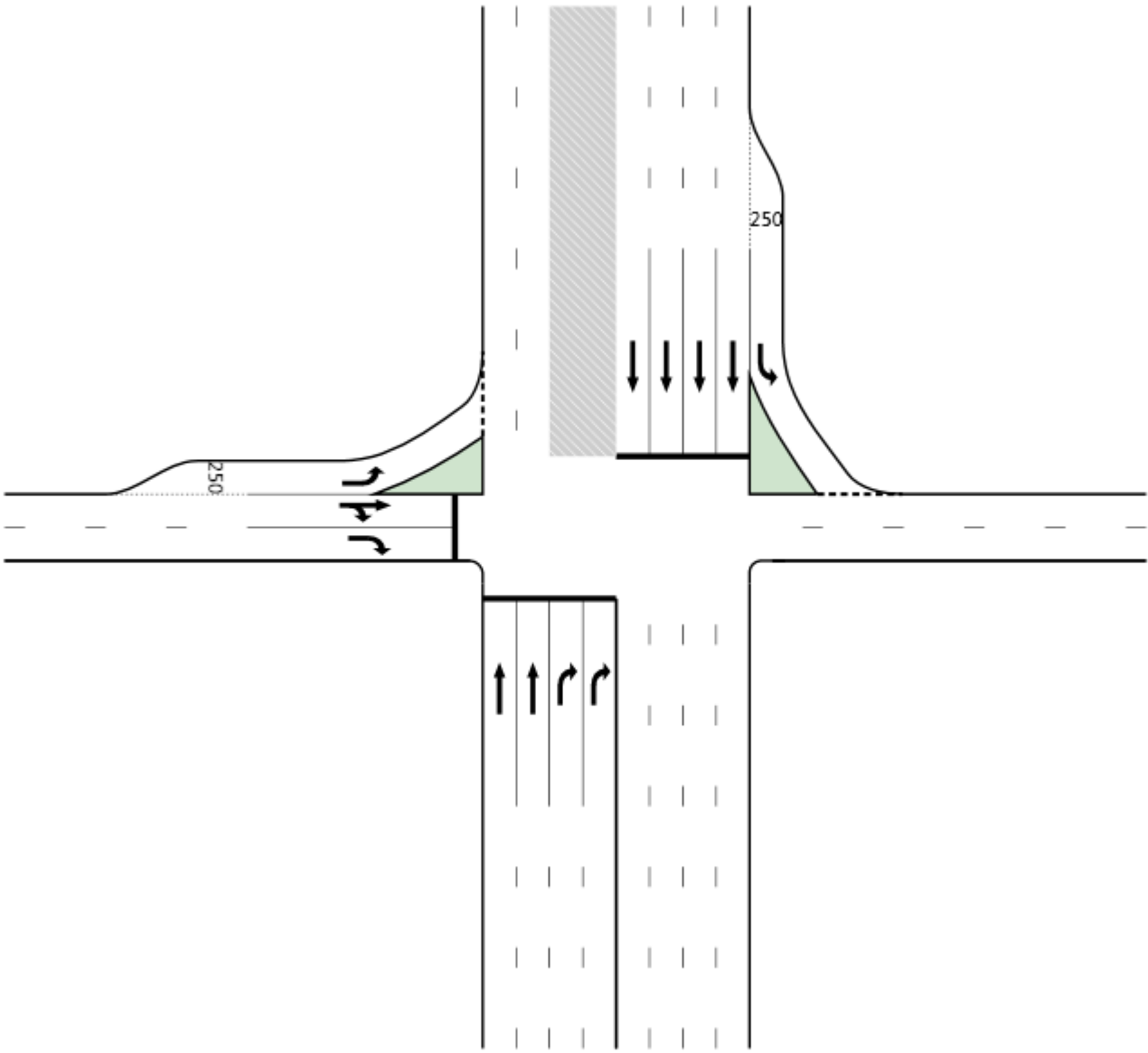
250

Centenary Highway Exit Ramp (W)

250

Centenary Highway On Ramp (E)

Wensley Road (S)



PHASING SUMMARY

Site: 2031 AM - DTMR Layout

Wensley Road Interchange - Northern Intersection

DTMR Layout

2031 AM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

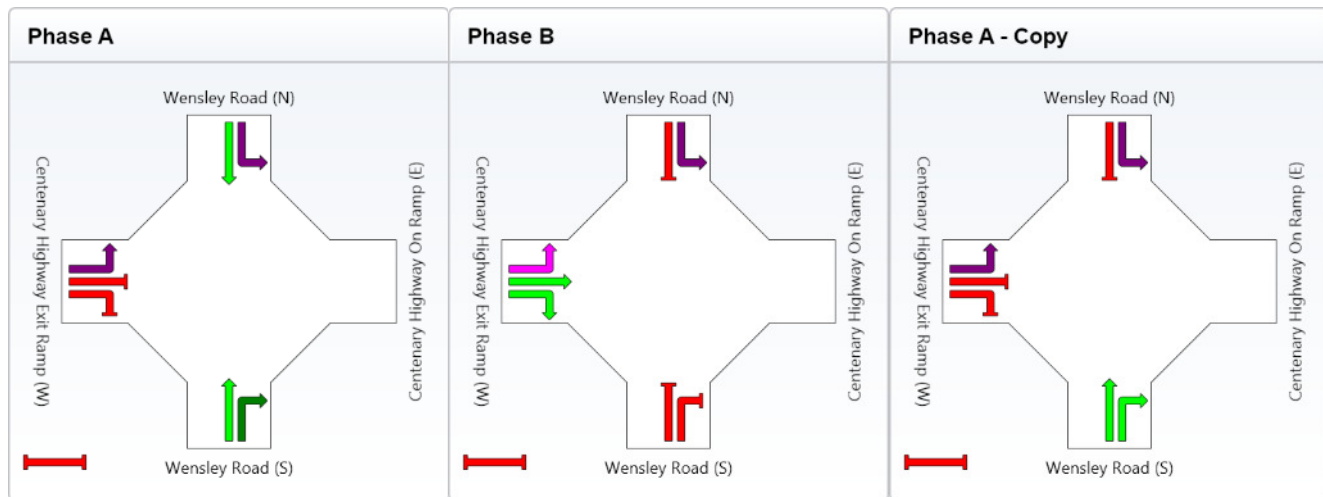
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	6	15	21
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	12	21	27
Phase Split	20 %	35 %	45 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

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LANE SUMMARY

Site: 2031 AM - DTMR Layout

Wensley Road Interchange - Northern Intersection

DTMR Layout

2031 AM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	0	590	0	590	5.0	1039	0.568	100	9.6	LOS A	11.4	83.1	200	–	0.0	0.0
Lane 2	0	590	0	590	5.0	1039	0.568	100	9.6	LOS A	11.4	83.1	200	–	0.0	0.0
Lane 3	0	0	122	122	5.0	778	0.156	100	15.9	LOS B	1.7	12.7	200	–	0.0	0.0
Lane 4	0	0	122	122	5.0	778	0.156	100	15.9	LOS B	1.7	12.7	200	–	0.0	0.0
Approach	0	1179	243	1422	5.0		0.568		10.7	LOS B	11.4	83.1				
North: Wensley Road (N)																
Lane 1	241	0	0	241	5.0	1238	0.195	100	8.6	LOS A	1.0	7.2	250 Turn Bay		0.0	0.0
Lane 2	0	66	0	66	5.0	189	0.347	100	29.2	LOS C	1.9	14.1	500	–	0.0	0.0
Lane 3	0	66	0	66	5.0	189	0.347	100	29.2	LOS C	1.9	14.1	500	–	0.0	0.0
Lane 4	0	66	0	66	5.0	189	0.347	100	29.2	LOS C	1.9	14.1	500	–	0.0	0.0
Lane 5	0	66	0	66	5.0	189	0.347	100	29.2	LOS C	1.9	14.1	500	–	0.0	0.0
Approach	241	262	0	503	5.0		0.347		19.4	LOS B	1.9	14.1				
West: Centenary Highway Exit Ramp (W)																
Lane 1	218	0	0	218	5.0	721	0.302	100	12.5	LOS B	2.9	21.0	250 Turn Bay		0.0	0.0
Lane 2	0	1	251	252	5.0	448	0.562	100	30.2	LOS C	6.7	48.9	500	–	0.0	0.0
Lane 3	0	0	252	252	5.0	448	0.562	100	30.2	LOS C	6.7	48.9	500	–	0.0	0.0
Approach	218	1	503	722	5.0		0.562		24.9	LOS C	6.7	48.9				
Intersection				2647	5.0		0.568		16.2	LOS B	11.4	83.1				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

Processed: Thursday, 14 February 2013 4:14:05 PM

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PHASING SUMMARY

Site: 2031 PM - DTMR Layout

Wensley Road Interchange - Northern Intersection

DTMR Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

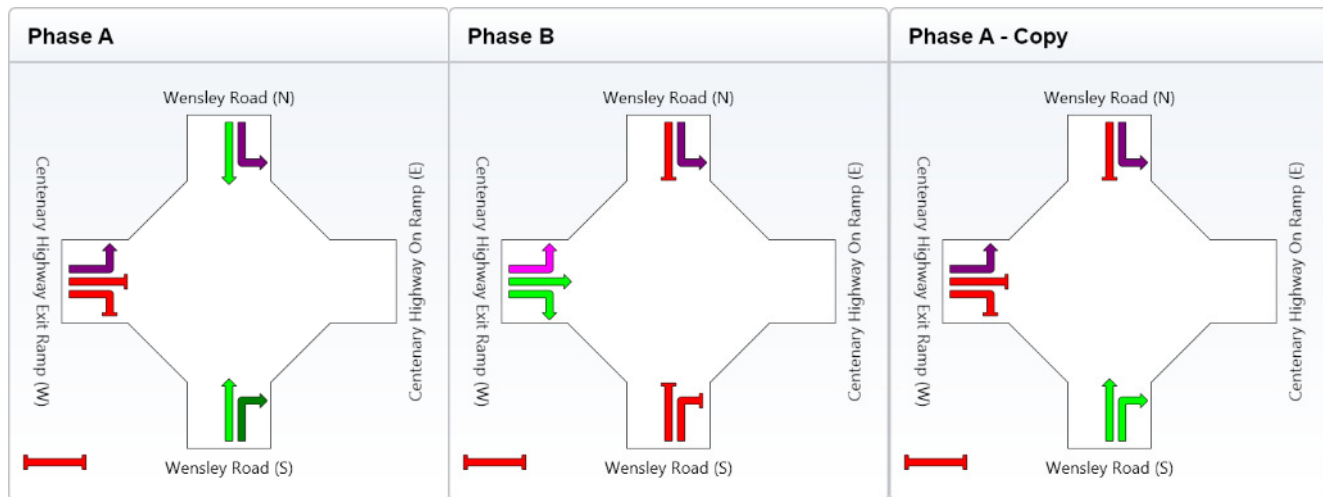
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	14	19	9
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	20	25	15
Phase Split	33 %	42 %	25 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Processed: Thursday, 14 February 2013 4:14:05 PM

SIDRA INTERSECTION 5.1.9.2068

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LANE SUMMARY

Site: 2031 PM - DTMR Layout

Wensley Road Interchange - Northern Intersection

DTMR Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	SL	Cap.	Prob.		
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	0	349	0	349	5.0	913	0.382	100	10.7	LOS B	6.5	47.7	200	–	0.0	0.0
Lane 2	0	349	0	349	5.0	913	0.382	100	10.7	LOS B	6.5	47.7	200	–	0.0	0.0
Lane 3	0	0	62	62	5.0	569	0.109	100	18.1	LOS B	1.0	7.5	200	–	0.0	0.0
Lane 4	0	0	62	62	5.0	569	0.109	100	18.1	LOS B	1.0	7.5	200	–	0.0	0.0
Approach	0	698	124	822	5.0		0.382		11.8	LOS B	6.5	47.7				
North: Wensley Road (N)																
Lane 1	184	0	0	184	5.0	1309	0.141	100	8.6	LOS A	0.7	5.2	250 Turn Bay		0.0	0.0
Lane 2	0	65	0	65	5.0	441	0.148	100	20.2	LOS C	1.6	11.4	500	–	0.0	0.0
Lane 3	0	65	0	65	5.0	441	0.148	100	20.2	LOS C	1.6	11.4	500	–	0.0	0.0
Lane 4	0	65	0	65	5.0	441	0.148	100	20.2	LOS C	1.6	11.4	500	–	0.0	0.0
Lane 5	0	65	0	65	5.0	441	0.148	100	20.2	LOS C	1.6	11.4	500	–	0.0	0.0
Approach	184	261	0	445	5.0		0.148		15.4	LOS B	1.6	11.4				
West: Centenary Highway Exit Ramp (W)																
Lane 1	268	0	0	268	5.0	963	0.278	100	10.2	LOS B	2.4	17.4	250 Turn Bay		0.0	0.0
Lane 2	0	1	217	218	5.0	568	0.384	100	25.8	LOS C	5.1	37.2	500	–	0.0	0.0
Lane 3	0	0	218	218	5.0	568	0.384	100	25.9	LOS C	5.1	37.2	500	–	0.0	0.0
Approach	268	1	435	704	5.0		0.384		19.9	LOS B	5.1	37.2				
Intersection				1971	5.0		0.384		15.5	LOS B	6.5	47.7				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

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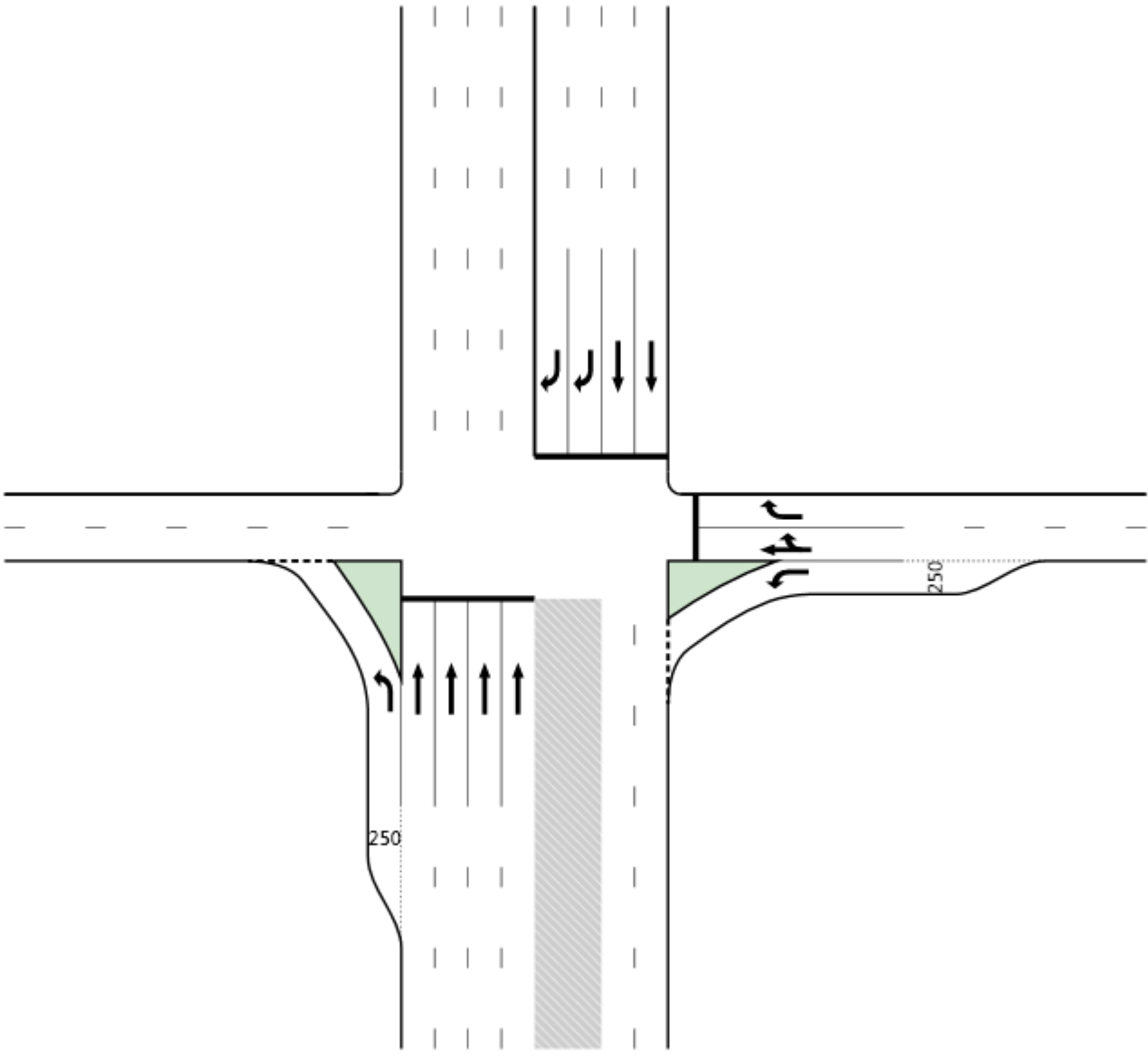


Centenary Highway Exit Ramp (W)

Wensley Road (N)

Centenary Highway On Ramp (E)

Wensley Road (S)



PHASING SUMMARY

Site: 2031 AM - DTMR Layout

Wensley Road Interchange - Southern Intersection

DTMR Layout

2031 AM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

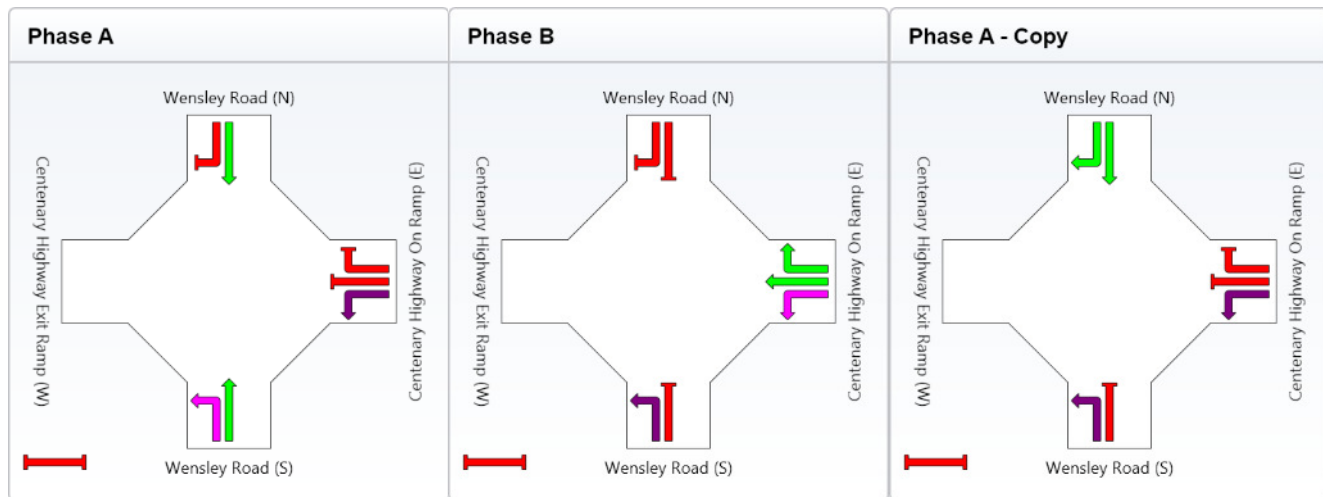
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	17	19	6
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	23	25	12
Phase Split	38 %	42 %	20 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Processed: Thursday, 14 February 2013 4:16:51 PM

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LANE SUMMARY

Site: 2031 AM - DTMR Layout

Wensley Road Interchange - Southern Intersection

DTMR Layout

2031 AM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back of	Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	506	0	0	506	5.0	1350	0.375	100	8.8	LOS A	2.5	18.3	250	Turn Bay	0.0	0.0
Lane 2	0	233	0	233	5.0	535	0.434	100	19.5	LOS B	5.7	41.8	500	–	0.0	0.0
Lane 3	0	233	0	233	5.0	535	0.434	100	19.5	LOS B	5.7	41.8	500	–	0.0	0.0
Lane 4	0	233	0	233	5.0	535	0.434	100	19.5	LOS B	5.7	41.8	500	–	0.0	0.0
Lane 5	0	233	0	233	5.0	535	0.434	100	19.5	LOS B	5.7	41.8	500	–	0.0	0.0
Approach	506	930	0	1436	5.0		0.434		15.7	LOS B	5.7	41.8				
East: Centenary Highway On Ramp (E)																
Lane 1	283	0	0	283	5.0	968	0.292	100	10.0	LOS A	2.4	17.5	250	Turn Bay	0.0	0.0
Lane 2	0	1	246	247	5.0	568	0.434	100	26.2	LOS C	5.9	42.9	500	–	0.0	0.0
Lane 3	0	0	246	246	5.0	568	0.434	100	26.2	LOS C	5.9	42.9	500	–	0.0	0.0
Approach	283	1	492	776	5.0		0.434		20.3	LOS C	5.9	42.9				
North: Wensley Road (N)																
Lane 1	0	343	0	343	5.0	913	0.375	100	10.6	LOS B	6.4	46.6	200	–	0.0	0.0
Lane 2	0	343	0	343	5.0	913	0.375	100	10.6	LOS B	6.4	46.6	200	–	0.0	0.0
Lane 3	0	0	40	40	5.0	179	0.223	100	37.0	LOS D	1.2	8.5	200	–	0.0	0.0
Lane 4	0	0	40	40	5.0	179	0.223	100	37.0	LOS D	1.2	8.5	200	–	0.0	0.0
Approach	0	685	80	765	5.0		0.375		13.4	LOS B	6.4	46.6				
Intersection				2977	5.0		0.434		16.3	LOS B	6.4	46.6				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

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PHASING SUMMARY

Site: 2031 PM - DTMR Layout

Wensley Road Interchange - Southern Intersection

DTMR Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

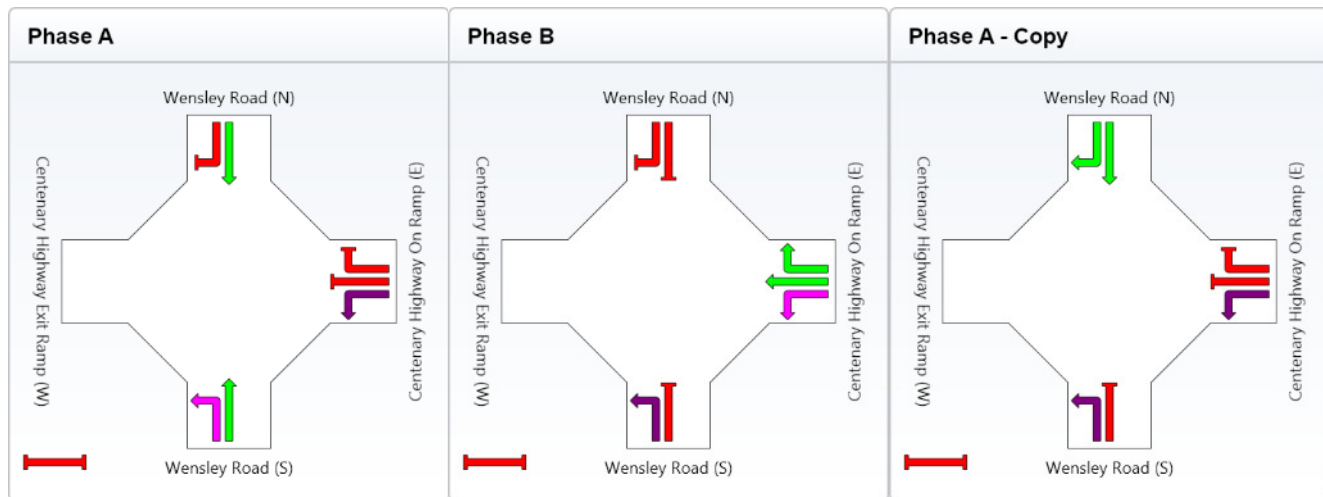
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	19	16	7
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	25	22	13
Phase Split	42 %	37 %	22 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Processed: Thursday, 14 February 2013 4:16:51 PM

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LANE SUMMARY

Site: 2031 PM - DTMR Layout

Wensley Road Interchange - Southern Intersection

DTMR Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	372	0	0	372	5.0	1369	0.272	100	8.6	LOS A	1.4	10.4	250	Turn Bay	0.0	0.0
Lane 2	0	132	0	132	5.0	598	0.221	100	16.5	LOS B	2.9	21.1	500	–	0.0	0.0
Lane 3	0	132	0	132	5.0	598	0.221	100	16.5	LOS B	2.9	21.1	500	–	0.0	0.0
Lane 4	0	132	0	132	5.0	598	0.221	100	16.5	LOS B	2.9	21.1	500	–	0.0	0.0
Lane 5	0	132	0	132	5.0	598	0.221	100	16.5	LOS B	2.9	21.1	500	–	0.0	0.0
Approach	372	528	0	900	5.0		0.272		13.2	LOS B	2.9	21.1				
East: Centenary Highway On Ramp (E)																
Lane 1	311	0	0	311	5.0	949	0.328	100	9.7	LOS A	2.5	18.2	250	Turn Bay	0.0	0.0
Lane 2	0	1	147	148	5.0	478	0.308	100	27.7	LOS C	3.6	26.0	500	–	0.0	0.0
Lane 3	0	0	147	147	5.0	478	0.308	100	27.8	LOS C	3.6	26.0	500	–	0.0	0.0
Approach	311	1	294	606	5.0		0.328		18.5	LOS B	3.6	26.0				
North: Wensley Road (N)																
Lane 1	0	320	0	320	5.0	1007	0.318	100	8.5	LOS A	5.3	38.6	200	–	0.0	0.0
Lane 2	0	320	0	320	5.0	1007	0.318	100	8.5	LOS A	5.3	38.6	200	–	0.0	0.0
Lane 3	0	0	29	29	5.0	209	0.136	100	35.4	LOS D	0.8	5.8	200	–	0.0	0.0
Lane 4	0	0	29	29	5.0	209	0.136	100	35.4	LOS D	0.8	5.8	200	–	0.0	0.0
Approach	0	640	57	697	5.0		0.318		10.7	LOS B	5.3	38.6				
Intersection				2203	5.0		0.328		13.9	LOS B	5.3	38.6				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

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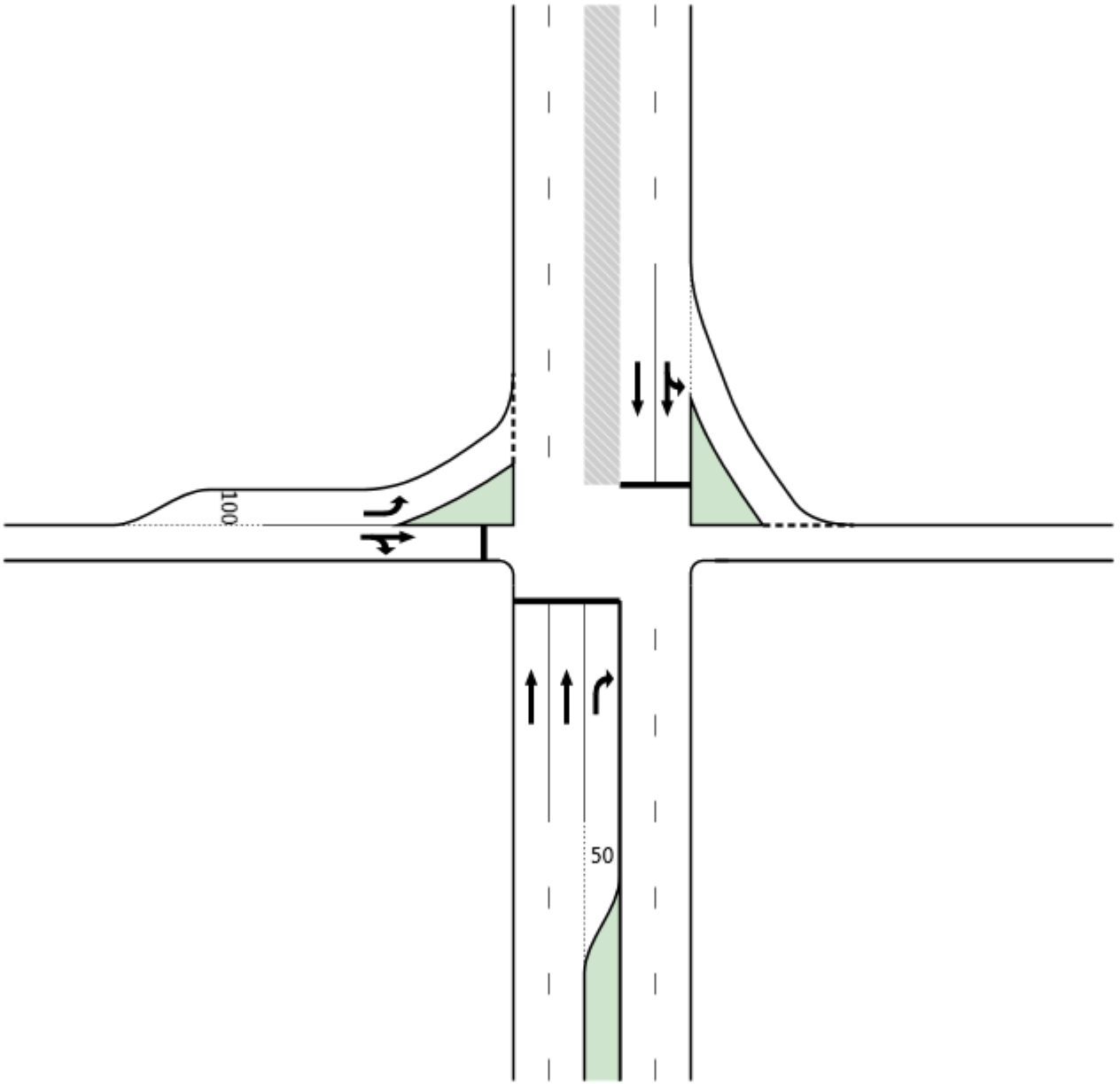
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Wensley Road (N)

Centenary Highway Exit Ramp (W)



Centenary Highway On Ramp (E)

Wensley Road (S)

PHASING SUMMARY

Site: 2031 AM - Reduced Layout

Wensley Road Interchange - Northern Intersection

Reduced Layout

2031 AM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

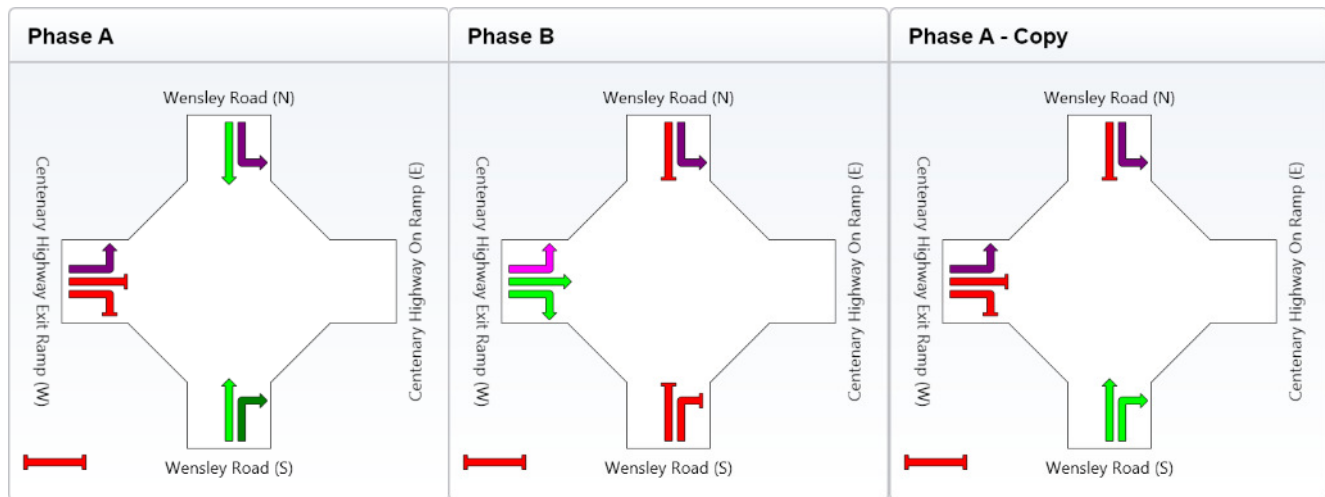
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	9	23	10
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	15	29	16
Phase Split	25 %	48 %	27 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Processed: Thursday, 14 February 2013 4:14:05 PM

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LANE SUMMARY

Site: 2031 AM - Reduced Layout

Wensley Road Interchange - Northern Intersection

Reduced Layout

2031 AM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	0	590	0	590	5.0	787	0.749	100	18.0	LOS B	15.8	115.6	200	–	0.0	0.0
Lane 2	0	590	0	590	5.0	787	0.749	100	18.0	LOS B	15.8	115.6	200	–	0.0	0.0
Lane 3	0	0	243	243	5.0	441	0.551	100	23.5	LOS C	5.1	37.3	50 Turn Bay		0.0	0.0
Approach	0	1179	243	1422	5.0		0.749		19.0	LOS B	15.8	115.6				
North: Wensley Road (N)																
Lane 1	241	82	0	323	5.0	506	0.637	100	20.2	LOS C	6.7	49.0	500	–	0.0	0.0
Lane 2	0	180	0	180	5.0	283	0.637	100	28.0	LOS C	5.4	39.2	500	–	0.0	0.0
Approach	241	262	0	503	5.0		0.637		23.0	LOS C	6.7	49.0				
West: Centenary Highway Exit Ramp (W)																
Lane 1	218	0	0	218	5.0	879	0.248	100	13.5	LOS B	3.0	22.2	100 Turn Bay		0.0	0.0
Lane 2	0	1	503	504	5.0	687	0.733	100	27.4	LOS C	13.7	99.8	500	–	0.0	0.0
Approach	218	1	503	722	5.0		0.733		23.2	LOS C	13.7	99.8				
Intersection				2647	5.0		0.749		20.9	LOS C	15.8	115.6				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

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PHASING SUMMARY

Site: 2031 PM - Reduced Layout

Wensley Road Interchange - Northern Intersection

Reduced Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

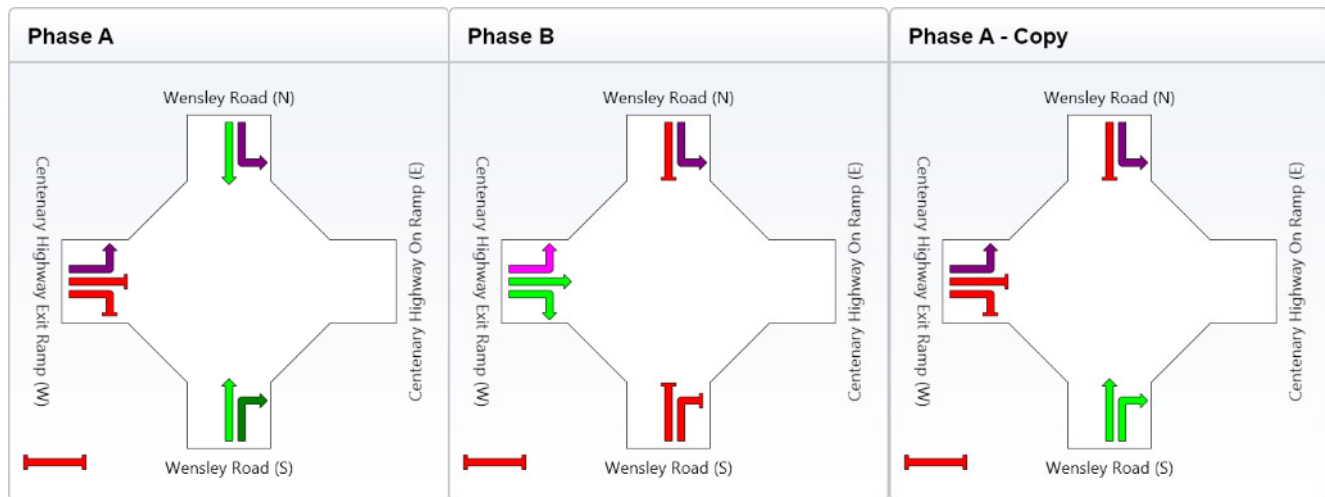
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	10	26	6
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	16	32	12
Phase Split	27 %	53 %	20 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Processed: Thursday, 14 February 2013 4:19:51 PM

SIDRA INTERSECTION 5.1.9.2068

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LANE SUMMARY

Site: 2031 PM - Reduced Layout

Wensley Road Interchange - Northern Intersection

Reduced Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	0	349	0	349	5.0	692	0.504	100	16.2	LOS B	8.1	59.2	200	–	0.0	0.0
Lane 2	0	349	0	349	5.0	692	0.504	100	16.2	LOS B	8.1	59.2	200	–	0.0	0.0
Lane 3	0	0	124	124	5.0	343	0.361	100	25.1	LOS C	2.7	19.7	50 Turn Bay		0.0	0.0
Approach	0	698	124	822	5.0		0.504		17.6	LOS B	8.1	59.2				
North: Wensley Road (N)																
Lane 1	184	84	0	268	5.0	476	0.563	100	20.7	LOS C	5.8	42.6	500	–	0.0	0.0
Lane 2	0	177	0	177	5.0	315	0.563	100	26.2	LOS C	5.0	36.9	500	–	0.0	0.0
Approach	184	261	0	445	5.0		0.563		22.9	LOS C	5.8	42.6				
West: Centenary Highway Exit Ramp (W)																
Lane 1	268	0	0	268	5.0	1061	0.253	100	10.5	LOS B	2.5	18.4	100 Turn Bay		0.0	0.0
Lane 2	0	1	435	436	5.0	777	0.561	100	22.3	LOS C	9.7	71.1	500	–	0.0	0.0
Approach	268	1	435	704	5.0		0.561		17.8	LOS B	9.7	71.1				
Intersection				1971	5.0		0.563		18.9	LOS B	9.7	71.1				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

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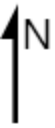
Project: G:\790147 AMEX\790147_027 AMEX\SIDRA\Wensley Road Interchange - Northern Intersection.sip

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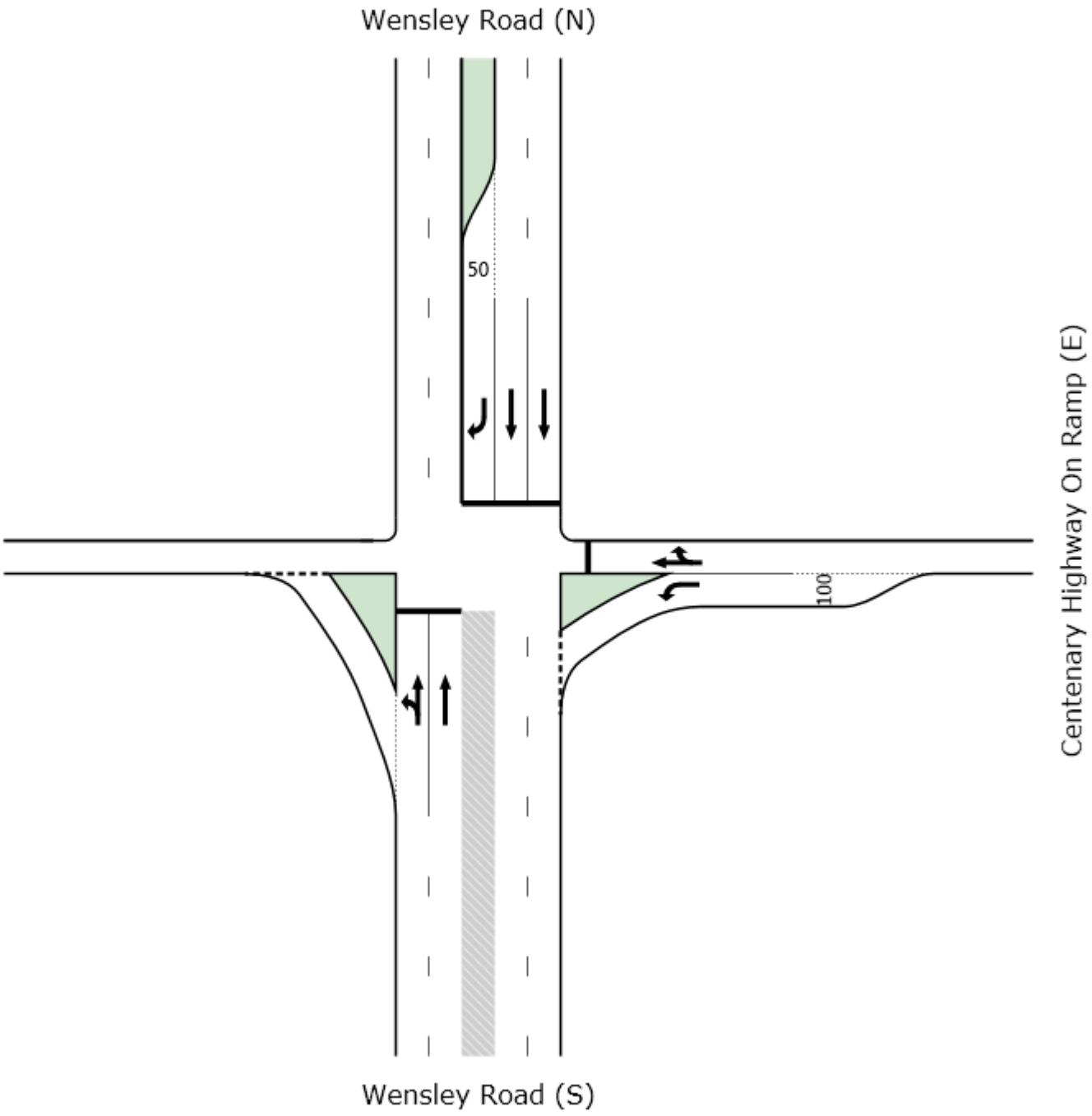
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Centenary Highway Exit Ramp (W)



Wensley Road (N)

50

Wensley Road (S)

100

Centenary Highway On Ramp (E)

PHASING SUMMARY

Site: 2031 AM - Reduced Layout

Wensley Road Interchange - Southern Intersection

Reduced Layout

2031 AM

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

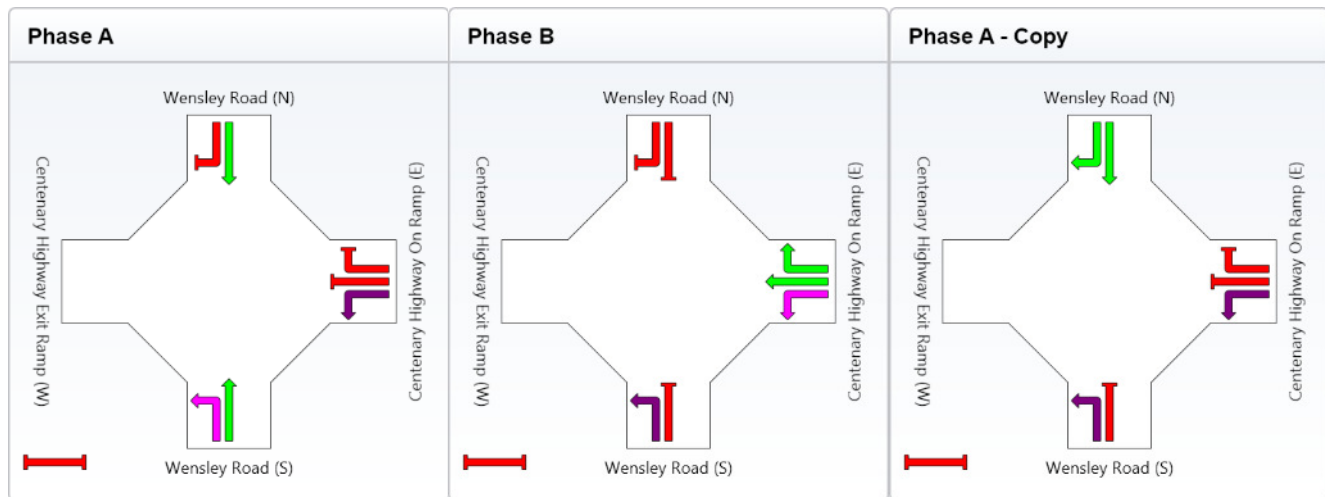
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	49	37	6
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	55	43	12
Phase Split	50 %	39 %	11 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Processed: Thursday, 14 February 2013 4:22:16 PM

SIDRA INTERSECTION 5.1.9.2068

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LANE SUMMARY

Site: 2031 AM - Reduced Layout

Wensley Road Interchange - Southern Intersection

Reduced Layout

2031 AM

Signals - Fixed Time Cycle Time = 110 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	506	236	0	742	5.0	899	0.825	100	28.2	LOS C	31.2	228.1	500	–	0.0	0.0
Lane 2	0	694	0	694	5.0	841	0.825	100	32.0	LOS C	34.6	252.3	500	–	0.0	0.0
Approach	506	930	0	1436	5.0		0.825		30.0	LOS C	34.6	252.3				
East: Centenary Highway On Ramp (E)																
Lane 1	283	0	0	283	5.0	736 ¹	0.384	100	9.8	LOS A	3.3	24.0	100 Turn Bay		0.0	0.0
Lane 2	0	1	492	493	5.0	603	0.817	100	48.9	LOS D	26.2	191.1	500	–	0.0	0.0
Approach	283	1	492	776	5.0		0.817		34.6	LOS C	26.2	191.1				
North: Wensley Road (N)																
Lane 1	0	343	0	343	5.0	1047	0.327	100	14.1	LOS B	9.8	71.9	200	–	0.0	0.0
Lane 2	0	343	0	343	5.0	1047	0.327	100	14.1	LOS B	9.8	71.9	200	–	0.0	0.0
Lane 3	0	0	80	80	5.0	98	0.818	100	72.3	LOS E	4.8	35.1	50 Turn Bay		0.0	0.0
Approach	0	685	80	765	5.0		0.818		20.2	LOS C	9.8	71.9				
Intersection				2977	5.0		0.825		28.7	LOS C	34.6	252.3				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

¹ Reduced capacity due to a short lane effect

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PHASING SUMMARY

Site: 2031 PM - Reduced Layout

Wensley Road Interchange - Southern Intersection

Reduced Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Phase times determined by the program

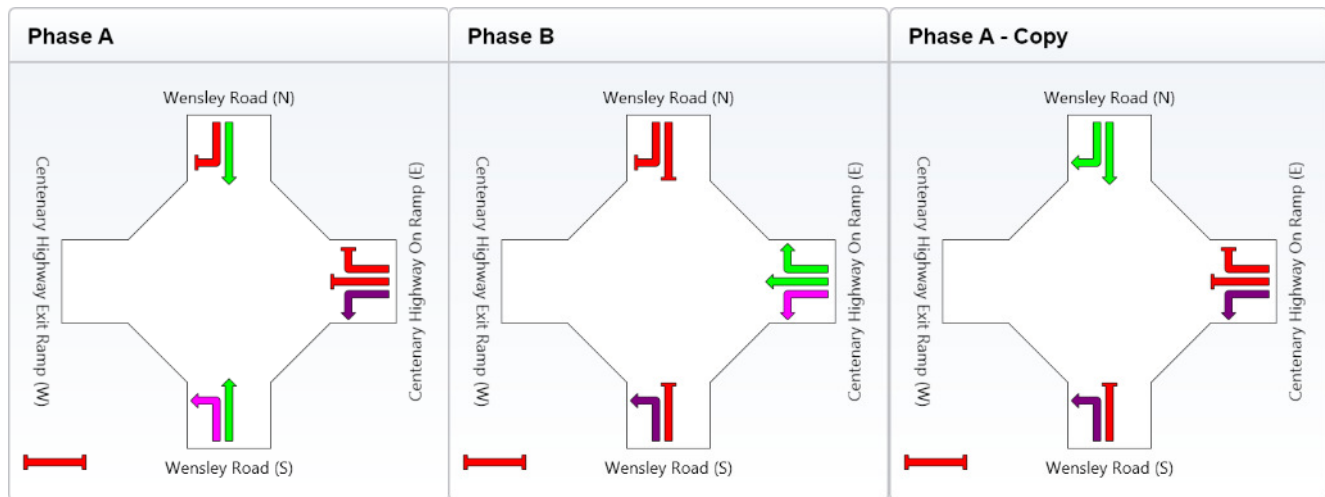
Sequence: Two-Phase

Input Sequence: A, B, A - Copy

Output Sequence: A, B, A - Copy

Phase Timing Results

Phase	A	B	A - Copy
Green Time (sec)	20	16	6
Yellow Time (sec)	4	4	4
All-Red Time (sec)	2	2	2
Phase Time (sec)	26	22	12
Phase Split	43 %	37 %	20 %



	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

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LANE SUMMARY

Site: 2031 PM - Reduced Layout

Wensley Road Interchange - Southern Intersection

Reduced Layout

2031 PM

Signals - Fixed Time Cycle Time = 60 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	372	133	0	505	5.0	805	0.627	100	15.3	LOS B	9.2	66.8	500	–	0.0	0.0
Lane 2	0	395	0	395	5.0	630	0.627	100	18.6	LOS B	10.0	73.1	500	–	0.0	0.0
Approach	372	528	0	900	5.0		0.627		16.7	LOS B	10.0	73.1				
East: Centenary Highway On Ramp (E)																
Lane 1	311	0	0	311	5.0	949	0.328	100	9.7	LOS A	2.5	18.2	100 Turn Bay		0.0	0.0
Lane 2	0	1	294	295	5.0	478	0.617	100	30.1	LOS C	7.9	57.7	500	–	0.0	0.0
Approach	311	1	294	606	5.0		0.617		19.6	LOS B	7.9	57.7				
North: Wensley Road (N)																
Lane 1	0	320	0	320	5.0	1007	0.318	100	8.5	LOS A	5.3	38.6	200	–	0.0	0.0
Lane 2	0	320	0	320	5.0	1007	0.318	100	8.5	LOS A	5.3	38.6	200	–	0.0	0.0
Lane 3	0	0	57	57	5.0	179	0.318	100	37.8	LOS D	1.7	12.2	50 Turn Bay		0.0	0.0
Approach	0	640	57	697	5.0		0.318		10.9	LOS B	5.3	38.6				
Intersection				2203	5.0		0.627		15.7	LOS B	10.0	73.1				

Level of Service (LOS) Method: Delay (HCM 2000).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model used.

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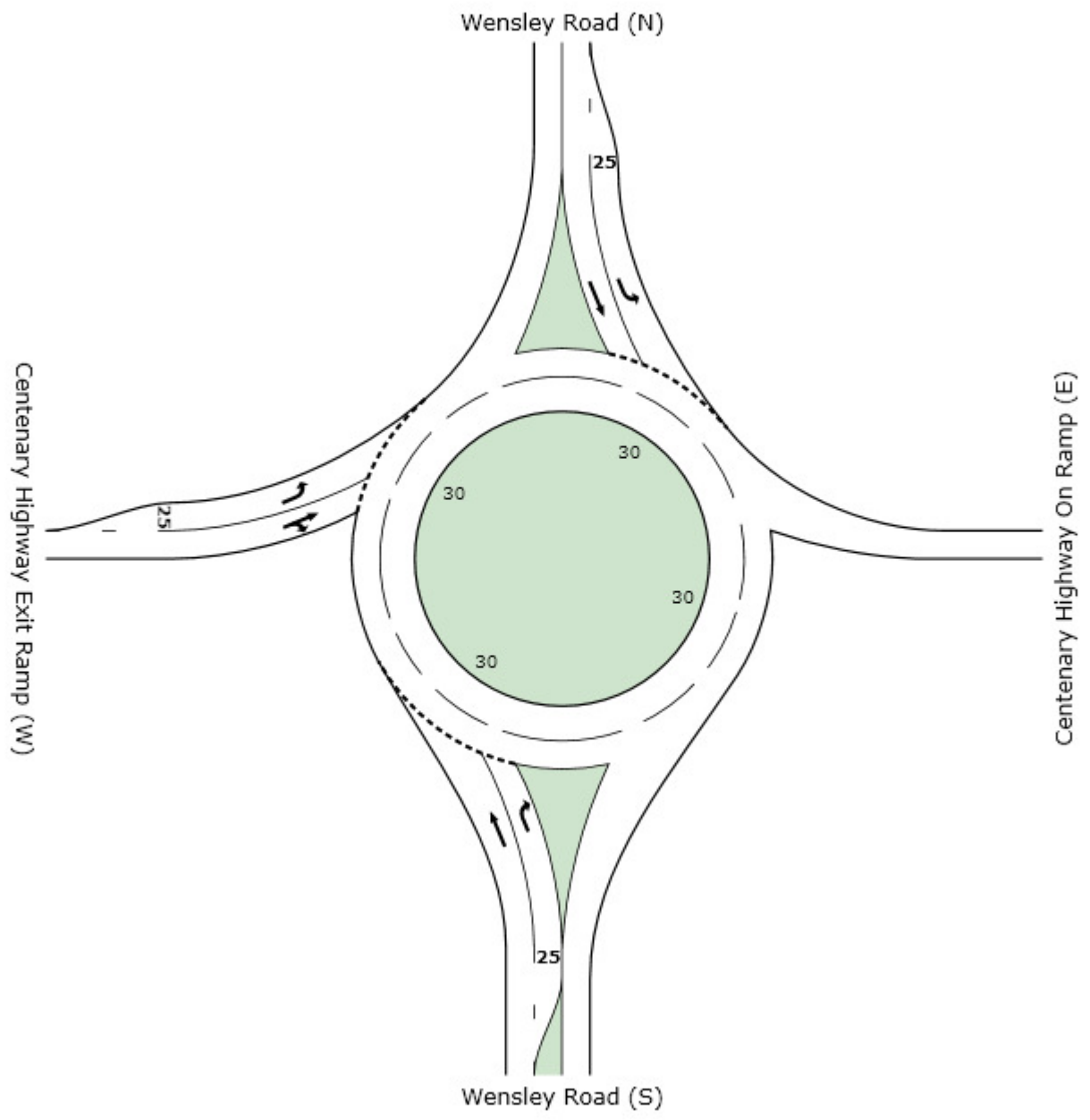
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LANE SUMMARY

Site: 2031 AM - Roundabout Layout

Wensley Road Interchange - Northern Intersection
Roundabout Layout
2031 AM
Roundabout

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	0	1179	0	1179	5.0	1803	0.654	100	4.5	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	243	243	5.0	1308	0.186	100	11.3	LOS B	0.0	0.0	25 Turn Bay		0.0	0.0
Approach	0	1179	243	1422	5.0		0.654		5.6	LOS A	0.0	0.0				
North: Wensley Road (N)																
Lane 1	241	0	0	241	5.0	645 ¹	0.374	100	10.1	LOS B	2.2	15.9	25 Turn Bay		0.0	0.0
Lane 2	0	262	0	262	5.0	844	0.311	100	8.2	LOS A	2.1	15.6	500	–	0.0	0.0
Approach	241	262	0	503	5.0		0.374		9.1	LOS A	2.2	15.9				
West: Centenary Highway Exit Ramp (W)																
Lane 1	218	0	0	218	5.0	562	0.388	100	15.5	LOS B	2.2	15.9	25 Turn Bay		0.0	0.0
Lane 2	0	1	503	504	5.0	785	0.642	100	24.2	LOS C	6.2	45.1	500	–	0.0	0.0
Approach	218	1	503	722	5.0		0.642		21.6	LOS C	6.2	45.1				
Intersection				2647	5.0		0.654		10.6	LOS B	6.2	45.1				

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model used.

¹ Reduced capacity due to a short lane effect

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LANE SUMMARY

Site: 2031 PM - Roundabout Layout

Wensley Road Interchange - Northern Intersection
Roundabout Layout
2031 PM
Roundabout

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	SL	Cap.	Prob.		
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	0	698	0	698	5.0	1803	0.387	100	4.5	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	124	124	5.0	1308	0.095	100	11.3	LOS B	0.0	0.0	25 Turn Bay		0.0	0.0
Approach	0	698	124	822	5.0		0.387		5.5	LOS A	0.0	0.0				
North: Wensley Road (N)																
Lane 1	184	0	0	184	5.0	741 ¹	0.248	100	8.4	LOS A	1.2	8.6	25 Turn Bay		0.0	0.0
Lane 2	0	261	0	261	5.0	1026	0.254	100	6.8	LOS A	1.5	11.2	500	–	0.0	0.0
Approach	184	261	0	445	5.0		0.254		7.5	LOS A	1.5	11.2				
West: Centenary Highway Exit Ramp (W)																
Lane 1	268	0	0	268	5.0	830	0.323	100	9.4	LOS A	1.5	10.9	25 Turn Bay		0.0	0.0
Lane 2	0	1	435	436	5.0	1051	0.415	100	14.6	LOS B	2.3	16.6	500	–	0.0	0.0
Approach	268	1	435	704	5.0		0.415		12.6	LOS B	2.3	16.6				
Intersection				1971	5.0		0.415		8.5	LOS A	2.3	16.6				

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

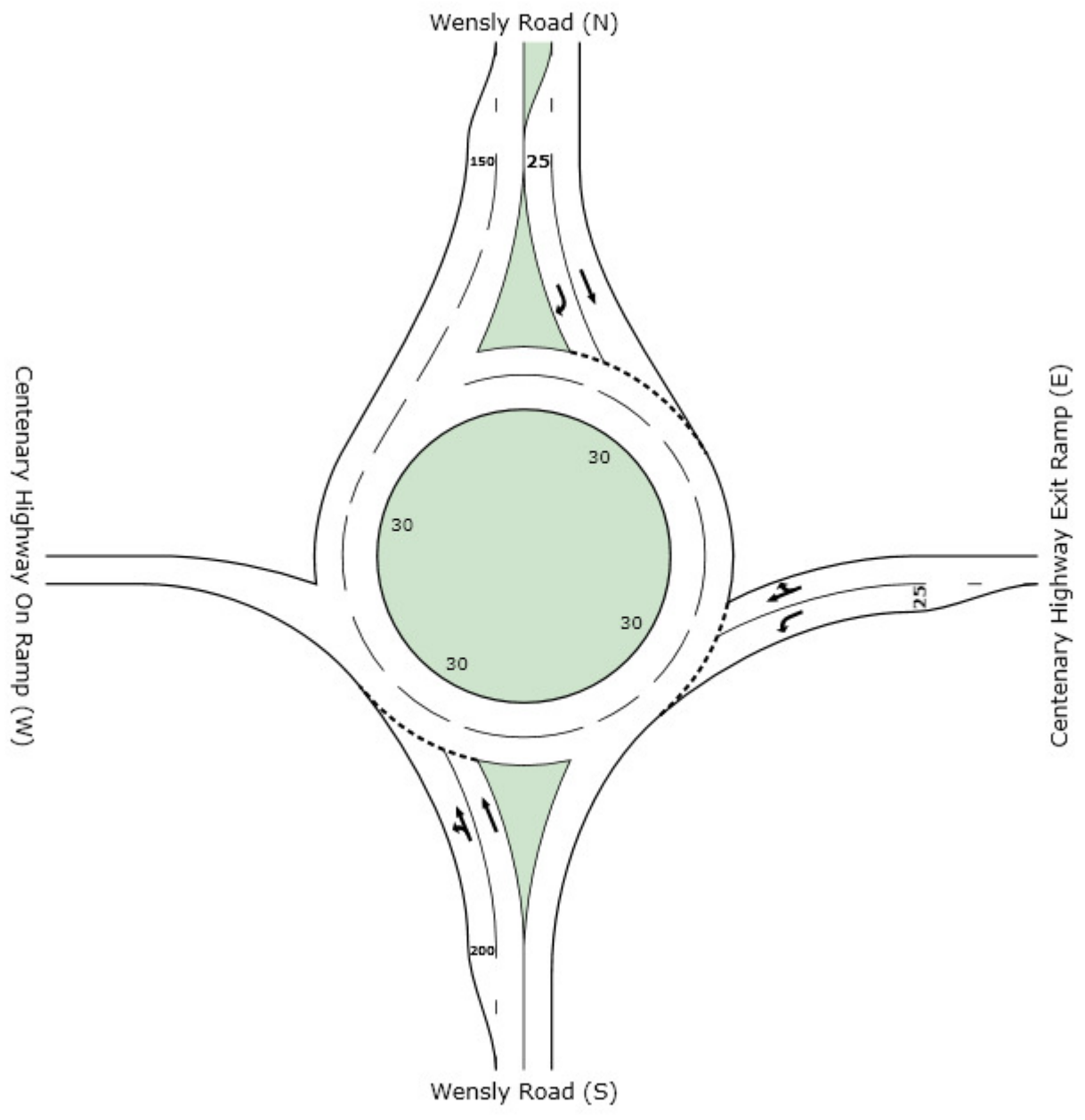
SIDRA Standard Delay Model used.

¹ Reduced capacity due to a short lane effect

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LANE SUMMARY

Site: 2031 AM - Roundabout Layout

Wensley Road Interchange - Southern Intersection
Roundabout Layout
2031 AM
Roundabout

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	SL	Cap.	Prob.		
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensley Road (S)																
Lane 1	506	152	0	658	5.0	863	0.762	98 ⁶	14.4	LOS B	9.6	70.1	200	Turn Bay	0.0	0.0
Lane 2	0	778	0	778	5.0	1005	0.775	100	12.6	LOS B	10.7	78.2	500	–	0.0	0.0
Approach	506	930	0	1436	5.0		0.775		13.4	LOS B	10.7	78.2				
East: Centenary Highway Exit Ramp (E)																
Lane 1	283	0	0	283	5.0	834	0.339	100	9.4	LOS A	1.6	11.8	25	Turn Bay	0.0	0.0
Lane 2	0	1	492	493	5.0	1063	0.464	100	14.9	LOS B	2.8	20.6	500	–	0.0	0.0
Approach	283	1	492	776	5.0		0.464		12.9	LOS B	2.8	20.6				
North: Wensley Road (N)																
Lane 1	0	685	0	685	5.0	1803	0.380	100	4.5	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	80	80	5.0	1308	0.061	100	11.3	LOS B	0.0	0.0	25	Turn Bay	0.0	0.0
Approach	0	685	80	765	5.0		0.380		5.2	LOS A	0.0	0.0				
Intersection				2977	5.0		0.775		11.2	LOS B	10.7	78.2				

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model used.

⁶ Lane underutilisation due to downstream effects

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LANE SUMMARY

Site: 2031 PM - Roundabout Layout

Wensley Road Interchange - Southern Intersection
Roundabout Layout
2031 PM
Roundabout

Lane Use and Performance																
	Demand Flows															
	L	T	R	Total	HV	Cap.	Deg.	Lane	Average	Level of	95% Back	of Queue	Lane	SL	Cap.	Prob.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	Satn	Util.	Delay	Service	Vehicles	Distance	Length	Type	Adj.	Block.
							v/c	%	sec		veh	m	m		%	%
South: Wensly Road (S)																
Lane 1	372	47	0	419	5.0	1063	0.394	98 ⁶	7.4	LOS A	2.4	17.5	200	Turn Bay	0.0	0.0
Lane 2	0	481	0	481	5.0	1199	0.401	100	6.0	LOS A	2.5	18.5	500	–	0.0	0.0
Approach	372	528	0	900	5.0		0.401		6.6	LOS A	2.5	18.5				
East: Centenary Highway Exit Ramp (E)																
Lane 1	311	0	0	311	5.0	978 ¹	0.318	100	8.2	LOS A	1.4	10.3	25	Turn Bay	0.0	0.0
Lane 2	0	1	294	295	5.0	932	0.317	100	14.4	LOS B	1.5	11.1	500	–	0.0	0.0
Approach	311	1	294	606	5.0		0.318		11.2	LOS B	1.5	11.1				
North: Wensly Road (N)																
Lane 1	0	640	0	640	5.0	1803	0.355	100	4.5	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	57	57	5.0	1308	0.044	100	11.3	LOS B	0.0	0.0	25	Turn Bay	0.0	0.0
Approach	0	640	57	697	5.0		0.355		5.0	LOS A	0.0	0.0				
Intersection				2203	5.0		0.401		7.4	LOS A	2.5	18.5				

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model used.

¹ Reduced capacity due to a short lane effect

⁶ Lane underutilisation due to downstream effects

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AMEX Ripley – ARP
West

APPENDIX F

SITE LAYOUT

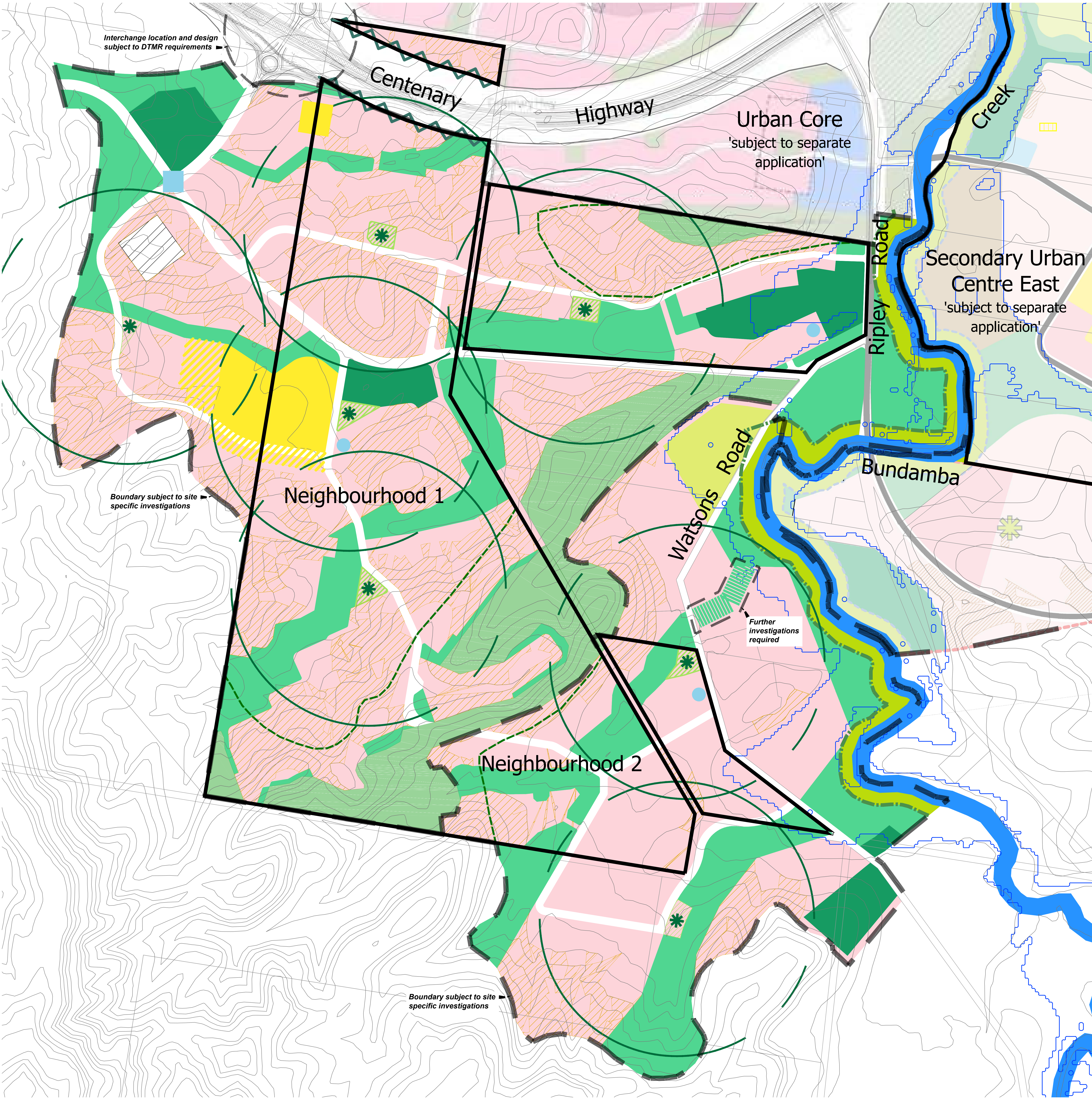
Legend

General

- Amex Land Boundary
- Context Plan Boundary
- Environmental Protection Zone Boundary
- Acoustic Barrier & Landscaping
- Slope Constrained Residential Land
- 400m Catchment
- Possible Alternate School Site
- Local Neighbourhood Centre
- Potential Retail Node

DEVELOPMENT STATISTICS				
	AMEX LAND		NON AMEX LAND	
	Area in Ha	Percentage	Area in Ha	Percentage
Total Site Area	234.5	100.0%	238.0	100.0%
Total Area of Neighbourhood 1	193.8	82.6%	123.6	51.9%
Total Area of Major New Road	10.3	4.4%	12.3	5.1%
Total Developable Area	117.9	50.3%	53.1	22.3%
Low Density Residential (North of Centenary Highway)	3.2	1.4%	—	0.0%
Low Density Residential (incl. local roads & neighbourhood recreation parks)	114.7	48.9%	51.1	21.5%
Utilities	—	0.0%	2.0	0.8%
Community Purpose (School) Land Use Area *	4.6	2.0%	3.4	1.4%
Total Area of Open Space (neighbourhood recreation parks incl in developable land)	61.0	26.0%	54.8	23.0%
Bundamba Creek Buffer	—	0.0%	8.4	3.5%
Conservation Buffer	22.8	9.7%	16.4	6.9%
District Recreation Park	9.5	4.0%	4.1	1.7%
Linear Park & Stormwater Management	28.7	12.2%	25.9	10.9%
Total Area of Neighbourhood 2	40.7	17.3%	114.5	48.1%
Total Area of Major New Road	2.7	1.1%	6.0	2.5%
Total Developable Area	29.0	12.4%	62.2	26.1%
Low Density Residential (incl. local roads & neighbourhood recreation parks)	29.0	12.4%	62.2	26.1%
Total Area of Open Space (neighbourhood recreation parks incl in developable land)	9.1	3.9%	46.3	19.5%
Bundamba Creek Buffer	—	0.0%	9.7	4.1%
Conservation Buffer	—	0.0%	0.1	0.0%
District Sports Park incl. Stormwater Management	—	0.0%	5.3	2.2%
District Recreation Park	—	0.0%	4.0	1.7%
Linear Park & Stormwater Management	9.1	3.9%	27.2	11.4%
* Areas subject to detailed site planning requirements by DETE				

DENSITY STATISTICS - CONTEXT PLAN MINIMUM TARGET			
	Development Area	Dwellings / Ha	Total Dwellings
NEIGHBOURHOOD 1			
AMEX LAND			
Low Density Residential (inc. local roads & park)	56.1	15	842
Low Density Residential (inc. local roads & park) - slope constrained	61.8	8	495
Sub Total	117.9		1,336
EXTERNAL LAND			
Low Density Residential (inc. local roads & park)	28.5	15	428
Low Density Residential (inc. local roads & park) - slope constrained	22.6	8	181
Sub Total	51.1		608
WEST (NEIGHBOURHOOD 1) TOTAL	169.0	11.5 average	1,944
NEIGHBOURHOOD 2			
AMEX LAND			
Low Density Residential (inc. local roads & park)	22.0	15	330
Low Density Residential (inc. local roads & park) - slope constrained	7.0	8	56
Sub Total	29.0		386
EXTERNAL LAND			
Low Density Residential (inc. local roads & park)	46.0	15	690
Low Density Residential (inc. local roads & park) - slope constrained	16.2	8	130
Sub Total	62.2		820
WEST (NEIGHBOURHOOD 2) TOTAL	91.2	13.2 average	1,206
DENSITY STATISTICS - MASTER PLAN			
	Development Area	Dwellings / Ha (net residential density)	Total Dwellings (maximum)
AMEX LAND			
Low Density Residential Land Use Area (inc. local roads & local neighbourhood park)	78.1	10. - 20	1,562
Low Density Residential Land Use Area - slope constrained (inc. local roads & local neighbourhood park)	68.8	8. - 18	1,238
WEST TOTAL	146.9	up to 19.1 average	2,800



REVISION

A: 16/01/13 Add EP zone bdy
B: 19/07/13 Amend land uses, update stats
C: 22/07/13 Amend land uses
D: 24/07/13 Add retail nodes

DISCLAIMER:

The Context Plans are intended to guide development and show the preferred land use designations and structural elements. The Context Plans do not prescribe these designations and structural elements with complete accuracy and the final location will be determined through further detailed design and development applications.

NOTES:

All linework is approximate only, and subject to survey and Council approval.

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: DCDB
Adjoining information: DCDB
Contours: Cardno
Environment constraints: DERM
Flood: Cardno

CLIENT

AMEX

PROJECT

RIPLEY WEST

CONTEXT PLAN
LAND USE

Level Datum

Origin

Date

24 JULY 2013

Comp By:

JLS

DWG Name:

111179-11D

Local Authority

IPSWICH CITY COUNCIL

Locality

RIPLEY

Job Reference

111179

Scale

1:4000

Sheet

A0

Plan Ref

111179-11

Rev

D

RPS

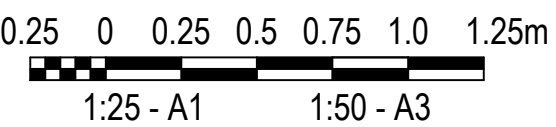
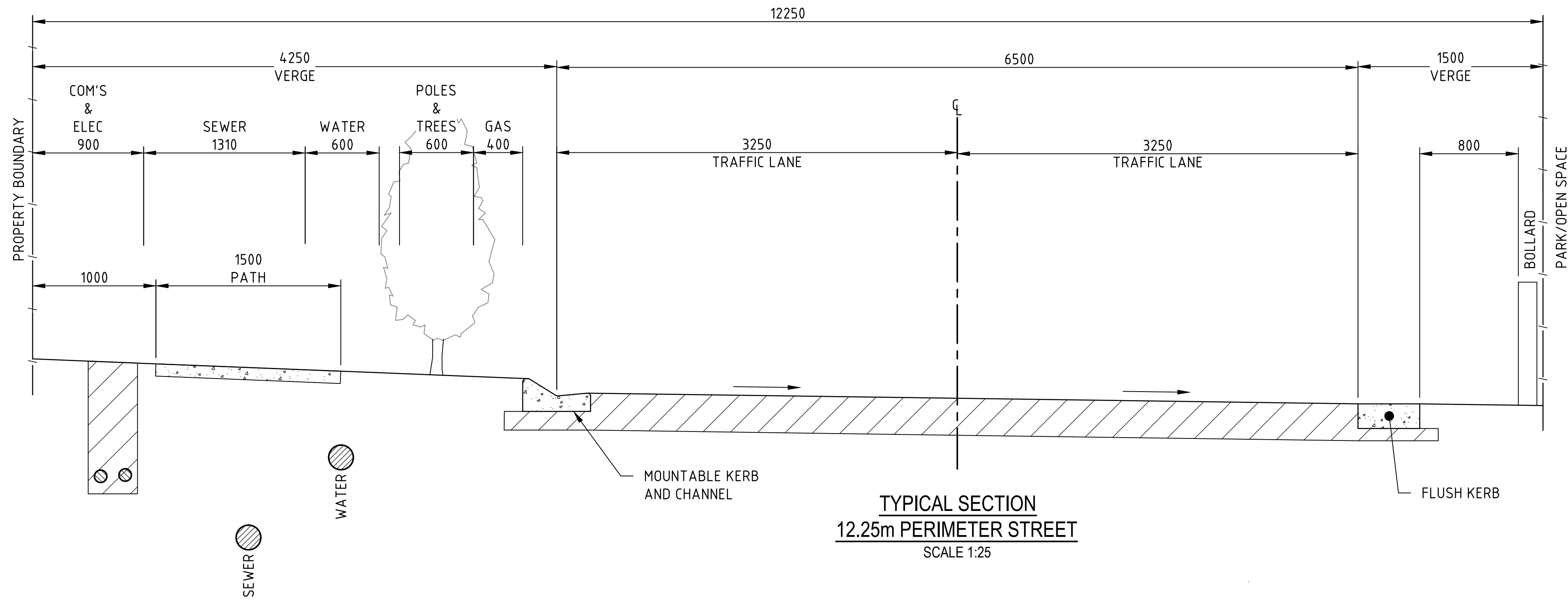
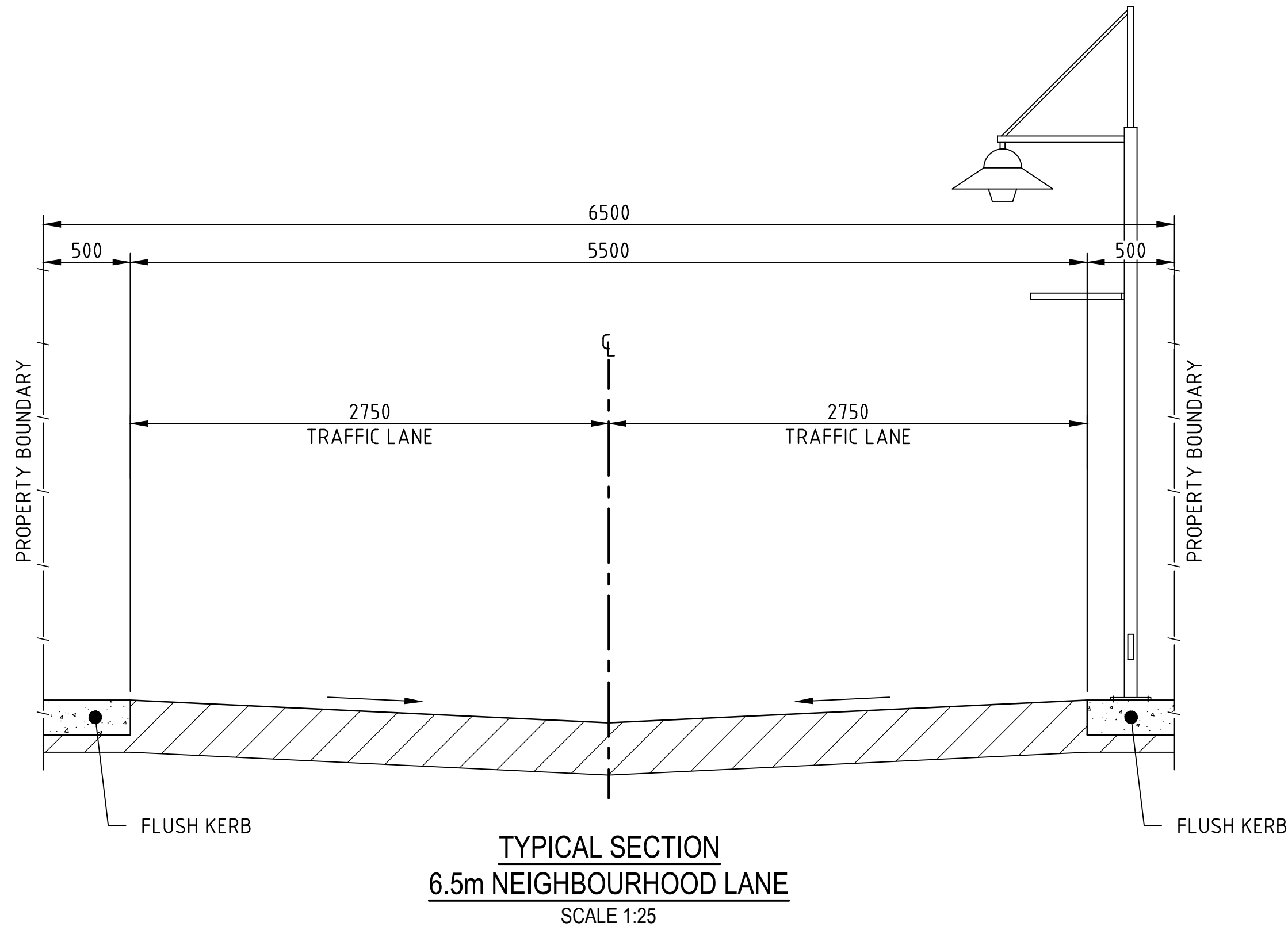
RPS Australia East Pty Ltd
ACN 140 292 762
ABN 44 140 292 762
Urban Design
Brisbane Design Studio
435 Brunswick Street
Fortitude Valley QLD 4006
T +61 7 3124 9300
F +61 7 3124 9399
W rpsgroup.com.au

AMEX Ripley – ARP
West

APPENDIX G

CROSS SECTIONS

NOTE:
SERVICES ALIGNMENTS TO BE
GENERALLY IN ACCORDANCE WITH
ICC STANDARD DRAWING SR 22



						Verified	
						P.O.	Date
						Approved	07/03/2013
						A.S.	Date
1	07/03/2013	ORIGINAL ISSUE		T.W.	P.O.	A.S.	07/03/2013
Rev.	Date	Description		Des.	Verif.	Appd.	RPEQ No. 7946



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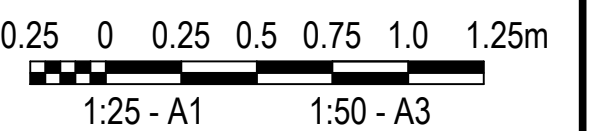
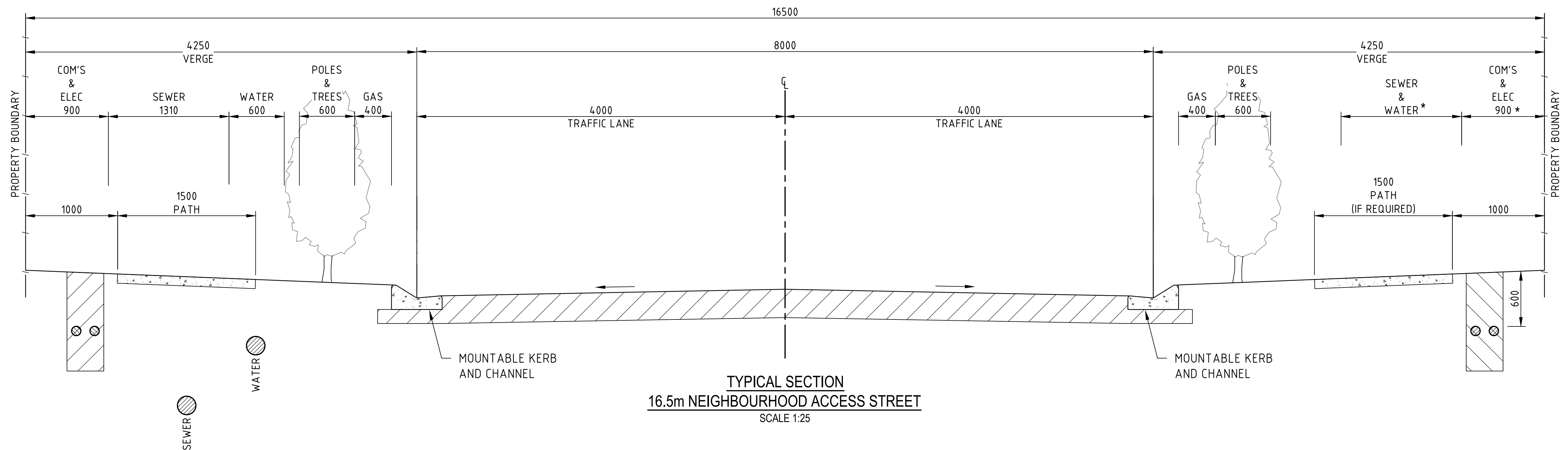
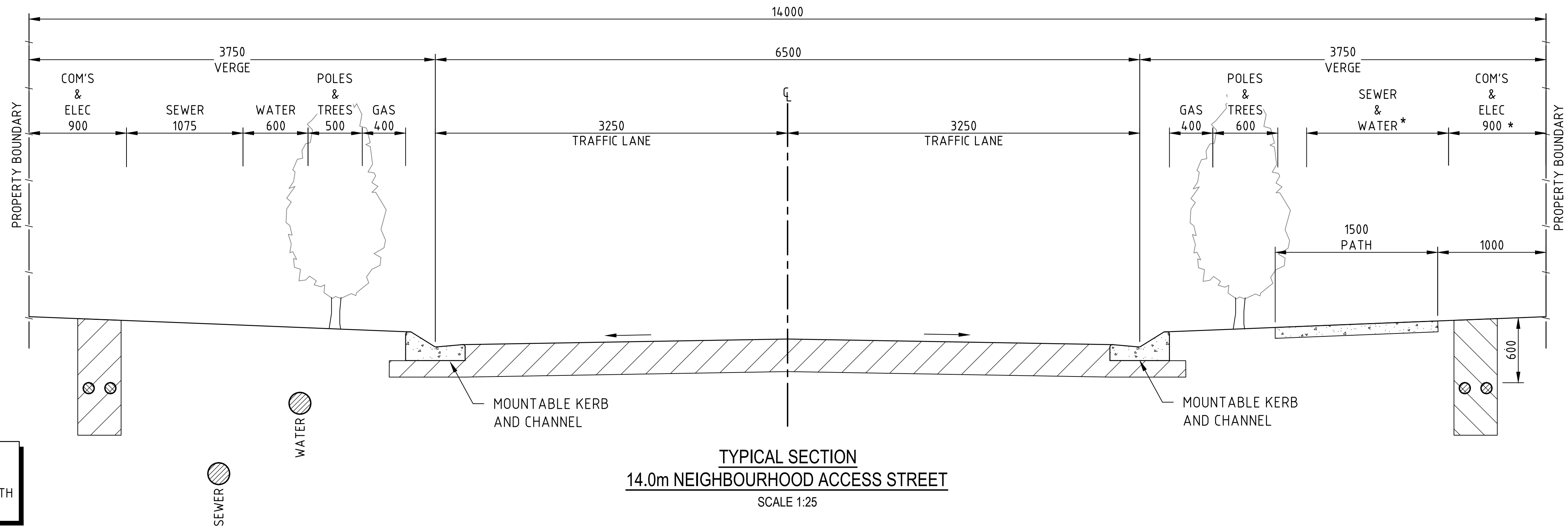
Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Locked Bag 4006, Fortitude Valley QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Email: brisbane@cardno.com.au Web: www.cardno.com.au

Drawn	Date
D.J.S.	07/03/2013
Checked	Date
P.J.O.	07/03/2013
Designed	Date
T.C.W.	07/03/2013

Client
AMEX PTY. LTD.
RIPLEY - WEST

TYPICAL CROSS SECTIONS
SHEET 1 OF 4

Status FOR APPROVAL			
NOT TO BE USED FOR CONSTRUCTION PURPOSES			
Datum	Grid	Scale	Size
A.H.D.		AS SHOWN	A1
Drawing Number			Revision
7901-47-027-SK-003			1



Verified		Date	
P.O.		07/03/2013	
Approved		Date	
A.S.		07/03/2013	
RPEQ No. 7946		Date	
1	07/03/2013	ORIGINAL ISSUE	
Rev.	Date	Description	
T.W.	P.O.	A.S.	
Des.	Verif.	Appd.	



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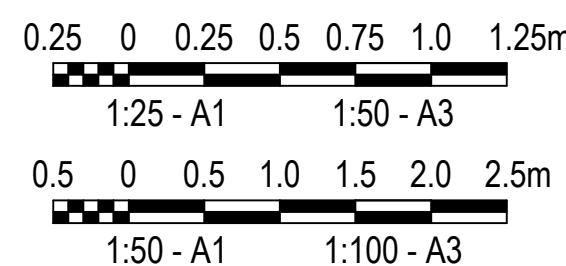
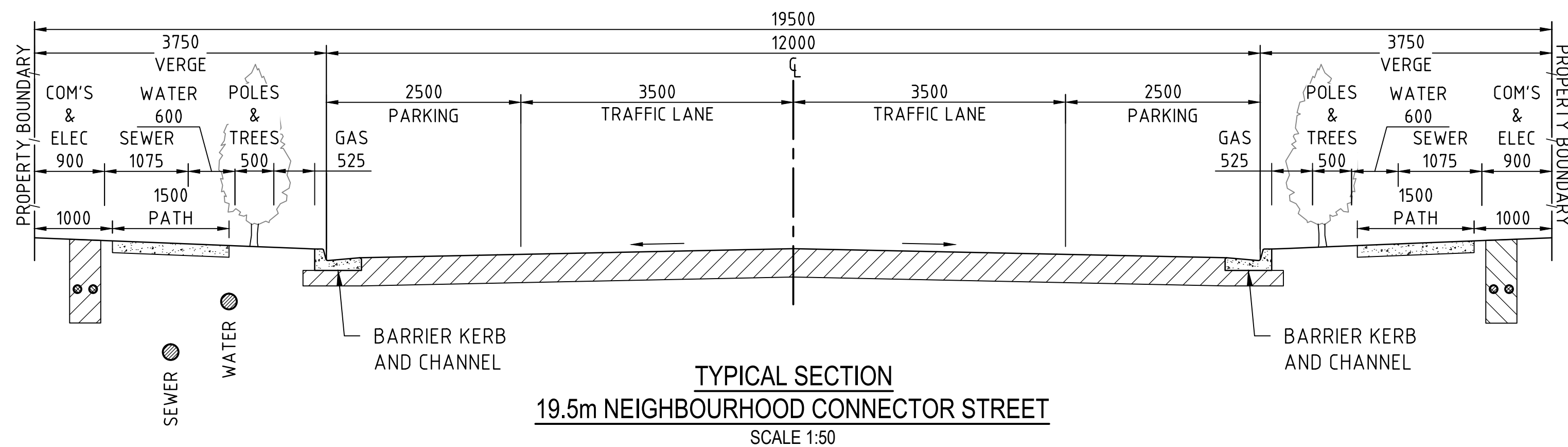
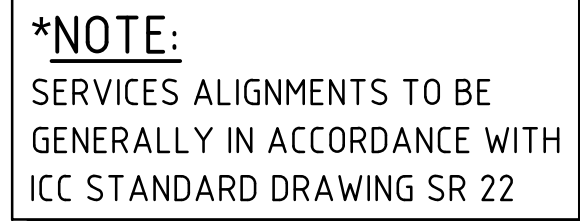
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Drawn	Date
D.J.S.	07/03/2013
Checked	Date
P.J.O.	07/03/2013
Designed	Date
T.C.W.	07/03/2013

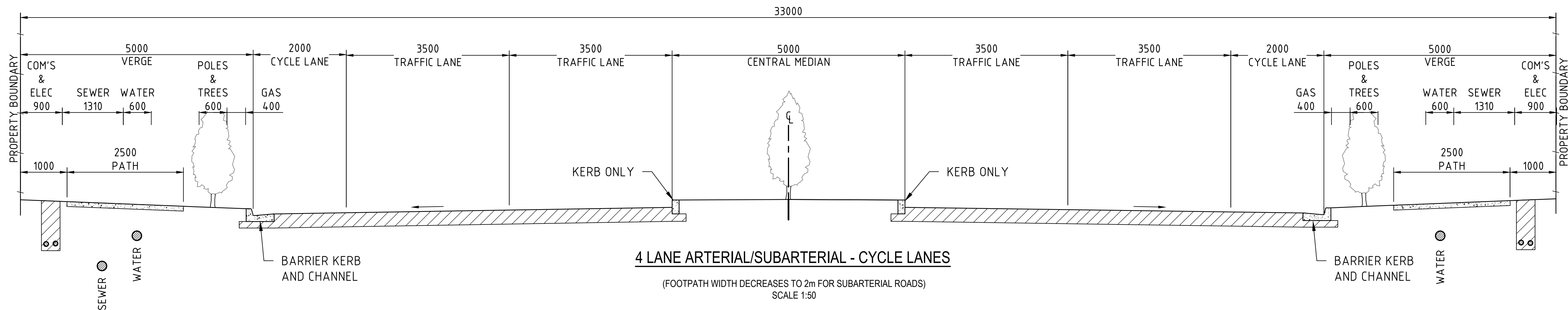
Client	
AMEX PTY. LTD.	
RIPLEY - WEST	
TYPICAL CROSS SECTIONS	
SHEET 2 OF 4	

Status			
FOR APPROVAL			
NOT TO BE USED FOR CONSTRUCTION PURPOSES			
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Drawing Number			Revision
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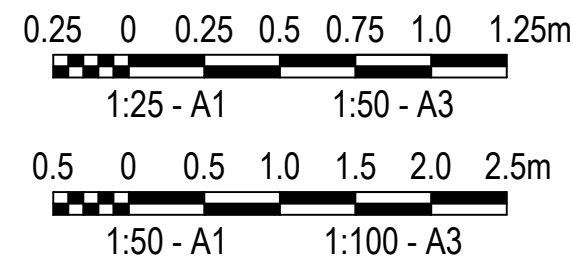
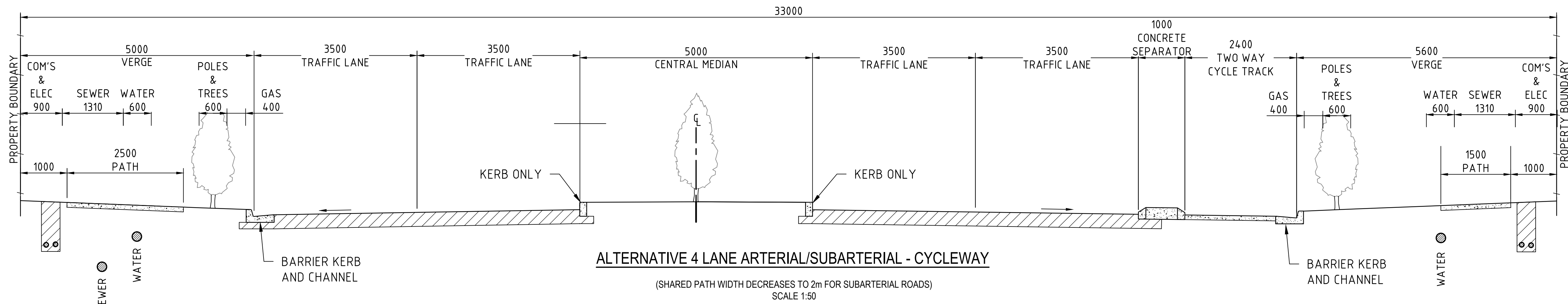
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DATE PLOTTED: 19 March 2014 11:28 AM BY : STEVEN HANCOCK (BRISBANE)

XREFs: X-QLD-SHT-A1
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***NOTE:**
SERVICES ALIGNMENTS TO BE
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				Verified				
				B.M.	Date			
				Approved	18/03/2014			
1	18/03/2014	ADDITIONAL CROSS SECTIONS AMENDED	S.H.	B.M.	A.S.	A.S.	Date	
Rev.	Date	Description	Des.	Verif.	Appd.	RPEQ No. 7946	18/03/2014	



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Drawn	S.H.	Date	18/03/2014
Checked	A.S.	Date	18/03/2014
Designed	B.M.	Date	18/03/2014

Client
AMEX PTY. LTD.
RIPLEY - WEST

TYPICAL CROSS SECTIONS
SHEET 4 OF 4

Status FOR APPROVAL			
NOT TO BE USED FOR CONSTRUCTION PURPOSES			
Datum A.H.D.	Grid	Scale AS SHOWN	Size A1
Drawing Number 7901-47-027-SK-006			Revision 1