



Wyndham West Precinct Structure Plan  
Transport Assessment

transportation planning, design and delivery

# Wyndham West Precinct Structure Plan

## Transport Assessment

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# 1. Introduction

## 1.1 Background

A number of Precinct Structure Plans (PSP's) are being developed in the Wyndham West area for incorporation into the Wyndham Council Planning Scheme via an amendment process. It is noted that whilst the Wyndham West area is being assessed as a broader precinct it incorporates a number of smaller PSP Areas, as follows:

- PSP<sub>40</sub>: Ballan Road
- PSP<sub>41</sub>: Manor Lakes
- PSP<sub>42.1</sub>: Black Forest Road North
- PSP<sub>42.2</sub>: Black Forest Road South
- PSP<sub>43</sub>: Alfred Road
- PSP<sub>92</sub>: Westbrook
- PSP<sub>93</sub>: Mambourin East

The Precinct is generally bound by the future Outer Metropolitan Ring Road to the west, Bulban Road to the south, the existing Werribee and Wyndham West townships to the east and the Werribee River to the north. The land is currently used for agricultural purposes, and forms part of the State Government Western Growth Corridor Plan.

The Wyndham West PSP Area is currently being prepared by the Growth Areas Authority (GAA) in consultation with Wyndham Council, state authorities, and major stakeholders.

## 1.2 Purpose of this Report

GTA Consultants (GTA) has been engaged to undertake traffic modelling for the PSPs and translate the outputs into road cross sections and concept intersection designs for input to the PSP process.

## 1.3 Referenced Documents

In preparing this report, reference has been made to a number of background documents, including:

- Wyndham Planning Scheme
- various GAA plans for the PSP
- refined MITM modelling for the precinct
- GAA Draft Corridor Plans
- various technical data as referenced in this report
- other documents as nominated.

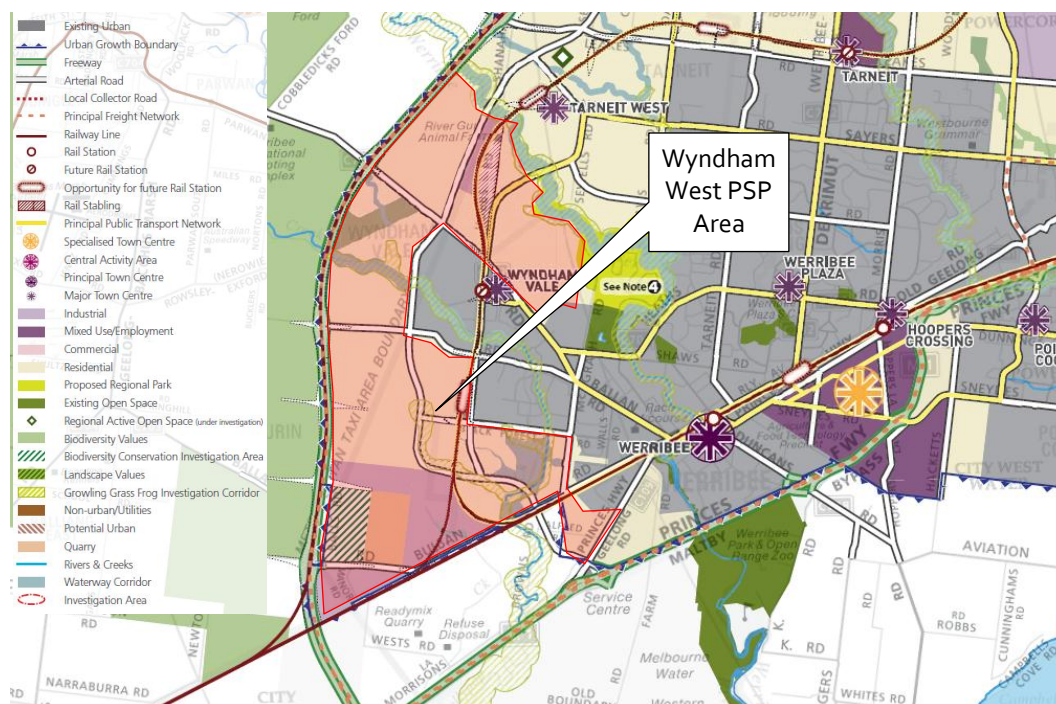
## 1.4 Consultation

This report has been prepared in consultation with the GAA, Council and VicRoads.

## 1.5 Wyndham West PSP Area Overview

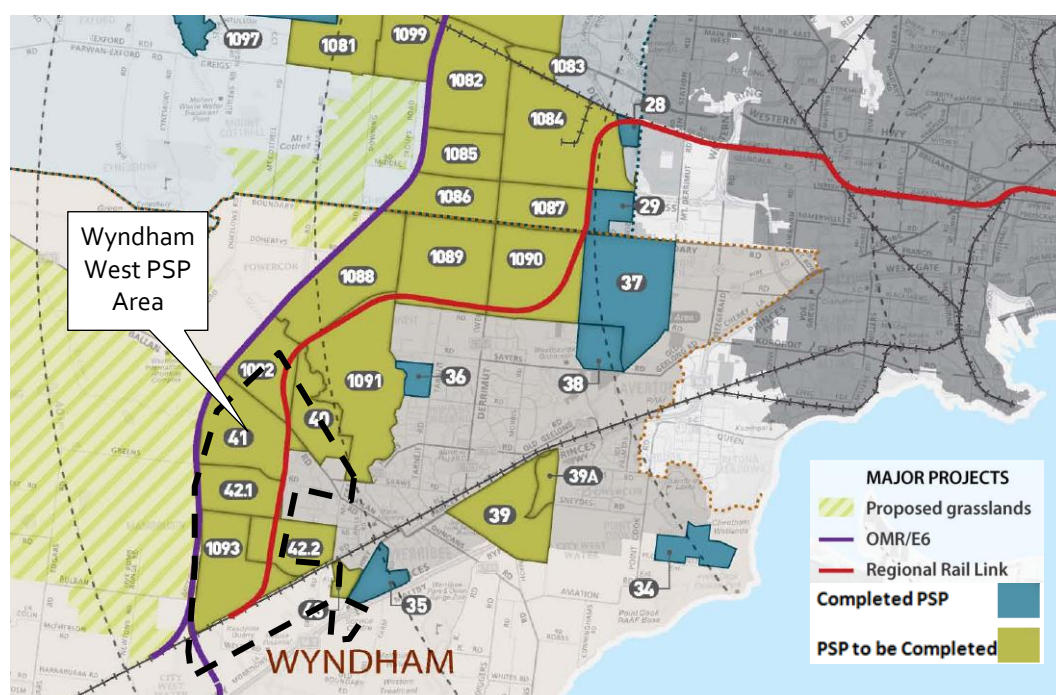
The GAA Western Corridor Plan is shown in Figure 1.1.

Figure 1.1: GAA – Western Corridor Plan



The location of the Wyndham West PSP Area, including the individual PSP Areas, is shown in Figure 1.2.

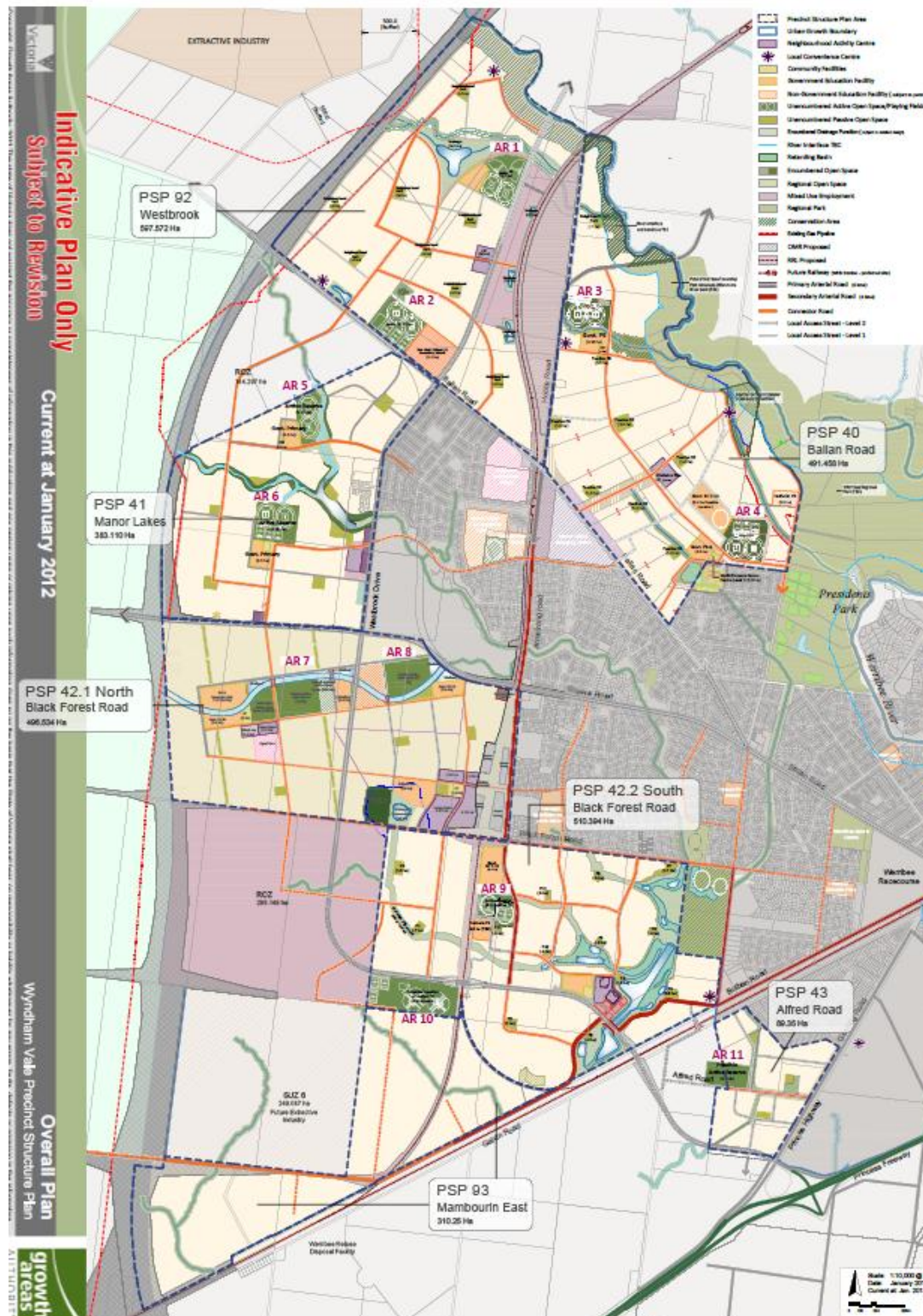
Figure 1.2: Wyndham West PSP Area Overview



(Source: Overall Plan dated November 2011 prepared by GAA)

An overview of the PSP Area is shown in Figure 1.3.

Figure 1.3: Wyndham West PSP Area



(Base Plan provided by GAA)

## 2. Transport Modelling

### 2.1 Melbourne Integrated Transport Model

The Melbourne Integrated Transport Model (MITM) is a multi-modal strategic model developed by The Department of Transport (DoT) and subsequently refined by Sinclair Knight Merz (SKM). It is a travel demand model incorporating a link-based network model with an integrated public transport model. The model is implemented in the Cube Voyager TRIPS software environment.

GTA was engaged by the GAA to further refine the SKM MITM model to reflect the anticipated land use growth and road network improvements in the Western Growth Corridor (previously shown in Figure 1.1). Separate models were prepared for 2021 and 2046 representing the future interim and ultimate conditions at completion of development within the PSP area. The wider MITM network contains all major freeways, main arterial and connector roads in the Melbourne Statistical Division area.

The model is for an AM peak period and is a two hour model representing travel for the 7:00 to 9:00am period. Daily volumes are then arrived at by factoring the 2-hour peak period volumes by 6.69. This peak to daily factor is derived from a comparison of existing peak to daily rates from traffic counts covering the western metropolitan Melbourne Area.

The modelled results have been used to estimate vehicle demands on roads to plan the internal road network and intersection types within the PSP area. Further discussion on refinements made to the modelling outputs is contained in Section 13 and Appendix C.

It should be noted that while this report forms the basis for road and intersection concept layouts and configurations, actual detailed road and intersection designs will be prepared at a later date as part of detailed planning connected with approvals and permit processes for specific development applications.

### 2.2 SKM Model

On behalf of VicRoads and the Department of Transport, SKM prepared an updated Melbourne Integrated Transport Model (MITM) for the western suburbs of Melbourne. The model utilised land use inputs based on past broad level estimates and incorporated the basic arterial road network. Traffic volume plots for the design years 2009, 2021 and 2046 were produced. The 2009 model was used to calibrate the model against existing traffic volume counts for western metropolitan Melbourne.

This model has been adapted by GTA to better reflect the current PSP land uses and road layouts as described in the following sections.

### 2.3 Model Calibration

In order to model future conditions on the road network, an existing conditions model was run and compared against existing traffic data including mid-block and intersection counts. When the model results sufficiently match the existing traffic flows in the model, this considered to be calibrated and therefore suitable for use as the base to undertake future model runs. It is understood that the model was calibrated by SKM as part of the further refinements that they undertook.

## 2.4 Model Limitations

The MITM model is an AM peak two hour period model, which means it does not produce daily traffic volume information directly. However, this is dealt with by preparing daily traffic volume estimates for existing and future years using conversion factors based on actual recorded volumes.

Furthermore the purpose of the strategic modelling is to identify broad level traffic and travel patterns and changes as an input to more detailed consideration during the Precinct Structure Planning (PSP) process.

## 2.5 PSP Land Use Forecasts and Road Network

### 2.5.1 General

Transport modelling prepared for the PSP area is reliant on land use inputs anticipated for the precinct. A summary of the MITM land use zone inputs for each of the individual PSP Areas is provided below.

### 2.5.2 MITM Zones

In order to ensure that the model reflected the likely access arrangements across the precinct zones were developed to encapsulate land uses that would be accessed in a similar manner. In developing these zones, regard was given to the physical constraints (i.e. creeks, arterial roads, etc) that may affect access along with an assessment of the likely access, via the connector road network, to the adjoining arterial road network. Similarly, zone connectors were linked to the connector road network to best distribute traffic from each zone onto the adjoining road network. The adopted zone boundaries and associated zone connectors are illustrated in Figures A1 and A2 in Appendix A.

### 2.5.3 Land Uses

The land uses contained within the SKM model have been updated and based on the anticipated PSP land uses (provided by GAA). A summary of the PSP land uses (households, jobs and enrolments) by MITM Zone are provided in Table 2.1.

Table 2.1: Forecasted PSP Land Uses by MITM Zone (Provided by GAA)

| PSP Area     | GAA Zone No. | MITM Zone No. | Land Use      |              |               |
|--------------|--------------|---------------|---------------|--------------|---------------|
|              |              |               | Households    | Jobs         | Enrolments    |
| PSP43        | 1            | 311           | 1350 [1]      | 166          | 0             |
| PSP42.2      | 2            | 264           | 255           | 70           | 0             |
|              | 3            | 2894          | 188           | 19           | 0             |
|              | 4            | 1958          | 1127          | 113          | 0             |
|              | 5            | 2895          | 310           | 386          | 450           |
|              | 6            | 1977          | 1119          | 112          | 0             |
|              | 7            | 1959          | 371           | 167          | 1500          |
|              | 8            | 1960          | 1442          | 144          | 0             |
| PSP42.1      | 9            | 1957          | 300           | 810          | 0             |
|              | 10           | 1963          | 1656          | 256          | 1500          |
|              | 11           | 1955          | 381           | 78           | 450           |
|              | 12           | 1962          | 1336          | 174          | 400           |
|              | 13           | 2548          | 1728          | 498          | 1550          |
| 41           | 14           | 1952          | 1204          | 193          | 450           |
|              | 15           | 1953          | 126           | 313          | 0             |
|              | 16           | 261           | 1431          | 120          | 0             |
|              | 17           | 2550          | 2672          | 317          | 450           |
| PSP92        | 18           | 1954          | 73            | 97           | 1500          |
|              | 19           | 259           | 4040          | 499          | 450           |
|              | 20           | 1943          | 882           | 748          | 0             |
|              | 22           | 1944          | 51            | 315          | 0             |
| PSP40        | 23           | 1942          | 2769          | 562          | 450           |
|              | 24           | 2552          | 286           | 29           | 0             |
|              | 25           | 1941          | 1004          | 390          | 450           |
|              | 26           | 1940          | 1307          | 451          | 1500          |
| PSP93        | 27           | 2547          | 1388          | 1389         | 450           |
|              | 28           | 1961          | 544           | 54           | 0             |
| <b>Total</b> |              |               | <b>29,340</b> | <b>8,470</b> | <b>11,550</b> |

[1] MITM Zone 311 contains 1208 future households as part of the Alfred Road PSP and 142 existing households.

## 2.5.4 Road Network

The SKM and GTA MITM ultimate road networks (2046) are provided in Figures A3 and A4 in Appendix A, respectively.

Figures A3 and A4 indicate that the adopted ultimate arterial road networks within the SKM and GTA models are generally the same, however, the connector road network within the PSP Areas have been coded into the GTA MITM model to better reflect the proposed PSP road network. The inclusion of the connector roads within the model will result in more refined traffic distribution plots.

### 2.5.5 Summary of GTA vs. SKM Modelling

In terms of land uses and arterial road network, the SKM and GTA MITM models are similar, however the GTA model has been updated to include:

- the most recent land use estimates for the PSP Area including the 'Stella' and 'Triangle' land parcels
- the connector road network coded into the MITM road network.

Given the above, the GTA MITM model is expected to provide more refined results than the SKM model.

## 2.6 Traffic Volume Generation

A summary of the anticipated traffic generation for each of the MITM zones for the 2021 and 2046 model runs are provided in Table 2.2. In addition a first principles assessment of the traffic volumes anticipated to be generated by each of the zones is also provided. The following traffic generation rates have been used to form the empirical assessment, noting that these rates have typically been adopted for other first principle assessments of PSP Areas:

- Residential: 6.8 trips per dwelling<sup>1</sup>
- Education: 1.5 trips per enrolment
- Employment: 3 trips per job

It is noted that this assessment does not take into account the retail floor area associated with each of the local town centres within the various PSP Areas, such an assessment has been undertaken in later sections of the report (where relevant).

<sup>1</sup> Based on a conservative traffic generation rate for Wyndham of 8.5 trips per dwelling per day applying a reduction factor of 20% to take into account the internal trips as a result of the proximity of retail, employment and school uses (sourced from RTANSW 'Guide to Traffic Generating Developments').

Table 2.2: MITM Traffic Generation vs. First Principles Assessment

| GAA Zone No. | MITM Zone No. | Land Use      |              |               | Traffic Generation |                |                              |
|--------------|---------------|---------------|--------------|---------------|--------------------|----------------|------------------------------|
|              |               | Households    | Jobs         | Enrolments    | MITM 2021          | MITM 2046      | First Principles (2021&2046) |
| 1            | 311           | 1350          | 166          | 0             | 10,183             | 7,626          | 9,678                        |
| 2            | 264           | 255           | 70           | 0             | 1,859              | 2,206          | 1,944                        |
| 3            | 2894          | 188           | 19           | 0             | 2,572              | 1,741          | 1,335                        |
| 4            | 1958          | 1127          | 113          | 0             | 5,330              | 5,472          | 8,003                        |
| 5            | 2895          | 310           | 386          | 450           | 2,421              | 3,011          | 3,941                        |
| 6            | 1977          | 1119          | 112          | 0             | 4,930              | 6,817          | 7,945                        |
| 7            | 1959          | 371           | 167          | 1500          | 7,048              | 7,046          | 5,274                        |
| 8            | 1960          | 1442          | 144          | 0             | 6,448              | 6,914          | 10,238                       |
| 9            | 1957          | 300           | 810          | 0             | 3,762              | 4,109          | 4,470                        |
| 10           | 1963          | 1656          | 256          | 1500          | 11,978             | 12,470         | 14,279                       |
| 11           | 1955          | 381           | 78           | 450           | 4,727              | 5,195          | 3,500                        |
| 12           | 1962          | 1336          | 174          | 400           | 9,201              | 10,185         | 10,207                       |
| 13           | 2548          | 1728          | 498          | 1550          | 19,638             | 20,233         | 15,569                       |
| 14           | 1952          | 1204          | 193          | 450           | 8,585              | 10,102         | 9,441                        |
| 15           | 1953          | 126           | 313          | 0             | 1,563              | 2,517          | 1,796                        |
| 16           | 261           | 1431          | 120          | 0             | 8,821              | 8,299          | 10,091                       |
| 17           | 2550          | 2672          | 317          | 450           | 22,402             | 20,874         | 19,796                       |
| 18           | 1954          | 73            | 97           | 1500          | 6,257              | 7,314          | 3,037                        |
| 19           | 259           | 4040          | 499          | 450           | 21,691             | 23,520         | 29,644                       |
| 20           | 1943          | 882           | 748          | 0             | 6,516              | 7,590          | 8,242                        |
| 22           | 1944          | 51            | 315          | 0             | 2,199              | 7,422          | 1,292                        |
| 23           | 1942          | 2769          | 562          | 450           | 16,677             | 17,752         | 21,190                       |
| 24           | 2552          | 286           | 29           | 0             | 3,073              | 3,487          | 2,032                        |
| 25           | 1941          | 1004          | 390          | 450           | 9,471              | 4,791          | 8,672                        |
| 26           | 1940          | 1307          | 451          | 1500          | 12,624             | 12,284         | 12,491                       |
| 27           | 2547          | 1388          | 1389         | 450           | 13,878             | 13,606         | 14,280                       |
| 28           | 1961          | 544           | 54           | 0             | 2,445              | 2,670          | 3,861                        |
| <b>Total</b> |               | <b>29,340</b> | <b>8,470</b> | <b>11,550</b> | <b>226,298</b>     | <b>235,255</b> | <b>242,247</b>               |

Table 2.2 indicates that the PSP Areas are anticipated to generate approximately 226,000 and 235,000 daily vehicle trips for the 2021 and 2046 model years based on the MITM outputs. An empirical assessment of the proposed land uses within the PSP Areas indicates an anticipated traffic generation of 242,000 daily vehicle trips. The MITM traffic volumes are generally consistent with the empirical assessment (3 to 6% difference).

## 2.7 Interim versus Ultimate

Both interim and ultimate traffic volumes are presented in this report. The interim traffic volumes represent the +10 year scenario (~2021) and the ultimate volumes the +35 scenario (~2046). The interim volumes are used to inform intersection works up to the interim scenario for inclusion into the Development Contributions Plan (DCP), whilst the ultimate volumes are used to validate the provision of ultimate road reserves including flaring requirements at intersections.

This approach is consistent with the assumptions used for the previous PSP assessments GTA has undertaken in Metropolitan Melbourne and has been agreed by VicRoads.

## 2.8 MITM Traffic Volumes

The AM peak 2 hour and daily MITM plots from the GTA model for the 2021 and 2046 design years are provided in Appendix B of this report. It is noted that the daily traffic volumes have been determined by factoring the AM peak 2 hour volumes by 6.69 as outlined in Section 2.1.

The SKM MITM model is an AM peak hour model. In order to ensure that the proposed intersection designs accounted for in the DCP are capable of accommodating both the AM and PM peak hour traffic volumes, it is necessary to model the PM peak hour. To do this, the modelled AM peak hour volumes have been reversed. This typically presents a conservative analysis given that the modelled AM peak hour volumes incorporate trips associated with educational uses whereas the PM commuter peak hour occurs outside of typical school periods. This is generally an acceptable approach, the exception being those intersections which may be heavily influenced by activity centre uses which are not accounted for in the AM peak hour model.

The anticipated AM and PM peak hour turning movements generated by this model are provided in Appendix A. As discussed above the 'raw MITM' volumes do not include 'shopper' trips likely to be generated by the retail uses within the PSP's. As a result, the modelled traffic volumes may need to be increased to account for these trips (see Section 13 and Appendix C).

Furthermore, whilst the development of the zones and zone connectors has been done to distribute traffic across the road network accurately, as MITM is a gravity model, there are instances where certain road links are favoured over another, when in reality there would be a greater balancing of traffic. In this regard, GTA has reviewed the raw outputs of the model and made manual adjustments to the model as outlined in Appendix C.

## 2.9 Further Model Refinements

A number of model refinements were undertaken such that the MITM output volumes better reflected the future road network. For example traffic volume outputs on some connector level streets, such as McGrath Road and Alfred Road, were modelled in excess of their future capacities and as such, measures were taken in MITM to constrain the amount of traffic utilising these links consistent with their future capacities. Similarly, traffic utilising the Galvin Road rail crossing was constrained to ensure that unreasonable levels of traffic were not using this link as an alternative to Westbrook Drive. In order to constrain the above links the speed limits for these roads were manually reduced such that they offered a less attractive route for vehicles.

The existing MITM model assumed that the Armstrong Road / Hobbs Road corridor connected to Sewells Road only north of the Wyndham West PSP Area. Under the advice of GAA an additional link from the Armstrong Road corridor to Hogans Road was added to the MITM model. It is noted that this modification was made outside of the Wyndham West PSP Area (i.e. to land north of the Werribee River).

Finally, it is noted that a number of additional connector roads are provided within the Black Forest Road South PSP (4.2.2) that are not provided in the MITM modelling. Specifically, an additional east-west connector is provided to Armstrong Road and a north-south connector to Black Forest Road from the PSP Area. The provision of the two additional links in MITM would have a negligible impact on the traffic volumes in this PSP as there is ample capacity on the links servicing the area. As such, the model remains "fit for purpose" even though these two links are not provided.

## 3. Existing and Future Arterial Road Network

### 3.1 Existing and Future Arterial Road Network

#### 3.1.1 Overview

The PSP area is generally bordered by the future Outer Metropolitan Ring Road to the west, Bulban Road to the south, the existing Werribee and Wyndham Vale townships to the east and the Werribee River to the north. In addition a number of higher order roads pass through the PSP Area, including Ballan Road, Greens Road, Black Forest Road, Westbrook Drive and the Armstrong Road / Hobbs Road corridor.

The existing and anticipated future characteristics of each of these roads are discussed below.

#### 3.1.2 Ballan Road

Southeast of the Manor Lakes Shopping Centre, Ballan Road is configured with a two lane urban cross-section. A variety of property access arrangements are provided along the existing Ballan Road including direct vehicle access, service road access and no property access (i.e. rear loaded). Northwest of the Shopping Centre it is configured with a two lane rural cross-section.

Ballan Road has been modelled as a four lane road as per the VicRoads Westbrook Drive Model. The resulting modelled daily traffic volumes are reflective of this cross-section. As such, it is expected to ultimately be duplicated to an urban standard with 2 lanes in each direction (4-lane road). Ultimate access to Ballan Road from the PSP area is proposed via signalised intersections, and restricted left-in / left-out intersections in the ultimate (full site build-out) case.

It is noted that VicRoads has indicated that Ballan Road should be provided with a 6-lane cross-section however, given the modelled volumes do not reflect this further discussion should be had with VicRoads to confirm these requirements and an appropriate mechanism to reserve the necessary land take.

#### 3.1.3 Greens Road

East of the Wyndham Vale Square Shopping Centre, Greens Road is configured with a two lane urban cross-section with service roads provided on both sides catering for property access. West of the Shopping Centre it is configured with an unsealed rural cross-section.

Greens Road has been modelled as a four lane road. However, the resulting modelled daily traffic volumes are only reflective of a two lane cross-section. Notwithstanding the modelled volumes given this will provide a strategic link between the PSP Areas, Werribee and a future interchange with the OMR, it is considered appropriate that allowance be made for Greens Road to be ultimately duplicated to an urban standard with 2 lanes in each direction (4-lane road). Ultimate access to Greens Road from the PSP area is proposed via signalised intersections, and restricted left-in / left-out intersections in the ultimate (full site build-out) case.

#### 3.1.4 Black Forest Road

East of Haines Drive, Black Forest Road is configured with a two lane urban cross-section. West of Haines Drive it is configured with an unsealed rural cross-section.

Black Forest Road has been modelled as a two lane road. The resulting modelled daily traffic volumes are reflective of this cross-section. As such, it is expected to be ultimately upgraded to an urban standard with 1 lane in each direction (2-lane road). Ultimate access to Black Forest Road from the PSP area is proposed via a combination of signalised intersections, roundabouts, and restricted left-in / left-out intersections in the ultimate (full site build-out) case.

### 3.1.5 Bulban Road

Bulban Road is configured with a two-lane rural cross-section connecting to Ballan Road and Cottrell Street to the east and Edgars Road to the west.

Bulban Road has been modelled as a four lane road. However, the resulting modelled daily traffic volumes are only reflective of a two lane cross-section. Notwithstanding the modelled volumes given this will provide a strategic link between the PSP Areas, Werribee and a future interchange with the OMR, it is recommended that further consideration be given to the ultimate configuration of Bulban Road. Ultimate access to Bulban Road from the PSP area is proposed via controlled intersections, and restricted left-in / left-out intersections in the ultimate (full site build-out) case. However, it is noted that the road network accessing Bulban Road within the PSP Area still needs refining particularly between the OMR and RRL.

### 3.1.6 Westbrook Drive

Westbrook Drive is generally aligned in a north-south direction through the PSP Area, connecting with the Princes Freeway to the south and crossing the Werribee River to the north.

Westbrook Drive has been modelled as a six lane road. However, the resulting modelled daily traffic volumes are only reflective of a four lane cross-section. Ultimate access to Westbrook Drive from the PSP area is proposed via signalised intersections, and restricted left-in / left-out intersections in the ultimate (full site build-out) case.

It is noted that VicRoads has indicated that Westbrook Drive should be provided with a 6-lane cross-section however, given the modelled volumes do not reflect this further discussion should be had with VicRoads to confirm these requirements and an appropriate mechanism to reserve the necessary land take. In this instance, VicRoads has advised that the additional lanes may be utilised as dedicated public transport lanes.

### 3.1.7 Armstrong Road / Hobbs Road

The Armstrong Road / Hobbs Road corridor generally runs adjacent to the regional rail link, parallel to the proposed Westbrook Drive. Armstrong Road was originally mooted to form part of the arterial road network, however, due to space constraints as a result of existing properties and the proposed regional rail link there would be insufficient space to construct Armstrong Road to an appropriate arterial standard for its entirety (i.e. between Manor Lakes Activity Centre and Greens Road). As a result, it is now proposed that it be replaced as the north-south arterial link by Westbrook Drive. Given the above it is envisaged that the Armstrong Road / Hobbs Road corridor will form part of the lower order road network (i.e. sub arterial / connector road).

Armstrong Road and Hobbs Road has been modelled with a 4 lane urban cross-section. However, the resultant modelled volumes are more reflective of a 2-lane road, except adjacent to the Manor Lakes

Town Centre south of Ballan Road where it is anticipated that Armstrong Road will consist of a 4-lane carriageway.

### 3.1.8 Outer Metropolitan Ring Road (OMR)

The OMR/E6 Transport Corridor is expected to cater for increases in volumes of freight and people moving around metropolitan Melbourne and Victoria over coming decades, with construction expected to start after 2020. However *Delivering Melbourne's Newest Sustainable Communities* notes that some sections of the OMR/E6 Transport Corridor could be constructed earlier, depending on need, particularly in developing residential and/or business/industrial areas.

The OMR/E6 transport corridor extends some 93 kilometres from the Princes Freeway near Werribee in the south-west of Melbourne to the Metropolitan Ring Road in Thomastown in the north of Melbourne. The OMR section of the corridor (west of the subject site) will ultimately feature four traffic lanes in both directions with a central reserve for four rail tracks carrying both freight and passenger trains.

Table 3.1 below presents a summary of the proposed interchanges with non-freeway roads in the vicinity of the subject site with the OMR (source VicRoads website).

**Table 3.1: OMR/E6 Transport Corridor – Cross-Sections and Configurations**

| Road Link       | Cross-Section at OMR [1] | Intersection Configuration  | Interchange type with OMR / E6 |
|-----------------|--------------------------|-----------------------------|--------------------------------|
| Ballan Road     | 4 lane divided           | Grade separated (under OMR) | Full diamond interchange       |
| Greens Road     | 4 lane divided           | Grade separated (over OMR)  | Full diamond interchange       |
| Bulban Road [2] | 4 lane divided           | Grade separated (over OMR)  | Full diamond interchange       |

[1] Based on MITM roadway capacities.

[2] An alternate interchange could be provided at Kirks Bridge Road in place of Bulban Road.

A full freeway interchange is proposed at the intersection of the OMR / Princes Freeway, with land surrounding the interchange set aside assuming movements on all approaches.

## 4. Wyndham West PSP Overview

The PSP Areas include residential, education, community and town centre uses. Bulban Road, Black Forest Road, Greens Road and Ballan Road radiate from the existing Werribee township through the PSP Areas. Armstrong Road, Westbrook Drive and the future OMR form the main north-south routes through the PSP Area. The local and connector street network link to these roads.

The Werribee township is located approximately 5km to the east of the PSP Area, whilst Melton is located approximately 20km north of the PSP Area.

The major land use patterns and indicative road network of the PSP is shown in Figure 4.1.

Figure 4.1: Wyndham West PSP



(Base Plan provided by GAA)

Each of the PSP Areas is individually discussed in the following sections.

## 5. Ballan Road PSP (PSP 40)

### 5.1 PSP Area and Land Use Summary

A summary of the Ballan Road PSP land uses and site layout are provided in Table 5.1 and Figure 5.1 respectively. The Ballan Road PSP is generally bound by Ballan Road to the south, Werribee River to the north and east and Hobbs Road to the west.

**Table 5.1: Ballan Road PSP Land Use**

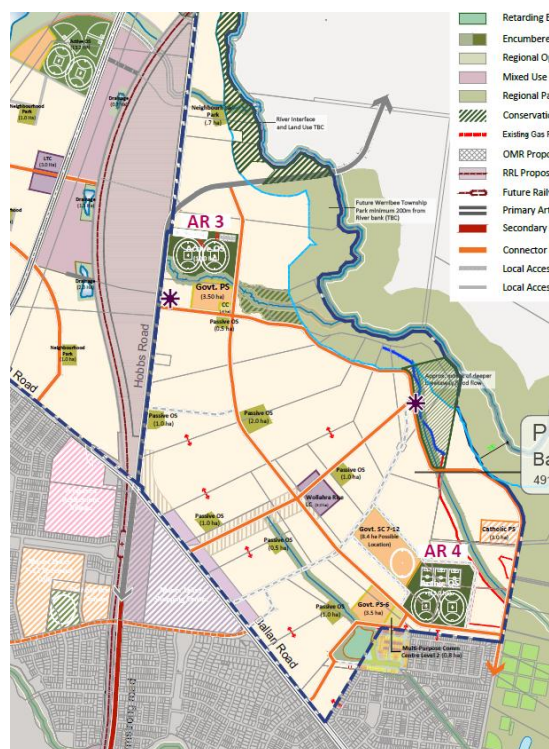
| PSP Area            | GAA ZONE / MITM Zone<br>(Refer to Fig 2.1) | Anticipated Land Use Yields |                   |                                      |                         |
|---------------------|--------------------------------------------|-----------------------------|-------------------|--------------------------------------|-------------------------|
|                     |                                            | Residential Dwellings       | Employment        | Activity Centre Developable Area [1] | Schools [2]             |
| Ballan Road (PSP40) | 23 (1942)                                  | 2,769                       | 562               | 1,000sq.m                            | 450                     |
|                     | 24 (2552)                                  | 286                         | 29                | -                                    | 0                       |
|                     | 25 (1941)                                  | 1,004                       | 390               | -                                    | 450                     |
|                     | 26 (1940)                                  | 1,307                       | 451               | 5,000sq.m                            | 1,500                   |
| <b>Total</b>        |                                            | <b>5,366 dwellings</b>      | <b>1,432 jobs</b> | <b>6,000sq.m</b>                     | <b>2,400 enrolments</b> |

[1] Traffic generated by the retail floor areas has been added in addition to the MITM traffic volumes.

[2] Primary School = 450 enrolments, Secondary School = 1,100 enrolments, Catholic Primary School = 400 enrolments.

Table 2.1 indicates that the Ballan Road PSP Area includes 5,366 dwellings, 1,432 jobs and 2,400 enrolments. Separate to the MITM modelling, a total of 6,000sq.m of retail land uses is anticipated in this PSP (traffic generated from this retail use is in addition to traffic generated in MITM).

**Figure 5.1: Ballan Road PSP Area**



## 5.2 Traffic Generation

A summary of the individual land uses and the resulting MITM traffic generation versus a first principles assessment for the Ballan Road PSP is provided in Table 5.2.

**Table 5.2: Comparison of Land Use and Traffic Generation – Ballan Road PSP**

| Land Uses    | Size             | GTA MITM Daily Trips (vpd) | Empirical Data Daily Trips (vpd) [1] |
|--------------|------------------|----------------------------|--------------------------------------|
| Residential  | 5,366 dwellings  | 41,845                     | 36,489                               |
| Employment   | 1,432 jobs       |                            | 4,296                                |
| Enrolments   | 2,400 enrolments |                            | 3,600                                |
| <b>Total</b> |                  | <b>41,845</b>              | <b>44,385</b>                        |

[1] Adopting traffic generation rates of 6.8, 1.5 and 3 vehicle trips per day for the residential (per dwelling), school (per enrolment) and movements per job, respectively.

Table 5.2 indicates that that the PSP Area is anticipated to generate 41,845 vehicle trips per day based on the MITM Model and 44,385 trips per day based on a first principles assessment. The results show that the MITM generated traffic movements are similar to those of a first principles assessment and subject to the refinements described in Section 13 are appropriate for assessment purposes.

The anticipated AM and PM peak hour turning movements for the Ballan Road PSP Area are provided in Appendix C.

## 6. Manor Lakes PSP (PSP 41)

### 6.1 PSP Area and Land Use Summary

A summary of the Manor Lakes PSP land uses and site layout are provided in Table 6.1 and Figure 6.1 respectively. The Manor Lakes PSP is generally bound by Greens Road to the south, Westbrook Drive to the east, Ballan Road to the north and the OMR to the west.

**Table 6.1: Manor Lakes PSP Land Use**

| PSP Area            | GAA ZONE / MITM Zone<br>(Refer to Fig 2.1) | Anticipated Land Use Yields |                 |                                      |                       |
|---------------------|--------------------------------------------|-----------------------------|-----------------|--------------------------------------|-----------------------|
|                     |                                            | Residential Dwellings       | Employment      | Activity Centre Developable Area [1] | Schools [2]           |
| Manor Lakes (PSP41) | 14 (1952)                                  | 1,204                       | 193             |                                      | 450                   |
|                     | 15 (1953)                                  | 126                         | 313             | 8,000sq.m                            | 0                     |
|                     | 16 (261)                                   | 1,431                       | 120             | 1,500sq.m                            | 0                     |
|                     | 17 (2550)                                  | 2,672                       | 317             | -                                    | 450                   |
| <b>Total</b>        |                                            | <b>5,433 dwellings</b>      | <b>943 jobs</b> | <b>9,500sq.m</b>                     | <b>900 enrolments</b> |

[1] Traffic generated by the retail floor areas has been added in addition to the MITM traffic volumes.

[2] Primary School = 450 enrolments, Secondary School = 1,100 enrolments, Catholic Primary School = 400 enrolments.

Table 6.1 indicates that the Manor Lakes PSP Area includes 5,433 dwellings, 943 jobs and 900 enrolments (including the 'Triangle' land). Separate to the MITM modelling, a total of 9,500sq.m of retail land uses is anticipated in this PSP (traffic generated from this retail use is in addition to traffic generated in MITM).

**Figure 6.1: Manor Lakes PSP Area**



## 6.2 Traffic Generation

A summary of the individual land uses and the resulting MITM traffic generation versus a first principles assessment for the Manor Lakes PSP is provided in Table 6.2.

**Table 6.2: Comparison of Land Use and Traffic Generation – Manor Lakes PSP / 'Triangle' Land**

| Land Uses    | Size            | GTA MITM Daily Trips (vpd) | Empirical Data Daily Trips (vpd) [1] |
|--------------|-----------------|----------------------------|--------------------------------------|
| Residential  | 5,433 dwellings | 41,370                     | 36,944                               |
| Employment   | 943 jobs        |                            | 2,829                                |
| Enrolments   | 900 enrolments  |                            | 1,350                                |
| <b>Total</b> |                 | <b>41,370</b>              | <b>41,124</b>                        |

[1] Adopting traffic generation rates of 6.8, 1.5 and 3 vehicle trips per day for the residential (per dwelling), school (per enrolment) and movements per job, respectively.

Table 6.2 indicates that the PSP Area is anticipated to generate 41,370 vehicle trips per day based on the MITM Model and 41,124 trips per day based on a first principles assessment. The results show that the MITM generated traffic movements are similar to those of a first principles assessment and subject to the refinements described in Section 13 are appropriate for assessment purposes.

The anticipated AM and PM peak hour turning movements for the Ballan Road PSP Area are provided in Appendix C.

## 7. Black Forest Road North (PSP42.1)

### 7.1 PSP Area and Land Use Summary

A summary of the Black Forest Road North PSP land uses and site layout are provided in Table 7.1 and Figure 7.1 respectively. The Black Forest North PSP is generally bound by Black Forest Road to the south, Armstrong Road to the east, Greens Road to the north and the OMR to the west.

**Table 7.1: Black Forest Road North PSP Land Use**

| PSP Area                          | GAA ZONE / MITM Zone<br>(Refer to Fig 2.1) | Anticipated Land Use Yields |                   |                                      |                         |
|-----------------------------------|--------------------------------------------|-----------------------------|-------------------|--------------------------------------|-------------------------|
|                                   |                                            | Residential Dwellings       | Employment        | Activity Centre Developable Area [1] | Schools [2]             |
| Black Forest Road North (PSP42.1) | 9 (1957)                                   | 300                         | 810               | 15,000sq.m                           | 0                       |
|                                   | 10 (1963)                                  | 1,656                       | 256               | -                                    | 1,500                   |
|                                   | 11 (1955)                                  | 381                         | 78                | -                                    | 450                     |
|                                   | 12 (1962)                                  | 1,336                       | 174               | -                                    | 400                     |
|                                   | 13 (2548)                                  | 1,728                       | 498               | 5,000sq.m                            | 1,550                   |
| <b>Total</b>                      |                                            | <b>5,401 dwellings</b>      | <b>1,816 jobs</b> | <b>20,000sq.m</b>                    | <b>3,900 enrolments</b> |

[1] Traffic generated by the retail floor areas has been added in addition to the MITM traffic volumes.

[2] Primary School = 450 enrolments, Secondary School = 1,100 enrolments, Catholic Primary School = 400 enrolments.

Table 7.1 indicates that the Black Forest Road North PSP Area includes 5,401 dwellings, 1,816 jobs and 3,900 enrolments. Separate to the MITM modelling, a total of 20,000sq.m of retail land uses is anticipated in this PSP (traffic generated from this retail use is in addition to traffic generated in MITM).

**Figure 7.1: Black Forest Road North PSP Area**



## 7.2 Traffic Generation

A summary of the individual land uses and the resulting MITM traffic generation versus a first principles assessment for the Manor Lakes PSP is provided in Table 7.2.

**Table 7.2: Comparison of Land Use and Traffic Generation – Black Forest Road North PSP**

| Land Uses    | Size             | GTA MITM Daily Trips (vpd) | Empirical Data Daily Trips (vpd) [1] |
|--------------|------------------|----------------------------|--------------------------------------|
| Residential  | 5,401 dwellings  | 49,306                     | 36,727                               |
| Employment   | 1,816 jobs       |                            | 5,448                                |
| Enrolments   | 3,900 enrolments |                            | 5,850                                |
| <b>Total</b> |                  | <b>49,306</b>              | <b>48,025</b>                        |

[1] Adopting traffic generation rates of 6.8, 1.5 and 3 vehicle trips per day for the residential (per dwelling), school (per enrolment) and movements per job, respectively.

Table 7.2 indicates that the PSP Area is anticipated to generate 49,306 vehicle trips per day based on the MITM Model and 48,025 trips per day based on a first principles assessment. The results show that the MITM generated traffic movements are similar to those of a first principles assessment and subject to the refinements described in Section 13 are appropriate for assessment purposes.

The anticipated AM and PM peak hour turning movements for the Ballan Road PSP Area are provided in Appendix C.

## 8. Black Forest Road South (PSP42.2)

### 8.1 PSP Area and Land Use Summary

A summary of the Black Forest Road South PSP land uses and site layout are provided in Table 8.1 and Figure 8.1 respectively. The Black Forest Road South PSP is generally bound by Bulban Road to the south, McGrath Road to the east, Black Forest Road to the north and the RRL to the west.

**Table 8.1: Black Forest Road South PSP Land Use**

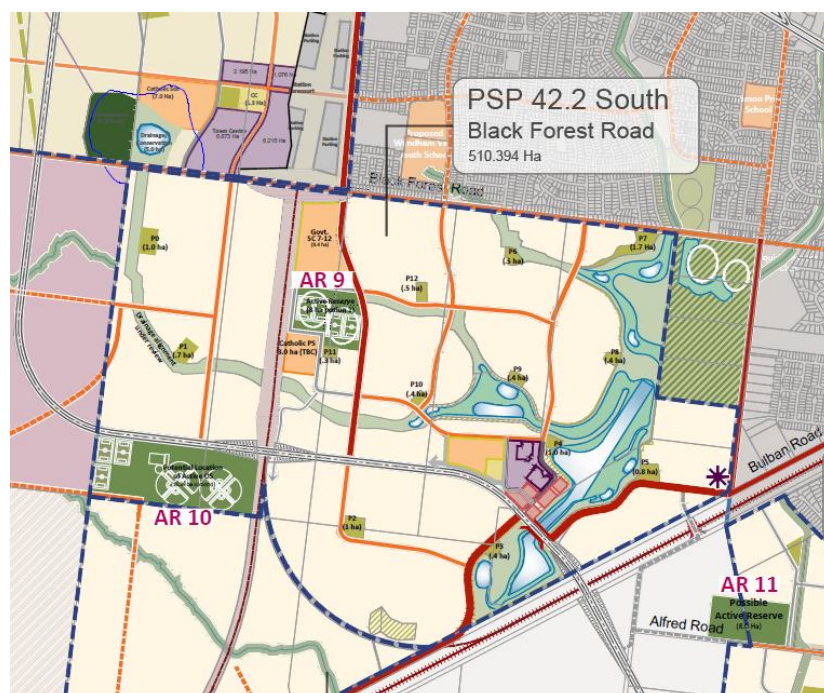
| PSP Area                          | GAA Zone / MITM Zone<br>(Refer to Fig 2.1) | Anticipated Land Use Yields |                   |                                      |                         |
|-----------------------------------|--------------------------------------------|-----------------------------|-------------------|--------------------------------------|-------------------------|
|                                   |                                            | Residential Dwellings       | Employment        | Activity Centre Developable Area [1] | Schools [2]             |
| Black Forest Road South (PSP42.2) | 2 (264)                                    | 255                         | 70                | 1,000sq.m                            |                         |
|                                   | 3 (2894)                                   | 188                         | 19                | -                                    |                         |
|                                   | 4 (1958)                                   | 1,127                       | 113               | -                                    |                         |
|                                   | 5 (2895)                                   | 310                         | 386               | 8,000sq.m                            | 450                     |
|                                   | 6 (1977)                                   | 1,119                       | 112               | -                                    |                         |
|                                   | 7 (1959)                                   | 371                         | 167               | -                                    | 1,500                   |
|                                   | 8 (1960)                                   | 1,442                       | 144               | -                                    |                         |
| <b>Total</b>                      |                                            | <b>4,812 dwellings</b>      | <b>1,011 jobs</b> | <b>9,000sq.m</b>                     | <b>1,950 enrolments</b> |

[1] Traffic generated by the retail floor areas has been added in addition to the MITM traffic volumes.

[2] Primary School = 450 enrolments, Secondary School = 1,100 enrolments, Catholic Primary School = 400 enrolments.

Table 8.1 indicates that the Black Forest Road South PSP Area includes 4,812 dwellings, 1,011 jobs and 1,950 enrolments. Separate to the MITM modelling, a total of 9,000sq.m of retail land uses is anticipated in this PSP (traffic generated from this retail use is in addition to traffic generated in MITM).

**Figure 8.1: Black Forest Road South PSP Area**



## 8.2 Traffic Generation

A summary of the individual land uses and the resulting MITM traffic generation versus a first principles assessment for the Black Forest Road PSP is provided in Table 8.2.

**Table 8.2: Comparison of Land Use and Traffic Generation – Black Forest Road South PSP**

| Land Uses    | Size             | GTA MITM Daily Trips (vpd) | Empirical Data Daily Trips (vpd) [1] |
|--------------|------------------|----------------------------|--------------------------------------|
| Residential  | 4,812 dwellings  | 30,607                     | 32,722                               |
| Employment   | 1,011 jobs       |                            | 3,033                                |
| Enrolments   | 1,950 enrolments |                            | 2,925                                |
| <b>Total</b> |                  | <b>30,607</b>              | <b>38,680</b>                        |

[1] Adopting traffic generation rates of 6.8, 1.5 and 3 vehicle trips per day for the residential (per dwelling), school (per enrolment) and movements per job, respectively.

Table 8.2 indicates that the PSP Area is anticipated to generate 30,607 vehicle trips per day based on the MITM Model and 38,680 trips per day based on a first principles assessment. The results show that the MITM generated traffic movements are similar to those of a first principles assessment and subject to the refinements described in Section 13 are appropriate for assessment purposes.

The anticipated AM and PM peak hour turning movements for the Ballan Road PSP Area are provided in Appendix C.

## 9. Alfred Road (PSP 43)

### 9.1 PSP Area and Land Use Summary

A summary of the Alfred Road PSP land uses and site layout are provided in Table 9.1 and Figure 9.1 respectively. The Alfred Road PSP is generally bound by Westbrook Drive to the south and west, Princes Highway to the east and Bulban Road to the north.

**Table 9.1: Alfred Road PSP Land Use**

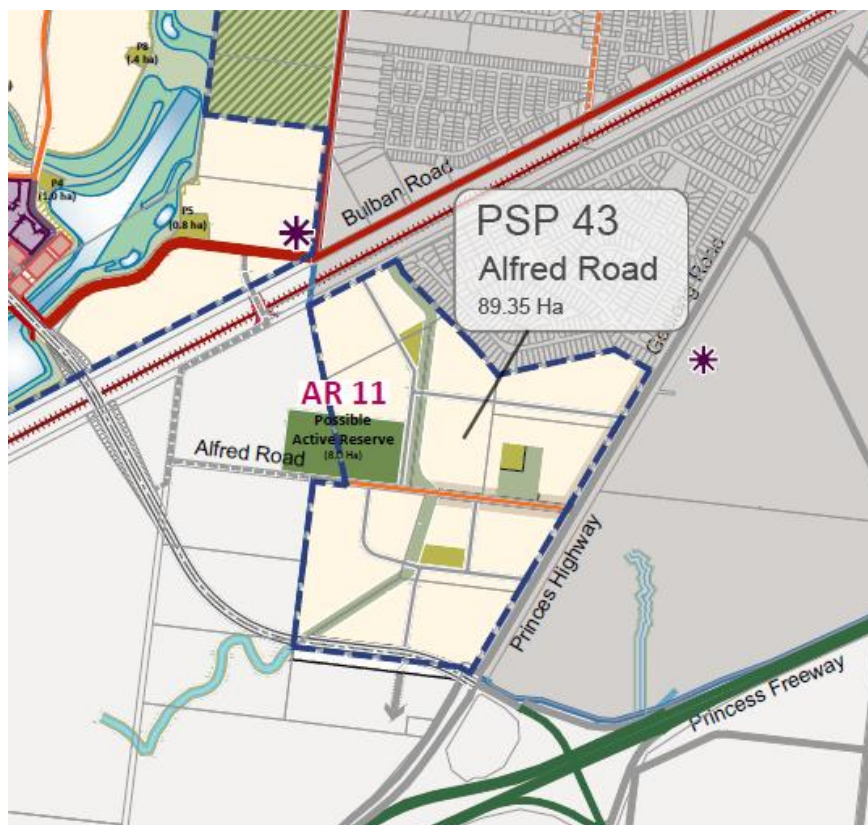
| PSP Area            | GAA Zone / MITM Zone<br>(Refer to Fig 2.1) | Anticipated Land Use Yields |                 |                                      |                     |
|---------------------|--------------------------------------------|-----------------------------|-----------------|--------------------------------------|---------------------|
|                     |                                            | Residential Dwellings       | Employment      | Activity Centre Developable Area [1] | Schools [2]         |
| Alfred Road (PSP43) | 1 (311)                                    | 1,208                       | 166             | 1,500sq.m                            | 0                   |
| <b>Total</b>        |                                            | <b>1,208 dwellings</b>      | <b>166 jobs</b> | <b>1,500sq.m</b>                     | <b>0 enrolments</b> |

[1] Traffic generated by the retail floor areas has been added in addition to the MITM traffic volumes.

[2] Primary School = 450 enrolments, Secondary School = 1,100 enrolments, Catholic Primary School = 400 enrolments.

Table 9.1 indicates that the Alfred Road PSP Area includes 1,208 dwellings, 166 jobs and no enrolments. Separate to the MITM modelling, a total of 1,500sq.m of retail land uses is anticipated in this PSP (traffic generated from this retail use is in addition to traffic generated in MITM).

**Figure 9.1: Alfred Road PSP Area**



## 9.2 Traffic Generation

A summary of the individual land uses and the resulting MITM traffic generation versus a first principles assessment for the Alfred Road PSP is provided in Table 9.2.

**Table 9.2: Comparison of Land Use and Traffic Generation – Alfred Road PSP**

| Land Uses    | Size            | GTA MITM Daily Trips (vpd) | Empirical Data Daily Trips (vpd) [1] |
|--------------|-----------------|----------------------------|--------------------------------------|
| Residential  | 1,208 dwellings | 10,183 [2]                 | 8,214                                |
| Employment   | 166 jobs        |                            | 498                                  |
| Enrolments   | 0 enrolments    |                            | NA                                   |
| <b>Total</b> |                 | <b>10,183</b>              | <b>8,712</b>                         |

[1] Adopting traffic generation rates of 6.8, 1.5 and 3 vehicle trips per day for the residential (per dwelling), school (per enrolment) and movements per job, respectively.

[2] MITM generation includes 1,310 dwellings within zone, taking into account 102 existing dwellings within the MITM Zone (311).

Table 9.2 indicates that that the PSP Area is anticipated to generate 10,183 vehicle trips per day based on the MITM Model and 8,712 trips per day based on a first principles assessment. The results show that the MITM generated traffic movements are similar to those of a first principles assessment and subject to the refinements described in Section 13 are appropriate for assessment purposes.

The anticipated AM and PM peak hour turning movements for the Ballan Road PSP Area are provided in Appendix C.

## 10. Westbrook Drive (PSP92)

### 10.1 PSP Areal and Land Use Summary

A summary of the Westbrook Drive PSP land uses and site layout are provided in Table 10.1 and Figure 10.1 respectively. The Westbrook Drive PSP is generally bound by Ballan Road to the south, Hobbs Road to the east, Werribee River to the north and the OMR to the west.

**Table 10.1: Westbrook Drive PSP Land Use**

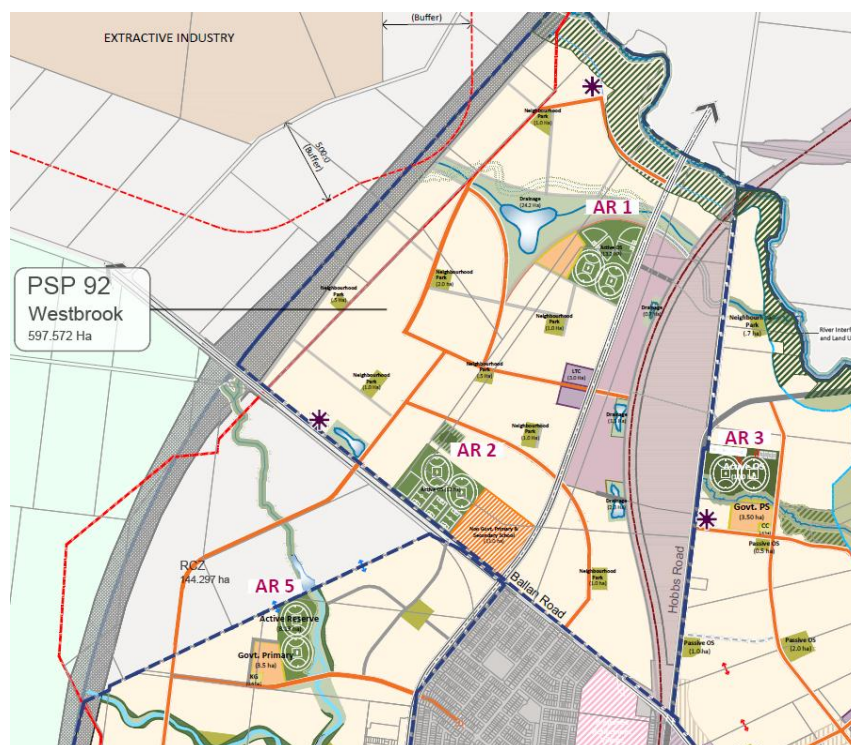
| PSP Area                | GAA Zone / MITM Zone<br>(Refer to Fig 2.1) | Anticipated Land Use Yields |                   |                                      |                         |
|-------------------------|--------------------------------------------|-----------------------------|-------------------|--------------------------------------|-------------------------|
|                         |                                            | Residential Dwellings       | Employment        | Activity Centre Developable Area [1] | Schools [2]             |
| Westbrook Drive (PSP92) | 18 (1954)                                  | 73                          | 97                | -                                    | 1,500                   |
|                         | 19 (259)                                   | 4,040                       | 499               | 1,000sq.m                            | 450                     |
|                         | 20 (1943)                                  | 882                         | 748               | -                                    | 0                       |
|                         | 22 (1944)                                  | 51                          | 315               | 8,000sq.m                            | 0                       |
| <b>Total</b>            |                                            | <b>5,046 dwellings</b>      | <b>1,659 jobs</b> | <b>9,000sq.m</b>                     | <b>1,950 enrolments</b> |

[1] Traffic generated by the retail floor areas has been added in addition to the MITM traffic volumes.

[2] Primary School = 450 enrolments, Secondary School = 1,100 enrolments, Catholic Primary School = 400 enrolments.

Table 10.1 indicates that the Westbrook Drive PSP Area includes 5,046 dwellings, 1,659 jobs and 1,950 enrolments. Separate to the MITM modelling, a total of 9,000sq.m of retail land uses is anticipated in this PSP (traffic generated from this retail use is in addition to traffic generated in MITM).

**Figure 10.1: Westbrook Drive PSP Area**



## 10.2 Traffic Generation

A summary of the individual land uses and the resulting MITM traffic generation versus a first principles assessment for the Westbrook Drive PSP is provided in Table 10.2.

**Table 10.2: Comparison of Land Use and Traffic Generation – Westbrook Drive PSP**

| Land Uses    | Size             | GTA MITM Daily Trips (vpd) | Empirical Data Daily Trips (vpd) [1] |
|--------------|------------------|----------------------------|--------------------------------------|
| Residential  | 5,046 dwellings  | 36,664                     | 34,313                               |
| Employment   | 1,659 jobs       |                            | 4,977                                |
| Enrolments   | 1,950 enrolments |                            | 2,925                                |
| <b>Total</b> |                  | <b>36,664</b>              | <b>42,215</b>                        |

[1] Adopting traffic generation rates of 6.8, 1.5 and 3 vehicle trips per day for the residential (per dwelling), school (per enrolment) and movements per job, respectively.

Table 10.2 indicates that that the PSP Area is anticipated to generate 36,664 vehicle trips per day based on the MITM Model and 42,215 trips per day based on a first principles assessment. The results show that the MITM generated traffic movements are similar to those of a first principles assessment and subject to the refinements described in Section 13 are appropriate for assessment purposes.

The anticipated AM and PM peak hour turning movements for the Ballan Road PSP Area are provided in Appendix C.

## 11. Mambourin East (PSP93) / Stella Land

### 11.1 PSP Area and Land Use Summary

A summary of the Mambourin East PSP land uses and site layout are provided in Table 11.1 and Figure 11.1 respectively. The Mambourin East PSP is generally bound by Bulban Road to the south, RRL to the east, Black Forest Road to the north and the OMR to the west.

**Table 11.1: Mambourin East PSP Land Use / 'Stella' Land**

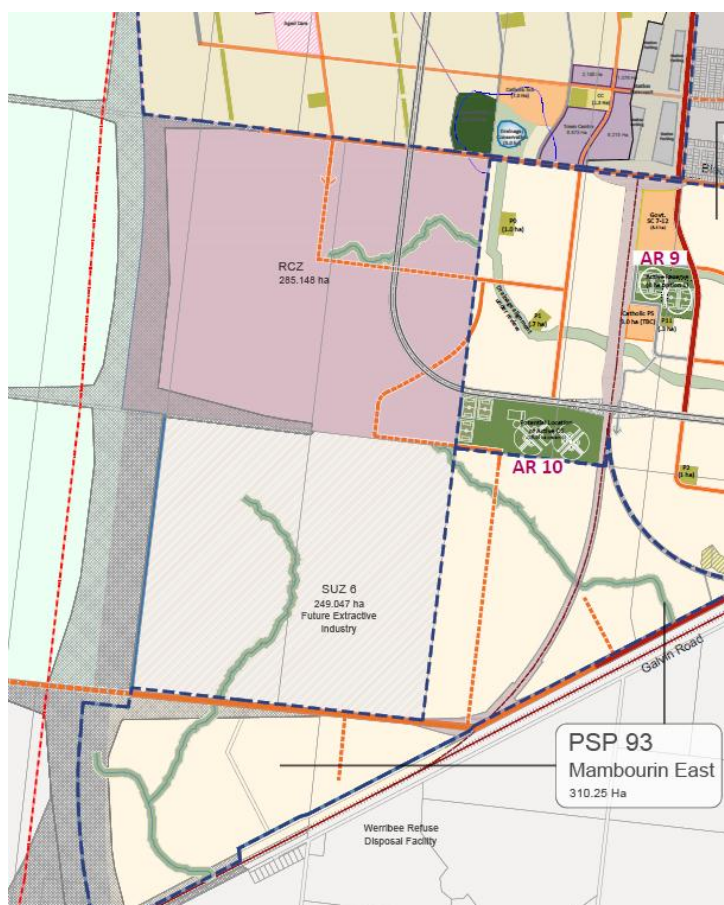
| PSP Area             | MITM Zone<br>(Refer to<br>Fig 2.1) | Anticipated Land Use Yields |                   |                                            |                       |
|----------------------|------------------------------------|-----------------------------|-------------------|--------------------------------------------|-----------------------|
|                      |                                    | Residential<br>Dwellings    | Employment        | Activity Centre<br>Developable<br>Area [1] | Schools<br>[2]        |
| Mambourin<br>(PSP93) | 27 (2514)                          | 1,388                       | 1,389             | -                                          | 450                   |
|                      | 28 (1961)                          | 544                         | 54                | -                                          | 0                     |
| <b>Total</b>         |                                    | <b>1,932 dwellings</b>      | <b>1,443 jobs</b> | <b>-</b>                                   | <b>450 enrolments</b> |

[1] Traffic generated by the retail floor areas has been added in addition to the MITM traffic volumes.

[2] Primary School = 450 enrolments, Secondary School = 1,100 enrolments, Catholic Primary School = 400 enrolments.

Table 11.1 indicates that the Mambourin PSP Area includes 1,932 dwellings, 1,443 jobs and 450 enrolments (including the 'Stella' land). No retail floor area is anticipated for this PSP..

**Figure 11.1: Mambourin PSP Area**



## 11.2 Traffic Generation

A summary of the individual land uses and the resulting MITM traffic generation versus a first principles assessment for the Mambourin East PSP (including 'Stella' land) is provided in Table 11.2.

**Table 11.2: Comparison of Land Use and Traffic Generation – Mambourin PSP / 'Stella' Land**

| Land Uses    | Size            | GTA MITM Daily Trips (vpd) | Empirical Data Daily Trips (vpd) [1] |
|--------------|-----------------|----------------------------|--------------------------------------|
| Residential  | 1,932 dwellings | 16,322                     | 13,138                               |
| Employment   | 1,443 jobs      |                            | 4,329                                |
| Enrolments   | 450 enrolments  |                            | 675                                  |
| <b>Total</b> |                 | <b>16,322</b>              | <b>18,142</b>                        |

[1] Adopting traffic generation rates of 6.8, 1.5 and 3 vehicle trips per day for the residential (per dwelling), school (per enrolment) and movements per job, respectively.

Table 11.2 indicates that the PSP Area is anticipated to generate 16,322 vehicle trips per day based on the MITM Model and 18,142 trips per day based on a first principles assessment. The results show that the MITM generated traffic movements are similar to those of a first principles assessment and subject to the refinements described in Section 13 are appropriate for assessment purposes.

The anticipated AM and PM peak hour turning movements for the Ballan Road PSP Area are provided in Appendix C.

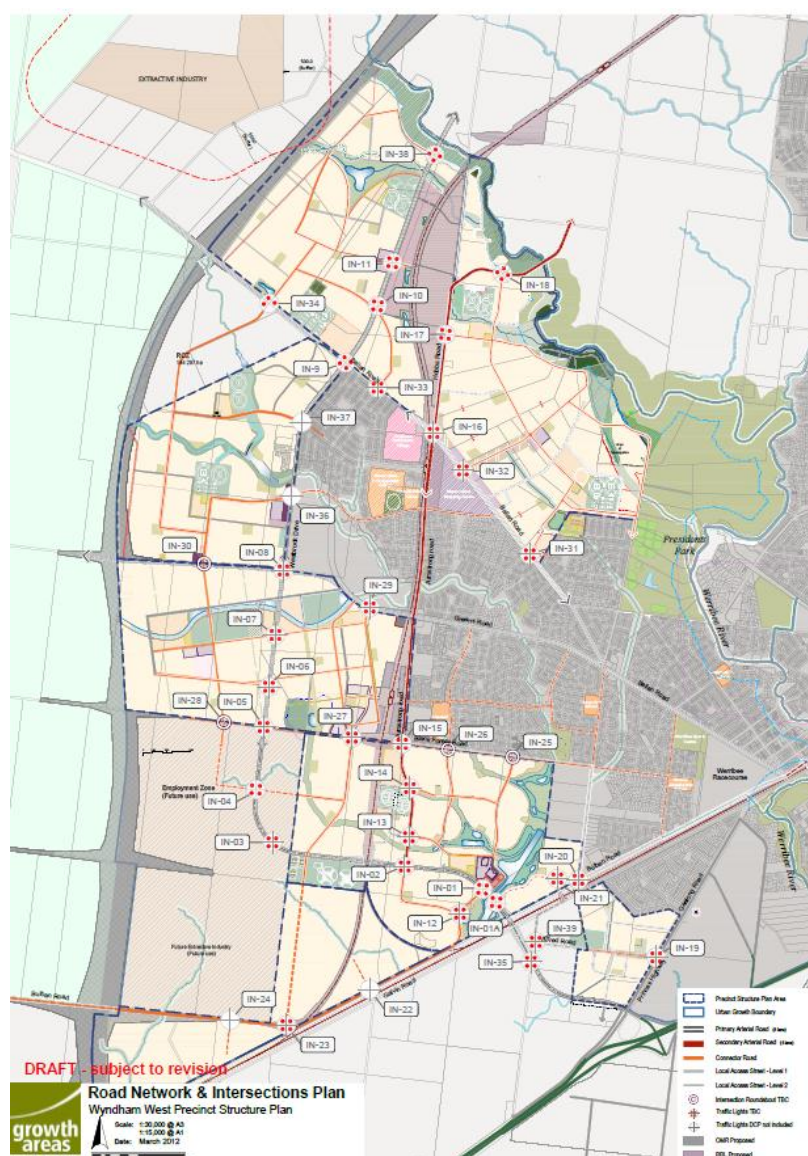
## 12. PSP Road Network

### 12.1 Road Hierarchy

#### 12.1.1 Overview

The anticipated road connections to the surrounding arterial road network are summarised in Figure 12.1. It is noted that VicRoads has indicated that both Ballan Road and Westbrook Drive will be configured with 6-lanes. Modelling undertaken as part of this assessment indicates that from a capacity point of view Ballan Road and Westbrook Drive will only require 4-lanes each. The additional lanes required by VicRoads could be used as dedicated public transport lanes and as such, 6-lane cross-sections have been assumed for future planning purposes.

Figure 12.1: PSP Road Network and DCP Intersection



(Base Plan provided by GAA)

The PSP proposes a road hierarchy that utilises existing roads where possible as well as new strategic links. As highlighted in the previous section, Ballan Road, Greens Road and Bulban Road (all existing roads) are to be upgraded and extended to form arterial roads throughout the site and the broader road network. Black Forest Road will be retained and function as a higher order Council road. Westbrook Drive will form the main north-south arterial route through the PSP Area, whilst Armstrong Road will form a lower order north-south link road. The proposed road network within the PSP will adopt a grid spacing which is similar to that observed on the road network surrounding the site, noting that the irregular nature of the existing road network means that a perfect grid network cannot be formed.

The modified arterial road network is anticipated to operate satisfactorily given the anticipated PSP traffic generation which are discussed in the previous sections and further analysed in the following sections.

### 12.1.2 Future Freeway Interchanges

As described above, it is anticipated that there will be full diamond interchanges located at Ballan Road and Greens Road. An additional interchange is proposed for either Bulban Road or Kirks Bridge Road, for assessment purposes it has been assumed that the interchange will be located at Bulban Road. It is noted that the OMR is not anticipated to be completed in the interim 2021 scenario.

### 12.1.3 Regional Rail Link / Armstrong Road Corridor

As previously discussed, the Regional Rail Link is proposed to travel through the Wyndham West area generally in a north-south alignment adjacent to Armstrong Road. As part of the development of the RRL, a number of intersections and bridge crossings have been proposed to maintain east-west links across the rail line. Whilst the proposed bridge crossings do not generally impede on the ability to provide for necessary intersections, given the proximity of the Armstrong Road / Ballan Road intersection to the RRL (approximately <50m spacing) further consideration has been needed in order to identify how the proposed intersection can be designed to accommodate the necessary traffic volumes within the constraints of the proposed Ballan Road railway bridge.

In this regard, a review of the proposed RRL intersection design indicates that there may be scope to incorporate up to 4 traffic lanes across the bridge and a design that accounts for this constraint has been developed as illustrated in Table 12.2 (IN16). Further refinement of this design may be needed at the design stage to ensure that all components are capable of being supported having regard to the associated intersection constraints.

## 12.2 Anticipated PSP Cross Sections

The GAA has a series of road cross-sections for PSP's. The following cross-sections will be applied to the various Wyndham West PSP's, noting that there will be requirements for flaring/widening at the intersections.

Table 12.1 sets out the proposed ultimate road reserve widths by road type and cross-section name to link the GAA road cross section terminology with the appropriate planning scheme reference. These road reserve widths will require further widening at intersections to accommodate flaring for extra lanes.

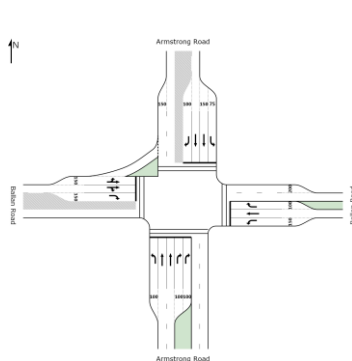
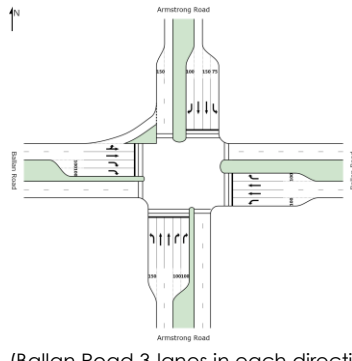
**Table 12.1: Wyndham West PSP Road Cross-sections**

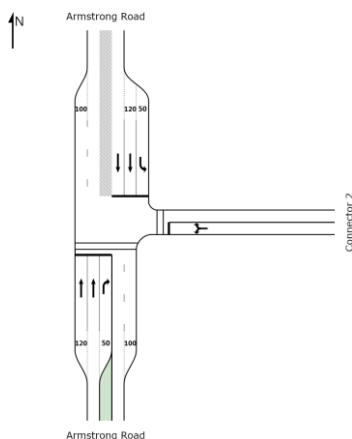
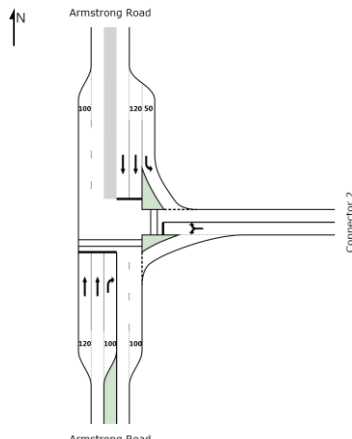
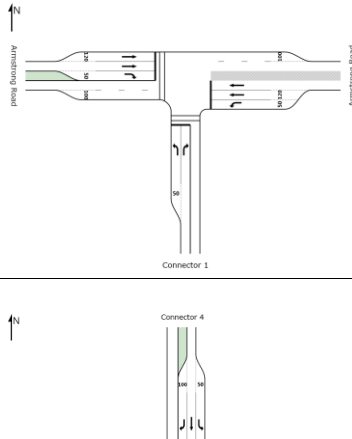
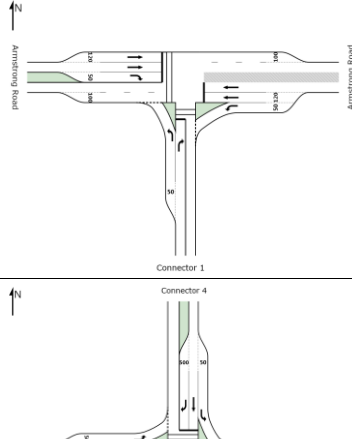
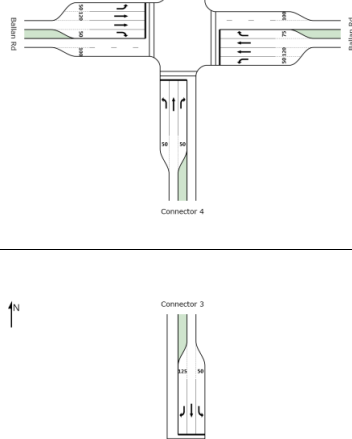
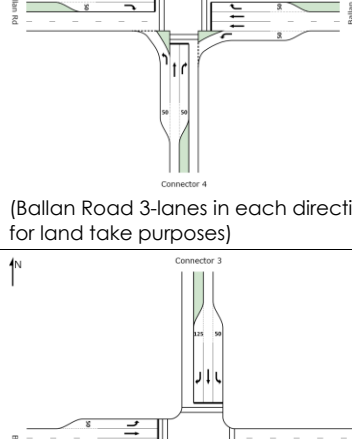
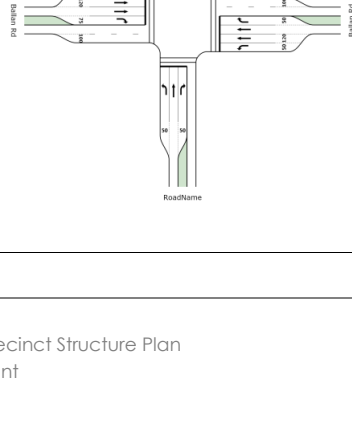
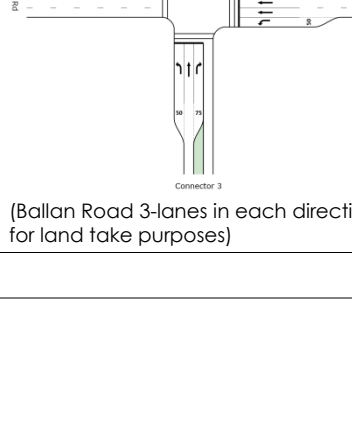
| GAA Road Cross-section Title (ultimate)       | Description                                                                                                                                                          | Anticipated 2046 Daily Traffic Volumes (MITM) | Planning Scheme CI56.06 Table C1 Reference |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------|
| 6 lane arterial 41m                           | Westbrook Drive                                                                                                                                                      | ~25,000vpd                                    | Arterial Road                              |
|                                               | Ballan Road                                                                                                                                                          | ~30,000vpd                                    | Arterial Road                              |
| 4 lane arterial 34m                           | Armstrong Road between Manor Lakes and Ballan Road                                                                                                                   | ~22,500vpd                                    | Arterial Road                              |
|                                               | Greens Road                                                                                                                                                          | ~14,000vpd                                    | Arterial Road                              |
| 2 lane arterial                               | Black Forest Road                                                                                                                                                    | ~10,000vpd                                    | Arterial Road                              |
|                                               | Bulban Road                                                                                                                                                          | ~5,000vpd                                     | Arterial Road                              |
|                                               | Armstrong Road                                                                                                                                                       | ~16,000vpd                                    | Arterial Road                              |
| Connector Street (Residential) 31m            | Connector streets with Boulevard Treatments                                                                                                                          | Up to ~12,000vpd                              | Connector Street                           |
| Connector Street (Residential) 25m            | Various residential Connector Streets                                                                                                                                | Up to ~7,000vpd                               | Connector Street – Level 2                 |
|                                               | Connector Streets within the Activity Centre, the standard residential Connector Street cross-section will be modified to enhance amenity within the Activity Centre | Up to ~7,000vpd                               | Connector Street – Level 2                 |
| Access Street Level 2 20m                     | Various access streets through the PSP that generally connect to the connector street network                                                                        | 2,000 to 3,000vpd                             | Access Street Level 2                      |
| Access Place/Access Street, Level 1 – 16m-21m | Lower order local roads that facilitate residential access                                                                                                           | 0 – 2,000vpd                                  | Access Street Level 1                      |

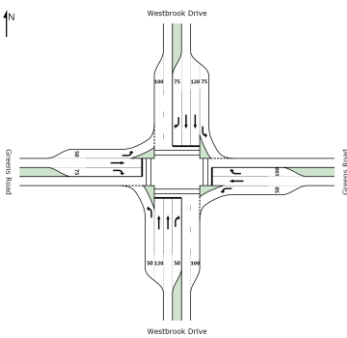
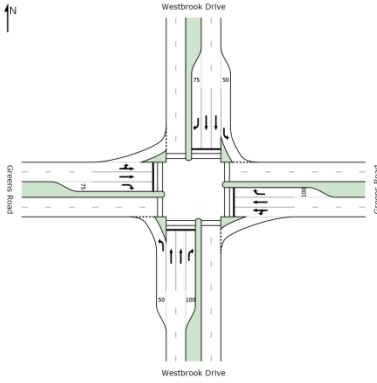
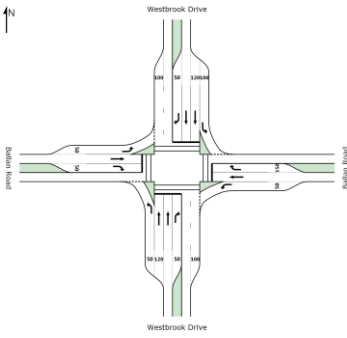
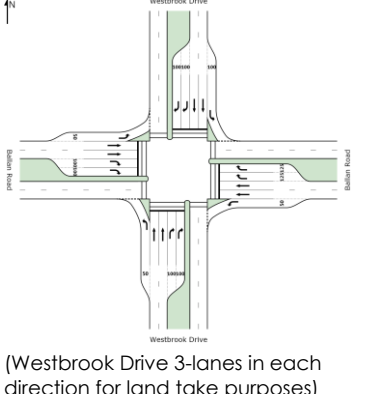
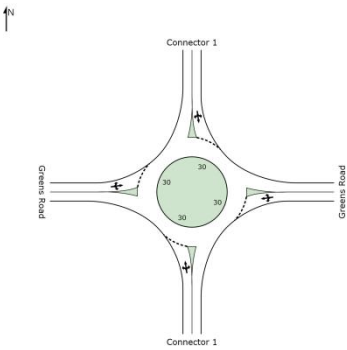
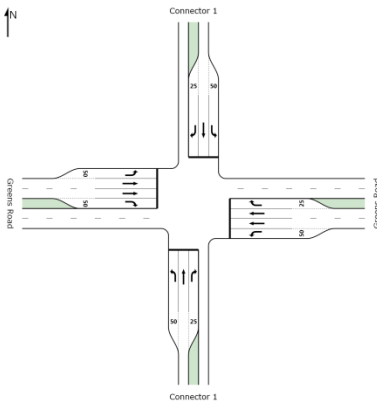
## 12.3 Anticipated Interim and Ultimate Intersection Provisions

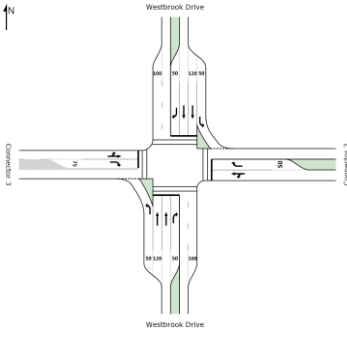
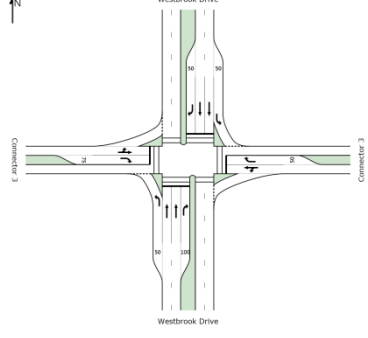
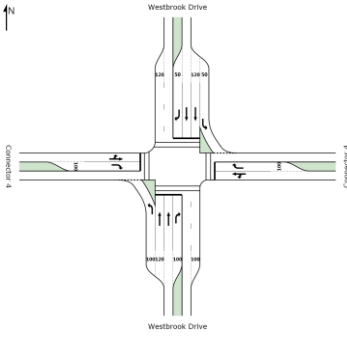
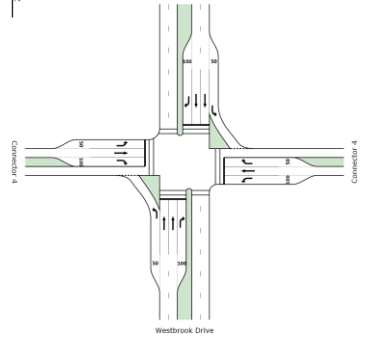
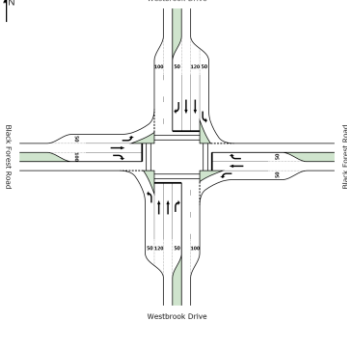
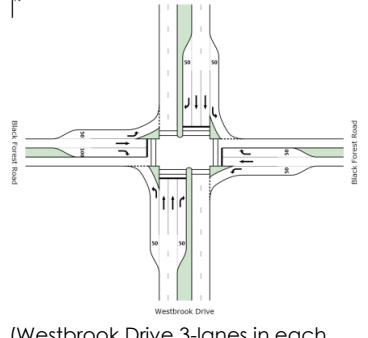
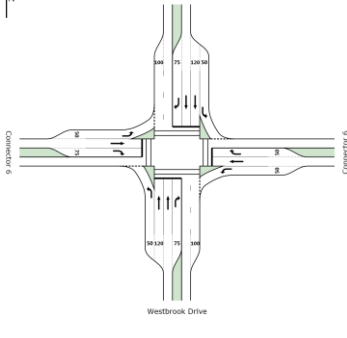
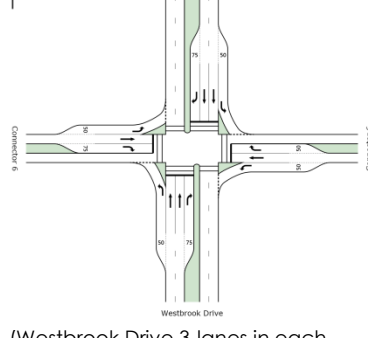
The anticipated layouts and differences between the DCP intersections in the interim and ultimate cases is summarised below in Table 12.2 and provided in Appendix D. The cross-sections proposed will accommodate the anticipated traffic.

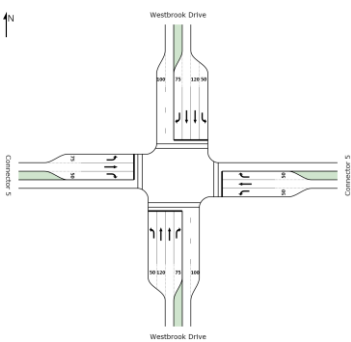
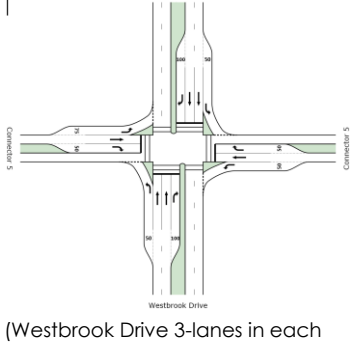
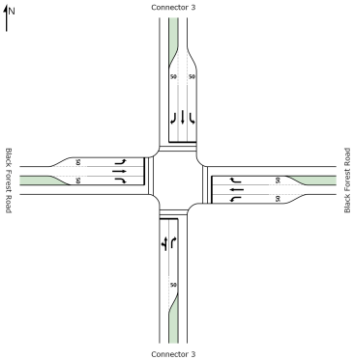
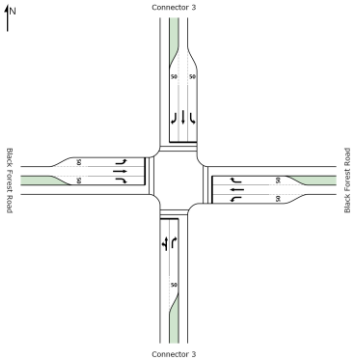
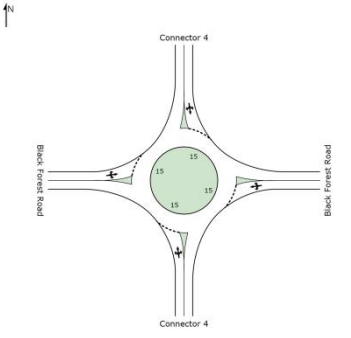
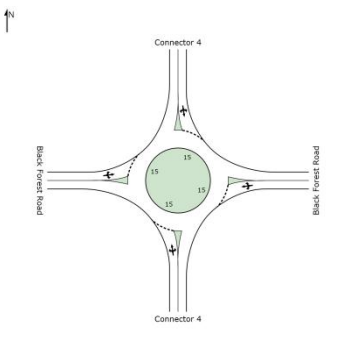
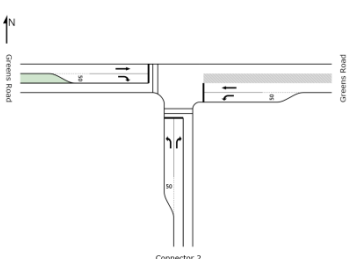
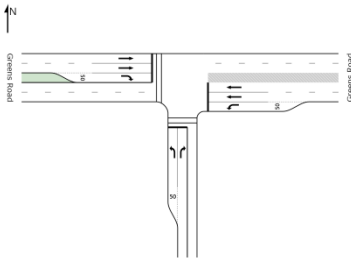
**Table 12.2: Interim versus Ultimate Intersection Layout**

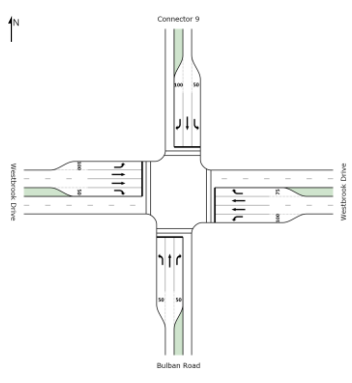
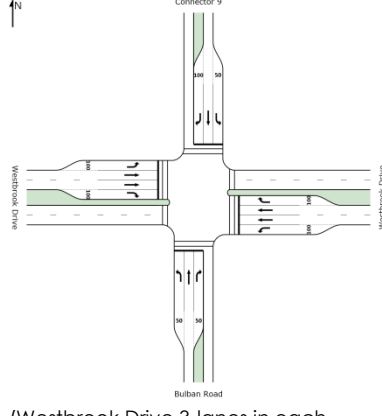
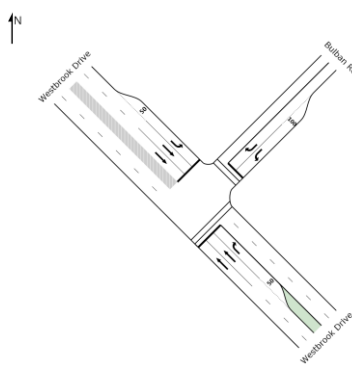
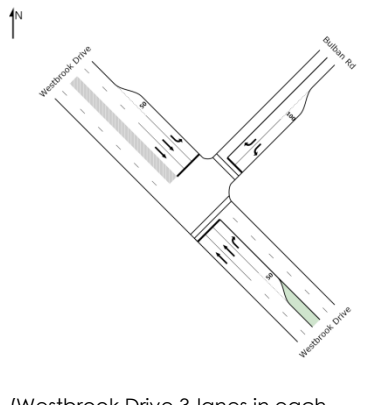
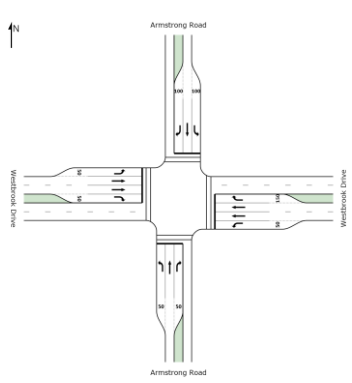
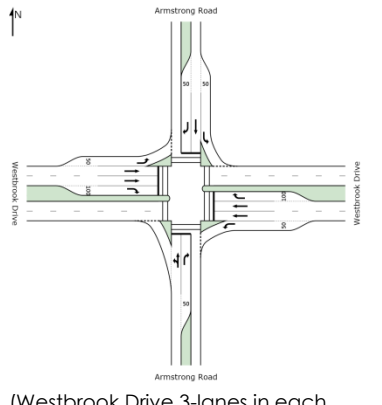
| Intersection                       | Interim Layout                                                                      | Ultimate Layout                                                                      | Additional Requirements for Ultimate Layout                                                                                                                                                  |
|------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PSP40                              |                                                                                     |                                                                                      |                                                                                                                                                                                              |
| Armstrong Road/ Ballan Road (IN16) |  |  | <ul style="list-style-type: none"> <li>Extension of short through lanes to full lanes (i.e. Ballan Road to be 4-lane road)</li> <li>Additional right turn lane from west to south</li> </ul> |

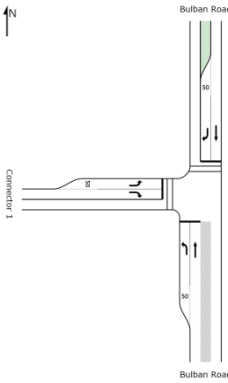
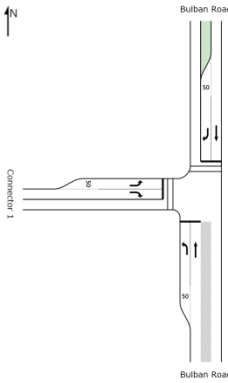
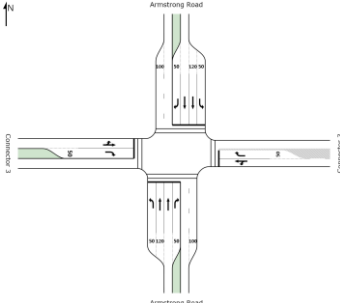
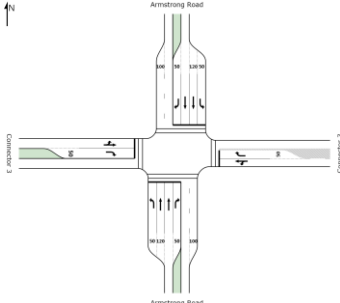
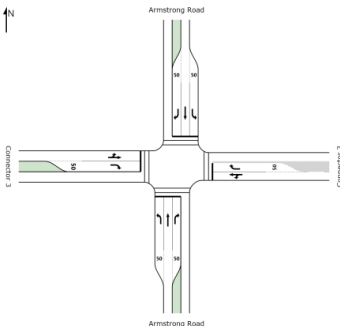
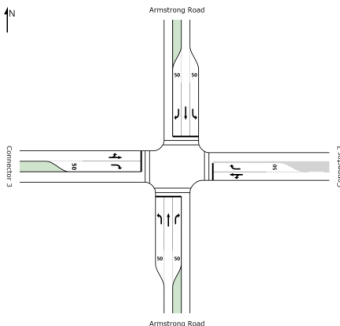
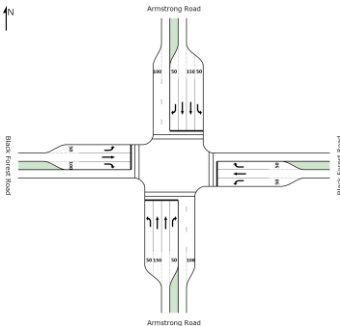
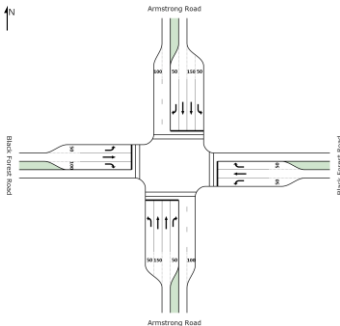
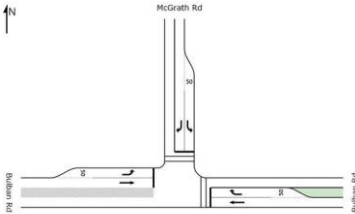
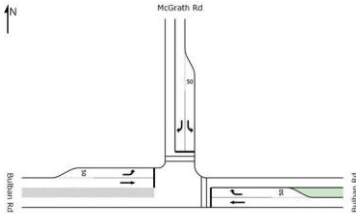
| Intersection                        | Interim Layout                                                                      | Ultimate Layout                                                                                                                                        | Additional Requirements for Ultimate Layout                                                                                             |
|-------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Armstrong Road/<br>Connector (IN17) |    |                                                                      | <ul style="list-style-type: none"> <li>• Addition of slip lanes on north and east approach</li> </ul>                                   |
| Armstrong Road/<br>Connector (IN18) |   |                                                                     | <ul style="list-style-type: none"> <li>• Additional of slip lanes on east and south approach</li> </ul>                                 |
| Ballan Road/<br>Connector (IN31)    |  | <br>(Ballan Road 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>• Extension of short through lanes to full lanes (i.e. Ballan Road to be 4-lane road)</li> </ul> |
| Ballan Road/<br>Connector (IN32)    |  | <br>(Ballan Road 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>• Extension of short through lanes to full lanes (i.e. Ballan Road to be 4-lane road)</li> </ul> |

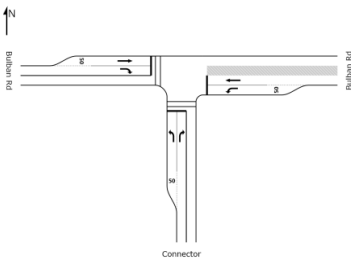
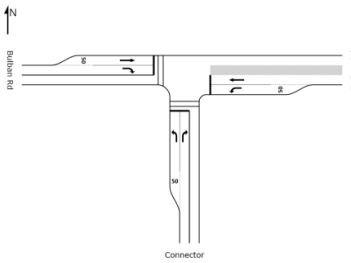
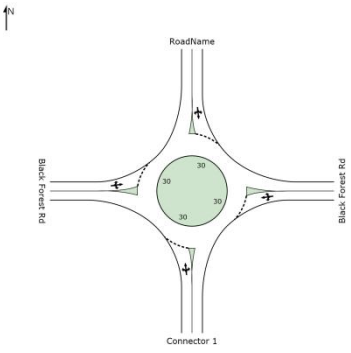
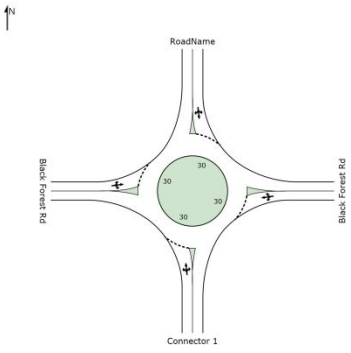
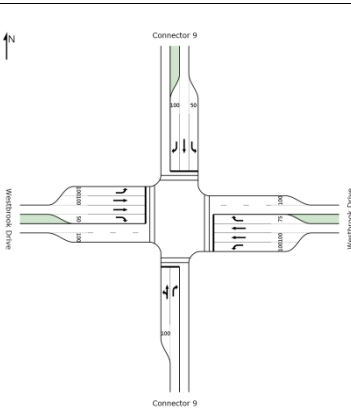
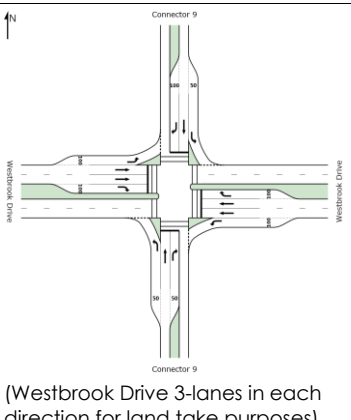
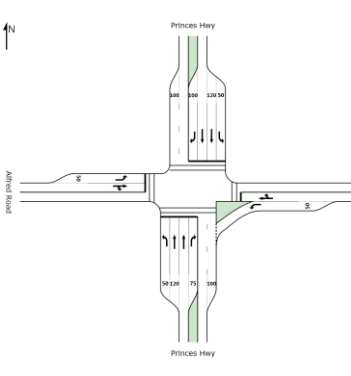
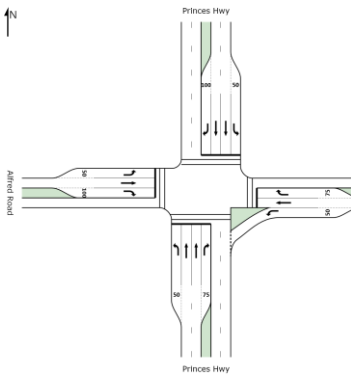
| Intersection                        | Interim Layout                                                                      | Ultimate Layout                                                                                                                                                                                                                  | Additional Requirements for Ultimate Layout                                                                                                                                                                                                                         |
|-------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PSP 41                              |                                                                                     |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                     |
| Westbrook Drive/ Greens Road (IN08) |    |  <p>(Westbrook Drive 3-lanes in each direction for land take purposes)</p>                                                                     | <ul style="list-style-type: none"> <li>• Duplication of through lanes on east and west approaches</li> <li>• Extension of short through lanes to full lanes (i.e. Westbrook Drive to be 4-lane road)</li> <li>• Addition of slip lanes on all approaches</li> </ul> |
| Westbrook Drive/ Ballan Road (IN09) |   |  <p>(Westbrook Drive 3-lanes in each direction for land take purposes)<br/>(Ballan Road 3-lanes in each direction for land take purposes)</p> | <ul style="list-style-type: none"> <li>• Duplication of through lanes on Ballan Road and Westbrook Drive</li> <li>• Duplication of right turn lanes on all approaches</li> <li>• Extension of through lanes on Westbrook Drive</li> </ul>                           |
| Greens Road/ Connector 1 (IN30)     |  |                                                                                                                                              | <ul style="list-style-type: none"> <li>• Conversion to a signalised intersection</li> <li>• Duplication of through lanes on east and west approaches</li> </ul>                                                                                                     |

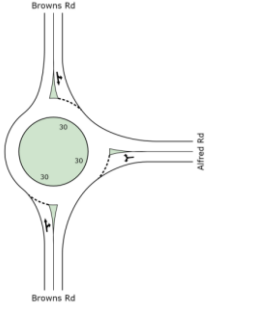
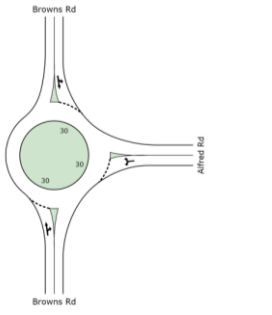
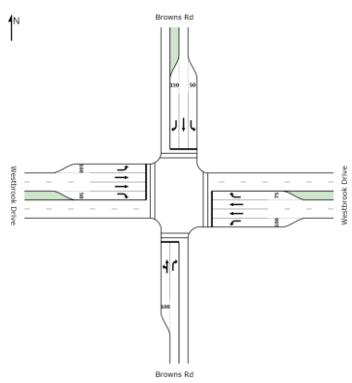
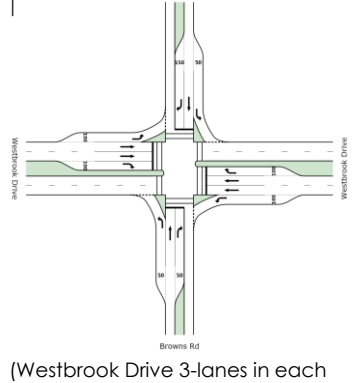
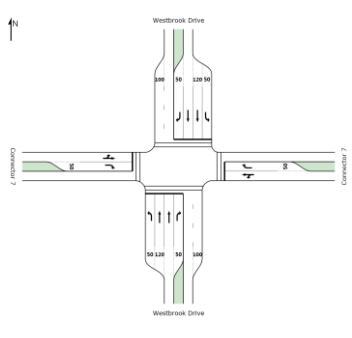
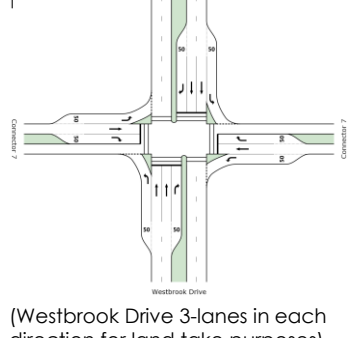
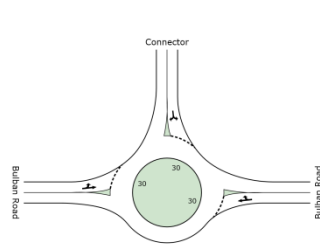
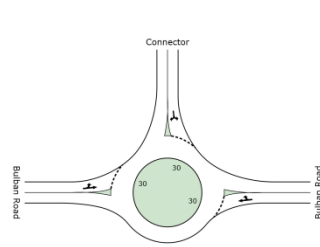
| Intersection                              | Interim Layout                                                                      | Ultimate Layout                                                                                                                                            | Additional Requirements for Ultimate Layout                                                                                                                                                                       |
|-------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Westbrook Drive/<br>Connector (IN37)      |    | <br>(Westbrook Drive 3-lanes in each direction for land take purposes)   | <ul style="list-style-type: none"> <li>Extension of through lanes on north and south approaches</li> <li>Additional of left-turn slip lanes on east and west approaches</li> </ul>                                |
| Westbrook Drive/<br>Connector (IN36)      |   | <br>(Westbrook Drive 3-lanes in each direction for land take purposes)  | <ul style="list-style-type: none"> <li>Extension of short through lanes to full lanes (i.e. Westbrook Drive to be 4-lane road)</li> <li>Addition of left-turn slip lanes on north and south approaches</li> </ul> |
| PSP42.1                                   |                                                                                     |                                                                                                                                                            |                                                                                                                                                                                                                   |
| Westbrook Drive/ Black Forest Road (IN05) |  | <br>(Westbrook Drive 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>Extension of through lanes on north and south approaches</li> </ul>                                                                                                        |
| Westbrook Drive/<br>Connector (IN06)      |  | <br>(Westbrook Drive 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>Extension of through lanes on north and south approaches</li> </ul>                                                                                                        |

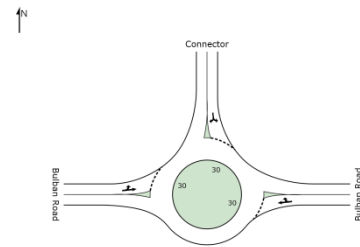
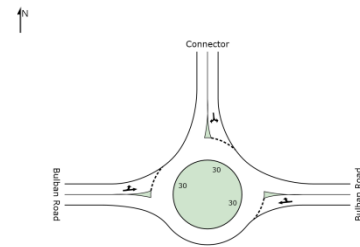
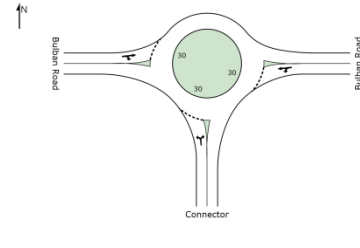
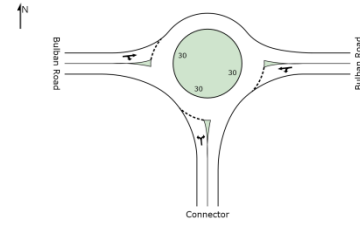
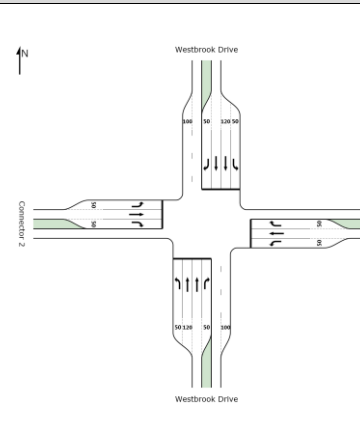
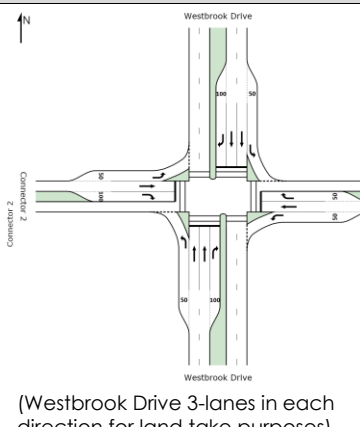
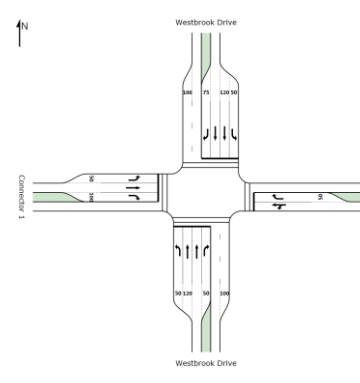
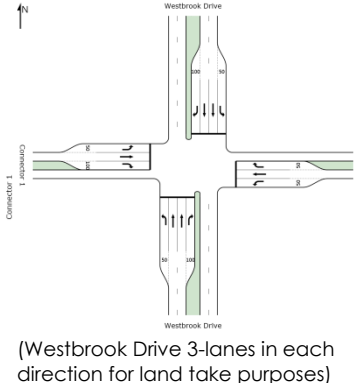
| Intersection                           | Interim Layout                                                                      | Ultimate Layout                                                                                                                                          | Additional Requirements for Ultimate Layout                                                                                                                            |
|----------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Westbrook Drive/<br>Connector (IN07)   |    | <br>(Westbrook Drive 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>Extension of through lanes on north and south approaches</li> <li>Addition of left-turn slip lanes on all approaches</li> </ul> |
| Black Forest Road/<br>Connector (IN27) |   |                                                                       | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                                                                            |
| Black Forest Road/<br>Connector (IN28) |  |                                                                      | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                                                                            |
| Greens Road/<br>Connector (IN29)       |  |                                                                      | <ul style="list-style-type: none"> <li>Duplication of through lanes on east and west approach</li> </ul>                                                               |

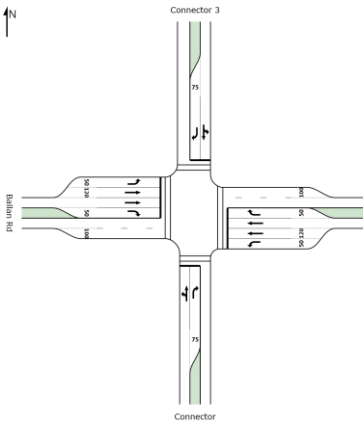
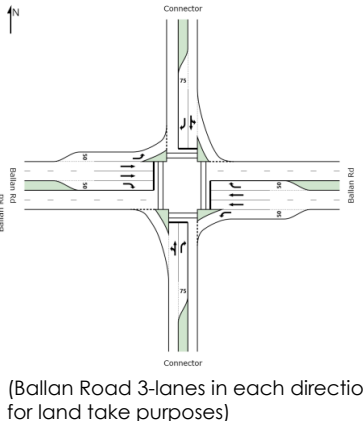
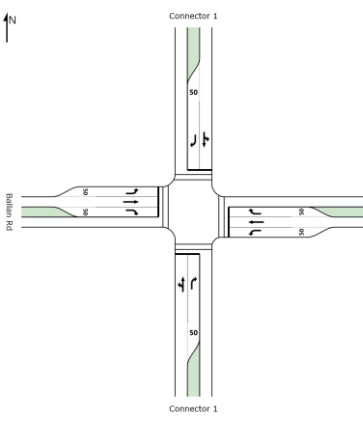
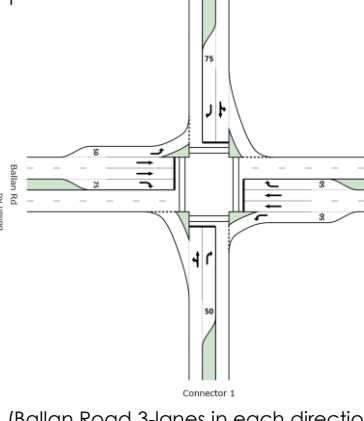
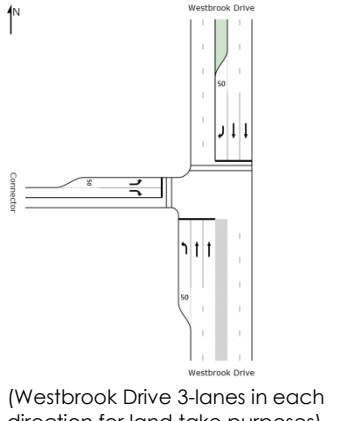
| Intersection                           | Interim Layout                                                                      | Ultimate Layout                                                                                                                                                | Additional Requirements for Ultimate Layout                                                          |
|----------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| PSP 42.2                               |                                                                                     |                                                                                                                                                                |                                                                                                      |
| Westbrook Drive/ Bulban Road (IN01)    |    |  <p>(Westbrook Drive 3-lanes in each direction for land take purposes)</p>   | <ul style="list-style-type: none"> <li>No change</li> </ul>                                          |
| Bulban Road/ Westbrook Drive (IN01A)   |   |  <p>(Westbrook Drive 3-lanes in each direction for land take purposes)</p>  | <ul style="list-style-type: none"> <li>No change</li> </ul>                                          |
| Westbrook Drive/ Armstrong Road (IN02) |  |  <p>(Westbrook Drive 3-lanes in each direction for land take purposes)</p> | <ul style="list-style-type: none"> <li>Addition of left-turn slip lanes on all approaches</li> </ul> |

| Intersection                                | Interim Layout                                                                      | Ultimate Layout                                                                      | Additional Requirements for Ultimate Layout                 |
|---------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Bulban Road/<br>Armstrong Road (IN12)       |    |    | <ul style="list-style-type: none"> <li>No change</li> </ul> |
| Armstrong Road /<br>Connector (IN13)        |   |   | <ul style="list-style-type: none"> <li>No change</li> </ul> |
| Armstrong Road /<br>Connector (IN14)        |  |  | <ul style="list-style-type: none"> <li>No change</li> </ul> |
| Black Forest Road/<br>Armstrong Road (IN15) |  |  | <ul style="list-style-type: none"> <li>No change</li> </ul> |
| Bulban Road/<br>McGrath Rd (IN 20)          |  |  | <ul style="list-style-type: none"> <li>No change</li> </ul> |

| Intersection                                 | Interim Layout                                                                      | Ultimate Layout                                                                                                                                            | Additional Requirements for Ultimate Layout                                                                                                                                                           |
|----------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bulban Road/<br>Connector<br>(IN21)          |    |                                                                          | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                                                                                                           |
| Black Forest Road/<br>Connector<br>(IN25/26) |   |                                                                         | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                                                                                                           |
| Westbrook Drive/<br>Connector<br>(IN03)      |  | <br>(Westbrook Drive 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>Extension of short through lanes to full lanes (i.e. Westbrook Drive to be 4-lane road)</li> <li>Addition of left turn slip lanes on all approaches</li> </ul> |
| PSP 43                                       |                                                                                     |                                                                                                                                                            |                                                                                                                                                                                                       |
| Alfred Road/<br>Princes Highway<br>(IN19)    |  |                                                                        | <ul style="list-style-type: none"> <li>Extension of through lanes on Princes Hwy (north and south approaches)</li> </ul>                                                                              |

| Intersection                           | Interim Layout                                                                      | Ultimate Layout                                                                                                                                            | Additional Requirements for Ultimate Layout                                                                                                                                |
|----------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alfred Road/<br>Browns Rd<br>(IN39)    |    |                                                                          | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                                                                                |
| Browns Road/<br>Westbrook Drive (IN35) |   | <br>(Westbrook Drive 3-lanes in each direction for land take purposes)  | <ul style="list-style-type: none"> <li>Addition of left-turn slip lanes on all approaches</li> </ul>                                                                       |
| PSP 93                                 |                                                                                     |                                                                                                                                                            |                                                                                                                                                                            |
| Westbrook Drive/<br>Connector (IN04)   |  | <br>(Westbrook Drive 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>Extension of through lanes on the north and south approaches</li> <li>Addition of left turn slip lanes on all approaches</li> </ul> |
| Bulban Road/<br>Connector (IN22)       |  |                                                                        | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                                                                                |

| Intersection                            | Interim Layout                                                                      | Ultimate Layout                                                                                                                                            | Additional Requirements for Ultimate Layout                                                                  |
|-----------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Bulban Road/<br>Connector<br>(IN23)     |    |                                                                          | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                  |
| Bulban Road/<br>Connector<br>(IN24)     |    |                                                                          | <ul style="list-style-type: none"> <li>No change</li> </ul>                                                  |
| PSP 92                                  |                                                                                     |                                                                                                                                                            |                                                                                                              |
| Westbrook Drive/<br>Connector<br>(IN10) |   | <br>(Westbrook Drive 3-lanes in each direction for land take purposes)  | <ul style="list-style-type: none"> <li>Extension of through lanes on the north and south approach</li> </ul> |
| Westbrook Drive/<br>Connector<br>(IN11) |  | <br>(Westbrook Drive 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>Extension of through lanes on the north and south approach</li> </ul> |

| Intersection                                      | Interim Layout                                                                     | Ultimate Layout                                                                                                                                            | Additional Requirements for Ultimate Layout                                                                                                                                      |
|---------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ballan Road/<br>Connector Road (IN33)             |   | <br>(Ballan Road 3-lanes in each direction for land take purposes)       | <ul style="list-style-type: none"> <li>Extension of through lanes on east and west approaches</li> <li>Addition of left-turn slip lanes on all approaches</li> </ul>             |
| Ballan Road/<br>Connector Road (IN34)             |  | <br>(Ballan Road 3-lanes in each direction for land take purposes)      | <ul style="list-style-type: none"> <li>Duplication of through lanes on Ballan Rd (east and west approach)</li> <li>Addition of left-turn slip lanes on all approaches</li> </ul> |
| Westbrook Drive/<br>Connector Intersection (IN38) | Not Assessed                                                                       | <br>(Westbrook Drive 3-lanes in each direction for land take purposes) | <ul style="list-style-type: none"> <li>New intersection (Westbrook Drive terminates at the intersection in the interim)</li> </ul>                                               |

## 13. Road Network Assessment

### 13.1 Traffic Volumes

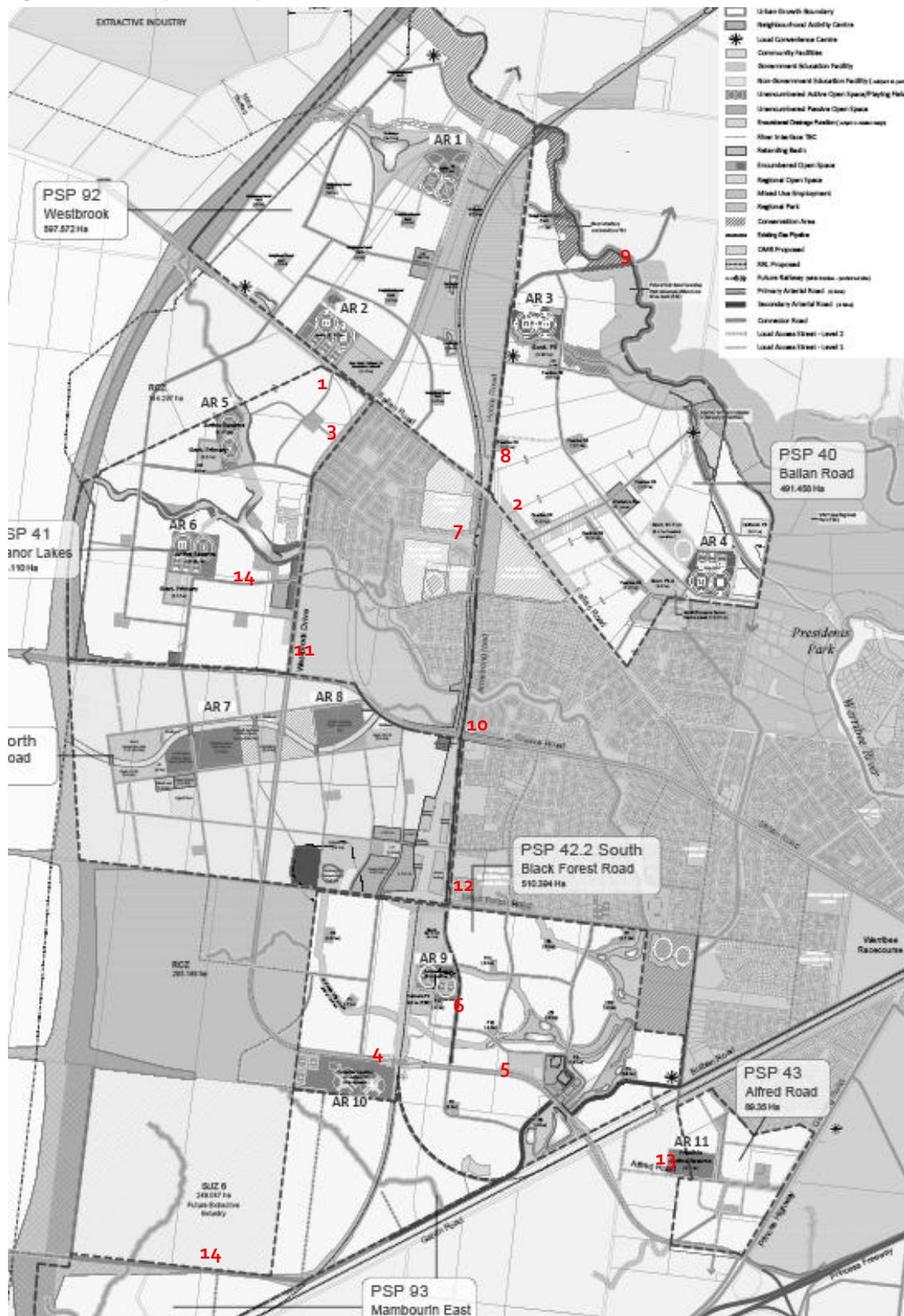
#### 13.1.1 Road Infrastructure Requirements

In order to identify the road infrastructure requirements (number of lanes) for each of the key roads within the precinct reference has been made to the daily traffic volume thresholds provided in the Austroads Guidelines which are summarised as follows:

- Two-lane road: 18,000 vehicles per day
- Four-lane road: 36,000 vehicles per day
- Six-lane road: 54,000 vehicles per day.

Based on the above thresholds and the daily MITM volumes at key locations (illustrated in Figure 13.1) the relevant lane requirements for each of the key roads is summarised in Table 13.1.

Figure 13.1: Anticipated Daily Traffic Volumes Location Points



(Base Plan provided by GAA)

Table 13.1: Daily Traffic Volumes – Key Locations

| Location | Road                                 | Interim Daily Traffic Volumes (2021) |                  | Ultimate Daily Traffic Volumes (2046) |                  |
|----------|--------------------------------------|--------------------------------------|------------------|---------------------------------------|------------------|
|          |                                      | MITM                                 | No. of Lanes [1] | MITM                                  | No. of Lanes [1] |
| 1        | Ballan Rd west of Westbrook Dve      | 3,300                                | 2                | 19,600                                | 4-6              |
| 2        | Ballan Rd east of Armstrong Rd       | 17,000                               | 2                | 23,600                                | 4-6              |
| 3        | Westbrook Dve south of Ballan Rd     | 12,000                               | 2                | 21,000                                | 4-6              |
| 4        | Westbrook Dve west of Armstrong Rd   | 20,500                               | 2                | 15,500                                | 4-6              |
| 5        | Westbrook Dve east of Armstrong Rd   | 28,200                               | 2                | 22,100                                | 4-6              |
| 6        | Armstrong Rd north of Westbrook Dve  | 13,400                               | 2                | 11,100                                | 2                |
| 7        | Armstrong Rd south of Ballan Rd      | 17,100                               | 2                | 22,500                                | 4                |
| 8        | Hobbs Road north of Ballan Road      | 9,400                                | 2                | 18,700                                | 2                |
| 9        | Hobbs Road at Werribee River         | 16,300                               | 2                | 19,300                                | 2                |
| 10       | Greens Rd east of Armstrong Rd       | 11,700                               | 2                | 9,800                                 | 2-4              |
| 11       | Greens Rd east of Westbrook Dve      | 7,200                                | 2                | 4,200                                 | 2-4              |
| 12       | Black Forest Rd east of Armstrong Rd | 5,600                                | 2                | 3,700                                 | 2                |
| 13       | Alfred Road                          | 7,100                                | 2                | 4,300                                 | 2                |
| 14       | Bulban Road (east of OMR)            | 4,000                                | 2                | 2,900                                 | 2-4              |

[1] Subject to further discussions between VicRoads, Council and GAA.

## 13.2 Interim Daily Traffic Volumes

### 13.2.1 Arterial Road Network

#### Ballan Road

Daily traffic volumes on Ballan Road are anticipated to conservatively vary between 10,000vpd and 18,000vpd. The anticipated traffic volumes are at the upper limit for a two-way (one-lane in each direction) arterial road, whereby consideration to increase the capacity may be required.

Notwithstanding, road capacity is rarely limited by the mid-block capacity but rather the intersections along it. In this regard additional capacity (short through traffic lanes and turning lanes) may be provided at intersections along Ballan Road in the interim.

#### Greens Road

Daily traffic volumes on Greens Road are anticipated to conservatively vary between 8,000vpd and 17,000vpd. The anticipated traffic volumes are within the indicative threshold of a two-way (one-lane in each direction) arterial road.

### Black Forest Road

Daily traffic volumes on Black Forest Road are anticipated to be in the order of 2,000 to 10,000vpd. As such, Black Forest Road is anticipated to continue to operate as a higher order council road (connector street).

### Bulban Road

Daily traffic volumes on Bulban Road are anticipated to vary between approximately 8,000vpd at its eastern end near Ballan Road and 4,000vpd at its western end near the RRL. As such, Bulban Road is anticipated to continue to operate as a higher order council road (connector street).

### Armstrong Road

In order to assess the likely traffic volumes that would utilise Armstrong Road its link capacity has been coded to reflect a 4-lane arterial road. By modelling Armstrong Road in this fashion, provides an indication of the maximum number of vehicles that would wish to utilise this route and in reality, particularly if Armstrong Road were ultimately provided as a two-lane road, there would be an element of traffic that would be redistributed to the higher capacity Westbrook Drive. Notwithstanding, even adopting the traffic volumes provided by the model, daily traffic volumes on Armstrong Road are anticipated to conservatively vary between 13,000vpd and 17,000vpd. The anticipated traffic volumes are at the upper limit for a two-way (one-lane in each direction) arterial road.

In addition, it is noted that existing physical constraints along the Armstrong Road corridor may restrict this road to a two-lane road.

### Westbrook Drive

Daily traffic volumes on Westbrook Drive are anticipated to conservatively vary between 34,000vpd at its southern end and 20,000vpd near Ballan Road. The anticipated traffic volumes north of Black Forest Road are at the upper limit for a two-way (one-lane in each direction) arterial road, whereby consideration to increase the capacity of the roads may be required. Between Black Forest Road and the Princes Freeway interchange the anticipated traffic volumes are likely to warrant a four-lane divided carriageway for Westbrook Drive. In addition, consideration could be given to providing Westbrook Drive as a four-lane divided road north of Black Forest Road in the interim to reduce traffic on Armstrong Road and any resultant need to upgrade Armstrong Road beyond a two-lane road.

## 13.2.2 Connector Street Network

A review of the raw model outputs indicates that a number of connector road links would carry daily traffic volumes near or above the preferred upper threshold (7,000vpd). However, the model does not take into account the provision of numerous local access streets that would provide access into each of the zones with each local access street capable of accommodating 2,000 - 3,000vpd. When account is made of the local access street network, the volumes on the connector road network is reduced. In this regard a review of the local access street network in the vicinity of those connector roads that have been identified with high traffic volumes has been undertaken with the resultant approximate traffic volumes as follows:

- PSP40 Western Connector to Ballan Road (reduced from ~8,600 to 6,500vpd)
- PSP42.1 Northern Connector to Westbrook Drive (reduced from ~11,300 to 7,000vpd)
- PSP42.1 Western Connector to Black Forest Road (reduced from ~9,200 to 7,000vpd)
- PSP92 Western Connector to Ballan Road (reduced from ~6,700 to 5,000vpd)

Notwithstanding, even when account of the local road network is made, a number of connector roads will still carry traffic volumes greater than 7,000vpd and will need to be provided as boulevard connector roads with restricted access. This type of road is capable of accommodating in the order of 10,000 - 12,000vpd and is recommended for the following road links:

- PSP<sub>4.1</sub> Connector to Greens Road (reduced from ~12,500 to 10,000vpd)
- PSP<sub>4.1</sub> Connector to Ballan Road (reduced from 9,700 to 7,500vpd)
- PSP<sub>4.2.1</sub> Eastern Connector to Greens Road (reduced from ~13,700 to 11,000vpd)

It is noted that the remaining connector roads within the PSP area (i.e. the majority of connector roads) operate within their theoretical capacities (i.e. less than 7,000vpd).

#### Access Street Level 2 Network

Daily traffic volumes on the access street network are anticipated to be typically in the order of 2,000 to 3,000vpd. Traffic volumes near intersections with arterial roads may in some cases be at the upper limit for an access street level 2 (typical daily capacity of 2,000 to 3,000 vehicles per day). Ultimately it is proposed to manage volumes at these intersections by restricting turning movements to left in / left out only and providing limited connectivity to the intersections from the PSP.

### 13.3 Ultimate Daily Traffic Volumes

#### Ballan Road

Daily traffic volumes on Ballan Road are anticipated to conservatively vary between 20,000vpd and 35,000vpd. It is noted that the majority of the additional traffic utilising Ballan Road compared with the 2021 scenario is traffic accessing the OMR (which does not exist in the 2021 scenario). The anticipated traffic volumes are at the upper limit for a four-lane (two-lanes in each direction) arterial road, whereby consideration to increase the capacity of the roads may be required.

#### Greens Road

Daily traffic volumes on Greens Road are anticipated to conservatively vary between 10,000vpd and 15,000vpd. The anticipated traffic volumes are within the indicative bounds of a two-lane (one-lane in each direction) arterial road. Indeed traffic volumes on Greens Road are anticipated to remain relatively unchanged, noting that traffic has a preference to use Ballan Road when accessing the OMR.

#### Black Forest Road

Daily traffic volumes on Black Forest Road are anticipated to be in the order of 3,000 to 10,000vpd. As such, Black Forest Road is anticipated to continue to operate as a higher order council road (connector street) under ultimate conditions.

#### Bulban Road

Daily traffic volumes on Bulban Road are anticipated to vary between approximately 7,000vpd at its eastern end and 3,000vpd at its western end near RRL, noting that it increases to 11,000vpd at McGrath Road. As such, Bulban Road is anticipated to continue to operate as a higher order council road (connector street) under ultimate conditions.

### Armstrong Road / Hobbs Road

Daily traffic volumes on Armstrong Road are anticipated to conservatively vary between 11,000vpd and 17,500vpd, with up to 22,500vpd at its northern end at Ballan Road. The anticipated traffic volumes are at the upper limit for a two-way (one-lane in each direction) arterial road.

Again, it is noted that existing physical constraints along the Armstrong Road corridor may restrict it to only a two-lane road.

### Westbrook Drive

Daily traffic volumes on Westbrook Drive are anticipated to conservatively vary between 17,000 and 26,000vpd. The anticipated traffic volumes are reflective of a four lane (two-lanes in each direction) arterial road.

### Connector Street Network

No significant changes in traffic volumes are anticipated between the interim and ultimate cases.

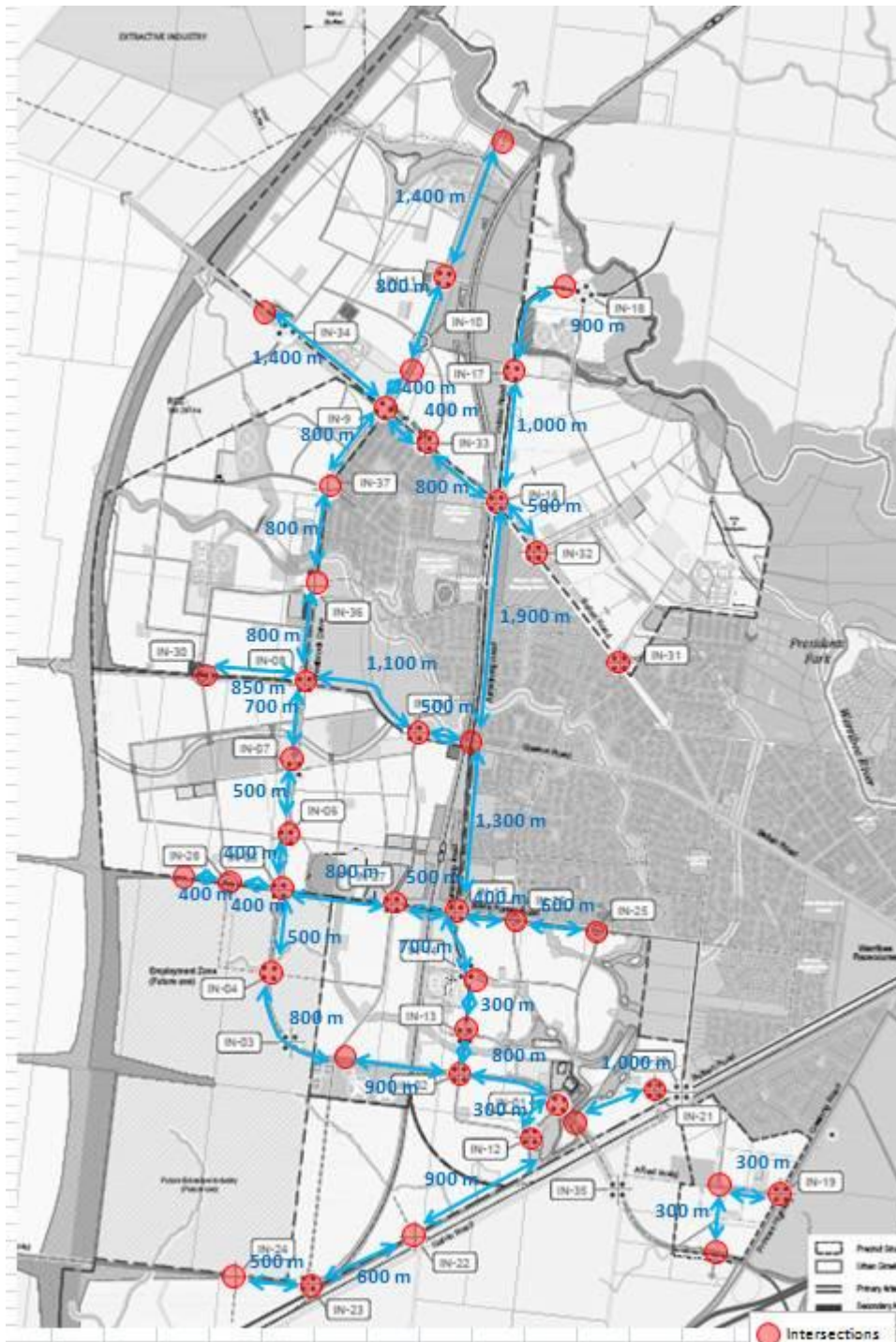
### Access Street Level 2 Network

No significant changes in traffic volumes are anticipated between the interim and ultimate cases.

## 13.4 Intersection Spacings

The approximate spacing of the intersections within the PSP area is shown in Figure 13.2.

Figure 13.2: Overview of Intersection Spacings



As shown in Figure 13.2 the intersection spacings generally accord with VicRoads Guidelines (i.e. signals spaced at approximately 800m intervals). It is noted that as a result of the irregular arterial road network there are some locations where the 800m spacing has not been provided.

Of particular note the spacing between IN-01 and IN-01A which are in the order of 150m apart. The two signalised intersections will need to be linked to allow for continuous flow along Westbrook Drive between the two intersections and hence avoid queuing through the intersections.

## 13.5 Road Cross Sections

### 13.5.1 Ultimate Cross Sections

#### Arterial Road Network

The future roadway capacities for the arterial road need to be confirmed with VicRoads and GAA. However, based on the daily modelled traffic volume estimates, the following cross-sections are required:

- Westbrook Drive: 4 lanes
- Ballan Road: 4 lanes
- Greens Road: 2 lanes
- Bulban Road: 2 lanes
- Armstrong Road: 2 lanes  
(4 lanes adjacent to Manor Lakes Activity Centre south of Ballan Road)

#### Connector Street Network

As discussed above, the proposed residential connector street system is anticipated to carry traffic volumes reflective of a connector street (3,000 – 7,000vpd) in residential areas. It is noted that where volumes are anticipated to be above 7,000vpd at the intersections with arterial road network additional capacity will be provided.

### 13.5.2 Interim Road Cross Sections

#### Arterial Road Network

It is envisaged that each of the arterial roads within the PSP Area in the interim will remain 2-lane roads capable of carrying volumes up to 18,000vpd with additional capacity to be provided at intersections along their length. With the exception of Westbrook Drive in the vicinity of Ballan Road, the daily traffic volumes outlined in Section 6 are anticipated to be adequately catered for by the interim 2-lane roads.

In order to accommodate the likely traffic volumes generated on Westbrook Drive in the vicinity of Ballan Road, consideration should be given to duplicating the road in the interim.

#### Connector Street Network

The interim Connector Street network is envisaged to be consistent with the ultimate Connector Street network with modified intersections to the arterial road network.

## 13.6 Intersections

### 13.6.1 Interim versus Ultimate Intersection Provisions

The interim intersection layouts are used to determine intersection works to be included in the Developers Contribution Plan(DCP), whilst the ultimate intersection layouts are used to confirm the level of intersection flaring and subsequent land acquisition' required to be included in the DCP.

Ballan Road, Greens Road, and Westbrook Drive are or will be in the future VicRoads declared arterials (and require duplication). The future classification of Black Forest Road and Bulban Road needs to be

confirmed. These duplication works (when required) will be funded by VicRoads and not as part of the DCP. It is noted that the interim assessments undertaken for intersections along these roads assume a single carriageway with additional lanes provided at the intersections as needed. In regards to intersection control, signals have been assumed for intersections located in close proximity to activity centres, whilst at other locations roundabouts have been assumed. Left turn slip lanes have only been modelled in locations where high left turn volumes are present, whilst they have been avoided at locations in close proximity to schools and activity centres.

The ultimate scenario intersection assessment assumes that each of the arterial roads are duplicated.

### 13.6.2 Assessment Methodology

It is noted that MITM is a strategic network model and hence care should be exercised when extracting individual links or turning movement flows. The approach adopted in arriving at turning flows for the purpose of assessing the Wyndham West PSP areas is as follows:

- Extract AM peak period (2-hour) intersection turning movements from MITM for key intersections and covert to peak hour flows using the 0.55 factor.
- Assess each intersection individually to ensure that turn flows are reasonable having regard for the arterial and local road networks and adjacent activity centres and schools and make refinements where appropriate. The modifications made in this regard are explained in further detail in Appendix C and summarised as follows:
  - Manor Lakes PSP Area: Activity Centre (9,500sq.m) = 722 PM peak hour total movements (assume 25% of the movements via IN-36 to Westbrook Drive)
  - Black Forest Road North PSP Area: Activity Centre (20,000sq.m) = 1520 PM peak hour total movements (assume 33% of the movements via IN-27 to Black Forest Road)
  - Black Forest Road South PSP Area: Activity Centre (9,000sq.m) = 680 PM peak hour total movements (assume 50% of the movements via IN-01 to Westbrook Drive)
  - Manor Lakes Activity Centre (50,000sq.m) = 3,800 PM peak hour total movements (assume 25% of the movements via IN-16 to Ballan Road).
- Factor the MITM traffic volumes to achieve consistency with the anticipated first principles traffic generation assessment (not necessary in this case).
- Where required, balance the traffic volumes undertaking similar movements at adjacent intersections (i.e. right turns at adjacent intersections). When balancing the volumes a 110% factor has been applied, such that the balanced volumes are conservative.
- Determine the PM peak period turning volumes based on the assumption that the turning movements are the inverse of the AM peak hour turning movements, subtract the school related trips and add the visitor trips from the activity centres (where relevant).
- Where MITM assumes a low volume during a peak hour for a movement at an intersection, for assessment purposes a minimum turning movement volume of 20 movements per hour has been assumed.

It is noted that the strategic modelling outputs relate to the connector and arterial road network only and do not take into consideration the lower order access streets, as a result the outputs of the strategic modelling are conservative as traffic volumes that would otherwise be carried by the access streets are assumed to be carried by the higher order roads.

### 13.6.3 Anticipated Operation Overview

On the basis of the above, the anticipated peak hour turning movements outlined in Appendix C and the intersection layouts in Section 12.3 the following detail of this section illustrates the indicative interim and ultimate intersection operation.

The operation of each of the key intersections (interim and ultimate) has been assessed using *SIDRA INTERSECTION 5.1*<sup>2</sup>, a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance is referred to as the *Degree of Saturation (DOS)*. The DOS represents the flow-to-capacity ratio for the most critical movement on each leg of the intersection.

For signalised intersections, a DOS of around 0.95 has been typically considered the 'ideal' limit, beyond which queues and delays increase disproportionately<sup>3</sup>. For unsignalised intersections a DOS of 0.90 is considered the 'ideal' limit. For signalised intersections the SIDRA models were run with a 120-150 second cycle time and incorporate a leading right-turn arrangement in accordance with VicRoads requirements.

The following information is provided in Appendix C for each of the assessed intersections for interim and ultimate layouts:

- indicative interim and ultimate intersection layouts
- degree of saturation (DOS) and level of service (LOS)
- intersection average delay across all approaches
- 95<sup>th</sup> percentile queue in terms of the length in metres followed by the approach (E, W, N, S) and movement (L, T, R)
- indicative cycle times.

In addition a summary of the anticipated operation of each of the intersections is presented in Table 13.2. It is noted that the 'average delay' refers to the average delay for all vehicles utilising the intersection and the '95<sup>th</sup> percentile queue' refers to the maximum 95<sup>th</sup> percentile queue length for all approaches of the intersection (not necessarily just the arterial road approaches).

**Table 13.2: Summary of Intersection Operation**

| PSP Area       | Intersection                      | Peak Hour | Anticipated Traffic Volumes |            |                                   |
|----------------|-----------------------------------|-----------|-----------------------------|------------|-----------------------------------|
|                |                                   |           | DOS                         | Ave. Delay | 95 <sup>th</sup> Percentile Queue |
| Interim (2021) |                                   |           |                             |            |                                   |
| PSP 40         | Armstrong Road/Ballan Road (IN16) | AM Peak   | 0.61                        | 43 sec     | 128 m                             |
|                |                                   | PM Peak   | 0.91                        | 62 sec     | 330 m                             |
| PSP 40         | Armstrong Road/Connector (IN17)   | AM Peak   | 0.30                        | 14 sec     | 67 m                              |
|                |                                   | PM Peak   | 0.30                        | 18 sec     | 70 m                              |

<sup>2</sup> Program used under license from Akcelik & Associates Pty Ltd.

<sup>3</sup> SIDRA INTERSECTION 4.0 adopts the following criteria for Level of Service assessment:

| LOS |            | Intersection Degree of Saturation (DOS) or X value |                         |
|-----|------------|----------------------------------------------------|-------------------------|
|     |            | Unsignalised Intersection                          | Signalised Intersection |
| A   | Excellent  | <=0.50                                             | <=0.60                  |
| B   | Very Good  | 0.50-0.70                                          | 0.60-0.75               |
| C   | Good       | 0.70-0.80                                          | 0.75-0.90               |
| D   | Acceptable | 0.80-0.90                                          | 0.90-0.95               |
| E   | Poor       | 0.90-1.00                                          | 0.95-1.00               |
| F   | Very Poor  | >=1.0                                              | >=1.0                   |

| PSP Area | Intersection                             | Peak Hour | Anticipated Traffic Volumes |            |                                   |
|----------|------------------------------------------|-----------|-----------------------------|------------|-----------------------------------|
|          |                                          |           | DOS                         | Ave. Delay | 95 <sup>th</sup> Percentile Queue |
| PSP 40   | Armstrong Road/Connector (IN18)          | AM Peak   | 0.40                        | 23 sec     | 90 m                              |
|          |                                          | PM Peak   | 0.42                        | 24 sec     | 97 m                              |
| PSP 40   | Ballan Road/Connector (IN31)             | AM Peak   | 0.78                        | 39 sec     | 212 m                             |
|          |                                          | PM Peak   | 0.75                        | 37 sec     | 203 m                             |
| PSP 40   | Ballan Road/Connector (IN32)             | AM Peak   | 0.82                        | 43 sec     | 113 m                             |
|          |                                          | PM Peak   | 0.73                        | 43 sec     | 116 m                             |
| PSP 41   | Westbrook Drive/Greens Road (IN08)       | AM Peak   | 0.74                        | 34 sec     | 208 m                             |
|          |                                          | PM Peak   | 0.70                        | 33 sec     | 205 m                             |
| PSP 41   | Westbrook Drive/Ballan Road (IN09)       | AM Peak   | 0.69                        | 36 sec     | 153 m                             |
|          |                                          | PM Peak   | 0.73                        | 37 sec     | 155 m                             |
| PSP 41   | Greens Road/Connector (IN30)             | AM Peak   | 0.35                        | 7 sec      | 20 m                              |
|          |                                          | PM Peak   | 0.28                        | 8 sec      | 14 m                              |
| PSP 41   | Westbrook Drive/Connector (IN37)         | AM Peak   | 0.76                        | 45 sec     | 159 m                             |
|          |                                          | PM Peak   | 0.51                        | 30 sec     | 132 m                             |
| PSP 41   | Westbrook Drive/Connector (IN36)         | AM Peak   | 0.75                        | 41 sec     | 199 m                             |
|          |                                          | PM Peak   | 0.75                        | 42 sec     | 190 m                             |
| PSP 42.1 | Westbrook Drive/Black Forest Road (IN05) | AM Peak   | 0.65                        | 33 sec     | 161 m                             |
|          |                                          | PM Peak   | 0.60                        | 30 sec     | 153 m                             |
| PSP 42.1 | Westbrook Drive/Connector (IN06)         | AM Peak   | 0.59                        | 31 sec     | 154 m                             |
|          |                                          | PM Peak   | 0.61                        | 32 sec     | 158 m                             |
| PSP 42.1 | Westbrook Drive/Connector (IN07)         | AM Peak   | 0.70                        | 40 sec     | 173 m                             |
|          |                                          | PM Peak   | 0.66                        | 40 sec     | 169 m                             |
| PSP 42.1 | Black Forest Road/Connector (IN27)       | AM Peak   | 0.93                        | 49 sec     | 82 m                              |
|          |                                          | PM Peak   | 0.75                        | 46 sec     | 65 m                              |
| PSP 42.1 | Black Forest Road/Connector (IN28)       | AM Peak   | 0.24                        | 8 sec      | 11 m                              |
|          |                                          | PM Peak   | 0.19                        | 9 sec      | 8 m                               |
| PSP 42.1 | Greens Road/Connector (IN29)             | AM Peak   | 0.77                        | 31 sec     | 86 m                              |
|          |                                          | PM Peak   | 0.50                        | 28 sec     | 120 m                             |
| PSP 42.2 | Westbrook Drive/Bulban Road (IN01)       | AM Peak   | 0.73                        | 31 sec     | 215 m                             |
|          |                                          | PM Peak   | 0.84                        | 42 sec     | 264 m                             |
| PSP 42.2 | Westbrook Road/Bulban Road (IN01A)       | AM Peak   | 0.59                        | 15 sec     | 148 m                             |
|          |                                          | PM Peak   | 0.59                        | 21 sec     | 166 m                             |
| PSP 42.2 | Westbrook Drive/Armstrong Road (IN02)    | AM Peak   | 0.92                        | 46 sec     | 189 m                             |
|          |                                          | PM Peak   | 0.91                        | 39 sec     | 173 m                             |
| PSP 42.2 | Bulban Road/Connector (IN12)             | AM Peak   | 0.17                        | 12 sec     | 12 m                              |
|          |                                          | PM Peak   | 0.17                        | 12 sec     | 12 m                              |
| PSP 42.2 | Armstrong Road/Connector (IN13)          | AM Peak   | 0.89                        | 54 sec     | 144 m                             |
|          |                                          | PM Peak   | 0.74                        | 45 sec     | 122 m                             |
| PSP 42.2 | Armstrong Road/Connector (IN14)          | AM Peak   | 0.94                        | 55 sec     | 253 m                             |
|          |                                          | PM Peak   | 0.79                        | 44 sec     | 183 m                             |
| PSP 42.2 | Armstrong Road/Black Forest Road (IN15)  | AM Peak   | 0.57                        | 38 sec     | 118 m                             |
|          |                                          | PM Peak   | 0.52                        | 38 sec     | 116 m                             |
| PSP 42.2 | Bulban Road/McGrath Road (IN20)          | AM Peak   | 0.30                        | 19 sec     | 67 m                              |
|          |                                          | PM Peak   | 0.28                        | 14 sec     | 41 m                              |
| PSP 42.2 | Bulban Road/Connector (IN21)             | AM Peak   | 0.51                        | 19 sec     | 47 m                              |
|          |                                          | PM Peak   | 0.37                        | 12 sec     | 46 m                              |

| PSP Area        | Intersection                          | Peak Hour | Anticipated Traffic Volumes |            |                                   |
|-----------------|---------------------------------------|-----------|-----------------------------|------------|-----------------------------------|
|                 |                                       |           | DOS                         | Ave. Delay | 95 <sup>th</sup> Percentile Queue |
| PSP 42.2        | Black Forest Road/Connector (IN25)    | AM Peak   | 0.12                        | 7 sec      | 5 m                               |
|                 |                                       | PM Peak   | 0.13                        | 7 sec      | 5 m                               |
| PSP 42.2        | Black Forest Road/Connector (IN25/26) | AM Peak   | 0.18                        | 8 sec      | 8 m                               |
|                 |                                       | PM Peak   | 0.22                        | 7 sec      | 11 m                              |
| PSP 42.2        | Westbrook Road/Connector (IN3)        | AM Peak   | 0.65                        | 41 sec     | 129 m                             |
|                 |                                       | PM Peak   | 0.84                        | 48 sec     | 192 m                             |
| PSP 43          | Alfred Road/Princes Highway (IN19)    | AM Peak   | 0.78                        | 42 sec     | 131 m                             |
|                 |                                       | PM Peak   | 0.88                        | 45 sec     | 141 m                             |
| PSP 43          | Alfred Road/Connector (IN39)          | AM Peak   | 0.26                        | 8 sec      | 11 m                              |
|                 |                                       | PM Peak   | 0.21                        | 9 sec      | 10 m                              |
| PSP 43          | Westbrook Drive/Connector (IN35)      | AM Peak   | 0.80                        | 37 sec     | 236 m                             |
|                 |                                       | PM Peak   | 0.59                        | 22 sec     | 155 m                             |
| PSP 93          | Westbrook Drive/Connector (IN4)       | AM Peak   | 0.74                        | 42 sec     | 166 m                             |
|                 |                                       | PM Peak   | 0.85                        | 46 sec     | 181 m                             |
| PSP 93          | Bulban Road/Connector (IN22)          | AM Peak   | 0.20                        | 7 sec      | 8 m                               |
|                 |                                       | PM Peak   | 0.19                        | 7 sec      | 7 m                               |
| PSP 93          | Bulban Road/Connector (IN23)          | AM Peak   | 0.15                        | 6 sec      | 6 m                               |
|                 |                                       | PM Peak   | 0.13                        | 6 sec      | 5 m                               |
| PSP 93          | Bulban Road/Connector (IN24)          | AM Peak   | 0.18                        | 7 sec      | 7 m                               |
|                 |                                       | PM Peak   | 0.15                        | 7 sec      | 6 m                               |
| PSP 92          | Westbrook Drive/Connector (IN10)      | AM Peak   | 0.49                        | 14 sec     | 26 m                              |
|                 |                                       | PM Peak   | 0.44                        | 13 sec     | 25 m                              |
| PSP 92          | Westbrook Drive/Connector (IN11)      | AM Peak   | 0.67                        | 45 sec     | 100 m                             |
|                 |                                       | PM Peak   | 0.76                        | 42 sec     | 102 m                             |
| PSP 92          | Ballan Road/Connector (IN33)          | AM Peak   | 0.51                        | 33 sec     | 132 m                             |
|                 |                                       | PM Peak   | 0.51                        | 31 sec     | 132 m                             |
| PSP 92          | Ballan Road/Connector (IN34)          | AM Peak   | 0.73                        | 55 sec     | 177 m                             |
|                 |                                       | PM Peak   | 0.85                        | 55 sec     | 206 m                             |
| PSP 92          | Westbrook Drive/Connector (IN38)      | AM Peak   | 0.67                        | 25 sec     | 168 m                             |
|                 |                                       | PM Peak   | 0.84                        | 31 sec     | 220 m                             |
| Ultimate (2046) |                                       |           |                             |            |                                   |
| PSP 40          | Armstrong Road/Ballan Road (IN16)     | AM Peak   | 0.82                        | 46 sec     | 234 m                             |
|                 |                                       | PM Peak   | 0.90                        | 54 sec     | 245 m                             |
| PSP 40          | Armstrong Road/Connector (IN17)       | AM Peak   | 0.55                        | 29 sec     | 123 m                             |
|                 |                                       | PM Peak   | 0.51                        | 27 sec     | 119 m                             |
| PSP 40          | Armstrong Road/Connector (IN18)       | AM Peak   | 0.51                        | 26 sec     | 123 m                             |
|                 |                                       | PM Peak   | 0.44                        | 18 sec     | 113 m                             |
| PSP 40          | Ballan Road/Connector (IN31)          | AM Peak   | 0.75                        | 31 sec     | 236 m                             |
|                 |                                       | PM Peak   | 0.80                        | 33 sec     | 250 m                             |
| PSP 40          | Ballan Road/Connector (IN32)          | AM Peak   | 0.65                        | 37 sec     | 159 m                             |
|                 |                                       | PM Peak   | 0.72                        | 41 sec     | 168 m                             |
| PSP 41          | Westbrook Drive/Greens Road (IN08)    | AM Peak   | 0.45                        | 29 sec     | 111 m                             |
|                 |                                       | PM Peak   | 0.43                        | 26 sec     | 108 m                             |
| PSP 41          | Westbrook Drive/Ballan Road (IN09)    | AM Peak   | 0.70                        | 42 sec     | 134 m                             |
|                 |                                       | PM Peak   | 0.64                        | 38 sec     | 129 m                             |
| PSP 41          | Greens Road/Connector (IN30)          | AM Peak   | 0.62                        | 15 sec     | 27 m                              |

| PSP Area | Intersection                             | Peak Hour | Anticipated Traffic Volumes |            |                                   |
|----------|------------------------------------------|-----------|-----------------------------|------------|-----------------------------------|
|          |                                          |           | DOS                         | Ave. Delay | 95 <sup>th</sup> Percentile Queue |
|          |                                          | PM Peak   | 0.53                        | 16 sec     | 29 m                              |
| PSP 41   | Westbrook Drive/Connector (IN37)         | AM Peak   | 0.80                        | 44 sec     | 119 m                             |
|          |                                          | PM Peak   | 0.90                        | 49 sec     | 124 m                             |
| PSP 41   | Westbrook Drive/Connector (IN36)         | AM Peak   | 0.74                        | 42 sec     | 123 m                             |
|          |                                          | PM Peak   | 0.68                        | 42 sec     | 118 m                             |
| PSP 42.1 | Westbrook Drive/Black Forest Road (IN05) | AM Peak   | 0.45                        | 36 sec     | 66 m                              |
|          |                                          | PM Peak   | 0.39                        | 36 sec     | 63 m                              |
| PSP 42.1 | Westbrook Drive/Connector (IN06)         | AM Peak   | 0.38                        | 35 sec     | 62 m                              |
|          |                                          | PM Peak   | 0.59                        | 43 sec     | 70 m                              |
| PSP 42.1 | Westbrook Drive/Connector (IN07)         | AM Peak   | 0.68                        | 43 sec     | 100 m                             |
|          |                                          | PM Peak   | 0.56                        | 39 sec     | 92 m                              |
| PSP 42.1 | Black Forest Road/Connector (IN27)       | AM Peak   | 0.50                        | 42 sec     | 56 m                              |
|          |                                          | PM Peak   | 0.78                        | 51 sec     | 126 m                             |
| PSP 42.1 | Black Forest Road/Connector (IN28)       | AM Peak   | 0.30                        | 9 sec      | 15 m                              |
|          |                                          | PM Peak   | 0.28                        | 9 sec      | 14 m                              |
| PSP 42.1 | Greens Road/Connector (IN29)             | AM Peak   | 0.53                        | 25 sec     | 52 m                              |
|          |                                          | PM Peak   | 0.40                        | 26 sec     | 81 m                              |
| PSP 42.2 | Westbrook Drive/Bulban Road (IN01)       | AM Peak   | 0.56                        | 30 sec     | 147 m                             |
|          |                                          | PM Peak   | 0.67                        | 38 sec     | 168 m                             |
| PSP 42.2 | Westbrook Road/Bulban Road (IN01A)       | AM Peak   | 0.46                        | 13 sec     | 117 m                             |
|          |                                          | PM Peak   | 0.40                        | 13 sec     | 91 m                              |
| PSP 42.2 | Westbrook Drive/Armstrong Road (IN02)    | AM Peak   | 0.72                        | 41 sec     | 123 m                             |
|          |                                          | PM Peak   | 0.68                        | 39 sec     | 119 m                             |
| PSP 42.2 | Bulban Road/Connector (IN12)             | AM Peak   | 0.17                        | 15 sec     | 10 m                              |
|          |                                          | PM Peak   | 0.20                        | 15 sec     | 11 m                              |
| PSP 42.2 | Armstrong Road/Connector (IN13)          | AM Peak   | 0.81                        | 52 sec     | 94 m                              |
|          |                                          | PM Peak   | 0.73                        | 46 sec     | 94 m                              |
| PSP 42.2 | Armstrong Road/Connector (IN14)          | AM Peak   | 0.81                        | 51 sec     | 148 m                             |
|          |                                          | PM Peak   | 0.74                        | 45 sec     | 140 m                             |
| PSP 42.2 | Armstrong Road/Black Forest Road (IN15)  | AM Peak   | 0.78                        | 46 sec     | 114 m                             |
|          |                                          | PM Peak   | 0.64                        | 43 sec     | 104 m                             |
| PSP 42.2 | Bulban Road/McGrath Road (IN20)          | AM Peak   | 0.22                        | 24 sec     | 45 m                              |
|          |                                          | PM Peak   | 0.22                        | 23 sec     | 42 m                              |
| PSP 42.2 | Bulban Road/Connector (IN 21)            | AM Peak   | 0.49                        | 29 sec     | 76 m                              |
|          |                                          | PM Peak   | 0.53                        | 27 sec     | 37 m                              |
| PSP 42.2 | Black Forest Road/Connector (IN25)       | AM Peak   | 0.16                        | 7 sec      | 6 m                               |
|          |                                          | PM Peak   | 0.19                        | 7 sec      | 8 m                               |
| PSP 42.2 | Black Forest Road/Connector (IN26)       | AM Peak   | 0.15                        | 6 sec      | 7 m                               |
|          |                                          | PM Peak   | 0.15                        | 6 sec      | 7 m                               |
| PSP 42.2 | Westbrook Road/Connector (IN3)           | AM Peak   | 0.53                        | 37 sec     | 57 m                              |
|          |                                          | PM Peak   | 0.73                        | 43 sec     | 78 m                              |
| PSP 43   | Alfred Road/Princes Highway (IN19)       | AM Peak   | 0.60                        | 39 sec     | 129 m                             |
|          |                                          | PM Peak   | 0.55                        | 36 sec     | 124 m                             |
| PSP 43   | Alfred Road/Connector (IN39)             | AM Peak   | 0.18                        | 7 sec      | 7 m                               |
|          |                                          | PM Peak   | 0.18                        | 7 sec      | 8 m                               |

| PSP Area | Intersection                     | Peak Hour | Anticipated Traffic Volumes |            |                                   |
|----------|----------------------------------|-----------|-----------------------------|------------|-----------------------------------|
|          |                                  |           | DOS                         | Ave. Delay | 95 <sup>th</sup> Percentile Queue |
| PSP 43   | Westbrook Drive/Connector (IN35) | AM Peak   | 0.66                        | 32 sec     | 169 m                             |
|          |                                  | PM Peak   | 0.60                        | 28 sec     | 159 m                             |
| PSP 93   | Westbrook Drive/Connector (IN4)  | AM Peak   | 0.85                        | 43 sec     | 76 m                              |
|          |                                  | PM Peak   | 0.57                        | 35 sec     | 71 m                              |
| PSP 92   | Westbrook Drive/Connector (IN10) | AM Peak   | 0.67                        | 35 sec     | 162 m                             |
|          |                                  | PM Peak   | 0.67                        | 35 sec     | 162 m                             |
| PSP 93   | Bulban Road/Connector (IN22)     | AM Peak   | 0.52                        | 6 sec      | 30 m                              |
|          |                                  | PM Peak   | 0.49                        | 6 sec      | 29 m                              |
| PSP 93   | Bulban Road/Connector (IN23)     | AM Peak   | 0.44                        | 5 sec      | 25 m                              |
|          |                                  | PM Peak   | 0.43                        | 5 sec      | 25 m                              |
| PSP 93   | Bulban Road/Connector (IN24)     | AM Peak   | 0.52                        | 6 sec      | 31 m                              |
|          |                                  | PM Peak   | 0.47                        | 6 sec      | 28 m                              |
| PSP 92   | Ballan Road/Connector (IN33)     | AM Peak   | 0.68                        | 25 sec     | 211 m                             |
|          |                                  | PM Peak   | 0.68                        | 29 sec     | 211m                              |
| PSP 92   | Westbrook Drive/Connector (IN11) | AM Peak   | 0.64                        | 42 sec     | 98 m                              |
|          |                                  | PM Peak   | 0.58                        | 41 sec     | 96 m                              |
| PSP 92   | Ballan Road/Connector (IN34)     | AM Peak   | 0.83                        | 47 sec     | 182 m                             |
|          |                                  | PM Peak   | 0.88                        | 47 sec     | 197 m                             |
| PSP 92   | Westbrook Drive/Connector (IN38) | AM Peak   | 0.58                        | 23 sec     | 127 m                             |
|          |                                  | PM Peak   | 0.77                        | 30 sec     | 152 m                             |

The SIDRA results summarised in Table 13.2 and included in Appendix D indicate that each of the intersections are expected to operate with a satisfactory level of service, with manageable queues and delays during peak periods in both the interim and ultimates cases.

It is noted that at some intersection locations on the arterial road network, notable queuing (up to 300m) is anticipated. However, the associated delay times are considered acceptable indicating that the queues clear regularly and do not result in the failure of the intersection operation.

## 13.7 Staging of Road Infrastructure

### 13.7.1 North-South Arterial

Westbrook Drive and Armstrong Road run in parallel, north-south through the precinct with Westbrook Drive intended to operate as a high order arterial road whilst Armstrong Road is to be a higher order connector street. In order to ensure that these roads reflect this function, it is imperative that the full length of Westbrook Drive be delivered in the early stages of the development of the precinct.

The early development of Westbrook Drive will provide traffic travelling north-south through the precinct with a high order, convenient route, reducing the level of through traffic that would otherwise utilise Armstrong Road. The reduction in vehicles using Armstrong Road is considered desirable as it has a limited road reserve available, travels through an existing residential areas, will primarily service the Activity Centre and railway station, all of which are likely to lead to a high concentration of pedestrian activity.

To ensure Westbrook Drive is a more attractive route, it will be necessary to deliver key elements including crossings of the two railway lines in the south and the various creek crossings early in the

process. It would also be beneficial to consider reducing the desirability of Armstrong Road to through vehicles by creating a pedestrian friendly environment with traffic having a lesser role.

### 13.7.2 Rail Crossings

Access to the precinct from the south (Princes Freeway) is currently constrained by a limited number of rail crossings with crossings currently available at Cottrell Street / Geelong Road and Galvin Road. In order to provide convenient access into the precinct from the south, it will be necessary to maximise capacity at these rail crossings as well as provide for additional links (i.e. Westbrook Drive). In the short term this may initially be achieved through the upgrade of the Cottrell Street crossing (i.e. extend turn lanes) and the upgrade of the Galvin Road crossing. It is noted that the Galvin Road crossing consists of only a single lane in each direction and connects into Alfred Road which is intended to be a connector level road and as such this crossing will not be able to support large levels of development. The Cottrell Street crossing is also currently operating at or close to capacity. In this regard, it will be necessary to create the Westbrook Drive rail crossing in order to allow for significant development of the precinct. This will also support the intent of Westbrook Drive becoming the preferred north-south arterial route described above.

## 14. Conclusion

This report addresses the land use inputs, traffic demands and resulting road network layout for the purposes of the various Wyndham West PSP Areas. Based on the analysis and discussions presented within this report, the following conclusions are made:

- i The Wyndham West PSP is anticipated to generate in the order of 240,000 daily vehicle movements.
- ii The interim intersection layouts included in this report are considered suitable for the development by the DCP.
- iii The ultimate intersection analysis presented in this report indicates the additional intersection land take needed to cater for the anticipated ultimate traffic volumes that will be catered by the upgrade of the arterial road network.
- iv There are no traffic and transport reasons why the PSP process should not proceed as it satisfactorily provides for the long term road network demands within the PSP area.

## Appendix A

Appendix A

### MITM Inputs (Road Network, Zone Structure Etc)

**Figure A1: MITM Zone Structure**

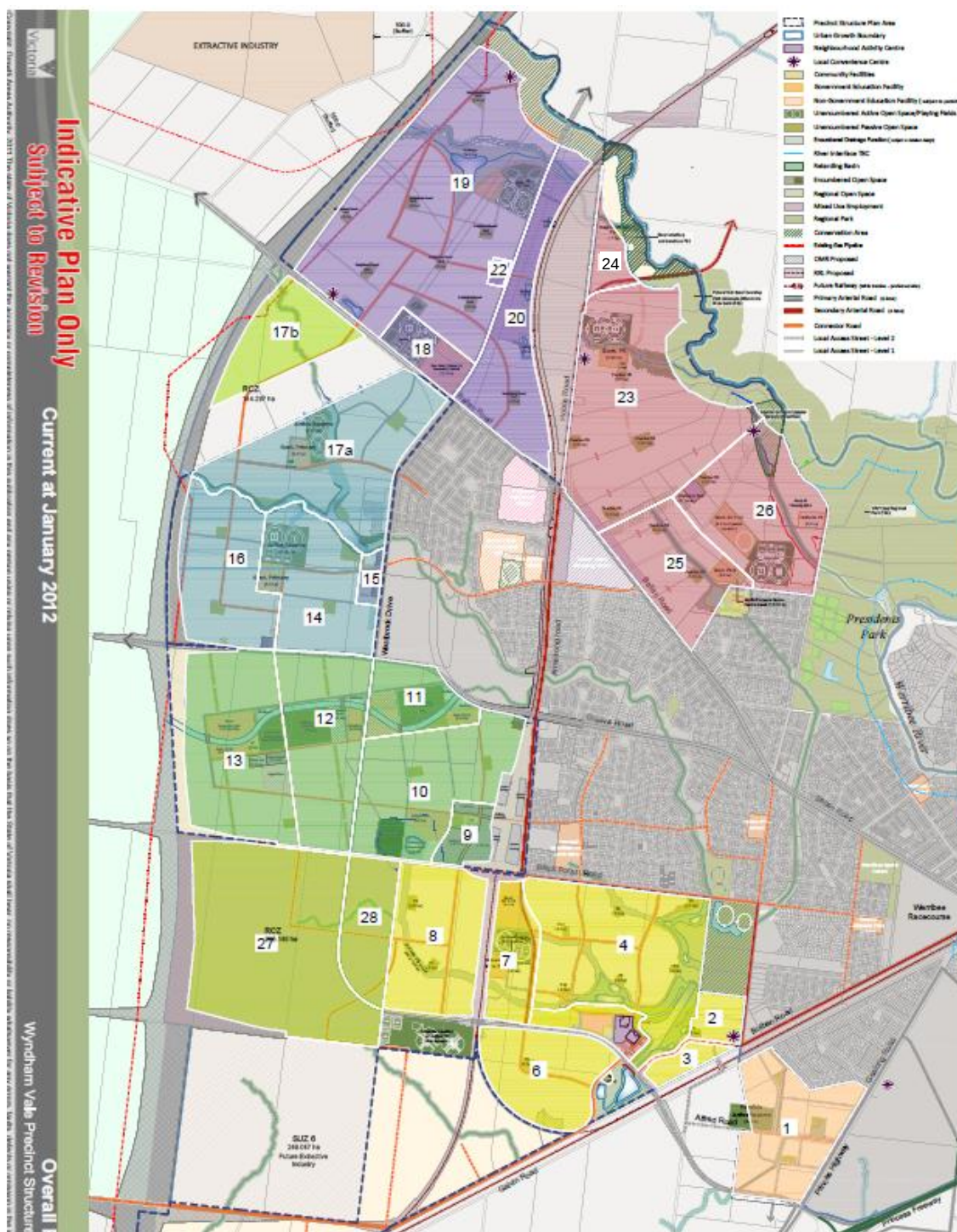


Figure A2: MITM Zone Connectors



Figure A3: SKM MITM Road Network



M:\VITM\MITM\_Taylors\_Road\_SKM\Base\AM\Y2046\Y2046\_12M1296Base\Y2046WD\_NetworkV3\_12M1296\Y2046WD\_NetworkV3\_12M1296\_Rev1\_z2895\y2046\_nETWORKv3\_12m1296\_RevQ\_z2895\HWY\_LOAD\_AVE\_y2046\_nETWORKV3\_12M1296\_RevQ\_z2895

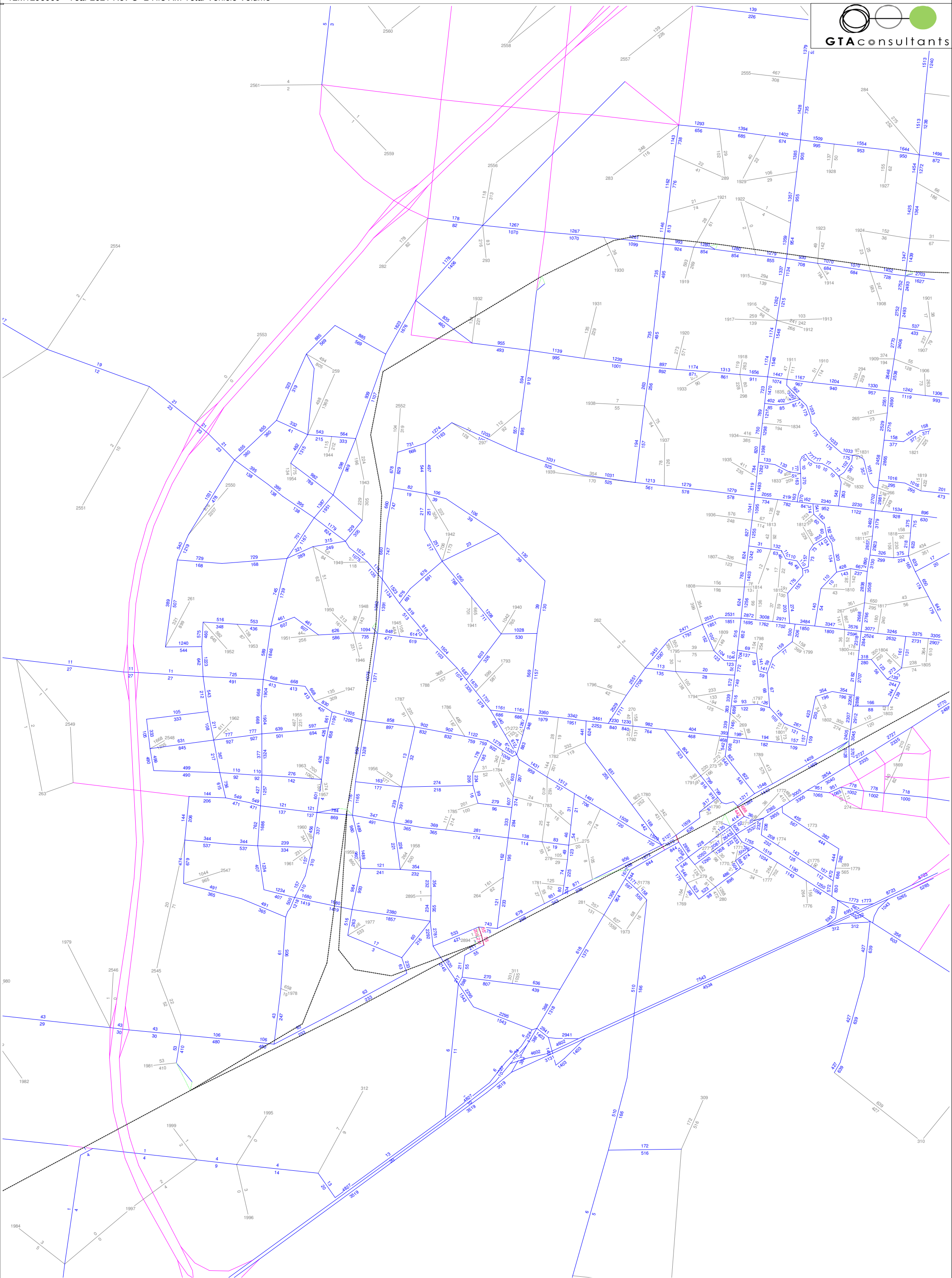
4/2/2012

GTA consultants

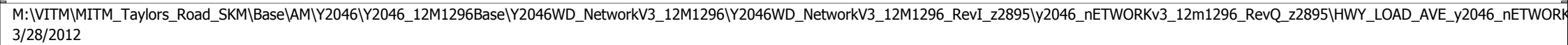
Licensed to GTA Consultants

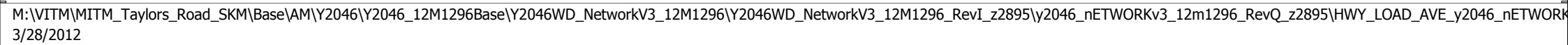
## Appendix B

### MITM Outputs









## Appendix C

### AM and PM Peak Hour Turning Movements

Figure C1: PSP 40 'Raw' MITM Traffic Volumes – AM Peak Hour 2021

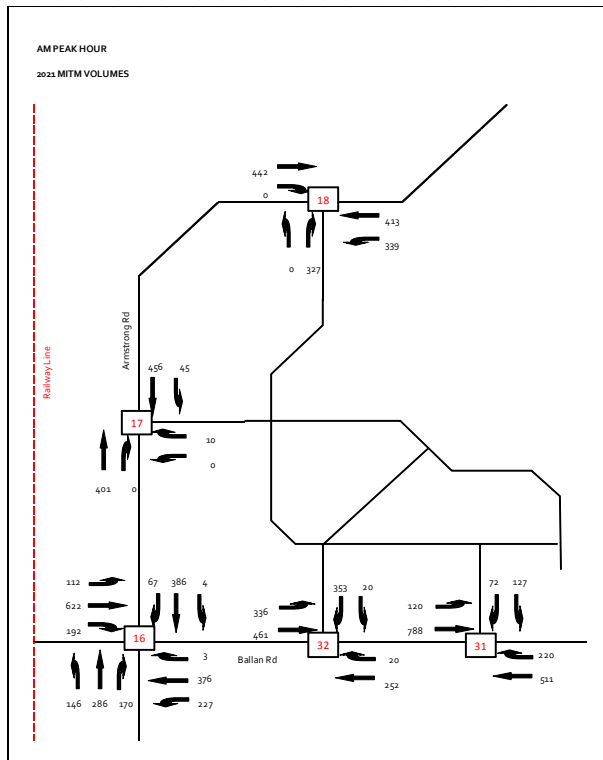


Figure C2: PSP40 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2021

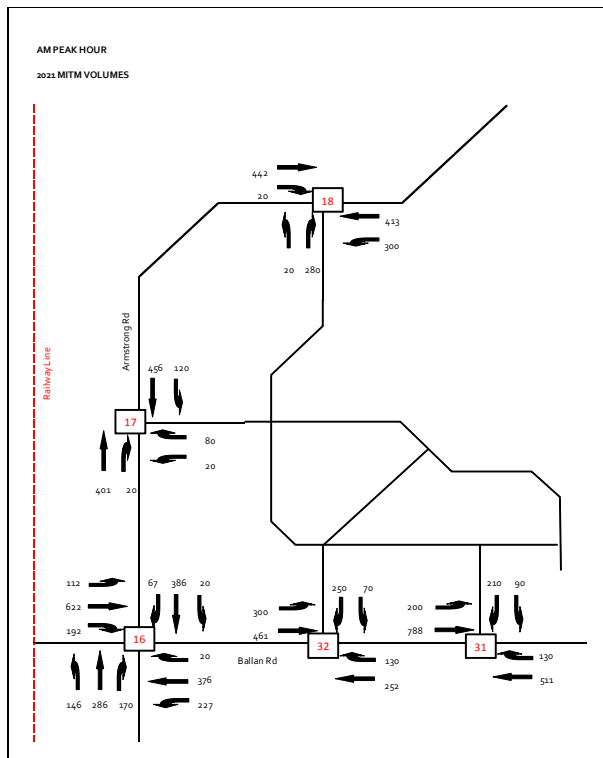


Figure C3: PSP 40 'Raw' MITM Traffic Volumes – PM Peak Hour 2021

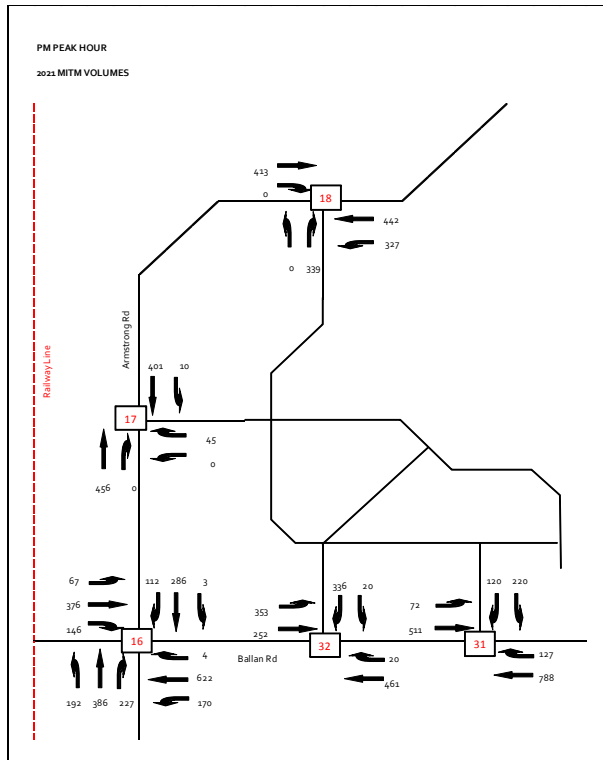


Figure C4: PSP40 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2021

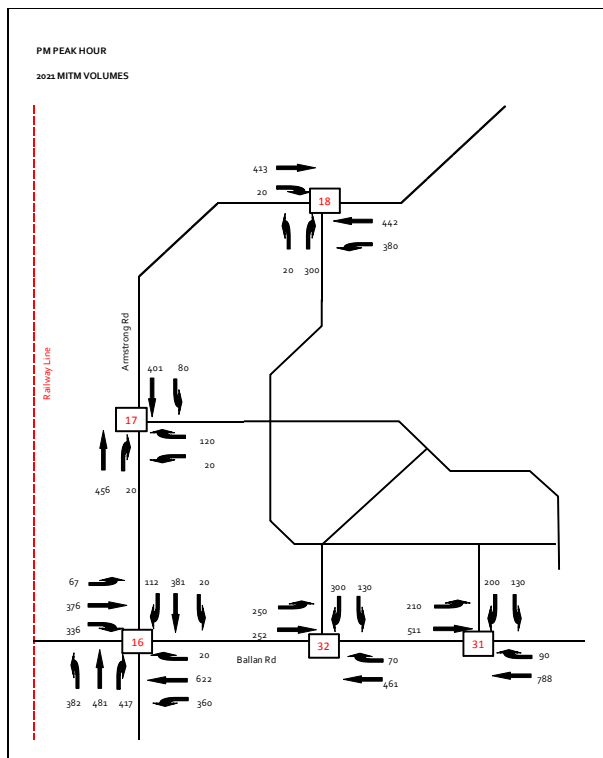


Figure C5: PSP 40 'Raw' MITM Traffic Volumes – AM Peak Hour 2046

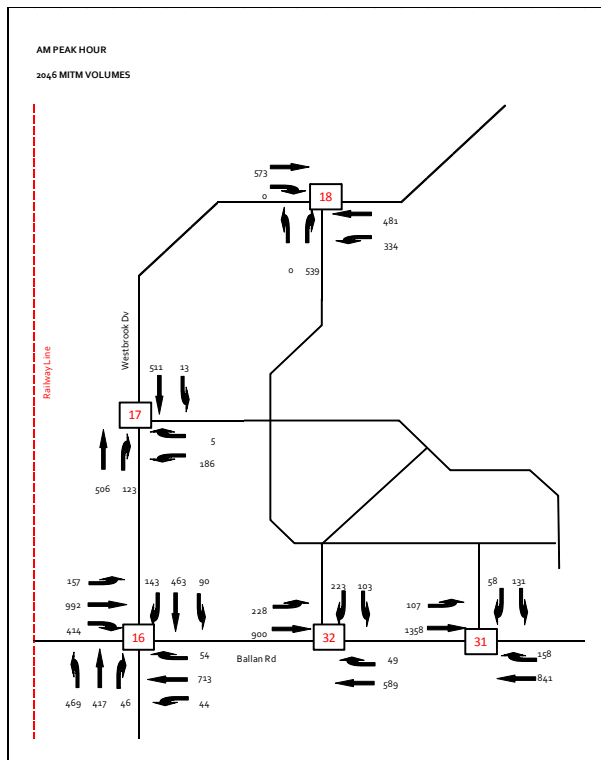


Figure C6: PSP40 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2046

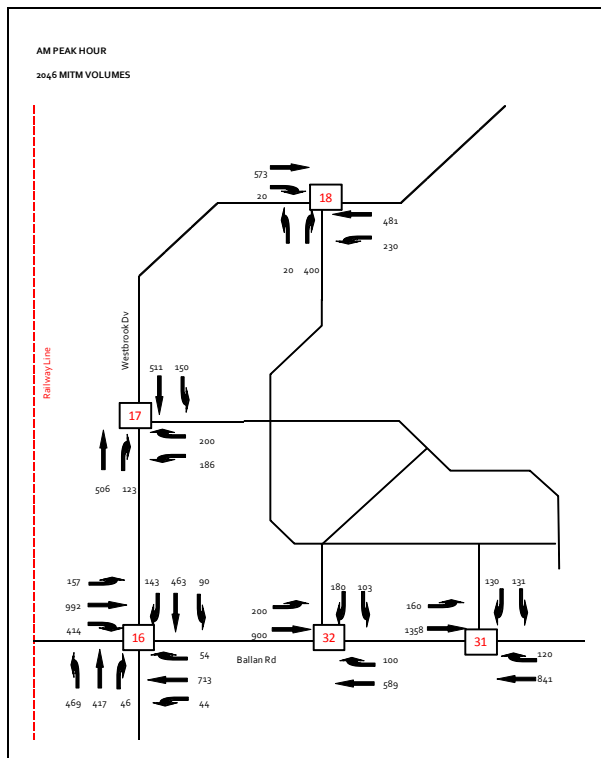


Figure C7: PSP 40 'Raw' MITM Traffic Volumes – PM Peak Hour 2046

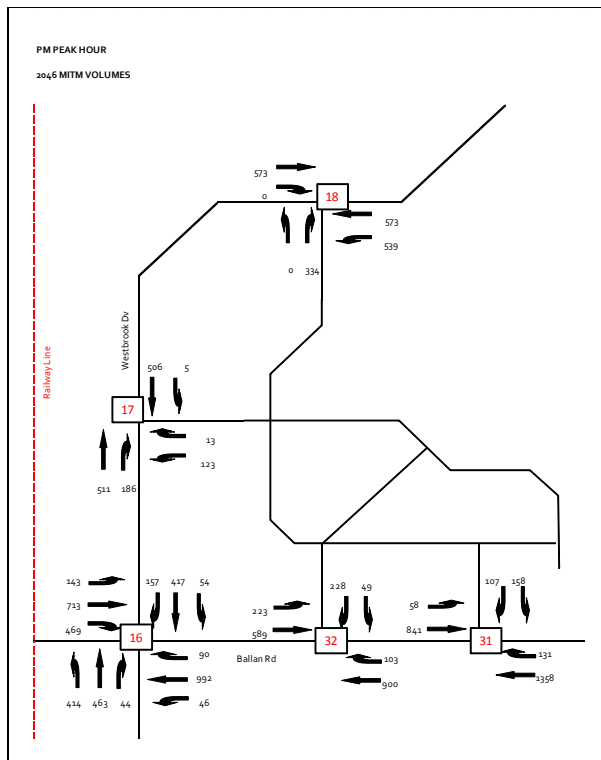


Figure C8: PSP40 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2046

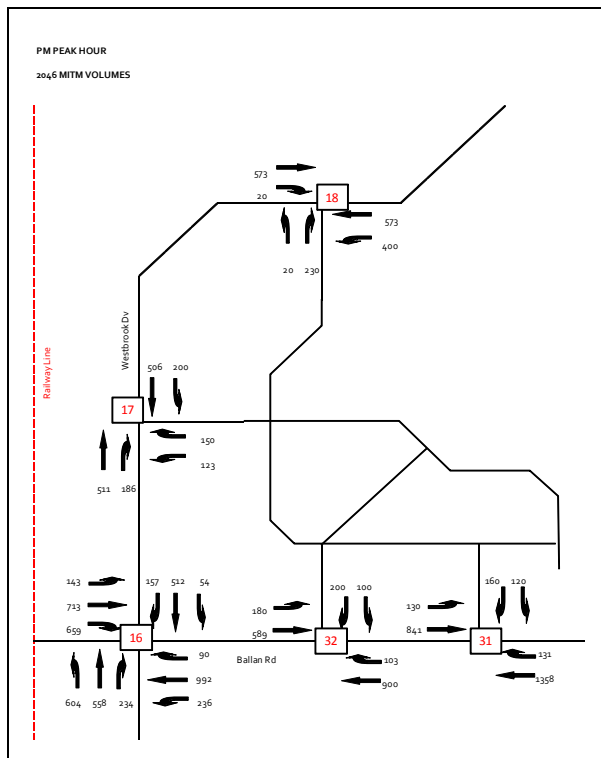


Figure C9: PSP 41 'Raw' MITM Traffic Volumes – AM Peak Hour 2021

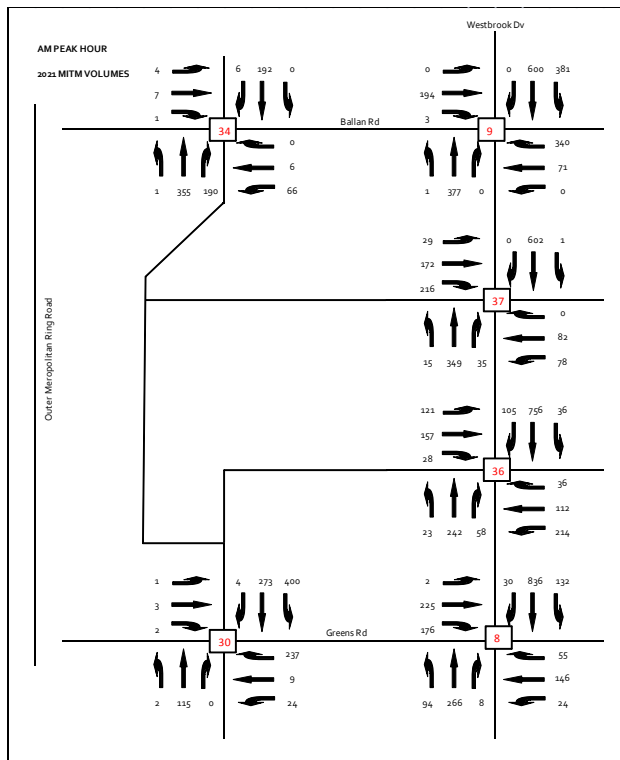


Figure C10: PSP41 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2021

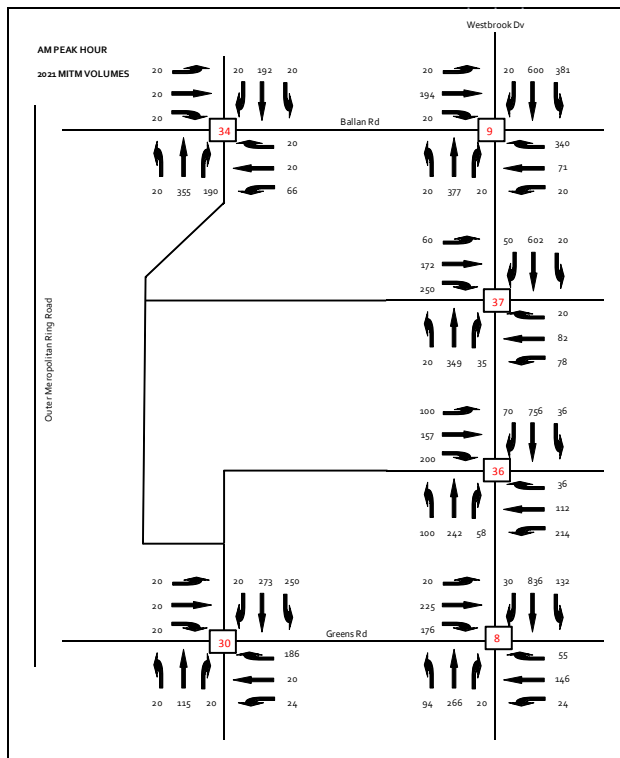


Figure C11: PSP 41 'Raw' MITM Traffic Volumes – PM Peak Hour 2021

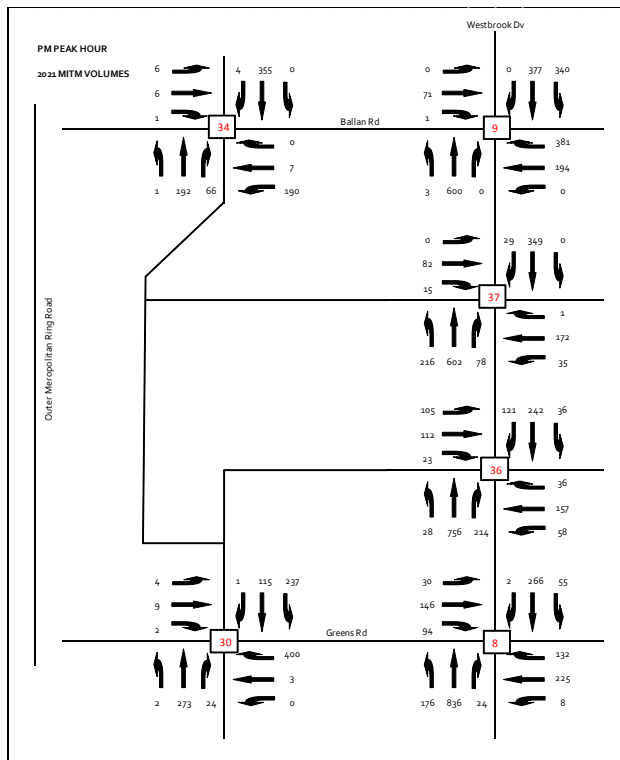


Figure C12: PSP41 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2021

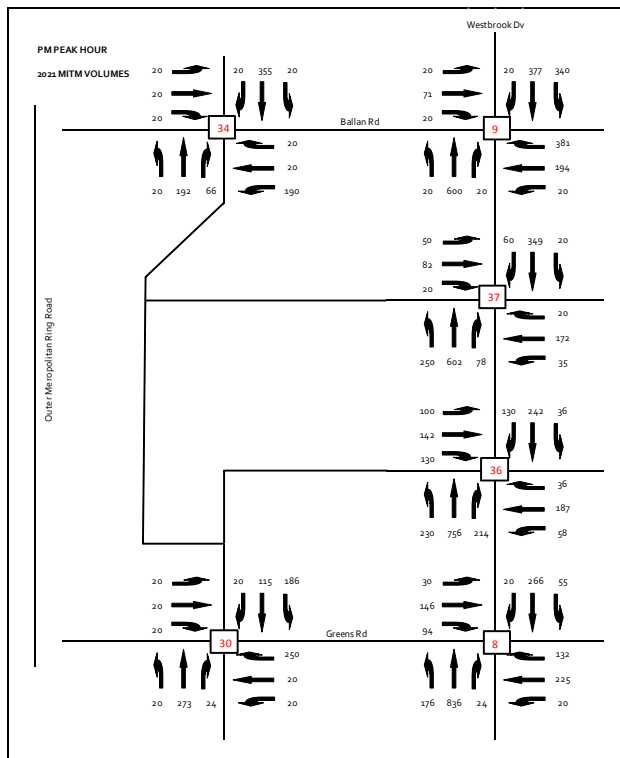


Figure C13: PSP 41 'Raw' MITM Traffic Volumes – AM Peak Hour 2046

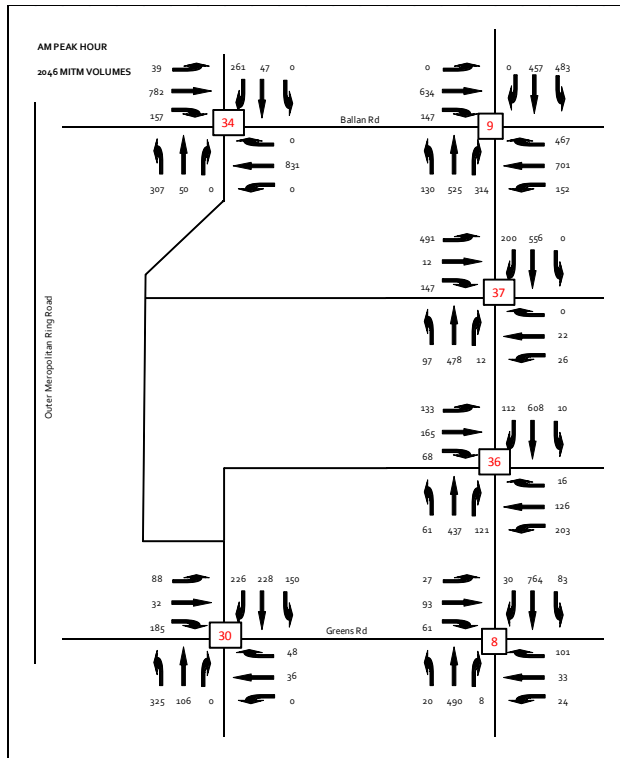


Figure C14: PSP41 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2046

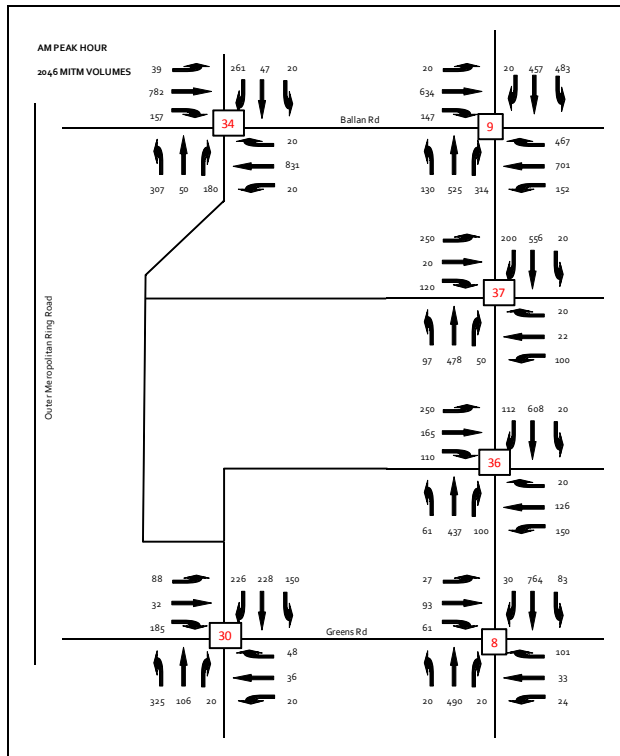


Figure C15: PSP 41 'Raw' MITM Traffic Volumes – PM Peak Hour 2046

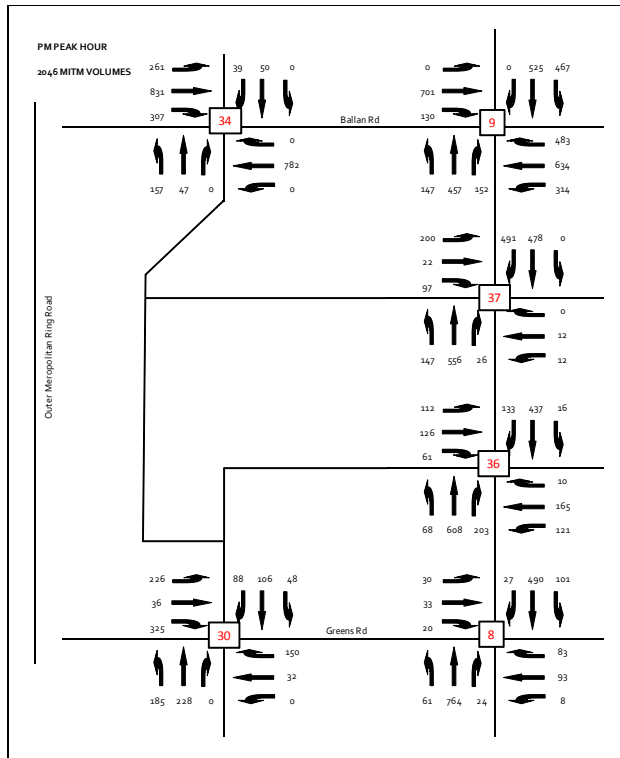


Figure C16: PSP41 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2046

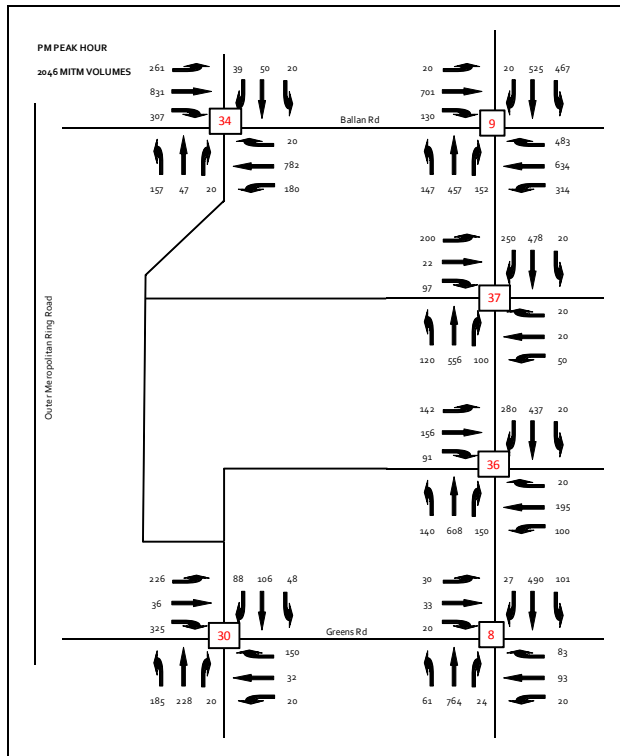






Figure C21: PSP 42.1 'Raw' MITM Traffic Volumes – AM Peak Hour 2046

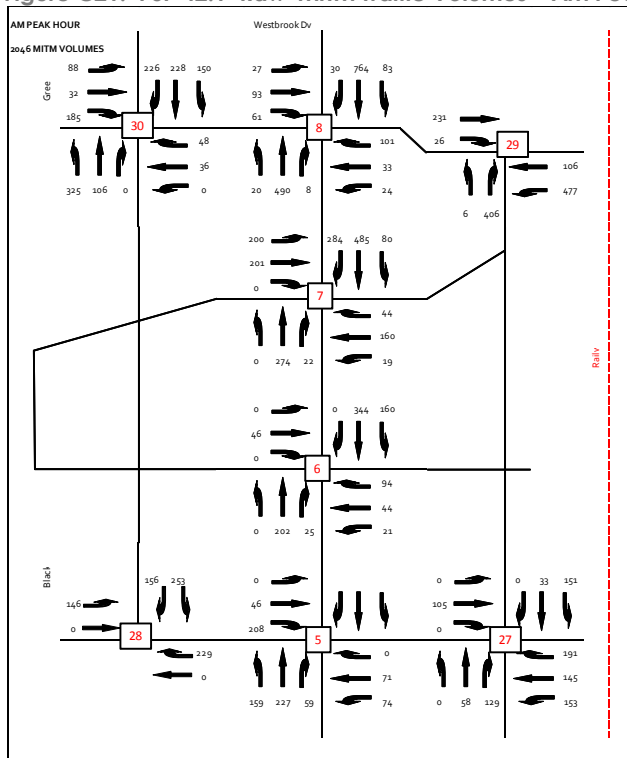


Figure C22: PSP42.1 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2046

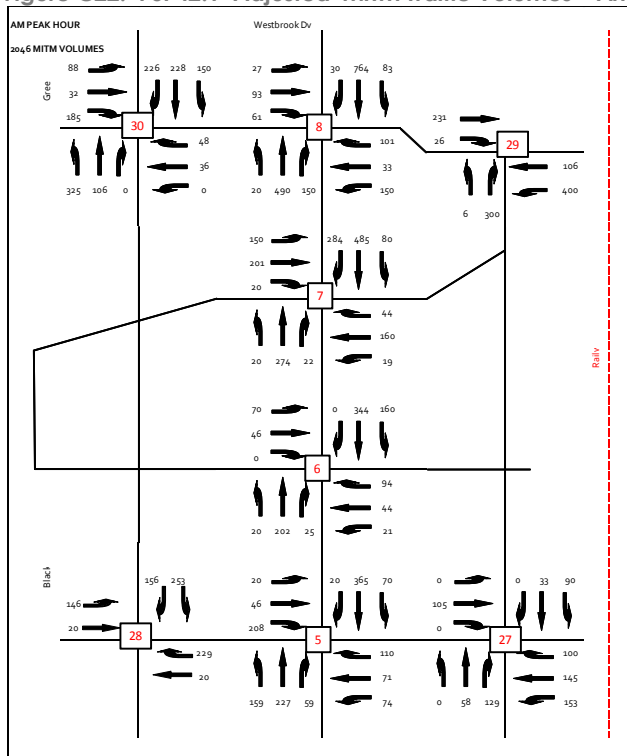


Figure C23: PSP 42.1 'Raw' MITM Traffic Volumes – PM Peak Hour 2046

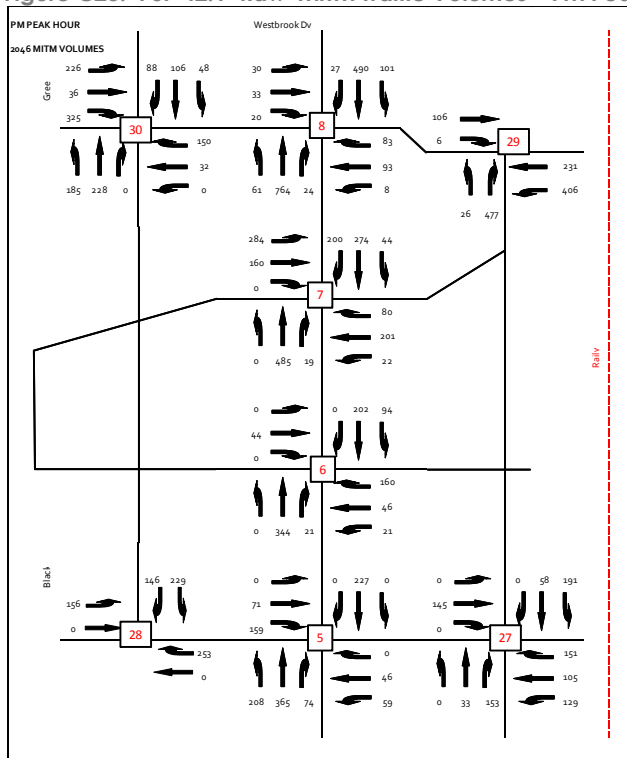


Figure C24: PSP42.1 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2046

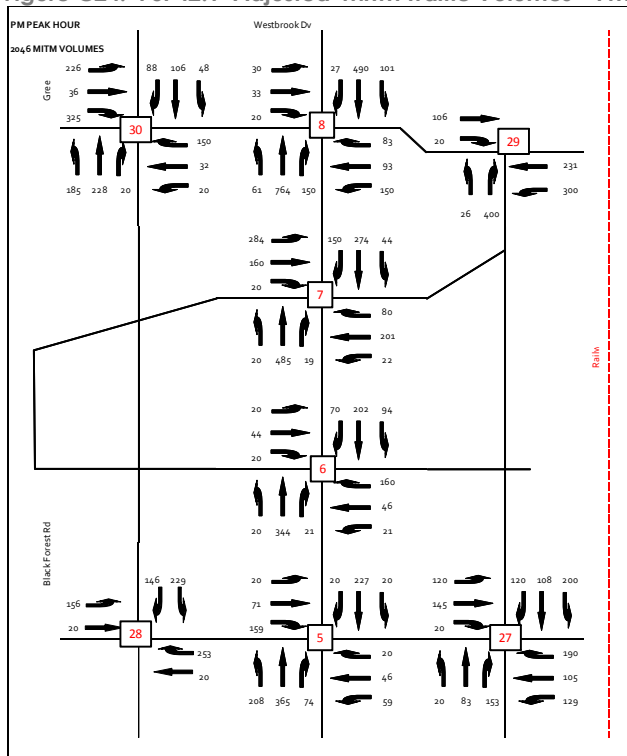


Figure C25: PSP 42.2 'Raw' MITM Traffic Volumes – AM Peak Hour 2021

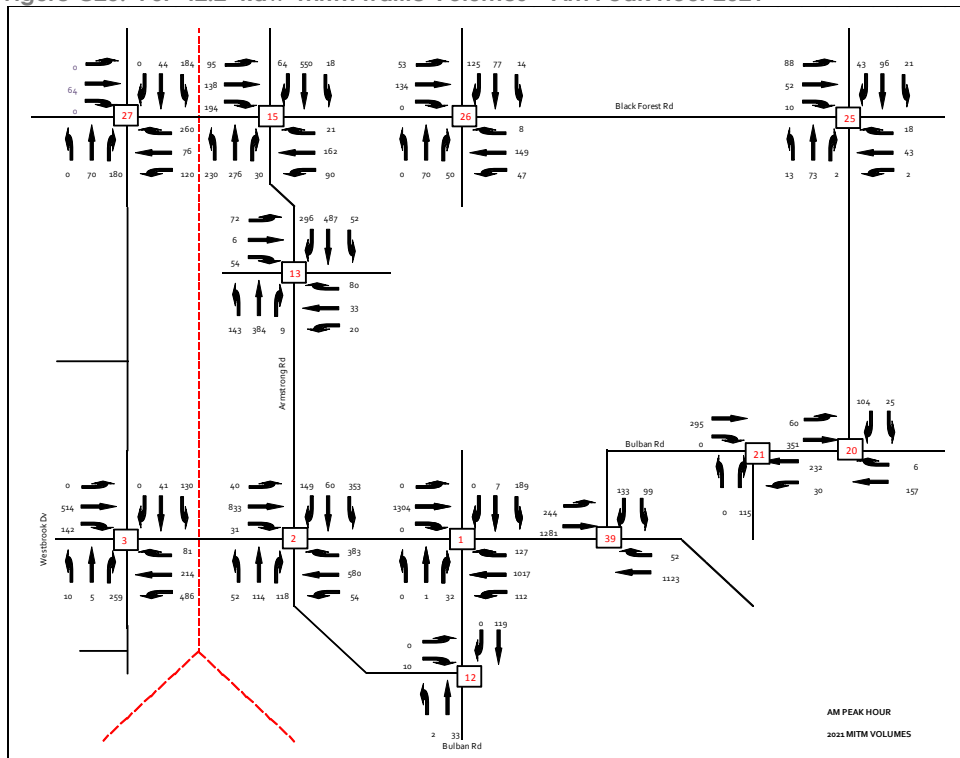


Figure C26: PSP42.2 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2021

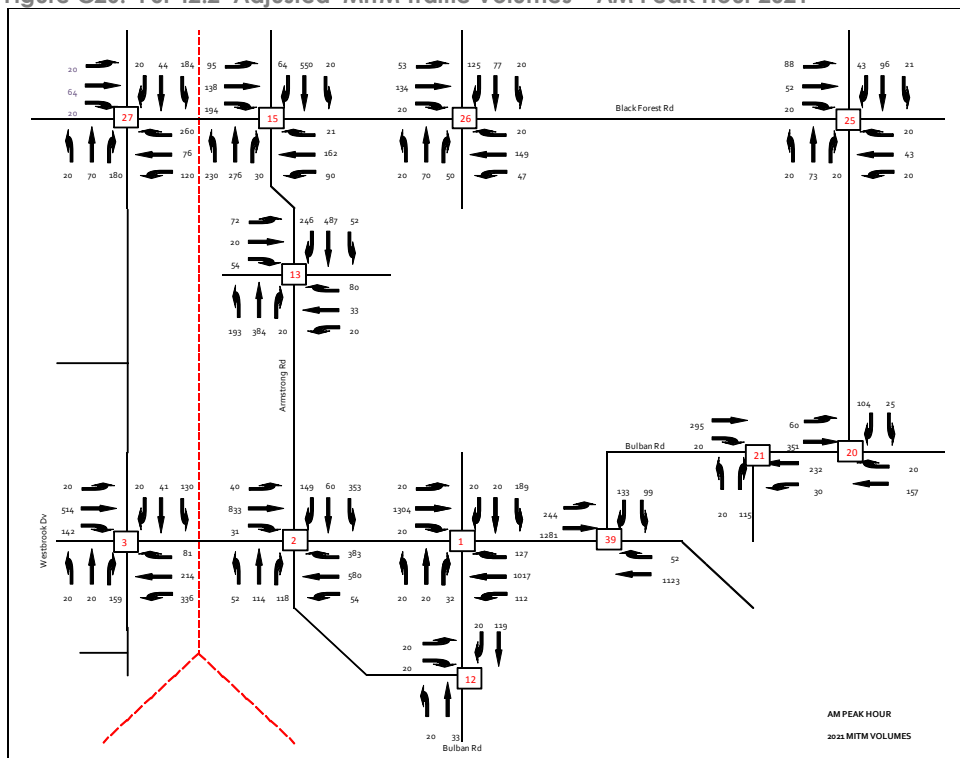


Figure C27: PSP 42.2 'Raw' MITM Traffic Volumes – PM Peak Hour 2021

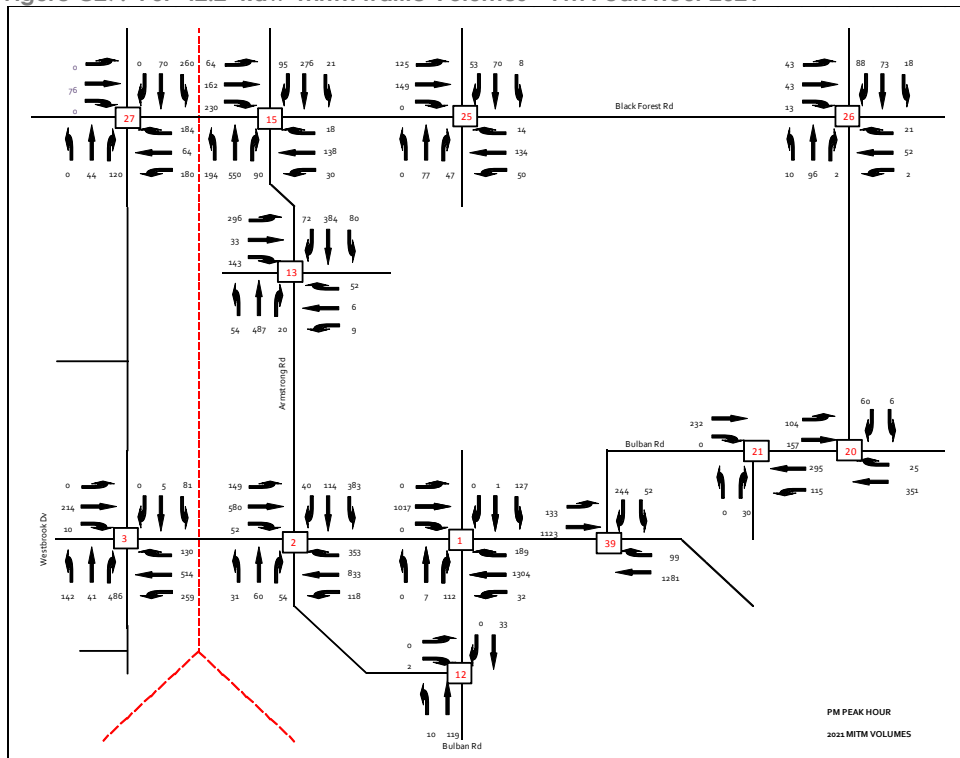


Figure C28: PSP42.2 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2021

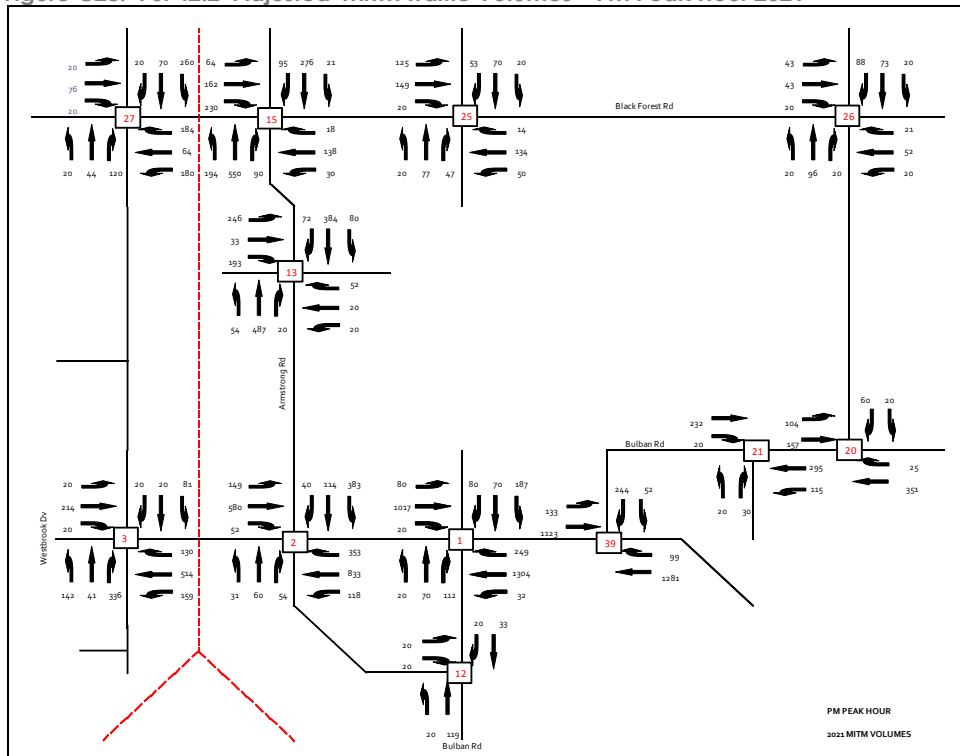


Figure C29: PSP 42.2 'Raw' MITM Traffic Volumes – AM Peak Hour 2046

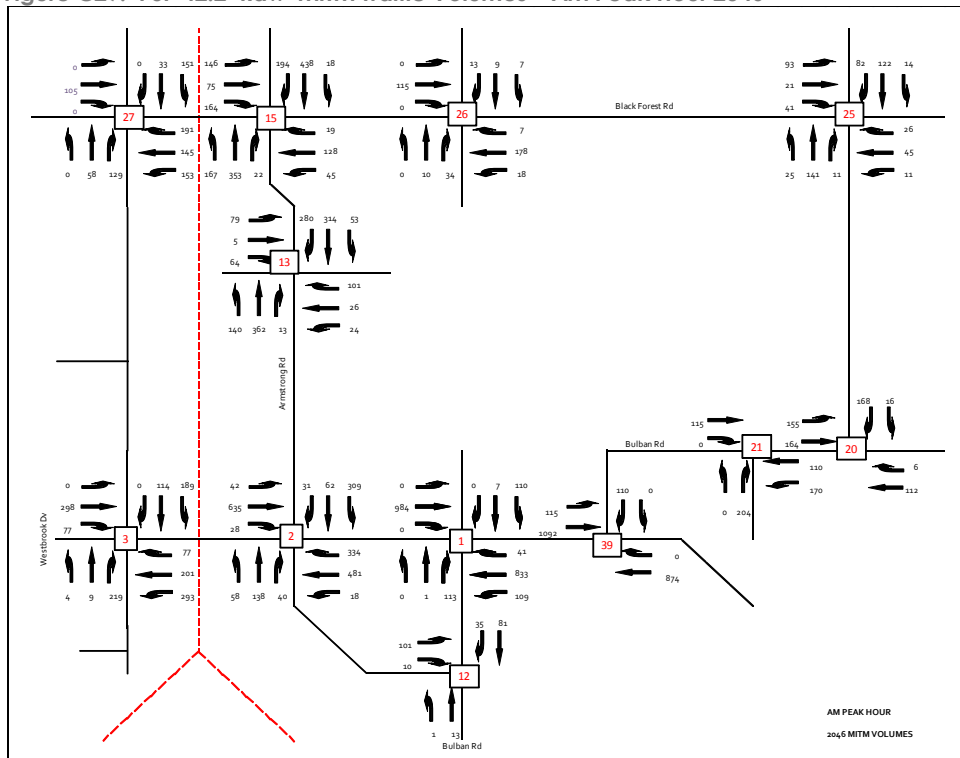


Figure C30: PSP42.2 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2046

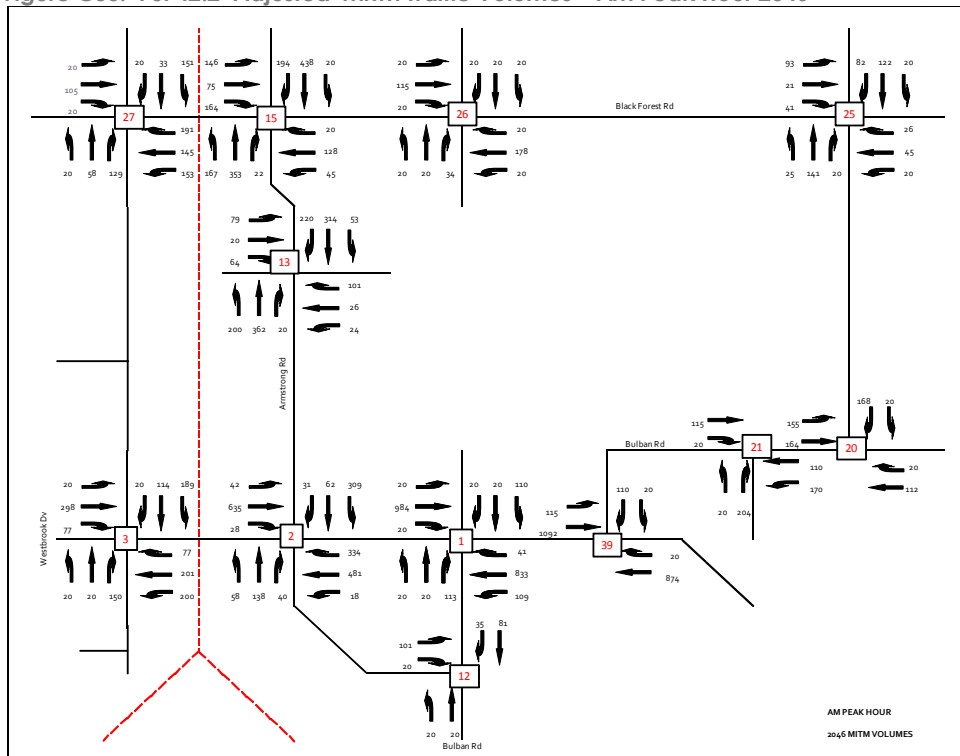


Figure C31: PSP 42.2 'Raw' MITM Traffic Volumes – PM Peak Hour 2046

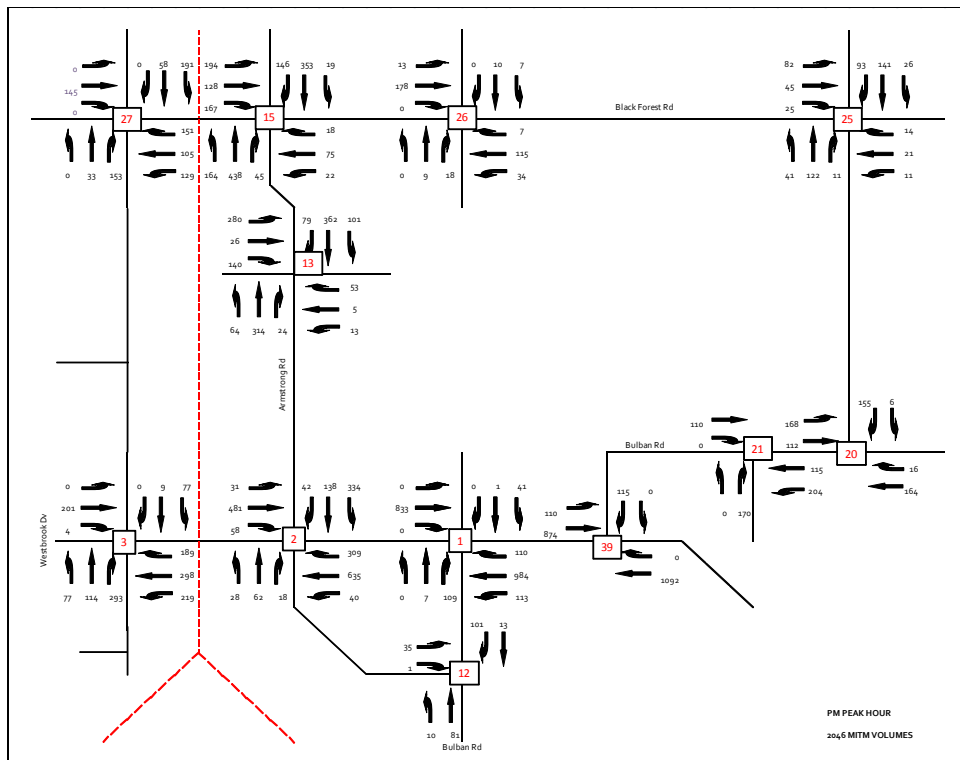


Figure C32: PSP42.2 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2046

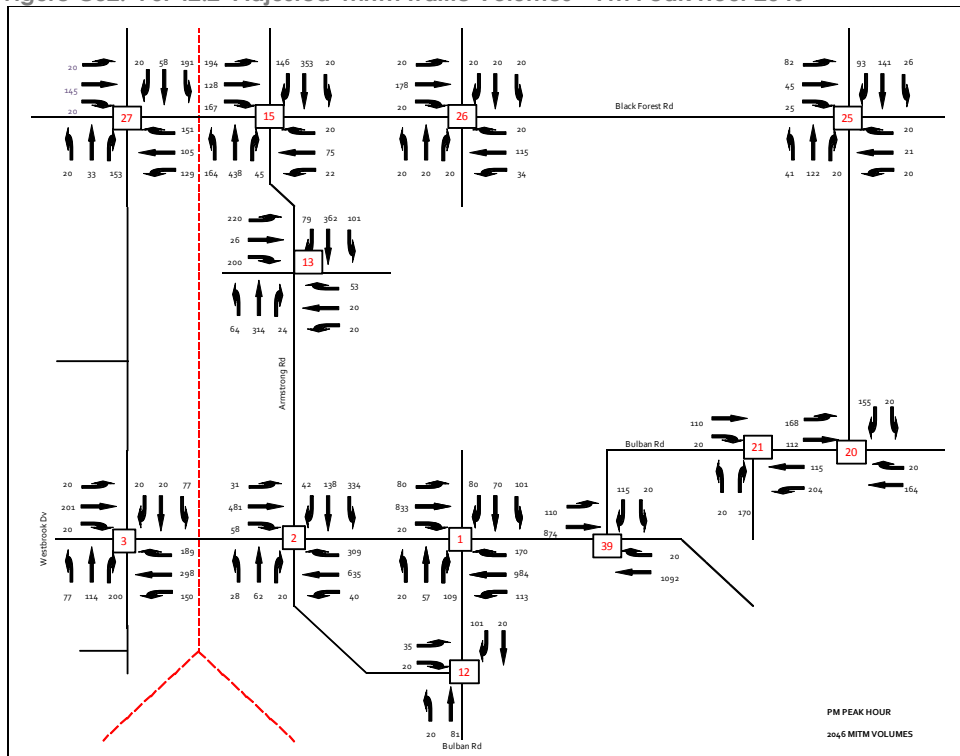


Figure C33: PSP 43 'Raw' MITM Traffic Volumes – AM Peak Hour 2021

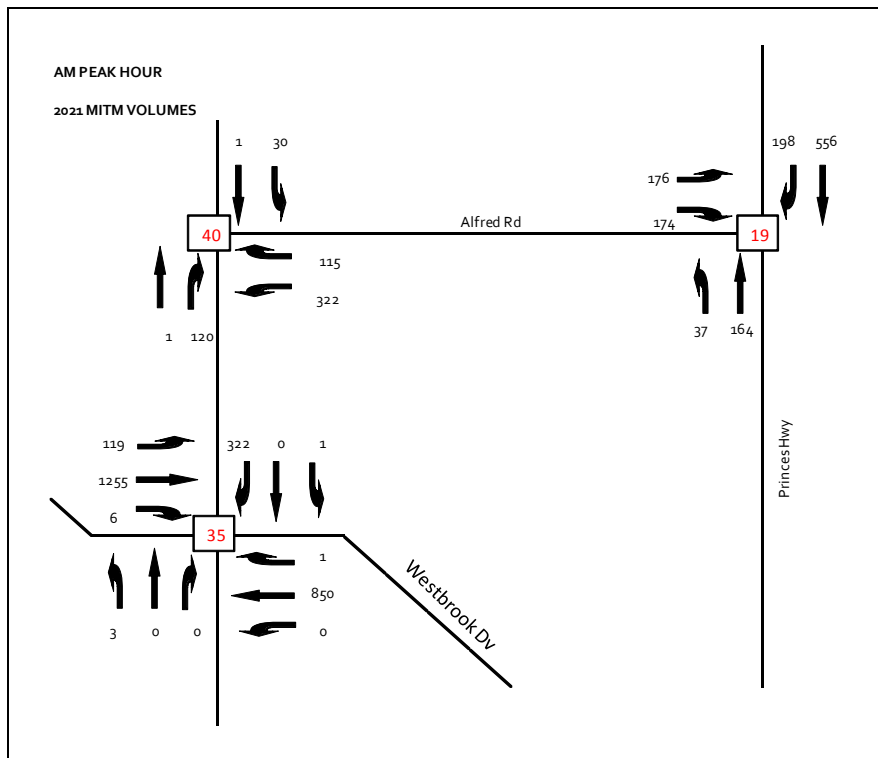


Figure C34: PSP43 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2021

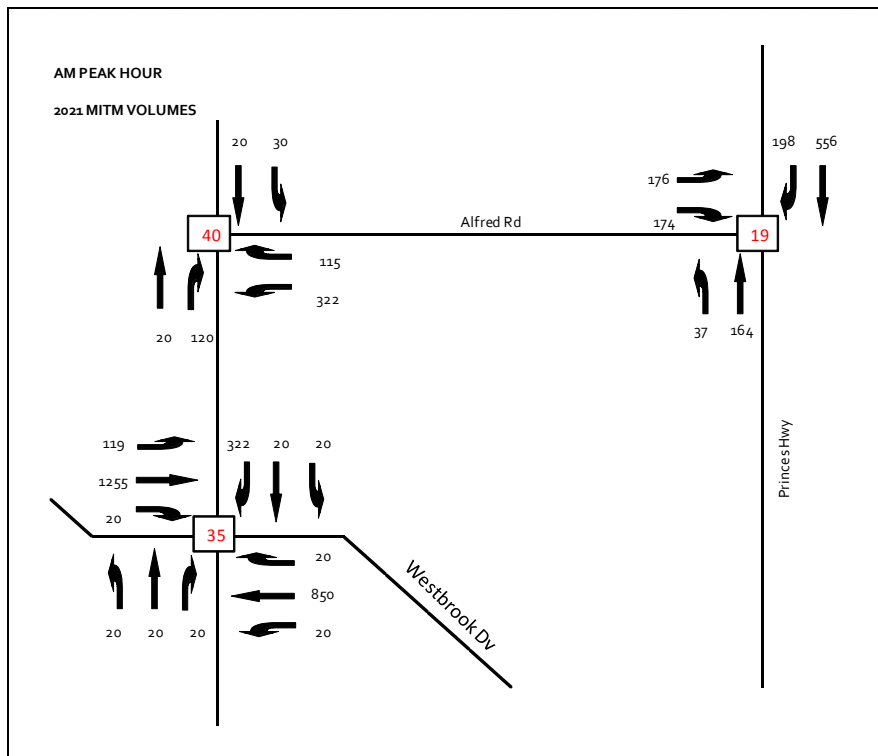


Figure C35: PSP 43 'Raw' MITM Traffic Volumes – PM Peak Hour 2021

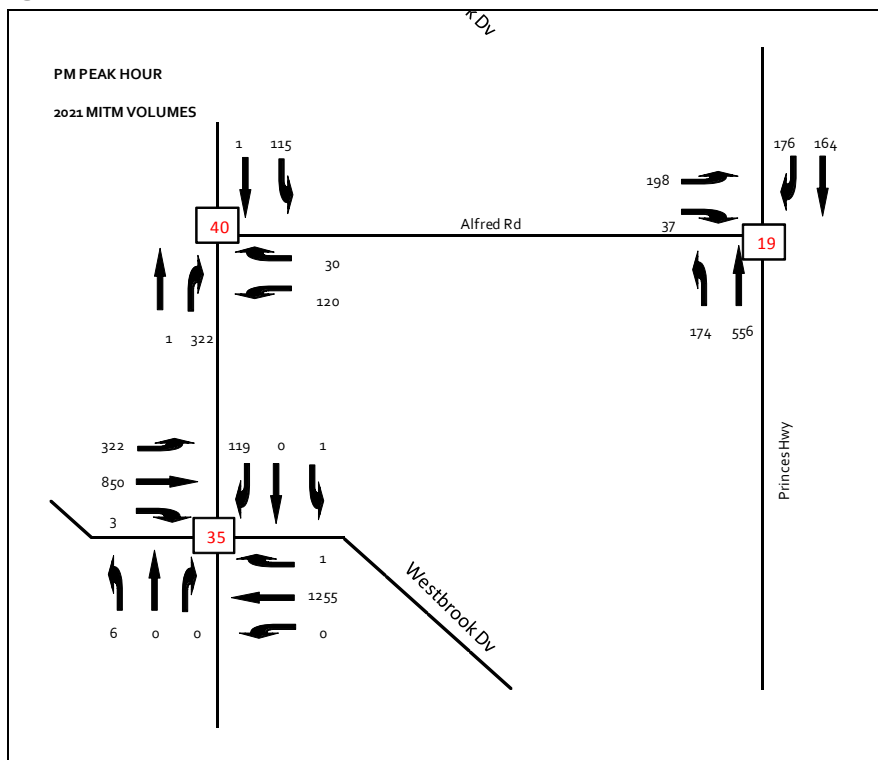


Figure C36: PSP43 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2021

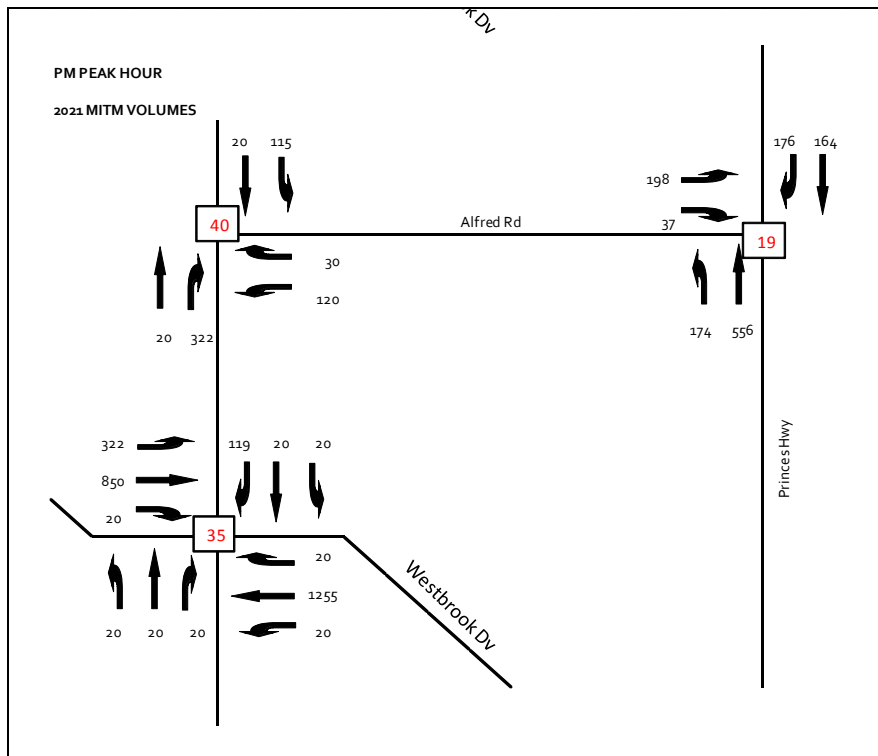


Figure C37: PSP 43 'Raw' MITM Traffic Volumes – AM Peak Hour 2046

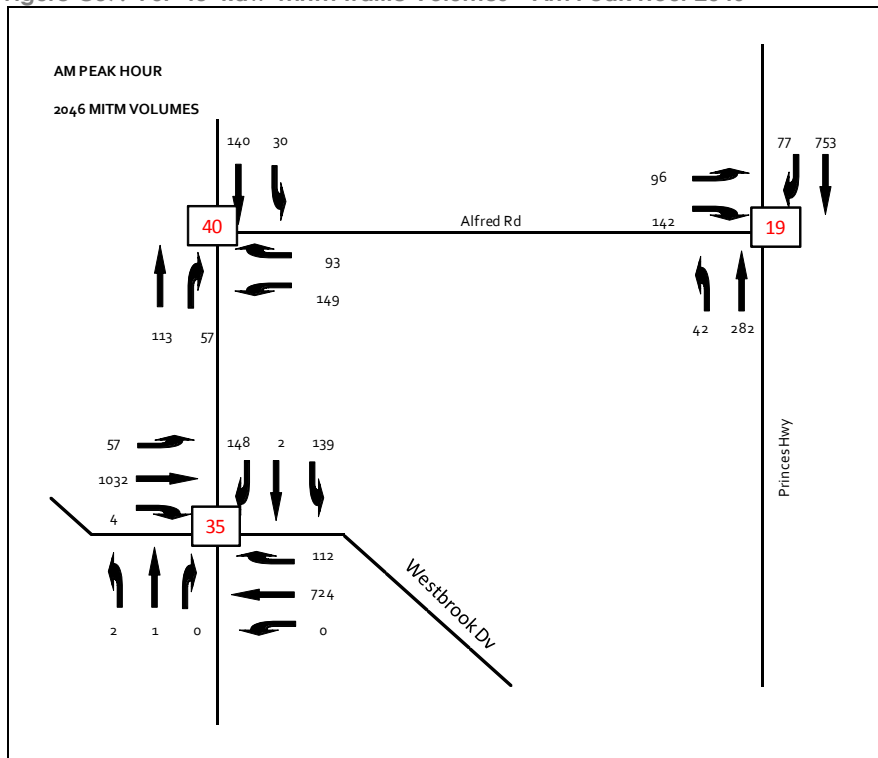


Figure C38: PSP43 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2046

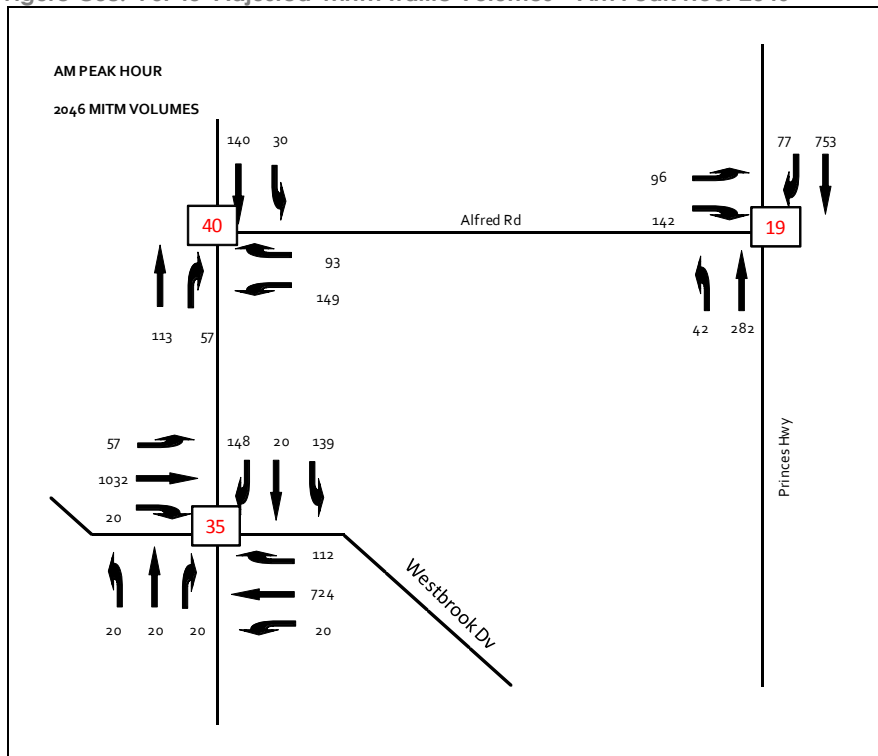


Figure C39: PSP 43 'Raw' MITM Traffic Volumes – PM Peak Hour 2046

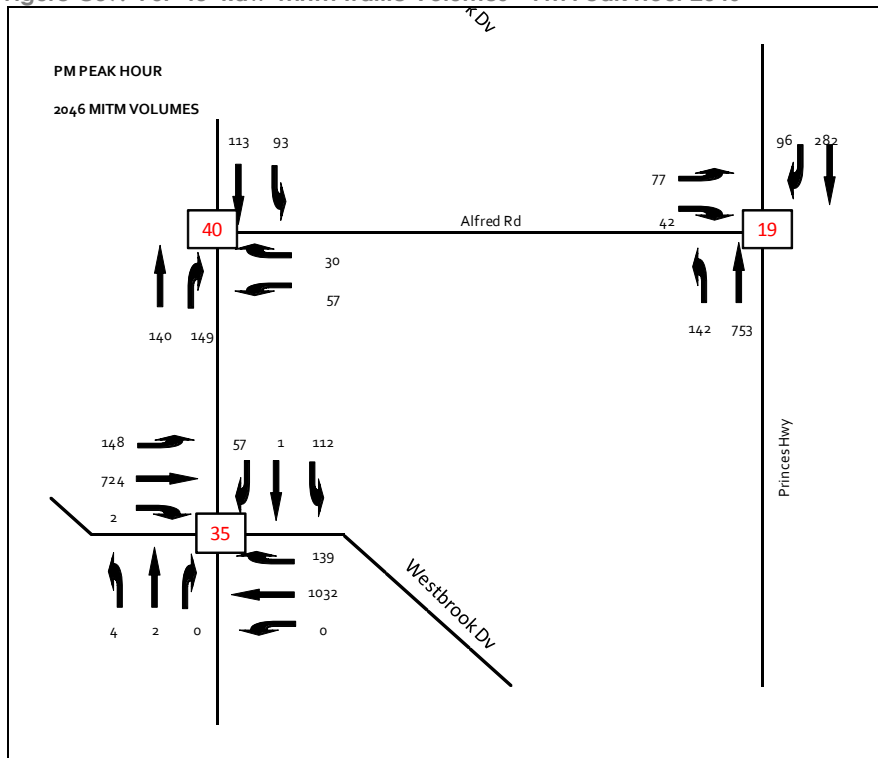


Figure C40: PSP43 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2046

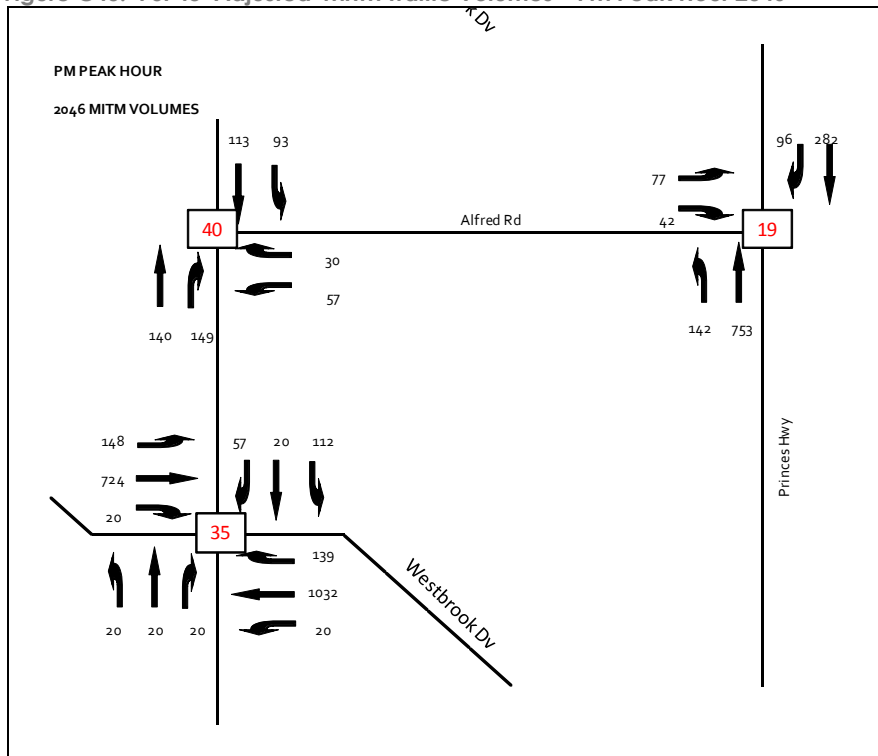


Figure C41: PSP 92 'Raw' MITM Traffic Volumes – AM Peak Hour 2021

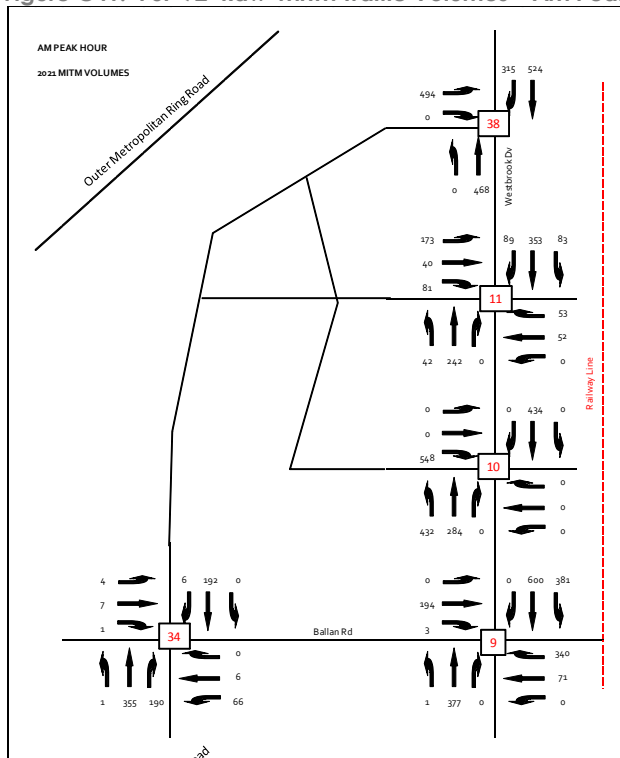


Figure C42: PSP92 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2021

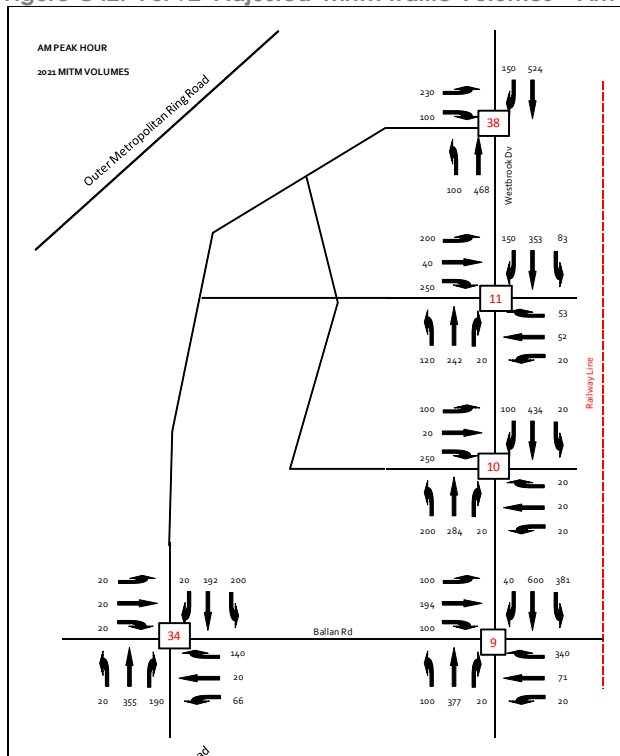


Figure C92: PSP 92 'Raw' MITM Traffic Volumes – PM Peak Hour 2021

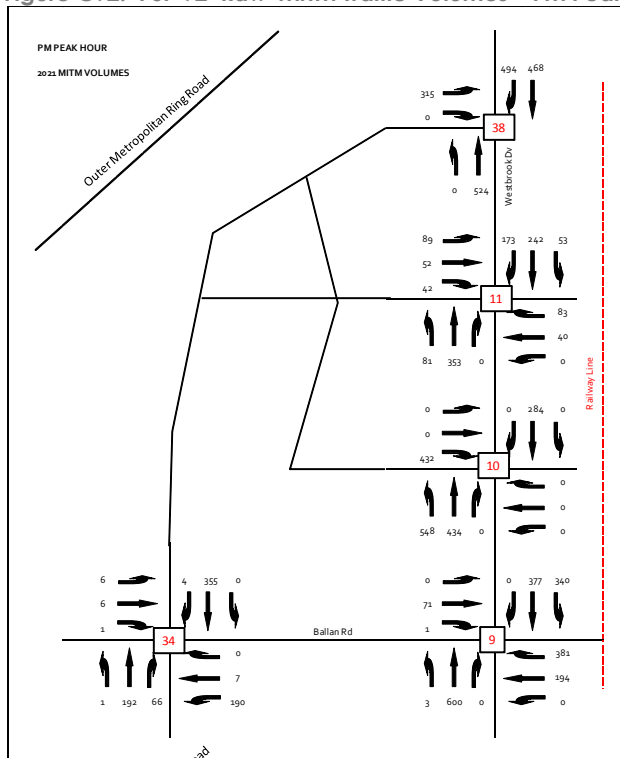


Figure C44: PSP92 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2021

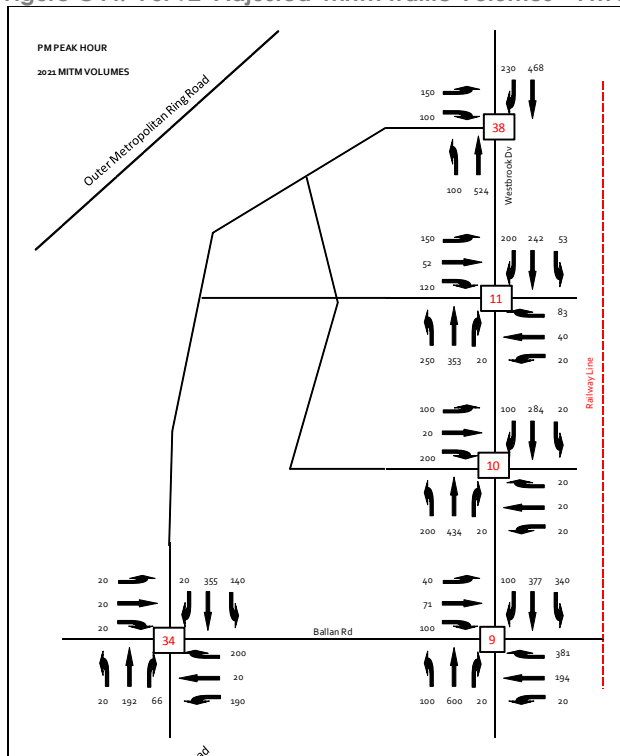


Figure C45: PSP 92 'Raw' MITM Traffic Volumes – AM Peak Hour 2046

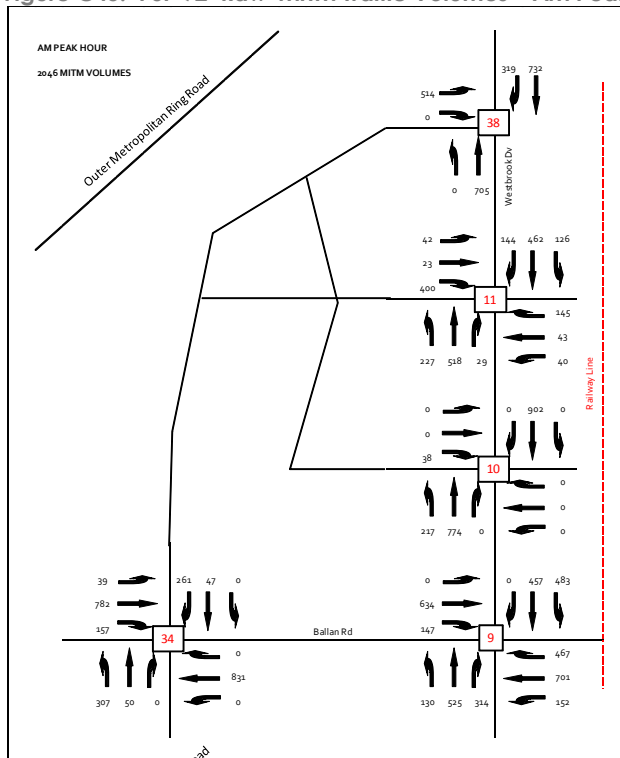


Figure C46: PSP92 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2046

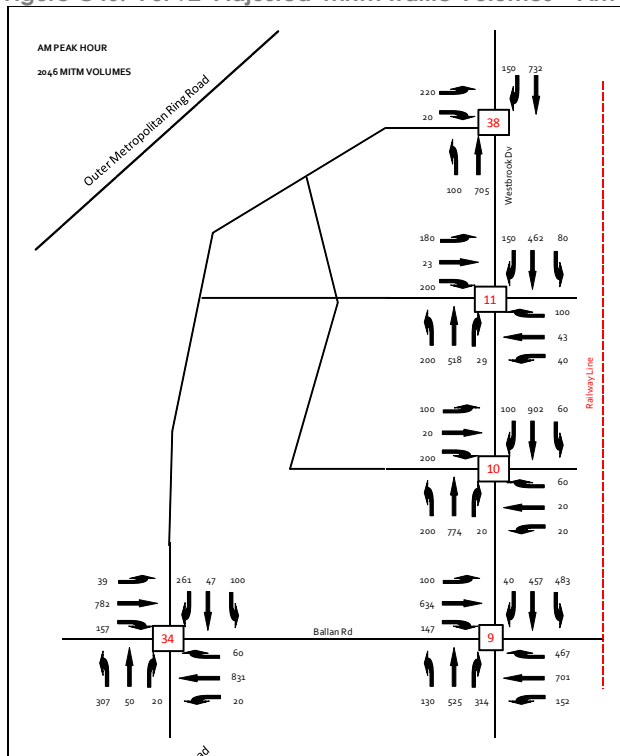


Figure C47: PSP 92 'Raw' MITM Traffic Volumes – PM Peak Hour 2046

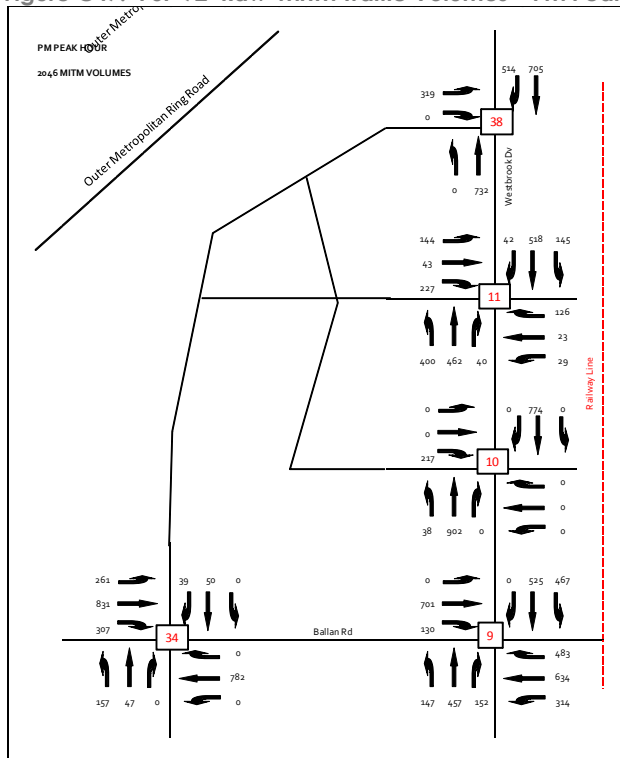
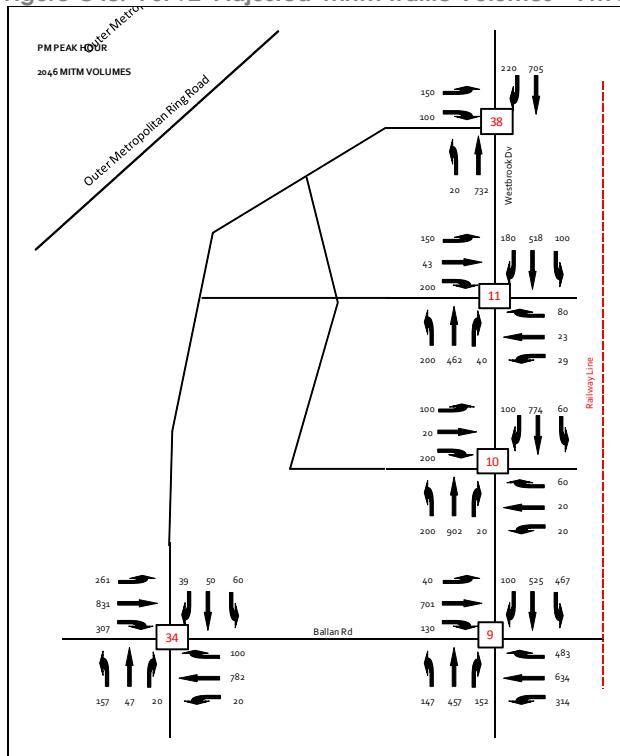


Figure C48: PSP92 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2046



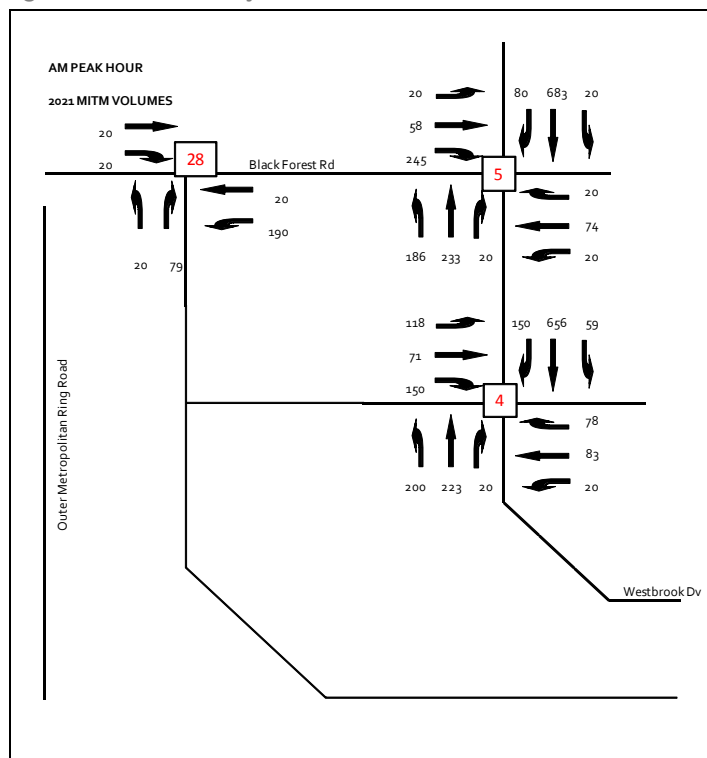


Figure C51: PSP 93 'Raw' MITM Traffic Volumes – PM Peak Hour 2021

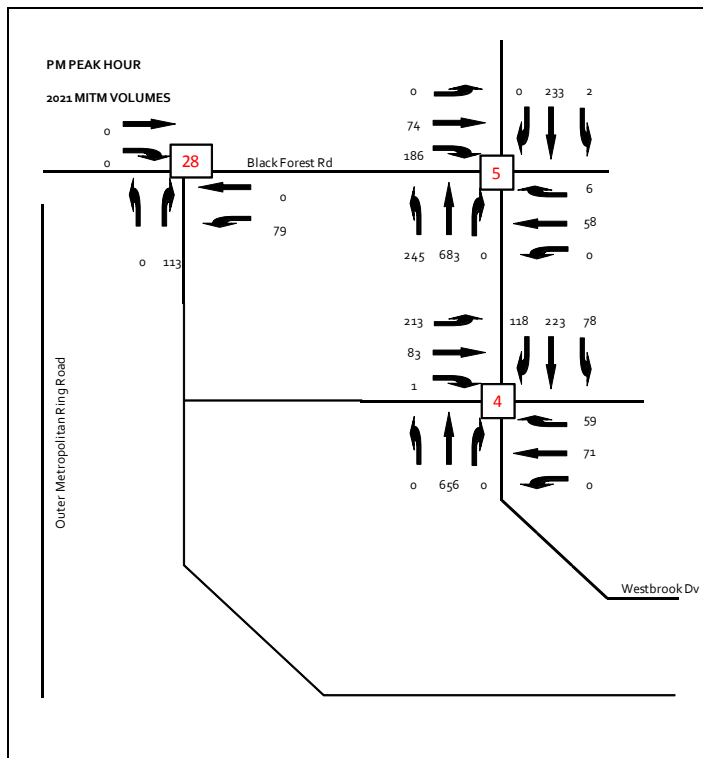


Figure C52: PSP93 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2021

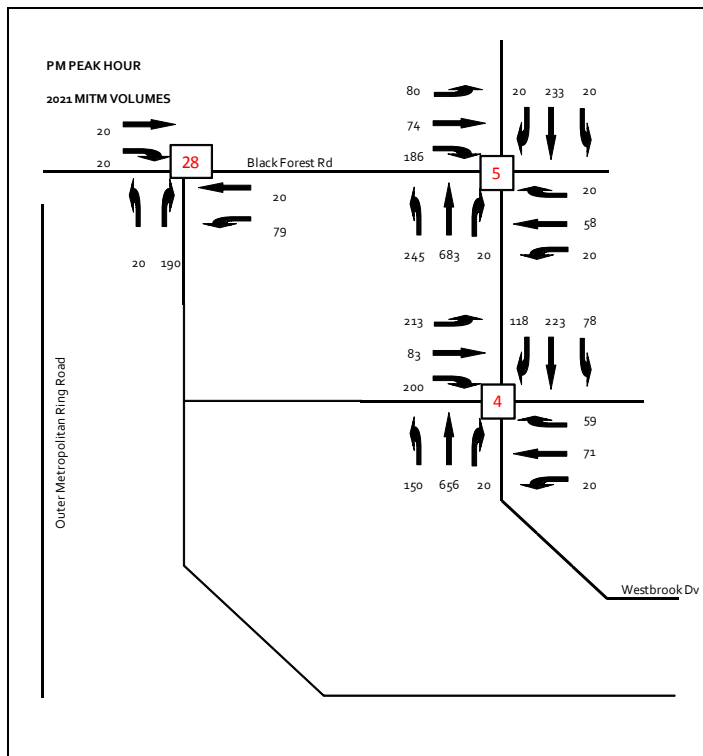


Figure C53: PSP 93 'Raw' MITM Traffic Volumes – AM Peak Hour 2046

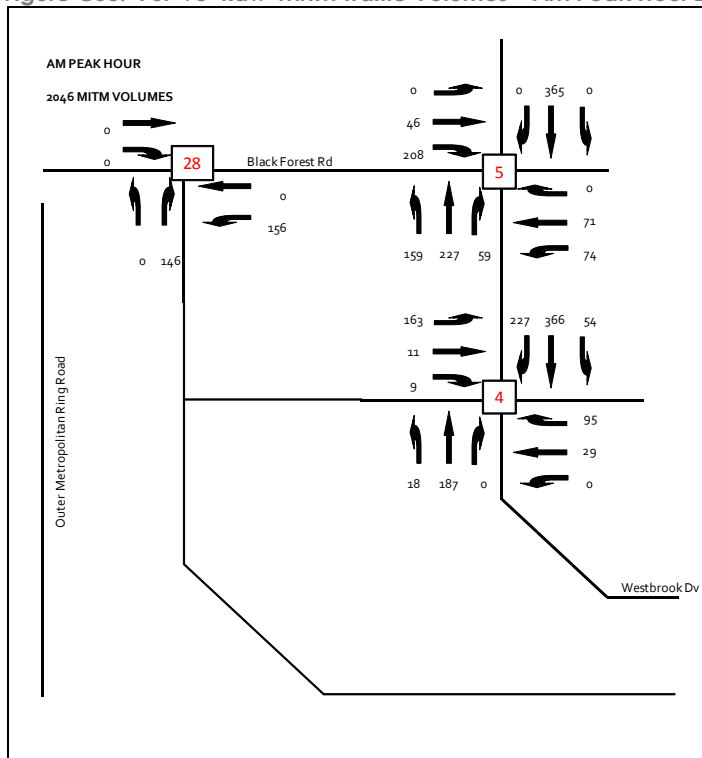


Figure C54: PSP93 'Adjusted' MITM Traffic Volumes – AM Peak Hour 2046

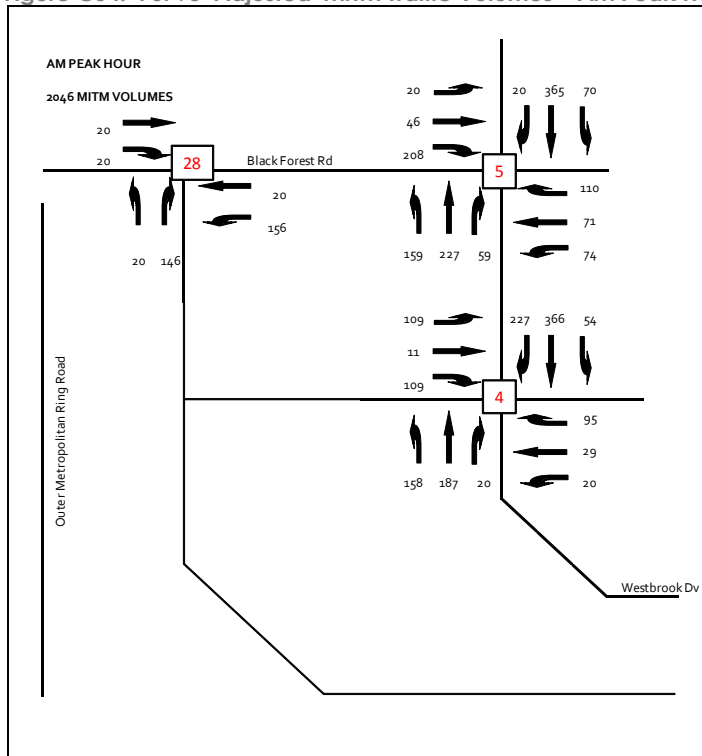


Figure C55: PSP 93 'Raw' MITM Traffic Volumes – PM Peak Hour 2046

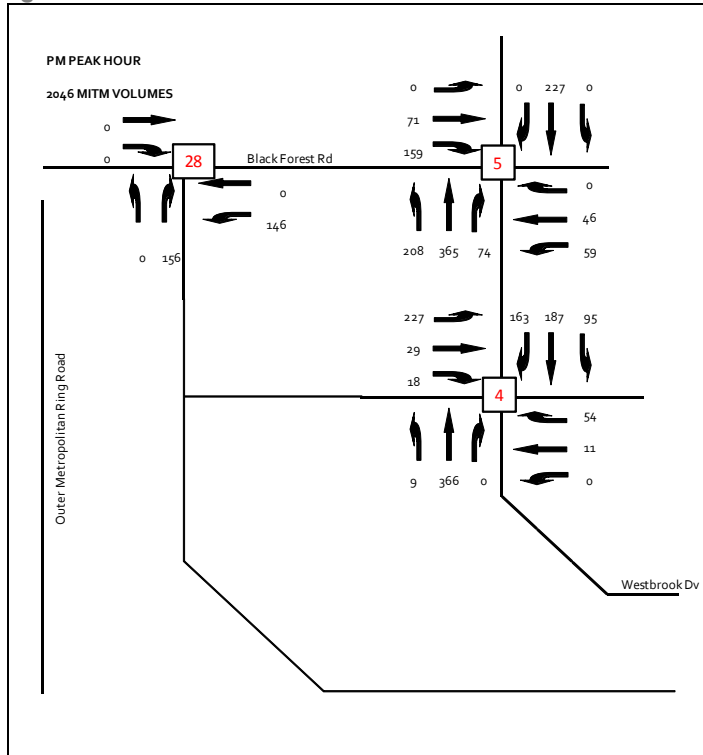
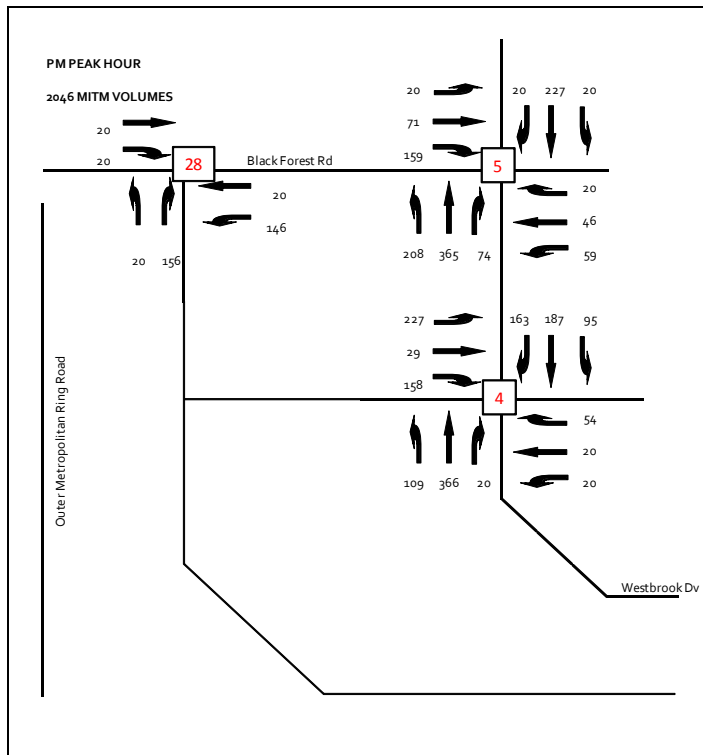


Figure C56: PSP93 'Adjusted' MITM Traffic Volumes – PM Peak Hour 2046



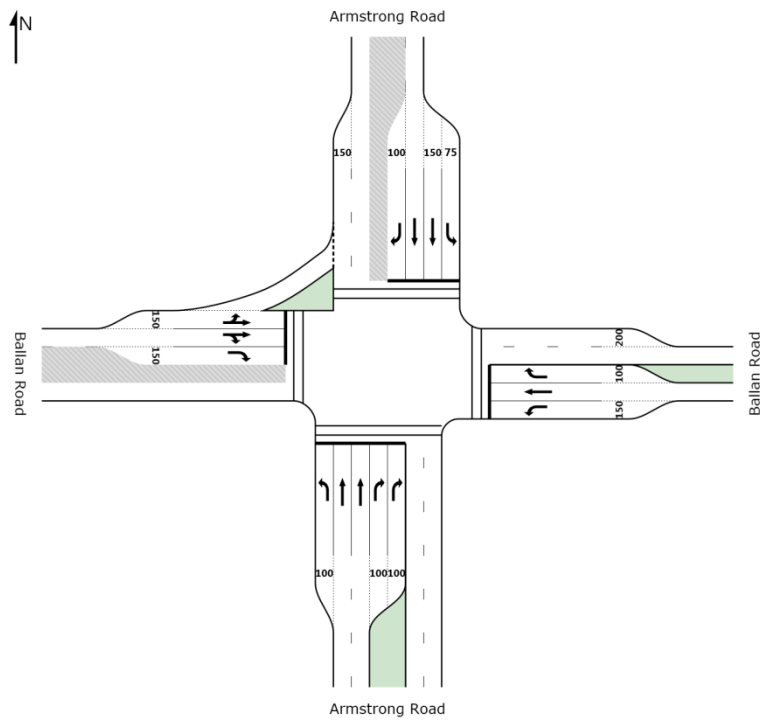
## Appendix D

### SIDRA Intersection Results

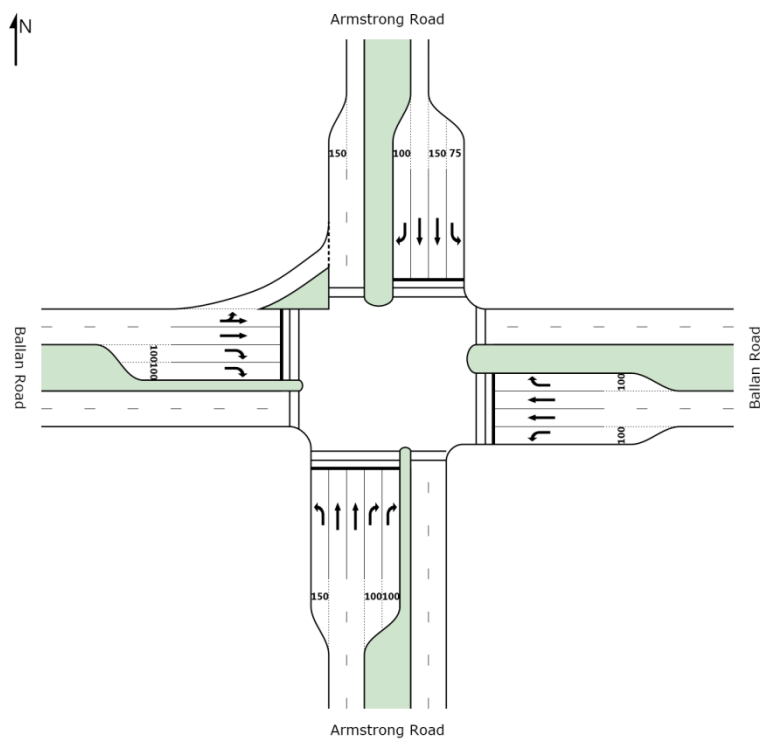
PSP 40

IN 16

Interim Layout



Ultimate Layout



## MOVEMENT SUMMARY

Site: Armstrong Rd & Ballan Rd (IN16) - AM Peak Interim

120221sid-12M1296000 - Armstrong Rd & Ballan Rd - IN8

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                       |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Armstrong Road |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                     | L    | 146         | 5.0 | 0.305     | 32.7          | LOS C            | 5.4               | 39.7  | 0.68         | 0.77                | 31.6          |
| 2                     | T    | 286         | 5.0 | 0.472     | 48.3          | LOS D            | 8.4               | 61.0  | 0.94         | 0.76                | 24.8          |
| 3                     | R    | 170         | 5.0 | 0.569     | 68.2          | LOS E            | 5.0               | 36.8  | 1.00         | 0.78                | 20.9          |
| Approach              |      | 602         | 5.0 | 0.569     | 50.2          | LOS D            | 8.4               | 61.0  | 0.89         | 0.77                | 24.8          |
| East: Ballan Road     |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                     | L    | 227         | 5.0 | 0.379     | 38.6          | LOS D            | 9.7               | 70.9  | 0.78         | 0.81                | 29.1          |
| 5                     | T    | 376         | 5.0 | 0.556     | 33.1          | LOS C            | 17.6              | 128.2 | 0.86         | 0.74                | 30.1          |
| 6                     | R    | 20          | 5.0 | 0.061     | 51.7          | LOS D            | 1.0               | 7.1   | 0.86         | 0.71                | 24.9          |
| Approach              |      | 623         | 5.0 | 0.556     | 35.7          | LOS D            | 17.6              | 128.2 | 0.83         | 0.77                | 29.5          |
| North: Armstrong Road |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                     | L    | 20          | 5.0 | 0.052     | 30.7          | LOS C            | 0.7               | 5.0   | 0.62         | 0.70                | 32.6          |
| 8                     | T    | 386         | 5.0 | 0.584     | 49.8          | LOS D            | 10.6              | 77.2  | 0.97         | 0.80                | 24.3          |
| 9                     | R    | 67          | 5.0 | 0.448     | 67.4          | LOS E            | 3.9               | 28.6  | 0.99         | 0.76                | 21.1          |
| Approach              |      | 473         | 5.0 | 0.584     | 51.5          | LOS D            | 10.6              | 77.2  | 0.96         | 0.79                | 24.1          |
| West: Ballan Road     |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                    | L    | 112         | 5.0 | 0.608     | 40.0          | LOS D            | 16.6              | 121.3 | 0.84         | 0.90                | 29.6          |
| 11                    | T    | 622         | 5.0 | 0.608     | 32.4          | LOS C            | 16.6              | 121.3 | 0.85         | 0.75                | 30.2          |
| 12                    | R    | 192         | 5.0 | 0.584     | 57.2          | LOS E            | 10.5              | 76.5  | 0.97         | 0.82                | 23.4          |
| Approach              |      | 926         | 5.0 | 0.608     | 38.5          | LOS D            | 16.6              | 121.3 | 0.87         | 0.78                | 28.4          |
| All Vehicles          |      | 2624        | 5.0 | 0.608     | 42.8          | LOS D            | 17.6              | 128.2 | 0.88         | 0.78                | 26.9          |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Ballan Rd (IN16) - PM Peak Interim with additional MAC - Copy

120221sid-12M1296000 - Armstrong Rd & Ballan Rd - IN8

Signals - Fixed Time Cycle Time = 130 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV Deg. | Satn  | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|-----------------------|------|-------------|---------|-------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
|                       |      | veh/h       | %       | v/c   | sec           |                  | Vehicles          | Distance     | per veh             | km/h          |      |
|                       |      |             |         |       |               |                  | veh               | m            |                     |               |      |
| South: Armstrong Road |      |             |         |       |               |                  |                   |              |                     |               |      |
| 1                     | L    | 382         | 5.0     | 0.893 | 54.6          | LOS D            | 22.4              | 163.2        | 0.86                | 0.90          | 24.0 |
| 2                     | T    | 481         | 5.0     | 0.903 | 67.3          | LOS E            | 19.3              | 140.7        | 1.00                | 0.99          | 20.4 |
| 3                     | R    | 417         | 5.0     | 0.889 | 81.5          | LOS F            | 15.1              | 110.0        | 1.00                | 0.99          | 18.5 |
| Approach              |      | 1280        | 5.0     | 0.903 | 68.1          | LOS E            | 22.4              | 163.2        | 0.96                | 0.96          | 20.6 |
| East: Ballan Road     |      |             |         |       |               |                  |                   |              |                     |               |      |
| 4                     | L    | 360         | 5.0     | 0.633 | 43.9          | LOS D            | 18.1              | 132.4        | 0.85                | 0.84          | 27.2 |
| 5                     | T    | 622         | 5.0     | 0.911 | 58.7          | LOS E            | 45.2              | 329.9        | 1.00                | 1.07          | 22.1 |
| 6                     | R    | 20          | 5.0     | 0.047 | 36.3          | LOS D            | 0.8               | 5.8          | 0.67                | 0.70          | 30.1 |
| Approach              |      | 1002        | 5.0     | 0.911 | 52.9          | LOS D            | 45.2              | 329.9        | 0.94                | 0.98          | 23.9 |
| North: Armstrong Road |      |             |         |       |               |                  |                   |              |                     |               |      |
| 7                     | L    | 20          | 5.0     | 0.031 | 16.6          | LOS B            | 0.3               | 2.4          | 0.51                | 0.70          | 41.3 |
| 8                     | T    | 381         | 5.0     | 0.656 | 57.0          | LOS E            | 11.6              | 84.9         | 0.99                | 0.82          | 22.5 |
| 9                     | R    | 112         | 5.0     | 0.478 | 66.1          | LOS E            | 6.8               | 49.3         | 0.97                | 0.79          | 21.3 |
| Approach              |      | 513         | 5.0     | 0.656 | 57.4          | LOS E            | 11.6              | 84.9         | 0.97                | 0.81          | 22.6 |
| West: Ballan Road     |      |             |         |       |               |                  |                   |              |                     |               |      |
| 10                    | L    | 67          | 5.0     | 0.827 | 68.3          | LOS E            | 17.3              | 126.4        | 1.00                | 0.97          | 21.5 |
| 11                    | T    | 376         | 5.0     | 0.827 | 61.4          | LOS E            | 17.3              | 126.6        | 1.00                | 0.96          | 21.3 |
| 12                    | R    | 336         | 5.0     | 0.827 | 71.0          | LOS E            | 17.3              | 126.6        | 1.00                | 0.93          | 20.6 |
| Approach              |      | 779         | 5.0     | 0.827 | 66.1          | LOS E            | 17.3              | 126.6        | 1.00                | 0.95          | 21.0 |
| All Vehicles          |      | 3574        | 5.0     | 0.911 | 61.9          | LOS E            | 45.2              | 329.9        | 0.96                | 0.94          | 21.8 |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Ballan Rd (IN16) - AM Peak Ultimate

120221sid-12M1296000 - Armstrong Rd & Ballan Rd - IN8

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg.  | Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-------|------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   |       | v/c  | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 1                     | L    | 469         | 5.0 | 0.765 |      | 42.8          | LOS D            | 23.4                       | 171.0    | 0.90         | 0.87                | 27.6          |
| 2                     | T    | 417         | 5.0 | 0.619 |      | 48.2          | LOS D            | 12.2                       | 89.2     | 0.96         | 0.80                | 24.8          |
| 3                     | R    | 46          | 5.0 | 0.128 |      | 62.4          | LOS E            | 1.3                        | 9.2      | 0.94         | 0.71                | 22.2          |
| Approach              |      | 932         | 5.0 | 0.765 |      | 46.2          | LOS D            | 23.4                       | 171.0    | 0.93         | 0.83                | 26.0          |
| East: Ballan Road     |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 4                     | L    | 44          | 5.0 | 0.079 |      | 23.5          | LOS C            | 1.2                        | 9.1      | 0.52         | 0.72                | 36.5          |
| 5                     | T    | 713         | 5.0 | 0.515 |      | 31.8          | LOS C            | 16.2                       | 118.3    | 0.83         | 0.72                | 30.7          |
| 6                     | R    | 54          | 5.0 | 0.213 |      | 58.0          | LOS E            | 2.9                        | 20.8     | 0.92         | 0.75                | 23.3          |
| Approach              |      | 811         | 5.0 | 0.515 |      | 33.1          | LOS C            | 16.2                       | 118.3    | 0.82         | 0.72                | 30.3          |
| North: Armstrong Road |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 7                     | L    | 90          | 5.0 | 0.241 |      | 33.9          | LOS C            | 3.4                        | 24.6     | 0.68         | 0.75                | 31.1          |
| 8                     | T    | 463         | 5.0 | 0.640 |      | 48.9          | LOS D            | 12.7                       | 92.6     | 0.98         | 0.81                | 24.6          |
| 9                     | R    | 143         | 5.0 | 0.798 |      | 71.2          | LOS E            | 9.0                        | 65.5     | 1.00         | 0.91                | 20.4          |
| Approach              |      | 696         | 5.0 | 0.798 |      | 51.5          | LOS D            | 12.7                       | 92.6     | 0.94         | 0.83                | 24.2          |
| West: Ballan Road     |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 10                    | L    | 157         | 5.0 | 0.822 |      | 50.5          | LOS D            | 31.8                       | 231.8    | 0.97         | 0.98                | 26.1          |
| 11                    | T    | 992         | 5.0 | 0.822 |      | 41.4          | LOS D            | 32.0                       | 233.5    | 0.97         | 0.94                | 26.7          |
| 12                    | R    | 414         | 5.0 | 0.815 |      | 68.2          | LOS E            | 12.9                       | 94.1     | 1.00         | 0.93                | 21.0          |
| Approach              |      | 1563        | 5.0 | 0.822 |      | 49.4          | LOS D            | 32.0                       | 233.5    | 0.98         | 0.94                | 24.9          |
| All Vehicles          |      | 4002        | 5.0 | 0.822 |      | 45.7          | LOS D            | 32.0                       | 233.5    | 0.93         | 0.85                | 25.9          |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Ballan Rd (IN16) - PM Peak Ultimate with additional MAC

120221sid-12M1296000 - Armstrong Rd & Ballan Rd - IN8

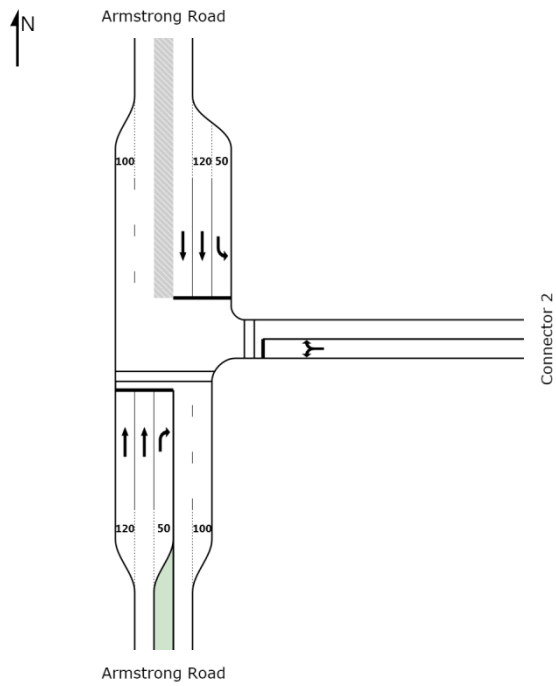
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

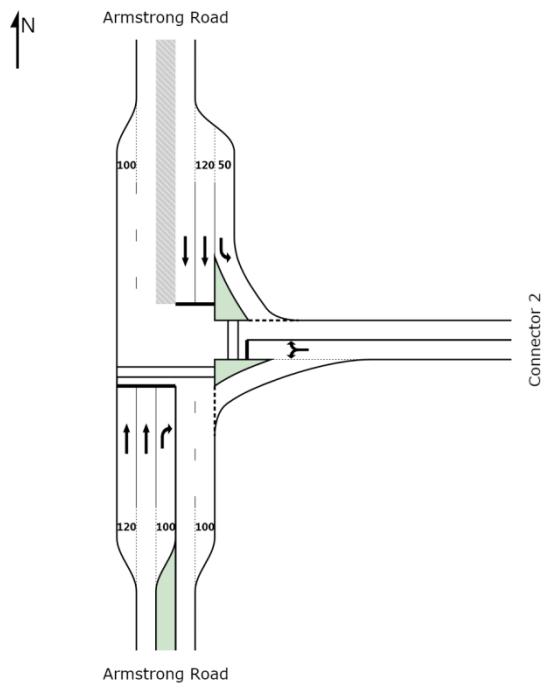
| Mov ID                | Turn | Demand Flow | HV  | Deg.  | Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-------|------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   |       | v/c  | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 1                     | L    | 604         | 5.0 | 0.904 |      | 47.3          | LOS D            | 33.5                       | 244.8    | 0.88         | 0.92                | 26.1          |
| 2                     | T    | 558         | 5.0 | 0.828 |      | 53.8          | LOS D            | 18.5                       | 134.8    | 1.00         | 0.92                | 23.3          |
| 3                     | R    | 234         | 5.0 | 0.653 |      | 67.1          | LOS E            | 7.0                        | 50.8     | 1.00         | 0.82                | 21.2          |
| Approach              |      | 1396        | 5.0 | 0.904 |      | 53.2          | LOS D            | 33.5                       | 244.8    | 0.95         | 0.90                | 24.0          |
| East: Ballan Road     |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 4                     | L    | 236         | 5.0 | 0.473 |      | 31.3          | LOS C            | 8.8                        | 64.1     | 0.68         | 0.79                | 32.3          |
| 5                     | T    | 992         | 5.0 | 0.900 |      | 58.5          | LOS E            | 33.4                       | 243.8    | 1.00         | 1.08                | 22.2          |
| 6                     | R    | 90          | 5.0 | 0.232 |      | 49.9          | LOS D            | 4.4                        | 31.9     | 0.87         | 0.77                | 25.4          |
| Approach              |      | 1318        | 5.0 | 0.900 |      | 53.1          | LOS D            | 33.4                       | 243.8    | 0.93         | 1.01                | 23.7          |
| North: Armstrong Road |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 7                     | L    | 54          | 5.0 | 0.130 |      | 27.5          | LOS C            | 1.7                        | 12.6     | 0.59         | 0.73                | 34.2          |
| 8                     | T    | 512         | 5.0 | 0.707 |      | 50.4          | LOS D            | 14.4                       | 105.4    | 0.99         | 0.86                | 24.2          |
| 9                     | R    | 157         | 5.0 | 0.876 |      | 76.8          | LOS E            | 10.4                       | 76.0     | 1.00         | 1.00                | 19.4          |
| Approach              |      | 723         | 5.0 | 0.876 |      | 54.4          | LOS D            | 14.4                       | 105.4    | 0.96         | 0.88                | 23.4          |
| West: Ballan Road     |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 10                    | L    | 143         | 5.0 | 0.763 |      | 52.8          | LOS D            | 22.8                       | 166.8    | 0.97         | 0.95                | 25.3          |
| 11                    | T    | 713         | 5.0 | 0.763 |      | 43.9          | LOS D            | 23.1                       | 168.3    | 0.97         | 0.90                | 25.9          |
| 12                    | R    | 659         | 5.0 | 0.848 |      | 64.6          | LOS E            | 20.7                       | 151.2    | 1.00         | 0.95                | 21.8          |
| Approach              |      | 1515        | 5.0 | 0.848 |      | 53.7          | LOS D            | 23.1                       | 168.3    | 0.98         | 0.93                | 23.9          |
| All Vehicles          |      | 4952        | 5.0 | 0.904 |      | 53.5          | LOS D            | 33.5                       | 244.8    | 0.96         | 0.93                | 23.8          |

## IN 17

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 2 (IN17) - AM Peak  
Interim

120221sid-12M1296000 - Armstrong Rd & Connector 2 - IN7

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|-----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 2                     | T    | 401                  | 5.0  | 0.221            | 5.8                  | LOS A            | 5.7                                  | 41.9          | 0.35         | 0.30                           | 50.2                  |
| 3                     | R    | 20                   | 5.0  | 0.223            | 71.3                 | LOS E            | 1.2                                  | 8.8           | 0.99         | 0.70                           | 20.2                  |
| Approach              |      | 421                  | 5.0  | 0.223            | 8.9                  | LOS A            | 5.7                                  | 41.9          | 0.38         | 0.32                           | 46.9                  |
| East: Connector 2     |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                     | L    | 20                   | 5.0  | 0.297            | 53.7                 | LOS D            | 5.1                                  | 37.1          | 0.90         | 0.78                           | 24.3                  |
| 6                     | R    | 80                   | 5.0  | 0.297            | 53.6                 | LOS D            | 5.1                                  | 37.1          | 0.90         | 0.78                           | 24.3                  |
| Approach              |      | 100                  | 5.0  | 0.297            | 53.6                 | LOS D            | 5.1                                  | 37.1          | 0.90         | 0.78                           | 24.3                  |
| North: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 7                     | L    | 120                  | 5.0  | 0.158            | 9.9                  | LOS A            | 1.1                                  | 8.0           | 0.17         | 0.69                           | 47.3                  |
| 8                     | T    | 456                  | 5.0  | 0.293            | 11.0                 | LOS B            | 9.2                                  | 66.9          | 0.48         | 0.42                           | 44.5                  |
| Approach              |      | 576                  | 5.0  | 0.293            | 10.7                 | LOS B            | 9.2                                  | 66.9          | 0.42         | 0.47                           | 45.1                  |
| All Vehicles          |      | 1097                 | 5.0  | 0.297            | 14.0                 | LOS B            | 9.2                                  | 66.9          | 0.45         | 0.44                           | 42.4                  |

## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 2 (IN17) - PM Peak  
Interim

120221sid-12M1296000 - Armstrong Rd & Connector 2 - IN7

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|-----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 2                     | T    | 456                  | 5.0  | 0.286            | 10.0                 | LOS B            | 8.8                                  | 64.0          | 0.46         | 0.40                           | 45.4                  |
| 3                     | R    | 20                   | 5.0  | 0.223            | 71.3                 | LOS E            | 1.2                                  | 8.8           | 0.99         | 0.70                           | 20.2                  |
| Approach              |      | 476                  | 5.0  | 0.286            | 12.6                 | LOS B            | 8.8                                  | 64.0          | 0.49         | 0.41                           | 43.2                  |
| East: Connector 2     |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                     | L    | 20                   | 5.0  | 0.290            | 45.3                 | LOS D            | 6.5                                  | 47.2          | 0.83         | 0.79                           | 26.8                  |
| 6                     | R    | 120                  | 5.0  | 0.290            | 45.3                 | LOS D            | 6.5                                  | 47.2          | 0.83         | 0.79                           | 26.8                  |
| Approach              |      | 140                  | 5.0  | 0.290            | 45.3                 | LOS D            | 6.5                                  | 47.2          | 0.83         | 0.79                           | 26.8                  |
| North: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 7                     | L    | 80                   | 5.0  | 0.105            | 9.8                  | LOS A            | 0.7                                  | 5.2           | 0.17         | 0.69                           | 47.4                  |
| 8                     | T    | 401                  | 5.0  | 0.297            | 15.9                 | LOS B            | 9.5                                  | 69.6          | 0.57         | 0.49                           | 40.2                  |
| Approach              |      | 481                  | 5.0  | 0.297            | 14.9                 | LOS B            | 9.5                                  | 69.6          | 0.51         | 0.52                           | 41.2                  |
| All Vehicles          |      | 1097                 | 5.0  | 0.297            | 17.8                 | LOS B            | 9.5                                  | 69.6          | 0.54         | 0.51                           | 39.3                  |

## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 2 (IN17) - AM Peak  
Ultimate

120221sid-12M1296000 - Armstrong Rd & Connector 2 - IN7  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 2                               | T    | 506         | 5.0 | 0.369     | 16.1          | LOS B            | 12.5                       | 90.9     | 0.59         | 0.51                | 40.0          |
| 3                               | R    | 123         | 5.0 | 0.514     | 62.1          | LOS E            | 6.9                        | 50.4     | 0.98         | 0.80                | 22.1          |
| Approach                        |      | 629         | 5.0 | 0.514     | 25.1          | LOS C            | 12.5                       | 90.9     | 0.67         | 0.57                | 34.6          |
| East: Connector 2               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 186         | 5.0 | 0.548     | 38.0          | LOS D            | 15.4                       | 112.4    | 0.83         | 0.90                | 29.4          |
| 6                               | R    | 200         | 5.0 | 0.548     | 38.3          | LOS D            | 15.4                       | 112.4    | 0.83         | 0.91                | 29.3          |
| Approach                        |      | 386         | 5.0 | 0.548     | 38.1          | LOS D            | 15.4                       | 112.4    | 0.83         | 0.91                | 29.4          |
| North: Armstrong Road           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                               | L    | 150         | 5.0 | 0.155     | 8.8           | LOS A            | 1.1                        | 8.1      | 0.18         | 0.64                | 48.5          |
| 8                               | T    | 511         | 5.0 | 0.538     | 31.6          | LOS C            | 16.9                       | 123.1    | 0.82         | 0.70                | 30.8          |
| Approach                        |      | 661         | 5.0 | 0.538     | 26.4          | LOS C            | 16.9                       | 123.1    | 0.67         | 0.68                | 33.6          |
| All Vehicles                    |      | 1676        | 5.0 | 0.548     | 28.6          | LOS C            | 16.9                       | 123.1    | 0.71         | 0.69                | 32.9          |

## MOVEMENT SUMMARY

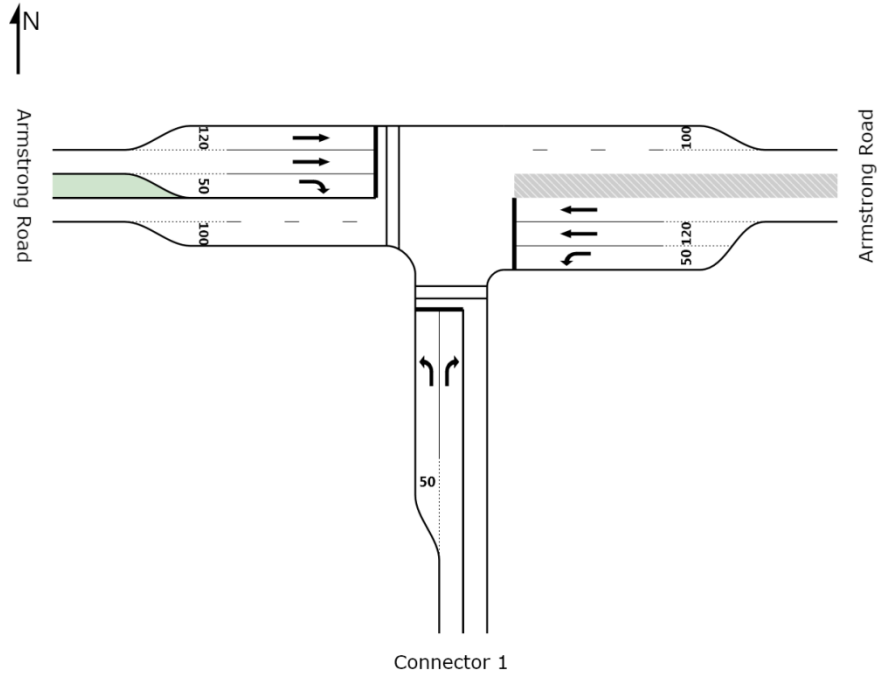
Site: Armstrong Rd &  
Connector 2 (IN17) - PM Peak  
Ultimate

120221sid-12M1296000 - Armstrong Rd & Connector 2 - IN7  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

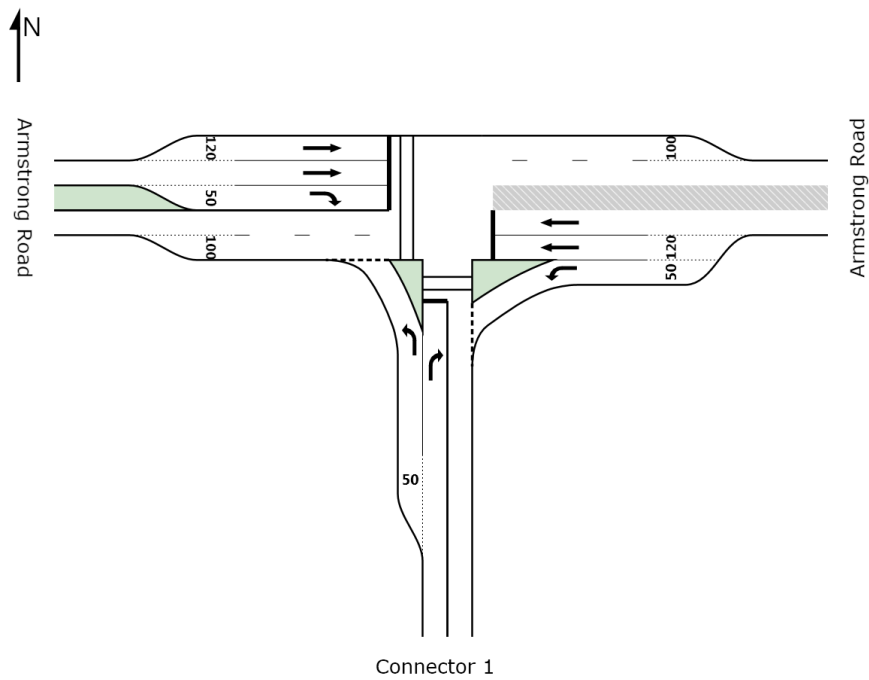
| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 2                               | T    | 511         | 5.0 | 0.320     | 10.3          | LOS B            | 10.1                       | 73.7     | 0.47         | 0.41                | 45.2          |
| 3                               | R    | 186         | 5.0 | 0.498     | 54.2          | LOS D            | 9.7                        | 71.1     | 0.93         | 0.82                | 24.0          |
| Approach                        |      | 697         | 5.0 | 0.498     | 22.0          | LOS C            | 10.1                       | 73.7     | 0.60         | 0.52                | 36.6          |
| East: Connector 2               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 123         | 5.0 | 0.513     | 45.1          | LOS D            | 11.5                       | 84.1     | 0.88         | 0.90                | 26.8          |
| 6                               | R    | 150         | 5.0 | 0.513     | 45.5          | LOS D            | 11.5                       | 84.1     | 0.88         | 0.91                | 26.8          |
| Approach                        |      | 273         | 5.0 | 0.513     | 45.3          | LOS D            | 11.5                       | 84.1     | 0.88         | 0.90                | 26.8          |
| North: Armstrong Road           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                               | L    | 200         | 5.0 | 0.251     | 9.3           | LOS A            | 1.9                        | 13.7     | 0.22         | 0.65                | 48.0          |
| 8                               | T    | 506         | 5.0 | 0.513     | 29.9          | LOS C            | 16.3                       | 119.3    | 0.80         | 0.68                | 31.6          |
| Approach                        |      | 706         | 5.0 | 0.513     | 24.0          | LOS C            | 16.3                       | 119.3    | 0.63         | 0.67                | 35.0          |
| All Vehicles                    |      | 1676        | 5.0 | 0.513     | 26.7          | LOS C            | 16.3                       | 119.3    | 0.66         | 0.65                | 33.9          |

IN 18

## Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 1 (IN18) - AM Peak  
Int

120221sid-12M1296000 - Armstrong Rd & Connector 1 - IN18

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID               | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 1   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                    | L    | 20                   | 5.0  | 0.026            | 9.8                  | LOS A            | 0.2                                  | 1.2           | 0.16         | 0.68                           | 47.4                  |
| 3                    | R    | 280                  | 5.0  | 0.390            | 35.7                 | LOS D            | 11.6                                 | 84.4          | 0.76         | 0.81                           | 30.3                  |
| Approach             |      | 300                  | 5.0  | 0.390            | 33.9                 | LOS C            | 11.6                                 | 84.4          | 0.72         | 0.80                           | 31.1                  |
| East: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                    | L    | 300                  | 5.0  | 0.245            | 8.8                  | LOS A            | 1.0                                  | 7.6           | 0.13         | 0.69                           | 48.4                  |
| 5                    | T    | 413                  | 5.0  | 0.393            | 26.5                 | LOS C            | 12.2                                 | 89.4          | 0.74         | 0.62                           | 33.3                  |
| Approach             |      | 713                  | 5.0  | 0.393            | 19.0                 | LOS B            | 12.2                                 | 89.4          | 0.48         | 0.65                           | 38.3                  |
| West: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 11                   | T    | 442                  | 5.0  | 0.345            | 18.6                 | LOS B            | 11.3                                 | 82.8          | 0.62         | 0.53                           | 38.2                  |
| 12                   | R    | 20                   | 5.0  | 0.247            | 72.6                 | LOS E            | 1.2                                  | 8.9           | 1.00         | 0.70                           | 20.0                  |
| Approach             |      | 462                  | 5.0  | 0.345            | 20.9                 | LOS C            | 11.3                                 | 82.8          | 0.64         | 0.54                           | 36.7                  |
| All Vehicles         |      | 1475                 | 5.0  | 0.393            | 22.7                 | LOS C            | 12.2                                 | 89.4          | 0.58         | 0.65                           | 36.1                  |

## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 1 (IN18) - PM Peak  
Int

120221sid-12M1296000 - Armstrong Rd & Connector 1 - IN18

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID               | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 1   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                    | L    | 20                   | 5.0  | 0.073            | 31.4                 | LOS C            | 0.7                                  | 5.1           | 0.63         | 0.70                           | 32.3                  |
| 3                    | R    | 300                  | 5.0  | 0.418            | 36.1                 | LOS D            | 12.6                                 | 91.7          | 0.77         | 0.82                           | 30.2                  |
| Approach             |      | 320                  | 5.0  | 0.418            | 35.8                 | LOS D            | 12.6                                 | 91.7          | 0.76         | 0.81                           | 30.3                  |
| East: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                    | L    | 280                  | 5.0  | 0.229            | 8.7                  | LOS A            | 1.0                                  | 7.0           | 0.13         | 0.69                           | 48.4                  |
| 5                    | T    | 442                  | 5.0  | 0.420            | 26.8                 | LOS C            | 13.3                                 | 97.0          | 0.74         | 0.63                           | 33.2                  |
| Approach             |      | 722                  | 5.0  | 0.420            | 19.8                 | LOS B            | 13.3                                 | 97.0          | 0.50         | 0.65                           | 37.8                  |
| West: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 11                   | T    | 413                  | 5.0  | 0.322            | 18.4                 | LOS B            | 10.4                                 | 76.3          | 0.62         | 0.52                           | 38.3                  |
| 12                   | R    | 20                   | 5.0  | 0.218            | 71.1                 | LOS E            | 1.2                                  | 8.7           | 0.99         | 0.70                           | 20.3                  |
| Approach             |      | 433                  | 5.0  | 0.322            | 20.8                 | LOS C            | 10.4                                 | 76.3          | 0.63         | 0.53                           | 36.8                  |
| All Vehicles         |      | 1475                 | 5.0  | 0.420            | 23.6                 | LOS C            | 13.3                                 | 97.0          | 0.60         | 0.65                           | 35.6                  |

## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 1 (IN18) - AM Peak  
Ultimate

120221sid-12M1296000 - Armstrong Rd & Connector 1 - IN6  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 1              |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 1           | 5.0 | 0.002     | 9.9           | LOS A            | 0.0                        | 0.1      | 0.24         | 0.60                | 47.2          |
| 3                               | R    | 400         | 5.0 | 0.505     | 34.0          | LOS C            | 16.7                       | 121.8    | 0.77         | 0.83                | 31.0          |
| Approach                        |      | 401         | 5.0 | 0.505     | 34.0          | LOS C            | 16.7                       | 121.8    | 0.77         | 0.83                | 31.1          |
| East: Armstrong Road            |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 230         | 5.0 | 0.194     | 8.1           | LOS A            | 0.8                        | 5.9      | 0.12         | 0.63                | 49.1          |
| 5                               | T    | 481         | 5.0 | 0.502     | 31.1          | LOS C            | 15.5                       | 113.0    | 0.81         | 0.69                | 31.0          |
| Approach                        |      | 711         | 5.0 | 0.502     | 23.7          | LOS C            | 15.5                       | 113.0    | 0.58         | 0.67                | 35.3          |
| West: Armstrong Road            |      |             |     |           |               |                  |                            |          |              |                     |               |
| 11                              | T    | 573         | 5.0 | 0.484     | 23.0          | LOS C            | 16.9                       | 123.1    | 0.71         | 0.62                | 35.2          |
| 12                              | R    | 1           | 5.0 | 0.011     | 68.3          | LOS E            | 0.1                        | 0.4      | 0.97         | 0.59                | 20.8          |
| Approach                        |      | 574         | 5.0 | 0.484     | 23.1          | LOS C            | 16.9                       | 123.1    | 0.71         | 0.62                | 35.2          |
| All Vehicles                    |      | 1686        | 5.0 | 0.505     | 25.9          | LOS C            | 16.9                       | 123.1    | 0.67         | 0.69                | 34.1          |

## MOVEMENT SUMMARY

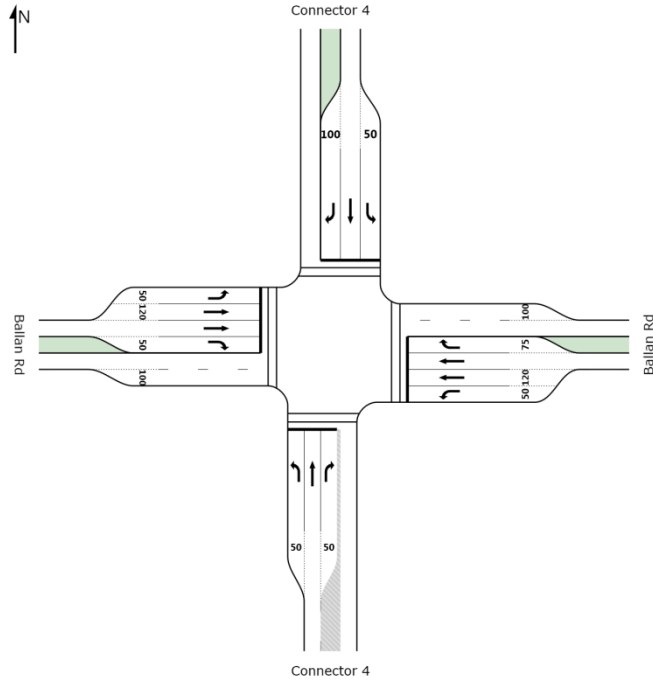
Site: Armstrong Rd &  
Connector 1 (IN18) - PM Peak  
Ultimate

120221sid-12M1296000 - Armstrong Rd & Connector 1 - IN6  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

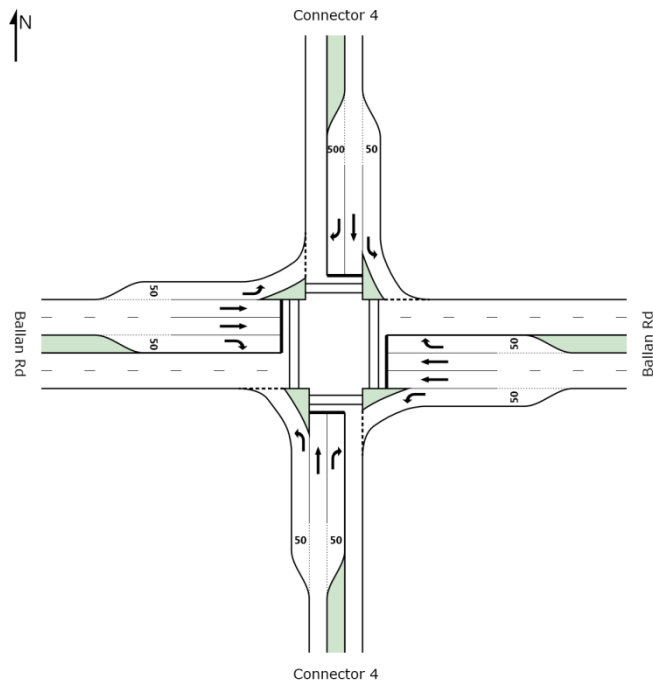
| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 1              |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 20          | 5.0 | 0.039     | 10.3          | LOS B            | 0.2                        | 1.7      | 0.26         | 0.64                | 47.0          |
| 3                               | R    | 230         | 5.0 | 0.440     | 45.6          | LOS D            | 11.0                       | 80.0     | 0.86         | 0.82                | 26.7          |
| Approach                        |      | 250         | 5.0 | 0.440     | 42.7          | LOS D            | 11.0                       | 80.0     | 0.81         | 0.80                | 27.6          |
| East: Armstrong Road            |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 400         | 5.0 | 0.356     | 8.2           | LOS A            | 1.8                        | 13.3     | 0.14         | 0.63                | 49.0          |
| 5                               | T    | 573         | 5.0 | 0.440     | 19.0          | LOS B            | 15.5                       | 112.8    | 0.65         | 0.56                | 37.8          |
| Approach                        |      | 973         | 5.0 | 0.440     | 14.6          | LOS B            | 15.5                       | 112.8    | 0.44         | 0.59                | 41.8          |
| West: Armstrong Road            |      |             |     |           |               |                  |                            |          |              |                     |               |
| 11                              | T    | 573         | 5.0 | 0.371     | 12.0          | LOS B            | 12.4                       | 90.4     | 0.52         | 0.45                | 43.4          |
| 12                              | R    | 20          | 5.0 | 0.223     | 71.2          | LOS E            | 1.2                        | 8.8      | 0.99         | 0.70                | 20.3          |
| Approach                        |      | 593         | 5.0 | 0.371     | 14.0          | LOS B            | 12.4                       | 90.4     | 0.54         | 0.46                | 41.8          |
| All Vehicles                    |      | 1816        | 5.0 | 0.440     | 18.3          | LOS B            | 15.5                       | 112.8    | 0.52         | 0.58                | 39.1          |

IN 31

## Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN31 Ballan Rd &  
Connector 4 - AM Peak  
Interim

120221sid-12M1296000 - Ballan Rd & Connector 4 - IN10

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 4 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 84                   | 0.0               | 0.324 | 37.9                 | LOS D            | 3.4                                  | 23.8          | 0.73         | 0.75                           | 29.3                  |
| 2                  | T    | 53                   | 0.0               | 0.147 | 44.4                 | LOS D            | 2.6                                  | 18.2          | 0.88         | 0.67                           | 26.0                  |
| 3                  | R    | 84                   | 0.0               | 0.416 | 58.9                 | LOS E            | 4.5                                  | 31.7          | 0.94         | 0.77                           | 22.9                  |
| Approach           |      | 221                  | 0.0               | 0.416 | 47.5                 | LOS D            | 4.5                                  | 31.7          | 0.85         | 0.74                           | 25.8                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 63                   | 0.0               | 0.168 | 20.4                 | LOS C            | 1.6                                  | 11.3          | 0.47         | 0.72                           | 38.4                  |
| 5                  | T    | 511                  | 5.0               | 0.505 | 29.8                 | LOS C            | 16.1                                 | 117.2         | 0.79         | 0.68                           | 31.6                  |
| 6                  | R    | 130                  | 5.0               | 0.725 | 68.8                 | LOS E            | 7.9                                  | 57.7          | 1.00         | 0.86                           | 20.8                  |
| Approach           |      | 704                  | 4.6               | 0.725 | 36.2                 | LOS D            | 16.1                                 | 117.2         | 0.80         | 0.71                           | 29.3                  |
| North: Connector 4 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 80                   | 5.0               | 0.319 | 38.0                 | LOS D            | 3.2                                  | 23.6          | 0.73         | 0.75                           | 29.4                  |
| 8                  | T    | 53                   | 0.0               | 0.142 | 44.3                 | LOS D            | 2.6                                  | 18.1          | 0.87         | 0.67                           | 26.0                  |
| 9                  | R    | 200                  | 5.0               | 0.760 | 65.5                 | LOS E            | 12.0                                 | 87.6          | 1.00         | 0.88                           | 21.5                  |
| Approach           |      | 333                  | 4.2               | 0.760 | 55.5                 | LOS E            | 12.0                                 | 87.6          | 0.92         | 0.81                           | 23.7                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 200                  | 5.0               | 0.557 | 21.7                 | LOS C            | 5.6                                  | 40.9          | 0.52         | 0.75                           | 37.6                  |
| 11                 | T    | 788                  | 5.0               | 0.780 | 34.2                 | LOS C            | 29.0                                 | 211.7         | 0.89         | 0.80                           | 29.6                  |
| 12                 | R    | 63                   | 0.0               | 0.340 | 64.1                 | LOS E            | 3.6                                  | 25.0          | 0.97         | 0.76                           | 21.7                  |
| Approach           |      | 1051                 | 4.7               | 0.780 | 33.6                 | LOS C            | 29.0                                 | 211.7         | 0.83         | 0.78                           | 30.2                  |
| All Vehicles       |      | 2309                 | 4.1               | 0.780 | 38.9                 | LOS D            | 29.0                                 | 211.7         | 0.83         | 0.76                           | 28.3                  |

## MOVEMENT SUMMARY

Site: IN31 Ballan Rd &  
Connector 4 - PM Peak Interim

120221sid-12M1296000 - Ballan Rd & Connector 4 - IN10

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 4 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 63                   | 0.0               | 0.251 | 39.8                 | LOS D            | 2.6                                  | 18.3          | 0.75         | 0.74                           | 28.6                  |
| 2                  | T    | 84                   | 0.0               | 0.236 | 45.4                 | LOS D            | 4.2                                  | 29.7          | 0.89         | 0.70                           | 25.7                  |
| 3                  | R    | 63                   | 0.0               | 0.311 | 58.2                 | LOS E            | 3.3                                  | 23.4          | 0.93         | 0.76                           | 23.1                  |
| Approach           |      | 211                  | 0.0               | 0.311 | 47.6                 | LOS D            | 4.2                                  | 29.7          | 0.86         | 0.73                           | 25.6                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 84                   | 0.0               | 0.214 | 19.2                 | LOS B            | 2.1                                  | 14.4          | 0.45         | 0.72                           | 39.2                  |
| 5                  | T    | 788                  | 5.0               | 0.742 | 30.9                 | LOS C            | 27.9                                 | 203.4         | 0.86         | 0.76                           | 31.0                  |
| 6                  | R    | 90                   | 5.0               | 0.669 | 70.7                 | LOS E            | 5.5                                  | 40.2          | 1.00         | 0.82                           | 20.4                  |
| Approach           |      | 962                  | 4.6               | 0.742 | 33.6                 | LOS C            | 27.9                                 | 203.4         | 0.84         | 0.76                           | 30.1                  |
| North: Connector 4 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 120                  | 5.0               | 0.500 | 41.3                 | LOS D            | 5.2                                  | 37.8          | 0.78         | 0.77                           | 28.1                  |
| 8                  | T    | 53                   | 0.0               | 0.147 | 44.4                 | LOS D            | 2.6                                  | 18.2          | 0.88         | 0.67                           | 26.0                  |
| 9                  | R    | 190                  | 5.0               | 0.748 | 65.2                 | LOS E            | 11.4                                 | 82.9          | 1.00         | 0.87                           | 21.5                  |
| Approach           |      | 363                  | 4.3               | 0.748 | 54.3                 | LOS D            | 11.4                                 | 82.9          | 0.91         | 0.81                           | 24.0                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 210                  | 5.0               | 0.557 | 20.6                 | LOS C            | 5.6                                  | 40.7          | 0.50         | 0.75                           | 38.4                  |
| 11                 | T    | 511                  | 5.0               | 0.481 | 27.5                 | LOS C            | 15.7                                 | 114.4         | 0.76         | 0.65                           | 32.8                  |
| 12                 | R    | 84                   | 0.0               | 0.605 | 69.5                 | LOS E            | 5.1                                  | 35.5          | 1.00         | 0.79                           | 20.6                  |
| Approach           |      | 805                  | 4.5               | 0.605 | 30.1                 | LOS C            | 15.7                                 | 114.4         | 0.72         | 0.69                           | 32.0                  |
| All Vehicles       |      | 2341                 | 4.1               | 0.748 | 36.9                 | LOS D            | 27.9                                 | 203.4         | 0.81         | 0.74                           | 29.1                  |

## MOVEMENT SUMMARY

Site: IN31 Ballan Rd &  
Connector 4 - AM Peak Ult

120221sid-12M1296000 - Ballan Rd & Connector 4 - IN10

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow | HV Deg. Satn |       | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|--------------------|------|-------------|--------------|-------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                    |      | veh/h       | %            | v/c   |               |                  | sec               | veh   |              |                     |               |
| South: Connector 4 |      |             |              |       |               |                  |                   |       |              |                     |               |
| 1                  | L    | 84          | 0.0          | 0.197 | 12.2          | LOS B            | 1.4               | 9.6   | 0.35         | 0.67                | 45.0          |
| 2                  | T    | 53          | 0.0          | 0.180 | 48.5          | LOS D            | 2.7               | 19.1  | 0.91         | 0.69                | 24.8          |
| 3                  | R    | 84          | 0.0          | 0.495 | 66.3          | LOS E            | 4.9               | 34.3  | 0.99         | 0.77                | 21.3          |
| Approach           |      | 221         | 0.0          | 0.495 | 41.5          | LOS D            | 4.9               | 34.3  | 0.73         | 0.72                | 27.8          |
| East: Ballan Rd    |      |             |              |       |               |                  |                   |       |              |                     |               |
| 4                  | L    | 63          | 0.0          | 0.068 | 8.3           | LOS A            | 0.4               | 2.5   | 0.15         | 0.63                | 48.9          |
| 5                  | T    | 841         | 5.0          | 0.465 | 23.2          | LOS C            | 16.6              | 120.9 | 0.73         | 0.64                | 35.1          |
| 6                  | R    | 120         | 5.0          | 0.730 | 70.0          | LOS E            | 7.4               | 53.7  | 1.00         | 0.86                | 20.6          |
| Approach           |      | 1024        | 4.7          | 0.730 | 27.7          | LOS C            | 16.6              | 120.9 | 0.73         | 0.67                | 33.0          |
| North: Connector 4 |      |             |              |       |               |                  |                   |       |              |                     |               |
| 7                  | L    | 121         | 5.0          | 0.381 | 18.7          | LOS B            | 3.2               | 23.2  | 0.52         | 0.72                | 39.8          |
| 8                  | T    | 53          | 0.0          | 0.180 | 48.5          | LOS D            | 2.7               | 19.1  | 0.91         | 0.69                | 24.8          |
| 9                  | R    | 120         | 5.0          | 0.730 | 69.9          | LOS E            | 7.4               | 53.7  | 1.00         | 0.86                | 20.6          |
| Approach           |      | 294         | 4.1          | 0.730 | 45.0          | LOS D            | 7.4               | 53.7  | 0.78         | 0.77                | 26.8          |
| West: Ballan Rd    |      |             |              |       |               |                  |                   |       |              |                     |               |
| 10                 | L    | 107         | 5.0          | 0.138 | 9.0           | LOS A            | 0.8               | 6.2   | 0.20         | 0.64                | 48.3          |
| 11                 | T    | 1358        | 5.0          | 0.751 | 28.0          | LOS C            | 32.3              | 236.0 | 0.89         | 0.80                | 32.3          |
| 12                 | R    | 53          | 0.0          | 0.301 | 64.9          | LOS E            | 3.0               | 20.9  | 0.97         | 0.75                | 21.6          |
| Approach           |      | 1518        | 4.8          | 0.751 | 27.9          | LOS C            | 32.3              | 236.0 | 0.84         | 0.79                | 32.5          |
| All Vehicles       |      | 3056        | 4.4          | 0.751 | 30.5          | LOS C            | 32.3              | 236.0 | 0.79         | 0.74                | 31.6          |

## MOVEMENT SUMMARY

Site: IN31 Ballan Rd &  
Connector 4 - PM Peak  
Ultimate

120221sid-12M1296000 - Ballan Rd & Connector 4 - IN10

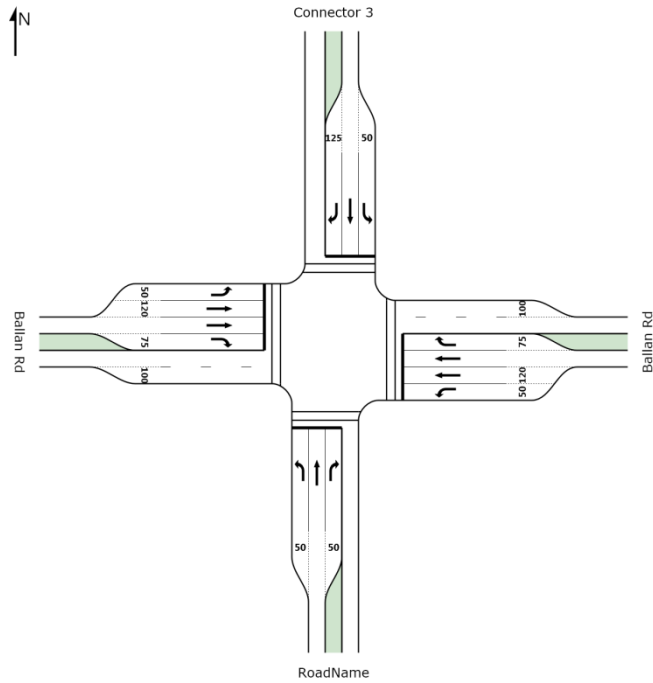
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

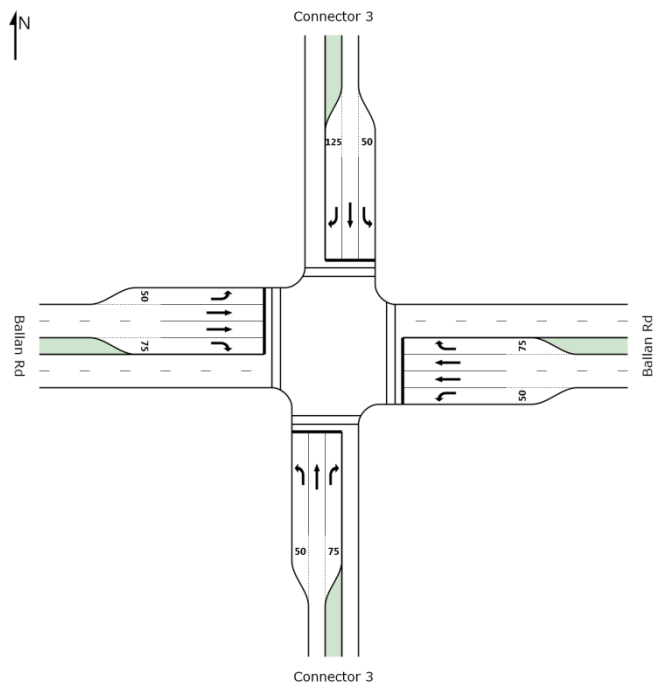
| Mov ID             | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|--------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
|                    |      | veh/h       | %   | v/c       | sec           |                  | Vehicles veh      | Distance m   | per veh             | km/h          |      |
| South: Connector 4 |      |             |     |           |               |                  |                   |              |                     |               |      |
| 1                  | L    | 63          | 0.0 | 0.206     | 20.7          | LOS C            | 1.7               | 12.2         | 0.53                | 0.70          | 38.4 |
| 2                  | T    | 84          | 0.0 | 0.273     | 48.5          | LOS D            | 4.4               | 30.8         | 0.92                | 0.72          | 24.8 |
| 3                  | R    | 63          | 0.0 | 0.314     | 62.8          | LOS E            | 3.5               | 24.6         | 0.96                | 0.76          | 22.0 |
| Approach           |      | 211         | 0.0 | 0.314     | 44.4          | LOS D            | 4.4               | 30.8         | 0.82                | 0.73          | 26.6 |
| East: Ballan Rd    |      |             |     |           |               |                  |                   |              |                     |               |      |
| 4                  | L    | 84          | 0.0 | 0.097     | 8.5           | LOS A            | 0.6               | 4.0          | 0.18                | 0.64          | 48.6 |
| 5                  | T    | 1358        | 5.0 | 0.794     | 31.3          | LOS C            | 34.3              | 250.1        | 0.93                | 0.85          | 30.7 |
| 6                  | R    | 131         | 5.0 | 0.797     | 72.3          | LOS E            | 8.2               | 60.2         | 1.00                | 0.90          | 20.1 |
| Approach           |      | 1573        | 4.7 | 0.797     | 33.5          | LOS C            | 34.3              | 250.1        | 0.89                | 0.84          | 30.0 |
| North: Connector 4 |      |             |     |           |               |                  |                   |              |                     |               |      |
| 7                  | L    | 110         | 5.0 | 0.240     | 11.6          | LOS B            | 1.6               | 12.0         | 0.32                | 0.67          | 45.7 |
| 8                  | T    | 53          | 0.0 | 0.170     | 47.5          | LOS D            | 2.7               | 18.8         | 0.90                | 0.68          | 25.1 |
| 9                  | R    | 150         | 5.0 | 0.772     | 69.5          | LOS E            | 9.2               | 67.5         | 1.00                | 0.89          | 20.7 |
| Approach           |      | 313         | 4.2 | 0.772     | 45.4          | LOS D            | 9.2               | 67.5         | 0.75                | 0.78          | 26.6 |
| West: Ballan Rd    |      |             |     |           |               |                  |                   |              |                     |               |      |
| 10                 | L    | 130         | 5.0 | 0.182     | 9.5           | LOS A            | 1.3               | 9.2          | 0.23                | 0.65          | 47.8 |
| 11                 | T    | 841         | 5.0 | 0.492     | 25.4          | LOS C            | 17.4              | 126.7        | 0.76                | 0.67          | 33.8 |
| 12                 | R    | 84          | 0.0 | 0.482     | 66.2          | LOS E            | 4.9               | 34.2         | 0.99                | 0.77          | 21.3 |
| Approach           |      | 1055        | 4.6 | 0.492     | 26.7          | LOS C            | 17.4              | 126.7        | 0.72                | 0.68          | 33.5 |
| All Vehicles       |      | 3152        | 4.3 | 0.797     | 33.1          | LOS C            | 34.3              | 250.1        | 0.81                | 0.77          | 30.4 |

## IN 32

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: IN32 Ballan Rd &  
Connector 3 - AM Peak  
Interim

120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: RoadName    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 53                   | 0.0               | 0.204 | 38.1                 | LOS D            | 2.1                                  | 14.8          | 0.73         | 0.73                           | 29.3                  |
| 2                  | T    | 21                   | 0.0               | 0.059 | 43.4                 | LOS D            | 1.0                                  | 7.1           | 0.86         | 0.62                           | 26.3                  |
| 3                  | R    | 53                   | 0.0               | 0.228 | 46.1                 | LOS D            | 2.4                                  | 16.8          | 0.82         | 0.74                           | 26.5                  |
| Approach           |      | 126                  | 0.0               | 0.228 | 42.3                 | LOS D            | 2.4                                  | 16.8          | 0.79         | 0.72                           | 27.5                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 53                   | 0.0               | 0.138 | 19.9                 | LOS B            | 1.3                                  | 9.2           | 0.46         | 0.71                           | 38.8                  |
| 5                  | T    | 252                  | 5.0               | 0.314 | 35.7                 | LOS D            | 7.7                                  | 56.3          | 0.82         | 0.66                           | 29.1                  |
| 6                  | R    | 130                  | 5.0               | 0.791 | 72.0                 | LOS E            | 8.2                                  | 59.6          | 1.00         | 0.90                           | 20.2                  |
| Approach           |      | 435                  | 4.4               | 0.791 | 44.7                 | LOS D            | 8.2                                  | 59.6          | 0.83         | 0.74                           | 26.4                  |
| North: Connector 3 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 20                   | 5.0               | 0.081 | 37.6                 | LOS D            | 0.8                                  | 5.7           | 0.71         | 0.70                           | 29.5                  |
| 8                  | T    | 21                   | 0.0               | 0.059 | 43.4                 | LOS D            | 1.0                                  | 7.1           | 0.86         | 0.62                           | 26.3                  |
| 9                  | R    | 250                  | 5.0               | 0.577 | 51.7                 | LOS D            | 13.0                                 | 95.0          | 0.94         | 0.83                           | 24.9                  |
| Approach           |      | 291                  | 4.6               | 0.577 | 50.1                 | LOS D            | 13.0                                 | 95.0          | 0.91         | 0.81                           | 25.2                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 300                  | 5.0               | 0.823 | 38.5                 | LOS D            | 11.2                                 | 81.6          | 0.80         | 0.87                           | 29.2                  |
| 11                 | T    | 461                  | 5.0               | 0.574 | 38.5                 | LOS D            | 15.4                                 | 112.7         | 0.88         | 0.74                           | 28.0                  |
| 12                 | R    | 53                   | 0.0               | 0.309 | 65.0                 | LOS E            | 3.0                                  | 20.9          | 0.97         | 0.75                           | 21.5                  |
| Approach           |      | 814                  | 4.7               | 0.823 | 40.2                 | LOS D            | 15.4                                 | 112.7         | 0.86         | 0.79                           | 27.9                  |
| All Vehicles       |      | 1666                 | 4.2               | 0.823 | 43.3                 | LOS D            | 15.4                                 | 112.7         | 0.85         | 0.77                           | 27.0                  |

## MOVEMENT SUMMARY

Site: IN32 Ballan Rd & Connector  
3 - PM Peak Interim - Copy

120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: RoadName    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 158                  | 0.0               | 0.596 | 37.8                 | LOS D            | 6.5                                  | 45.6          | 0.75         | 0.78                           | 29.4                  |
| 2                  | T    | 63                   | 0.0               | 0.177 | 44.8                 | LOS D            | 3.1                                  | 22.0          | 0.88         | 0.68                           | 25.9                  |
| 3                  | R    | 158                  | 0.0               | 0.667 | 47.3                 | LOS D            | 7.6                                  | 53.2          | 0.85         | 0.81                           | 26.1                  |
| Approach           |      | 379                  | 0.0               | 0.667 | 42.9                 | LOS D            | 7.6                                  | 53.2          | 0.81         | 0.77                           | 27.3                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 158                  | 0.0               | 0.434 | 22.2                 | LOS C            | 4.5                                  | 31.2          | 0.52         | 0.74                           | 37.2                  |
| 5                  | T    | 461                  | 5.0               | 0.671 | 44.1                 | LOS D            | 15.9                                 | 116.0         | 0.94         | 0.79                           | 26.0                  |
| 6                  | R    | 70                   | 5.0               | 0.335 | 62.3                 | LOS E            | 3.9                                  | 28.4          | 0.96         | 0.77                           | 22.2                  |
| Approach           |      | 689                  | 3.9               | 0.671 | 40.9                 | LOS D            | 15.9                                 | 116.0         | 0.84         | 0.78                           | 27.4                  |
| North: Connector 3 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 130                  | 5.0               | 0.511 | 37.5                 | LOS D            | 5.3                                  | 38.6          | 0.74         | 0.77                           | 29.6                  |
| 8                  | T    | 63                   | 0.0               | 0.177 | 44.8                 | LOS D            | 3.1                                  | 22.0          | 0.88         | 0.68                           | 25.9                  |
| 9                  | R    | 300                  | 5.0               | 0.627 | 50.2                 | LOS D            | 15.6                                 | 113.7         | 0.94         | 0.84                           | 25.3                  |
| Approach           |      | 493                  | 4.4               | 0.627 | 46.1                 | LOS D            | 15.6                                 | 113.7         | 0.88         | 0.80                           | 26.4                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 252                  | 5.0               | 0.724 | 30.3                 | LOS C            | 8.4                                  | 61.4          | 0.69         | 0.81                           | 32.8                  |
| 11                 | T    | 252                  | 5.0               | 0.367 | 41.1                 | LOS D            | 8.0                                  | 58.2          | 0.87         | 0.71                           | 27.1                  |
| 12                 | R    | 158                  | 0.0               | 0.729 | 66.9                 | LOS E            | 9.5                                  | 66.4          | 1.00         | 0.86                           | 21.1                  |
| Approach           |      | 662                  | 3.8               | 0.729 | 43.1                 | LOS D            | 9.5                                  | 66.4          | 0.83         | 0.78                           | 27.1                  |
| All Vehicles       |      | 2223                 | 3.3               | 0.729 | 43.1                 | LOS D            | 15.9                                 | 116.0         | 0.84         | 0.78                           | 27.1                  |

## MOVEMENT SUMMARY

Site: IN32 Ballan Rd &  
Connector 3 - AM Peak Ult

120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|--------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                    |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Connector 3 |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                  | L    | 53          | 0.0 | 0.204     | 38.1          | LOS D            | 2.1               | 14.8  | 0.73         | 0.73                | 29.3          |
| 2                  | T    | 21          | 0.0 | 0.059     | 43.4          | LOS D            | 1.0               | 7.1   | 0.86         | 0.62                | 26.3          |
| 3                  | R    | 53          | 0.0 | 0.179     | 55.7          | LOS E            | 2.7               | 18.9  | 0.90         | 0.75                | 23.7          |
| Approach           |      | 126         | 0.0 | 0.204     | 46.3          | LOS D            | 2.7               | 18.9  | 0.82         | 0.72                | 26.2          |
| East: Ballan Rd    |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                  | L    | 53          | 0.0 | 0.138     | 19.9          | LOS B            | 1.3               | 9.2   | 0.46         | 0.71                | 38.8          |
| 5                  | T    | 589         | 5.0 | 0.425     | 30.5          | LOS C            | 12.9              | 93.8  | 0.80         | 0.69                | 31.3          |
| 6                  | R    | 100         | 5.0 | 0.608     | 67.6          | LOS E            | 5.9               | 43.3  | 1.00         | 0.80                | 21.0          |
| Approach           |      | 742         | 4.6 | 0.608     | 34.7          | LOS C            | 12.9              | 93.8  | 0.80         | 0.70                | 29.8          |
| North: Connector 3 |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                  | L    | 103         | 5.0 | 0.419     | 39.4          | LOS D            | 4.3               | 31.3  | 0.75         | 0.76                | 28.8          |
| 8                  | T    | 21          | 0.0 | 0.059     | 43.4          | LOS D            | 1.0               | 7.1   | 0.86         | 0.62                | 26.3          |
| 9                  | R    | 180         | 5.0 | 0.634     | 60.4          | LOS E            | 10.1              | 73.9  | 0.99         | 0.82                | 22.6          |
| Approach           |      | 304         | 4.7 | 0.634     | 52.1          | LOS D            | 10.1              | 73.9  | 0.90         | 0.79                | 24.7          |
| West: Ballan Rd    |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                 | L    | 200         | 5.0 | 0.548     | 21.2          | LOS C            | 5.5               | 40.1  | 0.51         | 0.75                | 38.0          |
| 11                 | T    | 900         | 5.0 | 0.650     | 33.9          | LOS C            | 21.8              | 159.3 | 0.89         | 0.78                | 29.7          |
| 12                 | R    | 53          | 0.0 | 0.309     | 65.0          | LOS E            | 3.0               | 20.9  | 0.97         | 0.75                | 21.5          |
| Approach           |      | 1153        | 4.8 | 0.650     | 33.1          | LOS C            | 21.8              | 159.3 | 0.83         | 0.78                | 30.3          |
| All Vehicles       |      | 2325        | 4.5 | 0.650     | 36.8          | LOS D            | 21.8              | 159.3 | 0.83         | 0.75                | 29.0          |

## MOVEMENT SUMMARY

Site: IN32 Ballan Rd &  
Connector 3 - PM Peak Ult -  
Copy

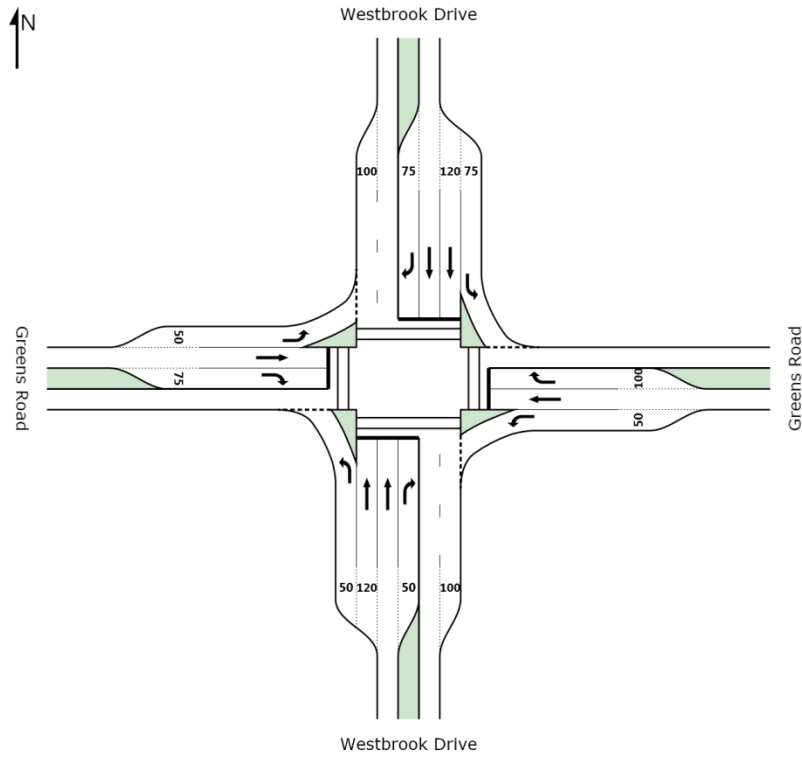
120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

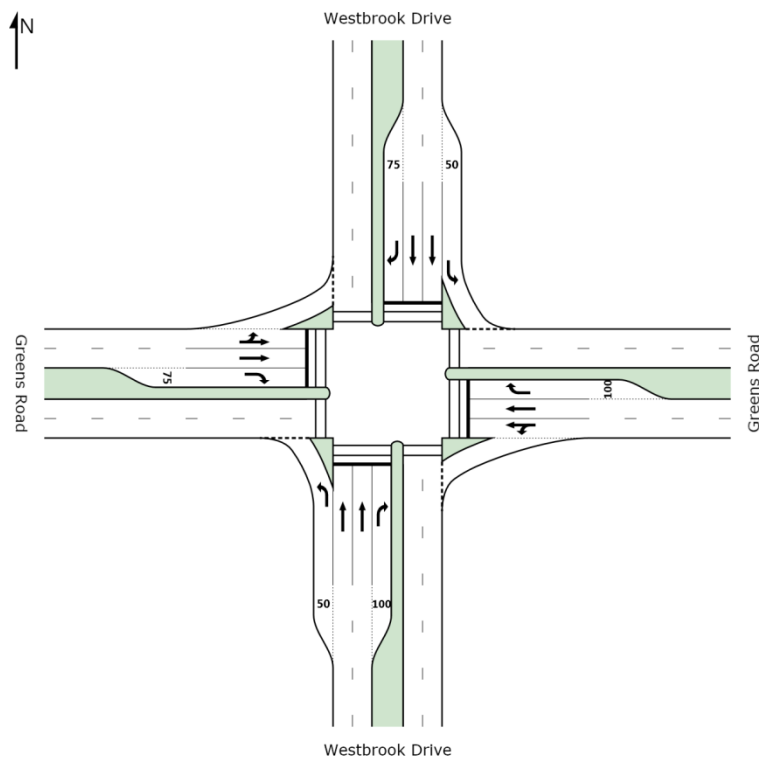
### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |
|--------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|
|                    |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     | per veh             | km/h          |
|                    |      |             |     |           |               |                  | veh               | m            |                     |               |
| South: Connector 3 |      |             |     |           |               |                  |                   |              |                     |               |
| 1                  | L    | 158         | 0.0 | 0.589     | 37.0          | LOS D            | 6.4               | 45.0         | 0.74                | 29.7          |
| 2                  | T    | 63          | 0.0 | 0.177     | 44.8          | LOS D            | 3.1               | 22.0         | 0.88                | 25.9          |
| 3                  | R    | 158         | 0.0 | 0.537     | 59.1          | LOS E            | 8.7               | 60.8         | 0.97                | 22.9          |
| Approach           |      | 379         | 0.0 | 0.589     | 47.5          | LOS D            | 8.7               | 60.8         | 0.86                | 25.9          |
| East: Ballan Rd    |      |             |     |           |               |                  |                   |              |                     |               |
| 4                  | L    | 158         | 0.0 | 0.441     | 22.7          | LOS C            | 4.5               | 31.7         | 0.53                | 36.9          |
| 5                  | T    | 900         | 5.0 | 0.715     | 37.7          | LOS D            | 23.0              | 168.2        | 0.94                | 28.2          |
| 6                  | R    | 103         | 5.0 | 0.460     | 62.3          | LOS E            | 5.8               | 42.1         | 0.97                | 22.2          |
| Approach           |      | 1161        | 4.3 | 0.715     | 37.8          | LOS D            | 23.0              | 168.2        | 0.89                | 28.4          |
| North: Connector 3 |      |             |     |           |               |                  |                   |              |                     |               |
| 7                  | L    | 100         | 5.0 | 0.388     | 36.2          | LOS D            | 3.9               | 28.7         | 0.72                | 30.1          |
| 8                  | T    | 63          | 0.0 | 0.177     | 44.8          | LOS D            | 3.1               | 22.0         | 0.88                | 25.9          |
| 9                  | R    | 200         | 5.0 | 0.704     | 62.1          | LOS E            | 11.6              | 84.5         | 1.00                | 22.2          |
| Approach           |      | 363         | 4.1 | 0.704     | 52.0          | LOS D            | 11.6              | 84.5         | 0.90                | 24.6          |
| West: Ballan Rd    |      |             |     |           |               |                  |                   |              |                     |               |
| 10                 | L    | 180         | 5.0 | 0.524     | 23.2          | LOS C            | 5.3               | 38.5         | 0.54                | 36.7          |
| 11                 | T    | 589         | 5.0 | 0.468     | 33.9          | LOS C            | 13.6              | 99.1         | 0.84                | 29.8          |
| 12                 | R    | 158         | 0.0 | 0.680     | 64.7          | LOS E            | 9.3               | 64.8         | 1.00                | 21.6          |
| Approach           |      | 927         | 4.1 | 0.680     | 37.1          | LOS D            | 13.6              | 99.1         | 0.81                | 29.0          |
| All Vehicles       |      | 2830        | 3.7 | 0.715     | 40.7          | LOS D            | 23.0              | 168.2        | 0.86                | 27.7          |

**PSP 41**  
**IN o8**  
**Interim Layout**



**Ultimate Layout**



## MOVEMENT SUMMARY

Site: Westbrook Dr & Greens  
Rd - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Greens Rd - IN14  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                               | L    | 94          | 5.0 | 0.116     | 8.9           | LOS A            | 0.7               | 5.3   | 0.20         | 0.64                | 48.3          |
| 2                               | T    | 266         | 5.0 | 0.226     | 21.0          | LOS C            | 6.8               | 49.6  | 0.64         | 0.53                | 36.6          |
| 3                               | R    | 20          | 5.0 | 0.223     | 71.1          | LOS E            | 1.2               | 8.8   | 0.99         | 0.70                | 20.3          |
| Approach                        |      | 380         | 5.0 | 0.226     | 20.7          | LOS C            | 6.8               | 49.6  | 0.55         | 0.56                | 37.3          |
| East: Greens Road               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                               | L    | 24          | 5.0 | 0.068     | 18.3          | LOS B            | 0.6               | 4.1   | 0.48         | 0.67                | 40.1          |
| 5                               | T    | 146         | 5.0 | 0.464     | 49.5          | LOS D            | 7.9               | 57.4  | 0.95         | 0.77                | 24.5          |
| 6                               | R    | 55          | 5.0 | 0.230     | 59.3          | LOS E            | 2.9               | 21.5  | 0.93         | 0.75                | 22.9          |
| Approach                        |      | 225         | 5.0 | 0.464     | 48.6          | LOS D            | 7.9               | 57.4  | 0.90         | 0.75                | 25.1          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                               | L    | 132         | 5.0 | 0.152     | 9.8           | LOS A            | 1.4               | 10.1  | 0.25         | 0.65                | 47.4          |
| 8                               | T    | 836         | 5.0 | 0.712     | 26.7          | LOS C            | 28.4              | 207.5 | 0.82         | 0.72                | 33.1          |
| 9                               | R    | 30          | 5.0 | 0.335     | 71.8          | LOS E            | 1.8               | 13.3  | 1.00         | 0.72                | 20.2          |
| Approach                        |      | 998         | 5.0 | 0.712     | 25.8          | LOS C            | 28.4              | 207.5 | 0.75         | 0.71                | 33.8          |
| West: Greens Road               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                              | L    | 20          | 5.0 | 0.028     | 9.0           | LOS A            | 0.2               | 1.1   | 0.19         | 0.63                | 48.3          |
| 11                              | T    | 225         | 5.0 | 0.715     | 53.2          | LOS D            | 13.0              | 94.7  | 1.00         | 0.87                | 23.4          |
| 12                              | R    | 176         | 5.0 | 0.736     | 65.7          | LOS E            | 10.5              | 76.8  | 1.00         | 0.86                | 21.4          |
| Approach                        |      | 421         | 5.0 | 0.736     | 56.3          | LOS E            | 13.0              | 94.7  | 0.96         | 0.85                | 23.1          |
| All Vehicles                    |      | 2024        | 5.0 | 0.736     | 33.7          | LOS C            | 28.4              | 207.5 | 0.77         | 0.72                | 30.3          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Greens  
Rd - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Greens Rd - IN14  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |      |       |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|------|-------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. | Satn  | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c  | sec   |               |                  | Vehicles          | Distance |              |                     |               |
| South: Westbrook Drive          |      |             |     |      |       |               |                  |                   |          |              |                     |               |
| 1                               | L    | 185         | 0.0 |      | 0.262 | 9.8           | LOS A            | 2.0               | 14.2     | 0.26         | 0.66                | 47.3          |
| 2                               | T    | 880         | 0.0 |      | 0.701 | 25.3          | LOS C            | 29.3              | 205.2    | 0.80         | 0.71                | 33.9          |
| 3                               | R    | 25          | 0.0 |      | 0.272 | 71.1          | LOS E            | 1.5               | 10.6     | 1.00         | 0.71                | 20.3          |
| Approach                        |      | 1091        | 0.0 |      | 0.701 | 23.7          | LOS C            | 29.3              | 205.2    | 0.71         | 0.70                | 35.0          |
| East: Greens Road               |      |             |     |      |       |               |                  |                   |          |              |                     |               |
| 4                               | L    | 21          | 0.0 |      | 0.031 | 9.3           | LOS A            | 0.2               | 1.4      | 0.22         | 0.63                | 47.8          |
| 5                               | T    | 237         | 0.0 |      | 0.694 | 51.6          | LOS D            | 13.4              | 93.8     | 0.99         | 0.85                | 23.9          |
| 6                               | R    | 139         | 0.0 |      | 0.691 | 66.8          | LOS E            | 8.3               | 58.0     | 1.00         | 0.84                | 21.2          |
| Approach                        |      | 397         | 0.0 |      | 0.694 | 54.6          | LOS D            | 13.4              | 93.8     | 0.96         | 0.83                | 23.5          |
| North: Westbrook Drive          |      |             |     |      |       |               |                  |                   |          |              |                     |               |
| 7                               | L    | 58          | 0.0 |      | 0.059 | 8.9           | LOS A            | 0.5               | 3.2      | 0.20         | 0.64                | 48.2          |
| 8                               | T    | 280         | 0.0 |      | 0.223 | 19.8          | LOS B            | 6.9               | 48.6     | 0.62         | 0.51                | 37.4          |
| 9                               | R    | 21          | 0.0 |      | 0.227 | 70.8          | LOS E            | 1.3               | 8.8      | 0.99         | 0.70                | 20.4          |
| Approach                        |      | 359         | 0.0 |      | 0.227 | 21.0          | LOS C            | 6.9               | 48.6     | 0.57         | 0.54                | 37.0          |
| West: Greens Road               |      |             |     |      |       |               |                  |                   |          |              |                     |               |
| 10                              | L    | 32          | 0.0 |      | 0.085 | 17.0          | LOS B            | 0.7               | 4.9      | 0.46         | 0.67                | 41.0          |
| 11                              | T    | 154         | 0.0 |      | 0.450 | 48.4          | LOS D            | 8.2               | 57.2     | 0.94         | 0.77                | 24.8          |
| 12                              | R    | 99          | 0.0 |      | 0.492 | 64.2          | LOS E            | 5.7               | 39.6     | 0.99         | 0.78                | 21.7          |
| Approach                        |      | 284         | 0.0 |      | 0.492 | 50.4          | LOS D            | 8.2               | 57.2     | 0.90         | 0.76                | 24.7          |
| All Vehicles                    |      | 2131        | 0.0 |      | 0.701 | 32.6          | LOS C            | 29.3              | 205.2    | 0.76         | 0.71                | 30.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Greens  
Rd - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Greens Rd - IN14

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn |       | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|-------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                        |      |             |              |       |               |                  | Vehicles          | Distance |              |                     |               |
|                        |      | veh/h       | %            | v/c   | sec           |                  | veh               | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 1                      | L    | 20          | 5.0          | 0.020 | 8.2           | LOS A            | 0.1               | 0.6      | 0.12         | 0.62                | 49.1          |
| 2                      | T    | 490         | 5.0          | 0.288 | 22.1          | LOS C            | 8.9               | 65.3     | 0.67         | 0.57                | 35.8          |
| 3                      | R    | 20          | 5.0          | 0.223 | 71.0          | LOS E            | 1.2               | 8.8      | 0.99         | 0.70                | 20.4          |
| Approach               |      | 530         | 5.0          | 0.288 | 23.4          | LOS C            | 8.9               | 65.3     | 0.66         | 0.58                | 35.2          |
| East: Greens Road      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 4                      | L    | 24          | 5.0          | 0.071 | 25.5          | LOS C            | 0.9               | 6.3      | 0.75         | 0.74                | 35.9          |
| 5                      | T    | 33          | 5.0          | 0.071 | 36.7          | LOS D            | 1.1               | 8.4      | 0.83         | 0.61                | 28.5          |
| 6                      | R    | 101         | 5.0          | 0.451 | 62.0          | LOS E            | 5.7               | 41.3     | 0.97         | 0.78                | 22.3          |
| Approach               |      | 158         | 5.0          | 0.451 | 51.2          | LOS D            | 5.7               | 41.3     | 0.91         | 0.74                | 24.9          |
| North: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 7                      | L    | 83          | 5.0          | 0.090 | 8.4           | LOS A            | 0.4               | 3.1      | 0.15         | 0.63                | 49.0          |
| 8                      | T    | 764         | 5.0          | 0.449 | 24.2          | LOS C            | 15.2              | 111.3    | 0.74         | 0.65                | 34.5          |
| 9                      | R    | 30          | 5.0          | 0.335 | 71.6          | LOS E            | 1.8               | 13.3     | 1.00         | 0.72                | 20.3          |
| Approach               |      | 877         | 5.0          | 0.449 | 24.3          | LOS C            | 15.2              | 111.3    | 0.69         | 0.65                | 34.7          |
| West: Greens Road      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 10                     | L    | 27          | 5.0          | 0.171 | 32.2          | LOS C            | 2.0               | 14.9     | 0.85         | 0.77                | 32.8          |
| 11                     | T    | 93          | 5.0          | 0.171 | 37.3          | LOS D            | 2.8               | 20.7     | 0.87         | 0.67                | 28.2          |
| 12                     | R    | 61          | 5.0          | 0.272 | 60.5          | LOS E            | 3.3               | 24.2     | 0.95         | 0.76                | 22.7          |
| Approach               |      | 181         | 5.0          | 0.272 | 44.3          | LOS D            | 3.3               | 24.2     | 0.90         | 0.71                | 26.6          |
| All Vehicles           |      | 1746        | 5.0          | 0.451 | 28.6          | LOS C            | 15.2              | 111.3    | 0.72         | 0.64                | 32.6          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Greens  
Rd - PM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Greens Rd - IN14

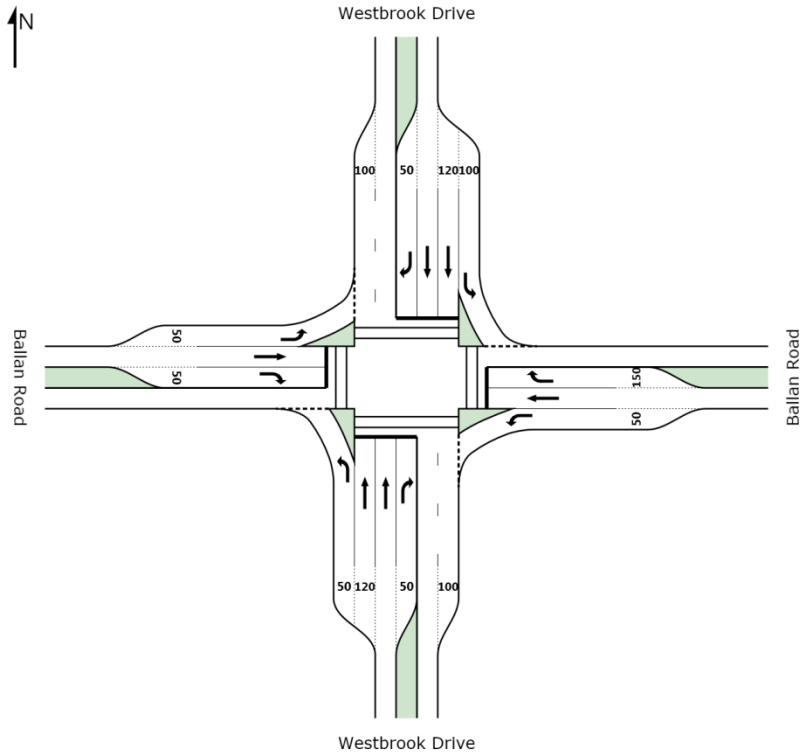
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

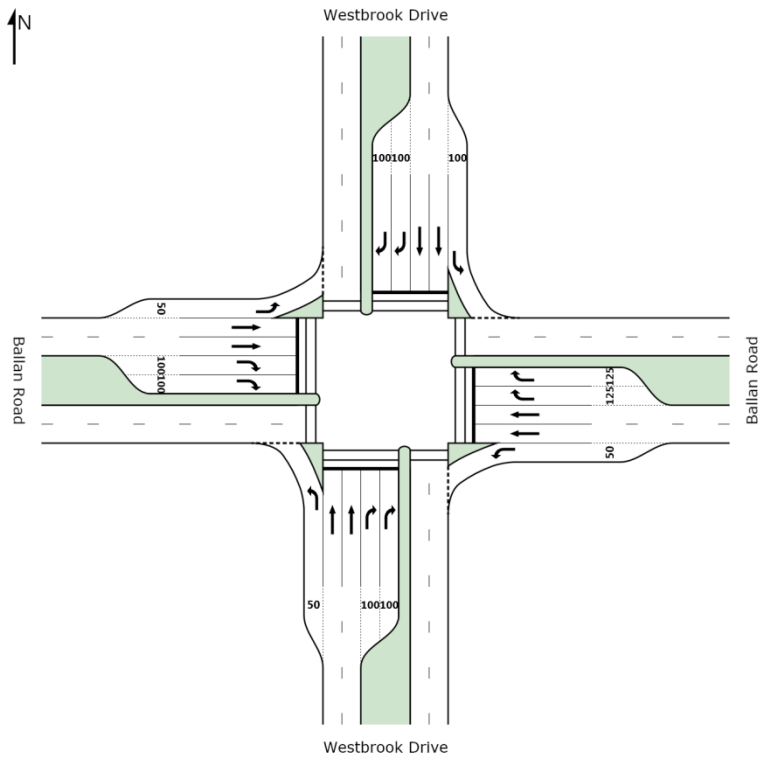
| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                        |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                      | L    | 61          | 5.0 | 0.065     | 8.3           | LOS A            | 0.3               | 2.1   | 0.14         | 0.63                | 49.0          |
| 2                      | T    | 764         | 5.0 | 0.433     | 22.7          | LOS C            | 14.8              | 107.8 | 0.72         | 0.63                | 35.4          |
| 3                      | R    | 24          | 5.0 | 0.268     | 71.2          | LOS E            | 1.4               | 10.6  | 0.99         | 0.71                | 20.4          |
| Approach               |      | 849         | 5.0 | 0.433     | 23.1          | LOS C            | 14.8              | 107.8 | 0.68         | 0.63                | 35.4          |
| East: Greens Road      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                      | L    | 20          | 5.0 | 0.165     | 34.5          | LOS C            | 2.1               | 15.0  | 0.86         | 0.77                | 31.9          |
| 5                      | T    | 93          | 5.0 | 0.165     | 37.7          | LOS D            | 2.7               | 19.9  | 0.88         | 0.67                | 28.1          |
| 6                      | R    | 83          | 5.0 | 0.427     | 63.8          | LOS E            | 4.7               | 34.4  | 0.98         | 0.77                | 21.9          |
| Approach               |      | 196         | 5.0 | 0.427     | 48.4          | LOS D            | 4.7               | 34.4  | 0.92         | 0.72                | 25.4          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                      | L    | 101         | 5.0 | 0.100     | 8.2           | LOS A            | 0.4               | 3.1   | 0.13         | 0.63                | 49.1          |
| 8                      | T    | 490         | 5.0 | 0.278     | 20.8          | LOS C            | 8.7               | 63.2  | 0.65         | 0.56                | 36.7          |
| 9                      | R    | 27          | 5.0 | 0.301     | 71.5          | LOS E            | 1.6               | 11.9  | 1.00         | 0.71                | 20.3          |
| Approach               |      | 618         | 5.0 | 0.301     | 20.9          | LOS C            | 8.7               | 63.2  | 0.58         | 0.57                | 36.9          |
| West: Greens Road      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                     | L    | 30          | 5.0 | 0.074     | 23.5          | LOS C            | 0.9               | 6.6   | 0.71         | 0.73                | 37.0          |
| 11                     | T    | 33          | 5.0 | 0.074     | 37.0          | LOS D            | 1.2               | 8.7   | 0.83         | 0.61                | 28.4          |
| 12                     | R    | 20          | 5.0 | 0.103     | 61.1          | LOS E            | 1.1               | 7.9   | 0.93         | 0.71                | 22.5          |
| Approach               |      | 83          | 5.0 | 0.103     | 37.9          | LOS D            | 1.2               | 8.7   | 0.81         | 0.68                | 29.0          |
| All Vehicles           |      | 1746        | 5.0 | 0.433     | 25.9          | LOS C            | 14.8              | 107.8 | 0.68         | 0.62                | 34.0          |

## IN 09

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Dr & Ballan Rd - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Ballan Rd - IN4

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn |       | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|-------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                        |      |             |              |       |               |                  | Vehicles          | Distance |              |                     |               |
|                        |      | veh/h       | %            | v/c   | sec           |                  | veh               | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 1                      | L    | 20          | 5.0          | 0.021 | 8.3           | LOS A            | 0.1               | 0.7      | 0.14         | 0.62                | 49.0          |
| 2                      | T    | 377         | 5.0          | 0.431 | 33.9          | LOS C            | 11.9              | 87.0     | 0.82         | 0.68                | 29.8          |
| 3                      | R    | 20          | 5.0          | 0.191 | 69.4          | LOS E            | 1.2               | 8.6      | 0.98         | 0.70                | 20.7          |
| Approach               |      | 417         | 5.0          | 0.431 | 34.4          | LOS C            | 11.9              | 87.0     | 0.79         | 0.68                | 29.8          |
| East: Ballan Road      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 4                      | L    | 20          | 5.0          | 0.039 | 11.4          | LOS B            | 0.3               | 2.0      | 0.30         | 0.64                | 45.9          |
| 5                      | T    | 71          | 5.0          | 0.251 | 49.3          | LOS D            | 3.7               | 27.2     | 0.92         | 0.71                | 24.5          |
| 6                      | R    | 340         | 5.0          | 0.690 | 50.4          | LOS D            | 17.9              | 130.9    | 0.95         | 0.85                | 25.2          |
| Approach               |      | 431         | 5.0          | 0.690 | 48.4          | LOS D            | 17.9              | 130.9    | 0.92         | 0.82                | 25.7          |
| North: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 7                      | L    | 381         | 5.0          | 0.335 | 9.9           | LOS A            | 4.5               | 32.8     | 0.28         | 0.67                | 47.3          |
| 8                      | T    | 600         | 5.0          | 0.687 | 36.9          | LOS D            | 21.0              | 153.3    | 0.89         | 0.77                | 28.5          |
| 9                      | R    | 20          | 5.0          | 0.191 | 69.4          | LOS E            | 1.2               | 8.6      | 0.98         | 0.70                | 20.7          |
| Approach               |      | 1001        | 5.0          | 0.687 | 27.3          | LOS C            | 21.0              | 153.3    | 0.66         | 0.73                | 33.4          |
| West: Ballan Road      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 10                     | L    | 20          | 5.0          | 0.049 | 14.4          | LOS B            | 0.4               | 2.7      | 0.39         | 0.65                | 43.2          |
| 11                     | T    | 194         | 5.0          | 0.685 | 54.0          | LOS D            | 11.2              | 81.5     | 1.00         | 0.85                | 23.2          |
| 12                     | R    | 20          | 5.0          | 0.086 | 42.1          | LOS D            | 0.8               | 6.2      | 0.76         | 0.70                | 27.9          |
| Approach               |      | 234         | 5.0          | 0.685 | 49.6          | LOS D            | 11.2              | 81.5     | 0.93         | 0.82                | 24.6          |
| All Vehicles           |      | 2083        | 5.0          | 0.690 | 35.6          | LOS D            | 21.0              | 153.3    | 0.77         | 0.75                | 29.6          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Ballan Rd - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Ballan Rd - IN4

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                        |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                      | L    | 20          | 5.0 | 0.028     | 9.4           | LOS A            | 0.2               | 1.3   | 0.21         | 0.63                | 47.9          |
| 2                      | T    | 600         | 5.0 | 0.717     | 38.7          | LOS D            | 21.3              | 155.1 | 0.91         | 0.78                | 27.9          |
| 3                      | R    | 20          | 5.0 | 0.223     | 71.1          | LOS E            | 1.2               | 8.8   | 0.99         | 0.70                | 20.3          |
| Approach               |      | 640         | 5.0 | 0.717     | 38.8          | LOS D            | 21.3              | 155.1 | 0.89         | 0.78                | 27.9          |
| East: Ballan Road      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                      | L    | 20          | 5.0 | 0.030     | 9.5           | LOS A            | 0.2               | 1.3   | 0.22         | 0.63                | 47.8          |
| 5                      | T    | 194         | 5.0 | 0.649     | 52.3          | LOS D            | 10.9              | 79.8  | 0.99         | 0.82                | 23.7          |
| 6                      | R    | 381         | 5.0 | 0.729     | 50.1          | LOS D            | 20.4              | 148.6 | 0.96         | 0.87                | 25.3          |
| Approach               |      | 595         | 5.0 | 0.729     | 49.4          | LOS D            | 20.4              | 148.6 | 0.95         | 0.84                | 25.2          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                      | L    | 340         | 5.0 | 0.260     | 8.5           | LOS A            | 2.1               | 15.7  | 0.18         | 0.65                | 48.8          |
| 8                      | T    | 377         | 5.0 | 0.450     | 35.6          | LOS D            | 12.1              | 88.1  | 0.84         | 0.70                | 29.1          |
| 9                      | R    | 20          | 5.0 | 0.223     | 71.1          | LOS E            | 1.2               | 8.8   | 0.99         | 0.70                | 20.3          |
| Approach               |      | 737         | 5.0 | 0.450     | 24.1          | LOS C            | 12.1              | 88.1  | 0.54         | 0.67                | 35.3          |
| West: Ballan Road      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                     | L    | 20          | 5.0 | 0.060     | 19.8          | LOS B            | 0.5               | 3.7   | 0.50         | 0.66                | 39.1          |
| 11                     | T    | 71          | 5.0 | 0.237     | 48.2          | LOS D            | 3.7               | 26.9  | 0.91         | 0.71                | 24.9          |
| 12                     | R    | 20          | 5.0 | 0.084     | 40.5          | LOS D            | 0.8               | 6.0   | 0.74         | 0.70                | 28.5          |
| Approach               |      | 111         | 5.0 | 0.237     | 41.7          | LOS D            | 3.7               | 26.9  | 0.81         | 0.70                | 27.3          |
| All Vehicles           |      | 2083        | 5.0 | 0.729     | 36.8          | LOS D            | 21.3              | 155.1 | 0.78         | 0.76                | 29.1          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Ballan Rd - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Ballan Rd - IN4

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                        |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                      | L    | 130         | 5.0 | 0.240     | 11.0          | LOS B            | 1.8               | 12.9     | 0.30         | 0.67                | 46.2          |
| 2                      | T    | 525         | 5.0 | 0.695     | 49.2          | LOS D            | 14.6              | 106.7    | 0.99         | 0.84                | 24.5          |
| 3                      | R    | 314         | 5.0 | 0.657     | 63.2          | LOS E            | 9.1               | 66.3     | 1.00         | 0.83                | 22.1          |
| Approach               |      | 969         | 5.0 | 0.695     | 48.6          | LOS D            | 14.6              | 106.7    | 0.90         | 0.81                | 25.2          |
| East: Ballan Road      |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                      | L    | 152         | 5.0 | 0.260     | 10.6          | LOS B            | 1.9               | 14.0     | 0.28         | 0.66                | 46.7          |
| 5                      | T    | 701         | 5.0 | 0.675     | 41.9          | LOS D            | 18.4              | 134.0    | 0.95         | 0.82                | 26.7          |
| 6                      | R    | 467         | 5.0 | 0.679     | 57.7          | LOS E            | 13.0              | 95.1     | 0.98         | 0.84                | 23.4          |
| Approach               |      | 1320        | 5.0 | 0.679     | 43.9          | LOS D            | 18.4              | 134.0    | 0.89         | 0.81                | 26.7          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                      | L    | 483         | 5.0 | 0.597     | 15.7          | LOS B            | 12.8              | 93.3     | 0.54         | 0.75                | 42.1          |
| 8                      | T    | 457         | 5.0 | 0.605     | 47.7          | LOS D            | 12.3              | 90.1     | 0.96         | 0.80                | 25.0          |
| 9                      | R    | 20          | 5.0 | 0.042     | 57.0          | LOS E            | 0.5               | 3.8      | 0.90         | 0.68                | 23.6          |
| Approach               |      | 960         | 5.0 | 0.605     | 31.8          | LOS C            | 12.8              | 93.3     | 0.75         | 0.78                | 31.4          |
| West: Ballan Road      |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                     | L    | 20          | 5.0 | 0.045     | 13.5          | LOS B            | 0.3               | 2.6      | 0.36         | 0.65                | 44.0          |
| 11                     | T    | 634         | 5.0 | 0.610     | 40.9          | LOS D            | 16.2              | 118.5    | 0.93         | 0.79                | 27.1          |
| 12                     | R    | 147         | 5.0 | 0.214     | 52.3          | LOS D            | 3.7               | 26.7     | 0.88         | 0.76                | 24.8          |
| Approach               |      | 801         | 5.0 | 0.610     | 42.3          | LOS D            | 16.2              | 118.5    | 0.91         | 0.78                | 26.9          |
| All Vehicles           |      | 4050        | 5.0 | 0.695     | 41.8          | LOS D            | 18.4              | 134.0    | 0.86         | 0.80                | 27.3          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Ballan Rd - PM Peak Ultimate

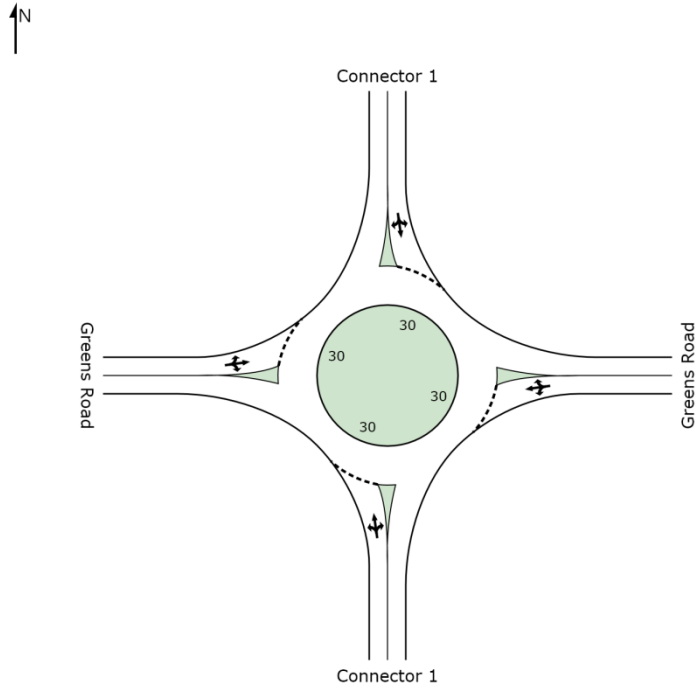
120221sid-12M1296000 - Westbrook Dr & Ballan Rd - IN4

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

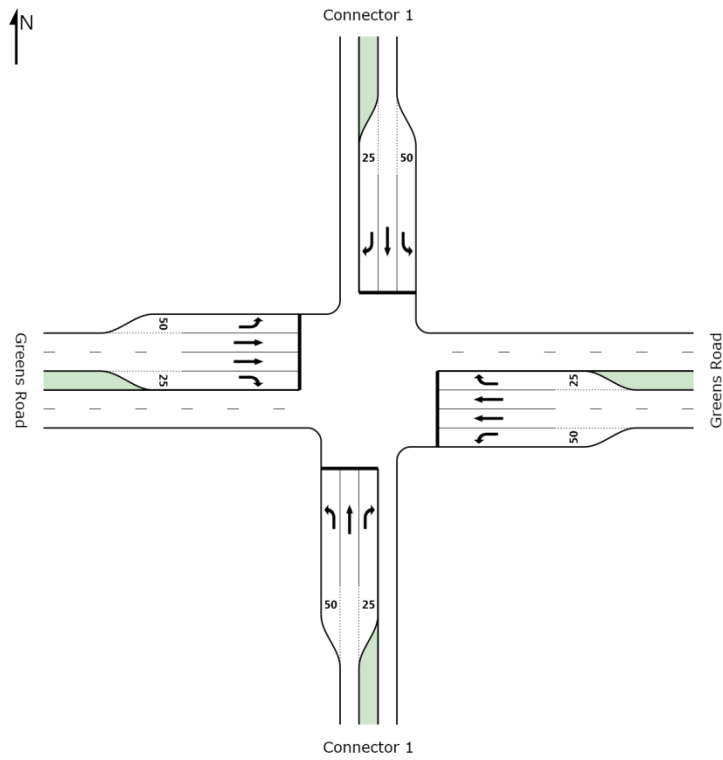
### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                        |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                      | L    | 147         | 5.0 | 0.263     | 10.4          | LOS B            | 1.8               | 13.3     | 0.28         | 0.66                | 46.8          |
| 2                      | T    | 457         | 5.0 | 0.558     | 45.6          | LOS D            | 12.0              | 88.0     | 0.94         | 0.79                | 25.6          |
| 3                      | R    | 152         | 5.0 | 0.636     | 71.0          | LOS E            | 4.7               | 34.0     | 1.00         | 0.80                | 20.5          |
| Approach               |      | 756         | 5.0 | 0.636     | 43.8          | LOS D            | 12.0              | 88.0     | 0.83         | 0.77                | 26.6          |
| East: Ballan Road      |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                      | L    | 314         | 5.0 | 0.556     | 11.3          | LOS B            | 4.8               | 35.0     | 0.34         | 0.69                | 46.0          |
| 5                      | T    | 634         | 5.0 | 0.559     | 38.1          | LOS D            | 15.6              | 114.0    | 0.90         | 0.77                | 28.1          |
| 6                      | R    | 483         | 5.0 | 0.622     | 54.3          | LOS D            | 13.0              | 94.7     | 0.96         | 0.83                | 24.3          |
| Approach               |      | 1431        | 5.0 | 0.622     | 37.7          | LOS D            | 15.6              | 114.0    | 0.80         | 0.77                | 29.1          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                      | L    | 467         | 5.0 | 0.530     | 14.3          | LOS B            | 11.2              | 81.6     | 0.49         | 0.74                | 43.2          |
| 8                      | T    | 525         | 5.0 | 0.641     | 46.6          | LOS D            | 14.1              | 103.3    | 0.97         | 0.81                | 25.3          |
| 9                      | R    | 20          | 5.0 | 0.084     | 66.7          | LOS E            | 0.6               | 4.2      | 0.97         | 0.68                | 21.3          |
| Approach               |      | 1012        | 5.0 | 0.641     | 32.1          | LOS C            | 14.1              | 103.3    | 0.75         | 0.78                | 31.2          |
| West: Ballan Road      |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                     | L    | 20          | 5.0 | 0.044     | 12.5          | LOS B            | 0.3               | 2.3      | 0.33         | 0.64                | 44.8          |
| 11                     | T    | 701         | 5.0 | 0.619     | 38.9          | LOS D            | 17.7              | 128.9    | 0.92         | 0.79                | 27.8          |
| 12                     | R    | 130         | 5.0 | 0.167     | 49.1          | LOS D            | 3.1               | 22.7     | 0.85         | 0.75                | 25.7          |
| Approach               |      | 851         | 5.0 | 0.619     | 39.8          | LOS D            | 17.7              | 128.9    | 0.89         | 0.78                | 27.7          |
| All Vehicles           |      | 4050        | 5.0 | 0.641     | 37.9          | LOS D            | 17.7              | 128.9    | 0.81         | 0.77                | 28.8          |

## IN 30 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN30 Greens Rd &  
Connector 1 - AM Peak  
Interim

120221sid-12M1296000 - Greens Rd & Connector 1 - IN13  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |      |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Connector 1              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                               | L    | 20          | 5.0 | 0.129     | 6.6           | LOS A            | 0.8               | 5.9  | 0.45         | 0.54                | 49.5          |
| 2                               | T    | 115         | 5.0 | 0.129     | 5.6           | LOS A            | 0.8               | 5.9  | 0.45         | 0.48                | 49.8          |
| 3                               | R    | 20          | 5.0 | 0.129     | 12.5          | LOS B            | 0.8               | 5.9  | 0.45         | 0.78                | 46.4          |
| Approach                        |      | 155         | 5.0 | 0.129     | 6.7           | LOS A            | 0.8               | 5.9  | 0.45         | 0.53                | 49.2          |
| East: Greens Road               |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                               | L    | 24          | 5.0 | 0.203     | 7.2           | LOS A            | 1.3               | 9.4  | 0.53         | 0.57                | 48.1          |
| 5                               | T    | 20          | 5.0 | 0.203     | 6.3           | LOS A            | 1.3               | 9.4  | 0.53         | 0.52                | 48.2          |
| 6                               | R    | 186         | 5.0 | 0.203     | 13.1          | LOS B            | 1.3               | 9.4  | 0.53         | 0.71                | 44.9          |
| Approach                        |      | 230         | 5.0 | 0.203     | 11.9          | LOS B            | 1.3               | 9.4  | 0.53         | 0.68                | 45.4          |
| North: Connector 1              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 7                               | L    | 250         | 5.0 | 0.353     | 5.8           | LOS A            | 2.8               | 20.1 | 0.27         | 0.46                | 50.6          |
| 8                               | T    | 273         | 5.0 | 0.353     | 4.8           | LOS A            | 2.8               | 20.1 | 0.27         | 0.38                | 51.3          |
| 9                               | R    | 20          | 5.0 | 0.353     | 11.7          | LOS B            | 2.8               | 20.1 | 0.27         | 0.79                | 46.5          |
| Approach                        |      | 543         | 5.0 | 0.353     | 5.5           | LOS A            | 2.8               | 20.1 | 0.27         | 0.43                | 50.8          |
| West: Greens Road               |      |             |     |           |               |                  |                   |      |              |                     |               |
| 10                              | L    | 20          | 5.0 | 0.053     | 7.0           | LOS A            | 0.3               | 2.3  | 0.49         | 0.53                | 48.8          |
| 11                              | T    | 20          | 5.0 | 0.053     | 6.0           | LOS A            | 0.3               | 2.3  | 0.49         | 0.48                | 49.1          |
| 12                              | R    | 20          | 5.0 | 0.053     | 12.9          | LOS B            | 0.3               | 2.3  | 0.49         | 0.73                | 45.9          |
| Approach                        |      | 60          | 5.0 | 0.053     | 8.6           | LOS A            | 0.3               | 2.3  | 0.49         | 0.58                | 47.8          |
| All Vehicles                    |      | 988         | 5.0 | 0.353     | 7.4           | LOS A            | 2.8               | 20.1 | 0.37         | 0.51                | 48.9          |

## MOVEMENT SUMMARY

Site: IN30 Greens Rd & Connector 1  
- PM Peak Interim

120221sid-12M1296000 - Greens Rd & Connector 1 - IN13  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | m        |              | per veh             | km/h          |
| South: Connector 1              |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 20          | 5.0 | 0.276     | 7.2           | LOS A            | 1.9               | 13.8     | 0.55         | 0.61                | 49.0          |
| 2                               | T    | 273         | 5.0 | 0.276     | 6.3           | LOS A            | 1.9               | 13.8     | 0.55         | 0.56                | 49.1          |
| 3                               | R    | 24          | 5.0 | 0.276     | 13.1          | LOS B            | 1.9               | 13.8     | 0.55         | 0.82                | 46.2          |
| Approach                        |      | 317         | 5.0 | 0.276     | 6.8           | LOS A            | 1.9               | 13.8     | 0.55         | 0.58                | 48.8          |
| East: Greens Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 20          | 5.0 | 0.219     | 6.3           | LOS A            | 1.4               | 10.3     | 0.38         | 0.47                | 49.2          |
| 5                               | T    | 20          | 5.0 | 0.219     | 5.3           | LOS A            | 1.4               | 10.3     | 0.38         | 0.42                | 49.6          |
| 6                               | R    | 250         | 5.0 | 0.219     | 12.2          | LOS B            | 1.4               | 10.3     | 0.38         | 0.66                | 45.3          |
| Approach                        |      | 290         | 5.0 | 0.219     | 11.3          | LOS B            | 1.4               | 10.3     | 0.38         | 0.63                | 45.8          |
| North: Connector 1              |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                               | L    | 186         | 5.0 | 0.215     | 5.7           | LOS A            | 1.5               | 10.7     | 0.25         | 0.46                | 50.7          |
| 8                               | T    | 115         | 5.0 | 0.215     | 4.8           | LOS A            | 1.5               | 10.7     | 0.25         | 0.38                | 51.4          |
| 9                               | R    | 20          | 5.0 | 0.215     | 11.7          | LOS B            | 1.5               | 10.7     | 0.25         | 0.78                | 46.5          |
| Approach                        |      | 321         | 5.0 | 0.215     | 5.8           | LOS A            | 1.5               | 10.7     | 0.25         | 0.45                | 50.6          |
| West: Greens Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                              | L    | 20          | 5.0 | 0.064     | 8.4           | LOS A            | 0.4               | 2.9      | 0.64         | 0.62                | 47.9          |
| 11                              | T    | 20          | 5.0 | 0.064     | 7.4           | LOS A            | 0.4               | 2.9      | 0.64         | 0.58                | 47.9          |
| 12                              | R    | 20          | 5.0 | 0.064     | 14.3          | LOS B            | 0.4               | 2.9      | 0.64         | 0.76                | 44.8          |
| Approach                        |      | 60          | 5.0 | 0.064     | 10.0          | LOS B            | 0.4               | 2.9      | 0.64         | 0.65                | 46.8          |
| All Vehicles                    |      | 988         | 5.0 | 0.276     | 8.0           | LOS A            | 1.9               | 13.8     | 0.41         | 0.56                | 48.3          |

## MOVEMENT SUMMARY

**Site: IN30 Greens Rd &  
Connector 1 - AM Peak  
Ultimate - Conversion**

120221sid-12M1296000 - Greens Rd & Connector 1 - IN13  
Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |      |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Connector 1              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                               | L    | 325         | 5.0 | 0.453     | 15.9          | LOS B            | 3.7               | 26.9 | 0.78         | 0.80                | 41.9          |
| 2                               | T    | 106         | 5.0 | 0.140     | 6.4           | LOS A            | 1.0               | 7.5  | 0.67         | 0.52                | 48.3          |
| 3                               | R    | 20          | 5.0 | 0.051     | 15.8          | LOS B            | 0.2               | 1.5  | 0.70         | 0.69                | 42.0          |
| Approach                        |      | 451         | 5.0 | 0.453     | 13.6          | LOS B            | 3.7               | 26.9 | 0.75         | 0.73                | 43.2          |
| East: Greens Road               |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                               | L    | 20          | 5.0 | 0.056     | 19.5          | LOS B            | 0.3               | 1.8  | 0.83         | 0.70                | 39.1          |
| 5                               | T    | 36          | 5.0 | 0.048     | 11.1          | LOS B            | 0.2               | 1.6  | 0.83         | 0.58                | 43.3          |
| 6                               | R    | 48          | 5.0 | 0.143     | 20.7          | LOS C            | 0.6               | 4.7  | 0.89         | 0.72                | 38.4          |
| Approach                        |      | 104         | 5.0 | 0.143     | 17.1          | LOS B            | 0.6               | 4.7  | 0.86         | 0.67                | 40.1          |
| North: Connector 1              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 7                               | L    | 150         | 5.0 | 0.209     | 15.0          | LOS B            | 1.5               | 11.0 | 0.69         | 0.76                | 42.6          |
| 8                               | T    | 228         | 5.0 | 0.302     | 6.9           | LOS A            | 2.4               | 17.4 | 0.72         | 0.59                | 47.6          |
| 9                               | R    | 226         | 5.0 | 0.618     | 19.3          | LOS B            | 3.2               | 23.2 | 0.88         | 0.86                | 39.4          |
| Approach                        |      | 604         | 5.0 | 0.618     | 13.6          | LOS B            | 3.2               | 23.2 | 0.77         | 0.73                | 43.0          |
| West: Greens Road               |      |             |     |           |               |                  |                   |      |              |                     |               |
| 10                              | L    | 88          | 5.0 | 0.245     | 20.2          | LOS C            | 1.2               | 8.6  | 0.88         | 0.76                | 38.7          |
| 11                              | T    | 32          | 5.0 | 0.042     | 11.0          | LOS B            | 0.2               | 1.5  | 0.83         | 0.57                | 43.3          |
| 12                              | R    | 185         | 5.0 | 0.484     | 20.8          | LOS C            | 2.6               | 19.2 | 0.93         | 0.79                | 38.3          |
| Approach                        |      | 305         | 5.0 | 0.484     | 19.6          | LOS B            | 2.6               | 19.2 | 0.90         | 0.76                | 38.9          |
| All Vehicles                    |      | 1464        | 5.0 | 0.618     | 15.1          | LOS B            | 3.7               | 26.9 | 0.80         | 0.73                | 41.9          |

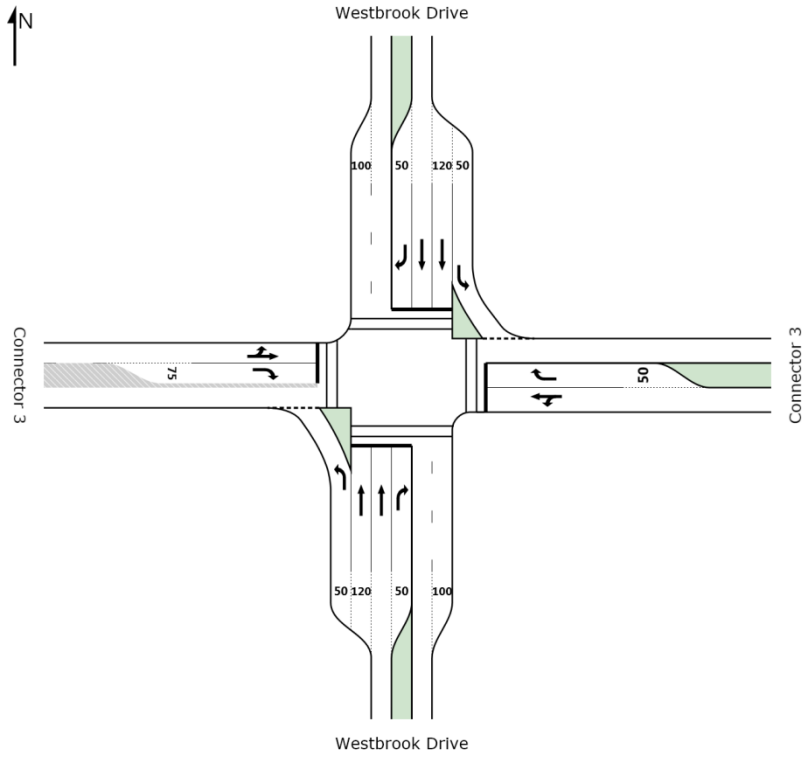
## MOVEMENT SUMMARY

**Site: IN30 Greens Rd & Connector 1  
- PM Peak Ultimate - Conversion**

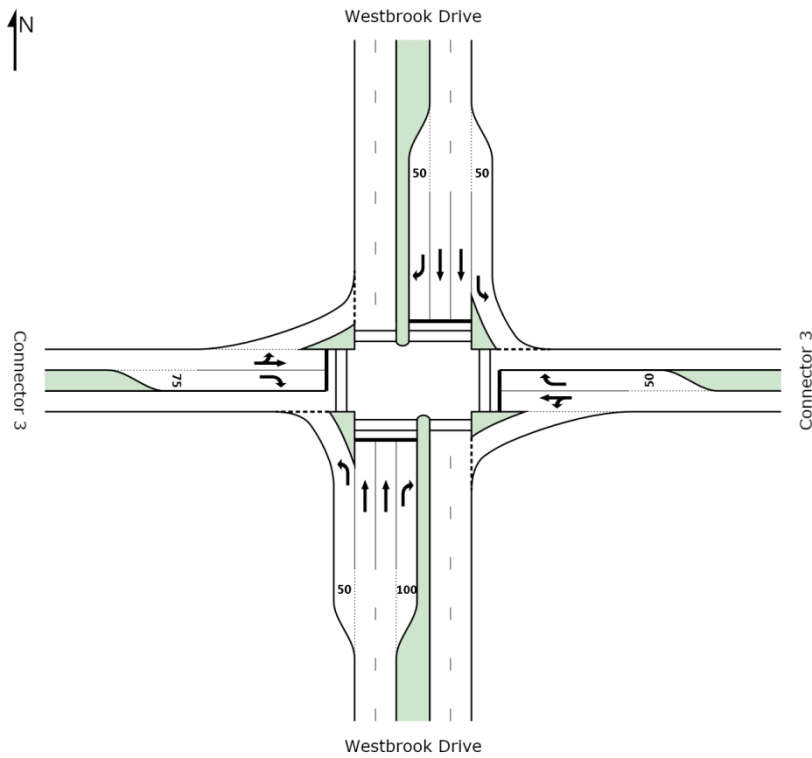
120221sid-12M1296000 - Greens Rd & Connector 1 - IN13  
Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

| Movement Performance - Vehicles |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Connector 1              |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                               | L    | 185                  | 5.0               | 0.442 | 19.9                 | LOS B            | 2.5                                  | 18.4          | 0.90         | 0.79                           | 38.9                  |
| 2                               | T    | 228                  | 5.0               | 0.517 | 11.7                 | LOS B            | 3.2                                  | 23.1          | 0.92         | 0.75                           | 42.5                  |
| 3                               | R    | 20                   | 5.0               | 0.054 | 19.3                 | LOS B            | 0.3                                  | 1.8           | 0.83         | 0.69                           | 39.3                  |
| Approach                        |      | 433                  | 5.0               | 0.517 | 15.6                 | LOS B            | 3.2                                  | 23.1          | 0.91         | 0.76                           | 40.7                  |
| East: Greens Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 20                   | 5.0               | 0.030 | 15.1                 | LOS B            | 0.2                                  | 1.4           | 0.66         | 0.70                           | 42.5                  |
| 5                               | T    | 32                   | 5.0               | 0.023 | 6.7                  | LOS A            | 0.2                                  | 1.1           | 0.66         | 0.46                           | 48.1                  |
| 6                               | R    | 150                  | 5.0               | 0.397 | 17.7                 | LOS B            | 1.8                                  | 13.5          | 0.82         | 0.77                           | 40.5                  |
| Approach                        |      | 202                  | 5.0               | 0.397 | 15.7                 | LOS B            | 1.8                                  | 13.5          | 0.78         | 0.72                           | 41.7                  |
| North: Connector 1              |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 48                   | 5.0               | 0.115 | 18.8                 | LOS B            | 0.6                                  | 4.3           | 0.82         | 0.73                           | 39.7                  |
| 8                               | T    | 106                  | 5.0               | 0.241 | 10.8                 | LOS B            | 1.4                                  | 9.9           | 0.85         | 0.66                           | 43.5                  |
| 9                               | R    | 88                   | 5.0               | 0.305 | 22.1                 | LOS C            | 1.3                                  | 9.4           | 0.94         | 0.75                           | 37.4                  |
| Approach                        |      | 242                  | 5.0               | 0.305 | 16.5                 | LOS B            | 1.4                                  | 9.9           | 0.88         | 0.71                           | 40.3                  |
| West: Greens Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 226                  | 5.0               | 0.344 | 16.2                 | LOS B            | 2.5                                  | 18.5          | 0.76         | 0.79                           | 41.6                  |
| 11                              | T    | 36                   | 5.0               | 0.026 | 6.7                  | LOS A            | 0.2                                  | 1.3           | 0.66         | 0.47                           | 48.0                  |
| 12                              | R    | 325                  | 5.0               | 0.537 | 16.9                 | LOS B            | 4.0                                  | 29.3          | 0.84         | 0.81                           | 41.1                  |
| Approach                        |      | 587                  | 5.0               | 0.537 | 16.0                 | LOS B            | 4.0                                  | 29.3          | 0.80         | 0.78                           | 41.7                  |
| All Vehicles                    |      | 1464                 | 5.0               | 0.537 | 15.9                 | LOS B            | 4.0                                  | 29.3          | 0.84         | 0.75                           | 41.2                  |

## IN 37 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN37 Westbrook Dr &  
Connector 3 - AM Peak  
Interim

111201sid-JM12960 - Westbrook Dr & Connector 3 - IN11

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                               | L    | 20          | 5.0 | 0.023     | 8.6           | LOS A            | 0.1               | 0.9   | 0.17         | 0.62                | 48.7          |
| 2                               | T    | 349         | 5.0 | 0.427     | 36.1          | LOS D            | 11.1              | 81.4  | 0.84         | 0.70                | 28.9          |
| 3                               | R    | 35          | 5.0 | 0.390     | 72.1          | LOS E            | 2.1               | 15.6  | 1.00         | 0.73                | 20.1          |
| Approach                        |      | 404         | 5.0 | 0.427     | 37.9          | LOS D            | 11.1              | 81.4  | 0.82         | 0.69                | 28.4          |
| East: Connector 3               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                               | L    | 78          | 5.0 | 0.462     | 56.1          | LOS E            | 8.5               | 61.9  | 0.94         | 0.82                | 24.1          |
| 5                               | T    | 82          | 5.0 | 0.462     | 47.7          | LOS D            | 8.5               | 61.9  | 0.94         | 0.77                | 24.4          |
| 6                               | R    | 20          | 5.0 | 0.084     | 40.4          | LOS D            | 0.8               | 6.0   | 0.74         | 0.70                | 28.5          |
| Approach                        |      | 180         | 5.0 | 0.462     | 50.6          | LOS D            | 8.5               | 61.9  | 0.92         | 0.78                | 24.7          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                               | L    | 20          | 5.0 | 0.027     | 9.3           | LOS A            | 0.2               | 1.3   | 0.21         | 0.63                | 48.0          |
| 8                               | T    | 602         | 5.0 | 0.738     | 40.1          | LOS D            | 21.8              | 158.9 | 0.92         | 0.80                | 27.4          |
| 9                               | R    | 50          | 5.0 | 0.558     | 73.3          | LOS E            | 3.1               | 22.6  | 1.00         | 0.76                | 19.9          |
| Approach                        |      | 672         | 5.0 | 0.738     | 41.6          | LOS D            | 21.8              | 158.9 | 0.91         | 0.79                | 27.0          |
| West: Connector 3               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                              | L    | 60          | 5.0 | 0.723     | 61.1          | LOS E            | 13.4              | 97.7  | 1.00         | 0.87                | 23.1          |
| 11                              | T    | 172         | 5.0 | 0.723     | 52.7          | LOS D            | 13.4              | 97.7  | 1.00         | 0.87                | 23.2          |
| 12                              | R    | 250         | 5.0 | 0.759     | 49.7          | LOS D            | 12.9              | 94.0  | 0.87         | 0.86                | 25.4          |
| Approach                        |      | 482         | 5.0 | 0.759     | 52.2          | LOS D            | 13.4              | 97.7  | 0.94         | 0.87                | 24.3          |
| All Vehicles                    |      | 1738        | 5.0 | 0.759     | 44.6          | LOS D            | 21.8              | 158.9 | 0.90         | 0.79                | 26.2          |

## MOVEMENT SUMMARY

Site: IN37 Westbrook Dr &  
Connector 3 - PM Peak Interim

111201sid-JM12960 - Westbrook Dr & Connector 3 - IN11

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive          |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 250         | 5.0 | 0.363     | 9.8           | LOS A            | 2.7                        | 20.1     | 0.26         | 0.66                | 47.4          |
| 2                               | T    | 602         | 5.0 | 0.514     | 24.0          | LOS C            | 18.1                       | 132.2    | 0.73         | 0.64                | 34.6          |
| 3                               | R    | 78          | 5.0 | 0.475     | 66.5          | LOS E            | 4.5                        | 33.1     | 0.99         | 0.77                | 21.2          |
| Approach                        |      | 930         | 5.0 | 0.514     | 23.8          | LOS C            | 18.1                       | 132.2    | 0.63         | 0.65                | 35.4          |
| East: Connector 3               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 35          | 5.0 | 0.505     | 53.3          | LOS D            | 10.8                       | 78.6     | 0.93         | 0.84                | 25.3          |
| 5                               | T    | 172         | 5.0 | 0.505     | 44.9          | LOS D            | 10.8                       | 78.6     | 0.93         | 0.77                | 25.6          |
| 6                               | R    | 20          | 5.0 | 0.215     | 70.8          | LOS E            | 1.2                        | 8.7      | 0.99         | 0.70                | 20.4          |
| Approach                        |      | 227         | 5.0 | 0.505     | 48.5          | LOS D            | 10.8                       | 78.6     | 0.94         | 0.78                | 25.0          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                               | L    | 20          | 5.0 | 0.025     | 8.9           | LOS A            | 0.1                        | 1.1      | 0.18         | 0.62                | 48.4          |
| 8                               | T    | 349         | 5.0 | 0.298     | 21.7          | LOS C            | 9.3                        | 67.8     | 0.66         | 0.55                | 36.1          |
| 9                               | R    | 60          | 5.0 | 0.365     | 65.8          | LOS E            | 3.4                        | 25.1     | 0.98         | 0.76                | 21.3          |
| Approach                        |      | 429         | 5.0 | 0.365     | 27.3          | LOS C            | 9.3                        | 67.8     | 0.68         | 0.58                | 33.3          |
| West: Connector 3               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                              | L    | 50          | 5.0 | 0.327     | 50.5          | LOS D            | 6.5                        | 47.5     | 0.88         | 0.82                | 25.8          |
| 11                              | T    | 82          | 5.0 | 0.327     | 42.2          | LOS D            | 6.5                        | 47.5     | 0.88         | 0.71                | 26.2          |
| 12                              | R    | 20          | 5.0 | 0.223     | 71.0          | LOS E            | 1.2                        | 8.8      | 0.99         | 0.70                | 20.4          |
| Approach                        |      | 152         | 5.0 | 0.327     | 48.7          | LOS D            | 6.5                        | 47.5     | 0.90         | 0.75                | 25.1          |
| All Vehicles                    |      | 1738        | 5.0 | 0.514     | 30.0          | LOS C            | 18.1                       | 132.2    | 0.70         | 0.66                | 32.0          |

## MOVEMENT SUMMARY

Site: IN37 Westbrook Dr &  
Connector 3 - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 3 - IN11

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn |       | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|-------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                        |      |             |              |       |               |                  | Vehicles          | Distance |              |                     |               |
|                        |      | veh/h       | %            | v/c   | sec           |                  | veh               | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 1                      | L    | 97          | 5.0          | 0.114 | 8.5           | LOS A            | 0.6               | 4.0      | 0.16         | 0.63                | 48.8          |
| 2                      | T    | 478         | 5.0          | 0.660 | 49.1          | LOS D            | 13.2              | 96.1     | 0.98         | 0.82                | 24.5          |
| 3                      | R    | 50          | 5.0          | 0.112 | 36.0          | LOS D            | 1.9               | 14.1     | 0.70         | 0.73                | 30.2          |
| Approach               |      | 625         | 5.0          | 0.660 | 41.8          | LOS D            | 13.2              | 96.1     | 0.83         | 0.78                | 27.1          |
| East: Connector 3      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 4                      | L    | 100         | 5.0          | 0.214 | 32.3          | LOS C            | 4.6               | 33.9     | 0.76         | 0.77                | 32.2          |
| 5                      | T    | 22          | 5.0          | 0.214 | 24.3          | LOS C            | 4.6               | 33.9     | 0.76         | 0.60                | 33.1          |
| 6                      | R    | 20          | 5.0          | 0.134 | 64.9          | LOS E            | 1.1               | 8.2      | 0.96         | 0.71                | 21.6          |
| Approach               |      | 142         | 5.0          | 0.214 | 35.7          | LOS D            | 4.6               | 33.9     | 0.79         | 0.73                | 30.2          |
| North: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 7                      | L    | 20          | 5.0          | 0.018 | 8.0           | LOS A            | 0.1               | 0.4      | 0.11         | 0.62                | 49.2          |
| 8                      | T    | 556         | 5.0          | 0.768 | 52.8          | LOS D            | 16.3              | 118.8    | 1.00         | 0.90                | 23.5          |
| 9                      | R    | 200         | 5.0          | 0.789 | 47.5          | LOS D            | 9.9               | 72.1     | 0.78         | 0.87                | 26.0          |
| Approach               |      | 776         | 5.0          | 0.789 | 50.3          | LOS D            | 16.3              | 118.8    | 0.92         | 0.89                | 24.5          |
| West: Connector 3      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 10                     | L    | 250         | 5.0          | 0.318 | 21.5          | LOS C            | 7.8               | 57.3     | 0.64         | 0.77                | 38.0          |
| 11                     | T    | 20          | 5.0          | 0.318 | 13.4          | LOS B            | 7.8               | 57.3     | 0.64         | 0.54                | 39.9          |
| 12                     | R    | 120         | 5.0          | 0.803 | 73.3          | LOS E            | 7.6               | 55.6     | 1.00         | 0.91                | 20.0          |
| Approach               |      | 390         | 5.0          | 0.803 | 37.0          | LOS D            | 7.8               | 57.3     | 0.75         | 0.81                | 29.8          |
| All Vehicles           |      | 1933        | 5.0          | 0.803 | 43.8          | LOS D            | 16.3              | 118.8    | 0.85         | 0.83                | 26.6          |

## MOVEMENT SUMMARY

Site: IN37 Westbrook Dr &  
Connector 3 - PM Peak  
Ultimate

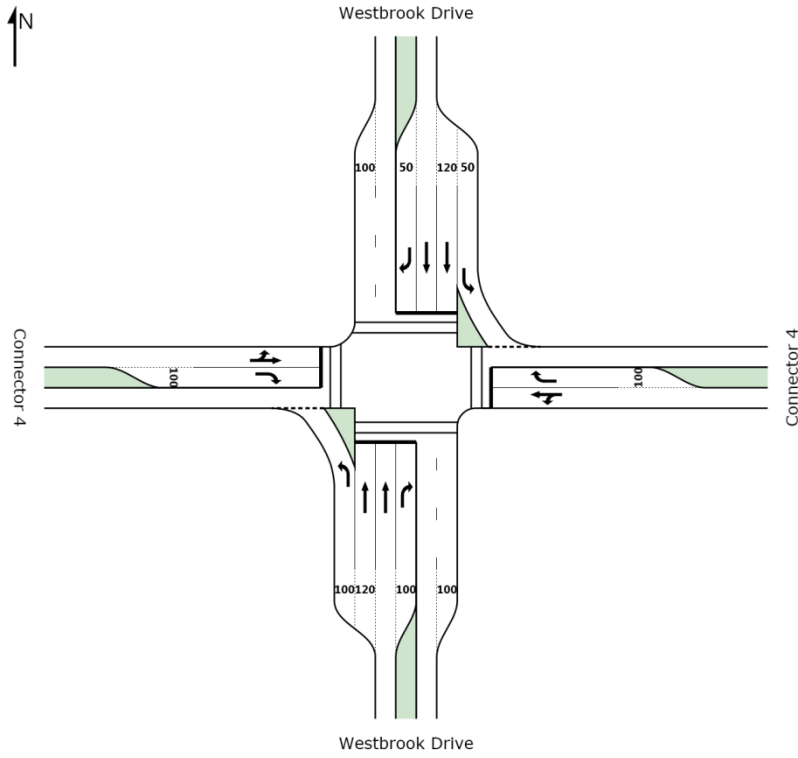
120221sid-12M1296000 - Westbrook Dr & Connector 3 - IN11

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

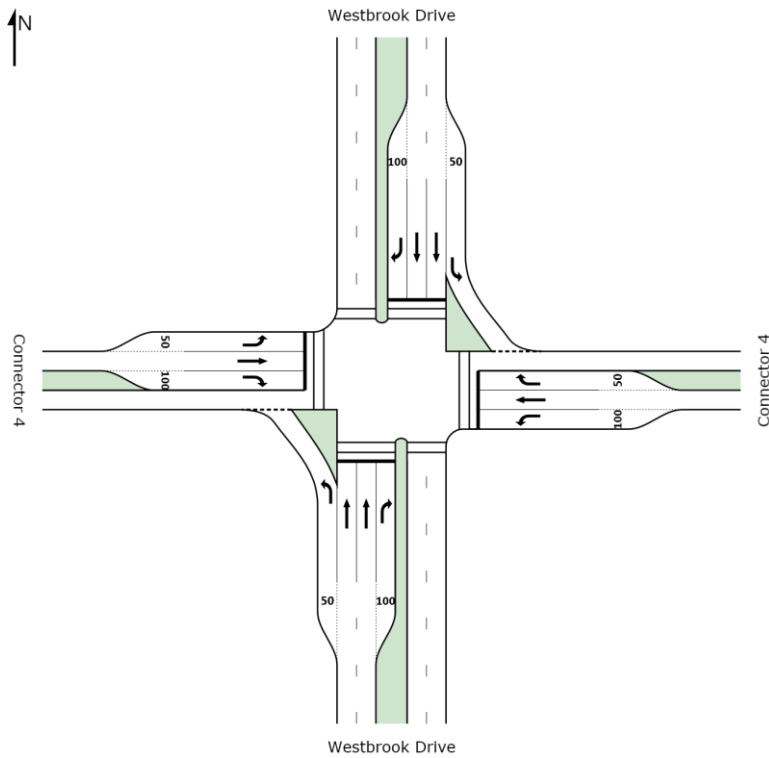
### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %            | v/c           | sec              | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |               |                  |                            |          |              |                     |               |
| 1                      | L    | 120         | 0.0          | 0.170         | 9.1              | LOS A                      | 1.1      | 7.5          | 0.22                | 48.0          |
| 2                      | T    | 556         | 0.0          | 0.855         | 60.8             | LOS E                      | 17.7     | 123.9        | 1.00                | 21.7          |
| 3                      | R    | 100         | 0.0          | 0.202         | 32.3             | LOS C                      | 3.7      | 25.6         | 0.67                | 31.7          |
| Approach               |      | 776         | 0.0          | 0.855         | 49.2             | LOS D                      | 17.7     | 123.9        | 0.84                | 24.8          |
| East: Connector 3      |      |             |              |               |                  |                            |          |              |                     |               |
| 4                      | L    | 50          | 0.0          | 0.144         | 35.6             | LOS D                      | 2.8      | 19.7         | 0.80                | 30.7          |
| 5                      | T    | 20          | 0.0          | 0.144         | 27.8             | LOS C                      | 2.8      | 19.7         | 0.80                | 31.5          |
| 6                      | R    | 20          | 0.0          | 0.185         | 68.9             | LOS E                      | 1.2      | 8.2          | 0.98                | 20.8          |
| Approach               |      | 90          | 0.0          | 0.185         | 41.3             | LOS D                      | 2.8      | 19.7         | 0.84                | 27.9          |
| North: Westbrook Drive |      |             |              |               |                  |                            |          |              |                     |               |
| 7                      | L    | 20          | 0.0          | 0.018         | 7.9              | LOS A                      | 0.1      | 0.4          | 0.11                | 49.2          |
| 8                      | T    | 478         | 0.0          | 0.735         | 53.7             | LOS D                      | 13.9     | 97.2         | 1.00                | 23.3          |
| 9                      | R    | 250         | 0.0          | 0.881         | 48.4             | LOS D                      | 11.7     | 81.6         | 0.86                | 25.7          |
| Approach               |      | 748         | 0.0          | 0.881         | 50.7             | LOS D                      | 13.9     | 97.2         | 0.93                | 24.4          |
| West: Connector 3      |      |             |              |               |                  |                            |          |              |                     |               |
| 10                     | L    | 200         | 0.0          | 0.298         | 28.1             | LOS C                      | 7.9      | 55.2         | 0.71                | 34.1          |
| 11                     | T    | 22          | 0.0          | 0.298         | 20.2             | LOS C                      | 7.9      | 55.2         | 0.71                | 35.2          |
| 12                     | R    | 97          | 0.0          | 0.895         | 81.5             | LOS F                      | 6.6      | 46.0         | 1.00                | 18.6          |
| Approach               |      | 319         | 0.0          | 0.895         | 43.8             | LOS D                      | 7.9      | 55.2         | 0.80                | 27.2          |
| All Vehicles           |      | 1933        | 0.0          | 0.895         | 48.5             | LOS D                      | 17.7     | 123.9        | 0.87                | 25.2          |

## IN 36 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN36 Westbrook Dr &  
Connector 4 - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 4 - IN12

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                        |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                      | L    | 100         | 5.0 | 0.089     | 9.1           | LOS A            | 0.8               | 6.2   | 0.21         | 0.64                | 48.1          |
| 2                      | T    | 242         | 5.0 | 0.238     | 26.2          | LOS C            | 6.8               | 49.5  | 0.71         | 0.58                | 33.5          |
| 3                      | R    | 58          | 5.0 | 0.555     | 71.9          | LOS E            | 3.5               | 25.9  | 1.00         | 0.76                | 20.2          |
| Approach               |      | 400         | 5.0 | 0.555     | 28.6          | LOS C            | 6.8               | 49.5  | 0.62         | 0.62                | 32.9          |
| East: Connector 4      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                      | L    | 214         | 5.0 | 0.752     | 56.0          | LOS E            | 18.4              | 134.2 | 0.99         | 0.89                | 24.0          |
| 5                      | T    | 112         | 5.0 | 0.752     | 47.6          | LOS D            | 18.4              | 134.2 | 0.99         | 0.88                | 24.1          |
| 6                      | R    | 36          | 5.0 | 0.134     | 56.4          | LOS E            | 1.9               | 13.5  | 0.90         | 0.73                | 23.6          |
| Approach               |      | 362         | 5.0 | 0.752     | 53.4          | LOS D            | 18.4              | 134.2 | 0.98         | 0.87                | 24.0          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                      | L    | 36          | 5.0 | 0.052     | 9.4           | LOS A            | 0.3               | 2.4   | 0.21         | 0.63                | 47.9          |
| 8                      | T    | 756         | 5.0 | 0.746     | 32.3          | LOS C            | 27.2              | 198.5 | 0.87         | 0.77                | 30.4          |
| 9                      | R    | 70          | 5.0 | 0.669     | 73.2          | LOS E            | 4.4               | 31.8  | 1.00         | 0.81                | 19.9          |
| Approach               |      | 862         | 5.0 | 0.746     | 34.7          | LOS C            | 27.2              | 198.5 | 0.86         | 0.76                | 29.6          |
| West: Connector 4      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                     | L    | 100         | 5.0 | 0.635     | 54.2          | LOS D            | 13.8              | 100.6 | 0.96         | 0.84                | 24.8          |
| 11                     | T    | 157         | 5.0 | 0.635     | 45.8          | LOS D            | 13.8              | 100.6 | 0.96         | 0.81                | 25.0          |
| 12                     | R    | 200         | 5.0 | 0.744     | 64.2          | LOS E            | 11.9              | 86.7  | 1.00         | 0.87                | 21.7          |
| Approach               |      | 457         | 5.0 | 0.744     | 55.7          | LOS E            | 13.8              | 100.6 | 0.98         | 0.84                | 23.4          |
| All Vehicles           |      | 2081        | 5.0 | 0.752     | 41.4          | LOS D            | 27.2              | 198.5 | 0.86         | 0.77                | 27.4          |

## MOVEMENT SUMMARY

Site: IN36 Westbrook Dr &  
Connector 4 - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 4 - IN12

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                        |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                      | L    | 230         | 5.0 | 0.247     | 11.0          | LOS B            | 3.2               | 23.6  | 0.31         | 0.68                | 46.2          |
| 2                      | T    | 756         | 5.0 | 0.749     | 34.4          | LOS C            | 26.0              | 189.8 | 0.89         | 0.78                | 29.5          |
| 3                      | R    | 214         | 5.0 | 0.716     | 61.8          | LOS E            | 12.4              | 90.4  | 1.00         | 0.86                | 22.2          |
| Approach               |      | 1200        | 5.0 | 0.749     | 34.8          | LOS C            | 26.0              | 189.8 | 0.80         | 0.77                | 29.9          |
| East: Connector 4      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                      | L    | 58          | 5.0 | 0.730     | 60.5          | LOS E            | 14.1              | 103.0 | 1.00         | 0.88                | 23.3          |
| 5                      | T    | 187         | 5.0 | 0.730     | 52.2          | LOS D            | 14.1              | 103.0 | 1.00         | 0.88                | 23.4          |
| 6                      | R    | 36          | 5.0 | 0.201     | 63.3          | LOS E            | 2.0               | 14.6  | 0.95         | 0.73                | 22.0          |
| Approach               |      | 281         | 5.0 | 0.730     | 55.3          | LOS E            | 14.1              | 103.0 | 0.99         | 0.86                | 23.2          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                      | L    | 36          | 5.0 | 0.066     | 11.2          | LOS B            | 0.5               | 3.6   | 0.29         | 0.64                | 46.0          |
| 8                      | T    | 242         | 5.0 | 0.252     | 28.4          | LOS C            | 7.0               | 51.0  | 0.73         | 0.60                | 32.4          |
| 9                      | R    | 130         | 5.0 | 0.651     | 58.5          | LOS E            | 7.1               | 51.7  | 0.95         | 0.81                | 23.0          |
| Approach               |      | 408         | 5.0 | 0.651     | 36.5          | LOS D            | 7.1               | 51.7  | 0.76         | 0.67                | 29.4          |
| West: Connector 4      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                     | L    | 100         | 5.0 | 0.702     | 58.9          | LOS E            | 13.7              | 99.8  | 0.99         | 0.86                | 23.5          |
| 11                     | T    | 142         | 5.0 | 0.702     | 50.5          | LOS D            | 13.7              | 99.8  | 0.99         | 0.85                | 23.6          |
| 12                     | R    | 130         | 5.0 | 0.725     | 68.9          | LOS E            | 7.9               | 57.7  | 1.00         | 0.85                | 20.8          |
| Approach               |      | 372         | 5.0 | 0.725     | 59.2          | LOS E            | 13.7              | 99.8  | 0.99         | 0.86                | 22.5          |
| All Vehicles           |      | 2261        | 5.0 | 0.749     | 41.7          | LOS D            | 26.0              | 189.8 | 0.85         | 0.78                | 27.3          |

## MOVEMENT SUMMARY

Site: IN36 Westbrook Dr &  
Connector 4 - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 4 - IN12

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                      | L    | 61          | 5.0 | 0.088     | 9.4           | LOS A            | 0.6                        | 4.0      | 0.22         | 0.64                | 47.9          |
| 2                      | T    | 437         | 5.0 | 0.514     | 44.2          | LOS D            | 11.3                       | 82.6     | 0.93         | 0.77                | 26.0          |
| 3                      | R    | 100         | 5.0 | 0.268     | 51.4          | LOS D            | 4.9                        | 36.1     | 0.88         | 0.78                | 24.9          |
| Approach               |      | 598         | 5.0 | 0.514     | 41.9          | LOS D            | 11.3                       | 82.6     | 0.85         | 0.76                | 27.1          |
| East: Connector 4      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                      | L    | 150         | 5.0 | 0.260     | 22.9          | LOS C            | 4.3                        | 31.4     | 0.53         | 0.75                | 36.9          |
| 5                      | T    | 126         | 5.0 | 0.235     | 35.4          | LOS D            | 5.6                        | 41.2     | 0.81         | 0.66                | 29.2          |
| 6                      | R    | 20          | 5.0 | 0.134     | 64.9          | LOS E            | 1.1                        | 8.2      | 0.96         | 0.71                | 21.6          |
| Approach               |      | 296         | 5.0 | 0.260     | 31.1          | LOS C            | 5.6                        | 41.2     | 0.68         | 0.71                | 31.8          |
| North: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                      | L    | 20          | 5.0 | 0.030     | 9.5           | LOS A            | 0.2                        | 1.3      | 0.22         | 0.63                | 47.8          |
| 8                      | T    | 608         | 5.0 | 0.715     | 47.4          | LOS D            | 16.8                       | 122.8    | 0.98         | 0.85                | 25.0          |
| 9                      | R    | 112         | 5.0 | 0.300     | 51.7          | LOS D            | 5.6                        | 40.8     | 0.89         | 0.78                | 24.8          |
| Approach               |      | 740         | 5.0 | 0.715     | 47.1          | LOS D            | 16.8                       | 122.8    | 0.95         | 0.84                | 25.3          |
| West: Connector 4      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                     | L    | 250         | 5.0 | 0.729     | 31.3          | LOS C            | 8.6                        | 62.5     | 0.69         | 0.82                | 32.3          |
| 11                     | T    | 165         | 5.0 | 0.308     | 36.3          | LOS D            | 7.6                        | 55.3     | 0.83         | 0.68                | 28.9          |
| 12                     | R    | 110         | 5.0 | 0.736     | 71.0          | LOS E            | 6.8                        | 49.6     | 1.00         | 0.86                | 20.4          |
| Approach               |      | 525         | 5.0 | 0.736     | 41.2          | LOS D            | 8.6                        | 62.5     | 0.80         | 0.78                | 27.8          |
| All Vehicles           |      | 2159        | 5.0 | 0.736     | 42.0          | LOS D            | 16.8                       | 122.8    | 0.85         | 0.79                | 27.2          |

## MOVEMENT SUMMARY

Site: IN36 Westbrook Dr &  
Connector 4 - PM Peak  
Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 4 - IN12

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

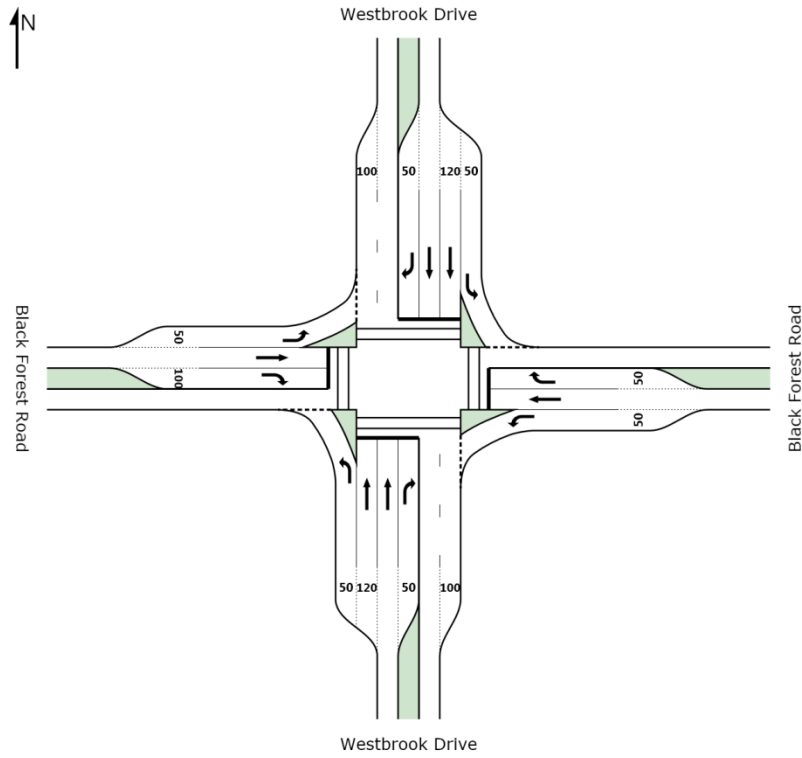
### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                      | L    | 140         | 5.0 | 0.296     | 13.0          | LOS B            | 2.4                        | 17.8     | 0.37         | 0.68                | 44.4          |
| 2                      | T    | 608         | 5.0 | 0.666     | 44.6          | LOS D            | 16.2                       | 118.4    | 0.96         | 0.82                | 25.9          |
| 3                      | R    | 150         | 5.0 | 0.354     | 41.8          | LOS D            | 6.6                        | 48.2     | 0.80         | 0.78                | 28.0          |
| Approach               |      | 898         | 5.0 | 0.666     | 39.2          | LOS D            | 16.2                       | 118.4    | 0.84         | 0.79                | 28.1          |
| East: Connector 4      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                      | L    | 100         | 5.0 | 0.175     | 22.9          | LOS C            | 2.8                        | 20.7     | 0.52         | 0.74                | 36.9          |
| 5                      | T    | 195         | 5.0 | 0.590     | 49.9          | LOS D            | 10.7                       | 78.1     | 0.97         | 0.80                | 24.3          |
| 6                      | R    | 20          | 5.0 | 0.149     | 66.3          | LOS E            | 1.1                        | 8.3      | 0.97         | 0.71                | 21.3          |
| Approach               |      | 315         | 5.0 | 0.590     | 42.4          | LOS D            | 10.7                       | 78.1     | 0.83         | 0.77                | 27.0          |
| North: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                      | L    | 20          | 5.0 | 0.032     | 9.8           | LOS A            | 0.2                        | 1.5      | 0.24         | 0.63                | 47.4          |
| 8                      | T    | 437         | 5.0 | 0.479     | 42.2          | LOS D            | 11.0                       | 80.6     | 0.91         | 0.76                | 26.7          |
| 9                      | R    | 280         | 5.0 | 0.664     | 44.8          | LOS D            | 13.5                       | 98.2     | 0.87         | 0.82                | 27.0          |
| Approach               |      | 737         | 5.0 | 0.664     | 42.3          | LOS D            | 13.5                       | 98.2     | 0.88         | 0.78                | 27.1          |
| West: Connector 4      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                     | L    | 142         | 5.0 | 0.419     | 23.3          | LOS C            | 4.1                        | 30.1     | 0.54         | 0.74                | 36.6          |
| 11                     | T    | 156         | 5.0 | 0.472     | 48.7          | LOS D            | 8.3                        | 60.9     | 0.95         | 0.77                | 24.7          |
| 12                     | R    | 91          | 5.0 | 0.677     | 70.7          | LOS E            | 5.6                        | 40.7     | 1.00         | 0.82                | 20.5          |
| Approach               |      | 389         | 5.0 | 0.677     | 44.6          | LOS D            | 8.3                        | 60.9     | 0.81         | 0.77                | 26.5          |
| All Vehicles           |      | 2339        | 5.0 | 0.677     | 41.5          | LOS D            | 16.2                       | 118.4    | 0.85         | 0.78                | 27.4          |

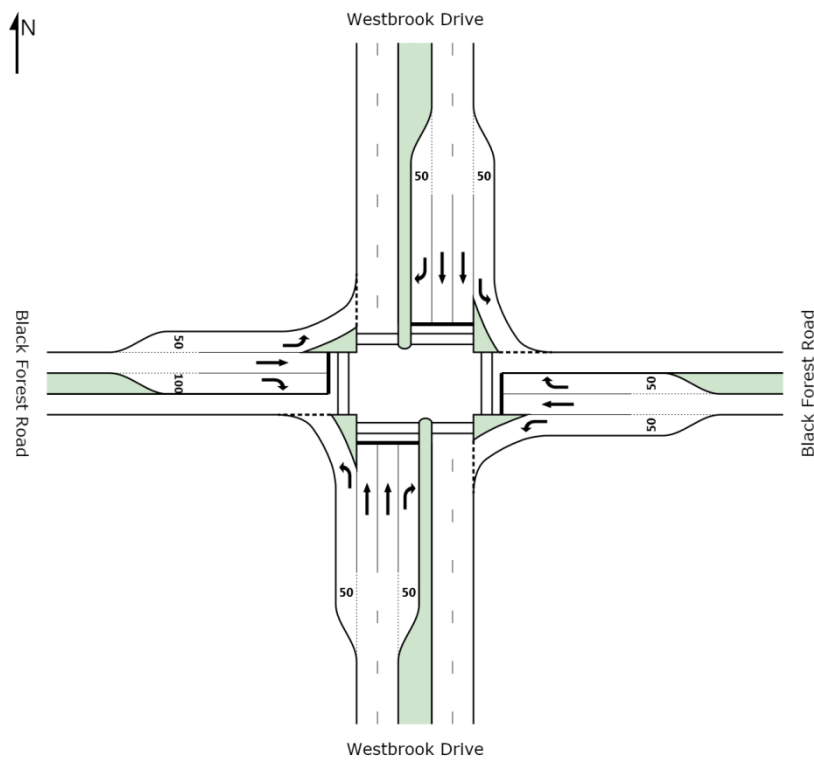
PSP 42.1

IN 05

Interim Layout



Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Dr & Black Forest Rd (IN05) - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Black Forest Rd - IN21

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                  | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                         |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive  |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                       | L    | 186         | 0.0 | 0.190     | 8.4           | LOS A            | 1.1                        | 7.7      | 0.17         | 0.64                | 48.8          |
| 2                       | T    | 233         | 0.0 | 0.220     | 26.0          | LOS C            | 6.4                        | 44.8     | 0.70         | 0.57                | 33.6          |
| 3                       | R    | 20          | 0.0 | 0.215     | 70.7          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.4          |
| Approach                |      | 439         | 0.0 | 0.220     | 20.6          | LOS C            | 6.4                        | 44.8     | 0.49         | 0.61                | 37.5          |
| East: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                       | L    | 20          | 0.0 | 0.052     | 16.4          | LOS B            | 0.4                        | 3.0      | 0.44         | 0.66                | 41.4          |
| 5                       | T    | 74          | 0.0 | 0.240     | 48.2          | LOS D            | 3.8                        | 26.9     | 0.92         | 0.71                | 24.9          |
| 6                       | R    | 110         | 0.0 | 0.500     | 51.3          | LOS D            | 5.5                        | 38.2     | 0.88         | 0.77                | 24.9          |
| Approach                |      | 204         | 0.0 | 0.500     | 46.8          | LOS D            | 5.5                        | 38.2     | 0.85         | 0.74                | 25.9          |
| North: Westbrook Drive  |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                       | L    | 90          | 0.0 | 0.088     | 8.2           | LOS A            | 0.5                        | 3.2      | 0.15         | 0.63                | 49.0          |
| 8                       | T    | 683         | 0.0 | 0.645     | 30.9          | LOS C            | 23.0                       | 161.0    | 0.84         | 0.73                | 31.1          |
| 9                       | R    | 20          | 0.0 | 0.215     | 70.7          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.4          |
| Approach                |      | 793         | 0.0 | 0.645     | 29.3          | LOS C            | 23.0                       | 161.0    | 0.76         | 0.72                | 32.0          |
| West: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                      | L    | 20          | 0.0 | 0.028     | 9.2           | LOS A            | 0.2                        | 1.2      | 0.21         | 0.63                | 48.0          |
| 11                      | T    | 58          | 0.0 | 0.188     | 47.7          | LOS D            | 3.0                        | 20.8     | 0.91         | 0.69                | 25.0          |
| 12                      | R    | 245         | 0.0 | 0.633     | 55.3          | LOS E            | 13.3                       | 92.8     | 0.97         | 0.83                | 23.8          |
| Approach                |      | 323         | 0.0 | 0.633     | 51.0          | LOS D            | 13.3                       | 92.8     | 0.91         | 0.79                | 24.8          |
| All Vehicles            |      | 1759        | 0.0 | 0.645     | 33.1          | LOS C            | 23.0                       | 161.0    | 0.73         | 0.71                | 30.7          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Black Forest Rd (IN05) - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Black Forest Rd - IN21

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                  | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                         |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive  |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                       | L    | 245         | 0.0 | 0.242     | 8.3           | LOS A            | 1.4                        | 9.6      | 0.16         | 0.64                | 48.9          |
| 2                       | T    | 683         | 0.0 | 0.591     | 26.9          | LOS C            | 21.8                       | 152.7    | 0.78         | 0.68                | 33.1          |
| 3                       | R    | 20          | 0.0 | 0.215     | 70.7          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.4          |
| Approach                |      | 948         | 0.0 | 0.591     | 23.0          | LOS C            | 21.8                       | 152.7    | 0.63         | 0.67                | 35.6          |
| East: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                       | L    | 20          | 0.0 | 0.033     | 10.1          | LOS B            | 0.2                        | 1.6      | 0.25         | 0.64                | 47.0          |
| 5                       | T    | 58          | 0.0 | 0.188     | 47.7          | LOS D            | 3.0                        | 20.8     | 0.91         | 0.69                | 25.0          |
| 6                       | R    | 90          | 0.0 | 0.431     | 55.8          | LOS E            | 4.7                        | 32.8     | 0.92         | 0.77                | 23.7          |
| Approach                |      | 168         | 0.0 | 0.431     | 47.6          | LOS D            | 4.7                        | 32.8     | 0.83         | 0.73                | 25.7          |
| North: Westbrook Drive  |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                       | L    | 110         | 0.0 | 0.113     | 8.3           | LOS A            | 0.6                        | 4.3      | 0.16         | 0.64                | 48.8          |
| 8                       | T    | 233         | 0.0 | 0.201     | 22.6          | LOS C            | 6.0                        | 42.3     | 0.65         | 0.53                | 35.6          |
| 9                       | R    | 20          | 0.0 | 0.215     | 70.7          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.4          |
| Approach                |      | 363         | 0.0 | 0.215     | 20.9          | LOS C            | 6.0                        | 42.3     | 0.52         | 0.57                | 37.2          |
| West: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                      | L    | 20          | 0.0 | 0.043     | 12.9          | LOS B            | 0.3                        | 2.3      | 0.35         | 0.65                | 44.4          |
| 11                      | T    | 74          | 0.0 | 0.240     | 48.2          | LOS D            | 3.8                        | 26.9     | 0.92         | 0.71                | 24.9          |
| 12                      | R    | 186         | 0.0 | 0.601     | 58.9          | LOS E            | 10.3                       | 72.1     | 0.98         | 0.82                | 22.9          |
| Approach                |      | 280         | 0.0 | 0.601     | 52.8          | LOS D            | 10.3                       | 72.1     | 0.92         | 0.78                | 24.3          |
| All Vehicles            |      | 1759        | 0.0 | 0.601     | 29.6          | LOS C            | 21.8                       | 152.7    | 0.67         | 0.67                | 32.3          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Black Forest Rd (IN05) - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Black Forest Rd - IN21  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |      |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Westbrook Drive          |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                               | L    | 159         | 0.0 | 0.165     | 8.2           | LOS A            | 0.9               | 6.1  | 0.16         | 0.64                | 48.9          |
| 2                               | T    | 227         | 0.0 | 0.279     | 43.2          | LOS D            | 5.6               | 39.3 | 0.88         | 0.71                | 26.4          |
| 3                               | R    | 59          | 0.0 | 0.424     | 68.0          | LOS E            | 3.5               | 24.3 | 0.99         | 0.75                | 20.9          |
| Approach                        |      | 445         | 0.0 | 0.424     | 34.0          | LOS C            | 5.6               | 39.3 | 0.64         | 0.69                | 30.4          |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                               | L    | 74          | 0.0 | 0.129     | 10.5          | LOS B            | 0.9               | 6.4  | 0.28         | 0.66                | 46.7          |
| 5                               | T    | 71          | 0.0 | 0.208     | 46.0          | LOS D            | 3.6               | 25.1 | 0.90         | 0.69                | 25.5          |
| 6                               | R    | 110         | 0.0 | 0.419     | 37.4          | LOS D            | 4.5               | 31.2 | 0.74         | 0.75                | 29.6          |
| Approach                        |      | 255         | 0.0 | 0.419     | 32.0          | LOS C            | 4.5               | 31.2 | 0.65         | 0.71                | 31.6          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                   |      |              |                     |               |
| 7                               | L    | 70          | 0.0 | 0.075     | 8.3           | LOS A            | 0.4               | 2.8  | 0.16         | 0.63                | 48.9          |
| 8                               | T    | 365         | 0.0 | 0.449     | 45.0          | LOS D            | 9.4               | 65.9 | 0.92         | 0.76                | 25.8          |
| 9                               | R    | 20          | 0.0 | 0.144     | 66.0          | LOS E            | 1.1               | 8.0  | 0.97         | 0.71                | 21.3          |
| Approach                        |      | 455         | 0.0 | 0.449     | 40.3          | LOS D            | 9.4               | 65.9 | 0.81         | 0.74                | 27.5          |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |      |              |                     |               |
| 10                              | L    | 20          | 0.0 | 0.026     | 8.7           | LOS A            | 0.1               | 1.0  | 0.18         | 0.63                | 48.4          |
| 11                              | T    | 46          | 0.0 | 0.135     | 45.2          | LOS D            | 2.3               | 16.0 | 0.88         | 0.66                | 25.8          |
| 12                              | R    | 208         | 0.0 | 0.454     | 39.3          | LOS D            | 9.0               | 62.8 | 0.79         | 0.79                | 28.9          |
| Approach                        |      | 274         | 0.0 | 0.454     | 38.0          | LOS D            | 9.0               | 62.8 | 0.76         | 0.76                | 29.2          |
| All Vehicles                    |      | 1429        | 0.0 | 0.454     | 36.4          | LOS D            | 9.4               | 65.9 | 0.72         | 0.72                | 29.4          |

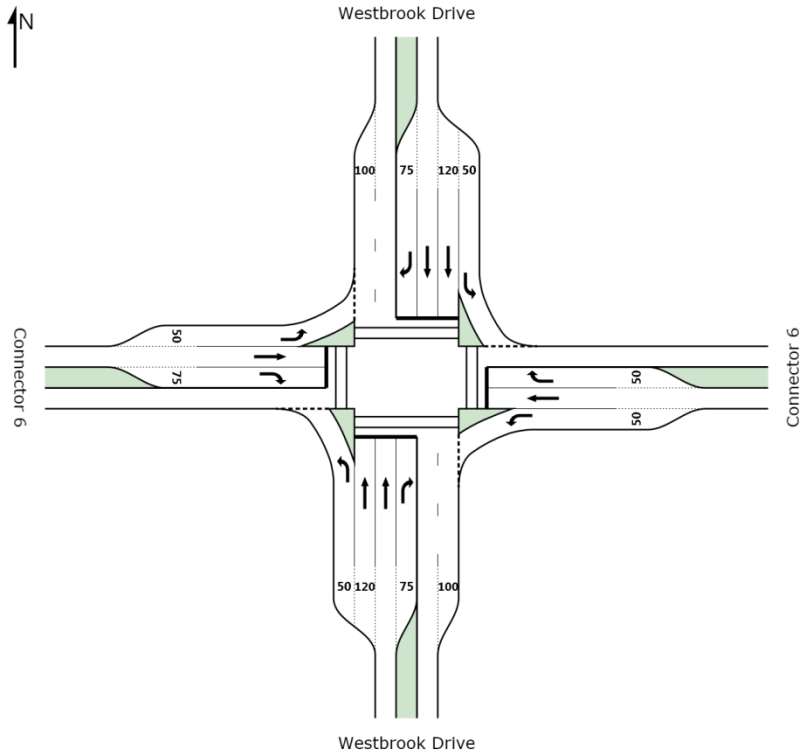
## MOVEMENT SUMMARY

Site: Westbrook Dr & Black Forest Rd (IN05) - PM Peak Ultimate

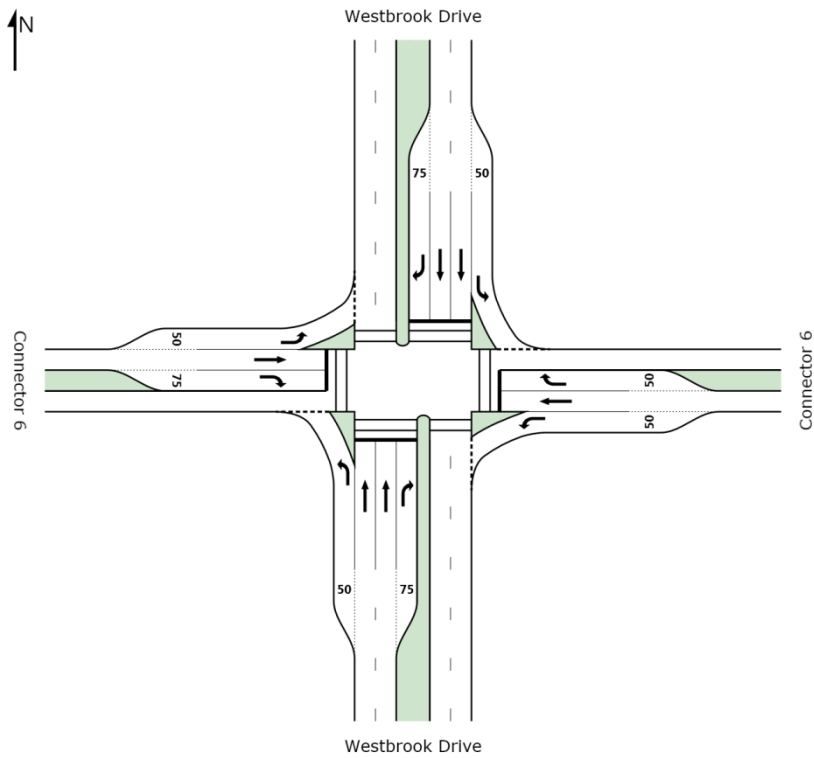
120221sid-12M1296000 - Westbrook Dr & Black Forest Rd - IN21  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles veh      | m        |              | per veh             | km/h          |
| South: Westbrook Drive          |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 208         | 0.0 | 0.207     | 8.2           | LOS A            | 1.0               | 7.3      | 0.15         | 0.64                | 48.9          |
| 2                               | T    | 365         | 0.0 | 0.387     | 41.1          | LOS D            | 9.0               | 62.8     | 0.88         | 0.73                | 27.1          |
| 3                               | R    | 74          | 0.0 | 0.373     | 60.8          | LOS E            | 4.1               | 28.4     | 0.95         | 0.76                | 22.5          |
| Approach                        |      | 647         | 0.0 | 0.387     | 32.8          | LOS C            | 9.0               | 62.8     | 0.66         | 0.70                | 30.8          |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 59          | 0.0 | 0.088     | 9.4           | LOS A            | 0.6               | 3.9      | 0.23         | 0.64                | 47.7          |
| 5                               | T    | 46          | 0.0 | 0.135     | 45.2          | LOS D            | 2.3               | 16.0     | 0.88         | 0.66                | 25.8          |
| 6                               | R    | 20          | 0.0 | 0.084     | 43.4          | LOS D            | 0.9               | 6.1      | 0.78         | 0.70                | 27.4          |
| Approach                        |      | 125         | 0.0 | 0.135     | 28.0          | LOS C            | 2.3               | 16.0     | 0.56         | 0.66                | 33.4          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                               | L    | 20          | 0.0 | 0.023     | 8.5           | LOS A            | 0.1               | 0.9      | 0.17         | 0.62                | 48.7          |
| 8                               | T    | 227         | 0.0 | 0.241     | 39.4          | LOS D            | 5.3               | 37.4     | 0.85         | 0.68                | 27.7          |
| 9                               | R    | 20          | 0.0 | 0.100     | 58.7          | LOS E            | 1.1               | 7.4      | 0.92         | 0.71                | 23.0          |
| Approach                        |      | 267         | 0.0 | 0.241     | 38.5          | LOS D            | 5.3               | 37.4     | 0.80         | 0.68                | 28.2          |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                              | L    | 20          | 0.0 | 0.026     | 8.7           | LOS A            | 0.1               | 1.0      | 0.18         | 0.63                | 48.4          |
| 11                              | T    | 71          | 0.0 | 0.208     | 46.0          | LOS D            | 3.6               | 25.1     | 0.90         | 0.69                | 25.5          |
| 12                              | R    | 159         | 0.0 | 0.382     | 46.8          | LOS D            | 7.6               | 53.0     | 0.86         | 0.79                | 26.3          |
| Approach                        |      | 250         | 0.0 | 0.382     | 43.6          | LOS D            | 7.6               | 53.0     | 0.81         | 0.75                | 27.1          |
| All Vehicles                    |      | 1289        | 0.0 | 0.387     | 35.6          | LOS D            | 9.0               | 62.8     | 0.71         | 0.70                | 29.7          |

## IN 06 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN06 Westbrook Dr &  
Connector 6 (IN18) - AM Peak  
Interim

120221sid-12M1296000 - Westbrook Dr & Connector 6 - IN18  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       |               |                  | sec               | Vehicles |              |                     |               |
| South: Westbrook Drive          |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 120         | 5.0 | 0.160     | 9.3           | LOS A            | 1.1               | 7.8      | 0.22         | 0.65                | 48.0          |
| 2                               | T    | 203         | 5.0 | 0.178     | 21.8          | LOS C            | 5.2               | 37.7     | 0.64         | 0.52                | 36.1          |
| 3                               | R    | 32          | 5.0 | 0.143     | 59.6          | LOS E            | 1.7               | 12.4     | 0.92         | 0.73                | 22.8          |
| Approach                        |      | 355         | 5.0 | 0.178     | 21.0          | LOS C            | 5.2               | 37.7     | 0.52         | 0.58                | 37.3          |
| East: Connector 6               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 23          | 5.0 | 0.051     | 13.1          | LOS B            | 0.4               | 2.8      | 0.35         | 0.65                | 44.4          |
| 5                               | T    | 51          | 5.0 | 0.171     | 47.5          | LOS D            | 2.6               | 19.1     | 0.90         | 0.68                | 25.1          |
| 6                               | R    | 20          | 5.0 | 0.134     | 65.0          | LOS E            | 1.1               | 8.2      | 0.96         | 0.71                | 21.6          |
| Approach                        |      | 94          | 5.0 | 0.171     | 42.8          | LOS D            | 2.6               | 19.1     | 0.78         | 0.68                | 27.0          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                               | L    | 59          | 5.0 | 0.064     | 8.4           | LOS A            | 0.3               | 2.4      | 0.15         | 0.63                | 48.9          |
| 8                               | T    | 666         | 5.0 | 0.586     | 26.2          | LOS C            | 21.1              | 154.4    | 0.77         | 0.68                | 33.4          |
| 9                               | R    | 130         | 5.0 | 0.580     | 63.4          | LOS E            | 7.4               | 54.2     | 0.99         | 0.80                | 21.9          |
| Approach                        |      | 855         | 5.0 | 0.586     | 30.6          | LOS C            | 21.1              | 154.4    | 0.76         | 0.69                | 31.6          |
| West: Connector 6               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                              | L    | 80          | 5.0 | 0.095     | 8.6           | LOS A            | 0.5               | 3.5      | 0.17         | 0.63                | 48.8          |
| 11                              | T    | 61          | 5.0 | 0.204     | 47.9          | LOS D            | 3.1               | 23.0     | 0.91         | 0.70                | 25.0          |
| 12                              | R    | 80          | 5.0 | 0.535     | 67.9          | LOS E            | 4.7               | 34.5     | 1.00         | 0.77                | 21.0          |
| Approach                        |      | 221         | 5.0 | 0.535     | 40.9          | LOS D            | 4.7               | 34.5     | 0.67         | 0.70                | 28.0          |
| All Vehicles                    |      | 1525        | 5.0 | 0.586     | 30.6          | LOS C            | 21.1              | 154.4    | 0.70         | 0.67                | 31.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector  
6 - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 6 - IN18  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |         |       |               |                  |                   |              |                     |               |      |
|---------------------------------|------|-------------|---------|-------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
| Mov ID                          | Turn | Demand Flow | HV Deg. | Satn  | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|                                 |      | veh/h       | %       | v/c   | sec           |                  | Vehicles veh      | Distance m   | per veh             | km/h          |      |
| South: Westbrook Drive          |      |             |         |       |               |                  |                   |              |                     |               |      |
| 1                               | L    | 80          | 5.0     | 0.097 | 8.8           | LOS A            | 0.6               | 4.1          | 0.18                | 0.64          | 48.5 |
| 2                               | T    | 666         | 5.0     | 0.607 | 27.7          | LOS C            | 21.6              | 158.0        | 0.80                | 0.69          | 32.6 |
| 3                               | R    | 23          | 5.0     | 0.171 | 66.6          | LOS E            | 1.3               | 9.6          | 0.97                | 0.71          | 21.2 |
| Approach                        |      | 769         | 5.0     | 0.607 | 26.9          | LOS C            | 21.6              | 158.0        | 0.74                | 0.69          | 33.2 |
| East: Connector 6               |      |             |         |       |               |                  |                   |              |                     |               |      |
| 4                               | L    | 23          | 5.0     | 0.033 | 9.3           | LOS A            | 0.2               | 1.5          | 0.21                | 0.63          | 47.9 |
| 5                               | T    | 61          | 5.0     | 0.149 | 41.0          | LOS D            | 2.9               | 21.1         | 0.85                | 0.65          | 27.2 |
| 6                               | R    | 59          | 5.0     | 0.359 | 65.6          | LOS E            | 3.4               | 24.7         | 0.98                | 0.76          | 21.5 |
| Approach                        |      | 143         | 5.0     | 0.359 | 46.0          | LOS D            | 3.4               | 24.7         | 0.80                | 0.69          | 26.1 |
| North: Westbrook Drive          |      |             |         |       |               |                  |                   |              |                     |               |      |
| 7                               | L    | 20          | 5.0     | 0.021 | 8.3           | LOS A            | 0.1               | 0.7          | 0.14                | 0.62          | 49.0 |
| 8                               | T    | 203         | 5.0     | 0.185 | 23.1          | LOS C            | 5.3               | 38.7         | 0.66                | 0.53          | 35.3 |
| 9                               | R    | 80          | 5.0     | 0.595 | 69.7          | LOS E            | 4.8               | 35.2         | 1.00                | 0.79          | 20.6 |
| Approach                        |      | 303         | 5.0     | 0.595 | 34.4          | LOS C            | 5.3               | 38.7         | 0.71                | 0.61          | 30.2 |
| West: Connector 6               |      |             |         |       |               |                  |                   |              |                     |               |      |
| 10                              | L    | 130         | 5.0     | 0.284 | 13.3          | LOS B            | 2.3               | 16.9         | 0.38                | 0.68          | 44.2 |
| 11                              | T    | 51          | 5.0     | 0.125 | 40.7          | LOS D            | 2.4               | 17.5         | 0.84                | 0.64          | 27.3 |
| 12                              | R    | 100         | 5.0     | 0.608 | 67.6          | LOS E            | 5.9               | 43.3         | 1.00                | 0.80          | 21.0 |
| Approach                        |      | 281         | 5.0     | 0.608 | 37.6          | LOS D            | 5.9               | 43.3         | 0.68                | 0.72          | 29.4 |
| All Vehicles                    |      | 1496        | 5.0     | 0.608 | 32.3          | LOS C            | 21.6              | 158.0        | 0.73                | 0.68          | 31.0 |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector 6  
(IN18) - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 6 - IN18

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|---------------|------------------|-------------------|--------------|---------------------|---------------|
|                        |      | veh/h       | %            | v/c           | sec              | veh               | m            | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |               |                  |                   |              |                     |               |
| 1                      | L    | 20          | 5.0          | 0.020         | 8.2              | LOS A             | 0.1          | 0.62                | 49.1          |
| 2                      | T    | 302         | 5.0          | 0.331         | 40.5             | LOS D             | 7.3          | 0.87                | 27.3          |
| 3                      | R    | 25          | 5.0          | 0.279         | 71.4             | LOS E             | 1.5          | 1.00                | 20.3          |
| Approach               |      | 347         | 5.0          | 0.331         | 40.9             | LOS D             | 7.3          | 0.84                | 27.3          |
| East: Connector 6      |      |             |              |               |                  |                   |              |                     |               |
| 4                      | L    | 21          | 5.0          | 0.028         | 8.9              | LOS A             | 0.2          | 0.18                | 48.4          |
| 5                      | T    | 44          | 5.0          | 0.133         | 45.3             | LOS D             | 2.2          | 0.88                | 25.8          |
| 6                      | R    | 94          | 5.0          | 0.378         | 38.1             | LOS D             | 3.8          | 0.74                | 29.4          |
| Approach               |      | 159         | 5.0          | 0.378         | 36.2             | LOS D             | 3.8          | 0.71                | 29.8          |
| North: Westbrook Drive |      |             |              |               |                  |                   |              |                     |               |
| 7                      | L    | 160         | 5.0          | 0.163         | 8.3              | LOS A             | 0.8          | 0.15                | 49.0          |
| 8                      | T    | 344         | 5.0          | 0.377         | 41.0             | LOS D             | 8.4          | 0.88                | 27.1          |
| 9                      | R    | 20          | 5.0          | 0.223         | 71.0             | LOS E             | 1.2          | 0.99                | 20.4          |
| Approach               |      | 524         | 5.0          | 0.377         | 32.2             | LOS C             | 8.4          | 0.66                | 31.0          |
| West: Connector 6      |      |             |              |               |                  |                   |              |                     |               |
| 10                     | L    | 70          | 5.0          | 0.101         | 9.2              | LOS A             | 0.6          | 0.21                | 48.0          |
| 11                     | T    | 46          | 5.0          | 0.139         | 45.3             | LOS D             | 2.3          | 0.88                | 25.7          |
| 12                     | R    | 20          | 5.0          | 0.057         | 36.6             | LOS D             | 0.8          | 0.70                | 30.0          |
| Approach               |      | 136         | 5.0          | 0.139         | 25.5             | LOS C             | 2.3          | 0.51                | 34.8          |
| All Vehicles           |      | 1166        | 5.0          | 0.378         | 34.5             | LOS C             | 8.4          | 0.70                | 30.0          |

## MOVEMENT SUMMARY

Site: Westbrook Dr &  
Connector 6 (IN18) - PM Peak  
Ultimate

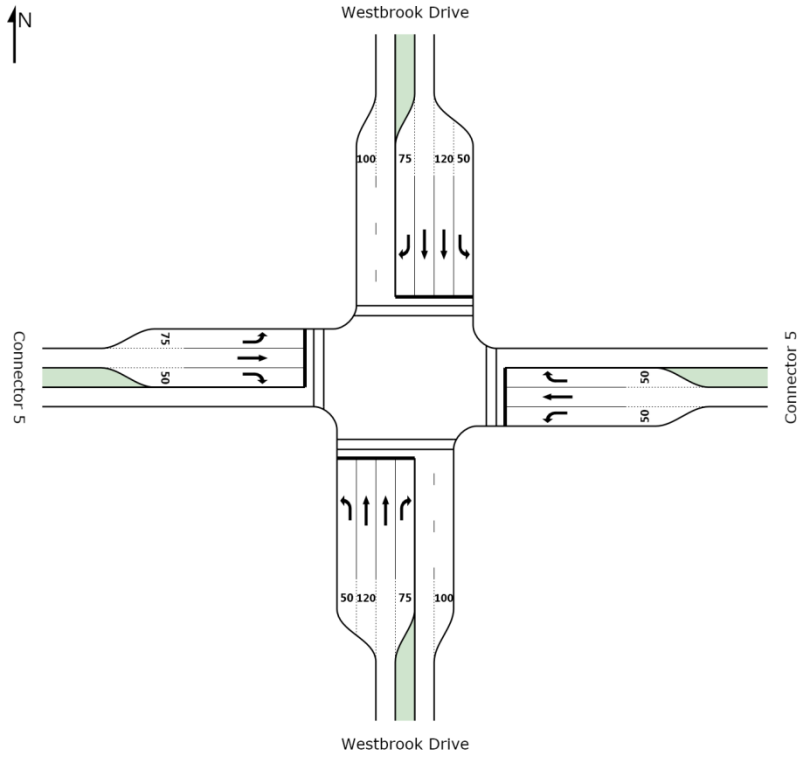
120221sid-12M1296000 - Westbrook Dr & Connector 6 - IN18

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

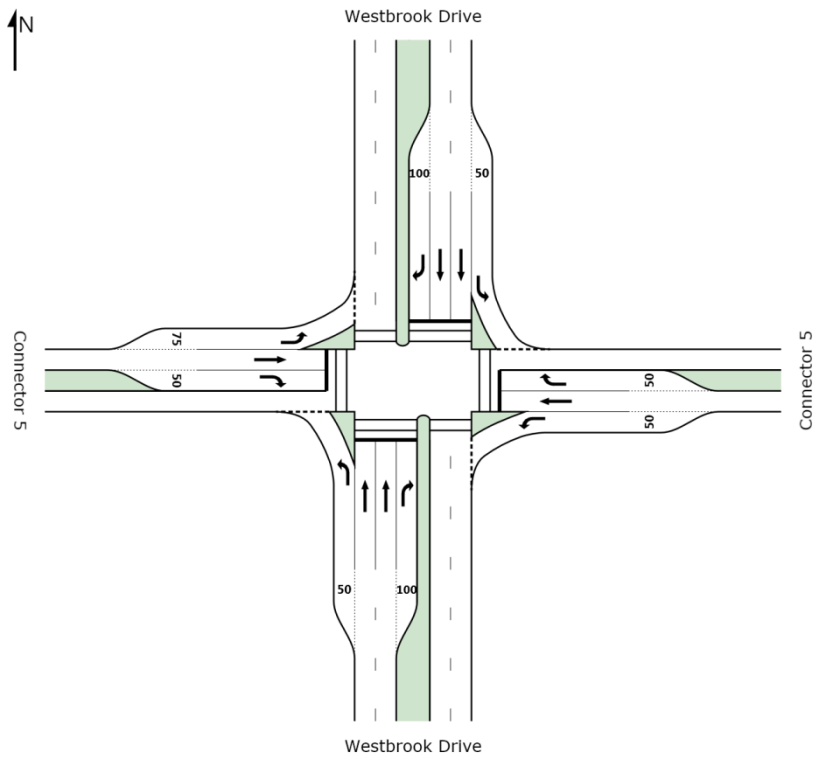
### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|---------------|------------------|-------------------|--------------|---------------------|---------------|
|                        |      | veh/h       | %            | v/c           | sec              | veh               | m            | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |               |                  |                   |              |                     |               |
| 1                      | L    | 20          | 5.0          | 0.023         | 8.5              | LOS A             | 0.1          | 0.16                | 48.8          |
| 2                      | T    | 344         | 5.0          | 0.575         | 51.4             | LOS D             | 9.5          | 0.98                | 23.9          |
| 3                      | R    | 21          | 5.0          | 0.176         | 67.9             | LOS E             | 1.2          | 0.98                | 21.0          |
| Approach               |      | 385         | 5.0          | 0.575         | 50.1             | LOS D             | 9.5          | 0.93                | 24.4          |
| East: Connector 6      |      |             |              |               |                  |                   |              |                     |               |
| 4                      | L    | 21          | 5.0          | 0.024         | 8.4              | LOS A             | 0.1          | 0.15                | 48.9          |
| 5                      | T    | 46          | 5.0          | 0.139         | 45.3             | LOS D             | 2.3          | 0.88                | 25.7          |
| 6                      | R    | 160         | 5.0          | 0.586         | 33.3             | LOS C             | 6.1          | 0.70                | 31.4          |
| Approach               |      | 227         | 5.0          | 0.586         | 33.5             | LOS C             | 6.1          | 0.68                | 31.1          |
| North: Westbrook Drive |      |             |              |               |                  |                   |              |                     |               |
| 7                      | L    | 94          | 5.0          | 0.095         | 8.3              | LOS A             | 0.4          | 0.14                | 49.0          |
| 8                      | T    | 202         | 5.0          | 0.338         | 49.2             | LOS D             | 5.3          | 0.93                | 24.6          |
| 9                      | R    | 70          | 5.0          | 0.586         | 70.7             | LOS E             | 4.3          | 1.00                | 20.4          |
| Approach               |      | 366         | 5.0          | 0.586         | 42.8             | LOS D             | 5.3          | 0.74                | 27.0          |
| West: Connector 6      |      |             |              |               |                  |                   |              |                     |               |
| 10                     | L    | 20          | 5.0          | 0.034         | 10.2             | LOS B             | 0.2          | 0.25                | 47.0          |
| 11                     | T    | 44          | 5.0          | 0.133         | 45.3             | LOS D             | 2.2          | 0.88                | 25.8          |
| 12                     | R    | 20          | 5.0          | 0.052         | 31.1             | LOS C             | 0.7          | 0.63                | 32.5          |
| Approach               |      | 84          | 5.0          | 0.133         | 33.6             | LOS C             | 2.2          | 0.67                | 30.6          |
| All Vehicles           |      | 1062        | 5.0          | 0.586         | 42.7             | LOS D             | 9.5          | 0.79                | 27.0          |

## IN 07 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector 5 - AM  
Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 5 - IN17

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                      | L    | 50          | 5.0 | 0.167     | 27.4          | LOS C            | 1.6                        | 11.7     | 0.58         | 0.72                | 34.2          |
| 2                      | T    | 178         | 5.0 | 0.184     | 27.8          | LOS C            | 4.9                        | 36.1     | 0.71         | 0.57                | 32.7          |
| 3                      | R    | 29          | 5.0 | 0.098     | 51.2          | LOS D            | 1.4                        | 10.2     | 0.85         | 0.72                | 25.0          |
| Approach               |      | 257         | 5.0 | 0.184     | 30.4          | LOS C            | 4.9                        | 36.1     | 0.71         | 0.62                | 31.9          |
| East: Connector 5      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                      | L    | 48          | 5.0 | 0.164     | 28.6          | LOS C            | 1.6                        | 11.5     | 0.60         | 0.72                | 33.6          |
| 5                      | T    | 212         | 5.0 | 0.561     | 47.2          | LOS D            | 11.3                       | 82.7     | 0.95         | 0.79                | 25.1          |
| 6                      | R    | 22          | 5.0 | 0.245     | 71.2          | LOS E            | 1.3                        | 9.7      | 0.99         | 0.71                | 20.3          |
| Approach               |      | 282         | 5.0 | 0.561     | 45.9          | LOS D            | 11.3                       | 82.7     | 0.90         | 0.77                | 25.7          |
| North: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                      | L    | 62          | 5.0 | 0.207     | 27.6          | LOS C            | 2.0                        | 14.6     | 0.59         | 0.73                | 34.2          |
| 8                      | T    | 677         | 5.0 | 0.701     | 33.6          | LOS C            | 23.7                       | 173.1    | 0.87         | 0.76                | 29.9          |
| 9                      | R    | 200         | 5.0 | 0.686     | 57.4          | LOS E            | 11.0                       | 80.3     | 0.96         | 0.84                | 23.3          |
| Approach               |      | 939         | 5.0 | 0.701     | 38.3          | LOS D            | 23.7                       | 173.1    | 0.87         | 0.77                | 28.4          |
| West: Connector 5      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                     | L    | 110         | 5.0 | 0.272     | 29.5          | LOS C            | 3.8                        | 27.5     | 0.63         | 0.75                | 33.2          |
| 11                     | T    | 258         | 5.0 | 0.683     | 48.9          | LOS D            | 14.3                       | 104.2    | 0.98         | 0.83                | 24.6          |
| 12                     | R    | 40          | 5.0 | 0.446     | 72.3          | LOS E            | 2.4                        | 17.9     | 1.00         | 0.73                | 20.1          |
| Approach               |      | 408         | 5.0 | 0.683     | 45.9          | LOS D            | 14.3                       | 104.2    | 0.89         | 0.80                | 25.8          |
| All Vehicles           |      | 1886        | 5.0 | 0.701     | 40.0          | LOS D            | 23.7                       | 173.1    | 0.86         | 0.76                | 27.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr &  
Connector 5 - PM Peak  
Interim

120221sid-12M1296000 - Westbrook Dr & Connector 5 - IN17

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                      | L    | 40          | 5.0 | 0.126     | 25.0          | LOS C            | 1.2                        | 8.7      | 0.54         | 0.71                | 35.6          |
| 2                      | T    | 677         | 5.0 | 0.662     | 31.1          | LOS C            | 23.1                       | 168.5    | 0.84         | 0.73                | 31.0          |
| 3                      | R    | 48          | 5.0 | 0.178     | 56.9          | LOS E            | 2.5                        | 18.2     | 0.91         | 0.75                | 23.4          |
| Approach               |      | 765         | 5.0 | 0.662     | 32.4          | LOS C            | 23.1                       | 168.5    | 0.83         | 0.73                | 30.6          |
| East: Connector 5      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                      | L    | 29          | 5.0 | 0.104     | 30.9          | LOS C            | 1.0                        | 7.3      | 0.63         | 0.71                | 32.5          |
| 5                      | T    | 258         | 5.0 | 0.656     | 47.5          | LOS D            | 14.0                       | 102.4    | 0.97         | 0.82                | 25.0          |
| 6                      | R    | 62          | 5.0 | 0.593     | 72.1          | LOS E            | 3.8                        | 27.8     | 1.00         | 0.78                | 20.2          |
| Approach               |      | 349         | 5.0 | 0.656     | 50.5          | LOS D            | 14.0                       | 102.4    | 0.95         | 0.80                | 24.4          |
| North: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                      | L    | 22          | 5.0 | 0.069     | 24.8          | LOS C            | 0.6                        | 4.7      | 0.54         | 0.70                | 35.7          |
| 8                      | T    | 178         | 5.0 | 0.174     | 25.6          | LOS C            | 4.8                        | 35.1     | 0.69         | 0.55                | 33.9          |
| 9                      | R    | 169         | 5.0 | 0.628     | 61.2          | LOS E            | 9.6                        | 69.7     | 0.99         | 0.82                | 22.4          |
| Approach               |      | 369         | 5.0 | 0.628     | 41.9          | LOS D            | 9.6                        | 69.7     | 0.82         | 0.68                | 27.5          |
| West: Connector 5      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                     | L    | 200         | 5.0 | 0.520     | 33.5          | LOS C            | 7.7                        | 56.3     | 0.71         | 0.78                | 31.2          |
| 11                     | T    | 212         | 5.0 | 0.539     | 46.1          | LOS D            | 11.2                       | 81.7     | 0.94         | 0.78                | 25.4          |
| 12                     | R    | 50          | 5.0 | 0.478     | 71.1          | LOS E            | 3.0                        | 22.1     | 1.00         | 0.74                | 20.4          |
| Approach               |      | 462         | 5.0 | 0.539     | 43.4          | LOS D            | 11.2                       | 81.7     | 0.85         | 0.78                | 26.9          |
| All Vehicles           |      | 1945        | 5.0 | 0.662     | 40.1          | LOS D            | 23.1                       | 168.5    | 0.85         | 0.75                | 27.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector 5  
(IN17) - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 5 - IN17

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn |       | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|-------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                        |      |             |              |       |               |                  | Vehicles          | Distance |              |                     |               |
|                        |      | veh/h       | %            | v/c   | sec           |                  | veh               | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 1                      | L    | 20          | 5.0          | 0.040 | 11.9          | LOS B            | 0.3               | 2.2      | 0.32         | 0.64                | 45.4          |
| 2                      | T    | 274         | 5.0          | 0.378 | 46.0          | LOS D            | 7.1               | 51.6     | 0.92         | 0.74                | 25.5          |
| 3                      | R    | 22          | 5.0          | 0.052 | 39.0          | LOS D            | 0.9               | 6.5      | 0.73         | 0.71                | 29.0          |
| Approach               |      | 316         | 5.0          | 0.378 | 43.4          | LOS D            | 7.1               | 51.6     | 0.87         | 0.73                | 26.5          |
| East: Connector 5      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 4                      | L    | 19          | 5.0          | 0.030 | 9.9           | LOS A            | 0.2               | 1.4      | 0.24         | 0.63                | 47.4          |
| 5                      | T    | 160         | 5.0          | 0.678 | 56.5          | LOS E            | 9.4               | 68.3     | 1.00         | 0.84                | 22.6          |
| 6                      | R    | 44          | 5.0          | 0.231 | 59.9          | LOS E            | 2.4               | 17.3     | 0.93         | 0.74                | 22.8          |
| Approach               |      | 223         | 5.0          | 0.678 | 53.2          | LOS D            | 9.4               | 68.3     | 0.92         | 0.80                | 23.7          |
| North: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 7                      | L    | 80          | 5.0          | 0.111 | 9.4           | LOS A            | 0.7               | 5.3      | 0.22         | 0.64                | 47.9          |
| 8                      | T    | 485         | 5.0          | 0.670 | 49.4          | LOS D            | 13.4              | 98.0     | 0.98         | 0.83                | 24.5          |
| 9                      | R    | 284         | 5.0          | 0.673 | 44.9          | LOS D            | 13.7              | 99.9     | 0.88         | 0.82                | 26.9          |
| Approach               |      | 849         | 5.0          | 0.673 | 44.1          | LOS D            | 13.7              | 99.9     | 0.87         | 0.81                | 26.5          |
| West: Connector 5      |      |             |              |       |               |                  |                   |          |              |                     |               |
| 10                     | L    | 150         | 5.0          | 0.154 | 9.0           | LOS A            | 1.2               | 8.6      | 0.20         | 0.65                | 48.3          |
| 11                     | T    | 201         | 5.0          | 0.608 | 50.1          | LOS D            | 11.1              | 80.8     | 0.98         | 0.81                | 24.3          |
| 12                     | R    | 20          | 5.0          | 0.098 | 52.7          | LOS D            | 1.0               | 7.1      | 0.86         | 0.70                | 24.6          |
| Approach               |      | 371         | 5.0          | 0.608 | 33.6          | LOS C            | 11.1              | 80.8     | 0.66         | 0.74                | 30.5          |
| All Vehicles           |      | 1759        | 5.0          | 0.678 | 42.9          | LOS D            | 13.7              | 99.9     | 0.83         | 0.78                | 26.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector  
5 PM Peak Ultimate

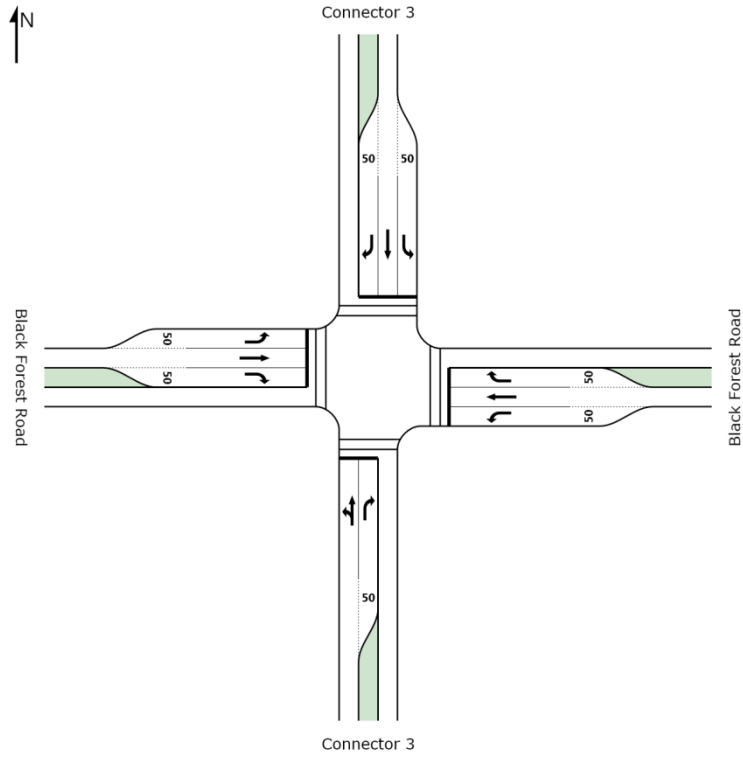
120221sid-12M1296000 - Westbrook Dr & Connector 5 - IN17

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

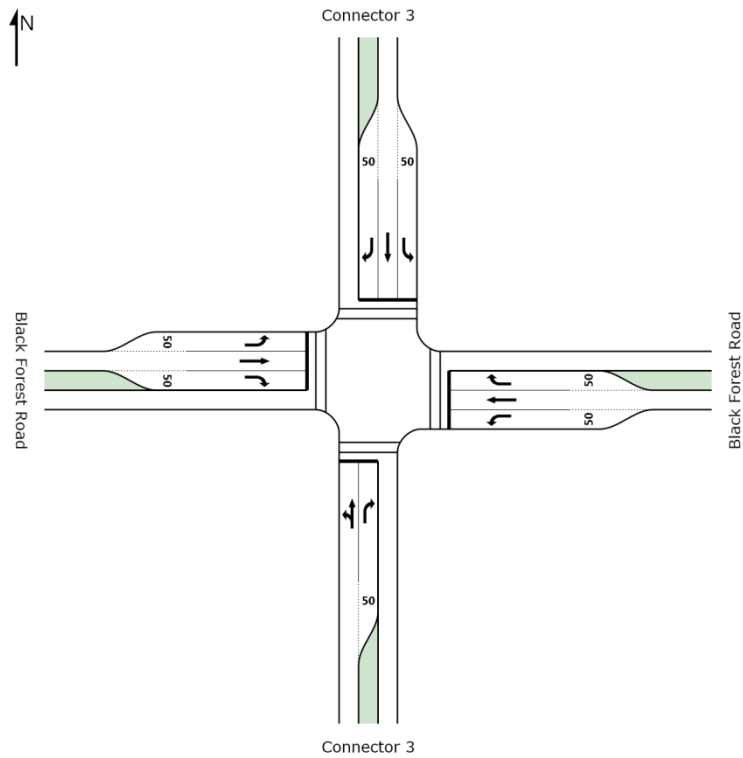
### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
|                        |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                      | L    | 20          | 5.0 | 0.036     | 10.9          | LOS B            | 0.3               | 1.9  | 0.28         | 0.64                | 46.3          |
| 2                      | T    | 485         | 5.0 | 0.550     | 43.9          | LOS D            | 12.6              | 91.9 | 0.93         | 0.78                | 26.1          |
| 3                      | R    | 19          | 5.0 | 0.071     | 55.7          | LOS E            | 1.0               | 7.0  | 0.89         | 0.71                | 23.8          |
| Approach               |      | 524         | 5.0 | 0.550     | 43.1          | LOS D            | 12.6              | 91.9 | 0.91         | 0.78                | 26.5          |
| East: Connector 5      |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                      | L    | 22          | 5.0 | 0.028     | 8.7           | LOS A            | 0.1               | 1.1  | 0.18         | 0.62                | 48.5          |
| 5                      | T    | 201         | 5.0 | 0.555     | 47.9          | LOS D            | 10.8              | 78.9 | 0.96         | 0.79                | 24.9          |
| 6                      | R    | 80          | 5.0 | 0.387     | 52.7          | LOS D            | 4.0               | 29.2 | 0.89         | 0.76                | 24.6          |
| Approach               |      | 303         | 5.0 | 0.555     | 46.3          | LOS D            | 10.8              | 78.9 | 0.88         | 0.77                | 25.7          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |      |              |                     |               |
| 7                      | L    | 44          | 5.0 | 0.055     | 8.9           | LOS A            | 0.3               | 2.4  | 0.19         | 0.63                | 48.4          |
| 8                      | T    | 274         | 5.0 | 0.311     | 41.1          | LOS D            | 6.7               | 48.6 | 0.87         | 0.71                | 27.1          |
| 9                      | R    | 150         | 5.0 | 0.558     | 60.4          | LOS E            | 8.4               | 61.0 | 0.98         | 0.81                | 22.6          |
| Approach               |      | 468         | 5.0 | 0.558     | 44.3          | LOS D            | 8.4               | 61.0 | 0.84         | 0.73                | 26.5          |
| West: Connector 5      |      |             |     |           |               |                  |                   |      |              |                     |               |
| 10                     | L    | 284         | 5.0 | 0.370     | 10.8          | LOS B            | 3.9               | 28.1 | 0.31         | 0.68                | 46.5          |
| 11                     | T    | 160         | 5.0 | 0.377     | 42.6          | LOS D            | 8.0               | 58.3 | 0.89         | 0.73                | 26.6          |
| 12                     | R    | 20          | 5.0 | 0.092     | 47.1          | LOS D            | 0.9               | 6.7  | 0.81         | 0.70                | 26.3          |
| Approach               |      | 464         | 5.0 | 0.377     | 23.3          | LOS C            | 8.0               | 58.3 | 0.54         | 0.70                | 36.0          |
| All Vehicles           |      | 1759        | 5.0 | 0.558     | 38.7          | LOS D            | 12.6              | 91.9 | 0.79         | 0.74                | 28.3          |

## IN 27 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN27 Black Forest Rd &  
Connector 3 - AM Peak Interim

120221sid-12M1296000 - Blackforest Rd & Connector 3 - IN22

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                  | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                         |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                       | L    | 20          | 0.0 | 0.339     | 59.7          | LOS E            | 4.4                        | 30.5     | 0.95         | 0.83                | 23.5          |
| 2                       | T    | 70          | 0.0 | 0.339     | 51.5          | LOS D            | 4.4                        | 30.5     | 0.95         | 0.78                | 23.7          |
| 3                       | R    | 180         | 0.0 | 0.895     | 73.7          | LOS E            | 11.7                       | 81.6     | 1.00         | 0.97                | 19.8          |
| Approach                |      | 270         | 0.0 | 0.895     | 66.9          | LOS E            | 11.7                       | 81.6     | 0.98         | 0.91                | 20.9          |
| East: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                       | L    | 120         | 0.0 | 0.468     | 39.4          | LOS D            | 5.0                        | 35.2     | 0.76         | 0.77                | 28.8          |
| 5                       | T    | 76          | 0.0 | 0.292     | 51.5          | LOS D            | 4.1                        | 28.7     | 0.94         | 0.73                | 23.9          |
| 6                       | R    | 260         | 0.0 | 0.927     | 47.5          | LOS D            | 11.7                       | 81.6     | 0.91         | 0.86                | 26.0          |
| Approach                |      | 456         | 0.0 | 0.927     | 46.0          | LOS D            | 11.7                       | 81.6     | 0.88         | 0.81                | 26.3          |
| North: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                       | L    | 120         | 0.0 | 0.315     | 20.4          | LOS C            | 3.1                        | 21.8     | 0.48         | 0.73                | 38.4          |
| 8                       | T    | 44          | 0.0 | 0.169     | 50.4          | LOS D            | 2.3                        | 16.2     | 0.92         | 0.69                | 24.2          |
| 9                       | R    | 20          | 0.0 | 0.098     | 56.7          | LOS E            | 1.0                        | 7.2      | 0.90         | 0.71                | 23.4          |
| Approach                |      | 184         | 0.0 | 0.315     | 31.5          | LOS C            | 3.1                        | 21.8     | 0.63         | 0.72                | 31.8          |
| West: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                      | L    | 20          | 0.0 | 0.077     | 37.4          | LOS D            | 0.8                        | 5.5      | 0.71         | 0.70                | 29.5          |
| 11                      | T    | 64          | 0.0 | 0.246     | 51.1          | LOS D            | 3.4                        | 23.9     | 0.94         | 0.72                | 24.0          |
| 12                      | R    | 20          | 0.0 | 0.070     | 31.9          | LOS C            | 0.7                        | 4.9      | 0.64         | 0.70                | 31.9          |
| Approach                |      | 104         | 0.0 | 0.246     | 44.8          | LOS D            | 3.4                        | 23.9     | 0.83         | 0.71                | 26.2          |
| All Vehicles            |      | 1014        | 0.0 | 0.927     | 48.8          | LOS D            | 11.7                       | 81.6     | 0.86         | 0.81                | 25.3          |

## MOVEMENT SUMMARY

Site: IN27 Black Forest Rd &  
Connector 3 - PM Peak Interim

120221sid-12M1296000 - Blackforest Rd & Connector 3 - IN22

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                  | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                         |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                       | L    | 20          | 0.0 | 0.432     | 63.0          | LOS E            | 5.9                        | 41.2     | 0.96         | 0.84                | 22.7          |
| 2                       | T    | 94          | 0.0 | 0.432     | 54.8          | LOS D            | 5.9                        | 41.2     | 0.96         | 0.80                | 22.9          |
| 3                       | R    | 120         | 0.0 | 0.705     | 69.1          | LOS E            | 7.3                        | 50.9     | 1.00         | 0.84                | 20.7          |
| Approach                |      | 234         | 0.0 | 0.705     | 62.9          | LOS E            | 7.3                        | 50.9     | 0.98         | 0.82                | 21.7          |
| East: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                       | L    | 180         | 0.0 | 0.736     | 48.0          | LOS D            | 8.9                        | 62.0     | 0.83         | 0.84                | 25.8          |
| 5                       | T    | 64          | 0.0 | 0.219     | 48.9          | LOS D            | 3.3                        | 23.4     | 0.92         | 0.70                | 24.7          |
| 6                       | R    | 220         | 0.0 | 0.746     | 38.0          | LOS D            | 9.3                        | 65.0     | 0.71         | 0.83                | 29.3          |
| Approach                |      | 464         | 0.0 | 0.746     | 43.4          | LOS D            | 9.3                        | 65.0     | 0.79         | 0.82                | 27.2          |
| North: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                       | L    | 280         | 0.0 | 0.690     | 23.9          | LOS C            | 7.6                        | 53.3     | 0.64         | 0.79                | 36.2          |
| 8                       | T    | 120         | 0.0 | 0.462     | 53.0          | LOS D            | 6.6                        | 46.5     | 0.97         | 0.77                | 23.5          |
| 9                       | R    | 120         | 0.0 | 0.705     | 69.1          | LOS E            | 7.3                        | 50.9     | 1.00         | 0.84                | 20.7          |
| Approach                |      | 520         | 0.0 | 0.705     | 41.0          | LOS D            | 7.6                        | 53.3     | 0.80         | 0.80                | 27.9          |
| West: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                      | L    | 120         | 0.0 | 0.490     | 42.7          | LOS D            | 5.3                        | 37.1     | 0.80         | 0.77                | 27.6          |
| 11                      | T    | 76          | 0.0 | 0.260     | 49.3          | LOS D            | 4.0                        | 28.0     | 0.93         | 0.72                | 24.5          |
| 12                      | R    | 20          | 0.0 | 0.067     | 29.3          | LOS C            | 0.7                        | 4.6      | 0.60         | 0.70                | 33.1          |
| Approach                |      | 216         | 0.0 | 0.490     | 43.8          | LOS D            | 5.3                        | 37.1     | 0.82         | 0.75                | 26.8          |
| All Vehicles            |      | 1434        | 0.0 | 0.746     | 45.8          | LOS D            | 9.3                        | 65.0     | 0.83         | 0.80                | 26.3          |

## MOVEMENT SUMMARY

Site: IN27 Black Forest Rd &  
Connector 3 - AM Peak Ultimate

120221sid-12M1296000 - Blackforest Rd & Connector 3 - IN22

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                  | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                         |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                       | L    | 20          | 0.0 | 0.292     | 58.8          | LOS E            | 4.2                        | 29.2     | 0.94         | 0.79                | 23.6          |
| 2                       | T    | 58          | 0.0 | 0.292     | 50.6          | LOS D            | 4.2                        | 29.2     | 0.94         | 0.73                | 23.9          |
| 3                       | R    | 129         | 0.0 | 0.487     | 37.2          | LOS D            | 5.2                        | 36.6     | 0.74         | 0.76                | 29.6          |
| Approach                |      | 207         | 0.0 | 0.487     | 43.0          | LOS D            | 5.2                        | 36.6     | 0.81         | 0.76                | 27.1          |
| East: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                       | L    | 153         | 0.0 | 0.421     | 22.1          | LOS C            | 4.3                        | 30.1     | 0.52         | 0.74                | 37.3          |
| 5                       | T    | 145         | 0.0 | 0.496     | 51.5          | LOS D            | 8.0                        | 55.7     | 0.97         | 0.78                | 23.9          |
| 6                       | R    | 100         | 0.0 | 0.479     | 56.3          | LOS E            | 5.2                        | 36.7     | 0.92         | 0.78                | 23.5          |
| Approach                |      | 398         | 0.0 | 0.496     | 41.4          | LOS D            | 8.0                        | 55.7     | 0.78         | 0.76                | 27.6          |
| North: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                       | L    | 90          | 0.0 | 0.339     | 36.5          | LOS D            | 3.6                        | 24.9     | 0.72         | 0.75                | 29.9          |
| 8                       | T    | 33          | 0.0 | 0.127     | 50.0          | LOS D            | 1.7                        | 12.1     | 0.92         | 0.67                | 24.4          |
| 9                       | R    | 20          | 0.0 | 0.075     | 35.2          | LOS D            | 0.8                        | 5.3      | 0.68         | 0.70                | 30.5          |
| Approach                |      | 143         | 0.0 | 0.339     | 39.4          | LOS D            | 3.6                        | 24.9     | 0.76         | 0.73                | 28.5          |
| West: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                      | L    | 20          | 0.0 | 0.055     | 21.0          | LOS C            | 0.5                        | 3.6      | 0.47         | 0.69                | 38.0          |
| 11                      | T    | 105         | 0.0 | 0.359     | 50.2          | LOS D            | 5.6                        | 39.4     | 0.94         | 0.74                | 24.3          |
| 12                      | R    | 20          | 0.0 | 0.095     | 53.8          | LOS D            | 1.0                        | 6.9      | 0.87         | 0.71                | 24.1          |
| Approach                |      | 145         | 0.0 | 0.359     | 46.7          | LOS D            | 5.6                        | 39.4     | 0.87         | 0.73                | 25.5          |
| All Vehicles            |      | 893         | 0.0 | 0.496     | 42.3          | LOS D            | 8.0                        | 55.7     | 0.80         | 0.75                | 27.3          |

## MOVEMENT SUMMARY

Site: IN27 Black Forest Rd &  
Connector 3 - PM Peak  
Ultimate

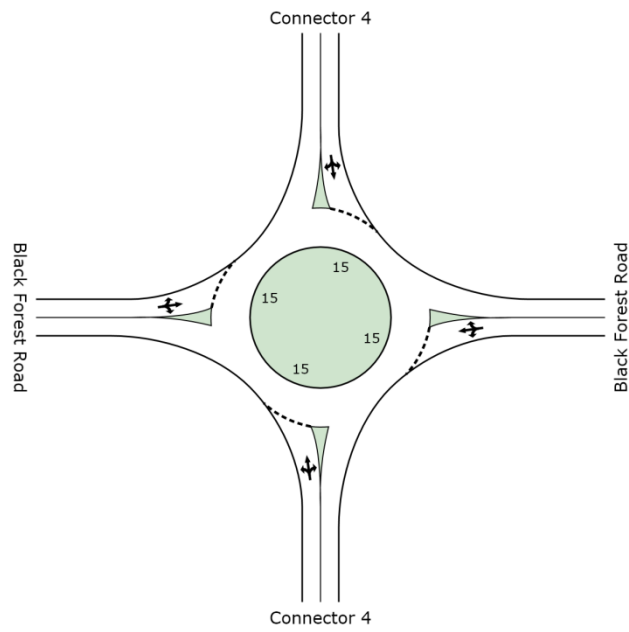
120221sid-12M1296000 - Blackforest Rd & Connector 3 - IN22

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

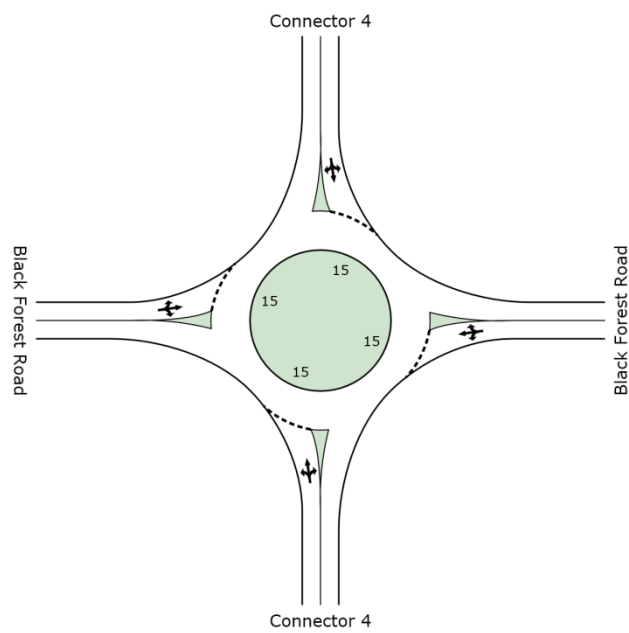
### Movement Performance - Vehicles

| Mov ID                  | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                         |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                       | L    | 20          | 0.0 | 0.054     | 20.5          | LOS C            | 0.5                        | 3.5      | 0.46         | 0.69                | 38.3          |
| 2                       | T    | 83          | 0.0 | 0.204     | 42.4          | LOS D            | 4.0                        | 28.2     | 0.87         | 0.68                | 26.7          |
| 3                       | R    | 153         | 0.0 | 0.743     | 62.0          | LOS E            | 8.8                        | 61.3     | 0.97         | 0.86                | 22.2          |
| Approach                |      | 256         | 0.0 | 0.743     | 52.4          | LOS D            | 8.8                        | 61.3     | 0.89         | 0.79                | 24.3          |
| East: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                       | L    | 129         | 0.0 | 0.492     | 38.0          | LOS D            | 5.3                        | 37.1     | 0.75         | 0.77                | 29.3          |
| 5                       | T    | 105         | 0.0 | 0.404     | 52.5          | LOS D            | 5.8                        | 40.3     | 0.96         | 0.76                | 23.7          |
| 6                       | R    | 190         | 0.0 | 0.769     | 49.6          | LOS D            | 9.6                        | 67.1     | 0.83         | 0.86                | 25.3          |
| Approach                |      | 424         | 0.0 | 0.769     | 46.8          | LOS D            | 9.6                        | 67.1     | 0.84         | 0.81                | 25.9          |
| North: Connector 3      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                       | L    | 200         | 0.0 | 0.783     | 60.2          | LOS E            | 18.1                       | 126.5    | 1.00         | 0.90                | 22.9          |
| 8                       | T    | 108         | 0.0 | 0.783     | 52.0          | LOS D            | 18.1                       | 126.5    | 1.00         | 0.90                | 23.0          |
| 9                       | R    | 120         | 0.0 | 0.582     | 58.0          | LOS E            | 6.4                        | 45.1     | 0.95         | 0.79                | 23.1          |
| Approach                |      | 428         | 0.0 | 0.783     | 57.5          | LOS E            | 18.1                       | 126.5    | 0.98         | 0.87                | 23.0          |
| West: Black Forest Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                      | L    | 120         | 0.0 | 0.458     | 37.8          | LOS D            | 4.9                        | 34.3     | 0.74         | 0.76                | 29.4          |
| 11                      | T    | 145         | 0.0 | 0.558     | 53.8          | LOS D            | 8.2                        | 57.1     | 0.98         | 0.79                | 23.3          |
| 12                      | R    | 20          | 0.0 | 0.080     | 39.6          | LOS D            | 0.8                        | 5.7      | 0.73         | 0.70                | 28.7          |
| Approach                |      | 285         | 0.0 | 0.558     | 46.1          | LOS D            | 8.2                        | 57.1     | 0.87         | 0.77                | 25.9          |
| All Vehicles            |      | 1393        | 0.0 | 0.783     | 51.0          | LOS D            | 18.1                       | 126.5    | 0.90         | 0.82                | 24.6          |

## IN 28 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN28 Black Forest Rd &  
Connector 4 - AM Peak Interim

120221sid-12M1296000 - Black Forest Rd & Connector 4 - IN24  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |      |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Connector 4              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                               | L    | 20          | 0.0 | 0.104     | 7.7           | LOS A            | 0.6               | 4.3  | 0.41         | 0.58                | 48.6          |
| 2                               | T    | 79          | 0.0 | 0.104     | 7.1           | LOS A            | 0.6               | 4.3  | 0.41         | 0.52                | 48.7          |
| 3                               | R    | 20          | 0.0 | 0.104     | 12.2          | LOS B            | 0.6               | 4.3  | 0.41         | 0.75                | 45.9          |
| Approach                        |      | 119         | 0.0 | 0.104     | 8.0           | LOS A            | 0.6               | 4.3  | 0.41         | 0.57                | 48.2          |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.159     | 7.5           | LOS A            | 1.0               | 6.7  | 0.38         | 0.54                | 48.3          |
| 5                               | T    | 20          | 0.0 | 0.159     | 6.9           | LOS A            | 1.0               | 6.7  | 0.38         | 0.49                | 48.5          |
| 6                               | R    | 150         | 0.0 | 0.159     | 12.0          | LOS B            | 1.0               | 6.7  | 0.38         | 0.68                | 45.2          |
| Approach                        |      | 190         | 0.0 | 0.159     | 11.0          | LOS B            | 1.0               | 6.7  | 0.38         | 0.64                | 45.9          |
| North: Connector 4              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 7                               | L    | 200         | 0.0 | 0.235     | 6.9           | LOS A            | 1.6               | 11.1 | 0.24         | 0.53                | 49.4          |
| 8                               | T    | 113         | 0.0 | 0.235     | 6.3           | LOS A            | 1.6               | 11.1 | 0.24         | 0.46                | 49.8          |
| 9                               | R    | 20          | 0.0 | 0.235     | 11.4          | LOS B            | 1.6               | 11.1 | 0.24         | 0.75                | 46.1          |
| Approach                        |      | 333         | 0.0 | 0.235     | 7.0           | LOS A            | 1.6               | 11.1 | 0.24         | 0.52                | 49.3          |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |      |              |                     |               |
| 10                              | L    | 20          | 0.0 | 0.055     | 8.0           | LOS A            | 0.3               | 2.1  | 0.44         | 0.57                | 48.2          |
| 11                              | T    | 20          | 0.0 | 0.055     | 7.3           | LOS A            | 0.3               | 2.1  | 0.44         | 0.52                | 48.3          |
| 12                              | R    | 20          | 0.0 | 0.055     | 12.4          | LOS B            | 0.3               | 2.1  | 0.44         | 0.72                | 45.5          |
| Approach                        |      | 60          | 0.0 | 0.055     | 9.2           | LOS A            | 0.3               | 2.1  | 0.44         | 0.60                | 47.3          |
| All Vehicles                    |      | 702         | 0.0 | 0.235     | 8.4           | LOS A            | 1.6               | 11.1 | 0.32         | 0.57                | 48.0          |

## MOVEMENT SUMMARY

Site: IN28 Black Forest Rd &  
Connector 4 - PM Peak  
Interim

120221sid-12M1296000 - Black Forest Rd & Connector 4 - IN24  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |              |                     |               |      |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     |                     |               |      |
|                                 |      |             |     |           |               |                  | veh               | m            |                     | km/h          |      |
| South: Connector 4              |      |             |     |           |               |                  |                   |              |                     |               |      |
| 1                               | L    | 20          | 0.0 | 0.140     | 8.0           | LOS A            | 0.8               | 5.9          | 0.47                | 0.61          | 48.3 |
| 2                               | T    | 113         | 0.0 | 0.140     | 7.4           | LOS A            | 0.8               | 5.9          | 0.47                | 0.56          | 48.4 |
| 3                               | R    | 20          | 0.0 | 0.140     | 12.5          | LOS B            | 0.8               | 5.9          | 0.47                | 0.77          | 45.7 |
| Approach                        |      | 153         | 0.0 | 0.140     | 8.2           | LOS A            | 0.8               | 5.9          | 0.47                | 0.59          | 48.0 |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |              |                     |               |      |
| 4                               | L    | 20          | 0.0 | 0.189     | 7.3           | LOS A            | 1.2               | 8.2          | 0.34                | 0.52          | 48.6 |
| 5                               | T    | 20          | 0.0 | 0.189     | 6.7           | LOS A            | 1.2               | 8.2          | 0.34                | 0.47          | 48.8 |
| 6                               | R    | 200         | 0.0 | 0.189     | 11.8          | LOS B            | 1.2               | 8.2          | 0.34                | 0.67          | 45.3 |
| Approach                        |      | 240         | 0.0 | 0.189     | 11.0          | LOS B            | 1.2               | 8.2          | 0.34                | 0.64          | 45.8 |
| North: Connector 4              |      |             |     |           |               |                  |                   |              |                     |               |      |
| 7                               | L    | 150         | 0.0 | 0.179     | 6.9           | LOS A            | 1.1               | 8.0          | 0.23                | 0.53          | 49.5 |
| 8                               | T    | 79          | 0.0 | 0.179     | 6.3           | LOS A            | 1.1               | 8.0          | 0.23                | 0.46          | 49.9 |
| 9                               | R    | 20          | 0.0 | 0.179     | 11.4          | LOS B            | 1.1               | 8.0          | 0.23                | 0.75          | 46.1 |
| Approach                        |      | 249         | 0.0 | 0.179     | 7.1           | LOS A            | 1.1               | 8.0          | 0.23                | 0.52          | 49.3 |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |              |                     |               |      |
| 10                              | L    | 20          | 0.0 | 0.059     | 8.5           | LOS A            | 0.3               | 2.3          | 0.50                | 0.60          | 47.9 |
| 11                              | T    | 20          | 0.0 | 0.059     | 7.8           | LOS A            | 0.3               | 2.3          | 0.50                | 0.56          | 47.9 |
| 12                              | R    | 20          | 0.0 | 0.059     | 12.9          | LOS B            | 0.3               | 2.3          | 0.50                | 0.73          | 45.1 |
| Approach                        |      | 60          | 0.0 | 0.059     | 9.7           | LOS A            | 0.3               | 2.3          | 0.50                | 0.63          | 46.9 |
| All Vehicles                    |      | 702         | 0.0 | 0.189     | 8.9           | LOS A            | 1.2               | 8.2          | 0.34                | 0.59          | 47.6 |

## MOVEMENT SUMMARY

Site: IN28 Black Forest Rd &  
Connector 4 - AM Peak Ultimate

120221sid-12M1296000 - Black Forest Rd & Connector 4 - IN24  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |      |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Connector 4              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                               | L    | 20          | 0.0 | 0.176     | 8.3           | LOS A            | 1.1               | 7.7  | 0.51         | 0.63                | 48.1          |
| 2                               | T    | 146         | 0.0 | 0.176     | 7.6           | LOS A            | 1.1               | 7.7  | 0.51         | 0.59                | 48.1          |
| 3                               | R    | 20          | 0.0 | 0.176     | 12.8          | LOS B            | 1.1               | 7.7  | 0.51         | 0.78                | 45.6          |
| Approach                        |      | 186         | 0.0 | 0.176     | 8.3           | LOS A            | 1.1               | 7.7  | 0.51         | 0.61                | 47.8          |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.234     | 7.9           | LOS A            | 1.5               | 10.5 | 0.45         | 0.57                | 47.8          |
| 5                               | T    | 20          | 0.0 | 0.234     | 7.3           | LOS A            | 1.5               | 10.5 | 0.45         | 0.53                | 47.9          |
| 6                               | R    | 229         | 0.0 | 0.234     | 12.4          | LOS B            | 1.5               | 10.5 | 0.45         | 0.69                | 44.9          |
| Approach                        |      | 269         | 0.0 | 0.234     | 11.6          | LOS B            | 1.5               | 10.5 | 0.45         | 0.67                | 45.3          |
| North: Connector 4              |      |             |     |           |               |                  |                   |      |              |                     |               |
| 7                               | L    | 253         | 0.0 | 0.299     | 7.0           | LOS A            | 2.2               | 15.4 | 0.26         | 0.53                | 49.3          |
| 8                               | T    | 156         | 0.0 | 0.299     | 6.3           | LOS A            | 2.2               | 15.4 | 0.26         | 0.47                | 49.7          |
| 9                               | R    | 20          | 0.0 | 0.299     | 11.4          | LOS B            | 2.2               | 15.4 | 0.26         | 0.74                | 46.1          |
| Approach                        |      | 429         | 0.0 | 0.299     | 6.9           | LOS A            | 2.2               | 15.4 | 0.26         | 0.52                | 49.3          |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |      |              |                     |               |
| 10                              | L    | 20          | 0.0 | 0.063     | 8.9           | LOS A            | 0.4               | 2.5  | 0.55         | 0.62                | 47.6          |
| 11                              | T    | 20          | 0.0 | 0.063     | 8.2           | LOS A            | 0.4               | 2.5  | 0.55         | 0.58                | 47.6          |
| 12                              | R    | 20          | 0.0 | 0.063     | 13.3          | LOS B            | 0.4               | 2.5  | 0.55         | 0.74                | 44.8          |
| Approach                        |      | 60          | 0.0 | 0.063     | 10.1          | LOS B            | 0.4               | 2.5  | 0.55         | 0.65                | 46.6          |
| All Vehicles                    |      | 944         | 0.0 | 0.299     | 8.7           | LOS A            | 2.2               | 15.4 | 0.38         | 0.59                | 47.6          |

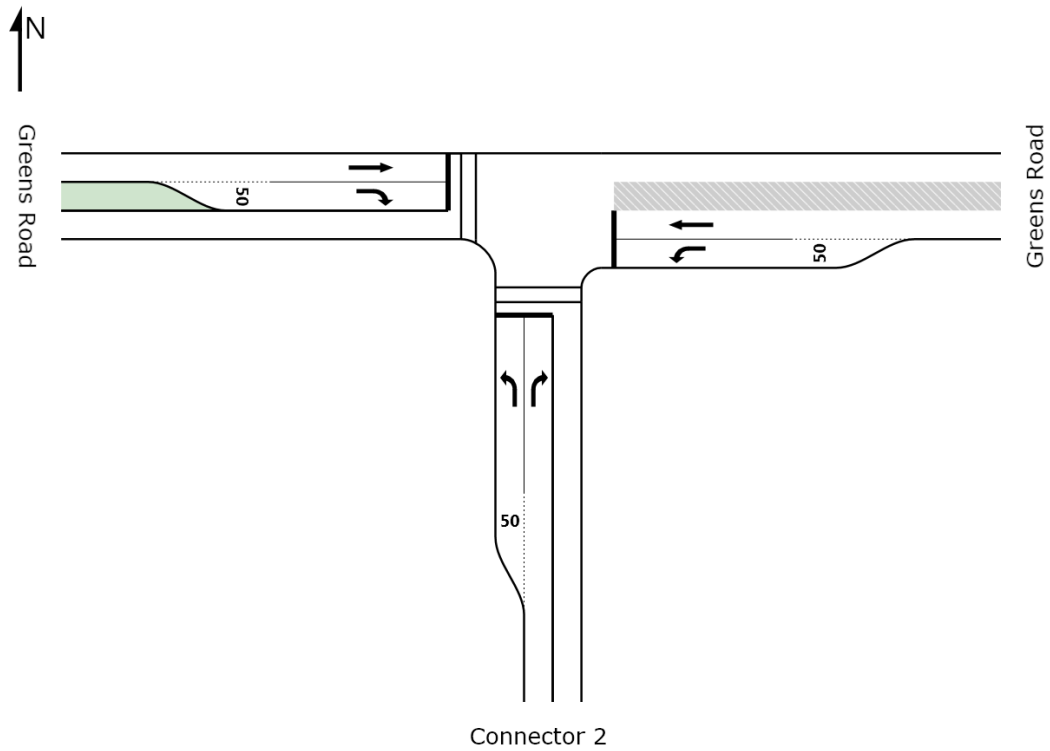
## MOVEMENT SUMMARY

Site: IN28 Black Forest Rd &  
Connector 4 - PM Peak  
Ultimate

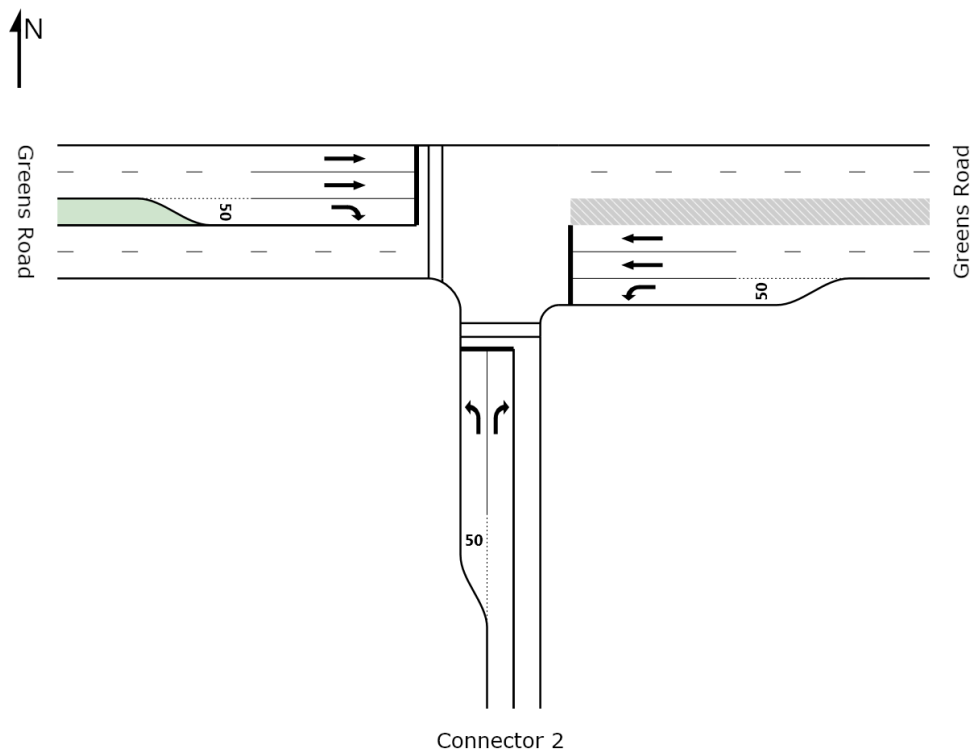
120221sid-12M1296000 - Black Forest Rd & Connector 4 - IN24  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 4              |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 20          | 0.0 | 0.190     | 8.5           | LOS A            | 1.2                        | 8.4      | 0.54         | 0.64                | 48.0          |
| 2                               | T    | 156         | 0.0 | 0.190     | 7.8           | LOS A            | 1.2                        | 8.4      | 0.54         | 0.60                | 48.0          |
| 3                               | R    | 20          | 0.0 | 0.190     | 12.9          | LOS B            | 1.2                        | 8.4      | 0.54         | 0.79                | 45.4          |
| Approach                        |      | 196         | 0.0 | 0.190     | 8.4           | LOS A            | 1.2                        | 8.4      | 0.54         | 0.63                | 47.7          |
| East: Black Forest Road         |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.250     | 7.8           | LOS A            | 1.6                        | 11.4     | 0.44         | 0.57                | 47.9          |
| 5                               | T    | 20          | 0.0 | 0.250     | 7.2           | LOS A            | 1.6                        | 11.4     | 0.44         | 0.52                | 47.9          |
| 6                               | R    | 253         | 0.0 | 0.250     | 12.3          | LOS B            | 1.6                        | 11.4     | 0.44         | 0.69                | 44.9          |
| Approach                        |      | 293         | 0.0 | 0.250     | 11.6          | LOS B            | 1.6                        | 11.4     | 0.44         | 0.67                | 45.3          |
| North: Connector 4              |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                               | L    | 229         | 0.0 | 0.276     | 6.9           | LOS A            | 2.0                        | 14.0     | 0.26         | 0.53                | 49.3          |
| 8                               | T    | 146         | 0.0 | 0.276     | 6.3           | LOS A            | 2.0                        | 14.0     | 0.26         | 0.47                | 49.7          |
| 9                               | R    | 20          | 0.0 | 0.276     | 11.4          | LOS B            | 2.0                        | 14.0     | 0.26         | 0.75                | 46.1          |
| Approach                        |      | 395         | 0.0 | 0.276     | 6.9           | LOS A            | 2.0                        | 14.0     | 0.26         | 0.52                | 49.3          |
| West: Black Forest Road         |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                              | L    | 20          | 0.0 | 0.065     | 9.1           | LOS A            | 0.4                        | 2.6      | 0.57         | 0.63                | 47.5          |
| 11                              | T    | 20          | 0.0 | 0.065     | 8.5           | LOS A            | 0.4                        | 2.6      | 0.57         | 0.60                | 47.4          |
| 12                              | R    | 20          | 0.0 | 0.065     | 13.6          | LOS B            | 0.4                        | 2.6      | 0.57         | 0.75                | 44.6          |
| Approach                        |      | 60          | 0.0 | 0.065     | 10.4          | LOS B            | 0.4                        | 2.6      | 0.57         | 0.66                | 46.5          |
| All Vehicles                    |      | 944         | 0.0 | 0.276     | 8.9           | LOS A            | 2.0                        | 14.0     | 0.39         | 0.60                | 47.5          |

## IN 29 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN29 Greens Rd &  
Connector 2 - AM Peak  
Interim

120221sid-12M1296000 - Greens Rd & Connector 2 - IN15

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 2 |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 62                   | 5.0  | 0.137            | 15.2                 | LOS B            | 1.2                                  | 8.7           | 0.35         | 0.71                           | 42.4                  |
| 3                  | R    | 300                  | 5.0  | 0.365            | 31.0                 | LOS C            | 11.3                                 | 82.4          | 0.69         | 0.81                           | 32.4                  |
| Approach           |      | 362                  | 5.0  | 0.365            | 28.3                 | LOS C            | 11.3                                 | 82.4          | 0.64         | 0.79                           | 33.8                  |
| East: Greens Road  |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 400                  | 5.0  | 0.769            | 24.4                 | LOS C            | 9.6                                  | 70.0          | 0.72         | 0.84                           | 36.0                  |
| 5                  | T    | 157                  | 5.0  | 0.369            | 42.6                 | LOS D            | 7.8                                  | 57.1          | 0.89         | 0.73                           | 26.6                  |
| Approach           |      | 557                  | 5.0  | 0.769            | 29.5                 | LOS C            | 9.6                                  | 70.0          | 0.77         | 0.81                           | 32.7                  |
| West: Greens Road  |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 11                 | T    | 307                  | 5.0  | 0.368            | 23.7                 | LOS C            | 11.8                                 | 86.4          | 0.71         | 0.61                           | 34.8                  |
| 12                 | R    | 148                  | 5.0  | 0.742            | 61.5                 | LOS E            | 8.4                                  | 61.4          | 0.96         | 0.86                           | 22.3                  |
| Approach           |      | 455                  | 5.0  | 0.742            | 36.0                 | LOS D            | 11.8                                 | 86.4          | 0.79         | 0.69                           | 29.5                  |
| All Vehicles       |      | 1374                 | 5.0  | 0.769            | 31.4                 | LOS C            | 11.8                                 | 86.4          | 0.74         | 0.77                           | 31.8                  |

## MOVEMENT SUMMARY

Site: IN29 Greens Rd &  
Connector 2 - PM Peak  
Interim

120221sid-12M1296000 - Greens Rd & Connector 2 - IN15

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 2 |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 148                  | 5.0  | 0.405            | 20.8                 | LOS C            | 3.9                                  | 28.7          | 0.49         | 0.74                           | 38.2                  |
| 3                  | R    | 400                  | 5.0  | 0.496            | 33.4                 | LOS C            | 16.4                                 | 119.9         | 0.76         | 0.83                           | 31.3                  |
| Approach           |      | 548                  | 5.0  | 0.496            | 30.0                 | LOS C            | 16.4                                 | 119.9         | 0.69         | 0.81                           | 32.9                  |
| East: Greens Road  |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 300                  | 5.0  | 0.435            | 11.7                 | LOS B            | 3.6                                  | 26.2          | 0.33         | 0.73                           | 45.5                  |
| 5                  | T    | 307                  | 5.0  | 0.500            | 35.1                 | LOS D            | 14.5                                 | 105.5         | 0.86         | 0.74                           | 29.3                  |
| Approach           |      | 607                  | 5.0  | 0.500            | 23.5                 | LOS C            | 14.5                                 | 105.5         | 0.60         | 0.73                           | 35.5                  |
| West: Greens Road  |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 11                 | T    | 157                  | 5.0  | 0.185            | 21.0                 | LOS C            | 5.4                                  | 39.6          | 0.64         | 0.53                           | 36.6                  |
| 12                 | R    | 62                   | 5.0  | 0.461            | 68.8                 | LOS E            | 3.7                                  | 26.8          | 1.00         | 0.76                           | 20.7                  |
| Approach           |      | 219                  | 5.0  | 0.461            | 34.5                 | LOS C            | 5.4                                  | 39.6          | 0.74         | 0.59                           | 30.1                  |
| All Vehicles       |      | 1374                 | 5.0  | 0.500            | 27.9                 | LOS C            | 16.4                                 | 119.9         | 0.66         | 0.74                           | 33.5                  |

## MOVEMENT SUMMARY

Site: IN29 Greens Rd &  
Connector 2 - AM Peak  
Ultimate

120221sid-12M1296000 - Greens Rd & Connector 2 - IN15

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Connector 2              |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                               | L    | 20                   | 5.0               | 0.036 | 12.0                 | LOS B            | 0.3                                  | 2.0           | 0.25         | 0.68                           | 45.2                  |
| 3                               | R    | 300                  | 5.0               | 0.254 | 17.2                 | LOS B            | 7.1                                  | 51.5          | 0.44         | 0.75                           | 40.8                  |
| Approach                        |      | 320                  | 5.0               | 0.254 | 16.9                 | LOS B            | 7.1                                  | 51.5          | 0.43         | 0.75                           | 41.1                  |
| East: Greens Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 400                  | 5.0               | 0.529 | 11.9                 | LOS B            | 4.4                                  | 32.1          | 0.40         | 0.75                           | 45.3                  |
| 5                               | T    | 106                  | 5.0               | 0.198 | 49.7                 | LOS D            | 2.8                                  | 20.3          | 0.92         | 0.70                           | 24.4                  |
| Approach                        |      | 506                  | 5.0               | 0.529 | 19.8                 | LOS B            | 4.4                                  | 32.1          | 0.51         | 0.74                           | 38.4                  |
| West: Greens Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 11                              | T    | 231                  | 5.0               | 0.253 | 39.6                 | LOS D            | 5.5                                  | 39.9          | 0.85         | 0.68                           | 27.6                  |
| 12                              | R    | 26                   | 5.0               | 0.290 | 71.6                 | LOS E            | 1.6                                  | 11.5          | 1.00         | 0.71                           | 20.2                  |
| Approach                        |      | 257                  | 5.0               | 0.290 | 42.8                 | LOS D            | 5.5                                  | 39.9          | 0.86         | 0.69                           | 26.6                  |
| All Vehicles                    |      | 1083                 | 5.0               | 0.529 | 24.4                 | LOS C            | 7.1                                  | 51.5          | 0.57         | 0.73                           | 35.4                  |

## MOVEMENT SUMMARY

Site: IN29 Greens Rd &  
Connector 2 - PM Peak  
Ultimate

120221sid-12M1296000 - Greens Rd & Connector 2 - IN15

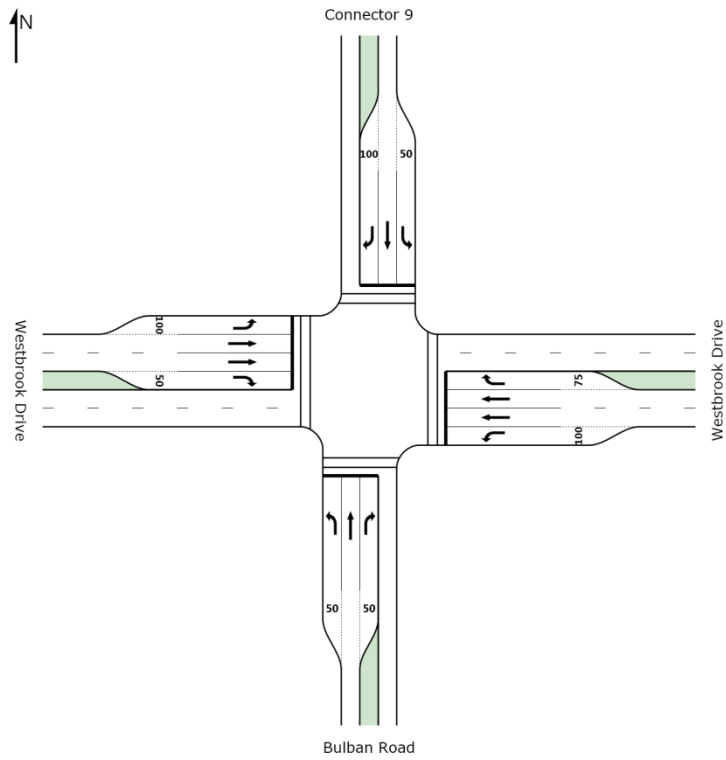
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Connector 2              |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                               | L    | 26                   | 5.0               | 0.051 | 13.2                 | LOS B            | 0.4                                  | 3.0           | 0.29         | 0.69                           | 44.2                  |
| 3                               | R    | 400                  | 5.0               | 0.357 | 19.8                 | LOS B            | 11.1                                 | 81.0          | 0.52         | 0.78                           | 38.9                  |
| Approach                        |      | 426                  | 5.0               | 0.357 | 19.4                 | LOS B            | 11.1                                 | 81.0          | 0.50         | 0.77                           | 39.2                  |
| East: Greens Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 300                  | 5.0               | 0.397 | 10.8                 | LOS B            | 3.1                                  | 22.5          | 0.28         | 0.72                           | 46.4                  |
| 5                               | T    | 231                  | 5.0               | 0.349 | 47.5                 | LOS D            | 6.0                                  | 44.0          | 0.92         | 0.74                           | 25.1                  |
| Approach                        |      | 531                  | 5.0               | 0.397 | 26.8                 | LOS C            | 6.0                                  | 44.0          | 0.56         | 0.73                           | 33.8                  |
| West: Greens Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 11                              | T    | 106                  | 5.0               | 0.102 | 34.6                 | LOS C            | 2.3                                  | 16.8          | 0.78         | 0.60                           | 29.6                  |
| 12                              | R    | 20                   | 5.0               | 0.223 | 71.2                 | LOS E            | 1.2                                  | 8.8           | 0.99         | 0.70                           | 20.3                  |
| Approach                        |      | 126                  | 5.0               | 0.223 | 40.4                 | LOS D            | 2.3                                  | 16.8          | 0.81         | 0.62                           | 27.6                  |
| All Vehicles                    |      | 1083                 | 5.0               | 0.397 | 25.5                 | LOS C            | 11.1                                 | 81.0          | 0.57         | 0.73                           | 34.8                  |

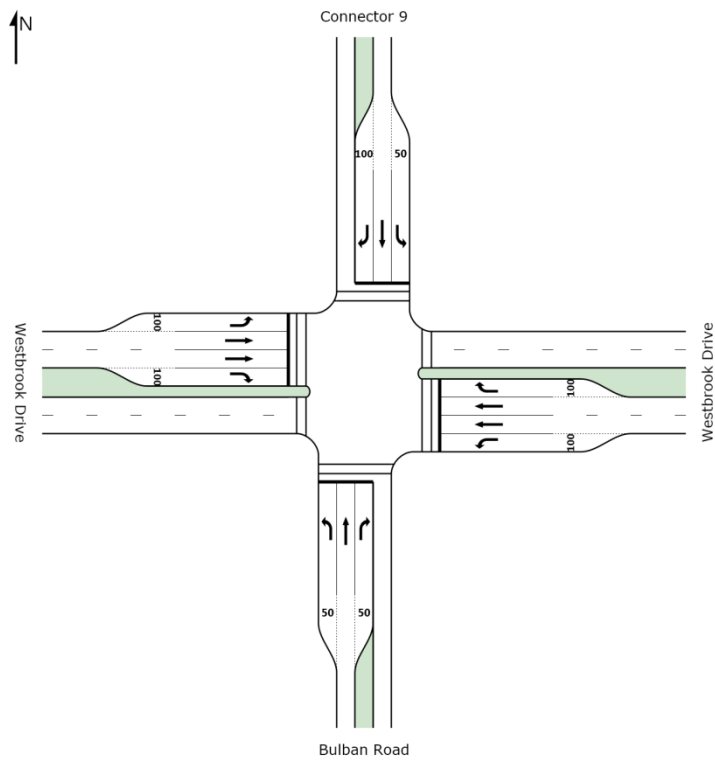
PSP 42.2

IN 01

Interim Layout



Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector 9  
(IN01) - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     | per veh             | km/h          |
|                       |      |             |     |           |               |                  | veh               | m            |                     |               |
| South: Bulban Road    |      |             |     |           |               |                  |                   |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.076     | 35.9          | LOS D            | 0.8               | 5.3          | 0.69                | 30.1          |
| 2                     | T    | 20          | 0.0 | 0.056     | 43.4          | LOS D            | 1.0               | 6.7          | 0.85                | 26.4          |
| 3                     | R    | 32          | 0.0 | 0.345     | 71.5          | LOS E            | 1.9               | 13.6         | 1.00                | 20.3          |
| Approach              |      | 72          | 0.0 | 0.345     | 53.8          | LOS D            | 1.9               | 13.6         | 0.87                | 24.0          |
| East: Westbrook Drive |      |             |     |           |               |                  |                   |              |                     |               |
| 4                     | L    | 112         | 0.0 | 0.182     | 21.3          | LOS C            | 3.0               | 21.1         | 0.50                | 37.8          |
| 5                     | T    | 1017        | 0.0 | 0.569     | 25.3          | LOS C            | 21.6              | 151.0        | 0.79                | 33.8          |
| 6                     | R    | 127         | 0.0 | 0.631     | 65.7          | LOS E            | 7.4               | 52.1         | 1.00                | 21.4          |
| Approach              |      | 1256        | 0.0 | 0.631     | 29.1          | LOS C            | 21.6              | 151.0        | 0.78                | 32.2          |
| North: Connector 9    |      |             |     |           |               |                  |                   |              |                     |               |
| 7                     | L    | 189         | 0.0 | 0.723     | 42.7          | LOS D            | 8.6               | 60.5         | 0.78                | 27.5          |
| 8                     | T    | 20          | 0.0 | 0.056     | 43.4          | LOS D            | 1.0               | 6.7          | 0.85                | 26.4          |
| 9                     | R    | 20          | 0.0 | 0.215     | 70.7          | LOS E            | 1.2               | 8.4          | 0.99                | 20.4          |
| Approach              |      | 229         | 0.0 | 0.723     | 45.2          | LOS D            | 8.6               | 60.5         | 0.80                | 26.6          |
| West: Westbrook Drive |      |             |     |           |               |                  |                   |              |                     |               |
| 10                    | L    | 20          | 0.0 | 0.032     | 20.5          | LOS C            | 0.5               | 3.5          | 0.46                | 38.3          |
| 11                    | T    | 1304        | 0.0 | 0.730     | 28.2          | LOS C            | 30.8              | 215.3        | 0.88                | 32.3          |
| 12                    | R    | 20          | 0.0 | 0.099     | 61.0          | LOS E            | 1.1               | 7.5          | 0.93                | 22.4          |
| Approach              |      | 1344        | 0.0 | 0.730     | 28.6          | LOS C            | 30.8              | 215.3        | 0.87                | 32.1          |
| All Vehicles          |      | 2901        | 0.0 | 0.730     | 30.7          | LOS C            | 30.8              | 215.3        | 0.83                | 31.4          |

## MOVEMENT SUMMARY

Site: Westbrook Dr &  
Connector 9 (IN01) - Pm Pk  
Interim

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 125 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     | per veh             | km/h          |
|                       |      |             |     |           |               |                  | veh               | m            |                     |               |
| South: Bulban Road    |      |             |     |           |               |                  |                   |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.074     | 33.4          | LOS C            | 0.7               | 5.2          | 0.65                | 31.2          |
| 2                     | T    | 70          | 0.0 | 0.204     | 47.7          | LOS D            | 3.7               | 25.7         | 0.89                | 25.0          |
| 3                     | R    | 112         | 0.0 | 0.838     | 78.3          | LOS E            | 7.5               | 52.7         | 1.00                | 19.0          |
| Approach              |      | 202         | 0.0 | 0.838     | 63.3          | LOS E            | 7.5               | 52.7         | 0.93                | 21.7          |
| East: Westbrook Drive |      |             |     |           |               |                  |                   |              |                     |               |
| 4                     | L    | 32          | 0.0 | 0.056     | 23.5          | LOS C            | 0.9               | 6.5          | 0.51                | 36.4          |
| 5                     | T    | 1304        | 0.0 | 0.836     | 39.9          | LOS D            | 37.8              | 264.4        | 0.97                | 27.4          |
| 6                     | R    | 249         | 0.0 | 0.838     | 70.4          | LOS E            | 16.3              | 113.8        | 1.00                | 20.4          |
| Approach              |      | 1585        | 0.0 | 0.838     | 44.4          | LOS D            | 37.8              | 264.4        | 0.97                | 26.1          |
| North: Connector 9    |      |             |     |           |               |                  |                   |              |                     |               |
| 7                     | L    | 187         | 0.0 | 0.696     | 38.7          | LOS D            | 8.1               | 57.0         | 0.73                | 29.0          |
| 8                     | T    | 70          | 0.0 | 0.204     | 47.7          | LOS D            | 3.7               | 25.7         | 0.89                | 25.0          |
| 9                     | R    | 80          | 0.0 | 0.598     | 72.2          | LOS E            | 5.0               | 35.1         | 1.00                | 20.1          |
| Approach              |      | 337         | 0.0 | 0.696     | 48.5          | LOS D            | 8.1               | 57.0         | 0.83                | 25.5          |
| West: Westbrook Drive |      |             |     |           |               |                  |                   |              |                     |               |
| 10                    | L    | 80          | 0.0 | 0.141     | 24.0          | LOS C            | 2.4               | 16.7         | 0.53                | 36.1          |
| 11                    | T    | 1017        | 0.0 | 0.652     | 32.5          | LOS C            | 25.0              | 174.7        | 0.87                | 30.3          |
| 12                    | R    | 20          | 0.0 | 0.099     | 56.2          | LOS E            | 1.0               | 7.3          | 0.88                | 23.6          |
| Approach              |      | 1117        | 0.0 | 0.652     | 32.3          | LOS C            | 25.0              | 174.7        | 0.85                | 30.5          |
| All Vehicles          |      | 3241        | 0.0 | 0.838     | 41.8          | LOS D            | 37.8              | 264.4        | 0.91                | 27.0          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector 9  
(IN01) - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Bulban Road    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.081     | 40.4          | LOS D            | 0.8                        | 5.8      | 0.74         | 0.70                | 28.4          |
| 2                     | T    | 20          | 0.0 | 0.054     | 42.4          | LOS D            | 1.0                        | 6.7      | 0.85         | 0.61                | 26.7          |
| 3                     | R    | 113         | 0.0 | 0.562     | 64.7          | LOS E            | 6.5                        | 45.6     | 1.00         | 0.79                | 21.7          |
| Approach              |      | 153         | 0.0 | 0.562     | 58.6          | LOS E            | 6.5                        | 45.6     | 0.94         | 0.75                | 22.9          |
| East: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 109         | 0.0 | 0.207     | 28.6          | LOS C            | 3.7                        | 25.6     | 0.62         | 0.75                | 33.6          |
| 5                     | T    | 833         | 0.0 | 0.475     | 24.5          | LOS C            | 16.9                       | 118.0    | 0.75         | 0.66                | 34.3          |
| 6                     | R    | 41          | 0.0 | 0.442     | 72.0          | LOS E            | 2.5                        | 17.5     | 1.00         | 0.73                | 20.2          |
| Approach              |      | 983         | 0.0 | 0.475     | 27.0          | LOS C            | 16.9                       | 118.0    | 0.75         | 0.67                | 33.3          |
| North: Connector 9    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 110         | 0.0 | 0.449     | 42.5          | LOS D            | 4.8                        | 33.8     | 0.79         | 0.77                | 27.6          |
| 8                     | T    | 20          | 0.0 | 0.054     | 42.4          | LOS D            | 1.0                        | 6.7      | 0.85         | 0.61                | 26.7          |
| 9                     | R    | 20          | 0.0 | 0.099     | 60.9          | LOS E            | 1.1                        | 7.5      | 0.93         | 0.71                | 22.5          |
| Approach              |      | 150         | 0.0 | 0.449     | 44.9          | LOS D            | 4.8                        | 33.8     | 0.82         | 0.74                | 26.7          |
| West: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 20          | 0.0 | 0.038     | 27.4          | LOS C            | 0.6                        | 4.4      | 0.58         | 0.70                | 34.2          |
| 11                    | T    | 984         | 0.0 | 0.561     | 25.8          | LOS C            | 21.0                       | 146.7    | 0.79         | 0.70                | 33.6          |
| 12                    | R    | 20          | 0.0 | 0.215     | 70.7          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.4          |
| Approach              |      | 1024        | 0.0 | 0.561     | 26.7          | LOS C            | 21.0                       | 146.7    | 0.79         | 0.70                | 33.2          |
| All Vehicles          |      | 2310        | 0.0 | 0.562     | 30.1          | LOS C            | 21.0                       | 146.7    | 0.78         | 0.69                | 31.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr &  
Connector 9 (IN01) - PM Peak  
Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

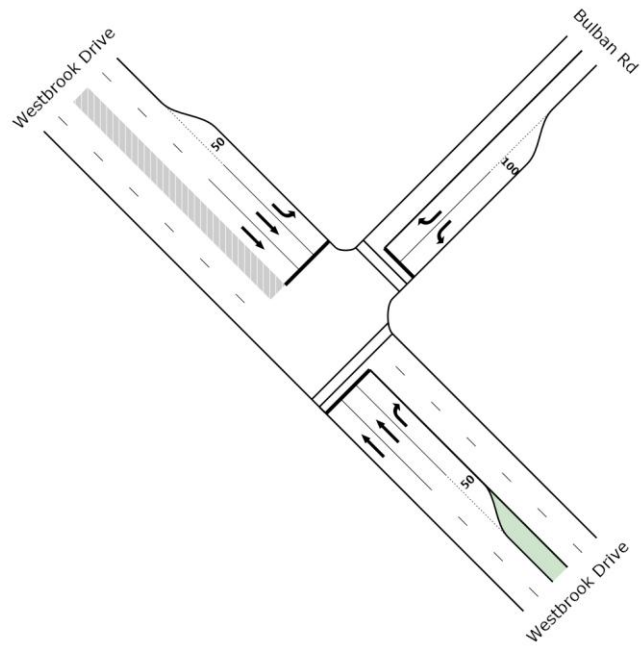
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

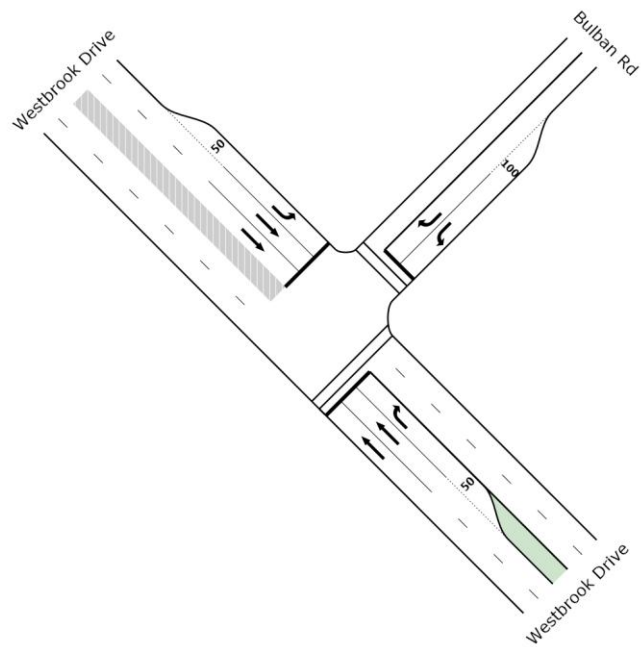
| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Bulban Road    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.071     | 32.5          | LOS C            | 0.7                        | 5.0      | 0.65         | 0.70                | 31.7          |
| 2                     | T    | 57          | 0.0 | 0.153     | 43.6          | LOS D            | 2.8                        | 19.5     | 0.87         | 0.67                | 26.3          |
| 3                     | R    | 109         | 0.0 | 0.640     | 67.7          | LOS E            | 6.5                        | 45.5     | 1.00         | 0.81                | 21.0          |
| Approach              |      | 186         | 0.0 | 0.640     | 56.5          | LOS E            | 6.5                        | 45.5     | 0.92         | 0.75                | 23.3          |
| East: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 113         | 0.0 | 0.236     | 34.7          | LOS C            | 4.3                        | 30.4     | 0.70         | 0.76                | 30.7          |
| 5                     | T    | 984         | 0.0 | 0.673     | 33.6          | LOS C            | 24.0                       | 167.7    | 0.90         | 0.79                | 29.9          |
| 6                     | R    | 170         | 0.0 | 0.646     | 62.1          | LOS E            | 9.7                        | 68.0     | 1.00         | 0.82                | 22.2          |
| Approach              |      | 1267        | 0.0 | 0.673     | 37.5          | LOS D            | 24.0                       | 167.7    | 0.89         | 0.79                | 28.6          |
| North: Connector 9    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 101         | 0.0 | 0.363     | 33.8          | LOS C            | 3.8                        | 26.6     | 0.69         | 0.75                | 31.1          |
| 8                     | T    | 70          | 0.0 | 0.187     | 44.0          | LOS D            | 3.5                        | 24.2     | 0.88         | 0.68                | 26.2          |
| 9                     | R    | 80          | 0.0 | 0.470     | 66.0          | LOS E            | 4.6                        | 32.5     | 0.99         | 0.77                | 21.4          |
| Approach              |      | 251         | 0.0 | 0.470     | 46.9          | LOS D            | 4.6                        | 32.5     | 0.84         | 0.74                | 25.9          |
| West: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 80          | 0.0 | 0.167     | 34.2          | LOS C            | 3.0                        | 21.1     | 0.69         | 0.75                | 30.9          |
| 11                    | T    | 833         | 0.0 | 0.570     | 31.9          | LOS C            | 19.3                       | 134.8    | 0.85         | 0.74                | 30.6          |
| 12                    | R    | 20          | 0.0 | 0.076     | 56.5          | LOS E            | 1.0                        | 7.2      | 0.90         | 0.71                | 23.5          |
| Approach              |      | 933         | 0.0 | 0.570     | 32.6          | LOS C            | 19.3                       | 134.8    | 0.84         | 0.74                | 30.5          |
| All Vehicles          |      | 2637        | 0.0 | 0.673     | 38.0          | LOS D            | 24.0                       | 167.7    | 0.87         | 0.77                | 28.5          |

## IN 01A

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: IN39 Westbrook Dr &  
Bulban Rd - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN01A

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South East: Westbrook Drive     |      |             |     |           |               |                  |                   |       |              |                     |               |
| 22                              | T    | 1182        | 0.0 | 0.409     | 6.0           | LOS A            | 12.5              | 87.7  | 0.40         | 0.36                | 49.8          |
| 23                              | R    | 55          | 0.0 | 0.589     | 73.2          | LOS E            | 3.4               | 23.8  | 1.00         | 0.77                | 19.9          |
| Approach                        |      | 1237        | 0.0 | 0.589     | 9.0           | LOS A            | 12.5              | 87.7  | 0.43         | 0.38                | 46.7          |
| North East: Bulban Rd           |      |             |     |           |               |                  |                   |       |              |                     |               |
| 24                              | L    | 104         | 0.0 | 0.250     | 45.8          | LOS D            | 4.8               | 33.5  | 0.83         | 0.78                | 26.5          |
| 26                              | R    | 140         | 0.0 | 0.476     | 58.7          | LOS E            | 7.6               | 53.3  | 0.96         | 0.80                | 22.9          |
| Approach                        |      | 244         | 0.0 | 0.476     | 53.2          | LOS D            | 7.6               | 53.3  | 0.90         | 0.79                | 24.3          |
| North West: Westbrook Drive     |      |             |     |           |               |                  |                   |       |              |                     |               |
| 27                              | L    | 257         | 0.0 | 0.590     | 19.5          | LOS B            | 6.1               | 42.8  | 0.53         | 0.76                | 39.0          |
| 28                              | T    | 1348        | 0.0 | 0.539     | 12.4          | LOS B            | 21.2              | 148.4 | 0.59         | 0.54                | 42.9          |
| Approach                        |      | 1605        | 0.0 | 0.590     | 13.6          | LOS B            | 21.2              | 148.4 | 0.58         | 0.57                | 42.2          |
| All Vehicles                    |      | 3086        | 0.0 | 0.590     | 14.9          | LOS B            | 21.2              | 148.4 | 0.55         | 0.51                | 41.4          |

## MOVEMENT SUMMARY

Site: IN39 Westbrook Dr &  
Bulban Rd - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN01A

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South East: Westbrook Drive     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 22                              | T    | 1348        | 0.0 | 0.519     | 10.7          | LOS B            | 19.7                       | 137.9    | 0.55         | 0.50                | 44.5          |
| 23                              | R    | 104         | 0.0 | 0.561     | 65.9          | LOS E            | 6.1                        | 42.4     | 1.00         | 0.79                | 21.3          |
| Approach                        |      | 1453        | 0.0 | 0.561     | 14.7          | LOS B            | 19.7                       | 137.9    | 0.58         | 0.52                | 41.3          |
| North East: Bulban Rd           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 24                              | L    | 55          | 0.0 | 0.113     | 33.1          | LOS C            | 2.0                        | 14.0     | 0.67         | 0.74                | 31.4          |
| 26                              | R    | 257         | 0.0 | 0.593     | 52.6          | LOS D            | 13.5                       | 94.5     | 0.94         | 0.83                | 24.5          |
| Approach                        |      | 312         | 0.0 | 0.593     | 49.2          | LOS D            | 13.5                       | 94.5     | 0.90         | 0.82                | 25.5          |
| North West: Westbrook Drive     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 27                              | L    | 140         | 0.0 | 0.408     | 24.2          | LOS C            | 4.2                        | 29.4     | 0.55         | 0.75                | 36.0          |
| 28                              | T    | 1182        | 0.0 | 0.587     | 21.3          | LOS C            | 23.7                       | 165.7    | 0.75         | 0.67                | 36.2          |
| Approach                        |      | 1322        | 0.0 | 0.587     | 21.6          | LOS C            | 23.7                       | 165.7    | 0.73         | 0.68                | 36.1          |
| All Vehicles                    |      | 3086        | 0.0 | 0.593     | 21.2          | LOS C            | 23.7                       | 165.7    | 0.68         | 0.62                | 36.7          |

## MOVEMENT SUMMARY

Site: IN39 Westbrook Dr &  
Bulban Rd - AM Peak  
Ultimate - Copy

120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN01A  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South East: Westbrook Drive     |      |             |     |           |               |                  |                   |       |              |                     |               |
| 22                              | T    | 920         | 0.0 | 0.318     | 5.5           | LOS A            | 8.9               | 62.2  | 0.36         | 0.32                | 50.6          |
| 23                              | R    | 21          | 0.0 | 0.227     | 70.9          | LOS E            | 1.3               | 8.8   | 0.99         | 0.70                | 20.3          |
| Approach                        |      | 941         | 0.0 | 0.318     | 7.0           | LOS A            | 8.9               | 62.2  | 0.38         | 0.33                | 48.9          |
| North East: Bulban Rd           |      |             |     |           |               |                  |                   |       |              |                     |               |
| 24                              | L    | 21          | 0.0 | 0.050     | 43.7          | LOS D            | 0.9               | 6.4   | 0.78         | 0.71                | 27.2          |
| 26                              | R    | 116         | 0.0 | 0.394     | 57.9          | LOS E            | 6.2               | 43.4  | 0.94         | 0.79                | 23.1          |
| Approach                        |      | 137         | 0.0 | 0.394     | 55.7          | LOS E            | 6.2               | 43.4  | 0.92         | 0.78                | 23.7          |
| North West: Westbrook Drive     |      |             |     |           |               |                  |                   |       |              |                     |               |
| 27                              | L    | 121         | 0.0 | 0.277     | 16.8          | LOS B            | 2.6               | 18.5  | 0.41         | 0.72                | 41.0          |
| 28                              | T    | 1149        | 0.0 | 0.459     | 11.5          | LOS B            | 16.8              | 117.3 | 0.55         | 0.49                | 43.8          |
| Approach                        |      | 1271        | 0.0 | 0.459     | 12.0          | LOS B            | 16.8              | 117.3 | 0.53         | 0.52                | 43.5          |
| All Vehicles                    |      | 2348        | 0.0 | 0.459     | 12.5          | LOS B            | 16.8              | 117.3 | 0.49         | 0.46                | 43.3          |

## MOVEMENT SUMMARY

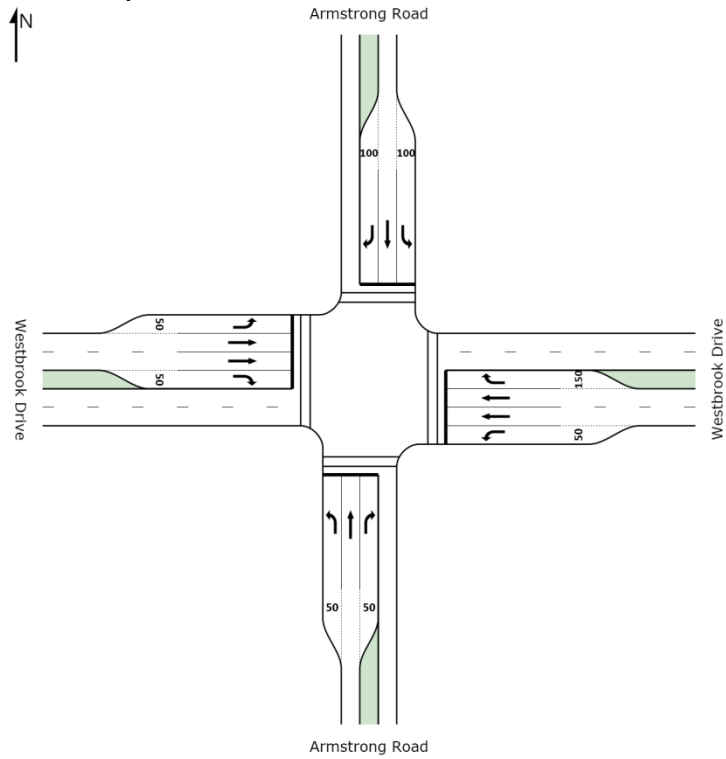
Site: IN39 Westbrook Dr &  
Bulban Rd - PM Peak  
Ultimate - Copy - Copy

120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN01A  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

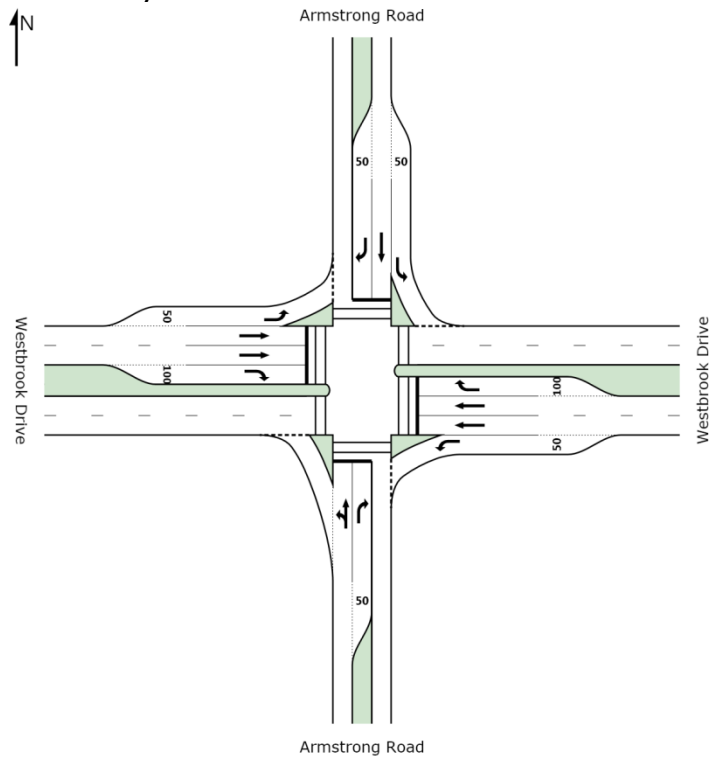
| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South East: Westbrook Drive     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 22                              | T    | 1149        | 0.0 | 0.402     | 6.4           | LOS A            | 12.4                       | 87.0     | 0.41         | 0.37                | 49.4          |
| 23                              | R    | 21          | 0.0 | 0.194     | 69.2          | LOS E            | 1.2                        | 8.7      | 0.98         | 0.71                | 20.6          |
| Approach                        |      | 1171        | 0.0 | 0.402     | 7.5           | LOS A            | 12.4                       | 87.0     | 0.42         | 0.38                | 48.2          |
| North East: Bulban Rd           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 24                              | L    | 21          | 0.0 | 0.049     | 42.1          | LOS D            | 0.9                        | 6.2      | 0.76         | 0.71                | 27.8          |
| 26                              | R    | 121         | 0.0 | 0.391     | 57.0          | LOS E            | 6.4                        | 45.0     | 0.94         | 0.79                | 23.4          |
| Approach                        |      | 142         | 0.0 | 0.391     | 54.7          | LOS D            | 6.4                        | 45.0     | 0.91         | 0.78                | 23.9          |
| North West: Westbrook Drive     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 27                              | L    | 116         | 0.0 | 0.275     | 17.6          | LOS B            | 2.6                        | 18.5     | 0.42         | 0.72                | 40.4          |
| 28                              | T    | 920         | 0.0 | 0.377     | 11.6          | LOS B            | 12.9                       | 90.6     | 0.53         | 0.47                | 43.7          |
| Approach                        |      | 1036        | 0.0 | 0.377     | 12.3          | LOS B            | 12.9                       | 90.6     | 0.52         | 0.50                | 43.3          |
| All Vehicles                    |      | 2348        | 0.0 | 0.402     | 12.5          | LOS B            | 12.9                       | 90.6     | 0.49         | 0.45                | 43.4          |

## IN 02

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Rd & Armstrong Rd  
(IN02) - AM Peak Interim

120221sid-12M1296000 - Westbrook Rd & Armstrong Rd - IN29

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 52          | 0.0 | 0.166     | 27.2          | LOS C            | 1.7                        | 11.6     | 0.58         | 0.72                | 34.3          |
| 2                     | T    | 114         | 0.0 | 0.319     | 46.2          | LOS D            | 5.5                        | 38.7     | 0.86         | 0.69                | 25.5          |
| 3                     | R    | 118         | 0.0 | 0.693     | 68.7          | LOS E            | 7.1                        | 49.9     | 1.00         | 0.83                | 20.8          |
| Approach              |      | 284         | 0.0 | 0.693     | 52.1          | LOS D            | 7.1                        | 49.9     | 0.87         | 0.75                | 24.3          |
| East: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 54          | 0.0 | 0.177     | 28.5          | LOS C            | 1.8                        | 12.5     | 0.60         | 0.72                | 33.6          |
| 5                     | T    | 580         | 0.0 | 0.496     | 36.6          | LOS D            | 12.7                       | 88.8     | 0.80         | 0.68                | 28.8          |
| 6                     | R    | 383         | 0.0 | 0.917     | 75.7          | LOS E            | 27.1                       | 189.4    | 1.00         | 1.02                | 19.5          |
| Approach              |      | 1017        | 0.0 | 0.917     | 50.9          | LOS D            | 27.1                       | 189.4    | 0.86         | 0.81                | 24.6          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 353         | 0.0 | 0.665     | 31.3          | LOS C            | 13.7                       | 95.6     | 0.72         | 0.81                | 32.2          |
| 8                     | T    | 60          | 0.0 | 0.168     | 44.7          | LOS D            | 2.8                        | 19.5     | 0.82         | 0.63                | 26.0          |
| 9                     | R    | 149         | 0.0 | 0.875     | 77.1          | LOS E            | 9.9                        | 69.0     | 1.00         | 0.99                | 19.3          |
| Approach              |      | 562         | 0.0 | 0.875     | 44.9          | LOS D            | 13.7                       | 95.6     | 0.80         | 0.84                | 26.7          |
| West: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 40          | 0.0 | 0.131     | 28.3          | LOS C            | 1.3                        | 9.1      | 0.60         | 0.72                | 33.7          |
| 11                    | T    | 833         | 0.0 | 0.712     | 39.7          | LOS D            | 20.5                       | 143.4    | 0.90         | 0.78                | 27.5          |
| 12                    | R    | 31          | 0.0 | 0.137     | 47.3          | LOS D            | 1.4                        | 10.0     | 0.82         | 0.72                | 26.1          |
| Approach              |      | 904         | 0.0 | 0.712     | 39.5          | LOS D            | 20.5                       | 143.4    | 0.88         | 0.78                | 27.7          |
| All Vehicles          |      | 2767        | 0.0 | 0.917     | 46.1          | LOS D            | 27.1                       | 189.4    | 0.86         | 0.80                | 25.9          |

## MOVEMENT SUMMARY

Site: Westbrook Rd & Armstrong Rd (IN02) - PM Peak Interim

120221sid-12M1296000 - Westbrook Rd & Armstrong Rd - IN29

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 31          | 0.0 | 0.102     | 28.2          | LOS C            | 1.0                        | 7.0      | 0.59         | 0.71                | 33.8          |
| 2                     | T    | 60          | 0.0 | 0.168     | 44.7          | LOS D            | 2.8                        | 19.5     | 0.82         | 0.63                | 26.0          |
| 3                     | R    | 54          | 0.0 | 0.582     | 73.0          | LOS E            | 3.3                        | 23.4     | 1.00         | 0.77                | 20.0          |
| Approach              |      | 145         | 0.0 | 0.582     | 51.7          | LOS D            | 3.3                        | 23.4     | 0.84         | 0.70                | 24.4          |
| East: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 118         | 0.0 | 0.379     | 28.1          | LOS C            | 3.9                        | 27.5     | 0.61         | 0.75                | 33.8          |
| 5                     | T    | 833         | 0.0 | 0.596     | 31.5          | LOS C            | 17.7                       | 124.0    | 0.78         | 0.68                | 30.9          |
| 6                     | R    | 353         | 0.0 | 0.912     | 75.6          | LOS E            | 24.7                       | 172.8    | 1.00         | 1.02                | 19.5          |
| Approach              |      | 1304        | 0.0 | 0.912     | 43.1          | LOS D            | 24.7                       | 172.8    | 0.83         | 0.78                | 26.8          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 383         | 0.0 | 0.738     | 34.5          | LOS C            | 16.1                       | 112.4    | 0.75         | 0.83                | 30.7          |
| 8                     | T    | 114         | 0.0 | 0.319     | 46.2          | LOS D            | 5.5                        | 38.7     | 0.86         | 0.69                | 25.5          |
| 9                     | R    | 40          | 0.0 | 0.431     | 71.9          | LOS E            | 2.4                        | 17.1     | 1.00         | 0.73                | 20.2          |
| Approach              |      | 537         | 0.0 | 0.738     | 39.8          | LOS D            | 16.1                       | 112.4    | 0.79         | 0.79                | 28.4          |
| West: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 149         | 0.0 | 0.479     | 28.4          | LOS C            | 5.1                        | 35.4     | 0.62         | 0.76                | 33.6          |
| 11                    | T    | 580         | 0.0 | 0.415     | 29.0          | LOS C            | 11.0                       | 76.9     | 0.69         | 0.59                | 32.2          |
| 12                    | R    | 52          | 0.0 | 0.235     | 49.8          | LOS D            | 2.5                        | 17.4     | 0.85         | 0.74                | 25.3          |
| Approach              |      | 781         | 0.0 | 0.479     | 30.3          | LOS C            | 11.0                       | 76.9     | 0.69         | 0.63                | 31.9          |
| All Vehicles          |      | 2767        | 0.0 | 0.912     | 39.3          | LOS D            | 24.7                       | 172.8    | 0.78         | 0.74                | 28.3          |

## MOVEMENT SUMMARY

Site: Westbrook Rd & Armstrong Rd  
(IN29) - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Rd & Armstrong Rd - IN29

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 58          | 0.0 | 0.542     | 62.6          | LOS E            | 9.8                        | 68.4     | 0.95         | 0.90                | 22.7          |
| 2                     | T    | 138         | 0.0 | 0.542     | 54.7          | LOS D            | 9.8                        | 68.4     | 0.95         | 0.86                | 22.8          |
| 3                     | R    | 40          | 0.0 | 0.431     | 71.8          | LOS E            | 2.4                        | 17.1     | 1.00         | 0.73                | 20.2          |
| Approach              |      | 236         | 0.0 | 0.542     | 59.6          | LOS E            | 9.8                        | 68.4     | 0.96         | 0.85                | 22.3          |
| East: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 18          | 0.0 | 0.019     | 8.2           | LOS A            | 0.1                        | 0.6      | 0.14         | 0.62                | 49.0          |
| 5                     | T    | 481         | 0.0 | 0.548     | 44.6          | LOS D            | 12.5                       | 87.8     | 0.94         | 0.79                | 25.9          |
| 6                     | R    | 334         | 0.0 | 0.723     | 42.1          | LOS D            | 15.7                       | 110.2    | 0.85         | 0.84                | 27.8          |
| Approach              |      | 833         | 0.0 | 0.723     | 42.8          | LOS D            | 15.7                       | 110.2    | 0.88         | 0.80                | 26.9          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 309         | 0.0 | 0.556     | 11.8          | LOS B            | 5.2                        | 36.1     | 0.35         | 0.69                | 45.4          |
| 8                     | T    | 62          | 0.0 | 0.182     | 45.7          | LOS D            | 3.1                        | 21.8     | 0.89         | 0.68                | 25.6          |
| 9                     | R    | 31          | 0.0 | 0.334     | 71.3          | LOS E            | 1.9                        | 13.1     | 1.00         | 0.72                | 20.3          |
| Approach              |      | 402         | 0.0 | 0.556     | 21.6          | LOS C            | 5.2                        | 36.1     | 0.49         | 0.69                | 37.4          |
| West: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 42          | 0.0 | 0.083     | 11.9          | LOS B            | 0.6                        | 4.4      | 0.32         | 0.65                | 45.3          |
| 11                    | T    | 635         | 0.0 | 0.724     | 47.6          | LOS D            | 17.6                       | 123.3    | 0.98         | 0.86                | 25.0          |
| 12                    | R    | 28          | 0.0 | 0.060     | 35.3          | LOS D            | 1.1                        | 7.4      | 0.69         | 0.71                | 30.4          |
| Approach              |      | 705         | 0.0 | 0.724     | 45.0          | LOS D            | 17.6                       | 123.3    | 0.93         | 0.84                | 25.8          |
| All Vehicles          |      | 2176        | 0.0 | 0.724     | 41.4          | LOS D            | 17.6                       | 123.3    | 0.83         | 0.80                | 27.4          |

## MOVEMENT SUMMARY

Site: Westbrook Rd & Armstrong Rd (IN29) - PM Peak Ultimate

120221sid-12M1296000 - Westbrook Rd & Armstrong Rd - IN29

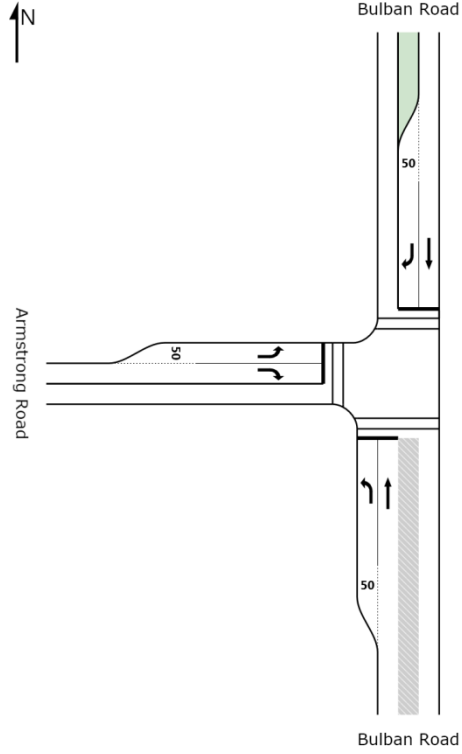
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

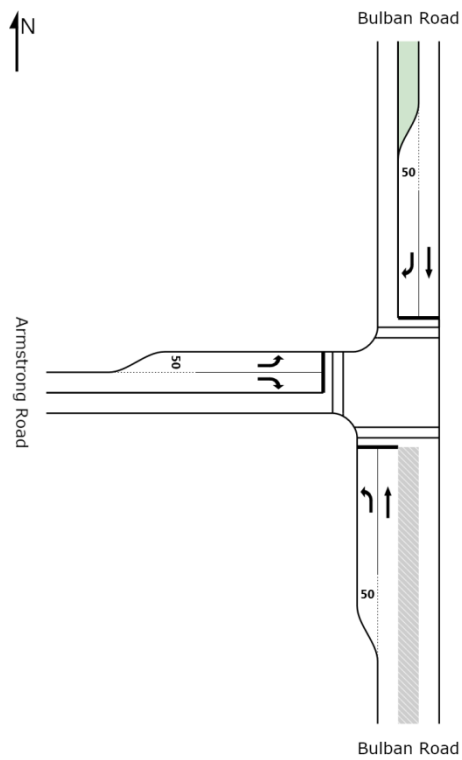
| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 28          | 0.0 | 0.248     | 56.7          | LOS E            | 4.3                        | 30.4     | 0.89         | 0.86                | 24.1          |
| 2                     | T    | 62          | 0.0 | 0.248     | 48.9          | LOS D            | 4.3                        | 30.4     | 0.89         | 0.77                | 24.4          |
| 3                     | R    | 20          | 0.0 | 0.215     | 70.6          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.5          |
| Approach              |      | 110         | 0.0 | 0.248     | 54.8          | LOS D            | 4.3                        | 30.4     | 0.91         | 0.78                | 23.5          |
| East: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 40          | 0.0 | 0.051     | 8.8           | LOS A            | 0.3                        | 2.1      | 0.19         | 0.63                | 48.4          |
| 5                     | T    | 635         | 0.0 | 0.674     | 44.7          | LOS D            | 17.0                       | 118.7    | 0.96         | 0.82                | 25.8          |
| 6                     | R    | 309         | 0.0 | 0.682     | 42.4          | LOS D            | 14.4                       | 101.0    | 0.85         | 0.82                | 27.7          |
| Approach              |      | 984         | 0.0 | 0.682     | 42.5          | LOS D            | 17.0                       | 118.7    | 0.90         | 0.81                | 26.9          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 334         | 0.0 | 0.514     | 10.0          | LOS A            | 4.2                        | 29.4     | 0.29         | 0.68                | 47.1          |
| 8                     | T    | 138         | 0.0 | 0.404     | 47.9          | LOS D            | 7.3                        | 50.9     | 0.93         | 0.75                | 24.9          |
| 9                     | R    | 42          | 0.0 | 0.452     | 72.0          | LOS E            | 2.6                        | 18.0     | 1.00         | 0.73                | 20.2          |
| Approach              |      | 514         | 0.0 | 0.514     | 25.2          | LOS C            | 7.3                        | 50.9     | 0.52         | 0.70                | 35.0          |
| West: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 31          | 0.0 | 0.052     | 10.1          | LOS B            | 0.4                        | 2.5      | 0.26         | 0.64                | 47.0          |
| 11                    | T    | 481         | 0.0 | 0.510     | 42.6          | LOS D            | 12.2                       | 85.7     | 0.92         | 0.77                | 26.6          |
| 12                    | R    | 58          | 0.0 | 0.127     | 37.4          | LOS D            | 2.3                        | 16.1     | 0.72         | 0.74                | 29.6          |
| Approach              |      | 570         | 0.0 | 0.510     | 40.3          | LOS D            | 12.2                       | 85.7     | 0.86         | 0.76                | 27.5          |
| All Vehicles          |      | 2178        | 0.0 | 0.682     | 38.5          | LOS D            | 17.0                       | 118.7    | 0.80         | 0.77                | 28.4          |

## IN 12

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: IN12 - Bulban  
Rd/Armstrong Rd - AM Peak  
Interim

New Site

Signals - Fixed Time Cycle Time = 40 seconds (Practical Cycle Time)

### Movement Performance - Vehicles

| Mov ID               | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                    | L    | 21                   | 0.0  | 0.034            | 16.8                 | LOS B            | 0.3                                  | 1.8           | 0.65         | 0.70                           | 41.0                  |
| 2                    | T    | 35                   | 0.0  | 0.048            | 8.7                  | LOS A            | 0.4                                  | 3.1           | 0.66         | 0.49                           | 46.0                  |
| Approach             |      | 56                   | 0.0  | 0.048            | 11.8                 | LOS B            | 0.4                                  | 3.1           | 0.66         | 0.57                           | 44.0                  |
| North: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 8                    | T    | 125                  | 0.0  | 0.171            | 9.2                  | LOS A            | 1.7                                  | 11.8          | 0.70         | 0.56                           | 45.4                  |
| 9                    | R    | 21                   | 0.0  | 0.036            | 17.0                 | LOS B            | 0.3                                  | 1.9           | 0.66         | 0.71                           | 40.8                  |
| Approach             |      | 146                  | 0.0  | 0.171            | 10.4                 | LOS B            | 1.7                                  | 11.8          | 0.69         | 0.58                           | 44.7                  |
| West: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                   | L    | 21                   | 0.0  | 0.035            | 18.3                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.9                  |
| 12                   | R    | 21                   | 0.0  | 0.035            | 18.4                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.7                  |
| Approach             |      | 42                   | 0.0  | 0.035            | 18.4                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.8                  |
| All Vehicles         |      | 244                  | 0.0  | 0.171            | 12.1                 | LOS B            | 1.7                                  | 11.8          | 0.69         | 0.60                           | 43.6                  |

## MOVEMENT SUMMARY

Site: IN12 - Bulban  
Rd/Armstrong Rd - PM Peak  
Interim

New Site

Signals - Fixed Time Cycle Time = 40 seconds (Practical Cycle Time)

### Movement Performance - Vehicles

| Mov ID               | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                    | L    | 21                   | 0.0  | 0.034            | 16.8                 | LOS B            | 0.3                                  | 1.8           | 0.65         | 0.70                           | 41.0                  |
| 2                    | T    | 125                  | 0.0  | 0.171            | 9.2                  | LOS A            | 1.7                                  | 11.8          | 0.70         | 0.56                           | 45.4                  |
| Approach             |      | 146                  | 0.0  | 0.171            | 10.3                 | LOS B            | 1.7                                  | 11.8          | 0.69         | 0.58                           | 44.7                  |
| North: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 8                    | T    | 35                   | 0.0  | 0.048            | 8.7                  | LOS A            | 0.4                                  | 3.1           | 0.66         | 0.49                           | 46.0                  |
| 9                    | R    | 21                   | 0.0  | 0.041            | 17.8                 | LOS B            | 0.3                                  | 2.0           | 0.68         | 0.71                           | 40.2                  |
| Approach             |      | 56                   | 0.0  | 0.048            | 12.1                 | LOS B            | 0.4                                  | 3.1           | 0.67         | 0.57                           | 43.6                  |
| West: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                   | L    | 21                   | 0.0  | 0.035            | 18.3                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.9                  |
| 12                   | R    | 21                   | 0.0  | 0.035            | 18.4                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.7                  |
| Approach             |      | 42                   | 0.0  | 0.035            | 18.4                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.8                  |
| All Vehicles         |      | 244                  | 0.0  | 0.171            | 12.1                 | LOS B            | 1.7                                  | 11.8          | 0.69         | 0.60                           | 43.5                  |

## MOVEMENT SUMMARY

Site: IN12 - Bulban  
Rd/Armstrong Rd - AM Peak  
Ultimate

New Site

Signals - Fixed Time Cycle Time = 40 seconds (Practical Cycle Time)

### Movement Performance - Vehicles

| Mov ID               | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                    | L    | 21                   | 0.0  | 0.035            | 18.3                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.9                  |
| 2                    | T    | 21                   | 0.0  | 0.033            | 10.1                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.50                           | 44.6                  |
| Approach             |      | 42                   | 0.0  | 0.035            | 14.2                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.60                           | 42.1                  |
| North: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 8                    | T    | 85                   | 0.0  | 0.135            | 10.6                 | LOS B            | 1.2                                  | 8.5           | 0.74         | 0.57                           | 44.0                  |
| 9                    | R    | 37                   | 0.0  | 0.071            | 18.7                 | LOS B            | 0.5                                  | 3.6           | 0.72         | 0.73                           | 39.6                  |
| Approach             |      | 122                  | 0.0  | 0.135            | 13.0                 | LOS B            | 1.2                                  | 8.5           | 0.73         | 0.62                           | 42.6                  |
| West: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                   | L    | 106                  | 0.0  | 0.172            | 17.4                 | LOS B            | 1.4                                  | 9.9           | 0.70         | 0.75                           | 40.6                  |
| 12                   | R    | 21                   | 0.0  | 0.030            | 16.9                 | LOS B            | 0.3                                  | 1.8           | 0.65         | 0.70                           | 40.9                  |
| Approach             |      | 127                  | 0.0  | 0.172            | 17.3                 | LOS B            | 1.4                                  | 9.9           | 0.69         | 0.74                           | 40.6                  |
| All Vehicles         |      | 292                  | 0.0  | 0.172            | 15.1                 | LOS B            | 1.4                                  | 9.9           | 0.71         | 0.67                           | 41.6                  |

## MOVEMENT SUMMARY

Site: IN12 - Bulban  
Rd/Armstrong Rd - PM Peak  
Ultimate

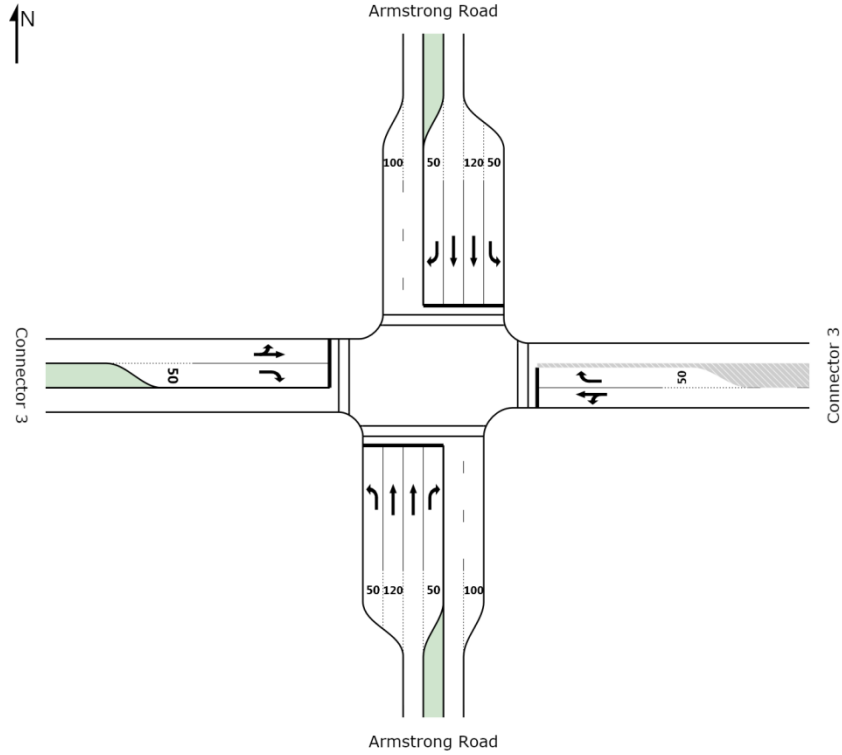
New Site

Signals - Fixed Time Cycle Time = 40 seconds (Practical Cycle Time)

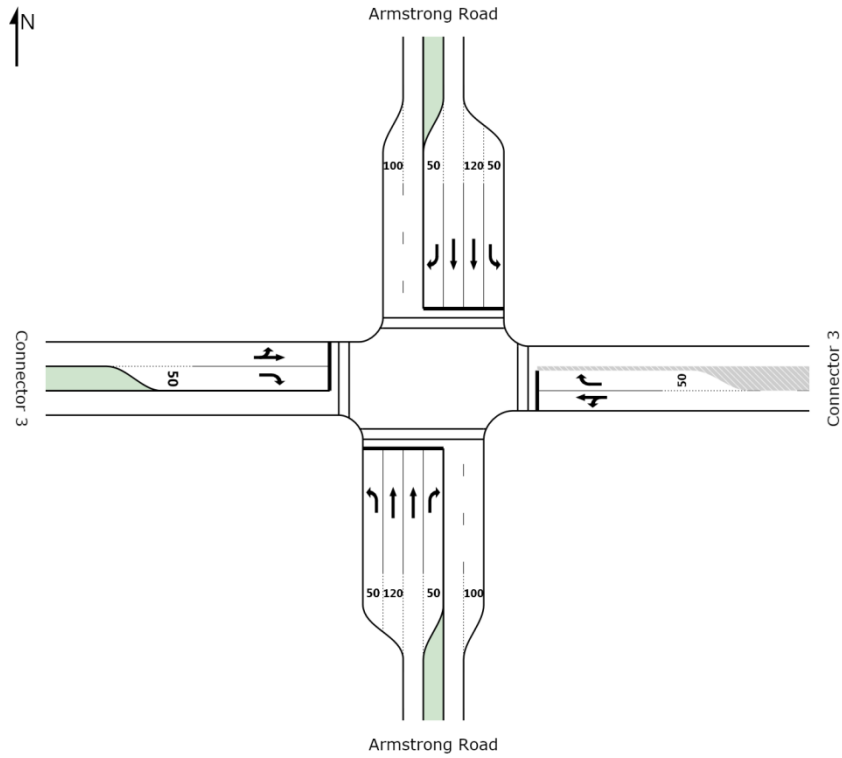
### Movement Performance - Vehicles

| Mov ID               | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|----------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                    | L    | 21                   | 0.0  | 0.034            | 16.8                 | LOS B            | 0.3                                  | 1.8           | 0.65         | 0.70                           | 41.0                  |
| 2                    | T    | 85                   | 0.0  | 0.117            | 9.0                  | LOS A            | 1.1                                  | 7.8           | 0.68         | 0.53                           | 45.7                  |
| Approach             |      | 106                  | 0.0  | 0.117            | 10.6                 | LOS B            | 1.1                                  | 7.8           | 0.68         | 0.56                           | 44.6                  |
| North: Bulban Road   |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 8                    | T    | 21                   | 0.0  | 0.029            | 8.6                  | LOS A            | 0.3                                  | 1.8           | 0.65         | 0.47                           | 46.1                  |
| 9                    | R    | 106                  | 0.0  | 0.197            | 18.5                 | LOS B            | 1.5                                  | 10.6          | 0.73         | 0.76                           | 39.7                  |
| Approach             |      | 127                  | 0.0  | 0.197            | 16.9                 | LOS B            | 1.5                                  | 10.6          | 0.72         | 0.72                           | 40.6                  |
| West: Armstrong Road |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                   | L    | 37                   | 0.0  | 0.061            | 18.5                 | LOS B            | 0.5                                  | 3.6           | 0.72         | 0.72                           | 39.8                  |
| 12                   | R    | 21                   | 0.0  | 0.035            | 18.4                 | LOS B            | 0.3                                  | 2.0           | 0.71         | 0.70                           | 39.7                  |
| Approach             |      | 58                   | 0.0  | 0.061            | 18.4                 | LOS B            | 0.5                                  | 3.6           | 0.71         | 0.71                           | 39.8                  |
| All Vehicles         |      | 292                  | 0.0  | 0.197            | 14.9                 | LOS B            | 1.5                                  | 10.6          | 0.70         | 0.66                           | 41.8                  |

### IN 13 Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: Armstrong Rd & Connector 3 (IN14) -  
AM Peak Interim - Conversion

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 193         | 0.0 | 0.799     | 53.4          | LOS D            | 10.3                       | 71.8     | 0.85         | 0.88                | 24.3          |
| 2                     | T    | 384         | 0.0 | 0.693     | 49.3          | LOS D            | 13.9                       | 97.5     | 0.97         | 0.81                | 24.5          |
| 3                     | R    | 20          | 0.0 | 0.071     | 32.5          | LOS C            | 0.7                        | 5.0      | 0.65         | 0.70                | 31.7          |
| Approach              |      | 597         | 0.0 | 0.799     | 50.1          | LOS D            | 13.9                       | 97.5     | 0.92         | 0.83                | 24.6          |
| East: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 20          | 0.0 | 0.144     | 50.9          | LOS D            | 2.6                        | 18.0     | 0.86         | 0.78                | 25.6          |
| 5                     | T    | 33          | 0.0 | 0.144     | 42.7          | LOS D            | 2.6                        | 18.0     | 0.86         | 0.66                | 26.1          |
| 6                     | R    | 80          | 0.0 | 0.862     | 79.4          | LOS E            | 5.3                        | 37.2     | 1.00         | 0.95                | 18.9          |
| Approach              |      | 133         | 0.0 | 0.862     | 66.0          | LOS E            | 5.3                        | 37.2     | 0.94         | 0.85                | 21.2          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 52          | 0.0 | 0.214     | 42.0          | LOS D            | 2.2                        | 15.6     | 0.77         | 0.74                | 27.8          |
| 8                     | T    | 487         | 0.0 | 0.879     | 57.2          | LOS E            | 20.6                       | 144.0    | 0.98         | 0.94                | 22.5          |
| 9                     | R    | 246         | 0.0 | 0.888     | 49.3          | LOS D            | 11.7                       | 81.6     | 0.87         | 0.87                | 25.5          |
| Approach              |      | 785         | 0.0 | 0.888     | 53.7          | LOS D            | 20.6                       | 144.0    | 0.93         | 0.91                | 23.6          |
| West: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 72          | 0.0 | 0.198     | 47.1          | LOS D            | 4.3                        | 30.0     | 0.84         | 0.78                | 26.3          |
| 11                    | T    | 20          | 0.0 | 0.198     | 39.0          | LOS D            | 4.3                        | 30.0     | 0.84         | 0.66                | 26.9          |
| 12                    | R    | 54          | 0.0 | 0.561     | 72.6          | LOS E            | 3.3                        | 23.3     | 1.00         | 0.76                | 20.1          |
| Approach              |      | 146         | 0.0 | 0.561     | 55.4          | LOS E            | 4.3                        | 30.0     | 0.90         | 0.76                | 23.6          |
| All Vehicles          |      | 1661        | 0.0 | 0.888     | 53.6          | LOS D            | 20.6                       | 144.0    | 0.92         | 0.86                | 23.8          |

## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 3 (IN14) - PM Peak  
Interim

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 54          | 0.0 | 0.132     | 18.1          | LOS B            | 1.2                        | 8.7      | 0.42         | 0.71                | 40.0          |
| 2                     | T    | 487         | 0.0 | 0.716     | 45.7          | LOS D            | 17.4                       | 121.5    | 0.95         | 0.81                | 25.5          |
| 3                     | R    | 20          | 0.0 | 0.185     | 69.2          | LOS E            | 1.2                        | 8.2      | 0.98         | 0.70                | 20.6          |
| Approach              |      | 561         | 0.0 | 0.716     | 43.9          | LOS D            | 17.4                       | 121.5    | 0.90         | 0.80                | 26.2          |
| East: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 20          | 0.0 | 0.106     | 50.4          | LOS D            | 1.9                        | 13.4     | 0.85         | 0.76                | 25.6          |
| 5                     | T    | 20          | 0.0 | 0.106     | 42.2          | LOS D            | 1.9                        | 13.4     | 0.85         | 0.64                | 26.1          |
| 6                     | R    | 52          | 0.0 | 0.200     | 37.1          | LOS D            | 2.1                        | 14.4     | 0.72         | 0.73                | 29.7          |
| Approach              |      | 92          | 0.0 | 0.200     | 41.1          | LOS D            | 2.1                        | 14.4     | 0.78         | 0.72                | 27.9          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 80          | 0.0 | 0.196     | 18.3          | LOS B            | 1.9                        | 13.1     | 0.43         | 0.72                | 39.9          |
| 8                     | T    | 384         | 0.0 | 0.565     | 43.8          | LOS D            | 13.0                       | 90.9     | 0.92         | 0.76                | 26.2          |
| 9                     | R    | 72          | 0.0 | 0.665     | 72.7          | LOS E            | 4.5                        | 31.3     | 1.00         | 0.81                | 20.0          |
| Approach              |      | 536         | 0.0 | 0.665     | 43.8          | LOS D            | 13.0                       | 90.9     | 0.86         | 0.76                | 26.4          |
| West: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 246         | 0.0 | 0.575     | 50.1          | LOS D            | 14.3                       | 100.1    | 0.93         | 0.84                | 25.3          |
| 11                    | T    | 33          | 0.0 | 0.575     | 41.9          | LOS D            | 14.3                       | 100.1    | 0.93         | 0.79                | 25.6          |
| 12                    | R    | 193         | 0.0 | 0.742     | 44.3          | LOS D            | 9.1                        | 63.4     | 0.79         | 0.84                | 27.1          |
| Approach              |      | 472         | 0.0 | 0.742     | 47.2          | LOS D            | 14.3                       | 100.1    | 0.87         | 0.83                | 26.0          |
| All Vehicles          |      | 1661        | 0.0 | 0.742     | 44.6          | LOS D            | 17.4                       | 121.5    | 0.87         | 0.79                | 26.3          |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Connector 3  
(IN14) - AM Peak Ultimate

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
|                       |      | Vehicles    |     |           |               |                  | Distance          |      |              |                     |               |
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh               | m    |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                     | L    | 200         | 0.0 | 0.810     | 53.2          | LOS D            | 10.6              | 74.5 | 0.83         | 0.89                | 24.3          |
| 2                     | T    | 362         | 0.0 | 0.719     | 51.6          | LOS D            | 13.5              | 94.2 | 0.98         | 0.83                | 23.9          |
| 3                     | R    | 20          | 0.0 | 0.073     | 33.8          | LOS C            | 0.7               | 5.1  | 0.66         | 0.70                | 31.0          |
| Approach              |      | 582         | 0.0 | 0.810     | 51.5          | LOS D            | 13.5              | 94.2 | 0.92         | 0.84                | 24.2          |
| East: Connector 3     |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                     | L    | 24          | 0.0 | 0.133     | 50.7          | LOS D            | 2.4               | 16.9 | 0.86         | 0.77                | 25.6          |
| 5                     | T    | 26          | 0.0 | 0.133     | 42.5          | LOS D            | 2.4               | 16.9 | 0.86         | 0.65                | 26.0          |
| 6                     | R    | 101         | 0.0 | 0.653     | 69.0          | LOS E            | 6.1               | 42.6 | 1.00         | 0.81                | 20.7          |
| Approach              |      | 151         | 0.0 | 0.653     | 61.5          | LOS E            | 6.1               | 42.6 | 0.95         | 0.78                | 22.2          |
| North: Armstrong Road |      |             |     |           |               |                  |                   |      |              |                     |               |
| 7                     | L    | 53          | 0.0 | 0.213     | 40.4          | LOS D            | 2.2               | 15.5 | 0.75         | 0.74                | 28.4          |
| 8                     | T    | 314         | 0.0 | 0.623     | 50.0          | LOS D            | 11.2              | 78.7 | 0.96         | 0.78                | 24.3          |
| 9                     | R    | 220         | 0.0 | 0.813     | 49.3          | LOS D            | 11.1              | 77.5 | 0.78         | 0.89                | 25.5          |
| Approach              |      | 587         | 0.0 | 0.813     | 48.9          | LOS D            | 11.2              | 78.7 | 0.88         | 0.82                | 25.1          |
| West: Connector 3     |      |             |     |           |               |                  |                   |      |              |                     |               |
| 10                    | L    | 79          | 0.0 | 0.209     | 46.5          | LOS D            | 4.6               | 32.1 | 0.83         | 0.78                | 26.5          |
| 11                    | T    | 20          | 0.0 | 0.209     | 38.3          | LOS D            | 4.6               | 32.1 | 0.83         | 0.66                | 27.1          |
| 12                    | R    | 61          | 0.0 | 0.380     | 66.4          | LOS E            | 3.5               | 24.7 | 0.99         | 0.76                | 21.3          |
| Approach              |      | 160         | 0.0 | 0.380     | 53.0          | LOS D            | 4.6               | 32.1 | 0.89         | 0.76                | 24.3          |
| All Vehicles          |      | 1480        | 0.0 | 0.813     | 51.7          | LOS D            | 13.5              | 94.2 | 0.90         | 0.82                | 24.3          |

## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 3 (IN14) - PM Peak  
Ultimate - Copy

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28

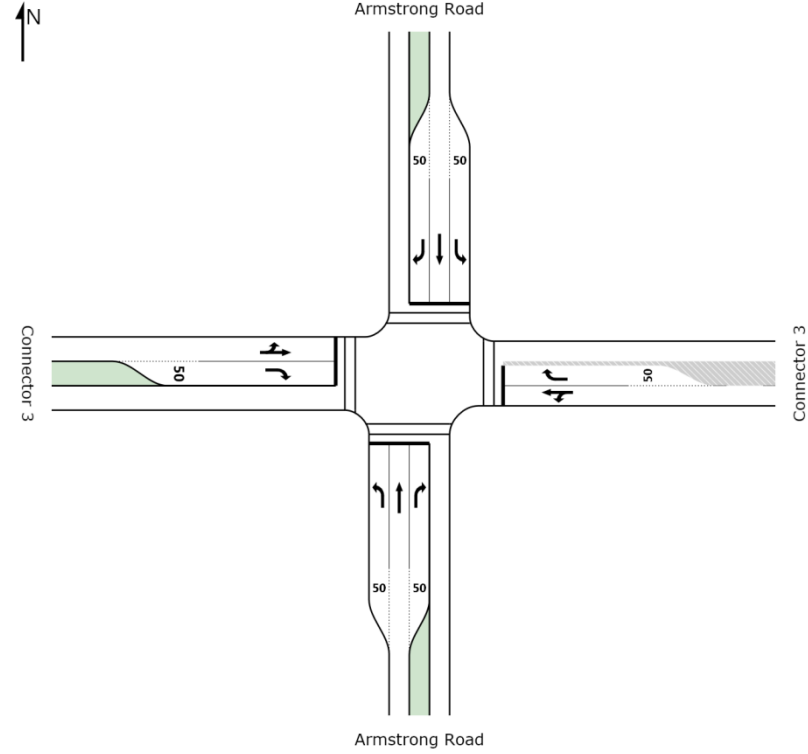
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

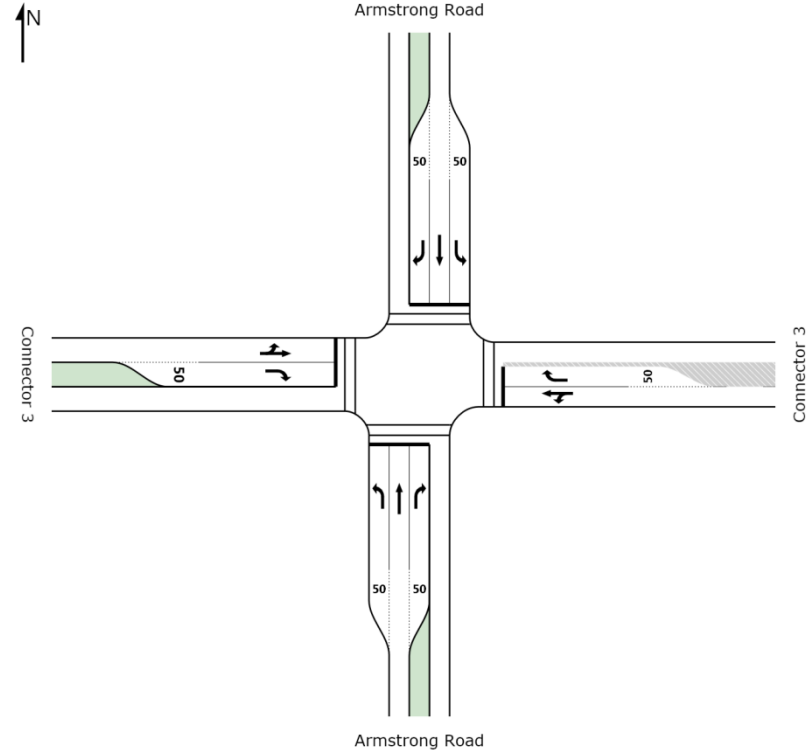
| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     |                     |               |      |
|                       |      |             |     |           |               |                  | veh               | m            | per veh             | km/h          |      |
| South: Armstrong Road |      |             |     |           |               |                  |                   |              |                     |               |      |
| 1                     | L    | 64          | 0.0 | 0.157     | 18.2          | LOS B            | 1.5               | 10.3         | 0.43                | 0.71          | 40.0 |
| 2                     | T    | 314         | 0.0 | 0.623     | 50.0          | LOS D            | 11.2              | 78.7         | 0.96                | 0.78          | 24.3 |
| 3                     | R    | 24          | 0.0 | 0.222     | 69.4          | LOS E            | 1.4               | 9.9          | 0.99                | 0.71          | 20.6 |
| Approach              |      | 402         | 0.0 | 0.623     | 46.1          | LOS D            | 11.2              | 78.7         | 0.88                | 0.77          | 25.6 |
| East: Connector 3     |      |             |     |           |               |                  |                   |              |                     |               |      |
| 4                     | L    | 20          | 0.0 | 0.106     | 50.4          | LOS D            | 1.9               | 13.4         | 0.85                | 0.76          | 25.6 |
| 5                     | T    | 20          | 0.0 | 0.106     | 42.2          | LOS D            | 1.9               | 13.4         | 0.85                | 0.64          | 26.1 |
| 6                     | R    | 53          | 0.0 | 0.188     | 32.2          | LOS C            | 1.9               | 13.4         | 0.66                | 0.72          | 31.9 |
| Approach              |      | 93          | 0.0 | 0.188     | 38.3          | LOS D            | 1.9               | 13.4         | 0.74                | 0.71          | 29.0 |
| North: Armstrong Road |      |             |     |           |               |                  |                   |              |                     |               |      |
| 7                     | L    | 101         | 0.0 | 0.248     | 18.4          | LOS B            | 2.4               | 16.7         | 0.44                | 0.72          | 39.8 |
| 8                     | T    | 362         | 0.0 | 0.719     | 51.6          | LOS D            | 13.5              | 94.2         | 0.98                | 0.83          | 23.9 |
| 9                     | R    | 79          | 0.0 | 0.729     | 73.8          | LOS E            | 5.0               | 34.8         | 1.00                | 0.84          | 19.8 |
| Approach              |      | 542         | 0.0 | 0.729     | 48.6          | LOS D            | 13.5              | 94.2         | 0.88                | 0.81          | 25.0 |
| West: Connector 3     |      |             |     |           |               |                  |                   |              |                     |               |      |
| 10                    | L    | 220         | 0.0 | 0.500     | 49.1          | LOS D            | 12.3              | 86.2         | 0.90                | 0.83          | 25.6 |
| 11                    | T    | 26          | 0.0 | 0.500     | 41.0          | LOS D            | 12.3              | 86.2         | 0.90                | 0.76          | 25.9 |
| 12                    | R    | 200         | 0.0 | 0.708     | 37.2          | LOS D            | 8.4               | 58.6         | 0.72                | 0.80          | 29.7 |
| Approach              |      | 446         | 0.0 | 0.708     | 43.3          | LOS D            | 12.3              | 86.2         | 0.82                | 0.81          | 27.3 |
| All Vehicles          |      | 1483        | 0.0 | 0.729     | 45.7          | LOS D            | 13.5              | 94.2         | 0.85                | 0.79          | 26.1 |

# IN 14

## Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 3 (IN14) - AM Peak  
Interim - Conversion - Copy

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |                      |                  |                   |               |              |                                |                       |
|---------------------------------|------|-------------|-----|-----------|----------------------|------------------|-------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay<br>sec | Level of Service | 95% Back of Queue |               | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|                                 |      | veh/h       | %   | v/c       |                      |                  | Vehicles<br>veh   | Distance<br>m |              |                                |                       |
| South: Armstrong Road           |      |             |     |           |                      |                  |                   |               |              |                                |                       |
| 1                               | L    | 193         | 0.0 | 0.713     | 40.0                 | LOS D            | 8.5               | 59.2          | 0.75         | 0.82                           | 28.5                  |
| 2                               | T    | 384         | 0.0 | 0.738     | 44.2                 | LOS D            | 20.9              | 146.3         | 0.97         | 0.86                           | 26.0                  |
| 3                               | R    | 20          | 0.0 | 0.075     | 35.3                 | LOS D            | 0.8               | 5.3           | 0.68         | 0.71                           | 30.3                  |
| Approach                        |      | 597         | 0.0 | 0.738     | 42.5                 | LOS D            | 20.9              | 146.3         | 0.89         | 0.84                           | 26.9                  |
| East: Connector 3               |      |             |     |           |                      |                  |                   |               |              |                                |                       |
| 4                               | L    | 20          | 0.0 | 0.194     | 57.0                 | LOS E            | 2.8               | 19.3          | 0.91         | 0.77                           | 23.9                  |
| 5                               | T    | 33          | 0.0 | 0.194     | 48.8                 | LOS D            | 2.8               | 19.3          | 0.91         | 0.69                           | 24.2                  |
| 6                               | R    | 80          | 0.0 | 0.862     | 79.6                 | LOS E            | 5.3               | 37.2          | 1.00         | 0.95                           | 18.8                  |
| Approach                        |      | 133         | 0.0 | 0.862     | 68.6                 | LOS E            | 5.3               | 37.2          | 0.97         | 0.86                           | 20.6                  |
| North: Armstrong Road           |      |             |     |           |                      |                  |                   |               |              |                                |                       |
| 7                               | L    | 52          | 0.0 | 0.191     | 34.4                 | LOS C            | 2.0               | 13.7          | 0.68         | 0.73                           | 30.8                  |
| 8                               | T    | 487         | 0.0 | 0.937     | 70.7                 | LOS E            | 36.2              | 253.1         | 1.00         | 1.18                           | 19.7                  |
| 9                               | R    | 246         | 0.0 | 0.931     | 50.1                 | LOS D            | 11.7              | 81.6          | 0.91         | 0.85                           | 25.2                  |
| Approach                        |      | 785         | 0.0 | 0.937     | 61.8                 | LOS E            | 36.2              | 253.1         | 0.95         | 1.05                           | 21.7                  |
| West: Connector 3               |      |             |     |           |                      |                  |                   |               |              |                                |                       |
| 10                              | L    | 72          | 0.0 | 0.251     | 52.8                 | LOS D            | 4.6               | 32.3          | 0.89         | 0.78                           | 24.6                  |
| 11                              | T    | 20          | 0.0 | 0.251     | 44.7                 | LOS D            | 4.6               | 32.3          | 0.89         | 0.70                           | 25.0                  |
| 12                              | R    | 54          | 0.0 | 0.561     | 72.7                 | LOS E            | 3.3               | 23.3          | 1.00         | 0.76                           | 20.0                  |
| Approach                        |      | 146         | 0.0 | 0.561     | 59.1                 | LOS E            | 4.6               | 32.3          | 0.93         | 0.76                           | 22.7                  |
| All Vehicles                    |      | 1661        | 0.0 | 0.937     | 55.2                 | LOS E            | 36.2              | 253.1         | 0.93         | 0.93                           | 23.3                  |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Connector 3  
(IN14) - PM Peak Interim - Copy

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 54          | 0.0 | 0.117     | 15.4          | LOS B            | 1.1                        | 7.4      | 0.36         | 0.70                | 42.2          |
| 2                               | T    | 487         | 0.0 | 0.768     | 40.3          | LOS D            | 26.1                       | 182.9    | 0.96         | 0.87                | 27.3          |
| 3                               | R    | 20          | 0.0 | 0.215     | 71.0          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.3          |
| Approach                        |      | 561         | 0.0 | 0.768     | 39.0          | LOS D            | 26.1                       | 182.9    | 0.91         | 0.85                | 27.9          |
| East: Connector 3               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.141     | 56.4          | LOS E            | 2.1                        | 14.4     | 0.90         | 0.75                | 24.0          |
| 5                               | T    | 20          | 0.0 | 0.141     | 48.2          | LOS D            | 2.1                        | 14.4     | 0.90         | 0.67                | 24.3          |
| 6                               | R    | 52          | 0.0 | 0.211     | 41.2          | LOS D            | 2.2                        | 15.4     | 0.76         | 0.74                | 28.1          |
| Approach                        |      | 92          | 0.0 | 0.211     | 46.0          | LOS D            | 2.2                        | 15.4     | 0.82         | 0.73                | 26.2          |
| North: Armstrong Road           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                               | L    | 80          | 0.0 | 0.173     | 15.5          | LOS B            | 1.6                        | 11.1     | 0.37         | 0.71                | 42.1          |
| 8                               | T    | 384         | 0.0 | 0.606     | 36.6          | LOS D            | 18.9                       | 132.0    | 0.90         | 0.78                | 28.7          |
| 9                               | R    | 72          | 0.0 | 0.775     | 76.1          | LOS E            | 4.6                        | 32.4     | 1.00         | 0.87                | 19.3          |
| Approach                        |      | 536         | 0.0 | 0.775     | 38.7          | LOS D            | 18.9                       | 132.0    | 0.83         | 0.78                | 28.2          |
| West: Connector 3               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                              | L    | 246         | 0.0 | 0.730     | 58.5          | LOS E            | 15.8                       | 110.9    | 0.99         | 0.87                | 23.1          |
| 11                              | T    | 33          | 0.0 | 0.730     | 50.4          | LOS D            | 15.8                       | 110.9    | 0.99         | 0.86                | 23.2          |
| 12                              | R    | 193         | 0.0 | 0.785     | 51.2          | LOS D            | 10.0                       | 69.7     | 0.83         | 0.87                | 24.9          |
| Approach                        |      | 472         | 0.0 | 0.785     | 55.0          | LOS D            | 15.8                       | 110.9    | 0.93         | 0.87                | 23.8          |
| All Vehicles                    |      | 1661        | 0.0 | 0.785     | 43.8          | LOS D            | 26.1                       | 182.9    | 0.88         | 0.82                | 26.6          |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Connector 3  
(IN14) - AM Peak Ultimate - Copy

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 200         | 0.0 | 0.756     | 44.2          | LOS D            | 9.4                        | 65.8     | 0.77         | 0.84                | 27.0          |
| 2                     | T    | 362         | 0.0 | 0.796     | 50.3          | LOS D            | 21.1                       | 148.0    | 1.00         | 0.93                | 24.2          |
| 3                     | R    | 20          | 0.0 | 0.073     | 33.9          | LOS C            | 0.7                        | 5.1      | 0.66         | 0.70                | 31.0          |
| Approach              |      | 582         | 0.0 | 0.796     | 47.6          | LOS D            | 21.1                       | 148.0    | 0.91         | 0.89                | 25.3          |
| East: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 24          | 0.0 | 0.178     | 56.8          | LOS E            | 2.6                        | 18.1     | 0.91         | 0.76                | 23.9          |
| 5                     | T    | 26          | 0.0 | 0.178     | 48.6          | LOS D            | 2.6                        | 18.1     | 0.91         | 0.69                | 24.2          |
| 6                     | R    | 101         | 0.0 | 0.816     | 75.4          | LOS E            | 6.5                        | 45.4     | 1.00         | 0.91                | 19.5          |
| Approach              |      | 151         | 0.0 | 0.816     | 67.8          | LOS E            | 6.5                        | 45.4     | 0.97         | 0.85                | 20.8          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 53          | 0.0 | 0.199     | 35.9          | LOS D            | 2.0                        | 14.3     | 0.70         | 0.73                | 30.2          |
| 8                     | T    | 314         | 0.0 | 0.690     | 45.7          | LOS D            | 17.0                       | 118.7    | 0.97         | 0.83                | 25.5          |
| 9                     | R    | 220         | 0.0 | 0.813     | 49.4          | LOS D            | 11.1                       | 77.5     | 0.78         | 0.89                | 25.4          |
| Approach              |      | 587         | 0.0 | 0.813     | 46.2          | LOS D            | 17.0                       | 118.7    | 0.88         | 0.84                | 25.8          |
| West: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 79          | 0.0 | 0.262     | 52.1          | LOS D            | 4.9                        | 34.5     | 0.89         | 0.79                | 24.8          |
| 11                    | T    | 20          | 0.0 | 0.262     | 43.9          | LOS D            | 4.9                        | 34.5     | 0.89         | 0.70                | 25.2          |
| 12                    | R    | 61          | 0.0 | 0.475     | 69.5          | LOS E            | 3.6                        | 25.5     | 1.00         | 0.75                | 20.6          |
| Approach              |      | 160         | 0.0 | 0.475     | 57.7          | LOS E            | 4.9                        | 34.5     | 0.93         | 0.76                | 23.1          |
| All Vehicles          |      | 1480        | 0.0 | 0.816     | 50.2          | LOS D            | 21.1                       | 148.0    | 0.91         | 0.85                | 24.7          |

## MOVEMENT SUMMARY

Site: Armstrong Rd &  
Connector 3 (IN14) - PM Peak  
Ultimate - Copy - Copy

120221sid-12M1296000 - Armstrong Rd & Connector 3 - IN28

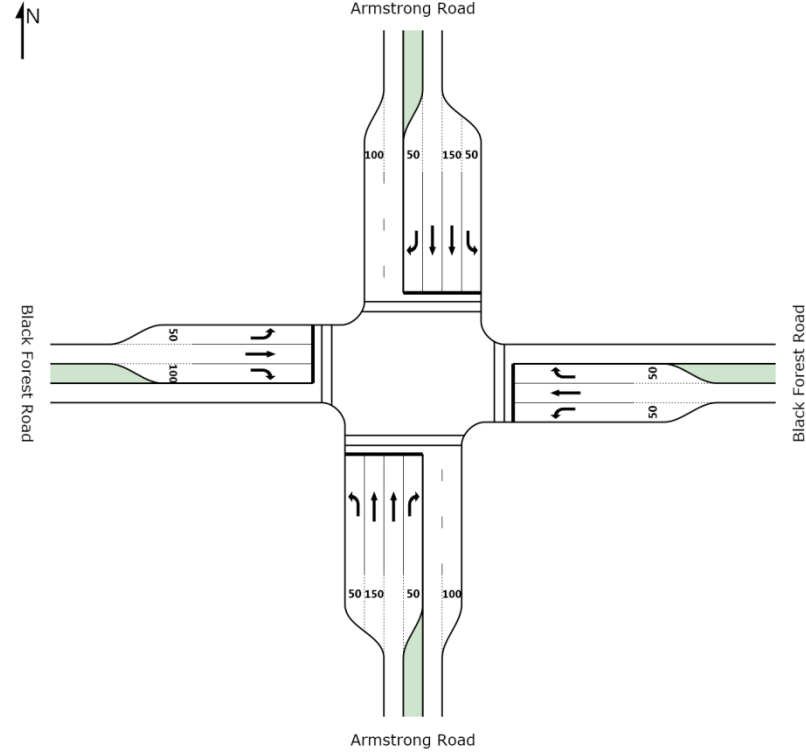
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

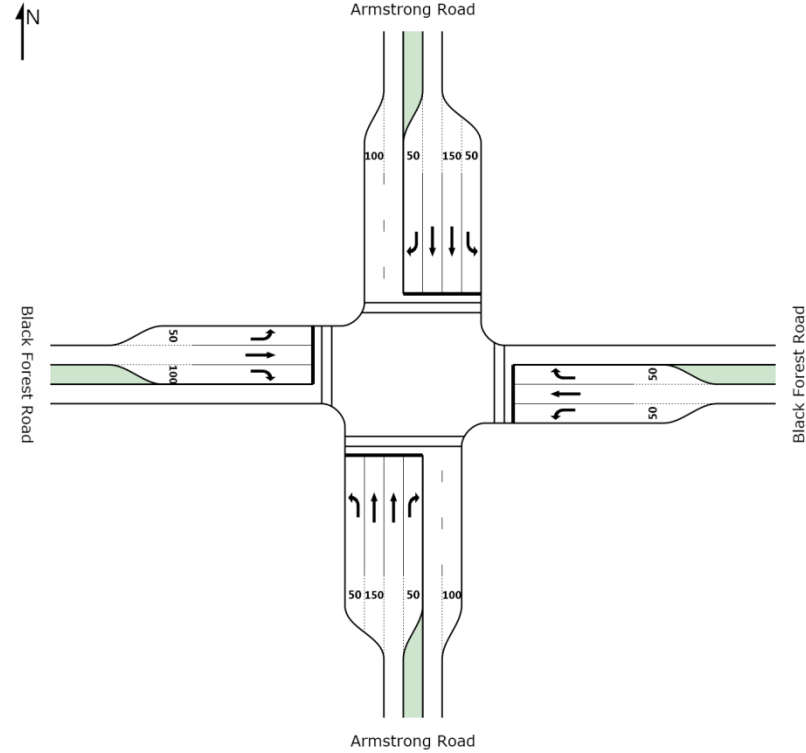
| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                     | L    | 64          | 0.0 | 0.141     | 15.8          | LOS B            | 1.3                        | 9.0      | 0.37         | 0.71                | 41.8          |
| 2                     | T    | 314         | 0.0 | 0.644     | 43.6          | LOS D            | 16.5                       | 115.7    | 0.95         | 0.81                | 26.2          |
| 3                     | R    | 24          | 0.0 | 0.222     | 69.5          | LOS E            | 1.4                        | 9.9      | 0.99         | 0.71                | 20.5          |
| Approach              |      | 402         | 0.0 | 0.644     | 40.7          | LOS D            | 16.5                       | 115.7    | 0.86         | 0.79                | 27.4          |
| East: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                     | L    | 20          | 0.0 | 0.141     | 56.4          | LOS E            | 2.1                        | 14.4     | 0.90         | 0.75                | 24.0          |
| 5                     | T    | 20          | 0.0 | 0.141     | 48.2          | LOS D            | 2.1                        | 14.4     | 0.90         | 0.67                | 24.3          |
| 6                     | R    | 53          | 0.0 | 0.197     | 35.1          | LOS D            | 2.0                        | 14.1     | 0.69         | 0.73                | 30.5          |
| Approach              |      | 93          | 0.0 | 0.197     | 42.5          | LOS D            | 2.1                        | 14.4     | 0.78         | 0.72                | 27.4          |
| North: Armstrong Road |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                     | L    | 101         | 0.0 | 0.223     | 15.9          | LOS B            | 2.1                        | 14.5     | 0.38         | 0.72                | 41.7          |
| 8                     | T    | 362         | 0.0 | 0.743     | 46.0          | LOS D            | 20.0                       | 140.0    | 0.98         | 0.87                | 25.4          |
| 9                     | R    | 79          | 0.0 | 0.729     | 73.9          | LOS E            | 5.0                        | 34.8     | 1.00         | 0.84                | 19.7          |
| Approach              |      | 542         | 0.0 | 0.743     | 44.4          | LOS D            | 20.0                       | 140.0    | 0.87         | 0.84                | 26.2          |
| West: Connector 3     |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                    | L    | 220         | 0.0 | 0.623     | 55.3          | LOS E            | 13.3                       | 92.9     | 0.96         | 0.83                | 23.9          |
| 11                    | T    | 26          | 0.0 | 0.623     | 47.1          | LOS D            | 13.3                       | 92.9     | 0.96         | 0.81                | 24.1          |
| 12                    | R    | 200         | 0.0 | 0.743     | 42.3          | LOS D            | 9.1                        | 63.8     | 0.76         | 0.83                | 27.7          |
| Approach              |      | 446         | 0.0 | 0.743     | 49.0          | LOS D            | 13.3                       | 92.9     | 0.87         | 0.83                | 25.5          |
| All Vehicles          |      | 1483        | 0.0 | 0.743     | 44.7          | LOS D            | 20.0                       | 140.0    | 0.86         | 0.81                | 26.4          |

## IN 15

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: Armstrong Rd & Black Forest Rd (IN15) - AM Peak Interim

120221sid-12M1296000 - Armstrong Rd & Black Forest Rd - IN23  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Armstrong Road           |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                               | L    | 230         | 0.0 | 0.566     | 20.1          | LOS C            | 5.9               | 41.2  | 0.51         | 0.75                | 38.6          |
| 2                               | T    | 276         | 0.0 | 0.262     | 28.5          | LOS C            | 7.5               | 52.7  | 0.74         | 0.60                | 32.3          |
| 3                               | R    | 30          | 0.0 | 0.277     | 69.7          | LOS E            | 1.8               | 12.5  | 0.99         | 0.72                | 20.6          |
| Approach                        |      | 536         | 0.0 | 0.566     | 27.2          | LOS C            | 7.5               | 52.7  | 0.65         | 0.67                | 33.6          |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                               | L    | 90          | 0.0 | 0.367     | 42.0          | LOS D            | 3.9               | 27.3  | 0.78         | 0.76                | 27.8          |
| 5                               | T    | 162         | 0.0 | 0.453     | 47.6          | LOS D            | 8.6               | 59.9  | 0.94         | 0.77                | 25.0          |
| 6                               | R    | 21          | 0.0 | 0.095     | 49.7          | LOS D            | 1.0               | 6.9   | 0.84         | 0.70                | 25.4          |
| Approach                        |      | 273         | 0.0 | 0.453     | 45.9          | LOS D            | 8.6               | 59.9  | 0.88         | 0.76                | 25.9          |
| North: Armstrong Road           |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                               | L    | 20          | 0.0 | 0.049     | 17.9          | LOS B            | 0.4               | 3.1   | 0.41         | 0.69                | 40.2          |
| 8                               | T    | 550         | 0.0 | 0.523     | 31.4          | LOS C            | 16.8              | 117.6 | 0.81         | 0.70                | 30.9          |
| 9                               | R    | 61          | 0.0 | 0.563     | 71.5          | LOS E            | 3.7               | 26.1  | 1.00         | 0.77                | 20.2          |
| Approach                        |      | 631         | 0.0 | 0.563     | 34.8          | LOS C            | 16.8              | 117.6 | 0.82         | 0.70                | 29.6          |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                              | L    | 95          | 0.0 | 0.387     | 42.1          | LOS D            | 4.1               | 28.9  | 0.79         | 0.76                | 27.8          |
| 11                              | T    | 138         | 0.0 | 0.386     | 46.9          | LOS D            | 7.2               | 50.3  | 0.93         | 0.75                | 25.2          |
| 12                              | R    | 194         | 0.0 | 0.522     | 54.8          | LOS D            | 10.3              | 72.0  | 0.94         | 0.82                | 24.0          |
| Approach                        |      | 427         | 0.0 | 0.522     | 49.4          | LOS D            | 10.3              | 72.0  | 0.90         | 0.78                | 25.1          |
| All Vehicles                    |      | 1867        | 0.0 | 0.566     | 37.6          | LOS D            | 16.8              | 117.6 | 0.80         | 0.72                | 28.8          |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Black Forest Rd (IN15) - PM Peak Interim

120221sid-12M1296000 - Armstrong Rd & Black Forest Rd - IN23  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |              |                     |               |      |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles veh      | Distance m   |                     | per veh       | km/h |
| South: Armstrong Road           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 1                               | L    | 194         | 0.0 | 0.518     | 21.4          | LOS C            | 5.4               | 37.7         | 0.51                | 0.75          | 37.7 |
| 2                               | T    | 550         | 0.0 | 0.504     | 29.8          | LOS C            | 16.5              | 115.7        | 0.79                | 0.68          | 31.7 |
| 3                               | R    | 90          | 0.0 | 0.485     | 65.2          | LOS E            | 5.2               | 36.3         | 0.99                | 0.78          | 21.5 |
| Approach                        |      | 834         | 0.0 | 0.518     | 31.7          | LOS C            | 16.5              | 115.7        | 0.75                | 0.71          | 31.2 |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |              |                     |               |      |
| 4                               | L    | 30          | 0.0 | 0.115     | 36.9          | LOS D            | 1.2               | 8.2          | 0.71                | 0.71          | 29.7 |
| 5                               | T    | 138         | 0.0 | 0.386     | 46.9          | LOS D            | 7.2               | 50.3         | 0.93                | 0.75          | 25.2 |
| 6                               | R    | 18          | 0.0 | 0.088     | 56.4          | LOS E            | 0.9               | 6.4          | 0.90                | 0.70          | 23.5 |
| Approach                        |      | 186         | 0.0 | 0.386     | 46.2          | LOS D            | 7.2               | 50.3         | 0.89                | 0.74          | 25.7 |
| North: Armstrong Road           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 7                               | L    | 21          | 0.0 | 0.056     | 20.1          | LOS C            | 0.5               | 3.7          | 0.46                | 0.69          | 38.6 |
| 8                               | T    | 276         | 0.0 | 0.253     | 27.1          | LOS C            | 7.4               | 51.7         | 0.72                | 0.59          | 33.1 |
| 9                               | R    | 95          | 0.0 | 0.512     | 65.4          | LOS E            | 5.5               | 38.4         | 0.99                | 0.78          | 21.4 |
| Approach                        |      | 392         | 0.0 | 0.512     | 36.0          | LOS D            | 7.4               | 51.7         | 0.77                | 0.64          | 29.4 |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |              |                     |               |      |
| 10                              | L    | 64          | 0.0 | 0.246     | 37.5          | LOS D            | 2.6               | 17.9         | 0.72                | 0.74          | 29.5 |
| 11                              | T    | 162         | 0.0 | 0.453     | 47.6          | LOS D            | 8.6               | 59.9         | 0.94                | 0.77          | 25.0 |
| 12                              | R    | 130         | 0.0 | 0.494     | 60.5          | LOS E            | 7.2               | 50.4         | 0.97                | 0.80          | 22.6 |
| Approach                        |      | 356         | 0.0 | 0.494     | 50.5          | LOS D            | 8.6               | 59.9         | 0.91                | 0.77          | 24.7 |
| All Vehicles                    |      | 1768        | 0.0 | 0.518     | 37.9          | LOS D            | 16.5              | 115.7        | 0.80                | 0.71          | 28.7 |

## MOVEMENT SUMMARY

Site: Armstrong Rd & Black Forest Rd (IN15) - AM Peak Ultimate

120221sid-12M1296000 - Armstrong Rd & Black Forest Rd - IN23  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Armstrong Road           |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                               | L    | 167         | 0.0 | 0.623     | 37.2          | LOS D            | 6.8               | 47.9  | 0.75         | 0.78                | 29.6          |
| 2                               | T    | 353         | 0.0 | 0.607     | 47.4          | LOS D            | 12.3              | 86.3  | 0.95         | 0.78                | 25.1          |
| 3                               | R    | 22          | 0.0 | 0.087     | 38.8          | LOS D            | 0.9               | 6.2   | 0.73         | 0.70                | 29.0          |
| Approach                        |      | 542         | 0.0 | 0.623     | 43.9          | LOS D            | 12.3              | 86.3  | 0.88         | 0.78                | 26.5          |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                               | L    | 45          | 0.0 | 0.125     | 21.7          | LOS C            | 1.2               | 8.4   | 0.49         | 0.71                | 37.5          |
| 5                               | T    | 128         | 0.0 | 0.358     | 46.6          | LOS D            | 6.6               | 46.4  | 0.92         | 0.74                | 25.3          |
| 6                               | R    | 20          | 0.0 | 0.101     | 59.8          | LOS E            | 1.1               | 7.4   | 0.92         | 0.71                | 22.7          |
| Approach                        |      | 193         | 0.0 | 0.358     | 42.2          | LOS D            | 6.6               | 46.4  | 0.82         | 0.73                | 27.0          |
| North: Armstrong Road           |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                               | L    | 20          | 0.0 | 0.074     | 34.5          | LOS C            | 0.7               | 5.2   | 0.67         | 0.70                | 30.7          |
| 8                               | T    | 438         | 0.0 | 0.753     | 50.0          | LOS D            | 16.3              | 114.0 | 0.97         | 0.84                | 24.3          |
| 9                               | R    | 194         | 0.0 | 0.776     | 49.2          | LOS D            | 9.8               | 68.5  | 0.82         | 0.87                | 25.5          |
| Approach                        |      | 652         | 0.0 | 0.776     | 49.3          | LOS D            | 16.3              | 114.0 | 0.92         | 0.84                | 24.8          |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                              | L    | 146         | 0.0 | 0.408     | 22.6          | LOS C            | 4.2               | 29.1  | 0.53         | 0.74                | 37.0          |
| 11                              | T    | 75          | 0.0 | 0.210     | 45.1          | LOS D            | 3.8               | 26.3  | 0.89         | 0.69                | 25.8          |
| 12                              | R    | 164         | 0.0 | 0.757     | 67.7          | LOS E            | 10.0              | 69.8  | 1.00         | 0.87                | 21.0          |
| Approach                        |      | 385         | 0.0 | 0.757     | 46.2          | LOS D            | 10.0              | 69.8  | 0.80         | 0.79                | 26.2          |
| All Vehicles                    |      | 1772        | 0.0 | 0.776     | 46.2          | LOS D            | 16.3              | 114.0 | 0.87         | 0.80                | 25.8          |

## MOVEMENT SUMMARY

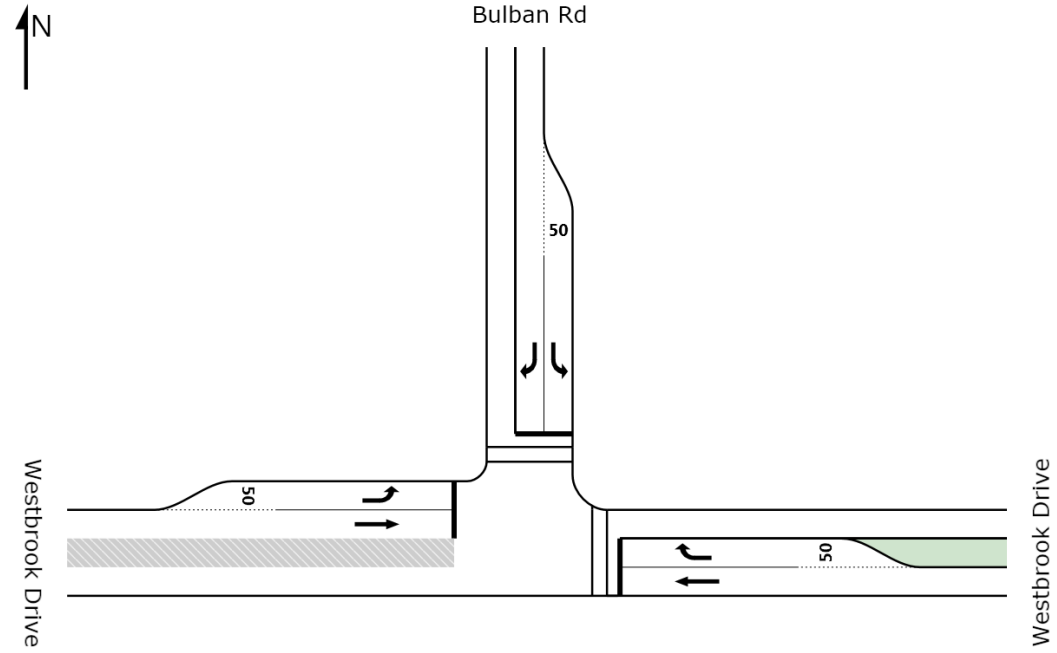
Site: Armstrong Rd & Black Forest Rd (IN05) - PM Peak Ultimate

120221sid-12M1296000 - Armstrong Rd & Black Forest Rd - IN23  
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

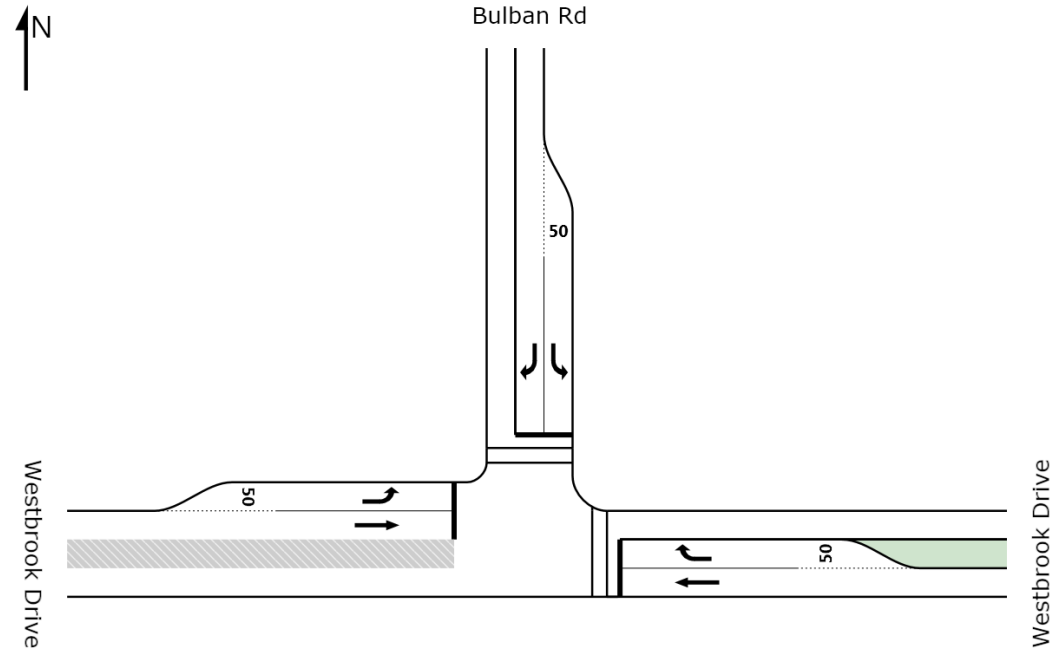
| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |              |                     |               |      |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles veh      | Distance m   | per veh             | km/h          |      |
| South: Armstrong Road           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 1                               | L    | 164         | 0.0 | 0.555     | 31.3          | LOS C            | 6.0               | 41.8         | 0.67                | 0.77          | 32.2 |
| 2                               | T    | 438         | 0.0 | 0.619     | 43.5          | LOS D            | 14.9              | 104.2        | 0.93                | 0.77          | 26.2 |
| 3                               | R    | 45          | 0.0 | 0.195     | 46.0          | LOS D            | 2.0               | 14.3         | 0.81                | 0.73          | 26.5 |
| Approach                        |      | 647         | 0.0 | 0.619     | 40.6          | LOS D            | 14.9              | 104.2        | 0.85                | 0.77          | 27.6 |
| East: Black Forest Road         |      |             |     |           |               |                  |                   |              |                     |               |      |
| 4                               | L    | 22          | 0.0 | 0.068     | 25.7          | LOS C            | 0.7               | 4.7          | 0.55                | 0.70          | 35.1 |
| 5                               | T    | 75          | 0.0 | 0.210     | 45.1          | LOS D            | 3.8               | 26.3         | 0.89                | 0.69          | 25.8 |
| 6                               | R    | 20          | 0.0 | 0.098     | 56.5          | LOS E            | 1.0               | 7.2          | 0.90                | 0.71          | 23.5 |
| Approach                        |      | 117         | 0.0 | 0.210     | 43.4          | LOS D            | 3.8               | 26.3         | 0.83                | 0.70          | 26.7 |
| North: Armstrong Road           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 7                               | L    | 20          | 0.0 | 0.067     | 29.2          | LOS C            | 0.7               | 4.6          | 0.60                | 0.70          | 33.2 |
| 8                               | T    | 353         | 0.0 | 0.499     | 42.3          | LOS D            | 11.6              | 81.2         | 0.90                | 0.74          | 26.7 |
| 9                               | R    | 146         | 0.0 | 0.637     | 49.1          | LOS D            | 7.1               | 50.0         | 0.87                | 0.80          | 25.5 |
| Approach                        |      | 519         | 0.0 | 0.637     | 43.7          | LOS D            | 11.6              | 81.2         | 0.88                | 0.76          | 26.5 |
| West: Black Forest Road         |      |             |     |           |               |                  |                   |              |                     |               |      |
| 10                              | L    | 194         | 0.0 | 0.608     | 27.7          | LOS C            | 6.6               | 45.9         | 0.62                | 0.76          | 34.0 |
| 11                              | T    | 128         | 0.0 | 0.358     | 46.6          | LOS D            | 6.6               | 46.4         | 0.92                | 0.74          | 25.3 |
| 12                              | R    | 167         | 0.0 | 0.635     | 61.9          | LOS E            | 9.5               | 66.5         | 0.99                | 0.82          | 22.2 |
| Approach                        |      | 489         | 0.0 | 0.635     | 44.3          | LOS D            | 9.5               | 66.5         | 0.83                | 0.78          | 26.7 |
| All Vehicles                    |      | 1772        | 0.0 | 0.637     | 42.7          | LOS D            | 14.9              | 104.2        | 0.85                | 0.76          | 27.0 |

## IN 20

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: Bulban Rd & McGrath Rd  
(IN20) - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN32

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg.  | Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-------|------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   |       | v/c  | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| East: Westbrook Drive |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 5                     | T    | 157         | 0.0 | 0.114 |      | 5.8           | LOS A            | 2.8                        | 19.8     | 0.34         | 0.28                | 50.3          |
| 6                     | R    | 20          | 0.0 | 0.215 |      | 71.0          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.3          |
| Approach              |      | 177         | 0.0 | 0.215 |      | 13.2          | LOS B            | 2.8                        | 19.8     | 0.41         | 0.33                | 43.1          |
| North: Bulban Rd      |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 7                     | L    | 25          | 0.0 | 0.101 |      | 40.6          | LOS D            | 1.0                        | 7.3      | 0.75         | 0.71                | 28.3          |
| 9                     | R    | 104         | 0.0 | 0.292 |      | 53.4          | LOS D            | 5.3                        | 36.9     | 0.90         | 0.78                | 24.2          |
| Approach              |      | 129         | 0.0 | 0.292 |      | 50.9          | LOS D            | 5.3                        | 36.9     | 0.87         | 0.77                | 24.9          |
| West: Westbrook Drive |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 10                    | L    | 60          | 0.0 | 0.076 |      | 9.6           | LOS A            | 0.5                        | 3.7      | 0.16         | 0.69                | 47.4          |
| 11                    | T    | 351         | 0.0 | 0.296 |      | 11.8          | LOS B            | 9.6                        | 67.3     | 0.51         | 0.45                | 43.6          |
| Approach              |      | 411         | 0.0 | 0.296 |      | 11.5          | LOS B            | 9.6                        | 67.3     | 0.46         | 0.48                | 44.1          |
| All Vehicles          |      | 717         | 0.0 | 0.296 |      | 19.0          | LOS B            | 9.6                        | 67.3     | 0.52         | 0.50                | 38.6          |

## MOVEMENT SUMMARY

Site: Bulban Rd & McGrath Rd  
(IN20) - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN32

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg.  | Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-------|------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   |       | v/c  | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| East: Westbrook Drive |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 5                     | T    | 351         | 0.0 | 0.237 |      | 4.5           | LOS A            | 5.9                        | 41.3     | 0.32         | 0.28                | 52.0          |
| 6                     | R    | 25          | 0.0 | 0.147 |      | 64.0          | LOS E            | 1.4                        | 9.7      | 0.95         | 0.72                | 21.7          |
| Approach              |      | 376         | 0.0 | 0.237 |      | 8.4           | LOS A            | 5.9                        | 41.3     | 0.36         | 0.31                | 47.6          |
| North: Bulban Rd      |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 7                     | L    | 20          | 0.0 | 0.082 |      | 41.2          | LOS D            | 0.8                        | 5.9      | 0.75         | 0.70                | 28.1          |
| 9                     | R    | 60          | 0.0 | 0.228 |      | 58.4          | LOS E            | 3.2                        | 22.2     | 0.93         | 0.76                | 23.0          |
| Approach              |      | 80          | 0.0 | 0.228 |      | 54.1          | LOS D            | 3.2                        | 22.2     | 0.88         | 0.74                | 24.1          |
| West: Westbrook Drive |      |             |     |       |      |               |                  |                            |          |              |                     |               |
| 10                    | L    | 104         | 0.0 | 0.153 |      | 10.6          | LOS B            | 1.2                        | 8.4      | 0.21         | 0.70                | 46.4          |
| 11                    | T    | 157         | 0.0 | 0.131 |      | 10.1          | LOS B            | 3.7                        | 26.1     | 0.44         | 0.37                | 45.5          |
| Approach              |      | 261         | 0.0 | 0.153 |      | 10.3          | LOS B            | 3.7                        | 26.1     | 0.35         | 0.50                | 45.8          |
| All Vehicles          |      | 717         | 0.0 | 0.237 |      | 14.2          | LOS B            | 5.9                        | 41.3     | 0.41         | 0.43                | 42.4          |

## MOVEMENT SUMMARY

Site: Bulban Rd & McGrath Rd  
(IN20) - AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN32

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| East: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 5                               | T    | 122                  | 0.0  | 0.129            | 18.0                 | LOS B            | 3.9                                  | 27.0          | 0.58         | 0.48                           | 38.7                  |
| 6                               | R    | 20                   | 0.0  | 0.215            | 71.0                 | LOS E            | 1.2                                  | 8.4           | 0.99         | 0.70                           | 20.3                  |
| Approach                        |      | 142                  | 0.0  | 0.215            | 25.5                 | LOS C            | 3.9                                  | 27.0          | 0.64         | 0.51                           | 34.3                  |
| North: Bulban Rd                |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 20                   | 0.0  | 0.058            | 23.0                 | LOS C            | 0.6                                  | 3.9           | 0.51         | 0.69                           | 36.7                  |
| 9                               | R    | 168                  | 0.0  | 0.217            | 32.1                 | LOS C            | 6.2                                  | 43.6          | 0.68         | 0.78                           | 31.8                  |
| Approach                        |      | 188                  | 0.0  | 0.217            | 31.2                 | LOS C            | 6.2                                  | 43.6          | 0.66         | 0.77                           | 32.2                  |
| West: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 155                  | 0.0  | 0.197            | 9.7                  | LOS A            | 1.4                                  | 10.1          | 0.17         | 0.70                           | 47.3                  |
| 11                              | T    | 164                  | 0.0  | 0.219            | 26.5                 | LOS C            | 6.4                                  | 44.7          | 0.71         | 0.59                           | 33.4                  |
| Approach                        |      | 319                  | 0.0  | 0.219            | 18.3                 | LOS B            | 6.4                                  | 44.7          | 0.45         | 0.64                           | 38.9                  |
| All Vehicles                    |      | 649                  | 0.0  | 0.219            | 23.6                 | LOS C            | 6.4                                  | 44.7          | 0.55         | 0.65                           | 35.7                  |

## MOVEMENT SUMMARY

Site: Bulban Rd & McGrath Rd  
(IN20) - PM Peak Ultimate

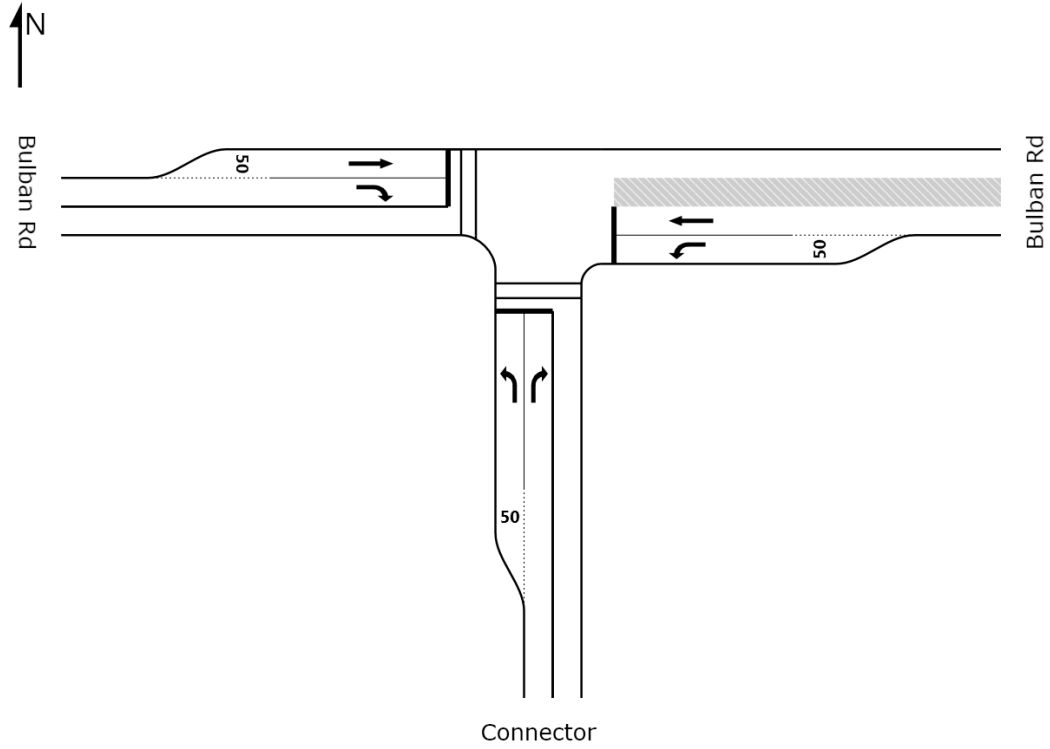
120221sid-12M1296000 - Westbrook Dr & Bulban Rd - IN32

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

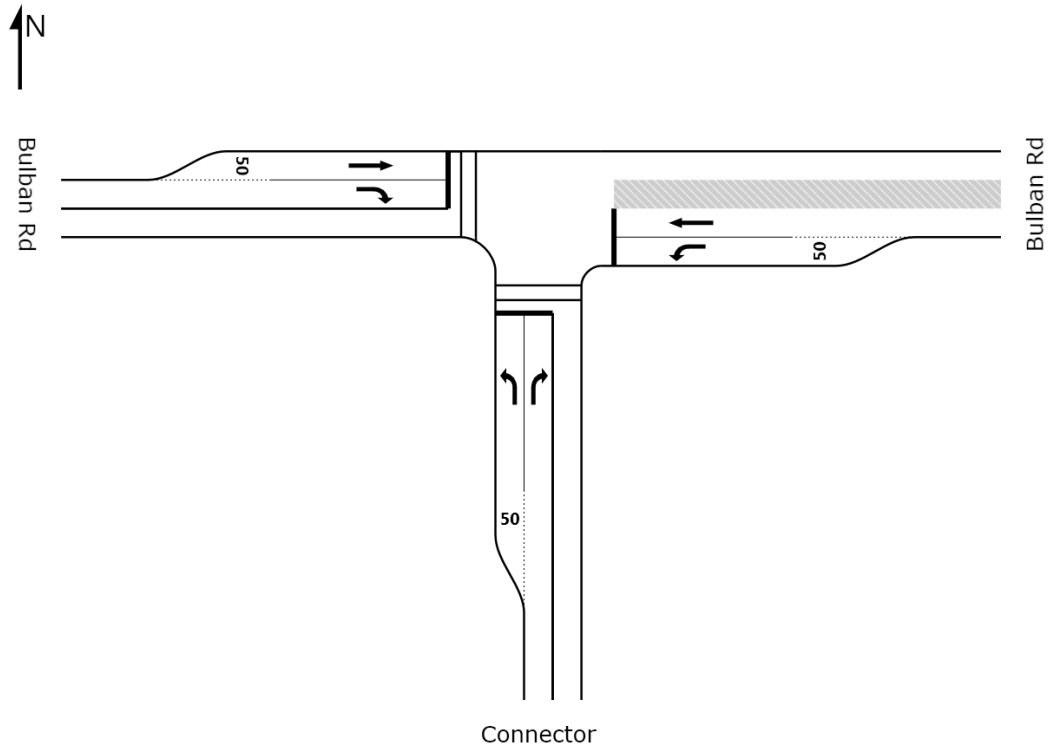
| Movement Performance - Vehicles |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| East: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 5                               | T    | 164                  | 0.0  | 0.198            | 22.9                 | LOS C            | 5.9                                  | 41.5          | 0.67         | 0.55                           | 35.4                  |
| 6                               | R    | 20                   | 0.0  | 0.215            | 71.0                 | LOS E            | 1.2                                  | 8.4           | 0.99         | 0.70                           | 20.3                  |
| Approach                        |      | 184                  | 0.0  | 0.215            | 28.2                 | LOS C            | 5.9                                  | 41.5          | 0.70         | 0.57                           | 32.7                  |
| North: Bulban Rd                |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 20                   | 0.0  | 0.052            | 19.6                 | LOS B            | 0.5                                  | 3.4           | 0.45         | 0.69                           | 38.9                  |
| 9                               | R    | 155                  | 0.0  | 0.176            | 27.4                 | LOS C            | 5.1                                  | 35.8          | 0.61         | 0.77                           | 34.1                  |
| Approach                        |      | 175                  | 0.0  | 0.176            | 26.5                 | LOS C            | 5.1                                  | 35.8          | 0.59         | 0.76                           | 34.6                  |
| West: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 168                  | 0.0  | 0.213            | 9.7                  | LOS A            | 1.6                                  | 11.0          | 0.18         | 0.70                           | 47.3                  |
| 11                              | T    | 112                  | 0.0  | 0.177            | 30.9                 | LOS C            | 4.6                                  | 32.5          | 0.75         | 0.61                           | 31.2                  |
| Approach                        |      | 280                  | 0.0  | 0.213            | 18.2                 | LOS B            | 4.6                                  | 32.5          | 0.41         | 0.66                           | 39.2                  |
| All Vehicles                    |      | 639                  | 0.0  | 0.215            | 23.3                 | LOS C            | 5.9                                  | 41.5          | 0.54         | 0.66                           | 35.9                  |

IN 21

Interim Layout



Ultimate Layout



## MOVEMENT SUMMARY

Site: Bulban Rd & Connector  
1 (IN21) - AM Peak Interim -  
Conversion

120221sid-12M1296000 - Bulban Rd & Connector 1 - IN31

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector                |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 20          | 0.0 | 0.086     | 45.4          | LOS D            | 0.9                        | 6.2      | 0.80         | 0.70                | 26.7          |
| 3                               | R    | 121         | 0.0 | 0.489     | 61.6          | LOS E            | 6.8                        | 47.3     | 0.97         | 0.79                | 22.2          |
| Approach                        |      | 141         | 0.0 | 0.489     | 59.3          | LOS E            | 6.8                        | 47.3     | 0.95         | 0.78                | 22.7          |
| East: Bulban Rd                 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 32          | 0.0 | 0.069     | 15.6          | LOS B            | 0.6                        | 4.4      | 0.36         | 0.70                | 41.9          |
| 5                               | T    | 244         | 0.0 | 0.190     | 8.4           | LOS A            | 5.4                        | 38.1     | 0.42         | 0.36                | 47.2          |
| Approach                        |      | 276         | 0.0 | 0.190     | 9.2           | LOS A            | 5.4                        | 38.1     | 0.41         | 0.40                | 46.5          |
| West: Bulban Rd                 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 11                              | T    | 311         | 0.0 | 0.513     | 5.9           | LOS A            | 4.9                        | 34.4     | 0.43         | 0.37                | 49.8          |
| 12                              | R    | 20          | 0.0 | 0.185     | 69.3          | LOS E            | 1.2                        | 8.2      | 0.98         | 0.70                | 20.6          |
| Approach                        |      | 331         | 0.0 | 0.513     | 9.7           | LOS A            | 4.9                        | 34.4     | 0.46         | 0.39                | 45.9          |
| All Vehicles                    |      | 747         | 0.0 | 0.513     | 18.9          | LOS B            | 6.8                        | 47.3     | 0.54         | 0.47                | 38.7          |

## MOVEMENT SUMMARY

Site: Bulban Rd & Connector  
1 (IN21) - PM Peak Interim

120221sid-12M1296000 - Bulban Rd & Connector 1 - IN31

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector                |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 20          | 0.0 | 0.090     | 48.9          | LOS D            | 0.9                        | 6.5      | 0.83         | 0.71                | 25.6          |
| 3                               | R    | 32          | 0.0 | 0.157     | 61.8          | LOS E            | 1.7                        | 12.0     | 0.94         | 0.73                | 22.1          |
| Approach                        |      | 52          | 0.0 | 0.157     | 56.8          | LOS E            | 1.7                        | 12.0     | 0.90         | 0.72                | 23.4          |
| East: Bulban Rd                 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 121         | 0.0 | 0.247     | 14.6          | LOS B            | 2.3                        | 15.9     | 0.35         | 0.72                | 42.8          |
| 5                               | T    | 311         | 0.0 | 0.230     | 7.1           | LOS A            | 6.5                        | 45.5     | 0.39         | 0.34                | 48.6          |
| Approach                        |      | 432         | 0.0 | 0.247     | 9.2           | LOS A            | 6.5                        | 45.5     | 0.38         | 0.45                | 46.8          |
| West: Bulban Rd                 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 11                              | T    | 244         | 0.0 | 0.373     | 3.5           | LOS A            | 3.3                        | 23.2     | 0.29         | 0.25                | 53.3          |
| 12                              | R    | 20          | 0.0 | 0.215     | 71.0          | LOS E            | 1.2                        | 8.4      | 0.99         | 0.70                | 20.3          |
| Approach                        |      | 264         | 0.0 | 0.373     | 8.6           | LOS A            | 3.3                        | 23.2     | 0.34         | 0.28                | 47.5          |
| All Vehicles                    |      | 747         | 0.0 | 0.373     | 12.3          | LOS B            | 6.5                        | 45.5     | 0.40         | 0.41                | 44.0          |

## MOVEMENT SUMMARY

Site: Bulban Rd & Connector  
1 (IN21) - AM Ultimate

120221sid-12M1296000 - Bulban Rd & Connector 1 - IN31

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID           | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
|                  |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Connector |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                | L    | 20          | 0.0 | 0.076     | 35.9          | LOS D            | 0.8               | 5.3  | 0.69         | 0.70                | 30.1          |
| 3                | R    | 215         | 0.0 | 0.478     | 50.6          | LOS D            | 10.9              | 76.0 | 0.91         | 0.82                | 25.0          |
| Approach         |      | 235         | 0.0 | 0.478     | 49.3          | LOS D            | 10.9              | 76.0 | 0.89         | 0.81                | 25.4          |
| East: Bulban Rd  |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                | L    | 179         | 0.0 | 0.485     | 21.8          | LOS C            | 5.0               | 35.1 | 0.52         | 0.75                | 37.4          |
| 5                | T    | 116         | 0.0 | 0.106     | 13.1          | LOS B            | 3.1               | 21.7 | 0.50         | 0.41                | 42.6          |
| Approach         |      | 295         | 0.0 | 0.485     | 18.4          | LOS B            | 5.0               | 35.1 | 0.51         | 0.61                | 39.3          |
| West: Bulban Rd  |      |             |     |           |               |                  |                   |      |              |                     |               |
| 11               | T    | 121         | 0.0 | 0.264     | 7.8           | LOS A            | 2.5               | 17.6 | 0.39         | 0.31                | 47.9          |
| 12               | R    | 20          | 0.0 | 0.215     | 71.0          | LOS E            | 1.2               | 8.4  | 0.99         | 0.70                | 20.3          |
| Approach         |      | 141         | 0.0 | 0.264     | 16.8          | LOS B            | 2.5               | 17.6 | 0.47         | 0.37                | 40.2          |
| All Vehicles     |      | 671         | 0.0 | 0.485     | 28.9          | LOS C            | 10.9              | 76.0 | 0.64         | 0.63                | 33.1          |

## MOVEMENT SUMMARY

Site: Bulban Rd & Connector  
1 (IN21) - PM Ultimate

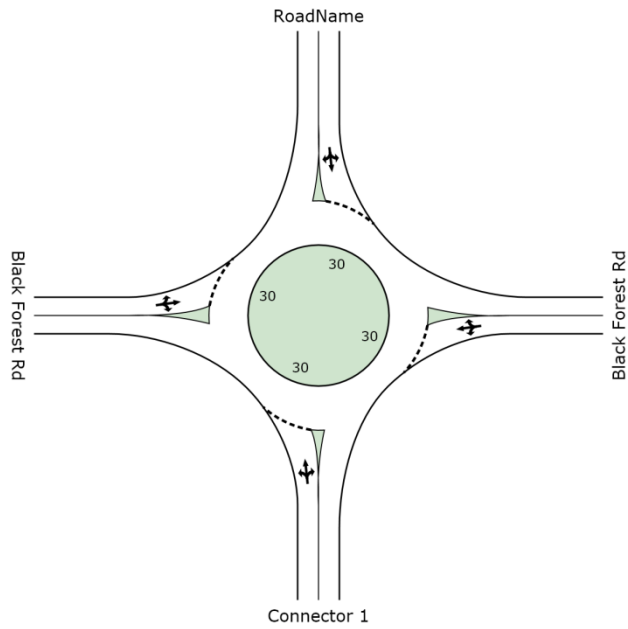
120221sid-12M1296000 - Bulban Rd & Connector 1 - IN31

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

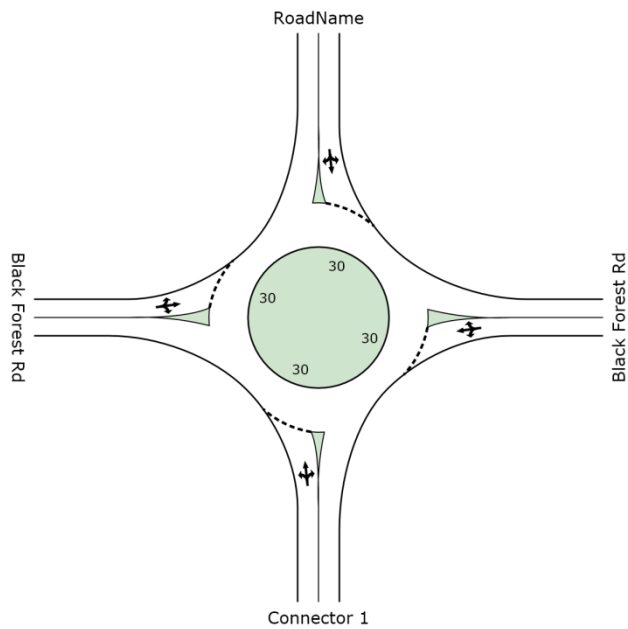
### Movement Performance - Vehicles

| Mov ID           | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
|                  |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Connector |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                | L    | 20          | 0.0 | 0.082     | 41.2          | LOS D            | 0.8               | 5.9  | 0.75         | 0.70                | 28.1          |
| 3                | R    | 179         | 0.0 | 0.526     | 56.7          | LOS E            | 9.6               | 67.4 | 0.95         | 0.81                | 23.4          |
| Approach         |      | 199         | 0.0 | 0.526     | 55.2          | LOS E            | 9.6               | 67.4 | 0.93         | 0.80                | 23.8          |
| East: Bulban Rd  |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                | L    | 215         | 0.0 | 0.520     | 18.7          | LOS B            | 5.3               | 37.3 | 0.46         | 0.74                | 39.6          |
| 5                | T    | 121         | 0.0 | 0.101     | 9.9           | LOS A            | 2.8               | 19.7 | 0.43         | 0.35                | 45.7          |
| Approach         |      | 336         | 0.0 | 0.520     | 15.5          | LOS B            | 5.3               | 37.3 | 0.45         | 0.60                | 41.6          |
| West: Bulban Rd  |      |             |     |           |               |                  |                   |      |              |                     |               |
| 11               | T    | 116         | 0.0 | 0.219     | 5.3           | LOS A            | 2.0               | 13.9 | 0.32         | 0.26                | 50.9          |
| 12               | R    | 20          | 0.0 | 0.215     | 71.0          | LOS E            | 1.2               | 8.4  | 0.99         | 0.70                | 20.3          |
| Approach         |      | 136         | 0.0 | 0.219     | 15.0          | LOS B            | 2.0               | 13.9 | 0.42         | 0.32                | 41.7          |
| All Vehicles     |      | 671         | 0.0 | 0.526     | 27.2          | LOS C            | 9.6               | 67.4 | 0.59         | 0.61                | 34.0          |

## IN 25 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: Black Forest Rd &  
Connector 1 - AM Peak  
Interim

120221sid-12M1296000 - Black Forest Rd & Connector 1 - IN19  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |     |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-----|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |     | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec |              |                     |               |
| South: Connector 1              |      |             |     |           |               |                  |                   |     |              |                     |               |
| 1                               | L    | 20          | 5.0 | 0.085     | 5.9           | LOS A            | 0.4               | 3.0 | 0.25         | 0.48                | 50.6          |
| 2                               | T    | 77          | 0.0 | 0.085     | 4.8           | LOS A            | 0.4               | 3.0 | 0.25         | 0.39                | 51.4          |
| 3                               | R    | 20          | 5.0 | 0.085     | 11.8          | LOS B            | 0.4               | 3.0 | 0.25         | 0.80                | 46.5          |
| Approach                        |      | 117         | 1.7 | 0.085     | 6.2           | LOS A            | 0.4               | 3.0 | 0.25         | 0.48                | 50.3          |
| East: Black Forest Rd           |      |             |     |           |               |                  |                   |     |              |                     |               |
| 4                               | L    | 20          | 5.0 | 0.065     | 6.2           | LOS A            | 0.4               | 2.7 | 0.35         | 0.48                | 49.9          |
| 5                               | T    | 43          | 5.0 | 0.065     | 5.3           | LOS A            | 0.4               | 2.7 | 0.35         | 0.41                | 50.4          |
| 6                               | R    | 21          | 0.0 | 0.065     | 12.0          | LOS B            | 0.4               | 2.7 | 0.35         | 0.75                | 46.3          |
| Approach                        |      | 84          | 3.7 | 0.065     | 7.2           | LOS A            | 0.4               | 2.7 | 0.35         | 0.52                | 49.2          |
| North: RoadName                 |      |             |     |           |               |                  |                   |     |              |                     |               |
| 7                               | L    | 22          | 0.0 | 0.117     | 5.7           | LOS A            | 0.6               | 4.3 | 0.24         | 0.47                | 50.7          |
| 8                               | T    | 99          | 0.0 | 0.117     | 4.7           | LOS A            | 0.6               | 4.3 | 0.24         | 0.38                | 51.4          |
| 9                               | R    | 45          | 0.0 | 0.117     | 11.6          | LOS B            | 0.6               | 4.3 | 0.24         | 0.78                | 46.5          |
| Approach                        |      | 166         | 0.0 | 0.117     | 6.7           | LOS A            | 0.6               | 4.3 | 0.24         | 0.50                | 49.8          |
| West: Black Forest Rd           |      |             |     |           |               |                  |                   |     |              |                     |               |
| 10                              | L    | 93          | 0.0 | 0.122     | 5.9           | LOS A            | 0.7               | 5.1 | 0.31         | 0.47                | 50.2          |
| 11                              | T    | 52          | 5.0 | 0.122     | 5.1           | LOS A            | 0.7               | 5.1 | 0.31         | 0.40                | 50.8          |
| 12                              | R    | 20          | 5.0 | 0.122     | 11.9          | LOS B            | 0.7               | 5.1 | 0.31         | 0.76                | 46.4          |
| Approach                        |      | 165         | 2.2 | 0.122     | 6.4           | LOS A            | 0.7               | 5.1 | 0.31         | 0.48                | 49.9          |
| All Vehicles                    |      | 532         | 1.6 | 0.122     | 6.6           | LOS A            | 0.7               | 5.1 | 0.28         | 0.49                | 49.8          |

## MOVEMENT SUMMARY

Site: Black Forest Rd &  
Connector 1 - PM Peak Interim

120221sid-12M1296000 - Black Forest Rd & Connector 1 - IN19  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 1              |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 20          | 5.0 | 0.107     | 6.1           | LOS A            | 0.5                        | 3.9      | 0.32         | 0.50                | 50.3          |
| 2                               | T    | 101         | 0.0 | 0.107     | 5.0           | LOS A            | 0.5                        | 3.9      | 0.32         | 0.43                | 50.8          |
| 3                               | R    | 20          | 5.0 | 0.107     | 12.0          | LOS B            | 0.5                        | 3.9      | 0.32         | 0.80                | 46.5          |
| Approach                        |      | 141         | 1.4 | 0.107     | 6.2           | LOS A            | 0.5                        | 3.9      | 0.32         | 0.49                | 50.0          |
| East: Black Forest Rd           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 20          | 5.0 | 0.075     | 6.3           | LOS A            | 0.4                        | 3.1      | 0.38         | 0.50                | 49.8          |
| 5                               | T    | 52          | 5.0 | 0.075     | 5.4           | LOS A            | 0.4                        | 3.1      | 0.38         | 0.43                | 50.2          |
| 6                               | R    | 22          | 0.0 | 0.075     | 12.1          | LOS B            | 0.4                        | 3.1      | 0.38         | 0.76                | 46.3          |
| Approach                        |      | 94          | 3.8 | 0.075     | 7.2           | LOS A            | 0.4                        | 3.1      | 0.38         | 0.52                | 49.1          |
| North: RoadName                 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                               | L    | 21          | 0.0 | 0.132     | 5.6           | LOS A            | 0.7                        | 4.9      | 0.23         | 0.45                | 50.6          |
| 8                               | T    | 77          | 0.0 | 0.132     | 4.7           | LOS A            | 0.7                        | 4.9      | 0.23         | 0.37                | 51.4          |
| 9                               | R    | 93          | 0.0 | 0.132     | 11.5          | LOS B            | 0.7                        | 4.9      | 0.23         | 0.74                | 46.3          |
| Approach                        |      | 191         | 0.0 | 0.132     | 8.1           | LOS A            | 0.7                        | 4.9      | 0.23         | 0.56                | 48.6          |
| West: Black Forest Rd           |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                              | L    | 45          | 0.0 | 0.083     | 6.0           | LOS A            | 0.5                        | 3.4      | 0.34         | 0.48                | 50.0          |
| 11                              | T    | 43          | 5.0 | 0.083     | 5.2           | LOS A            | 0.5                        | 3.4      | 0.34         | 0.41                | 50.6          |
| 12                              | R    | 20          | 5.0 | 0.083     | 12.0          | LOS B            | 0.5                        | 3.4      | 0.34         | 0.75                | 46.3          |
| Approach                        |      | 108         | 2.9 | 0.083     | 6.8           | LOS A            | 0.5                        | 3.4      | 0.34         | 0.50                | 49.5          |
| All Vehicles                    |      | 534         | 1.6 | 0.132     | 7.2           | LOS A            | 0.7                        | 4.9      | 0.30         | 0.52                | 49.2          |

## MOVEMENT SUMMARY

Site: Black Forest Rd &  
Connector 1 - AM Peak Ultimate

120221sid-12M1296000 - Black Forest Rd & Connector 1 - IN19  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |     |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-----|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |     | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec |              |                     |               |
| South: Connector 1              |      |             |     |           |               |                  |                   |     |              |                     |               |
| 1                               | L    | 25          | 5.0 | 0.146     | 6.1           | LOS A            | 0.8               | 5.5 | 0.32         | 0.51                | 50.3          |
| 2                               | T    | 148         | 0.0 | 0.146     | 5.0           | LOS A            | 0.8               | 5.5 | 0.32         | 0.43                | 50.8          |
| 3                               | R    | 20          | 5.0 | 0.146     | 12.0          | LOS B            | 0.8               | 5.5 | 0.32         | 0.81                | 46.6          |
| Approach                        |      | 193         | 1.2 | 0.146     | 5.9           | LOS A            | 0.8               | 5.5 | 0.32         | 0.48                | 50.3          |
| East: Black Forest Rd           |      |             |     |           |               |                  |                   |     |              |                     |               |
| 4                               | L    | 20          | 5.0 | 0.077     | 6.7           | LOS A            | 0.4               | 3.2 | 0.44         | 0.52                | 49.3          |
| 5                               | T    | 45          | 5.0 | 0.077     | 5.7           | LOS A            | 0.4               | 3.2 | 0.44         | 0.46                | 49.6          |
| 6                               | R    | 27          | 0.0 | 0.077     | 12.5          | LOS B            | 0.4               | 3.2 | 0.44         | 0.75                | 46.1          |
| Approach                        |      | 92          | 3.5 | 0.077     | 7.9           | LOS A            | 0.4               | 3.2 | 0.44         | 0.56                | 48.4          |
| North: RoadName                 |      |             |     |           |               |                  |                   |     |              |                     |               |
| 7                               | L    | 21          | 0.0 | 0.162     | 5.6           | LOS A            | 0.9               | 6.3 | 0.23         | 0.46                | 50.7          |
| 8                               | T    | 128         | 0.0 | 0.162     | 4.7           | LOS A            | 0.9               | 6.3 | 0.23         | 0.38                | 51.4          |
| 9                               | R    | 86          | 0.0 | 0.162     | 11.5          | LOS B            | 0.9               | 6.3 | 0.23         | 0.76                | 46.4          |
| Approach                        |      | 236         | 0.0 | 0.162     | 7.3           | LOS A            | 0.9               | 6.3 | 0.23         | 0.53                | 49.3          |
| West: Black Forest Rd           |      |             |     |           |               |                  |                   |     |              |                     |               |
| 10                              | L    | 98          | 0.0 | 0.128     | 6.3           | LOS A            | 0.8               | 5.5 | 0.41         | 0.50                | 49.4          |
| 11                              | T    | 21          | 5.0 | 0.128     | 5.5           | LOS A            | 0.8               | 5.5 | 0.41         | 0.44                | 49.8          |
| 12                              | R    | 41          | 5.0 | 0.128     | 12.4          | LOS B            | 0.8               | 5.5 | 0.41         | 0.73                | 46.0          |
| Approach                        |      | 160         | 1.9 | 0.128     | 7.7           | LOS A            | 0.8               | 5.5 | 0.41         | 0.55                | 48.5          |
| All Vehicles                    |      | 681         | 1.3 | 0.162     | 7.1           | LOS A            | 0.9               | 6.3 | 0.33         | 0.52                | 49.2          |

## MOVEMENT SUMMARY

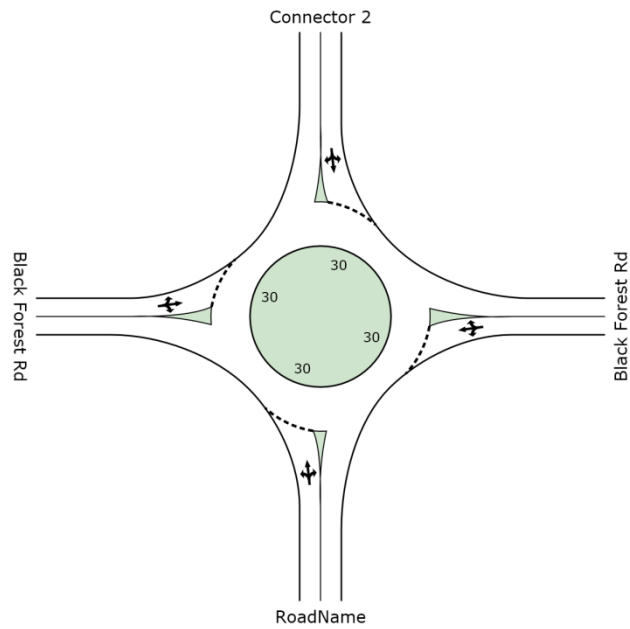
Site: Black Forest Rd &  
Connector 1 - PM Peak  
Ultimate

120221sid-12M1296000 - Black Forest Rd & Connector 1 - IN19  
Roundabout

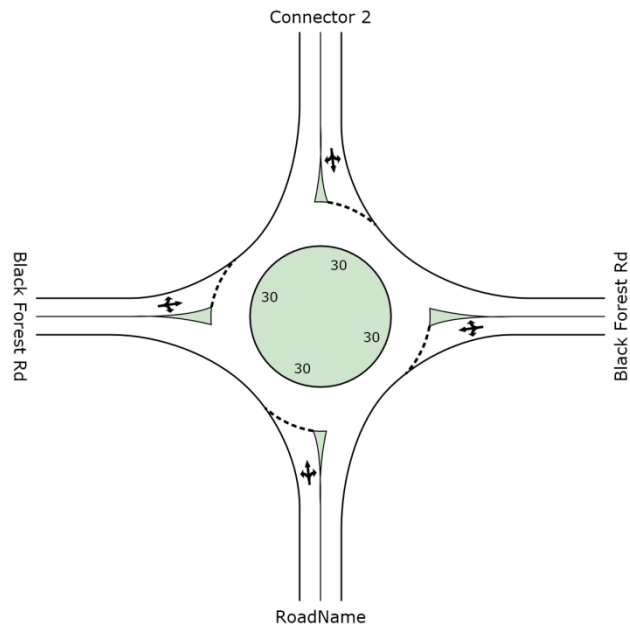
| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |              |                     |               |      |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     |                     | per veh       | km/h |
| South: Connector 1              |      |             |     |           |               |                  |                   |              |                     |               |      |
| 1                               | L    | 41          | 5.0 | 0.140     | 6.0           | LOS A            | 0.7               | 5.2          | 0.30                | 0.50          | 50.4 |
| 2                               | T    | 128         | 0.0 | 0.140     | 4.9           | LOS A            | 0.7               | 5.2          | 0.30                | 0.42          | 51.0 |
| 3                               | R    | 20          | 5.0 | 0.140     | 11.9          | LOS B            | 0.7               | 5.2          | 0.30                | 0.81          | 46.5 |
| Approach                        |      | 189         | 1.6 | 0.140     | 5.9           | LOS A            | 0.7               | 5.2          | 0.30                | 0.48          | 50.3 |
| East: Black Forest Rd           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 4                               | L    | 20          | 5.0 | 0.053     | 6.7           | LOS A            | 0.3               | 2.1          | 0.45                | 0.51          | 49.2 |
| 5                               | T    | 21          | 5.0 | 0.053     | 5.8           | LOS A            | 0.3               | 2.1          | 0.45                | 0.46          | 49.5 |
| 6                               | R    | 21          | 0.0 | 0.053     | 12.5          | LOS B            | 0.3               | 2.1          | 0.45                | 0.73          | 45.9 |
| Approach                        |      | 62          | 3.3 | 0.053     | 8.4           | LOS A            | 0.3               | 2.1          | 0.45                | 0.57          | 48.1 |
| North: RoadName                 |      |             |     |           |               |                  |                   |              |                     |               |      |
| 7                               | L    | 27          | 0.0 | 0.188     | 5.7           | LOS A            | 1.1               | 7.5          | 0.25                | 0.46          | 50.6 |
| 8                               | T    | 148         | 0.0 | 0.188     | 4.7           | LOS A            | 1.1               | 7.5          | 0.25                | 0.38          | 51.3 |
| 9                               | R    | 98          | 0.0 | 0.188     | 11.6          | LOS B            | 1.1               | 7.5          | 0.25                | 0.76          | 46.4 |
| Approach                        |      | 274         | 0.0 | 0.188     | 7.3           | LOS A            | 1.1               | 7.5          | 0.25                | 0.53          | 49.2 |
| West: Black Forest Rd           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 10                              | L    | 86          | 0.0 | 0.122     | 6.1           | LOS A            | 0.7               | 5.2          | 0.38                | 0.50          | 49.7 |
| 11                              | T    | 45          | 5.0 | 0.122     | 5.3           | LOS A            | 0.7               | 5.2          | 0.38                | 0.43          | 50.2 |
| 12                              | R    | 25          | 5.0 | 0.122     | 12.2          | LOS B            | 0.7               | 5.2          | 0.38                | 0.75          | 46.2 |
| Approach                        |      | 156         | 2.2 | 0.122     | 6.9           | LOS A            | 0.7               | 5.2          | 0.38                | 0.52          | 49.2 |
| All Vehicles                    |      | 681         | 1.3 | 0.188     | 6.9           | LOS A            | 1.1               | 7.5          | 0.31                | 0.51          | 49.4 |

## IN 26

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: Black Forest Rd & Connector 2  
(IN26) - AM Peak Interim

120221sid-12M1296000 - Black Forest Rd & Connector 2 - IN20  
Roundabout

| Movement Performance - Vehicles |      |             |              |               |                  |                   |     |              |                     |               |
|---------------------------------|------|-------------|--------------|---------------|------------------|-------------------|-----|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |     | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %            | v/c           | sec              | veh               | m   |              | per veh             | km/h          |
| South: RoadName                 |      |             |              |               |                  |                   |     |              |                     |               |
| 1                               | L    | 20          | 0.0          | 0.117         | 6.6              | LOS A             | 0.6 | 4.4          | 0.44                | 49.3          |
| 2                               | T    | 70          | 0.0          | 0.117         | 5.6              | LOS A             | 0.6 | 4.4          | 0.44                | 49.6          |
| 3                               | R    | 50          | 0.0          | 0.117         | 12.5             | LOS B             | 0.6 | 4.4          | 0.44                | 46.0          |
| Approach                        |      | 140         | 0.0          | 0.117         | 8.2              | LOS A             | 0.6 | 4.4          | 0.44                | 48.2          |
| East: Black Forest Rd           |      |             |              |               |                  |                   |     |              |                     |               |
| 4                               | L    | 47          | 0.0          | 0.177         | 6.5              | LOS A             | 1.1 | 8.1          | 0.45                | 49.5          |
| 5                               | T    | 149         | 5.0          | 0.177         | 5.7              | LOS A             | 1.1 | 8.1          | 0.45                | 49.8          |
| 6                               | R    | 20          | 5.0          | 0.177         | 12.6             | LOS B             | 1.1 | 8.1          | 0.45                | 46.4          |
| Approach                        |      | 216         | 3.9          | 0.177         | 6.5              | LOS A             | 1.1 | 8.1          | 0.45                | 49.3          |
| North: Connector 2              |      |             |              |               |                  |                   |     |              |                     |               |
| 7                               | L    | 20          | 5.0          | 0.174         | 6.4              | LOS A             | 1.0 | 6.9          | 0.38                | 49.4          |
| 8                               | T    | 77          | 0.0          | 0.174         | 5.3              | LOS A             | 1.0 | 6.9          | 0.38                | 49.9          |
| 9                               | R    | 125         | 5.0          | 0.174         | 12.2             | LOS B             | 1.0 | 6.9          | 0.38                | 45.8          |
| Approach                        |      | 222         | 3.3          | 0.174         | 9.3              | LOS A             | 1.0 | 6.9          | 0.38                | 47.4          |
| West: Black Forest Rd           |      |             |              |               |                  |                   |     |              |                     |               |
| 10                              | L    | 53          | 5.0          | 0.157         | 6.2              | LOS A             | 1.0 | 7.2          | 0.36                | 50.0          |
| 11                              | T    | 134         | 5.0          | 0.157         | 5.2              | LOS A             | 1.0 | 7.2          | 0.36                | 50.5          |
| 12                              | R    | 20          | 0.0          | 0.157         | 12.0             | LOS B             | 1.0 | 7.2          | 0.36                | 46.5          |
| Approach                        |      | 207         | 4.5          | 0.157         | 6.1              | LOS A             | 1.0 | 7.2          | 0.36                | 49.9          |
| All Vehicles                    |      | 785         | 3.2          | 0.177         | 7.5              | LOS A             | 1.1 | 8.1          | 0.41                | 48.7          |

## MOVEMENT SUMMARY

Site: Black Forest Rd &  
Connector 2 (IN26) - PM Peak  
Interim

120221sid-12M1296000 - Black Forest Rd & Connector 2 - IN20  
Roundabout

| Movement Performance - Vehicles |      |             |              |               |                  |                   |     |              |                     |               |
|---------------------------------|------|-------------|--------------|---------------|------------------|-------------------|-----|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |     | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %            | v/c           | sec              | veh               | m   |              | per veh             | km/h          |
| South: RoadName                 |      |             |              |               |                  |                   |     |              |                     |               |
| 1                               | L    | 20          | 0.0          | 0.112         | 6.1              | LOS A             | 0.6 | 4.1          | 0.36                | 49.8          |
| 2                               | T    | 77          | 0.0          | 0.112         | 5.2              | LOS A             | 0.6 | 4.1          | 0.36                | 50.3          |
| 3                               | R    | 47          | 0.0          | 0.112         | 12.0             | LOS B             | 0.6 | 4.1          | 0.36                | 46.2          |
| Approach                        |      | 144         | 0.0          | 0.112         | 7.6              | LOS A             | 0.6 | 4.1          | 0.36                | 48.8          |
| East: Black Forest Rd           |      |             |              |               |                  |                   |     |              |                     |               |
| 4                               | L    | 50          | 0.0          | 0.151         | 6.0              | LOS A             | 0.9 | 6.7          | 0.36                | 50.1          |
| 5                               | T    | 134         | 5.0          | 0.151         | 5.2              | LOS A             | 0.9 | 6.7          | 0.36                | 50.6          |
| 6                               | R    | 14          | 5.0          | 0.151         | 12.1             | LOS B             | 0.9 | 6.7          | 0.36                | 46.5          |
| Approach                        |      | 198         | 3.7          | 0.151         | 5.9              | LOS A             | 0.9 | 6.7          | 0.36                | 50.1          |
| North: Connector 2              |      |             |              |               |                  |                   |     |              |                     |               |
| 7                               | L    | 20          | 5.0          | 0.113         | 6.3              | LOS A             | 0.6 | 4.3          | 0.38                | 49.7          |
| 8                               | T    | 70          | 0.0          | 0.113         | 5.2              | LOS A             | 0.6 | 4.3          | 0.38                | 50.1          |
| 9                               | R    | 53          | 5.0          | 0.113         | 12.2             | LOS B             | 0.6 | 4.3          | 0.38                | 46.1          |
| Approach                        |      | 143         | 2.6          | 0.113         | 8.0              | LOS A             | 0.6 | 4.3          | 0.38                | 48.4          |
| West: Black Forest Rd           |      |             |              |               |                  |                   |     |              |                     |               |
| 10                              | L    | 125         | 5.0          | 0.218         | 6.2              | LOS A             | 1.4 | 10.5         | 0.37                | 49.9          |
| 11                              | T    | 149         | 5.0          | 0.218         | 5.2              | LOS A             | 1.4 | 10.5         | 0.37                | 50.4          |
| 12                              | R    | 20          | 0.0          | 0.218         | 12.0             | LOS B             | 1.4 | 10.5         | 0.37                | 46.4          |
| Approach                        |      | 294         | 4.7          | 0.218         | 6.1              | LOS A             | 1.4 | 10.5         | 0.37                | 49.9          |
| All Vehicles                    |      | 779         | 3.2          | 0.218         | 6.7              | LOS A             | 1.4 | 10.5         | 0.37                | 49.4          |

## MOVEMENT SUMMARY

Site: Black Forest Rd & Connector 2  
(IN26) - AM Peak Ultimate

120221sid-12M1296000 - Black Forest Rd & Connector 2 - IN20  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |     |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-----|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |     | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec |              |                     |               |
| South: RoadName                 |      |             |     |           |               |                  |                   |     |              |                     |               |
| 1                               | L    | 20          | 0.0 | 0.058     | 6.2           | LOS A            | 0.3               | 2.0 | 0.36         | 0.49                | 49.7          |
| 2                               | T    | 20          | 0.0 | 0.058     | 5.2           | LOS A            | 0.3               | 2.0 | 0.36         | 0.42                | 50.2          |
| 3                               | R    | 34          | 0.0 | 0.058     | 12.1          | LOS B            | 0.3               | 2.0 | 0.36         | 0.72                | 45.9          |
| Approach                        |      | 74          | 0.0 | 0.058     | 8.6           | LOS A            | 0.3               | 2.0 | 0.36         | 0.58                | 47.9          |
| East: Black Forest Rd           |      |             |     |           |               |                  |                   |     |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.147     | 5.6           | LOS A            | 0.9               | 6.5 | 0.21         | 0.47                | 51.0          |
| 5                               | T    | 178         | 5.0 | 0.147     | 4.8           | LOS A            | 0.9               | 6.5 | 0.21         | 0.38                | 51.8          |
| 6                               | R    | 20          | 5.0 | 0.147     | 11.6          | LOS B            | 0.9               | 6.5 | 0.21         | 0.83                | 46.7          |
| Approach                        |      | 218         | 4.5 | 0.147     | 5.5           | LOS A            | 0.9               | 6.5 | 0.21         | 0.43                | 51.1          |
| North: Connector 2              |      |             |     |           |               |                  |                   |     |              |                     |               |
| 7                               | L    | 20          | 5.0 | 0.046     | 6.1           | LOS A            | 0.2               | 1.6 | 0.31         | 0.47                | 50.1          |
| 8                               | T    | 20          | 0.0 | 0.046     | 5.0           | LOS A            | 0.2               | 1.6 | 0.31         | 0.40                | 50.7          |
| 9                               | R    | 20          | 5.0 | 0.046     | 12.0          | LOS B            | 0.2               | 1.6 | 0.31         | 0.73                | 46.2          |
| Approach                        |      | 60          | 3.3 | 0.046     | 7.7           | LOS A            | 0.2               | 1.6 | 0.31         | 0.54                | 48.8          |
| West: Black Forest Rd           |      |             |     |           |               |                  |                   |     |              |                     |               |
| 10                              | L    | 20          | 5.0 | 0.108     | 5.8           | LOS A            | 0.6               | 4.7 | 0.24         | 0.47                | 50.8          |
| 11                              | T    | 115         | 5.0 | 0.108     | 4.8           | LOS A            | 0.6               | 4.7 | 0.24         | 0.38                | 51.5          |
| 12                              | R    | 20          | 0.0 | 0.108     | 11.6          | LOS B            | 0.6               | 4.7 | 0.24         | 0.81                | 46.6          |
| Approach                        |      | 155         | 4.4 | 0.108     | 5.8           | LOS A            | 0.6               | 4.7 | 0.24         | 0.45                | 50.7          |
| All Vehicles                    |      | 507         | 3.7 | 0.147     | 6.3           | LOS A            | 0.9               | 6.5 | 0.25         | 0.47                | 50.2          |

## MOVEMENT SUMMARY

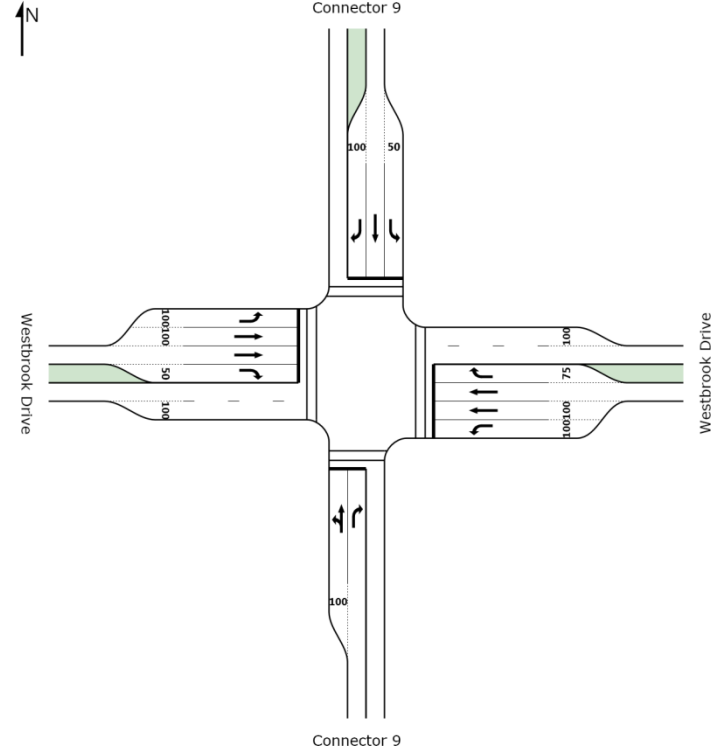
Site: Black Forest Rd &  
Connector 2 (IN26) - PM Peak  
Ultimate

120221sid-12M1296000 - Black Forest Rd & Connector 2 - IN20  
Roundabout

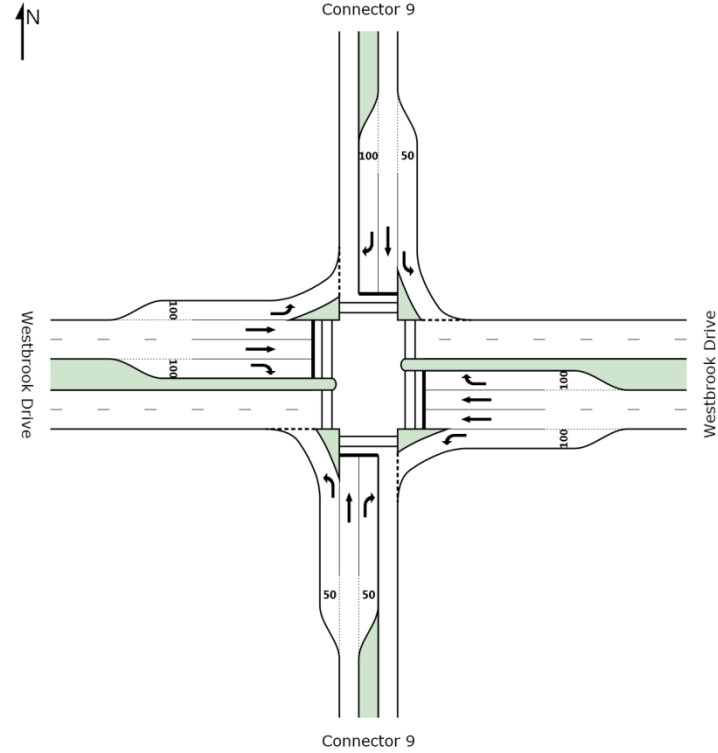
| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |              |                     |               |      |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |      |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     |                     | per veh       | km/h |
| South: RoadName                 |      |             |     |           |               |                  |                   |              |                     |               |      |
| 1                               | L    | 20          | 0.0 | 0.045     | 5.9           | LOS A            | 0.2               | 1.5          | 0.29                | 0.47          | 50.2 |
| 2                               | T    | 20          | 0.0 | 0.045     | 4.9           | LOS A            | 0.2               | 1.5          | 0.29                | 0.39          | 50.8 |
| 3                               | R    | 20          | 0.0 | 0.045     | 11.8          | LOS B            | 0.2               | 1.5          | 0.29                | 0.74          | 46.2 |
| Approach                        |      | 60          | 0.0 | 0.045     | 7.5           | LOS A            | 0.2               | 1.5          | 0.29                | 0.53          | 48.9 |
| East: Black Forest Rd           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 4                               | L    | 34          | 0.0 | 0.115     | 5.6           | LOS A            | 0.7               | 5.0          | 0.21                | 0.46          | 51.0 |
| 5                               | T    | 115         | 5.0 | 0.115     | 4.7           | LOS A            | 0.7               | 5.0          | 0.21                | 0.38          | 51.8 |
| 6                               | R    | 20          | 5.0 | 0.115     | 11.6          | LOS B            | 0.7               | 5.0          | 0.21                | 0.81          | 46.6 |
| Approach                        |      | 169         | 4.0 | 0.115     | 5.7           | LOS A            | 0.7               | 5.0          | 0.21                | 0.44          | 50.9 |
| North: Connector 2              |      |             |     |           |               |                  |                   |              |                     |               |      |
| 7                               | L    | 20          | 5.0 | 0.047     | 6.3           | LOS A            | 0.2               | 1.7          | 0.35                | 0.49          | 49.8 |
| 8                               | T    | 20          | 0.0 | 0.047     | 5.2           | LOS A            | 0.2               | 1.7          | 0.35                | 0.42          | 50.3 |
| 9                               | R    | 20          | 5.0 | 0.047     | 12.2          | LOS B            | 0.2               | 1.7          | 0.35                | 0.73          | 46.1 |
| Approach                        |      | 60          | 3.3 | 0.047     | 7.9           | LOS A            | 0.2               | 1.7          | 0.35                | 0.55          | 48.6 |
| West: Black Forest Rd           |      |             |     |           |               |                  |                   |              |                     |               |      |
| 10                              | L    | 20          | 5.0 | 0.147     | 5.7           | LOS A            | 0.9               | 6.5          | 0.21                | 0.47          | 51.0 |
| 11                              | T    | 178         | 5.0 | 0.147     | 4.8           | LOS A            | 0.9               | 6.5          | 0.21                | 0.38          | 51.8 |
| 12                              | R    | 20          | 0.0 | 0.147     | 11.5          | LOS B            | 0.9               | 6.5          | 0.21                | 0.83          | 46.7 |
| Approach                        |      | 218         | 4.5 | 0.147     | 5.5           | LOS A            | 0.9               | 6.5          | 0.21                | 0.43          | 51.2 |
| All Vehicles                    |      | 507         | 3.7 | 0.147     | 6.1           | LOS A            | 0.9               | 6.5          | 0.24                | 0.46          | 50.5 |

### IN 03

#### Interim Layout



#### Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector  
IN3 - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                       |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.106     | 50.4          | LOS D            | 1.9               | 13.4     | 0.85         | 0.76                | 25.6          |
| 2                     | T    | 20          | 0.0 | 0.106     | 42.2          | LOS D            | 1.9               | 13.4     | 0.85         | 0.64                | 26.1          |
| 3                     | R    | 159         | 0.0 | 0.642     | 63.0          | LOS E            | 9.1               | 64.0     | 1.00         | 0.82                | 22.0          |
| Approach              |      | 199         | 0.0 | 0.642     | 59.6          | LOS E            | 9.1               | 64.0     | 0.97         | 0.80                | 22.7          |
| East: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                     | L    | 336         | 0.0 | 0.625     | 30.3          | LOS C            | 12.6              | 88.5     | 0.70         | 0.80                | 32.7          |
| 5                     | T    | 214         | 0.0 | 0.269     | 35.2          | LOS D            | 6.7               | 47.1     | 0.81         | 0.65                | 29.3          |
| 6                     | R    | 81          | 0.0 | 0.262     | 51.6          | LOS D            | 4.0               | 27.9     | 0.88         | 0.77                | 24.8          |
| Approach              |      | 631         | 0.0 | 0.625     | 34.7          | LOS C            | 12.6              | 88.5     | 0.76         | 0.75                | 30.3          |
| North: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                     | L    | 130         | 0.0 | 0.434     | 30.1          | LOS C            | 4.6               | 31.9     | 0.64         | 0.75                | 32.8          |
| 8                     | T    | 41          | 0.0 | 0.115     | 44.1          | LOS D            | 2.0               | 14.0     | 0.87         | 0.65                | 26.1          |
| 9                     | R    | 20          | 0.0 | 0.081     | 57.6          | LOS E            | 1.0               | 7.3      | 0.91         | 0.71                | 23.2          |
| Approach              |      | 191         | 0.0 | 0.434     | 36.0          | LOS D            | 4.6               | 31.9     | 0.72         | 0.73                | 29.9          |
| West: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                    | L    | 20          | 0.0 | 0.037     | 26.3          | LOS C            | 0.6               | 4.3      | 0.56         | 0.70                | 34.8          |
| 11                    | T    | 514         | 0.0 | 0.648     | 39.3          | LOS D            | 18.4              | 129.0    | 0.90         | 0.77                | 27.7          |
| 12                    | R    | 142         | 0.0 | 0.653     | 54.3          | LOS D            | 7.4               | 51.8     | 0.91         | 0.81                | 24.0          |
| Approach              |      | 676         | 0.0 | 0.653     | 42.0          | LOS D            | 18.4              | 129.0    | 0.89         | 0.77                | 27.0          |
| All Vehicles          |      | 1697        | 0.0 | 0.653     | 40.7          | LOS D            | 18.4              | 129.0    | 0.83         | 0.76                | 27.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector  
IN3 - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                       |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                     | L    | 142         | 0.0 | 0.453     | 50.5          | LOS D            | 9.2               | 64.2     | 0.90         | 0.82                | 25.3          |
| 2                     | T    | 41          | 0.0 | 0.453     | 42.4          | LOS D            | 9.2               | 64.2     | 0.90         | 0.74                | 25.7          |
| 3                     | R    | 486         | 0.0 | 0.805     | 51.1          | LOS D            | 27.4              | 191.8    | 0.98         | 0.91                | 25.0          |
| Approach              |      | 669         | 0.0 | 0.805     | 50.4          | LOS D            | 27.4              | 191.8    | 0.96         | 0.88                | 25.1          |
| East: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                     | L    | 159         | 0.0 | 0.248     | 20.2          | LOS C            | 4.1               | 29.0     | 0.48         | 0.74                | 38.6          |
| 5                     | T    | 514         | 0.0 | 0.813     | 50.6          | LOS D            | 19.9              | 139.0    | 0.97         | 0.88                | 24.1          |
| 6                     | R    | 130         | 0.0 | 0.840     | 75.0          | LOS E            | 8.4               | 58.7     | 1.00         | 0.94                | 19.6          |
| Approach              |      | 803         | 0.0 | 0.840     | 48.5          | LOS D            | 19.9              | 139.0    | 0.88         | 0.86                | 25.0          |
| North: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                     | L    | 81          | 0.0 | 0.319     | 39.4          | LOS D            | 3.4               | 23.5     | 0.75         | 0.75                | 28.7          |
| 8                     | T    | 20          | 0.0 | 0.056     | 43.4          | LOS D            | 1.0               | 6.7      | 0.85         | 0.61                | 26.4          |
| 9                     | R    | 20          | 0.0 | 0.044     | 37.2          | LOS D            | 0.8               | 5.5      | 0.71         | 0.70                | 29.7          |
| Approach              |      | 121         | 0.0 | 0.319     | 39.7          | LOS D            | 3.4               | 23.5     | 0.76         | 0.72                | 28.5          |
| West: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                    | L    | 20          | 0.0 | 0.031     | 19.2          | LOS B            | 0.5               | 3.3      | 0.44         | 0.69                | 39.3          |
| 11                    | T    | 214         | 0.0 | 0.339     | 43.3          | LOS D            | 6.9               | 48.3     | 0.89         | 0.71                | 26.4          |
| 12                    | R    | 20          | 0.0 | 0.129     | 64.9          | LOS E            | 1.1               | 7.8      | 0.96         | 0.71                | 21.5          |
| Approach              |      | 254         | 0.0 | 0.339     | 43.1          | LOS D            | 6.9               | 48.3     | 0.86         | 0.71                | 26.6          |
| All Vehicles          |      | 1847        | 0.0 | 0.840     | 47.9          | LOS D            | 27.4              | 191.8    | 0.90         | 0.84                | 25.5          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector IN3  
- AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                       |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.022     | 8.4           | LOS A            | 0.1               | 0.8      | 0.16         | 0.62                | 48.8          |
| 2                     | T    | 20          | 0.0 | 0.059     | 44.4          | LOS D            | 1.0               | 6.8      | 0.86         | 0.62                | 26.0          |
| 3                     | R    | 150         | 0.0 | 0.533     | 33.6          | LOS C            | 5.7               | 40.2     | 0.70         | 0.76                | 31.2          |
| Approach              |      | 190         | 0.0 | 0.533     | 32.1          | LOS C            | 5.7               | 40.2     | 0.66         | 0.73                | 31.8          |
| East: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                     | L    | 200         | 0.0 | 0.179     | 9.0           | LOS A            | 1.7               | 12.0     | 0.22         | 0.65                | 48.1          |
| 5                     | T    | 201         | 0.0 | 0.344     | 50.1          | LOS D            | 5.4               | 37.6     | 0.94         | 0.74                | 24.3          |
| 6                     | R    | 77          | 0.0 | 0.498     | 67.3          | LOS E            | 4.5               | 31.6     | 1.00         | 0.77                | 21.1          |
| Approach              |      | 478         | 0.0 | 0.498     | 35.7          | LOS D            | 5.4               | 37.6     | 0.65         | 0.71                | 29.8          |
| North: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                     | L    | 189         | 0.0 | 0.282     | 9.8           | LOS A            | 2.1               | 14.5     | 0.26         | 0.66                | 47.3          |
| 8                     | T    | 114         | 0.0 | 0.334     | 47.2          | LOS D            | 5.9               | 41.4     | 0.92         | 0.73                | 25.1          |
| 9                     | R    | 20          | 0.0 | 0.041     | 31.5          | LOS C            | 0.7               | 4.9      | 0.64         | 0.69                | 32.2          |
| Approach              |      | 323         | 0.0 | 0.334     | 24.3          | LOS C            | 5.9               | 41.4     | 0.52         | 0.69                | 35.4          |
| West: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                    | L    | 20          | 0.0 | 0.016     | 8.3           | LOS A            | 0.1               | 0.7      | 0.15         | 0.62                | 48.9          |
| 11                    | T    | 298         | 0.0 | 0.509     | 51.6          | LOS D            | 8.2               | 57.4     | 0.97         | 0.78                | 23.9          |
| 12                    | R    | 77          | 0.0 | 0.498     | 67.3          | LOS E            | 4.5               | 31.6     | 1.00         | 0.77                | 21.1          |
| Approach              |      | 395         | 0.0 | 0.509     | 52.5          | LOS D            | 8.2               | 57.4     | 0.93         | 0.77                | 23.9          |
| All Vehicles          |      | 1386        | 0.0 | 0.533     | 37.3          | LOS D            | 8.2               | 57.4     | 0.70         | 0.73                | 29.1          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector IN3  
- PM Peak Ultimate

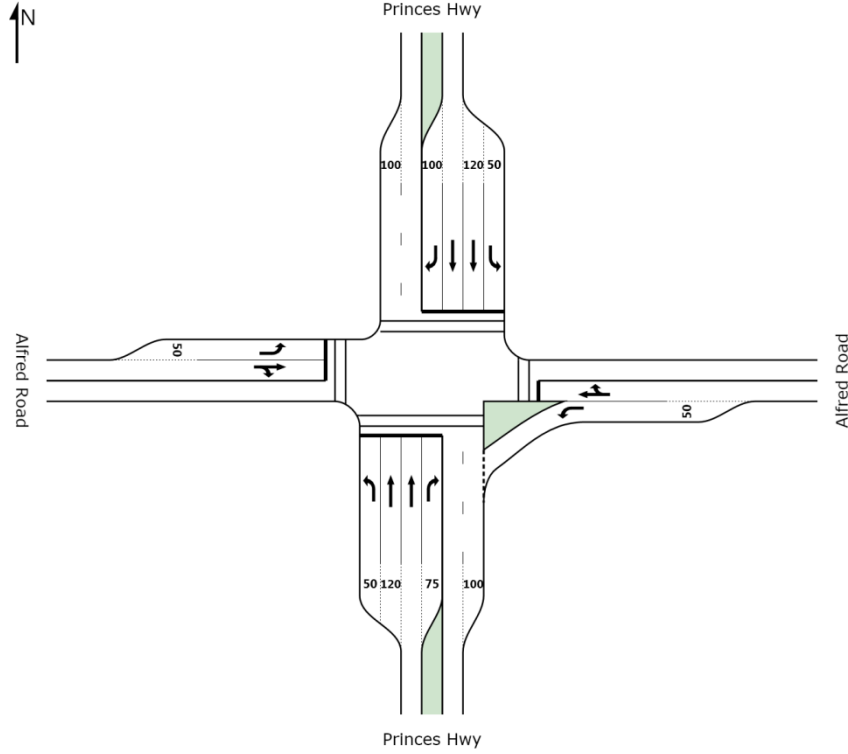
120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

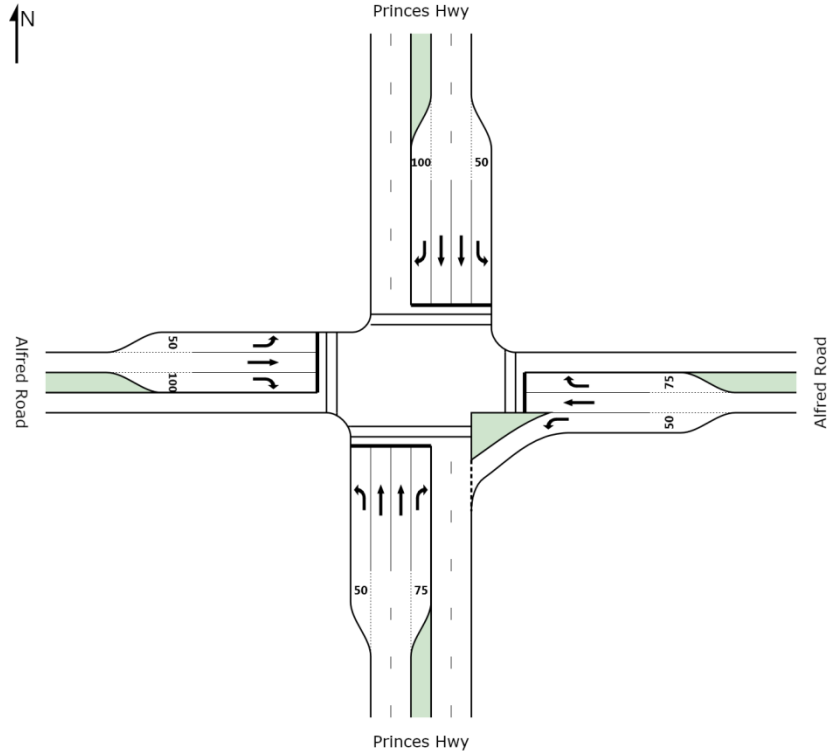
### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                       |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                     | L    | 77          | 0.0 | 0.094     | 8.8           | LOS A            | 0.6               | 4.0      | 0.19         | 0.64                | 48.4          |
| 2                     | T    | 114         | 0.0 | 0.334     | 47.2          | LOS D            | 5.9               | 41.4     | 0.92         | 0.73                | 25.1          |
| 3                     | R    | 200         | 0.0 | 0.730     | 40.0          | LOS D            | 8.8               | 61.8     | 0.74         | 0.82                | 28.6          |
| Approach              |      | 391         | 0.0 | 0.730     | 36.0          | LOS D            | 8.8               | 61.8     | 0.69         | 0.76                | 29.8          |
| East: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                     | L    | 150         | 0.0 | 0.113     | 8.1           | LOS A            | 0.6               | 4.4      | 0.13         | 0.63                | 49.0          |
| 5                     | T    | 298         | 0.0 | 0.705     | 58.9          | LOS E            | 8.9               | 62.2     | 1.00         | 0.85                | 22.1          |
| 6                     | R    | 189         | 0.0 | 0.718     | 63.9          | LOS E            | 11.1              | 77.8     | 1.00         | 0.85                | 21.8          |
| Approach              |      | 637         | 0.0 | 0.718     | 48.4          | LOS D            | 11.1              | 77.8     | 0.80         | 0.80                | 25.3          |
| North: Connector 9    |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                     | L    | 77          | 0.0 | 0.113     | 9.6           | LOS A            | 0.8               | 5.4      | 0.24         | 0.65                | 47.5          |
| 8                     | T    | 20          | 0.0 | 0.059     | 44.4          | LOS D            | 1.0               | 6.8      | 0.86         | 0.62                | 26.0          |
| 9                     | R    | 20          | 0.0 | 0.041     | 32.9          | LOS C            | 0.7               | 5.1      | 0.66         | 0.70                | 31.6          |
| Approach              |      | 117         | 0.0 | 0.113     | 19.5          | LOS B            | 1.0               | 6.8      | 0.42         | 0.65                | 38.8          |
| West: Westbrook Drive |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                    | L    | 20          | 0.0 | 0.021     | 10.1          | LOS B            | 0.2               | 1.5      | 0.25         | 0.64                | 47.0          |
| 11                    | T    | 201         | 0.0 | 0.476     | 55.9          | LOS E            | 5.7               | 40.0     | 0.98         | 0.77                | 22.8          |
| 12                    | R    | 20          | 0.0 | 0.076     | 56.5          | LOS E            | 1.0               | 7.2      | 0.90         | 0.71                | 23.5          |
| Approach              |      | 241         | 0.0 | 0.476     | 52.2          | LOS D            | 5.7               | 40.0     | 0.92         | 0.75                | 23.9          |
| All Vehicles          |      | 1386        | 0.0 | 0.730     | 43.1          | LOS D            | 11.1              | 77.8     | 0.75         | 0.77                | 27.0          |

**PSP 43**  
**IN 19**  
**Interim Layout**



**Ultimate Layout**



## MOVEMENT SUMMARY

Site: Princes Hwy & Alfred Rd  
- AM Peak Interim -  
Conversion

120221sid-12M1296000 - Princes Hwy & Alfred Rd - IN36  
Signals - Fixed Time Cycle Time = 110 seconds (Practical Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       |               |                  | sec               | Vehicles |              |                     |               |
| South: Princes Hwy              |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 37          | 0.0 | 0.148     | 42.4          | LOS D            | 1.5               | 10.7     | 0.80         | 0.73                | 27.6          |
| 2                               | T    | 164         | 0.0 | 0.223     | 35.3          | LOS D            | 4.6               | 32.0     | 0.83         | 0.65                | 29.2          |
| 3                               | R    | 84          | 0.0 | 0.333     | 55.7          | LOS E            | 4.2               | 29.4     | 0.95         | 0.77                | 23.7          |
| Approach                        |      | 285         | 0.0 | 0.333     | 42.3          | LOS D            | 4.6               | 32.0     | 0.86         | 0.70                | 27.1          |
| East: Alfred Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 168         | 0.0 | 0.333     | 13.7          | LOS B            | 3.0               | 21.0     | 0.42         | 0.69                | 43.7          |
| 5                               | T    | 63          | 0.0 | 0.559     | 43.4          | LOS D            | 10.4              | 72.5     | 0.95         | 0.79                | 25.4          |
| 6                               | R    | 147         | 0.0 | 0.559     | 51.4          | LOS D            | 10.4              | 72.5     | 0.95         | 0.82                | 25.2          |
| Approach                        |      | 379         | 0.0 | 0.559     | 33.3          | LOS C            | 10.4              | 72.5     | 0.71         | 0.76                | 31.1          |
| North: Princes Hwy              |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                               | L    | 74          | 0.0 | 0.296     | 43.3          | LOS D            | 3.1               | 21.8     | 0.82         | 0.75                | 27.3          |
| 8                               | T    | 556         | 0.0 | 0.755     | 41.4          | LOS D            | 18.7              | 130.8    | 0.95         | 0.83                | 26.9          |
| 9                               | R    | 198         | 0.0 | 0.782     | 62.5          | LOS E            | 11.1              | 77.9     | 1.00         | 0.89                | 22.0          |
| Approach                        |      | 828         | 0.0 | 0.782     | 46.7          | LOS D            | 18.7              | 130.8    | 0.95         | 0.84                | 25.6          |
| West: Alfred Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                              | L    | 176         | 0.0 | 0.584     | 32.2          | LOS C            | 6.3               | 44.1     | 0.71         | 0.77                | 31.8          |
| 11                              | T    | 32          | 0.0 | 0.549     | 43.3          | LOS D            | 10.1              | 70.6     | 0.95         | 0.79                | 25.3          |
| 12                              | R    | 174         | 0.0 | 0.549     | 51.3          | LOS D            | 10.1              | 70.6     | 0.95         | 0.82                | 25.1          |
| Approach                        |      | 382         | 0.0 | 0.584     | 41.8          | LOS D            | 10.1              | 70.6     | 0.84         | 0.80                | 27.8          |
| All Vehicles                    |      | 1873        | 0.0 | 0.782     | 42.3          | LOS D            | 18.7              | 130.8    | 0.87         | 0.79                | 27.2          |

## MOVEMENT SUMMARY

Site: Princes Hwy & Alfred Rd - PM  
Peak Interim - Conversion

120221sid-12M1296000 - Princes Hwy & Alfred Rd - IN36  
Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | m        |              | per veh             | km/h          |
| South: Princes Hwy              |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 174         | 0.0 | 0.680     | 47.2          | LOS D            | 7.7               | 54.2     | 0.92         | 0.83                | 26.1          |
| 2                               | T    | 556         | 0.0 | 0.882     | 47.4          | LOS D            | 20.2              | 141.3    | 0.97         | 0.95                | 25.0          |
| 3                               | R    | 168         | 0.0 | 0.824     | 62.2          | LOS E            | 9.0               | 63.1     | 1.00         | 0.93                | 22.1          |
| Approach                        |      | 898         | 0.0 | 0.882     | 50.1          | LOS D            | 20.2              | 141.3    | 0.97         | 0.93                | 24.6          |
| East: Alfred Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 84          | 0.0 | 0.090     | 8.5           | LOS A            | 0.5               | 3.3      | 0.19         | 0.64                | 48.7          |
| 5                               | T    | 32          | 0.0 | 0.254     | 35.1          | LOS D            | 4.3               | 30.0     | 0.87         | 0.69                | 28.3          |
| 6                               | R    | 74          | 0.0 | 0.254     | 43.1          | LOS D            | 4.3               | 30.0     | 0.87         | 0.79                | 27.8          |
| Approach                        |      | 189         | 0.0 | 0.254     | 26.4          | LOS C            | 4.3               | 30.0     | 0.57         | 0.70                | 34.6          |
| North: Princes Hwy              |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                               | L    | 147         | 0.0 | 0.575     | 45.3          | LOS D            | 6.3               | 43.9     | 0.90         | 0.79                | 26.7          |
| 8                               | T    | 164         | 0.0 | 0.260     | 35.5          | LOS D            | 4.4               | 30.8     | 0.87         | 0.68                | 29.1          |
| 9                               | R    | 176         | 0.0 | 0.862     | 64.8          | LOS E            | 9.7               | 68.0     | 1.00         | 0.97                | 21.5          |
| Approach                        |      | 487         | 0.0 | 0.862     | 49.0          | LOS D            | 9.7               | 68.0     | 0.93         | 0.82                | 25.2          |
| West: Alfred Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                              | L    | 198         | 0.0 | 0.610     | 30.5          | LOS C            | 6.6               | 46.0     | 0.72         | 0.78                | 32.6          |
| 11                              | T    | 63          | 0.0 | 0.238     | 34.9          | LOS C            | 4.1               | 28.4     | 0.86         | 0.68                | 28.8          |
| 12                              | R    | 37          | 0.0 | 0.238     | 42.9          | LOS D            | 4.1               | 28.4     | 0.86         | 0.80                | 28.3          |
| Approach                        |      | 298         | 0.0 | 0.610     | 33.0          | LOS C            | 6.6               | 46.0     | 0.77         | 0.76                | 31.1          |
| All Vehicles                    |      | 1873        | 0.0 | 0.882     | 44.7          | LOS D            | 20.2              | 141.3    | 0.89         | 0.85                | 26.4          |

## MOVEMENT SUMMARY

Site: Princes Hwy & Alfred Rd  
- AM Peak Ultimate

120221sid-12M1296000 - Princes Hwy & Alfred Rd - IN36

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|--------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                    |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                    |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Princes Hwy |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                  | L    | 42          | 0.0 | 0.124     | 23.7          | LOS C            | 1.2               | 8.4      | 0.53         | 0.71                | 36.3          |
| 2                  | T    | 282         | 0.0 | 0.222     | 31.4          | LOS C            | 6.0               | 41.7     | 0.77         | 0.63                | 30.9          |
| 3                  | R    | 84          | 0.0 | 0.286     | 56.8          | LOS E            | 4.4               | 30.9     | 0.92         | 0.77                | 23.4          |
| Approach           |      | 408         | 0.0 | 0.286     | 35.9          | LOS D            | 6.0               | 41.7     | 0.78         | 0.67                | 29.4          |
| East: Alfred Road  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                  | L    | 168         | 0.0 | 0.379     | 13.6          | LOS B            | 3.2               | 22.6     | 0.40         | 0.69                | 43.8          |
| 5                  | T    | 63          | 0.0 | 0.177     | 44.8          | LOS D            | 3.1               | 22.0     | 0.88         | 0.68                | 25.9          |
| 6                  | R    | 147         | 0.0 | 0.595     | 62.3          | LOS E            | 8.4               | 58.5     | 0.99         | 0.80                | 22.1          |
| Approach           |      | 379         | 0.0 | 0.595     | 37.7          | LOS D            | 8.4               | 58.5     | 0.71         | 0.73                | 29.3          |
| North: Princes Hwy |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                  | L    | 74          | 0.0 | 0.217     | 24.1          | LOS C            | 2.2               | 15.1     | 0.54         | 0.73                | 36.1          |
| 8                  | T    | 753         | 0.0 | 0.594     | 36.4          | LOS D            | 18.4              | 128.8    | 0.89         | 0.77                | 28.7          |
| 9                  | R    | 77          | 0.0 | 0.262     | 56.5          | LOS E            | 4.0               | 28.1     | 0.92         | 0.77                | 23.5          |
| Approach           |      | 904         | 0.0 | 0.594     | 37.1          | LOS D            | 18.4              | 128.8    | 0.87         | 0.77                | 28.7          |
| West: Alfred Road  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                 | L    | 96          | 0.0 | 0.341     | 33.0          | LOS C            | 3.6               | 24.9     | 0.68         | 0.75                | 31.4          |
| 11                 | T    | 32          | 0.0 | 0.088     | 43.8          | LOS D            | 1.5               | 10.7     | 0.86         | 0.64                | 26.2          |
| 12                 | R    | 142         | 0.0 | 0.573     | 62.1          | LOS E            | 8.0               | 56.2     | 0.99         | 0.80                | 22.2          |
| Approach           |      | 270         | 0.0 | 0.573     | 49.6          | LOS D            | 8.0               | 56.2     | 0.86         | 0.76                | 25.3          |
| All Vehicles       |      | 1960        | 0.0 | 0.595     | 38.7          | LOS D            | 18.4              | 128.8    | 0.82         | 0.74                | 28.4          |

## MOVEMENT SUMMARY

Site: Princes Hwy & Alfred Rd  
- PM Peak Ultimate - Copy

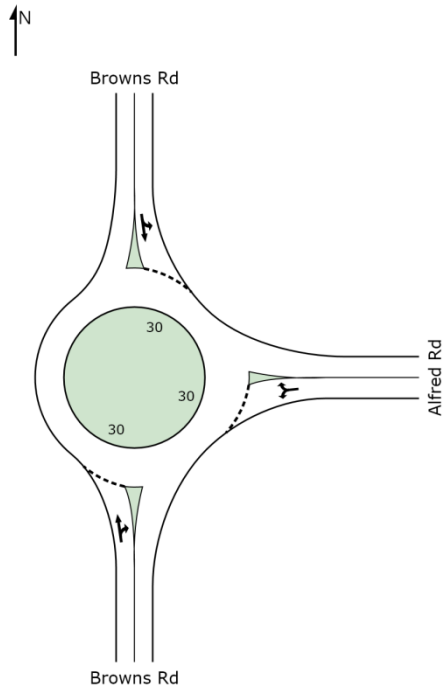
120221sid-12M1296000 - Princes Hwy & Alfred Rd - IN36

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

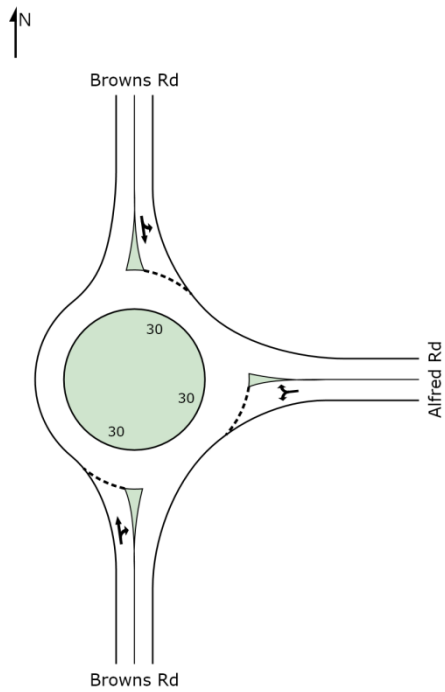
### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|--------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                    |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                    |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Princes Hwy |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                  | L    | 142         | 0.0 | 0.444     | 27.1          | LOS C            | 4.6               | 32.5     | 0.60         | 0.75                | 34.3          |
| 2                  | T    | 753         | 0.0 | 0.552     | 33.7          | LOS C            | 17.7              | 123.7    | 0.86         | 0.75                | 29.9          |
| 3                  | R    | 168         | 0.0 | 0.553     | 55.1          | LOS E            | 8.9               | 62.2     | 0.94         | 0.81                | 23.8          |
| Approach           |      | 1063        | 0.0 | 0.553     | 36.2          | LOS D            | 17.7              | 123.7    | 0.84         | 0.76                | 29.2          |
| East: Alfred Road  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                  | L    | 84          | 0.0 | 0.110     | 8.7           | LOS A            | 0.6               | 4.3      | 0.19         | 0.64                | 48.5          |
| 5                  | T    | 32          | 0.0 | 0.088     | 43.8          | LOS D            | 1.5               | 10.7     | 0.86         | 0.64                | 26.2          |
| 6                  | R    | 74          | 0.0 | 0.529     | 68.7          | LOS E            | 4.4               | 30.7     | 1.00         | 0.76                | 20.8          |
| Approach           |      | 189         | 0.0 | 0.529     | 37.9          | LOS D            | 4.4               | 30.7     | 0.62         | 0.69                | 29.3          |
| North: Princes Hwy |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                  | L    | 147         | 0.0 | 0.461     | 27.2          | LOS C            | 4.8               | 33.8     | 0.60         | 0.75                | 34.3          |
| 8                  | T    | 282         | 0.0 | 0.207     | 29.1          | LOS C            | 5.7               | 40.0     | 0.74         | 0.61                | 32.1          |
| 9                  | R    | 96          | 0.0 | 0.270     | 53.0          | LOS D            | 4.8               | 33.9     | 0.89         | 0.78                | 24.4          |
| Approach           |      | 525         | 0.0 | 0.461     | 32.9          | LOS C            | 5.7               | 40.0     | 0.73         | 0.68                | 30.9          |
| West: Alfred Road  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                 | L    | 77          | 0.0 | 0.260     | 30.1          | LOS C            | 2.7               | 18.6     | 0.63         | 0.74                | 32.8          |
| 11                 | T    | 63          | 0.0 | 0.177     | 44.8          | LOS D            | 3.1               | 22.0     | 0.88         | 0.68                | 25.9          |
| 12                 | R    | 42          | 0.0 | 0.302     | 67.2          | LOS E            | 2.4               | 17.1     | 0.98         | 0.74                | 21.1          |
| Approach           |      | 182         | 0.0 | 0.302     | 43.7          | LOS D            | 3.1               | 22.0     | 0.80         | 0.72                | 26.9          |
| All Vehicles       |      | 1960        | 0.0 | 0.553     | 36.2          | LOS D            | 17.7              | 123.7    | 0.78         | 0.73                | 29.4          |

### IN 39 Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: IN40 Alfred Rd &  
Connector - AM Peak Interim

120221sid-12M1296000 - Alfred Rd & Connector 1 - IN35  
Roundabout

### Movement Performance - Vehicles

| Mov ID           | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Browns Rd |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 2                | T    | 20                   | 0.0               | 0.103 | 4.9                  | LOS A            | 0.6                                  | 4.1           | 0.29         | 0.37                           | 50.5                  |
| 3                | R    | 120                  | 0.0               | 0.103 | 11.8                 | LOS B            | 0.6                                  | 4.1           | 0.29         | 0.65                           | 45.7                  |
| Approach         |      | 140                  | 0.0               | 0.103 | 10.8                 | LOS B            | 0.6                                  | 4.1           | 0.29         | 0.61                           | 46.3                  |
| East: Alfred Rd  |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                | L    | 322                  | 0.0               | 0.261 | 5.4                  | LOS A            | 1.6                                  | 11.4          | 0.11         | 0.43                           | 51.5                  |
| 6                | R    | 115                  | 0.0               | 0.261 | 11.3                 | LOS B            | 1.6                                  | 11.4          | 0.11         | 0.76                           | 46.5                  |
| Approach         |      | 437                  | 0.0               | 0.261 | 6.9                  | LOS A            | 1.6                                  | 11.4          | 0.11         | 0.52                           | 50.0                  |
| North: Browns Rd |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                | L    | 30                   | 0.0               | 0.037 | 5.8                  | LOS A            | 0.2                                  | 1.5           | 0.30         | 0.47                           | 50.4                  |
| 8                | T    | 20                   | 0.0               | 0.037 | 4.9                  | LOS A            | 0.2                                  | 1.5           | 0.30         | 0.39                           | 51.0                  |
| Approach         |      | 50                   | 0.0               | 0.037 | 5.5                  | LOS A            | 0.2                                  | 1.5           | 0.30         | 0.44                           | 50.6                  |
| All Vehicles     |      | 627                  | 0.0               | 0.261 | 7.7                  | LOS A            | 1.6                                  | 11.4          | 0.17         | 0.53                           | 49.1                  |

## MOVEMENT SUMMARY

Site: IN40 Alfred Rd &  
Connector - PM Peak Interim

120221sid-12M1296000 - Alfred Rd & Connector 1 - IN35  
Roundabout

### Movement Performance - Vehicles

| Mov ID           | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Browns Rd |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 2                | T    | 20                   | 0.0               | 0.212 | 4.5                  | LOS A            | 1.4                                  | 9.5           | 0.15         | 0.32                           | 52.0                  |
| 3                | R    | 322                  | 0.0               | 0.212 | 11.4                 | LOS B            | 1.4                                  | 9.5           | 0.15         | 0.65                           | 46.1                  |
| Approach         |      | 342                  | 0.0               | 0.212 | 11.0                 | LOS B            | 1.4                                  | 9.5           | 0.15         | 0.63                           | 46.4                  |
| East: Alfred Rd  |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                | L    | 120                  | 0.0               | 0.094 | 5.4                  | LOS A            | 0.5                                  | 3.6           | 0.10         | 0.44                           | 51.6                  |
| 6                | R    | 30                   | 0.0               | 0.094 | 11.3                 | LOS B            | 0.5                                  | 3.6           | 0.10         | 0.77                           | 46.5                  |
| Approach         |      | 150                  | 0.0               | 0.094 | 6.6                  | LOS A            | 0.5                                  | 3.6           | 0.10         | 0.50                           | 50.4                  |
| North: Browns Rd |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                | L    | 115                  | 0.0               | 0.118 | 7.0                  | LOS A            | 0.7                                  | 4.9           | 0.50         | 0.56                           | 49.0                  |
| 8                | T    | 20                   | 0.0               | 0.118 | 6.0                  | LOS A            | 0.7                                  | 4.9           | 0.50         | 0.51                           | 49.2                  |
| Approach         |      | 135                  | 0.0               | 0.118 | 6.8                  | LOS A            | 0.7                                  | 4.9           | 0.50         | 0.56                           | 49.0                  |
| All Vehicles     |      | 627                  | 0.0               | 0.212 | 9.0                  | LOS A            | 1.4                                  | 9.5           | 0.21         | 0.58                           | 47.8                  |

## MOVEMENT SUMMARY

Site: IN40 Alfred Rd &  
Connector - AM Peak  
Ultimate

120221sid-12M1296000 - Alfred Rd & Connector 1 - IN35  
Roundabout

| Movement Performance - Vehicles |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Browns Rd                |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 2                               | T    | 113                  | 0.0               | 0.121 | 4.8                  | LOS A            | 0.7                                  | 5.2           | 0.28         | 0.39                           | 51.1                  |
| 3                               | R    | 57                   | 0.0               | 0.121 | 11.7                 | LOS B            | 0.7                                  | 5.2           | 0.28         | 0.76                           | 46.4                  |
| Approach                        |      | 170                  | 0.0               | 0.121 | 7.1                  | LOS A            | 0.7                                  | 5.2           | 0.28         | 0.51                           | 49.3                  |
| East: Alfred Rd                 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 149                  | 0.0               | 0.177 | 5.9                  | LOS A            | 1.0                                  | 6.8           | 0.31         | 0.47                           | 50.0                  |
| 6                               | R    | 93                   | 0.0               | 0.177 | 11.8                 | LOS B            | 1.0                                  | 6.8           | 0.31         | 0.71                           | 46.0                  |
| Approach                        |      | 242                  | 0.0               | 0.177 | 8.2                  | LOS A            | 1.0                                  | 6.8           | 0.31         | 0.56                           | 48.3                  |
| North: Browns Rd                |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 30                   | 0.0               | 0.115 | 5.5                  | LOS A            | 0.7                                  | 4.8           | 0.21         | 0.47                           | 51.1                  |
| 8                               | T    | 140                  | 0.0               | 0.115 | 4.6                  | LOS A            | 0.7                                  | 4.8           | 0.21         | 0.38                           | 51.9                  |
| Approach                        |      | 170                  | 0.0               | 0.115 | 4.8                  | LOS A            | 0.7                                  | 4.8           | 0.21         | 0.40                           | 51.7                  |
| All Vehicles                    |      | 582                  | 0.0               | 0.177 | 6.9                  | LOS A            | 1.0                                  | 6.8           | 0.27         | 0.50                           | 49.5                  |

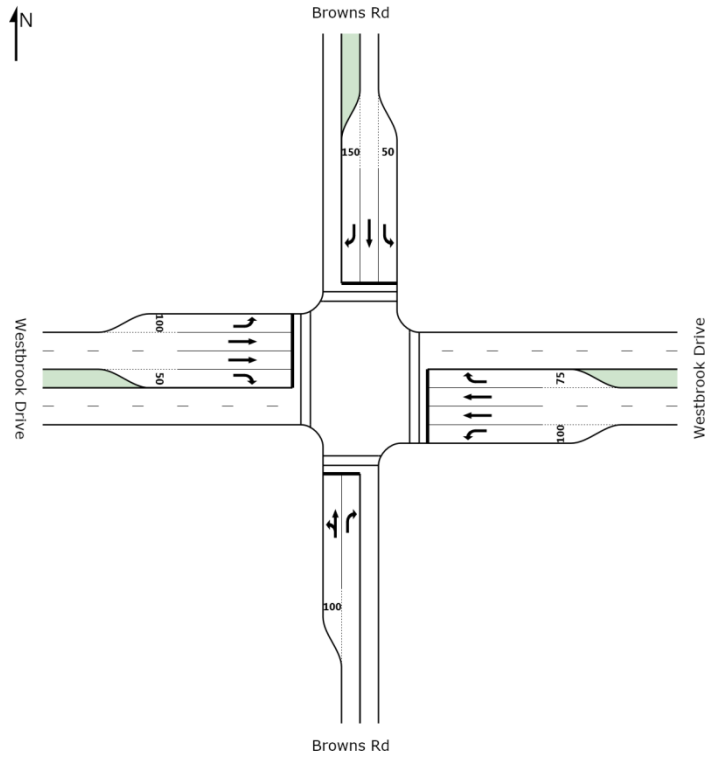
## MOVEMENT SUMMARY

Site: IN40 Alfred Rd &  
Connector - PM Peak  
Ultimate

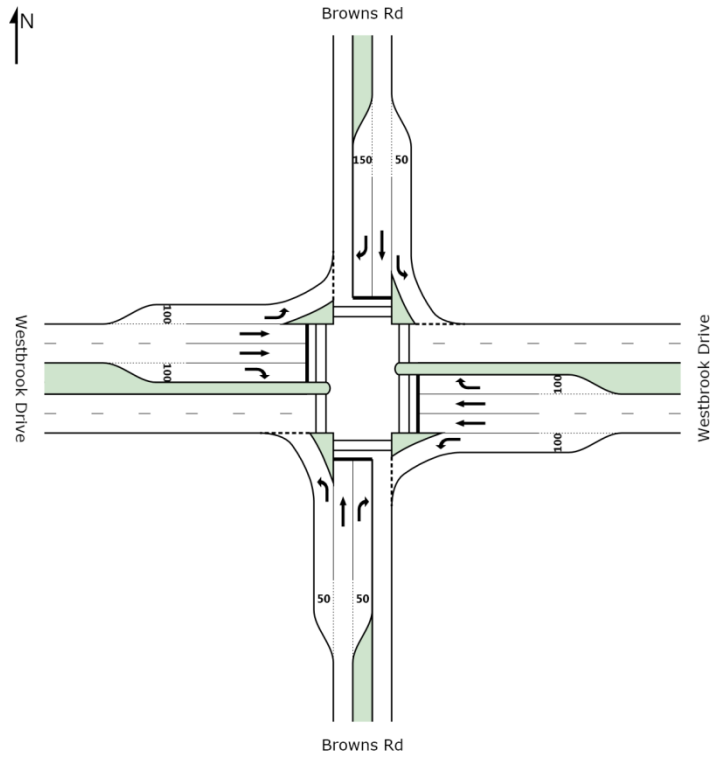
120221sid-12M1296000 - Alfred Rd & Connector 1 - IN35  
Roundabout

| Movement Performance - Vehicles |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Browns Rd                |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 2                               | T    | 140                  | 0.0               | 0.181 | 4.5                  | LOS A            | 1.2                                  | 8.2           | 0.15         | 0.34                           | 52.2                  |
| 3                               | R    | 149                  | 0.0               | 0.181 | 11.3                 | LOS B            | 1.2                                  | 8.2           | 0.15         | 0.75                           | 46.4                  |
| Approach                        |      | 289                  | 0.0               | 0.181 | 8.0                  | LOS A            | 1.2                                  | 8.2           | 0.15         | 0.55                           | 48.9                  |
| East: Alfred Rd                 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 57                   | 0.0               | 0.064 | 5.7                  | LOS A            | 0.3                                  | 2.3           | 0.26         | 0.45                           | 50.3                  |
| 6                               | R    | 30                   | 0.0               | 0.064 | 11.6                 | LOS B            | 0.3                                  | 2.3           | 0.26         | 0.71                           | 46.1                  |
| Approach                        |      | 87                   | 0.0               | 0.064 | 7.8                  | LOS A            | 0.3                                  | 2.3           | 0.26         | 0.54                           | 48.7                  |
| North: Browns Rd                |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 93                   | 0.0               | 0.156 | 6.1                  | LOS A            | 0.9                                  | 6.5           | 0.35         | 0.50                           | 50.1                  |
| 8                               | T    | 113                  | 0.0               | 0.156 | 5.1                  | LOS A            | 0.9                                  | 6.5           | 0.35         | 0.43                           | 50.6                  |
| Approach                        |      | 206                  | 0.0               | 0.156 | 5.6                  | LOS A            | 0.9                                  | 6.5           | 0.35         | 0.47                           | 50.4                  |
| All Vehicles                    |      | 582                  | 0.0               | 0.181 | 7.1                  | LOS A            | 1.2                                  | 8.2           | 0.24         | 0.52                           | 49.4                  |

## IN 35 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN35 Westbrook Dr &  
Connector - AM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 135 seconds (Optimum Cycle Time - Minimum Delay)

| Movement Performance - Vehicles |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Browns Rd                |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                               | L    | 20                   | 0.0  | 0.119            | 58.4                 | LOS E            | 2.2                                  | 15.5          | 0.88         | 0.76                           | 23.4                  |
| 2                               | T    | 20                   | 0.0  | 0.119            | 50.2                 | LOS D            | 2.2                                  | 15.5          | 0.88         | 0.66                           | 23.8                  |
| 3                               | R    | 20                   | 0.0  | 0.050            | 52.8                 | LOS D            | 1.0                                  | 7.2           | 0.82         | 0.71                           | 24.5                  |
| Approach                        |      | 60                   | 0.0  | 0.119            | 53.8                 | LOS D            | 2.2                                  | 15.5          | 0.86         | 0.71                           | 23.9                  |
| East: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 20                   | 0.0  | 0.029            | 16.4                 | LOS B            | 0.4                                  | 3.1           | 0.36         | 0.69                           | 41.3                  |
| 5                               | T    | 850                  | 0.0  | 0.538            | 29.4                 | LOS C            | 18.3                                 | 128.2         | 0.70         | 0.62                           | 32.0                  |
| 6                               | R    | 20                   | 0.0  | 0.242            | 79.4                 | LOS E            | 1.4                                  | 9.5           | 1.00         | 0.70                           | 18.9                  |
| Approach                        |      | 890                  | 0.0  | 0.538            | 30.3                 | LOS C            | 18.3                                 | 128.2         | 0.70         | 0.62                           | 31.6                  |
| North: Browns Rd                |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 20                   | 0.0  | 0.094            | 48.7                 | LOS D            | 1.0                                  | 6.9           | 0.78         | 0.70                           | 25.6                  |
| 8                               | T    | 20                   | 0.0  | 0.063            | 51.3                 | LOS D            | 1.1                                  | 7.8           | 0.88         | 0.63                           | 24.0                  |
| 9                               | R    | 322                  | 0.0  | 0.807            | 66.8                 | LOS E            | 21.4                                 | 150.0         | 1.00         | 0.90                           | 21.2                  |
| Approach                        |      | 362                  | 0.0  | 0.807            | 64.9                 | LOS E            | 21.4                                 | 150.0         | 0.98         | 0.88                           | 21.5                  |
| West: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 119                  | 0.0  | 0.175            | 16.9                 | LOS B            | 2.8                                  | 19.4          | 0.39         | 0.72                           | 40.9                  |
| 11                              | T    | 1255                 | 0.0  | 0.794            | 34.2                 | LOS C            | 33.6                                 | 235.5         | 0.87         | 0.79                           | 29.6                  |
| 12                              | R    | 20                   | 0.0  | 0.242            | 79.5                 | LOS E            | 1.4                                  | 9.5           | 1.00         | 0.70                           | 18.8                  |
| Approach                        |      | 1394                 | 0.0  | 0.794            | 33.4                 | LOS C            | 33.6                                 | 235.5         | 0.83         | 0.78                           | 30.1                  |
| All Vehicles                    |      | 2706                 | 0.0  | 0.807            | 37.0                 | LOS D            | 33.6                                 | 235.5         | 0.81         | 0.74                           | 28.8                  |

## MOVEMENT SUMMARY

Site: IN35 Westbrook Dr &  
Connector - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 150 seconds (Optimum Cycle Time - Minimum Delay)

| Movement Performance - Vehicles |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| South: Browns Rd                |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 1                               | L    | 20                   | 0.0  | 0.132            | 66.4                 | LOS E            | 2.5                                  | 17.6          | 0.89         | 0.76                           | 21.6                  |
| 2                               | T    | 20                   | 0.0  | 0.132            | 58.2                 | LOS E            | 2.5                                  | 17.6          | 0.89         | 0.67                           | 21.9                  |
| 3                               | R    | 20                   | 0.0  | 0.095            | 72.7                 | LOS E            | 1.3                                  | 9.3           | 0.93         | 0.71                           | 20.0                  |
| Approach                        |      | 60                   | 0.0  | 0.132            | 65.8                 | LOS E            | 2.5                                  | 17.6          | 0.91         | 0.71                           | 21.1                  |
| East: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 4                               | L    | 20                   | 0.0  | 0.029            | 15.6                 | LOS B            | 0.4                                  | 3.1           | 0.32         | 0.69                           | 42.0                  |
| 5                               | T    | 1255                 | 0.0  | 0.588            | 17.2                 | LOS B            | 22.1                                 | 154.8         | 0.53         | 0.48                           | 39.4                  |
| 6                               | R    | 20                   | 0.0  | 0.269            | 88.0                 | LOS F            | 1.5                                  | 10.6          | 1.00         | 0.70                           | 17.5                  |
| Approach                        |      | 1295                 | 0.0  | 0.588            | 18.2                 | LOS B            | 22.1                                 | 154.8         | 0.53         | 0.48                           | 38.7                  |
| North: Browns Rd                |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 20                   | 0.0  | 0.106            | 56.3                 | LOS E            | 1.1                                  | 7.9           | 0.81         | 0.71                           | 23.5                  |
| 8                               | T    | 20                   | 0.0  | 0.070            | 59.2                 | LOS E            | 1.3                                  | 8.8           | 0.89         | 0.64                           | 22.1                  |
| 9                               | R    | 119                  | 0.0  | 0.565            | 77.5                 | LOS E            | 8.5                                  | 59.2          | 0.99         | 0.80                           | 19.2                  |
| Approach                        |      | 159                  | 0.0  | 0.565            | 72.5                 | LOS E            | 8.5                                  | 59.2          | 0.96         | 0.77                           | 20.0                  |
| West: Westbrook Drive           |      |                      |      |                  |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 322                  | 0.0  | 0.475            | 17.1                 | LOS B            | 8.5                                  | 59.5          | 0.40         | 0.75                           | 40.8                  |
| 11                              | T    | 850                  | 0.0  | 0.398            | 14.9                 | LOS B            | 12.1                                 | 84.6          | 0.42         | 0.37                           | 41.4                  |
| 12                              | R    | 20                   | 0.0  | 0.269            | 88.2                 | LOS F            | 1.5                                  | 10.6          | 1.00         | 0.70                           | 17.5                  |
| Approach                        |      | 1192                 | 0.0  | 0.475            | 16.7                 | LOS B            | 12.1                                 | 84.6          | 0.43         | 0.48                           | 40.3                  |

All Vehicles 2706 0.0 0.588 21.8 LOS C 22.1 154.8 0.52 0.50 36.6

## MOVEMENT SUMMARY

Site: IN35 Westbrook Dr & Connector 9  
- AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                       |      | Vehicles    |     |           |               |                  | Distance          |       |              |                     |               |
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh               | m     |              | per veh             | km/h          |
| South: Browns Rd      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.041     | 12.0          | LOS B            | 0.3               | 2.1   | 0.33         | 0.65                | 45.2          |
| 2                     | T    | 20          | 0.0 | 0.059     | 44.4          | LOS D            | 1.0               | 6.8   | 0.86         | 0.62                | 26.0          |
| 3                     | R    | 20          | 0.0 | 0.100     | 58.6          | LOS E            | 1.1               | 7.4   | 0.92         | 0.71                | 23.0          |
| Approach              |      | 60          | 0.0 | 0.100     | 38.3          | LOS D            | 1.1               | 7.4   | 0.70         | 0.66                | 28.9          |
| East: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                     | L    | 20          | 0.0 | 0.015     | 8.0           | LOS A            | 0.1               | 0.5   | 0.12         | 0.62                | 49.1          |
| 5                     | T    | 724         | 0.0 | 0.455     | 27.5          | LOS C            | 15.2              | 106.7 | 0.78         | 0.67                | 32.8          |
| 6                     | R    | 112         | 0.0 | 0.658     | 68.1          | LOS E            | 6.7               | 46.9  | 1.00         | 0.82                | 20.9          |
| Approach              |      | 856         | 0.0 | 0.658     | 32.3          | LOS C            | 15.2              | 106.7 | 0.79         | 0.69                | 30.7          |
| North: Browns Rd      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                     | L    | 139         | 0.0 | 0.292     | 12.9          | LOS B            | 2.4               | 16.9  | 0.37         | 0.68                | 44.4          |
| 8                     | T    | 20          | 0.0 | 0.059     | 44.4          | LOS D            | 1.0               | 6.8   | 0.86         | 0.62                | 26.0          |
| 9                     | R    | 148         | 0.0 | 0.638     | 63.7          | LOS E            | 8.6               | 59.9  | 1.00         | 0.82                | 21.9          |
| Approach              |      | 307         | 0.0 | 0.638     | 39.4          | LOS D            | 8.6               | 59.9  | 0.71         | 0.74                | 28.8          |
| West: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                    | L    | 57          | 0.0 | 0.049     | 8.6           | LOS A            | 0.4               | 2.8   | 0.18         | 0.63                | 48.5          |
| 11                    | T    | 1032        | 0.0 | 0.648     | 30.5          | LOS C            | 24.1              | 168.8 | 0.86         | 0.77                | 31.2          |
| 12                    | R    | 20          | 0.0 | 0.117     | 63.4          | LOS E            | 1.1               | 7.7   | 0.95         | 0.71                | 21.9          |
| Approach              |      | 1109        | 0.0 | 0.648     | 30.0          | LOS C            | 24.1              | 168.8 | 0.83         | 0.76                | 31.6          |
| All Vehicles          |      | 2332        | 0.0 | 0.658     | 32.3          | LOS C            | 24.1              | 168.8 | 0.80         | 0.73                | 30.8          |

## MOVEMENT SUMMARY

Site: IN35 Westbrook Dr & Connector 9  
- PM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 9 - IN37

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

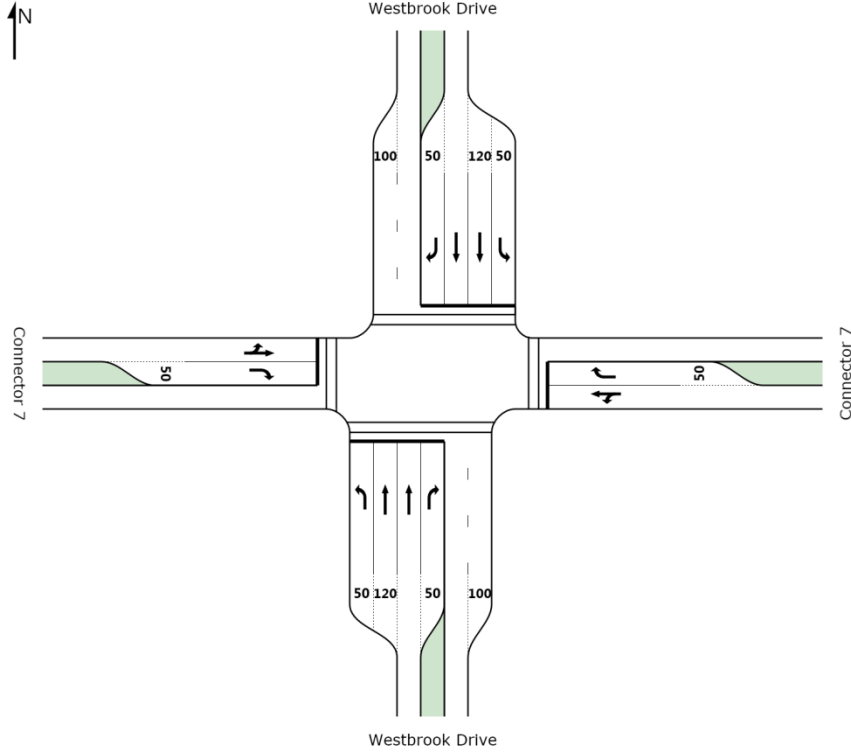
### Movement Performance - Vehicles

| Mov ID                | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Queue Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|-----------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------------|--------------|---------------------|---------------|
|                       |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m              |              | per veh             | km/h          |
| South: Browns Rd      |      |             |     |           |               |                  |                            |                |              |                     |               |
| 1                     | L    | 20          | 0.0 | 0.043     | 12.6          | LOS B            | 0.3                        | 2.3            | 0.34         | 0.65                | 44.6          |
| 2                     | T    | 20          | 0.0 | 0.059     | 44.4          | LOS D            | 1.0                        | 6.8            | 0.86         | 0.62                | 26.0          |
| 3                     | R    | 20          | 0.0 | 0.185     | 68.9          | LOS E            | 1.2                        | 8.2            | 0.98         | 0.70                | 20.8          |
| Approach              |      | 60          | 0.0 | 0.185     | 42.0          | LOS D            | 1.2                        | 8.2            | 0.73         | 0.66                | 27.6          |
| East: Westbrook Drive |      |             |     |           |               |                  |                            |                |              |                     |               |
| 4                     | L    | 20          | 0.0 | 0.015     | 8.0           | LOS A            | 0.1                        | 0.5            | 0.12         | 0.62                | 49.1          |
| 5                     | T    | 1032        | 0.0 | 0.599     | 27.1          | LOS C            | 22.7                       | 158.9          | 0.82         | 0.73                | 32.9          |
| 6                     | R    | 139         | 0.0 | 0.599     | 63.2          | LOS E            | 7.9                        | 55.6           | 0.99         | 0.80                | 21.9          |
| Approach              |      | 1191        | 0.0 | 0.599     | 31.0          | LOS C            | 22.7                       | 158.9          | 0.83         | 0.73                | 31.2          |
| North: Browns Rd      |      |             |     |           |               |                  |                            |                |              |                     |               |
| 7                     | L    | 112         | 0.0 | 0.189     | 10.1          | LOS B            | 1.3                        | 9.1            | 0.27         | 0.66                | 47.0          |
| 8                     | T    | 20          | 0.0 | 0.059     | 44.4          | LOS D            | 1.0                        | 6.8            | 0.86         | 0.62                | 26.0          |
| 9                     | R    | 57          | 0.0 | 0.526     | 71.0          | LOS E            | 3.5                        | 24.2           | 1.00         | 0.75                | 20.4          |
| Approach              |      | 189         | 0.0 | 0.526     | 32.1          | LOS C            | 3.5                        | 24.2           | 0.55         | 0.68                | 31.8          |
| West: Westbrook Drive |      |             |     |           |               |                  |                            |                |              |                     |               |
| 10                    | L    | 148         | 0.0 | 0.135     | 8.8           | LOS A            | 1.2                        | 8.3            | 0.20         | 0.65                | 48.3          |
| 11                    | T    | 724         | 0.0 | 0.420     | 24.4          | LOS C            | 14.4                       | 100.5          | 0.73         | 0.64                | 34.4          |
| 12                    | R    | 20          | 0.0 | 0.086     | 58.7          | LOS E            | 1.1                        | 7.4            | 0.92         | 0.71                | 23.0          |
| Approach              |      | 892         | 0.0 | 0.420     | 22.6          | LOS C            | 14.4                       | 100.5          | 0.65         | 0.64                | 35.8          |
| All Vehicles          |      | 2332        | 0.0 | 0.599     | 28.2          | LOS C            | 22.7                       | 158.9          | 0.73         | 0.69                | 32.8          |

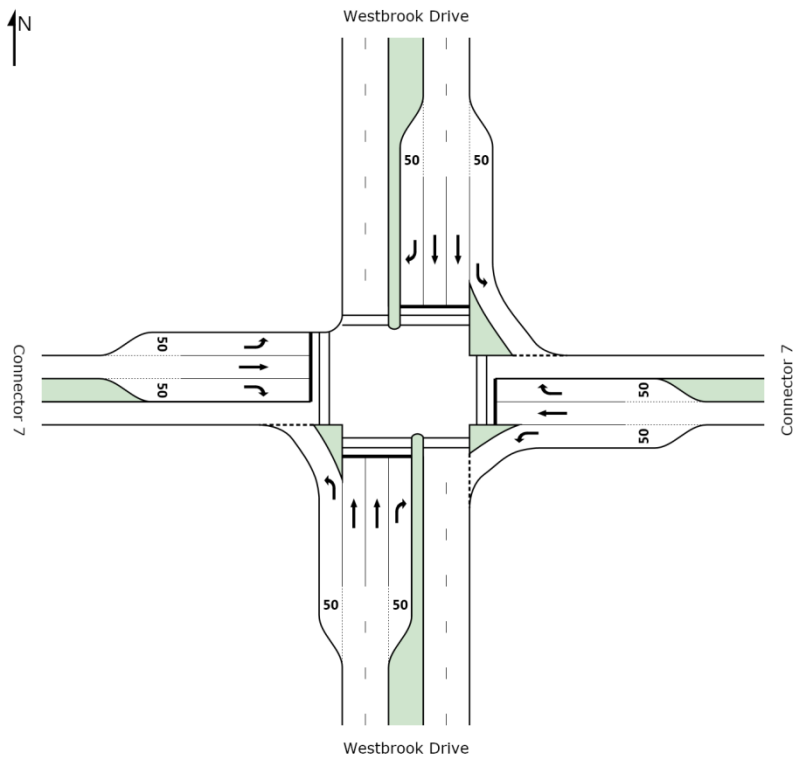
PSP 93

IN 04

Interim Layout



Ultimate Layout



## MOVEMENT SUMMARY

Site: IN04 Westbrook Dr & Connector - AM  
Peak Interim - Conversion

120221sid-12M1296000 - Westbrook Dr & Connector 7 - IN26  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                               | L    | 200         | 0.0 | 0.605     | 26.5          | LOS C            | 6.5               | 45.7  | 0.60         | 0.76                | 34.7          |
| 2                               | T    | 233         | 0.0 | 0.262     | 33.6          | LOS C            | 7.0               | 49.1  | 0.79         | 0.64                | 30.0          |
| 3                               | R    | 20          | 0.0 | 0.096     | 55.4          | LOS E            | 1.0               | 7.1   | 0.89         | 0.70                | 23.8          |
| Approach                        |      | 453         | 0.0 | 0.605     | 31.4          | LOS C            | 7.0               | 49.1  | 0.71         | 0.70                | 31.5          |
| East: Connector 7               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.243     | 50.1          | LOS D            | 5.0               | 35.0  | 0.87         | 0.82                | 26.1          |
| 5                               | T    | 83          | 0.0 | 0.243     | 41.9          | LOS D            | 5.0               | 35.0  | 0.87         | 0.69                | 26.5          |
| 6                               | R    | 78          | 0.0 | 0.383     | 58.4          | LOS E            | 4.2               | 29.1  | 0.94         | 0.76                | 23.1          |
| Approach                        |      | 181         | 0.0 | 0.383     | 49.9          | LOS D            | 5.0               | 35.0  | 0.90         | 0.74                | 24.9          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                               | L    | 59          | 0.0 | 0.178     | 25.0          | LOS C            | 1.8               | 12.4  | 0.55         | 0.72                | 35.5          |
| 8                               | T    | 656         | 0.0 | 0.739     | 39.1          | LOS D            | 23.7              | 165.9 | 0.92         | 0.80                | 27.7          |
| 9                               | R    | 150         | 0.0 | 0.732     | 62.2          | LOS E            | 8.6               | 60.0  | 0.97         | 0.85                | 22.2          |
| Approach                        |      | 865         | 0.0 | 0.739     | 42.1          | LOS D            | 23.7              | 165.9 | 0.90         | 0.80                | 27.0          |
| West: Connector 7               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                              | L    | 118         | 0.0 | 0.413     | 49.6          | LOS D            | 9.4               | 65.6  | 0.89         | 0.82                | 25.7          |
| 11                              | T    | 71          | 0.0 | 0.413     | 41.4          | LOS D            | 9.4               | 65.6  | 0.89         | 0.74                | 26.1          |
| 12                              | R    | 150         | 0.0 | 0.741     | 63.3          | LOS E            | 8.7               | 60.8  | 0.98         | 0.86                | 22.0          |
| Approach                        |      | 339         | 0.0 | 0.741     | 53.9          | LOS D            | 9.4               | 65.6  | 0.93         | 0.82                | 24.0          |
| All Vehicles                    |      | 1838        | 0.0 | 0.741     | 42.4          | LOS D            | 23.7              | 165.9 | 0.86         | 0.77                | 27.1          |

## MOVEMENT SUMMARY

Site: IN04 Westbrook Dr & Connector - PM Peak Interim

120221sid-12M1296000 - Westbrook Dr & Connector 7 - IN26  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |       |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                               | L    | 150         | 0.0 | 0.397     | 21.0          | LOS C            | 4.0               | 28.2  | 0.50         | 0.74                | 38.0          |
| 2                               | T    | 656         | 0.0 | 0.830     | 46.8          | LOS D            | 25.8              | 180.8 | 0.96         | 0.88                | 25.2          |
| 3                               | R    | 20          | 0.0 | 0.139     | 65.9          | LOS E            | 1.1               | 7.9   | 0.97         | 0.70                | 21.3          |
| Approach                        |      | 826         | 0.0 | 0.830     | 42.6          | LOS D            | 25.8              | 180.8 | 0.88         | 0.85                | 26.7          |
| East: Connector 7               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.214     | 49.8          | LOS D            | 4.4               | 30.7  | 0.86         | 0.81                | 26.1          |
| 5                               | T    | 71          | 0.0 | 0.214     | 41.6          | LOS D            | 4.4               | 30.7  | 0.86         | 0.68                | 26.6          |
| 6                               | R    | 59          | 0.0 | 0.249     | 44.3          | LOS D            | 2.6               | 18.4  | 0.80         | 0.73                | 27.2          |
| Approach                        |      | 150         | 0.0 | 0.249     | 43.8          | LOS D            | 4.4               | 30.7  | 0.84         | 0.72                | 26.8          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                               | L    | 78          | 0.0 | 0.206     | 20.5          | LOS C            | 2.0               | 14.1  | 0.48         | 0.72                | 38.3          |
| 8                               | T    | 223         | 0.0 | 0.282     | 37.7          | LOS D            | 6.9               | 48.1  | 0.83         | 0.67                | 28.3          |
| 9                               | R    | 118         | 0.0 | 0.817     | 74.3          | LOS E            | 7.5               | 52.7  | 1.00         | 0.92                | 19.7          |
| Approach                        |      | 419         | 0.0 | 0.817     | 44.8          | LOS D            | 7.5               | 52.7  | 0.81         | 0.75                | 26.4          |
| West: Connector 7               |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                              | L    | 213         | 0.0 | 0.619     | 51.4          | LOS D            | 15.5              | 108.3 | 0.94         | 0.84                | 25.1          |
| 11                              | T    | 83          | 0.0 | 0.619     | 43.3          | LOS D            | 15.5              | 108.3 | 0.94         | 0.80                | 25.4          |
| 12                              | R    | 200         | 0.0 | 0.850     | 61.2          | LOS E            | 11.7              | 81.6  | 0.88         | 0.95                | 22.5          |
| Approach                        |      | 496         | 0.0 | 0.850     | 54.0          | LOS D            | 15.5              | 108.3 | 0.92         | 0.88                | 24.0          |
| All Vehicles                    |      | 1891        | 0.0 | 0.850     | 46.2          | LOS D            | 25.8              | 180.8 | 0.87         | 0.83                | 25.9          |

## MOVEMENT SUMMARY

Site: IN04 Westbrook Dr &  
Connector - AM Peak  
Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 7 - IN26  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |      |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|------|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV   | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %    | v/c       |               |                  | sec               | Vehicles |              |                     |               |
| South: Westbrook Drive          |      |             |      |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 166         | 20.0 | 0.265     | 9.6           | LOS A            | 1.5               | 12.2     | 0.22         | 0.65                | 48.0          |
| 2                               | T    | 187         | 0.0  | 0.308     | 49.7          | LOS D            | 5.0               | 34.7     | 0.93         | 0.73                | 24.4          |
| 3                               | R    | 20          | 0.0  | 0.070     | 31.4          | LOS C            | 0.7               | 4.9      | 0.64         | 0.69                | 32.3          |
| Approach                        |      | 373         | 8.9  | 0.308     | 30.8          | LOS C            | 5.0               | 34.7     | 0.60         | 0.69                | 31.9          |
| East: Connector 7               |      |             |      |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 20          | 0.0  | 0.029     | 9.8           | LOS A            | 0.2               | 1.5      | 0.24         | 0.63                | 47.3          |
| 5                               | T    | 29          | 0.0  | 0.075     | 42.7          | LOS D            | 1.4               | 9.7      | 0.85         | 0.63                | 26.6          |
| 6                               | R    | 95          | 0.0  | 0.740     | 72.4          | LOS E            | 5.9               | 41.5     | 1.00         | 0.85                | 20.2          |
| Approach                        |      | 144         | 0.0  | 0.740     | 57.7          | LOS E            | 5.9               | 41.5     | 0.86         | 0.78                | 23.2          |
| North: Westbrook Drive          |      |             |      |           |               |                  |                   |          |              |                     |               |
| 7                               | L    | 54          | 0.0  | 0.048     | 7.9           | LOS A            | 0.2               | 1.1      | 0.11         | 0.62                | 49.2          |
| 8                               | T    | 366         | 0.0  | 0.604     | 52.4          | LOS D            | 10.2              | 71.6     | 0.99         | 0.80                | 23.7          |
| 9                               | R    | 227         | 0.0  | 0.804     | 46.7          | LOS D            | 10.9              | 76.4     | 0.78         | 0.88                | 26.4          |
| Approach                        |      | 647         | 0.0  | 0.804     | 46.7          | LOS D            | 10.9              | 76.4     | 0.84         | 0.82                | 25.7          |
| West: Connector 7               |      |             |      |           |               |                  |                   |          |              |                     |               |
| 10                              | L    | 163         | 0.0  | 0.377     | 17.4          | LOS B            | 3.7               | 26.1     | 0.43         | 0.73                | 40.5          |
| 11                              | T    | 20          | 0.0  | 0.052     | 42.4          | LOS D            | 1.0               | 6.7      | 0.85         | 0.61                | 26.7          |
| 12                              | R    | 109         | 0.0  | 0.849     | 76.5          | LOS E            | 7.1               | 49.7     | 1.00         | 0.95                | 19.4          |
| Approach                        |      | 292         | 0.0  | 0.849     | 41.2          | LOS D            | 7.1               | 49.7     | 0.67         | 0.81                | 28.1          |
| All Vehicles                    |      | 1456        | 2.3  | 0.849     | 42.6          | LOS D            | 10.9              | 76.4     | 0.75         | 0.78                | 27.2          |

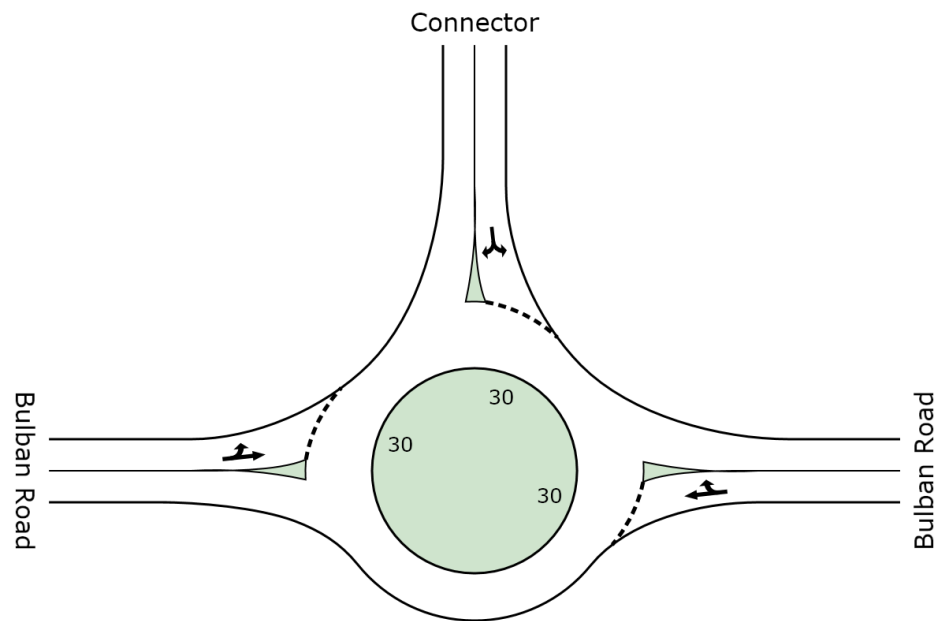
## MOVEMENT SUMMARY

Site: IN04 Westbrook Dr &  
Connector - PM Peak Ultimate

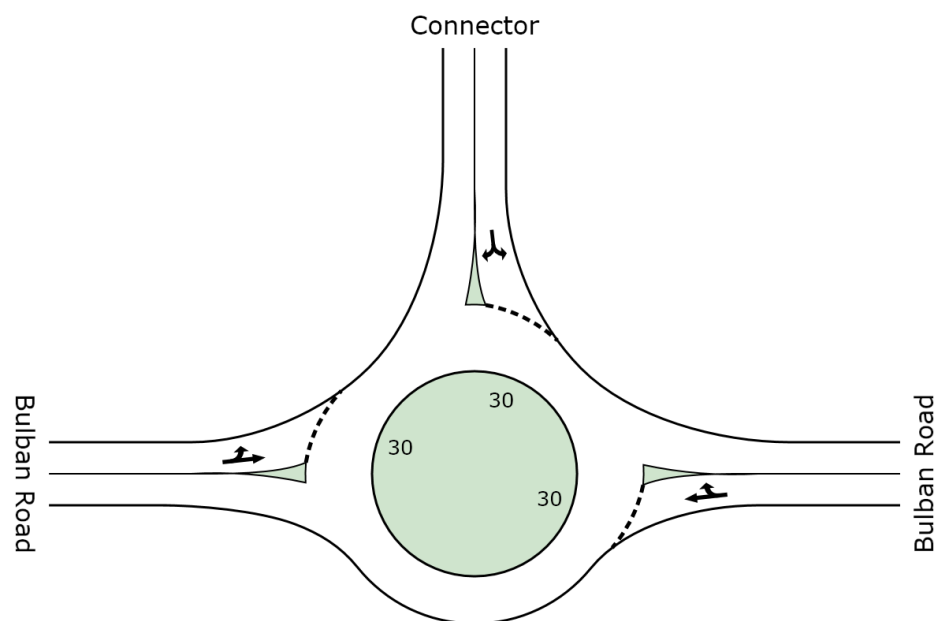
120221sid-12M1296000 - Westbrook Dr & Connector 7 - IN26  
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

| Movement Performance - Vehicles |      |             |     |           |               |                  |                            |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive          |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                               | L    | 109         | 0.0 | 0.129     | 8.4           | LOS A            | 0.7                        | 4.7      | 0.17         | 0.64                | 48.7          |
| 2                               | T    | 366         | 0.0 | 0.572     | 51.2          | LOS D            | 10.1                       | 70.7     | 0.98         | 0.80                | 24.0          |
| 3                               | R    | 20          | 0.0 | 0.069     | 30.8          | LOS C            | 0.7                        | 4.8      | 0.63         | 0.68                | 32.6          |
| Approach                        |      | 495         | 0.0 | 0.572     | 41.0          | LOS D            | 10.1                       | 70.7     | 0.78         | 0.76                | 27.4          |
| East: Connector 7               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                               | L    | 20          | 0.0 | 0.022     | 8.3           | LOS A            | 0.1                        | 0.8      | 0.15         | 0.62                | 48.9          |
| 5                               | T    | 20          | 0.0 | 0.052     | 42.4          | LOS D            | 1.0                        | 6.7      | 0.85         | 0.61                | 26.7          |
| 6                               | R    | 54          | 0.0 | 0.561     | 72.4          | LOS E            | 3.3                        | 23.3     | 1.00         | 0.76                | 20.2          |
| Approach                        |      | 94          | 0.0 | 0.561     | 52.3          | LOS D            | 3.3                        | 23.3     | 0.79         | 0.70                | 24.5          |
| North: Westbrook Drive          |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                               | L    | 95          | 0.0 | 0.089     | 8.0           | LOS A            | 0.3                        | 2.4      | 0.12         | 0.63                | 49.1          |
| 8                               | T    | 187         | 0.0 | 0.292     | 48.6          | LOS D            | 4.9                        | 34.3     | 0.92         | 0.73                | 24.7          |
| 9                               | R    | 163         | 0.0 | 0.569     | 32.9          | LOS C            | 6.2                        | 43.2     | 0.69         | 0.76                | 31.6          |
| Approach                        |      | 445         | 0.0 | 0.569     | 34.2          | LOS C            | 6.2                        | 43.2     | 0.67         | 0.72                | 30.4          |
| West: Connector 7               |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                              | L    | 227         | 0.0 | 0.321     | 9.7           | LOS A            | 2.5                        | 17.6     | 0.25         | 0.66                | 47.4          |
| 11                              | T    | 29          | 0.0 | 0.075     | 42.7          | LOS D            | 1.4                        | 9.7      | 0.85         | 0.63                | 26.6          |
| 12                              | R    | 18          | 0.0 | 0.187     | 70.1          | LOS E            | 1.1                        | 7.5      | 0.99         | 0.70                | 20.6          |
| Approach                        |      | 274         | 0.0 | 0.321     | 17.1          | LOS B            | 2.5                        | 17.6     | 0.37         | 0.66                | 40.6          |
| All Vehicles                    |      | 1308        | 0.0 | 0.572     | 34.5          | LOS C            | 10.1                       | 70.7     | 0.66         | 0.72                | 30.2          |

**IN 22**  
**Interim Layout**



**Ultimate Layout**



## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - AM Interim

IN22 - Bulban Road / Connector  
Roundabout

### Movement Performance - Vehicles

| Mov ID            | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                   |      | veh/h       | %   | v/c       |               |                  | Vehicles          | Distance |              |                     |               |
|                   |      |             |     |           | sec           |                  | veh               | m        |              | per veh             | km/h          |
| East: Bulban Road |      |             |     |           |               |                  |                   |          |              |                     |               |
| 5                 | T    | 158         | 0.0 | 0.188     | 4.6           | LOS A            | 1.1               | 7.5      | 0.21         | 0.37                | 51.6          |
| 6                 | R    | 126         | 0.0 | 0.188     | 11.5          | LOS B            | 1.1               | 7.5      | 0.21         | 0.76                | 46.4          |
| Approach          |      | 284         | 0.0 | 0.188     | 7.7           | LOS A            | 1.1               | 7.5      | 0.21         | 0.54                | 49.1          |
| North: Connector  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                 | L    | 63          | 0.0 | 0.095     | 5.9           | LOS A            | 0.5               | 3.5      | 0.32         | 0.47                | 49.8          |
| 9                 | R    | 63          | 0.0 | 0.095     | 11.8          | LOS B            | 0.5               | 3.5      | 0.32         | 0.70                | 45.8          |
| Approach          |      | 126         | 0.0 | 0.095     | 8.9           | LOS A            | 0.5               | 3.5      | 0.32         | 0.58                | 47.7          |
| West: Bulban Road |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                | L    | 126         | 0.0 | 0.203     | 5.9           | LOS A            | 1.1               | 8.0      | 0.30         | 0.50                | 50.4          |
| 11                | T    | 158         | 0.0 | 0.203     | 4.9           | LOS A            | 1.1               | 8.0      | 0.30         | 0.42                | 51.0          |
| Approach          |      | 284         | 0.0 | 0.203     | 5.3           | LOS A            | 1.1               | 8.0      | 0.30         | 0.45                | 50.8          |
| All Vehicles      |      | 695         | 0.0 | 0.203     | 6.9           | LOS A            | 1.1               | 8.0      | 0.26         | 0.51                | 49.5          |

## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - PM Interim

IN22 - Bulban Road / Connector  
Roundabout

### Movement Performance - Vehicles

| Mov ID            | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|-------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                   |      | veh/h       | %   | v/c       |               |                  | Vehicles          | Distance |              |                     |               |
|                   |      |             |     |           | sec           |                  | veh               | m        |              | per veh             | km/h          |
| East: Bulban Road |      |             |     |           |               |                  |                   |          |              |                     |               |
| 5                 | T    | 158         | 0.0 | 0.160     | 4.9           | LOS A            | 0.9               | 6.2      | 0.30         | 0.41                | 50.9          |
| 6                 | R    | 63          | 0.0 | 0.160     | 11.7          | LOS B            | 0.9               | 6.2      | 0.30         | 0.78                | 46.4          |
| Approach          |      | 221         | 0.0 | 0.160     | 6.8           | LOS A            | 0.9               | 6.2      | 0.30         | 0.52                | 49.5          |
| North: Connector  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                 | L    | 126         | 0.0 | 0.188     | 6.0           | LOS A            | 1.0               | 7.2      | 0.33         | 0.48                | 49.7          |
| 9                 | R    | 126         | 0.0 | 0.188     | 11.9          | LOS B            | 1.0               | 7.2      | 0.33         | 0.70                | 45.8          |
| Approach          |      | 253         | 0.0 | 0.188     | 9.0           | LOS A            | 1.0               | 7.2      | 0.33         | 0.59                | 47.6          |
| West: Bulban Road |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                | L    | 63          | 0.0 | 0.148     | 5.6           | LOS A            | 0.8               | 5.7      | 0.20         | 0.48                | 51.1          |
| 11                | T    | 158         | 0.0 | 0.148     | 4.6           | LOS A            | 0.8               | 5.7      | 0.20         | 0.39                | 51.9          |
| Approach          |      | 221         | 0.0 | 0.148     | 4.9           | LOS A            | 0.8               | 5.7      | 0.20         | 0.41                | 51.7          |
| All Vehicles      |      | 695         | 0.0 | 0.188     | 7.0           | LOS A            | 1.0               | 7.2      | 0.28         | 0.51                | 49.4          |

## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - AM  
Ultimate - Copy

IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| East: Bulban Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 5                               | T    | 632                  | 0.0               | 0.485 | 4.7                  | LOS A            | 4.3                                  | 30.3          | 0.31         | 0.39                           | 50.9                  |
| 6                               | R    | 126                  | 0.0               | 0.485 | 11.6                 | LOS B            | 4.3                                  | 30.3          | 0.31         | 0.78                           | 46.6                  |
| Approach                        |      | 758                  | 0.0               | 0.485 | 5.9                  | LOS A            | 4.3                                  | 30.3          | 0.31         | 0.46                           | 50.1                  |
| North: Connector                |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 63                   | 0.0               | 0.139 | 8.5                  | LOS A            | 0.9                                  | 6.1           | 0.68         | 0.68                           | 47.2                  |
| 9                               | R    | 63                   | 0.0               | 0.139 | 14.4                 | LOS B            | 0.9                                  | 6.1           | 0.68         | 0.79                           | 44.4                  |
| Approach                        |      | 126                  | 0.0               | 0.139 | 11.4                 | LOS B            | 0.9                                  | 6.1           | 0.68         | 0.73                           | 45.7                  |
| West: Bulban Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 126                  | 0.0               | 0.522 | 6.1                  | LOS A            | 4.3                                  | 30.3          | 0.42         | 0.53                           | 49.8                  |
| 11                              | T    | 632                  | 0.0               | 0.522 | 5.2                  | LOS A            | 4.3                                  | 30.3          | 0.42         | 0.46                           | 50.1                  |
| Approach                        |      | 758                  | 0.0               | 0.522 | 5.3                  | LOS A            | 4.3                                  | 30.3          | 0.42         | 0.47                           | 50.1                  |
| All Vehicles                    |      | 1642                 | 0.0               | 0.522 | 6.0                  | LOS A            | 4.3                                  | 30.3          | 0.39         | 0.49                           | 49.7                  |

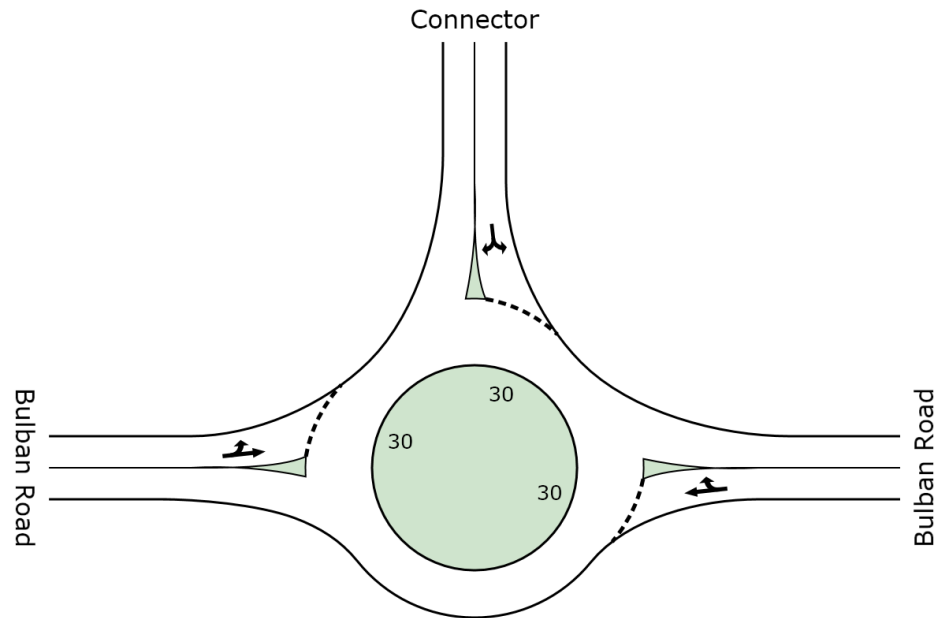
## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - AM  
Ultimate - Copy - Copy

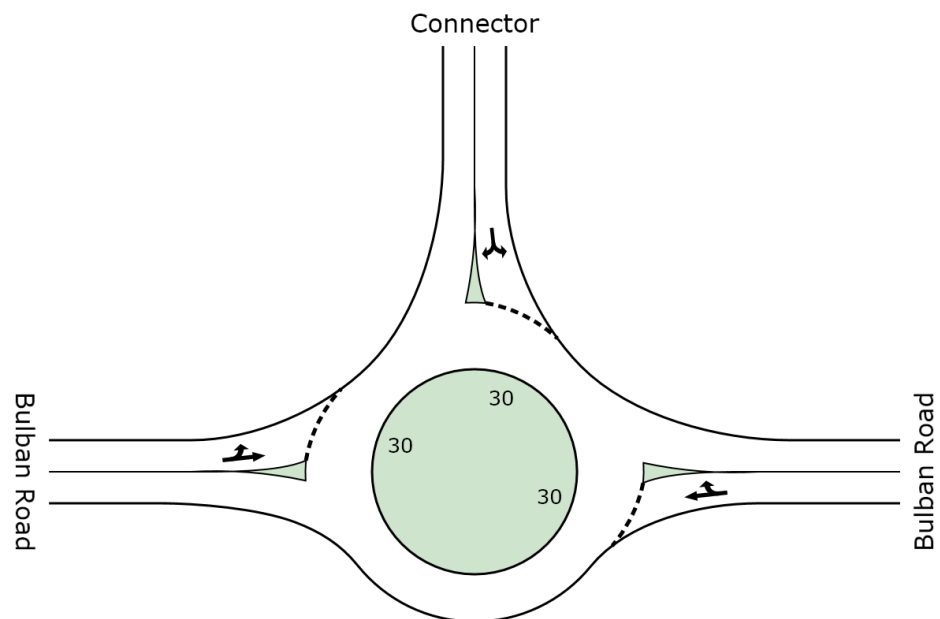
IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
|---------------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| East: Bulban Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 5                               | T    | 632                  | 0.0               | 0.487 | 5.1                  | LOS A            | 4.2                                  | 29.3          | 0.44         | 0.46                           | 50.0                  |
| 6                               | R    | 63                   | 0.0               | 0.487 | 12.0                 | LOS B            | 4.2                                  | 29.3          | 0.44         | 0.78                           | 46.6                  |
| Approach                        |      | 695                  | 0.0               | 0.487 | 5.7                  | LOS A            | 4.2                                  | 29.3          | 0.44         | 0.49                           | 49.6                  |
| North: Connector                |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                               | L    | 126                  | 0.0               | 0.270 | 8.8                  | LOS A            | 1.7                                  | 12.2          | 0.70         | 0.73                           | 47.1                  |
| 9                               | R    | 126                  | 0.0               | 0.270 | 14.7                 | LOS B            | 1.7                                  | 12.2          | 0.70         | 0.83                           | 44.1                  |
| Approach                        |      | 253                  | 0.0               | 0.270 | 11.8                 | LOS B            | 1.7                                  | 12.2          | 0.70         | 0.78                           | 45.5                  |
| West: Bulban Road               |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                              | L    | 63                   | 0.0               | 0.444 | 5.7                  | LOS A            | 3.5                                  | 24.7          | 0.28         | 0.48                           | 50.7                  |
| 11                              | T    | 632                  | 0.0               | 0.444 | 4.7                  | LOS A            | 3.5                                  | 24.7          | 0.28         | 0.40                           | 51.3                  |
| Approach                        |      | 695                  | 0.0               | 0.444 | 4.8                  | LOS A            | 3.5                                  | 24.7          | 0.28         | 0.41                           | 51.3                  |
| All Vehicles                    |      | 1642                 | 0.0               | 0.487 | 6.3                  | LOS A            | 4.2                                  | 29.3          | 0.41         | 0.50                           | 49.6                  |

# IN 23 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - AM Interim

IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |     |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-----|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |     | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec |              |                     |               |
| East: Bulban Road               |      |             |     |           |               |                  |                   |     |              |                     |               |
| 5                               | T    | 158         | 0.0 | 0.143     | 4.5           | LOS A            | 0.8               | 5.5 | 0.16         | 0.36                | 52.2          |
| 6                               | R    | 63          | 0.0 | 0.143     | 11.4          | LOS B            | 0.8               | 5.5 | 0.16         | 0.81                | 46.6          |
| Approach                        |      | 221         | 0.0 | 0.143     | 6.5           | LOS A            | 0.8               | 5.5 | 0.16         | 0.49                | 50.4          |
| North: Connector                |      |             |     |           |               |                  |                   |     |              |                     |               |
| 7                               | L    | 42          | 0.0 | 0.063     | 5.9           | LOS A            | 0.3               | 2.2 | 0.30         | 0.46                | 50.0          |
| 9                               | R    | 42          | 0.0 | 0.063     | 11.8          | LOS B            | 0.3               | 2.2 | 0.30         | 0.69                | 45.9          |
| Approach                        |      | 84          | 0.0 | 0.063     | 8.9           | LOS A            | 0.3               | 2.2 | 0.30         | 0.58                | 47.7          |
| West: Bulban Road               |      |             |     |           |               |                  |                   |     |              |                     |               |
| 10                              | L    | 63          | 0.0 | 0.148     | 5.6           | LOS A            | 0.8               | 5.4 | 0.19         | 0.48                | 51.1          |
| 11                              | T    | 158         | 0.0 | 0.148     | 4.6           | LOS A            | 0.8               | 5.4 | 0.19         | 0.39                | 52.0          |
| Approach                        |      | 221         | 0.0 | 0.148     | 4.9           | LOS A            | 0.8               | 5.4 | 0.19         | 0.41                | 51.7          |
| All Vehicles                    |      | 526         | 0.0 | 0.148     | 6.2           | LOS A            | 0.8               | 5.5 | 0.19         | 0.47                | 50.5          |

## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - PM Interim

IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       |               |                  | sec               | Vehicles |              |                     |               |
| East: Bulban Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 5                               | T    | 158         | 0.0 | 0.134     | 4.6           | LOS A            | 0.7               | 5.1      | 0.20         | 0.38                | 51.9          |
| 6                               | R    | 42          | 0.0 | 0.134     | 11.5          | LOS B            | 0.7               | 5.1      | 0.20         | 0.82                | 46.6          |
| Approach                        |      | 200         | 0.0 | 0.134     | 6.0           | LOS A            | 0.7               | 5.1      | 0.20         | 0.47                | 50.6          |
| North: Connector                |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                               | L    | 63          | 0.0 | 0.095     | 5.9           | LOS A            | 0.5               | 3.3      | 0.31         | 0.46                | 49.9          |
| 9                               | R    | 63          | 0.0 | 0.095     | 11.8          | LOS B            | 0.5               | 3.3      | 0.31         | 0.70                | 45.9          |
| Approach                        |      | 126         | 0.0 | 0.095     | 8.9           | LOS A            | 0.5               | 3.3      | 0.31         | 0.58                | 47.7          |
| West: Bulban Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10                              | L    | 42          | 0.0 | 0.130     | 5.5           | LOS A            | 0.7               | 4.8      | 0.15         | 0.48                | 51.4          |
| 11                              | T    | 158         | 0.0 | 0.130     | 4.5           | LOS A            | 0.7               | 4.8      | 0.15         | 0.38                | 52.3          |
| Approach                        |      | 200         | 0.0 | 0.130     | 4.7           | LOS A            | 0.7               | 4.8      | 0.15         | 0.40                | 52.1          |
| All Vehicles                    |      | 526         | 0.0 | 0.134     | 6.2           | LOS A            | 0.7               | 5.1      | 0.21         | 0.47                | 50.4          |

## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - AM  
Ultimate - Copy

IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
|---------------------------------|------|----------------------|------|------------------|----------------------|------------------|-----------------------------------|-----------------------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue Vehicles<br>veh | Back of Queue Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| East: Bulban Road               |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
| 5                               | T    | 632                  | 0.0  | 0.430            | 4.6                  | LOS A            | 3.6                               | 25.1                        | 0.23         | 0.38                           | 51.7                  |
| 6                               | R    | 63                   | 0.0  | 0.430            | 11.4                 | LOS B            | 3.6                               | 25.1                        | 0.23         | 0.83                           | 46.7                  |
| Approach                        |      | 695                  | 0.0  | 0.430            | 5.2                  | LOS A            | 3.6                               | 25.1                        | 0.23         | 0.42                           | 51.2                  |
| North: Connector                |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
| 7                               | L    | 42                   | 0.0  | 0.090            | 8.4                  | LOS A            | 0.5                               | 3.7                         | 0.64         | 0.64                           | 47.5                  |
| 9                               | R    | 42                   | 0.0  | 0.090            | 14.3                 | LOS B            | 0.5                               | 3.7                         | 0.64         | 0.76                           | 44.5                  |
| Approach                        |      | 84                   | 0.0  | 0.090            | 11.3                 | LOS B            | 0.5                               | 3.7                         | 0.64         | 0.70                           | 45.9                  |
| West: Bulban Road               |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
| 10                              | L    | 63                   | 0.0  | 0.442            | 5.7                  | LOS A            | 3.3                               | 23.2                        | 0.26         | 0.49                           | 50.8                  |
| 11                              | T    | 632                  | 0.0  | 0.442            | 4.7                  | LOS A            | 3.3                               | 23.2                        | 0.26         | 0.40                           | 51.5                  |
| Approach                        |      | 695                  | 0.0  | 0.442            | 4.8                  | LOS A            | 3.3                               | 23.2                        | 0.26         | 0.41                           | 51.4                  |
| All Vehicles                    |      | 1474                 | 0.0  | 0.442            | 5.3                  | LOS A            | 3.6                               | 25.1                        | 0.27         | 0.43                           | 50.9                  |

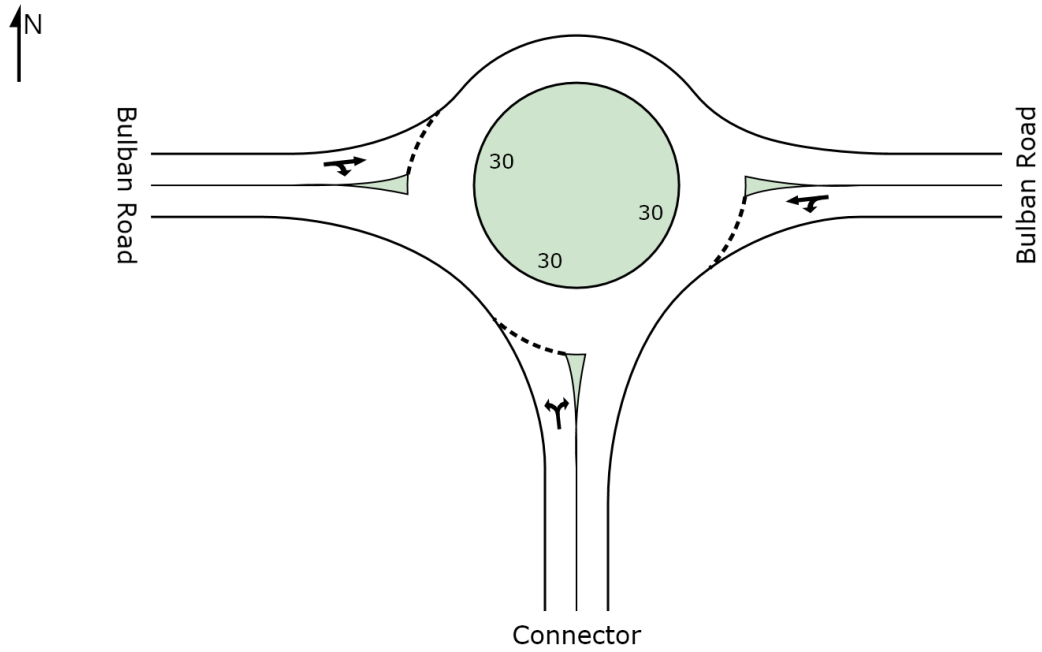
## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - PM Ultimate

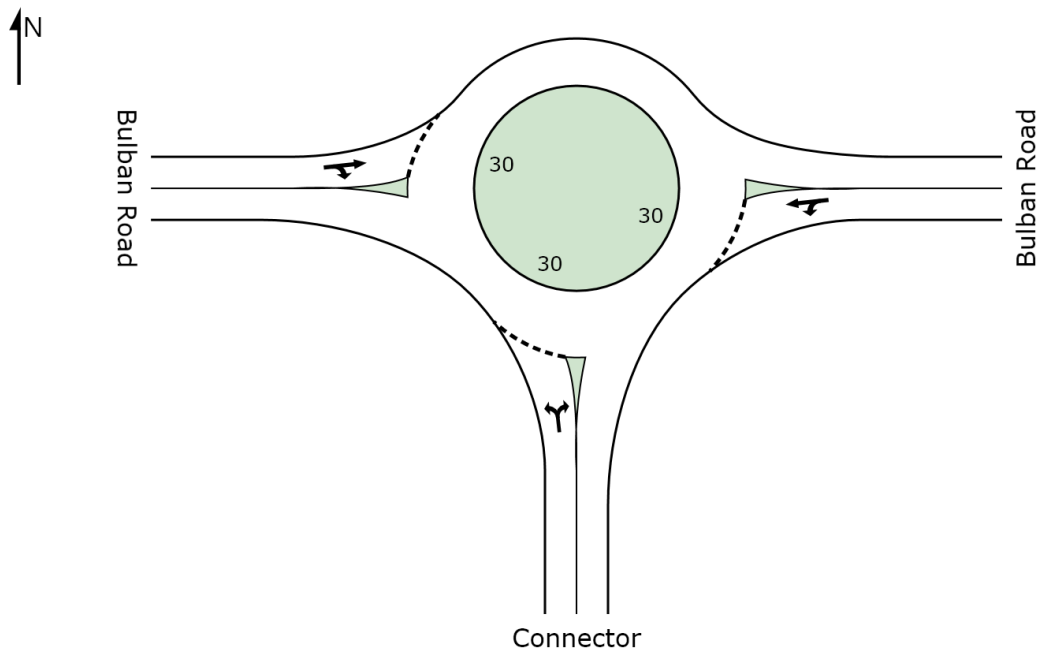
IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
|---------------------------------|------|----------------------|------|------------------|----------------------|------------------|-----------------------------------|-----------------------------|--------------|--------------------------------|-----------------------|
| Mov ID                          | Turn | Demand Flow<br>veh/h | HV % | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue Vehicles<br>veh | Back of Queue Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
| East: Bulban Road               |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
| 5                               | T    | 632                  | 0.0  | 0.433            | 4.7                  | LOS A            | 3.6                               | 25.0                        | 0.29         | 0.40                           | 51.2                  |
| 6                               | R    | 42                   | 0.0  | 0.433            | 11.5                 | LOS B            | 3.6                               | 25.0                        | 0.29         | 0.82                           | 46.7                  |
| Approach                        |      | 674                  | 0.0  | 0.433            | 5.1                  | LOS A            | 3.6                               | 25.0                        | 0.29         | 0.43                           | 50.9                  |
| North: Connector                |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
| 7                               | L    | 63                   | 0.0  | 0.133            | 8.5                  | LOS A            | 0.8                               | 5.5                         | 0.64         | 0.66                           | 47.5                  |
| 9                               | R    | 63                   | 0.0  | 0.133            | 14.4                 | LOS B            | 0.8                               | 5.5                         | 0.64         | 0.78                           | 44.4                  |
| Approach                        |      | 126                  | 0.0  | 0.133            | 11.4                 | LOS B            | 0.8                               | 5.5                         | 0.64         | 0.72                           | 45.8                  |
| West: Bulban Road               |      |                      |      |                  |                      |                  |                                   |                             |              |                                |                       |
| 10                              | L    | 42                   | 0.0  | 0.415            | 5.5                  | LOS A            | 3.1                               | 21.6                        | 0.20         | 0.48                           | 51.1                  |
| 11                              | T    | 632                  | 0.0  | 0.415            | 4.6                  | LOS A            | 3.1                               | 21.6                        | 0.20         | 0.39                           | 51.9                  |
| Approach                        |      | 674                  | 0.0  | 0.415            | 4.6                  | LOS A            | 3.1                               | 21.6                        | 0.20         | 0.39                           | 51.9                  |
| All Vehicles                    |      | 1474                 | 0.0  | 0.433            | 5.4                  | LOS A            | 3.6                               | 25.0                        | 0.28         | 0.44                           | 50.8                  |

# IN 24 Interim Layout



# Ultimate Layout



## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - AM Interim

IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |     |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-----|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |     | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       |               |                  | sec               | veh |              |                     |               |
| South: Connector                |      |             |     |           |               |                  |                   |     |              |                     |               |
| 1                               | L    | 63          | 0.0 | 0.095     | 5.9           | LOS A            | 0.5               | 3.4 | 0.31         | 0.47                | 49.9          |
| 3                               | R    | 63          | 0.0 | 0.095     | 11.8          | LOS B            | 0.5               | 3.4 | 0.31         | 0.70                | 45.8          |
| Approach                        |      | 126         | 0.0 | 0.095     | 8.9           | LOS A            | 0.5               | 3.4 | 0.31         | 0.58                | 47.7          |
| East: Bulban Road               |      |             |     |           |               |                  |                   |     |              |                     |               |
| 4                               | L    | 95          | 0.0 | 0.175     | 5.7           | LOS A            | 1.0               | 6.7 | 0.25         | 0.49                | 50.7          |
| 5                               | T    | 158         | 0.0 | 0.175     | 4.7           | LOS A            | 1.0               | 6.7 | 0.25         | 0.40                | 51.5          |
| Approach                        |      | 253         | 0.0 | 0.175     | 5.1           | LOS A            | 1.0               | 6.7 | 0.25         | 0.43                | 51.2          |
| West: Bulban Road               |      |             |     |           |               |                  |                   |     |              |                     |               |
| 11                              | T    | 158         | 0.0 | 0.168     | 4.6           | LOS A            | 0.9               | 6.6 | 0.20         | 0.37                | 51.7          |
| 12                              | R    | 95          | 0.0 | 0.168     | 11.5          | LOS B            | 0.9               | 6.6 | 0.20         | 0.78                | 46.5          |
| Approach                        |      | 253         | 0.0 | 0.168     | 7.2           | LOS A            | 0.9               | 6.6 | 0.20         | 0.52                | 49.5          |
| All Vehicles                    |      | 632         | 0.0 | 0.175     | 6.7           | LOS A            | 1.0               | 6.7 | 0.24         | 0.50                | 49.8          |

## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - PM Interim

IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       |               |                  | sec               | Vehicles |              |                     |               |
| South: Connector                |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 95          | 0.0 | 0.142     | 6.0           | LOS A            | 0.8               | 5.3      | 0.32         | 0.47                | 49.8          |
| 3                               | R    | 95          | 0.0 | 0.142     | 11.9          | LOS B            | 0.8               | 5.3      | 0.32         | 0.70                | 45.8          |
| Approach                        |      | 189         | 0.0 | 0.142     | 8.9           | LOS A            | 0.8               | 5.3      | 0.32         | 0.59                | 47.7          |
| East: Bulban Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 63          | 0.0 | 0.148     | 5.6           | LOS A            | 0.8               | 5.6      | 0.20         | 0.48                | 51.1          |
| 5                               | T    | 158         | 0.0 | 0.148     | 4.6           | LOS A            | 0.8               | 5.6      | 0.20         | 0.39                | 51.9          |
| Approach                        |      | 221         | 0.0 | 0.148     | 4.9           | LOS A            | 0.8               | 5.6      | 0.20         | 0.41                | 51.7          |
| West: Bulban Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 11                              | T    | 158         | 0.0 | 0.154     | 4.7           | LOS A            | 0.9               | 6.0      | 0.25         | 0.39                | 51.3          |
| 12                              | R    | 63          | 0.0 | 0.154     | 11.6          | LOS B            | 0.9               | 6.0      | 0.25         | 0.79                | 46.5          |
| Approach                        |      | 221         | 0.0 | 0.154     | 6.7           | LOS A            | 0.9               | 6.0      | 0.25         | 0.50                | 49.8          |
| All Vehicles                    |      | 632         | 0.0 | 0.154     | 6.7           | LOS A            | 0.9               | 6.0      | 0.25         | 0.50                | 49.7          |

## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - AM  
Ultimate

IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |          |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       | %   | v/c       |               |                  | sec               | Vehicles |              |                     |               |
| South: Connector                |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                               | L    | 63          | 0.0 | 0.138     | 8.5           | LOS A            | 0.9               | 6.0      | 0.67         | 0.68                | 47.3          |
| 3                               | R    | 63          | 0.0 | 0.138     | 14.4          | LOS B            | 0.9               | 6.0      | 0.67         | 0.79                | 44.4          |
| Approach                        |      | 126         | 0.0 | 0.138     | 11.4          | LOS B            | 0.9               | 6.0      | 0.67         | 0.73                | 45.7          |
| East: Bulban Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                               | L    | 95          | 0.0 | 0.523     | 6.0           | LOS A            | 4.4               | 30.7     | 0.38         | 0.51                | 50.0          |
| 5                               | T    | 632         | 0.0 | 0.523     | 5.0           | LOS A            | 4.4               | 30.7     | 0.38         | 0.44                | 50.5          |
| Approach                        |      | 726         | 0.0 | 0.523     | 5.2           | LOS A            | 4.4               | 30.7     | 0.38         | 0.45                | 50.4          |
| West: Bulban Road               |      |             |     |           |               |                  |                   |          |              |                     |               |
| 11                              | T    | 632         | 0.0 | 0.465     | 4.7           | LOS A            | 4.0               | 28.3     | 0.30         | 0.40                | 51.0          |
| 12                              | R    | 95          | 0.0 | 0.465     | 11.6          | LOS B            | 4.0               | 28.3     | 0.30         | 0.80                | 46.6          |
| Approach                        |      | 726         | 0.0 | 0.465     | 5.6           | LOS A            | 4.0               | 28.3     | 0.30         | 0.45                | 50.4          |
| All Vehicles                    |      | 1579        | 0.0 | 0.523     | 5.9           | LOS A            | 4.4               | 30.7     | 0.37         | 0.47                | 50.0          |

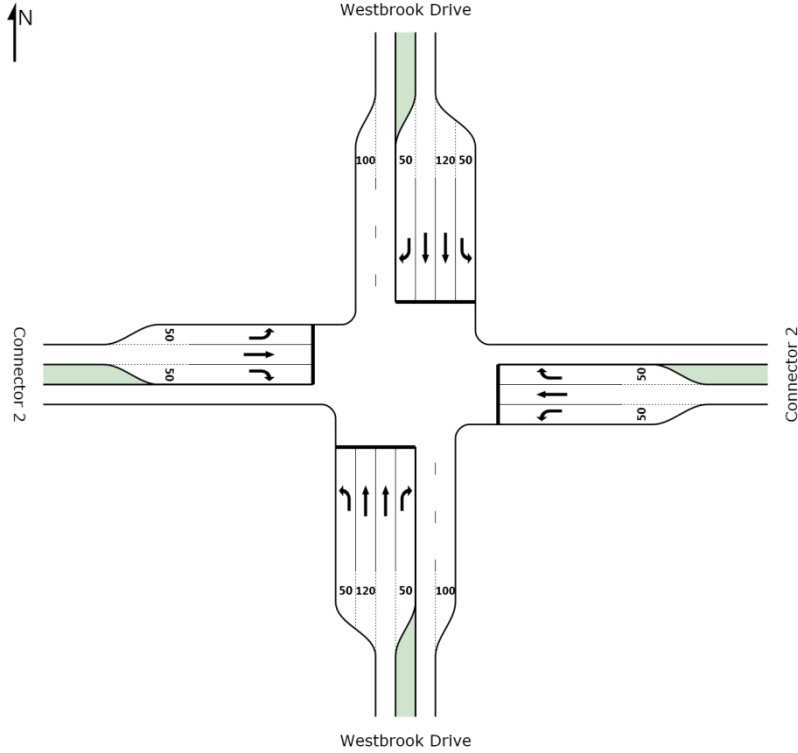
## MOVEMENT SUMMARY

Site: IN22 - Bulban  
Road/Connector - PM Ultimate  
- Copy

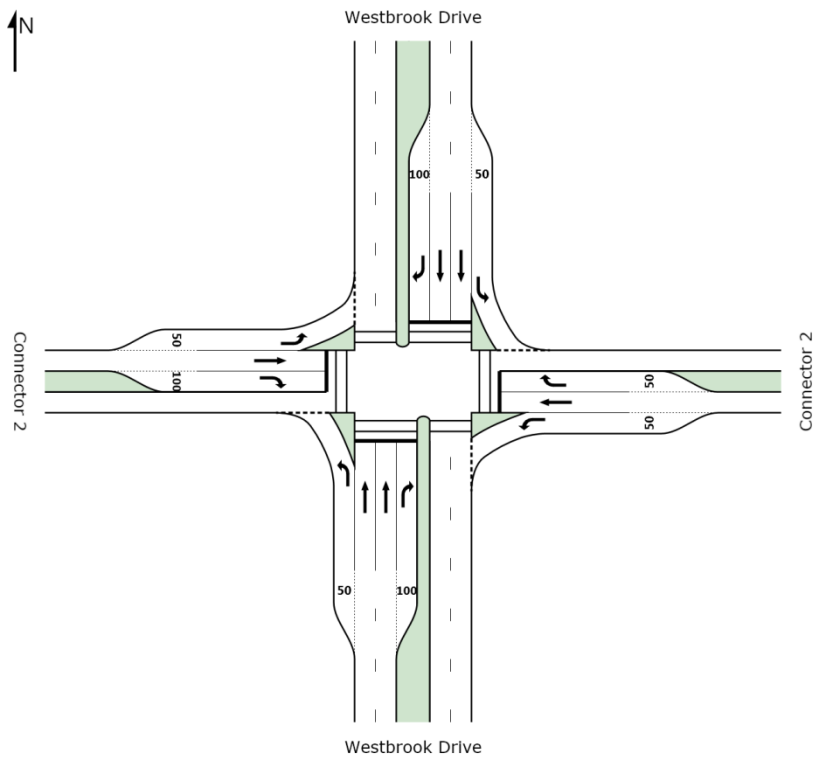
IN22 - Bulban Road / Connector  
Roundabout

| Movement Performance - Vehicles |      |             |     |           |               |                  |                   |      |              |                     |               |
|---------------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|------|--------------|---------------------|---------------|
| Mov ID                          | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |      | Prop. Queued | Effective Stop Rate | Average Speed |
|                                 |      | veh/h       |     | %         |               |                  | v/c               | sec  |              |                     |               |
| South: Connector                |      |             |     |           |               |                  |                   |      |              |                     |               |
| 1                               | L    | 95          | 0.0 | 0.203     | 8.7           | LOS A            | 1.3               | 8.8  | 0.68         | 0.70                | 47.2          |
| 3                               | R    | 95          | 0.0 | 0.203     | 14.5          | LOS B            | 1.3               | 8.8  | 0.68         | 0.81                | 44.2          |
| Approach                        |      | 189         | 0.0 | 0.203     | 11.6          | LOS B            | 1.3               | 8.8  | 0.68         | 0.75                | 45.6          |
| East: Bulban Road               |      |             |     |           |               |                  |                   |      |              |                     |               |
| 4                               | L    | 63          | 0.0 | 0.443     | 5.7           | LOS A            | 3.5               | 24.2 | 0.27         | 0.48                | 50.7          |
| 5                               | T    | 632         | 0.0 | 0.443     | 4.7           | LOS A            | 3.5               | 24.2 | 0.27         | 0.40                | 51.4          |
| Approach                        |      | 695         | 0.0 | 0.443     | 4.8           | LOS A            | 3.5               | 24.2 | 0.27         | 0.41                | 51.3          |
| West: Bulban Road               |      |             |     |           |               |                  |                   |      |              |                     |               |
| 11                              | T    | 632         | 0.0 | 0.467     | 4.9           | LOS A            | 4.0               | 27.8 | 0.37         | 0.43                | 50.5          |
| 12                              | R    | 63          | 0.0 | 0.467     | 11.8          | LOS B            | 4.0               | 27.8 | 0.37         | 0.79                | 46.6          |
| Approach                        |      | 695         | 0.0 | 0.467     | 5.5           | LOS A            | 4.0               | 27.8 | 0.37         | 0.46                | 50.1          |
| All Vehicles                    |      | 1579        | 0.0 | 0.467     | 5.9           | LOS A            | 4.0               | 27.8 | 0.37         | 0.47                | 50.0          |

PSP 92  
IN 10  
Interim Layout



Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector (IN10) - AM  
Peak Interim - Conversion - Conversion

120221sid-12M1296000 - Westbrook Dr & Connector 2 - IN3

Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                      | L    | 200         | 5.0 | 0.372     | 17.9          | LOS B            | 2.5                        | 18.0     | 0.83         | 0.79                | 40.3          |
| 2                      | T    | 284         | 5.0 | 0.322     | 9.1           | LOS A            | 2.2                        | 16.1     | 0.80         | 0.64                | 45.1          |
| 3                      | R    | 20          | 5.0 | 0.060     | 19.5          | LOS B            | 0.3                        | 1.9      | 0.84         | 0.70                | 39.2          |
| Approach               |      | 504         | 5.0 | 0.372     | 13.0          | LOS B            | 2.5                        | 18.0     | 0.81         | 0.70                | 42.8          |
| East: Connector 2      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                      | L    | 20          | 5.0 | 0.037     | 16.7          | LOS B            | 0.2                        | 1.6      | 0.73         | 0.70                | 41.2          |
| 5                      | T    | 20          | 5.0 | 0.035     | 8.3           | LOS A            | 0.2                        | 1.6      | 0.73         | 0.52                | 46.2          |
| 6                      | R    | 20          | 5.0 | 0.044     | 17.4          | LOS B            | 0.2                        | 1.7      | 0.77         | 0.69                | 40.7          |
| Approach               |      | 60          | 5.0 | 0.044     | 14.1          | LOS B            | 0.2                        | 1.7      | 0.74         | 0.64                | 42.6          |
| North: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                      | L    | 20          | 5.0 | 0.037     | 16.7          | LOS B            | 0.2                        | 1.6      | 0.73         | 0.70                | 41.2          |
| 8                      | T    | 434         | 5.0 | 0.492     | 9.7           | LOS A            | 3.6                        | 26.2     | 0.84         | 0.69                | 44.5          |
| 9                      | R    | 100         | 5.0 | 0.278     | 19.3          | LOS B            | 1.3                        | 9.6      | 0.86         | 0.76                | 39.3          |
| Approach               |      | 554         | 5.0 | 0.492     | 11.7          | LOS B            | 3.6                        | 26.2     | 0.84         | 0.70                | 43.4          |
| West: Connector 2      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                     | L    | 100         | 5.0 | 0.186     | 17.3          | LOS B            | 1.2                        | 8.4      | 0.78         | 0.75                | 40.8          |
| 11                     | T    | 20          | 5.0 | 0.035     | 8.3           | LOS A            | 0.2                        | 1.6      | 0.73         | 0.52                | 46.2          |
| 12                     | R    | 250         | 5.0 | 0.482     | 18.1          | LOS B            | 3.2                        | 23.5     | 0.86         | 0.80                | 40.2          |
| Approach               |      | 370         | 5.0 | 0.482     | 17.4          | LOS B            | 3.2                        | 23.5     | 0.83         | 0.77                | 40.6          |
| All Vehicles           |      | 1488        | 5.0 | 0.492     | 13.6          | LOS B            | 3.6                        | 26.2     | 0.83         | 0.72                | 42.4          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector (IN10) - PM  
Peak Interim - Conversion - Copy - Conversion

120221sid-12M1296000 - Westbrook Dr & Connector 2 - IN3

Signals - Fixed Time Cycle Time = 30 seconds (Practical Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                      | L    | 250         | 5.0 | 0.418     | 17.3          | LOS B            | 3.0                        | 22.1     | 0.82         | 0.80                | 40.8          |
| 2                      | T    | 434         | 5.0 | 0.443     | 8.7           | LOS A            | 3.4                        | 24.8     | 0.80         | 0.66                | 45.5          |
| 3                      | R    | 20          | 5.0 | 0.046     | 17.5          | LOS B            | 0.2                        | 1.7      | 0.77         | 0.70                | 40.6          |
| Approach               |      | 704         | 5.0 | 0.443     | 12.0          | LOS B            | 3.4                        | 24.8     | 0.81         | 0.71                | 43.6          |
| East: Connector 2      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                      | L    | 20          | 5.0 | 0.042     | 17.6          | LOS B            | 0.2                        | 1.7      | 0.77         | 0.70                | 40.6          |
| 5                      | T    | 20          | 5.0 | 0.040     | 9.2           | LOS A            | 0.2                        | 1.7      | 0.77         | 0.54                | 45.2          |
| 6                      | R    | 20          | 5.0 | 0.048     | 18.3          | LOS B            | 0.2                        | 1.8      | 0.80         | 0.69                | 40.0          |
| Approach               |      | 60          | 5.0 | 0.048     | 15.0          | LOS B            | 0.2                        | 1.8      | 0.78         | 0.64                | 41.8          |
| North: Westbrook Drive |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                      | L    | 20          | 5.0 | 0.033     | 15.9          | LOS B            | 0.2                        | 1.5      | 0.70         | 0.70                | 41.9          |
| 8                      | T    | 284         | 5.0 | 0.290     | 8.2           | LOS A            | 2.1                        | 15.2     | 0.76         | 0.61                | 46.1          |
| 9                      | R    | 100         | 5.0 | 0.290     | 19.4          | LOS B            | 1.3                        | 9.6      | 0.86         | 0.76                | 39.2          |
| Approach               |      | 404         | 5.0 | 0.290     | 11.4          | LOS B            | 2.1                        | 15.2     | 0.78         | 0.65                | 44.0          |
| West: Connector 2      |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                     | L    | 100         | 5.0 | 0.209     | 18.2          | LOS B            | 1.2                        | 8.9      | 0.81         | 0.76                | 40.1          |
| 11                     | T    | 20          | 5.0 | 0.040     | 9.2           | LOS A            | 0.2                        | 1.7      | 0.77         | 0.54                | 45.2          |
| 12                     | R    | 200         | 5.0 | 0.422     | 18.7          | LOS B            | 2.6                        | 19.1     | 0.87         | 0.79                | 39.7          |
| Approach               |      | 320         | 5.0 | 0.422     | 18.0          | LOS B            | 2.6                        | 19.1     | 0.84         | 0.76                | 40.2          |
| All Vehicles           |      | 1488        | 5.0 | 0.443     | 13.2          | LOS B            | 3.4                        | 24.8     | 0.81         | 0.70                | 42.8          |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector In10)  
- AM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 2 - IN12

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                        |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                      | L    | 200         | 5.0 | 0.236     | 8.8           | LOS A            | 1.5               | 10.6  | 0.19         | 0.65                | 48.5          |
| 2                      | T    | 774         | 5.0 | 0.572     | 33.3          | LOS C            | 18.2              | 132.9 | 0.86         | 0.75                | 30.0          |
| 3                      | R    | 20          | 5.0 | 0.122     | 63.7          | LOS E            | 1.1               | 8.1   | 0.95         | 0.71                | 21.9          |
| Approach               |      | 994         | 5.0 | 0.572     | 29.0          | LOS C            | 18.2              | 132.9 | 0.73         | 0.73                | 32.3          |
| East: Connector 2      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 4                      | L    | 20          | 5.0 | 0.055     | 16.0          | LOS B            | 0.4               | 3.1   | 0.42         | 0.66                | 41.9          |
| 5                      | T    | 20          | 5.0 | 0.061     | 44.4          | LOS D            | 1.0               | 7.1   | 0.86         | 0.62                | 26.0          |
| 6                      | R    | 60          | 5.0 | 0.296     | 54.1          | LOS D            | 3.0               | 22.1  | 0.89         | 0.75                | 24.2          |
| Approach               |      | 100         | 5.0 | 0.296     | 44.5          | LOS D            | 3.0               | 22.1  | 0.79         | 0.71                | 26.9          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 7                      | L    | 60          | 5.0 | 0.057     | 8.2           | LOS A            | 0.2               | 1.8   | 0.13         | 0.62                | 49.1          |
| 8                      | T    | 902         | 5.0 | 0.666     | 34.8          | LOS C            | 22.2              | 162.0 | 0.90         | 0.79                | 29.3          |
| 9                      | R    | 100         | 5.0 | 0.608     | 67.6          | LOS E            | 5.9               | 43.3  | 1.00         | 0.80                | 21.0          |
| Approach               |      | 1062        | 5.0 | 0.666     | 36.4          | LOS D            | 22.2              | 162.0 | 0.87         | 0.78                | 28.9          |
| West: Connector 2      |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                     | L    | 100         | 5.0 | 0.207     | 11.7          | LOS B            | 1.5               | 10.9  | 0.32         | 0.67                | 45.6          |
| 11                     | T    | 20          | 5.0 | 0.061     | 44.4          | LOS D            | 1.0               | 7.1   | 0.86         | 0.62                | 26.0          |
| 12                     | R    | 200         | 5.0 | 0.637     | 58.6          | LOS E            | 11.1              | 81.1  | 0.98         | 0.82                | 23.1          |
| Approach               |      | 320         | 5.0 | 0.637     | 43.1          | LOS D            | 11.1              | 81.1  | 0.77         | 0.76                | 27.5          |
| All Vehicles           |      | 2476        | 5.0 | 0.666     | 34.6          | LOS C            | 22.2              | 162.0 | 0.80         | 0.76                | 29.9          |

## MOVEMENT SUMMARY

Site: Westbrook Dr &  
Connector In10) - PM Peak  
Ultimate - Copy

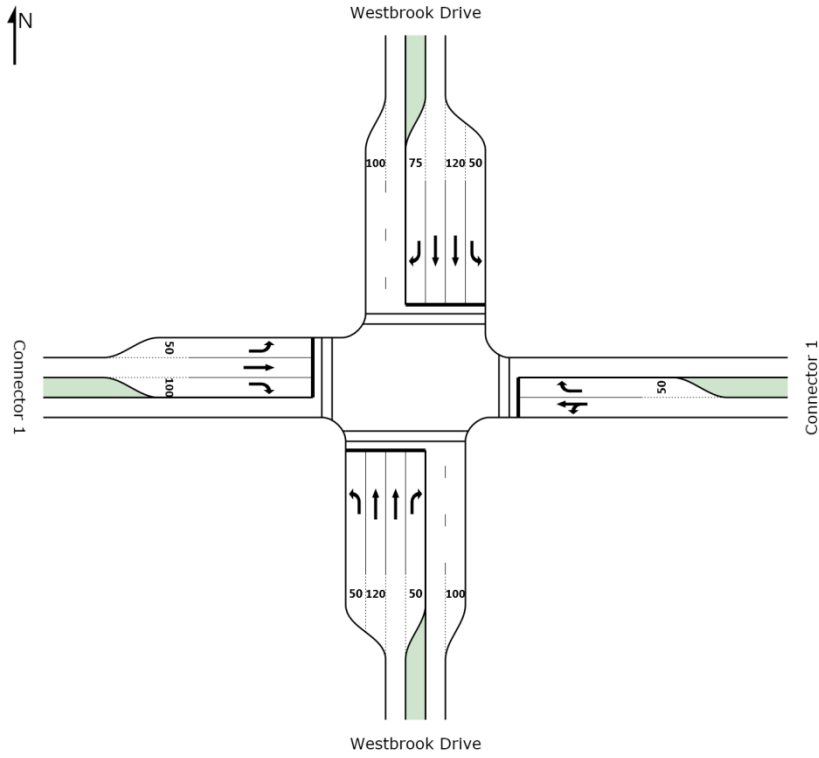
120221sid-12M1296000 - Westbrook Dr & Connector 2 - IN12

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

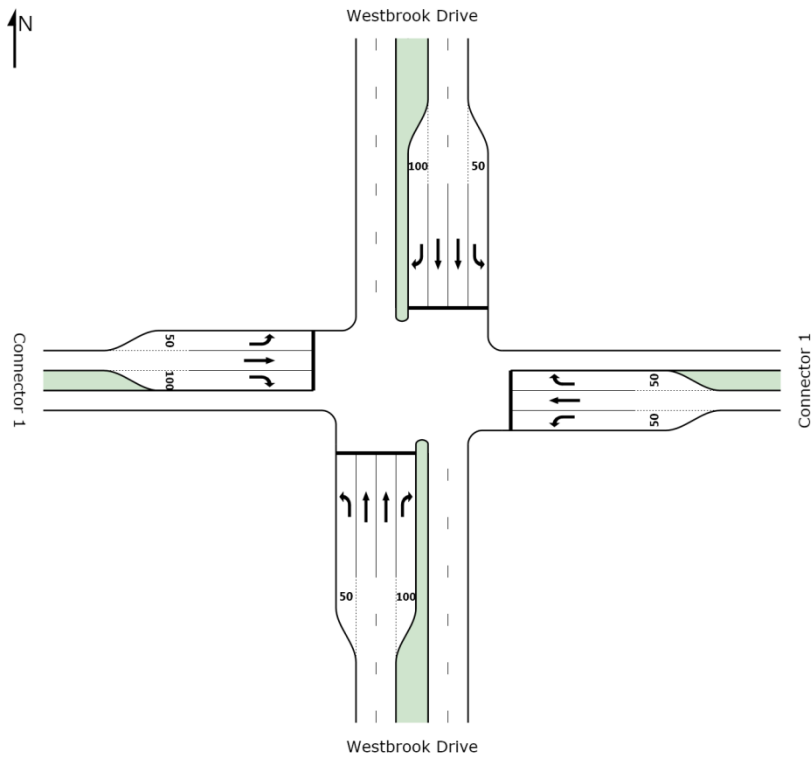
### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|--------------|---------------------|---------------|
|                        |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance     |                     |               |
|                        |      |             |     |           |               |                  | veh               | m            | per veh             | km/h          |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |              |                     |               |
| 1                      | L    | 200         | 5.0 | 0.236     | 8.8           | LOS A            | 1.5               | 10.6         | 0.19                | 48.5          |
| 2                      | T    | 902         | 5.0 | 0.666     | 34.8          | LOS C            | 22.2              | 162.0        | 0.90                | 29.3          |
| 3                      | R    | 20          | 5.0 | 0.122     | 63.7          | LOS E            | 1.1               | 8.1          | 0.95                | 21.9          |
| Approach               |      | 1122        | 5.0 | 0.666     | 30.7          | LOS C            | 22.2              | 162.0        | 0.78                | 31.4          |
| East: Connector 2      |      |             |     |           |               |                  |                   |              |                     |               |
| 4                      | L    | 20          | 5.0 | 0.050     | 14.1          | LOS B            | 0.4               | 2.7          | 0.38                | 43.4          |
| 5                      | T    | 20          | 5.0 | 0.061     | 44.4          | LOS D            | 1.0               | 7.1          | 0.86                | 26.0          |
| 6                      | R    | 60          | 5.0 | 0.296     | 54.1          | LOS D            | 3.0               | 22.1         | 0.89                | 24.2          |
| Approach               |      | 100         | 5.0 | 0.296     | 44.2          | LOS D            | 3.0               | 22.1         | 0.78                | 27.0          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |              |                     |               |
| 7                      | L    | 60          | 5.0 | 0.057     | 8.2           | LOS A            | 0.2               | 1.8          | 0.13                | 49.1          |
| 8                      | T    | 774         | 5.0 | 0.572     | 33.3          | LOS C            | 18.2              | 132.9        | 0.86                | 30.0          |
| 9                      | R    | 100         | 5.0 | 0.608     | 67.6          | LOS E            | 5.9               | 43.3         | 1.00                | 21.0          |
| Approach               |      | 934         | 5.0 | 0.608     | 35.4          | LOS D            | 18.2              | 132.9        | 0.83                | 29.4          |
| West: Connector 2      |      |             |     |           |               |                  |                   |              |                     |               |
| 10                     | L    | 100         | 5.0 | 0.228     | 13.2          | LOS B            | 1.8               | 12.9         | 0.37                | 44.2          |
| 11                     | T    | 20          | 5.0 | 0.061     | 44.4          | LOS D            | 1.0               | 7.1          | 0.86                | 26.0          |
| 12                     | R    | 200         | 5.0 | 0.637     | 58.6          | LOS E            | 11.1              | 81.1         | 0.98                | 23.1          |
| Approach               |      | 320         | 5.0 | 0.637     | 43.6          | LOS D            | 11.1              | 81.1         | 0.78                | 27.4          |
| All Vehicles           |      | 2476        | 5.0 | 0.666     | 34.7          | LOS C            | 22.2              | 162.0        | 0.80                | 29.9          |

## IN 11 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector - AM  
Peak Interim IN 11

120221sid-12M1296000 - Westbrook Dr & Connector 1 - IN1

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|------------------------|------|----------------------|-------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Westbrook Drive |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 1                      | L    | 120                  | 5.0               | 0.412                | LOS C            | 4.1                                  | 30.2          | 0.63         | 0.75                           | 33.1                  |
| 2                      | T    | 242                  | 5.0               | 0.449                | LOS D            | 8.2                                  | 60.0          | 0.92         | 0.74                           | 25.2                  |
| 3                      | R    | 20                   | 5.0               | 0.096                | LOS D            | 1.0                                  | 7.0           | 0.85         | 0.71                           | 25.0                  |
| Approach               |      | 382                  | 5.0               | 0.449                | LOS D            | 8.2                                  | 60.0          | 0.83         | 0.74                           | 27.2                  |
| East: Connector 1      |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 4                      | L    | 20                   | 5.0               | 0.174                | LOS D            | 3.4                                  | 24.9          | 0.84         | 0.80                           | 26.4                  |
| 5                      | T    | 52                   | 5.0               | 0.174                | LOS D            | 3.4                                  | 24.9          | 0.84         | 0.66                           | 27.0                  |
| 6                      | R    | 53                   | 5.0               | 0.250                | LOS D            | 2.5                                  | 18.5          | 0.85         | 0.74                           | 25.3                  |
| Approach               |      | 125                  | 5.0               | 0.250                | LOS D            | 3.4                                  | 24.9          | 0.85         | 0.72                           | 26.2                  |
| North: Westbrook Drive |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 7                      | L    | 83                   | 5.0               | 0.285                | LOS C            | 2.8                                  | 20.4          | 0.62         | 0.74                           | 33.4                  |
| 8                      | T    | 353                  | 5.0               | 0.655                | LOS D            | 12.6                                 | 91.7          | 0.96         | 0.79                           | 24.7                  |
| 9                      | R    | 150                  | 5.0               | 0.513                | LOS D            | 7.9                                  | 57.4          | 0.93         | 0.80                           | 23.9                  |
| Approach               |      | 586                  | 5.0               | 0.655                | LOS D            | 12.6                                 | 91.7          | 0.90         | 0.79                           | 25.4                  |
| West: Connector 1      |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 10                     | L    | 200                  | 5.0               | 0.671                | LOS C            | 7.3                                  | 53.2          | 0.65         | 0.78                           | 32.6                  |
| 11                     | T    | 40                   | 5.0               | 0.098                | LOS D            | 1.9                                  | 13.6          | 0.83         | 0.63                           | 27.4                  |
| 12                     | R    | 250                  | 5.0               | 0.669                | LOS E            | 13.7                                 | 100.0         | 0.98         | 0.84                           | 23.7                  |
| Approach               |      | 490                  | 5.0               | 0.671                | LOS D            | 13.7                                 | 100.0         | 0.83         | 0.80                           | 27.0                  |
| All Vehicles           |      | 1583                 | 5.0               | 0.671                | LOS D            | 13.7                                 | 100.0         | 0.86         | 0.77                           | 26.4                  |

## MOVEMENT SUMMARY

Site: Westbrook Dr &  
Connector - PM Peak Interim  
-IN11

120221sid-12M1296000 - Westbrook Dr & Connector 1 - IN1

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|------------------------|------|----------------------|-------------------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Westbrook Drive |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 1                      | L    | 250                  | 5.0               | 0.762                | LOS D            | 9.6                                  | 69.7          | 0.73         | 0.84                           | 30.1                  |
| 2                      | T    | 434                  | 5.0               | 0.486                | LOS C            | 14.0                                 | 102.0         | 0.83         | 0.70                           | 29.9                  |
| 3                      | R    | 20                   | 5.0               | 0.101                | LOS E            | 1.0                                  | 7.4           | 0.89         | 0.71                           | 23.6                  |
| Approach               |      | 704                  | 5.0               | 0.762                | LOS D            | 14.0                                 | 102.0         | 0.79         | 0.75                           | 29.7                  |
| East: Connector 1      |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 4                      | L    | 20                   | 5.0               | 0.169                | LOS D            | 2.9                                  | 21.4          | 0.87         | 0.79                           | 25.6                  |
| 5                      | T    | 40                   | 5.0               | 0.169                | LOS D            | 2.9                                  | 21.4          | 0.87         | 0.67                           | 26.0                  |
| 6                      | R    | 83                   | 5.0               | 0.428                | LOS E            | 4.5                                  | 32.7          | 0.94         | 0.77                           | 22.9                  |
| Approach               |      | 143                  | 5.0               | 0.428                | LOS D            | 4.5                                  | 32.7          | 0.91         | 0.74                           | 24.1                  |
| North: Westbrook Drive |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 7                      | L    | 53                   | 5.0               | 0.161                | LOS C            | 1.5                                  | 11.0          | 0.52         | 0.72                           | 36.5                  |
| 8                      | T    | 242                  | 5.0               | 0.271                | LOS C            | 7.2                                  | 52.2          | 0.77         | 0.63                           | 30.9                  |
| 9                      | R    | 200                  | 5.0               | 0.744                | LOS E            | 11.9                                 | 86.7          | 1.00         | 0.87                           | 21.7                  |
| Approach               |      | 495                  | 5.0               | 0.744                | LOS D            | 11.9                                 | 86.7          | 0.84         | 0.73                           | 26.8                  |
| West: Connector 1      |      |                      |                   |                      |                  |                                      |               |              |                                |                       |
| 10                     | L    | 150                  | 5.0               | 0.563                | LOS C            | 5.8                                  | 42.7          | 0.71         | 0.77                           | 30.7                  |
| 11                     | T    | 52                   | 5.0               | 0.150                | LOS D            | 2.6                                  | 18.8          | 0.88         | 0.67                           | 26.0                  |
| 12                     | R    | 120                  | 5.0               | 0.472                | LOS E            | 6.6                                  | 48.4          | 0.97         | 0.79                           | 22.6                  |
| Approach               |      | 322                  | 5.0               | 0.563                | LOS D            | 6.6                                  | 48.4          | 0.83         | 0.76                           | 26.4                  |
| All Vehicles           |      | 1664                 | 5.0               | 0.762                | LOS D            | 14.0                                 | 102.0         | 0.82         | 0.75                           | 27.6                  |

## MOVEMENT SUMMARY

Site: Westbrook Dr &  
Connector In11 - AM Peak  
Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 1 - IN1

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Westbrook Drive |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                      | L    | 200                  | 5.0               | 0.644 | 27.7                 | LOS C            | 6.7                                  | 49.2          | 0.62         | 0.77                           | 34.1                  |
| 2                      | T    | 518                  | 5.0               | 0.567 | 43.3                 | LOS D            | 13.4                                 | 98.0          | 0.93         | 0.79                           | 26.3                  |
| 3                      | R    | 29                   | 5.0               | 0.069 | 39.9                 | LOS D            | 1.2                                  | 8.7           | 0.74         | 0.72                           | 28.7                  |
| Approach               |      | 747                  | 5.0               | 0.644 | 39.0                 | LOS D            | 13.4                                 | 98.0          | 0.84         | 0.78                           | 28.1                  |
| East: Connector 1      |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                      | L    | 40                   | 5.0               | 0.142 | 30.4                 | LOS C            | 1.4                                  | 10.0          | 0.62         | 0.72                           | 32.7                  |
| 5                      | T    | 43                   | 5.0               | 0.342 | 60.6                 | LOS E            | 2.5                                  | 18.5          | 0.99         | 0.73                           | 21.7                  |
| 6                      | R    | 100                  | 5.0               | 0.484 | 53.3                 | LOS D            | 5.1                                  | 37.0          | 0.90         | 0.77                           | 24.4                  |
| Approach               |      | 183                  | 5.0               | 0.484 | 50.0                 | LOS D            | 5.1                                  | 37.0          | 0.86         | 0.75                           | 25.1                  |
| North: Westbrook Drive |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                      | L    | 80                   | 5.0               | 0.257 | 26.0                 | LOS C            | 2.5                                  | 18.1          | 0.57         | 0.73                           | 35.0                  |
| 8                      | T    | 462                  | 5.0               | 0.506 | 42.6                 | LOS D            | 11.8                                 | 85.8          | 0.92         | 0.77                           | 26.6                  |
| 9                      | R    | 150                  | 5.0               | 0.358 | 42.6                 | LOS D            | 6.7                                  | 48.9          | 0.81         | 0.78                           | 27.7                  |
| Approach               |      | 692                  | 5.0               | 0.506 | 40.7                 | LOS D            | 11.8                                 | 85.8          | 0.85         | 0.77                           | 27.6                  |
| West: Connector 1      |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                     | L    | 180                  | 5.0               | 0.644 | 33.0                 | LOS C            | 6.8                                  | 50.0          | 0.69         | 0.78                           | 31.5                  |
| 11                     | T    | 23                   | 5.0               | 0.183 | 59.6                 | LOS E            | 1.3                                  | 9.7           | 0.98         | 0.69                           | 22.0                  |
| 12                     | R    | 200                  | 5.0               | 0.582 | 56.4                 | LOS E            | 10.8                                 | 79.1          | 0.96         | 0.82                           | 23.6                  |
| Approach               |      | 403                  | 5.0               | 0.644 | 46.2                 | LOS D            | 10.8                                 | 79.1          | 0.84         | 0.79                           | 26.4                  |
| All Vehicles           |      | 2025                 | 5.0               | 0.644 | 42.0                 | LOS D            | 13.4                                 | 98.0          | 0.85         | 0.78                           | 27.3                  |

## MOVEMENT SUMMARY

Site: Westbrook Dr & Connector  
In11 - PM Peak Ultimate

120221sid-12M1296000 - Westbrook Dr & Connector 1 - IN1

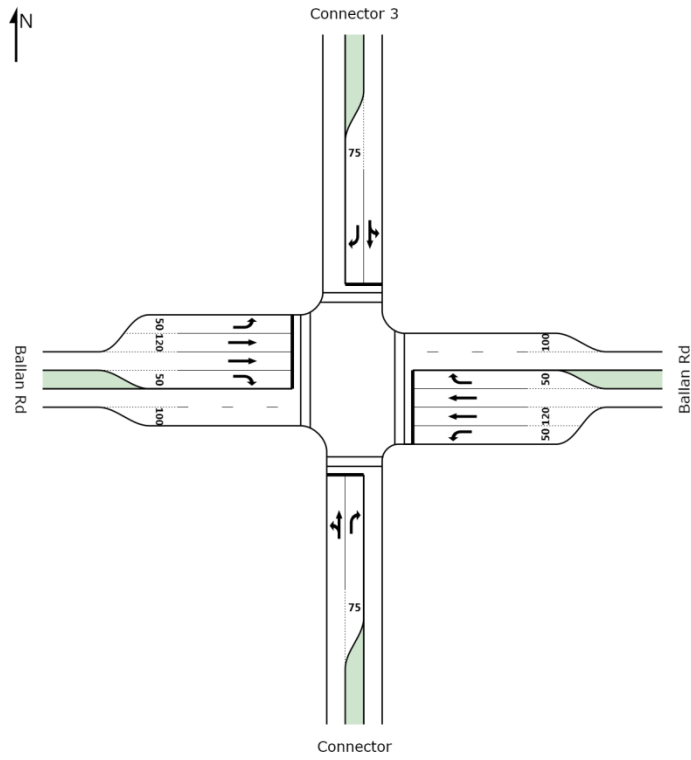
Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

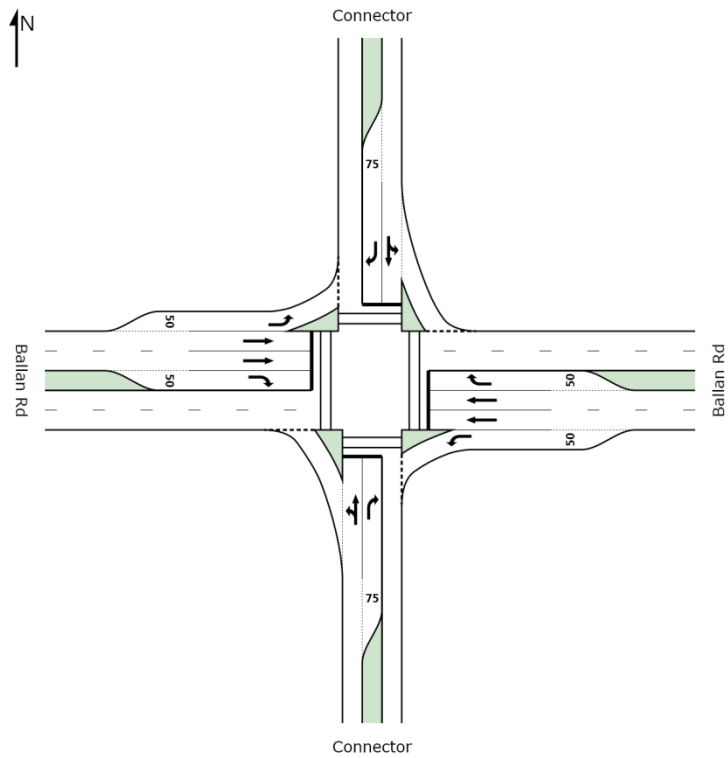
| Mov ID                 | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|------------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Westbrook Drive |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                      | L    | 200                  | 5.0               | 0.583 | 23.4                 | LOS C            | 5.9                                  | 43.3          | 0.55         | 0.76                           | 36.6                  |
| 2                      | T    | 462                  | 5.0               | 0.473 | 40.6                 | LOS D            | 11.5                                 | 83.7          | 0.90         | 0.75                           | 27.2                  |
| 3                      | R    | 40                   | 5.0               | 0.100 | 44.3                 | LOS D            | 1.8                                  | 12.9          | 0.79         | 0.73                           | 27.1                  |
| Approach               |      | 702                  | 5.0               | 0.583 | 35.9                 | LOS D            | 11.5                                 | 83.7          | 0.79         | 0.75                           | 29.4                  |
| East: Connector 1      |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                      | L    | 29                   | 5.0               | 0.112 | 34.9                 | LOS C            | 1.1                                  | 7.9           | 0.68         | 0.71                           | 30.6                  |
| 5                      | T    | 23                   | 5.0               | 0.244 | 62.8                 | LOS E            | 1.4                                  | 10.1          | 0.99         | 0.70                           | 21.3                  |
| 6                      | R    | 80                   | 5.0               | 0.367 | 47.9                 | LOS D            | 3.8                                  | 27.5          | 0.84         | 0.76                           | 26.0                  |
| Approach               |      | 132                  | 5.0               | 0.367 | 47.6                 | LOS D            | 3.8                                  | 27.5          | 0.83         | 0.74                           | 25.9                  |
| North: Westbrook Drive |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                      | L    | 100                  | 5.0               | 0.291 | 22.4                 | LOS C            | 2.8                                  | 20.3          | 0.51         | 0.73                           | 37.2                  |
| 8                      | T    | 518                  | 5.0               | 0.531 | 41.4                 | LOS D            | 13.1                                 | 95.6          | 0.91         | 0.77                           | 27.0                  |
| 9                      | R    | 180                  | 5.0               | 0.452 | 47.8                 | LOS D            | 8.7                                  | 63.7          | 0.87         | 0.80                           | 26.0                  |
| Approach               |      | 798                  | 5.0               | 0.531 | 40.4                 | LOS D            | 13.1                                 | 95.6          | 0.85         | 0.77                           | 27.7                  |
| West: Connector 1      |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                     | L    | 150                  | 5.0               | 0.584 | 37.1                 | LOS D            | 6.1                                  | 44.5          | 0.74         | 0.77                           | 29.7                  |
| 11                     | T    | 43                   | 5.0               | 0.455 | 64.0                 | LOS E            | 2.6                                  | 19.2          | 1.00         | 0.73                           | 21.0                  |
| 12                     | R    | 200                  | 5.0               | 0.517 | 51.2                 | LOS D            | 10.2                                 | 74.4          | 0.91         | 0.81                           | 25.0                  |
| Approach               |      | 393                  | 5.0               | 0.584 | 47.2                 | LOS D            | 10.2                                 | 74.4          | 0.86         | 0.79                           | 26.0                  |
| All Vehicles           |      | 2025                 | 5.0               | 0.584 | 40.7                 | LOS D            | 13.1                                 | 95.6          | 0.83         | 0.77                           | 27.8                  |

## IN 33

### Interim Layout



### Ultimate Layout



## MOVEMENT SUMMARY

Site: IN33 Ballan Rd &  
Connector 3 - AM Peak  
Interim

120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector   |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 80                   | 0.0               | 0.275 | 50.6                 | LOS D            | 5.4                                  | 37.8          | 0.88         | 0.79                           | 25.3                  |
| 2                  | T    | 30                   | 0.0               | 0.275 | 42.4                 | LOS D            | 5.4                                  | 37.8          | 0.88         | 0.70                           | 25.7                  |
| 3                  | R    | 80                   | 0.0               | 0.431 | 64.8                 | LOS E            | 4.6                                  | 32.0          | 0.98         | 0.77                           | 21.6                  |
| Approach           |      | 190                  | 0.0               | 0.431 | 55.3                 | LOS E            | 5.4                                  | 37.8          | 0.92         | 0.77                           | 23.7                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 40                   | 0.0               | 0.096 | 17.6                 | LOS B            | 0.9                                  | 6.2           | 0.41         | 0.70                           | 40.4                  |
| 5                  | T    | 440                  | 5.0               | 0.365 | 21.1                 | LOS C            | 11.9                                 | 87.1          | 0.66         | 0.57                           | 36.5                  |
| 6                  | R    | 50                   | 5.0               | 0.478 | 71.3                 | LOS E            | 3.0                                  | 22.1          | 1.00         | 0.74                           | 20.3                  |
| Approach           |      | 530                  | 4.6               | 0.478 | 25.6                 | LOS C            | 11.9                                 | 87.1          | 0.68         | 0.59                           | 34.1                  |
| North: Connector 3 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 90                   | 5.0               | 0.303 | 50.3                 | LOS D            | 5.9                                  | 42.5          | 0.88         | 0.80                           | 25.4                  |
| 8                  | T    | 30                   | 0.0               | 0.303 | 41.9                 | LOS D            | 5.9                                  | 42.5          | 0.88         | 0.71                           | 25.9                  |
| 9                  | R    | 90                   | 5.0               | 0.502 | 65.5                 | LOS E            | 5.2                                  | 38.0          | 0.99         | 0.78                           | 21.5                  |
| Approach           |      | 210                  | 4.3               | 0.502 | 55.6                 | LOS E            | 5.9                                  | 42.5          | 0.93         | 0.78                           | 23.6                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 50                   | 5.0               | 0.125 | 17.9                 | LOS B            | 1.1                                  | 8.2           | 0.41         | 0.71                           | 40.3                  |
| 11                 | T    | 610                  | 5.0               | 0.506 | 22.7                 | LOS C            | 18.0                                 | 131.5         | 0.71         | 0.62                           | 35.4                  |
| 12                 | R    | 40                   | 0.0               | 0.369 | 70.4                 | LOS E            | 2.4                                  | 16.8          | 1.00         | 0.73                           | 20.4                  |
| Approach           |      | 700                  | 4.7               | 0.506 | 25.1                 | LOS C            | 18.0                                 | 131.5         | 0.71         | 0.63                           | 34.3                  |
| All Vehicles       |      | 1630                 | 4.1               | 0.506 | 32.7                 | LOS C            | 18.0                                 | 131.5         | 0.75         | 0.65                           | 30.8                  |

## MOVEMENT SUMMARY

Site: IN33 Ballan Rd & Connector 3  
- PM Peak Interim

120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector   |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 40                   | 0.0               | 0.188 | 51.4                 | LOS D            | 3.4                                  | 24.0          | 0.87         | 0.78                           | 25.3                  |
| 2                  | T    | 30                   | 0.0               | 0.188 | 43.2                 | LOS D            | 3.4                                  | 24.0          | 0.87         | 0.68                           | 25.7                  |
| 3                  | R    | 40                   | 0.0               | 0.369 | 70.2                 | LOS E            | 2.4                                  | 16.8          | 1.00         | 0.73                           | 20.5                  |
| Approach           |      | 110                  | 0.0               | 0.369 | 56.0                 | LOS E            | 3.4                                  | 24.0          | 0.92         | 0.73                           | 23.4                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 80                   | 0.0               | 0.210 | 20.1                 | LOS C            | 2.0                                  | 14.2          | 0.47         | 0.72                           | 38.6                  |
| 5                  | T    | 610                  | 5.0               | 0.506 | 22.7                 | LOS C            | 18.0                                 | 131.5         | 0.71         | 0.62                           | 35.4                  |
| 6                  | R    | 90                   | 5.0               | 0.502 | 65.7                 | LOS E            | 5.2                                  | 38.0          | 0.99         | 0.78                           | 21.4                  |
| Approach           |      | 780                  | 4.5               | 0.506 | 27.4                 | LOS C            | 18.0                                 | 131.5         | 0.72         | 0.65                           | 33.2                  |
| North: Connector 3 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 50                   | 5.0               | 0.215 | 51.0                 | LOS D            | 3.9                                  | 28.1          | 0.87         | 0.78                           | 25.4                  |
| 8                  | T    | 30                   | 0.0               | 0.215 | 42.6                 | LOS D            | 3.9                                  | 28.1          | 0.87         | 0.68                           | 25.8                  |
| 9                  | R    | 50                   | 5.0               | 0.478 | 71.1                 | LOS E            | 3.0                                  | 22.1          | 1.00         | 0.74                           | 20.4                  |
| Approach           |      | 130                  | 3.8               | 0.478 | 56.8                 | LOS E            | 3.9                                  | 28.1          | 0.92         | 0.75                           | 23.3                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 90                   | 5.0               | 0.246 | 20.4                 | LOS C            | 2.3                                  | 16.8          | 0.47         | 0.73                           | 38.6                  |
| 11                 | T    | 440                  | 5.0               | 0.365 | 21.1                 | LOS C            | 11.9                                 | 87.1          | 0.66         | 0.57                           | 36.5                  |
| 12                 | R    | 80                   | 0.0               | 0.431 | 64.9                 | LOS E            | 4.6                                  | 32.0          | 0.98         | 0.77                           | 21.5                  |
| Approach           |      | 610                  | 4.3               | 0.431 | 26.8                 | LOS C            | 11.9                                 | 87.1          | 0.68         | 0.62                           | 33.7                  |
| All Vehicles       |      | 1630                 | 4.1               | 0.506 | 31.4                 | LOS C            | 18.0                                 | 131.5         | 0.73         | 0.65                           | 31.4                  |

## MOVEMENT SUMMARY

Site: IN33 Ballan Rd &  
Connector 3 - AM Peak Ult

120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID           | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                  |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                  |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Connector |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                | L    | 53          | 0.0 | 0.164     | 25.8          | LOS C            | 2.0               | 14.1     | 0.78         | 0.77                | 35.6          |
| 2                | T    | 21          | 0.0 | 0.164     | 18.0          | LOS B            | 2.0               | 14.1     | 0.78         | 0.62                | 36.8          |
| 3                | R    | 53          | 0.0 | 0.425     | 69.2          | LOS E            | 3.1               | 21.9     | 1.00         | 0.75                | 20.7          |
| Approach         |      | 126         | 0.0 | 0.425     | 42.6          | LOS D            | 3.1               | 21.9     | 0.87         | 0.74                | 27.5          |
| East: Ballan Rd  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                | L    | 32          | 0.0 | 0.029     | 8.0           | LOS A            | 0.1               | 0.8      | 0.12         | 0.62                | 49.1          |
| 5                | T    | 1250        | 5.0 | 0.630     | 21.5          | LOS C            | 25.6              | 187.2    | 0.77         | 0.69                | 36.0          |
| 6                | R    | 40          | 5.0 | 0.446     | 72.5          | LOS E            | 2.4               | 17.9     | 1.00         | 0.73                | 20.0          |
| Approach         |      | 1322        | 4.9 | 0.630     | 22.7          | LOS C            | 25.6              | 187.2    | 0.76         | 0.69                | 35.4          |
| North: Connector |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                | L    | 80          | 5.0 | 0.206     | 24.4          | LOS C            | 2.8               | 20.4     | 0.75         | 0.78                | 36.4          |
| 8                | T    | 21          | 0.0 | 0.206     | 16.4          | LOS B            | 2.8               | 20.4     | 0.75         | 0.61                | 37.8          |
| 9                | R    | 80          | 5.0 | 0.669     | 71.8          | LOS E            | 4.9               | 36.0     | 1.00         | 0.82                | 20.2          |
| Approach         |      | 181         | 4.4 | 0.669     | 44.4          | LOS D            | 4.9               | 36.0     | 0.86         | 0.78                | 27.0          |
| West: Ballan Rd  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10               | L    | 40          | 5.0 | 0.039     | 8.2           | LOS A            | 0.2               | 1.2      | 0.12         | 0.62                | 49.1          |
| 11               | T    | 1350        | 5.0 | 0.681     | 22.4          | LOS C            | 28.8              | 210.6    | 0.80         | 0.72                | 35.4          |
| 12               | R    | 32          | 0.0 | 0.340     | 71.6          | LOS E            | 1.9               | 13.4     | 1.00         | 0.72                | 20.2          |
| Approach         |      | 1422        | 4.9 | 0.681     | 23.1          | LOS C            | 28.8              | 210.6    | 0.78         | 0.72                | 35.1          |
| All Vehicles     |      | 3051        | 4.7 | 0.681     | 25.0          | LOS C            | 28.8              | 210.6    | 0.78         | 0.71                | 34.2          |

## MOVEMENT SUMMARY

Site: IN33 Ballan Rd &  
Connector 3 - PM Peak Ult

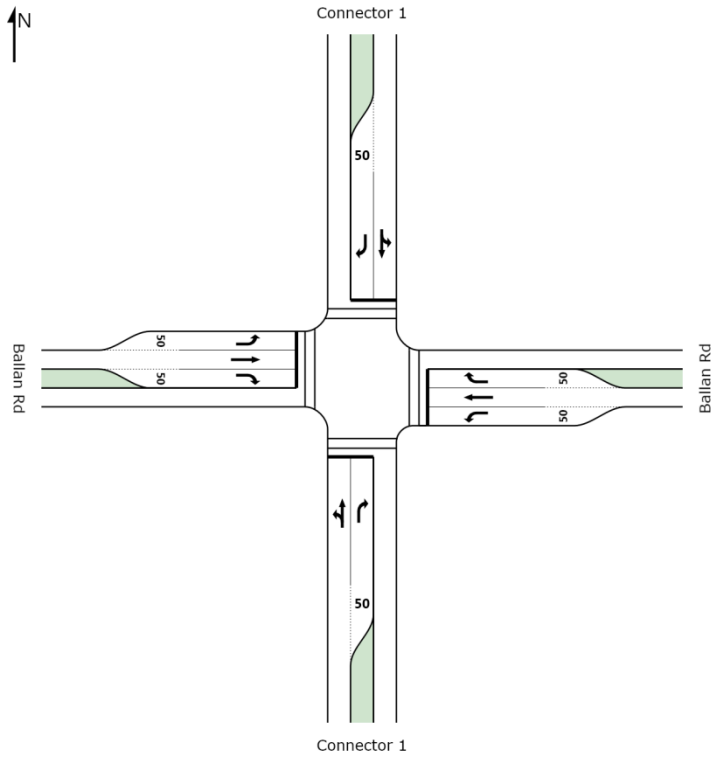
120221sid-12M1296000 - Ballan Rd & Connector 3 - IN9

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

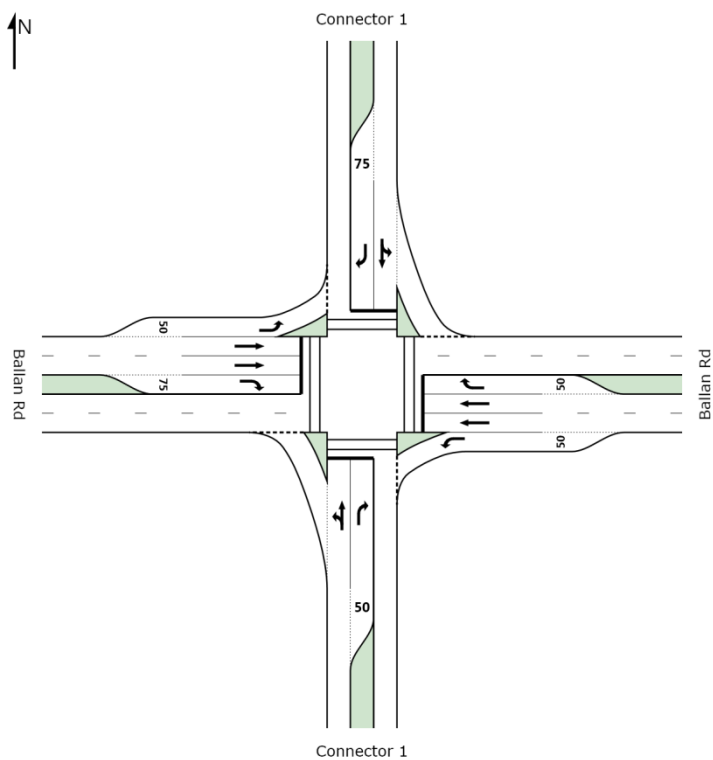
### Movement Performance - Vehicles

| Mov ID           | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                  |      | veh/h       | %   | v/c       | sec           |                  | Vehicles          | Distance |              | per veh             | km/h          |
|                  |      |             |     |           |               |                  | veh               | m        |              |                     |               |
| South: Connector |      |             |     |           |               |                  |                   |          |              |                     |               |
| 1                | L    | 32          | 0.0 | 0.132     | 28.7          | LOS C            | 1.6               | 11.1     | 0.82         | 0.76                | 34.2          |
| 2                | T    | 21          | 0.0 | 0.132     | 20.8          | LOS C            | 1.6               | 11.1     | 0.82         | 0.63                | 35.1          |
| 3                | R    | 32          | 0.0 | 0.340     | 71.4          | LOS E            | 1.9               | 13.4     | 1.00         | 0.72                | 20.3          |
| Approach         |      | 84          | 0.0 | 0.340     | 42.8          | LOS D            | 1.9               | 13.4     | 0.89         | 0.71                | 27.3          |
| East: Ballan Rd  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 4                | L    | 53          | 0.0 | 0.052     | 8.1           | LOS A            | 0.2               | 1.7      | 0.14         | 0.63                | 49.0          |
| 5                | T    | 1350        | 5.0 | 0.681     | 22.4          | LOS C            | 28.8              | 210.6    | 0.80         | 0.72                | 35.4          |
| 6                | R    | 80          | 5.0 | 0.669     | 72.0          | LOS E            | 4.9               | 36.0     | 1.00         | 0.82                | 20.1          |
| Approach         |      | 1483        | 4.8 | 0.681     | 24.6          | LOS C            | 28.8              | 210.6    | 0.79         | 0.73                | 34.4          |
| North: Connector |      |             |     |           |               |                  |                   |          |              |                     |               |
| 7                | L    | 40          | 5.0 | 0.147     | 27.2          | LOS C            | 1.6               | 11.6     | 0.80         | 0.77                | 35.0          |
| 8                | T    | 21          | 0.0 | 0.147     | 19.2          | LOS B            | 1.6               | 11.6     | 0.80         | 0.62                | 36.1          |
| 9                | R    | 40          | 5.0 | 0.446     | 72.3          | LOS E            | 2.4               | 17.9     | 1.00         | 0.73                | 20.1          |
| Approach         |      | 101         | 4.0 | 0.446     | 43.4          | LOS D            | 2.4               | 17.9     | 0.88         | 0.72                | 27.2          |
| West: Ballan Rd  |      |             |     |           |               |                  |                   |          |              |                     |               |
| 10               | L    | 80          | 5.0 | 0.087     | 8.5           | LOS A            | 0.5               | 3.3      | 0.16         | 0.63                | 48.8          |
| 11               | T    | 1250        | 5.0 | 0.630     | 21.5          | LOS C            | 25.6              | 187.2    | 0.77         | 0.69                | 36.0          |
| 12               | R    | 53          | 0.0 | 0.425     | 69.4          | LOS E            | 3.1               | 21.9     | 1.00         | 0.75                | 20.6          |
| Approach         |      | 1383        | 4.8 | 0.630     | 22.6          | LOS C            | 25.6              | 187.2    | 0.74         | 0.69                | 35.6          |
| All Vehicles     |      | 3051        | 4.7 | 0.681     | 24.8          | LOS C            | 28.8              | 210.6    | 0.77         | 0.71                | 34.4          |

## IN 34 Interim Layout



## Ultimate Layout



## MOVEMENT SUMMARY

Site: IN34 Ballan Rd &  
Connector 1 - AM Peak  
Interim

120221sid-12M1296000 - Ballan Rd & Connector 1 - IN2

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 1 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 20                   | 5.0               | 0.725 | 74.5                 | LOS E            | 24.3                                 | 177.1         | 0.98         | 0.92                           | 20.4                  |
| 2                  | T    | 335                  | 5.0               | 0.725 | 66.1                 | LOS E            | 24.3                                 | 177.1         | 0.98         | 0.89                           | 20.5                  |
| 3                  | R    | 190                  | 5.0               | 0.718 | 39.8                 | LOS D            | 8.3                                  | 60.4          | 0.74         | 0.82                           | 28.7                  |
| Approach           |      | 545                  | 5.0               | 0.725 | 57.3                 | LOS E            | 24.3                                 | 177.1         | 0.89         | 0.87                           | 22.8                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 66                   | 5.0               | 0.189 | 21.6                 | LOS C            | 1.8                                  | 12.9          | 0.49         | 0.72                           | 37.7                  |
| 5                  | T    | 20                   | 5.0               | 0.085 | 50.6                 | LOS D            | 1.0                                  | 7.7           | 0.92         | 0.65                           | 24.2                  |
| 6                  | R    | 20                   | 5.0               | 0.223 | 71.2                 | LOS E            | 1.2                                  | 8.8           | 0.99         | 0.70                           | 20.3                  |
| Approach           |      | 106                  | 5.0               | 0.223 | 36.5                 | LOS D            | 1.8                                  | 12.9          | 0.67         | 0.70                           | 29.7                  |
| North: Connector 1 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 20                   | 5.0               | 0.433 | 68.8                 | LOS E            | 14.0                                 | 102.2         | 0.89         | 0.91                           | 21.5                  |
| 8                  | T    | 192                  | 5.0               | 0.433 | 60.4                 | LOS E            | 14.0                                 | 102.2         | 0.89         | 0.79                           | 21.7                  |
| 9                  | R    | 20                   | 5.0               | 0.075 | 33.2                 | LOS C            | 0.7                                  | 5.3           | 0.66         | 0.70                           | 31.4                  |
| Approach           |      | 232                  | 5.0               | 0.433 | 58.8                 | LOS E            | 14.0                                 | 102.2         | 0.87         | 0.80                           | 22.3                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 20                   | 5.0               | 0.057 | 21.2                 | LOS C            | 0.5                                  | 3.8           | 0.47         | 0.69                           | 38.0                  |
| 11                 | T    | 20                   | 5.0               | 0.085 | 50.6                 | LOS D            | 1.0                                  | 7.7           | 0.92         | 0.65                           | 24.2                  |
| 12                 | R    | 20                   | 5.0               | 0.223 | 71.2                 | LOS E            | 1.2                                  | 8.8           | 0.99         | 0.70                           | 20.3                  |
| Approach           |      | 60                   | 5.0               | 0.223 | 47.7                 | LOS D            | 1.2                                  | 8.8           | 0.79         | 0.68                           | 25.6                  |
| All Vehicles       |      | 943                  | 5.0               | 0.725 | 54.7                 | LOS D            | 24.3                                 | 177.1         | 0.86         | 0.82                           | 23.4                  |

## MOVEMENT SUMMARY

Site: IN34 Ballan Rd & Connector 1  
- PM Peak Interim - Copy

120221sid-12M1296000 - Ballan Rd & Connector 1 - IN2

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow<br>veh/h | HV Deg. Satn<br>% | v/c   | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate<br>per veh | Average Speed<br>km/h |
|--------------------|------|----------------------|-------------------|-------|----------------------|------------------|--------------------------------------|---------------|--------------|--------------------------------|-----------------------|
| South: Connector 1 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 1                  | L    | 20                   | 5.0               | 0.382 | 51.5                 | LOS D            | 9.8                                  | 71.3          | 0.85         | 0.90                           | 25.8                  |
| 2                  | T    | 192                  | 5.0               | 0.382 | 43.1                 | LOS D            | 9.8                                  | 71.3          | 0.85         | 0.74                           | 26.3                  |
| 3                  | R    | 66                   | 5.0               | 0.355 | 64.5                 | LOS E            | 3.7                                  | 27.3          | 0.97         | 0.76                           | 21.7                  |
| Approach           |      | 278                  | 5.0               | 0.382 | 48.8                 | LOS D            | 9.8                                  | 71.3          | 0.88         | 0.76                           | 25.0                  |
| East: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 4                  | L    | 190                  | 5.0               | 0.829 | 58.1                 | LOS E            | 10.7                                 | 77.9          | 0.86         | 0.92                           | 23.1                  |
| 5                  | T    | 20                   | 5.0               | 0.085 | 50.6                 | LOS D            | 1.0                                  | 7.7           | 0.92         | 0.65                           | 24.2                  |
| 6                  | R    | 200                  | 5.0               | 0.854 | 57.8                 | LOS E            | 11.2                                 | 81.6          | 0.85         | 0.91                           | 23.2                  |
| Approach           |      | 410                  | 5.0               | 0.854 | 57.6                 | LOS E            | 11.2                                 | 81.6          | 0.85         | 0.90                           | 23.2                  |
| North: Connector 1 |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 7                  | L    | 140                  | 5.0               | 0.850 | 61.6                 | LOS E            | 28.2                                 | 206.1         | 1.00         | 1.03                           | 23.0                  |
| 8                  | T    | 335                  | 5.0               | 0.850 | 53.2                 | LOS D            | 28.2                                 | 206.1         | 1.00         | 1.03                           | 23.1                  |
| 9                  | R    | 20                   | 5.0               | 0.108 | 62.4                 | LOS E            | 1.1                                  | 8.0           | 0.94         | 0.71                           | 22.1                  |
| Approach           |      | 495                  | 5.0               | 0.850 | 56.0                 | LOS E            | 28.2                                 | 206.1         | 1.00         | 1.01                           | 23.0                  |
| West: Ballan Rd    |      |                      |                   |       |                      |                  |                                      |               |              |                                |                       |
| 10                 | L    | 20                   | 5.0               | 0.086 | 42.3                 | LOS D            | 0.8                                  | 6.2           | 0.76         | 0.70                           | 27.8                  |
| 11                 | T    | 20                   | 5.0               | 0.085 | 50.6                 | LOS D            | 1.0                                  | 7.7           | 0.92         | 0.65                           | 24.2                  |
| 12                 | R    | 20                   | 5.0               | 0.084 | 40.7                 | LOS D            | 0.8                                  | 6.0           | 0.74         | 0.70                           | 28.3                  |
| Approach           |      | 60                   | 5.0               | 0.086 | 44.5                 | LOS D            | 1.0                                  | 7.7           | 0.81         | 0.69                           | 26.6                  |
| All Vehicles       |      | 1243                 | 5.0               | 0.854 | 54.4                 | LOS D            | 28.2                                 | 206.1         | 0.91         | 0.90                           | 23.6                  |

## MOVEMENT SUMMARY

Site: IN34 Ballan Rd & Connector 1 -  
AM Peak Ultimate

120221sid-12M1296000 - Ballan Rd & Connector 1 - IN2

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|--------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                    |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 1 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                  | L    | 307         | 5.0 | 0.681     | 28.9          | LOS C            | 10.5                       | 76.3     | 0.94         | 0.84                | 33.8          |
| 2                  | T    | 50          | 5.0 | 0.681     | 20.9          | LOS C            | 10.5                       | 76.3     | 0.94         | 0.81                | 34.2          |
| 3                  | R    | 20          | 5.0 | 0.088     | 43.6          | LOS D            | 0.9                        | 6.3      | 0.78         | 0.70                | 27.4          |
| Approach           |      | 377         | 5.0 | 0.681     | 28.7          | LOS C            | 10.5                       | 76.3     | 0.93         | 0.83                | 33.4          |
| East: Ballan Rd    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                  | L    | 20          | 5.0 | 0.027     | 9.2           | LOS A            | 0.2                        | 1.2      | 0.20         | 0.63                | 48.1          |
| 5                  | T    | 831         | 5.0 | 0.830     | 50.7          | LOS D            | 24.9                       | 181.9    | 1.00         | 0.96                | 24.1          |
| 6                  | R    | 60          | 5.0 | 0.309     | 63.2          | LOS E            | 3.3                        | 24.4     | 0.96         | 0.76                | 21.9          |
| Approach           |      | 911         | 5.0 | 0.830     | 50.6          | LOS D            | 24.9                       | 181.9    | 0.98         | 0.94                | 24.2          |
| North: Connector 1 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                  | L    | 100         | 5.0 | 0.360     | 32.9          | LOS C            | 5.1                        | 36.9     | 0.89         | 0.80                | 32.1          |
| 8                  | T    | 47          | 5.0 | 0.360     | 24.9          | LOS C            | 5.1                        | 36.9     | 0.89         | 0.72                | 32.7          |
| 9                  | R    | 261         | 5.0 | 0.820     | 57.2          | LOS E            | 14.8                       | 108.0    | 0.92         | 0.91                | 23.4          |
| Approach           |      | 408         | 5.0 | 0.820     | 47.5          | LOS D            | 14.8                       | 108.0    | 0.91         | 0.86                | 26.0          |
| West: Ballan Rd    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                 | L    | 39          | 5.0 | 0.040     | 8.3           | LOS A            | 0.2                        | 1.4      | 0.14         | 0.62                | 49.0          |
| 11                 | T    | 782         | 5.0 | 0.781     | 47.2          | LOS D            | 22.2                       | 162.3    | 0.99         | 0.91                | 25.1          |
| 12                 | R    | 157         | 5.0 | 0.808     | 71.3          | LOS E            | 9.9                        | 72.0     | 1.00         | 0.91                | 20.3          |
| Approach           |      | 978         | 5.0 | 0.808     | 49.5          | LOS D            | 22.2                       | 162.3    | 0.96         | 0.90                | 24.6          |
| All Vehicles       |      | 2674        | 5.0 | 0.830     | 46.6          | LOS D            | 24.9                       | 181.9    | 0.95         | 0.90                | 25.6          |

## MOVEMENT SUMMARY

Site: IN34 Ballan Rd &  
Connector 1 - PM Peak  
Ultimate

120221sid-12M1296000 - Ballan Rd & Connector 1 - IN2

Signals - Fixed Time Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

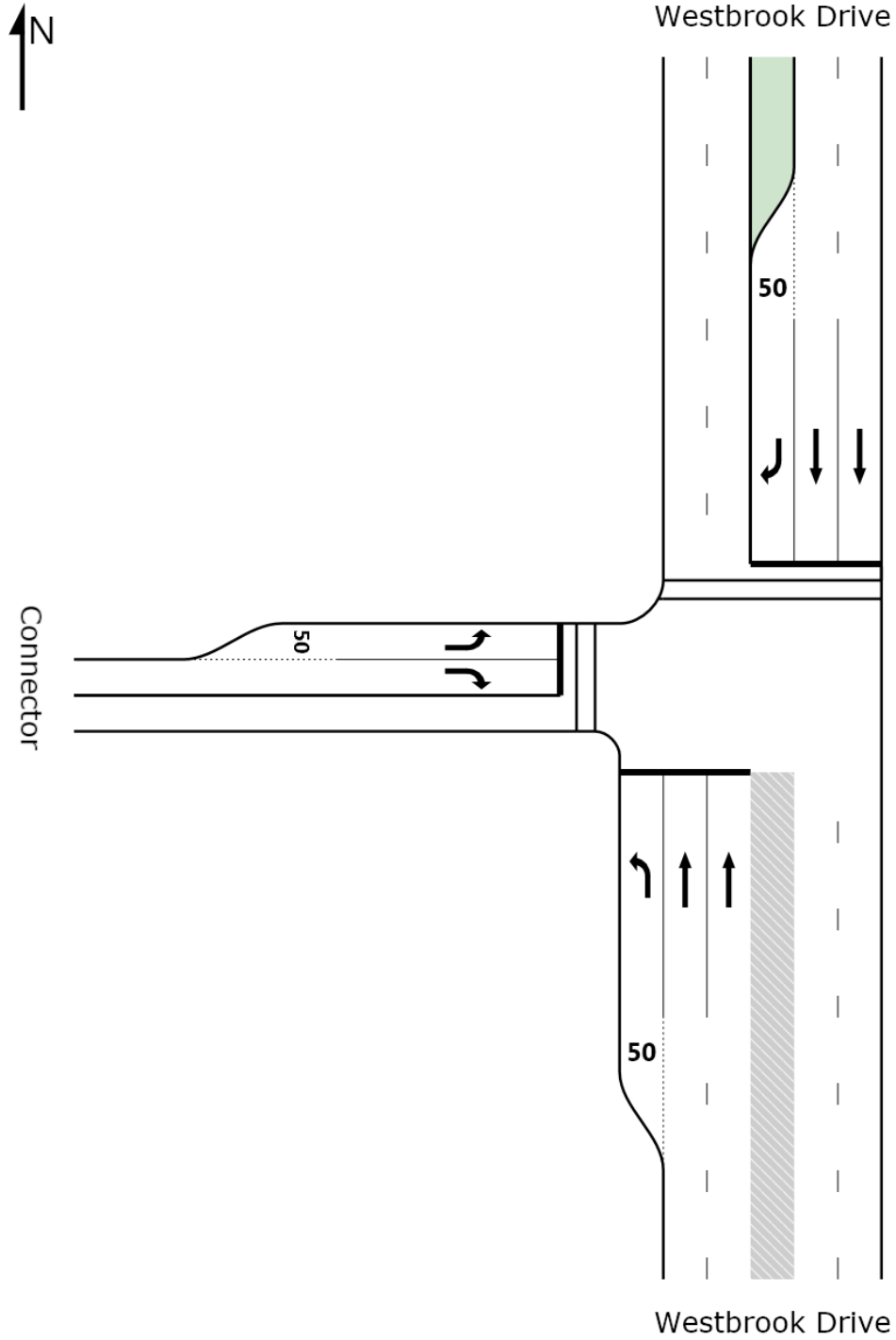
### Movement Performance - Vehicles

| Mov ID             | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue Vehicles | Distance | Prop. Queued | Effective Stop Rate | Average Speed |
|--------------------|------|-------------|-----|-----------|---------------|------------------|----------------------------|----------|--------------|---------------------|---------------|
|                    |      | veh/h       | %   | v/c       | sec           |                  | veh                        | m        |              | per veh             | km/h          |
| South: Connector 1 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 1                  | L    | 157         | 5.0 | 0.491     | 33.1          | LOS C            | 7.1                        | 51.7     | 0.92         | 0.81                | 31.9          |
| 2                  | T    | 47          | 5.0 | 0.491     | 25.1          | LOS C            | 7.1                        | 51.7     | 0.92         | 0.75                | 32.3          |
| 3                  | R    | 20          | 5.0 | 0.215     | 70.8          | LOS E            | 1.2                        | 8.7      | 0.99         | 0.70                | 20.4          |
| Approach           |      | 224         | 5.0 | 0.491     | 34.8          | LOS C            | 7.1                        | 51.7     | 0.93         | 0.79                | 30.5          |
| East: Ballan Rd    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 4                  | L    | 20          | 5.0 | 0.034     | 10.4          | LOS B            | 0.2                        | 1.7      | 0.26         | 0.64                | 46.8          |
| 5                  | T    | 782         | 5.0 | 0.828     | 51.5          | LOS D            | 23.5                       | 171.8    | 1.00         | 0.96                | 23.9          |
| 6                  | R    | 100         | 5.0 | 0.397     | 37.7          | LOS D            | 4.0                        | 29.5     | 0.73         | 0.76                | 29.5          |
| Approach           |      | 902         | 5.0 | 0.828     | 49.0          | LOS D            | 23.5                       | 171.8    | 0.95         | 0.93                | 24.7          |
| North: Connector 1 |      |             |     |           |               |                  |                            |          |              |                     |               |
| 7                  | L    | 60          | 5.0 | 0.319     | 34.8          | LOS C            | 3.8                        | 27.9     | 0.91         | 0.78                | 31.5          |
| 8                  | T    | 50          | 5.0 | 0.319     | 26.8          | LOS C            | 3.8                        | 27.9     | 0.91         | 0.71                | 31.9          |
| 9                  | R    | 39          | 5.0 | 0.420     | 72.0          | LOS E            | 2.4                        | 17.3     | 1.00         | 0.73                | 20.2          |
| Approach           |      | 149         | 5.0 | 0.420     | 41.9          | LOS D            | 3.8                        | 27.9     | 0.93         | 0.75                | 27.6          |
| West: Ballan Rd    |      |             |     |           |               |                  |                            |          |              |                     |               |
| 10                 | L    | 261         | 5.0 | 0.304     | 8.7           | LOS A            | 1.8                        | 13.2     | 0.19         | 0.65                | 48.6          |
| 11                 | T    | 831         | 5.0 | 0.880     | 57.8          | LOS E            | 27.0                       | 197.2    | 1.00         | 1.04                | 22.3          |
| 12                 | R    | 307         | 5.0 | 0.876     | 53.3          | LOS D            | 16.8                       | 122.4    | 0.85         | 0.91                | 24.4          |
| Approach           |      | 1399        | 5.0 | 0.880     | 47.6          | LOS D            | 27.0                       | 197.2    | 0.82         | 0.94                | 25.4          |
| All Vehicles       |      | 2674        | 5.0 | 0.880     | 46.7          | LOS D            | 27.0                       | 197.2    | 0.88         | 0.91                | 25.6          |

IN 38

(Interim Layout not assessed)

Ultimate Layout



## MOVEMENT SUMMARY

Site: IN38 Westbrook Dr T Int.  
- Am Peak Ult

120221sid-12M1296000 - Ballan Rd & Connector 2 - IN5

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV Deg. Satn |       | Average Delay | Level of Service | 95% Back of Queue |          | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|--------------|-------|---------------|------------------|-------------------|----------|--------------|---------------------|---------------|
|                        |      |             |              |       |               |                  | Vehicles          | Distance |              |                     |               |
|                        |      | veh/h       | %            | v/c   | sec           |                  | veh               | m        |              | per veh             | km/h          |
| South: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 1                      | L    | 100         | 5.0          | 0.288 | 22.4          | LOS C            | 2.8               | 20.2     | 0.51         | 0.73                | 37.2          |
| 2                      | T    | 705         | 5.0          | 0.584 | 37.6          | LOS D            | 17.4              | 127.0    | 0.90         | 0.78                | 28.3          |
| Approach               |      | 805         | 5.0          | 0.584 | 35.7          | LOS D            | 17.4              | 127.0    | 0.85         | 0.77                | 29.1          |
| North: Westbrook Drive |      |             |              |       |               |                  |                   |          |              |                     |               |
| 8                      | T    | 732         | 5.0          | 0.261 | 6.2           | LOS A            | 7.3               | 53.2     | 0.37         | 0.33                | 49.7          |
| 9                      | R    | 150         | 5.0          | 0.580 | 36.9          | LOS D            | 6.1               | 44.3     | 0.74         | 0.77                | 29.8          |
| Approach               |      | 882         | 5.0          | 0.580 | 11.4          | LOS B            | 7.3               | 53.2     | 0.44         | 0.40                | 44.6          |
| West: Connector        |      |             |              |       |               |                  |                   |          |              |                     |               |
| 10                     | L    | 220         | 5.0          | 0.584 | 21.2          | LOS C            | 5.9               | 42.9     | 0.53         | 0.76                | 38.0          |
| 12                     | R    | 20          | 5.0          | 0.061 | 51.8          | LOS D            | 1.0               | 7.1      | 0.86         | 0.71                | 24.8          |
| Approach               |      | 240         | 5.0          | 0.584 | 23.8          | LOS C            | 5.9               | 42.9     | 0.56         | 0.75                | 36.3          |
| All Vehicles           |      | 1927        | 5.0          | 0.584 | 23.1          | LOS C            | 17.4              | 127.0    | 0.62         | 0.60                | 35.7          |

## MOVEMENT SUMMARY

Site: IN38 Westbrook Dr T Int.  
- Pm Peak Ultimate

120221sid-12M1296000 - Ballan Rd & Connector 2 - IN5

Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

### Movement Performance - Vehicles

| Mov ID                 | Turn | Demand Flow | HV  | Deg. Satn | Average Delay | Level of Service | 95% Back of Queue |       | Prop. Queued | Effective Stop Rate | Average Speed |
|------------------------|------|-------------|-----|-----------|---------------|------------------|-------------------|-------|--------------|---------------------|---------------|
|                        |      | veh/h       |     | %         |               |                  | v/c               | sec   |              |                     |               |
| South: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 1                      | L    | 20          | 5.0 | 0.064     | 25.9          | LOS C            | 0.6               | 4.4   | 0.55         | 0.70                | 35.1          |
| 2                      | T    | 732         | 5.0 | 0.774     | 48.2          | LOS D            | 20.9              | 152.2 | 0.99         | 0.90                | 24.8          |
| Approach               |      | 752         | 5.0 | 0.774     | 47.6          | LOS D            | 20.9              | 152.2 | 0.98         | 0.90                | 25.0          |
| North: Westbrook Drive |      |             |     |           |               |                  |                   |       |              |                     |               |
| 8                      | T    | 705         | 5.0 | 0.251     | 6.2           | LOS A            | 7.0               | 50.8  | 0.37         | 0.33                | 49.8          |
| 9                      | R    | 220         | 5.0 | 0.773     | 41.7          | LOS D            | 9.7               | 70.7  | 0.74         | 0.85                | 28.0          |
| Approach               |      | 925         | 5.0 | 0.773     | 14.6          | LOS B            | 9.7               | 70.7  | 0.46         | 0.45                | 42.0          |
| West: Connector        |      |             |     |           |               |                  |                   |       |              |                     |               |
| 10                     | L    | 150         | 5.0 | 0.345     | 16.4          | LOS B            | 3.2               | 23.3  | 0.40         | 0.73                | 41.5          |
| 12                     | R    | 100         | 5.0 | 0.304     | 54.4          | LOS D            | 5.1               | 37.5  | 0.91         | 0.78                | 24.1          |
| Approach               |      | 250         | 5.0 | 0.345     | 31.6          | LOS C            | 5.1               | 37.5  | 0.60         | 0.75                | 32.2          |
| All Vehicles           |      | 1927        | 5.0 | 0.774     | 29.7          | LOS C            | 20.9              | 152.2 | 0.68         | 0.66                | 32.2          |

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