Appendix D

Integrated Transport Assessment

Planning. Traffic. Development.

Integrated Transport Assessment

Prepared for

ROLLESTON WEST RESIDENTIAL LTD

Dunns Crossing Road
Rolleston

November 2020

Integrated Transport Assessment
Prepared for

Rolleston West Residential Ltd

Dunns Crossing Road
Rolleston

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Introduction

1. Rolleston West Residential Ltd has commissioned Novo Group to prepare an Integrated Transport Assessment (ITA) to support the proposed Plan Change for land at Dunns Crossing Road, on the western edge of Rolleston.

2. This report provides an assessment of the transport aspects of the proposed development. It also describes the transport environment in the vicinity of the site and describes the transport related components of the proposal. It has been prepared broadly in accordance with the Integrated Transportation Assessment Guidelines specified in New Zealand Transport Agency Research report 422.

3. The land associated with this proposed Plan Change is illustrated in **Figure 1**, which is two sites on Dunns Crossing Road. The northern site (Holmes Block) is located at the south-western corner of the State Highway 1 / Dunns Crossing Road intersection. It is proposed that the Holmes Block could provide up to 1,150 residential Lots, plus a small Local Centre. The southern site (Skellerup Block) is located approximately 690m north of Selwyn Road and is proposed to accommodate up to 950 residential Lots, plus a small Local Centre.

4. Copies of the Outline Development Plans for these sites are included in **Appendix 1**.

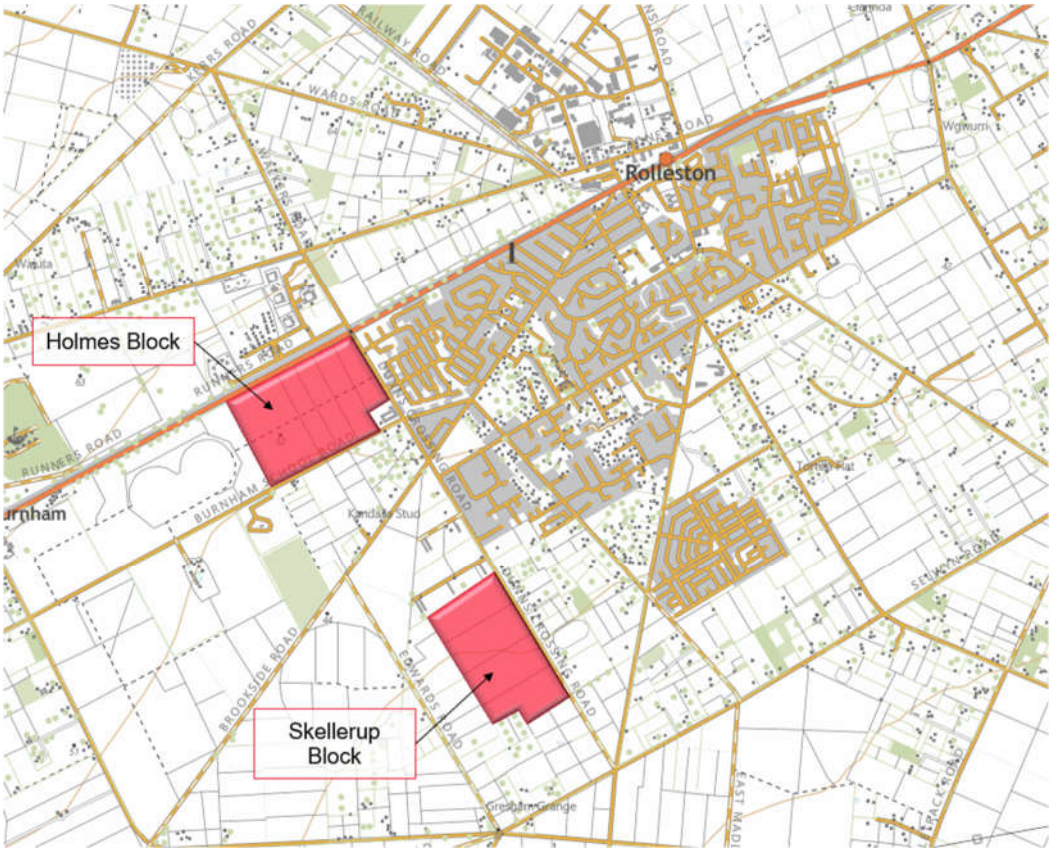


Figure 1: Site Location

Transport Environment

Road Network

State Highway 1

5. **Table 1** sets out the transport characteristics of State Highway 1 (SH1) in the vicinity of the application site.

Table 1: State Highway 1 Road Characteristics

Key Feature or Characteristic	Comment
Road Classification	State Highway and Arterial Road
Cross-Section Description	3.5m lanes in both directions, plus sealed shoulders.
Traffic Volumes	20,500 vehicles per day[1].
Speed	100km/hr (although currently a 70km/hr limit at the intersection with Dunns Crossing Road)
Cycling, Pedestrian Infrastructure and Public Transport	None

6. The SH1 / Dunns Crossing Road / Walkers Road intersection is a priority controlled cross-road, with SH1 having the priority. This intersection is currently operating poorly with regards to traffic capacity and it is understood that the NZ Transport Agency (NZTA) and Selwyn District Council (the Council) are committed to upgrading this intersection with the current proposal being a roundabout. The design of this roundabout is understood to be under investigation and it would be constructed within three to four years (to coincide with the opening of an over-bridge of SH1 between Rolleston Drive and Jones Road). There is funding committed for this project, although the final design of the roundabout is not yet known.

7. The NZTA Crash Analysis System (CAS) has been reviewed to identify crashes that have been reported within 100m of this intersection in the most recent five-year period available. **Figure 2** is the collision diagram, and the crashes are summarised below.

   i. SH1 South-West Bound Approach: 1 minor injury and 4 non-injury crashes:

      (a) Head-on when a south-west bound driver hit a vehicle waiting to turn right into Dunns Crossing Road – 1 minor injury crash.

      (b) Merging crash where a driver in the right turn bay changed to the through lane without checking – 2 non-injury crashes.

      (c) Loss of control turning right to Walkers Road – 1 non-injury crash.

      (d) Rear-end when vehicles have stopped for road works – 1 non-injury crash.

[1] From Mobile Road website

ii. Dunns Crossing Road: 1 serious, 4 minor injury and 3 non-injury crashes:

(a) Failure to give-way to traffic – 1 serious injury crash, 4 minor injury crashes and 3 non-injury crashes.

iii. Walkers Road: 2 minor injury and 2 non-injury crashes:

(a) Failure to give-way to through traffic – 2 minor injury crash and 2 non-injury crashes.

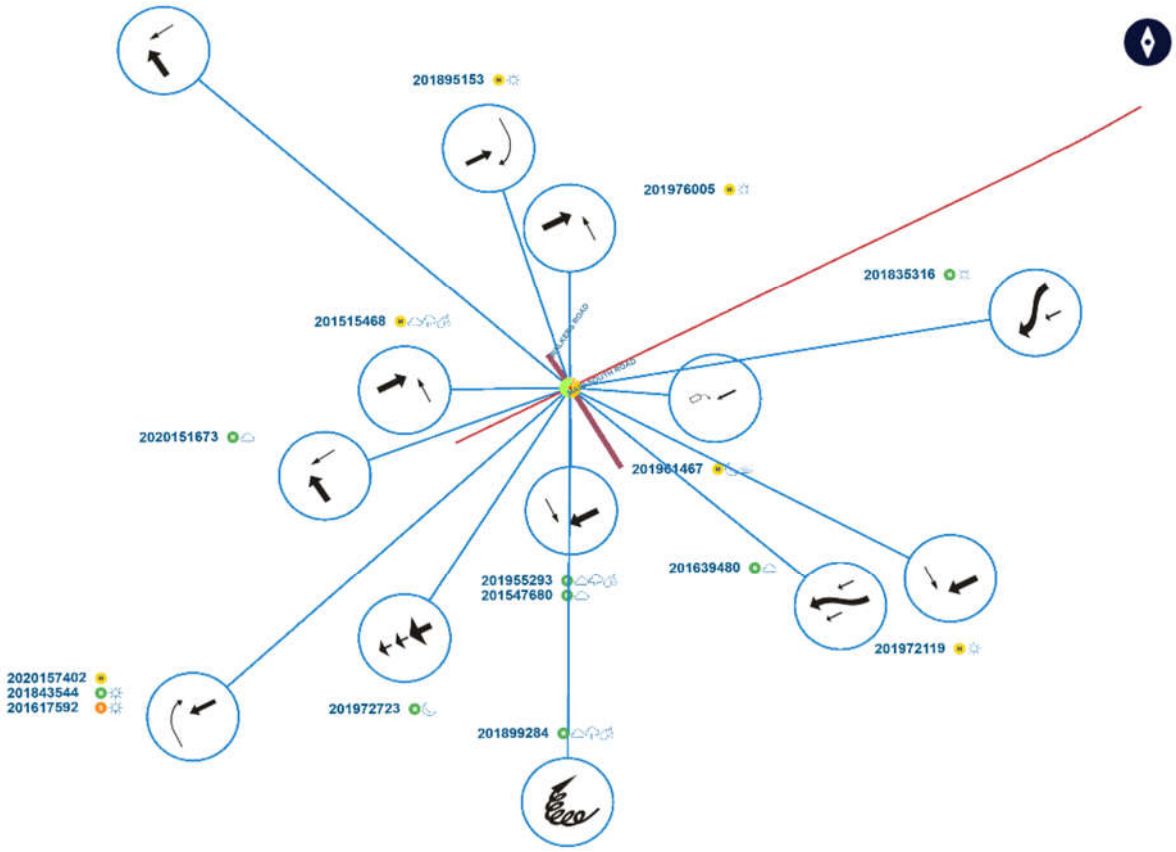


Figure 2: SH1 / Dunns Crossing Rd / Walkers Rd Collision Diagram

8. The above identifies that a number of crashes have occurred at the SH1 / Dunns Crossing Road / Walkers Road intersection. These are primarily caused by vehicles on the minor arms failing to give-way to through traffic on SH1 and these crashes would be addressed by the provision of a roundabout, as anticipated to occur at this location.

Dunns Crossing Road

9. **Table 2** sets out the transport characteristics of Dunns Crossing Road.

Table 2: Dunns Crossing Rd Characteristics

Key Feature or Characteristic	Comment
Road Classification	Arterial Road between Lowes Road and SH1. Local Road south of Lowes Road.
Cross-Section Description	Carriageway width of 8.4m (i.e. two 4.2m wide traffic lanes).
Traffic Volumes	1,600 to 2,500 vehicles per day[2] depending on location.
Speed	60km/hr north of Granite Drive. 50km/hr south of Granite Drive until south of Lowes Road, which is 60km/hr. The rural area south of Lowes Road is 80km/hr.
Cycling, Pedestrian Infrastructure and Public Transport	1.5m wide footpath on the eastern side where the urban development has occurred. No footpaths on the western side, with the exception of immediately adjacent to the West Rolleston Primary School and pre-school (both of which are at the Burnham School Road intersection). There is also a kea crossing of Dunns Crossing Road outside the primary school. No dedicated cycling facilities or public transport are provided.

Newman Road

10. **Table 3** sets out the transport details of Newman Road.

Table 3: Newman Rd Characteristics

Key Feature or Characteristic	Comment
Road Classification	Local Road
Cross-Section Description	Carriageway width of 8.0m (i.e. two 4.0m wide traffic lanes).
Traffic Volumes	50 to 400 vehicles per day[3] depending on location.
Speed	50km/hr
Cycling, Pedestrian Infrastructure and Public Transport	1.5m wide footpaths are provided on both sides of the road. No dedicated cycling facilities or public transport are provided.
Connectivity	Provides a connection to Granite Drive, which in turn links to Brookside Road to /from central Rolleston.

11. The Dunns Crossing Road / Newman Road intersection is a priority controlled T-intersection, with Dunns Crossing Road having the priority. No crashes have been reported at this intersection in the most recent five-year period available.

Granite Drive

12. **Table 4** sets out the transport details of Granite Drive.

[2] From Mobile Road website
[3] From Mobile Road website

Table 4: Granite Dr Characteristics

Key Feature or Characteristic	Comment
Road Classification	Local Road
Cross-Section Description	Carriageway width of 8.8m (i.e. two 4.4m wide traffic lanes).
Traffic Volumes	900 to 1,600 vehicles per day[4] depending on location.
Speed	50km/hr
Cycling, Pedestrian Infrastructure and Public Transport	1.5m wide footpaths are provided on both sides of the road. No dedicated cycling facilities or public transport are provided.
Connectivity	Provides a connection to Brookside Road, which links to /from central Rolleston.

13. The Dunns Crossing Road / Granite Drive intersection is a priority controlled T-intersection, with Dunns Crossing Road having the priority. No crashes have been reported at this intersection in the most recent five-year period available.

Burnham School Road

14. **Table 5** sets out the transport details of Burnham School Road, west of Dunns Crossing Road.

Table 5: Burnham School Rd Characteristics – West of Dunns Crossing Rd

Key Feature or Characteristic	Comment
Road Classification	Local Road
Cross-Section Description	Approximately 170m has an urbanised carriageway that is 7.4m wide and includes no-stopping lines both sides of the road. Beyond this, Burnham School Road is rural in character, with a 6.8m wide sealed carriageway.
Traffic Volumes	575 vehicles per day[5].
Speed	50km/hr for the section leading up to Dunns Crossing Road and 100km/hr west of this.
Cycling, Pedestrian Infrastructure and Public Transport	1.5m wide footpaths are provided on both sides of the road for the urban section only. No dedicated cycling facilities or public transport are provided.

15. **Table 6** sets out the transport details of Burnham School Road, east of Dunns Crossing Road.

[4] From Mobile Road website
[5] From Mobile Road website

Table 6: Burnham School Rd Characteristics – East of Dunns Crossing Rd

Key Feature or Characteristic	Comment
Road Classification	Local Road
Cross-Section Description	Carriageway of approximately 7.0m.
Traffic Volumes	800 vehicles per day[6].
Speed	50km/hr.
Cycling, Pedestrian Infrastructure and Public Transport	1.5m wide footpaths are provided on both sides of the road. No dedicated cycling facilities or public transport are provided.

16. The Dunns Crossing Road / Burnham School Road intersection is a priority controlled cross-road, with Dunns Crossing Road having the priority. No crashes have been reported at this intersection in the most recent five-year period available.

17. We understand that Council is investigating a set of traffic signals at this intersection, although we are unaware of the specific design for these signals at this stage.

Lowes Road

18. **Table 6** sets out the transport details of Lowes Road.

Table 7: Lowes Rd Characteristics

Key Feature or Characteristic	Comment
Road Classification	Arterial Road
Cross-Section Description	Carriageway width of 6.0m (i.e. two 3.0m wide traffic lanes), plus on-street parking on both sides.
Traffic Volumes	1,700 to 4,000 vehicles per day[7] depending on location.
Speed	50km/hr
Cycling, Pedestrian Infrastructure and Public Transport	1.5m wide footpaths are provided on both sides of the road. No dedicated cycling facilities or public transport are provided.
Connectivity	Provides a connection to Levi Road, which links toward central Rolleston, plus the Weedons – Ross interchange with SH1.

19. The Dunns Crossing Road / Lowes Road intersection is a priority controlled T-intersection, with Dunns Crossing Road having the priority. No crashes have been reported at this intersection in the most recent five-year period available.

[6] From Mobile Road website
[7] From Mobile Road website

Selwyn Road

20. **Table 8** sets out the transport details of Selwyn Road in the vicinity of the sites.

Table 8: Selwyn Rd Characteristics

Key Feature or Characteristic	Comment
Road Classification	Local Road, although this becomes an Arterial Road east of Lincoln Rolleston Road.
Cross-Section Description	Carriageway width of 6.6m (i.e. two 3.3m wide traffic lanes)
Traffic Volumes	700 to 3,000 vehicles per day[8] depending on location.
Speed	80km/hr
Cycling, Pedestrian Infrastructure and Public Transport	None.
Connectivity	Provides a connection to Shands Road, which links toward the Christchurch Southern Motorway interchange.

21. The Dunns Crossing Road intersection in this location is with Goulds Road, which in turn has an intersection with Selwyn Road. This configuration is illustrated in **Figure 3**.

Figure 3: Dunns Crossing Rd / Goulds Rd / Selwyn Rd Intersection Arrangement

[8] From Mobile Road website

22. The NZTA CAS database has been reviewed to identify crashes that have been reported within 100m of this intersection in the most recent five-year period available. **Figure 2** is the collision diagram, and the crashes are summarised below.

    i. Goulds Road Northbound Approach: 2 minor injury and 1 non-injury crashes:

        (a) Failure to give-way – 2 minor injury crashes and 1 non-injury crash.

    ii. Goulds Road Southbound Approach: 1 serious injury, 1 minor injury and 2 non-injury crashes:

        (a) Failure to give-way – 1 serious injury crash, 1 minor injury crash and 2 non-injury crash.

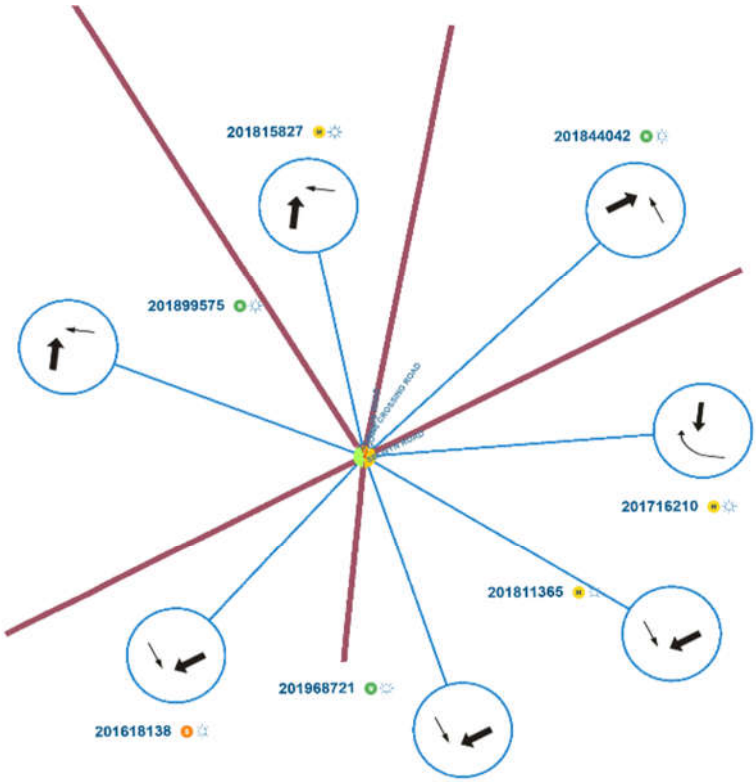


Figure 4: Dunns Crossing Rd / Goulds Rd / Selwyn Rd Collision Diagram

23. The above crash review indicates there is a trend in which drivers exiting the Goulds Road approaches are failing to give-way to traffic on Selwyn Road.

The Proposal

24. The transport components of the two proposed ODP areas are set out in turn in the following sections.

25. Unless otherwise stated, it is proposed to adopt the transport provisions of the Operative District Plan or Proposed District Plan, whichever is relevant at the time.

Holmes Block

26. The proposed Plan Change would enable up to 1,150 residential lots and a small commercial zone to be established at the application site. A copy of the ODP is included in **Figure 5** and included in more detail in **Appendix 1**.

Figure 5: Holmes Block ODP

Site Layout

Access Intersections

27. The ODP proposes a Primary Road access to Dunns Crossing Road, which is indicatively opposite Granite Drive. A Secondary Road access is also proposed to Dunns Crossing Road, which is indicatively opposite Newman Road.

28. A Primary Road access is also proposed to Burnham School Road. This has the potential to link to land further south of this site, should that land ever be developed.

29. The potential intersection layouts to Dunns Crossing Road will be cross-road arrangements. The intersection with Burnham School Road will be a T-intersection.

30. The detailed design and sight distances at the intersections will be confirmed at subdivision stage, although these are anticipated to comply as the road alignments are straight and flat.

31. No direct property access is proposed to Burnham School Road, although direct access is proposed to Dunns Crossing Road to be consistent with the existing development on the opposite side of the road.

Road Standards

32. The road cross-sections and intersection spacings within the Plan Change area are proposed to comply with the requirements of the District Plan. It is proposed that the roads identified on the ODP would be constructed as either Local Major or Local Intermediate roads.

Pedestrian & Cycle Links

33. Greenlink connections are provided within Outline Development Plan area. These are intended to reduce walking and cycling times within the subdivision, as well as connecting to the proposed commercial area and West Rolleston Primary School.

Off-Site Transport Improvements

34. The ODP acknowledges that an intersection upgrade is proposed by Council and NZTA at the SH1 / Dunns Crossing Road / Walkers Road intersection. It is anticipated that the construction of this as a roundabout (as is currently proposed by Council and NZTA) may require some of the Plan Change land and the proposed ODP allows for this eventuality. Ultimately, the details of the intersection design will be determined by Council and NZTA for implementation following rezoning.

Traffic Generation & Distribution

Traffic Generation

35. The traffic generation is based on an 85th percentile rate of 0.9 vehicles per dwelling in the peak hours and 8.2 vehicles per dwelling per day[9]. Applying this to the proposed 1,150 dwellings leads to the traffic generation set out in **Table 9**. This assumes the following arrival / departure splits from the ITE *Trip Generation* guidebook:

    i. AM Peak – 25% arrivals / 75% departures;

    ii. PM Peak – 63% arrivals / 37% departures: and

    iii. Daily – 50% arrivals / 50% departures.

[9] Based on Outer Suburban dwellings in the NZTA Research Report 453 – *Trips and Parking Related to Land Use*.

Table 9: Holmes Block Traffic Generation

	Arrivals	Departure	Total
AM Peak	259	776	1,035
PM Peak	652	383	1,035
Daily	4,715	4,715	9,430

36. No traffic generation has been assumed for the local centre, as this is intended to be of a scale that would accommodate pass-by trips associated with the dwellings in the proposed subdivision.

Traffic Distrubution

37. The distribution of traffic across the accesses to the wider road network is based on the broad catchments within the subdivision to each of these roads. This leads to an assumption that:

    i. Dunns Crossing Road northern access accommodates approximately 35% of the Plan Change traffic;

    ii. Dunns Crossing Road southern access accommodates approximately 40% of the Plan Change traffic; and

    iii. Burnham School Road accommodates approximately 25% of the Plan Change traffic.

38. The above traffic has also been distributed across the wider road network in accordance with information provided from the Rolleston traffic model from 2028. This used data from the residential development coded in that model for the Holmes Block. This distribution is included on the figures included in **Appendix 2**.

Skellerup Block

39. The proposed Plan Change would enable up to 950 residential lots and a small commercial zone to be established at the application site. A copy of the ODP is included in **Figure 6** and included in more detail in **Appendix 1**.

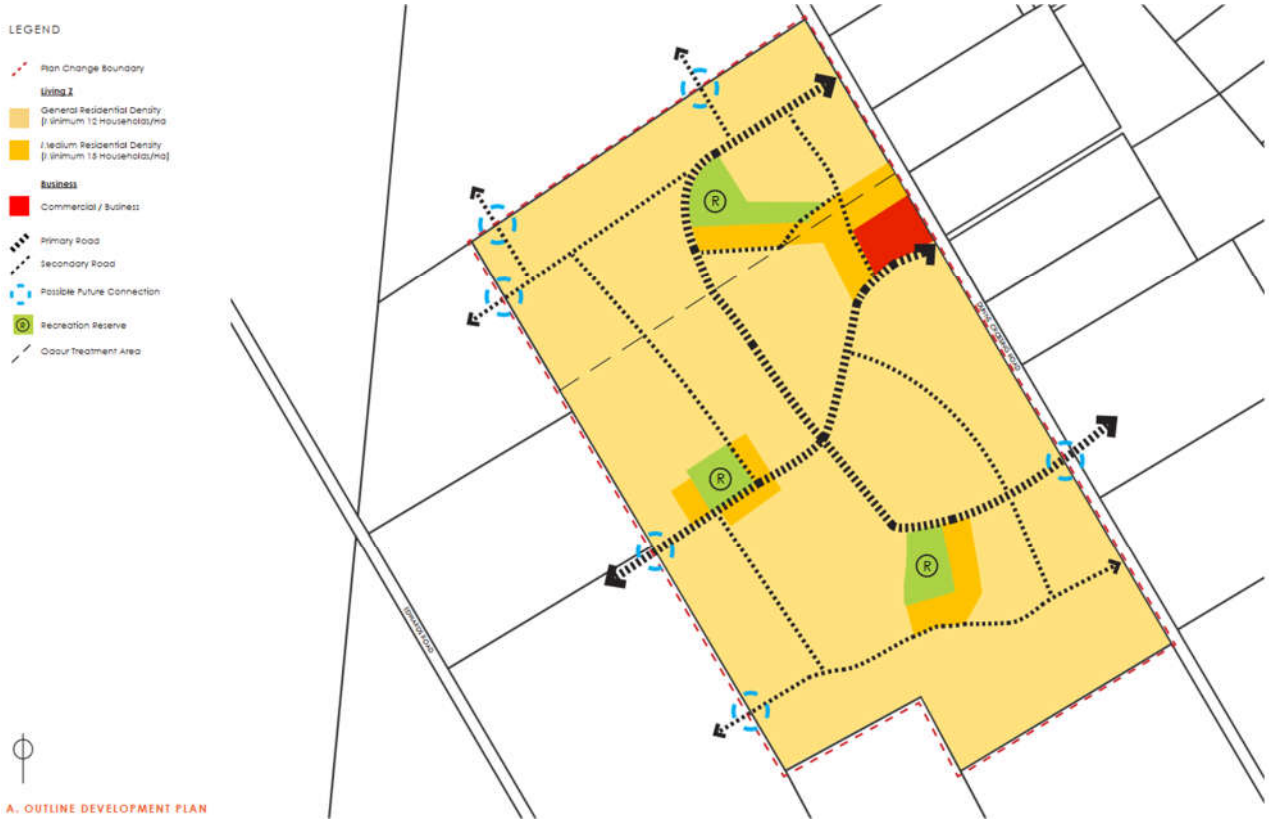


Figure 6: Skellerup Block ODP

Site Layout

Access Intersections

40. The ODP proposes three Primary Road accesses to Dunns Crossing Road, as well as a Secondary Access. The southern Primary Road access has the potential to connect to subdivision on the opposite side of Dunns Crossing Road, when that occurs.

41. The ODP also includes potential connections through to adjacent land to the north and west, should that land be developed.

42. The potential intersection layouts are proposed to be T-intersections for all the accesses. That said, the southern Primary Access intersection could be made into a cross-road to tie-in with access to the land on the eastern side of Dunns Crossing Road (if required).

43. The detailed design and sight distances at the intersections will be confirmed at subdivision stage, although these are anticipated to comply as the road alignments are straight and flat.

Road Standards

44. The road cross-sections and intersection spacings within the Plan Change area are proposed to comply with the requirements of the District Plan. It is proposed that the roads identified on the ODP would be constructed as either Local Major or Local Intermediate roads.

Traffic Generation & Distribution

Traffic Generation

45. The traffic generation rates and assumptions set out in paragraph 35 have been applied to the 950 lots proposed at the Skellerup Block. The resultant traffic generation for this block is set out in **Table 10**. Again, no traffic generation has been assumed for the local centre because this is intended to be of a scale that would accommodate pass-by trips associated with the dwellings in the proposed subdivision.

Table 10: Skellerup Block Traffic Generation

	Arrivals	Departure	Total
AM Peak	214	641	855
PM Peak	556	299	855
Daily	3,895	3,895	7,790

Traffic Distrubution

46. The distribution of this traffic across the accesses to the wider road network is based on the broad catchments within the subdivision to each of these roads. This leads to an assumption that:

    i. Dunns Crossing Road Northern primary access accommodates approximately 22% of the Plan Change traffic;

    ii. Dunns Crossing Road Central primary access accommodates approximately 40% of the Plan Change traffic;

    iii. Dunns Crossing Road Southern primary access accommodates approximately 19% of the Plan Change traffic; and

    iv. Dunns Crossing Road Southern secondary access accommodates approximately 19% of the Plan Change traffic.

47. The traffic has also been distributed across the wider road network in accordance with information provided from the Rolleston traffic model from 2028. This used data from the residential development coded in that model for the Skellerup Block. This distribution is included on the figures included in **Appendix 2**.

Assessment of Effects

48. Key matters for the assessment of transport effects associated with the proposed Plan Change are considered to be:

    i. Parking & Loading: Whether the District Plan rules adequately provide for the layout and provision of car parking and loading at the application site;

    ii. Access Arrangements: Where the accesses are anticipated to operate safely and efficiently and whether the District Plan rules adequately provide for access. Also, the internal roading pattern proposed in the ODP and the associated rules and formation standards; and

iii. **Wider Network Effects:** Whether the effects of the proposed activity can be satisfactorily accommodated by the surrounding road network. Whether the proposed Plan Change will be accessible by a range of transport modes.

49. The above matters are assessed in turn in the following sections.

Parking & Loading

50. The District Plan rules regarding parking and loading will be adopted for this Plan Change. This is considered to be sufficient to confirm that parking and loading will be satisfactorily provided for in a functional and practical manner.

Access Arrangements

51. The following assessment has been undertaken using 2028 traffic volume data from the Rolleston Paramics model as a basis for the background traffic volumes. It is understood that this is an interim model, although it is considered to be a reasonable basis for the determining of background traffic on the road network[10]. It is understood this model includes:

    i. A roundabout at the State Highway 1 / Dunns Crossing Road / Walkers Road intersection;

    ii. Anticipated land use growth (and associated increase in traffic volumes) in Rolleston to 2028; and

    iii. An assumption that 96 dwellings are constructed in the Holmes Block and 51 in the Skellerup Block.

52. In addition to the above, the proposed Plan Change traffic has been added to the network as described in previous sections of this report. The traffic flow diagrams that form the basis of the following assessment are contained in **Appendix 2** and these set out the calculation and distribution of the development generated traffic. These follow a process of:

    i. Setting out the received network traffic data;

    ii. Isolating the Holmes Block and Skellerup Block traffic volumes;

    iii. Determining the distribution of traffic associated with the Holmes Block and Skellerup Block based on the above;

    iv. Removing the Holmes Block and Skellerup Block traffic that was included in the model; and

    v. Adding in the quantum of traffic associated with the Holmes Block and Skellerup Block as proposed in this Plan Change.

53. The following assessments are undertaken using the 'Base Plus Plan Change' traffic volumes from **Appendix 2**.

[10] Note: this assessment does not consider or attempt to evaluate the implications of traffic associated with the *potential* future rezoning of other land.

Holmes Block

Dunns Crossing Road / Newman Road / Access

54. The Dunns Crossing Road / Newman Road / Site Access intersection has been modelled as a cross-road, with Dunns Crossing Road having the priority. It has also been assumed that the speed environment would be reduced to 50km/hr with the urbanisation of the western side of Dunns Crossing Road.

55. The concept layout for this intersection is illustrated in **Figure 7** (which includes a new right turn bay on Newman Road), with the intersection modelling results being included in **Appendix 3**. These results are summarised as:

    i. AM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service C[11]. The degree of saturations are also lower than the practical threshold for this type of intersection[12]; and

    ii. PM Peak Hour: Overall the intersection is considered to operate satisfactorily. The worst Level of Service is E, which occurs on the through and right turn movements from the site access and the right turn out of Newman Road. This is considered to be acceptable given this occurs in the weekday PM peak hour on movements that are not high volume. The degree of saturations are again lower than the practical threshold for this type of intersection.

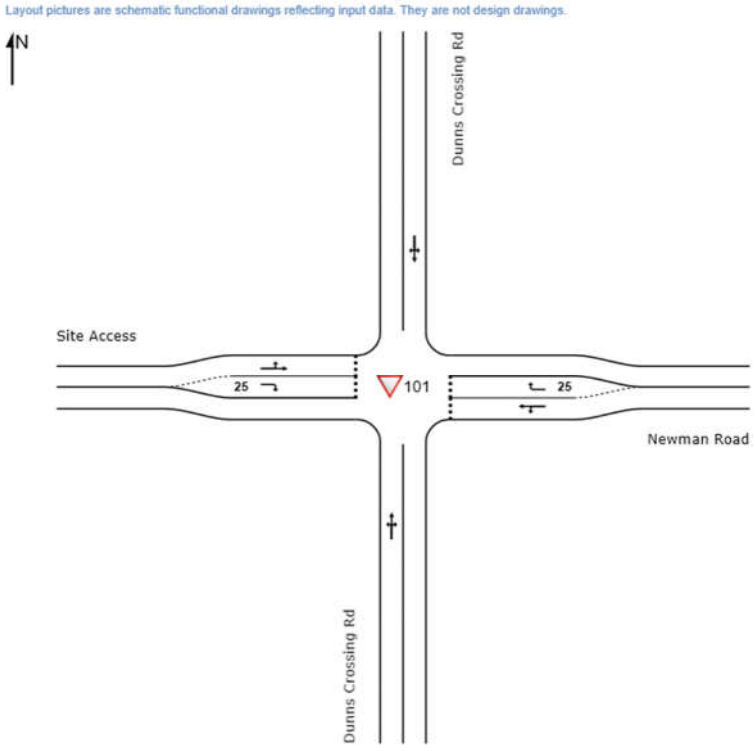


Figure 7: Dunns Crossing Rd / Newman Rd / Access Concept Arrangement

[11] Where 'A' is considered to be excellent operation, 'E' is at capacity and 'F' is over-capacity.
[12] The practical threshold for degree of saturation for unsignalized intersections is considered to be 0.85.

56. Overall, this access is predicted to operate satisfactorily in the 2028 peak periods.

Dunns Crossing Road / Granite Drive / Access

57. The Dunns Crossing Road / Granite Drive / Site Access intersection has been modelled as a cross-road, with Dunns Crossing Road having the priority. It has again been assumed that the speed environment would be reduced to 50km/hr.

58. The concept layout for this intersection is illustrated in **Figure 8**, with the intersection modelling results being included in **Appendix 4**. These results are summarised as:

    i. AM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service C. The degree of saturations are also lower than the practical threshold for this type of intersection; and

    ii. PM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service E, which is the through and right turn out of Granite Drive. This is again considered to be acceptable given this this the 2028 PM peak hour. The degree of saturations are also lower than the practical threshold for this type of intersection.

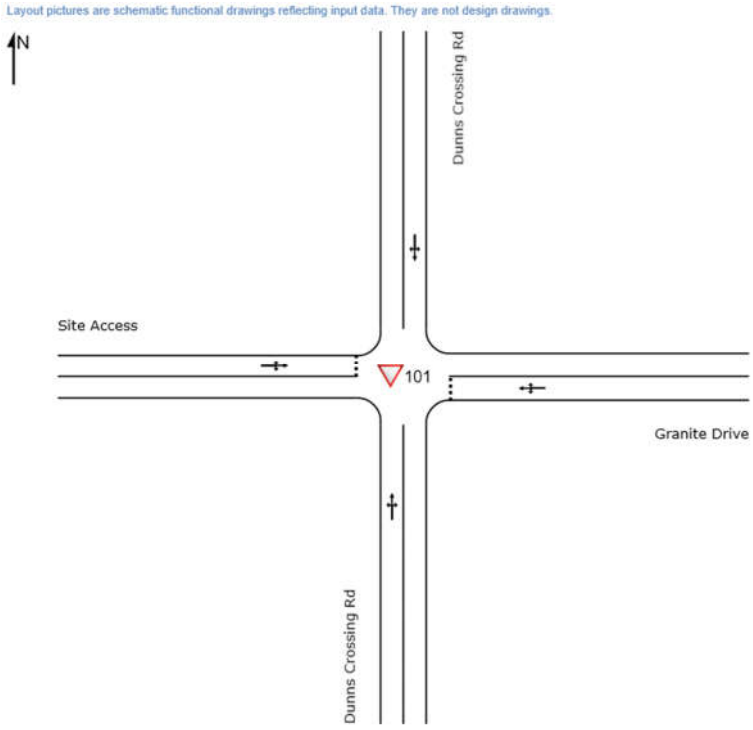


Figure 8: Dunns Crossing Rd / Granite Dr / Access Concept Arrangement

59. Overall, this access is predicted to operate satisfactorily in the 2028 peak periods.

Burnham School Road / Access

60. The Burnham School Road / Site Access intersection has been modelled as a T-intersection, with Burnham School Road having the priority. The concept layout for this intersection is illustrated in **Figure 9**, with the intersection modelling results being included in **Appendix 5**. These results are summarised as the intersection is predicted to operate satisfactorily, with no movement being worse than Level of

Service A. The degree of saturations are also lower than the practical threshold for this type of intersection.

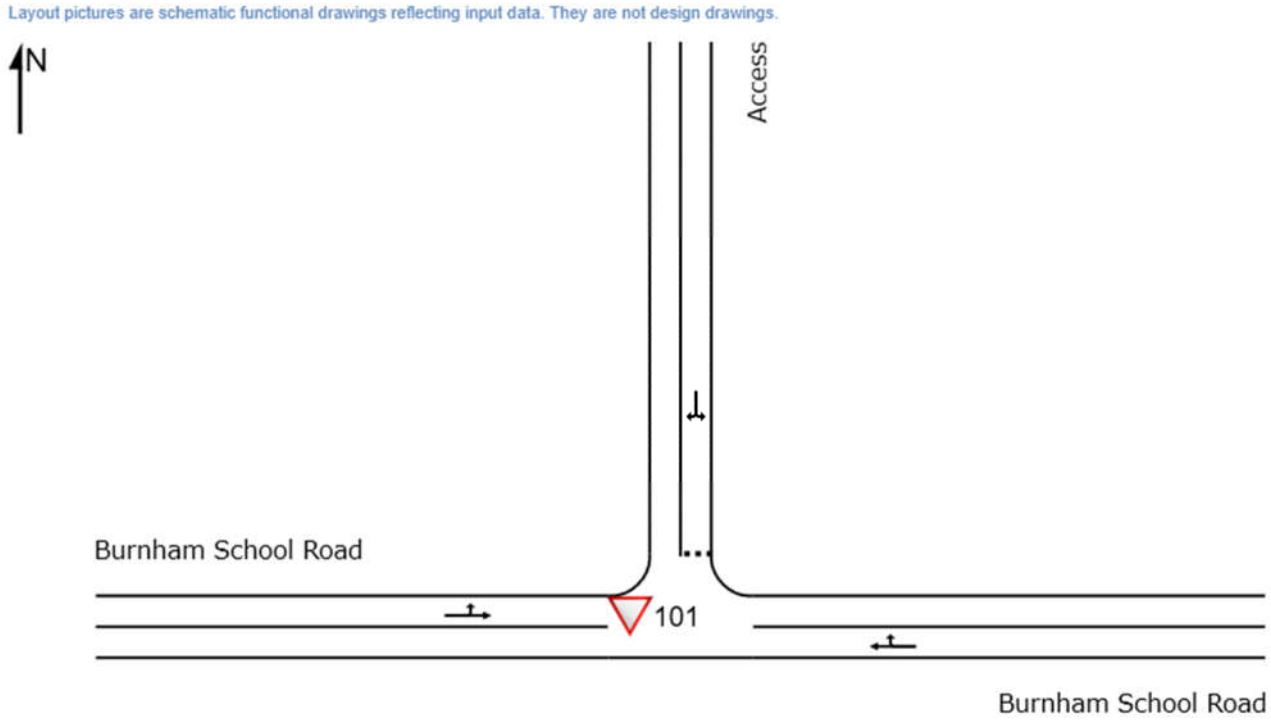


Figure 9: Burnham School Rd / Access Concept Arrangement

61. Overall, this access is predicted to operate satisfactorily in the 2028 peak periods.

Skellerup Block

62. The Dunns Crossing Road / Site Access intersections have been modelled as T-intersections, with Dunns Crossing Road having the priority. The concept layout for these intersections is illustrated in **Figure 10**, with the intersection modelling results being included in:

    i. **Appendix 6**: Dunns Crossing Road / Northern Primary Access;

    ii. **Appendix 7**: Dunns Crossing Road / Central Primary Access;

    iii. **Appendix 8**: Dunns Crossing Road / Southern Primary Access; and

    iv. **Appendix 9**: Dunns Crossing Road / Southern Secondary Access.

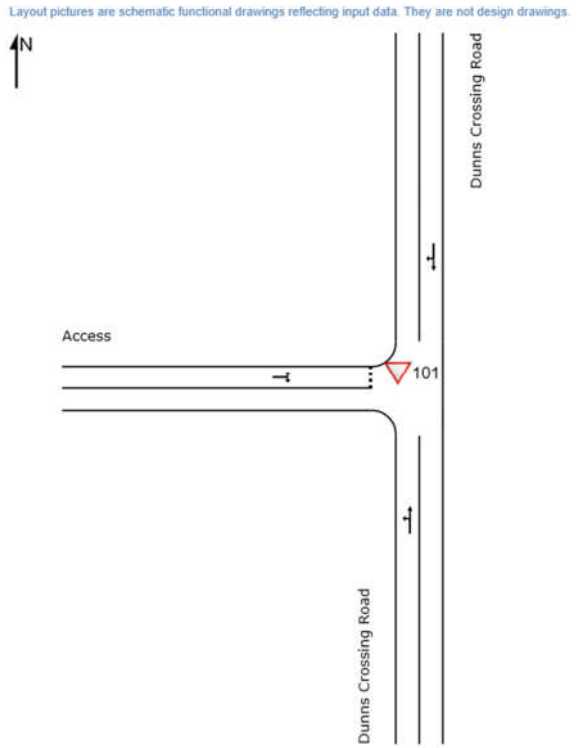


Figure 10: Dunns Crossing Rd / Access Concept Arrangement

63. These results of these intersection models are summarised as:

    i. AM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service B. The degree of saturations are also lower than the practical threshold for this type of intersection; and

    ii. PM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service C. The degree of saturations are also lower than the practical threshold for this type of intersection.

64. Overall, these accesses are predicted to operate satisfactorily in the 2028 peak periods.

Internal Access Roads

65. The internal access roads and intersections are proposed to comply with the District Plan requirements and will again be subject to road safety audits. This is considered to be sufficient to confirm the internal network will operate safely and efficiently.

66. Access to individual properties is also proposed to comply with the District Plan requirements. Any non-compliances will either be sought at subdivision stage or addressed on an individual basis and the effects of this on safety and efficiency considered at that stage.

67. The above is considered to be sufficient to confirm that the internal transport network will be safe and efficient.

Wider Effects

68. The following assessment sets out the traffic effects at key intersections on the wider road network. This assessment is undertaken using the 'Base Plus Plan Change' traffic volumes in **Appendix 2**.

SH1 / Dunns Crossing Road / Walkers Road

69. The traffic capacity assessment of this intersection has assumed that the roundabout will be constructed by the time significant development occurs within these Plan Change sites. It is noted that these sites are already zoned for residential development (albeit at a rural residential density), with the Holmes Block being permitted 97 lots and the Skellerup block 51 lots. As such, there is an element of development and associated traffic effects that could occur 'as of right' at present.

70. The concept arrangement for a roundabout at this location is illustrated in **Figure 11**, although a detailed design will need to be undertaken of this arrangement by the NZTA. It is assumed that the speed limit through this area is reduced to at least 80km/hr to safely accommodate the proposed roundabout.

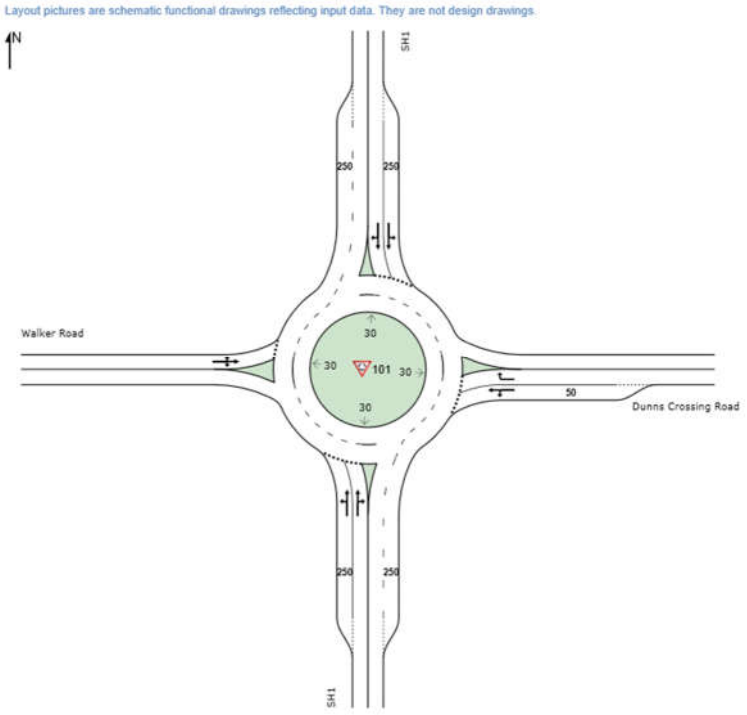


Figure 11: SH1 / Dunns Crossing Rd / Walkers Rd Roundabout Concept

71. The intersection modelling results being included in **Appendix 10**, which are summarised as:

i. AM Peak Hour: Overall the intersection is predicted to operate at Level of Service A, with no movement being worse than Level of Service B. The degree of saturations are also lower than the practical threshold for this type of intersection; and

ii. PM Peak Hour: Overall the intersection is predicted to operate at Level of Service A, with no movement being worse than Level of Service B. The degree of saturations are also lower than the practical threshold for this type of intersection.

72. Overall, this intersection is predicted to operate satisfactorily in the 2028 peak periods.

Burnham School Road / Dunns Crossing Road

73. An upgrade is understood to be planned for this location leading to a traffic signal controlled intersection. As such, traffic signals are the basis of the modelling undertaken to determine whether the proposed Plan Changes can be accommodated by the surrounding road network. The concept arrangement for traffic signals at this location is illustrated in **Figure 12**, although a detailed design will need to be undertaken of this arrangement by the Council in due course. It is anticipated this intersection would fit within the existing road corridor. A nominal 90 second cycle-time has been adopted for the purpose of this assessment.

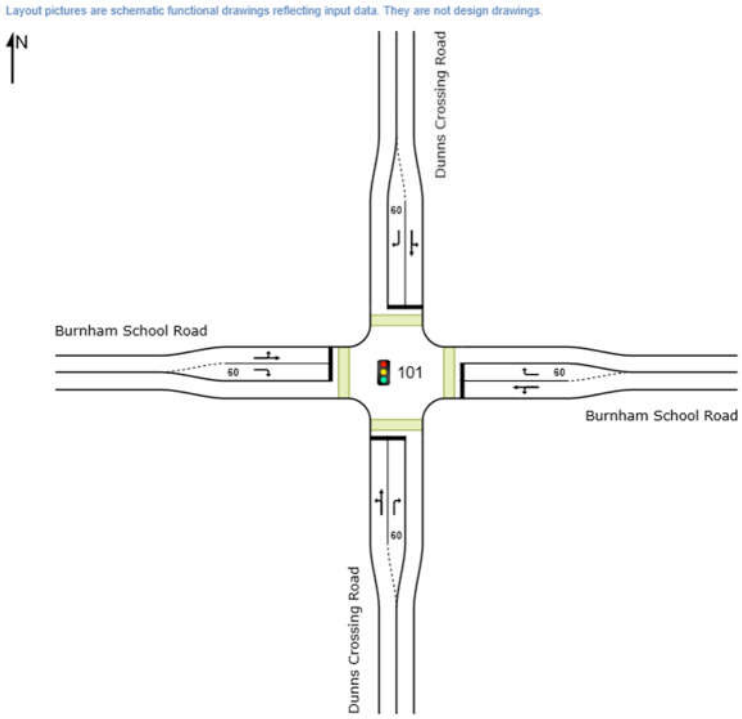


Figure 12: Burnham School Rd / Dunns Crossing Rd Traffic Signal Concept

74. The intersection modelling results being included in **Appendix 11**, which are summarised as:

    i. AM Peak Hour: Overall the intersection is predicted to operate at Level of Service C, with no movement being worse than Level of Service D. The degree of saturations are also lower than the practical threshold of 0.9 for signalised intersections; and

    ii. PM Peak Hour: Overall the intersection is predicted to operate at Level of Service C, with no movement being worse than Level of Service D. The degree of saturations are again lower than the practical threshold for this type of intersection.

75. Overall, this intersection is predicted to operate satisfactorily in the 2028 peak periods.

Brookside Road / Dunns Crossing Road

76. This intersection is a cross-road, with Dunns Crossing Road having the priority. The existing arrangement as illustrated in **Figure 13** has been used for the traffic model, with the results being included in **Appendix 12**. These results are summarised as:

i. AM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service D. The degree of saturations are also lower than the practical threshold for this type of intersection; and

ii. PM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service D. The degree of saturations are also lower than the practical threshold for this type of intersection.

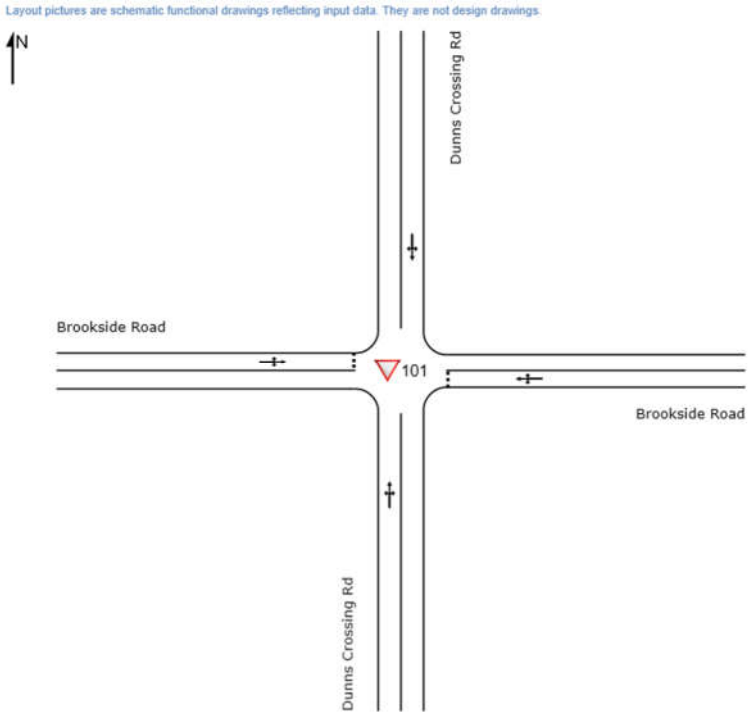


Figure 13: Brookside Rd / Dunns Crossing Rd Intersection Layout

77. Overall, this intersection is predicted to operate satisfactorily in the 2028 peak periods.

Lowes Road / Dunns Crossing Road

78. This intersection is a T-intersection, with Dunns Crossing Road having the priority. The existing arrangement (as illustrated in **Figure 14**) has been used for the traffic model, with the results being included in **Appendix 13**. These results are summarised as:

i. AM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service C. The degree of saturations are also lower than the practical threshold for this type of intersection; and

ii. PM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service E. That said, the degree of saturation for the right turn out of Lowes Road is predicted to be 0.889, which is greater than the practical threshold of 0.85. This indicates that large queues and delays could occur on this approach with small increases in traffic volumes.

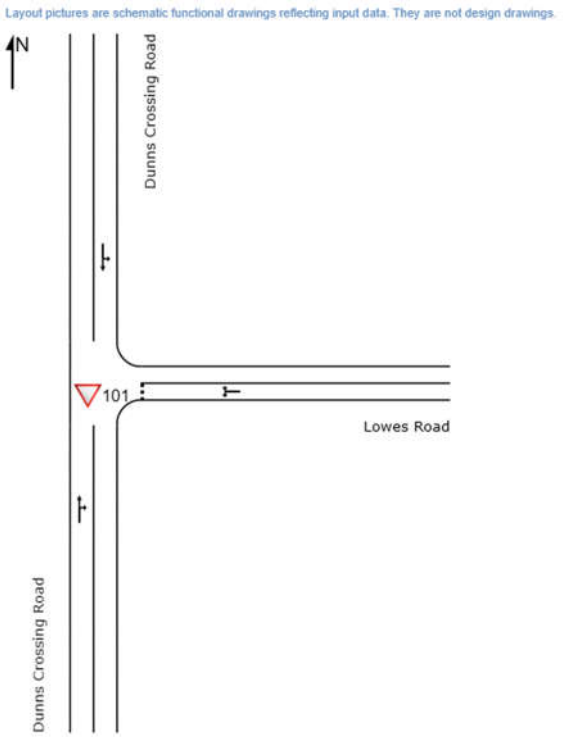


Figure 14: Dunns Crossing Rd / Lowes Rd Intersection Layout

79. Given the predicted operation in the weekday PM peak, a concept arrangement for traffic signals has been tested at this intersection. The concept layout is illustrated in **Figure 15**, which is anticipated to fit within the road corridor. This model assumes a 90 second cycle-time for the purpose of this assessment.

80. The results of this traffic model are contained in **Appendix 14**, which indicate:

    i. AM Peak Hour: Overall the intersection is predicted to operate at Level of Service B, with no movement being worse than Level of Service D. The degree of saturations are also lower than the practical threshold for signalised intersections; and

    ii. PM Peak Hour: Overall the intersection is predicted to operate at Level of Service B, with no movement being worse than Level of Service D. The degree of saturations are again lower than the practical threshold for this type of intersection.

81. This is considered to be sufficient to confirm that this intersection can be satisfactorily upgraded to accommodate the predicted future traffic volumes at this location.

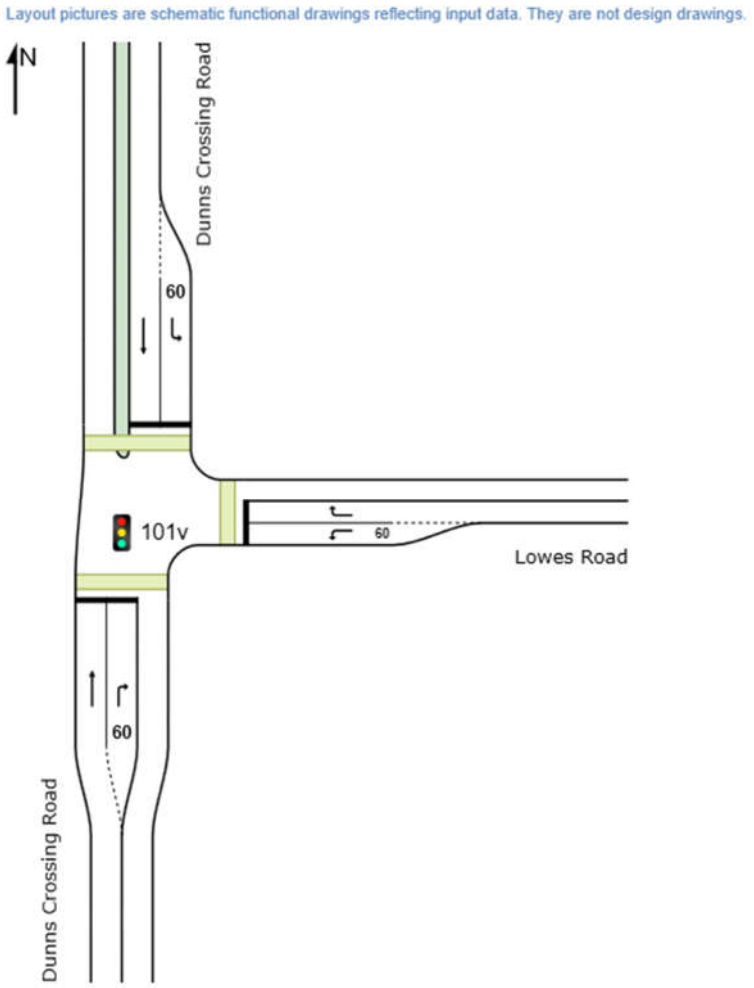


Figure 15: Dunns Crossing Rd / Lowes Rd Traffic Signal Intersection Layout

Dunns Crossing Road / Goulds Road / Selwyn Road

82. The existing arrangement at this intersection is illustrated in **Figure 3**, which indicates it comprises a closely spaced T-intersection (Goulds Road / Dunns Crossing Road) and a cross-road (Goulds Road / Selwyn Road). This intersection arrangement is used as the basis of traffic modelling at this location, with the two intersections being linked in SIDRA.

83. The results of this traffic model are included in **Appendix 15**, which indicate that:

    i. AM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service C. The degree of saturations are also lower than the practical threshold for this type of intersection; and

    ii. PM Peak Hour: Overall the intersection is considered to operate satisfactorily, with no movement being worse than Level of Service B. The degree of saturations are also lower than the practical threshold for this type of intersection.

84. Overall, this intersection is predicted to operate satisfactorily from a traffic capacity perspective in the 2028 peak periods.

85. The crash review undertaken of this intersection in paragraph 22 indicates there is currently a trend in which drivers exiting the Goulds Road approaches are failing to give-way to traffic on Selwyn Road. It is anticipated that the urbanisation of this area (as the adjacent residential zoned land is developed) would better highlight the intersection and reduce the speed limit on Selwyn Road. This may address the crash record at this location. If crashes continue after this area is urbanised, there would be value in Council rationalising the layout.

Accessibility

86. There is no public transport in the immediate vicinity of the Plan Change sites at present. The closest bus service is the Yellow Line, which undertakes a loop on Brookside Road, a short segment of Dunns Crossing Road and then Lowes Road to head back to Rolleston Town Centre. The Plan Change sites doe include road networks that would enable bus services to route through the sites on the Primary Road network, so these could accommodate passenger transport in the future.

87. The proposed site will include pedestrian and cycle links within the Plan Change area, as well as providing small local commercial areas that are intended to provide for everyday shopping and further reduce the need to travel by car for local trips. It is also noted that the Holmes Block has a boundary with the West Rolleston Primary School and there is a pre-school at the Burnham School Road / Dunns Crossing Road intersection. These place education facilities within walking distance of this site.

88. These Plan Change sites are within approximately 4.5km of Rolleston Town Centre[13], which means residents will be able to comfortably cycle to / from the shopping and employment in that area.

89. The above is considered to be sufficient to confirm that the site has access to a range of everyday facilities without the need to drive.

Summary & Conclusion

Summary

90. The Plan Change proposed would enable the development of up to 1,150 residential Lots plus a small commercial zone at the Holmes Block, plus up to 950 residential Lots plus a small commercial zone at the Skellerup Block.

91. Access to the Holmes Block would be via Dunns Crossing Road and Burnham School Road. The Dunns Crossing Road accesses are anticipated to be cross-road intersections with Newman Road and Granite Drive. Access to the Skellerup Block would be to Dunns Crossing Road, with the southern Primary Access having the potential to link to the road network of any future opposite subdivision.

92. The SH1 / Dunns Crossing Road / Walkers Road is assumed to be upgraded to a roundabout within the next three to four years, as has been advised by the NZTA and Council. This intersection is predicted to operate satisfactorily with the inclusion of Plan Change traffic.

93. It is understood that the Council intend to install traffic signals at the Dunns Crossing Road / Burnham School Road intersection. A concept arrangement has been tested and this layout can accommodate the traffic associated with the proposed Plan Change.

[13] Measured in a straight line.

94. The Dunns Crossing Road / Lowes Road intersection is predicted to operate over the practical capacity threshold with the Plan Change traffic added to the network. A concept traffic signal scheme has been tested at this location and was found to operate satisfactorily.

95. The traffic capacity of other intersections in the immediate vicinity of the Plan Change sites have been assessed and found to be acceptable.

96. The traffic capacity of the site accesses has been assessed and found to be acceptable. There will also be sufficient sight distance for these intersections to operate safely.

Conclusion

97. Overall and accounting for the off-site improvements outlined in this report, it is considered that the transport effects of the proposed Plan Change will be acceptable on the surrounding transport network.

Appendix 1

Outline Development Plans

LEGEND

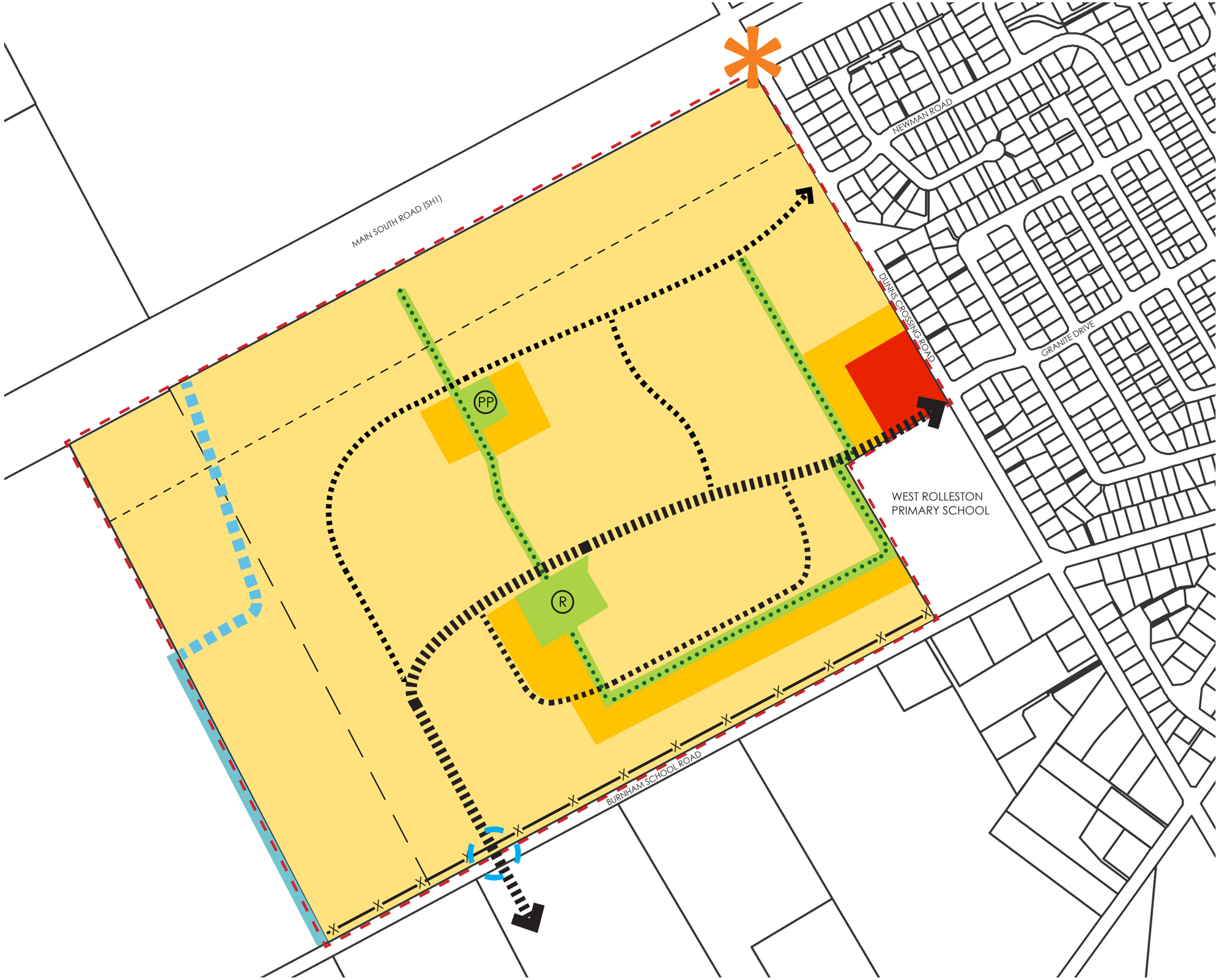
- Plan Change Boundary

Living Z

- General Residential Density (Minimum 12 Households/Ha
- Medium Residential Density (Minimum 15 Households/Ha)

Business

- Commercial / Business
- Primary Road
- Secondary Road
- Possible Future Connection
- Potential Intersection Upgrade
- Recreation Reserve
- Pocket Park
- Green Link
- Water Race
- Water Race Realigned
- Avoid access onto Burnham School Road from site
- Odour Treatment Area
- Acoustic Treatment Area



A. OUTLINE DEVELOPMENT PLAN

LEGEND

Plan Change Boundary

Living Z

General Residential Density
(Minimum 12 Households/Ha

Medium Residential Density
(Minimum 15 Households/Ha)

Business

Commercial / Business

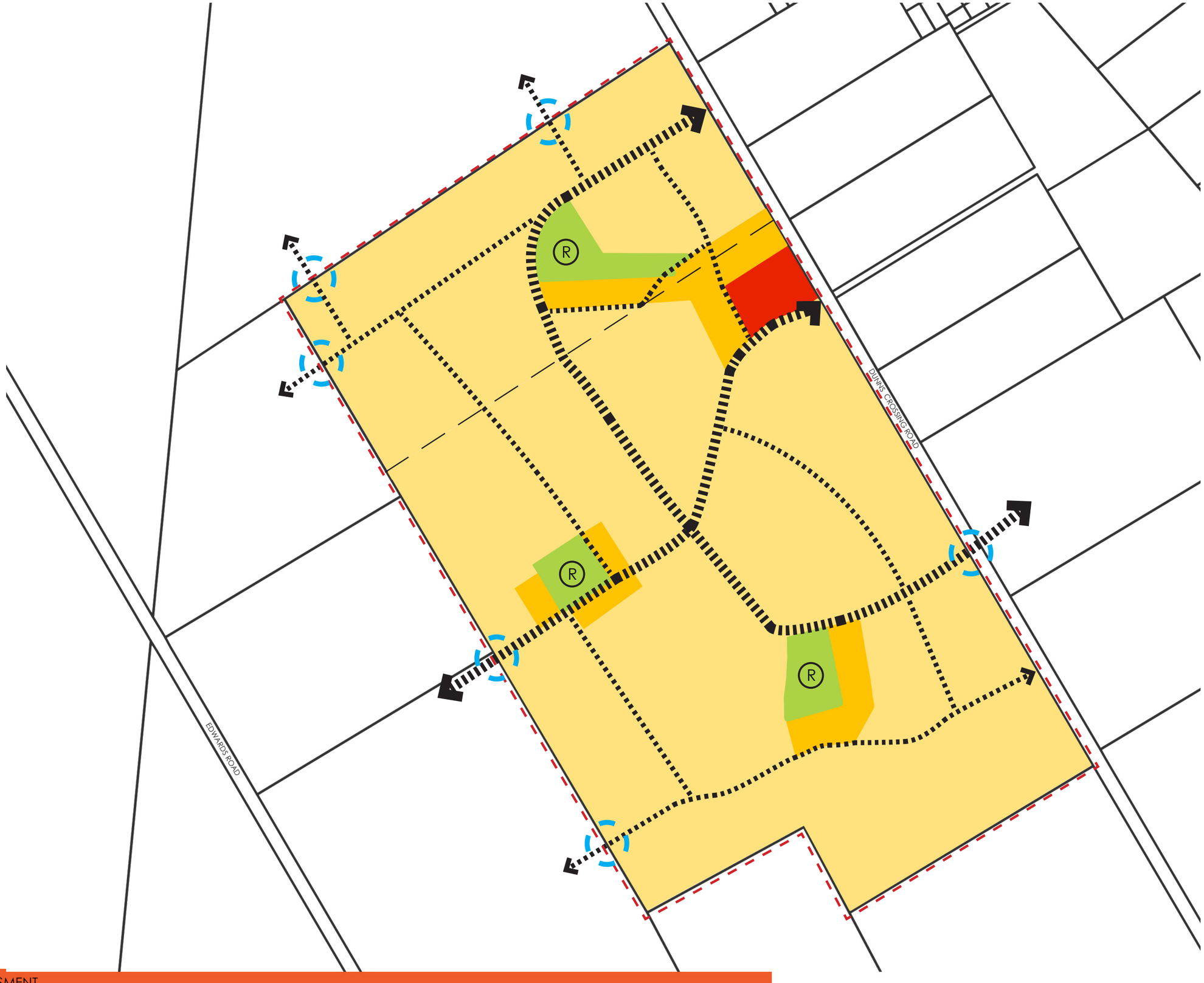
Primary Road

Secondary Road

Possible Future Connection

Recreation Reserve

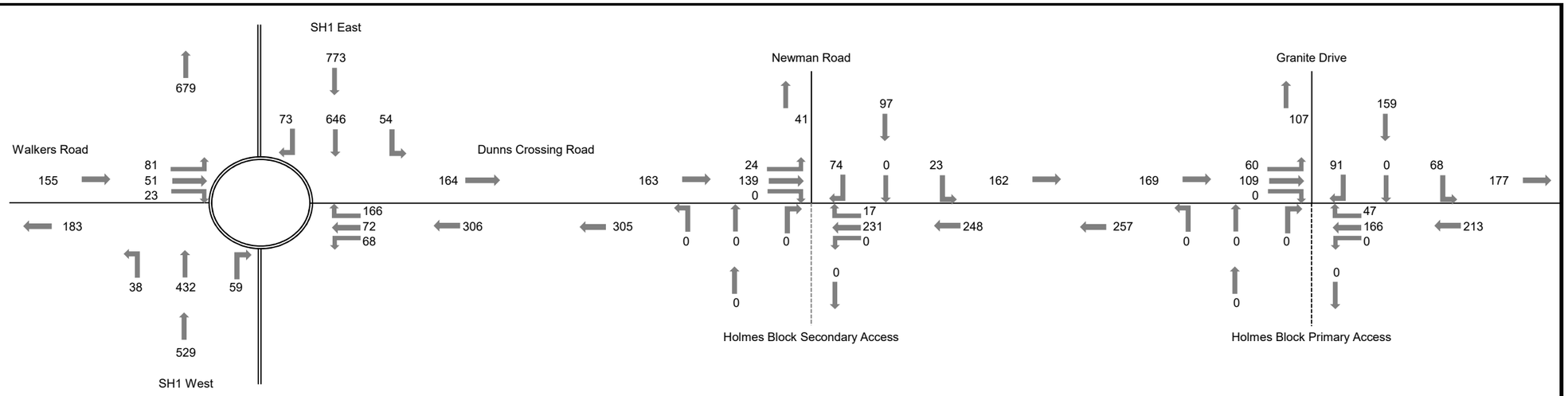
Odour Treatment Area



A. OUTLINE DEVELOPMENT PLAN

Appendix 2

Network Traffic Volumes



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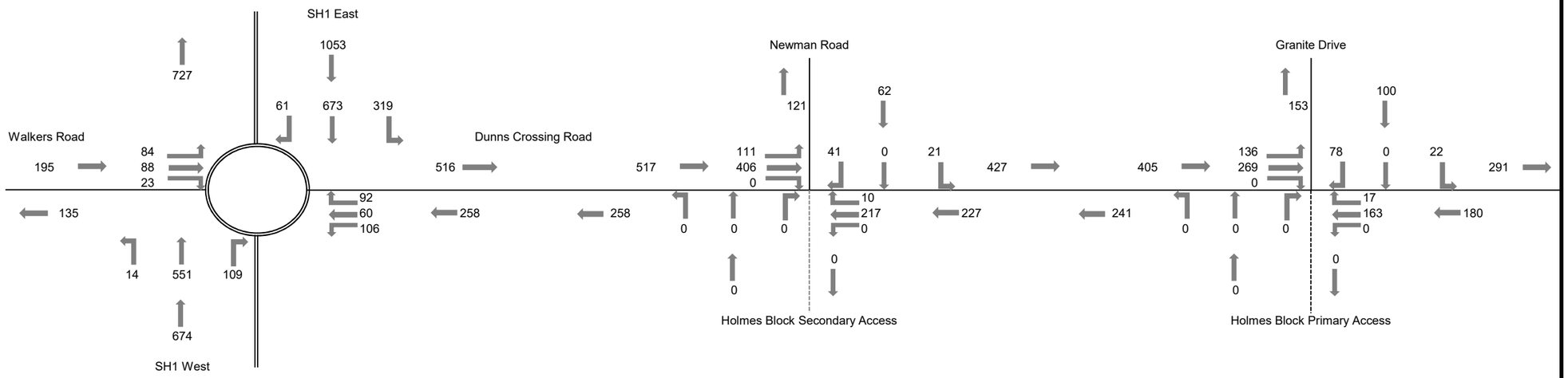
2028 Received Traffic Volumes

AM Peak Hour



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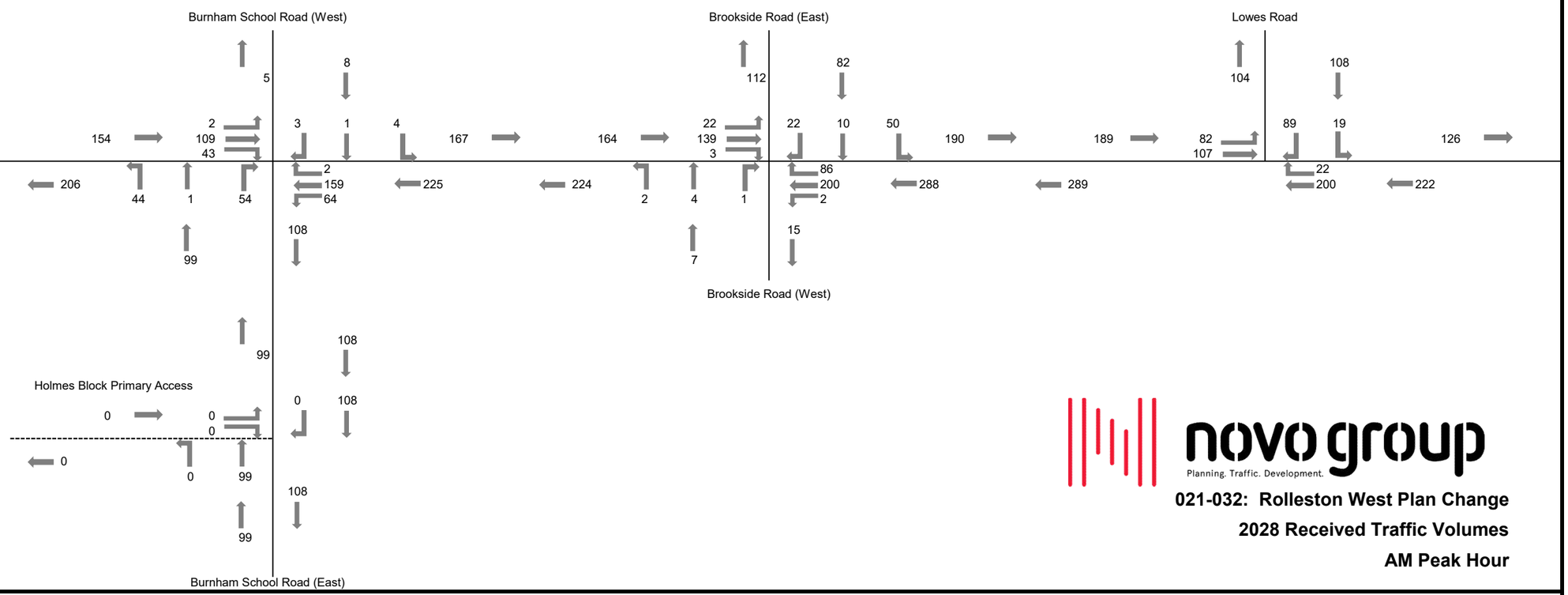
2028 Received Traffic Volumes

PM Peak Hour



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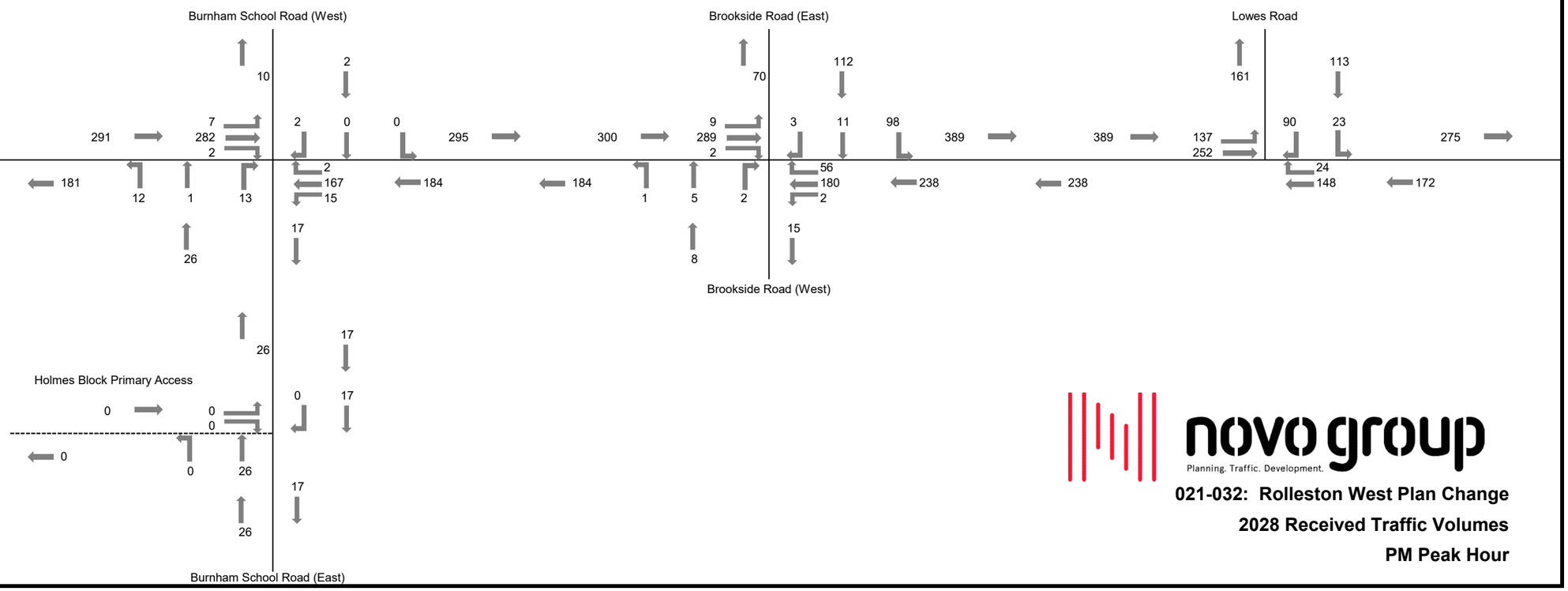
2028 Received Traffic Volumes

AM Peak Hour



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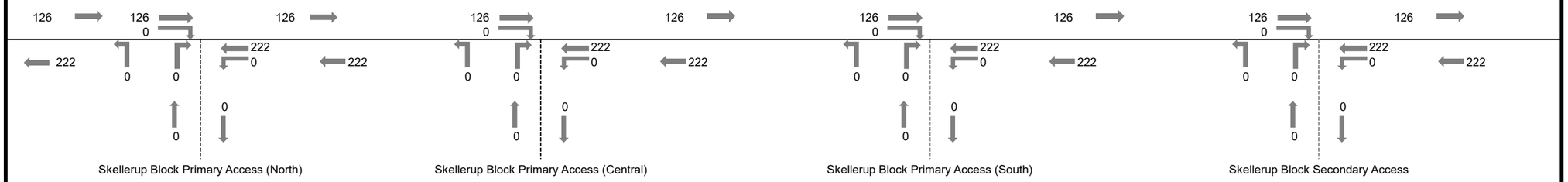

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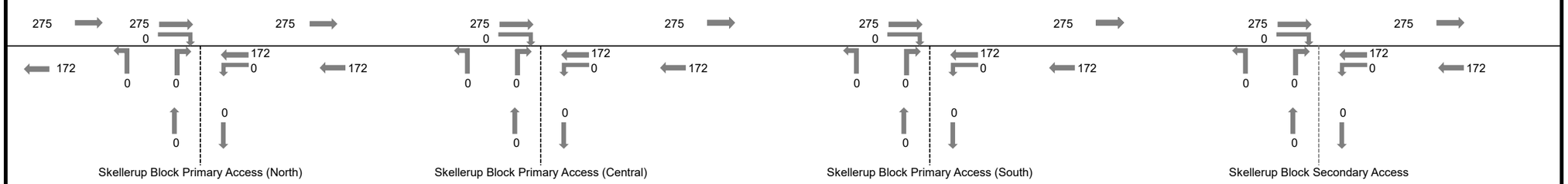
2028 Received Traffic Volumes

AM Peak Hour



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2028 Received Traffic Volumes

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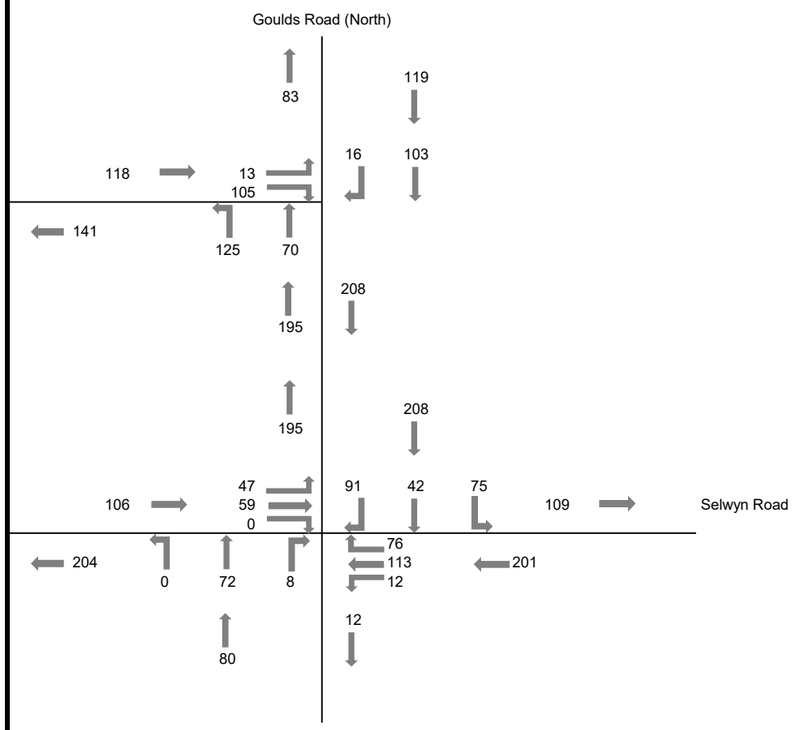

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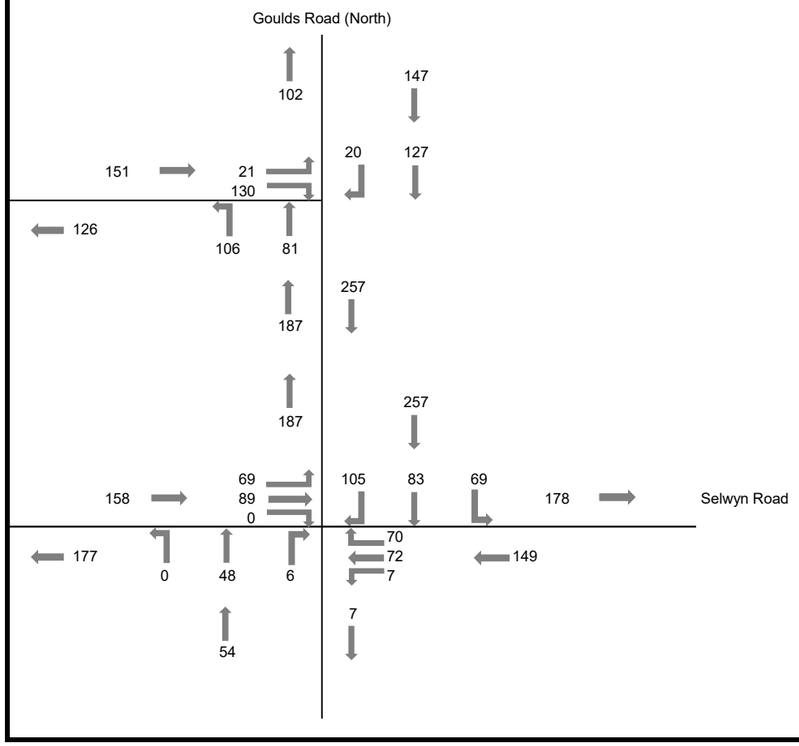
2028 Received Traffic Volumes

AM Peak Hour



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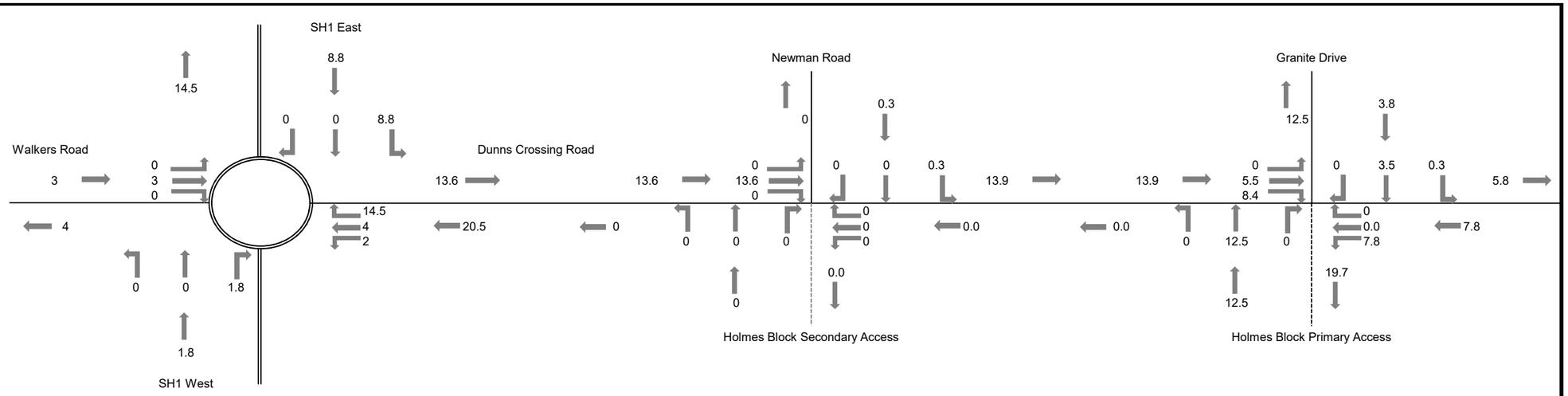
2028 Received Traffic Volumes

PM Peak Hour



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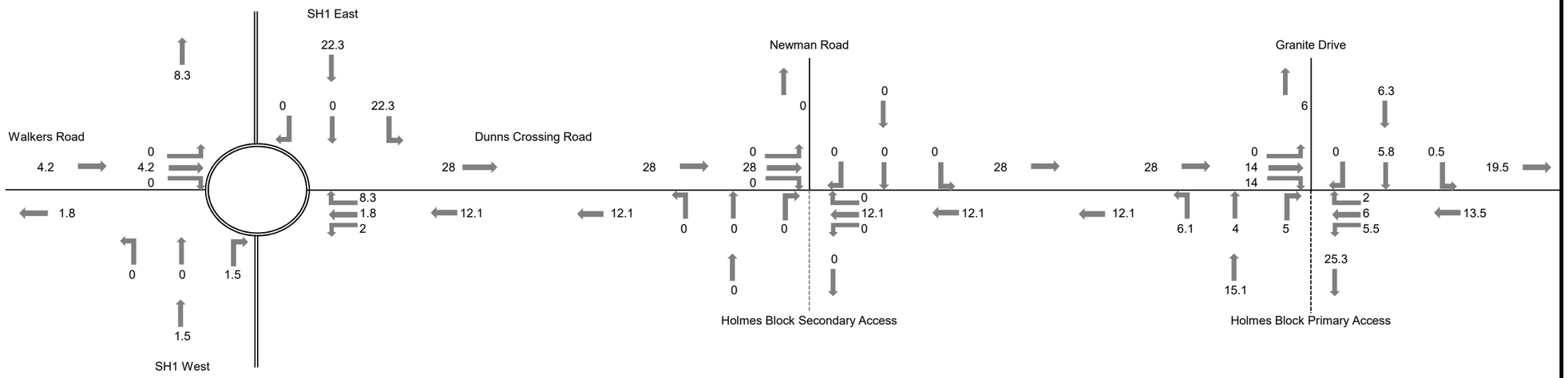
2028 Received Traffic Volumes

Holmes Block AM Peak



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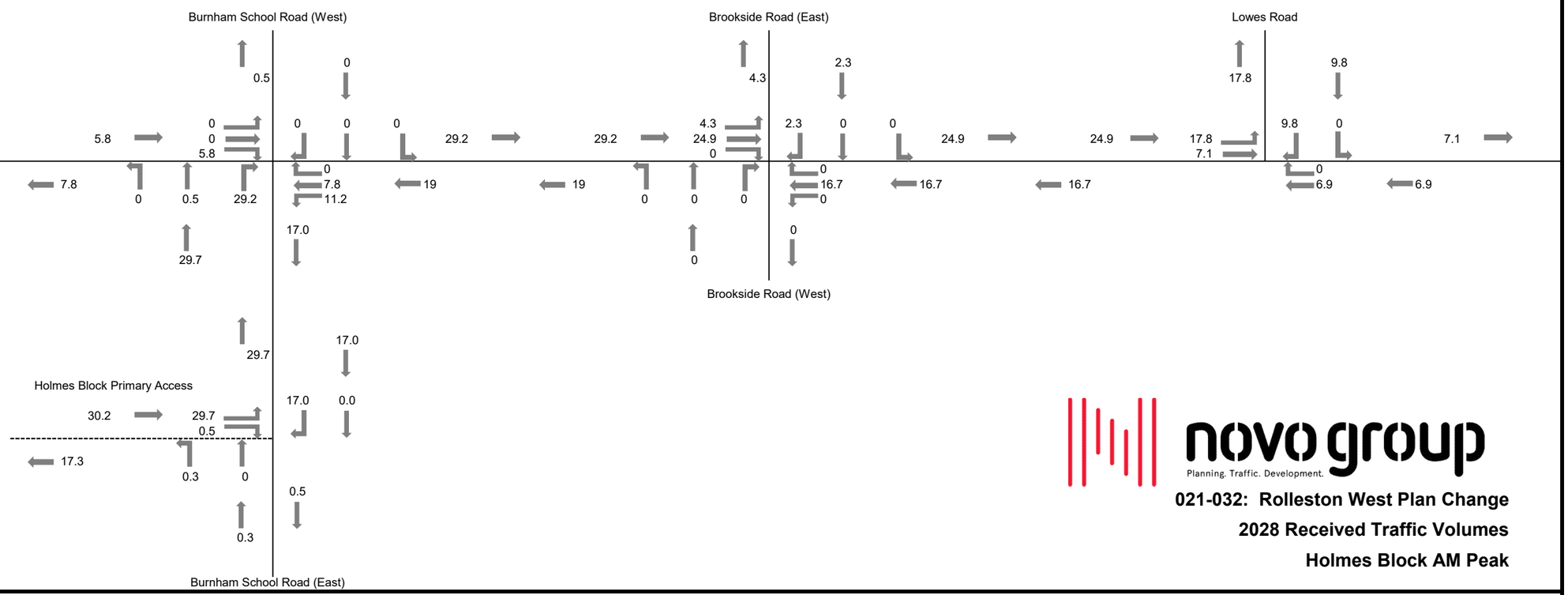
2028 Received Traffic Volumes

Holmes Block PM Peak



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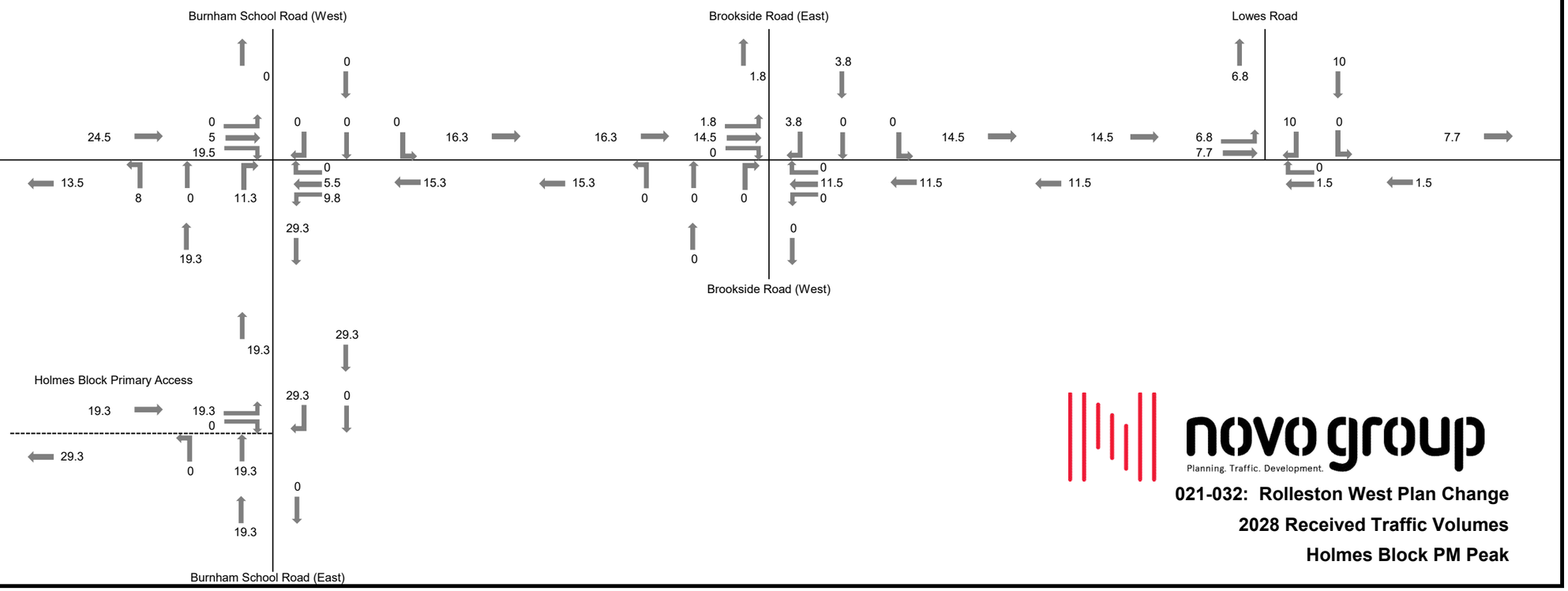
2028 Received Traffic Volumes

Holmes Block AM Peak



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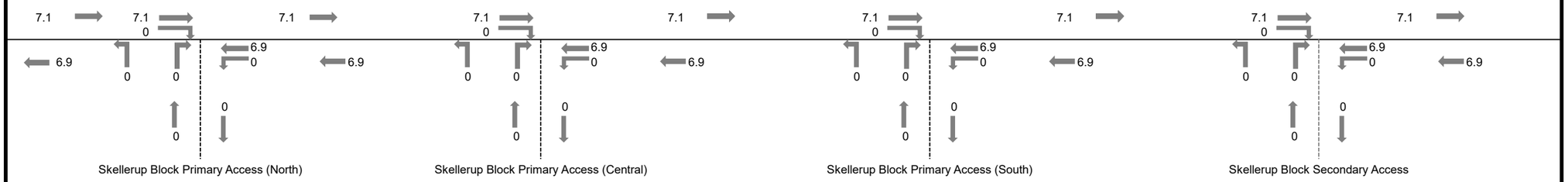
2028 Received Traffic Volumes

Holmes Block PM Peak



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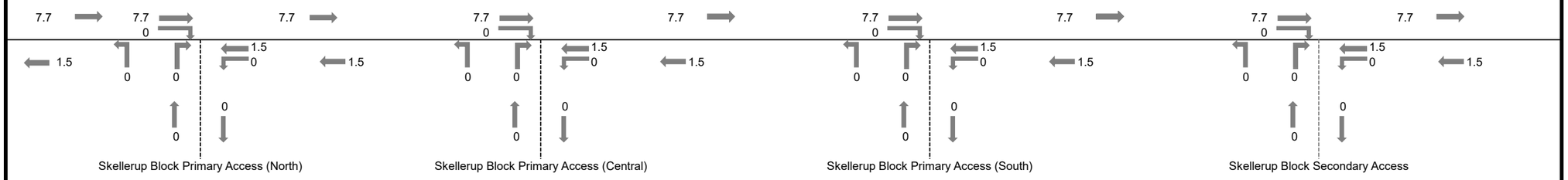
2028 Received Traffic Volumes
Holmes Block AM Peak



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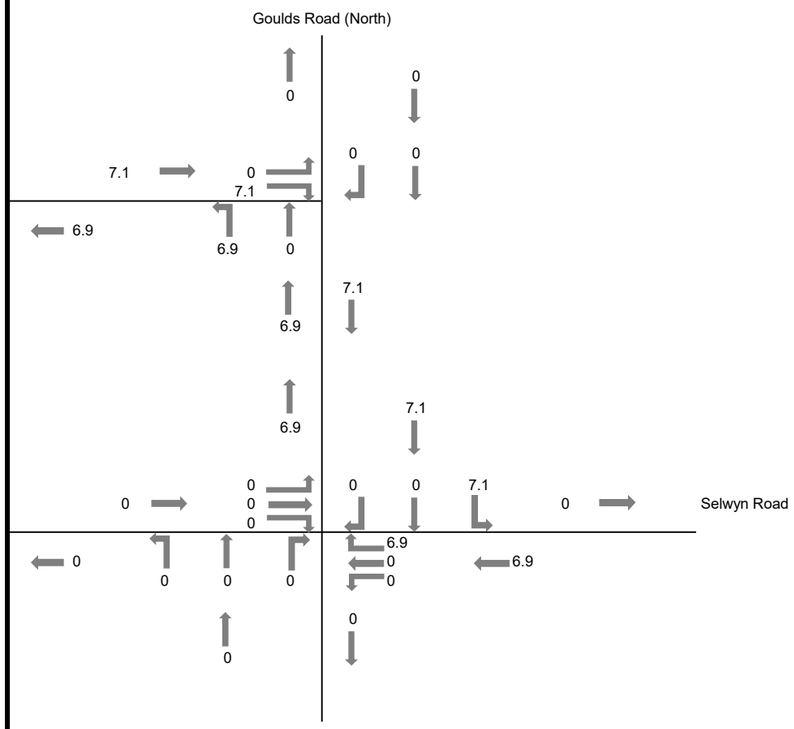
2028 Received Traffic Volumes
Holmes Block PM Peak



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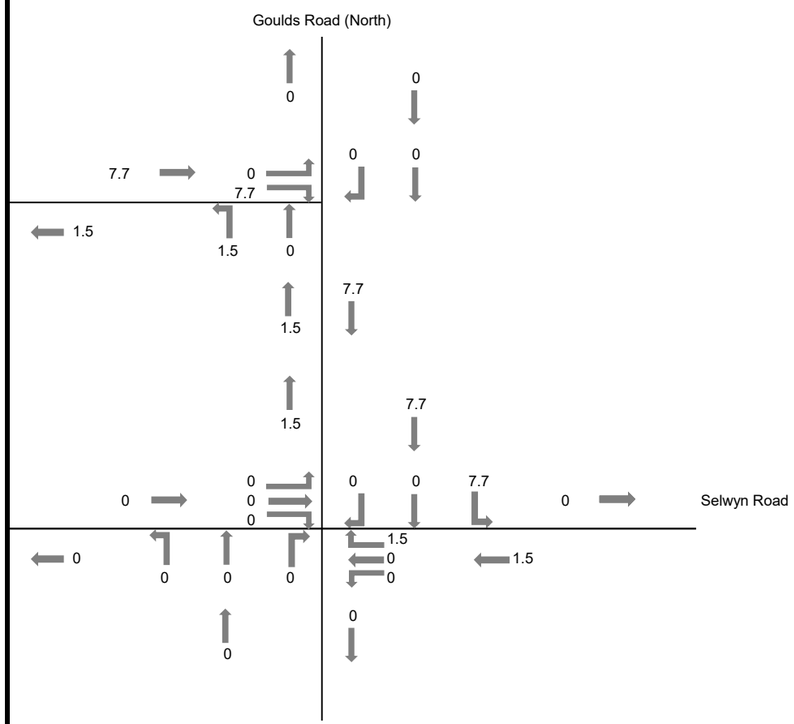
2028 Received Traffic Volumes

Holmes Block AM Peak



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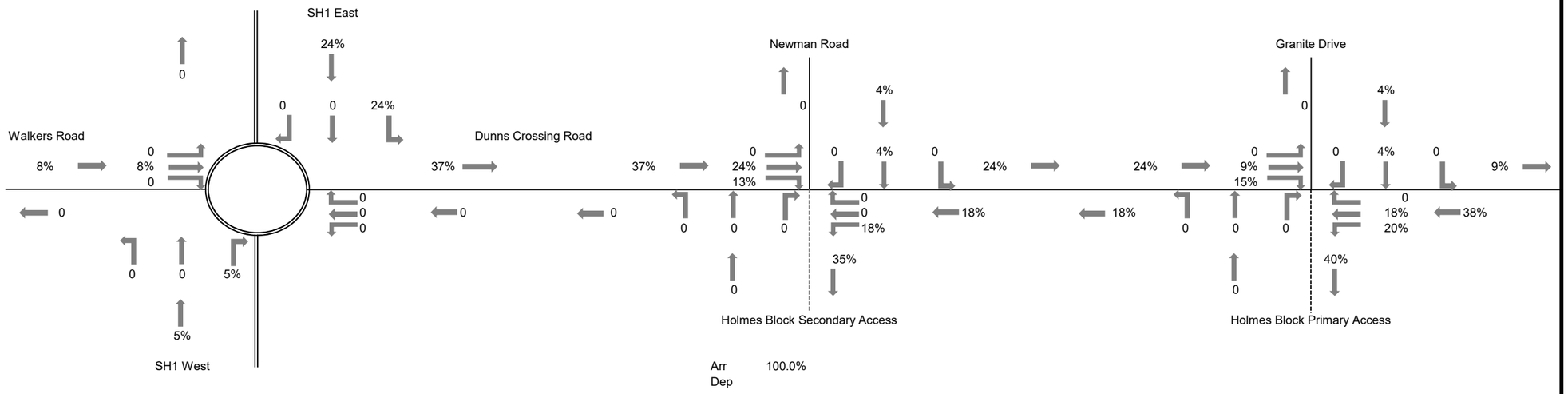
2028 Received Traffic Volumes

Holmes Block PM Peak



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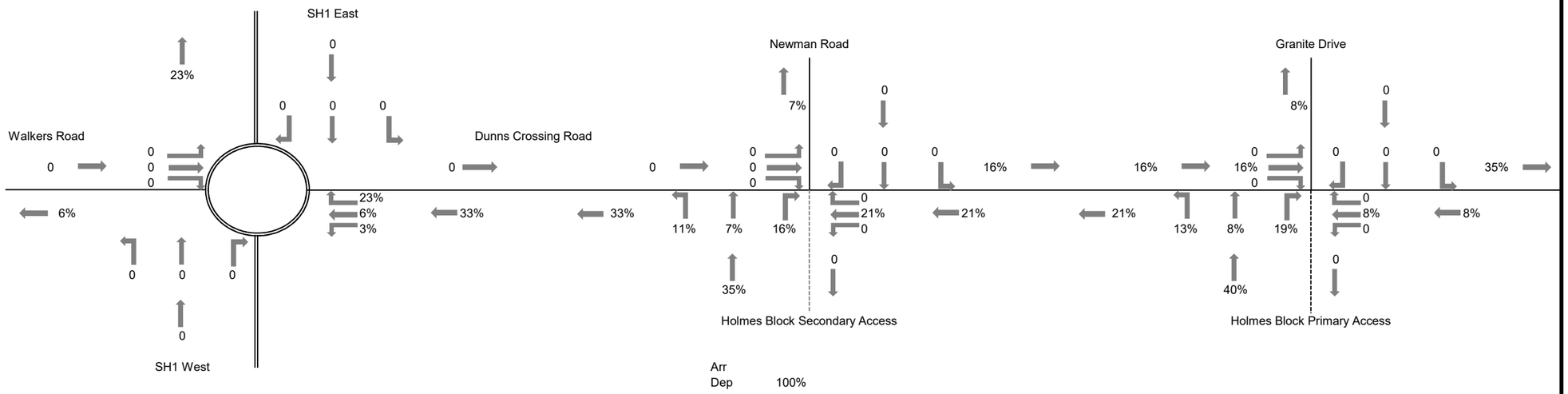
2028 Distribution Arrivals

Holmes Block AM Peak



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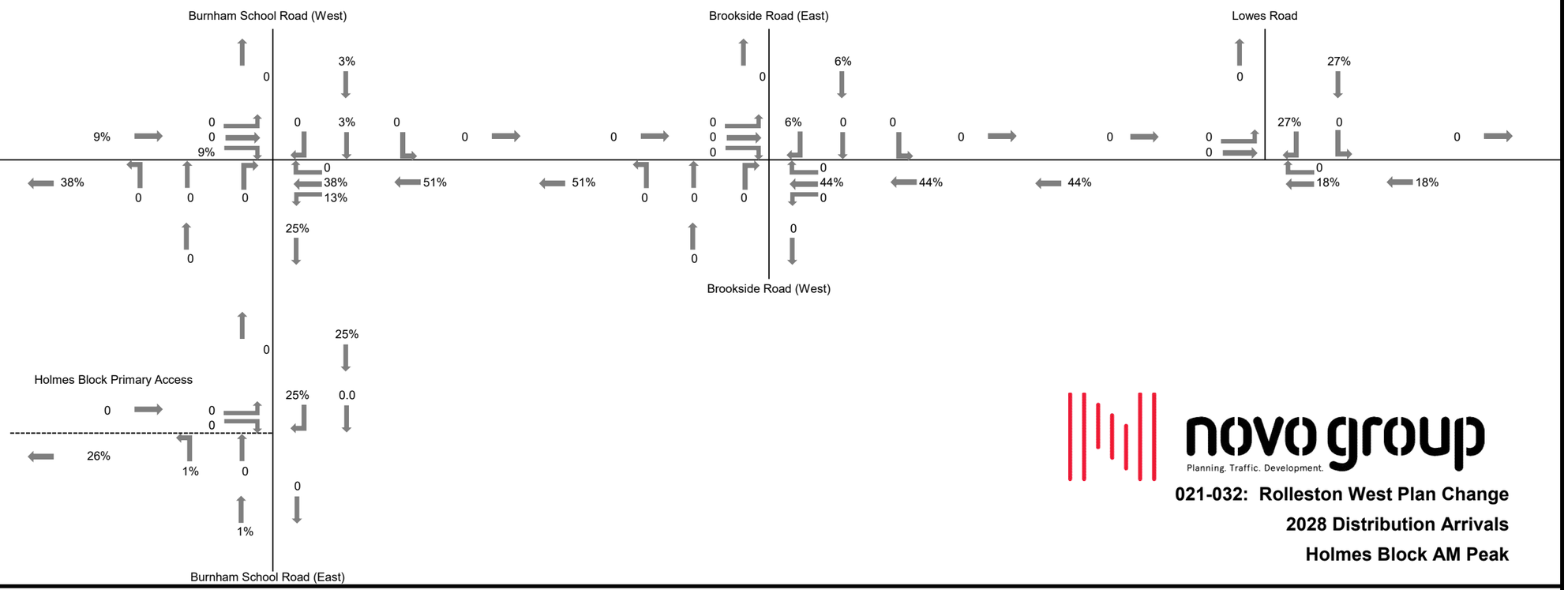
2028 Distribution Departures

Holmes Block AM Peak



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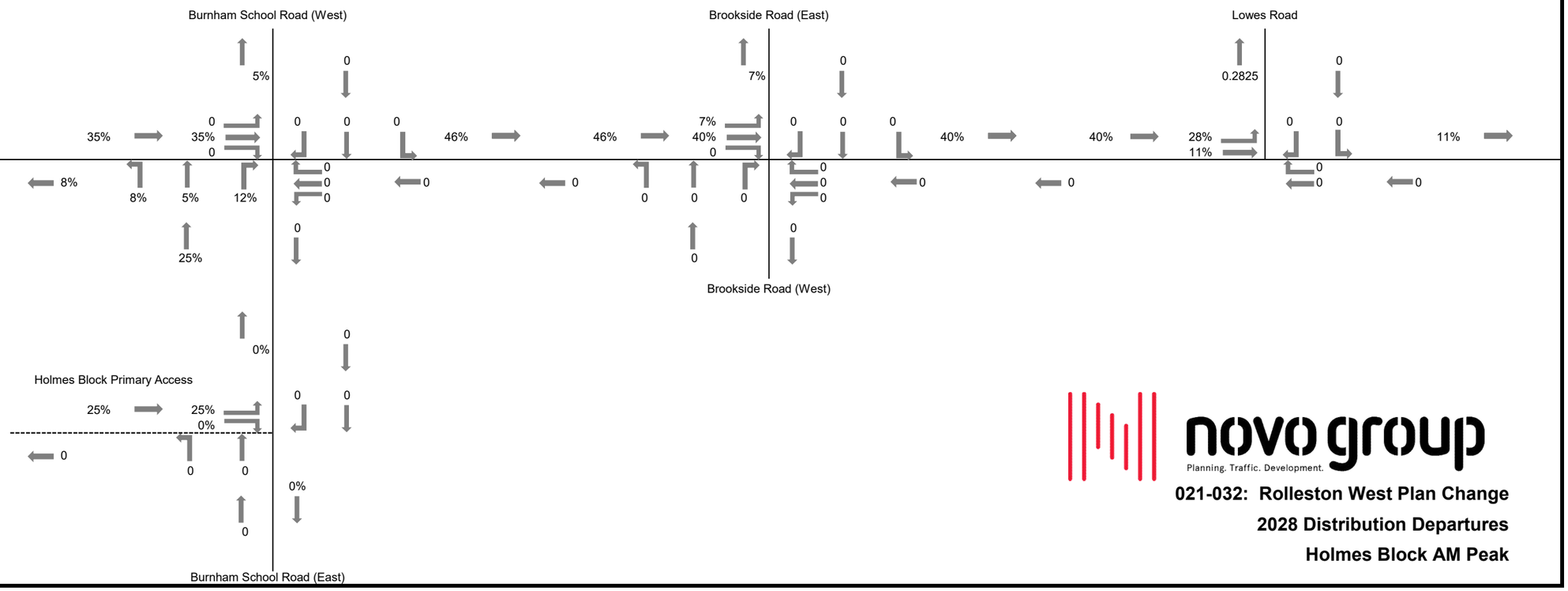
2028 Distribution Arrivals

Holmes Block AM Peak



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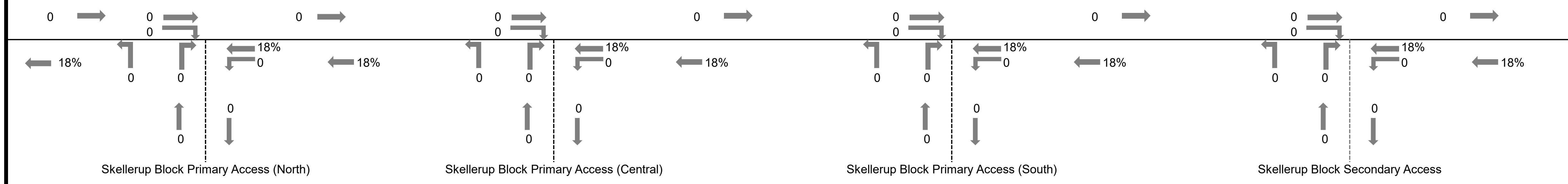
2028 Distribution Departures

Holmes Block AM Peak



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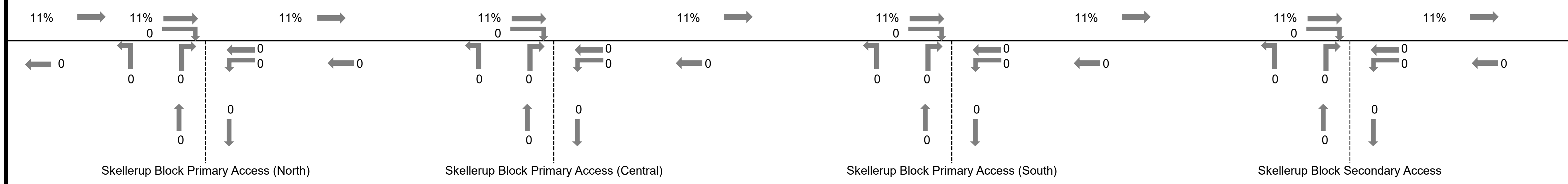
2028 Distribution Arrivals

Holmes Block AM Peak



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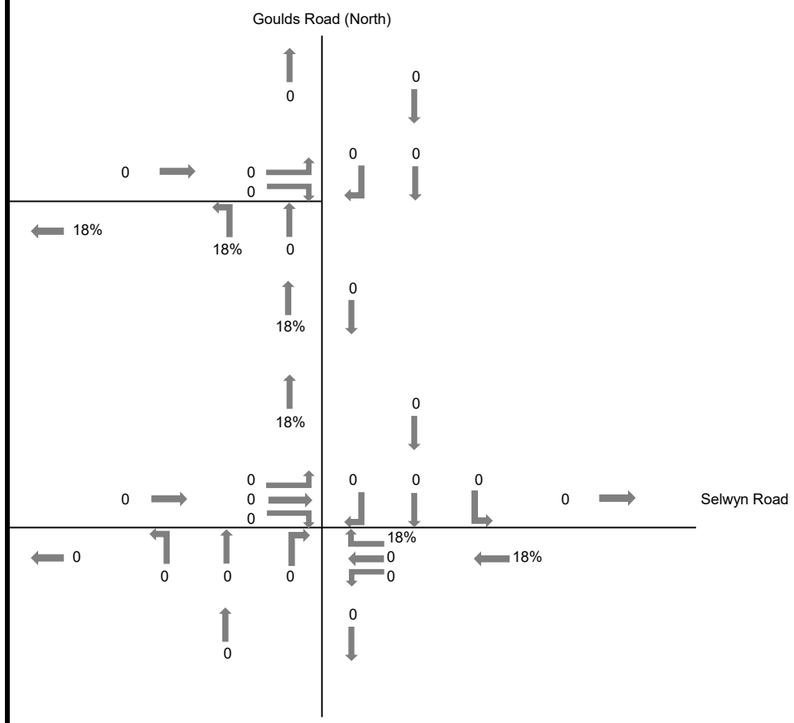
2028 Distribution Departures

Holmes Block AM Peak



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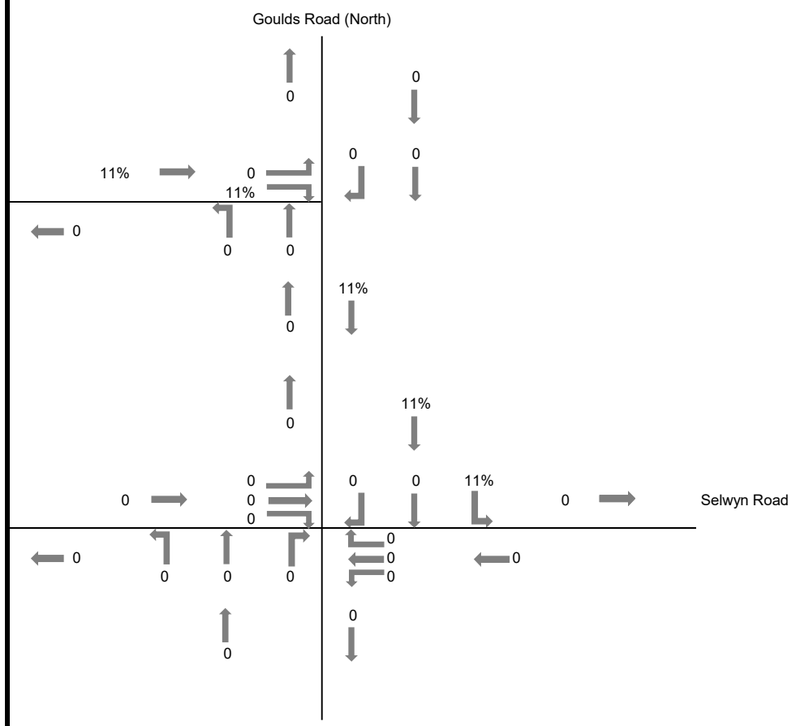
2028 Distribution Arrivals

Holmes Block AM Peak



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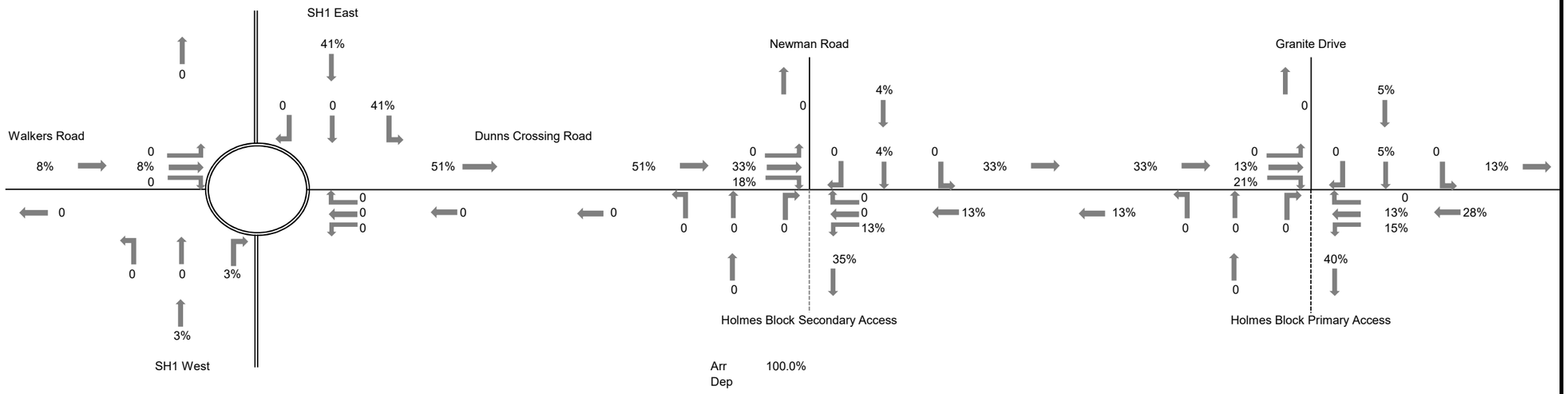
021-032: Rolleston West Plan Change

2028 Distribution Departures

Holmes Block AM Peak



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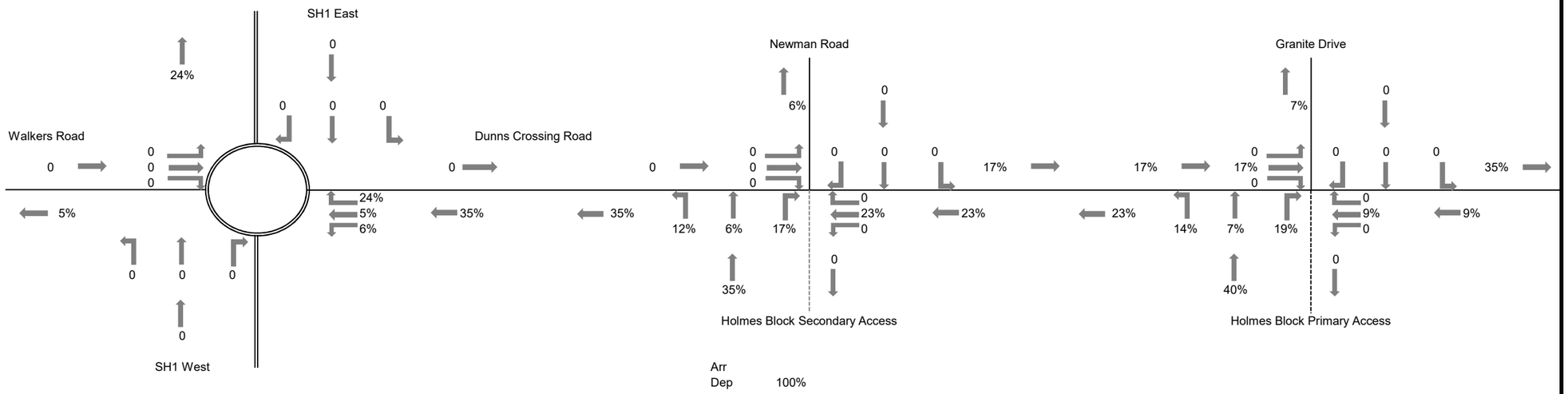
2028 Distribution Arrivals
Holmes Block PM Peak



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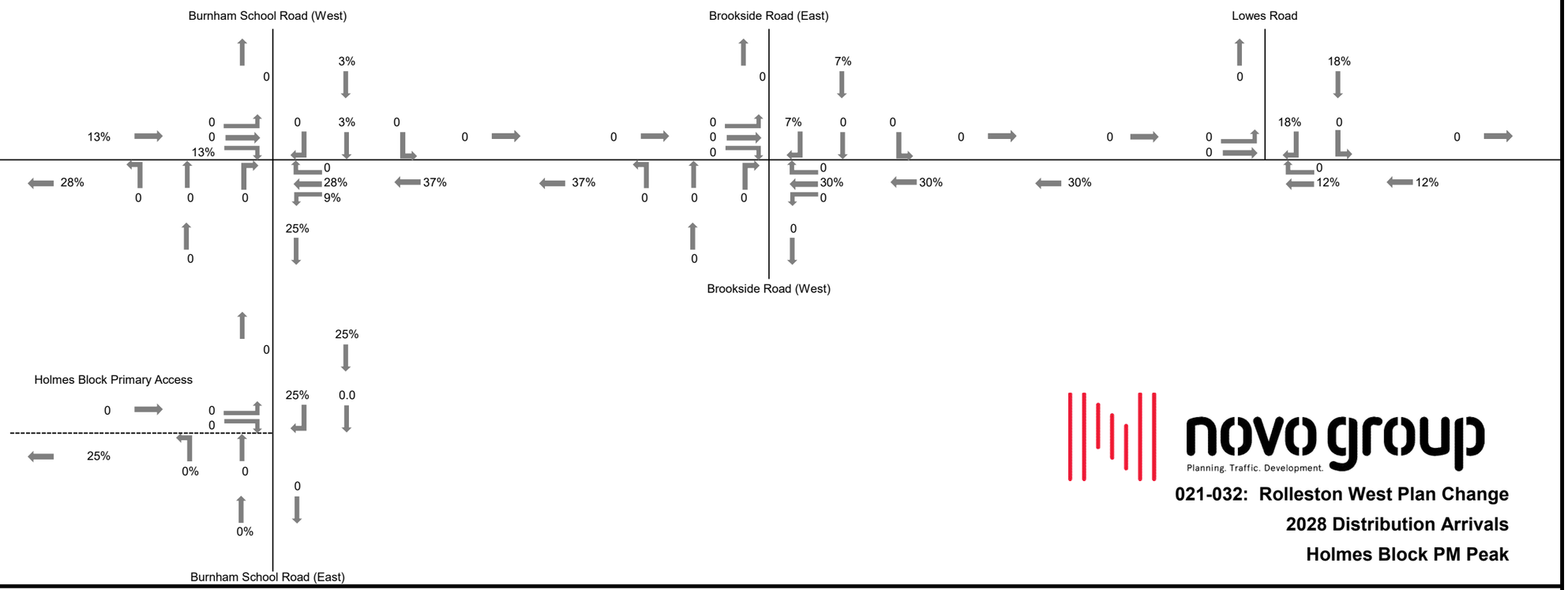
021-032: Rolleston West Plan Change
2028 Distribution Departures
Holmes Block PM Peak



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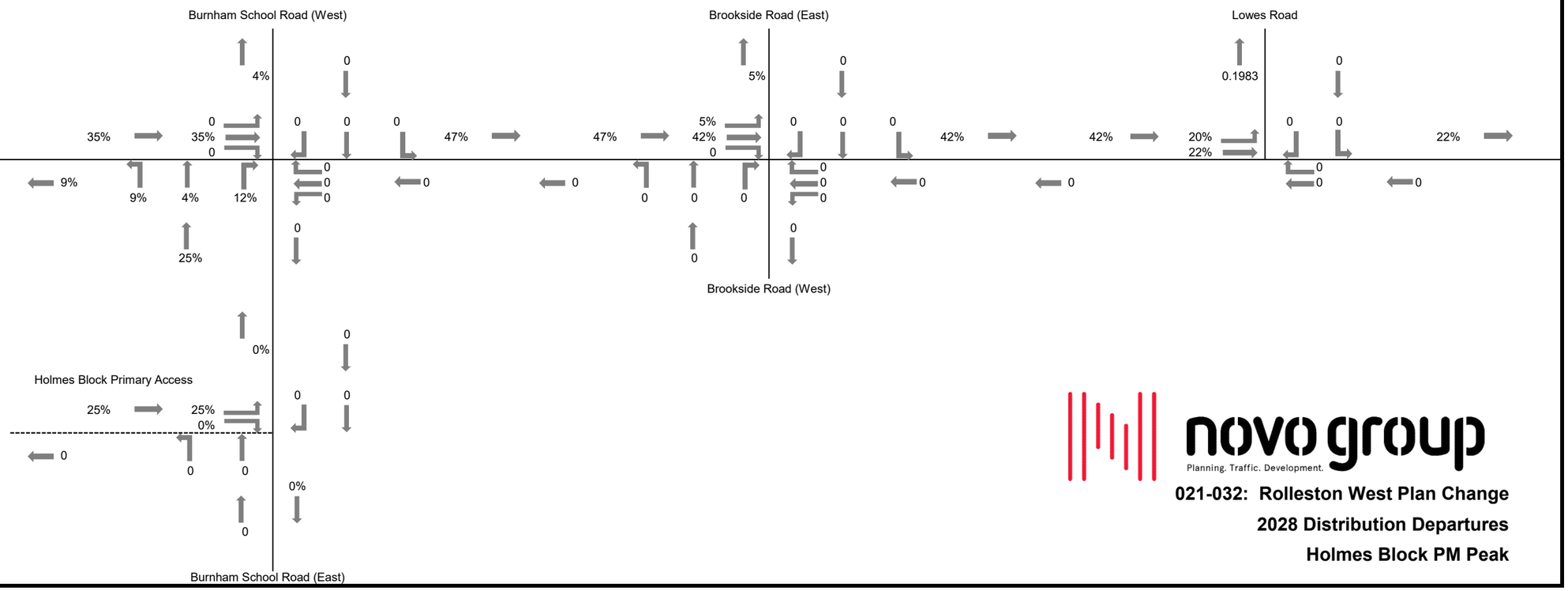
021-032: Rolleston West Plan Change

2028 Distribution Arrivals

Holmes Block PM Peak



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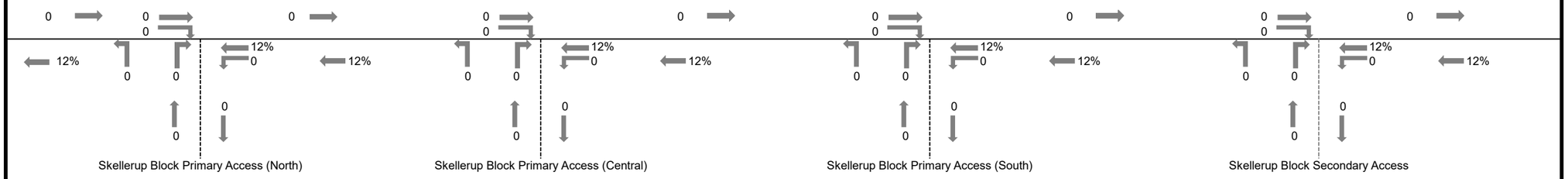
021-032: Rolleston West Plan Change

2028 Distribution Departures

Holmes Block PM Peak



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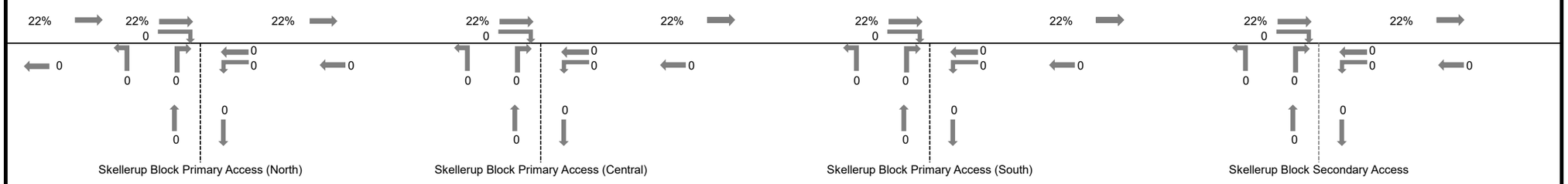
021-032: Rolleston West Plan Change

2028 Distribution Arrivals

Holmes Block PM Peak



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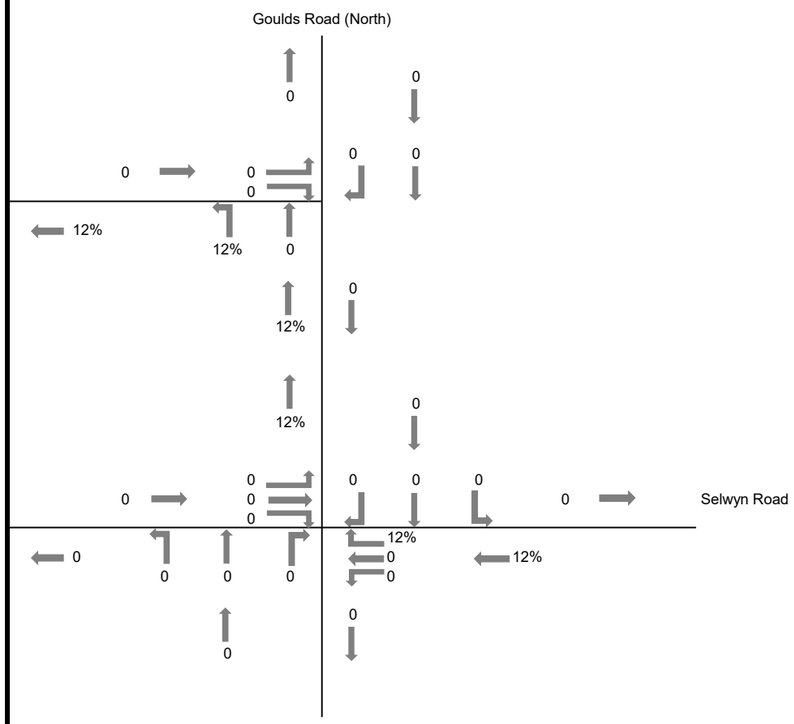
021-032: Rolleston West Plan Change

2028 Distribution Departures

Holmes Block PM Peak



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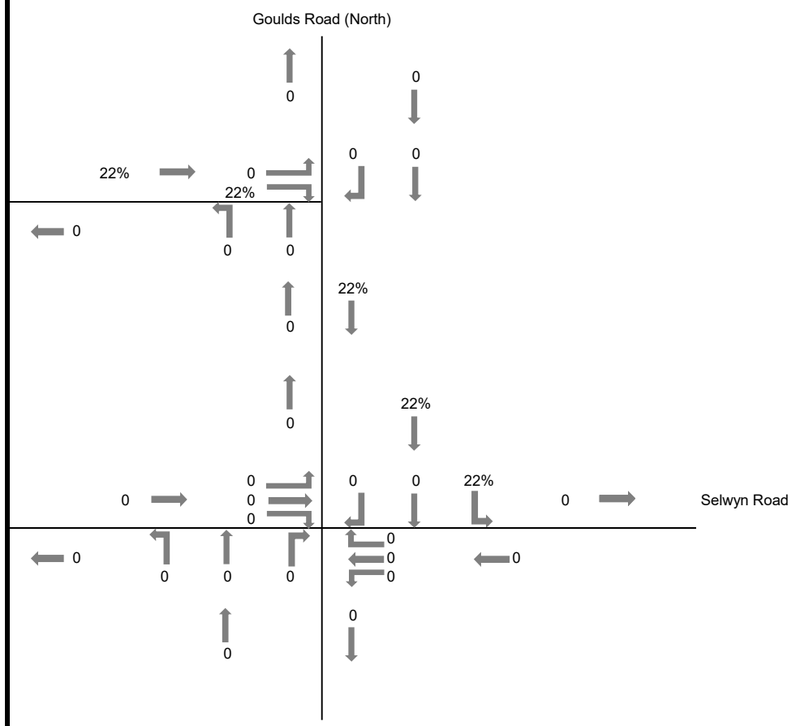
021-032: Rolleston West Plan Change

2028 Distribution Arrivals

Holmes Block PM Peak



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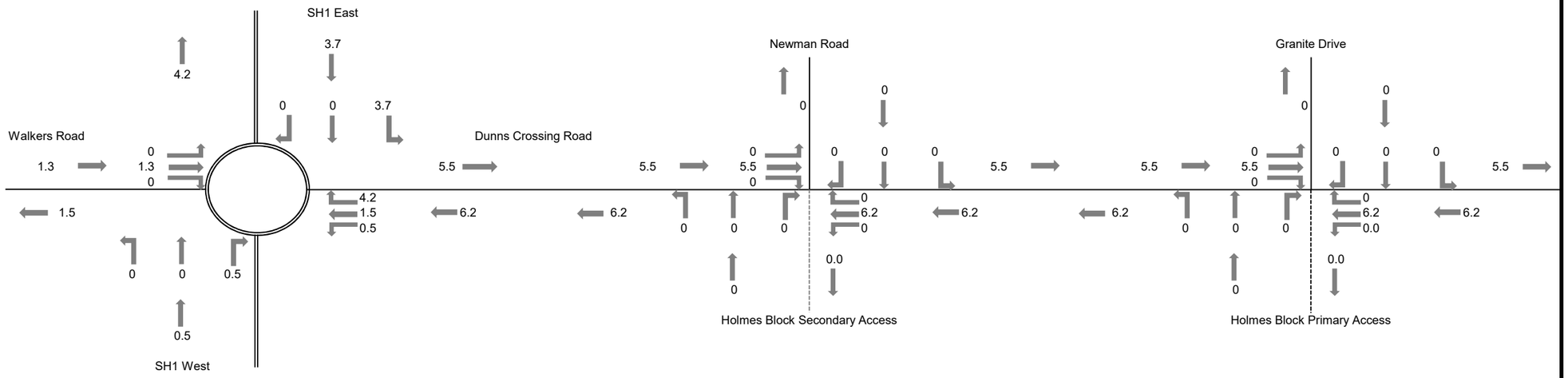
2028 Distribution Departures

Holmes Block PM Peak



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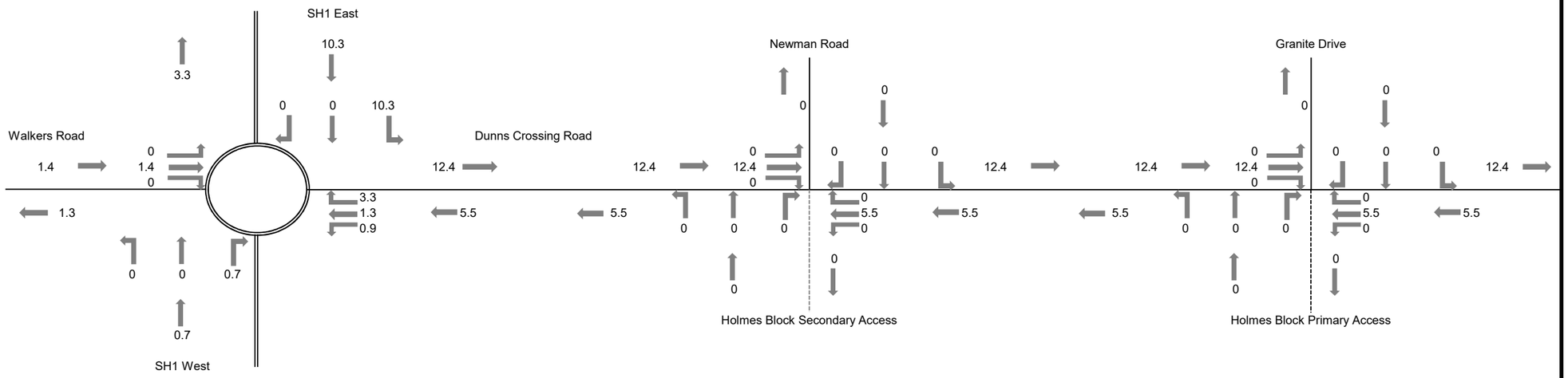
021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

Skellerup Block AM Peak



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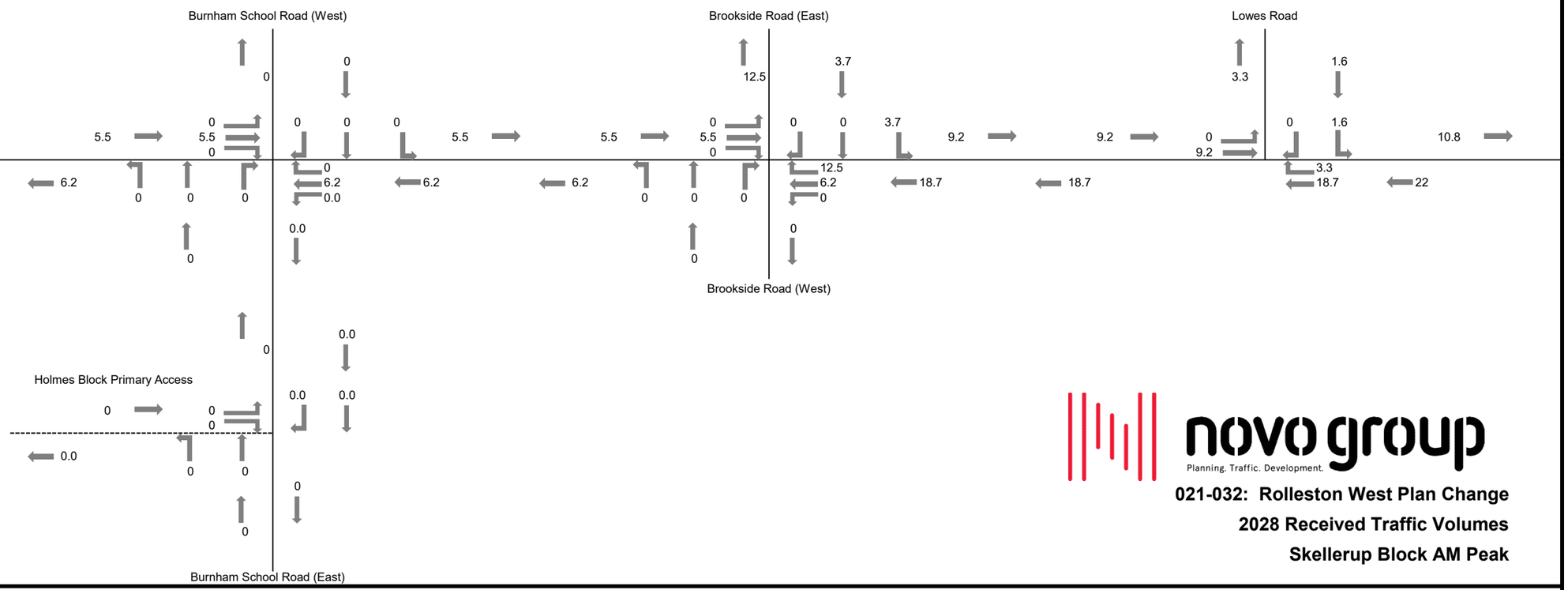
2028 Received Traffic Volumes

Skellerup Block PM Peak



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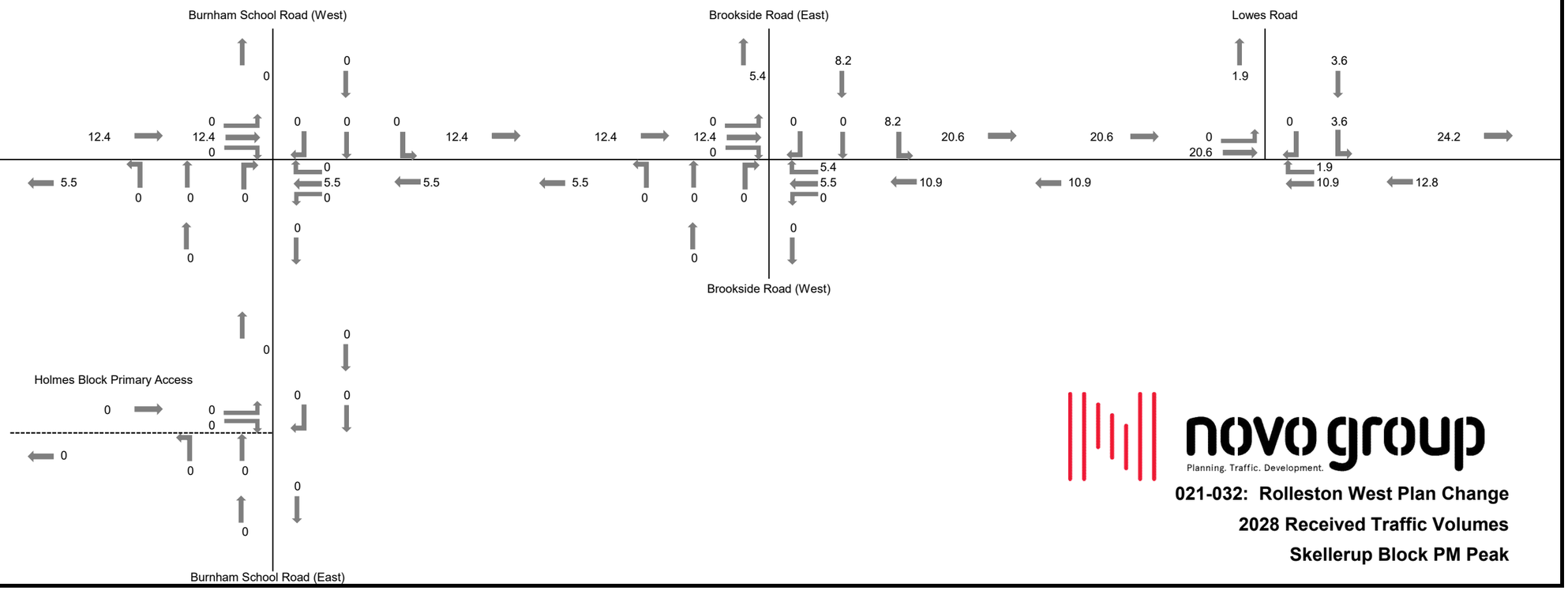
2028 Received Traffic Volumes

Skellerup Block AM Peak



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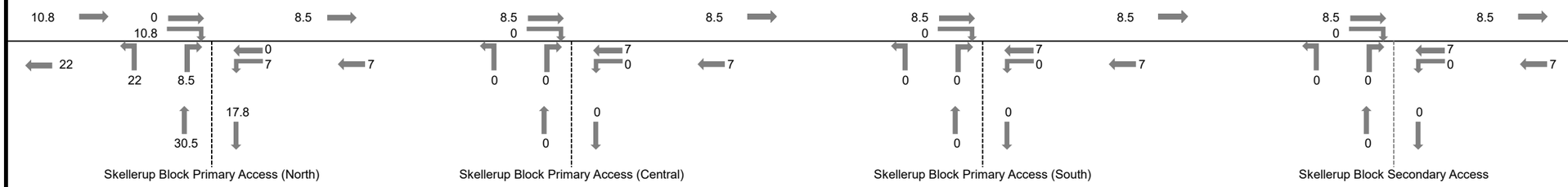
2028 Received Traffic Volumes

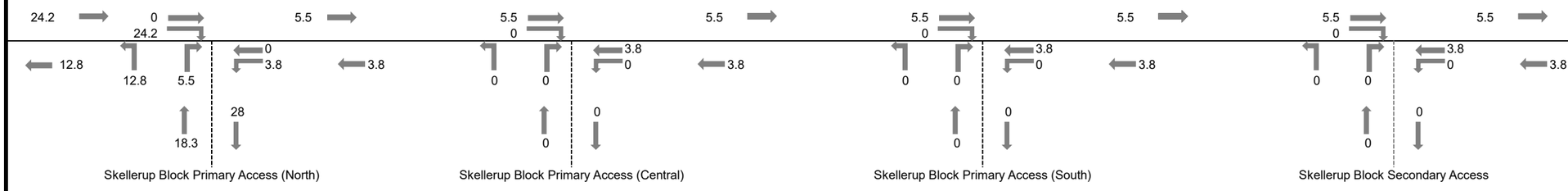
Skellerup Block PM Peak



021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

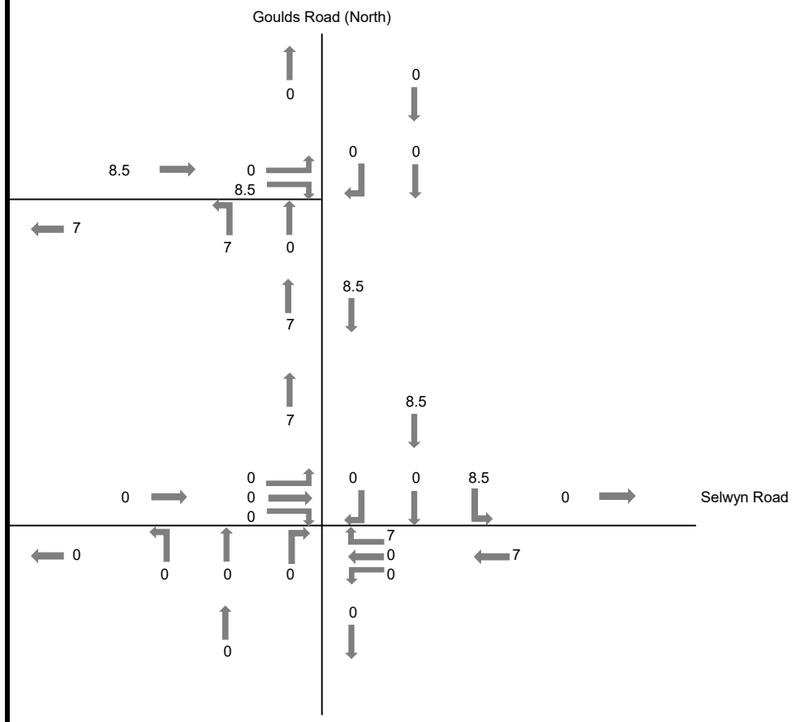
Skellerup Block AM Peak



021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

Skellerup Block PM Peak



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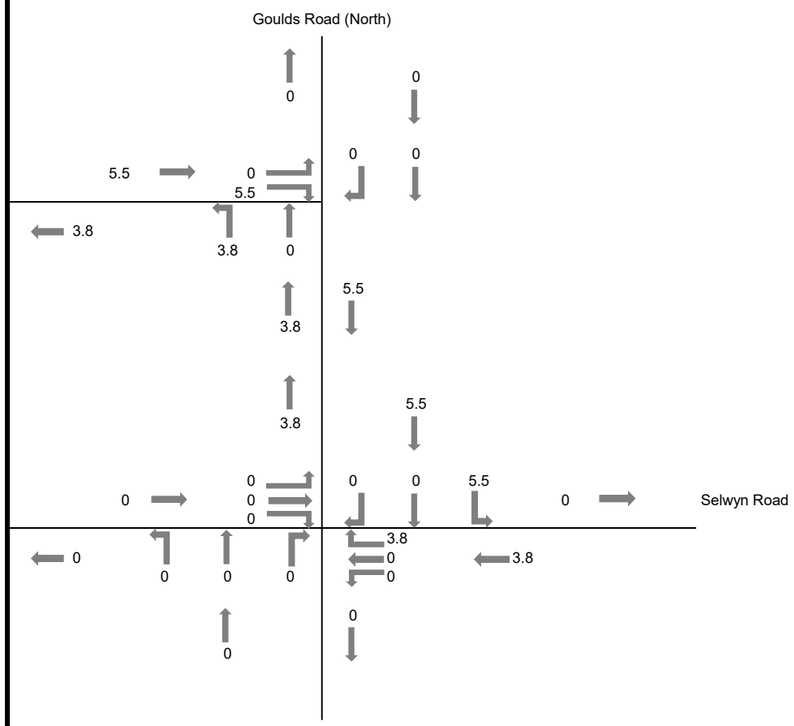
2028 Received Traffic Volumes

Skellerup Block AM Peak



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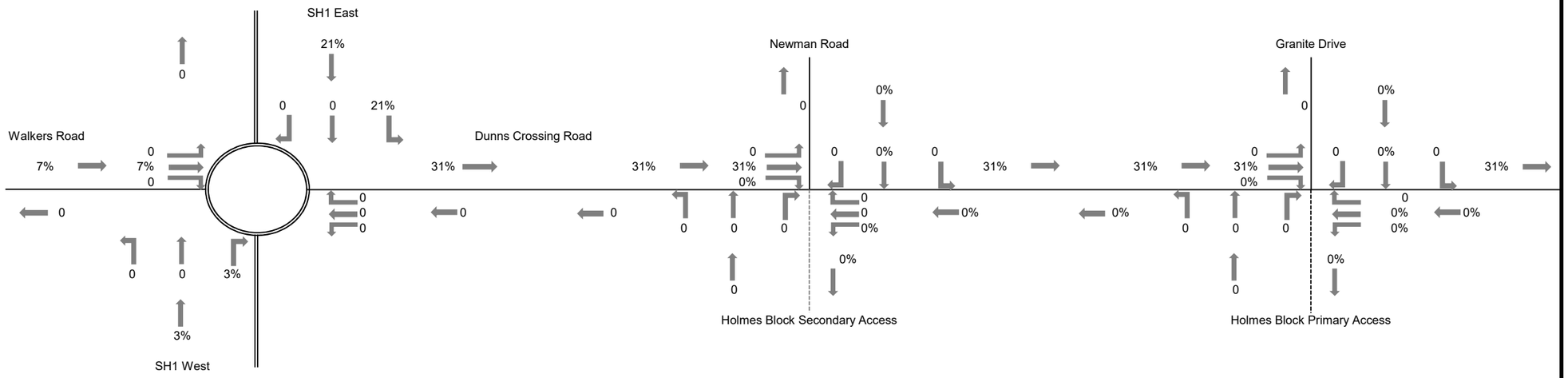
2028 Received Traffic Volumes

Skellerup Block PM Peak



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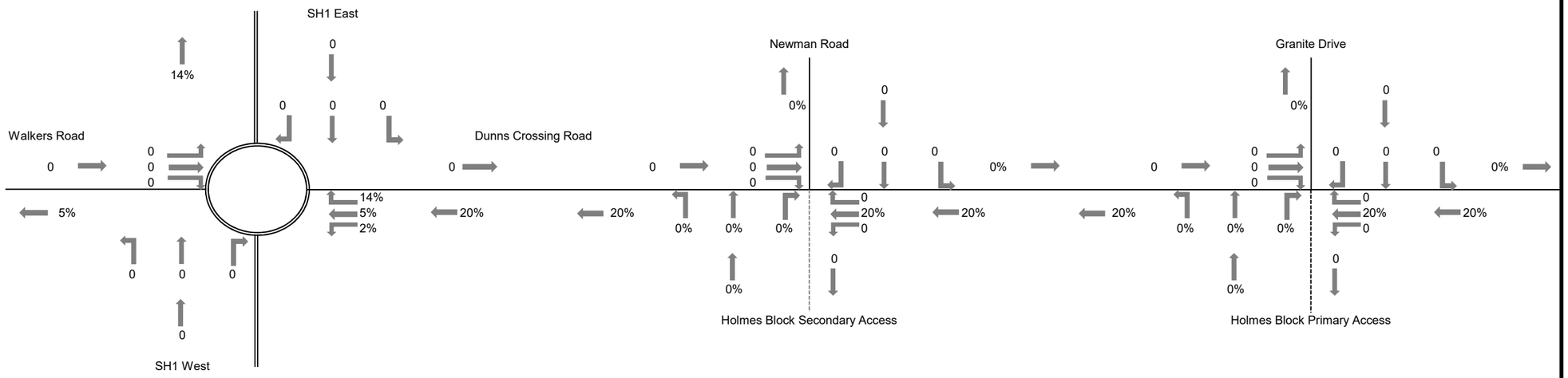
2028 Distribution Arrivals

Skellerup Block AM Peak



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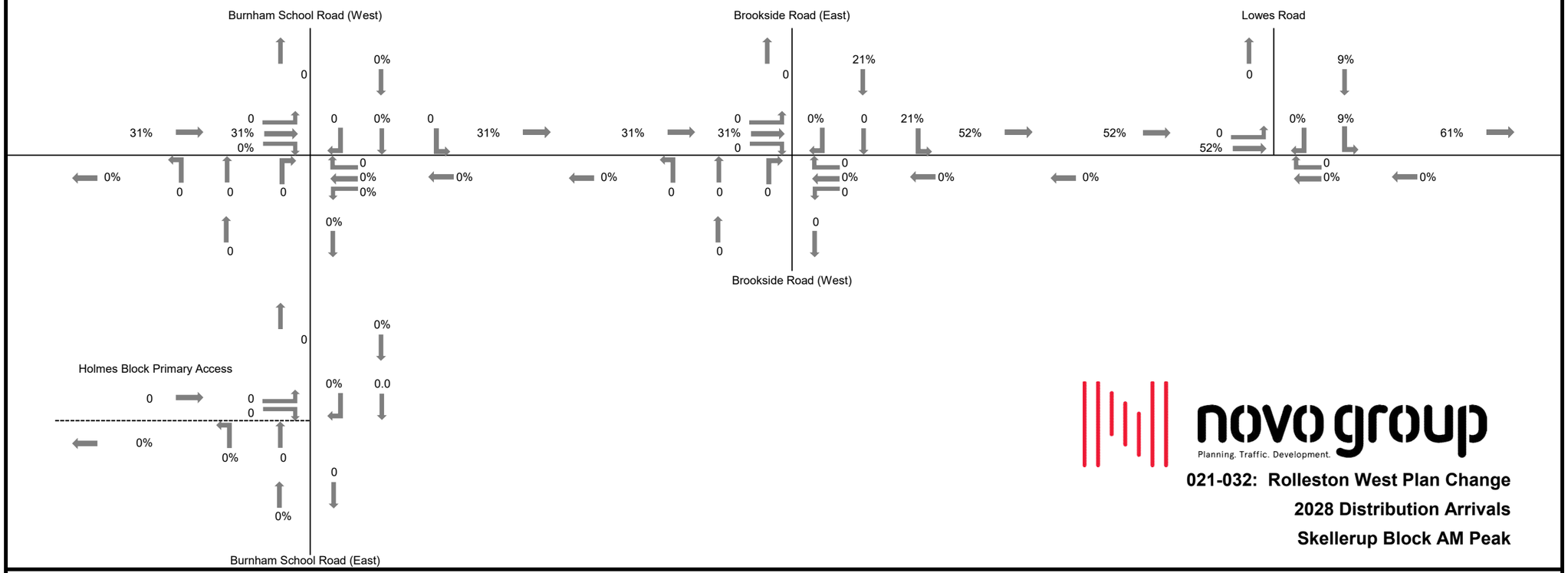
2028 Distribution Departures

Skellerup Block AM Peak



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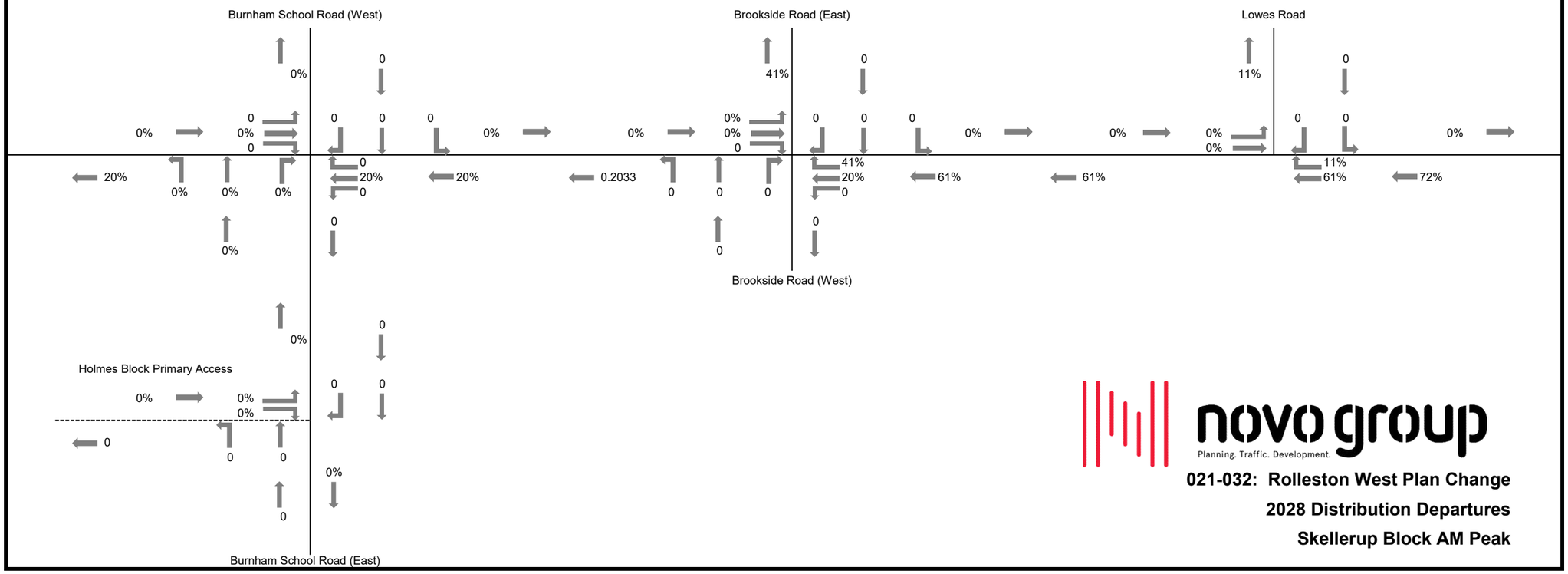
2028 Distribution Arrivals

Skellerup Block AM Peak



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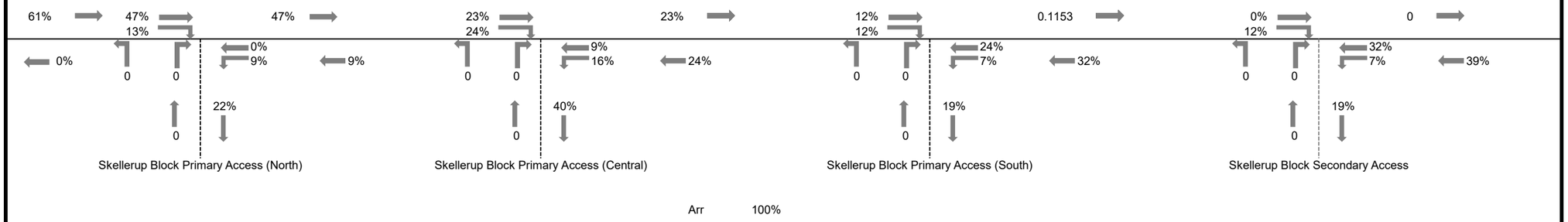
2028 Distribution Departures

Skellerup Block AM Peak



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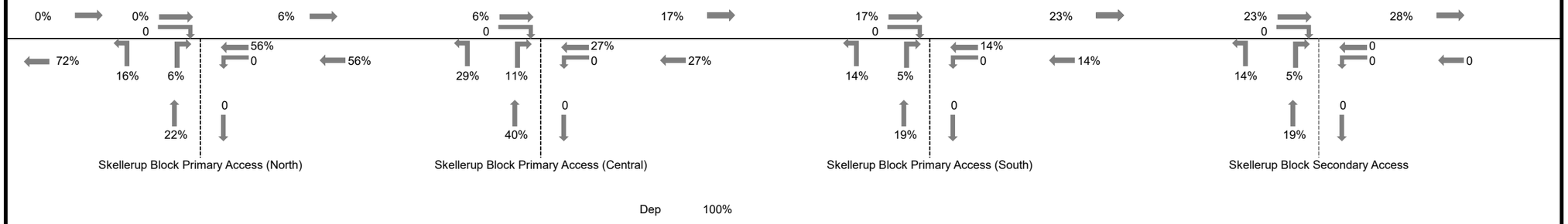
2028 Distribution Arrivals

Skellerup Block AM Peak



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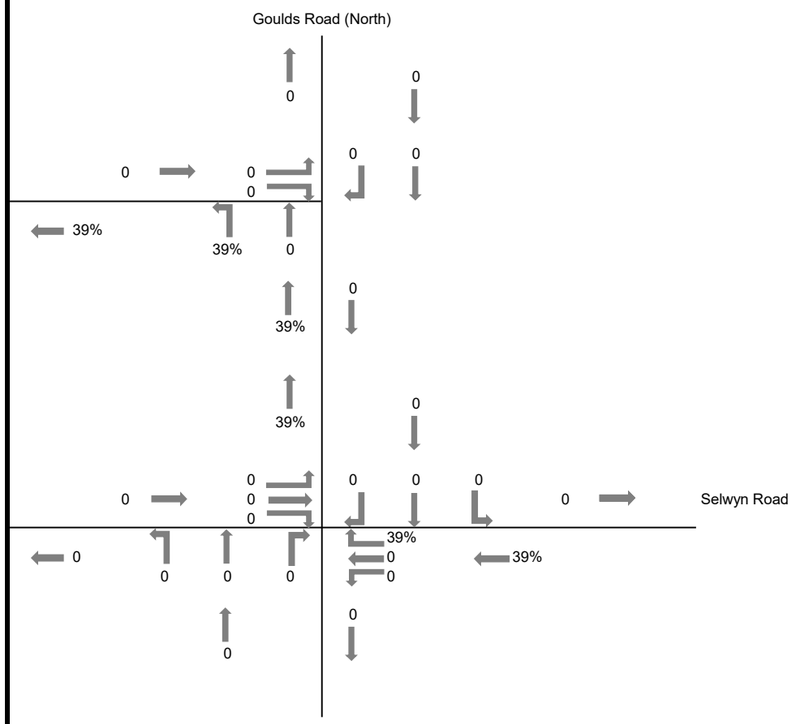
2028 Distribution Departures

Skellerup Block AM Peak



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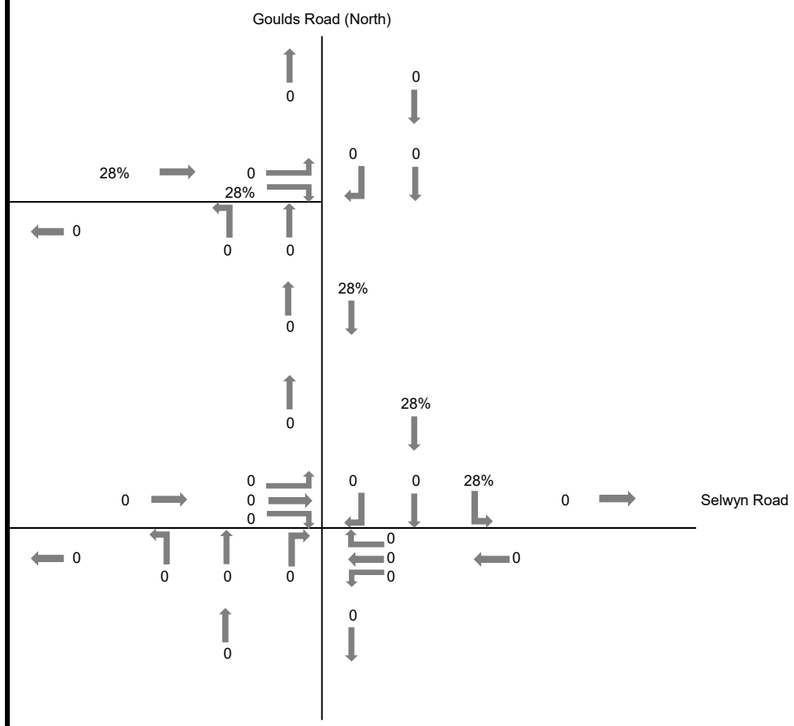
2028 Distribution Arrivals

Skellerup Block AM Peak



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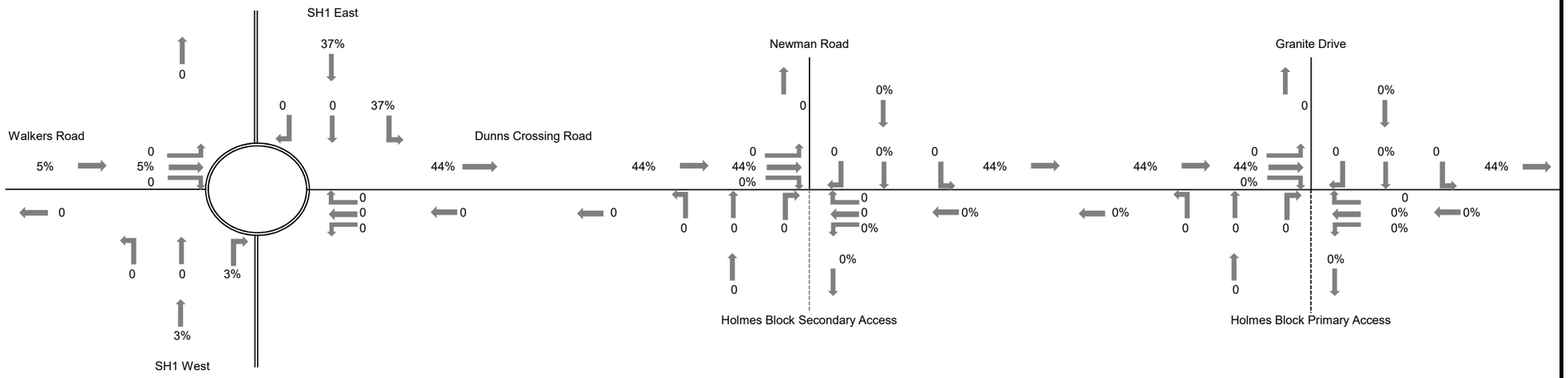
2028 Distribution Departures

Skellerup Block AM Peak



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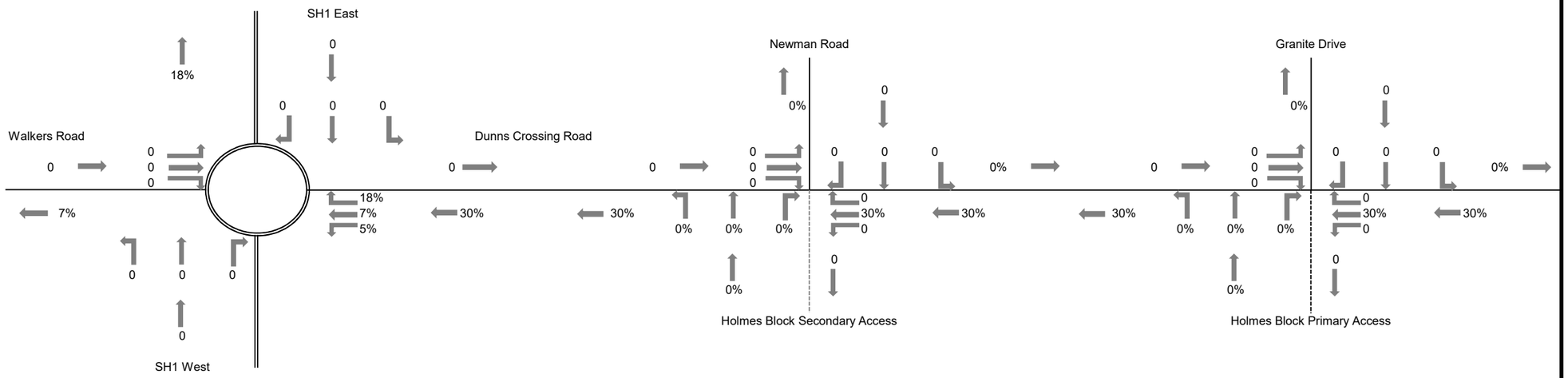
021-032: Rolleston West Plan Change

2028 Distribution Arrivals

Skellerup Block PM Peak



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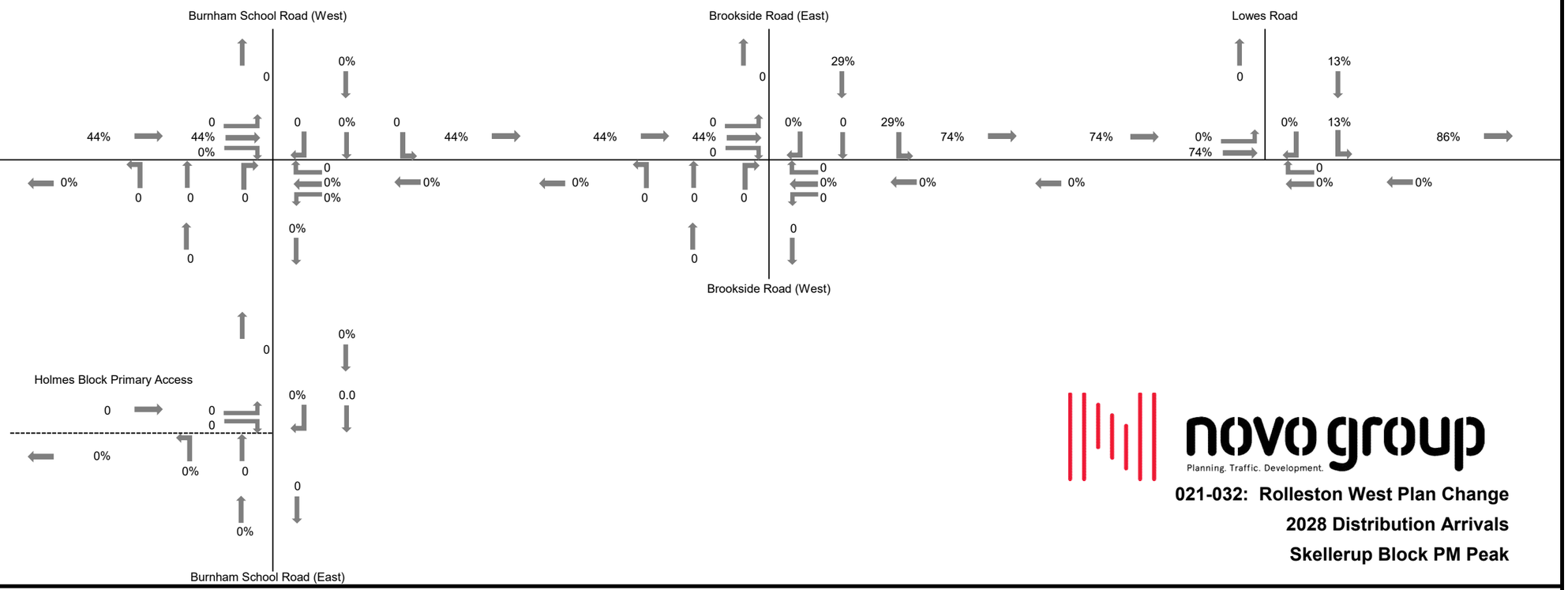
021-032: Rolleston West Plan Change

2028 Distribution Departures

Skellerup Block PM Peak



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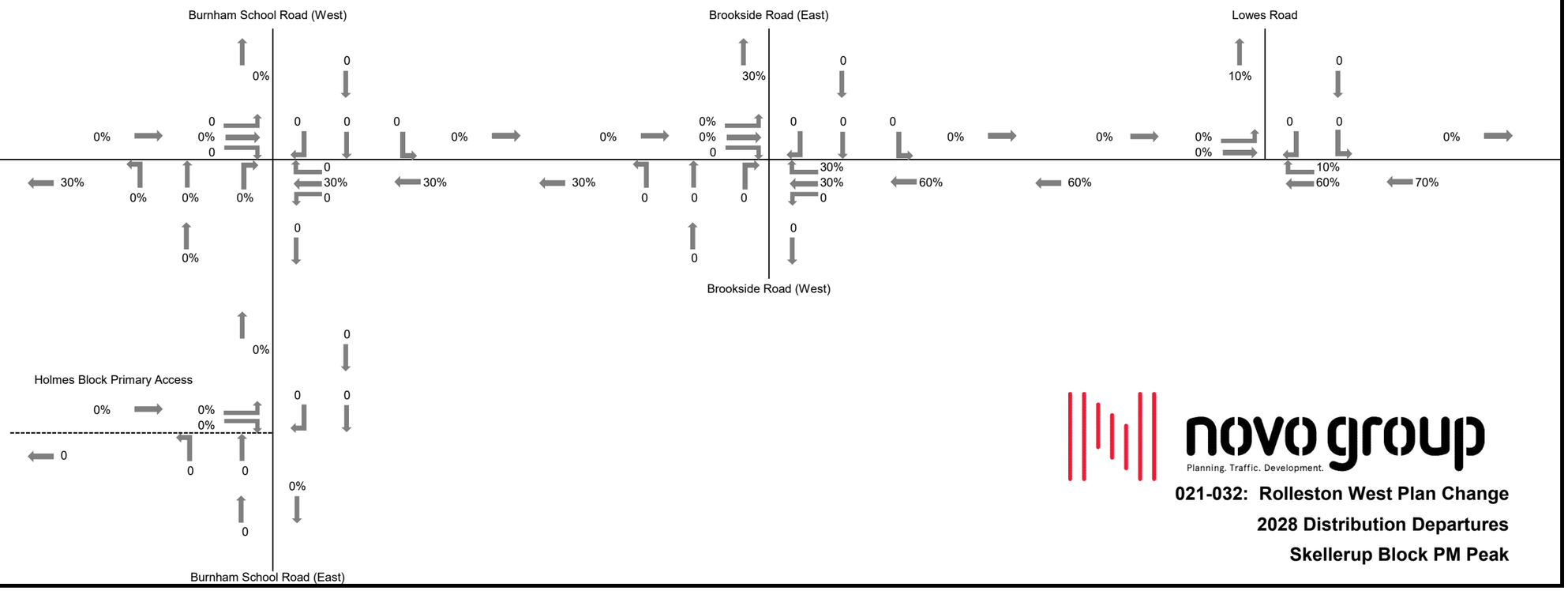
2028 Distribution Arrivals

Skellerup Block PM Peak



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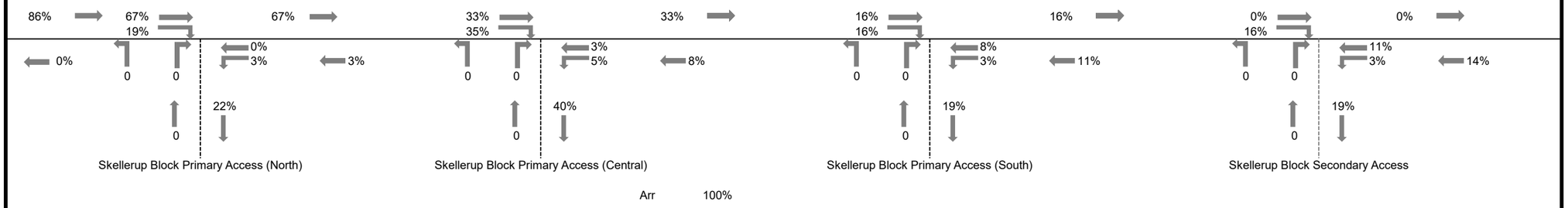
2028 Distribution Departures

Skellerup Block PM Peak



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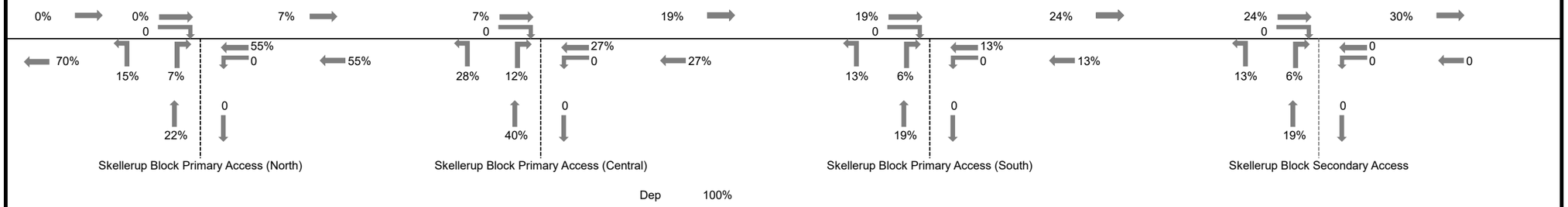
021-032: Rolleston West Plan Change

2028 Distribution Arrivals

Skellerup Block PM Peak



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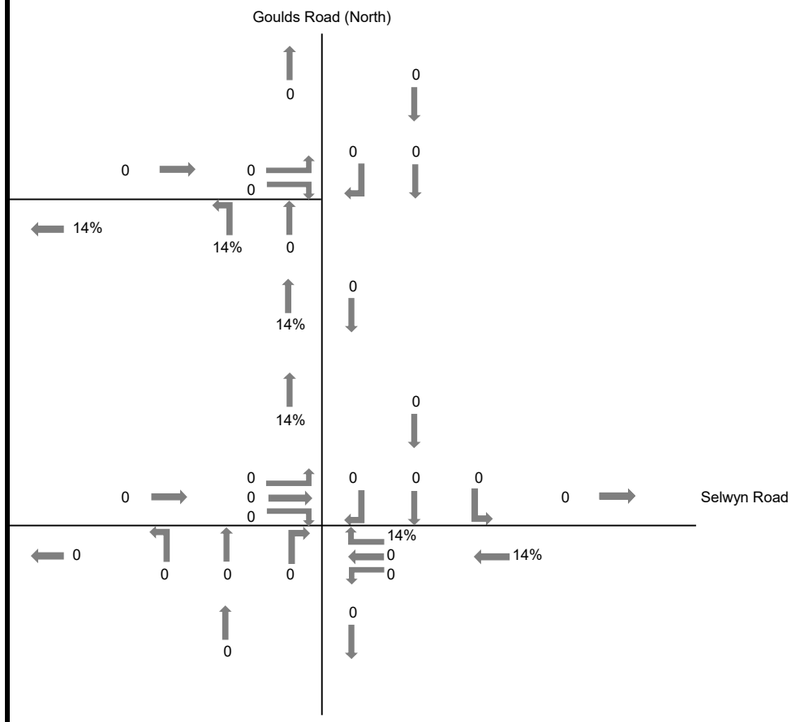
2028 Distribution Departures

Skellerup Block PM Peak



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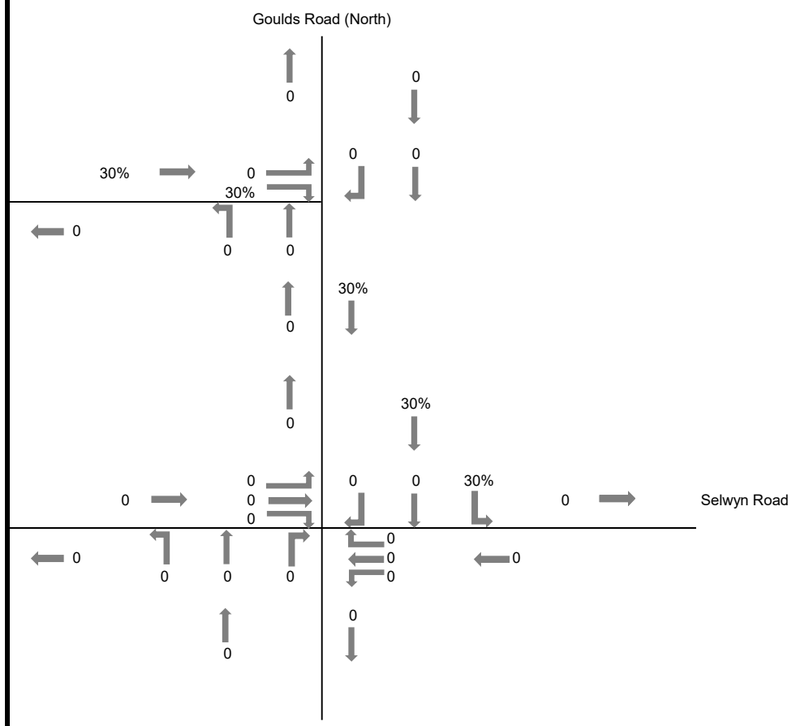
2028 Distribution Arrivals

Skellerup Block PM Peak



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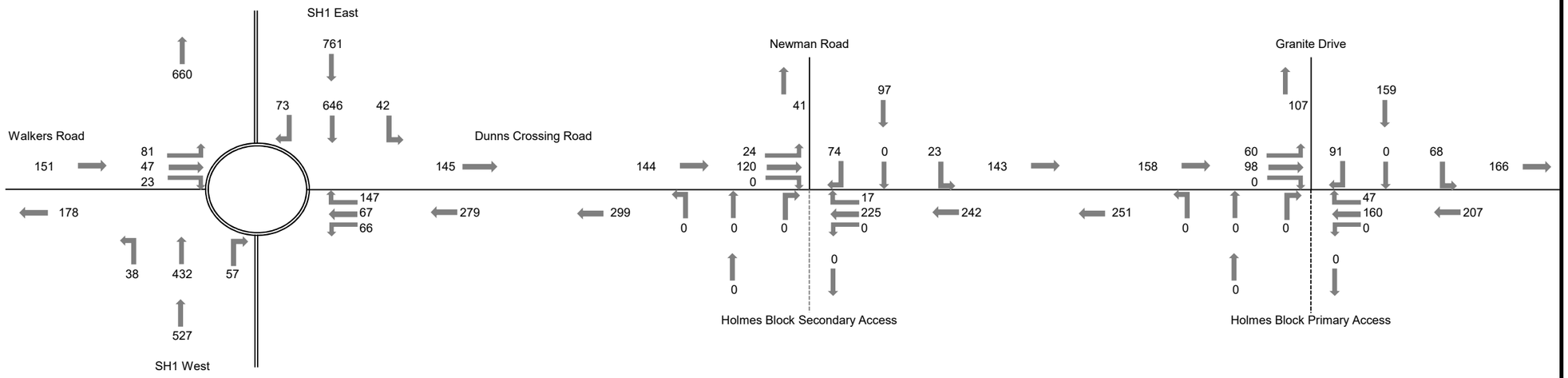
021-032: Rolleston West Plan Change

2028 Distribution Departures

Skellerup Block PM Peak



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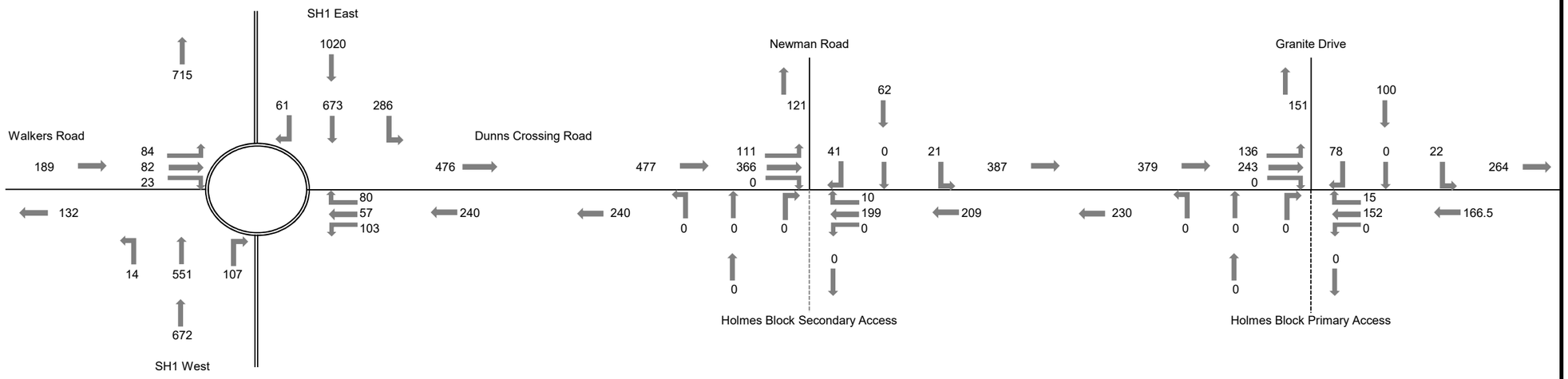
021-032: Rolleston West Plan Change

2028 Less Zoned Traffic

AM Peak Hour



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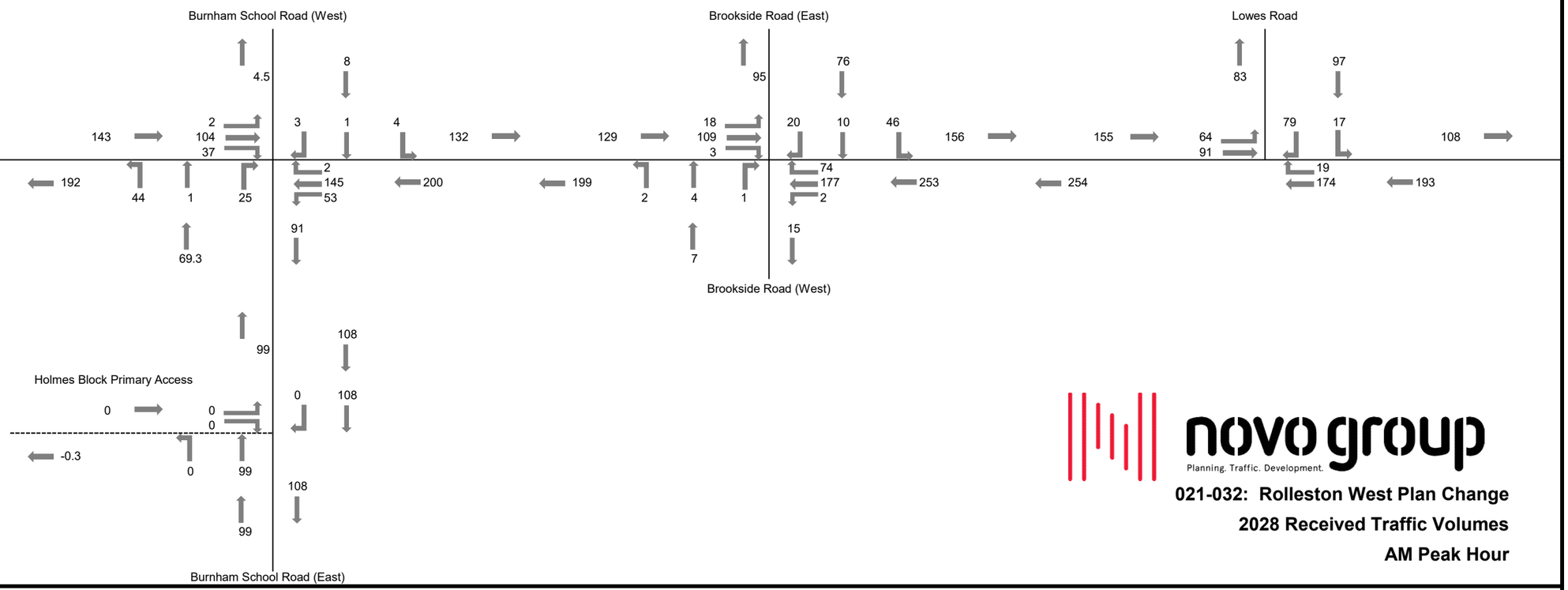
021-032: Rolleston West Plan Change

2028 Less Zoned Traffic

PM Peak Hour



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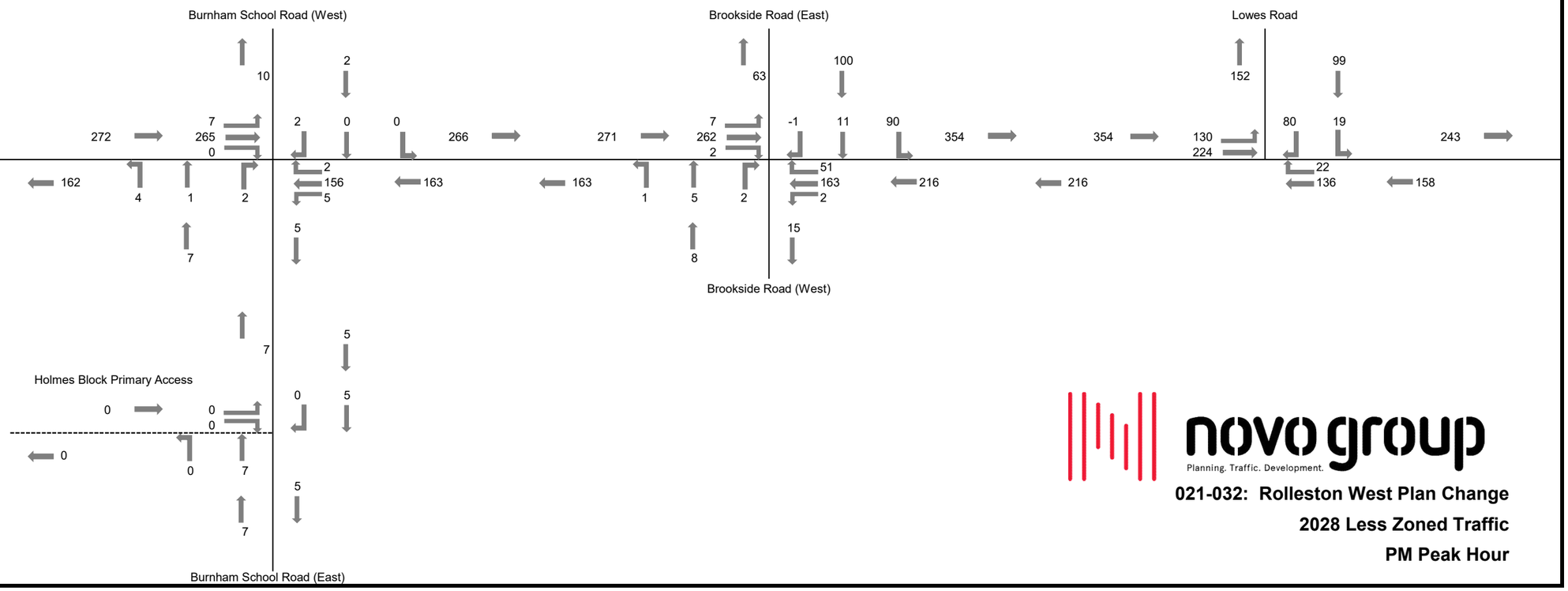
021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

AM Peak Hour



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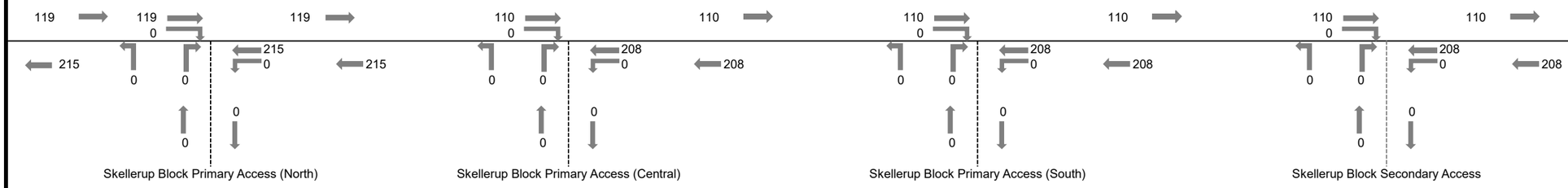
021-032: Rolleston West Plan Change

2028 Less Zoned Traffic

PM Peak Hour



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021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

AM Peak Hour

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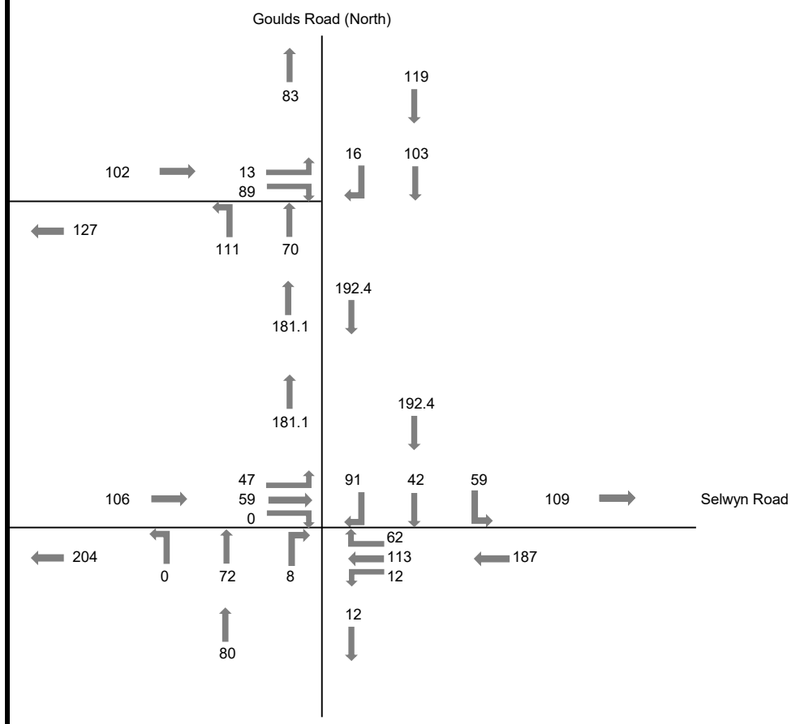
021-032: Rolleston West Plan Change

2028 Less Zoned Traffic

PM Peak Hour



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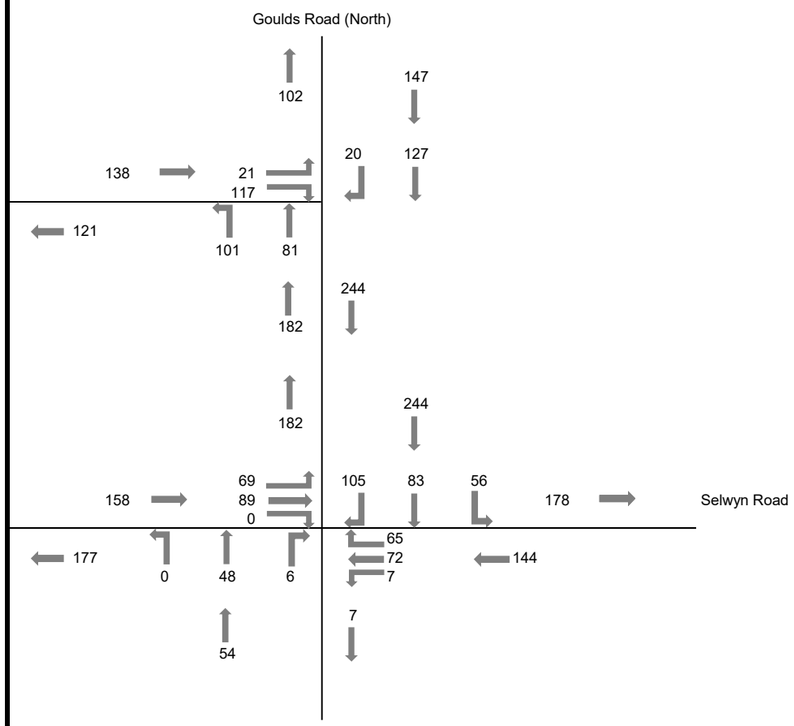
2028 Received Traffic Volumes

AM Peak Hour



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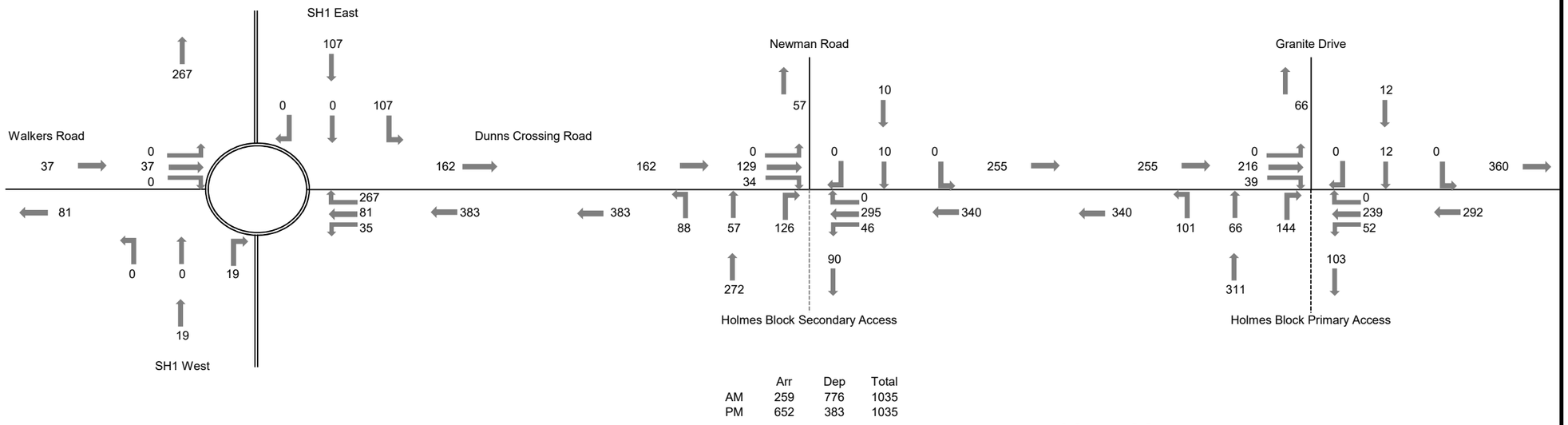
2028 Less Zoned Traffic

PM Peak Hour



	Arr	Dep	Total
AM	259	776	1035
PM	652	383	1035

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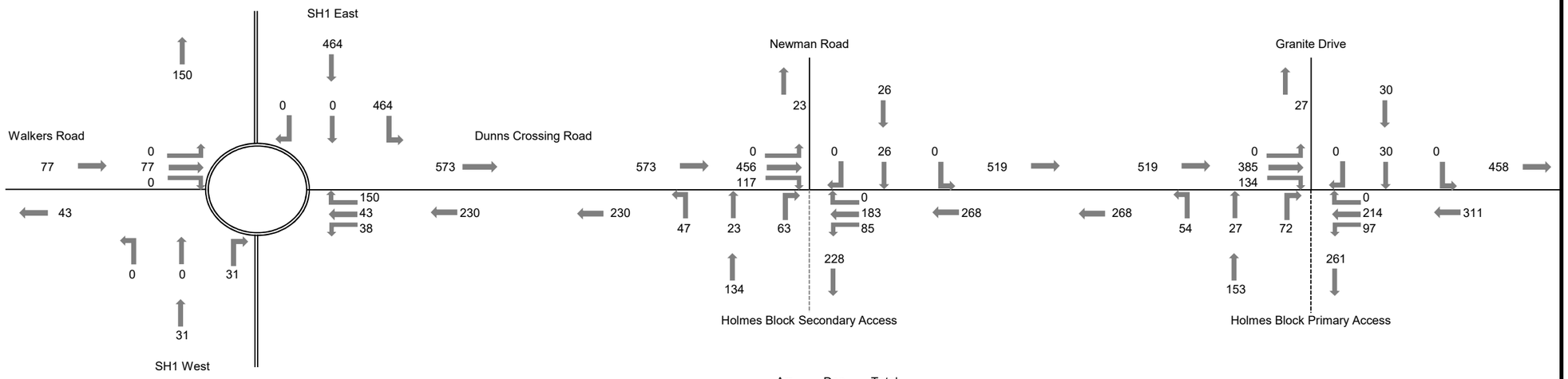
021-032: Rolleston West Plan Change

Plan Change Traffic

AM Peak Hour



	Arr	Dep	Total
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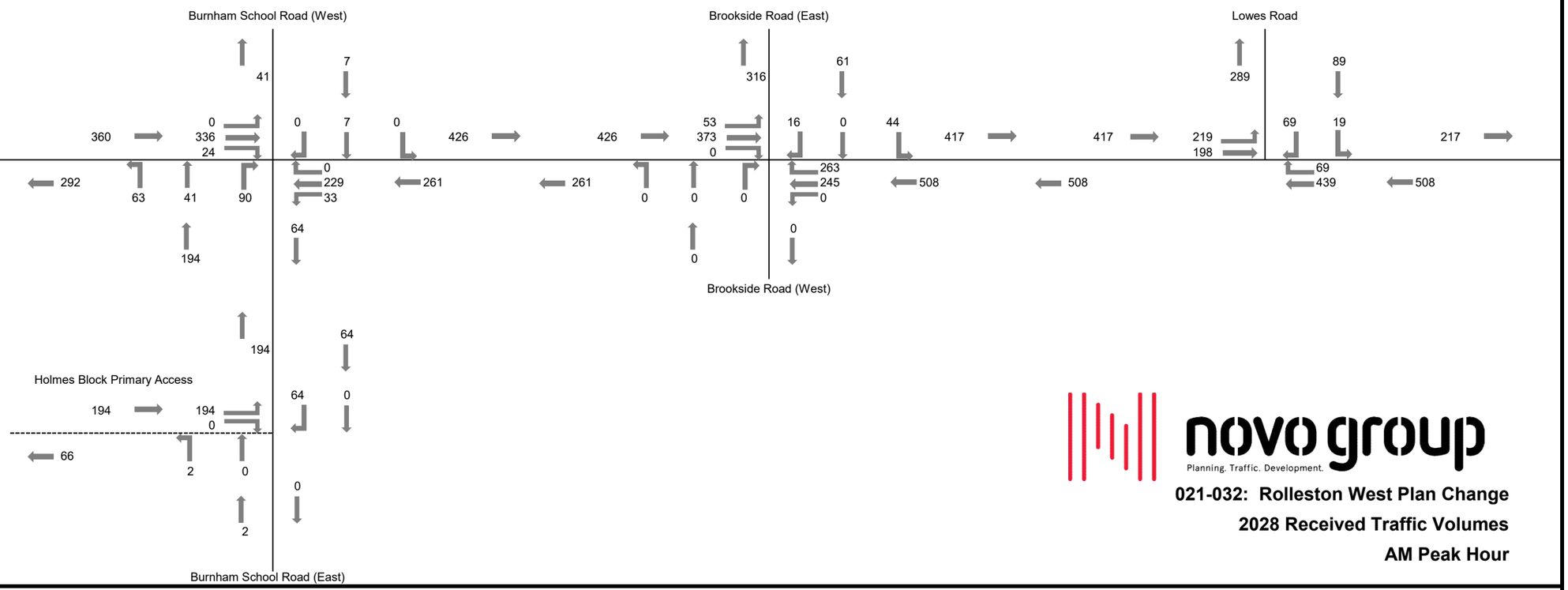
PM Peak Hour



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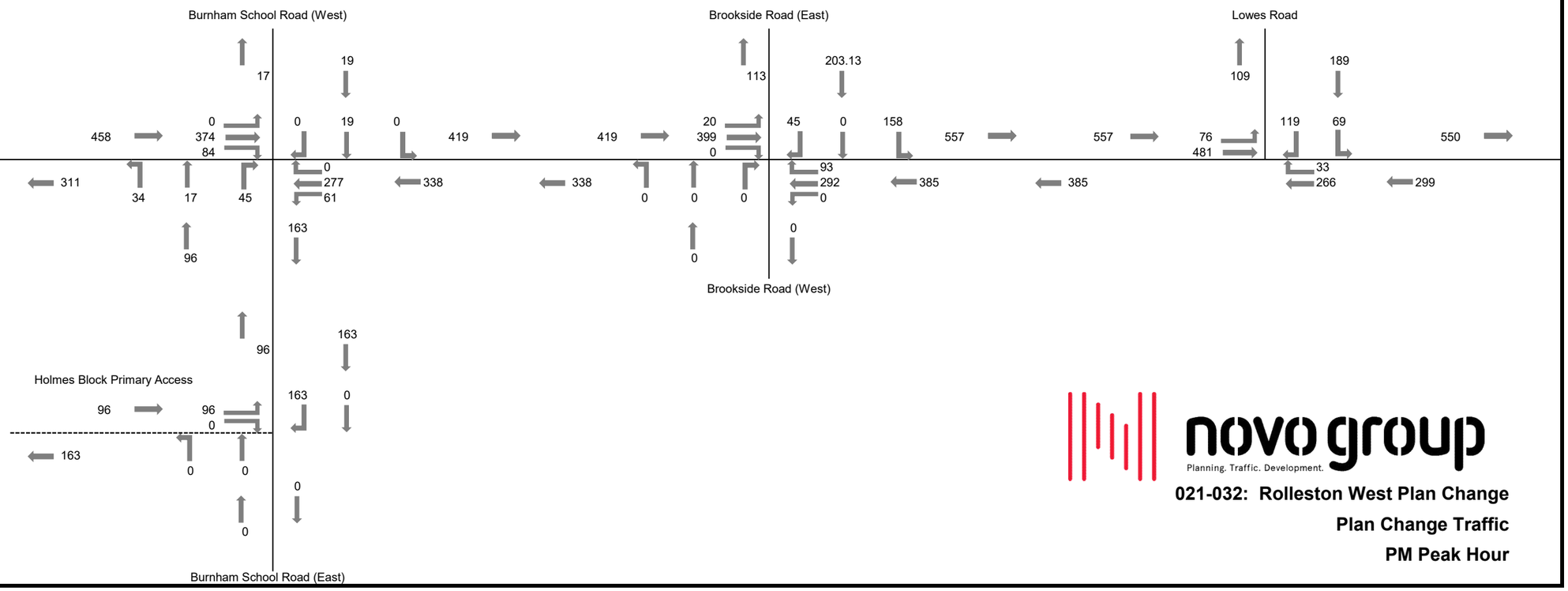
021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

AM Peak Hour



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021-032: Rolleston West Plan Change

Plan Change Traffic

PM Peak Hour

	Arr	Dep	Total
AM	214	641	855
PM	539	316	855

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021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

AM Peak Hour

	Arr	Dep	Total
AM	214	641	855
PM	539	316	855

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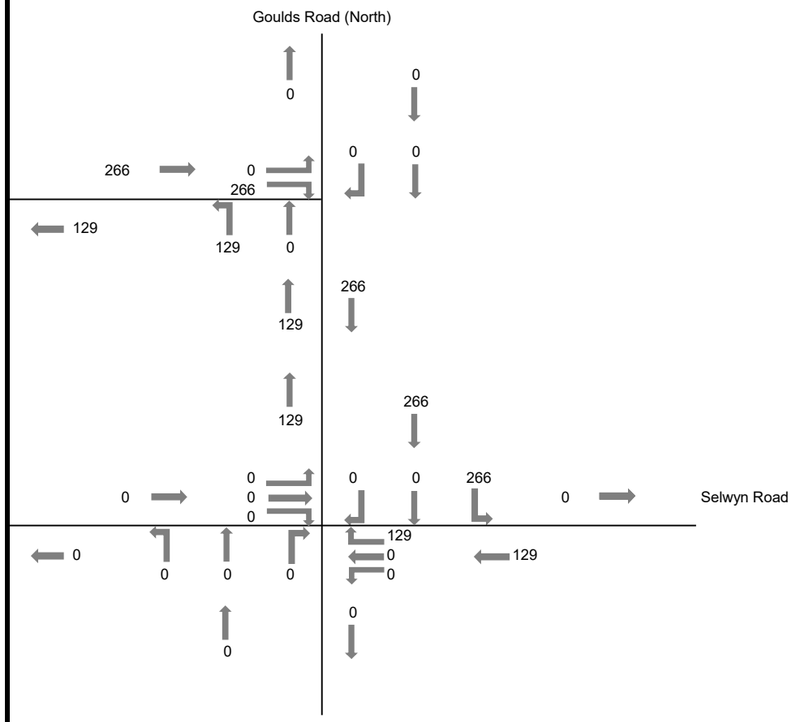
021-032: Rolleston West Plan Change

Plan Change Traffic

PM Peak Hour



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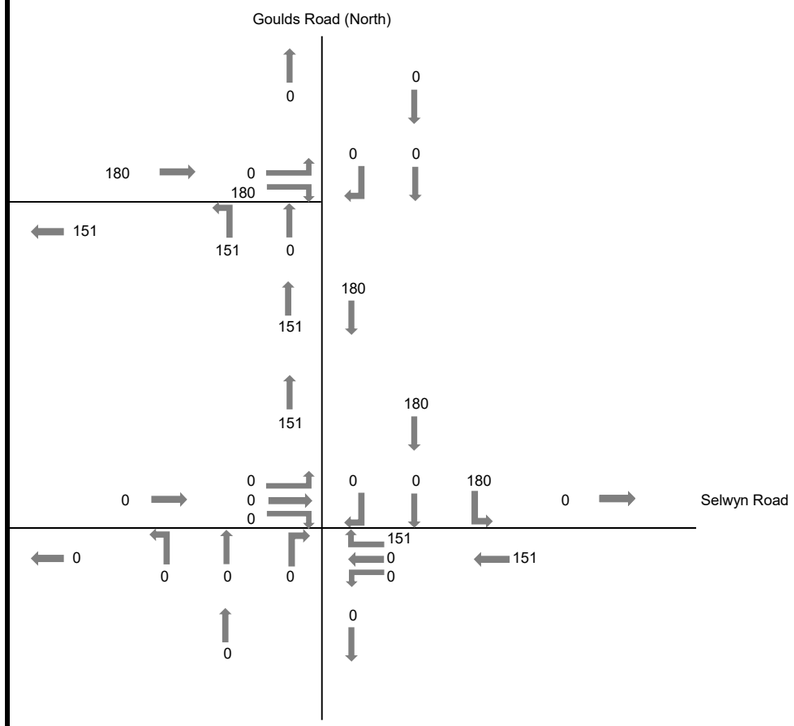
021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

AM Peak Hour



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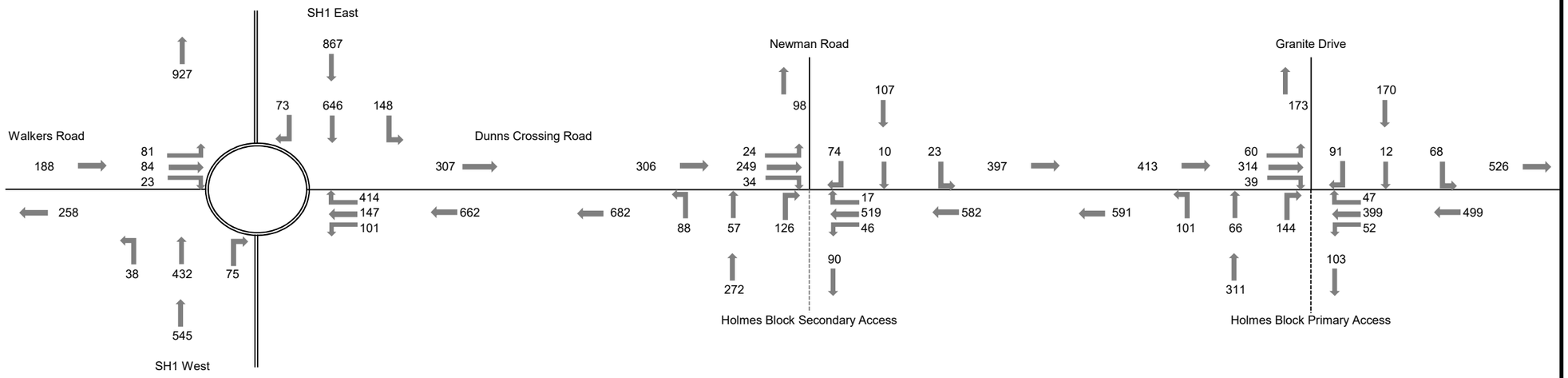
021-032: Rolleston West Plan Change

Plan Change Traffic

PM Peak Hour



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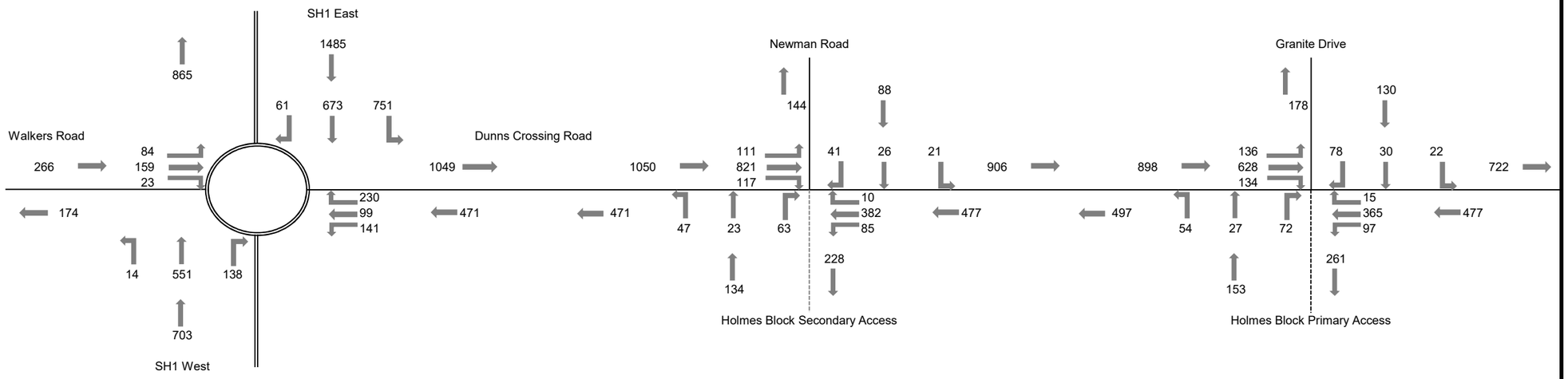
021-032: Rolleston West Plan Change

Base Plus Plan Change

AM Peak Hour



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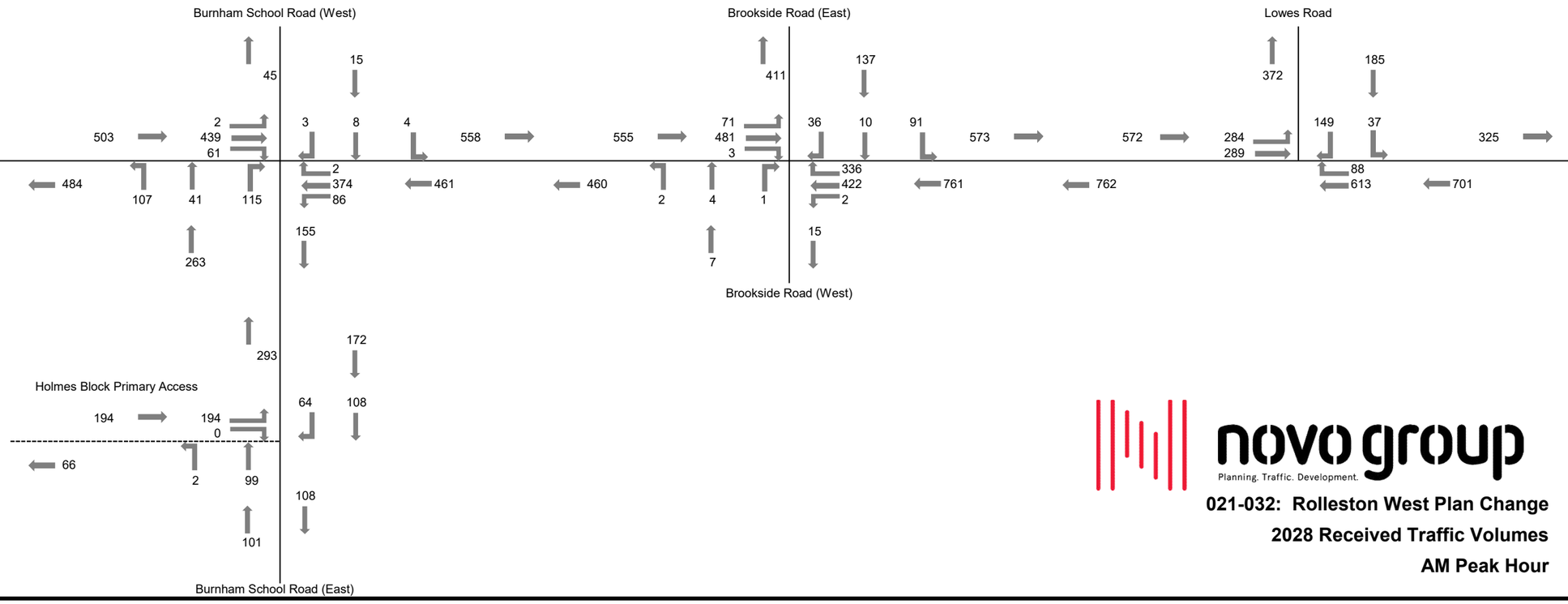
021-032: Rolleston West Plan Change

Base Plus Plan Change

PM Peak Hour



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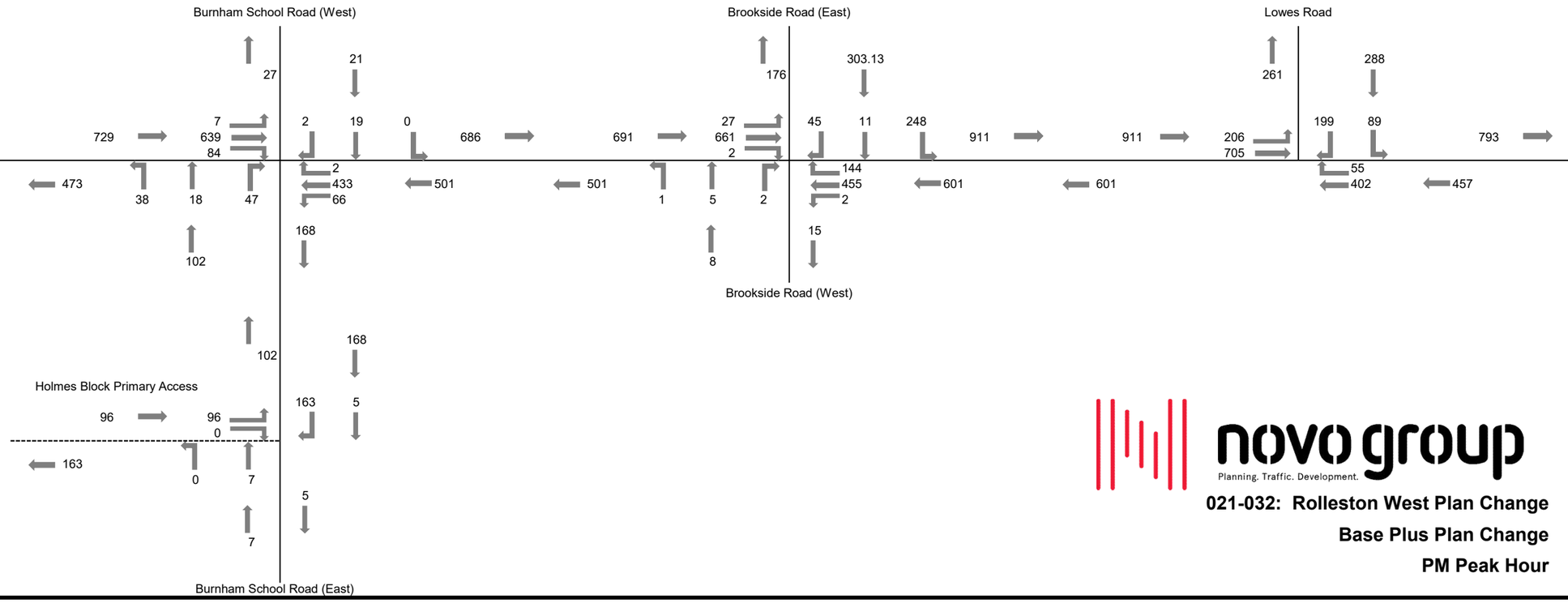
021-032: Rolleston West Plan Change

2028 Received Traffic Volumes

AM Peak Hour



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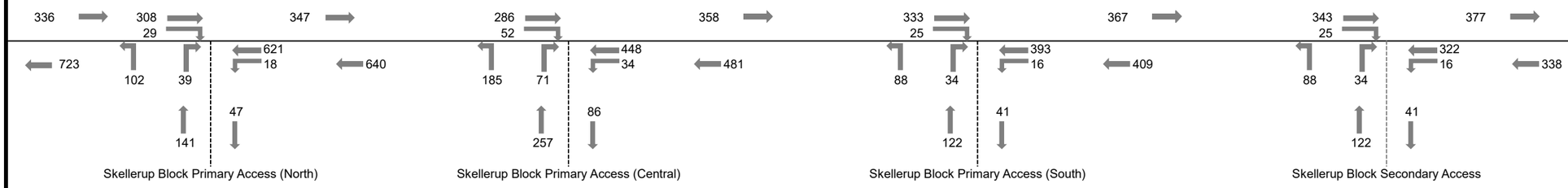
021-032: Rolleston West Plan Change

Base Plus Plan Change

PM Peak Hour



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2028 Received Traffic Volumes

AM Peak Hour

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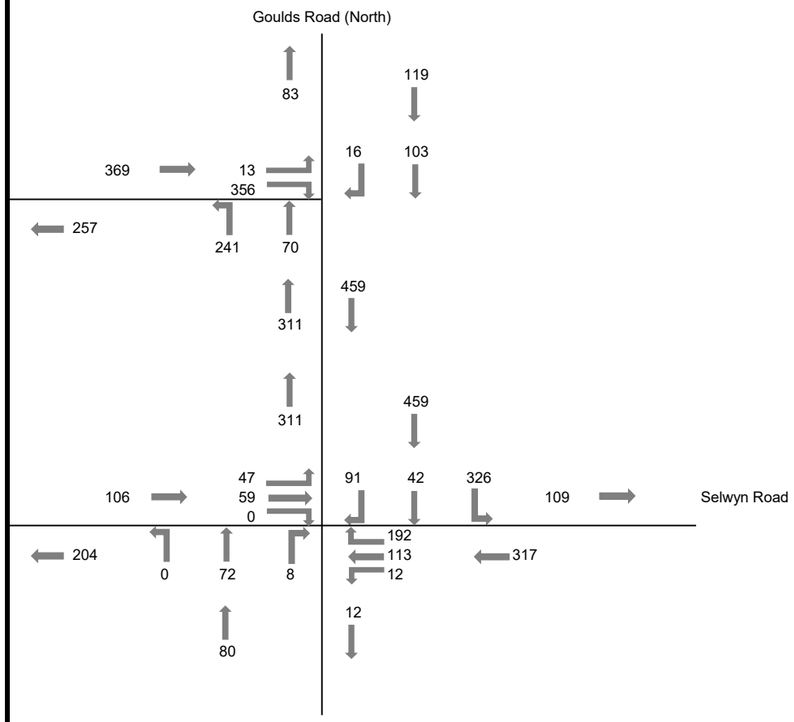
Base Plus Plan Change

PM Peak Hour



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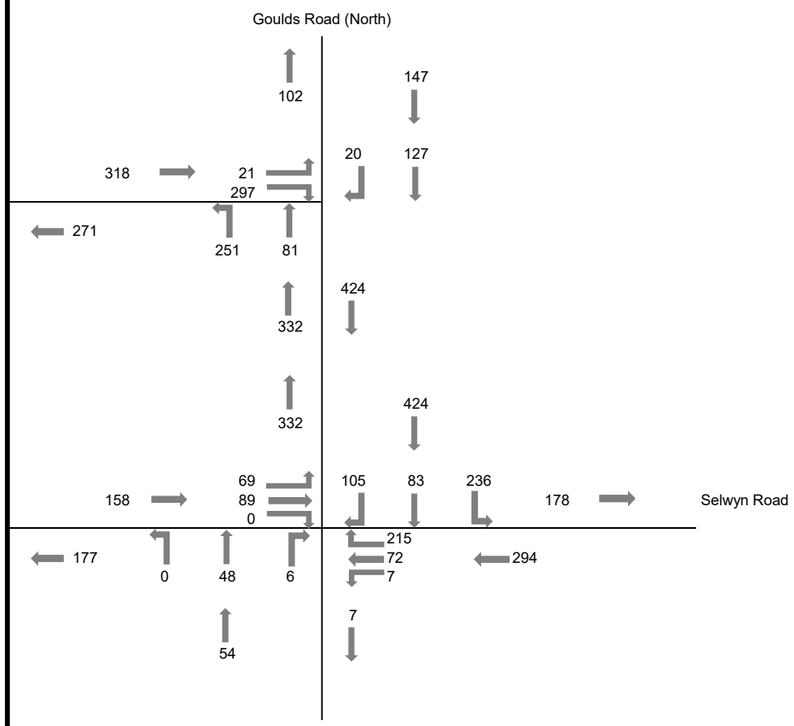
2028 Received Traffic Volumes

AM Peak Hour



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Base Plus Plan Change

PM Peak Hour

Appendix 3

Dunns Crossing Rd / Newman Rd / Access Traffic Model Results

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Newman / Access - 2028 AM (Site Folder: Dunns X-ing / Newman)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Rd														
1	L2	46	0.0	48	0.0	0.306	5.0	LOS A	0.2	1.7	0.05	0.06	0.05	49.0
2	T1	519	0.0	546	0.0	0.306	0.1	LOS A	0.2	1.7	0.05	0.06	0.05	49.5
3	R2	17	0.0	18	0.0	0.306	5.9	LOS A	0.2	1.7	0.05	0.06	0.05	49.1
Approach		582	0.0	613	0.0	0.306	0.6	NA	0.2	1.7	0.05	0.06	0.05	49.5
East: Newman Road														
4	L2	23	0.0	24	0.0	0.042	5.4	LOS A	0.1	1.0	0.40	0.59	0.40	45.4
5	T1	10	0.0	11	0.0	0.042	9.8	LOS A	0.1	1.0	0.40	0.59	0.40	45.5
6	R2	74	0.0	78	0.0	0.249	15.7	LOS C	0.9	6.0	0.78	0.93	0.87	40.6
Approach		107	0.0	113	0.0	0.249	12.9	LOS B	0.9	6.0	0.66	0.82	0.72	42.0
North: Dunns Crossing Rd														
7	L2	24	0.0	25	0.0	0.180	6.9	LOS A	0.5	3.8	0.22	0.10	0.22	48.2
8	T1	249	0.0	262	0.0	0.180	0.7	LOS A	0.5	3.8	0.22	0.10	0.22	48.7
9	R2	34	0.0	36	0.0	0.180	7.6	LOS A	0.5	3.8	0.22	0.10	0.22	48.3
Approach		307	0.0	323	0.0	0.180	1.9	NA	0.5	3.8	0.22	0.10	0.22	48.6
West: Site Access														
10	L2	88	0.0	93	0.0	0.229	7.1	LOS A	0.9	6.1	0.59	0.78	0.61	44.4
11	T1	57	0.0	60	0.0	0.229	10.5	LOS B	0.9	6.1	0.59	0.78	0.61	44.5
12	R2	126	0.0	133	0.0	0.371	15.5	LOS C	1.5	10.3	0.77	0.97	1.00	40.8
Approach		271	0.0	285	0.0	0.371	11.7	LOS B	1.5	10.3	0.68	0.87	0.79	42.7
All Vehicles		1267	0.0	1334	0.0	0.371	4.4	NA	1.5	10.3	0.27	0.31	0.30	47.0

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

Organisation: NOVO GROUP LIMITED | Licence: PLUS / 1PC | Processed: Monday 9 November 2020 8:19:55 am
Project: S:\Novo Projects\020-100 Favourites\021 Carter Group\021032 Rolleston West Plan Change\03 Transport\Sidra\021-032 - Rolleston West Plan Change - 2020-11-06.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Newman / Access - 2028 PM (Site Folder: Dunns X-ing / Newman)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Rd														
1	L2	85	0.0	89	0.0	0.264	6.8	LOS A	0.6	4.2	0.12	0.10	0.14	48.2
2	T1	382	0.0	402	0.0	0.264	0.7	LOS A	0.6	4.2	0.12	0.10	0.14	48.6
3	R2	10	0.0	11	0.0	0.264	14.0	LOS B	0.6	4.2	0.12	0.10	0.14	48.2
Approach		477	0.0	502	0.0	0.264	2.1	NA	0.6	4.2	0.12	0.10	0.14	48.5
East: Newman Road														
4	L2	21	0.0	22	0.0	0.257	11.4	LOS B	0.8	5.6	0.88	0.97	0.97	37.5
5	T1	26	0.0	27	0.0	0.257	33.5	LOS D	0.8	5.6	0.88	0.97	0.97	37.6
6	R2	41	0.0	43	0.0	0.418	46.8	LOS E	1.3	9.0	0.94	1.03	1.14	30.2
Approach		88	0.0	93	0.0	0.418	34.4	LOS D	1.3	9.0	0.91	0.99	1.05	33.7
North: Dunns Crossing Rd														
7	L2	111	0.0	117	0.0	0.599	8.0	LOS A	4.0	28.2	0.31	0.12	0.48	47.6
8	T1	821	0.0	864	0.0	0.599	1.4	LOS A	4.0	28.2	0.31	0.12	0.48	48.0
9	R2	117	0.0	123	0.0	0.599	9.5	LOS A	4.0	28.2	0.31	0.12	0.48	47.6
Approach		1049	0.0	1104	0.0	0.599	3.0	NA	4.0	28.2	0.31	0.12	0.48	47.9
West: Site Access														
10	L2	47	0.0	49	0.0	0.255	7.0	LOS A	0.8	5.8	0.68	0.79	0.74	40.5
11	T1	23	0.0	24	0.0	0.255	35.9	LOS E	0.8	5.8	0.68	0.79	0.74	40.6
12	R2	63	0.0	66	0.0	0.577	49.6	LOS E	2.0	13.8	0.95	1.08	1.33	29.5
Approach		133	0.0	140	0.0	0.577	32.2	LOS D	2.0	13.8	0.81	0.93	1.02	34.4
All Vehicles		1747	0.0	1839	0.0	0.599	6.6	NA	4.0	28.2	0.33	0.22	0.46	45.7

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

Appendix 4

Dunns Crossing Rd / Granite Dr / Access Traffic Model Results

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Granite / Access - 2028 AM (Site Folder: Dunns X-ing / Granite)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Rd														
1	L2	52	0.0	55	0.0	0.275	5.7	LOS A	0.7	4.7	0.16	0.10	0.16	48.5
2	T1	399	0.0	420	0.0	0.275	0.3	LOS A	0.7	4.7	0.16	0.10	0.16	48.9
3	R2	47	0.0	49	0.0	0.275	6.5	LOS A	0.7	4.7	0.16	0.10	0.16	48.3
Approach		498	0.0	524	0.0	0.275	1.5	NA	0.7	4.7	0.16	0.10	0.16	48.8
East: Granite Drive														
4	L2	68	0.0	72	0.0	0.392	7.4	LOS A	1.7	12.1	0.63	0.86	0.86	42.0
5	T1	12	0.0	13	0.0	0.392	12.4	LOS B	1.7	12.1	0.63	0.86	0.86	42.1
6	R2	91	0.0	96	0.0	0.392	17.6	LOS C	1.7	12.1	0.63	0.86	0.86	41.9
Approach		171	0.0	180	0.0	0.392	13.2	LOS B	1.7	12.1	0.63	0.86	0.86	41.9
North: Dunns Crossing Rd														
7	L2	60	0.0	63	0.0	0.232	5.8	LOS A	0.6	4.2	0.18	0.12	0.18	48.3
8	T1	314	0.0	331	0.0	0.232	0.4	LOS A	0.6	4.2	0.18	0.12	0.18	48.8
9	R2	39	0.0	41	0.0	0.232	6.9	LOS A	0.6	4.2	0.18	0.12	0.18	48.1
Approach		413	0.0	435	0.0	0.232	1.8	NA	0.6	4.2	0.18	0.12	0.18	48.6
West: Site Access														
10	L2	101	0.0	106	0.0	0.677	11.5	LOS B	4.5	31.7	0.77	1.17	1.57	40.2
11	T1	66	0.0	69	0.0	0.677	17.0	LOS C	4.5	31.7	0.77	1.17	1.57	40.3
12	R2	144	0.0	152	0.0	0.677	21.0	LOS C	4.5	31.7	0.77	1.17	1.57	40.0
Approach		311	0.0	327	0.0	0.677	17.1	LOS C	4.5	31.7	0.77	1.17	1.57	40.1
All Vehicles		1393	0.0	1466	0.0	0.677	6.5	NA	4.5	31.7	0.36	0.44	0.57	45.6

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

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Granite / Access - 2028 PM (Site Folder: Dunns X-ing / Granite)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Rd														
1	L2	97	0.0	102	0.0	0.264	6.0	LOS A	0.5	3.8	0.12	0.12	0.14	48.2
2	T1	365	0.0	384	0.0	0.264	0.6	LOS A	0.5	3.8	0.12	0.12	0.14	48.7
3	R2	15	0.0	16	0.0	0.264	10.6	LOS B	0.5	3.8	0.12	0.12	0.14	48.0
Approach		477	0.0	502	0.0	0.264	2.0	NA	0.5	3.8	0.12	0.12	0.14	48.6
East: Granite Drive														
4	L2	22	0.0	23	0.0	0.702	21.6	LOS C	3.2	22.1	0.93	1.19	1.70	32.8
5	T1	30	0.0	32	0.0	0.702	36.9	LOS E	3.2	22.1	0.93	1.19	1.70	32.9
6	R2	78	0.0	82	0.0	0.702	42.3	LOS E	3.2	22.1	0.93	1.19	1.70	32.7
Approach		130	0.0	137	0.0	0.702	37.6	LOS E	3.2	22.1	0.93	1.19	1.70	32.8
North: Dunns Crossing Rd														
7	L2	136	0.0	143	0.0	0.528	7.5	LOS A	3.8	26.6	0.36	0.17	0.52	47.2
8	T1	628	0.0	661	0.0	0.528	1.6	LOS A	3.8	26.6	0.36	0.17	0.52	47.7
9	R2	134	0.0	141	0.0	0.528	8.8	LOS A	3.8	26.6	0.36	0.17	0.52	47.0
Approach		898	0.0	945	0.0	0.528	3.5	NA	3.8	26.6	0.36	0.17	0.52	47.5
West: Site Access														
10	L2	54	0.0	57	0.0	0.627	14.9	LOS B	3.0	20.7	0.82	1.10	1.45	36.0
11	T1	27	0.0	28	0.0	0.627	34.3	LOS D	3.0	20.7	0.82	1.10	1.45	36.1
12	R2	72	0.0	76	0.0	0.627	34.9	LOS D	3.0	20.7	0.82	1.10	1.45	35.9
Approach		153	0.0	161	0.0	0.627	27.7	LOS D	3.0	20.7	0.82	1.10	1.45	35.9
All Vehicles		1658	0.0	1745	0.0	0.702	8.0	NA	3.8	26.6	0.38	0.32	0.59	44.9

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

Organisation: NOVO GROUP LIMITED | Licence: PLUS / 1PC | Processed: Monday, 9 November 2020 8:15:54 am
Project: S:\Novo Projects\020-100 Favourites\021 Carter Group\021032 Rolleston West Plan Change\03 Transport\Sidra\021-032 - Rolleston West Plan Change - 2020-11-06.sip9

Appendix 5

Burnham School Rd / Access Traffic Model Results

MOVEMENT SUMMARY

▽ Site: 101 [Burnham Schhol / Access - 2028 AM (Site Folder: Burnham School / Access)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Burnham School Road														
5	T1	108	0.0	114	0.0	0.100	0.2	LOS A	0.4	2.7	0.16	0.20	0.16	48.4
6	R2	64	0.0	67	0.0	0.100	4.9	LOS A	0.4	2.7	0.16	0.20	0.16	47.5
Approach		172	0.0	181	0.0	0.100	1.9	NA	0.4	2.7	0.16	0.20	0.16	48.1
North: Access														
7	L2	194	0.0	204	0.0	0.137	4.9	LOS A	0.6	4.2	0.21	0.51	0.21	46.1
9	R2	1	0.0	1	0.0	0.137	5.8	LOS A	0.6	4.2	0.21	0.51	0.21	45.7
Approach		195	0.0	205	0.0	0.137	4.9	LOS A	0.6	4.2	0.21	0.51	0.21	46.1
West: Burnham School Road														
10	L2	2	0.0	2	0.0	0.055	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
11	T1	99	0.0	104	0.0	0.055	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		101	0.0	106	0.0	0.055	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
All Vehicles		468	0.0	493	0.0	0.137	2.8	NA	0.6	4.2	0.15	0.29	0.15	47.6

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

MOVEMENT SUMMARY

Site: 101 [Burnham Schhol / Access - 2028 PM (Site Folder: Burnham School / Access)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Burnham School Road														
5	T1	5	0.0	5	0.0	0.099	0.0	LOS A	0.5	3.4	0.05	0.52	0.05	47.0
6	R2	163	0.0	172	0.0	0.099	4.6	LOS A	0.5	3.4	0.05	0.52	0.05	46.2
Approach		168	0.0	177	0.0	0.099	4.4	NA	0.5	3.4	0.05	0.52	0.05	46.2
North: Access														
7	L2	96	0.0	101	0.0	0.063	4.6	LOS A	0.3	1.8	0.04	0.51	0.04	46.5
9	R2	1	0.0	1	0.0	0.063	5.2	LOS A	0.3	1.8	0.04	0.51	0.04	46.1
Approach		97	0.0	102	0.0	0.063	4.6	LOS A	0.3	1.8	0.04	0.51	0.04	46.5
West: Burnham School Road														
10	L2	1	0.0	1	0.0	0.004	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	49.1
11	T1	7	0.0	7	0.0	0.004	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	49.6
Approach		8	0.0	8	0.0	0.004	0.6	NA	0.0	0.0	0.00	0.07	0.00	49.5
All Vehicles		273	0.0	287	0.0	0.099	4.4	NA	0.5	3.4	0.04	0.51	0.04	46.4

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

Appendix 6

Dunns Crossing Rd / Northern Primary Access Traffic Model Results

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / North Primary - 2028 AM (Site Folder: Dunns X-ing / North Primary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	18	0.0	19	0.0	0.330	4.7	LOS A	0.0	0.0	0.00	0.02	0.00	49.3
2	T1	621	0.0	654	0.0	0.330	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		639	0.0	673	0.0	0.330	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
North: Dunns Crossing Road														
8	T1	308	0.0	324	0.0	0.195	0.7	LOS A	0.5	3.2	0.16	0.05	0.16	49.1
9	R2	29	0.0	31	0.0	0.195	8.4	LOS A	0.5	3.2	0.16	0.05	0.16	48.4
Approach		337	0.0	355	0.0	0.195	1.3	NA	0.5	3.2	0.16	0.05	0.16	49.0
West: Access														
10	L2	102	0.0	107	0.0	0.233	8.0	LOS A	0.9	6.1	0.62	0.84	0.66	44.0
12	R2	39	0.0	41	0.0	0.233	12.6	LOS B	0.9	6.1	0.62	0.84	0.66	43.8
Approach		141	0.0	148	0.0	0.233	9.3	LOS A	0.9	6.1	0.62	0.84	0.66	43.9
All Vehicles		1117	0.0	1176	0.0	0.330	1.7	NA	0.9	6.1	0.13	0.13	0.13	48.7

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

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / North Primary - 2028 PM (Site Folder: Dunns X-ing / North Primary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	16	0.0	17	0.0	0.226	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.3
2	T1	421	0.0	443	0.0	0.226	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		437	0.0	460	0.0	0.226	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
North: Dunns Crossing Road														
8	T1	715	0.0	753	0.0	0.466	0.9	LOS A	2.0	14.2	0.23	0.08	0.30	48.8
9	R2	102	0.0	107	0.0	0.466	7.9	LOS A	2.0	14.2	0.23	0.08	0.30	48.1
Approach		817	0.0	860	0.0	0.466	1.8	NA	2.0	14.2	0.23	0.08	0.30	48.7
West: Access														
10	L2	49	0.0	52	0.0	0.140	6.2	LOS A	0.5	3.2	0.56	0.72	0.56	43.7
12	R2	21	0.0	22	0.0	0.140	18.4	LOS C	0.5	3.2	0.56	0.72	0.56	43.5
Approach		70	0.0	74	0.0	0.140	9.9	LOS A	0.5	3.2	0.56	0.72	0.56	43.6
All Vehicles		1324	0.0	1394	0.0	0.466	1.7	NA	2.0	14.2	0.17	0.10	0.21	48.8

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

Appendix 7

Dunns Crossing Rd / Central Primary Access Traffic Model Results

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Central Primary - 2028 AM (Site Folder: Dunns X-ing / Central Primary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	34	0.0	36	0.0	0.249	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.2
2	T1	448	0.0	472	0.0	0.249	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
Approach		482	0.0	507	0.0	0.249	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.6
North: Dunns Crossing Road														
8	T1	286	0.0	301	0.0	0.200	0.7	LOS A	0.6	4.3	0.22	0.10	0.22	48.9
9	R2	52	0.0	55	0.0	0.200	7.0	LOS A	0.6	4.3	0.22	0.10	0.22	48.2
Approach		338	0.0	356	0.0	0.200	1.7	NA	0.6	4.3	0.22	0.10	0.22	48.8
West: Access														
10	L2	185	0.0	195	0.0	0.329	7.1	LOS A	1.5	10.6	0.56	0.80	0.66	44.6
12	R2	71	0.0	75	0.0	0.329	10.9	LOS B	1.5	10.6	0.56	0.80	0.66	44.4
Approach		256	0.0	269	0.0	0.329	8.2	LOS A	1.5	10.6	0.56	0.80	0.66	44.5
All Vehicles		1076	0.0	1133	0.0	0.329	2.6	NA	1.5	10.6	0.20	0.24	0.23	48.1

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

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Central Primary - 2028 PM (Site Folder: Dunns X-ing / Central Primary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	29	0.0	31	0.0	0.193	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.2
2	T1	344	0.0	362	0.0	0.193	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
Approach		373	0.0	393	0.0	0.193	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.6
North: Dunns Crossing Road														
8	T1	544	0.0	573	0.0	0.443	1.3	LOS A	2.9	20.1	0.36	0.18	0.45	48.1
9	R2	186	0.0	196	0.0	0.443	7.2	LOS A	2.9	20.1	0.36	0.18	0.45	47.5
Approach		730	0.0	768	0.0	0.443	2.8	NA	2.9	20.1	0.36	0.18	0.45	48.0
West: Access														
10	L2	89	0.0	94	0.0	0.203	5.9	LOS A	0.7	5.0	0.51	0.69	0.51	44.3
12	R2	38	0.0	40	0.0	0.203	14.9	LOS B	0.7	5.0	0.51	0.69	0.51	44.1
Approach		127	0.0	134	0.0	0.203	8.6	LOS A	0.7	5.0	0.51	0.69	0.51	44.3
All Vehicles		1230	0.0	1295	0.0	0.443	2.7	NA	2.9	20.1	0.27	0.19	0.32	48.0

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

Appendix 8

Dunns Crossing Rd / Southern Primary Access Traffic Model Results

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / South Primary - 2028 AM (Site Folder: Dunns X-ing / South Primary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	16	0.0	17	0.0	0.211	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.3
2	T1	393	0.0	414	0.0	0.211	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		409	0.0	431	0.0	0.211	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
North: Dunns Crossing Road														
8	T1	333	0.0	351	0.0	0.195	0.2	LOS A	0.3	2.0	0.10	0.04	0.10	49.5
9	R2	25	0.0	26	0.0	0.195	6.5	LOS A	0.3	2.0	0.10	0.04	0.10	48.8
Approach		358	0.0	377	0.0	0.195	0.7	NA	0.3	2.0	0.10	0.04	0.10	49.5
West: Access														
10	L2	88	0.0	93	0.0	0.147	6.2	LOS A	0.5	3.8	0.48	0.69	0.48	45.2
12	R2	34	0.0	36	0.0	0.147	9.2	LOS A	0.5	3.8	0.48	0.69	0.48	45.0
Approach		122	0.0	128	0.0	0.147	7.0	LOS A	0.5	3.8	0.48	0.69	0.48	45.2
All Vehicles		889	0.0	936	0.0	0.211	1.3	NA	0.5	3.8	0.10	0.12	0.10	49.0

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

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / South Primary - 2028 PM (Site Folder: Dunns X-ing / South Primary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	14	0.0	15	0.0	0.179	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.3
2	T1	332	0.0	349	0.0	0.179	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		346	0.0	364	0.0	0.179	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
North: Dunns Crossing Road														
8	T1	494	0.0	520	0.0	0.328	0.5	LOS A	1.0	6.8	0.20	0.09	0.20	49.0
9	R2	86	0.0	91	0.0	0.328	6.4	LOS A	1.0	6.8	0.20	0.09	0.20	48.3
Approach		580	0.0	611	0.0	0.328	1.4	NA	1.0	6.8	0.20	0.09	0.20	48.9
West: Access														
10	L2	42	0.0	44	0.0	0.080	5.8	LOS A	0.3	1.9	0.45	0.65	0.45	45.0
12	R2	18	0.0	19	0.0	0.080	11.0	LOS B	0.3	1.9	0.45	0.65	0.45	44.8
Approach		60	0.0	63	0.0	0.080	7.3	LOS A	0.3	1.9	0.45	0.65	0.45	45.0
All Vehicles		986	0.0	1038	0.0	0.328	1.3	NA	1.0	6.8	0.14	0.10	0.14	48.9

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

Organisation: NOVO GROUP LIMITED | Licence: PLUS / 1PC | Processed: Sunday, 8 November 2020 8:37:18 am
Project: S:\Novo Projects\020-100 Favourites\021 Carter Group\021032 Rolleston West Plan Change\03 Transport\Sidra\021-032 - Rolleston West Plan Change - 2020-11-06.sip9

Appendix 9

Dunns Crossing Rd / Southern Secondary Access Traffic Model Results

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Secondary - 2028 AM (Site Folder: Dunns X-ing / Secondary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	16	0.0	17	0.0	0.175	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.3
2	T1	322	0.0	339	0.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
Approach		338	0.0	356	0.0	0.175	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.8
North: Dunns Crossing Road														
8	T1	343	0.0	361	0.0	0.198	0.2	LOS A	0.3	1.8	0.08	0.04	0.08	49.6
9	R2	25	0.0	26	0.0	0.198	6.1	LOS A	0.3	1.8	0.08	0.04	0.08	48.8
Approach		368	0.0	387	0.0	0.198	0.6	NA	0.3	1.8	0.08	0.04	0.08	49.5
West: Access														
10	L2	88	0.0	93	0.0	0.135	5.8	LOS A	0.5	3.5	0.43	0.65	0.43	45.5
12	R2	34	0.0	36	0.0	0.135	8.6	LOS A	0.5	3.5	0.43	0.65	0.43	45.2
Approach		122	0.0	128	0.0	0.135	6.6	LOS A	0.5	3.5	0.43	0.65	0.43	45.4
All Vehicles		828	0.0	872	0.0	0.198	1.3	NA	0.5	3.5	0.10	0.12	0.10	49.0

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

Organisation: NOVO GROUP LIMITED | Licence: PLUS / 1PC | Processed: Sunday, 8 November 2020 8:39:37 am
Project: S:\Novo Projects\020-100 Favourites\021 Carter Group\021032 Rolleston West Plan Change\03 Transport\Sidra\021-032 - Rolleston West Plan Change - 2020-11-06.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Secondary - 2028 PM (Site Folder: Dunns X-ing / Secondary)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	14	0.0	15	0.0	0.164	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	49.3
2	T1	304	0.0	320	0.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		318	0.0	335	0.0	0.164	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.8
North: Dunns Crossing Road														
8	T1	424	0.0	446	0.0	0.291	0.5	LOS A	0.9	6.4	0.20	0.10	0.20	48.9
9	R2	88	0.0	93	0.0	0.291	6.2	LOS A	0.9	6.4	0.20	0.10	0.20	48.2
Approach		512	0.0	539	0.0	0.291	1.4	NA	0.9	6.4	0.20	0.10	0.20	48.8
West: Access														
10	L2	42	0.0	44	0.0	0.073	5.6	LOS A	0.3	1.8	0.42	0.63	0.42	45.3
12	R2	18	0.0	19	0.0	0.073	9.8	LOS A	0.3	1.8	0.42	0.63	0.42	45.1
Approach		60	0.0	63	0.0	0.073	6.9	LOS A	0.3	1.8	0.42	0.63	0.42	45.2
All Vehicles		890	0.0	937	0.0	0.291	1.4	NA	0.9	6.4	0.15	0.11	0.15	48.9

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

Appendix 10

SH1 / Dunns Crossing Rd / Walkers Rd Traffic Model Results

MOVEMENT SUMMARY

Site: 101 [SH1 / Dunns X-ing / Walker - 2028 AM (Site Folder: SH1 / Dunns X-ing)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: SH1														
1	L2	38	0.0	40	0.0	0.295	7.4	LOS A	1.5	10.6	0.60	0.63	0.60	64.1
2	T1	432	0.0	455	0.0	0.295	9.1	LOS A	1.5	10.6	0.60	0.67	0.60	65.6
3	R2	75	0.0	79	0.0	0.295	14.1	LOS B	1.4	10.1	0.61	0.72	0.61	64.5
Approach		545	0.0	574	0.0	0.295	9.6	LOS A	1.5	10.6	0.60	0.68	0.60	65.4
East: Dunns Crossing Road														
4	L2	101	0.0	106	0.0	0.317	9.3	LOS A	1.4	10.1	0.62	0.74	0.62	64.4
5	T1	147	0.0	155	0.0	0.317	8.7	LOS A	1.4	10.1	0.62	0.74	0.62	66.6
6	R2	414	0.0	436	0.0	0.416	14.2	LOS B	2.2	15.6	0.64	0.86	0.67	61.0
Approach		662	0.0	697	0.0	0.416	12.2	LOS B	2.2	15.6	0.63	0.82	0.65	62.6
North: SH1														
7	L2	148	0.0	156	0.0	0.349	6.3	LOS A	2.0	14.3	0.38	0.54	0.38	65.9
8	T1	646	0.0	680	0.0	0.349	7.2	LOS A	2.0	14.3	0.39	0.56	0.39	67.4
9	R2	73	0.0	77	0.0	0.349	12.6	LOS B	2.0	14.1	0.39	0.58	0.39	66.6
Approach		867	0.0	913	0.0	0.349	7.5	LOS A	2.0	14.3	0.39	0.56	0.39	67.1
West: Walker Road														
10	L2	81	0.0	85	0.0	0.267	10.8	LOS B	1.3	8.9	0.68	0.82	0.68	63.5
11	T1	84	0.0	88	0.0	0.267	9.5	LOS A	1.3	8.9	0.68	0.82	0.68	65.4
12	R2	23	0.0	24	0.0	0.267	15.3	LOS B	1.3	8.9	0.68	0.82	0.68	65.3
Approach		188	0.0	198	0.0	0.267	10.8	LOS B	1.3	8.9	0.68	0.82	0.68	64.6
All Vehicles		2262	0.0	2381	0.0	0.416	9.7	LOS A	2.2	15.6	0.54	0.68	0.54	65.1

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

MOVEMENT SUMMARY

Site: 101 [SH1 / Dunns X-ing / Walker - 2028 PM (Site Folder: SH1 / Dunns X-ing)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: SH1														
1	L2	14	0.0	15	0.0	0.332	6.8	LOS A	1.8	12.3	0.51	0.58	0.51	64.6
2	T1	551	0.0	580	0.0	0.332	8.1	LOS A	1.8	12.3	0.52	0.61	0.52	66.1
3	R2	138	0.0	145	0.0	0.332	13.3	LOS B	1.7	12.0	0.53	0.68	0.53	64.7
Approach		703	0.0	740	0.0	0.332	9.1	LOS A	1.8	12.3	0.52	0.63	0.52	65.8
East: Dunns Crossing Road														
4	L2	141	0.0	148	0.0	0.283	10.3	LOS B	1.7	12.2	0.73	0.77	0.73	64.0
5	T1	99	0.0	104	0.0	0.283	9.0	LOS A	1.7	12.2	0.73	0.77	0.73	66.1
6	R2	230	0.0	242	0.0	0.321	15.4	LOS B	1.9	13.1	0.74	0.89	0.74	60.5
Approach		470	0.0	495	0.0	0.321	12.5	LOS B	1.9	13.1	0.73	0.83	0.73	62.6
North: SH1														
7	L2	751	0.0	791	0.0	0.662	8.3	LOS A	6.3	44.4	0.69	0.73	0.75	64.8
8	T1	673	0.0	708	0.0	0.662	9.3	LOS A	6.3	44.4	0.71	0.76	0.80	64.9
9	R2	61	0.0	64	0.0	0.662	15.1	LOS B	6.3	44.2	0.71	0.76	0.80	64.6
Approach		1485	0.0	1563	0.0	0.662	9.0	LOS A	6.3	44.4	0.70	0.74	0.77	64.9
West: Walker Road														
10	L2	84	0.0	88	0.0	0.372	10.3	LOS B	1.9	13.1	0.69	0.82	0.74	63.4
11	T1	159	0.0	167	0.0	0.372	9.6	LOS A	1.9	13.1	0.69	0.82	0.74	65.3
12	R2	23	0.0	24	0.0	0.372	15.5	LOS B	1.9	13.1	0.69	0.82	0.74	65.2
Approach		266	0.0	280	0.0	0.372	10.4	LOS B	1.9	13.1	0.69	0.82	0.74	64.7
All Vehicles		2924	0.0	3078	0.0	0.662	9.7	LOS A	6.3	44.4	0.66	0.74	0.70	64.7

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

Appendix 11

Burnham School Rd / Dunns Crossing Rd Traffic Model Results

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Burnham School - 2028 AM (Site Folder: Dunns X-ing / Burnham School)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	86	0.0	91	0.0	0.595	26.2	LOS C	16.4	114.8	0.83	0.74	0.83	38.0
2	T1	374	0.0	394	0.0	0.595	21.6	LOS C	16.4	114.8	0.83	0.74	0.83	38.2
3	R2	2	0.0	2	0.0	0.017	48.3	LOS D	0.1	0.6	0.95	0.61	0.95	29.8
Approach		462	0.0	486	0.0	0.595	22.6	LOS C	16.4	114.8	0.83	0.74	0.83	38.1
East: Burnham School Road														
4	L2	4	0.0	4	0.0	0.049	41.8	LOS D	0.5	3.4	0.90	0.64	0.90	32.4
5	T1	8	0.0	8	0.0	0.049	37.3	LOS D	0.5	3.4	0.90	0.64	0.90	32.6
6	R2	3	0.0	3	0.0	0.015	43.5	LOS D	0.1	0.9	0.91	0.63	0.91	31.0
Approach		15	0.0	16	0.0	0.049	39.7	LOS D	0.5	3.4	0.90	0.64	0.90	32.3
North: Dunns Crossing Road														
7	L2	2	0.0	2	0.0	0.609	25.8	LOS C	15.5	108.2	0.81	0.71	0.81	38.4
8	T1	439	0.0	462	0.0	*0.609	21.2	LOS C	15.5	108.2	0.81	0.71	0.81	38.7
9	R2	61	0.0	64	0.0	*0.519	51.8	LOS D	2.9	20.6	1.00	0.76	1.01	29.0
Approach		502	0.0	528	0.0	0.609	25.0	LOS C	15.5	108.2	0.84	0.72	0.84	37.2
West: Burnham School Road														
10	L2	107	0.0	113	0.0	0.621	46.3	LOS D	6.8	47.6	0.99	0.82	1.03	30.7
11	T1	41	0.0	43	0.0	*0.621	41.7	LOS D	6.8	47.6	0.99	0.82	1.03	30.9
12	R2	115	0.0	121	0.0	*0.587	47.9	LOS D	5.3	37.4	1.00	0.80	1.02	29.9
Approach		263	0.0	277	0.0	0.621	46.3	LOS D	6.8	47.6	0.99	0.81	1.02	30.4
All Vehicles		1242	0.0	1307	0.0	0.621	28.8	LOS C	16.4	114.8	0.87	0.75	0.87	35.8

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

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Burnham School - 2028 PM (Site Folder: Dunns X-ing / Burnham School)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
1	L2	66	0.0	69	0.0	0.532	20.4	LOS C	15.4	107.7	0.72	0.66	0.72	40.5
2	T1	433	0.0	456	0.0	0.532	15.8	LOS B	15.4	107.7	0.72	0.66	0.72	40.8
3	R2	2	0.0	2	0.0	0.017	48.3	LOS D	0.1	0.6	0.95	0.61	0.95	29.8
Approach		501	0.0	527	0.0	0.532	16.5	LOS B	15.4	107.7	0.72	0.66	0.72	40.7
East: Burnham School Road														
4	L2	1	0.0	1	0.0	0.122	46.9	LOS D	0.9	6.2	0.95	0.67	0.95	31.4
5	T1	19	0.0	20	0.0	0.122	42.4	LOS D	0.9	6.2	0.95	0.67	0.95	31.6
6	R2	2	0.0	2	0.0	0.017	48.3	LOS D	0.1	0.6	0.95	0.61	0.95	29.8
Approach		22	0.0	23	0.0	0.122	43.1	LOS D	0.9	6.2	0.95	0.67	0.95	31.4
North: Dunns Crossing Road														
7	L2	7	0.0	7	0.0	0.741	22.3	LOS C	22.3	156.3	0.81	0.73	0.81	39.9
8	T1	639	0.0	673	0.0	*0.741	17.7	LOS B	22.3	156.3	0.81	0.73	0.81	40.2
9	R2	84	0.0	88	0.0	*0.714	53.9	LOS D	4.2	29.5	1.00	0.86	1.21	26.5
Approach		730	0.0	768	0.0	0.741	21.9	LOS C	22.3	156.3	0.83	0.74	0.86	38.4
West: Burnham School Road														
10	L2	38	0.0	40	0.0	0.352	48.5	LOS D	2.6	18.0	0.98	0.74	0.98	30.3
11	T1	18	0.0	19	0.0	*0.352	43.9	LOS D	2.6	18.0	0.98	0.74	0.98	30.4
12	R2	47	0.0	49	0.0	*0.400	51.2	LOS D	2.2	15.7	1.00	0.74	1.00	29.1
Approach		103	0.0	108	0.0	0.400	48.9	LOS D	2.6	18.0	0.99	0.74	0.99	29.8
All Vehicles		1356	0.0	1427	0.0	0.741	22.3	LOS C	22.3	156.3	0.80	0.71	0.82	38.2

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

Appendix 12

Brookside Rd / Dunns Crossing Rd Traffic Model Results

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Brookside - 2028 AM (Site Folder: Dunns X-ing / Brookside)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Rd														
1	L2	2	0.0	2	0.0	0.587	10.3	LOS B	6.7	46.7	0.69	0.47	1.16	45.1
2	T1	422	0.0	444	0.0	0.587	4.7	LOS A	6.7	46.7	0.69	0.47	1.16	45.5
3	R2	336	0.0	354	0.0	0.587	10.3	LOS B	6.7	46.7	0.69	0.47	1.16	44.8
Approach		760	0.0	800	0.0	0.587	7.2	NA	6.7	46.7	0.69	0.47	1.16	45.2
East: Brookside Road														
4	L2	91	0.0	96	0.0	0.375	8.7	LOS A	1.5	10.6	0.70	0.92	0.93	41.1
5	T1	10	0.0	11	0.0	0.375	22.9	LOS C	1.5	10.6	0.70	0.92	0.93	41.2
6	R2	36	0.0	38	0.0	0.375	29.4	LOS D	1.5	10.6	0.70	0.92	0.93	40.8
Approach		137	0.0	144	0.0	0.375	15.2	LOS C	1.5	10.6	0.70	0.92	0.93	41.0
North: Dunns Crossing Rd														
7	L2	71	0.0	75	0.0	0.289	4.7	LOS A	0.1	0.4	0.01	0.07	0.01	49.1
8	T1	481	0.0	506	0.0	0.289	0.0	LOS A	0.1	0.4	0.01	0.07	0.01	49.6
9	R2	3	0.0	3	0.0	0.289	7.0	LOS A	0.1	0.4	0.01	0.07	0.01	48.7
Approach		555	0.0	584	0.0	0.289	0.7	NA	0.1	0.4	0.01	0.07	0.01	49.5
West: Brookside Road														
10	L2	2	0.0	2	0.0	0.029	6.1	LOS A	0.1	0.6	0.76	0.81	0.76	40.5
11	T1	4	0.0	4	0.0	0.029	19.2	LOS C	0.1	0.6	0.76	0.81	0.76	40.6
12	R2	1	0.0	1	0.0	0.029	25.6	LOS D	0.1	0.6	0.76	0.81	0.76	40.3
Approach		7	0.0	7	0.0	0.029	16.3	LOS C	0.1	0.6	0.76	0.81	0.76	40.5
All Vehicles		1459	0.0	1536	0.0	0.587	5.5	NA	6.7	46.7	0.44	0.36	0.70	46.2

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

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Brookside - 2028 PM (Site Folder: Dunns X-ing / Brookside)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Rd														
1	L2	2	0.0	2	0.0	0.425	10.5	LOS B	3.2	22.7	0.51	0.21	0.72	46.3
2	T1	445	0.0	468	0.0	0.425	3.2	LOS A	3.2	22.7	0.51	0.21	0.72	46.8
3	R2	144	0.0	152	0.0	0.425	10.5	LOS B	3.2	22.7	0.51	0.21	0.72	46.0
Approach		591	0.0	622	0.0	0.425	5.0	NA	3.2	22.7	0.51	0.21	0.72	46.6
East: Brookside Road														
4	L2	248	0.0	261	0.0	0.656	13.8	LOS B	4.1	28.7	0.80	1.18	1.59	40.1
5	T1	11	0.0	12	0.0	0.656	27.3	LOS D	4.1	28.7	0.80	1.18	1.59	40.2
6	R2	45	0.0	47	0.0	0.656	34.3	LOS D	4.1	28.7	0.80	1.18	1.59	39.9
Approach		304	0.0	320	0.0	0.656	17.3	LOS C	4.1	28.7	0.80	1.18	1.59	40.1
North: Dunns Crossing Rd														
7	L2	27	0.0	28	0.0	0.357	4.8	LOS A	0.0	0.3	0.01	0.02	0.01	49.4
8	T1	661	0.0	696	0.0	0.357	0.0	LOS A	0.0	0.3	0.01	0.02	0.01	49.8
9	R2	2	0.0	2	0.0	0.357	7.5	LOS A	0.0	0.3	0.01	0.02	0.01	49.0
Approach		690	0.0	726	0.0	0.357	0.2	NA	0.0	0.3	0.01	0.02	0.01	49.8
West: Brookside Road														
10	L2	1	0.0	1	0.0	0.041	6.2	LOS A	0.1	0.8	0.82	0.88	0.82	39.2
11	T1	5	0.0	5	0.0	0.041	17.5	LOS C	0.1	0.8	0.82	0.88	0.82	39.3
12	R2	2	0.0	2	0.0	0.041	31.0	LOS D	0.1	0.8	0.82	0.88	0.82	39.0
Approach		8	0.0	8	0.0	0.041	19.5	LOS C	0.1	0.8	0.82	0.88	0.82	39.2
All Vehicles		1593	0.0	1677	0.0	0.656	5.4	NA	4.1	28.7	0.35	0.32	0.58	46.4

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

Appendix 13

Lowes Rd / Dunns Crossing Rd Traffic Model Results – Priority Controlled

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Lowes - 2028 AM (Site Folder: Dunns X-ing / Lowes)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
2	T1	613	0.0	645	0.0	0.416	1.2	LOS A	1.9	13.3	0.26	0.09	0.35	48.5
3	R2	88	0.0	93	0.0	0.416	9.1	LOS A	1.9	13.3	0.26	0.09	0.35	47.7
Approach		701	0.0	738	0.0	0.416	2.2	NA	1.9	13.3	0.26	0.09	0.35	48.4
East: Lowes Road														
4	L2	37	0.0	39	0.0	0.539	9.2	LOS A	2.4	16.7	0.77	1.00	1.20	39.8
6	R2	149	0.0	157	0.0	0.539	20.0	LOS C	2.4	16.7	0.77	1.00	1.20	39.6
Approach		186	0.0	196	0.0	0.539	17.9	LOS C	2.4	16.7	0.77	1.00	1.20	39.6
North: Dunns Crossing Road														
7	L2	284	0.0	299	0.0	0.303	4.7	LOS A	0.0	0.0	0.00	0.27	0.00	47.9
8	T1	289	0.0	304	0.0	0.303	0.1	LOS A	0.0	0.0	0.00	0.27	0.00	48.4
Approach		573	0.0	603	0.0	0.303	2.4	NA	0.0	0.0	0.00	0.27	0.00	48.1
All Vehicles		1460	0.0	1537	0.0	0.539	4.3	NA	2.4	16.7	0.22	0.28	0.32	47.0

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

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Lowes - 2028 PM (Site Folder: Dunns X-ing / Lowes)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
2	T1	402	0.0	423	0.0	0.320	3.1	LOS A	1.9	13.3	0.38	0.09	0.48	47.2
3	R2	55	0.0	58	0.0	0.320	13.6	LOS B	1.9	13.3	0.38	0.09	0.48	46.6
Approach		457	0.0	481	0.0	0.320	4.3	NA	1.9	13.3	0.38	0.09	0.48	47.1
East: Lowes Road														
4	L2	89	0.0	94	0.0	0.131	8.4	LOS A	0.5	3.3	0.60	0.81	0.60	44.4
6	R2	199	0.0	209	0.0	0.889	47.2	LOS E	5.8	40.9	0.98	1.53	2.90	30.0
Approach		288	0.0	303	0.0	0.889	35.2	LOS E	5.8	40.9	0.86	1.31	2.19	33.4
North: Dunns Crossing Road														
7	L2	206	0.0	217	0.0	0.475	4.7	LOS A	0.0	0.0	0.00	0.12	0.00	48.6
8	T1	705	0.0	742	0.0	0.475	0.2	LOS A	0.0	0.0	0.00	0.12	0.00	49.0
Approach		911	0.0	959	0.0	0.475	1.2	NA	0.0	0.0	0.00	0.12	0.00	48.9
All Vehicles		1656	0.0	1743	0.0	0.889	8.0	NA	5.8	40.9	0.25	0.32	0.51	44.8

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

Appendix 14

Lowes Rd / Dunns Crossing Rd Traffic Model Results – Signal Controlled

MOVEMENT SUMMARY

Site: 101v [Dunns X-ing / Lowes - 2028 AM (Site Folder: Dunns X-ing / Lowes)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
2	T1	613	0.0	645	0.0	*0.466	7.2	LOS A	13.2	92.1	0.51	0.46	0.51	45.5
3	R2	88	0.0	93	0.0	0.206	17.2	LOS B	2.2	15.5	0.57	0.70	0.57	40.0
Approach		701	0.0	738	0.0	0.466	8.5	LOS A	13.2	92.1	0.52	0.49	0.52	44.7
East: Lowes Road														
4	L2	37	0.0	39	0.0	0.113	37.6	LOS D	1.4	10.1	0.86	0.72	0.86	32.8
6	R2	149	0.0	157	0.0	*0.454	40.4	LOS D	6.3	44.0	0.93	0.79	0.93	32.0
Approach		186	0.0	196	0.0	0.454	39.8	LOS D	6.3	44.0	0.92	0.78	0.92	32.2
North: Dunns Crossing Road														
7	L2	284	0.0	299	0.0	0.227	10.4	LOS B	4.9	34.4	0.41	0.66	0.41	43.4
8	T1	289	0.0	304	0.0	0.220	5.8	LOS A	5.0	34.7	0.40	0.35	0.40	46.3
Approach		573	0.0	603	0.0	0.227	8.1	LOS A	5.0	34.7	0.41	0.50	0.41	44.8
All Vehicles		1460	0.0	1537	0.0	0.466	12.3	LOS B	13.2	92.1	0.52	0.53	0.52	42.6

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

MOVEMENT SUMMARY

Site: 101v [Dunns X-ing / Lowes - 2028 PM (Site Folder: Dunns X-ing / Lowes)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunns Crossing Road														
2	T1	402	0.0	423	0.0	0.311	6.7	LOS A	7.7	53.8	0.45	0.40	0.45	45.8
3	R2	55	0.0	58	0.0	0.212	19.9	LOS B	1.5	10.8	0.61	0.71	0.61	38.9
Approach		457	0.0	481	0.0	0.311	8.3	LOS A	7.7	53.8	0.47	0.43	0.47	44.8
East: Lowes Road														
4	L2	89	0.0	94	0.0	0.256	37.9	LOS D	3.5	24.8	0.88	0.76	0.88	32.7
6	R2	199	0.0	209	0.0	*0.573	40.6	LOS D	8.5	59.8	0.95	0.81	0.95	32.0
Approach		288	0.0	303	0.0	0.573	39.7	LOS D	8.5	59.8	0.93	0.80	0.93	32.2
North: Dunns Crossing Road														
7	L2	206	0.0	217	0.0	0.167	10.5	LOS B	3.5	24.5	0.40	0.65	0.40	43.3
8	T1	705	0.0	742	0.0	*0.569	8.3	LOS A	16.8	117.9	0.57	0.51	0.57	44.9
Approach		911	0.0	959	0.0	0.569	8.8	LOS A	16.8	117.9	0.53	0.55	0.53	44.5
All Vehicles		1656	0.0	1743	0.0	0.573	14.1	LOS B	16.8	117.9	0.58	0.56	0.58	41.8

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

Appendix 15

Dunns Crossing Rd / Goulds Rd / Selwyn Rd Traffic Model Results

MOVEMENT SUMMARY

Site: 101 [Dunns X-ing / Goulds - 2028 AM (Site Folder: Dunns X-ing / Gould / Selwyn)]

Network: N101 [Dunns / Goulds / Selwyn - 2028 AM (Network Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Goulds Road														
1	L2	254	0.0	254	0.0	0.173	2.1	LOS A	0.0	0.0	0.00	0.37	0.00	47.0
2	T1	74	0.0	74	0.0	0.173	0.0	LOS A	0.0	0.0	0.00	0.37	0.00	47.9
Approach		327	0.0	327	0.0	0.173	1.6	NA	0.0	0.0	0.00	0.37	0.00	47.2
North: Goulds Road														
8	T1	108	0.0	108	0.0	0.109	0.2	LOS A	0.1	0.4	0.13	0.08	0.13	48.5
9	R2	17	0.0	17	0.0	0.109	5.7	LOS A	0.1	0.4	0.13	0.08	0.13	48.3
Approach		125	0.0	125	0.0	0.109	1.0	NA	0.1	0.4	0.13	0.08	0.13	48.4
West: Dunns Crossing Road														
10	L2	14	0.0	14	0.0	0.665	7.0	LOS A	1.2	8.5	0.42	0.80	0.69	44.4
12	R2	375	0.0	375	0.0	0.665	8.5	LOS A	1.2	8.5	0.42	0.80	0.69	40.7
Approach		388	0.0	388	0.0	0.665	8.4	LOS A	1.2	8.5	0.42	0.80	0.69	40.9
All Vehicles		841	0.0	841	0.0	0.665	4.7	NA	1.2	8.5	0.21	0.53	0.34	44.3

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

Organisation: NOVO GROUP LIMITED | Licence: PLUS / 1PC | Processed: Sunday, 8 November 2020 8:50:35 am
Project: S:\Novo Projects\020-100 Favourites\021 Carter Group\021032 Rolleston West Plan Change\03 Transport\Sidra\021-032 - Rolleston West Plan Change - 2020-11-06.sip9

MOVEMENT SUMMARY

Site: 101 [Goulds / Selwyn - 2028 AM (Site Folder: Dunns X-ing / Gould / Selwyn)]

Network: N101 [Dunns / Goulds / Selwyn - 2028 AM (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Goulds Road														
1	L2	1	0.0	1	0.0	0.127	9.3	LOS A	0.2	1.3	0.49	0.98	0.49	61.4
2	T1	76	0.0	76	0.0	0.127	11.1	LOS B	0.2	1.3	0.49	0.98	0.49	55.0
3	R2	8	0.0	8	0.0	0.127	16.0	LOS C	0.2	1.3	0.49	0.98	0.49	61.0
Approach		85	0.0	85	0.0	0.127	11.6	LOS B	0.2	1.3	0.49	0.98	0.49	56.1
East: Selwyn Road														
4	L2	13	0.0	13	0.0	0.193	7.3	LOS A	0.4	2.8	0.23	0.39	0.23	67.4
5	T1	119	0.0	119	0.0	0.193	0.3	LOS A	0.4	2.8	0.23	0.39	0.23	71.8
6	R2	202	0.0	202	0.0	0.193	7.0	LOS A	0.4	2.8	0.23	0.39	0.23	65.2
Approach		334	0.0	334	0.0	0.193	4.6	NA	0.4	2.8	0.23	0.39	0.23	68.5
North: Goulds Road														
7	L2	343	0.0	343	0.0	0.479	5.2	LOS A	1.3	9.1	0.22	0.94	0.25	56.3
8	T1	44	0.0	44	0.0	0.479	8.5	LOS A	1.3	9.1	0.22	0.94	0.25	55.9
9	R2	96	0.0	96	0.0	0.479	10.2	LOS B	1.3	9.1	0.22	0.94	0.25	55.6
Approach		483	0.0	483	0.0	0.479	6.5	LOS A	1.3	9.1	0.22	0.94	0.25	56.1
West: Selwyn Road														
10	L2	49	0.0	49	0.0	0.059	7.0	LOS A	0.0	0.0	0.01	0.29	0.01	70.4
11	T1	62	0.0	62	0.0	0.059	0.0	LOS A	0.0	0.0	0.01	0.29	0.01	74.8
12	R2	1	0.0	1	0.0	0.059	7.0	LOS A	0.0	0.0	0.01	0.29	0.01	69.6
Approach		113	0.0	113	0.0	0.059	3.1	NA	0.0	0.0	0.01	0.29	0.01	73.5
All Vehicles		1015	0.0	1015	0.0	0.479	5.9	NA	1.3	9.1	0.22	0.69	0.24	62.5

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

Organisation: NOVO GROUP LIMITED | Licence: PLUS / 1PC | Processed: Sunday, 8 November 2020 8:50:35 am
Project: S:\Novo Projects\020-100 Favourites\021 Carter Group\021032 Rolleston West Plan Change\03 Transport\Sidra\021-032 - Rolleston West Plan Change - 2020-11-06.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Dunns X-ing / Goulds - 2028 PM (Site Folder: Dunns X-ing / Gould / Selwyn)]

Network: N101 [Dunns / Goulds / Selwyn - 2028 PM (Network Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Goulds Road														
1	L2	264	0.0	264	0.0	0.184	2.1	LOS A	0.0	0.0	0.00	0.36	0.00	47.1
2	T1	85	0.0	85	0.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.36	0.00	47.9
Approach		349	0.0	349	0.0	0.184	1.6	NA	0.0	0.0	0.00	0.36	0.00	47.3
North: Goulds Road														
8	T1	134	0.0	134	0.0	0.085	0.3	LOS A	0.1	0.5	0.14	0.08	0.14	48.4
9	R2	21	0.0	21	0.0	0.085	5.8	LOS A	0.1	0.5	0.14	0.08	0.14	48.3
Approach		155	0.0	155	0.0	0.085	1.0	NA	0.1	0.5	0.14	0.08	0.14	48.4
West: Dunns Crossing Road														
10	L2	22	0.0	22	0.0	0.685	7.5	LOS A	1.1	7.4	0.41	0.83	0.71	44.1
12	R2	313	0.0	313	0.0	0.685	9.2	LOS A	1.1	7.4	0.41	0.83	0.71	40.1
Approach		335	0.0	335	0.0	0.685	9.1	LOS A	1.1	7.4	0.41	0.83	0.71	40.5
All Vehicles		839	0.0	839	0.0	0.685	4.5	NA	1.1	7.4	0.19	0.50	0.31	44.5

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

Organisation: NOVO GROUP LIMITED | Licence: PLUS / 1PC | Processed: Sunday, 8 November 2020 8:51:43 am
Project: S:\Novo Projects\020-100 Favourites\021 Carter Group\021032 Rolleston West Plan Change\03 Transport\Sidra\021-032 - Rolleston West Plan Change - 2020-11-06.sip9

MOVEMENT SUMMARY

Site: 101 [Goulds / Selwyn - 2028 PM (Site Folder: Dunns X-ing / Gould / Selwyn)]

Network: N101 [Dunns / Goulds / Selwyn - 2028 PM (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Goulds Road														
1	L2	1	0.0	1	0.0	0.088	9.1	LOS A	0.1	0.9	0.48	0.98	0.48	61.4
2	T1	51	0.0	51	0.0	0.088	11.3	LOS B	0.1	0.9	0.48	0.98	0.48	54.8
3	R2	6	0.0	6	0.0	0.088	15.0	LOS B	0.1	0.9	0.48	0.98	0.48	60.9
Approach		58	0.0	58	0.0	0.088	11.7	LOS B	0.1	0.9	0.48	0.98	0.48	56.1
East: Selwyn Road														
4	L2	7	0.0	7	0.0	0.190	7.5	LOS A	0.4	2.8	0.30	0.47	0.30	66.3
5	T1	76	0.0	76	0.0	0.190	0.6	LOS A	0.4	2.8	0.30	0.47	0.30	70.4
6	R2	226	0.0	226	0.0	0.190	7.2	LOS A	0.4	2.8	0.30	0.47	0.30	63.1
Approach		309	0.0	309	0.0	0.190	5.6	NA	0.4	2.8	0.30	0.47	0.30	65.8
North: Goulds Road														
7	L2	248	0.0	248	0.0	0.500	5.9	LOS A	1.4	10.0	0.33	0.98	0.43	54.7
8	T1	87	0.0	87	0.0	0.500	9.2	LOS A	1.4	10.0	0.33	0.98	0.43	54.3
9	R2	111	0.0	111	0.0	0.500	10.5	LOS B	1.4	10.0	0.33	0.98	0.43	54.1
Approach		446	0.0	446	0.0	0.500	7.7	LOS A	1.4	10.0	0.33	0.98	0.43	54.5
West: Selwyn Road														
10	L2	73	0.0	73	0.0	0.088	6.9	LOS A	0.0	0.0	0.00	0.29	0.00	70.6
11	T1	94	0.0	94	0.0	0.088	0.0	LOS A	0.0	0.0	0.00	0.29	0.00	74.9
12	R2	1	0.0	1	0.0	0.088	6.9	LOS A	0.0	0.0	0.00	0.29	0.00	69.7
Approach		167	0.0	167	0.0	0.088	3.1	NA	0.0	0.0	0.00	0.29	0.00	73.6
All Vehicles		981	0.0	981	0.0	0.500	6.5	NA	1.4	10.0	0.27	0.70	0.32	61.7

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