WAIKATO DISTRICT PLAN REVIEW SUBMISSION

SUBMITTER KONING FAMILY TRUST and MARTIN KONING

TOPIC: Extent of residential zoning at Raglan

STATEMENT OF EVIDENCE OF RHULANI MATSHEPO BALOYI

Dated: 17 February 2021

INTRODUCTION

1. My full name is Rhulani Matshepo Baloyi.

2. I am a Senior Traffic and Transportation Engineer employed by Bloxam Burnett & Olliver Ltd (**BBO**), a firm of consulting engineers, planners and surveyors based in Hamilton. I have held this position since July 2019.

QUALIFICATIONS AND EXPERIENCE

3. I hold a Bachelor of Engineering degree in Civil Engineering (2012) and a Bachelor of Engineering (Honours) degree in Transportation Engineering (2014) from the University of Pretoria in South Africa. I am registered as a Professional Engineer (PrEng) with the Engineering Council of South Africa (ECSA) and I am a Member of Engineering New Zealand (MEngNZ).

4. I have 9 years' experience in the field of traffic and transportation engineering gained through 7.5 years of employment in South Africa and 1.5 years of employment in New Zealand. I have experience in traffic and transportation engineering matters associated with resource management, including effects assessments for resource consents, plan changes and structure plans. I also have experience in traffic modelling and have provided input in the design of traffic infrastructure and facilities.

INVOLVEMENT IN THE SUBMISSION

5. I have been engaged by Koning Family Trust and Martin Koning ("**the Submitters**") to provide expert advice on traffic and transportation matters in relation to their submission to the Proposed Waikato District Plan (**PDP**) for the rezoning of their landholdings in Raglan. I, together with the assistance of my former colleague Ms Renata Gomez, have prepared an Integrated Transport Assessment (ITA) report which supports the rezoning submission.

6. I have visited the visited the site that is subject to the rezoning submission and inspected the surrounding road network on a few occasions, most recently on Friday, 12th February 2021.

CODE OF CONDUCT

7. I have read the Environment Court's Code of Conduct for Expert Witnesses in the Environment Court of New Zealand and I agree to comply with it. My qualifications and

experience as an expert are set out above. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

8. The evidence that I give in these proceedings is within my area of expertise, except when I rely on the evidence of another witness or other evidence, in which case I have explained that reliance.

SCOPE OF EVIDENCE

9. The purpose of my evidence is to provide an overview of the potential land transport related effects of the rezoning submission (and subsequent development) on the transport environment and the necessary mitigation measures to satisfactorily address those potential adverse effects. My evidence also addresses any other measures that are proposed to ensure a safe and efficient transport network for pedestrians, cyclists, motorists, and public transport commuters.

10. My evidence provides a summary of the ITA report and the conclusions reached. The ITA report, dated February 2021, is attached to this statement of evidence as **Attachment 1**.

SUMMARY OF EVIDENCE

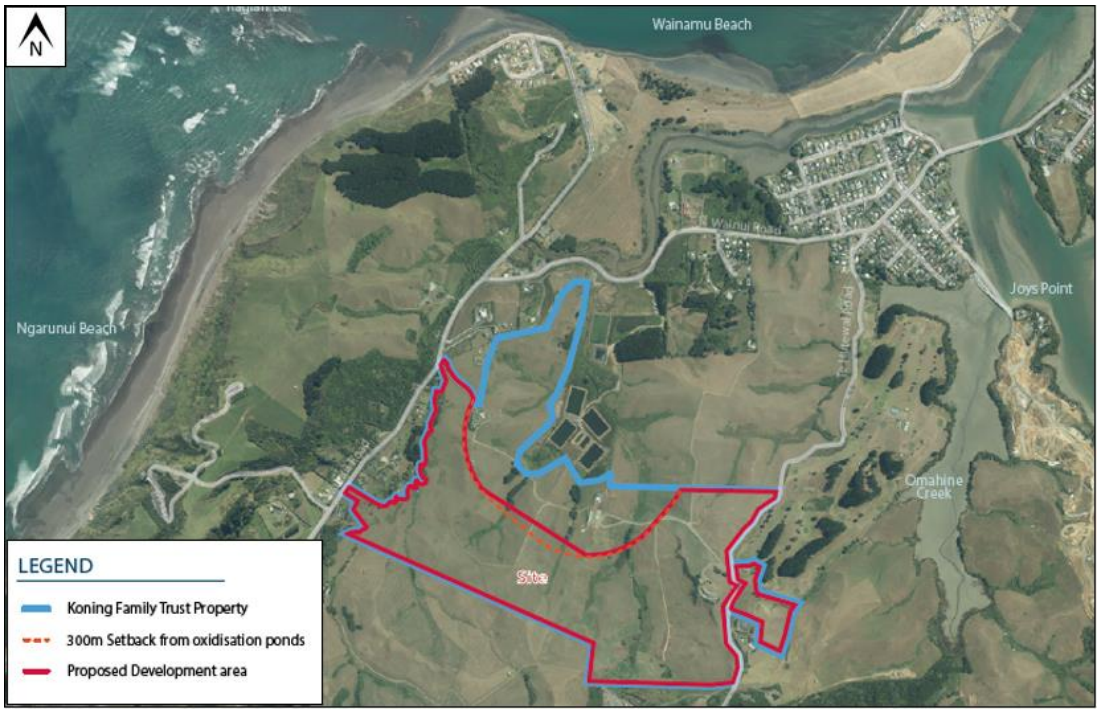
Proposal overview

11. The Submitters seek to rezone only part (approximately 63 hectares) of their 91 ha property from the current Rural and Coastal zoning (under the current Operative District Plan and the notified version of the Proposed District Plan) to Residential zoning. The site that is subject to this rezoning submission is located approximately 3 km south-west of the Raglan town centre on the rolling hills between Wainui Road and Te Hutewai Road, in close proximity to Wainui Reserve and Raglan Golf Club.

12. Figure 1 on the following page illustrates the locality and extent of the rezoning site (the blue outline indicates the Submitters property, while the red outline indicates the extent of the site sought to be rezoned).

13. As shown in Figure 1, the rezoning site is located greater than 300 m from the oxidation ponds located on Council's neighbouring wastewater treatment plant. The proposed zone boundaries ensures that the District Plan's requirement for residential dwellings to be setback at least 300 m from oxidation ponds is satisfied.

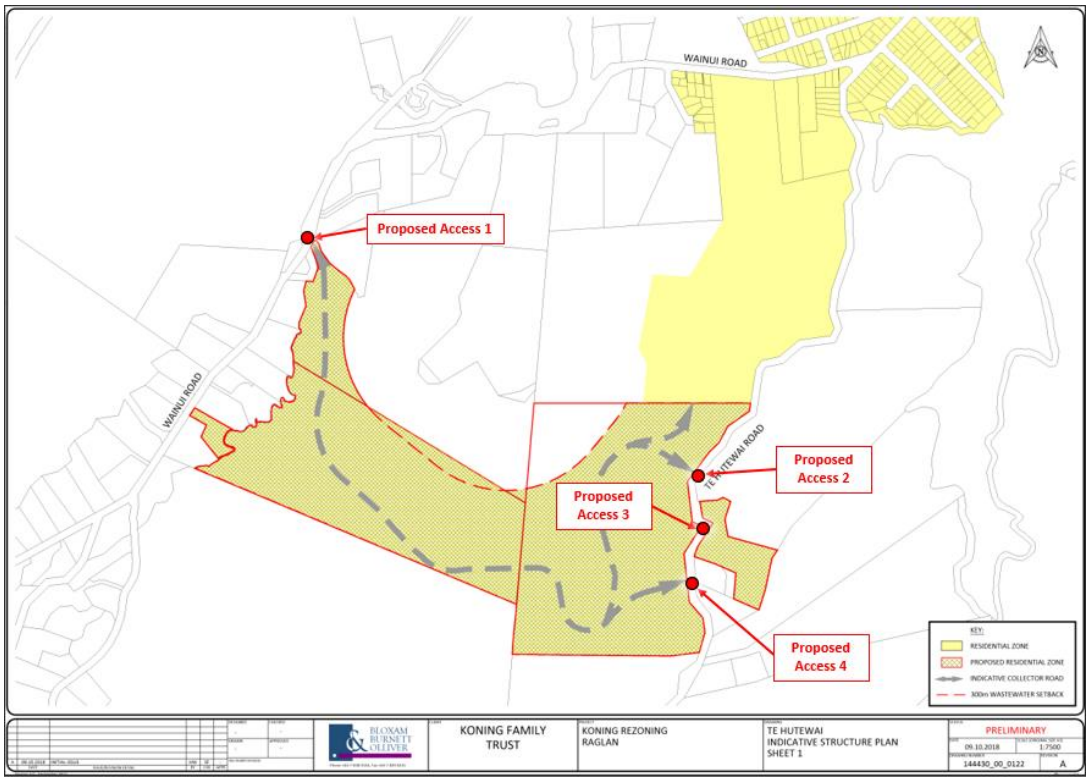
Figure 1: Locality and extent of proposed Rezoning Site



Proposed Structure Plan and anticipated development yield

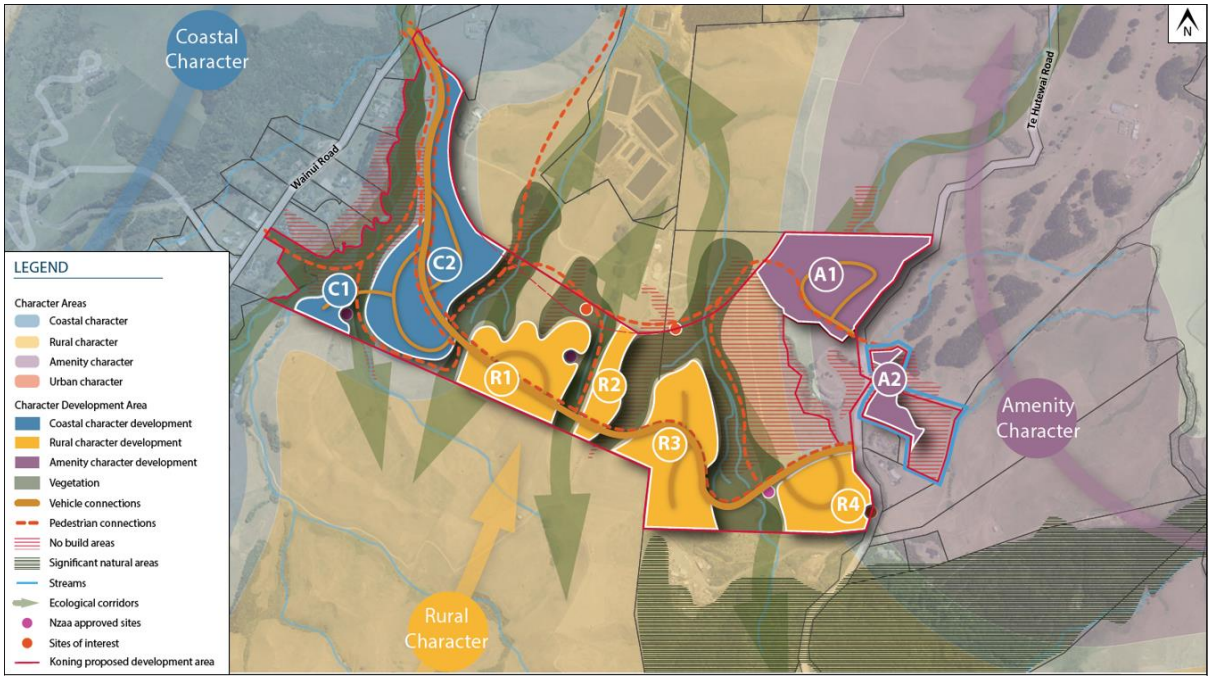
14. An indicative Structure Plan, which is illustrated in Figure 2 below, was developed at an early stage in the planning process to show the extent of land sought to be rezoned, as well as the potential roading connections through the rezoning site.

Figure 2: Indicative Structure Plan



15. A more comprehensive draft Structure Plan, which is illustrated in Figure 3 below, was prepared more recently which shows the extent of developable land which is anticipated to be available within the rezoning site, including the areas to be left undeveloped (i.e., “no built areas”) due to factors such as geotechnical risk, presence of identified archaeological features and ecological corridors. These areas are indicatively shown in Figure 3.

Figure 3: Comprehensive draft Structure Plan showing developable areas on the site



16. On the basis of the developable areas[1] in Figure 3 (shown as amenity character area A1 and A2, rural character area R1 to R4, and coastal area C1 and C2 in Figure 3), if approved, the rezoning submission will enable the staged development of approximately 25-30 ha of high-quality residential development over a 20-year period. It is anticipated that the rezoning of the subject site will result in a yield of some 300 – 400 residential allotments of varying sizes.

Internal roading network

17. As shown in the Structure Plans illustrated in Figure 2 and Figure 3, a network of internal local and collector roads has been designed at a concept level to demonstrate how the rezoning site could be serviced. The future cross-sections of these internal

[1] While the typology of residential development is not defined by the draft Structure Plan, indicative ‘character’ areas have been nominated, based on the surrounding zoning. These have been identified as coastal, rural and amenity character areas. According to the draft Development Plan Document, these character qualities may be expressed in the form of the streetscape and pattern of subdivision across these areas.

roads will be guided by the minimum access and road performance standards set out in Table 14.12.5.14 of the PDP.

18. A collector road with several accesses off Wainui Road and Te Hutewai Road is envisaged for good connectivity between the proposed residential lots and the two Council managed roads. Figure 4 to follow demonstrates how the future collector road could potentially be extended to neighbouring sites:

    a. There is potential to extent the proposed collector road west to provide a much-needed east-west link between the southern extent of the Rangitahi Peninsula Development through to Ngarunui Beach.

    b. Development of the subject site could enable the provision of a new road connection to the neighbouring Te Ahiawa residential subdivision. The new road link is envisaged to extend south from the proposed collector road within the subject site to Te Ahiawa Road.

19. It is recommended that further discussions with Council and the affected property owners be held at this rezoning stage to determine the feasibility of providing these new east-west connections.

Figure 4: Potential transport connections to the wider transport network

Site access proposals

20. As shown in Figure 2, four new accesses are likely to be required to service the future residential development within the rezoning site, including one new road intersection on Wainui Road (shown as Proposed Access 1 in Figure 2) located generally where the existing vehicle crossing to the property at 339A Wainui Road is currently located, and three new accesses/ intersections on Te Hutewai Road (shown as Proposed Access 2 to 4 in Figure 2).

21. The proposed road access locations are considered appropriate for the following reasons:

    a. Two of the four proposed accesses/ intersections (Proposed Access 1 and 2) are expected to have good sight lines in all directions, complying with the minimum required safe intersection sight distance (SISD) for the surrounding speed environment.

    b. While the available sightlines at Proposed Access 3 and 4 do not fully comply with the minimum SISD requirements (there is a shortfall of approximately 25 m based on a 60 km/h speed environment and two second reaction time), the non-complying sightlines can be improved by removing the overgrown vegetation on the eastern side of Te Hutewai Road (refer to Figure 5 on the following page for an illustration). With the removal of this vegetation, the sightlines are expected to comply with the minimum SISD requirements.

    c. The proposed intersection locations generally comply with the PDP's minimum intersection separation requirements, including the PDP's minimum access separation requirements to the nearest vehicle crossing.

22. I anticipate that a 'Tee' intersection layout will be the most appropriate configuration for all four new road accesses. In my opinion, auxiliary turning lanes (i.e., a left-turn bay and/ or right-bay treatment) are unlikely to be required at the new intersections given the low volume and low speed environment on both Wainui Road and Te Hutewai Road. However, I recommend in the ITA that further investigations be undertaken during the future subdivision stages to confirm whether channelized turning lane treatments would be required from a capacity and safety perspective. The appropriate control (either a Stop or Give-Way) for each intersection will also need to be determined at detailed design stage.

Figure 5: Proposed sightline improvements for Proposed Access 3 and 4

23. To improve night-time visibility and thus the safety of the intersections, it is recommended that street lighting be incorporated into the intersection designs.

Predicted trip generation and distribution

Predicted trip generation

24. Given the similarities in the zoning requested within the Koning site and the consented Rangitahi Peninsula Development, the trip generation rates that were derived for the residential activities within the Rangitahi Peninsula Development were adopted for the proposed residential activities that are anticipated to be provided within the Koning site.

25. On the basis of those trip rates[2], the proposed residential rezoning site is anticipated to generate approximately 1,800 – 2,400 trips per day and 180 - 240 trips during the peak hour.

Distribution of trips to/from the rezoning site:

[2] A reduced trip generation rate (6 trips/ dwelling/ day and 0.6 trips/ dwelling/ peak hour) was agreed with Council and adopted for the consented Rangitahi Peninsula Development based on traffic surveys that were conducted in October 2012 as part of the Rangitahi Peninsula ITA (dated July 2013) that was prepared by Traffic Engineering & Management Ltd. The adopted rates were based on the premise that not all existing dwellings within Raglan township are occupied during the year (i.e. a portion of the dwellings in Raglan are holiday homes which are unoccupied during the non-summer holiday season).

26. Based on the indicative location and extent of the developable areas shown in the draft Structure Plan (areas A1-A2, R1-R4 and C1-C2 in Figure 3), the following assumptions were made related to the distribution of trips to/ from the rezoning site:

    a. Approximately 40% to trips associated rezoning proposal would enter/ exit the site via Access 1.

    b. Approximately 25% to trips associated rezoning proposal would enter/ exit the site via Access 2.

    c. Approximately 5% to trips associated rezoning proposal would enter/ exit the site via Access 3.

    d. Approximately 30% to trips associated rezoning proposal would enter/ exit the site via Access 4.

External distribution of trips on the surrounding road network

27. The distribution pattern of new trips on the external road network was based on the existing observed travel patterns in Raglan, where approximately 50% of the working population commute (daily) out of Raglan for employment purposes[3]. These trips were consequently distributed onto the most probable routes from the proposed development to SH23. The likely routes include:

    a. (Te Hutewai Road) - Wainui Road – Norrie Avenue – Main Road – SH23.

    b. (Te Hutewai Road) - Wainui Road – Stewart Street – Norrie Avenue - Main Road – SH23.

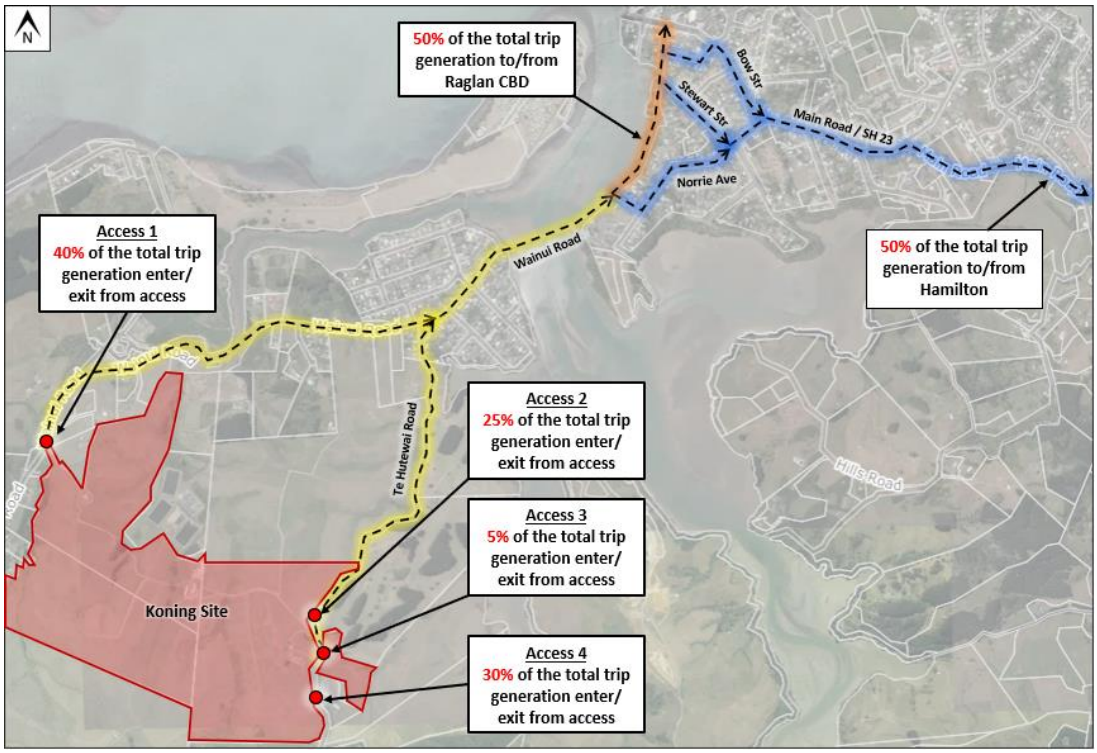
    c. (Te Hutewai Road) - Wainui Road – Bankart Street – Bow Street – Main Road – SH23.

28. The remaining 50% of the trips that are expected to be generated by the proposed residential dwellings within the Koning site will travel to the Raglan Central Business District (CBD) via Wainui Road.

29. The predicted trip distribution is illustrated in Figure 6 on the following page.

[3] This was based on figures provided by Statistics New Zealand which indicate that currently 50% of the working population commute (daily) out of Raglan.

Figure 6: Predicted Trip Distribution and Assignment



Effects assessment scenarios

Future Baseline Traffic

30. The effects assessment was conducted on the basis of a 20-year assessment period (2024[4] + 20 years), in line with the anticipated development period. The 2024 and 2044 baseline traffic demand projections were estimated based on the historic traffic growth along the local and wider road networks (i.e., Wainui Road, Te Hutewai Road and SH23)[5], as well as the long-term population and household growth projections[6] for Raglan township.

31. On the basis of the above, a conservative annual traffic growth rate figure of 1.5% was applied to road links and intersections within the local area network (i.e., Wainui Road and Te Hutewai Road), while a traffic growth rate figure of 1% per annum was applied to road links within the wider road network (i.e., SH23). These low traffic growth figures

[4] Considering the lengthy resource consent and design stage timeframes, construction of the first stage of the development is only expected to commence in 2024. The anticipated full development potential is expected to be realised over a period of 20 years (i.e., 2044). This equates to the subdivision/ development of approximately 75 – 100 allotments every five years.
[5] An analysis of traffic count data that was collected along Wainui Road, Te Hutewai Road, and SH23 over the previous 10-years showed an overall average growth rate of approximately 1% per annum.
[6] Based on projections by Statistics New Zealand, the population of Raglan is estimated to grow by approximately 0.5% per annum over the next 30 years, while the number of households in the township are projected to increase by approximately 1.5% per annum between 2019 and 2038 (according to a report titled *Raglan Residential Market Assessment Phase 1*, dated September 2018 by Property Economics).

are considered representative of Raglan given the relatively low population and household growth figures projected for the township.

32. Future traffic that is anticipated to be generated by the Rangitahi Peninsula Development, a major consented development within Raglan township, was included in the baseline traffic projections. The Rangitahi Peninsula residential subdivision, which is currently under construction, will result in the development of some 500 new residential dwelling units which will be constructed in stages over a 40-year period. Once fully developed (which is anticipated to be by the year 2061), the residential development is anticipated to generate approximately 3,060 vpd (and 306 trips during the peak hour).

Summer Holiday Period

33. Raglan is a popular visitor destination with its population increasing by between 300% and 400% during the summer holiday period (from December to January), consequently increasing the volume of traffic within the Raglan road network and along SH23. Based on an assessment of the yearly traffic data along SH23 for the previous five-year period, the following conservative assumptions were made related to the anticipated change in the peak hour traffic demand during the summer holiday periods

    a. The peak traffic demand along the local road network (i.e., Wainui Road, Norrie Avenue, Bow Street, etc.) is expected to increase by approximately 15% and 25% during the summer holiday period during the AM and PM peak periods respectively, while

    b. The peak traffic demand along SH23 is expected to increase by approximately 15% and 10% during the summer holiday period during the AM and PM peak periods respectively.

34. On this basis, sensitivity testing was undertaken to determine the impact of the increased traffic volumes during the summer periods on the external road network performance. The findings from the assessment are outlined in paragraphs 40 and 41 of this statement.

Transportation effects assessment and proposed mitigation measures

Effects assessment – road corridors

35. Traffic volumes on the existing roads within the vicinity of the site are expected to increase as shown in Table 1 if development of the Koning site occurs.

Table 1: Estimated ADT volumes on the surrounding road network with and without the additional rezoning traffic (during the "typical" weekday period)

Road Corridor/ Road Section	Estimated 2019 Baseline ADT (vpd)	Estimated 2044 Baseline ADT (vpd)	Additional Rezoning Traffic ADT (vpd)	2044 Baseline + Rezoning Traffic ADT (vpd)
Wainui Road				
Proposed Access 1 to Riria Kereopa Memorial Drive	1,740	2,525	960	3,485
Riria Kereopa Memorial Drive to Te Hutewai Road	3,700 – 4,800	5,370 – 6,965	960	6,330 – 7,925
Te Hutewai Road to One-way Bridge	3,200 – 7,010	4,645 – 10,170	960	5,605 – 11,130
Te Hutewai Road				
Proposed Access 4 to current urban boundary	130	190	1,440	1,630
Current urban limit to Wainui Road	805	1,170	1,440	2,610

36. As shown in the ADT figures in Table 1:

    a. The ADT on Wainui Road is anticipated to increase by between 15% to 40% with the addition of the proposed rezoning traffic to the 2044 baseline traffic. This equates to an increase in the peak hour traffic from approximately 175 – 480 vph to approximately 325 – 795 vph.

    b. While a significant increase in the ADT is anticipated on Te Hutewai Road with the addition of the proposed rezoning traffic to the 2044 baseline traffic, the ADT is not expected to exceed 3,000 vpd or 250 vehicle trips during the peak hour.

37. In my opinion, no adverse capacity effects are likely on these two district council roads given that the road links have amply spare capacity to accommodate the increased daily traffic volumes associated with the proposed rezoning given the low traffic volumes that presently exist on both roads and that the peak hour volumes along both roads are not anticipated to exceed the typical capacity of an urban road[7].

38. While several crashes were recorded along Wainui Road in the previous five years (and none on Te Hutewai Road), none of the crashes resulted in any deaths or serious

[7] According to Table 4.3 of the RTA's Guide to Traffic Generating Developments, the typical mid-block capacity of a two-way urban road with adjacent parking bays is **1,800 vehicles per hour**.

injuries. With the recent reduction of the posted speed limit from 100 km/h to 60 km/h (in line with the safe and appropriate speed of both roads), I consider that the risk and severity of crashes along both Wainui Road and Te Hutewai Road will have significantly reduced.

39. On this basis, I consider that the effects of the rezoning proposal on the capacity and efficiency of the surrounding road network is likely to be negligible.

Effects assessment – existing intersections

40. Table 2 below provides a summary of the performance analysis of intersections within Raglan township and the wider road network. The intersections listed in Table 2 are considered to be located along the likely travel route of traffic associated with any future development of the rezoning site (the anticipated distribution and assignment of trips associated with the rezoning proposal is shown in Figure 6 of this statement of evidence). The findings from the capacity assessment are provided for both the typical weekday and summer holiday periods.

Table 2: Effects Assessment Summary – Local and wider area intersections

Intersection	Period	Performance Assessment Findings			
		2024 Baseline Assessment Scenario	*2044 Baseline Assessment Scenario*	*2044 Baseline+ Rezoning Traffic Assessment Scenario*	*Upgrade trigger*
Local area Intersections					
Wainui Road / Te Hutewai Rd	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Wainui Road One-way Bridge	Typical Weekday	*Poor LOS; Upgrading required (interim solution - signalisation of one-way bridge)*	Acceptable LOS if upgraded to traffic signal - *No further upgrades required*	Acceptable LOS if upgraded to signal - *No further upgrades required*	*Upgrade triggered by 2024 (baseline traffic only)*
	Summer Holiday				
Wainui Road / Whitley Street	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Wainui Road / Stewart Street	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Wainui Road / Bankart Street	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				

Intersection	Period	Performance Assessment Findings			
		2024 Baseline Assessment Scenario	*2044 Baseline Assessment Scenario*	*2044 Baseline+ Rezoning Traffic Assessment Scenario*	*Upgrade trigger*
Bankart Street / Bow Street	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Bow Street / Norrie Avenue	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	*Poor LOS - Upgrading required (roundabout or traffic signal)*	*Upgrade triggered after completion of first 300 dwellings*
	Summer Holiday				
Wider Area Intersections					
SH23 / Te Mata Rd	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
SH23 / Te Pahu Rd	Typical Weekday	Acceptable LOS - *No upgrades required.*	Acceptable LOS - *No upgrades required.*	*Poor LOS; Upgrading required (roundabout)*	*Upgrade triggered after completion of first 300 dwellings*
	Summer Holiday		Intersection at capacity. *Upgrade to be considered.*		
SH23 / SH39	Typical Weekday	Intersection at capacity. *Upgrade to be considered.*	Acceptable LOS if upgraded to single-lane roundabout - *No further upgrades required.*	*Poor LOS* if upgraded to single-lane roundabout prior to 2044 baseline - *Further upgrades required (dual-lane roundabout)*	*Initial upgrade triggered prior to 2031 (baseline traffic only). Further upgrading likely required after completion of first 300 dwellings*
	Summer Holiday	*Poor LOS; Upgrading required (single-lane roundabout (as a minimum))*			

41. As shown in Table 2, the following conclusions were based on the performance analysis of intersections within Raglan township and the wider road network:

    a. Wainui Road One-way bridge: the assessment concluded that the existing one-way configuration will not have sufficient capacity to accommodate the 2024 baseline traffic demand (i.e., without any additional traffic from the rezoning site) and that capacity related upgrades will likely be required by 2024 to improve future operations at the bridge.

b. Bow Street/ Norrie Avenue intersection: the assessment concluded that capacity and safety related upgrades will likely be required at the intersection once the first 300 dwelling units are completed (i.e., at 75% development) to mitigate future capacity constraints.

c. SH23/ Te Pahu Road intersection: the assessment concluded that capacity and safety related upgrades will likely be required once the first 300 dwelling units are completed to mitigate future capacity constraints.

d. SH23/ SH39 Road intersection: the assessment concluded that capacity and safety related upgrades will likely be required at the intersection in the next 10 years (by 2031) - the current stop-controlled configuration will not have sufficient capacity to accommodate the future baseline traffic demand.

42. Furthermore, an assessment of the crash history concluded the following:

a. A total of 16 crashes were recorded within a 50 m radius of six of the seven “local area” intersections.

i. Several of these crashes were attributed to alcohol consumption and/ or occurred during a police pursuit. These crashes, which were recorded at the Wainui Road / Te Hutewai Road and Wainui Road/ Stewart Street intersections, were subsequently excluded from the assessment as I consider them not to be reflective of the current operations or safety of the respective intersections.

ii. Of the remaining crashes, two were associated with vehicles failing to give-way at the Wainui Road one-way bridge and seven were associated with turning movements at the Wainui Road/ Whitley Street and Bow Street/ Norrie Avenue intersections. While the crash assessment showed that the risk of crashes may be low to moderate, the severity of crashes is considered to be low as no deaths or serious injury crashes have been recorded at these three intersections in the previous five years. The road safety risks at these intersections are considered to be further reduced by the 40 km/h posted speed limit along the intersecting roads.

b. The majority of crashes (13 out of 15) recorded at the SH23/ Te Mata Road and SH23/ Te Pahu Road intersections were related to the road alignment through the intersection (i.e., vehicles/ motorcyclists losing control while navigating the horizontal bend through the intersection). The secondary crash cause was related to either speeding, inclement weather (i.e., light or heavy rain), an inexperienced driver, or a driver who was not familiar with the road environment. In my opinion, the moderate crash rate indicates a need to either improve the existing advanced warning signs, or to lower vehicle operating speeds through both intersections[8].

c. The high crash rate at the SH23 / SH39 intersection indicates there being an apparent road safety risk at the intersection. Accordingly, the intersection has been identified as being number 106 (out of 200) on Waka Kotahi NZ Transport Agency's high-risk intersections and has been earmarked for upgrading in the next 5-10 year. A technical assessment by Waka Kotahi concluded that the staggered 'Tee' intersection needed to be upgraded to a single-lane roundabout to improve the safety of the intersection.

43. On the basis of the above, the overall transportation effects of the rezoning proposal on the adjoining and wider road networks are expected to be more than minor, but are able to be managed and mitigated to an acceptable level if the following recommendations are implemented:

a. Wainui Road One-way Bridge:

i. It is recommended that traffic signals be installed on the bridge approaches if the planned upgrading (by Council)[9] of the one-lane one-way bridge to a two-lane bridge is not concluded by 2024.

[8] For context, the posted speed limit on SH23 at these intersections is currently 100 km/h, while the advisory speed for the horizontal bend through both intersections is 65 km/h.

[9] The Waikato District Council (WDC) Long Term Plan 2018 – 2028 (LTP) identifies the Wainui Bridge as being near the end of its useful life due to the delays that are currently observed at the bridge during the peak hours. The LTP therefore proposes the replacement of the bridge to address safety and congestion issues at this locality. WDC is currently investigating two upgrade options for the bridge as part of the LTP: the first and preferred option includes the replacement of the bridge with a newly constructed two-lane two-way bridge, while the second option includes constructing a new one-lane one-way bridge. The LTP indicates that a decision will be made by 2021, and that the design and implementation of the proposal will occur between 2023 and 2026.

ii. In addition to the signalisation of the bridge, it is recommended that advanced warning signs and road markings alerting drivers to the presence of the new traffic signals (and any hidden queues resulting from signalising the bridge) be provided on both bridge approaches.

b. SH 23/ SH39 Staggered T-intersections:

i. As a minimum, it is proposed that the intersection be upgraded within the next 10 years (i.e., by 2031) to a single-lane roundabout configuration in line with the findings from the technical assessment that was undertaken by Waka Kotahi.

ii. Consideration should, however, be given for a dual-lane roundabout if the effects of the Waikato Expressway (which is anticipated to be completed in 2021) do not result in a material reduction in traffic on SH39, as currently expected. The preferred roundabout configuration should be identified and implemented in collaboration with Waka Kotahi and Waikato District Council.

c. Bow Street & Norrie Avenue and SH23 & Te Pahu Road intersections. It is recommended that an ITA be conducted once the first 300 dwellings are completed (i.e., at development Year 15 or 2039, whichever comes first) to assess the impact of the proposed development traffic on both intersections as the trip generation and distribution assumptions become realised over time. Proposed (capacity and safety related) mitigation measures should then be reflected in the findings from the ITA. Based on this assessment, the following improvements may likely be required:

i. Bow Street & Norrie Avenue intersection: upgrading the stop-controlled intersection to traffic signal control or to a single-lane roundabout configuration.

ii. SH23 & Te Pahu Road Intersections: upgrading the stop-controlled intersection to a single-lane roundabout configuration.

Walking and cycling

Internal walking and cycling infrastructure

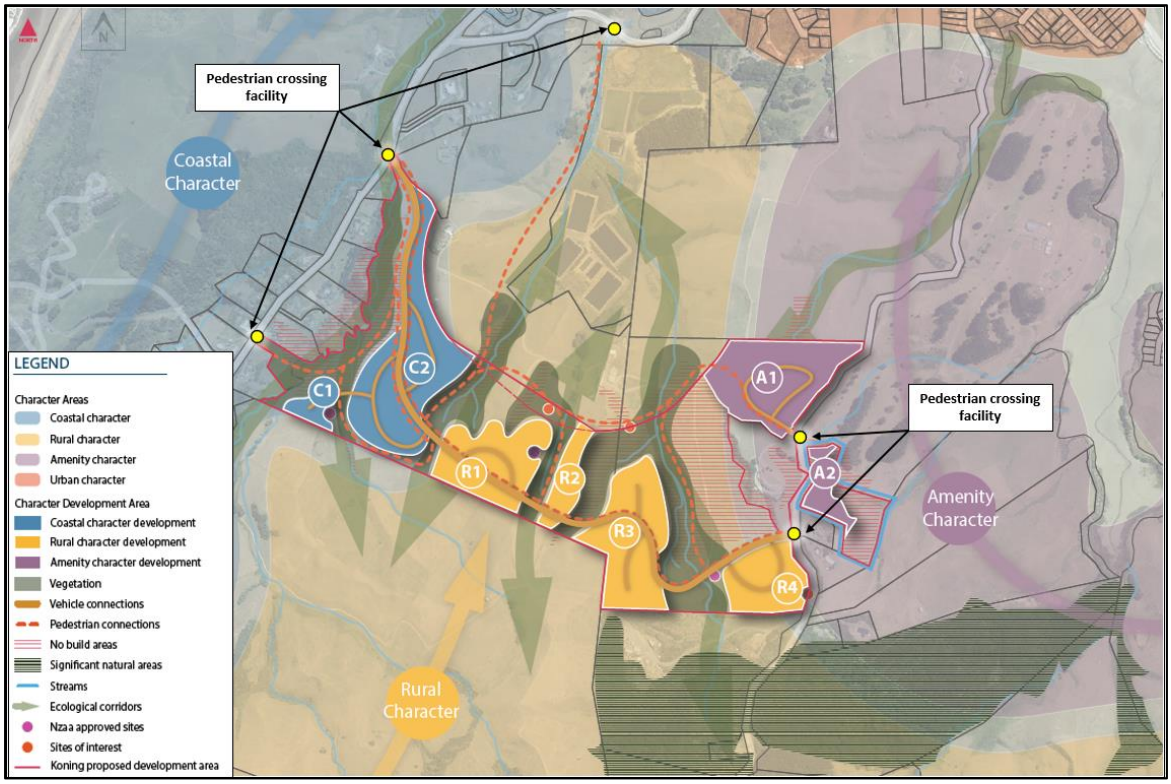
44. As a minimum, 1.8 m wide footpaths and on-road cycle paths (as per Table 14.12.5.14 of the PDP) will be provided through all residential streets within the proposed residential development. The proposed walking and cycling infrastructure within the Koning site could readily be extended and connected to the existing facilities on Wainui Road and to key land uses in the surrounding area as follows (refer to Figure 7 below):

a. A new 2.5 m wide (minimum) shared path is proposed which extends north through the Koning site to the existing footpath which is located on the northern side of Wainui Road. A new pedestrian crossing facility is proposed to be provided on Wainui Road at the pedestrian crossing location.

b. The pedestrian footpaths are proposed to extend west to Wainui Road (to the existing footpath on the western side of Wainui Road) and east to Te Hutewai Road (to provide key connections to land uses on the eastern side of Te Hutewai Road such as the Raglan Golf Club and the Rangitahi Peninsula Development). As shown in Figure 7, several new pedestrian crossing facilities are proposed along both Wainui Road and Te Hutewai Road.

c. The new pedestrian crossing facilities should, as a minimum, provide for a staged crossing with a pedestrian refuge island.

Figure 7: Potential walking and cycling connections



Walking and cycling connections to neighbouring sites

45. As shown in Figure 4 on page 5 of this statement of evidence, there is an opportunity to provide an additional north/ south shared pedestrian and cyclist link from the Koning site to Wainui Road via the neighbouring property to the north-east of the site. Considering that the neighbouring property is zoned Residential, I consider that a new walking/ cycling connection through the neighbouring site will be more in line with the desire lines and potentially move (recreational) cyclists away from Te Hutewai Road[10] and onto the internal cyclist network.

46. There is also opportunity to provide a direct walking and cycling connection to the Rangitahi Peninsula Development to the east of the subject site as well as the Te Ahiawa residential subdivision to the south of the site with the provision of walking/ cycling paths adjacent to the potential east-west connector road.

47. Consultation and buy-in from the owners of the neighbouring properties will need to be obtained. If buy-in is obtained, the final alignment of the proposed paths will need to be discussed and agreed with the property owners and Council as part of the future subdivision stages.

Public transport

48. Public transport is promoted within the site by ensuring that the proposed accesses on Wainui Road and Te Hutewai Road as well as the proposed collector road within the site are developed with a suitable road reserve width to enable public transport connectivity.

49. It is anticipated that with the development of the Koning site, the current bus route will be reviewed as the demand for public transport changes. Seeing as the nearest public transport facility is located at the Wainui Road & Te Hutewai Road intersection (located approximately 1.8 km north of the site), it is proposed that the existing public transport services be extended south to the proposed development via Wainui Road, through the site, and exiting on Te Hutewai Road heading north to the bus terminus (or vice versa).

50. It is recommended that consultation with Waikato Regional Council (WRC) be undertaken to investigate the potential of either extending public transport services

[10] While no formal on-road cycling facilities are provided along the surrounding road network, both Wainui Road and Te Hutewai Road form part of the Mount Karoio Loop ride. The cycle trail, which starts and finishes in central Raglan, is a Grade 3 45 km long trail that comprises of both gravel and sealed roads. Cyclists currently share the sealed carriageway with vehicles.

south to the Koning site, or providing a bus stopping facility near the new intersections on either Wainui Road or Te Hutewai Road.

Construction traffic effects

51. Development of the rezoning site is likely to occur in stages over a 20-year period, subject to market conditions. Separate resource consents will be required for each earthworks/ construction phase to determine and mitigate the associated transport related effects (including safety effects), if any.

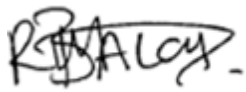
52. The construction traffic effects should be managed for the duration of the works through conditions requiring specific Construction Traffic Management Plans (CTMPs).

CONCLUSION

53. On the basis of the assessments carried out, I consider that the overall transportation effects of the rezoning proposal on the adjoining road network are likely to be minor to moderate in scale but are able to be managed and mitigated to an acceptable level provided the recommended mitigation measures are implemented as part of future development resource consents.

54. In my opinion, the transport infrastructure and further assessments recommended in this statement of evidence relating to safety, connectivity and accessibility for all anticipated vehicle and active travel modes ensure a safe and efficient transport network for pedestrians, cyclists, motorists and public transport commuters.

Dated: 17 February 2021



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Rhulani Matshepo Baloyi

Attachment 1 -

Draft Integrated Transport Assessment for the Raglan Rezoning and Structure Plan

Koning Family Trust

146 Te Hutewai Road, Raglan
Raglan Rezoning

Contract number/s: 144430.01

Integrated Transport Assessment

February 2021

BLOXAM BURNETT & OLLIVER

Document control

Project identification		
Client	Koning Family Trust	
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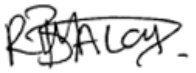
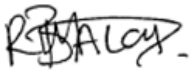
Job number/s	144430.01	
Job name	Raglan Rezoning	
Contract numbers	N/A	
Report name and number	Integrated Transport Assessment, Draft	
Date / period ending	February 2021	
File path	K:\144430 Koning Rezoning\Traffic\2020 Updated ITA and report\Reports\Koning Rezoning 2020 Updated ITA_Draft 20210217.docx	

Report status			
Status	**Name**	**Signature**	**Date**
Report prepared by	Renata Gomez / Rhulani Baloyi		17/02/2021
Checked by	Rhulani Baloyi		17/02/2021
Approved for issue	Cameron Inder		17/02/2021

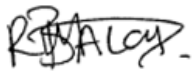
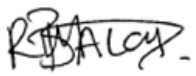
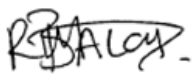
Document history			
Version	**Changes**	**Signature**	**Issue date**
Draft Issue 0.1	Updated based on internal review		26/09/2019
Draft Issue 1.0	Revised effects assessment based on revised development yield		10/01/2020
Draft Issue 2.0	Revised effects assessment based on revised development yield		27/11/2020

Table of contents

1. Executive Summary

Koning Properties Rezoning and Structure Plan

Koning Family Trust (Koning) seeks, through submissions to the Proposed Waikato District Plan (PDP), to rezone approximately 63 hectares (ha) of land which is located on the western outskirts of the Raglan township from the current Rural and Coastal zoning to Residential zoning. If approved, the rezoning submission will enable the staged development of approximately 25-30 hectares (ha) of high-quality residential development over a 20-year period. Based on the proposed extent of developable land indicated in the draft Structure Plan, it is anticipated that the rezoning of the subject site will result in a yield of some 300 – 400 residential allotments.

The Plan Change also seeks an amendment of the Proposed Indicative Urban Limit to include their entire site within the township's urban limit.

The proposed rezoning, and subsequent residential development, is anticipated to absorb a portion of the anticipated growth that Raglan is expected to experience over the long term.

Predicted Trip Generation

Based on trip rates that were derived for the consented Rangitahi Peninsula Development[1], the proposed residential rezoning site is anticipated to generate approximately 1,800 – 2,400 trips per day and 180 - 240 trips during the peak hour.

Transportation Effects Assessment

The overall transportation effects of the rezoning proposal on the adjoining and wider road networks are expected to be minor to moderate in scale, but are able to be managed and mitigated to an acceptable level provided the following recommendations are implemented as part of future development resource consents:

Site Access Proposals – New Intersections

Access to the proposed residential rezoning site is proposed to be via four new road intersections on Wainui Road and Te Hutewai Road as follows:

- One new road intersection on Wainui Road (to be located generally where the existing vehicle crossing to the property at 339 Wainui Road is currently located), and
- Three new road intersections/ accesses on Te Hutewai Road. To improve visibility at the two new southern-most accesses on Te Hutewai Road, it is recommended that the overgrown vegetation on the eastern side of Te Hutewai Road between the two intersection be removed.

At this rezoning stage, the access/ intersection designs have not yet been finalised. It is, however, anticipated that a 'Tee' intersection layout (with free-flow on Wainui Road and Te Hutewai Road) will likely be the appropriate configuration for all four new road accesses. Further investigations need to be undertaken at detailed design stage to determine whether channelized left-turn or right-turn treatments would be warranted from a capacity and safety perspective once the development yield is confirmed.

To improve night-time visibility and thus the safety of the intersections, it is recommended that street lighting be incorporated into the intersection design.

The four accesses/ intersections to the rezoning site should be in general accordance with the form and location described in this ITA, however, the final access location and form should be confirmed during the subsequent subdivision design stages. The accesses/ intersections should be designed in accordance with the provisions in the Waikato District Plan and the Regional Infrastructure Technical Specifications (RITS). The

[1] A daily trip generation of approximately 6 trips/ dwelling and a peak hour generation of 0.6 trips/ dwelling.

location and access design will be subject to planning and engineering approvals from Waikato District Council which will be finalised at the time of development.

Internal Road Network

A network of internal roads has been designed at a concept level to demonstrate how the rezoning site could be serviced (by private, public and active modes). While the draft Structure Plan reflects the high-level network configuration, the finer details of the road network will be refined at future subdivision stages.

A collector road with access off Wainui Road and Te Hutewai Road is envisaged for good connectivity between the proposed lots and the two Council managed roads. The draft Structure Plan also demonstrates how the collector road could potentially provide a much-needed east-west link between the southern extent of the Rangitahi Peninsula Development through to Ngarunui Beach, as well as to the Te Ahiawa residential subdivision. These road linkages would connect the currently disconnected Wainui Road, Te Hutewai Road and Opotoru Road.

Public Transport Infrastructure

Public transport is promoted within the site by ensuring that the proposed accesses on Wainui Road and Te Hutewai Road as well as any proposed collector roads within the site are developed with a suitable road reserve width to enable public transport connectivity.

It is anticipated that with the development of the Koning site, the current bus route will likely be reviewed in future as the demand for public transport changes. Seeing as the nearest public transport facility is located at the Wainui Road & Te Hutewai Road intersection (located approximately 1.8km north of the site), there is opportunity for the existing public transport services to be extended south via Wainui Road or Te Hutewai Road, through the site, and then north to the bus terminus via Te Hutewai Road or Wainui Road[2].

It is recommended that consultation with Waikato Regional Council (WRC) be undertaken to investigate the potential of either extending public transport services south to the Koning site, or providing a bus stop near the new intersections on either Wainui Road or Te Hutewai Road.

Walking and Cycling Infrastructure

A network of walking and cycling connections will be provided through all residential streets within the proposed development (a minimum 1.8 m wide footpaths as per Table 14.12.5.14 of the PDP and 2.5 m wide shared active paths). The proposed walking and cycling infrastructure within the Koning site could readily be extended and connected to the existing facilities on Wainui Road and to key land uses in the surrounding area as follows:

- A new 2.5 m wide (minimum) shared path is proposed which extends north through the Koning site to the existing footpath which is located on the northern side of Wainui Road. A new pedestrian crossing facility is proposed to be provided on Wainui Road at the crossing location.
- New 1.8 m wide (minimum) pedestrian footpaths are proposed to extend west to Wainui Road (to the existing footpath on the western side of Wainui Road, and further west to Ngarunui Beach) and east to Te Hutewai Road (to provide key connections to land uses on the eastern side of Te Hutewai Road such as the Raglan Golf Club and the Rangitahi Peninsula Development). Several new pedestrian crossing facilities are proposed along both Wainui Road and Te Hutewai Road.
- The new pedestrian crossing facilities should, as a minimum, provide for a staged crossing with a pedestrian refuge island.

Walking and cycling connections to neighbouring sites

There is an opportunity to provide an additional north/ south shared pedestrian and cyclist link from the Koning site to Wainui Road via the neighbouring property to the north-east of the site. Consultation and buy-

[2] Bus services are already extended south to Manu Bay during the summer holiday period.

in from the owners of the neighbouring northern property will need to be obtained. However, considering that the neighbouring property is zoned Residential, is it considered that a walking/ cycling connection through the neighbouring site will provide much needed north-south connectivity (and potentially move (recreational) cyclists away from Te Hutewai Road and onto the internal cyclist network). If buy-in is obtained, the final alignment of the proposed path will need to be discussed and agreed with the property owners and Council at the future subdivision stages.

There is also opportunity to provide a direct connection to the Rangitahi Peninsula Development to the east of the Koning site as well as the Te Ahiawa residential subdivision located south of the Koning site with the provision of walking/ cycling paths adjacent to the potential east-west connector road. Buy-in would also need to be obtained from the relevant property owners and Council.

Intersection Upgrades

On the basis of this assessment, the following recommendations are made with regards to the transportation aspects of the proposed rezoning and required intersection upgrades:

1. *Wainui Road One-way Bridge*

It is recommended that traffic signals be installed on the bridge approaches if the planned upgrading (by Council) of the one-lane one-way bridge to a two-lane bridge is not concluded by 2024. In addition to the signalisation of the bridge, it is recommended that advanced warning signs and road markings alerting drivers to the presence of the new traffic signals (and any hidden queues resulting from signalising the bridge) be provided on both bridge approaches.

2. *SH 23/ SH39 Staggered T-intersections*

As a minimum, it is proposed that the intersection be upgraded within the next 10 years (i.e. by 2031) to a single-lane roundabout configuration in line with the findings from the technical assessment that was undertaken by Waka Kotahi.

Consideration should, however, be given for a dual-lane roundabout if the effects of the Waikato Expressway completion in 2021 do not result in a material reduction in traffic on SH39, as currently expected. The preferred roundabout configuration should be identified and implemented in collaboration with Waka Kotahi NZ Transport Agency and Waikato District Council.

3. *Bow Street & Norrie Avenue and SH23 & Te Pahu Road Intersections*

The performance assessments of both intersections concluded that capacity and safety related upgrades will likely be required at both intersections once the first 300 dwelling units are completed to mitigate future capacity constraints. Improvements may likely involve:

- Bow Street & Norrie Avenue intersection: upgrading the stop-controlled intersection to traffic signal control or to a single-lane roundabout configuration.
- SH23 & Te Pahu Road Intersections: upgrading the stop-controlled intersection to a single-lane roundabout configuration.

It is recommended that an ITA be conducted at development Year 15 (i.e. 2039 or after the completion of the first 300 dwellings, whichever comes first) to assess the impact of the proposed development traffic on both intersections as the trip generation and distribution assumptions become realised over time. Proposed (capacity and safety related) mitigation measures should then be reflected in the findings from the ITA.

The ITA should include, but may not be restricted to, the assessment of the following intersections:

- Wainui Road One-way Bridge;
- Bow Street & Norrie Avenue intersection;
- SH23 & Te Pahu Road intersection, and

- SH 23/ SH39 intersection.

Construction Traffic Effects

Separate resource consents will be required for each earthworks/ construction phase to determine and mitigate the associated transport related effects (including safety effects), if any. The construction traffic effects should be managed for the duration of the works through conditions requiring specific Construction Traffic Management Plans (CTMPs).

2. Introduction

2.1 Background

Koning Family Trust (Koning) seeks, through submissions to the Proposed Waikato District Plan (PDP), to rezone land located on the western outskirts of the Raglan township from the current Rural and Coastal zoning (under the Operative District Plan) to Residential zoning.

If approved, the rezoning submission will enable the staged development of approximately 25-30 hectares (ha) of high-quality residential development over a 20-year period. The proposed rezoning, and subsequent residential development, is anticipated to absorb a portion of the anticipated growth that Raglan is expected to experience over the long term[3].

2.2 Report Purpose

This report is an Integrated Transportation Assessment (ITA) completed in accordance with the provisions of Waka Kotahi NZ Transport Agency's (Waka Kotahi) guideline document, published 1 June 2012, which outlines Waka Kotahi's preferred methodology for undertaking integrated transport assessments. It provides an assessment of the expected trip generation and associated land transport related effects of the rezoning submission and identifies the necessary mitigation measures to satisfactorily address those effects at each anticipated stage of development.

This report has been prepared on behalf of Koning as a technical input to the overall Assessment of Environmental Effects reporting for the rezoning at the site in Raglan.

2.3 Site Description and Location

The locality and extent of the site is shown in Figure No. 1 to follow. As shown in Figure No. 1, the subject site is located approximately 3 km south-west of the Raglan town centre on the rolling hills between Wainui Road and Te Hutewai Road.

The subject site is approximately 91 ha in size and comprises of several allotments as follows:

- Part Lot 1 Deposited Plan South Auckland 89073, Record of Title 216110;
- Lot 1 Deposited Plan South Auckland 90029, Record of Title 216110;
- Lot 1 Deposited Plan South Auckland 30217, Record of Title SA27B/621, and
- Lot 3 Deposited Plan 340412, Record of Title 406847.

In general, the land adjacent to the site is currently zoned as follows (the key land uses surrounding the subject site are illustrated in Figure No. 2 to follow):

- Country living to the west with several country living lots adjoining the western boundary of the subject site;
- Reserve further west with the Wainui Reserve Bush Park located on the western side of Wainui Road;
- Coastal along the eastern boundary of the site on the eastern side of Te Hutewai Road;
- Residential along the north-eastern boundary of the subject, and
- Rural along the remainder of the northern boundary and along the entirety of the southern boundary of the site. A Council owned wastewater treatment plant is located adjacent to the northern boundary of the site with a refuse transfer station "Raglan Extreme Zero Waste" (which was historically a landfill site) located adjacent to the southern boundary of the site.

[3] The 'Future Proof Strategy' prepared for the Waikato region has identified Raglan as one of the key sub-region growth areas.

Figure No. 1: Locality Map - Proposed Rezoning Sites

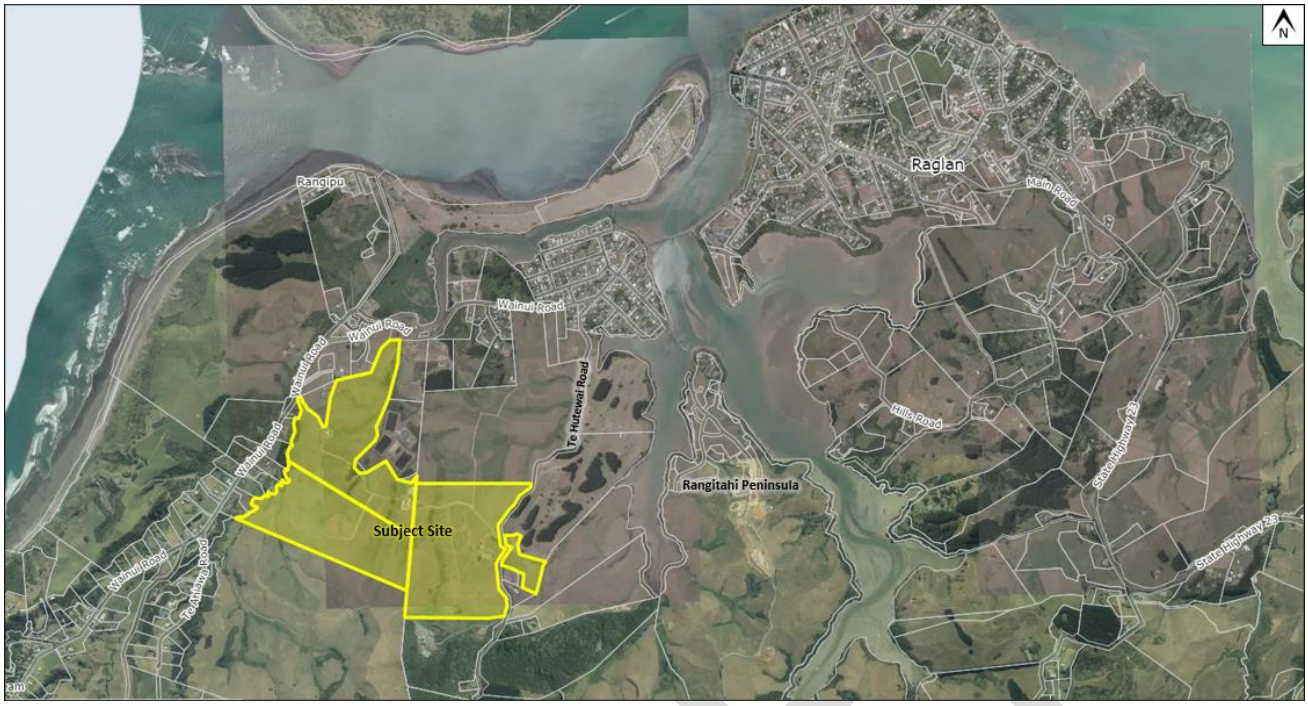
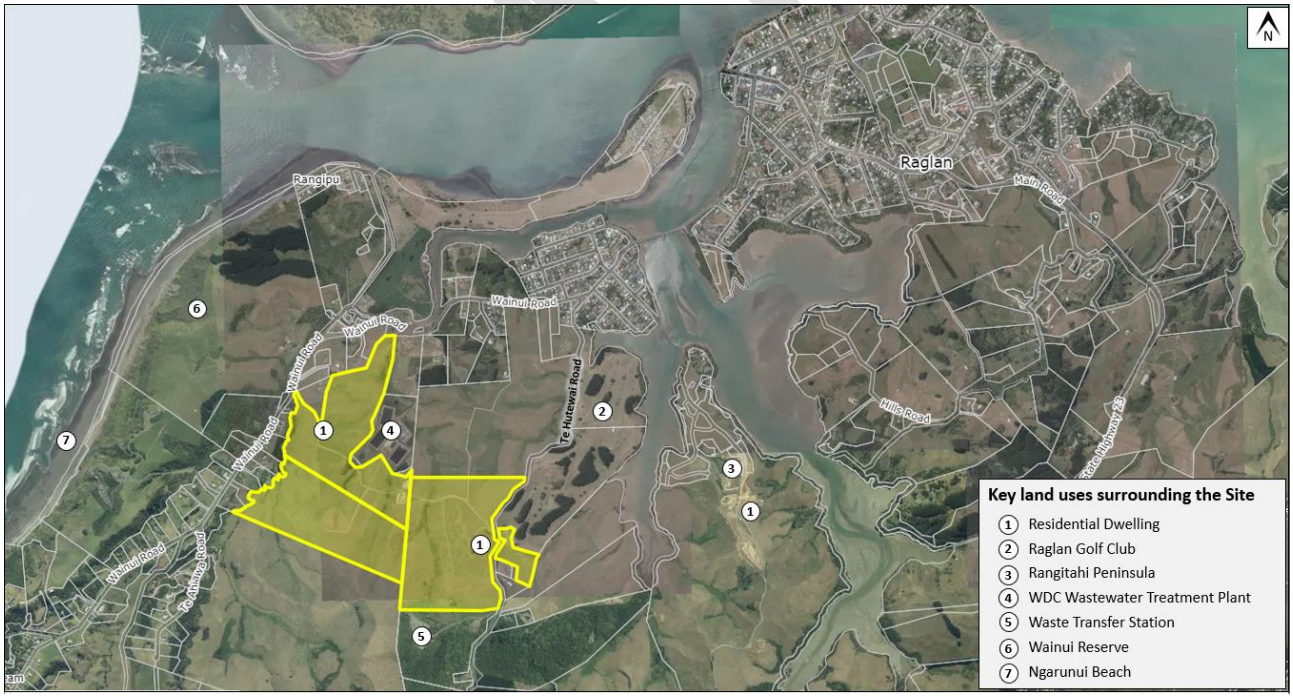


Figure No. 2: Key land uses surrounding the Koning Site

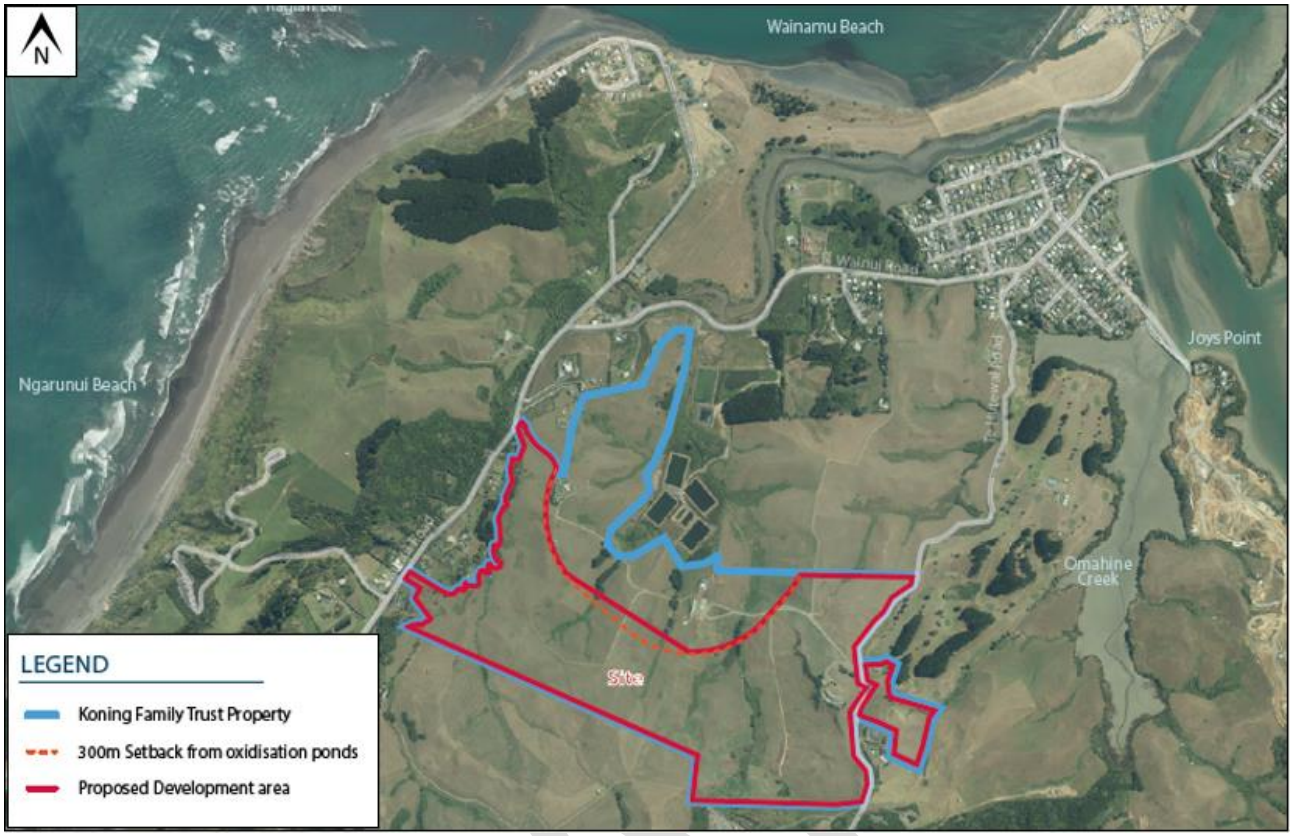


As shown in Figure No. 2 above, a portion of the Koning site is located in close proximity to the oxidation ponds from Council's neighbouring wastewater treatment plant.

2.4 Proposal Overview

Koning seeks to rezone only part (approximately 63 ha) of their 91 ha landholdings which is located greater than 300 m from the oxidation ponds located on the neighbouring property from Rural/ Coastal to Residential. The proposed Residential zone boundaries, which are illustrated in Figure No. 3 to follow, ensures that the District Plan's requirement for residential dwellings to be setback at least 300 m from oxidation ponds is satisfied.

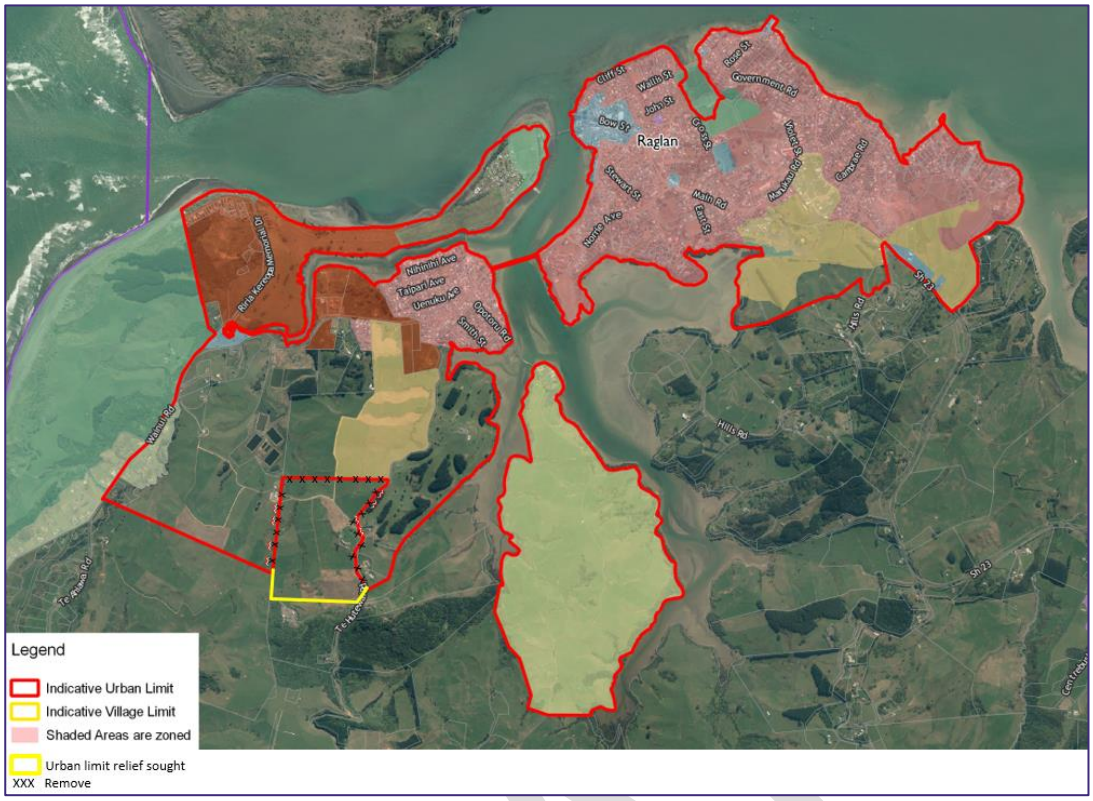
Figure No. 3: Proposed Re-zoning



As part of the rezoning submission, Koning also seeks to amend the Proposed Indicative Urban Limit (as identified in Map 1 of Appendix 2 of the Future Proof Strategy and illustrated in Figure No. 4 below) and include the land identified as SA27B/621 within Raglan township's urban limit. Figure No. 5 to follow illustrates the proposed amendments to the indicative urban limit boundary.

Figure No. 4: Indicative Urban Limits 2026 (Source: Map 1 of Appendix 2 of the Future Proof Strategy)

Figure No. 5: Proposed Amendments to the Raglan Township Indicative Urban Limits



Given the extent of the proposed development that will be enabled by the re-zoning, the proposed development will have implications for traffic movements in the area, particularly movements along Wainui Road and Te Hutewai Road. The transport effects of this proposals are considered and discussed in the subsequent sections of this report.

3. Existing Transport Environment

3.1 Existing Land Use

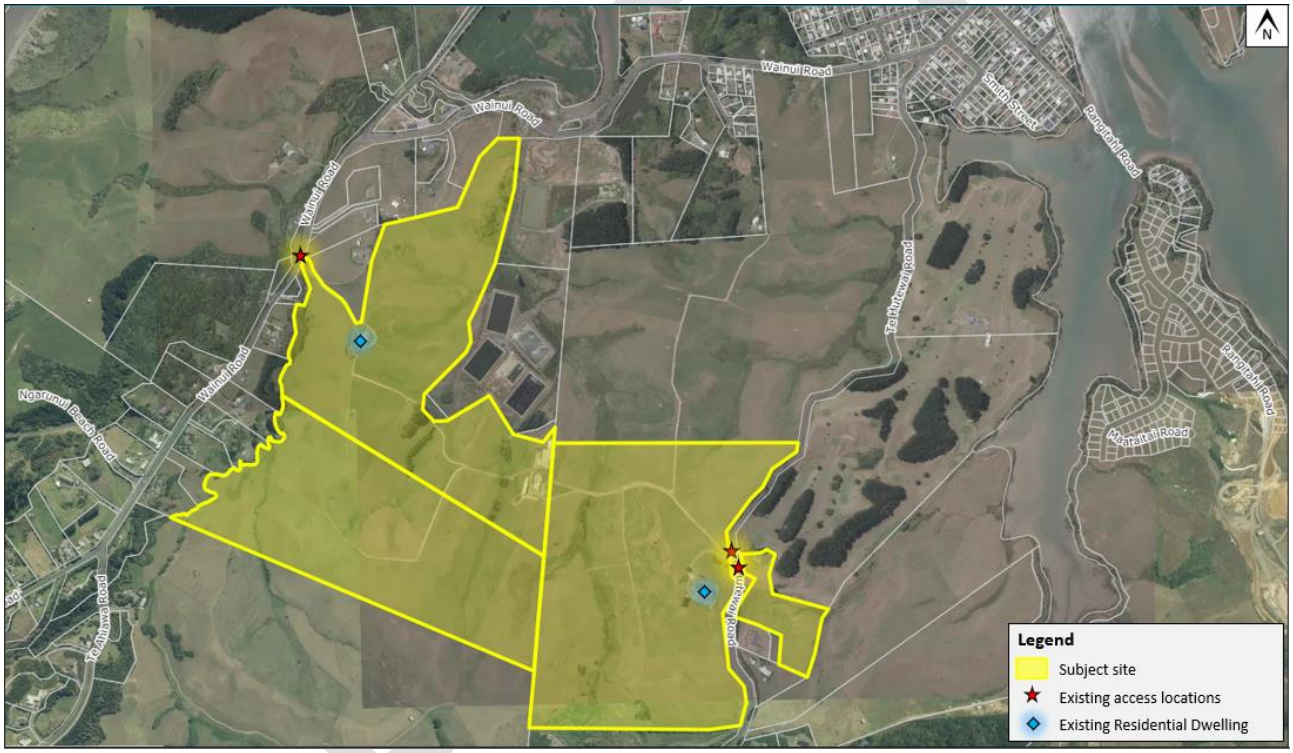
The four allotments which comprise the subject site are currently zoned as follows:

- The landholdings to the west of Te Hutewai Road, which are collectively approximately 89 ha in size, are contained within the Rural zone, while
- A small portion of the subject site (approximately 3 ha in size) which is located on the eastern side of Te Hutewai Road is contained within the Coastal Zone.

The majority of the site is currently used for dairy farming. In addition, there are also two large lot residential and lifestyle properties located within the subject site: one along the western boundary and the other along the eastern boundary of the site. The locations of these residential properties are indicated in Figure No. 6.

As shown in Figure No. 6, access to the existing properties/ activities within the site is currently provided via vehicle crossings on Wainui Road and Te Hutewai Road. No public roads current exists through the site.

Figure No. 6: Existing road network surrounding the Site



3.2 Existing Road Network Characteristics

The existing network of roads surrounding the subject site is shown in Figure No. 6 above and include Wainui Road and Te Hutewai Road. Access to the subject site is anticipated to be from these two district council roads.

A summary of the main characteristics of each road is provided in the subsections to follow.

3.2.1 Wainui Road

Wainui Road is a two-way two-lane sealed road with 3.3m wide lanes and generally no shoulders in the area around the site. The road currently provides access to several residential properties to the west of the subject site, as well as access to the Wainui Reserve Bush Park located directly opposite the site.

The road is currently classified as a Scenic and Tourism Route under the ODP road hierarchy list (Table 8 in Appendix A) and as a Collector Road under the PDP (Table 14.12.5.6). Based on Council's 2020 traffic count data, the section of Wainui Road that runs along the western boundary of the site has an estimated AADT of approximately 1,739 vehicles per day (vpd) with approximately 3% being heavy commercial vehicles (HCV).

Wainui Road currently has a posted speed limit of 80 km/h in the vicinity of the site. The legal speed limit for the section that runs parallel to the western boundary of the site has recently been reduced from 80 km/h to 60 km/h[4] in line with the safe and appropriate speed for the road.

Given the road's winding alignment (which is evident from the 55 km/h advisory speed just north of the existing access) the speed environment in the vicinity of the site is not expected to exceed the 60km/h legal speed limit.

3.2.2 Te Hutewai Road

Te Hutewai Road is classified as a Local Road under the ODP and PDP. According to Council's latest (2020) traffic count data, the section of Te Hutewai Road that runs along the eastern boundary of the site has an AADT of approximately 131 vpd with 6% HCVs. Te Hutewai Road is a two-way two-lane road with a seal width of 6.4 m.

The legal speed limit for the section that runs parallel to the eastern boundary of the site has recently been reduced from 100 km/h to 60 km/h in line with the safe and appropriate speed for the road.

3.2.3 Local Area Intersections

This section identifies existing intersections within the vicinity of the rezoning site which could potentially be affected by traffic associated with the rezoning. The intersections listed below, which are considered to be located along the likely travel route for traffic associated with any future development that would be consistent with the rezoning request (if successful). Refer to Section 6.2.3 of this report for discussions regarding the predicted assignment of traffic associated with the proposed rezoning in the surrounding road network.

1. Wainui Road and Te Hutewai Road intersection;
2. Wainui Road One-way Bridge;
3. Wainui Road and Whitley Street intersection;
4. Wainui Road and Stewart Street intersection;
5. Wainui Road and Bankart Street intersection;
6. Bankart Street and Bow Street intersection, and
7. Bow Street and Norrie Avenue intersection.

Figure No. 7 on the following page illustrates the location of the intersections listed above. A summary of the main characteristics of the affected intersections within Raglan township are summarised in Table No. 1 to follow.

[4] In accordance with the Waikato District Council's Speed Limit Bylaw 2019

Figure No. 7: Indicative locations of intersections within Raglan township that are likely to be impacted by the proposed rezoning traffic

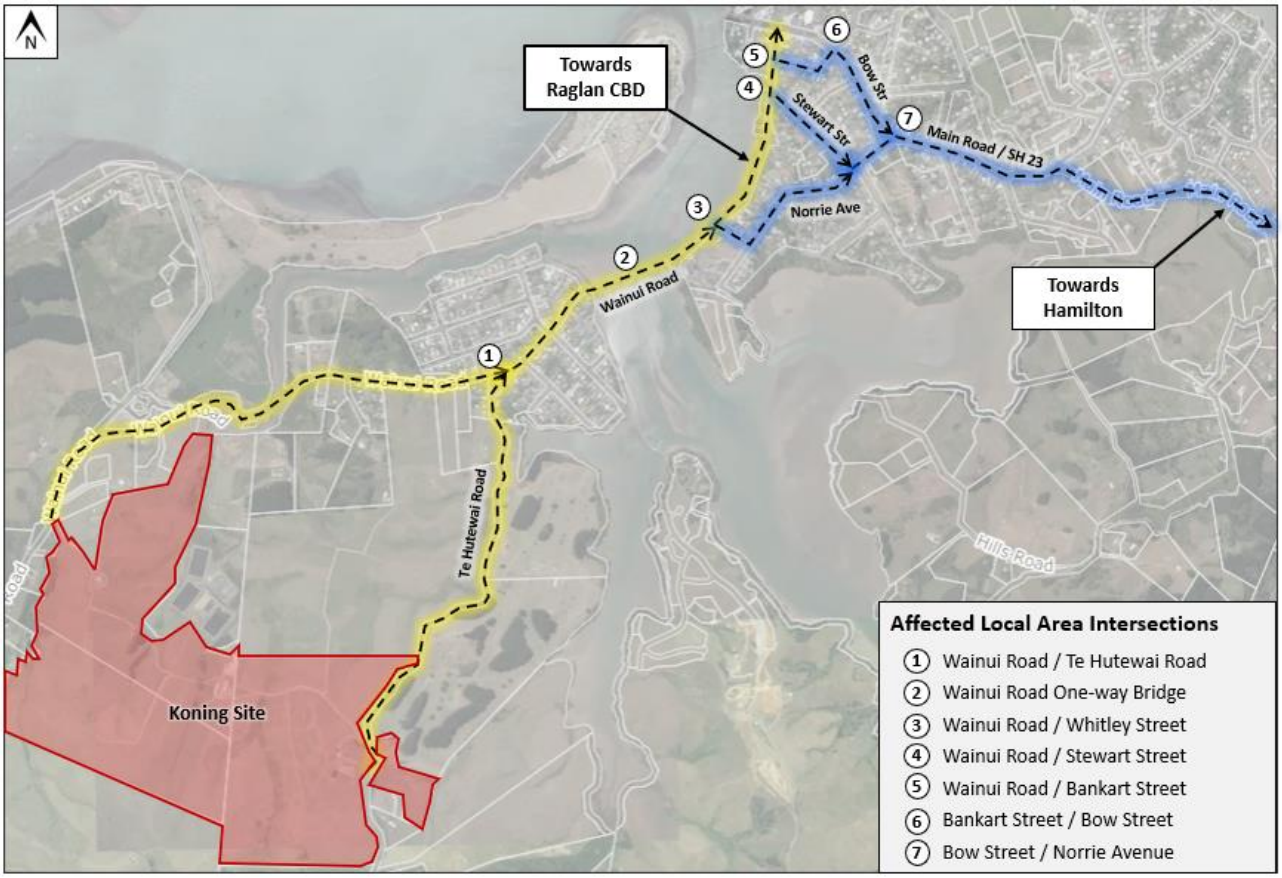


Table No. 1

Local area intersections	
1. Wainui Road & Te Hutewai Road Intersection	
• The Wainui Road & Te Hutewai Road T-intersection is Give-Way controlled on the Te Hutewai Road approach and free-flow on Wainui Road. An exclusive right-turn bay is provided on the eastbound approach while a left-turn slip lane is provided on the westbound approach. • A public transport stop, which services the regional bus service (refer to Section 3.5.1), is located on the south-eastern corner of the intersection.	
2. Wainui Road One-Bridge	
• The Wainui Road Bridge is a one-lane bridge which provides a connection between the western and eastern parts of Raglan. It is also the main connection between Raglan township and its famous beaches. • Westbound traffic has right of way; i.e. eastbound approach is Give-Way controlled. The existing configuration is shown on the following page.	

Local area intersections

3. Wainui Road & Whitley Street Intersection

- The Wainui Road & Whitley Street T-intersection, which was previously Give-way controlled on the Whitley Street approach and free-flow on Wainui Road, was recently upgraded to a stop-controlled intersection with a compulsory Stop on the Whitley Street approach.
- The pre-upgrade configuration is shown on the right.

4. Wainui Road & Stewart Street Intersection

- The Wainui Road & Stewart Street T-intersection is Give-Way controlled on the Stewart Street approach and free-flow on Wainui Road. The existing configuration is shown on the right.
- On-street parking is provided in the vicinity of the intersection as shown in the figure. Parallel parking bays are provided on one side of Wainui Road, while angled parking bays are provided on the southern side of Stewart Street.

Local area intersections

5. Wainui Road & Bankart Street Intersection

- The Wainui Road & Bankart Street intersection is a three-legged single-lane roundabout. There are, however, two vehicle crossings/ private vehicle accesses located on the western side of the roundabout (the configuration is shown in the figure on the right).
- The roundabout is separated by approximately 110 m to the Wainui Road/ Stewart Street intersection.

6. Bankart Street & Bow Street Intersection

- The Bankart Street & Bow Street intersection is a four-legged single-lane roundabout (the configuration is shown in the figure on the left).

7. Bow Street & Norrie Avenue Intersection

- The Bow Street & Norrie Avenue intersection is a stop controlled T-intersection with a compulsary Stop on the Norrie Avenue approach and free-flow on Bow Street (the configuration is shown on the right).
- There are two filling station accesses located on the northern side of the intersection (one left-in and one left-out access).
- Exclusive right-turn bays are provided on Bow Street on the westbound and eastbound approachs.

3.2.4 Wider Area Intersections

The scope of the assessment was expanded to include a number of intersections located along State Highway 23 (SH23) as this is the main route linking Raglan and Hamilton (refer to Section 6.2.3 of this report for discussions regarding the predicted assignment of traffic associated with the proposed rezoning in the surrounding road network.) – it is expected that a significant number of the trips that is expected to be generated by the proposed development will commute to Hamilton for employment purposes.

Only intersections located along the section of SH23 between Raglan and Hamilton with daily traffic volume figures exceeding 1,000 vpd on the minor approach road (i.e. the road intersecting with SH23) were included in the assessment. For road links where the AADT on the minor road approaches was less than 1,000 vpd, it is considered that sufficient spare capacity would be available at these intersections, and that the safety and capacity of these intersection are unlikely to be adversely impacted by the additional traffic associated with development of the rezoning site.

Based on the latest traffic volume data sourced from Waka Kotahi and Council, only three intersections meet this criterion (i.e. minor road approach has an AADT exceeding 1,000 vpd). These included:

1. SH23 & Te Mata Road intersection
2. SH23 & Te Pahu Road intersection
3. SH23 & SH39 intersection

Figure No. 8 illustrates the location of the intersections listed above, while Table No. 2 provides a summary of each intersection.

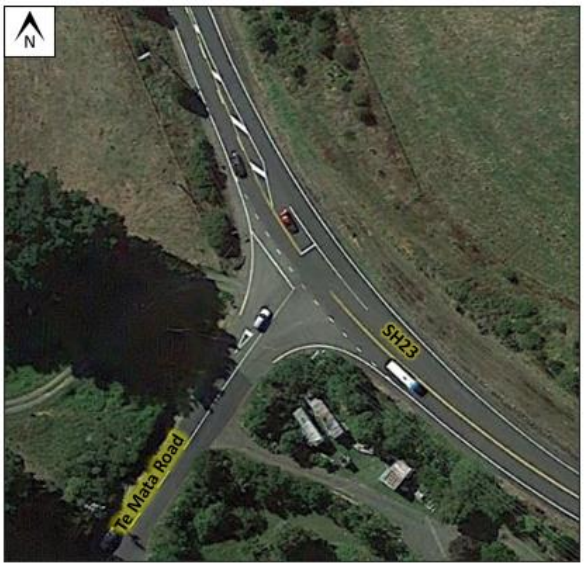
Figure No. 8: Indicative locations of intersections along SH23 that are likely to be impacted by the proposed rezoning traffic

Table No. 2

Wider area intersections

1. SH 23 & Te Mata Road Intersection

- The SH 23 & Te Mata Road intersection is a T-intersection with free-flow on SH 23 and Give-way control on the Te Mata Road approach (the existing intersection configuration is shown in the figure on the right).
- An exclusive right-turn bay is provided on the southbound approach.



2. SH23 & Te Pahu Road Intersection

- The SH 23 & Te Pahu Road intersection is a T-intersection with free-flow on SH 23 and Give-way control on the Te Pahu Road approach (the existing intersection configuration is shown in the figure on the left).
- An exclusive right-turn bay is provided on the eastbound approach, while a left-turn slip lane is provided on the westbound approach.
-

3. SH23 & SH39 Intersection

- The SH23 & SH39 intersection is a staggered intersection which consists of two T-intersections. The existing configuration is shown in the figure on the right.
- The two T-intersections are stop-controlled, with free-flow on SH23 and a compulsory Stop on the SH39 northbound and southbound approaches.
- Exclusive right-turn bays, which are separated by a raised median, are provided on SH23, while an channelised left turn lane is provided on the westbound approach of the eastbound intersection.

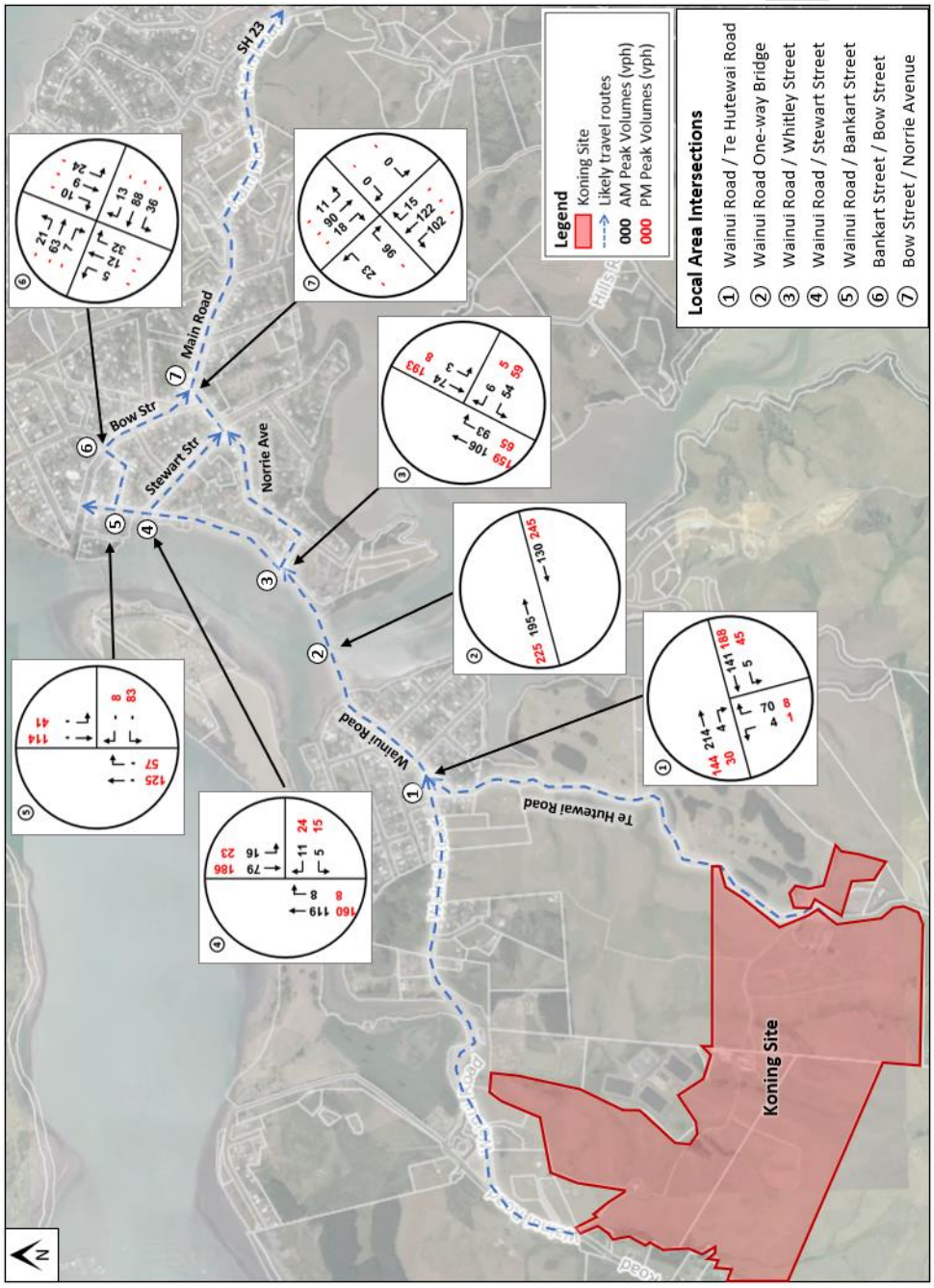
3.3 Existing Traffic Demand

3.3.1 External Road Network Traffic Demand – Typical Weekday Period

Local Road Network

Turning movement surveys were undertaken at several of the identified intersections within the local road network (refer to Section 3.2.3) on Thursday, 30 May 2019 either during the morning (6:30am to 8:30am), afternoon (4:45pm to 6:15pm), or both peak periods in order to determine the peak hour traffic demand[5]. The observed (2019/20) AM and/ or PM peak hour turning volumes are illustrated in Figure No. 9 to follow.

Figure No. 9: 2019/20 Peak Hour Turning Volumes – Local Area Intersections



[5] Where manual traffic surveys were undertaken during one peak period only (i.e. either during the AM or PM peak period), that period was observed to be the period when the peak traffic demand occurred at the intersection (this is based on an assessment of the Council provided traffic count data).

Wider Area Network

The peak hour traffic volumes for the SH 23/ Te Mata Road and SH 23/ Te Pahu Road intersections were derived from Council's 201/20 traffic count data. The observed peak hour traffic volumes at these two intersections are summarised in Table No. 3 below.

Table No. 3

Estimated 2019/20 Peak Hour Traffic Volumes at intersections along the wider road network				
SH23 Intersection	Peak Hour Traffic Volumes SH 23 (vph)		Peak Hour Tr0affic Volumes Minor Road Approach (vph)	
	AM Peak	PM Peak	AM Peak	PM Peak
SH23 / Te Mata Road Intersection	481	578	95	95
SH23 / Te Pahu Road Intersection	712	813	125	125

Manual turning movement surveys were conducted on Thursday, 29 August 2019 during the morning (6:45am – 8:45am) and afternoon (4:00pm – 6:00pm) periods at the SH23 & SH39 intersection to determine AM and PM peak traffic demand. The peak hour traffic volumes are provided in Figure No. 10 and Figure No. 11 for the AM and PM peak periods respectively.

Figure No. 10: SH23 & SH39 Intersection - Estimated 2019 AM Peak Hour Traffic Volumes

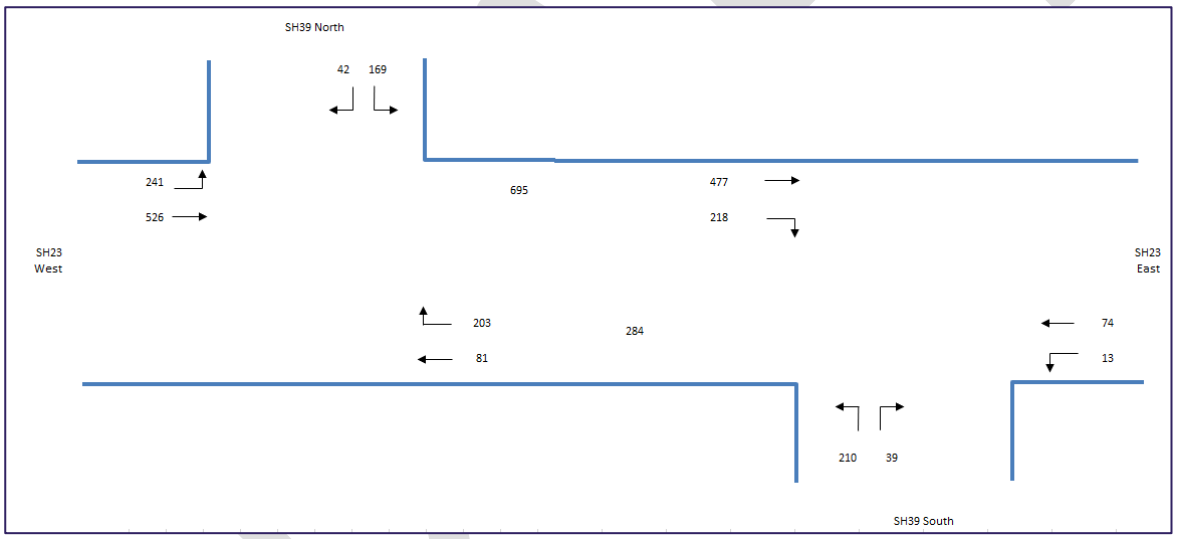
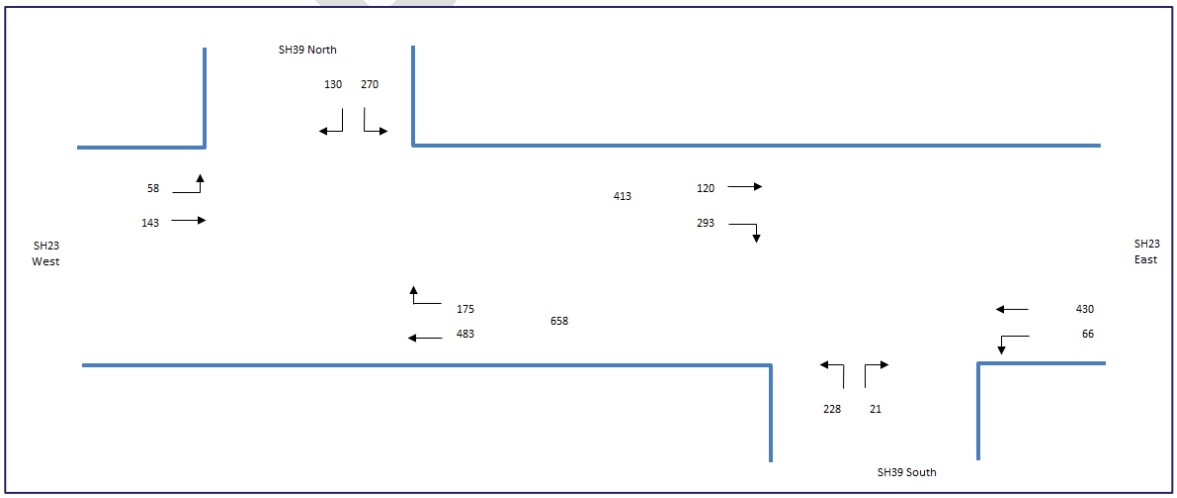


Figure No. 11: SH23 & SH39 Intersection - Estimated 2019 PM Peak Hour Traffic Volumes



3.3.2 External Road Network Traffic Demand - Holiday Period

Raglan is a popular visitor destination with its population increasing by between 300% and 400% during the summer holiday period, consequently increasing the volume of traffic within the Raglan road network and along SH23. This variation in traffic flows requires the consideration of two seasonal periods in the analysis, namely:

- The non-holiday period which includes the non-summer holiday period (i.e. February to November), and
- The holiday period which occurs during the summer holiday period (i.e. December to January).

In the absence of traffic count data for the holiday period, hourly traffic count data sourced from Waka Kotahi's Traffic Monitoring System (TMS) website was used to derive the holiday period traffic increase factor. Yearly traffic data for SH23 for the previous five-year period (2013 to 2019/20) was analysed to determine the difference/ change in the traffic demand between the holiday and non-holiday periods. The following observations were made during the analysis:

- Between Raglan township and the SH23 & Te Mata Road Intersection – the traffic demand increased by approximately 15% and 25% during the summer holiday period for the AM and PM peak periods respectively, and
- Between the SH23 & Te Pahu Road Intersection and the SH23 & SH39 intersections - the traffic demand increases by approximately 15% and 10% during the summer holiday period for the AM and PM peak periods respectively.

Based on the above, the following conservative assumptions were made related to the anticipated increase in traffic during the summer holiday period:

- The peak traffic demand along Wainui Road is expected to increase by approximately 15% and 25% during the AM and PM peak periods respectively, and
- The peak traffic demand along SH23 is anticipated to increase as follows:
  - By approximately 15% and 25% during the AM and PM peak periods respectively for the section between Raglan CBD and the Te Mata Road intersection
  - By approximately 15% and 10% during the AM and PM peak periods respectively for the section between the Sh23 / Te Pahu Road intersection and the SH23 / SH39 intersection.

Little to no increase in the traffic demand is anticipated along Te Hutewai Road, Te Mata Road and Te Pahu Road during the holiday periods as these roads do not provide any known linkages to significant tourist destinations or summer period activities. On this basis, it is anticipated that these roads will not attract additional traffic during the summer holiday period.

Sensitivity testing was undertaken to determine the impact of the increased traffic volumes during the summer periods on the external road network performance. The findings from the sensitivity analysis are provided as part of the assessments in Section 7.

3.4 Future Traffic Demand

The future baseline traffic demand along the external road network was estimated based on the following:

- Historic traffic growth along the local and wider road networks;
- Population and economic growth projections for Raglan township, and
- Future traffic generated by major consented developments within Raglan township.

These are discussed in more detail in the subsections to follow.

3.4.1 Traffic and Population Growth

The future traffic growth along the local and wider road networks was estimated based on the following:

- The projected household growth figures for Raglan township – based on the report[6] by Property Economics, the number of households in Raglan township are projected to increase by approximately 30% by 2038 (i.e. the number of households are expected to increase by 1.55% per annum between 2019 and 2038).
- The projected population growth figures for Raglan township – based on Statistics New Zealand, the population of Raglan is estimated to grow from approximately 3,115 in 2016 to 3,611 in 2045. This equates to a population growth of 0.5% per annum over the next 30 years.
- The historic traffic growth along the external road network (i.e. Wainui Road, Te Hutewai Road and SH23) – an analysis of the traffic count data for the previous 10 years (2009 to 2019/20) indicated that the traffic growth varied between -10% and 18% per annum during this 10-year period, with an overall average growth rate of 1% per annum.

Based on the above, the following conservative assumptions were made regarding the future traffic growth:

- An annual traffic growth rate figure of 1.5% was applied to road links and intersections within the local area network (i.e. Wainui Road and Te Hutewai Road), and
- A traffic growth rate figure of 1% per annum was applied to road links within the wider road network (i.e. along SH23).

These low traffic growth figures are considered representative of Raglan given the relatively low population and household growth figures projected for the township.

3.4.2 Major Consented Developments within Raglan Township

The Rangitahi Peninsula Development is a major consented residential development located to the east of the proposed Koning Family Trust residential development – Figure No. 12 shows the location of the consented development relative to the Koning Site. The Rangitahi Peninsula residential subdivision, which is currently under construction, will result in the development of 500 new residential dwelling units which will be constructed in stages over a 40-year period. The expected trip generation from this major development is discussed in Section 6.1 of this report.

[6] The report, titled *Raglan Residential Market Assessment Phase 1*, dated September 2018 was prepared by Property Economics for Koning Family Trust

Figure No. 12: Indicative location of the consented Rangitahi Peninsula Development

3.5 Existing Transport Modes

3.5.1 Public Transport

There are currently no public transport services provided within walking distance of the subject site. The lack of public transport services and PT infrastructure within the vicinity of the rezoning site is largely due to the current rural nature of the area.

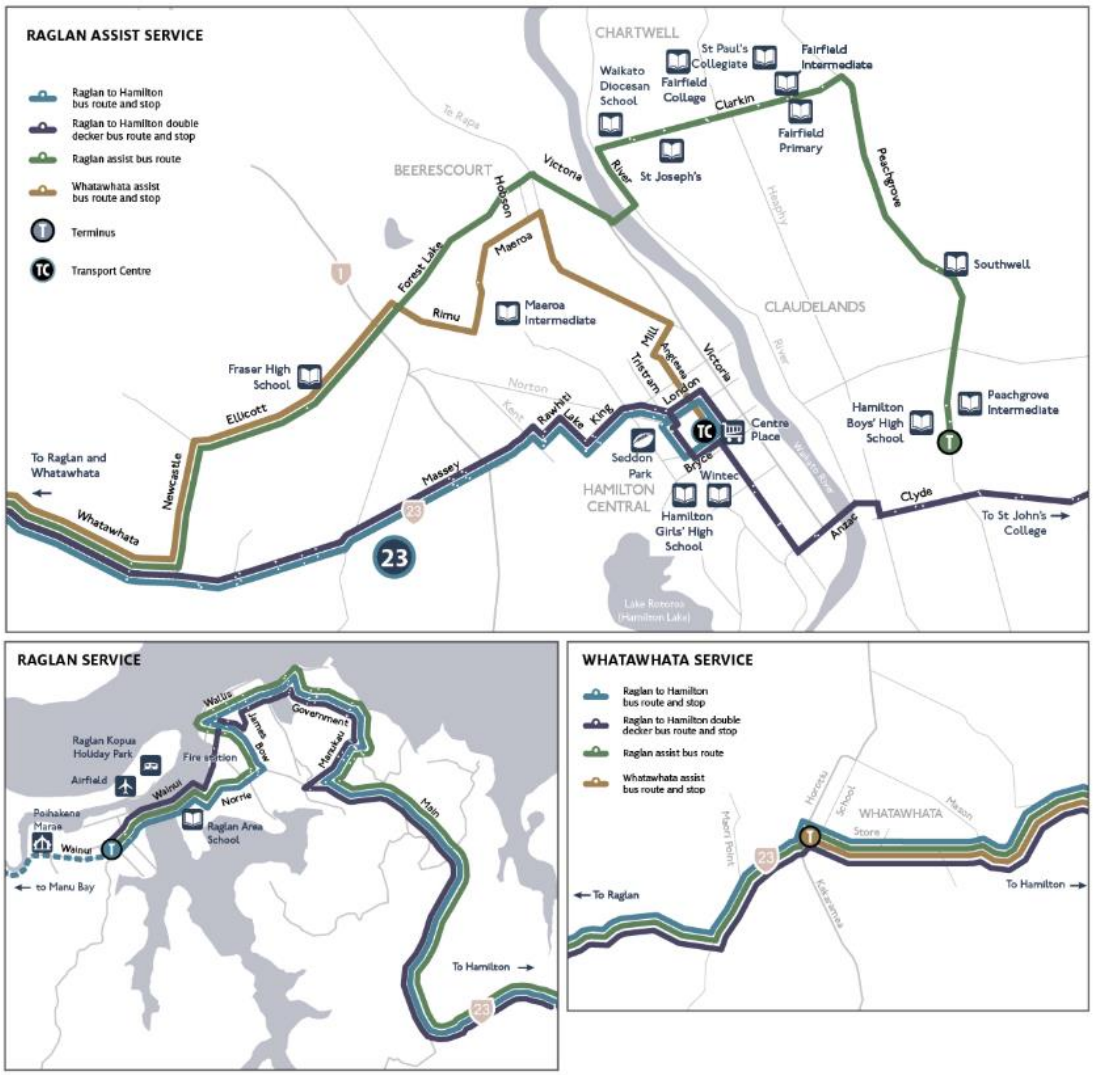
The closest bus service to the site is the Route 23 regional bus service (Raglan 23 Bus service) which operates between Raglan and the Hamilton Transport Centre. The route for the bus service is illustrated in Figure No. 13 to follow. As shown in Figure No. 13, the closest bust stop/ public transport terminus to the subject site is located at the intersection of Wainui Road and Te Hutewai Road.

The bus schedule for the Route 23 bus service is summarised as follows (source: BusIT website[7]):

- Monday to Friday during school terms:
  - Raglan to Hamilton: the bus service departs from the bus terminus at Wainui Road/ Te Hutewai Road intersection only once during the morning period (at 6:50am), once during the afternoon period (at 5:00pm), and twice during the midday/ off-peak periods (at 10:00am and 1:50pm).
  - Hamilton to Raglan: the bus service stops at the bus terminus only once during the morning period (at 9:30am), twice during the afternoon period (at 4:40pm and 4:47pm) and twice during the midday/ off-peak period (at 1:15pm and 6:50pm).
- The weekday bus service is reduced to four buses during school holidays.
- During weekends and public holidays, only one bus departs from Raglan during the morning and afternoon periods respectively.
- During the summer holidays, the bus services are extended to Manu Bay to cater for tourists.

[7] https://www.busit.co.nz/regional-services/raglan/ , accessed 23 October 2020

Figure No. 13: Existing Bus Service within Raglan Township (Source: BusIT website)



3.5.2 Walking and Cycling

The existing footpath on Wainui Road (which until recently terminated at Riria Keropa Memorial Drive intersection) has recently (in 2020) been extended south to the Wainui Reserve. A new 2m wide footpath has recently been constructed on the western side of Wainui Road from the Riria Keropa Memorial Drive intersection to the Wainui Reserve Carpark to serve the existing pedestrian traffic in the area.

There are currently no existing pedestrian facilities along Te Hutewai Road. This is likely due to the current undeveloped nature in the area and the low volumes of pedestrians observed in the area.

While no formal on-road cycling facilities are provided along the surrounding road network, both Wainui Road and Te Hutewai Road form part of the Mount Karoio Loop ride. The cycle trail, which starts and finishes in central Raglan, is a Grade 3 45 km long trail that comprises of both gravel and sealed roads. Cyclists currently share the sealed carriageway with vehicles.

4. Road Safety Environment

Crash data for the previous five years (January 2016 to December 2020, and including up to January 2021) was sourced from Waka Kotahi's Crash Analysis System (CAS) and analysed to identify any road safety related issues within the vicinity of the proposed development. Full crash records for each of the locations which were studied are provided in Appendix A.

4.1 Road Corridors

A summary of the crash data recorded on the adjacent road corridors located within the vicinity of the Koning site is provided in Table No. 4. The road corridors include Wainui Road and Te Hutewai Road.

Table No. 4

Crash summary for the previous five years (2016 to 2020) – Local road network					
Intersection	Crash Severity				Total No. of Crashes
	Fatal	Serious	Minor	Non-Injury	
Wainui Road	0	0	1	2	3
Te Hutewai Road	0	0	0	0	0
Total	**0**	**0**	**1**	**2**	**3**

The following observation were made during the analysis of the crash data:

- A total of three crashes were recorded along the section of Wainui Road which runs parallel to the western boundary of the subject site. Only one crash resulted in minor injuries, while the remaining two crashes did not result in any injuries. All three crashes were related to/ occurred in the vicinity of the horizontal bend located 30 m south of the existing access at 339 Wainui Road.
  - One crash was associated with a northbound vehicle on Wainui Road losing control while navigating the left bend, veering off the road and landing in a ditch. The crash report notes that the non-injury crash occurred during the night-time during inclement weather conditions (i.e. rain).
  - The remaining non-injury crash occurred as a result of a vehicle losing control while turning left onto the Wainui Reserve Carpark. However, the crash report does note that the vehicle was being pursued by police at the time of the crash.
  - One crash, which only resulted in minor injuries, occurred when a heavy vehicle/ truck failed to slow down while traveling downhill. The driver lost control of the vehicle, veered off the road and collided into a clay bank. The crash report notes that brake failure as the likely cause of the crash.
- No crashes were recorded along the section of Te Hutewai Road which runs through the eastern boundary of the subject site. The very low/ zero crash rate indicates that there are presently no apparent road safety issues along this section of the road. Furthermore, the crash data assessment did not identify any safety issues related to existing vehicle crossings along Te Hutewai Road.

While several crashes were recorded along Wainui Road in the previous five years, none of the crashes resulted in any deaths or serious injuries. With the recent reduction of the legal speed limit to 60 km/h (in line with the safe and appropriate speed of both roads), it is considered that the risk and severity of crashes along both Wainui Road and Te Hutewai Road has been significantly lowered.

4.2 Local Area Intersections

A summary of the crash data recorded at external intersections located within the vicinity of the site is provided in Table No. 5.

Table No. 5

Crash summary for the previous five years (2016 to 2020) – Local area intersections					
Intersection	Crash Severity				Total No. of Crashes
	Fatal	Serious	Minor	Non-Injury	
Wainui Road & Te Hutewai Road intersection	0	1	2	0	3
Wainui Road One-way Bridge	0	0	1	1	2
Wainui Road & Whitley Road intersection	0	0	2	3	5
Wainui Road & Stewart Street intersection	0	0	0	1	1
Wainui Road & Bankart Street intersection	0	0	0	0	0
Bankart Street & Bow St intersection	0	0	0	2	2
Bow Street & Norrie Avenue intersection	0	0	1	2	3
Total	**0**	**1**	**6**	**9**	**16**

The following observations were made during the analysis of the crash data:

1. Wainui Road & Te Hutewai Road intersection: One serious and two minor injury crashes were recorded within a 50 m radius of this intersection. All three crashes occurred during the night-time. A description is provided below.
   - Two of the three crashes occurred as a result of a westbound vehicle on Wainui Road veering off the road and either landing on the grass verge or colliding with a parked vehicle on Wainui Road.
   - The remaining crash, which resulted in minor injuries, was associated with a northbound vehicle on Te Hutewai Road losing control on a left bend located 50m south of the intersection, veering off the road and crashing into the fence of an adjacent property.
   - In all three crashes, the driver of the vehicle either admitted to, or was suspected of, driving while under the influence of alcohol. In two of the three crashes, the driver fell asleep behind the wheel.
2. Wainui Road One-way Bridge: Two crashes were recorded within a 150 m radius of the Wainui Road One-way bridge. A description is provided below.
   - One crash, which resulted in minor injuries, occurred as a result of an eastbound vehicle on Wainui Road approaching the back of a queue, failing to stop and rear-ending the last vehicle in the queue.
   - The remaining crash occurred as a result of a westbound vehicle on Wainui Road failing to stop and rear-ending a slower moving southbound vehicle. The crash, which occurred at night, did not result in any injuries.
3. Wainui Road & Whitley Road intersection: A total of five crashes were recorded at within a 50 m radius of the intersection. Two of the five crashes resulted in minor injuries, while the remining three crashes did not result in any injuries.
   - Four of the five crashes were related to vehicle traveling eastbound on Wainui Road intending on turning right onto Whitley Street failing to give-way to oncoming traffic and colliding head-on with a vehicle travelling westbound on Wainui Road.
   - The remaining crash, which did not result in any injuries, occurred when a northbound vehicle on Wainui Road intentionally reversed into a vehicle which had stopped behind it.

4. Wainui Road & Stewart Street intersection: Only one crash, which did not result in any injuries, was recorded at the intersection. The crash occurred during a police pursuit; while chasing an offending vehicle, a law enforcement vehicle travelling west on Stewart Street turned left onto Wainui Road, came up to the kerb and clipped the Give-way sign located at the intersection. The crash occurred during the night-time.
5. Wainui Road & Bankart Street intersection: no crashes were recorded within a 50 m radius of the roundabout in the previous five-year period.
6. Bankart Street & Bow Street intersection: Two non-injury crashes were recorded within a 50 m radius of the intersection. A description is provided below.
   - One crash occurred as a result of a vehicle travelling north on Bow Street rear-ending a westbound vehicle which had just reversed out of an angled park in front of the Raglan Community House.
   - The remaining crash occurred as a result of a northbound vehicle on Bow Street losing control while turning left onto Bankart Road, mounting the raised central island and colliding into the adjacent property. The crash occurred at night, during a police pursuit; the front tyres of the offending vehicle were deflated due to the vehicle being spiked just outside of Raglan township.
7. Bow Street & Norrie Avenue intersection: Three crashes were recorded at (and within a 50 m radius of) this intersection. Two of the three crashes did not result in any injuries, while the remaining crash resulted in minor injuries.
   - One crash occurred as a result of a vehicle travelling west on Bow Street rear-ending a westbound vehicle which has slowed down with the intention of turning right onto Norrie Avenue.
   - One crash occurred as a result of an eastbound vehicle exiting from the filling station located to the northern side of the intersection failing to give-way and colliding with a vehicle travelling east on Bow Street/ Main Road. The crash report states that the driver's sight was obstructed by a campervan that was parked on the western side of the filling station access.
   - The remaining crash, which resulted in minor injuries, occurred as a result of a northbound vehicle on Norrie Avenue intending on turning right onto Bow Street/ Main Road failing to stop and give-way to a vehicle travelling west on Main Road. The westbound vehicle, which had right-of-way, collided into the offending vehicle.

An assessment of the historic crash data indicates that five of the 16 crashes which were recorded within a 50 m radius of the above-mentioned intersections were attributed to alcohol consumption and/ or occurred during a police pursuit. These crashes were excluded from this assessment as they are considered to not be reflective of the current operations or safety of the respective intersection.

Of the remaining 11 crashes, two were associated with the Wainui Road one-way bridge and seven were associated with turning movements at the Wainui Road/ Whitley Street and Bow Street/ Norrie Avenue intersections. While the crash assessment shows that the risk of crashes may be low to moderate, the severity of crashes is considered to be low as no deaths or serious injury crashes have been recorded at these three intersections in the previous five years. The road safety risks within the vicinity of these intersections are considered to be further lowered by the 40 km/h posted speed limit along the intersecting roads.

Notwithstanding the above, safety related improvements are proposed as discussed in Section 7.2 of this report.

4.3 Wider Area Intersections

A summary of the crash data recorded within a 100 m radius of the wider road network intersections is provided in Table No. 6.

Table No. 6

Crash summary for the previous five years (2014 to 2019) – Wider road network intersections					
Intersection	Crash Severity				Total No. of Crashes
	Fatal	Serious	Minor	Non-Injury	
SH23 & Te Mata Road intersection	0	1	3	2	6
SH23 & Te Pahu Road intersection	0	2	2	5	9
SH23 & SH39 intersection	0	3	5	15	23
Total	**0**	**6**	**10**	**22**	**38**

The following observations were made during the analysis of the crash data:

- SH23 & Te Mata Road intersection: A total of six crashes were recorded within a 100 m radius of the intersection. A description is provided below.
  - Two crashes occurred at, or in the vicinity of, the unsealed stopping bay/ public transport layby located approximately 100 m north of the SH23 / Te Mata Road intersection.
    - One non-injury crash, which involved a vehicle that was reported stolen, occurred during the night-time. According to the crash report, the crash likely occurred when the stolen vehicle, which was travelling south on SH23, lost control, veered off the road and landed in a ditch while trying to pull over onto the unsealed layby. The cause of the crash was attributed to speeding.
    - One crash occurred when a motorcycle intending on overtaking a northbound vehicle on SH23 collided into the northbound vehicle as the vehicle was turning right into the unsealed layby. The crash resulted in minor injuries.
  - Two crashes which occurred approximately 40 m north of the intersection on SH23 and were related to a northbound motorcycle losing control while navigating the bend and veering off the road. According to the crash report, the unsafe road alignment ("unusual camber") may have contributed to both crashes. One which resulted in serious injuries, while the remining crash only resulted in minor injuries. In both crashes, either the driver was inexperienced, or the driver was unfamiliar with the road alignment.
  - One crash, which did not result in any injuries, occurred as a result of a northbound vehicle on SH23 losing control while navigating the bend, veering off the road and landing into a ditch. According to the crash report, the driver was unfamiliar with the road alignment.
  - The remaining crash was related to vehicles turning into/ out of the intersection. The crash, which resulted in minor injuries, occurred as a result of a northbound vehicle on Te Mata Road intending on turning right onto SH23 failing give-way to a vehicle travelling west on SH23. The westbound vehicle, which had right-of-way, collided into the offending vehicle.
- SH23 & Te Pahu Rd intersection: A total of nine crashes was recorded within 100 m of the intersection.
  - Five crashes were related to a westbound vehicle on SH23 losing control while navigating the horizontal bend through the intersection. Four of the five crashes occurred during inclement weather conditions (i.e. during light/ heavy rain). All five crashes did not result in any injuries.
  - One crash, which resulted in serious injuries, occurred as a result of a motorcycle travelling west SH23 losing control while navigating the horizontal bend through the intersection. A second motorcycle which was following closing behind the first motorcycle lost control and collided with the first motorcycle. The crash report notes that the drivers of both motorcycles were inexperienced and that speeding has a contributing factor to the crash.
  - One crash, which resulted in minor injuries, occurred as a result of an eastbound vehicle on SH23 losing control while navigating the horizontal bend through the intersection. The crash report notes

that the driver of the vehicle was inexperienced, and that speeding has a contributing factor to the crash.

- One crash, which resulted in serious injuries, occurred as a result of a westbound vehicle on Te Pahu Road losing control while navigating horizontal bend through the intersection, veering off the road and landing into a ditch. The crash report notes that the driver of the vehicle was driving under the influence of alcohol, and that speeding has a contributing factor to the crash.
- The remaining crash, which only resulted in minor injuries, occurred as a result of a northbound vehicle on Te Pahu Road not being aware of the intersection, failing to navigate the bend located immediate south of the intersection and veering off the road. The crash occurred during inclement weather conditions (i.e. heavy fog), when visibility was very poor. Poor visibility was identified as contributing factor to the crash.

- SH23 & SH39 intersection: A total of 23 crashes were recorded at the staggered intersection; ten at the western intersection and 13 at the eastern intersection.
  - Of the ten crashes that were recorded at the western intersection, two crashes resulted in serious injuries, four of the nine crashes resulted in minor injuries, and the remaining four crashes did not result in any injuries. Nine of the ten crashes occurred as a result of a right-turning vehicle failing to give-way to approaching traffic.
    - Five of the ten crashes occurred as a result of a southbound vehicle on SH39 intending on turning right onto SH23 failing to stop and give-way to an eastbound vehicle on SH23 approaching the intersection from the west. The eastbound vehicle, which had right-of-way, collided into the offending vehicle.
    - Four of the ten crashes occurred as a result of a westbound vehicle on SH23 intending on turning right onto SH39 failing to give-way to an eastbound motorcycle on SH23 approaching the intersection from the west. The motorcycle, which had right-of-way, collided into the offending vehicle.
    - The remaining crash, which did not result in any injuries, occurred as a result of a westbound vehicle on SH23 losing control while turning right onto SH39. The vehicle veered off the road and crashes into a nearby fence.
  - Of the thirteen crashes that were recorded in the vicinity of the eastern intersection, one crash resulted in serious injuries, one crash only resulted in minor injuries, and the remaining 11 crashes did not result in any injuries.
    - Four of the 13 crashes occurred as a result of a northbound vehicle on SH39 intending on turning right onto SH23 failing to give-way to a westbound vehicle on SH23 approaching the intersection from the east. The westbound vehicle, which had right-of-way, collided into the offending vehicle.
    - Seven crashes, which did not result in any injuries, occurred as a result of a northbound vehicle on SH39 approaching the back of a queue of vehicles stopped at the intersection, failing to stop and rear-ending the last vehicle in the queue.
    - One crash, which resulted in serious injuries, occurred as a result of an eastbound vehicle on SH23 (the eastbound vehicle, which was speeding, was driving on the westbound traffic lane) overtaking and colliding into an eastbound vehicle on SH23 that was intending on turning right onto SH39.
    - One crash, which did not result in any injuries, occurred as a result of two vehicles travelling west on SH23 (one turning left onto SH39 and the other going straight though) colliding into each other.

Based on an assessment of the historic crash data, the majority of crashes (13 out of 15) that the recorded at the SH23/ Te Mata Road and SH23/ Te Pahu Road intersections were related to the road alignment through the intersection (i.e. vehicles/ motorcyclists navigating the horizontal bend through the intersection). The secondary crash cause was either speeding, inclement weather, an inexperienced driver, or a driver who was not familiar with the road environment. The moderate to high crash rate indicates a need to either improve

on the existing advanced warning signs and markings, or to lower vehicle operating speeds through both intersection (the posted speed limit on SH23 is currently 100 km/h).

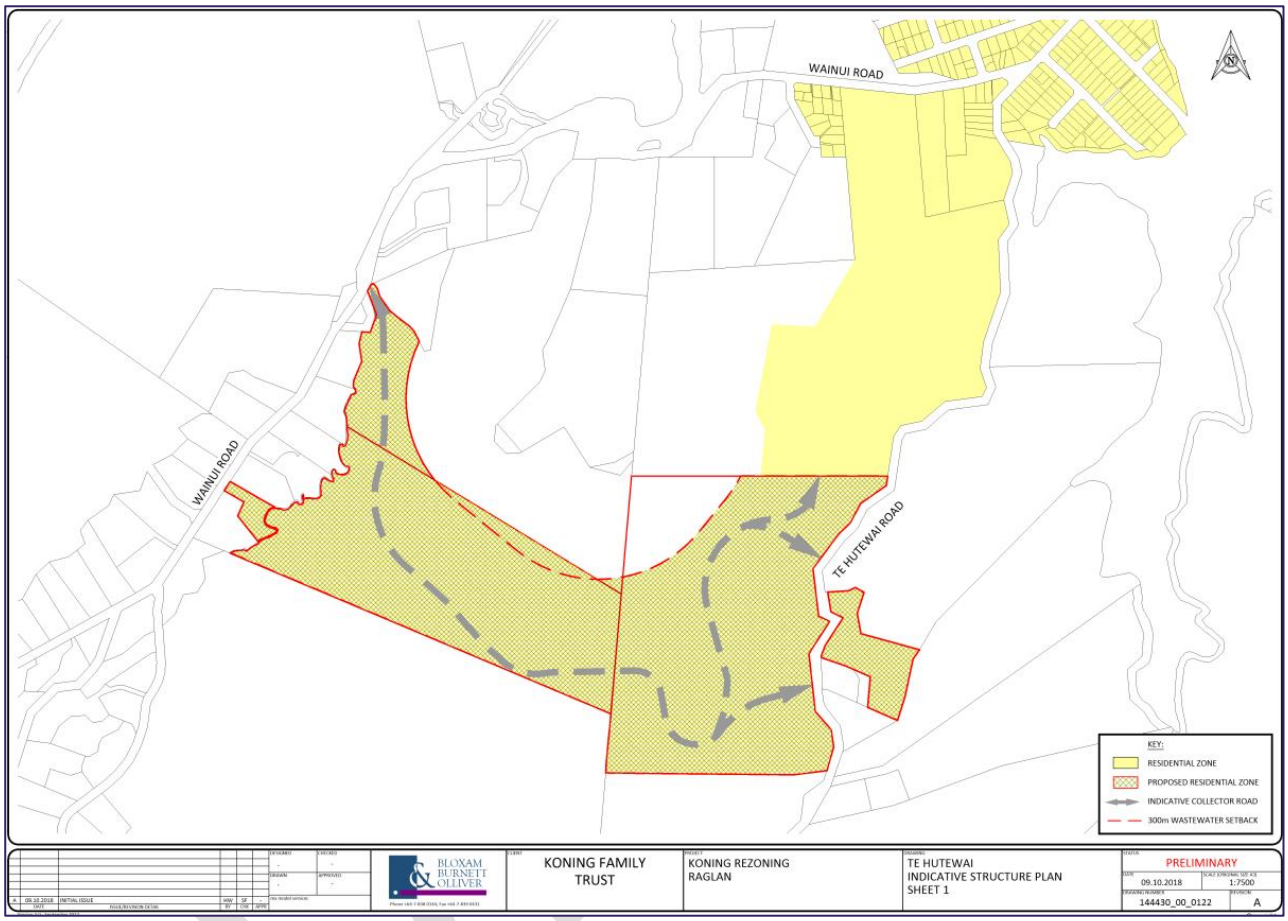
The high crash rate at the SH23 / SH39 intersection indicates there being an apparently road safety risk at the intersection. The intersection has been identified as being number 106 (out of 200) on Waka Kotahi's high-risk intersections and has been earmarked for upgrading in the next 5-10 year. Further details of the safety improvement works are discussed in Section 7.2.12.

5. Proposed Re-zoning & Structure Plan

5.1 Indicative Structure Plan

Koning have commissioned the development of an indicative Structure Plan which shows the extent of land sought to be rezoned, as well as the potential roading connection through the rezoning site. The indicative Structure Plan is shown in Figure No. 14.

Figure No. 14: Indicative Structure Plan



A more comprehensive draft Structure Plan has been prepared[8] which shows the level of development that could potentially be provided across the site. The draft Structure Plan, which is shown in Figure No. 15 and provided in Appendix B, is intended to be high level and will continue to evolve, ensuring that it responds to opportunities and constraints as they are identified throughout the rezoning and future subdivision consent processes.

Koning have had a number of assessments prepared regarding their property in order to understand the existing constraints and opportunities for accommodating residential development on the land. These have shown that:

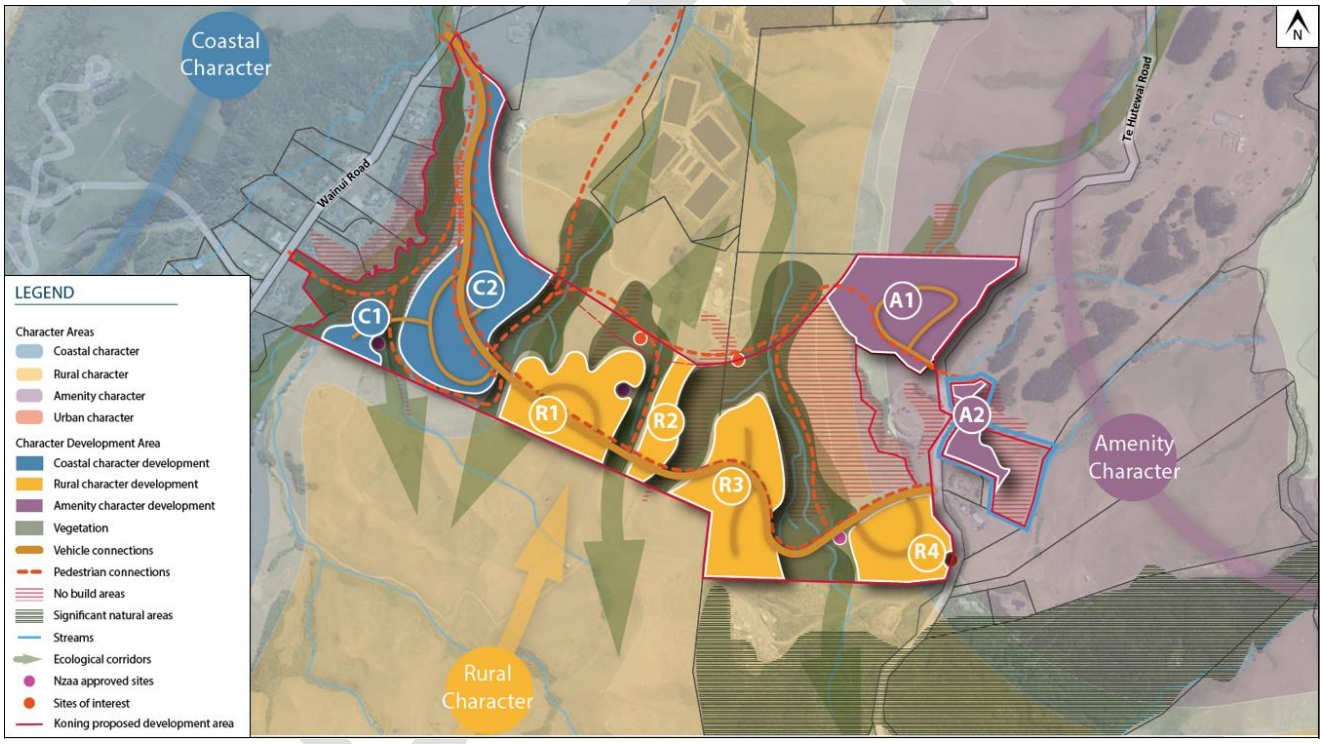
- There is a relatively large area within the rezoning site has been identified through geotechnical investigations as High Geotechnical Hazards (with significant slope instability and/or soft ground). These areas would be uneconomical to mitigate (for development). These areas are appropriately identified in the draft Structure Plan as 'no build' areas.

[8] The draft Development Plan Document, dated November 2020, was prepared by Wayfinder Landscape Planning and Strategy Ltd

- In terms of ecology, there are existing corridors of planting and watercourses that should be protected and enhanced on the site. These areas are identified in the draft Structure Plan as open space and areas of ecological advancement.
- In terms of archaeology, there is evidence of pre-European occupation of the land in the form of two identified midden sites and one pit site. There is the potential for other archaeological features to be present on the site, however it is not anticipated that these would be extensive, given that the land is setback from the coastal environment and features soils that are likely to have been considered unfavourable for cultivation. As shown in the draft Structure Plan, development over these sites is not proposed.

The extent of developable land which is anticipated to be available within the Koning site has been indicatively shown in the draft Structure Plan in Figure No. 15. Also identified in the figure are areas to be left undeveloped (i.e. "no built areas") due to factors such as geotechnical risk, presence of identified archaeological features and ecological corridors. Based on the draft Structure Plan, approximately 25-30 ha of land could be utilised for residential development consistent with the land use activities specified in Rule 16.1 of the PDP.

Figure No. 15: Draft Structure Plan showing developable areas within the rezoning site



5.2 Anticipated Development Yield

The average lot sizes have been generally guided by the PDP residential Zone Subdivision rules (Rule 16.4.1 of the PDP specifies that proposed lots should have a minimum et site area of 450 m^2). It is anticipated that development would result in a variety of site sizes across the rezoning site, but enabling site sizes down to the existing Residential Zone minimum is proposed to allow for more affordable parcels of land to be developed.

Based on the proposed extent of developable land indicated in the draft Structure Plan, it is anticipated that the rezoning of the subject site will result in a yield of some 300 – 400 residential allotments (equating to average lot sizes ranging between 560m^2 and 800m^2). The typology of residential development is not defined by the draft Structure Plan, however, indicative 'character' areas have been nominated, based on the surrounding zoning. These have been identified as coastal, rural and amenity character areas. According to

the draft Development Plan Document, these character qualities may be expressed in the form of the streetscape and pattern of subdivision across these areas.

Considering the lengthy resource consent and design stage timeframes, construction of the first stage of the development is only expected to commence in 2024. The anticipated full development potential is expected to be realised over a period of 20 years (i.e. 2044). This equates to the subdivision/ development of approximately 75 – 100 allotments every five years.

5.3 Proposed Site Accesses

As shown in the draft Structure Plan in Figure No. 15 and Figure No. 16 on the following page, access to the rezoning site is proposed via new road connections as follows:

- One new road intersection on Wainui Road[9] (i.e. Proposed Access Intersection 1 as shown in Figure No. 16), and
- Three new road intersections/ accesses on Te Hutewai Road (i.e. Proposed Access Intersection 2 to 4 as shown in Figure No. 16).

As shown in Figure No. 16 on the following page, a collector road with access off Wainui Road and Te Hutewai Road is envisaged for good connectivity between the proposed lots and Wainui Road and Te Hutewai Road.

Figure No. 17 on the following page illustrates how the rezoning site could potentially provide a much-needed east-west link between the southern extent of the Rangitahi Peninsula Development through to Ngarunui Beach. Development of the Koning site could also enable the provision of a new road connection to the neighbouring Te Ahiawa residential subdivision. The new road link is envisaged to extend south from the proposed collector road within the subject site to Te Ahiawa Road.

These proposed linkages would connect the currently disconnected Wainui Road, Te Hutewai Road and Opotoru Road. It is recommended that further discussions with Council be held at this rezoning stage to determine the feasibility of providing this new east-west connection.

In addition to the proposed road connections, there is potential to provide on- and off-road walking and cycling linkages within the site. As shown in Figure No. 16, the possibility of a fifth access is also being considered approximately 600 m south of Proposed Access 1 on Wainui Road to provide access for cyclists and pedestrian to Manu Bay Beach. Due to topographical constraints, a vehicle access would not suitable or recommended at this location. The proposed active mode infrastructure is discussed in Section 5.4.2.

[9] The new intersection is to be located generally where the existing vehicle crossing to the property at 339 Wainui Road is currently located.

Figure No. 16: Proposed Site Access Locations

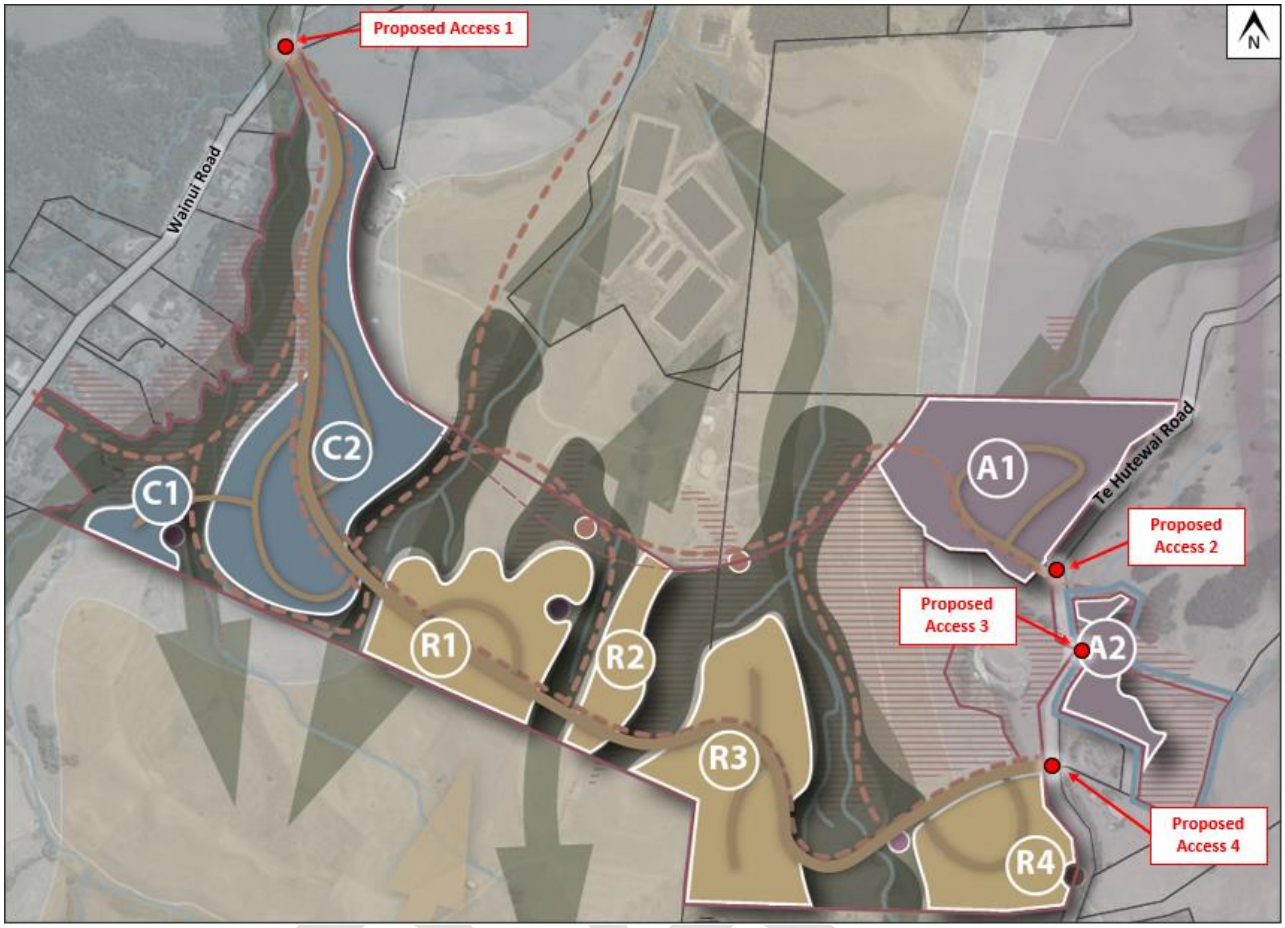


Figure No. 17: Potential transport connections to the wider transport network

5.3.1 Preliminary Access Configurations

At this rezoning stage, the access/ intersection designs have not yet been finalised. It is, however, anticipated that a 'Tee' intersection layout (with free-flow on Wainui Road and Te Hutewai Road) will likely be the appropriate configuration for all four new road accesses. The appropriate control (either a compulsory Stop or Give-way) for each access should be determined at detailed design stage.

Given the low volume of turning traffic that is expected at the new intersections (refer to Section 6.2 for the predicted trip generation and distribution), the low volume of traffic on Wainui Road and Te Hutewai Road, and low speed environment on the district council roads, it is considered that auxiliary turning lanes will not likely be required at the new intersections. However, further investigations need to be undertaken at detailed design stage to confirm whether channelised left-turn bay and right-turn bay treatments at one or all four access intersections would be warranted from a capacity[10] and safety perspective.

To improve night-time visibility and thus the safety of the intersections, it is recommended that street lighting be incorporated into the intersection design.

The final intersection location and configuration will need to be confirmed in future as part of the future subdivision consents. The new intersections should be designed in accordance with the provisions of the District Plan and the Waikato Regional Infrastructure Technical Specifications (RITS). The intersection configurations should be designed so that the spatial needs of the appropriate design vehicle are met. The appropriate vehicle includes an 8 m medium rigid truck (RTS 18).

5.3.2 Intersection Sight Distance

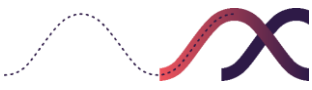
The District Plan refers to the Austroads' Guide to Road Design document (Table 3.2 in Part 4A: Unsignalised and Signalised Intersections) for the minimum required safe intersection sight distance (SISD). Table No. 7 provides a summary of the required vs achievable sight distances at the proposed accesses on the basis of the preliminary intersection locations (the final intersection locations will be confirmed as part of the subsequent subdivision consents) and the recently amended 60 km/h legal speed limit.

Table No. 7

Summary of the achievable vs required Sight Distances				
Access	**Legal Speed Limit**	**Minimum Required Sight Distance**	**Direction**	**Achievable Sight Distance**
Proposed Access 1	60 km/h	123 m	To the north	150 m
			To the south	>200 m
Proposed Access 2	60 km/h	123 m	To the north	200 m
			To the south	130 m
Proposed Access 3	60 km/h	123 m	To the north	150 m
			To the south	100 m
Proposed Access 4	60 km/h	123 m	To the north	100 m
			To the south	120 m

As shown in Table No. 7 above, an assessment of the achievable sight distance against the requirements (based on a two second reaction time) shows that the sightlines looking south at Access 3 as well as the sightlines looking north at Access 4 will not comply with the minimum SISD. Figure No. 18 shows the non-

[10] The warrants for a channelised right-turn treatment are provided in Part 4 (Figure A-10 in Appendix A) of the Austroads Guide to Road Design manual.



complying sightlines at both accesses; as shown in the figure, the sightlines at both accesses are obstructed by overgrown vegetation.

Figure No. 18: Observed sightlines looking south at Access 3, and looking north at Access 4 (source: Google Street View)

To obtain the maximum achievable sightlines, it is recommended that the overgrown vegetation on the eastern side of Te Hutewai Road between Access 3 and Access 4 be removed (refer to the illustration in Figure No. 19). It is considered that once this vegetation has been cleared, the sightlines at Access 3 and Access 4 are expected to comply with the minimum required SISD.

Figure No. 19: Proposed sightline improvements for Access 3 and Access 4

While the sightlines looking south from Access 4 do not fully meet the minimum SISD requirement, the shortfall is considered minor (less than 5 m), and the final intersection location (which will be confirmed during the detail design stage) should consider the minimum SISD requirements.

5.3.3 Access Separation

Table 14.12.5.1 (and Figure 14.12.5.2) of the PDP provides the minimum required access separation distances at intersections. Table No. 8 below provides a summary of the observed and required separation distances at the proposed intersections (on the basis of the preliminary intersection locations – the final intersection locations will be confirmed as part of the subsequent subdivision consents).

Table No. 8

Summary of the achievable vs required Separation Distances					
Access	Legal Speed Limit	To Nearest Vehicle Crossing		To Nearest Intersection/ Side Road	
		PDP's Separation Distance	Achievable Separation Distance	PDP's Separation Distance	Achievable Separation Distance
Proposed Access 1	60 km/h	30 m	75 m	150 m	350 m
Proposed Access 2			85 m		140 m
Proposed Access 3			55 m		140 m
Proposed Access 4			20 m		180 m

As shown in Table No. 8 above, an assessment of the access separation against Council's access spacing requirements showed that:

Available separation distance to the nearest intersection/ side road

- Access 1 and 4 are expected to comply with the PDP's minimum separation distance requirements (a minimum spacing of 150 m is specified for a 60 km/h speed environment) to the nearest intersecting road.
- Access 2 and 3 are separated by approximately 140 m from each other.
  - While the separation distance does not meet the minimum requirements, the approximately 10 m shortfall is not considered significant as Access 3 is anticipated to generate low volumes of traffic (serving less than 20 dwelling units). Due to the low traffic volumes that are expected to be generated at Access 3 (less than 120 vpd based on typical generation rates of a residential dwelling in Raglan – refer to Section 6.2), the reduced intersection separation distance is considered to be suitable for the proposal.
  - Furthermore, given the windy alignment of Te Hutewai Road at this location, it is considered that vehicle operating speeds will likely not exceed the 60 km/h legal speed limit; and on the basis of a 50 km/h speed environment, both accesses will comply with the minimum separation distance requirement of 100 m.

Available separation distance to the nearest vehicle crossing/ private access

- As shown in Table No. 8, Access 1 to 3 are expected to comply with the PDP's minimum separation distance requirements (a minimum spacing of 30 m is specified for a 60 km/h speed environment) to the nearest vehicle crossing.

- Access 4 is only separated by approximately 20 m to the nearest vehicle crossing. While this spacing does not comply with the PDP requirements, the available access separation is considered suitable for this proposal given that:
  - The nearby vehicle crossing is a private property access and will likely only generate approximately one vehicle movement per peak hour based on typical generation rates of a residential dwelling. The small amount of traffic is unlikely to cause regular conflict with the traffic from the rezoning site.
  - Sight distance well in excess of the minimum requirements is available to the proposed intersection and the existing private access.
  - The low-speed environment and the windy road alignment along this section of Te Hutewai Road would ensure that the likelihood and severity of crashes are minimised.

5.4 Other Transport Modes

5.4.1 Public Transport

Raglan is dependent on Hamilton City for education, employment, commerce and tourism; based on this, it is desirable that public transport connectivity be provided between the rezoning site and Hamilton City if the re-zoning is consented.

The proposed residential development within the rezoning site should support access to public transportation. The proposed accesses on Wainui Road and Te Hutewai Road as well as any proposed collector/ local road network within the site should be developed with a suitable road reserve width to enable public transport connectivity. A public transport stop/ stops would readily be provided within the site.

It is anticipated that with the development of the Koning site, the current bus route will be reviewed in future as the demand for public transport changes. Seeing as the nearest public transport facility is located at the Wainui Road / Te Hutewai Road intersection (located approximately 1.8 km north of the site), there is opportunity for the existing public transport services to be extended south[11] via Wainui Road or Te Hutewai Road, through the site, and then north to the bus terminus via Te Hutewai Road or Wainui Road.

It is recommended that consultation with Waikato Regional Council (WRC) be undertaken to investigate the potential of either extending public transport services south to the Koning site, or providing a bus stopping facility near the new intersections on either Wainui Road or Te Hutewai Road.

5.4.2 Walking and Cycling

As shown in the draft Structure Plan in Figure No. 15, walking and cycling connections will be provided through all residential streets within the proposed development (a minimum 1.8 m wide footpaths and on-road cycle paths in line with Table 14.12.5.14 of the PDP). In addition to the on-road facilities, off-street paths are proposed as illustrated in Figure No. 20 to follow.

As shown in Figure No. 20, the proposed network of walking and cycling infrastructure within the Koning site could readily be extended and connected to the existing facilities on Wainui Road and to key land uses in the surrounding area as follows:

- North/south connection: a new 2.5 m wide (minimum) shared path is proposed which extends north through the Koning site to the existing footpath which is located on the northern side of Wainui Road. A new pedestrian crossing facility is proposed to be provided on Wainui Road at the crossing location.
- East/ west connections:
  - The internal walking/ cycling facilities are proposed to extend to Wainui Road (to the existing footpath on the western side of Wainui Road and further west to Ngarunui Beach), south-west to the

[11] As shown in Section 3.5.1, the bus services are extended south to Manu Bay during the summer holidays the to cater for tourists/ holiday makers.

Te Ahiawa Road to the existing residential subdivision to the south of the site, and to Te Hutewai Road (to provide key connections to land uses on the eastern side of Te Hutewai Road such as the Raglan Golf Club and the Rangitahi Peninsula Development).

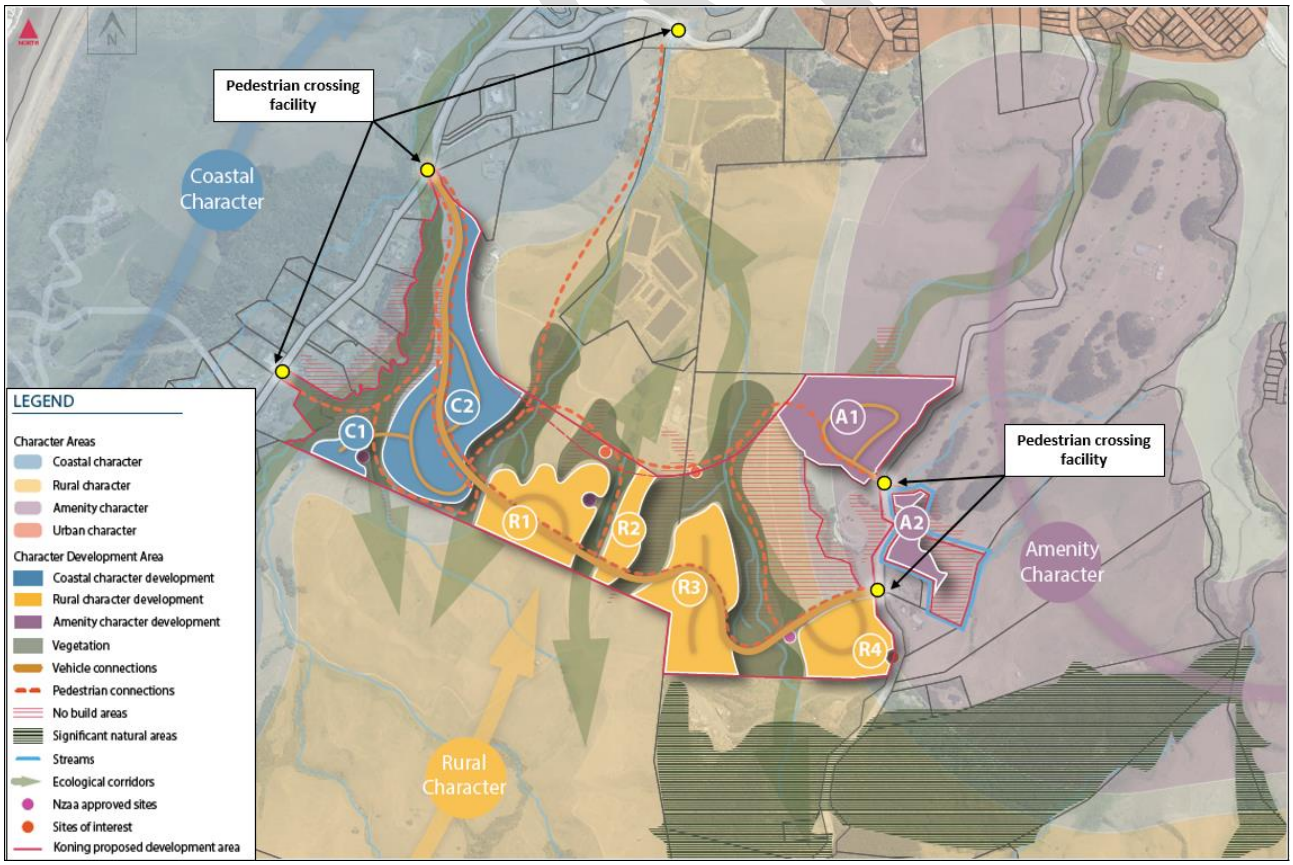
- Several new pedestrian crossing facilities are proposed along both Wainui Road and Te Hutewai Road. These should, as a minimum, provide for a pedestrian refuge island within a new central flush median).

As shown in Figure No. 17, there is an opportunity to provide an additional north/ south pedestrian/ cyclist link from the Koning site to Wainui Road via the neighbouring property to the north-east of the site. Consultation and buy-in from the owners of the neighbouring northern property will need to be obtained. However, considering that the neighbouring property is zoned Residential, is it considered that a walking/ cycling connection through the neighbouring site will provide mush needed north-south connectivity (and potentially move cyclists away from Te Hutewai Road and onto the internal cyclist network). If buy-in is obtained, the final alignment of the proposed path will need to be discussed and agreed with the property owners and Council at the future subdivision stages.

There is also opportunity to provide a direct connection to the Rangitahi Peninsula Development as well as the Te Ahiawa residential subdivision to the south of the site with the provision of walking/ cycling paths adjacent to the potential east-west connector road (refer to Section 5.3 for discussions on the potential new road connection). As discussed above, buy-in would need to be obtained from the relevant property owners and Council.

The design of the proposed walking and cycling infrastructure will be finalised as part of the subsequent subdivision consents as per the relevant District Plan and RITS specifications.

Figure No. 20: Potential walking and cycling connections



6. Predicted Trip Generation

6.1 Consented Rangitahi Peninsula Development

As previously mentioned, 500 new residential dwelling units are expected to be developed within the consented Rangitahi Peninsula Development, with construction expected to start in 2021.

While Table 14.12.5.13 of the PDP specifies a trip generation rate of 10 trips per day for a single residential dwelling, the ITA (dated July 2013) that was prepared by Traffic Engineering & Management Ltd as part of the assessment of environmental effects reporting for the now consented Rangitahi Peninsula Development states that it was agreed with Council at the time that the following reduced trip generation rates would be applicable for the residential development envisaged within the Rangitahi Peninsula Development:

- 6 trips/dwelling/day; and
- 0.6 trips/dwelling/hour during the peak hour.

These reduced trip rates were derived from traffic surveys that were conducted in October 2012 as part of the Rangitahi Peninsula ITA and were based on the premise that not all existing dwellings within Raglan township are occupied during the year (i.e. a portion of the dwellings in Raglan are holiday homes which are unoccupied during the non-holiday season).

A summary of the predicted trip generation for the Rangitahi Peninsula Development is provided in Table No. 9. As shown in Table No. 9, once fully developed, the consented development is expected to generate approximately 306 vehicle trips during the peak hour and 3,060 trips per day.

Table No. 9

Predicted Trip Generation - Consented Rangitahi Peninsula Development			
Time Horizon	**Estimated no. of Dwellings**	**Peak Hour Trip Generation**	**Daily Trip Generation**
2021	120	72 vph	720 vpd
2041	330	198 vph	1,980 vpd
2061	510	306 vph	3,060 vpd

The Rangitahi Project website was accessed in October 2020 to confirm whether the predicted subdivision staging indicated in the Rangitahi Peninsula ITA report was still applicable. The website showed that approximately 185 lots had been sold by October 2020. This indicated that development is developing as projected in the Rangitahi Peninsula ITA report.

6.2 Proposed Koning Development

6.2.1 Predicted Trip Generation

Given the similarities in the zoning requested within the Koning site to the consented Rangitahi Peninsula Development, it was considered appropriate to adopt the same trip generation rates for the proposed land use activities within the rezoning site. Table No. 9 provides a summary of the predicted trip generation for the proposed residential zoning on the basis of the trip rate data derived for the consented Rangitahi Peninsula Development.

Table No. 10

Predicted Trip Generation – Koning Site			
Zone Area	**Development Yield**	**Peak Hour Trip Generation**	**Daily Trip Generation**
Residential	300 – 400 dwellings	180 - 240 vph	1,800 – 2,400 vpd

As shown above, the land use activities associated with the proposed rezoning are anticipated to generate approximately 1,800 - 2,400 trips per day, and approximately 180 – 240 trips during the peak hour.

For ensuring a robust assessment, the higher yield (i.e. 400 dwellings) was adopted. Accordingly, the effects assessment (refer to Section 7) was conducted based on the higher development yield and trip generation (i.e. 240 vph and 2,400 vpd).

6.2.2 Directional Distribution Assumptions

Similar to the trip rate data, directional distribution data derived in the Rangitahi Peninsula Development ITA report was adopted for this assessment. Table No. 11 provides a summary of the anticipated number of inbound and outbound trips for each respective analysis period.

Table No. 11

Directional Distribution for the Rezoning Proposal					
Development Yield	**Period**	**Direction Distribution**		**Predicted Trip Generation**	
		IN	**OUT**	**IN**	**OUT**
300 – 400 dwellings	Daily	50%	50%	900 – 1,200 vpd	900 – 1,200 vpd
	AM Peak[12]	10%	90%	18 -24 vph	162 – 216 vph
	PM Peak	90%	10%	162 – 216 vph	18 -24 vph

6.2.3 External Trip Distribution Assumptions

Figure No. 21 to follow provides a summary of the assumptions that were made regarding the external distribution and assignment of trips on the surrounding road network. The assumptions are summarised as follows:

Distribution of trips to/from the rezoning site:

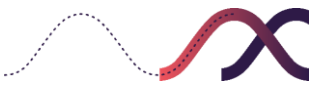
Based on the indicative location and extent of the developable areas shown in the draft Structure Plan (areas A1-A2, R1-R4 and C1-C2 in Figure No. 15), the following assumptions were made related to the distribution of trips to/ from the rezoning site:

- Approximately 40% to trips associated rezoning proposal would enter/ exit the site via Access 1;
- Approximately 25% to trips associated rezoning proposal would enter/ exit the site via Access 2;
- Approximately 5% to trips associated rezoning proposal would enter/ exit the site via Access 3, and
- Approximately 30% to trips associated rezoning proposal would enter/ exit the site via Access 4;

External distribution of trips on the surrounding road network:

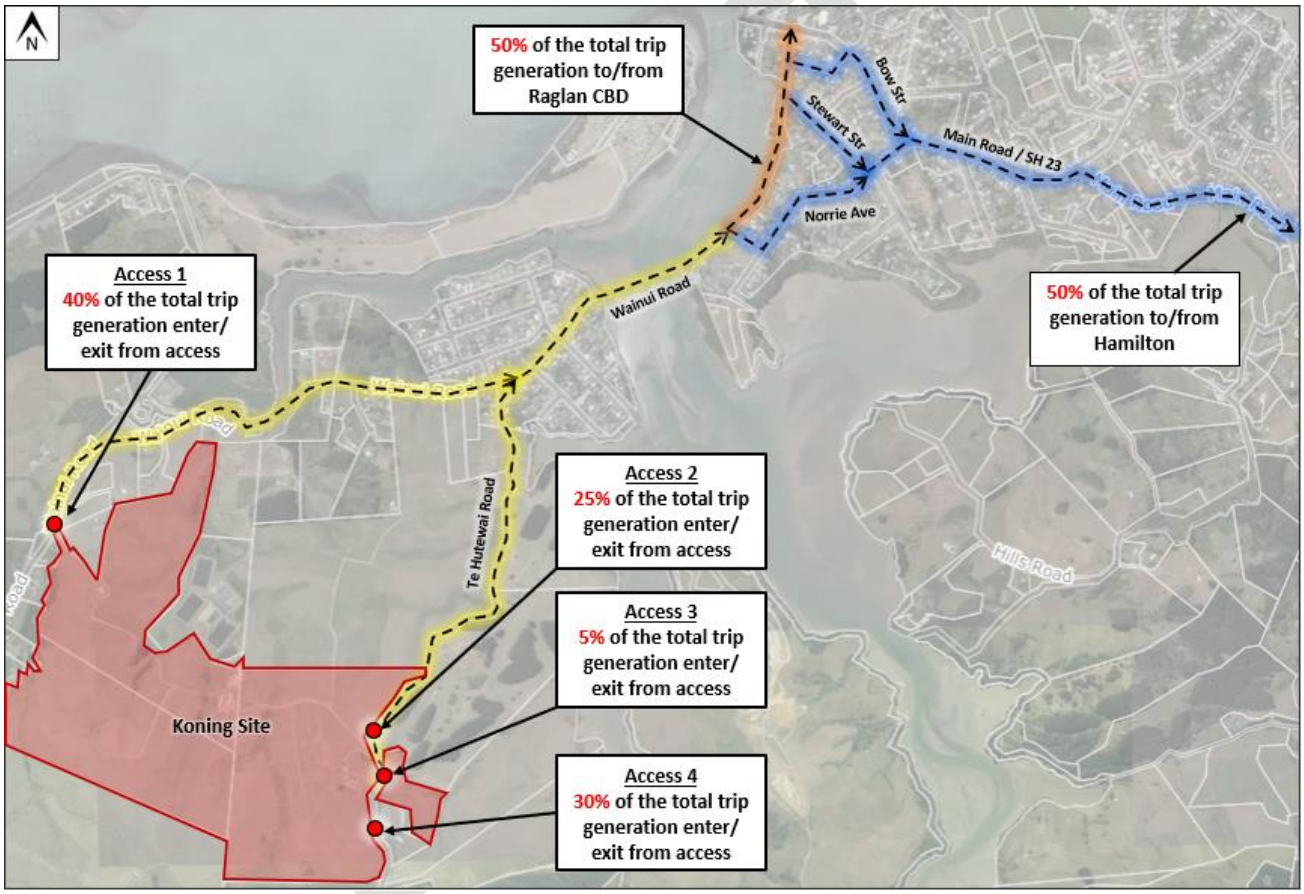
The following assumptions are made regarding the external trip distribution:

12 A lower number of trips would typically be generated during the AM peak period compared to the PM peak period for the anticipated land use activities. However, as a conservative approach, the PM peak trip generation was applied to the AM peak period.



- Daily commute to/from Hamilton City - approximately 50% of the trips generated by residential dwellings within Raglan will commute out of Raglan for employment purposes. This was based on figures provided by Statistics New Zealand which indicate that currently 50% of the working population commute (daily) out of Raglan. These trips were consequently distributed onto the most probable routes from the proposed development to SH23. The likely routes include:
  - (Te Hutewai Road) - Wainui Road – Norrie Avenue – Main Road – SH23;
  - (Te Hutewai Road) - Wainui Road – Stewart Street – Norrie Avenue - Main Road – SH23, and
  - (Te Hutewai Road) - Wainui Road – Bankart Street – Bow Street – Main Road – SH23.
- Existing travel patterns to/from Raglan CBD – the remaining 50% of the trips generated by residential dwellings within Raglan will travel to the CBD. The traffic is expected to be distributed on the local road network as per the existing distribution (i.e. based on the directional splits observed from the traffic survey data - the existing travel patterns are not expected to change).

Figure No. 21: External Trip Distribution and Assignment Assumptions



7. Appraisal of Transportation Effects

The following sections outline the assessment of transportation effects of the proposed re-zoning. The effects assessment was conducted on the basis of a 20-year assessment period (2024 + 20 years), in line with the anticipated development period.

7.1 Capacity Assessment – Road Corridors

Table No. 12 provides a summary of the estimated 2044 ADT figures on the surrounding road network with and without the additional rezoning traffic. The future ADT figures are based on:

- 2044 Baseline traffic: the annual traffic growth rate assumptions discussed in Section 3.4 of this report.
- The trip generation and distribution assumptions provided in Table No. 10 and Figure No. 21.

Table No. 12

Estimated ADT volumes on the surrounding road network with and without the additional rezoning traffic					
Road Corridor/ Road Section	**Estimated 2019 Baseline ADT (vpd)**	**Estimated 2044 Baseline ADT (vpd)**	**Additional Rezoning Traffic ADT (vpd)**	**2044 Baseline + Rezoning Traffic ADT (vpd)**	**% change**
Wainui Road: *Site to Riria Kereopa Memorial Drive*	1,740	2,525	960	3,485	40%
Wainui Road: *Riria Kereopa Memorial Drive to Te Hutewai Road*	3,700 – 4,800	5,370 – 6,965	960	6,330 – 7,925	15% - 20%
Wainui Road: *Te Hutewai Road to One-way Bridge*	3,200 – 7,010	4,645 – 10,170	960	5,605 – 11,130	10% - 20%
Te Hutewai Road: *Site to current urban boundary*	130	190	1,440	1,630	>750%
Te Hutewai Road: *Current urban limit to Wainui Road*	805	1,170	1,440	2,610	125%

The following observations were made related to the estimated ADT figures in Table No. 12:

- The ADT on the section of Wainui Road between the site and Te Hutewai Road is estimated to increase by between 15% and 40% (to between 3,245 – 7,925 vpd) with the addition of the proposed rezoning traffic to the 2044 baseline traffic. This equates to an increase in the peak hour traffic from approximately 175 – 480 vph to approximately 325 – 795 vph[13].
- While a significant increase in the ADT is anticipated on Te Hutewai Road with the addition of the proposed rezoning traffic to the 2044 baseline traffic, the ADT is not expected to exceed 3,000 vpd or 250 vehicle trips during the peak hour.

As shown above, no adverse capacity effects are likely on these roads given that the road links have amply spare capacity to accommodate the increased daily traffic volumes associated with the proposed rezoning given the low traffic volumes that presently exist on both roads and that the peak hour volumes along both

[13] Part 4 of the Austroads Guide to Road Design manual states that peak hour volumes or peak hour percentages are not available, it can be assumed that the design peak hour volume equals 8% to 10% of the Annual Average Daily Traffic (AADT) for urban situations and 11% to 16% for rural situations.

roads are not anticipated to exceed the typical capacity of an urban road[14]. On this basis, the effect of the rezoning proposal on the capacity and efficiency of the surrounding road network is expected to be negligible.

7.2 Capacity and Safety Assessment – Local and Wider Area Intersections

7.2.1 Background and Assessment Scenarios

For the reasons discussed in Sections 3.2.3 and 3.2.4 of this report, the following intersections were analysed for purposes of this study:

Local area intersections:

1. Wainui Road / Te Hutewai Road intersection;
2. Wainui Road One-Bridge;
3. Wainui Road / Whitley Street intersection;
4. Wainui Road / Stewart Street intersection;
5. Wainui Road / Bankart Street roundabout;
6. Bankart Street / Bow Street roundabout, and
7. Bow Street / Norrie Avenue intersection.

Wider area intersections:

1. SH23 & Te Mata Road intersection;
2. SH23 & Te Pahu Road intersection, and
3. SH23 & SH39 intersection.

As previously mentioned, the capacity assessment was conducted on the basis of a 20-year assessment period (i.e. 2044) with the full development traffic (i.e. the traffic generation of the 400 dwelling units) added to the 2044 baseline.

For intersections where one or more of the intersections approaches were found operate at poor levels of service (i.e. at LOS E and worse) during either the AM or PM (or both) peak periods with the full development traffic added to the 2044 baseline, additional assessments were conducted to determine at which level of development the intersection performance is expected to start deteriorating to an unacceptable level (i.e. at which level of development capacity and/or safety upgrades to the intersection will likely be triggered).

To summarises, the following scenarios were analysed:

- **Scenario 1**: 2024 Baseline traffic (including the consented Rangitahi Peninsula development traffic) on the existing road network, WITHOUT the proposed rezoning traffic.
- **Scenario 2**: 2044 Baseline traffic (including the consented Rangitahi Peninsula development traffic) on the existing road network, WITHOUT the proposed rezoning traffic.
- **Scenario 3**: 2044 Baseline traffic (including the consented Rangitahi Peninsula development traffic) on the existing road network, WITH the proposed rezoning traffic (at full development).

For intersections where the intersection performs at unacceptable LOS in **Scenario 3**:

- **Scenario 4**: Determine at what level of development (in terms of the number of residential dwellings and development year[15]) at which capacity and/or safety related upgrades would be triggered.

[14] According to Table 4.3 of the RTA's Guide to Traffic Generating Developments, the typical mid-block capacity of a two-way urban road with adjacent parking bays is 1,800 pcu/hour.

[15] Based on the assumption that approximately 75 – 100 allotments will be subdivided/ developed every five-years (i.e. indicative staging is assumed to be as follows: 2024 = start of construction; 2029 = 75 -100 dwellings completed; 2034 = 150 – 200 dwellings completed; 2039 = 225 – 300 dwellings completed; 2044 = 300 – 400 dwellings completed).

The intersection performance (or level of service (LOS)) with and without the proposed development was assessed using Sidra Intersection 8.0. PTV VISSIM, a microsimulation software package, was used in the appraisal of the transportation effects for the Wainui Road One-way Bridge as it better simulates the traffic behaviour at the bridge - Sidra Intersection does not have the capability to simulate alternating two-way traffic movements on one-lane road links.

These scenarios were developed for both the non-holiday and holiday periods (refer to Section 3.3.2 for discussions related to the summer holiday period). The intersection performance/ LOS for each analysed scenario is summarised in the subsequent sections, while the Sidra Intersection summaries are provided in Appendix C. The performance assessment is based on the existing (2020/21) intersection configurations as illustrated in Table No. 1 and Table No. 2.

7.2.2 Assessment Summary

Table No. 13 below provided a summary of the findings from the intersection performance assessments, while the detailed assessment of each intersection is provided in Sections 7.2.3 to 7.2.12 to follow.

Table No. 13

Effects Assessment Summary – Local and wider area intersections					
Intersection	**Period**	**Performance Assessment Findings**			
		Scenario 1: *2024 Baseline*	**Scenario 2: *2044 Baseline***	**Scenario 3: *2044 Baseline+ Rezoning***	**Scenario 4: *Upgrade trigger***
Local area Intersections					
Wainui Road / Te Hutewai Rd	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Wainui Road One-way Bridge	Typical Weekday	*Poor LOS; Upgrading required (signalisation)*	Acceptable LOS if upgraded to signal; *No further upgrades required*	Acceptable LOS if upgraded to signal; *No further upgrades required*	*Upgrade triggered by 2024 (baseline traffic only)*
	Summer Holiday				
Wainui Road / Whitley Street	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Wainui Road / Stewart Street	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Wainui Road / Bankart Street	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Bankart Street / Bow Street	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
Bow Street / Norrie Avenue	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	*Poor LOS; Upgrading required (roundabout or signalisation)*	*Upgrade triggered after completion of first 300 dwellings*
	Summer Holiday				
Wider Area Intersections					

Effects Assessment Summary – Local and wider area intersections					
Intersection	**Period**	**Performance Assessment Findings**			
		Scenario 1: *2024 Baseline*	**Scenario 2: *2044 Baseline***	**Scenario 3: *2044 Baseline+ Rezoning***	**Scenario 4: *Upgrade trigger***
SH23 / Te Mata Rd	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	No capacity upgrades triggered
	Summer Holiday				
SH23 / Te Pahu Rd	Typical Weekday	Acceptable LOS; *No upgrades required.*	Acceptable LOS; *No upgrades required.*	*Poor LOS; Upgrading required (roundabout)*	*Upgrade triggered after completion of first 300 dwellings*
	Summer Holiday		Intersection at capacity. *Upgrade to be considered.*		
SH23 / SH39	Typical Weekday	Intersection at capacity. *Upgrade to be considered.*	Acceptable LOS if upgraded to single-lane roundabout; *No further upgrades required.*	*Poor LOS; Further upgrades required (dual-lane roundabout)*	*Initial upgrade triggered prior to 2031 (baseline traffic only). Further upgrading likely required after completion of first 300 dwellings*
	Summer Holiday	*Poor LOS; Upgrading required (single-lane roundabout)*			

As shown in Table No. 13, capacity upgrades will likely be triggered as follows:

- Wainui Road One-way bridge (refer to Section 7.2.4 for the detailed assessment): the assessment concluded that upgrades will likely be required by 2024 (based on the baseline traffic demand only – without any traffic from the rezoning site) to improve future operations at the bridge. Should the bridge be signalised by 2024, further upgrading will likely not be required.
- Bow Street / Norrie Avenue intersection (refer to Section 7.2.9 for the detailed assessment): the assessment concluded that upgrades will likely be required once the first 300 dwelling units are completed (i.e. at 75% development) to mitigate future capacity constraints. Further assessments (i.e. an ITA) are recommended at that time to assess the impact of the proposed development traffic on the intersection, and to propose any required mitigation measures.
- SH23 / Te Pahu Road intersection (refer to Section 7.2.11 for the detailed assessment): the assessment concluded that upgrades will likely be required once the first 300 dwelling units are completed to mitigate future capacity constraints. Further assessments (i.e. an ITA) are recommended at that time to assess the impact of the proposed development traffic on the intersection, and to propose any required mitigation measures.
- SH23 / SH39 Road intersection (refer to Section 7.2.12 for the detailed assessment): the assessment concluded that capacity and safety upgrades will likely be required in the next 10 years (based on the baseline traffic demand only – without any traffic from the rezoning site). As a minimum, a single-lane roundabout configuration is proposed in line with the findings from the technical assessment that was undertaken by Waka Kotahi. It is, however, recommended that Waka Kotahi consider upgrading the intersection to a dual-lane roundabout (instead of a single-lane configuration) should it be found that the opening of the Hamilton section of the Waikato Expressway has not resulted in significantly reducing traffic volumes on SH and/ or SH39.

7.2.3 Wainui Road & Te Hutewai Road Intersection

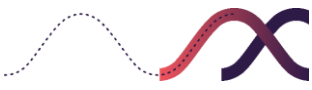
The capacity analysis results for the Wainui Road & Te Hutewai Road intersection are summarised in Table No. 14 below.

As shown in Table No. 14, the T-intersection is expected to operate at acceptable levels of service during the AM and PM peak periods during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenarios.

With the addition of the rezoning traffic to the 2044 baseline, only a minor increase in the average vehicle delay is expected during the peak operating periods. Furthermore, the 95th percentile queues on the Te Hutewai Road approach are not expected to exceed 30 m (or approximately 4 vehicles) during the peak operating periods for both the non-holiday and holiday assessment periods.

Table No. 14

Capacity Analysis Results – Wainui Road/ Te Hutewai Road Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Te Hutewai Rd	6.6	3.3	A	6.5	0.4	A
	East: Wainui Rd	0.2	0.1	A	0.9	1.0	A
	West: Wainui Rd	0.1	0.1	A	1.0	0.7	A
	Intersection	1.2	3.3	A	1.1	1.0	A
Holiday	South: Te Hutewai Rd	7.2	4.1	A	7.1	0.5	A
	East: Wainui Rd	0.2	0.1	A	0.9	1.1	A
	West: Wainui Rd	0.1	0.4	A	1.0	0.9	A
	Intersection	1.3	4.1	A	1.1	1.1	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Te Hutewai Rd	8.4	5.7	A	7.9	0.7	A
	East: Wainui Rd	0.2	0.2	A	0.9	1.3	A
	West: Wainui Rd	0.1	0.1	A	1.1	1.1	A
	Intersection	1.6	5.7	A	1.2	1.3	A
Holiday	South: Te Hutewai Rd	9.8	7.6	A	9.0	0.9	A
	East: Wainui Rd	0.2	0.2	A	0.9	1.6	A
	West: Wainui Rd	0.1	0.1	A	1.1	1.4	A
	Intersection	1.8	7.6	A	1.2	1.6	A
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holid	South: Te Hutewai Rd	13.9	22.7	B	10.4	1.8	B
	East: Wainui Rd	0.4	0.4	A	1.6	4.3	A



Capacity Analysis Results – Wainui Road/ Te Hutewai Road Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	West: Wainui Rd	0.1	0.1	A	1.1	1.2	A
	Intersection	3.9	22.7	A	1.8	4.3	A
Holiday	South: Te Hutewai Rd	17.6	29.5	C	12.1	2.2	B
	East: Wainui Rd	0.4	0.4	A	1.6	4.6	A
	West: Wainui Rd	0.1	0.1	A	1.2	1.5	A
	Intersection	4.8	29.5	A	1.8	4.6	A

Based on the above, the current intersection configuration is considered to have sufficient capacity to accommodate the 2044 baseline + full development traffic. On this basis, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be negligible.

7.2.4 Wainui Road One-way Bridge

As previously mentioned, PTV VISSIM was used in the appraisal of the transportation effects of Wainui Road One-way Bridge. The results of the microsimulation modelling are shown in Table No. 15. The values provided in Table No. 15 represent the expected performance of the one-way bridge (i.t.o average vehicle delays and average queue length for each approach) for the various scenarios that were analysed as discussed in Section 7.2.1 of this report. The expected performance of the bridge is represented by the following colours:

- Green: traffic flow is free to stable with minimal vehicle delays and queues on the approach.
- Orange: traffic flow is stable with notable vehicle delays and queues on the approach.
- Red: traffic flow is unstable with arrival flows exceeding the discharge capacity, and significant vehicle delays and queues on the approach.

Table No. 15

Capacity Analysis Results – Wainui Road One-Way Bridge (Existing Configuration)									
Analysis Scenario	Bridge Approach	Non-Holiday Period				Holiday Period			
		AM Peak Hour (vph)		PM Peak Hour (vph)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Ave Delay (sec)	Ave Queue (m)	Ave Delay (sec)	Ave Queue (m)	Ave Delay (sec)	Ave Queue (m)	Ave Delay (sec)	Ave Queue (m)
Scenario 1: 2024 Baseline Traffic	Eastern	6.8	1.1	5.0	2.0	6.5	1.2	4.9	2.2
	Western	36.4	19.0	733.1	377.4	62.1	41.0	861.8	420.7
Scenario 2: 2044 Baseline Traffic	Eastern	7.6	1.7	5.5	2.0	6.9	1.8	5.1	2.0
	Western	201.3	229.6	537.7	431.5	277.6	341.9	672.5	445.6
Scenario 3: 2044 Baseline + Development Traffic	Eastern	7.1	1.8	5.2	2.1	6.5	1.8	4.6	2.0
	Western	303.2	409.1	651.9	453.7	402.1	436.8	787.7	458.5

The following observations were made related to the capacity assessment of the Wainui Road One-way Bridge (refer to Table No. 15):

- The bridge is expected to operate at free-flow conditions for the 2024 Baseline assessment scenario (i.e. Scenario 1) during the AM peak non-holiday period, however, notable queuing and delays are expected for the eastbound approach during the AM peak summer holiday peak period. Findings from the capacity assessment also indicate that the bridge will likely operate at unacceptable levels of service (congested conditions with significant delays on the bridge approaches) during the PM peak period (summer and non-summer periods) for the 2024 Baseline (i.e. without the additional development traffic).
- The performance of the bridge is expected to deteriorate for the 2044 baseline assessment scenario (with and without the development traffic) – as shown in the table above, significant delays and queuing are expected on the western approach during both the AM and PM peak periods.

Based on this assessment, the Wainui Road Bridge will require upgrading by 2024 (based on the baseline traffic demand only – without any traffic from the rezoning site) to improve future operations at the bridge.

The Waikato District Council (WDC) Long Term Plan 2018 – 2028 (LTP) identifies the Wainui Bridge as being near the end of its useful life due to the delays that are currently observed at the bridge during the peak hours. The LTP therefore proposes the replacement of the bridge to address safety and congestion issues at this locality. The findings from the PTV VISSIM analysis align closely with the LTP conclusion.

WDC is currently investigating two upgrade options for the bridge as part of the LTP:

- The first and preferred option includes the replacement of the bridge with a newly constructed two-lane two-way bridge.
- The second option includes constructing a new one-lane one-way bridge.

The LTP indicates that a decision will be made by 2021, and that the design and implementation of the proposal will occur between 2023 and 2026.

As the final decision and timeframes are still uncertain, signalisation of the bridge approaches is recommended as an interim measure. PTV VISSIM was used to model the performance of the one-way bridge with the installation of traffic signals – a summary of the capacity assessment results is provided in Table No. 16.

Table No. 16

Capacity Analysis Results – Wainui Road One-Way Bridge (Signalised)									
Analysis Scenario	Bridge Approach	Non-Holiday Period				Holiday Period			
		AM Peak Hour (vph)		PM Peak Hour (vph)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Ave Delay (sec)	Ave Queue (m)	Ave Delay (sec)	Ave Queue (m)	Ave Delay (sec)	Ave Queue (m)	Ave Delay (sec)	Ave Queue (m)
Scenario 1: 2024 Baseline Traffic	Eastern	28.7	6.4	39.5	23.4	25.6	6.6	40.5	26.5
	Western	24.0	11.6	21.4	9.14	22.9	12.8	22.3	10.6
Scenario 2: 2044 Baseline Traffic	Eastern	26.9	7.8	27.1	21.5	39.1	13.5	28.9	27.1
	Western	24.5	18.2	36.9	20.6	24.1	19.6	48.9	33.4
Scenario 3: 2044 Baseline + Development Traffic	Eastern	38.7	13.1	34.9	80.4	44.0	17.6	74.0	156.8
	Western	37.4	50.3	37.4	30.8	45.0	68.7	74.9	58.2

As shown in Table No. 16, with signalisation of the approaches, the bridge is expected to operate at acceptable levels of service for the 2024 and 2044 Baseline assessment scenarios (i.e. Scenario 1 and 2).

The bridge is expected to continue operating at acceptable levels of service with the addition of the rezoning proposal traffic added to the 2044 Baseline (i.e. Scenario 3). While notable delays (approximately 45 seconds during the AM peak and 75 seconds during the PM peak) are expected during the summer holiday peak periods, the average queues on both the east- and westbound approach are not expected to exceed 70 m (or approximately 10 vehicles). Figure No. 22 provides an illustration of the anticipated queueing for the 2044 PM Holiday peak period.

Figure No. 22: Anticipated queuing during the 2044 PM Peak Holiday Period (Source: PTV VISSIM model scenario)

Based on the findings from the assessment, it is recommended that, as a minimum, traffic signals be installed at the approaches of the Wainui Road Bridge to mitigate the safety and efficiency issues of the existing one-way system if the implementation of the new bridge is not concluded by the year 2024. It is considered that further capacity related upgrades are unlikely to be required at the one-way bridge even with the addition of the proposed rezoning traffic added to the 2044 baseline traffic. However, further assessment should be conducted once the first 300 dwelling units are completed to assess the impact of the proposed development traffic on the signalised one-way bridge, and to propose any required mitigation measures (if required).

In addition to the signalisation of the bridge, it is recommended that advanced warning signs and road markings alerting drivers to the presence of the new traffic signals (and any hidden queues resulting from signalising the bridge) be provided on both bridge approaches.

On this basis, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be less than minor, provided that the proposed mitigation measures (i.e. signalisation of the bridge approaches + signage + road markings) are implemented by 2024.

7.2.5 Wainui Road & Whitley Street Intersection

The capacity analysis results for the Wainui Road & Whitley Street intersection are summarised in Table No. 17. As shown in Table No. 17, the T-intersection is expected to operate at acceptable levels of service during the AM and PM peak periods during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenarios.

With the addition of the rezoning traffic to the 2044 baseline, only a minor increase in the average vehicle delay and 95th percentile queue lengths (the 95th percentile queues on the Whitley Street approach are not

expected to exceed 18.5 m or approximately 3 vehicles) during the peak operating periods for both the non-holiday and holiday assessment periods.

Based on the above, the current intersection configuration is considered to have sufficient capacity to accommodate the 2044 baseline + full development traffic (i.e. the traffic associated with the rezoning proposal is not expected to trigger any capacity related upgrades at the intersection).

Table No. 17

Capacity Analysis Results – Wainui Road/ Whitley Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Whitley Str	4.8	0.7	A	5.1	1.0	A
	East: Wainui Rd	0.2	0.0	A	0.2	0.0	A
	West: Wainui Rd	2.2	5.6	A	2.1	4.3	A
	Intersection	2.2	5.6	A	1.7	4.3	A
Holiday	South: Whitley Str	4.8	0.8	A	5.1	1.2	A
	East: Wainui Rd	0.2	0.0	A	0.2	0.0	A
	West: Wainui Rd	2.3	6.3	A	2.2	5.3	A
	Intersection	2.3	6.3	A	1.8	5.3	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Whitley Str	5.0	1.1	A	5.4	2.0	A
	East: Wainui Rd	0.2	0.0	A	0.2	0.0	A
	West: Wainui Rd	2.3	10.3	A	2.8	7.7	A
	Intersection	2.3	10.3	A	2.0	7.7	A
Holiday	South: Whitley Str	5.0	1.2	A	5.5	2.3	A
	East: Wainui Rd	0.2	0.0	A	0.2	0.0	A
	West: Wainui Rd	2.4	11.6	A	3.2	10.0	A
	Intersection	2.4	11.6	A	2.2	10.0	A
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: Whitley Str	5.1	1.2	A	5.8	3.3	A
	East: Wainui Rd	0.2	0.0	A	0.1	0.0	A
	West: Wainui Rd	2.3	16.7	A	4.0	11.2	A
	Intersection	2.3	16.7	A	2.4	11.2	A
Holida	South: Whitley Str	5.1	1.3	A	6.0	3.7	A
	East: Wainui Rd	0.2	0.0	A	0.1	0.0	A

Capacity Analysis Results – Wainui Road/ Whitley Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	West: Wainui Rd	2.4	18.5	A	4.7	15.3	A
	Intersection	2.4	18.5	A	2.7	15.3	A

While the crash data assessment (refer to Section 4.2) indicated that four of the five crashes that were recorded in the vicinity of the intersection during the previous five years were related to turning movements at the intersection, the crashes did not result in any death or serious injuries. This is likely due to the low speed environment along this section of Wainui Road (40km/h posted speed limit). On this basis, the road safety risks at the intersection are considered to be low and that the traffic associated with the rezoning proposal is unlikely to adversely impact on the safety of the intersection.

On this basis, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be negligible to less than minor in scale.

7.2.6 Wainui Road & Stewart Street Intersection

The capacity analysis results for the Wainui Road & Stewart Street intersection are summarised in Table No. 18.

As shown in Table No. 18, the T-intersection is expected to operate at acceptable levels of service during the AM and PM peak periods during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenarios. With the addition of the rezoning traffic to the 2044 baseline, only a minor increase in the average vehicle delay and queues are expected during the peak periods.

Based on the above, the current intersection configuration is considered to have sufficient capacity to accommodate the 2044 baseline + full development traffic (i.e. the traffic associated with the rezoning proposal is not expected to trigger any capacity related upgrades at the intersection).

On this basis, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be negligible.

Table No. 18

Capacity Analysis Results – Wainui Road/ Stewart Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Wainui Rd	0.7	1.4	A	0.4	0.7	A
	East: Stewart Str	5.4	0.5	A	6.0	1.6	A
	North: Wainui Rd	0.8	0.0	A	0.5	0.0	A
	Intersection	1.0	1.4	A	1.1	1.6	A

Capacity Analysis Results – Wainui Road/ Stewart Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Holiday	South: Wainui Rd	0.7	1.5	A	0.5	0.9	A
	East: Stewart Str	5.6	0.6	A	6.4	1.9	A
	North: Wainui Rd	0.8	0.0	A	0.5	0.0	A
	Intersection	1.1	1.5	A	1.1	1.9	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Wainui Rd	1.0	3.2	A	0.7	1.5	A
	East: Stewart Str	6.0	0.8	A	7.0	3.4	A
	North: Wainui Rd	0.8	0.0	A	0.4	0.0	A
	Intersection	1.3	3.2	A	1.4	3.4	A
Holiday	South: Wainui Rd	1.0	3.4	A	0.7	1.9	A
	East: Stewart Str	6.2	1.0	A	7.7	3.9	A
	North: Wainui Rd	0.8	0.0	A	0.4	0.0	A
	Intersection	1.3	3.4	A	1.5	3.9	A
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: Wainui Rd	1.4	6.6	A	1.0	2.2	A
	East: Stewart Str	6.5	1.1	A	7.7	5.5	A
	North: Wainui Rd	0.7	0.0	A	0.4	0.0	A
	Intersection	1.5	6.6	A	1.7	5.5	A
Holiday	South: Wainui Rd	1.4	6.9	A	1.1	2.8	A
	East: Stewart Str	7.2	1.6	A	8.5	6.7	A
	North: Wainui Rd	0.7	0.0	A	0.4	0.0	A
	Intersection	1.6	6.9	A	1.9	6.7	A

7.2.7 Wainui Road & Bankart Street Intersection

The capacity analysis results for the Wainui Road & Bankart Street intersection are summarised in Table No. 19. Only the peak direction (the PM peak in this case) was analysed for the intersection as turning movements counts were only conducted during the afternoon period.

As shown in Table No. 19, the three-legged roundabout is expected to operate at acceptable levels of service during the PM peak period during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenarios. With the addition of the rezoning traffic to the 2044 baseline, only a minor increase in the average vehicle delay and queues are expected during the afternoon peak period. Although not analysed, it is anticipated that the intersection will operate at acceptable levels of service during the AM peak period.

Based on the above, the intersection is considered to have sufficient capacity to accommodate the 2044 baseline + full development traffic (i.e. the traffic associated with the rezoning proposal is not expected to trigger any capacity related upgrades at the intersection). Furthermore, the crash data assessment (refer to Section 4.2) indicates no apparent safety risks at the intersection given that no crashes have been recorded at the roundabout since January 2016.

On this basis, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be negligible.

Table No. 19

Capacity Analysis Results – Wainui Road/ Bankart Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Wainui Rd	-	-	-	4.5	5.7	A
	East: Bankart Str	-	-	-	4.5	4.5	A
	North: Wainui Rd	-	-	-	3.7	6.8	A
	Intersection	-	-	-	4.2	6.8	A
Holiday	South: Wainui Rd	-	-	-	4.5	6.9	A
	East: Bankart Str	-	-	-	4.7	5.3	A
	North: Wainui Rd	-	-	-	3.8	8.1	A
	Intersection	-	-	-	4.3	8.1	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Wainui Rd	-	-	-	4.6	8.8	A
	East: Bankart Str	-	-	-	5.2	7.9	A
	North: Wainui Rd	-	-	-	4.0	11.3	A
	Intersection	-	-	-	4.5	11.3	A
Holiday	South: Wainui Rd	-	-	-	4.6	10.7	A
	East: Bankart Str	-	-	-	5.4	9.5	A
	North: Wainui Rd	-	-	-	4.1	13.4	A
	Intersection	-	-	-	4.6	13.4	A
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: Wainui Rd	-	-	-	4.6	9.6	A
	East: Bankart Str	-	-	-	5.7	10.9	A
	North: Wainui Rd	-	-	-	4.0	14.3	A
	Intersection	-	-	-	4.6	14.3	A

Capacity Analysis Results – Wainui Road/ Bankart Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Holiday	South: Wainui Rd	-	-	-	4.6	11.5	A
	East: Bankart Str	-	-	-	6.0	12.8	A
	North: Wainui Rd	-	-	-	4.2	16.7	A
	Intersection	-	-	-	4.8	16.8	A

7.2.8 Bankart Street & Bow Street Intersection

The capacity analysis results for the Bankart Street & Bow Street intersection are summarised in Table No. 20. Only the peak direction (the AM peak in this case) was analysed for the intersection as turning movements counts were only conducted during the morning period.

As shown in Table No. 20, the four-legged roundabout is expected to operate at acceptable levels of service during the AM peak period during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenarios. With the addition of the rezoning traffic to the 2044 baseline, only a minor increase in the average vehicle delay and queues are expected during the morning peak period. Although not analysed, it is anticipated that the intersection will operate at acceptable levels of service during the PM peak period.

On this basis, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be negligible.

Table No. 20

Capacity Analysis Results – Bankart Street/ Bow Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	Southeast: Bow Str	3.7	5.1	A	-	-	-
	Northeast: James Str	4.8	1.7	A	-	-	-
	Northwest: Bow Str	3.9	3.7	A	-	-	-
	Southwest: Bankart St	6.7	2.3	A	-	-	-
	Intersection	4.4	5.1	A	-	-	-
Holiday	Southeast: Bow Str	3.7	5.8	A	-	-	-
	Northeast: James Str	4.9	2.0	A	-	-	-
	Northwest: Bow Str	4.0	4.1	A	-	-	-
	Southwest: Bankart St	6.8	2.6	A	-	-	-

Capacity Analysis Results – Bankart Street/ Bow Street Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	Intersection	4.4	5.8	A	-	-	-
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	Southeast: Bow Str	3.8	7.5	A	-	-	-
	Northeast: James Str	5.2	2.7	A	-	-	-
	Northwest: Bow Str	4.2	5.6	A	-	-	-
	Southwest: Bankart St	7.1	3.8	A	-	-	-
	Intersection	4.7	7.5	A	-	-	-
Holiday	Southeast: Bow Str	3.8	8.7	A	-	-	-
	Northeast: James Str	5.4	3.1	A	-	-	-
	Northwest: Bow Str	4.3	6.4	A	-	-	-
	Southwest: Bankart St	7.3	4.3	A	-	-	-
	Intersection	3.8	8.7	A	-	-	-
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	Southeast: Bow Str	3.8	7.6	A	-	-	-
	Northeast: James Str	5.4	2.7	A	-	-	-
	Northwest: Bow Str	4.4	5.8	A	-	-	-
	Southwest: Bankart St	7.4	4.7	A	-	-	-
	Intersection	4.9	7.6	A	-	-	-
Holiday	Southeast: Bow Str	3.8	8.8	A	-	-	-
	Northeast: James Str	5.6	3.2	A	-	-	-
	Northwest: Bow Str	4.5	6.6	A	-	-	-
	Southwest: Bankart St	7.5	5.3	A	-	-	-
	Intersection	5.0	8.8	A	-	-	-

7.2.9 Bow Street & Norrie Avenue Intersection

The capacity analysis results for the Bow Street & Norrie Avenue intersection are summarised in Table No. 21 below. Only the peak direction (the AM peak in this case) was analysed for the intersection as turning movements counts were only conducted during the morning period.

As shown in Table No. 21, the intersection is expected to operate at acceptable levels of service during the AM peak period during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenario. However, for the 2044 baseline holiday period assessment scenario, the Norrie Avenue approach is expected to operate at capacity (i.e. LOS

D). A notable increase in the average vehicle delay and 95th percentile queues on the Norrie Avenue approach is expected as a result of the increased traffic demand during the summer holiday period.

The performance of the intersection is expected to deteriorate with the addition of the rezoning traffic to the 2044 baseline. As shown in Table No. 21, the southern approach (i.e. Norrie Avenue approach) is expected to operate at poor levels of service during both the non-holiday and summer holiday period (i.e. at LOS E and F respectively).

- Vehicles on the Norrie Avenue approach are expected to experience significant delays (with average delays of approximately 42 seconds during the non-holiday period and approximately 90 seconds during the summer holiday period), while
- The 95th percentile queues on the Norrie Avenue approach are expected to double during the non-holiday period (from approximately 35 m (or five vehicles) to 97 m (or 13 vehicles)), and triple during the summer holiday period (from approximately 53 m (or seven vehicles) to 183 m (or 25 vehicles)) with the additional rezoning traffic added to the 2044 baseline.

Based on the findings from the capacity assessment, the Bow Street/ Norrie Avenue intersection will require upgrading prior to the development of the full rezoning site. An additional scenario was analysed (Scenario 4) to determine the level of development (in terms of the number of residential dwellings) at which capacity related upgrades would likely be triggered. The findings from the assessment scenario are summarised in Table No. 21.

The results for Scenario 4 show that at 75% development (i.e. 300 dwelling units or development Year 15), the Bow Street & Norrie Avenue intersection will operate at acceptable levels of service during both the typical (or non-holiday) and summer holiday periods. However, after the development of the first 300 residential dwellings, capacity improvements will likely be required at the intersection. Improvements may likely involve upgrading the stop-controlled intersection to traffic signal control or to a single-lane roundabout configuration.

Table No. 21

Capacity Analysis Results – Bow Street/ Norrie Avenue Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Norrie Ave	12.2	10.9	B	-	-	-
	East: Main Rd	2.3	0.4	A	-	-	-
	North: BP Access	10.2	0.1	B	-	-	-
	West: Bow Str	1.2	0.5	A	-	-	-
	Intersection	4.9	10.9	A	-	-	-
Holiday	South: Norrie Ave	13.7	14.3	B	-	-	-
	East: Main Rd	2.3	0.4	A	-	-	-
	North: BP Access	10.7	0.1	B	-	-	-
	West: Bow Str	1.2	0.5	A	-	-	-
	Intersection	5.3	14.3	A	-	-	-

Capacity Analysis Results – Bow Street/ Norrie Avenue Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Norrie Ave	21.2	35.2	C	-	-	-
	East: Main Rd	2.4	0.5	A	-	-	-
	North: BP Access	12.0	0.2	B	-	-	-
	West: Bow Str	1.2	0.7	A	-	-	-
	Intersection	7.9	35.2	A	-	-	-
Holiday	South: Norrie Ave	28.7	52.6	D	-	-	-
	East: Main Rd	2.4	0.6	A	-	-	-
	North: BP Access	12.9	0.2	B	-	-	-
	West: Bow Str	1.3	0.9	A	-	-	-
	Intersection	10.1	52.6	B	-	-	-
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: Norrie Ave	41.5	96.5	E	-	-	-
	East: Main Rd	2.4	0.6	A	-	-	-
	North: BP Access	12.4	0.2	B	-	-	-
	West: Bow Str	1.1	0.8	A	-	-	-
	Intersection	16.2	96.5	C	-	-	-
Holiday	South: Norrie Ave	89.8	182.9	F	-	-	-
	East: Main Rd	2.4	0.6	A	-	-	-
	North: BP Access	13.4	0.2	B	-	-	-
	West: Bow Str	1.2	0.9	A	-	-	-
	Intersection	32.8	182.9	E	-	-	-
Assessment Scenario 4 – 2039 Baseline WITH 75% of the rezoning traffic (i.e. of 300 dwellings)							
Non-Holiday	South: Norrie Ave	22.8	44.6	C	-	-	-
	East: Main Rd	2.4	0.5	A	-	-	-
	North: BP Access	11.7	0.2	B	-	-	-
	West: Bow Str	1.2	0.7	A	-	-	-
	Intersection	9.1	44.6	B	-	-	-
Holiday	South: Norrie Ave	31.1	65.2	D	-	-	-
	East: Main Rd	2.4	0.6	A	-	-	-

Capacity Analysis Results – Bow Street/ Norrie Avenue Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	North: BP Access	12.5	0.2	B	-	-	-
	West: Bow Str	1.2	0.8	A	-	-	-
	Intersection	11.7	65.2	B	-	-	-

On the basis of the above assessment, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be moderate but able to be managed and mitigated to an acceptable level. It is therefore recommended that an ITA be conducted at development Year 15 (i.e. 2039 or after the completion of the first 300 dwellings, whichever comes first) to assess the impact of the proposed development traffic on the intersection as the trip generation and distribution assumptions become realised over time. Proposed (capacity and safety related) mitigation measures should then be reflected in the findings from the ITA.

7.2.10 SH23 & Te Mata Road Intersection

The capacity analysis results for the SH23 & Te Mata Road intersection are summarised in Table No. 22.

As shown in Table No. 22, the T-intersection is expected to operate at acceptable levels of service during the AM and PM peak periods during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenarios. With the addition of the rezoning traffic to the 2044 baseline, only a minor increase in the average vehicle delay is expected during the peak operating periods. Based on the above, the intersection is considered to have sufficient capacity to accommodate the 2044 baseline + full development traffic.

On the basis of the above assessment, the effect of the rezoning proposal on the capacity and efficiency of the intersection is expected to be less than minor.

Table No. 22

Capacity Analysis Results – SH23 / Te Mata Road Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Te Mata Rd	9.4	3.0	A	8.6	1.0	A
	East: SH23	0.6	0.0	A	1.0	0.0	A
	West: SH23	0.5	0.6	A	1.1	0.6	A
	Intersection	1.7	3.0	A	1.5	1.0	A
Holiday	South: Te Mata Rd	10.0	3.6	B	8.6	1.0	A
	East: SH23	0.5	0.0	A	1.0	0.0	A
	West: SH23	0.4	0.6	A	1.1	0.6	A

Capacity Analysis Results – SH23 / Te Mata Road Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	Intersection	1.7	3.6	A	1.5	1.0	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Te Mata Rd	11.4	4.7	B	9.9	1.6	A
	East: SH23	0.6	0.0	A	1.0	0.0	A
	West: SH23	0.5	0.7	A	1.3	0.8	A
	Intersection	1.9	4.7	A	1.5	1.6	A
Holiday	South: Te Mata Rd	12.5	5.7	B	10.7	1.7	B
	East: SH23	0.6	0.0	A	0.9	0.0	A
	West: SH23	0.4	0.7	A	1.2	0.9	A
	Intersection	2.0	5.7	A	1.4	1.7	A
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: Te Mata Rd	13.5	5.7	B	11.3	1.8	B
	East: SH23	0.5	0.0	A	0.8	0.0	A
	West: SH23	0.4	0.7	A	1.3	1.0	A
	Intersection	1.8	5.7	A	1.4	1.8	A
Holiday	South: Te Mata Rd	15.6	7.6	C	12.3	2.1	B
	East: SH23	0.5	0.0	A	0.8	0.0	A
	West: SH23	0.4	0.8	A	1.3	1.1	A
	Intersection	2.1	7.6	A	1.4	2.1	A

7.2.11 SH23 & Te Pahu Road Intersection

The capacity analysis results for the SH23 & Te Mata Road intersection are summarised in Table No. 23.

Table No. 23

Capacity Analysis Results – SH23 / Te Pahu Road Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
N	South: Te Pahu Rd	13.6	7.1	B	9.8	2.0	A

Capacity Analysis Results – SH23 / Te Pahu Road Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	East: SH23	0.3	0.0	A	0.5	0.0	A
	West: SH23	0.3	0.8	A	1.0	1.0	A
	Intersection	1.7	7.1	A	1.0	2.0	A
Holiday	South: Te Pahu Rd	17.6	9.1	C	11.5	2.3	B
	East: SH23	0.2	0.0	A	0.5	0.0	A
	West: SH23	0.3	0.8	A	1.0	1.2	A
	Intersection	1.9	9.1	A	1.0	2.3	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: Te Pahu Rd	26.3	16.3	D	14.2	3.8	B
	East: SH23	0.3	0.0	A	0.5	0.0	A
	West: SH23	0.3	1.0	A	1.4	1.8	A
	Intersection	3.0	16.3	A	1.3	3.8	A
Holiday	South: Te Pahu Rd	47.1	25.2	E	19.2	5.2	C
	East: SH23	0.3	0	A	0.5	0.0	A
	West: SH23	0.3	1.1	A	1.5	2.3	A
	Intersection	4.5	25.2	A	1.4	5.2	A
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: Te Pahu Rd	43.6	23.8	E	18.5	5.0	C
	East: SH23	0.3	0.0	A	0.5	0.0	A
	West: SH23	0.3	1.1	A	1.6	2.3	A
	Intersection	4.3	23.8	A	1.4	5.0	A
Holiday	South: Te Pahu Rd	141.3	65.7	F	27.1	7.2	D
	East: SH23	0.2	0.0	A	0.5	0.0	A
	West: SH23	0.3	1.1	A	1.8	2.9	A
	Intersection	12.0	65.7	B	1.7	7.2	A
Assessment Scenario 4 – 2039 Baseline WITH 75% of the rezoning traffic (i.e. of 300 dwellings)							
Non-Holiday	South: Te Pahu Rd	26.9	15.6	D	14.4	3.5	B
	East: SH23	0.3	0.0	A	0.5	0.0	A
	West: SH23	0.3	1.0	A	1.4	1.7	A
	Intersection	2.8	15.6	A	1.2	3.5	A

Capacity Analysis Results – SH23 / Te Pahu Road Intersection							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Holiday	South: Te Pahu Rd	46.7	23.7	E	18.9	4.7	C
	East: SH23	0.2	0.0	A	0.4	0.0	A
	West: SH23	0.3	1.0	A	1.5	2.2	A
	Intersection	4.3	23.7	A	1.3	4.7	A

As shown in Table No. 23 above, the T-intersection is expected to operate at acceptable levels of service during the AM peak period during both the non-holiday and holiday periods for the 2024 and 2044 baseline (i.e. without the traffic associated with the rezoning proposal) assessment scenario. However, for the 2044 baseline assessment scenario, the Te Pahu Road approach is expected to deteriorate from LOS C during the typical/ non-holiday to LOS E during the summer holiday period. While a notable increase in the average vehicle delay is expected for vehicles on the Te Pahu Road approach (from approximately 26 seconds to 47 seconds) as a result of the increased traffic demand during the AM summer holiday period, the 95th percentile queues are not expected to exceed 25 m (or 4 vehicles) during the same period.

The performance of the intersection is expected to deteriorate with the addition of the rezoning traffic to the 2044 baseline. As shown in Table No. 23, the southern approach (i.e. Te Pahu Road approach) is expected to operate at poor levels of service during both the AM non-holiday and summer holiday period (i.e. at LOS E and F respectively).

- Vehicles on Te Pahu Roadare expected to experience significant delays (with average delays of approximately 45 seconds during the non-holiday period and approximately 140 seconds during the summer holiday period).
- While only a slight increase in the 95th percentile queues on Te Pahu Road is expected during the non-holiday period (from approximately 16m (or two vehicles) to 24 m (or four vehicles)), queue lengths are expected to double during the summer holiday period (from approximately 25 m (or four vehicles) to 65 m (or 9 vehicles)) with the additional rezoning traffic added to the 2044 baseline during the AM peak. However, queue lengths on Te Pahu Road are not expected to exceed 9 vehicles (or 65 m).

Based on the findings from the capacity assessment, the SH23 / Te Pahu Road intersection will require upgrading prior to the development of the full rezoning site. An additional scenario was analysed (Scenario 4) to determine the level of development (in terms of the number of residential dwellings) at which capacity related upgrades would likely be triggered. The findings from the assessment scenario are summarised in Table No. 23.

The results for Scenario 4 show that at 75% development (i.e. 300 dwelling units or development Year 15), the SH23 / Te Pahu Road intersection will operate at acceptable levels of service during both the typical (or non-holiday) and summer holiday periods. However, after the development of the first 300 residential dwellings, capacity improvements will likely be required at the intersection. Improvements may likely involve upgrading the stop-controlled intersection to a single-lane roundabout.

On this basis, the effect of the rezoning proposal on the capacity, efficiency and safety of the intersection is expected to be moderate but able to be managed and mitigated to an acceptable level. It is therefore recommended that an ITA be conducted at development Year 15 (i.e. 2039 or after the completion of the first 300 dwellings, whichever comes first) to assess the impact of the proposed development traffic on the intersection as the trip generation and distribution assumptions become realised over time. Proposed mitigation measures should then be reflected in the findings from the ITA.

7.2.12 SH23 & SH39 Intersection

The capacity analysis results for the SH23 & SH39 intersection are summarised in Table No. 24 and Table No. 25 for the western and eastern intersections respectively.

As shown in Table No. 24 and Table No. 25, the northern approach of the staggered intersection (i.e. the SH39 approach of the western intersection) is expected to operate at poor/ unacceptable levels of service (LOS E and worse) during the PM peak typical/non-holiday period for the 2024 baseline assessment scenario (i.e. prior to development of the Koning site). The performance of the intersection is expected to deteriorate even further (at LOS F) for the 2044 baseline assessment scenario (i.e. without any of the rezoning traffic added to the road network).

While the eastern intersection is expected to perform at acceptable levels of service for the 2024 baseline assessment scenario, the performance of that intersection is also expected to deteriorate for the 2044 baseline assessment scenario (the southern approach of the intersection is expected to operate at LOS E and worst during the PM peak typical/non-holiday period).

Table No. 24

Capacity Analysis Results – SH23 / SH39 Intersection (Western Intersection)							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	East: SH23	9.3	6.1	A	1.3	1.9	A
	North: SH39	21.1	9.6	C	48.0	59.8	E
	West: SH23	1.5	0.0	A	1.3	0.0	A
	Intersection	6.5	9.6	A	16.2	59.8	B
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	East: SH23	43.1	28.7	F	1.4	2.5	A
	North: SH39	255.1	124.7	F	811.4	542.8	F
	West: SH23	1.6	0.0	A	1.4	0.0	A
	Intersection	51.1	124.7	F	261.4	542.8	F

Table No. 25

Capacity Analysis Results – SH23 / SH39 Intersection (Eastern Intersection)							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: SH39	12.3	6.8	B	17.3	9.8	C
	East: SH23	0.7	0.0	A	0.6	0.0	A
	West: SH23	1.5	2.5	A	7.0	7.9	A

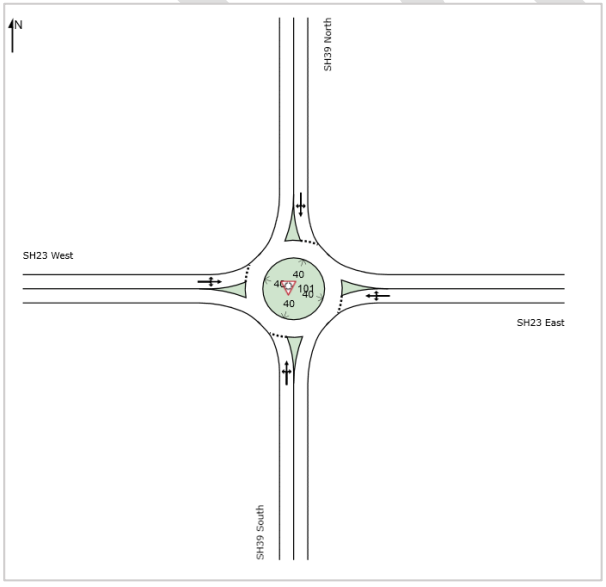
Capacity Analysis Results – SH23 / SH39 Intersection (Eastern Intersection)							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	Intersection	4.0	6.8	A	6.4	9.8	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: SH39	23.3	23.0	C	35.9	26.8	E
	East: SH23	0.7	0.0	A	0.6	0.0	A
	West: SH23	1.5	3.1	A	8.9	8.1	A
	Intersection	6.6	23.0	A	11.0	26.8	B

Based on this assessment, the staggered intersection will require upgrading by 2024 to improve future operations at the intersection. The opening of the SH1 Waikato Expressway, is expected to result in an overall reduction of the volume of traffic traveling along SH39. Accordingly, it is considered that the SH23 & SH39 intersection could experience an improvement in its performance. However, due to the uncertainty of the effects of the Waikato Expressway on operations at the intersection[16], an alternative intersection configuration will need to be considered to improve operations at the staggered intersection.

It is understood that funding could be approved by Waka Kotahi for the design and construction of a new roundabout after a technical assessment by Waka Kotahi concluded that the staggered intersection needed to be upgraded to a single-lane roundabout to improve safety. Construction of the new roundabout would, however, likely only occur in the next five to 10 years.

On this basis, a roundabout configuration was analysed to determine whether the proposed configuration would be sufficient to address the operational issues that are expected at the SH23 & SH39 intersection. The proposed roundabout configuration, which includes a 40 m internal island diameter with single approaching and circulating lanes is shown in Figure No. 23. The capacity analysis results for the roundabout configuration are summarised in Table No. 26 to follow.

Figure No. 23: Proposed Configuration - SH23 & SH39 Single-lane Roundabout Configuration



[16] No surveys have been conducted in 2020 as traffic is still expected to be affected by the effects of Covid-19.

Table No. 26

Capacity Analysis Results – SH23 / SH39 Intersection (Upgraded to single-lane roundabout)							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 1 – 2024 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: SH39	2.9	8.8	A	6.1	18.3	A
	East: SH23	3.6	4.5	A	6.0	41.1	A
	North: SH39	6.8	17.1	A	4.6	18.0	A
	West: SH23	5.7	73.2	A	3.2	10.1	A
	Intersection	5.2	73.2	A	5.1	41.1	A
Holiday	South: SH39	3.1	10.9	A	8.2	29.0	A
	East: SH23	3.8	5.7	A	10.1	71.2	B
	North: SH39	8.9	28.7	A	4.9	23.1	A
	West: SH23	12.5	158.1	B	3.4	12.8	A
	Intersection	9.7	158.1	A	7.1	71.2	A
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
Non-Holiday	South: SH39	3.2	12.0	A	12.5	42.1	B
	East: SH23	4.0	6.5	A	18.2	123.0	B
	North: SH39	12.2	38.4	B	5.3	27.	A
	West: SH23	42.9	402.8	D	3.6	14.5	A
	Intersection	28.6	402.8	C	11.1	123.0	B
Holiday	South: SH39	3.4	14.9	A	20.3	65.7	C
	East: SH23	4.2	8.0	A	127.3	586.4	F
	North: SH39	13.3	45.7	B	5.9	36.8	A
	West: SH23	203.9	1307.1	F	3.8	18.2	A
	Intersection	126.0	1307.1	F	53.6	586.4	E
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: SH39	3.2	12.1	A	20.1	57.0	C
	East: SH23	3.9	6.9	A	47.6	273.3	D
	North: SH39	12.2	38.7	B	5.7	30.7	A
	West: SH23	110.7	810.3	F	3.5	15.1	A
	Intersection	71.5	810.3	F	23.9	273.3	C
Holida	South: SH39	3.5	15.1	A	20.0	64.1	C
	East: SH23	4.2	8.4	A	268.9	1090.6	F

Capacity Analysis Results – SH23 / SH39 Intersection (Upgraded to single-lane roundabout)							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	North: SH39	13.4	46.2	B	6.7	43.9	A
	West: SH23	289.7	1811.1	F	3.8	18.9	A
	Intersection	182.2	1811.1	F	109.1	1090.6	F

As shown in Table No. 26, the single-lane roundabout configuration is expected to improve operations at the SH23 & SH39 intersection in the short term, however, the configuration is expected to reach its capacity (i.e. the critical approach will operate at LOS E and worse) prior to 2044 (with the baseline traffic only; i.e. without any of the rezoning traffic added to the road network). This indicates further upgrades will likely be required prior to the 2044 baseline to ensure that the intersection operates safely and efficiently.

A dual-lane roundabout configuration was analysed with two approaching lanes for the eastern and western approaches (refer to Figure No. 24), while the capacity analysis results for the two-lane roundabout configuration are summarised in Table No. 27 below.

Figure No. 24: Proposed Configuration - SH23 & SH39 Dual-lane Roundabout

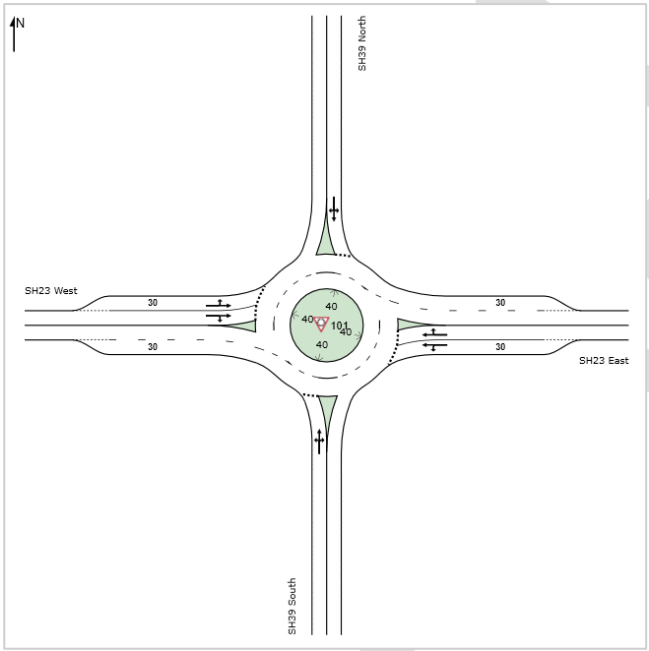


Table No. 27

Capacity Analysis Results – SH23 / SH39 Intersection (Upgraded to two-lane roundabout)							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
Assessment Scenario 2 – 2044 Baseline WITHOUT the rezoning traffic							
N	South: SH39	3.2	11.9	A	10.9	33.7	B

Capacity Analysis Results – SH23 / SH39 Intersection (Upgraded to two-lane roundabout)							
Period	Intersection Approach	AM Peak Hour			PM Peak Hour		
		Ave Delay (Sec)	95th percentile Queue (m)	LOS	Ave Delay (Sec)	95th percentile Queue (m)	LOS
	East: SH23	3.7	4.2	A	5.1	34.6	A
	North: SH39	10.9	30.4	B	5.3	26.7	A
	West: SH23	3.7	37.6	A	3.2	8.5	A
	Intersection	4.6	37.6	A	5.8	34.6	A
Holiday	South: SH39	3.4	14.8	A	23.5	68.2	C
	East: SH23	3.9	5.2	A	8.1	61.7	A
	North: SH39	24.5	63.9	C	5.8	35.9	A
	West: SH23	5.0	61.5	A	3.4	10.6	A
	Intersection	7.5	63.9	A	9.3	68.4	A
Assessment Scenario 3 – 2044 Baseline WITH the full rezoning traffic (on the basis of 400 dwellings)							
Non-Holiday	South: SH39	3.2	12.0	A	16.5	45.8	B
	East: SH23	3.6	4.4	A	6.3	47.0	A
	North: SH39	14.3	38.4	B	5.7	30.1	A
	West: SH23	3.9	45.3	A	3.2	8.9	A
	Intersection	5.2	45.3	A	7.3	47.0	A
Holiday	South: SH39	3.5	15.0	A	48.1	111.3	D
	East: SH23	3.8	5.4	A	11.2	87.6	B
	North: SH39	41.9	92.2	D	6.6	42.8	A
	West: SH23	5.6	75.5	A	3.4	10.9	A
	Intersection	10.3	92.2	B	14.6	111.3	B

As shown in the table, the dual-lane roundabout configuration is also expected to operate at acceptable levels of service during the typical/non-holiday and summer holiday periods for the 2044 baseline as well as for the 2044 baseline + full development traffic assessment scenarios.

Based on the findings from the assessment, it is recommended that, as a minimum, the intersection be upgraded to a single-lane roundabout in the next 10 years (by 2031) to mitigate the safety and efficiency issues of the existing staggered intersection. It is, however, recommended that Waka Kotahi consider upgrading the intersection to a dual-lane roundabout (instead of a single-lane configuration) should it be found that the opening of the Hamilton section of the Waikato Expressway has not resulted in significantly reducing traffic volumes on SH39.

8. Construction Traffic Management

Construction of the proposed rezoning sites and the internal road network is expected to occur in stages starting with ground improvements through to completion (subject to market conditions). Based on a preliminary geotechnical investigation, it is expected that earthworks and ground remediation works will be required to manage the identified geohazard risks associated with developing the subject site. The importation of clean fill material may likely be required during the development period from offsite to lift the ground levels above the existing site levels.

The clean fill material is expected to be sourced from several quarries within the Waikato Region and transported to site using 50MAX truck-and-trailer units. It is expected that most, if not all, of the truck-and-trailer units hauling fill material will access the rezoning site via Te Hutewai Road. The ground improvement earthworks, subdivision and building construction activities will all temporarily increase traffic volumes at various stages throughout development, on Wainui Road and Te Hutewai Road. Separate resource consent applications and Construction Traffic Management Plans (CTMP) for each phase of works will be required to determine, quantify and mitigate any transportation related effects of construction traffic.

However, an overarching principle for the bulk import fill phase of earthworks in particular is to minimise amenity effects on residents on Wainui Road Road on the western boundary of the subject site as well as on residents opposite the site on the eastern side of Te Hutewai Road. This will be achieved by requiring access to the rezoning site from purpose-built accesses (either temporary or at future permanent intersection locations) on Wainui Road and Te Hutewai Road, connecting to internal haul roads. The proposed temporary access or accesses should be constructed as per the RITS standards for heavy commercial rural entranceways. The location and access design will be subject to planning and engineering approvals from Waikato District Council.

9. Travel Demand Management

Travel Demand Management (TDM) refers to methods to reduce the need to travel as well as reducing short private vehicle trips. TDM is about providing greater choices of sustainable transportation options to the public, thereby spreading all trips over more travel modes and over more times of the day or removing the need to travel at all. TDM therefore also helps to reduce the impact on the environment by reducing the level of carbon produced by travel.

While the rezoning site is located approximately 1.8 km from the nearest public transport stopping facility, there is opportunity to extend the existing regional public transport services southwards to the site. Even if the existing services aren't extended, the location of the existing bus terminus is within easily cycled or walkable from the proposed residential development.

The proposed pedestrian and cycle facilities, which will link the site to the existing on- and off-road walking and cycling infrastructure in the Raglan west area, existing public transport services as well as to existing key land uses (such as the Rangitahi Peninsula Development and Raglan CBD) will encourage the use of alternative methods of transport (e.g. bicycles (electric and manual), scooters, etc.).

These transport options reduce reliance on private car use for residents within Raglan township for travel to work purposes.

10. Strategy and Policy Assessment

There are a number of national and regional transportation strategies and policies that influence transportation investment in the Waikato Region. Those most relevant to the proposed re-zoning are discussed below.

10.1 National

10.1.1 Government Policy Statement on Land Transport 2018/19 - 2027/28 (Draft)

The Government Policy Statement (GPS2018) outlines this Government's priorities for expenditure from the National Land Transport Fund over the next 10 years. It also provides guidance to decision-makers about where the Government will focus resources, consistent with the purpose of the Land Transport Management Act, which is:

"*To contribute to an effective, efficient, and safe land transport system in the public interest.*"

GPS2018 identifies new strategic priorities and amended objectives to the previous GPS, with themes focussed on safety, mode neutrality, liveable cities, regional economic development, protecting the environment, and delivering the best possible value for money.

Accordingly, the key strategic priorities of the GPS2018 are defined as Safety and Access, with supporting strategic priorities of Value for Money and Environment protection. These are defined further as follows:

- *Safety: A safe system, free of death and serious injury*
- *Access: Provides increased access to economic and social opportunities, enables transport choice and is resilient*
- *Value for Money: Delivers the right infrastructure and services to the right level, at the best cost*
- *Reduces the adverse effects on the climate, local environment and public health*

Further explanation of the Themes in the GPS2018 to assist with delivering the strategic priorities are to:

- *Addresses current and future demand for access to economic and social opportunities*
- *Provide appropriate transport choices*
- *Be resilient*
- *Be a safe system, increasingly free of death and serious injury*
- *Mitigate the effects of land transport on the environment*
- *Deliver the right infrastructure and services to the right level at the best cost*

10.1.2 Connecting New Zealand (2012)

Connecting New Zealand (2012) was prepared by the NZ Transport Agency to provide an overview of the government's broad policy direction for the transport sector from 2012 to 2022. The overall objective for transport is as follows:

"*The government is seeking an effective, efficient, safe, secure, accessible and resilient transport system that supports the growth of our country's economy, in order to deliver greater prosperity, security and opportunities for all New Zealanders."*

10.1.3 The Transport Outlook 2017

The Transport Outlook 2017 provides an overview of what we can expect by way of traffic movements in the future. The population is expected to grow consistently over the next 50 years which will create additional

demand on New Zealand's transport networks. Of particular relevance to this proposal is the projected increase in freight movements and general traffic movements on Waikato's Transport network.

10.1.4 Waka Kotahi Statement of Intent 2017-2021

This statement of intent presents a new direction for the NZ Transport Agency. Over the next three to five years the Transport Agency aims to deliver three big changes that form the foundation of this new direction:

- *One connected transport system: Transform the performance of the land transport system by integrating digital technology with physical infrastructure to create a safe, connected system that works for everyone*
- *People-centred services: Simplify our customers' lives and our partners' work with innovative services and experiences that make it easy for them to do what they need to*
- *Partnerships for prosperity: Unlock social and economic opportunities for customers, businesses and communities through targeted partnerships*

10.1.5 New Zealand Transport Agency Long Term Strategic View

The Long-Term Strategic View captures the pressure points and key economic, environmental, and population factors that will shape the transport system we need for the future.

10.1.6 National Land Transport Programme 2018-2021

The National Land Transport Programme provides an overview of the investment expected between 2018 and 2021 and what this spending will be focused on achieving. The National Land Transport Fund's investment is aimed squarely at improving economic growth and productivity, safety, and value for money. This reflects the strategic direction set by the Government Policy Statement on land transport as stated above.

10.2 Regional

10.2.1 The Waikato Plan 2017

The Waikato Plan was created as a collaborative effort between the Waikato Councils, the Central Government and other private and public agencies. The Plan provides an overview of the important issues that affect the region now and are likely to affect the region over the next 30 years. The plan provides strategic guidance and advocacy to multiple agencies across the Waikato Region. Of particular relevance in this instance is priority 2 which is:

"*Connecting our communities through targeted investment - To maximise our resources and access what we need, we must be able to connect with others quickly, safely and efficiently. Whether by road, rail, air or via new technology, the Waikato Plan will ensure we have the right infrastructure in the right place, at the right time so our people and economy can succeed and prosper*."

10.2.2 2018 Update to the Waikato Regional Land Transport Plan (WRLTP) 2015-2045

The 2018 update of the WRLTP, builds on the 2015 Plan. As a mid-term review, it focuses in particular, on the regions key transport problems and priorities over the next three years, leading up to a full review of the plan in 2021. The plan is built around the regions three key transport problems, being:

- *Protecting the function of our strategic corridors in the context of growth pressures in and around Hamilton, the North Waikato and in the upper North Island*
- *Tackling our complex road safety problem and the disproportionate number of deaths and serious injuries in the region*
- *Providing for the access and mobility needs of our communities in a changing social, demographic, economic and technological landscape*

10.2.3 Waikato Regional Public Transport Plan 2015 – 2025

The Waikato Regional Public Transport Plan is a strategic document that sets the objectives and policies for public transport in the region and contains details of the public transport network and development plans between 2015 and 2025. The plan builds on the strategic direction for transport established through the Waikato Regional Land Transport Plan 2015-2045 (detailed above), and aims to deliver an effective, efficient and integrated public transport system for the people of Waikato. The overall goal set-out in this plan is as follows:

"*A growing and affordable public transport system that contributes to the economic, social and environmental vitality of the region*."

10.3 District

10.3.1 Waikato District and Local Area Blueprints 2019

The WDC commissioned the development of a Blueprint for the district to provide a high- level spatial picture of how the district could progress over the next 30 years, address the community's social, economic and environmental needs, and respond to its regional context. The Waikato District Blueprint works to achieve the overall vision established by the Council for the district:

"*Liveable, Thriving and Connected Communities*."

Of the nine district-wide themes that were developed, the following are the most relevant in this instance:

- Theme 4: Communities – Strengthen, enable and connect local communities and citizens, and support those in need
- Theme 6: Economy – Support the rural and urban economy, attract more visitors and employment uses
- Theme 7: Transport – Leverage value off accessibility, help those disadvantaged by the lack of transport options, prepare for the future passenger rail

10.4 Commentary

It is considered that the proposal is consistent with the above strategies and policies, for the following reasons:

a) The development provides for mode neutrality by providing walking and cycling infrastructure within the development and also on the surrounding network to enable connections to the existing walking and cycling facilities on Wainui Road.

b) The proximity of the proposed development to the existing regional bus service, as well as the proposed pedestrian and cycle facilities provided between the site and Raglan CBD, ensures that the development is suitably connected to multi-modal travel, helping to reduce demand on roads and facilitate future sustainability.

c) The location of the rezoning site and proposed transport connections (vehicles, pedestrians and cyclists) ensures that there are opportunities to connect the consented and future communities which are located to the south-west of Raglan township.

11. Conclusions

The following key conclusions are drawn from this ITA report for the proposed re-zoning and development enabled by the Raglan Structure Plan:

- If successful, the proposed re-zoning will enable the development of approximately 25-30 ha of resident land (or between 300 and 400 residential dwelling units) over a 20-year period.
- On the basis of the trip rates that were derived for the consented Rangitahi Peninsula Development, the proposed residential rezoning site is anticipated to generate approximately 1,800 – 2,400 trips per day and 180 - 240 trips during the peak hour.
- A collector road with access off Wainui Road and Te Hutewai Road is envisaged for good connectivity between the proposed lots and Wainui Road and Te Hutewai Road.
- Access to the rezoned site will be via a new road intersection on Wainui Road (to be located generally where the existing vehicle crossing to the property at 339 Wainui Road is currently located) and three new accesses on Te Hutewai Road. All new accesses/ intersections will be located and designed in accordance with the provisions in the Waikato District Plan, RITS and Austroads Guide to Road Design Part 4 and 4A.
- Walking and cycling linkages are critical for promoting public health and reducing vehicle dependency for short trips. A network of footpaths and shared paths have been recommended as part of the Structure Plan and within the future road cross-sections within the rezoning site. These footpaths will connect the rezoning site to the existing on-road walking facilities along the external road network (i.e. along Wainui Road and Te Hutewai Road) as well as to key land uses surrounding the rezoning site. The internal network of footpaths shall be provided in general accordance with the draft Structure Plan and Table 14.12.5.14 of the PDP.
- It is anticipated that with the development of the Koning site, the current regional bus service route will likely be reviewed in future as the demand for public transport changes. Seeing as the nearest public transport facility is located at the Wainui Road / Te Hutewai Road intersection (located approximately 1.8 km north of the site), there is opportunity for the existing public transport services to be extended south via Wainui Road or Te Hutewai Road, through the site, and then north to the bus terminus via Te Hutewai Road or Wainui Road.
- An assessment of the capacity and safety operations of the existing road corridors within the vicinity of the rezoning site found that the traffic associated with the rezoning proposal is unlikely to adversely affect the performance and safety of these roads given the low volumes and speeds that presently exist.
- The performance analysis of intersections within Raglan township and the wider road network (i.e. intersections located along SH23) showed that:
  - Wainui Road One-way bridge: the assessment concluded that the existing one-way configuration will not have sufficient capacity to accommodate the 2024 baseline traffic demand (i.e. without any additional traffic from the rezoning site) and that capacity related upgrades will likely be required by 2024 to improve future operations at the bridge.
  - Bow Street/ Norrie Avenue intersection: the assessment concluded that capacity and safety related upgrades will likely be required at the intersection once the first 300 dwelling units are completed (i.e. at 75% development) to mitigate future capacity constraints.
  - SH23/ Te Pahu Road intersection: the assessment concluded that capacity and safety related upgrades will likely be required once the first 300 dwelling units are completed to mitigate future capacity constraints.
  - SH23/ SH39 Road intersection: the assessment concluded that capacity and safety related upgrades will likely be required at the intersection in the next 10 years - the current stop-controlled configuration will not have sufficient capacity to accommodate the baseline traffic demand.

- Development of the rezoning site is likely to occur in stages over a 20-year period, subject to market conditions. The vast majority of construction traffic for the subdivision and building works will likely access the site via the proposed accesses on Te Hutewai Road. Separate resource consents will be required for each earthworks/ construction phase to determine and mitigate the associated transport related effects (including safety effects), if any.

On this basis, the overall transportation effects of the rezoning proposal on the adjoining and wider road networks are expected to be minor to moderate in scale, but are able to be managed and mitigated to an acceptable level provided the recommendations on the following page are implemented as part of future development resource consents.

12. Recommendations

On the basis of this assessment, the following recommendations are made in relation to mitigation of the transportation effects of the proposed Raglan rezoning and Structure Plan:

New Road Intersections to the Rezoning Site

The four accesses/ intersections to the rezoning sites should be in general accordance with the form and location described in this ITA and shown on the draft Structure Plan. Access to the proposed residential rezoning site is proposed to be via four new road intersections on Wainui Road and Te Hutewai Road as follows:

- One new road intersection on Wainui Road (to be located generally where the existing vehicle crossing to the property at 339 Wainui Road is currently located), and
- Three new road intersections/ accesses on Te Hutewai Road. To obtain the maximum achievable sightlines, it is recommended that the overgrown vegetation on the eastern side of Te Hutewai Road between the two new southern-most accesses on Te Hutewai Road be removed.

It is anticipated that a 'Tee' intersection layout (with free-flow on Wainui Road and Te Hutewai Road) will likely be the appropriate configuration for all four new road accesses. The appropriate control (either a compulsory Stop or Give-way) for each access should be determined at detailed design stage. Further investigations need to be undertaken at detailed design stage to determine whether a right-turn bay treatment at any of these intersections would be warranted from a capacity and safety perspective.

To improve night-time visibility and thus the safety of the intersections, it is recommended that street lighting be incorporated into the intersection design.

The final intersection locations and forms will be confirmed in agreement with WDC during subdivision detailed design and shall be in accordance with the provisions of the District Plan and RITS. The location and access design will be subject to planning and engineering approvals from Council, so they could change from that identified above.

Internal Road Network

A network of internal roads has been designed at a concept level to demonstrate how the rezoning site could be serviced (by private, public and active modes). While the draft Structure Plan reflects the high-level network configuration, the finer details of the road network will be refined at future subdivision stages.

A collector road with access off Wainui Road and Te Hutewai Road is envisaged for good connectivity between the proposed lots and the two Council managed roads. The draft Structure Plan also demonstrates how the collector road could potentially provide a much-needed east-west link between the southern extent of the Rangitahi Peninsula Development through to Ngarunui Beach. This link would connect the currently disconnected Wainui Road, Te Hutewai Road and Opotoru Road.

It is recommended that further discussions with Council be held at this rezoning stage to determine the feasibility of provided this new east-west connection.

Intersection Upgrades

Wainui Road One-way Bridge

It is recommended that traffic signals be installed on the bridge approaches if the planned upgrading (by Council) of the one-lane one-way bridge to a two-lane bridge is not concluded by 2024.

In addition to the signalisation of the bridge, it is recommended that advanced warning signs and road markings alerting drivers to the presence of the new traffic signals (and any hidden queues resulting from signalising the bridge) be provided on both bridge approaches.

SH 23/ SH39 Staggered T-intersections

As a minimum, it is proposed that the intersection be upgraded within the next 10 years (i.e. by 2031) to a single-lane roundabout configuration in line with the findings from the technical assessment that was undertaken by Waka Kotahi.

Consideration should, however, be given for a dual-lane roundabout if the effects of the Waikato Expressway completion in 2021 do not result in a material reduction in traffic on SH39, as currently expected. The preferred roundabout configuration should be identified and implemented in collaboration with Waka Kotahi NZ Transport Agency and Waikato District Council.

Bow Street & Norrie Avenue and SH23 & Te Pahu Road intersections

The performance assessments of both intersections concluded that capacity and safety related upgrades will likely be required at both intersections once the first 300 dwelling units are completed to mitigate future capacity constraints. Improvements may likely involve:

- Bow Street & Norrie Avenue intersection: upgrading the stop-controlled intersection to traffic signal control or to a single-lane roundabout configuration.
- SH23 & Te Pahu Road Intersections: upgrading the stop-controlled intersection to a single-lane roundabout configuration.

It is recommended that an ITA be conducted at development Year 15 (i.e. 2039 or after the completion of the first 300 dwellings, whichever comes first) to assess the impact of the proposed development traffic on both intersections as the trip generation and distribution assumptions become realised over time. Proposed (capacity and safety related) mitigation measures should then be reflected in the findings from the ITA.

The ITA should include, but may not be restricted to, the assessment of the following intersections:

- Wainui Road One-way Bridge;
- Bow Street & Norrie Avenue intersection;
- SH23 & Te Pahu Road intersection, and
- SH 23/ SH39 intersection.

Walking and Cycling Infrastructure

A network of walking and cycling connections will be provided through all residential streets within the proposed development (a minimum 1.8 m wide footpaths as per Table 14.12.5.14 of the PDP and 2.5 m wide shared active paths). The proposed walking and cycling infrastructure within the Koning site could readily be extended and connected to the existing facilities on Wainui Road and to key land uses in the surrounding area as follows:

- A new 2.5 m wide (minimum) shared path is proposed which extends north through the Koning site to the existing footpath which is located on the northern side of Wainui Road. A new pedestrian crossing facility is proposed to be provided on Wainui Road at the crossing location.
- New 1.8 m wide (minimum) pedestrian footpaths are proposed to extend west to Wainui Road (to the existing footpath on the western side of Wainui Road and further west to Ngarunui Beach) and east to Te Hutewai Road (to provide key connections to land uses on the eastern side of Te Hutewai Road such as the Raglan Golf Club and the Rangitahi Peninsula Development). Several new pedestrian crossing facilities are proposed along both Wainui Road and Te Hutewai Road.
- The new pedestrian crossing facilities should, as a minimum, provide for a staged crossing with a pedestrian refuge island.

Walking and cycling connections to neighbouring sites

There is an opportunity to provide an additional north/ south shared pedestrian and cyclist link from the Koning site to Wainui Road via the neighbouring property to the north-east of the site. Consultation and buy-in from the owners of the neighbouring northern property will need to be obtained. However, considering that the neighbouring property is zoned Residential, is it considered that a walking/ cycling connection through the neighbouring site will provide much needed north-south connectivity (and potentially move (recreational) cyclists away from Te Hutewai Road and onto the internal cyclist network). If buy-in is obtained, the final alignment of the proposed path will need to be discussed and agreed with the property owners and Council at the future subdivision stages.

There is also opportunity to provide a direct connection to the Rangitahi Peninsula Development as well as the Te Ahiawa residential subdivision to the south of the site with the provision of walking/ cycling paths adjacent to the potential east-west connector road. Buy-in would also need to be obtained from the relevant property owners and Council.

Public Transport

Public transport is promoted within the site by ensuring that the proposed accesses on Wainui Road and Te Hutewai Road as well as any proposed collector roads within the site are developed with a suitable road reserve width to enable public transport connectivity.

It is anticipated that with the development of the Koning site, the current bus route will be reviewed as the demand for public transport changes. Seeing as the nearest public transport facility is located at the Wainui Road & Te Hutewai Road intersection (located approximately 1.8 km north of the site), it is proposed that the existing public transport services be extended south to the proposed development via Wainui Road, through the site, and exiting on Te Hutewai Road heading north to the bus terminus (or vice versa).

It is recommended that consultation with Waikato Regional Council (WRC) be undertaken to investigate the potential of extending public transport services south to the Koning site, or providing a bus stop near the new intersections on either Wainui Road or Te Hutewai Road.

Construction Traffic Effects

The construction traffic effects should be managed for the duration of the works through conditions of consent, including the requirement for a specific Construction Traffic Management Plan.

Appendix A – Waka Kotahi CAS Data

Untitled query

Saved sites

Wainui Road (1)

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

3 results from your query.

1-3 of 3

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1762091-5813123	**WAINUI ROAD**		WAINUI RESERVE ROAD	490m	N			1762016	5813017	174.840668	-37.815884	201812610	23/03/2018	Fri	15:48	Truck1 NDB on Wainui Road lost control; went off road to right, Truck1 hit non specific cliff, non specific pole	TRUCK1, alcohol test below limit, lost control under braking	Wet	Overcast	Fine	Nil (Default)	Unknown	0	0	1	0.11
1762091-5813123	**WAINUI ROAD**	RIRIAKEREOPA MEMORIAL DRI		490m	S			1762029	5813040	174.840805	-37.815674	201757902	29/12/2017	Fri	19:45	Car/Wagon1 NDB on Wainui Road, Raglan lost control turning left, Car/Wagon1 hit non specific other	CAR/WAGON1, alcohol test above limit or test refused, speed entering corner/curve, swung wide at intersection	Dry	Bright sun	Fine	Driveway	Nil	0	0	0	0.04
1762101-5813139	**WAINUI ROAD**	RIRIA KEREOPA MEMORIAL DR		340m	S			1762112	5813164	174.841721	-37.814541	201746707	15/08/2017	Tue	21:03	Van1 NDB on Wainui road, Raglan lost control turning left, Van1 hit non specific ditch	VAN1, driver over-reacted, inappropriate speed for road conditions, ENV: slippery road due to rain	Wet	Dark	Light rain	Nil (Default)	Unknown	0	0	0	0.04

1-3 of 3

Untitled query

Saved sites

Wainui Rd/ Te Hutewai Rd

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

3 results from your query.

1-3 of 3

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1763604-5813586	**TE HUTEWAI ROAD**	WAINUI ROAD		50m	S			1763599	5813580	174.858521	-37.810528	201812315	15/03/2018	Thu	22:55	Car/Wagon1 NDB on Te Hutewai Road, Raglan lost control turning right, Car/Wagon1 hit non specific fence, non specific tree	CAR/WAGON1, alcohol suspected, cutting corner on bend, speed entering corner/curve	Dry	Dark	Fine	Nil (Default)	Unknown	0	0	1	0.10
1763606-5813624	**WAINUI ROAD**	TE HUTEWAI ROAD			I			1763611	5813624	174.858650	-37.810126	201955859	09/02/2019	Sat	01:00	Car/Wagon1 WDB on Wainui lost control; went off road to left, Car/Wagon1 hit substantial vegetation (causing vehicle damage or stopping the vehicle)	CAR/WAGON1, alcohol suspected, too far left	Dry	Dark	Fine	T Junction	Nil	0	0	1	0.10
1763637-5813630	**WAINUI ROAD**	WAINUI ROAD			I			1763643	5813633	174.859013	-37.810035	2020173469	19/12/2020	Sat	02:05	Car/Wagon1 WDB on WAINUI ROAD hit parked veh, Car/Wagon1 hit parked (unattended) vehicle, Car/Wagon2 hit parked (unattended) vehicle	CAR/WAGON1, alcohol suspected, too far left	Dry	Dark	Fine	T Junction	Nil	0	1	0	

1-3 of 3

Untitled query

Saved sites

Wainui Road Bridge

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

2 results from your query.

1-2 of 2

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1764037-5813939	**WAINUI ROAD**	MARINE PARADE		140m	E			1764024	5813936	174.863266	-37.807243	201911278	05/01/2019	Sat	12:35	Car/Wagon1 WDB on WAINUI ROAD, RAGLAN, WAIKATO hit rear end of Van2 stop/slow for queue	CAR/WAGON1, alcohol test below limit, following too closely VAN2, alcohol test below limit	Dry	Bright sun	Fine	Nil (Default)	Unknown	0	0	1	0.10
1764037-5813939	**WAINUI ROAD**	MARINE PARADE		142m	E			1764023	5813935	174.863257	-37.807250	201984833	08/11/2019	Fri	21:00	Car/Wagon1 WDB on WAINUI ROAD hit rear end of Car/Wagon2 stopped/moving slowly	CAR/WAGON1, alcohol suspected, emotionally upset/road rage, intentional collision	Dry	Dark	Fine	Nil (Default)	Nil	0	0	0	0.02

1-2 of 2

Untitled query

Saved sites

Wainui Road & Whitley Str

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

5 results from your query.

1-5 of 5

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1764327-5814094	**WAINUI ROAD**	WHITLEY ST			I			1764327	5814094	174.866669	-37.805767	201617374	01/11/2016	Tue	08:40	Car/Wagon1 EDB on Wainui Road hit turning Car/Wagon2	CAR/WAGON2, failed to give way at priority traffic control	Dry	Bright sun	Fine	T Junction	Give way	0	0	1	0.10
1764327-5814094	**WAINUI ROAD**	WHITLEY ST			I			1764327	5814094	174.866669	-37.805767	201718277	27/09/2017	Wed	14:15	Car/Wagon2 turning right hit by oncoming Car/Wagon1 WDB on Wainui Road	CAR/WAGON2, didnt look/notice other party - visibility obstruc, failed to give way turning to non-turning traffic	Dry	Bright sun	Fine	T Junction	Give way	0	0	1	0.10
1764327-5814094	**WAINUI ROAD**	WHITLEY ST			I			1764327	5814094	174.866669	-37.805767	201652125	07/11/2016	Mon	08:00	Car/Wagon2 turning right hit by oncoming Car/Wagon1 NDB on Wainui Road	CAR/WAGON2, did not check/notice another party from other dirn, failed to give way turning to non-turning traffic	Wet	Overcast	Light rain	T Junction	Give way	0	0	0	0.02
1764327-5814094	**WAINUI ROAD**	WHITLEY STREET			I			1764321	5814090	174.866610	-37.805797	2020160540	14/02/2020	Fri	15:30	SUV1 NDB on WAINUI ROAD hit Car/Wagon2 reversing along road	SUV1, did not check/notice another party behind	Dry	Bright sun	Fine	T Junction	Give way	0	0	0	
1764327-5814094	**WAINUI ROAD**	WHITLEY STREET			I			1764329	5814096	174.866696	-37.805746	201953304	02/01/2019	Wed	17:30	Car/Wagon2 turning right hit by oncoming Car/Wagon1 EDB on WAINUI ROAD, RAGLAN, WAIKATO	CAR/WAGON1, alcohol test below limit CAR/WAGON2, alcohol test below limit, failed to give way at priority traffic control, new driver/under instruction	Dry	Overcast	Fine	T Junction	Stop	0	0	0	0.02

1-5 of 5

Untitled query

Saved sites

Wainui Road & Stewart Street

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

1 results from your query.

1-1 of 1

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1764515-5814526	**STEWART ST**	WAINUI ROAD			I			1764515	5814528	174.868698	-37.801823	201757085	22/12/2017	Fri	21:27	Car/Wagon1 EDB on Stewart Street lost control but did not leave the road, Car/Wagon1 hit non specific traffic sign	CAR/WAGON1, emergency vehicle attending emergency, misjudged own vehicle	Dry	Dark	Fine	T Junction	Give way	0	0	0	0.02

1-1 of 1

Untitled query

Saved sites

Wainui Road & Bow Street

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

2 results from your query.

1-2 of 2

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1764712-5814664	**BOW ST**	BANKART ST		20m	W			1764699	5814684	174.870758	-37.800385	201743823	16/04/2017	Sun	13:40	Car/Wagon1 WDB on BOW ST hit rear end of Car/Wagon2 stopped/moving slowly	CAR/WAGON1, other inattentive	Dry	Bright sun	Fine	Nil (Default)	Unknown	0	0	0	0.02
1764731-5814653	**BANKART ROAD**	BOW ST			I			1764724	5814650	174.871048	-37.800686	201831301	06/01/2018	Sat	00:38	Car/Wagon1 NDB on Bow street. Raglan lost control turning left, Car/Wagon1 hit non specific building, non specific traffic island, non specific ditch,	CAR/WAGON1, evading enforcement, inappropriate speed for road conditions, new driver/under instruction, worn tread on tyre, ENV: slippery road due to rain	Wet	Dark	Light rain	Roundabout	Give way	0	0	0	0.02

1-2 of 2

Untitled query

Saved sites

Bow Street & Norrie Ave

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

3 results from your query.

1-3 of 3

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1764931-5814374	**BOW STREET**	NORRIE AVENUE			I			1764919	5814381	174.873327	-37.803069	2020147860	29/02/2020	Sat	19:30	Car/Wagon1 WDB on MAIN ROAD, RAGLAN, WAIKATO hit rear of Car/Wagon2 WDB on MAIN ROAD, RAGLAN, WAIKATO turning right from centre line	CAR/WAGON1, failed to notice car slowing, stopping/stationary CAR/WAGON2, alcohol test below limit	Dry	Bright sun	Fine	T Junction	Give way	0	0	0	
1764931-5814374	**MAIN ROAD**	NORRIE AVENUE		30m	E			1764960	5814364	174.873795	-37.803219	201834787	18/02/2018	Sun	13:05	Car/Wagon1 EDB on Main Road hit Van2 turning right onto AXROAD from the left	VAN2, alcohol test below limit, didnt look/notice other party - visibility obstruc, failed to give way entering roadway from driveway CAR/WAGON1, alcohol test below limit	Dry	Bright sun	Fine	Driveway	Nil	0	0	0	0.02
1764931-5814374	**NORRIE AVENUE**	MAIN ROAD			I			1764932	5814375	174.873474	-37.803127	201818954	22/10/2018	Mon	11:00	Van1 WDB on Main Road hit Car/Wagon2 turning right onto AXROAD from the left	VAN1, alcohol test below limit CAR/WAGON2, alcohol test below limit, failed to give way at priority traffic control, misjudged intentions of another party	Dry	Bright sun	Fine	T Junction	Stop	0	0	1	0.10

1-3 of 3

NZ TRANSPORT AGENCY WAKA KOTAHI CAS

Untitled query

Saved sites

SH 23 & Te Mata Road

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

7 results from your query.

1-7 of 7

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1768729-5810907	**SH 23**	TE MATA ROAD		160m	N			1768668	5811058	174.916656	-37.832325	201753244	01/11/2017	Wed	16:15	SUV1 NDB on State Highway 23 hit rear end of SUV2 stop/slow for queue	SUV1, didnt look/notice other party - visibility obstruc, following too closely	Dry	Bright sun	Fine	Nil (Default)	Unknown	0	0	0	0.04
1768729-5810907	**SH 23**	TE MATA ROAD			I			1768731	5810904	174.917422	-37.833697	201899648	16/11/2018	Fri	05:00	Car/Wagon1 NDB on SH 23 lost control turning left; went off road to right, Car/Wagon1 hit drainage	CAR/WAGON1, lost control when turning	Dry	Dark	Fine	T Junction	Nil	0	0	0	0.04
1768729-5810907	**SH 23**	TE MATA ROAD		93m	N			1768690	5810992	174.916936	-37.832908	201986939	07/12/2019	Sat	22:00	Car/Wagon1 NDB on SH 23 lost control; went off road to left, Car/Wagon1 hit ditch	CAR/WAGON1, other lost control	Dry	Dark	Fine	Nil (Default)	Nil	0	0	0	0.04
1768729-5810907	**SH 23**	TE MATA ROAD		80m	N			1768695	5810982	174.916992	-37.833004	201614603	17/06/2016	Fri	14:30	Motorcycle1 NDB on SH 23 overtaking hit Car/Wagon2 NDB on SH 23 turning right	CAR/WAGON2, alcohol test above limit or test refused, did not check/notice another party behind	Wet	Overcast	Light rain	Driveway	Nil	0	0	1	0.11
1768729-5810907	**SH 23**	TE MATA ROAD		30m	N			1768713	5810936	174.917206	-37.833416	201818683	07/10/2018	Sun	10:00	Motorcycle1 NDB on SH 23, RAGLAN, WAIKATO lost control turning right, Motorcycle1 hit non specific embankment, non specific ditch	MOTORCYCLE1, alcohol test below limit, other inexperience, too far left	Dry	Overcast	Fine	Nil (Default)	Unknown	0	1	0	0.66
1768729-5810907	**SH 23**	TE MATA ROAD			I			1768728	5810910	174.917374	-37.833645	201616795	08/10/2016	Sat	13:05	Motorcycle1 NDB on State Highway 23 lost control turning right, Motorcycle1 hit non specific cliff	MOTORCYCLE1, alcohol test below limit, lost control when turning, too far left	Dry	Overcast	Fine	T Junction	Give way	0	0	1	0.11
1768729-5810907	**SH 23, RAGLAN, WAIKATO**	TE MATA ROAD			I			1768738	5810901	174.917496	-37.833721	2020143623	29/01/2020	Wed	07:20	Ute1 NDB on SH 23, RAGLAN, WAIKATO hit turning Car/Wagon2	CAR/WAGON2, alcohol suspected, failed to give way at priority traffic control, other attention diverted	Dry	Overcast	Fine	T Junction	Give way	0	0	2	

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NZ TRANSPORT AGENCY WAKA KOTAHI CAS

Untitled query

Saved sites

Sh23 & Te Pahu Rd (100m)

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

8 results from your query.

1-8 of 8

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1788849-5813691	**SH 23**	TE PAHU ROAD		50m	W			1788800	5813677	175.144608	-37.804790	201632432	01/02/2016	Mon	18:05	Car/Wagon1 WDB on SH 23 lost control turning right	CAR/WAGON1, lost control - road conditions, new driver/under instruction, ENV: road slippery (oil/diesel/fuel)	Wet	Overcast	Light rain	Nil (Default)	Unknown	0	0	0	0.04
1788849-5813691	**SH 23**	TE PAHU ROAD		30m	W			1788819	5813682	175.144821	-37.804741	201739859	22/05/2017	Mon	13:18	Van1 WDB on WHATAWHATA ROAD lost control turning right, Van1 hit non specific cliff, non specific fence, non specific traffic sign,	VAN1, alcohol test below limit, lost control when turning, other inexperience	Dry	Bright sun	Fine	Nil (Default)	Unknown	0	0	0	0.04
1788849-5813691	**SH 23**	TE PAHU ROAD		80m	W			1788770	5813676	175.144272	-37.804806	201631912	31/01/2016	Sun	17:02	Car/Wagon1 WDB on SH 23 lost control turning right, Car/Wagon1 hit non specific ditch	CAR/WAGON1, lost control - road conditions, ENV: heavy rain	Wet	Overcast	Heavy rain	Nil (Default)	Unknown	0	0	0	0.04
1788849-5813691	**SH 23**	TE PAHU ROAD		42m	E			1788877	5813716	175.145477	-37.804423	2020150814	28/02/2020	Fri	19:30	Car/Wagon1 SDB on SH 23 missed inters or end of road, Car/Wagon1 hit ditch	CAR/WAGON1, alcohol suspected, drugs suspected, lost control when turning, new driver/under instruction, speed entering corner/curve	Dry	Dark	Fine	Nil (Default)	Unknown	0	0	3	
1788849-5813691	**SH 23**	TE PAHU ROAD			I			1788847	5813694	175.145142	-37.804626	201816155	14/07/2018	Sat	12:47	Motorcycle1 WDB on State Highway 23, Whatawhata lost control turning right	MOTORCYCLE1, alcohol test below limit, new driver/under instruction, speed entering corner/curve MOTORCYCLE2, alcohol test below limit, following too closely, speed entering corner/curve	Dry	Overcast	Fine	T Junction	Give way	0	1	1	0.66
1788849-5813691	**SH 23**	TE PAHU ROAD		60m	W			1788790	5813676	175.144501	-37.804802	201632513	08/01/2016	Fri	17:50	Car/Wagon1 SDB on SH 23 lost control turning right, Car/Wagon1 hit non specific ditch	CAR/WAGON1, lost control when turning, too far left, ENV: other slippery road	Dry	Overcast	Light rain	Nil (Default)	Unknown	0	0	0	0.04
1788849-5813691	**TE PAHU ROAD**	SH 23		50m	S			1788857	5813646	175.145264	-37.805058	201817110	13/08/2018	Mon	05:40	Van1 NDB on TE PAHU ROAD, WHATAWHATA, WAIKATO lost control turning left, Van1 hit non specific cliff, non specific guard rail	VAN1, alcohol test below limit, inappropriate speed for weather conditions, swung wide on bend, ENV: fog or mist	Dry	Dark	Mist or Fog	Nil (Default)	Unknown	0	0	1	0.11
1788849-5813691	**TE PAHU ROAD**	SH 23		42m	S			1788859	5813651	175.145296	-37.805009	2020147848	11/03/2020	Wed	21:03	Car/Wagon1 NDB on TE PAHU ROAD lost control turning left; went off road to right, Car/Wagon1 hit traffic sign, drainage	CAR/WAGON1, alcohol test above limit or test refused, lost control when turning, other intentional actions, speed entering corner/curve	Dry	Dark	Fine	Nil (Default)	Nil	0	2	1	

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Untitled query

Saved sites

SH23 &SH39 (100m)

Crash severity

Fatal Crash, Serious Crash, Minor Crash, Non-Injury Crash

Crash year

2016 — 2021

Plain English report

24 results from your query.

Showing 20 100 results at once.

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Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1789575-5814437	**SH 39**	SH 23		40m	N			1789576	5814475	175.153214	-37.797443	201832393	03/02/2018	Sat	09:58	Car/Wagon1 SDB on Horotiu Road hit rear end of Car/Wagon2 stopped/moving slowly	CAR/WAGON2, alcohol test below limit, attention diverted by navigation device, other inexperience, suddenly braked CAR/WAGON1, alcohol test below limit	Dry	Overcast	Fine	Nil (Default)	Unknown	0	0	0	0.02
1789575-5814437	**SH 23**	HOROTIU			I			1789575	5814435	175.153214	-37.797802	201639069	04/03/2016	Fri	09:45	Car/Wagon1 EDB on SH 23 hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON2, failed to give way at priority traffic control	Dry	Overcast	Fine	T Junction	Stop	0	0	0	0.04
1789575-5814437	**SH 23**	HOROTIU ROAD			I			1789571	5814437	175.153171	-37.797783	2020173919	22/12/2020	Tue	15:43	Truck1 EDB on SH 23 hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON2, alcohol test below limit, did not check/notice another party from other dirn, failed to give way at priority traffic control TRUCK1, alcohol test below limit	Dry	Bright sun	Fine	T Junction	Stop	0	2	0	
1789575-5814437	**SH 23**	HOROTIU ROAD			I			1789569	5814436	175.153148	-37.797789	201975050	07/11/2019	Thu	10:50	Car/Wagon2 turning right hit by oncoming Car/Wagon1 EDB on SH 23	CAR/WAGON2, didnt look/notice other party - visibility obstruc, failed to give way turning to non-turning traffic	Dry	Bright sun	Fine	T Junction	Stop	0	0	1	0.11
1789575-5814437	**SH 23**	HOROTIU ROAD			I			1789569	5814436	175.153147	-37.797786	201956563	22/05/2019	Wed	07:37	Motorcycle1 EDB on SH 23 hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON2, alcohol test below limit, did not check/notice another party from other dirn, failed to give way at priority traffic control MOTORCYCLE1, alcohol test below limit	Dry	Overcast	Fine	T Junction	Stop	0	0	1	0.10
1789575-5814437	**SH 23**	HOROTIU ROAD			I			1789565	5814436	175.153095	-37.797789	2020147587	08/03/2020	Sun	16:08	Car/Wagon2 turning right hit by oncoming Motorcycle1 EDB on Whatawhata Road, Whatawhata	CAR/WAGON2, alcohol test below limit, did not check/notice another party from other dirn, failed to give way turning to non-turning traffic, overseas/migrant driver fail to adjust to nz roads MOTORCYCLE1, alcohol test below limit	Dry	Bright sun	Fine	T Junction	Give way	0	0	1	
1789575-5814437	**SH 23**	HOROTIU ROAD			I			1789575	5814435	175.153214	-37.797802	201749021	01/09/2017	Fri	16:00	SUV1 EDB on Whatawhata Road hit SUV2 turning right onto AXROAD from the left	SUV2, did not check/notice another party from other dirn, failed to give way at priority traffic control	Dry	Overcast	Fine	T Junction	Stop	0	0	0	0.04
1789575-5814437	**SH 23**	HOROTIU ROAD			I			1789575	5814435	175.153214	-37.797802	201715250	25/06/2017	Sun	14:30	Van1 EDB on Whatawhat hit Car/Wagon2 turning right onto AXROAD from the left, Van1 hit non specific guard rail	VAN1, alcohol test below limit CAR/WAGON2, did not check/notice another party from other dirn, failed to give way at priority traffic control, ENV: other weather	Dry	Overcast	Light rain	T Junction	Stop	0	0	1	0.11
1789575-5814437	**SH 23**	HOROTIU ROAD			I			1789575	5814435	175.153214	-37.797802	201737930	25/04/2017	Tue	13:12	Van1 EDB on Sh23 whatawhata rd hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON2, did not check/notice another party from other dirn, did not stop at stop sign	Dry	Bright sun	Fine	T Junction	Stop	0	0	0	0.04
1789575-5814437	**SH 39**	SH 23			I			1789575	5814435	175.153214	-37.797802	201744427	05/07/2017	Wed	07:45	Van1 NDB on Horotiu road lost control turning right, Van1 hit non specific fence	VAN1, lost control under acceleration	Wet	Overcast	Light rain	T Junction	Give way	0	0	0	0.04

Site Centre: Midpoint	Crash road	Side road	Feature	Distance from side road/feature	Direction	Reference station	Route position	Easting	Northing	Longitude	Latitude	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Casualty count fatal	Casualty count serious	Casualty count minor	Social cost $(m)
1789633-5814443	**023-0003**	KAKARAMEA ROAD			I			1789635	5814444	175.153885	-37.797703	201951119	16/02/2019	Sat	09:56	Car/Wagon1 WDB on Whatawhata Road hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON1, alcohol test below limit CAR/WAGON2, alcohol test below limit, driver dazzled, failed to give way at priority traffic control	Dry	Bright sun	Fine	T Junction	Stop	0	0	1	0.11
1789633-5814443	**SH 39**	SH 23			I			1789634	5814441	175.153870	-37.797737	201730445	13/01/2017	Fri	17:40	Motorcycle1 NDB on Karakamea road hit rear end of Car/Wagon2 stop/slow for cross traffic	MOTORCYCLE1, misjudged another vehicle, other inappropriate speed	Dry	Bright sun	Fine	T Junction	Stop	0	0	0	0.04
1789633-5814443	**SH 39**	WHATAWHATA ROAD			I			1789634	5814441	175.153870	-37.797737	201846642	19/08/2018	Sun	13:04	Van1 NDB on SH 39, WHATAWHATA, WAIKATO hit rear end of Car/Wagon2 stop/slow for cross traffic	VAN1, alcohol test below limit, failed to notice car slowing, stopping/stationary	Dry	Bright sun	Fine	T Junction	Stop	0	0	0	0.04
1789633-5814443	**SH 39**	SH 23			I			1789634	5814441	175.153870	-37.797737	201637538	10/03/2016	Thu	10:00	Car/Wagon1 NDB on SH 39 hit rear end of Car/Wagon2 stop/slow for cross traffic	CAR/WAGON1, failed to notice car slowing, stopping/stationary, following too closely	Dry	Bright sun	Fine	T Junction	Stop	0	0	0	0.04
1789633-5814443	**SH 39**	SH 23			I			1789634	5814441	175.153870	-37.797737	201830731	10/01/2018	Wed	15:49	Van1 NDB on SH39 hit rear end of Car/Wagon2 stop/slow for cross traffic	CAR/WAGON2, alcohol test below limit VAN1, alcohol test below limit, following too closely	Dry	Overcast	Fine	T Junction	Stop	0	0	0	0.04
1789633-5814443	**SH 23**	KAKARAMEA ROAD			I			1789634	5814441	175.153870	-37.797737	201733141	05/01/2017	Thu	16:55	Car/Wagon1 WDB on SH 23 hit Car/Wagon2 merging from the left	CAR/WAGON2, did not stop at stop sign	Dry	Bright sun	Fine	T Junction	Stop	0	0	0	0.04
1789633-5814443	**SH 23**	SH 39			I			1789634	5814441	175.153870	-37.797737	201749310	01/09/2017	Fri	17:40	Van1 WDB on SH23 hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON2, did not check/notice another party from other dirn, failed to give way at priority traffic control	Dry	Overcast	Fine	T Junction	Stop	0	0	0	0.04
1789633-5814443	**SH 23**	SH 39			I			1789634	5814441	175.153870	-37.797737	201717970	20/09/2017	Wed	16:35	Car/Wagon2 turning right hit by oncoming Van1 EDB on Whatawhata	CAR/WAGON2, did not check/notice another party from other dirn, failed to give way turning to non-turning traffic	Dry	Bright sun	Fine	T Junction	Stop	0	1	1	0.66
1789633-5814443	**SH 23**	KAKARAMEA ROAD			I			1789634	5814441	175.153870	-37.797737	201718580	14/10/2017	Sat	21:51	Car/Wagon1 EDB on Whatawhata road overtaking hit Car/Wagon2 EDB on Whatawhata road turning right	CAR/WAGON1, alcohol suspected, drugs suspected, non-compliance with regulatory device with sign or, speed on straight	Dry	Dark	Fine	T Junction	Give way	0	1	2	0.66
1789633-5814443	**SH 23**	KAKARAMEA ROAD			I			1789634	5814441	175.153870	-37.797737	201649498	30/09/2016	Fri	19:05	Car/Wagon1 WDB on Whatawhata Road hit Car/Wagon2 turning right onto AXROAD from the left	CAR/WAGON2, did not stop for trafic controller, didnt look/notice other party - visibility obstruc	Wet	Overcast	Fine	T Junction	Stop	0	0	0	0.04

1-20 of 24

Appendix B – Raglan Rezoning Development Plan (Draft)

DRAFT

Koning Family Trust
146 Te Hutewai Road, Raglan

Raglan Rezoning
Development Plan Document
November 2020

WAYFINDER
Landscape Planning & Strategy

DRAFT

DOCUMENT CONTROL

DEVELOPMENT PLAN DOCUMENT

Prepared for: Koning Family Trust

142 Te Hutewai Road, Raglan

Date: November 23, 2020

Photos taken by Author unless otherwise stated

Revision	Date	Prepared by	Reviewers
A - DRAFT	23.11.2020	L Burn/J Hunt	S Bray

Approved by:

Koning Family Trust

Prepared by: Lizzie Burn - Landscape Architect

Josh Hunt - Registered Landscape Architect

Shannon Bray - Registered Landscape Architect

Reviewed by: Shannon Bray - Registered Landscape Architect

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CONTENTS

CONTRIBUTORS

Planning (Bloxam Burnett and Olliver)

Geotechnical (CMW Geosciences)

Archaeological (Sian Keith Archaeology Ltd)

Ecological (Ecology New Zealand)

INTRODUCTION

The Koning Family Trust are seeking to develop their property on the outskirts of Raglan. The vision for this property is to provide a range of high quality residential development options which respond to the unique character of the site, while contributing positively to the wider context and community.

This document provides a multi-disciplinary overview of the constraints and opportunities associated with development this property. The following pages will take you through a series of maps which brings together the key contextual information, before outlining the site character and combining the relevant information into a proposed Development Plan. This document draws on information from assessments that have been undertaken by the following consultants:

- Bloxam Burnett and Olliver Ltd - Planning
- CMW Geosciences - Geotechnical
- Sian Keith Archaeology Ltd – Archaeological
- Ecology New Zealand – Ecology
- Wayfinder - Landscape

The key benefits of the proposal is a development that:

- is well screened from the wider area by the natural landform;
- is directly adjacent to existing residential zoning;
- is already predominantly within an 'Indicative Urban Limit' which seeks to provide a more compact urban form;
- is naturally backdropped by landforms with greater elevation;
- will not compromise the appreciation of the Mt Karioi Outstanding Natural Landscape (further to the south);
- does not contain any areas of High, Very High or Outstanding Natural Character, nor does it have any identified Significant Natural Areas (SNA's); and
- provides a significant opportunity for wider community connectivity by linking Wainui Rd and Te Hutewai Rd (and possibly even then connecting up across to the southern end of the Rangitahi Peninsula development).

Scale 1:15,000

LEGEND

- Koning Family Trust Property
- 300m Setback from oxidisation ponds
- Proposed Development area

CONTEXT

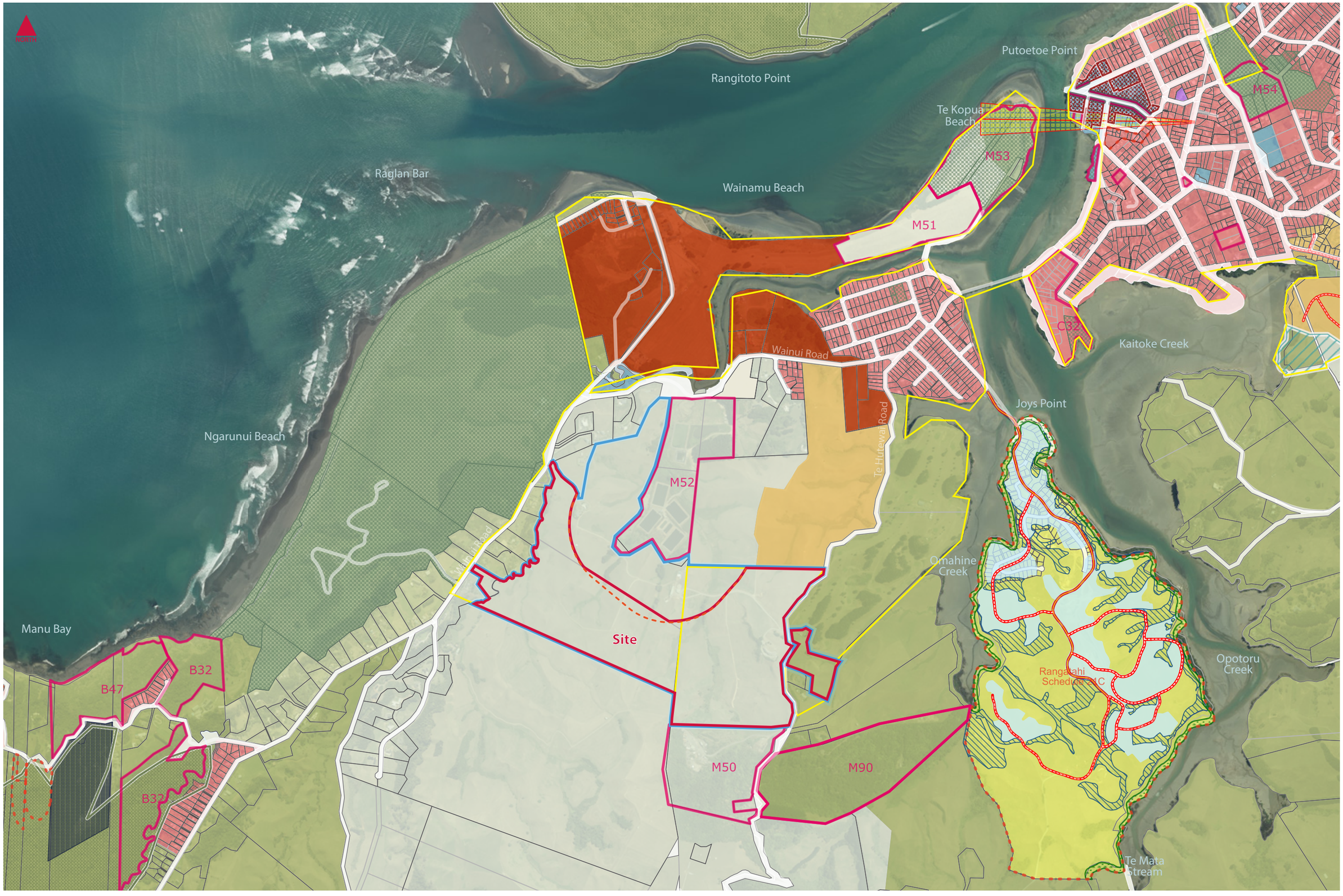
The property is approximately 3km south-west of central Raglan, located on rolling hills between Wainui Rd and Te Hutewai Rd, and is currently operated as a dairy farm by the Koning Family Trust. The property also includes a portion of land in close proximity to the oxidation ponds, however a 300m setback has been applied which excludes this area of the property from the actual development site.

This page includes three photographs taken from the wider area (which are part of a series of site photographs contained in a separate document, Viewpoint Location Document) looking back toward the proposed site, with the visible portion of the site indicated in light green.

Viewpoint - M (Raglan Rezoning Assessment)

Viewpoint - G (Raglan Rezoning Assessment)

Viewpoint - O (Raglan Rezoning Assessment)



Scale 1:15,000

LEGEND

- Living
- Business
- New residential
- Country living
- Recreation
- Coastal
- Rural
- Pa
- Reserve
- Town centre
- Land stability policy area
- Infrastructure designation
- Land restoration policy area
- Esplanade reserve
- Indicative roads
- Indicative roads
- Indicative urban limits
- Koning proposed zoning
- Koning proposed development area

PLANNING FRAMEWORK

The proposed site is primarily contained within the Rural Zone of the Operative District Plan. The land east of Te Hutewai Rd, and a small portion of the site, is contained within the Coastal Zone. The north-eastern boundary of the site abuts the existing extent of the Residential Zone (although not yet developed), while the remainder of the northern boundary and the entirety of the southern site boundary are adjacent to the Rural Zone. There is also a stretch of 6 Country Living Zone properties which share the western boundary with the submission site.

While the District Plan Zoning does influence the intensity of coastal lifestyle development that has extended out along Wainui Rd (west of the Riria Kereopa Memorial Drive intersection), it is clear that the areas character is a response to the underlying landform pattern, rather than the zoning. For example the development contained along Wainui Rd, Upper Wainui Road, Te Ahiawa Rd and Earls Place has a unifying character, despite being located across four separate zones.

One of the drivers for the proposed residential rezoning is in relation to the material demand for additional dwellings within proximity to Raglan. This demand has been identified and addressed within the Planning Submission by Bloxam Burnett and Olliver and is an important contributing factor in determining the appropriateness of the proposed rezone.

The higher-level analysis of growth management has been identified within the 'Future Proof Strategy' prepared for the Waikato region [1], which has identified Raglan as one of the key sub-region growth areas. The key features associated with the Raglan growth management area includes[2];

- Seaside settlement that maintains the established desirable character of the Raglan coastal environment.
- Destination town.
- High number of holiday houses.
- Residential growth is expected to occur due to coastal lifestyle, proximity to Hamilton and technological and transport improvements.
- Better public transport and improved opportunities for walking and cycling.

Additionally, the Indicative Urban Limit (IUL), from the Future Proof Strategy, has been transferred into the Proposed Waikato District Plan and includes a large proportion of the submission property. It is noted within the Proposed Waikato District Plan that these limits are only indicative, and this provides the opportunity for development analysis through structure planning, in a manner that is currently being undertaken by the Koning Family Trust. When reviewing the current extent of the Raglan IUL, it is considered logical to also include (at a minimum) the balance of the Koning Family Trust land that has been suggested for Rezoning. This additional pocket of land on the eastern side of the submission site has a similar context and proximity to Raglan as the land on the western side of the submission site. It is also positioned on the downward slope side of a Significant Natural Area (SNA) which visually backdrops views looking south.

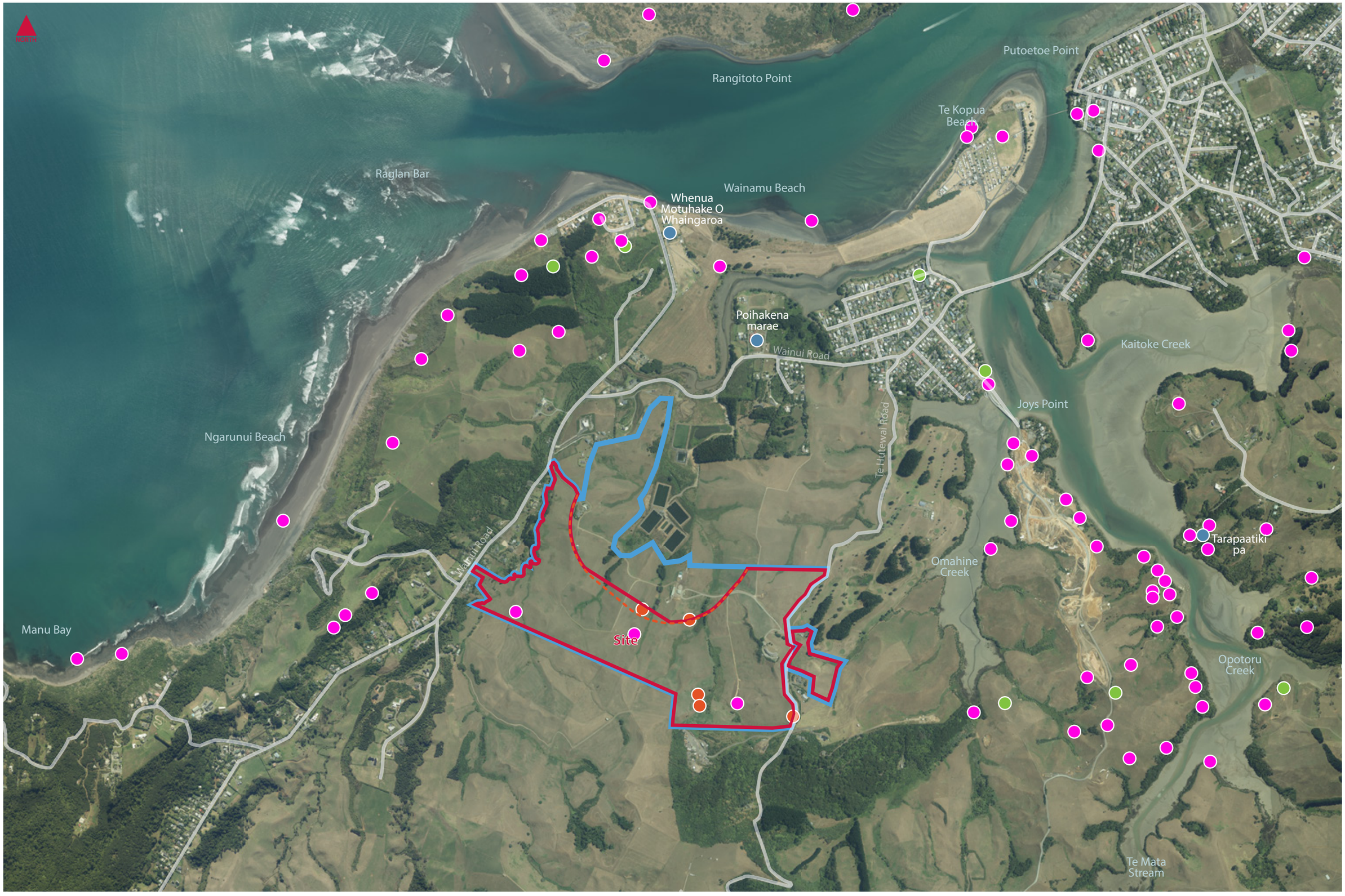
(1) Future Proof Strategy: Planning for Growth – November 2017

(2) Future Proof Strategy: Section 6.2

Raglan, Waikato District Council

Raglan, Te Ara

Rangitahi Development, Rangitahi.co.nz



Scale 1:15,000

LEGEND

- Nzaa approved sites
- Nzaa pending
- Sites of interest
- Pa and marae
- Koning proposed development area

ARCHAEOLOGICAL AND CULTURAL

There has been extensive Māori occupation within the surrounding landscape and recognition of the cultural value is important. The archaeological Assessment identifies the distribution of pa sites within the wider area as primarily being along the coastal fringe and waterways. In relation to existing cultural values, there are a number of significant features in the nearby context. Large areas of nearby land are within Māori ownership [3]. Of particular note are the Poihakena Marae and Te Kopua Whānau Camp, which are positioned approximately 1km north of the submission site at the harbours edge. Furthermore, the land directly abutting the north-eastern boundary of the submission property is within Māori ownership.

With regard to the specific submission site, the recommendations are to; preserve the existing pit site, including a programme of subsurface investigations prior to any bulk earthworks, and undertake consultation with tangata whenua.

> *The Assessment of Effects Section of the Archaeological Assessment contains the most pertinent information in relation to influencing the Development Plan for the site and states that [4];*
>
> *The study area landscape is set back c.300m from the more favourable coastal locations. Based on current information, it is thought that these locations are less likely to have been the focus of permanent pre-European settlement. There are no known pa sites, kainga, or urupā within the project footprint which could be affected by the proposed zone change.*
>
> *Three sites have been recorded, two represent (as a minimum) shell fish processing and/or consumption areas (middens) and the third crop storage (pit site). Such site types are some of the most common types of pre-European archaeological evidence. Additional sites may be present but not currently visible. The proposal is likely to see some modification to one or more of these recorded sites. Intrusive archaeological investigations (i.e. test trenching) can be the only way to confidently determine the presence/ absence of archaeological sites, and the extent of archaeological activity.*
>
> *No evidence has been gathered to date to suggest that there are sites of exceptional archaeological value located within the zone change proposal. Of the sites identified, the pit storage site is currently thought to be in good condition and would be worth preservation within any future subdivision plans. The remaining sites, and areas of interest, should be investigated in advance of any future development.*

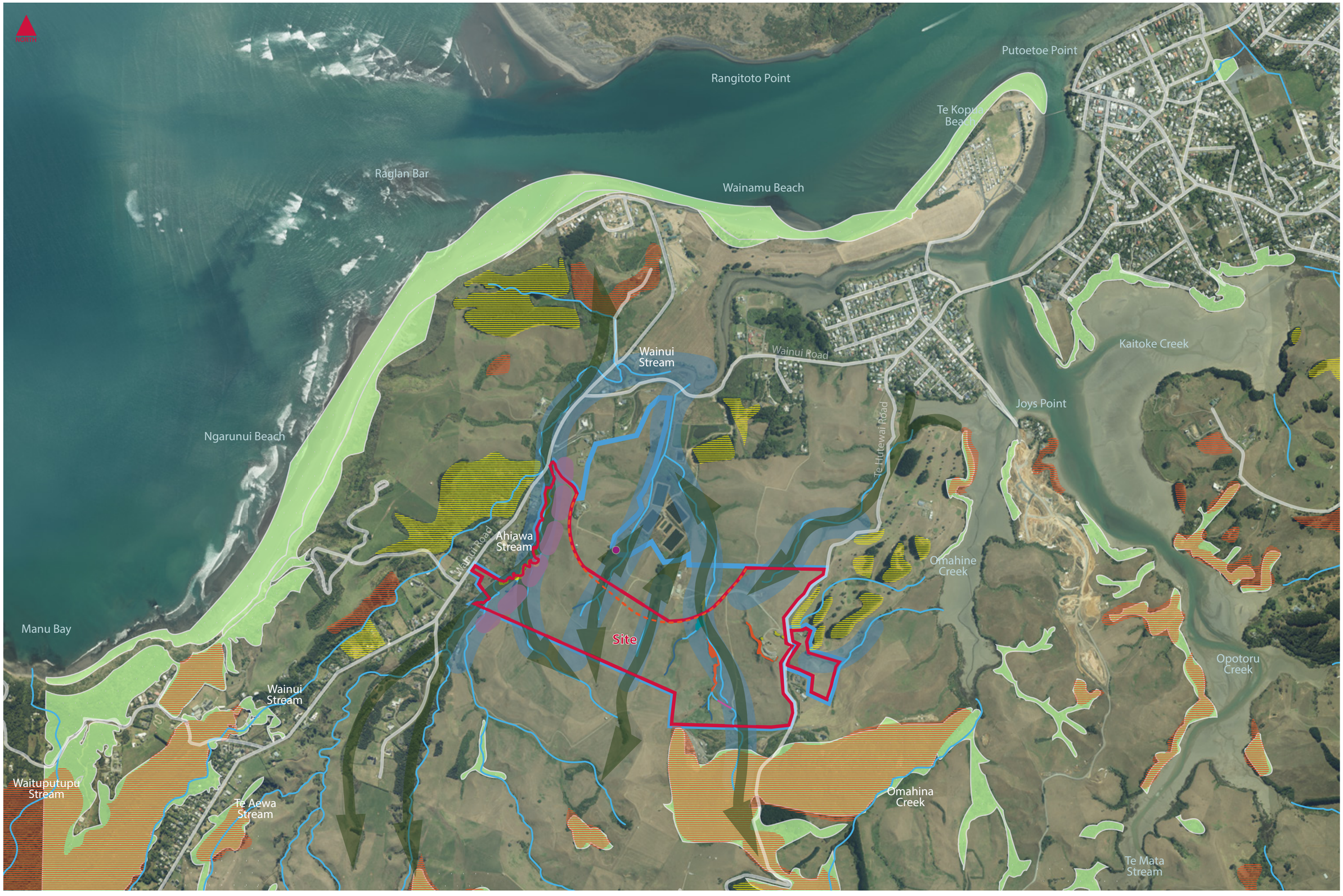
(3) whenuaviz.landcareresearch.co.nz

(4) Archaeological Assessment: Koning Family Trust, Raglan. Section 11.2, Pg. 34.

Area I, looking down the hill at the possible terraces. Facing SE. Sian Keith Archaeology Ltd.

Two pits, on possible lower terrace. Facing south. Sian Keith Archaeology Ltd.

Area C possible terracing, looking W. Sian Keith Archaeology Ltd.



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ECOLOGICAL

LEGEND

- Significant natural areas
- Predominantly exotic vegetation
- Predominantly native vegetation
- Pine and eucalypt stand
- Catchments
- Copper skink location
- Permanent streams
- Intermittent streams
- Piped streams
- Potential ecological connections
- Possible bat habitat and commuting ro
- Koning proposed development area

Existing vegetation on site, Ecology NZ Ltd

Copper skink, Department of Conservation

In relation to terrestrial ecology the combination of on-site observations and a desktop analysis has resulted in the identification of dominant vegetation systems and existing fauna (lizard, bats, avian). The freshwater ecology of the site was also assessed, with the key ecological functions of the submission property streams focusing on hydrolic function, biogeochemical function and habitat provision function.

The historic vegetation cover was identified as predominantly kahikatea-pukatea-tawa forest [5] and this information, in conjunction with the identified plants on-site [6] could be used to influence future native restoration across portions of the submission site. There is also the opportunity to link ecological values of the application site to the identified Significant Natural that is positioned on the neighbouring property to the south.

It has been identified that the existing vegetation corridors on-site provide only lower quality habitat for native skinks and geckos [7] and improving this habitat should be considered as part of the sites comprehensive development. The on site waterways and wetlands also contribute to the habitat for native birds and fish.

Interestingly, the cracked and broken exotic tree species within the site (pine, gum and blackwood) are actually suitable for hosting native bats [8]. Although the removal of exotic trees is quite a common development response in areas seeking vegetative restoration, it is important to note that (at least in the interim) they can provide value to other components of the endemic ecosystem (e.g. bay habitat) and that consideration of potential flight paths is important.

Overall, the ecological assessment concludes that the submission site provides no ecological constraints to development and has "the ability to not only protect existing ecological features but to enhance and extend them as part of the proposal" [9] . A list of recommendations and a list of opportunities is also included which provides a clear indication of anticipated outcomes for future development. This includes [10];

[5] Ibid – Section 3.1, Pg 6.

[6] Ibid – Appendix B.

[7] Ibid – Section 3.2.1 Herpetofauna.

[8] Ibid – Section 3.2.2 Bats.

[9] Ibid – Section 6 Summary

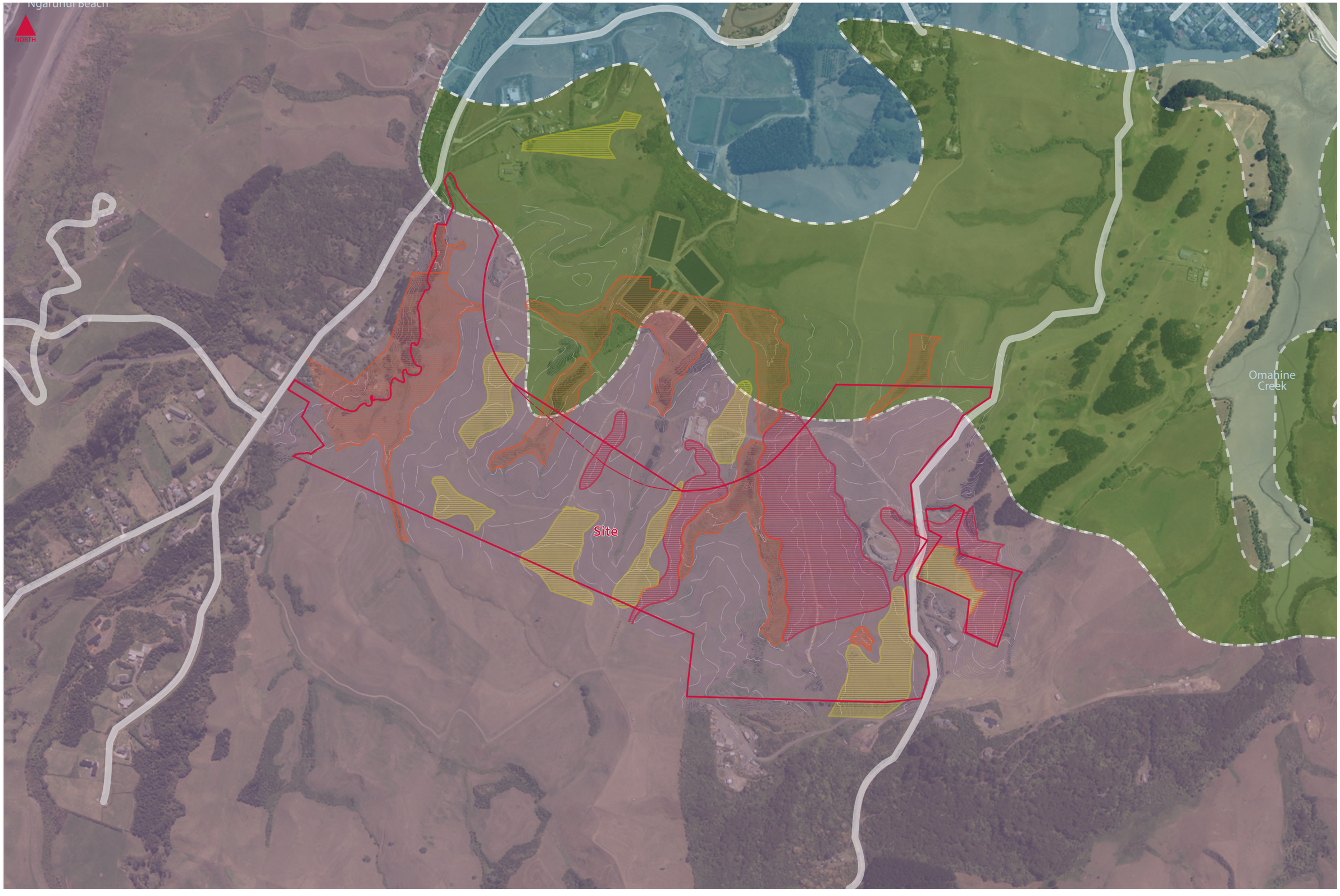
[10] Ibid – Section 5 Opportunities and Constraints

CONSTRAINTS AND RECOMMENDATIONS

- Indigenous vegetation to be retained - Avoid the removal of existing indigenous riparian vegetation other than where absolutely necessary for the construction of road crossings. Crossing design should reflect this approach and be positioned where vegetation is most sparse.
- Trees to be retained - Retain the two rimu trees situated alongside Catchment 2. Incorporate the retention of these tress within any development design.
- Stream reach to be retained – All stream reaches within the site will need to be retained and will require incorporation into any development design.
- Wetlands to be retained – All native natural wetlands within the site will need to be retained and may result in a reduction of land available for development.
- The Ahiawa Stream – The Ahiawa stream is likely to be a significant migratory corridor for At Risk and Threatened native fish species. As such any access over this stream will need to be designed in a way that will not impact fish passage.
- Further assessment for bat habitat - Large exotic trees within the identified areas have potential to act as bat roosting sites. Further acoustic assessments will be required to determine the significance of these trees to bats, prior to any management recommendations being made.
- Retention of lizard foraging habitat - There is moderate quality lizard foraging habitat with many continuous edges of vegetation, namely the riparian and bankside plantings. This ties in with previous considerations to retain indigenous vegetation wherever possible.
- Further assessment of lizard habitat - Due to copper skinks being observed just north of the assessment area(approx. 60metres), it is likely that there are native lizard populations on site. Should further assessments confirm this presence, appropriate mitigation measures would be required to mitigate potential impacts on species protected under the Wildlife Act 1953. This would likely include relocation of animals and enhancement of retained habitat.

OPPORTUNITIES

- Restoration of all existing intermittent streams, permanent streams and wetland areas through pest plant control, pest animal control and native infill planting. This would see the development of an Ecological Management Plan (EMP) for the retention and improvement of existing ecological features on site.
- Further protection of existing watercourses via 10-metre buffer planting around the edge of all intermittent streams, permanent streams, and wetland areas. This will further improve ecological value of the areas for similar reasons to those stated in the first opportunity above. If stock are not to be excluded from the proposed Lots as part of the consent process, these planting areas will require permanent, ungated stock-proof fencing installed outside the dripline of the new plantings.
- Completion of native revegetation along the bank situated at the eastern end of the site.
- An opportunity exists to daylight the main channel within catchment 2 (remove pipes and drains) and restore them to a more natural stream system via planting of riparian zones similar to that suggested in the second opportunity, as well as in-stream habitat creation.
- If bats are confirmed present on site and, specifically, found to be utilising the predicted western riparian corridor, its enhancement along with the retention of mature exotic trees could improve this commuting route for bats.
- It is expected that a current lack of site-wide pest control is restricting the current lizard population on site. The implementation of a pest management plan, as well as the revegetation mentioned in the first opportunity, will provide additional benefit by way of improving lizard habitat and protection from predators.



Scale 1:7,500

GEOTECHNICAL CONTEXT

LEGEND

- High geotech hazard (slope instability)
- High geotech hazard (soft ground)
- Low geotech hazard
- Poorly drained soils
- Moderately-well drained soils
- Well drained soils
- Koning proposed development area
- <70m
- Elevation
- >10m

The underlying geology of the area is a result of historic volcanic activity of the now extinct Mt Karioi volcano and other nearby volcanic activity[11]. This has produced a predominant ridgeline trend where the ridgeline orientation descends in elevation via a radial pattern centered on Mt Karioi. At the submission property this pattern is highlighted by the series of ridgeline/gully fingers which run parallel with the adjacent alignment of the Ahiawa Stream and Wainui/Te Hutewai Roads.

A Preliminary Concept Plan [12] identified areas of planting, open space and farmland in conjunction with the proposed residential development. However, subsequent investigations have determined the extent of a high geotechnical hazard (slope stability), along with expected soft ground areas and also areas of only low geotech hazard (which can be remediated).

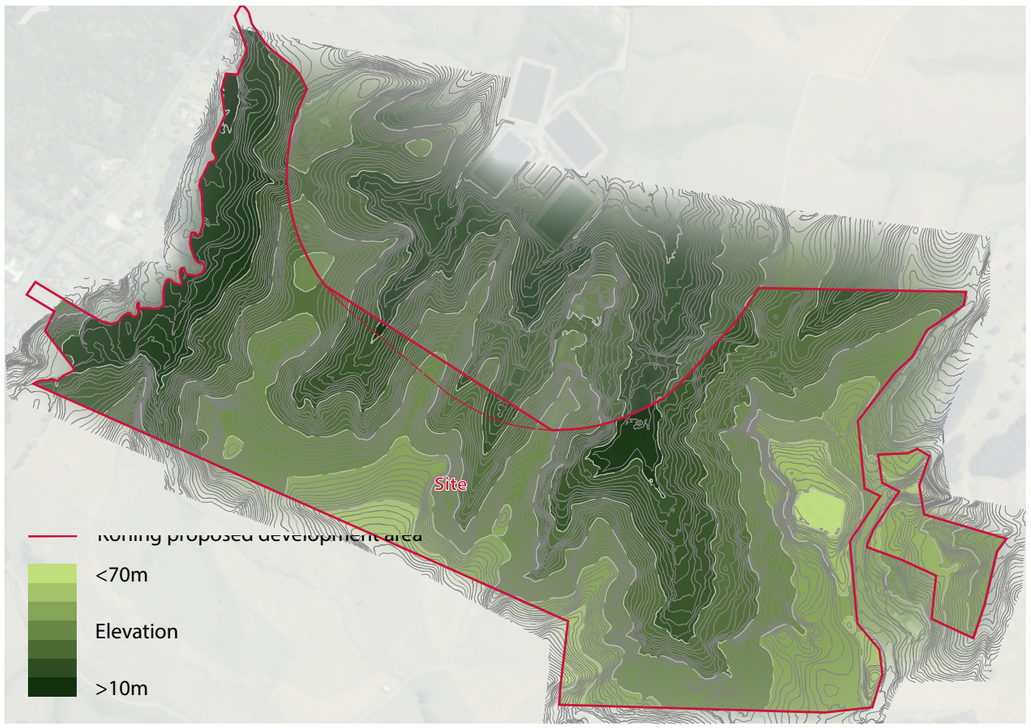
The most significant hindrance on development has been the identification of the High Geotechnical Hazard, which consist of a subsurface void within the limestone at a depth of 45m [13]. The key conclusion being that cost associated with suitable mitigation of this areas (for development) would be uneconomic.

Overall, the land outside of the High Geotechnical Hazard is appropriate for residential development provided that further geotechnical work is undertaken during the detailed design, construction and certification phases.

[11] CMW Geosciences: Koning Land Holdings Proposed Plan Change – Section 6.1.1

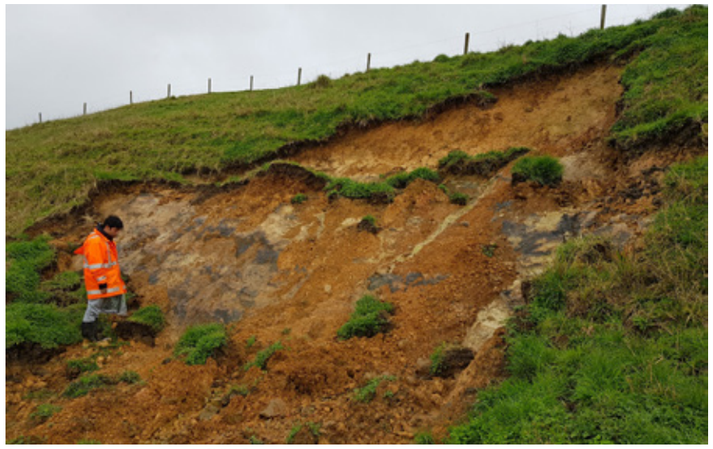
[12] CMW Geosciences: Koning Property - Appendix A: Schematic Development Plans

[13] CMW Geosciences: Koning Property – Section 6.5.1



Elevation Map

Not to scale



Geomorphology report photo 3. CMW Geosciences

Geomorphology report photo 5. CMW Geosciences

Geomorphology report photo 7. CMW Geosciences

Scale 1:15,000

CONNECTIVITY

LEGEND

- Pedestrian connection
- Mount karioi cycle loop
- Walking trails
- Horse riding trails
- Potential vehicle connections
- Potential pedestrian connections
- Recreational reserves and parks
- Car Parking
- Bus stops
- Key locations
- Education
- Walking distances to key locations
- Koning proposed development area

The New Zealand Urban Design Protocol provides a platform for implementing better towns and cities through the consideration of core concepts relating to urban design. Overall, there are 7 qualities (referred to as the 7 C's) which include; Context, Character, Choice, Connections, Creativity, Custodianship and Collaboration. While all 7 of these identified components contribute to positive outcomes for urban development, in the context of the Koning Family Trust Submission, it is considered that 'Connectivity' is a significant opportunity associated with this location.

CONNECTIONS

- creates safe, attractive and secure pathways and links between centres, landmarks and neighbourhoods
- facilitates green networks that link public and private open space
- places a high priority on walking, cycling and public transport
- anticipates travel demands and provides a sustainable choice of integrated transport modes
- improves accessibility to public services and facilities
- treats streets and other thoroughfares as positive spaces with multiple functions
- provides formal and informal opportunities for social and cultural interaction
- facilitates access to services and efficient movement of goods and people
- provides environments that encourage people to become more physically active.

The ability to provide for appropriate connections, both internally and externally of the site, will become a key factor when assessing the landscape character of the submission site and the the overall benefit that can be provided through the rezoning of this land. The wider context is important as the submission sites interaction with existing vehicle, pedestrian, cycling and other recreational (e.g. horse trails) routes will begin to expose benefits for the community as a whole.

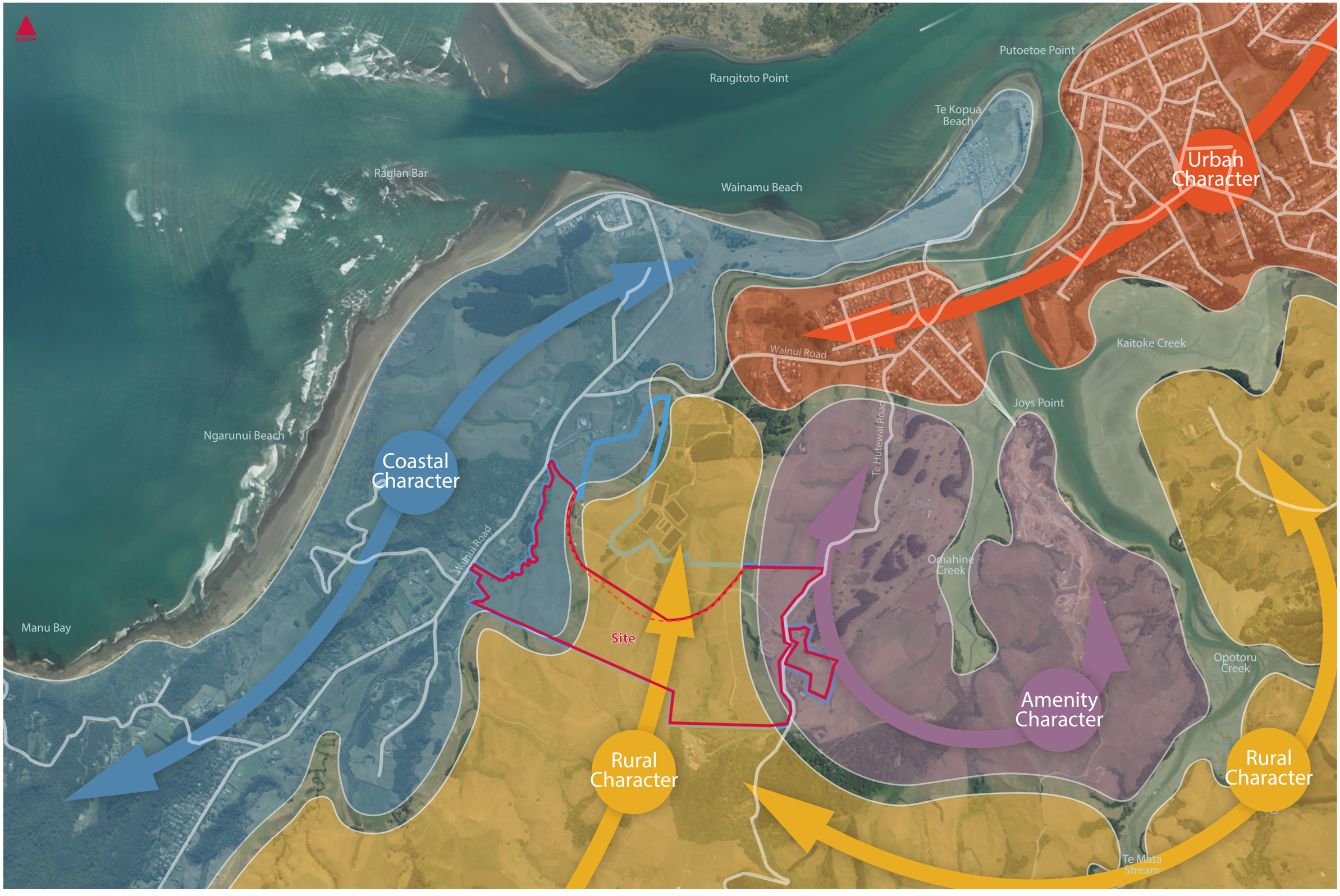
Possibly the most obvious connection benefit, associated with the Koning Family Trust submission site, is in relation to providing an east-west connection. At the south-western extent of raglans urban form, three key access roads (Wainui Rd, Te Hutewai Rd and Opotoru Rd) all divert south in a disconnected manner. This disconnect is a result of the existing roading pattern conforming to the ridgeline landform pattern of the surrounding area. By utilising the Koning Family Trust Property, a link could be provided between the southern extent of the Rangitahi Peninsula development (Opotoru Rd) through to Ngarunui Beach.

It is also worth identifying that the National Policy Statement on Urban Development was introduced in August 2020 and requires Councils to give effect to the objectives and policies contained within it. This includes enabling greater intensification (height and density) in high demand areas, considering outcomes relating to housing affordability, and accommodating urban growth through Future Development Strategies. The Koning Family Trust property is well positioned to respond to this direction.


Ngarunui Beach


Poihākena Marae. Maori Maps


Raglan Holiday Park. Papahua


NORTH
Rangitoto Point
Putoetoe Point
Te Kopua Beach
Raglan Bar
Wainamu Beach
Urban Character
Wainui Road
Kaitoke Creek
Joys Point
Ngarunui Beach
Coastal Character
Te Hutewai Road
Waiuru Road
Omahine Creek
Manu Bay
Site
Amenity Character
Opotoru Creek
Rural Character
Rural Character
Te Mata Stream

Scale 1:7,500

CHARACTER ASSESSMENT

LEGEND

- Urban character
- Coastal character
- Rural character
- Amenity character
- Koning proposed development area

Raglan is a small (approximately 3500 people) coastal township positioned near the entrance to Whaingaroa (Raglan) Harbour, located 35km west of Hamilton City. The town is located at the end of State Highway 23, with the palm tree lined main street of Raglan directing views out across the harbour. Public walkways wrap around the coastal edge of the town and link, via a pedestrian bridge, across to the Raglan Holiday Park and Raglan Airstrip which are located on their own narrow peninsula. The town and surrounding area represent a quintessential kiwi beach lifestyle that is renowned for its creativity, café culture and exceptional natural resources (the sea and surf breaks in particular).

Wainui Road starts in the Raglan town centre and travels south west out to Ngarunui Beach and Manu Bay. At the western extent of the existing Raglan residential form, Te Hutewai Rd splits from Wainui Rd and passes alongside the Raglan Golf Club before getting to the submission property. Wainui Rd continues from the Te Hutewai Rd intersection and passes; Poihākena Marae, the estuary, the Te Kopua Whānau Camp turnoff and Wainui Reserve Bush Park before arriving at the western entrance to the submission property.

From the Raglan town centre, pedestrians are now capable of walking all the way out to Ngarunui Beach (over 4km) along roadside pathways and public walkways. This highlights the existing level of walkability in the surrounding area, with the existing walkways being well utilised.

Beyond the Wainui Reserve Bush Park there is a continuation of residential occupation along Wainui Road, with discrete clusters of development such as Whale Bay and Upper Wainui Rd, while Te Ahiawa Rd is a more recent residential development close to the western extent of the submission property. These residential areas represent an existing development trend where residential properties splinter off along plateaus, with natural separation and a degree of openness being retained by the incised valley structure of the natural landform pattern. This pattern is highlighted by the Elevation Map located on page 13.

Based on the site observations and initial landscape assessment, the area surrounding the application site has been grouped in to four high level character precincts which include; urban, amenity, coastal and rural.

URBAN CHARACTER

The raglan settlement forms the bulk of this character area. The density is typical of a small New Zealand settlement, with a central business hub (around Bow Street) and residential development spreading outward. The residential development pattern is consistent with the sequence of historic quarter acre sections which have, over time, been further subdivided. This character areas contains a range of public amenities such as the Town Hall, School, Museum, shops and restaurants/cafes and components such as formed roads, roadside parking, curb and channel edges, mown berms, street signs, power poles, lampposts and footpaths, are all common commonplace within this character area.

It is also noted that it appears the streetscape has retained a degree of openness throughout the raglan urban area through the use of a 30m wide road reserve in many locations, as opposed to a standard 20m road reserve.

AMENITY CHARACTER

This Amenity character area comprises the Rangitahi Peninsula and the open slopes around the northern end of Te Hutewai Road (including the Golf Course) and has an interesting juxtaposition of expansiveness and containment. The degree of expansiveness is due to the gradual rise of the landform extending up toward Mt Karioi, which affords views across the series of creeks which connect to the Whaingaroa (Raglan) Harbour. At the same time, this area is relatively well sheltered by the surrounding landforms, which in my opinion results in a higher degree of pleasantness (and therefore perception of amenity). This location does not experience the same brutal exposure to the ocean that occurs on the nearby coastal character area. This character area includes the land in the north eastern corner of submission site as well as the existing primary dwelling.

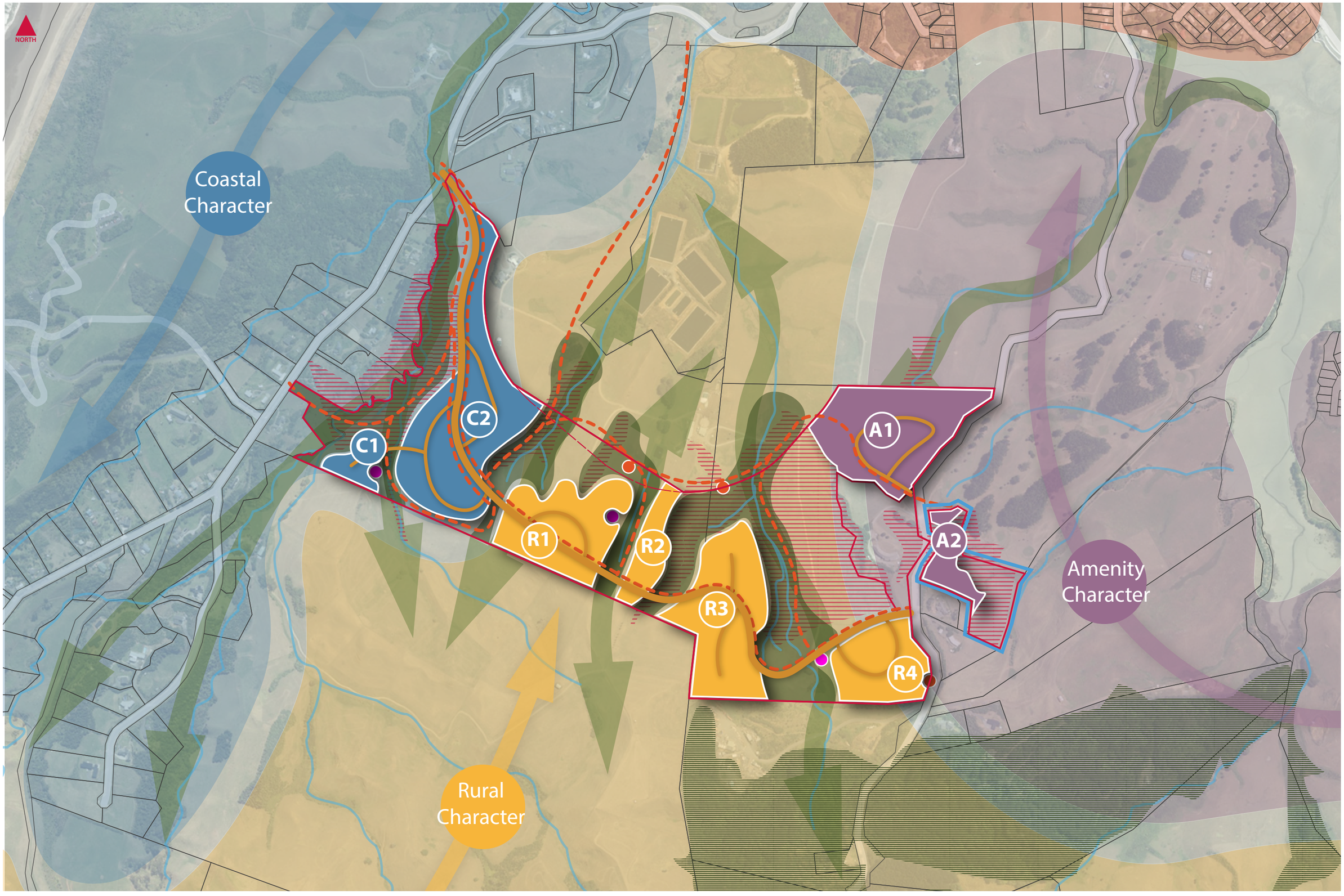
COASTAL CHARACTER

This Coastal character area wraps along the coastline and into the harbour. This includes the first ridgeline running parallel with the waters edge and the associated lifestyle development accessed along the Wainui Rd spine. Public access throughout this character area is extensive, both overland and along the series of beaches. From the elevated positions overlooking the coast, there is a high degree exposure and wildness which defines this coastal setting. Proximity to the beach is a key factor of the existing level of development. This character area extends into the western side of the submission site.

RURAL CHARACTER

This Rural character area is the productive landscape extending south from the harbour. It includes the three designation sites of wastewater (M52), landfill/refuse transfer (M50) and reservoir/water treatment (M90). The landform characteristics are similar to the surrounding areas, however the enclosure from ridgelines and the dominant land use define this area. It forms the central portion of the submission site and merges with the adjacent productive land to the south.

The intricate pattern of incised gullies extending down toward the coastline is a prominent characteristic of the surrounding landform and will inevitably require future development of the submission site to replicate existing development patterns.


NORTH
Coastal Character
C1
C2
R1
R2
R3
R4
A1
A2
Amenity Character
Rural Character

Scale 1:7,500

PRELIMINARY DEVELOPMENT PLAN

LEGEND

Character Areas
- Coastal character
- Rural character
- Amenity character
- Urban character

Character Development Area
- Coastal character development
- Rural character development
- Amenity character development
- Vegetation
- Vehicle connections
- Pedestrian connections
- No build areas
- Significant natural areas
- Streams
- Ecological corridors
- Nzaa approved sites
- Sites of interest
- Koning proposed development area

The preparation of a development plan is considered to be an appropriate method for directing development across the submission property. While this could have been achieved through a consent condition, the project team has agreed that it would be prudent to include the development plan as part of the PDP submission process.

The intention of the development plan for this property is to ensure an appropriate urban and landscape response to the site development. This will inform the location of developable land (free from geotechnical constraints), protection of on-site heritage features (e.g. archaeological sites), provision of vehicle/bicycle/pedestrian connectivity (both within and beyond the site), and that will enhance the existing ecological and opens pace values of the area. This is to be undertaken in a manner that promotes urban expansion, while enhancing community interaction and elevating the unique identity of this coastal area.

The adjacent Preliminary Development Plan has been prepared in collaboration with the wider project team in order to ensure that all relevant aspects are addressed. The structure plan is still conceptual (e.g. specific street and housing typologies have not been detailed or arranged), however it does provide clarity as to the intended development future of this location.

In all situations, the development areas across the site are intended to respond to the site conditions and topography. Additionally, each of the three identified character areas are intended to have a distinct typology which retains the overarching character of these spaces. The Development Plan provides for the following character components, as an indication of how development of each character area will be implemented.

COASTAL CHARACTER AREA (C1 & C2)

This area most readily responds to the development that has occurred along the Wainui Rd extent. A design response would include; wide open berms, stormwater running into swales (e.g. no curb/channel), informal native coastal planting along the roadside, limited street lighting and readily available links to the coastal walking network immediately west of the site.

RURAL CHARACTER AREA (R1, R2, R3 & R4)

This area is adjacent to the rural productive landscape further to the south. It is backdropped by an east-west running spur yet retains views north due to the topography. A key component of this character area is the retention of open space. This could be achieved through; the strategic positioning of lots and roads to allow for expansive views, a simple mown road verge, informal planting configuration, building setbacks from the road reserve, reduced levels of street lighting, natural drainage solutions through open swales and open gullies, clustering of development on plateaus, utilisation of valleys to provide a degree of development separation, connection to wider trails and a consistency of rural fencing styles.

AMENITY CHARACTER AREA (A1 & A2)

The area is visually connected to the open space amenity afforded by the golf course and estuary inlet beyond. This is the most typical urban response to residential development across the site. It is anticipated that it will include; a highly manicured road verge, a formalised planting arrangement, defined street trees, street lighting, curb and channel formed road, individual fencing styles, and footpaths on each side of a relatively confined carriageway.

WAYFINDER

Landscape Planning & Strategy

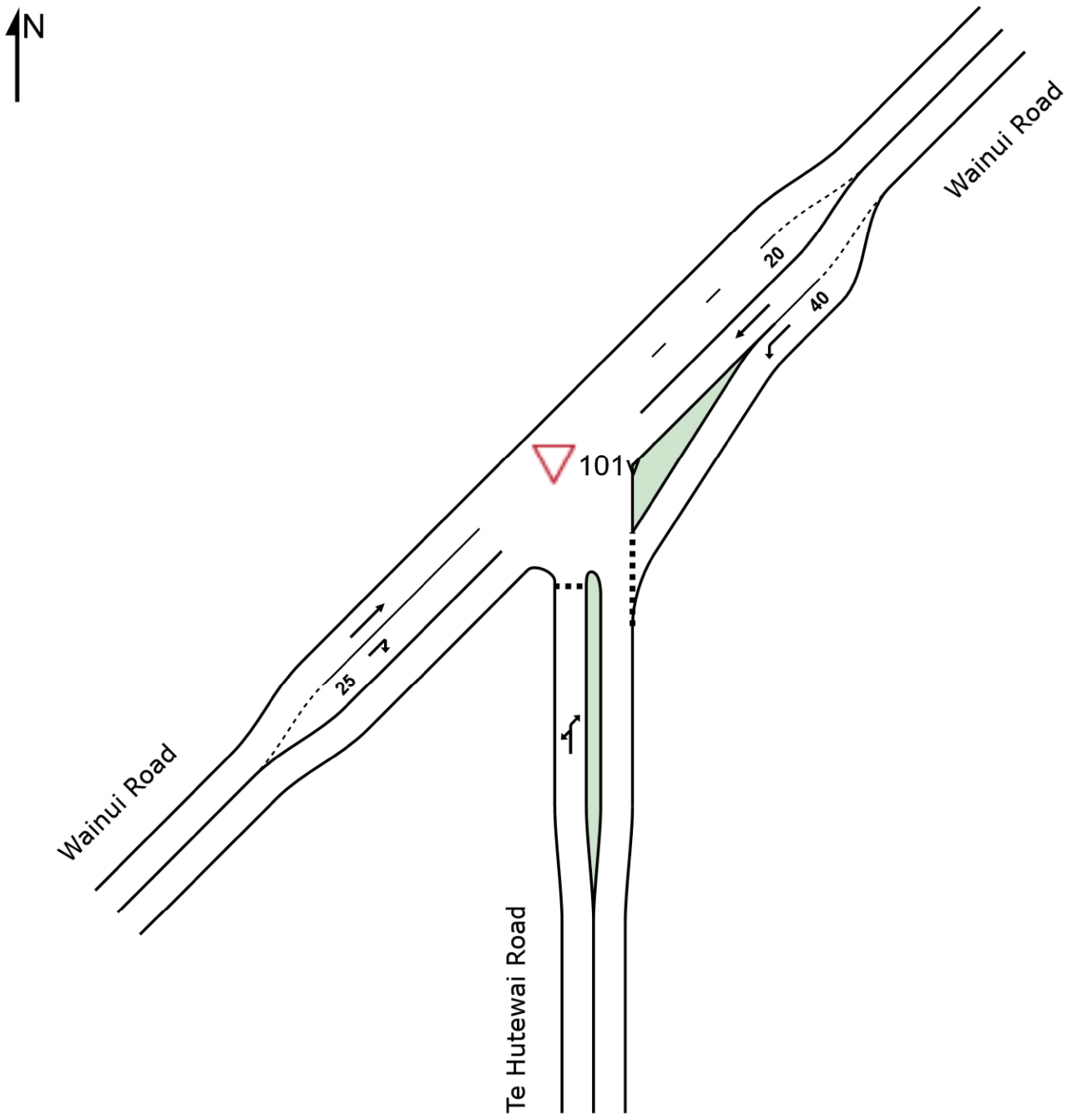
Appendix C – Capacity Assessment Results

Wainui Road / Te Hutewai Road

SITE LAYOUT

Site: 101v [Wainui Rd and Te Hutewai Road]

Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101v [Wainui Rd and Te Hutewai Road_2024_BS_AM_Non-Holiday]

2024 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te Hutewai Road												
21b	L3	4	5.0	0.117	6.0	LOS A	0.5	3.3	0.48	0.66	0.48	45.7
23a	R1	80	5.0	0.117	6.7	LOS A	0.5	3.3	0.48	0.66	0.48	45.3
Approach		84	5.0	0.117	6.6	LOS A	0.5	3.3	0.48	0.66	0.48	45.3
NorthEast: Wainui Road												
7a	L1	6	5.0	0.004	4.5	LOS A	0.0	0.1	0.03	0.54	0.03	46.1
8	T1	160	5.0	0.085	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		166	5.0	0.085	0.2	LOS A	0.0	0.1	0.00	0.02	0.00	49.8
SouthWest: Wainui Road												
2	T1	243	5.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	4	5.0	0.003	5.7	LOS A	0.0	0.1	0.27	0.54	0.27	45.2
Approach		247	5.0	0.129	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.9
All Vehicles		498	5.0	0.129	1.2	NA	0.5	3.3	0.08	0.12	0.08	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2024 BS_PM_Non-Holiday]

2024 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te Hutewai Road												
21b	L3	1	5.0	0.015	6.1	LOS A	0.1	0.4	0.46	0.59	0.46	45.8
23a	R1	9	5.0	0.015	6.5	LOS A	0.1	0.4	0.46	0.59	0.46	45.4
Approach		11	5.0	0.015	6.5	LOS A	0.1	0.4	0.46	0.59	0.46	45.4
NorthEast: Wainui Road												
7a	L1	51	5.0	0.033	4.6	LOS A	0.1	1.0	0.10	0.52	0.10	46.0
8	T1	214	5.0	0.113	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		264	5.0	0.113	0.9	LOS A	0.1	1.0	0.02	0.10	0.02	49.2
SouthWest: Wainui Road												
2	T1	164	5.0	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	34	5.0	0.024	5.9	LOS A	0.1	0.7	0.32	0.57	0.32	45.1
Approach		198	5.0	0.087	1.0	NA	0.1	0.7	0.05	0.10	0.05	49.1
All Vehicles		473	5.0	0.113	1.1	NA	0.1	1.0	0.04	0.11	0.04	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2024 BS_AM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	5	5.0	0.143	6.1	LOS A	0.6	4.1	0.51	0.70	0.51	45.4
23a	R1	91	5.0	0.143	7.3	LOS A	0.6	4.1	0.51	0.70	0.51	45.0
Approach		96	5.0	0.143	7.2	LOS A	0.6	4.1	0.51	0.70	0.51	45.0
NorthEast: Wainui Road												
7a	L1	6	5.0	0.004	4.5	LOS A	0.0	0.1	0.03	0.54	0.03	46.1
8	T1	181	5.0	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		187	5.0	0.096	0.2	LOS A	0.0	0.1	0.00	0.02	0.00	49.8
SouthWest: Wainui Road												
2	T1	275	5.0	0.145	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	4	5.0	0.003	5.8	LOS A	0.0	0.1	0.29	0.54	0.29	45.2
Approach		279	5.0	0.145	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.9
All Vehicles		562	5.0	0.145	1.3	NA	0.6	4.1	0.09	0.13	0.09	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2024 BS_PM_Holiday]

2024 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	1	5.0	0.018	6.2	LOS A	0.1	0.5	0.50	0.62	0.50	45.4
23a	R1	11	5.0	0.018	7.2	LOS A	0.1	0.5	0.50	0.62	0.50	45.0
Approach		12	5.0	0.018	7.1	LOS A	0.1	0.5	0.50	0.62	0.50	45.1
NorthEast: Wainui Road												
7a	L1	59	5.0	0.038	4.6	LOS A	0.2	1.1	0.11	0.52	0.11	45.9
8	T1	247	5.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		306	5.0	0.131	0.9	LOS A	0.2	1.1	0.02	0.10	0.02	49.2
SouthWest: Wainui Road												
2	T1	191	5.0	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	39	5.0	0.028	6.1	LOS A	0.1	0.9	0.35	0.58	0.35	45.0
Approach		229	5.0	0.102	1.0	NA	0.1	0.9	0.06	0.10	0.06	49.1
All Vehicles		547	5.0	0.131	1.1	NA	0.2	1.1	0.05	0.11	0.05	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS_AM_Non-Holiday]

2044 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te Hutewai Road												
21b	L3	6	5.0	0.199	6.2	LOS A	0.8	5.7	0.57	0.77	0.57	44.7
23a	R1	109	5.0	0.199	8.6	LOS A	0.8	5.7	0.57	0.77	0.57	44.3
Approach		116	5.0	0.199	8.4	LOS A	0.8	5.7	0.57	0.77	0.57	44.3
NorthEast: Wainui Road												
7a	L1	9	5.0	0.006	4.5	LOS A	0.0	0.2	0.04	0.53	0.04	46.1
8	T1	219	5.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		228	5.0	0.116	0.2	LOS A	0.0	0.2	0.00	0.02	0.00	49.8
SouthWest: Wainui Road												
2	T1	332	5.0	0.176	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	6	5.0	0.004	5.9	LOS A	0.0	0.1	0.32	0.55	0.32	45.1
Approach		338	5.0	0.176	0.1	NA	0.0	0.1	0.01	0.01	0.01	49.9
All Vehicles		682	5.0	0.199	1.6	NA	0.8	5.7	0.10	0.14	0.10	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS_PM_Non-Holiday]

2024 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te Hutewai Road												
21b	L3	3	5.0	0.028	6.4	LOS A	0.1	0.7	0.52	0.66	0.52	45.0
23a	R1	14	5.0	0.028	8.3	LOS A	0.1	0.7	0.52	0.66	0.52	44.6
Approach		17	5.0	0.028	7.9	LOS A	0.1	0.7	0.52	0.66	0.52	44.7
NorthEast: Wainui Road												
7a	L1	69	5.0	0.045	4.6	LOS A	0.2	1.3	0.13	0.52	0.13	45.9
8	T1	292	5.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		361	5.0	0.154	0.9	LOS A	0.2	1.3	0.02	0.10	0.02	49.1
SouthWest: Wainui Road												
2	T1	224	5.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	47	5.0	0.036	6.2	LOS A	0.2	1.1	0.38	0.60	0.38	45.0
Approach		272	5.0	0.120	1.1	NA	0.2	1.1	0.07	0.10	0.07	49.0
All Vehicles		649	5.0	0.154	1.2	NA	0.2	1.3	0.05	0.12	0.05	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS_AM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	7	5.0	0.251	6.7	LOS A	1.0	7.6	0.62	0.81	0.66	43.9
23a	R1	124	5.0	0.251	10.0	LOS A	1.0	7.6	0.62	0.81	0.66	43.6
Approach		132	5.0	0.251	9.8	LOS A	1.0	7.6	0.62	0.81	0.66	43.6
NorthEast: Wainui Road												
7a	L1	9	5.0	0.006	4.5	LOS A	0.0	0.2	0.04	0.53	0.04	46.1
8	T1	247	5.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		257	5.0	0.131	0.2	LOS A	0.0	0.2	0.00	0.02	0.00	49.8
SouthWest: Wainui Road												
2	T1	375	5.0	0.199	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	6	5.0	0.005	6.0	LOS A	0.0	0.1	0.34	0.55	0.34	45.1
Approach		381	5.0	0.199	0.1	NA	0.0	0.1	0.01	0.01	0.01	49.9
All Vehicles		769	5.0	0.251	1.8	NA	1.0	7.6	0.11	0.15	0.12	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS_PM_Holiday]

2044 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	3	5.0	0.034	6.6	LOS A	0.1	0.9	0.57	0.71	0.57	44.4
23a	R1	15	5.0	0.034	9.5	LOS A	0.1	0.9	0.57	0.71	0.57	44.0
Approach		18	5.0	0.034	9.0	LOS A	0.1	0.9	0.57	0.71	0.57	44.1
NorthEast: Wainui Road												
7a	L1	81	5.0	0.053	4.6	LOS A	0.2	1.6	0.14	0.52	0.14	45.9
8	T1	338	5.0	0.179	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		419	5.0	0.179	0.9	LOS A	0.2	1.6	0.03	0.10	0.03	49.1
SouthWest: Wainui Road												
2	T1	261	5.0	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	55	5.0	0.044	6.5	LOS A	0.2	1.4	0.42	0.62	0.42	44.9
Approach		316	5.0	0.139	1.1	NA	0.2	1.4	0.07	0.11	0.07	49.0
All Vehicles		753	5.0	0.179	1.2	NA	0.2	1.6	0.06	0.12	0.06	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS+D (400 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	6	5.0	0.524	9.1	LOS A	3.1	22.7	0.74	1.02	1.18	41.8
23a	R1	246	5.0	0.524	14.1	LOS B	3.1	22.7	0.74	1.02	1.18	41.5
Approach		253	5.0	0.524	13.9	LOS B	3.1	22.7	0.74	1.02	1.18	41.5
NorthEast: Wainui Road												
7a	L1	24	5.0	0.015	4.5	LOS A	0.1	0.4	0.04	0.53	0.04	46.1
8	T1	229	5.0	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		254	5.0	0.122	0.4	LOS A	0.1	0.4	0.00	0.05	0.00	49.6
SouthWest: Wainui Road												
2	T1	422	5.0	0.224	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	6	5.0	0.004	5.9	LOS A	0.0	0.1	0.33	0.55	0.33	45.1
Approach		428	5.0	0.224	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.9
All Vehicles		935	5.0	0.524	3.9	NA	3.1	22.7	0.20	0.29	0.32	47.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS+D (400 dwellings)_PM_Non-Holiday]

2024 Baseline + Rezoning Traffic_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	3	5.0	0.071	6.9	LOS A	0.3	1.8	0.63	0.80	0.63	43.6
23a	R1	28	5.0	0.071	10.8	LOS B	0.3	1.8	0.63	0.80	0.63	43.2
Approach		32	5.0	0.071	10.4	LOS B	0.3	1.8	0.63	0.80	0.63	43.3
NorthEast: Wainui Road												
7a	L1	206	5.0	0.135	4.6	LOS A	0.6	4.3	0.14	0.52	0.14	45.9
8	T1	382	5.0	0.202	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		588	5.0	0.202	1.6	LOS A	0.6	4.3	0.05	0.18	0.05	48.5
SouthWest: Wainui Road												
2	T1	235	5.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	47	5.0	0.040	6.7	LOS A	0.2	1.2	0.44	0.63	0.44	44.9
Approach		282	5.0	0.125	1.1	NA	0.2	1.2	0.07	0.11	0.07	49.0
All Vehicles		902	5.0	0.202	1.8	NA	0.6	4.3	0.08	0.18	0.08	48.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS+D (400 dwellings)_AM_Holiday]

2044 Baseline+Rezoning Traffic_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	7	5.0	0.625	11.2	LOS B	4.0	29.5	0.81	1.14	1.49	40.2
23a	R1	261	5.0	0.625	17.7	LOS C	4.0	29.5	0.81	1.14	1.49	39.9
Approach		268	5.0	0.625	17.6	LOS C	4.0	29.5	0.81	1.14	1.49	39.9
NorthEast: Wainui Road												
7a	L1	24	5.0	0.015	4.5	LOS A	0.1	0.4	0.04	0.53	0.04	46.1
8	T1	258	5.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		282	5.0	0.137	0.4	LOS A	0.1	0.4	0.00	0.05	0.00	49.6
SouthWest: Wainui Road												
2	T1	465	5.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	6	5.0	0.005	6.0	LOS A	0.0	0.1	0.35	0.56	0.35	45.0
Approach		472	5.0	0.247	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.9
All Vehicles		1022	5.0	0.625	4.8	NA	4.0	29.5	0.22	0.31	0.39	46.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd and Te Hutewai Road_2044 BS+D (400 dwellings)_PM_Holiday]

2044 Baseline+Rezoning Traffic_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Te hutewai Road												
21b	L3	3	5.0	0.086	7.1	LOS A	0.3	2.2	0.69	0.83	0.69	42.8
23a	R1	29	5.0	0.086	12.6	LOS B	0.3	2.2	0.69	0.83	0.69	42.4
Approach		33	5.0	0.086	12.1	LOS B	0.3	2.2	0.69	0.83	0.69	42.4
NorthEast: Wainui Road												
7a	L1	218	5.0	0.143	4.7	LOS A	0.6	4.6	0.15	0.52	0.15	45.9
8	T1	428	5.0	0.227	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		646	5.0	0.227	1.6	LOS A	0.6	4.6	0.05	0.18	0.05	48.5
SouthWest: Wainui Road												
2	T1	272	5.0	0.145	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
3b	R3	55	5.0	0.049	6.9	LOS A	0.2	1.5	0.47	0.66	0.47	44.7
Approach		326	5.0	0.145	1.2	NA	0.2	1.5	0.08	0.11	0.08	49.0
All Vehicles		1005	5.0	0.227	1.8	NA	0.6	4.6	0.08	0.18	0.08	48.4

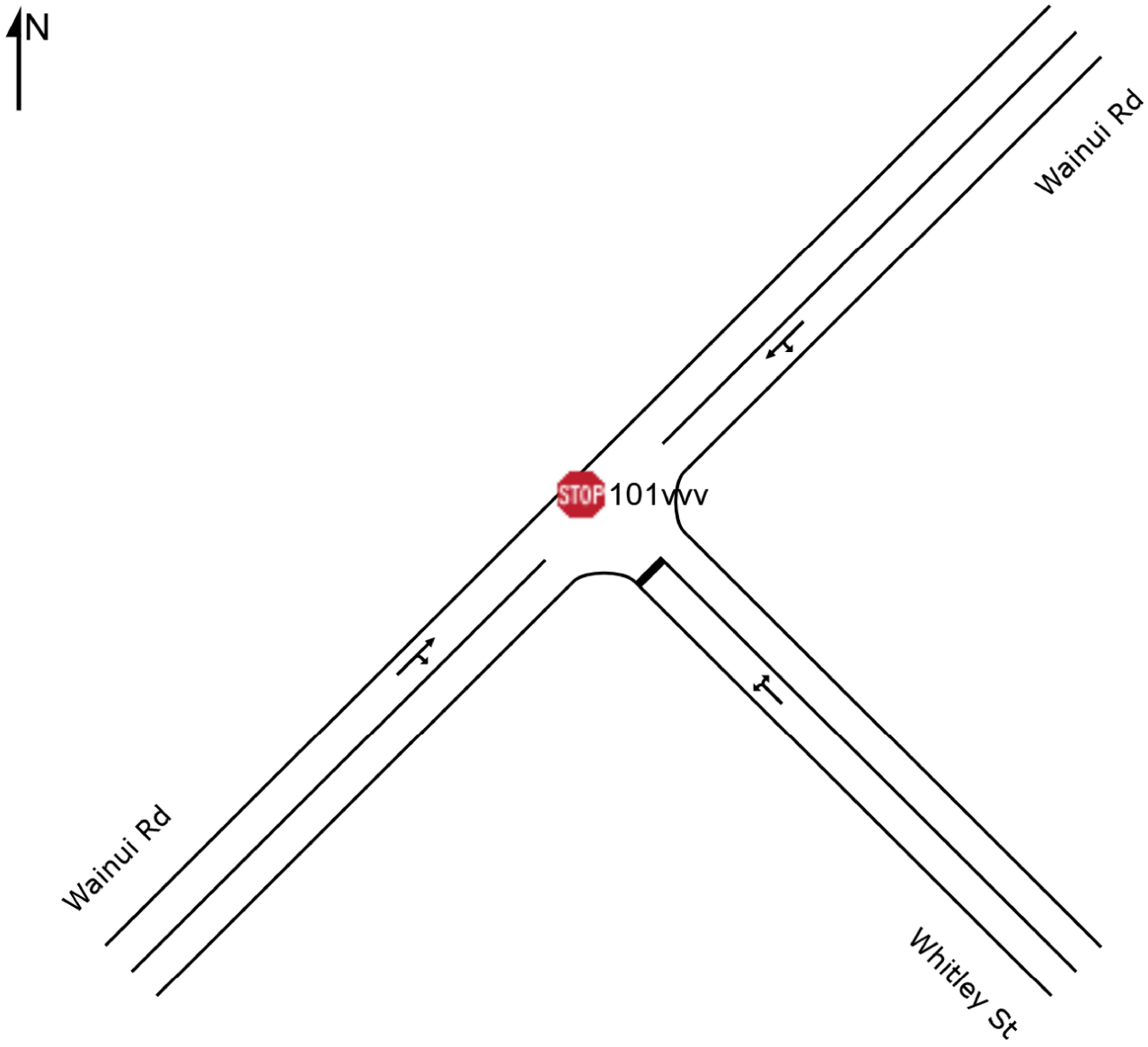
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

Wainui Road / Whitley Street

SITE LAYOUT

Site: 101vvv [Wainui Rd / Whitley St]

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



Organisation: BLOXAM, BURNETT & OLLIVER LTD | Created: Wednesday, 17 February 2021 3:38:47 PM
Project: K:\144430 Koning Rezoning\Traffic\2020 Updated ITA and report\SIDRA\Updated Sidra - February 2021\5. Wainui Rd & Whitley St intersection.sip8

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2024 BS_AM_Non-Holiday]

2024 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	65	4.0	0.057	7.8	LOS A	0.1	0.9	0.10	0.95	0.10	37.4
23	R2	7	4.0	0.057	8.2	LOS A	0.1	0.9	0.10	0.95	0.10	39.0
Approach		73	4.0	0.057	7.9	LOS A	0.1	0.9	0.10	0.95	0.10	37.6
NorthEast: Wainui Rd												
24	L2	4	4.0	0.049	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	89	4.0	0.049	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		94	4.0	0.049	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	177	4.0	0.175	0.2	LOS A	0.8	5.6	0.18	0.23	0.18	46.7
32	R2	131	4.0	0.175	4.9	LOS A	0.8	5.6	0.18	0.23	0.18	42.2
Approach		307	4.0	0.175	2.2	NA	0.8	5.6	0.18	0.23	0.18	45.2
All Vehicles		474	4.0	0.175	2.7	NA	0.8	5.6	0.13	0.30	0.13	45.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2024 BS_PM_Non-Holiday]

2024 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	92	4.0	0.084	8.2	LOS A	0.2	1.4	0.22	0.94	0.22	37.3
23	R2	6	4.0	0.084	8.7	LOS A	0.2	1.4	0.22	0.94	0.22	38.9
Approach		98	4.0	0.084	8.2	LOS A	0.2	1.4	0.22	0.94	0.22	37.4
NorthEast: Wainui Rd												
24	L2	9	4.0	0.150	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	276	4.0	0.150	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		285	4.0	0.150	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	186	4.0	0.157	0.5	LOS A	0.6	4.3	0.26	0.18	0.26	47.0
32	R2	78	4.0	0.157	5.8	LOS A	0.6	4.3	0.26	0.18	0.26	42.6
Approach		264	4.0	0.157	2.1	NA	0.6	4.3	0.26	0.18	0.26	46.0
All Vehicles		647	4.0	0.157	2.2	NA	0.6	4.3	0.14	0.22	0.14	46.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2024 BS_AM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	73	4.0	0.064	7.9	LOS A	0.1	1.0	0.11	0.95	0.11	37.4
23	R2	8	4.0	0.064	8.3	LOS A	0.1	1.0	0.11	0.95	0.11	39.0
Approach		81	4.0	0.064	7.9	LOS A	0.1	1.0	0.11	0.95	0.11	37.6
NorthEast: Wainui Rd												
24	L2	4	4.0	0.056	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	101	4.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		105	4.0	0.056	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	192	4.0	0.192	0.3	LOS A	0.9	6.3	0.19	0.23	0.19	46.6
32	R2	144	4.0	0.192	5.0	LOS A	0.9	6.3	0.19	0.23	0.19	42.1
Approach		336	4.0	0.192	2.3	NA	0.9	6.3	0.19	0.23	0.19	45.0
All Vehicles		522	4.0	0.192	2.7	NA	0.9	6.3	0.14	0.30	0.14	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2024 BS_PM_Holiday]

2024 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	102	4.0	0.096	8.3	LOS A	0.2	1.6	0.24	0.94	0.24	37.2
23	R2	7	4.0	0.096	9.0	LOS A	0.2	1.6	0.24	0.94	0.24	38.8
Approach		109	4.0	0.096	8.3	LOS A	0.2	1.6	0.24	0.94	0.24	37.3
NorthEast: Wainui Rd												
24	L2	12	4.0	0.169	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	309	4.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		321	4.0	0.169	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	215	4.0	0.183	0.7	LOS A	0.7	5.3	0.29	0.18	0.29	46.9
32	R2	89	4.0	0.183	6.0	LOS A	0.7	5.3	0.29	0.18	0.29	42.4
Approach		304	4.0	0.183	2.2	NA	0.7	5.3	0.29	0.18	0.29	45.9
All Vehicles		735	4.0	0.183	2.2	NA	0.7	5.3	0.15	0.22	0.15	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS_AM_Non-Holiday]

2044 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	92	4.0	0.085	7.9	LOS A	0.2	1.4	0.14	0.95	0.14	37.3
23	R2	12	4.0	0.085	9.1	LOS A	0.2	1.4	0.14	0.95	0.14	38.9
Approach		103	4.0	0.085	8.1	LOS A	0.2	1.4	0.14	0.95	0.14	37.5
NorthEast: Wainui Rd												
24	L2	6	4.0	0.072	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.0
25	T1	131	4.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
Approach		137	4.0	0.072	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.6
SouthWest: Wainui Rd												
31	T1	302	4.0	0.292	0.4	LOS A	1.4	10.3	0.24	0.23	0.24	46.5
32	R2	204	4.0	0.292	5.2	LOS A	1.4	10.3	0.24	0.23	0.24	42.0
Approach		506	4.0	0.292	2.3	NA	1.4	10.3	0.24	0.23	0.24	45.1
All Vehicles		746	4.0	0.292	2.7	NA	1.4	10.3	0.18	0.29	0.18	45.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS_PM_Non-Holiday]

2044 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	152	4.0	0.155	8.7	LOS A	0.4	2.7	0.31	0.97	0.31	36.9
23	R2	9	4.0	0.155	10.1	LOS B	0.4	2.7	0.31	0.97	0.31	38.6
Approach		161	4.0	0.155	8.8	LOS A	0.4	2.7	0.31	0.97	0.31	37.0
NorthEast: Wainui Rd												
24	L2	14	4.0	0.237	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	437	4.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		451	4.0	0.237	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	262	4.0	0.237	1.2	LOS A	1.1	7.7	0.37	0.20	0.37	46.5
32	R2	108	4.0	0.237	6.9	LOS A	1.1	7.7	0.37	0.20	0.37	41.9
Approach		371	4.0	0.237	2.8	NA	1.1	7.7	0.37	0.20	0.37	45.4
All Vehicles		982	4.0	0.237	2.6	NA	1.1	7.7	0.19	0.24	0.19	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS_AM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	101	4.0	0.095	7.9	LOS A	0.2	1.6	0.15	0.94	0.15	37.3
23	R2	13	4.0	0.095	9.4	LOS A	0.2	1.6	0.15	0.94	0.15	38.9
Approach		114	4.0	0.095	8.1	LOS A	0.2	1.6	0.15	0.94	0.15	37.5
NorthEast: Wainui Rd												
24	L2	6	4.0	0.080	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	145	4.0	0.080	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		152	4.0	0.080	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	322	4.0	0.316	0.4	LOS A	1.6	11.6	0.26	0.23	0.26	46.4
32	R2	222	4.0	0.316	5.3	LOS A	1.6	11.6	0.26	0.23	0.26	41.8
Approach		544	4.0	0.316	2.4	NA	1.6	11.6	0.26	0.23	0.26	44.9
All Vehicles		809	4.0	0.316	2.8	NA	1.6	11.6	0.20	0.29	0.20	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS_PM_Holiday]

2044 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	164	4.0	0.177	8.9	LOS A	0.4	3.1	0.34	0.98	0.34	36.7
23	R2	12	4.0	0.177	10.7	LOS B	0.4	3.1	0.34	0.98	0.34	38.4
Approach		176	4.0	0.177	9.0	LOS A	0.4	3.1	0.34	0.98	0.34	36.9
NorthEast: Wainui Rd												
24	L2	17	4.0	0.264	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	483	4.0	0.264	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		500	4.0	0.264	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	300	4.0	0.279	1.5	LOS A	1.4	10.0	0.40	0.21	0.41	46.1
32	R2	124	4.0	0.279	7.4	LOS A	1.4	10.0	0.40	0.21	0.41	41.4
Approach		424	4.0	0.279	3.2	NA	1.4	10.0	0.40	0.21	0.41	45.0
All Vehicles		1100	4.0	0.279	2.8	NA	1.4	10.0	0.21	0.24	0.21	46.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS+D (400 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	99	4.0	0.096	8.0	LOS A	0.2	1.6	0.15	0.94	0.15	37.1
23	R2	12	4.0	0.096	10.6	LOS B	0.2	1.6	0.15	0.94	0.15	38.8
Approach		111	4.0	0.096	8.2	LOS A	0.2	1.6	0.15	0.94	0.15	37.3
NorthEast: Wainui Rd												
24	L2	6	4.0	0.082	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	148	4.0	0.082	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		155	4.0	0.082	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	461	4.0	0.423	0.5	LOS A	2.3	16.7	0.28	0.21	0.28	46.5
32	R2	273	4.0	0.423	5.4	LOS A	2.3	16.7	0.28	0.21	0.28	42.0
Approach		734	4.0	0.423	2.3	NA	2.3	16.7	0.28	0.21	0.28	45.2
All Vehicles		999	4.0	0.423	2.6	NA	2.3	16.7	0.22	0.26	0.22	45.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS+D (400 dwellings)_PM_Non-Holiday]

2044 Baseline + Rezoning Traffic_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	220	4.0	0.248	9.4	LOS A	0.7	4.8	0.40	1.01	0.43	36.3
23	R2	9	4.0	0.248	11.7	LOS B	0.7	4.8	0.40	1.01	0.43	38.1
Approach		229	4.0	0.248	9.5	LOS A	0.7	4.8	0.40	1.01	0.43	36.4
NorthEast: Wainui Rd												
24	L2	14	4.0	0.321	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	48.2
25	T1	596	4.0	0.321	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		609	4.0	0.321	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.8
SouthWest: Wainui Rd												
31	T1	280	4.0	0.278	2.1	LOS A	1.5	11.2	0.45	0.23	0.49	45.2
32	R2	116	4.0	0.278	8.4	LOS A	1.5	11.2	0.45	0.23	0.49	40.3
Approach		396	4.0	0.278	4.0	NA	1.5	11.2	0.45	0.23	0.49	44.1
All Vehicles		1235	4.0	0.321	3.1	NA	1.5	11.2	0.22	0.27	0.24	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS+D (400 dwellings)_AM_Holiday]

2044 Baseline + Rezoning Traffic_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	108	4.0	0.107	8.0	LOS A	0.2	1.8	0.16	0.94	0.16	37.1
23	R2	13	4.0	0.107	11.0	LOS B	0.2	1.8	0.16	0.94	0.16	38.7
Approach		121	4.0	0.107	8.3	LOS A	0.2	1.8	0.16	0.94	0.16	37.3
NorthEast: Wainui Rd												
24	L2	6	4.0	0.089	4.6	LOS A	0.0	0.0	0.00	0.02	0.00	48.1
25	T1	163	4.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
Approach		169	4.0	0.089	0.2	NA	0.0	0.0	0.00	0.02	0.00	49.7
SouthWest: Wainui Rd												
31	T1	481	4.0	0.448	0.6	LOS A	2.6	18.5	0.31	0.22	0.31	46.4
32	R2	291	4.0	0.448	5.6	LOS A	2.6	18.5	0.31	0.22	0.31	41.8
Approach		772	4.0	0.448	2.4	NA	2.6	18.5	0.31	0.22	0.31	45.0
All Vehicles		1062	4.0	0.448	2.8	NA	2.6	18.5	0.24	0.27	0.24	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101vv [Wainui Rd / Whitley St_2044 BS+D (400 dwellings)_PM_Holiday]

2044 Baseline + Rezoning Traffic_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Whitley St												
21	L2	233	4.0	0.278	9.7	LOS A	0.8	5.7	0.44	1.03	0.50	36.0
23	R2	12	4.0	0.278	12.7	LOS B	0.8	5.7	0.44	1.03	0.50	37.8
Approach		244	4.0	0.278	9.8	LOS A	0.8	5.7	0.44	1.03	0.50	36.1
NorthEast: Wainui Rd												
24	L2	17	4.0	0.347	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	48.1
25	T1	642	4.0	0.347	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.8
Approach		659	4.0	0.347	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.7
SouthWest: Wainui Rd												
31	T1	318	4.0	0.328	2.8	LOS A	2.1	15.3	0.49	0.24	0.60	44.5
32	R2	132	4.0	0.328	9.3	LOS A	2.1	15.3	0.49	0.24	0.60	39.4
Approach		449	4.0	0.328	4.7	NA	2.1	15.3	0.49	0.24	0.60	43.3
All Vehicles		1353	4.0	0.347	3.4	NA	2.1	15.3	0.24	0.27	0.29	45.3

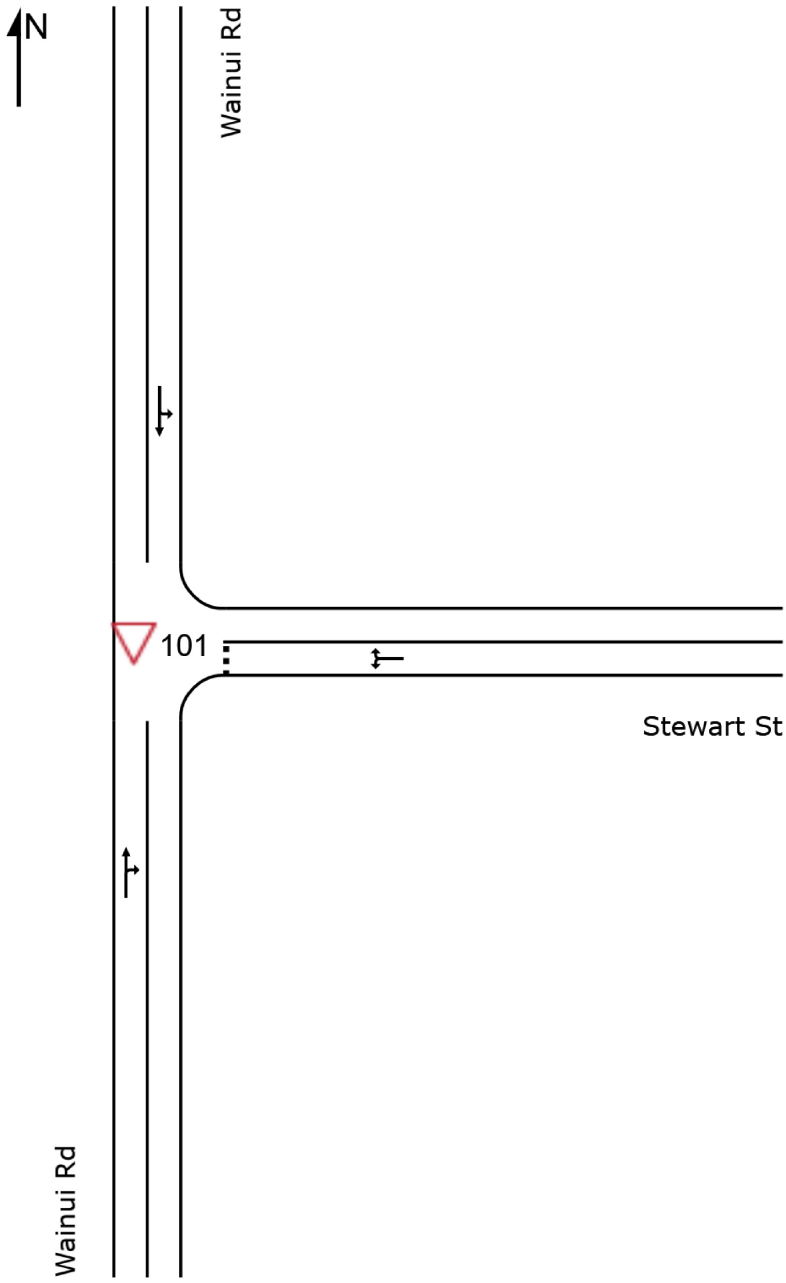
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

Wainui Road / Stewart Street

SITE LAYOUT

Site: 101 [Wainui Rd & Stewart St]

Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101 [Wainui Rd & Stewart St_2024 BS_AM_Non-Holiday]

2024 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	175	5.0	0.110	0.1	LOS A	0.2	1.4	0.07	0.08	0.07	49.4
3	R2	27	5.0	0.110	5.0	LOS A	0.2	1.4	0.07	0.08	0.07	48.3
Approach		202	5.0	0.110	0.7	NA	0.2	1.4	0.07	0.08	0.07	49.2
East: Stewart St												
4	L2	8	5.0	0.019	4.9	LOS A	0.1	0.5	0.22	0.54	0.22	46.0
6	R2	13	5.0	0.019	5.8	LOS A	0.1	0.5	0.22	0.54	0.22	45.6
Approach		21	5.0	0.019	5.4	LOS A	0.1	0.5	0.22	0.54	0.22	45.8
North: Wainui Rd												
7	L2	19	5.0	0.061	4.6	LOS A	0.0	0.0	0.00	0.09	0.00	48.9
8	T1	95	5.0	0.061	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.5
Approach		114	5.0	0.061	0.8	NA	0.0	0.0	0.00	0.09	0.00	49.4
All Vehicles		337	5.0	0.110	1.0	NA	0.2	1.4	0.06	0.11	0.06	49.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2024 BS_PM_Non-Holiday]

2024 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	186	5.0	0.108	0.1	LOS A	0.1	0.7	0.06	0.03	0.06	49.7
3	R2	12	5.0	0.108	5.7	LOS A	0.1	0.7	0.06	0.03	0.06	48.6
Approach		198	5.0	0.108	0.4	NA	0.1	0.7	0.06	0.03	0.06	49.6
East: Stewart St												
4	L2	36	5.0	0.063	5.5	LOS A	0.2	1.6	0.36	0.60	0.36	45.7
6	R2	27	5.0	0.063	6.7	LOS A	0.2	1.6	0.36	0.60	0.36	45.3
Approach		63	5.0	0.063	6.0	LOS A	0.2	1.6	0.36	0.60	0.36	45.5
North: Wainui Rd												
7	L2	26	5.0	0.147	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
8	T1	251	5.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.7
Approach		277	5.0	0.147	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.6
All Vehicles		538	5.0	0.147	1.1	NA	0.2	1.6	0.06	0.11	0.06	49.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2024 BS_AM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	192	5.0	0.120	0.1	LOS A	0.2	1.5	0.08	0.07	0.08	49.4
3	R2	28	5.0	0.120	5.1	LOS A	0.2	1.5	0.08	0.07	0.08	48.3
Approach		220	5.0	0.120	0.7	NA	0.2	1.5	0.08	0.07	0.08	49.3
East: Stewart St												
4	L2	9	5.0	0.023	4.9	LOS A	0.1	0.6	0.24	0.55	0.24	46.0
6	R2	15	5.0	0.023	6.0	LOS A	0.1	0.6	0.24	0.55	0.24	45.6
Approach		24	5.0	0.023	5.6	LOS A	0.1	0.6	0.24	0.55	0.24	45.7
North: Wainui Rd												
7	L2	21	5.0	0.068	4.6	LOS A	0.0	0.0	0.00	0.09	0.00	48.9
8	T1	106	5.0	0.068	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.5
Approach		127	5.0	0.068	0.8	NA	0.0	0.0	0.00	0.09	0.00	49.4
All Vehicles		372	5.0	0.120	1.1	NA	0.2	1.5	0.06	0.11	0.06	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2024 BS_PM_Holiday]

2024 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	216	5.0	0.125	0.1	LOS A	0.1	0.9	0.06	0.03	0.06	49.6
3	R2	14	5.0	0.125	5.9	LOS A	0.1	0.9	0.06	0.03	0.06	48.6
Approach		229	5.0	0.125	0.5	NA	0.1	0.9	0.06	0.03	0.06	49.6
East: Stewart St												
4	L2	38	5.0	0.075	5.6	LOS A	0.3	1.9	0.40	0.63	0.40	45.5
6	R2	33	5.0	0.075	7.2	LOS A	0.3	1.9	0.40	0.63	0.40	45.1
Approach		71	5.0	0.075	6.4	LOS A	0.3	1.9	0.40	0.63	0.40	45.3
North: Wainui Rd												
7	L2	31	5.0	0.168	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
8	T1	284	5.0	0.168	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.7
Approach		315	5.0	0.168	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.6
All Vehicles		615	5.0	0.168	1.1	NA	0.3	1.9	0.07	0.11	0.07	49.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS_AM_Non-Holiday]

2044 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	280	5.0	0.188	0.2	LOS A	0.4	3.2	0.12	0.10	0.12	49.1
3	R2	58	5.0	0.188	5.2	LOS A	0.4	3.2	0.12	0.10	0.12	48.1
Approach		338	5.0	0.188	1.0	NA	0.4	3.2	0.12	0.10	0.12	49.0
East: Stewart St												
4	L2	15	5.0	0.034	5.0	LOS A	0.1	0.8	0.28	0.57	0.28	45.7
6	R2	18	5.0	0.034	6.8	LOS A	0.1	0.8	0.28	0.57	0.28	45.3
Approach		33	5.0	0.034	6.0	LOS A	0.1	0.8	0.28	0.57	0.28	45.5
North: Wainui Rd												
7	L2	26	5.0	0.086	4.6	LOS A	0.0	0.0	0.00	0.09	0.00	48.9
8	T1	135	5.0	0.086	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.5
Approach		161	5.0	0.086	0.8	NA	0.0	0.0	0.00	0.09	0.00	49.4
All Vehicles		532	5.0	0.188	1.3	NA	0.4	3.2	0.09	0.12	0.09	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS_PM_Non-Holiday]

2044 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	259	5.0	0.154	0.2	LOS A	0.2	1.5	0.09	0.04	0.09	49.5
3	R2	19	5.0	0.154	6.6	LOS A	0.2	1.5	0.09	0.04	0.09	48.5
Approach		278	5.0	0.154	0.7	NA	0.2	1.5	0.09	0.04	0.09	49.5
East: Stewart St												
4	L2	69	5.0	0.127	6.2	LOS A	0.5	3.4	0.47	0.69	0.47	45.2
6	R2	39	5.0	0.127	8.6	LOS A	0.5	3.4	0.47	0.69	0.47	44.7
Approach		108	5.0	0.127	7.0	LOS A	0.5	3.4	0.47	0.69	0.47	45.0
North: Wainui Rd												
7	L2	37	5.0	0.223	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
8	T1	383	5.0	0.223	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.7
Approach		420	5.0	0.223	0.4	NA	0.0	0.0	0.00	0.05	0.00	49.6
All Vehicles		806	5.0	0.223	1.4	NA	0.5	3.4	0.09	0.13	0.09	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS_AM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	302	5.0	0.201	0.2	LOS A	0.5	3.4	0.12	0.09	0.12	49.2
3	R2	59	5.0	0.201	5.3	LOS A	0.5	3.4	0.12	0.09	0.12	48.1
Approach		361	5.0	0.201	1.0	NA	0.5	3.4	0.12	0.09	0.12	49.0
East: Stewart St												
4	L2	17	5.0	0.041	5.1	LOS A	0.1	1.0	0.30	0.58	0.30	45.6
6	R2	21	5.0	0.041	7.1	LOS A	0.1	1.0	0.30	0.58	0.30	45.2
Approach		38	5.0	0.041	6.2	LOS A	0.1	1.0	0.30	0.58	0.30	45.4
North: Wainui Rd												
7	L2	29	5.0	0.096	4.6	LOS A	0.0	0.0	0.00	0.09	0.00	48.9
8	T1	151	5.0	0.096	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.5
Approach		180	5.0	0.096	0.8	NA	0.0	0.0	0.00	0.09	0.00	49.4
All Vehicles		579	5.0	0.201	1.3	NA	0.5	3.4	0.10	0.12	0.10	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS_PM_Holiday]

2044 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	300	5.0	0.180	0.3	LOS A	0.3	1.9	0.10	0.04	0.10	49.5
3	R2	22	5.0	0.180	7.0	LOS A	0.3	1.9	0.10	0.04	0.10	48.4
Approach		322	5.0	0.180	0.7	NA	0.3	1.9	0.10	0.04	0.10	49.4
East: Stewart St												
4	L2	72	5.0	0.154	6.4	LOS A	0.6	4.0	0.51	0.72	0.51	44.8
6	R2	46	5.0	0.154	9.6	LOS A	0.6	4.0	0.51	0.72	0.51	44.4
Approach		118	5.0	0.154	7.7	LOS A	0.6	4.0	0.51	0.72	0.51	44.6
North: Wainui Rd												
7	L2	42	5.0	0.250	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	49.1
8	T1	428	5.0	0.250	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.7
Approach		471	5.0	0.250	0.4	NA	0.0	0.0	0.00	0.05	0.00	49.6
All Vehicles		911	5.0	0.250	1.5	NA	0.6	4.0	0.10	0.13	0.10	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS+D (400 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	388	5.0	0.281	0.3	LOS A	0.9	6.6	0.17	0.13	0.17	48.9
3	R2	109	5.0	0.281	5.4	LOS A	0.9	6.6	0.17	0.13	0.17	47.8
Approach		498	5.0	0.281	1.4	NA	0.9	6.6	0.17	0.13	0.17	48.6
East: Stewart St												
4	L2	20	5.0	0.043	5.1	LOS A	0.1	1.1	0.29	0.58	0.29	45.4
6	R2	18	5.0	0.043	8.2	LOS A	0.1	1.1	0.29	0.58	0.29	45.0
Approach		38	5.0	0.043	6.5	LOS A	0.1	1.1	0.29	0.58	0.29	45.2
North: Wainui Rd												
7	L2	26	5.0	0.092	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	49.0
8	T1	146	5.0	0.092	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach		173	5.0	0.092	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.4
All Vehicles		708	5.0	0.281	1.5	NA	0.9	6.6	0.14	0.14	0.14	48.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS+D (400 dwellings)_PM_Non-Holiday]

2044 Baseline + Rezoning Traffic_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	271	5.0	0.168	0.4	LOS A	0.3	2.2	0.13	0.05	0.13	49.3
3	R2	24	5.0	0.168	7.4	LOS A	0.3	2.2	0.13	0.05	0.13	48.3
Approach		295	5.0	0.168	1.0	NA	0.3	2.2	0.13	0.05	0.13	49.2
East: Stewart St												
4	L2	121	5.0	0.202	6.9	LOS A	0.8	5.5	0.54	0.75	0.54	44.8
6	R2	39	5.0	0.202	10.2	LOS B	0.8	5.5	0.54	0.75	0.54	44.4
Approach		160	5.0	0.202	7.7	LOS A	0.8	5.5	0.54	0.75	0.54	44.7
North: Wainui Rd												
7	L2	37	5.0	0.281	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.2
8	T1	492	5.0	0.281	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
Approach		528	5.0	0.281	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.7
All Vehicles		983	5.0	0.281	1.7	NA	0.8	5.5	0.13	0.16	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS+D (400 dwellings)_AM_Holiday]

2044 Baseline + Rezoning Traffic_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	411	5.0	0.295	0.3	LOS A	0.9	6.9	0.18	0.12	0.18	48.9
3	R2	111	5.0	0.295	5.5	LOS A	0.9	6.9	0.18	0.12	0.18	47.8
Approach		521	5.0	0.295	1.4	NA	0.9	6.9	0.18	0.12	0.18	48.6
East: Stewart St												
4	L2	21	5.0	0.066	5.1	LOS A	0.2	1.6	0.35	0.63	0.35	45.1
6	R2	29	5.0	0.066	8.6	LOS A	0.2	1.6	0.35	0.63	0.35	44.7
Approach		51	5.0	0.066	7.2	LOS A	0.2	1.6	0.35	0.63	0.35	44.8
North: Wainui Rd												
7	L2	29	5.0	0.102	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.9
8	T1	162	5.0	0.102	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach		192	5.0	0.102	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.4
All Vehicles		763	5.0	0.295	1.6	NA	0.9	6.9	0.15	0.15	0.15	48.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Stewart St_2044 BS+D (400 dwellings)_PM_Holiday]

2044 Baseline + Rezoning Traffic_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	312	5.0	0.196	0.5	LOS A	0.4	2.8	0.14	0.05	0.14	49.3
3	R2	27	5.0	0.196	7.9	LOS A	0.4	2.8	0.14	0.05	0.14	48.2
Approach		339	5.0	0.196	1.1	NA	0.4	2.8	0.14	0.05	0.14	49.2
East: Stewart St												
4	L2	123	5.0	0.240	7.4	LOS A	0.9	6.7	0.58	0.79	0.60	44.3
6	R2	46	5.0	0.240	11.6	LOS B	0.9	6.7	0.58	0.79	0.60	43.9
Approach		169	5.0	0.240	8.5	LOS A	0.9	6.7	0.58	0.79	0.60	44.2
North: Wainui Rd												
7	L2	42	5.0	0.308	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.2
8	T1	537	5.0	0.308	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
Approach		579	5.0	0.308	0.4	NA	0.0	0.0	0.00	0.04	0.00	49.7
All Vehicles		1087	5.0	0.308	1.9	NA	0.9	6.7	0.13	0.16	0.14	48.6

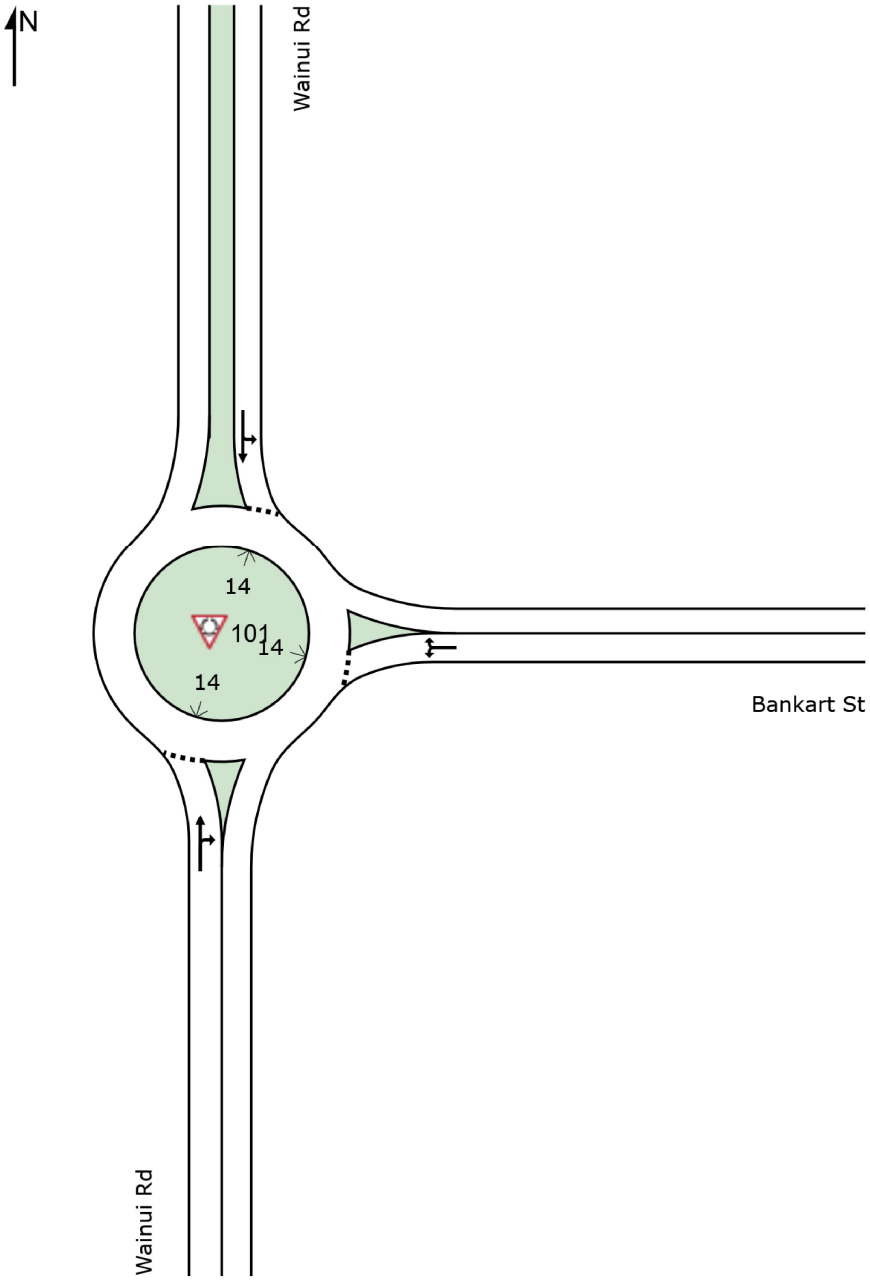
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

Wainui Road / Bankart Street

SITE LAYOUT

Site: 101 [Wainui Rd & Bankart St]

Site Category: (None)
Roundabout



MOVEMENT SUMMARY

Site: 101 [Wainui Rd & Bankart St_2024 BS_PM_Non-Holiday]

2024 Baseline_PM_Non-Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	144	5.0	0.139	3.3	LOS A	0.8	5.7	0.07	0.46	0.07	39.5
3	R2	67	5.0	0.139	7.1	LOS A	0.8	5.7	0.07	0.46	0.07	42.4
Approach		212	5.0	0.139	4.5	LOS A	0.8	5.7	0.07	0.46	0.07	40.6
East: Bankart St												
4	L2	111	5.0	0.109	4.2	LOS A	0.6	4.5	0.37	0.51	0.37	39.7
6	R2	9	5.0	0.109	8.1	LOS A	0.6	4.5	0.37	0.51	0.37	35.5
Approach		120	5.0	0.109	4.5	LOS A	0.6	4.5	0.37	0.51	0.37	39.3
North: Wainui Rd												
7	L2	47	5.0	0.158	3.7	LOS A	0.9	6.8	0.25	0.40	0.25	40.6
8	T1	154	5.0	0.158	3.7	LOS A	0.9	6.8	0.25	0.40	0.25	39.8
Approach		201	5.0	0.158	3.7	LOS A	0.9	6.8	0.25	0.40	0.25	40.1
All Vehicles		533	5.0	0.158	4.2	LOS A	0.9	6.8	0.20	0.45	0.20	40.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Bankart St_2024 BS_PM_Holiday]

2024 Baseline_PM_Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	167	5.0	0.161	3.3	LOS A	0.9	6.9	0.08	0.46	0.08	39.4
3	R2	78	5.0	0.161	7.1	LOS A	0.9	6.9	0.08	0.46	0.08	42.4
Approach		245	5.0	0.161	4.5	LOS A	0.9	6.9	0.08	0.46	0.08	40.5
East: Bankart St												
4	L2	125	5.0	0.127	4.4	LOS A	0.7	5.3	0.40	0.52	0.40	39.5
6	R2	12	5.0	0.127	8.2	LOS A	0.7	5.3	0.40	0.52	0.40	35.3
Approach		137	5.0	0.127	4.7	LOS A	0.7	5.3	0.40	0.52	0.40	39.1
North: Wainui Rd												
7	L2	55	5.0	0.182	3.8	LOS A	1.1	8.1	0.27	0.41	0.27	40.4
8	T1	174	5.0	0.182	3.8	LOS A	1.1	8.1	0.27	0.41	0.27	39.5
Approach		228	5.0	0.182	3.8	LOS A	1.1	8.1	0.27	0.41	0.27	39.8
All Vehicles		611	5.0	0.182	4.3	LOS A	1.1	8.1	0.22	0.46	0.22	39.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Bankart St_2044 BS_PM_Non-Holiday]

2044 Baseline_PM_Non-Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	201	5.0	0.195	3.3	LOS A	1.2	8.8	0.09	0.46	0.09	39.2
3	R2	95	5.0	0.195	7.1	LOS A	1.2	8.8	0.09	0.46	0.09	42.2
Approach		296	5.0	0.195	4.6	LOS A	1.2	8.8	0.09	0.46	0.09	40.4
East: Bankart St												
4	L2	169	5.0	0.180	4.9	LOS A	1.1	7.9	0.48	0.57	0.48	39.1
6	R2	14	5.0	0.180	8.7	LOS A	1.1	7.9	0.48	0.57	0.48	35.0
Approach		183	5.0	0.180	5.2	LOS A	1.1	7.9	0.48	0.57	0.48	38.8
North: Wainui Rd												
7	L2	65	5.0	0.241	3.9	LOS A	1.5	11.3	0.32	0.43	0.32	40.0
8	T1	233	5.0	0.241	4.0	LOS A	1.5	11.3	0.32	0.43	0.32	39.0
Approach		298	5.0	0.241	4.0	LOS A	1.5	11.3	0.32	0.43	0.32	39.3
All Vehicles		777	5.0	0.241	4.5	LOS A	1.5	11.3	0.27	0.47	0.27	39.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Bankart St_2044 BS_PM_Holiday]

2044 Baseline_PM_Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	233	5.0	0.226	3.4	LOS A	1.5	10.7	0.11	0.45	0.11	39.1
3	R2	107	5.0	0.226	7.2	LOS A	1.5	10.7	0.11	0.45	0.11	42.1
Approach		340	5.0	0.226	4.6	LOS A	1.5	10.7	0.11	0.45	0.11	40.3
East: Bankart St												
4	L2	191	5.0	0.211	5.1	LOS A	1.3	9.5	0.52	0.59	0.52	38.8
6	R2	17	5.0	0.211	9.0	LOS A	1.3	9.5	0.52	0.59	0.52	34.8
Approach		207	5.0	0.211	5.4	LOS A	1.3	9.5	0.52	0.59	0.52	38.5
North: Wainui Rd												
7	L2	76	5.0	0.275	4.0	LOS A	1.8	13.4	0.35	0.44	0.35	39.8
8	T1	260	5.0	0.275	4.1	LOS A	1.8	13.4	0.35	0.44	0.35	38.7
Approach		336	5.0	0.275	4.1	LOS A	1.8	13.4	0.35	0.44	0.35	39.0
All Vehicles		883	5.0	0.275	4.6	LOS A	1.8	13.4	0.30	0.48	0.30	39.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Bankart St_2044 BS+D (400 dwellings)_PM_Non-Holiday]

2044 Baseline + Rezoning Traffic_PM_Non-Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	208	5.0	0.203	3.3	LOS A	1.3	9.6	0.10	0.46	0.10	39.2
3	R2	100	5.0	0.203	7.1	LOS A	1.3	9.6	0.10	0.46	0.10	42.2
Approach		308	5.0	0.203	4.6	LOS A	1.3	9.6	0.10	0.46	0.10	40.4
East: Bankart St												
4	L2	215	5.0	0.240	5.4	LOS A	1.5	10.9	0.56	0.62	0.56	38.6
6	R2	14	5.0	0.240	9.3	LOS A	1.5	10.9	0.56	0.62	0.56	34.6
Approach		228	5.0	0.240	5.7	LOS A	1.5	10.9	0.56	0.62	0.56	38.3
North: Wainui Rd												
7	L2	65	5.0	0.290	4.0	LOS A	2.0	14.3	0.34	0.43	0.34	39.8
8	T1	295	5.0	0.290	4.1	LOS A	2.0	14.3	0.34	0.43	0.34	38.8
Approach		360	5.0	0.290	4.0	LOS A	2.0	14.3	0.34	0.43	0.34	39.0
All Vehicles		897	5.0	0.290	4.6	LOS A	2.0	14.3	0.31	0.49	0.31	39.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Wainui Rd & Bankart St_2044 BS+D (400 dwellings)_PM_Holiday]

2044 Baseline + Rezoning Traffic_PM_Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wainui Rd												
2	T1	240	5.0	0.234	3.4	LOS A	1.6	11.5	0.12	0.45	0.12	39.0
3	R2	113	5.0	0.234	7.2	LOS A	1.6	11.5	0.12	0.45	0.12	42.1
Approach		353	5.0	0.234	4.6	LOS A	1.6	11.5	0.12	0.45	0.12	40.2
East: Bankart St												
4	L2	236	5.0	0.272	5.7	LOS A	1.8	12.8	0.60	0.65	0.60	38.1
6	R2	17	5.0	0.272	9.6	LOS A	1.8	12.8	0.60	0.65	0.60	34.2
Approach		253	5.0	0.272	6.0	LOS A	1.8	12.8	0.60	0.65	0.60	37.9
North: Wainui Rd												
7	L2	76	5.0	0.326	4.1	LOS A	2.3	16.7	0.38	0.45	0.38	39.6
8	T1	322	5.0	0.326	4.2	LOS A	2.3	16.7	0.38	0.45	0.38	38.4
Approach		398	5.0	0.326	4.2	LOS A	2.3	16.7	0.38	0.45	0.38	38.7
All Vehicles		1003	5.0	0.326	4.8	LOS A	2.3	16.7	0.34	0.50	0.34	39.0

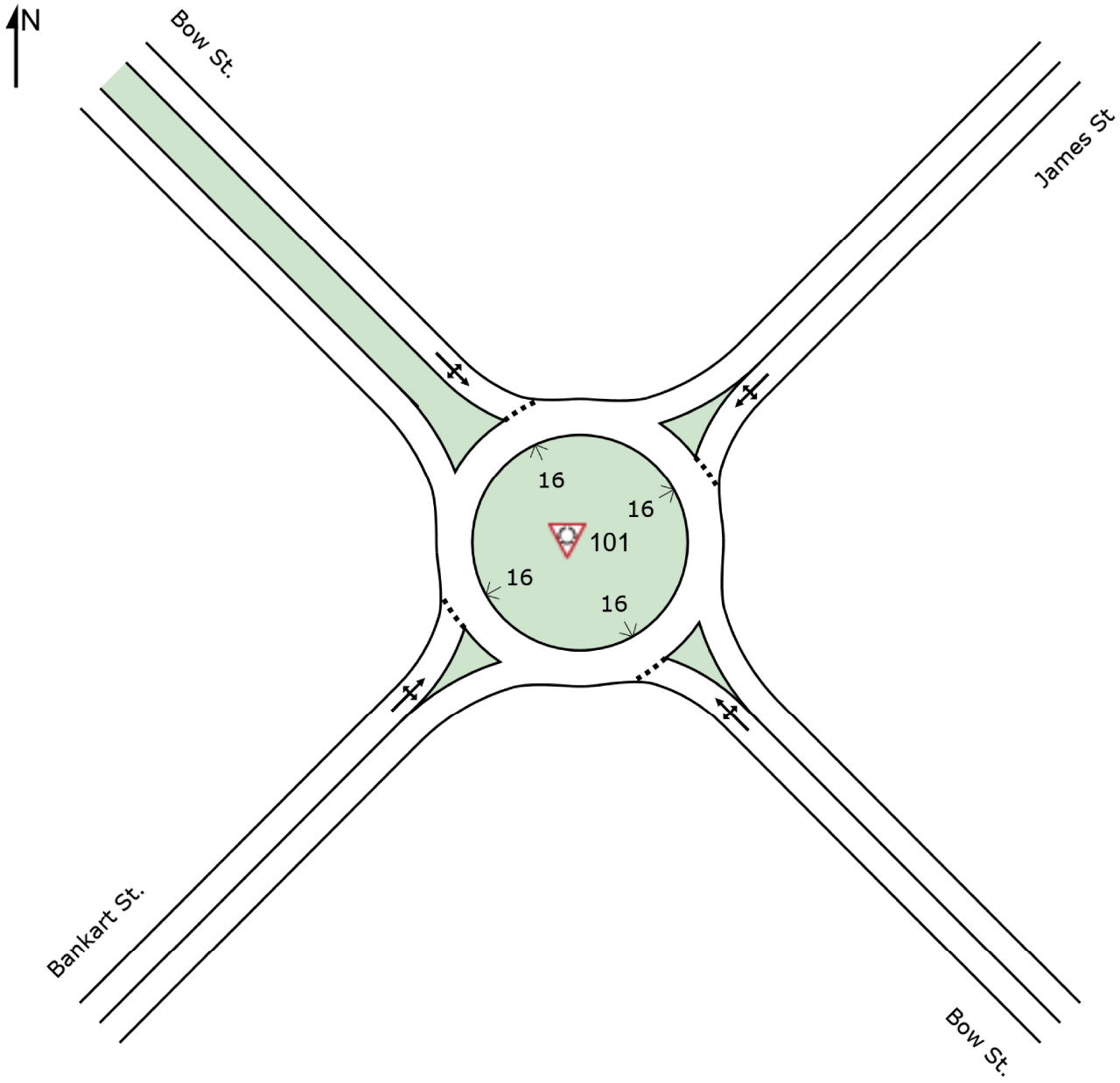
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay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

Bankart Street / Bow Street

SITE LAYOUT

Site: 101 [Bow St/ Bankart St]

Site Category: (None)
Roundabout



MOVEMENT SUMMARY

Site: 101 [Bow St/ Bankart St intersection_2024 BS_AM_Non-Holiday]

2024 Baseline_AM_Non-Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bow St.												
4	L2	42	5.0	0.116	3.3	LOS A	0.7	5.1	0.15	0.40	0.15	41.6
5	T1	101	5.0	0.116	3.3	LOS A	0.7	5.1	0.15	0.40	0.15	43.8
6	R2	16	5.0	0.116	7.3	LOS A	0.7	5.1	0.15	0.40	0.15	36.1
Approach		159	5.0	0.116	3.7	LOS A	0.7	5.1	0.15	0.40	0.15	42.6
NorthEast: James St												
7	L2	27	5.0	0.044	3.9	LOS A	0.2	1.7	0.32	0.48	0.32	35.9
8	T1	11	5.0	0.044	3.9	LOS A	0.2	1.7	0.32	0.48	0.32	42.0
9	R2	12	5.0	0.044	7.9	LOS A	0.2	1.7	0.32	0.48	0.32	41.8
Approach		49	5.0	0.044	4.8	LOS A	0.2	1.7	0.32	0.48	0.32	38.9
NorthWest: Bow St.												
10	L2	24	5.0	0.087	3.6	LOS A	0.5	3.7	0.26	0.41	0.26	40.3
11	T1	73	5.0	0.087	3.6	LOS A	0.5	3.7	0.26	0.41	0.26	42.8
12	R2	8	5.0	0.087	7.6	LOS A	0.5	3.7	0.26	0.41	0.26	44.6
Approach		105	5.0	0.087	3.9	LOS A	0.5	3.7	0.26	0.41	0.26	42.4
SouthWest: Bankart St.												
1	L2	6	5.0	0.057	3.9	LOS A	0.3	2.3	0.33	0.55	0.33	40.0
2	T1	14	5.0	0.057	3.9	LOS A	0.3	2.3	0.33	0.55	0.33	39.4
3	R2	44	5.0	0.057	8.0	LOS A	0.3	2.3	0.33	0.55	0.33	36.7
Approach		64	5.0	0.057	6.7	LOS A	0.3	2.3	0.33	0.55	0.33	37.6
All Vehicles		378	5.0	0.116	4.4	LOS A	0.7	5.1	0.23	0.44	0.23	41.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St/ Bankart St intersection_2024 BS_AM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bow St.												
4	L2	47	5.0	0.130	3.3	LOS A	0.8	5.8	0.17	0.40	0.17	41.5
5	T1	114	5.0	0.130	3.3	LOS A	0.8	5.8	0.17	0.40	0.17	43.8
6	R2	17	5.0	0.130	7.4	LOS A	0.8	5.8	0.17	0.40	0.17	36.0
Approach		178	5.0	0.130	3.7	LOS A	0.8	5.8	0.17	0.40	0.17	42.5
NorthEast: James St												
7	L2	32	5.0	0.051	4.0	LOS A	0.3	2.0	0.34	0.49	0.34	35.8
8	T1	12	5.0	0.051	4.0	LOS A	0.3	2.0	0.34	0.49	0.34	41.9
9	R2	14	5.0	0.051	8.0	LOS A	0.3	2.0	0.34	0.49	0.34	41.6
Approach		57	5.0	0.051	4.9	LOS A	0.3	2.0	0.34	0.49	0.34	38.7
NorthWest: Bow St.												
10	L2	24	5.0	0.095	3.6	LOS A	0.6	4.1	0.27	0.41	0.27	40.2
11	T1	81	5.0	0.095	3.6	LOS A	0.6	4.1	0.27	0.41	0.27	42.7
12	R2	9	5.0	0.095	7.7	LOS A	0.6	4.1	0.27	0.41	0.27	44.5
Approach		115	5.0	0.095	4.0	LOS A	0.6	4.1	0.27	0.41	0.27	42.3
SouthWest: Bankart St.												
1	L2	7	5.0	0.064	4.0	LOS A	0.4	2.6	0.35	0.55	0.35	39.9
2	T1	16	5.0	0.064	4.0	LOS A	0.4	2.6	0.35	0.55	0.35	39.4
3	R2	48	5.0	0.064	8.1	LOS A	0.4	2.6	0.35	0.55	0.35	36.6
Approach		72	5.0	0.064	6.8	LOS A	0.4	2.6	0.35	0.55	0.35	37.6
All Vehicles		421	5.0	0.130	4.4	LOS A	0.8	5.8	0.25	0.44	0.25	41.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St/ Bankart St intersection_2044 BS_AM_Non-Holiday]

2044 Baseline_AM_Non-Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bow St.												
4	L2	59	5.0	0.162	3.4	LOS A	1.0	7.5	0.20	0.41	0.20	41.3
5	T1	138	5.0	0.162	3.4	LOS A	1.0	7.5	0.20	0.41	0.20	43.5
6	R2	22	5.0	0.162	7.4	LOS A	1.0	7.5	0.20	0.41	0.20	35.7
Approach		219	5.0	0.162	3.8	LOS A	1.0	7.5	0.20	0.41	0.20	42.2
NorthEast: James St												
7	L2	39	5.0	0.066	4.3	LOS A	0.4	2.7	0.40	0.51	0.40	35.4
8	T1	15	5.0	0.066	4.3	LOS A	0.4	2.7	0.40	0.51	0.40	41.5
9	R2	17	5.0	0.066	8.3	LOS A	0.4	2.7	0.40	0.51	0.40	41.3
Approach		71	5.0	0.066	5.2	LOS A	0.4	2.7	0.40	0.51	0.40	38.4
NorthWest: Bow St.												
10	L2	34	5.0	0.126	3.8	LOS A	0.8	5.6	0.33	0.44	0.33	39.7
11	T1	100	5.0	0.126	3.9	LOS A	0.8	5.6	0.33	0.44	0.33	42.2
12	R2	13	5.0	0.126	7.9	LOS A	0.8	5.6	0.33	0.44	0.33	44.1
Approach		146	5.0	0.126	4.2	LOS A	0.8	5.6	0.33	0.44	0.33	41.8
SouthWest: Bankart St.												
1	L2	9	5.0	0.092	4.3	LOS A	0.5	3.8	0.40	0.58	0.40	39.6
2	T1	20	5.0	0.092	4.3	LOS A	0.5	3.8	0.40	0.58	0.40	39.0
3	R2	69	5.0	0.092	8.3	LOS A	0.5	3.8	0.40	0.58	0.40	36.3
Approach		99	5.0	0.092	7.1	LOS A	0.5	3.8	0.40	0.58	0.40	37.2
All Vehicles		535	5.0	0.162	4.7	LOS A	1.0	7.5	0.30	0.46	0.30	40.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St/ Bankart St intersection_2044 BS_AM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bow St.												
4	L2	66	5.0	0.183	3.4	LOS A	1.2	8.7	0.22	0.41	0.22	41.1
5	T1	155	5.0	0.183	3.4	LOS A	1.2	8.7	0.22	0.41	0.22	43.3
6	R2	24	5.0	0.183	7.5	LOS A	1.2	8.7	0.22	0.41	0.22	35.5
Approach		245	5.0	0.183	3.8	LOS A	1.2	8.7	0.22	0.41	0.22	42.0
NorthEast: James St												
7	L2	43	5.0	0.076	4.4	LOS A	0.4	3.1	0.42	0.53	0.42	35.2
8	T1	17	5.0	0.076	4.4	LOS A	0.4	3.1	0.42	0.53	0.42	41.3
9	R2	20	5.0	0.076	8.5	LOS A	0.4	3.1	0.42	0.53	0.42	41.1
Approach		80	5.0	0.076	5.4	LOS A	0.4	3.1	0.42	0.53	0.42	38.3
NorthWest: Bow St.												
10	L2	39	5.0	0.142	3.9	LOS A	0.9	6.4	0.36	0.45	0.36	39.6
11	T1	111	5.0	0.142	3.9	LOS A	0.9	6.4	0.36	0.45	0.36	42.0
12	R2	14	5.0	0.142	8.0	LOS A	0.9	6.4	0.36	0.45	0.36	44.0
Approach		163	5.0	0.142	4.3	LOS A	0.9	6.4	0.36	0.45	0.36	41.7
SouthWest: Bankart St.												
1	L2	12	5.0	0.104	4.4	LOS A	0.6	4.3	0.43	0.59	0.43	39.6
2	T1	22	5.0	0.104	4.4	LOS A	0.6	4.3	0.43	0.59	0.43	38.9
3	R2	76	5.0	0.104	8.5	LOS A	0.6	4.3	0.43	0.59	0.43	36.2
Approach		109	5.0	0.104	7.3	LOS A	0.6	4.3	0.43	0.59	0.43	37.1
All Vehicles		598	5.0	0.183	4.8	LOS A	1.2	8.7	0.32	0.47	0.32	40.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St/ Bankart St intersection_2044 BS+D (400 dwellings)_AM_Non-Holiday]

2044 Baseline + Development Tarffic_AM_Non-Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bow St.												
4	L2	61	5.0	0.164	3.4	LOS A	1.0	7.6	0.20	0.41	0.20	41.3
5	T1	138	5.0	0.164	3.4	LOS A	1.0	7.6	0.20	0.41	0.20	43.5
6	R2	22	5.0	0.164	7.4	LOS A	1.0	7.6	0.20	0.41	0.20	35.7
Approach		221	5.0	0.164	3.8	LOS A	1.0	7.6	0.20	0.41	0.20	42.2
NorthEast: James St												
7	L2	39	5.0	0.067	4.4	LOS A	0.4	2.7	0.42	0.52	0.42	35.2
8	T1	15	5.0	0.067	4.4	LOS A	0.4	2.7	0.42	0.52	0.42	41.4
9	R2	17	5.0	0.067	8.5	LOS A	0.4	2.7	0.42	0.52	0.42	41.1
Approach		71	5.0	0.067	5.4	LOS A	0.4	2.7	0.42	0.52	0.42	38.2
NorthWest: Bow St.												
10	L2	34	5.0	0.130	4.0	LOS A	0.8	5.8	0.37	0.46	0.37	39.5
11	T1	100	5.0	0.130	4.0	LOS A	0.8	5.8	0.37	0.46	0.37	41.9
12	R2	13	5.0	0.130	8.1	LOS A	0.8	5.8	0.37	0.46	0.37	43.8
Approach		146	5.0	0.130	4.4	LOS A	0.8	5.8	0.37	0.46	0.37	41.6
SouthWest: Bankart St.												
1	L2	9	5.0	0.113	4.3	LOS A	0.6	4.7	0.40	0.59	0.40	39.4
2	T1	20	5.0	0.113	4.3	LOS A	0.6	4.7	0.40	0.59	0.40	38.7
3	R2	93	5.0	0.113	8.4	LOS A	0.6	4.7	0.40	0.59	0.40	36.1
Approach		122	5.0	0.113	7.4	LOS A	0.6	4.7	0.40	0.59	0.40	36.8
All Vehicles		560	5.0	0.164	4.9	LOS A	1.0	7.6	0.32	0.47	0.32	40.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St/ Bankart St intersection_2044 BS+D (400 dwellings)_AM_Holiday]

2044 Baseline + Development Tarffic_AM_Holiday Period
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bow St.												
4	L2	68	5.0	0.185	3.4	LOS A	1.2	8.8	0.22	0.41	0.22	41.1
5	T1	155	5.0	0.185	3.4	LOS A	1.2	8.8	0.22	0.41	0.22	43.3
6	R2	24	5.0	0.185	7.5	LOS A	1.2	8.8	0.22	0.41	0.22	35.5
Approach		247	5.0	0.185	3.8	LOS A	1.2	8.8	0.22	0.41	0.22	42.0
NorthEast: James St												
7	L2	43	5.0	0.078	4.5	LOS A	0.4	3.2	0.44	0.54	0.44	35.0
8	T1	17	5.0	0.078	4.6	LOS A	0.4	3.2	0.44	0.54	0.44	41.2
9	R2	20	5.0	0.078	8.6	LOS A	0.4	3.2	0.44	0.54	0.44	40.9
Approach		80	5.0	0.078	5.6	LOS A	0.4	3.2	0.44	0.54	0.44	38.1
NorthWest: Bow St.												
10	L2	39	5.0	0.147	4.1	LOS A	0.9	6.6	0.39	0.47	0.39	39.4
11	T1	111	5.0	0.147	4.1	LOS A	0.9	6.6	0.39	0.47	0.39	41.8
12	R2	14	5.0	0.147	8.2	LOS A	0.9	6.6	0.39	0.47	0.39	43.7
Approach		163	5.0	0.147	4.5	LOS A	0.9	6.6	0.39	0.47	0.39	41.4
SouthWest: Bankart St.												
1	L2	12	5.0	0.126	4.5	LOS A	0.7	5.3	0.43	0.60	0.43	39.3
2	T1	22	5.0	0.126	4.5	LOS A	0.7	5.3	0.43	0.60	0.43	38.6
3	R2	99	5.0	0.126	8.5	LOS A	0.7	5.3	0.43	0.60	0.43	36.0
Approach		133	5.0	0.126	7.5	LOS A	0.7	5.3	0.43	0.60	0.43	36.7
All Vehicles		623	5.0	0.185	5.0	LOS A	1.2	8.8	0.34	0.48	0.34	40.1

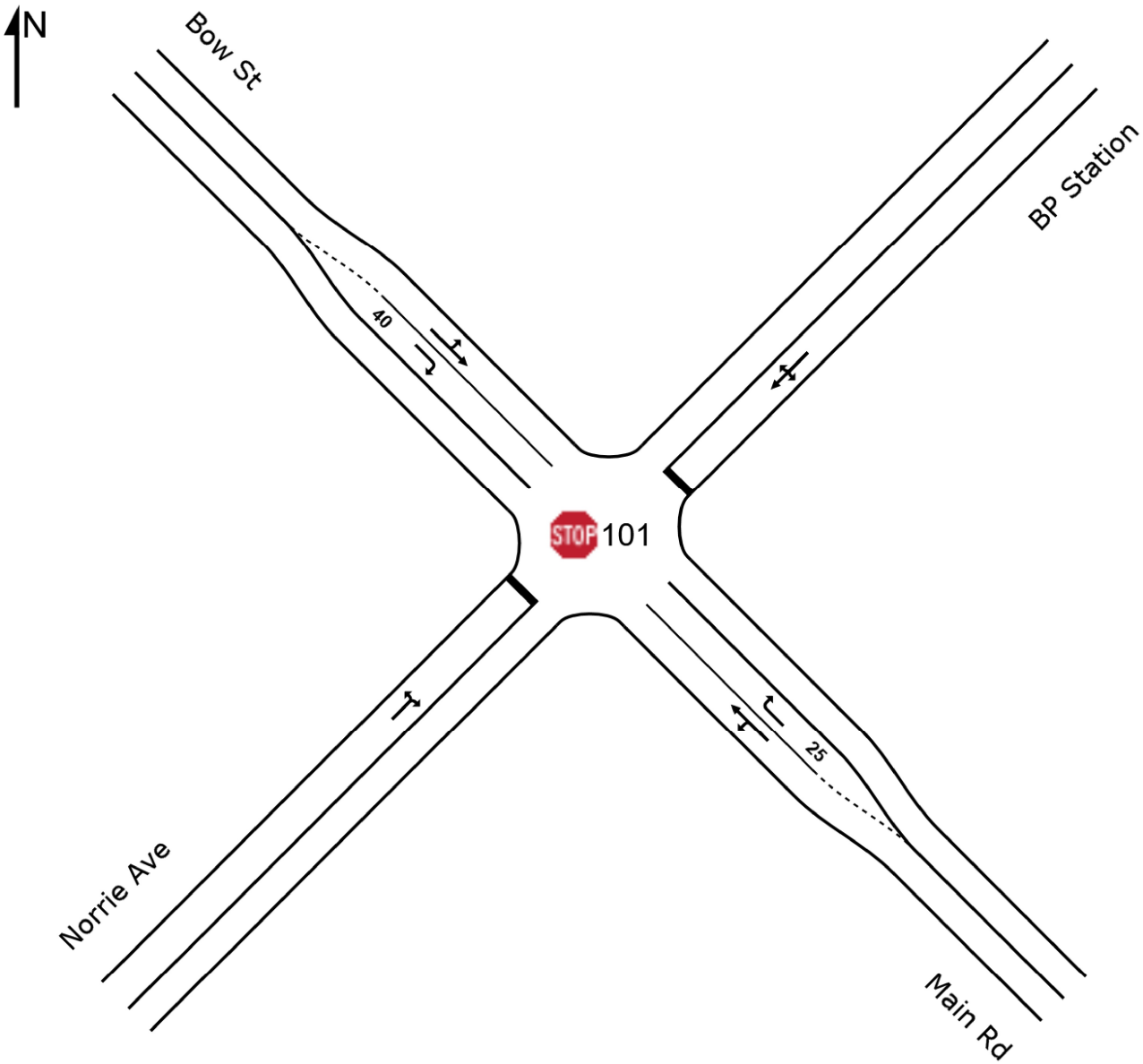
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay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

Bow Street/ Main Road / Norrie Avenue

SITE LAYOUT

Site: 101 [Bow St & Norrie Ave]

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



MOVEMENT SUMMARY

Site: 101 [Bow St & Norrie Ave_2024 BS_AM_Non-Holiday]

2024 Baseline_AM_Non-Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	121	5.0	0.144	4.6	LOS A	0.0	0.0	0.00	0.25	0.00	28.3
5	T1	140	5.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.25	0.00	44.4
23	R2	18	5.0	0.011	5.0	LOS A	0.1	0.4	0.23	0.52	0.23	43.3
Approach		279	5.0	0.144	2.3	NA	0.1	0.4	0.01	0.27	0.01	36.9
NorthEast: BP Station												
24	L2	1	5.0	0.005	8.1	LOS A	0.0	0.1	0.36	0.85	0.36	40.8
25	T1	1	5.0	0.005	11.6	LOS B	0.0	0.1	0.36	0.85	0.36	38.2
26	R2	1	5.0	0.005	10.8	LOS B	0.0	0.1	0.36	0.85	0.36	40.2
Approach		3	5.0	0.005	10.2	LOS B	0.0	0.1	0.36	0.85	0.36	39.8
NorthWest: Bow St												
27	L2	13	5.0	0.067	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	48.5
11	T1	111	5.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	48.6
12	R2	21	5.0	0.015	5.5	LOS A	0.1	0.5	0.36	0.55	0.36	29.7
Approach		144	5.0	0.067	1.2	NA	0.1	0.5	0.05	0.13	0.05	45.8
SouthWest: Norrie Ave												
1	L2	26	5.0	0.313	8.7	LOS A	1.5	10.9	0.53	0.99	0.59	25.1
3	R2	142	5.0	0.313	12.8	LOS B	1.5	10.9	0.53	0.99	0.59	26.5
Approach		168	5.0	0.313	12.2	LOS B	1.5	10.9	0.53	0.99	0.59	26.3
All Vehicles		595	5.0	0.313	4.9	NA	1.5	10.9	0.17	0.44	0.19	35.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St & Norrie Ave_2024 BS_AM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	136	5.0	0.162	4.6	LOS A	0.0	0.0	0.00	0.25	0.00	28.3
5	T1	158	5.0	0.162	0.0	LOS A	0.0	0.0	0.00	0.25	0.00	44.4
23	R2	20	5.0	0.013	5.0	LOS A	0.1	0.4	0.25	0.52	0.25	43.3
Approach		314	5.0	0.162	2.3	NA	0.1	0.4	0.02	0.27	0.02	36.9
NorthEast: BP Station												
24	L2	1	5.0	0.005	8.2	LOS A	0.0	0.1	0.39	0.85	0.39	40.5
25	T1	1	5.0	0.005	12.4	LOS B	0.0	0.1	0.39	0.85	0.39	37.9
26	R2	1	5.0	0.005	11.4	LOS B	0.0	0.1	0.39	0.85	0.39	39.9
Approach		3	5.0	0.005	10.7	LOS B	0.0	0.1	0.39	0.85	0.39	39.5
NorthWest: Bow St												
27	L2	15	5.0	0.075	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	48.5
11	T1	123	5.0	0.075	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	48.6
12	R2	23	5.0	0.018	5.6	LOS A	0.1	0.5	0.38	0.56	0.38	29.5
Approach		161	5.0	0.075	1.2	NA	0.1	0.5	0.05	0.13	0.05	45.8
SouthWest: Norrie Ave												
1	L2	31	5.0	0.370	9.4	LOS A	2.0	14.3	0.57	1.03	0.71	23.7
3	R2	156	5.0	0.370	14.5	LOS B	2.0	14.3	0.57	1.03	0.71	25.2
Approach		186	5.0	0.370	13.7	LOS B	2.0	14.3	0.57	1.03	0.71	24.9
All Vehicles		664	5.0	0.370	5.3	NA	2.0	14.3	0.18	0.45	0.22	34.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St & Norrie Ave_2044 BS_AM_Non-Holiday]

2044 Baseline_AM_Non-Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	168	5.0	0.199	4.6	LOS A	0.0	0.0	0.00	0.25	0.00	28.3
5	T1	192	5.0	0.199	0.0	LOS A	0.0	0.0	0.00	0.25	0.00	44.3
23	R2	25	5.0	0.017	5.2	LOS A	0.1	0.5	0.29	0.53	0.29	43.2
Approach		385	5.0	0.199	2.4	NA	0.1	0.5	0.02	0.27	0.02	36.8
NorthEast: BP Station												
24	L2	1	5.0	0.006	8.4	LOS A	0.0	0.2	0.45	0.84	0.45	39.7
25	T1	1	5.0	0.006	14.5	LOS B	0.0	0.2	0.45	0.84	0.45	37.1
26	R2	1	5.0	0.006	12.9	LOS B	0.0	0.2	0.45	0.84	0.45	39.1
Approach		3	5.0	0.006	12.0	LOS B	0.0	0.2	0.45	0.84	0.45	38.7
NorthWest: Bow St												
27	L2	18	5.0	0.097	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.5
11	T1	160	5.0	0.097	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
12	R2	29	5.0	0.024	5.9	LOS A	0.1	0.7	0.43	0.59	0.43	29.3
Approach		207	5.0	0.097	1.2	NA	0.1	0.7	0.06	0.13	0.06	45.8
SouthWest: Norrie Ave												
1	L2	37	5.0	0.634	13.8	LOS B	4.8	35.2	0.72	1.22	1.36	18.5
3	R2	227	5.0	0.634	22.3	LOS C	4.8	35.2	0.72	1.22	1.36	20.1
Approach		264	5.0	0.634	21.2	LOS C	4.8	35.2	0.72	1.22	1.36	19.9
All Vehicles		860	5.0	0.634	7.9	NA	4.8	35.2	0.25	0.53	0.44	31.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St & Norrie Ave_2044 BS_AM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	188	5.0	0.223	4.6	LOS A	0.0	0.0	0.00	0.25	0.00	28.3
5	T1	216	5.0	0.223	0.0	LOS A	0.0	0.0	0.00	0.25	0.00	44.3
23	R2	28	5.0	0.020	5.2	LOS A	0.1	0.6	0.31	0.54	0.31	43.1
Approach		433	5.0	0.223	2.4	NA	0.1	0.6	0.02	0.27	0.02	36.8
NorthEast: BP Station												
24	L2	1	5.0	0.007	8.5	LOS A	0.0	0.2	0.49	0.85	0.49	39.1
25	T1	1	5.0	0.007	16.2	LOS C	0.0	0.2	0.49	0.85	0.49	36.6
26	R2	1	5.0	0.007	14.0	LOS B	0.0	0.2	0.49	0.85	0.49	38.5
Approach		3	5.0	0.007	12.9	LOS B	0.0	0.2	0.49	0.85	0.49	38.1
NorthWest: Bow St												
27	L2	21	5.0	0.109	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	48.5
11	T1	178	5.0	0.109	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	48.6
12	R2	33	5.0	0.028	6.1	LOS A	0.1	0.9	0.45	0.61	0.45	29.1
Approach		232	5.0	0.109	1.3	NA	0.1	0.9	0.06	0.14	0.06	45.8
SouthWest: Norrie Ave												
1	L2	42	5.0	0.773	19.4	LOS C	7.2	52.6	0.81	1.40	1.95	15.1
3	R2	247	5.0	0.773	30.3	LOS D	7.2	52.6	0.81	1.40	1.95	16.6
Approach		289	5.0	0.773	28.7	LOS D	7.2	52.6	0.81	1.40	1.95	16.4
All Vehicles		957	5.0	0.773	10.1	NA	7.2	52.6	0.27	0.58	0.62	29.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St & Norrie Ave_2044 BS+D (400 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic (100% completed)_AM_Non-Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	179	5.0	0.206	4.6	LOS A	0.0	0.0	0.00	0.26	0.00	28.2
5	T1	194	5.0	0.206	0.0	LOS A	0.0	0.0	0.00	0.26	0.00	44.2
23	R2	25	5.0	0.017	5.3	LOS A	0.1	0.6	0.31	0.54	0.31	43.1
Approach		398	5.0	0.206	2.4	NA	0.1	0.6	0.02	0.28	0.02	36.5
NorthEast: BP Station												
24	L2	1	5.0	0.007	8.5	LOS A	0.0	0.2	0.48	0.84	0.48	39.4
25	T1	1	5.0	0.007	15.3	LOS C	0.0	0.2	0.48	0.84	0.48	36.9
26	R2	1	5.0	0.007	13.4	LOS B	0.0	0.2	0.48	0.84	0.48	38.8
Approach		3	5.0	0.007	12.4	LOS B	0.0	0.2	0.48	0.84	0.48	38.4
NorthWest: Bow St												
27	L2	18	5.0	0.109	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
11	T1	183	5.0	0.109	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.8
12	R2	29	5.0	0.025	6.0	LOS A	0.1	0.8	0.43	0.59	0.43	29.2
Approach		231	5.0	0.109	1.1	NA	0.1	0.8	0.06	0.12	0.06	46.2
SouthWest: Norrie Ave												
1	L2	37	5.0	0.921	31.4	LOS D	13.2	96.5	0.90	1.75	2.99	11.4
3	R2	318	5.0	0.921	42.7	LOS E	13.2	96.5	0.90	1.75	2.99	12.8
Approach		355	5.0	0.921	41.5	LOS E	13.2	96.5	0.90	1.75	2.99	12.7
All Vehicles		986	5.0	0.921	16.2	NA	13.2	96.5	0.34	0.77	1.10	24.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St & Norrie Ave_2044 BS+D (400 dwellings)_AM_Holiday]

2044 Baseline + Rezoning Traffic (100% completed)_AM_Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	199	5.0	0.230	4.6	LOS A	0.0	0.0	0.00	0.26	0.00	28.3
5	T1	218	5.0	0.230	0.0	LOS A	0.0	0.0	0.00	0.26	0.00	44.2
23	R2	28	5.0	0.020	5.3	LOS A	0.1	0.6	0.33	0.54	0.33	43.1
Approach		445	5.0	0.230	2.4	NA	0.1	0.6	0.02	0.28	0.02	36.5
NorthEast: BP Station												
24	L2	1	5.0	0.007	8.6	LOS A	0.0	0.2	0.51	0.85	0.51	38.8
25	T1	1	5.0	0.007	17.0	LOS C	0.0	0.2	0.51	0.85	0.51	36.3
26	R2	1	5.0	0.007	14.6	LOS B	0.0	0.2	0.51	0.85	0.51	38.2
Approach		3	5.0	0.007	13.4	LOS B	0.0	0.2	0.51	0.85	0.51	37.8
NorthWest: Bow St												
27	L2	21	5.0	0.121	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
11	T1	201	5.0	0.121	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.7
12	R2	33	5.0	0.029	6.2	LOS A	0.1	0.9	0.46	0.61	0.46	29.1
Approach		255	5.0	0.121	1.2	NA	0.1	0.9	0.06	0.12	0.06	46.1
SouthWest: Norrie Ave												
1	L2	42	5.0	1.100	78.3	LOS F	25.1	182.9	1.00	2.42	5.02	5.9
3	R2	338	5.0	1.100	91.2	LOS F	25.1	182.9	1.00	2.42	5.02	6.8
Approach		380	5.0	1.100	89.8	LOS F	25.1	182.9	1.00	2.42	5.02	6.7
All Vehicles		1083	5.0	1.100	32.8	NA	25.1	182.9	0.37	0.99	1.78	16.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St & Norrie Ave_2039 BS+D (300 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic (75% completed)_AM_Non-Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	161	5.0	0.188	4.6	LOS A	0.0	0.0	0.00	0.25	0.00	28.3
5	T1	180	5.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.25	0.00	44.3
23	R2	23	5.0	0.016	5.2	LOS A	0.1	0.5	0.29	0.53	0.29	43.2
Approach		364	5.0	0.188	2.4	NA	0.1	0.5	0.02	0.27	0.02	36.7
NorthEast: BP Station												
24	L2	1	5.0	0.006	8.4	LOS A	0.0	0.2	0.45	0.84	0.45	39.9
25	T1	1	5.0	0.006	14.1	LOS B	0.0	0.2	0.45	0.84	0.45	37.3
26	R2	1	5.0	0.006	12.6	LOS B	0.0	0.2	0.45	0.84	0.45	39.3
Approach		3	5.0	0.006	11.7	LOS B	0.0	0.2	0.45	0.84	0.45	38.8
NorthWest: Bow St												
27	L2	17	5.0	0.097	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
11	T1	161	5.0	0.097	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.7
12	R2	27	5.0	0.022	5.8	LOS A	0.1	0.7	0.41	0.58	0.41	29.4
Approach		205	5.0	0.097	1.2	NA	0.1	0.7	0.06	0.12	0.06	46.0
SouthWest: Norrie Ave												
1	L2	34	5.0	0.700	15.2	LOS C	6.1	44.6	0.75	1.29	1.57	17.6
3	R2	263	5.0	0.700	23.7	LOS C	6.1	44.6	0.75	1.29	1.57	19.2
Approach		297	5.0	0.700	22.8	LOS C	6.1	44.6	0.75	1.29	1.57	19.0
All Vehicles		869	5.0	0.700	9.1	NA	6.1	44.6	0.28	0.59	0.56	30.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Bow St & Norrie Ave_2039 BS+D (300 dwellings)_AM_Holiday]

2044 Baseline + Rezoning Traffic (75% completed)_AM_Holiday Period
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Main Rd												
4	L2	180	5.0	0.211	4.6	LOS A	0.0	0.0	0.00	0.25	0.00	28.3
5	T1	202	5.0	0.211	0.0	LOS A	0.0	0.0	0.00	0.25	0.00	44.3
23	R2	25	5.0	0.017	5.2	LOS A	0.1	0.6	0.30	0.53	0.30	43.1
Approach		407	5.0	0.211	2.4	NA	0.1	0.6	0.02	0.27	0.02	36.7
NorthEast: BP Station												
24	L2	1	5.0	0.007	8.5	LOS A	0.0	0.2	0.48	0.85	0.48	39.4
25	T1	1	5.0	0.007	15.4	LOS C	0.0	0.2	0.48	0.85	0.48	36.8
26	R2	1	5.0	0.007	13.5	LOS B	0.0	0.2	0.48	0.85	0.48	38.8
Approach		3	5.0	0.007	12.5	LOS B	0.0	0.2	0.48	0.85	0.48	38.4
NorthWest: Bow St												
27	L2	19	5.0	0.107	4.6	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
11	T1	177	5.0	0.107	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.7
12	R2	29	5.0	0.025	6.0	LOS A	0.1	0.8	0.44	0.60	0.44	29.2
Approach		225	5.0	0.107	1.2	NA	0.1	0.8	0.06	0.12	0.06	46.1
SouthWest: Norrie Ave												
1	L2	39	5.0	0.824	21.8	LOS C	8.9	65.2	0.83	1.50	2.23	14.2
3	R2	280	5.0	0.824	32.4	LOS D	8.9	65.2	0.83	1.50	2.23	15.7
Approach		319	5.0	0.824	31.1	LOS D	8.9	65.2	0.83	1.50	2.23	15.6
All Vehicles		955	5.0	0.824	11.7	NA	8.9	65.2	0.30	0.65	0.77	27.6

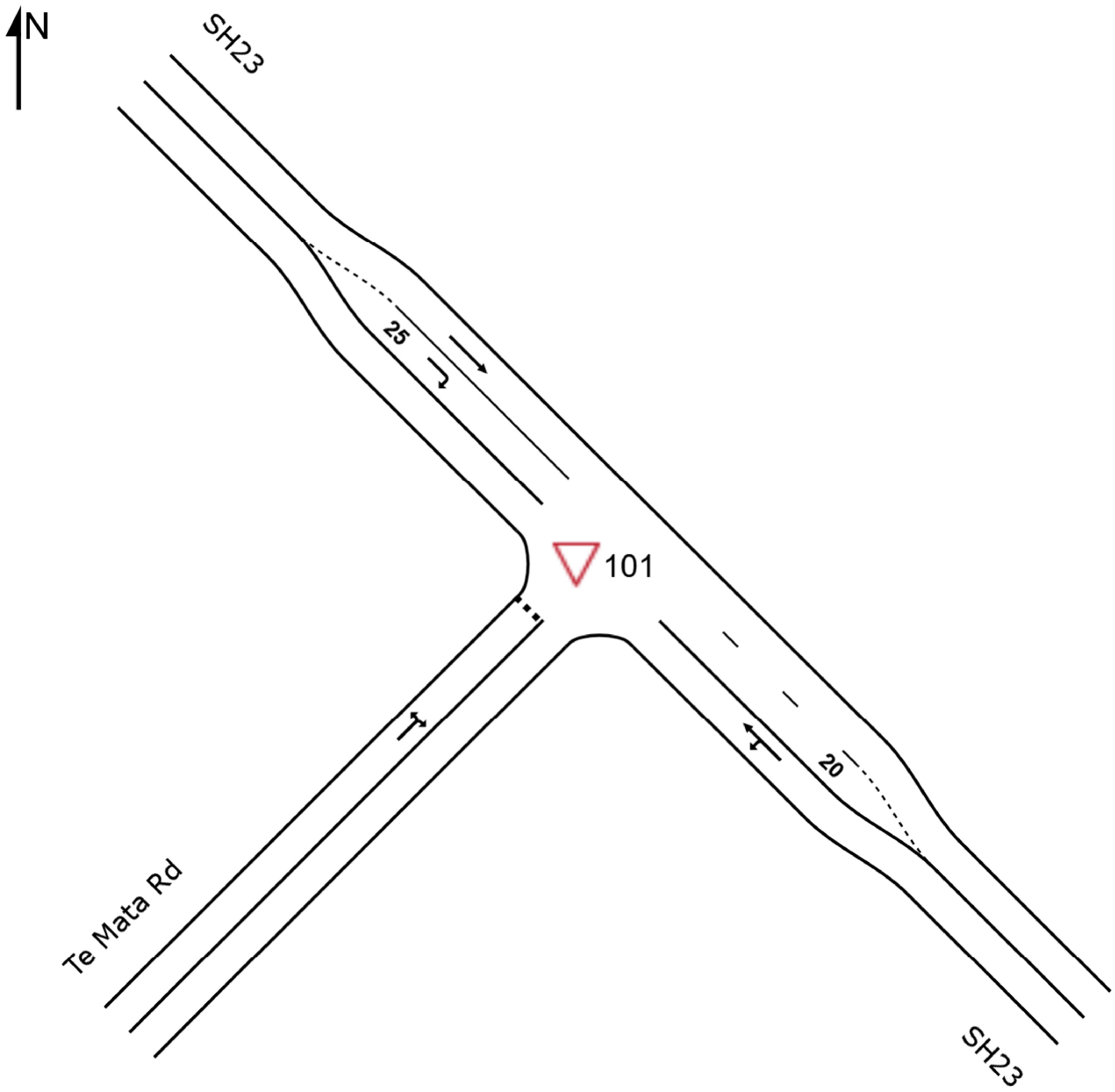
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

SH23 / Te Mata Road

SITE LAYOUT

Site: 101 [Te Mata Rd & SH23]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: BLOXAM, BURNETT & OLLIVER LTD | Created: Wednesday, 17 February 2021 4:15:45 PM
Project: K:\144430 Koning Rezoning\Traffic\2020 Updated ITA and report\SIDRA\Updated Sidra - February 2021\10. SH23 & Te Mata Rd intersection.sip8

MOVEMENT SUMMARY

Site: 101 [Te Mata Rd & SH23_2024 BS_AM_Non-Holiday]

2024 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	6	10.0	0.047	8.0	LOS A	0.0	0.0	0.00	0.05	0.00	81.4
5	T1	80	10.0	0.047	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	96.3
Approach		86	10.0	0.047	0.6	NA	0.0	0.0	0.00	0.05	0.00	95.0
NorthWest: SH23												
11	T1	363	10.0	0.197	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
12	R2	26	10.0	0.017	6.5	LOS A	0.1	0.6	0.19	0.57	0.19	62.1
Approach		389	10.0	0.197	0.5	NA	0.1	0.6	0.01	0.04	0.01	95.9
SouthWest: Te Mata Rd												
1	L2	15	6.0	0.107	6.7	LOS A	0.4	3.0	0.37	0.69	0.37	60.9
3	R2	60	6.0	0.107	10.1	LOS B	0.4	3.0	0.37	0.69	0.37	60.6
Approach		75	6.0	0.107	9.4	LOS A	0.4	3.0	0.37	0.69	0.37	60.7
All Vehicles		551	9.5	0.197	1.7	NA	0.4	3.0	0.06	0.13	0.06	88.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2024 BS_PM_Non-Holiday]

2024 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	55	10.0	0.232	8.0	LOS A	0.0	0.0	0.00	0.09	0.00	79.8
5	T1	372	10.0	0.232	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	93.6
Approach		426	10.0	0.232	1.0	NA	0.0	0.0	0.00	0.09	0.00	91.5
NorthWest: SH23												
11	T1	116	10.0	0.063	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	19	10.0	0.018	8.0	LOS A	0.1	0.6	0.48	0.64	0.48	61.0
Approach		135	10.0	0.063	1.1	NA	0.1	0.6	0.07	0.09	0.07	91.7
SouthWest: Te Mata Rd												
1	L2	24	6.0	0.037	7.9	LOS A	0.1	1.0	0.46	0.67	0.46	61.8
3	R2	8	6.0	0.037	10.5	LOS B	0.1	1.0	0.46	0.67	0.46	61.5
Approach		33	6.0	0.037	8.6	LOS A	0.1	1.0	0.46	0.67	0.46	61.7
All Vehicles		594	9.8	0.232	1.5	NA	0.1	1.0	0.04	0.12	0.04	89.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2024 BS_AM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	6	10.0	0.052	8.0	LOS A	0.0	0.0	0.00	0.04	0.00	81.7
5	T1	89	10.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	96.7
Approach		96	10.0	0.052	0.5	NA	0.0	0.0	0.00	0.04	0.00	95.5
NorthWest: SH23												
11	T1	405	10.0	0.220	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
12	R2	26	10.0	0.017	6.6	LOS A	0.1	0.6	0.21	0.57	0.21	62.0
Approach		432	10.0	0.220	0.4	NA	0.1	0.6	0.01	0.03	0.01	96.3
SouthWest: Te Mata Rd												
1	L2	15	6.0	0.128	6.7	LOS A	0.5	3.6	0.41	0.72	0.41	60.3
3	R2	67	6.0	0.128	10.8	LOS B	0.5	3.6	0.41	0.72	0.41	60.0
Approach		82	6.0	0.128	10.0	LOS B	0.5	3.6	0.41	0.72	0.41	60.0
All Vehicles		609	9.5	0.220	1.7	NA	0.5	3.6	0.06	0.13	0.06	88.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2024 BS_PM_Holiday]

2024 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	55	10.0	0.232	8.0	LOS A	0.0	0.0	0.00	0.09	0.00	79.8
5	T1	372	10.0	0.232	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	93.6
Approach		426	10.0	0.232	1.0	NA	0.0	0.0	0.00	0.09	0.00	91.5
NorthWest: SH23												
11	T1	116	10.0	0.063	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	19	10.0	0.018	8.0	LOS A	0.1	0.6	0.48	0.64	0.48	61.0
Approach		135	10.0	0.063	1.1	NA	0.1	0.6	0.07	0.09	0.07	91.7
SouthWest: Te Mata Rd												
1	L2	24	6.0	0.037	7.9	LOS A	0.1	1.0	0.46	0.67	0.46	61.8
3	R2	8	6.0	0.037	10.5	LOS B	0.1	1.0	0.46	0.67	0.46	61.5
Approach		33	6.0	0.037	8.6	LOS A	0.1	1.0	0.46	0.67	0.46	61.7
All Vehicles		594	9.8	0.232	1.5	NA	0.1	1.0	0.04	0.12	0.04	89.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_AM_Non-Holiday]

2044 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	8	10.0	0.061	8.0	LOS A	0.0	0.0	0.00	0.05	0.00	81.4
5	T1	104	10.0	0.061	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	96.2
Approach		113	10.0	0.061	0.6	NA	0.0	0.0	0.00	0.05	0.00	94.9
NorthWest: SH23												
11	T1	494	10.0	0.268	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
12	R2	34	10.0	0.022	6.6	LOS A	0.1	0.7	0.23	0.57	0.23	62.0
Approach		527	10.0	0.268	0.5	NA	0.1	0.7	0.01	0.04	0.01	96.1
SouthWest: Te Mata Rd												
1	L2	19	6.0	0.170	6.8	LOS A	0.6	4.7	0.46	0.75	0.46	59.0
3	R2	75	6.0	0.170	12.5	LOS B	0.6	4.7	0.46	0.75	0.46	58.7
Approach		94	6.0	0.170	11.4	LOS B	0.6	4.7	0.46	0.75	0.46	58.7
All Vehicles		734	9.5	0.268	1.9	NA	0.6	4.7	0.07	0.13	0.07	88.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_PM_Non-Holiday]

2044 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	68	10.0	0.312	8.0	LOS A	0.0	0.0	0.00	0.08	0.00	80.0
5	T1	504	10.0	0.312	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	93.9
Approach		573	10.0	0.312	1.0	NA	0.0	0.0	0.00	0.08	0.00	92.0
NorthWest: SH23												
11	T1	147	10.0	0.080	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	24	10.0	0.028	9.1	LOS A	0.1	0.8	0.55	0.71	0.55	59.9
Approach		172	10.0	0.080	1.3	NA	0.1	0.8	0.08	0.10	0.08	91.4
SouthWest: Te Mata Rd												
1	L2	31	6.0	0.058	8.7	LOS A	0.2	1.6	0.54	0.75	0.54	60.4
3	R2	11	6.0	0.058	13.3	LOS B	0.2	1.6	0.54	0.75	0.54	60.1
Approach		41	6.0	0.058	9.9	LOS A	0.2	1.6	0.54	0.75	0.54	60.4
All Vehicles		785	9.8	0.312	1.5	NA	0.2	1.6	0.05	0.12	0.05	89.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_AM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	8	10.0	0.067	8.0	LOS A	0.0	0.0	0.00	0.05	0.00	81.6
5	T1	115	10.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	96.5
Approach		123	10.0	0.067	0.6	NA	0.0	0.0	0.00	0.05	0.00	95.3
NorthWest: SH23												
11	T1	545	10.0	0.296	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
12	R2	34	10.0	0.022	6.7	LOS A	0.1	0.7	0.24	0.57	0.24	61.9
Approach		579	10.0	0.296	0.4	NA	0.1	0.7	0.01	0.03	0.01	96.4
SouthWest: Te Mata Rd												
1	L2	19	6.0	0.208	6.8	LOS A	0.8	5.7	0.51	0.77	0.51	57.9
3	R2	83	6.0	0.208	13.8	LOS B	0.8	5.7	0.51	0.77	0.51	57.6
Approach		102	6.0	0.208	12.5	LOS B	0.8	5.7	0.51	0.77	0.51	57.7
All Vehicles		804	9.5	0.296	2.0	NA	0.8	5.7	0.07	0.13	0.07	88.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_PM_Holiday]

2044 Baseline_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	68	10.0	0.346	8.0	LOS A	0.0	0.0	0.00	0.07	0.00	80.4
5	T1	567	10.0	0.346	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	94.5
Approach		636	10.0	0.346	0.9	NA	0.0	0.0	0.00	0.07	0.00	92.7
NorthWest: SH23												
11	T1	169	10.0	0.092	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	24	10.0	0.031	9.6	LOS A	0.1	0.9	0.58	0.74	0.58	59.4
Approach		194	10.0	0.092	1.2	NA	0.1	0.9	0.07	0.09	0.07	92.1
SouthWest: Te Mata Rd												
1	L2	31	6.0	0.066	9.1	LOS A	0.2	1.7	0.58	0.78	0.58	59.7
3	R2	11	6.0	0.066	15.1	LOS C	0.2	1.7	0.58	0.78	0.58	59.4
Approach		41	6.0	0.066	10.7	LOS B	0.2	1.7	0.58	0.78	0.58	59.6
All Vehicles		871	9.8	0.346	1.4	NA	0.2	1.7	0.04	0.11	0.04	90.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_+D (400 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	8	10.0	0.068	8.0	LOS A	0.0	0.0	0.00	0.05	0.00	81.6
5	T1	117	10.0	0.068	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	96.6
Approach		125	10.0	0.068	0.5	NA	0.0	0.0	0.00	0.05	0.00	95.4
NorthWest: SH23												
11	T1	607	10.0	0.330	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.8
12	R2	34	10.0	0.022	6.7	LOS A	0.1	0.7	0.24	0.57	0.24	61.9
Approach		641	10.0	0.330	0.4	NA	0.1	0.7	0.01	0.03	0.01	96.7
SouthWest: Te Mata Rd												
1	L2	19	6.0	0.212	6.9	LOS A	0.8	5.7	0.52	0.77	0.53	57.0
3	R2	75	6.0	0.212	15.2	LOS C	0.8	5.7	0.52	0.77	0.53	56.7
Approach		94	6.0	0.212	13.5	LOS B	0.8	5.7	0.52	0.77	0.53	56.8
All Vehicles		860	9.6	0.330	1.8	NA	0.8	5.7	0.07	0.11	0.07	89.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_+D (400 dwellings)_PM_Non-Holiday]

2044 Baseline + Rezoning Traffic_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	68	10.0	0.373	8.0	LOS A	0.0	0.0	0.00	0.07	0.00	80.6
5	T1	618	10.0	0.373	0.1	LOS A	0.0	0.0	0.00	0.07	0.00	94.8
Approach		686	10.0	0.373	0.8	NA	0.0	0.0	0.00	0.07	0.00	93.2
NorthWest: SH23												
11	T1	160	10.0	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
12	R2	24	10.0	0.033	10.1	LOS B	0.1	1.0	0.60	0.77	0.60	58.9
Approach		184	10.0	0.087	1.3	NA	0.1	1.0	0.08	0.10	0.08	91.6
SouthWest: Te Mata Rd												
1	L2	31	6.0	0.071	9.6	LOS A	0.3	1.8	0.60	0.80	0.60	59.1
3	R2	11	6.0	0.071	16.1	LOS C	0.3	1.8	0.60	0.80	0.60	58.8
Approach		41	6.0	0.071	11.3	LOS B	0.3	1.8	0.60	0.80	0.60	59.0
All Vehicles		912	9.8	0.373	1.4	NA	0.3	1.8	0.04	0.11	0.04	90.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_+D (400 dwellings)_AM_Holiday]

2044 Baseline + Rezoning Traffic_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	8	10.0	0.074	8.0	LOS A	0.0	0.0	0.00	0.04	0.00	81.8
5	T1	127	10.0	0.074	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	96.8
Approach		136	10.0	0.074	0.5	NA	0.0	0.0	0.00	0.04	0.00	95.7
NorthWest: SH23												
11	T1	659	10.0	0.358	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.7
12	R2	34	10.0	0.022	6.7	LOS A	0.1	0.8	0.25	0.58	0.25	61.9
Approach		693	10.0	0.358	0.4	NA	0.1	0.8	0.01	0.03	0.01	96.8
SouthWest: Te Mata Rd												
1	L2	19	6.0	0.263	7.5	LOS A	1.0	7.6	0.59	0.81	0.66	55.2
3	R2	83	6.0	0.263	17.4	LOS C	1.0	7.6	0.59	0.81	0.66	54.9
Approach		102	6.0	0.263	15.6	LOS C	1.0	7.6	0.59	0.81	0.66	55.0
All Vehicles		931	9.6	0.358	2.1	NA	1.0	7.6	0.07	0.12	0.08	89.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [Te Mata Rd & SH23_2044 BS_+D (400 dwellings)_PM_Holiday]

2044 Baseline + Rezoning Traffic_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: SH23												
4	L2	68	10.0	0.407	8.0	LOS A	0.0	0.0	0.00	0.06	0.00	80.8
5	T1	681	10.0	0.407	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	95.2
Approach		749	10.0	0.407	0.8	NA	0.0	0.0	0.00	0.06	0.00	93.6
NorthWest: SH23												
11	T1	182	10.0	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	99.9
12	R2	24	10.0	0.038	10.8	LOS B	0.1	1.1	0.63	0.80	0.63	58.2
Approach		206	10.0	0.099	1.3	NA	0.1	1.1	0.07	0.09	0.07	92.2
SouthWest: Te Mata Rd												
1	L2	31	6.0	0.082	10.2	LOS B	0.3	2.1	0.65	0.84	0.65	58.1
3	R2	11	6.0	0.082	18.5	LOS C	0.3	2.1	0.65	0.84	0.65	57.8
Approach		41	6.0	0.082	12.3	LOS B	0.3	2.1	0.65	0.84	0.65	58.0
All Vehicles		997	9.8	0.407	1.4	NA	0.3	2.1	0.04	0.10	0.04	91.0

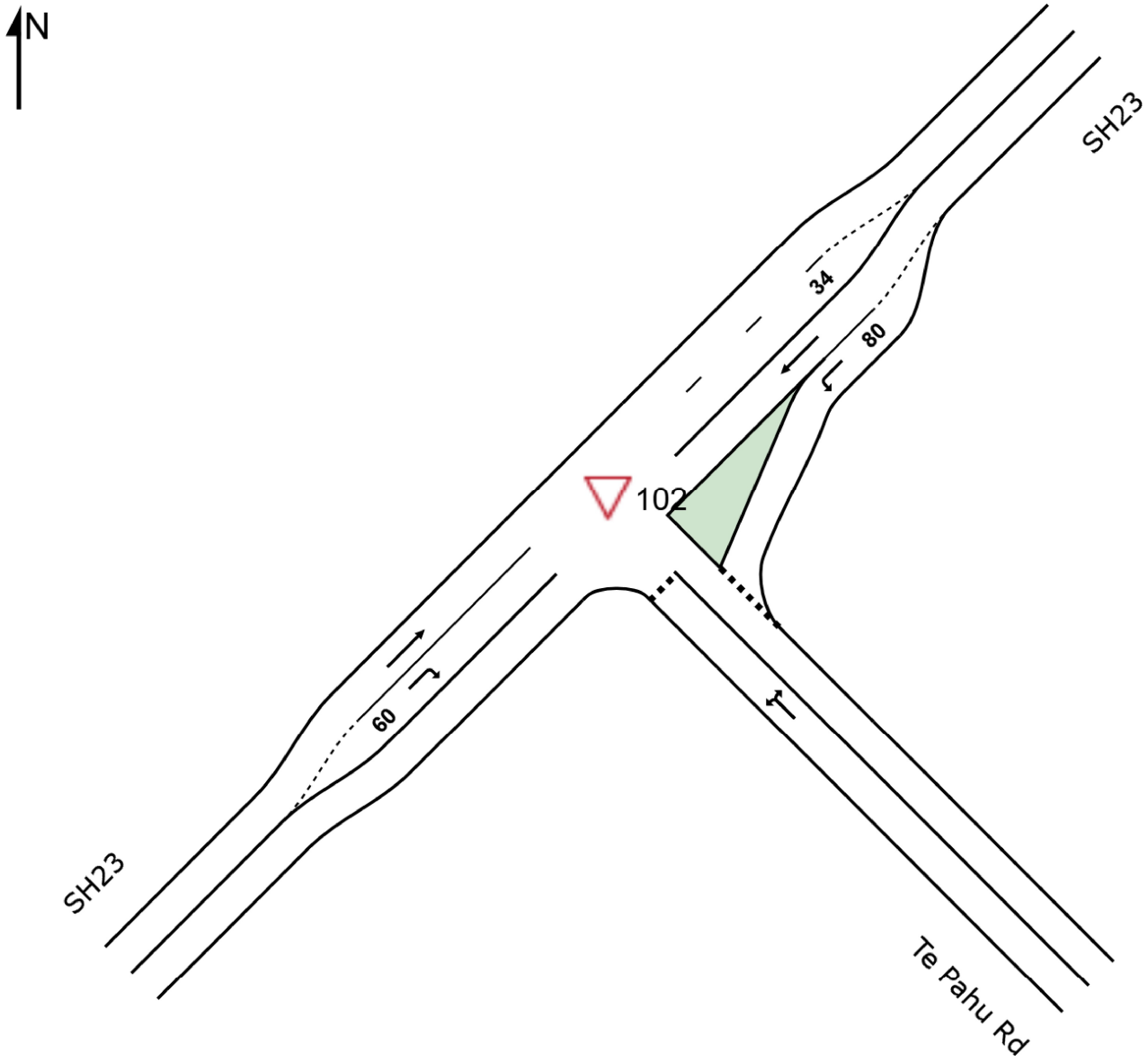
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

SH23 / Te Pahu Road

SITE LAYOUT

Site: 102 [Te Pahu Rd & SH23]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: BLOXAM, BURNETT & OLLIVER LTD | Created: Wednesday, 17 February 2021 4:44:55 PM
Project: K:\144430 Koning Rezoning\Traffic\2020 Updated ITA and report\SIDRA\Updated Sidra - February 2021\11. SH23 & Te Pahu Rd intersection.sip8

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2024 BS_AM_Non-Holiday]

2024 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	16	6.0	0.248	5.5	LOS A	1.0	7.1	0.59	0.78	0.64	41.7
3	R2	82	6.0	0.248	15.2	LOS C	1.0	7.1	0.59	0.78	0.64	41.6
Approach		98	6.0	0.248	13.6	LOS B	1.0	7.1	0.59	0.78	0.64	41.6
NorthEast: SH23												
4	L2	7	4.0	0.004	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	120	4.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		127	4.0	0.062	0.3	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
SouthWest: SH23												
11	T1	668	4.0	0.350	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	36	4.0	0.029	5.1	LOS A	0.1	0.8	0.23	0.53	0.23	45.7
Approach		704	4.0	0.350	0.3	NA	0.1	0.8	0.01	0.03	0.01	49.7
All Vehicles		929	4.2	0.350	1.7	NA	1.0	7.1	0.07	0.11	0.08	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2024 BS_PM_Non-Holiday]

2024 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	32	6.0	0.076	7.9	LOS A	0.3	2.0	0.61	0.78	0.61	43.7
3	R2	11	6.0	0.076	15.5	LOS C	0.3	2.0	0.61	0.78	0.61	43.5
Approach		42	6.0	0.076	9.8	LOS A	0.3	2.0	0.61	0.78	0.61	43.6
NorthEast: SH23												
4	L2	74	4.0	0.040	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	649	4.0	0.338	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		723	4.0	0.338	0.5	LOS A	0.0	0.0	0.00	0.05	0.00	49.6
SouthWest: SH23												
11	T1	195	4.0	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	23	4.0	0.040	9.3	LOS A	0.1	1.0	0.60	0.77	0.60	43.6
Approach		218	4.0	0.102	1.0	NA	0.1	1.0	0.06	0.08	0.06	49.2
All Vehicles		983	4.1	0.338	1.0	NA	0.3	2.0	0.04	0.09	0.04	49.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2024 BS_AM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	16	6.0	0.312	6.6	LOS A	1.2	9.1	0.67	0.85	0.81	39.9
3	R2	82	6.0	0.312	19.7	LOS C	1.2	9.1	0.67	0.85	0.81	39.8
Approach		98	6.0	0.312	17.6	LOS C	1.2	9.1	0.67	0.85	0.81	39.8
NorthEast: SH23												
4	L2	7	4.0	0.004	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	138	4.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		145	4.0	0.072	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	49.8
SouthWest: SH23												
11	T1	768	4.0	0.402	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	36	4.0	0.029	5.2	LOS A	0.1	0.8	0.25	0.53	0.25	45.6
Approach		804	4.0	0.402	0.3	NA	0.1	0.8	0.01	0.02	0.01	49.7
All Vehicles		1047	4.2	0.402	1.9	NA	1.2	9.1	0.07	0.10	0.08	48.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2024 BS_PM_Holiday]

2024 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	32	6.0	0.093	8.8	LOS A	0.3	2.3	0.69	0.85	0.69	42.8
3	R2	11	6.0	0.093	19.4	LOS C	0.3	2.3	0.69	0.85	0.69	42.7
Approach		42	6.0	0.093	11.5	LOS B	0.3	2.3	0.69	0.85	0.69	42.8
NorthEast: SH23												
4	L2	74	4.0	0.040	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	746	4.0	0.389	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		820	4.0	0.389	0.5	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
SouthWest: SH23												
11	T1	224	4.0	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	23	4.0	0.048	10.7	LOS B	0.2	1.2	0.67	0.84	0.67	42.9
Approach		247	4.0	0.118	1.0	NA	0.2	1.2	0.06	0.08	0.06	49.2
All Vehicles		1109	4.1	0.389	1.0	NA	0.3	2.3	0.04	0.08	0.04	49.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS_AM_Non-Holiday]

2044 Baseline_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	20	6.0	0.499	10.9	LOS B	2.2	16.1	0.77	0.96	1.13	36.4
3	R2	101	6.0	0.499	29.4	LOS D	2.2	16.1	0.77	0.96	1.13	36.4
Approach		121	6.0	0.499	26.3	LOS D	2.2	16.1	0.77	0.96	1.13	36.4
NorthEast: SH23												
4	L2	11	4.0	0.006	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	153	4.0	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		163	4.0	0.079	0.3	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
SouthWest: SH23												
11	T1	866	4.0	0.454	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	45	4.0	0.038	5.3	LOS A	0.1	1.1	0.27	0.54	0.27	45.6
Approach		912	4.0	0.454	0.3	NA	0.1	1.1	0.01	0.03	0.01	49.7
All Vehicles		1196	4.2	0.499	3.0	NA	2.2	16.1	0.09	0.12	0.12	47.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS_PM_Non-Holiday]

2044 Baseline_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	40	6.0	0.156	10.1	LOS B	0.5	3.8	0.77	0.89	0.77	41.5
3	R2	15	6.0	0.156	25.4	LOS D	0.5	3.8	0.77	0.89	0.77	41.3
Approach		55	6.0	0.156	14.2	LOS B	0.5	3.8	0.77	0.89	0.77	41.4
NorthEast: SH23												
4	L2	92	4.0	0.050	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	843	4.0	0.439	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		935	4.0	0.439	0.5	LOS A	0.0	0.0	0.00	0.05	0.00	49.6
SouthWest: SH23												
11	T1	243	4.0	0.127	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	29	4.0	0.075	12.8	LOS B	0.3	1.8	0.74	0.88	0.74	41.8
Approach		273	4.0	0.127	1.4	NA	0.3	1.8	0.08	0.10	0.08	49.0
All Vehicles		1262	4.1	0.439	1.3	NA	0.5	3.8	0.05	0.10	0.05	49.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS_AM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	20	6.0	0.704	24.5	LOS C	3.4	25.2	0.86	1.12	1.60	30.2
3	R2	101	6.0	0.704	51.6	LOS F	3.4	25.2	0.86	1.12	1.60	30.1
Approach		121	6.0	0.704	47.1	LOS E	3.4	25.2	0.86	1.12	1.60	30.1
NorthEast: SH23												
4	L2	11	4.0	0.006	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	175	4.0	0.091	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		185	4.0	0.091	0.3	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
SouthWest: SH23												
11	T1	987	4.0	0.517	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	45	4.0	0.039	5.4	LOS A	0.2	1.1	0.29	0.55	0.29	45.5
Approach		1033	4.0	0.517	0.3	NA	0.2	1.1	0.01	0.02	0.01	49.7
All Vehicles		1339	4.2	0.704	4.5	NA	3.4	25.2	0.09	0.12	0.16	46.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS_PM_Holiday]

2044 Baseline_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	40	6.0	0.216	12.9	LOS B	0.7	5.2	0.84	0.94	0.90	39.2
3	R2	15	6.0	0.216	36.5	LOS E	0.7	5.2	0.84	0.94	0.90	39.1
Approach		55	6.0	0.216	19.2	LOS C	0.7	5.2	0.84	0.94	0.90	39.2
NorthEast: SH23												
4	L2	92	4.0	0.050	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	961	4.0	0.500	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		1053	4.0	0.500	0.5	LOS A	0.0	0.0	0.00	0.04	0.00	49.6
SouthWest: SH23												
11	T1	280	4.0	0.147	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	29	4.0	0.097	15.7	LOS C	0.3	2.3	0.80	0.91	0.80	40.4
Approach		309	4.0	0.147	1.5	NA	0.3	2.3	0.08	0.09	0.08	48.9
All Vehicles		1417	4.1	0.500	1.4	NA	0.7	5.2	0.05	0.09	0.05	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS+D (400 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic (100% developed)_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	20	6.0	0.678	21.8	LOS C	3.2	23.8	0.84	1.09	1.52	31.1
3	R2	101	6.0	0.678	47.9	LOS E	3.2	23.8	0.84	1.09	1.52	31.0
Approach		121	6.0	0.678	43.6	LOS E	3.2	23.8	0.84	1.09	1.52	31.0
NorthEast: SH23												
4	L2	11	4.0	0.006	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	165	4.0	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		176	4.0	0.086	0.3	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
SouthWest: SH23												
11	T1	980	4.0	0.513	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	45	4.0	0.038	5.3	LOS A	0.1	1.1	0.28	0.55	0.28	45.6
Approach		1025	4.0	0.513	0.3	NA	0.1	1.1	0.01	0.02	0.01	49.7
All Vehicles		1322	4.2	0.678	4.3	NA	3.2	23.8	0.09	0.12	0.15	47.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS+D (400 dwellings)_PM_Non-Holiday]

2044 Baseline + Rezoning Traffic (100% developed)_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	40	6.0	0.207	12.6	LOS B	0.7	5.0	0.84	0.94	0.89	39.5
3	R2	15	6.0	0.207	34.4	LOS D	0.7	5.0	0.84	0.94	0.89	39.4
Approach		55	6.0	0.207	18.5	LOS C	0.7	5.0	0.84	0.94	0.89	39.5
NorthEast: SH23												
4	L2	92	4.0	0.050	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	957	4.0	0.498	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		1048	4.0	0.498	0.5	LOS A	0.0	0.0	0.00	0.04	0.00	49.6
SouthWest: SH23												
11	T1	256	4.0	0.134	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	29	4.0	0.096	15.6	LOS C	0.3	2.3	0.80	0.91	0.80	40.5
Approach		285	4.0	0.134	1.6	NA	0.3	2.3	0.08	0.09	0.08	48.8
All Vehicles		1388	4.1	0.498	1.4	NA	0.7	5.0	0.05	0.09	0.05	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS+D (400 dwellings)_AM_Holiday]

2044 Baseline + Rezoning Traffic (100% developed)_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	20	6.0	0.997	108.6	LOS F	8.9	65.7	0.92	1.71	3.52	17.0
3	R2	101	6.0	0.997	147.8	LOS F	8.9	65.7	0.92	1.71	3.52	16.9
Approach		121	6.0	0.997	141.3	LOS F	8.9	65.7	0.92	1.71	3.52	17.0
NorthEast: SH23												
4	L2	11	4.0	0.006	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	187	4.0	0.098	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		198	4.0	0.098	0.2	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
SouthWest: SH23												
11	T1	1101	4.0	0.577	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.8
12	R2	45	4.0	0.039	5.4	LOS A	0.2	1.1	0.30	0.55	0.30	45.5
Approach		1146	4.0	0.577	0.3	NA	0.2	1.1	0.01	0.02	0.01	49.7
All Vehicles		1465	4.2	0.997	12.0	NA	8.9	65.7	0.09	0.16	0.30	42.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2044 BS+D (400 dwellings)_PM_Holiday]

2044 Baseline + Rezoning Traffic (100% developed)_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	40	6.0	0.299	17.8	LOS C	1.0	7.2	0.90	0.99	1.03	36.2
3	R2	15	6.0	0.299	52.3	LOS F	1.0	7.2	0.90	0.99	1.03	36.1
Approach		55	6.0	0.299	27.1	LOS D	1.0	7.2	0.90	0.99	1.03	36.2
NorthEast: SH23												
4	L2	92	4.0	0.050	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	1075	4.0	0.560	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		1166	4.0	0.560	0.5	LOS A	0.0	0.0	0.00	0.04	0.00	49.6
SouthWest: SH23												
11	T1	293	4.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	29	4.0	0.129	19.9	LOS C	0.4	2.9	0.86	0.94	0.86	38.7
Approach		322	4.0	0.154	1.8	NA	0.4	2.9	0.08	0.09	0.08	48.7
All Vehicles		1543	4.1	0.560	1.7	NA	1.0	7.2	0.05	0.08	0.05	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2039 BS+D (300 dwellings)_AM_Non-Holiday]

2044 Baseline + Rezoning Traffic (75% developed)_AM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	19	6.0	0.491	11.0	LOS B	2.1	15.6	0.77	0.96	1.12	36.2
3	R2	96	6.0	0.491	30.1	LOS D	2.1	15.6	0.77	0.96	1.12	36.1
Approach		115	6.0	0.491	26.9	LOS D	2.1	15.6	0.77	0.96	1.12	36.2
NorthEast: SH23												
4	L2	9	4.0	0.005	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	152	4.0	0.079	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		161	4.0	0.079	0.3	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
SouthWest: SH23												
11	T1	885	4.0	0.463	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	42	4.0	0.035	5.2	LOS A	0.1	1.0	0.27	0.54	0.27	45.6
Approach		927	4.0	0.463	0.3	NA	0.1	1.0	0.01	0.02	0.01	49.7
All Vehicles		1203	4.2	0.491	2.8	NA	2.1	15.6	0.08	0.11	0.12	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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2039 BS+D (300 dwellings)_PM_Non-Holiday]

2044 Baseline + Rezoning Traffic (75% developed)_PM_Non-Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	37	6.0	0.144	10.4	LOS B	0.5	3.5	0.77	0.89	0.77	41.4
3	R2	13	6.0	0.144	26.0	LOS D	0.5	3.5	0.77	0.89	0.77	41.3
Approach		49	6.0	0.144	14.4	LOS B	0.5	3.5	0.77	0.89	0.77	41.4
NorthEast: SH23												
4	L2	86	4.0	0.047	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	863	4.0	0.449	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		949	4.0	0.449	0.5	LOS A	0.0	0.0	0.00	0.04	0.00	49.6
SouthWest: SH23												
11	T1	238	4.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	27	4.0	0.072	13.1	LOS B	0.2	1.7	0.75	0.89	0.75	41.7
Approach		265	4.0	0.125	1.4	NA	0.2	1.7	0.08	0.09	0.08	49.0
All Vehicles		1264	4.1	0.449	1.2	NA	0.5	3.5	0.05	0.09	0.05	49.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2039 BS+D (300 dwellings)_AM_Holiday]

2044 Baseline + Rezoning Traffic (75% developed)_AM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	19	6.0	0.685	23.6	LOS C	3.2	23.7	0.86	1.10	1.54	30.3
3	R2	96	6.0	0.685	51.3	LOS F	3.2	23.7	0.86	1.10	1.54	30.2
Approach		115	6.0	0.685	46.7	LOS E	3.2	23.7	0.86	1.10	1.54	30.2
NorthEast: SH23												
4	L2	9	4.0	0.005	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	173	4.0	0.090	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		182	4.0	0.090	0.2	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
SouthWest: SH23												
11	T1	1001	4.0	0.524	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	42	4.0	0.036	5.3	LOS A	0.1	1.0	0.29	0.55	0.29	45.5
Approach		1043	4.0	0.524	0.3	NA	0.1	1.0	0.01	0.02	0.01	49.7
All Vehicles		1340	4.2	0.685	4.3	NA	3.2	23.7	0.08	0.11	0.14	47.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [Te Pahu Rd & SH23_2039 BS+D (300 dwellings)_PM_Holiday]

2044 Baseline + Rezoning Traffic (75% developed)_PM_Holiday Period
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Te Pahu Rd												
1	L2	37	6.0	0.195	12.9	LOS B	0.6	4.7	0.84	0.94	0.88	39.4
3	R2	13	6.0	0.195	36.5	LOS E	0.6	4.7	0.84	0.94	0.88	39.3
Approach		49	6.0	0.195	18.9	LOS C	0.6	4.7	0.84	0.94	0.88	39.4
NorthEast: SH23												
4	L2	86	4.0	0.047	4.5	LOS A	0.0	0.0	0.00	0.49	0.00	47.2
5	T1	976	4.0	0.508	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		1062	4.0	0.508	0.4	LOS A	0.0	0.0	0.00	0.04	0.00	49.7
SouthWest: SH23												
11	T1	273	4.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	27	4.0	0.093	16.0	LOS C	0.3	2.2	0.81	0.91	0.81	40.3
Approach		300	4.0	0.143	1.5	NA	0.3	2.2	0.07	0.08	0.07	48.9
All Vehicles		1412	4.1	0.508	1.3	NA	0.6	4.7	0.05	0.08	0.05	49.0

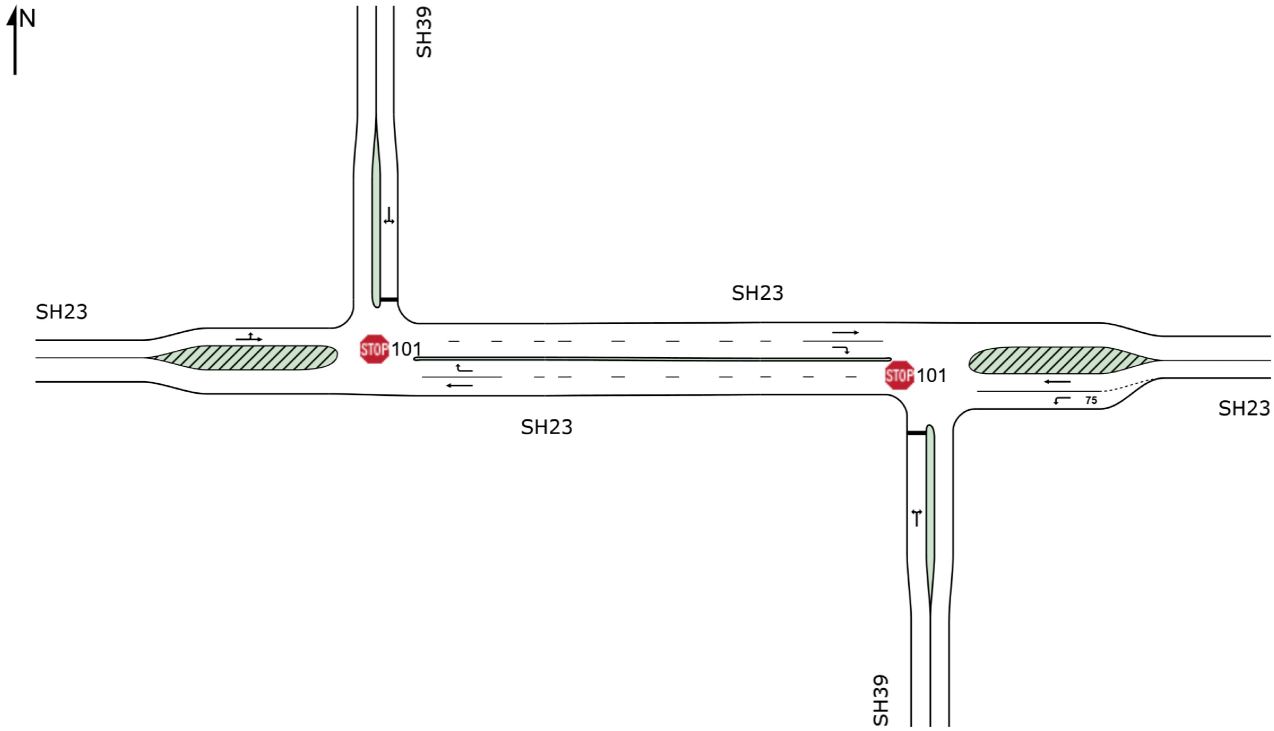
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

SH23 / SH39 – Existing Configuration

NETWORK LAYOUT

Network: N101 [SH23 & SH39_2024 BS_AM_Non-Holiday]

New Network
Network Category: (None)



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
101	NA	SH23 & SH39 West_2024 BS_AM_Non-Holiday
101	NA	SH23 & SH39 East_2024 BS_AM_Non-Holiday

MOVEMENT SUMMARY

Site: 101 [SH23 & SH39 East_2024 BS_AM_Non-Holiday]

Network: N101 [SH23 & SH39_2024 BS_AM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39														
1	L2	233	5.0	233	5.0	0.421	9.0	LOS A	0.9	6.8	0.28	0.92	0.33	38.1
3	R2	43	5.0	43	5.0	0.421	30.5	LOS D	0.9	6.8	0.28	0.92	0.33	42.7
Approach		276	5.0	276	5.0	0.421	12.3	LOS B	0.9	6.8	0.28	0.92	0.33	39.2
East: SH23														
4	L2	15	5.0	15	5.0	0.008	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	85	5.0	85	5.0	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		100	5.0	100	5.0	0.045	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.1
West: SH23														
11	T1	555	5.0	555	5.0	0.291	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	242	5.0	242	5.0	0.190	4.8	LOS A	0.3	2.5	0.24	0.52	0.24	43.3
Approach		797	5.0	797	5.0	0.291	1.5	NA	0.3	2.5	0.07	0.16	0.07	47.7
All Vehicles		1173	5.0	1173	5.0	0.421	4.0	NA	0.9	6.8	0.12	0.33	0.13	45.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39 West_2024 BS_AM_Non-Holiday]

Network: N101 [SH23 & SH39_2024 BS_AM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SH23														
11	T1	94	5.0	94	5.0	0.049	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	225	5.0	225	5.0	0.421	13.2	LOS B	0.8	6.1	0.80	1.01	1.10	28.0
Approach		319	5.0	319	5.0	0.421	9.3	NA	0.8	6.1	0.56	0.71	0.77	35.5
North: SH39														
1	L2	187	5.0	187	5.0	0.572	16.8	LOS C	1.3	9.6	0.79	1.21	1.36	21.0
3	R2	49	5.0	49	5.0	0.572	37.5	LOS E	1.3	9.6	0.79	1.21	1.36	35.4
Approach		237	5.0	237	5.0	0.572	21.1	LOS C	1.3	9.6	0.79	1.21	1.36	26.2
West: SH23														
4	L2	284	5.0	284	5.0	0.481	4.7	LOS A	0.0	0.0	0.00	0.17	0.00	47.7
5	T1	608	5.0	608	5.0	0.481	0.1	LOS A	0.0	0.0	0.00	0.17	0.00	48.0
Approach		893	5.0	893	5.0	0.481	1.5	NA	0.0	0.0	0.00	0.17	0.00	47.9
All Vehicles		1448	5.0	1448	5.0	0.572	6.5	NA	1.3	9.6	0.25	0.46	0.39	42.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39 East_2024 BS_PM_Non-Holiday]

Network: N101 [SH23 & SH39_2024 BS_PM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39														
1	L2	253	5.0	253	5.0	0.552	15.3	LOS C	1.3	9.8	0.70	1.18	1.18	35.2
3	R2	24	5.0	24	5.0	0.552	37.9	LOS E	1.3	9.8	0.70	1.18	1.18	40.7
Approach		277	5.0	277	5.0	0.552	17.3	LOS C	1.3	9.8	0.70	1.18	1.18	35.9
East: SH23														
4	L2	74	5.0	74	5.0	0.041	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	502	5.0	502	5.0	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		576	5.0	576	5.0	0.266	0.6	NA	0.0	0.0	0.00	0.07	0.00	49.1
West: SH23														
11	T1	137	5.0	137	5.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	324	5.0	324	5.0	0.453	10.0	LOS A	1.1	7.9	0.66	0.95	0.94	39.4
Approach		461	5.0	461	5.0	0.453	7.0	NA	1.1	7.9	0.46	0.67	0.66	42.0
All Vehicles		1314	5.0	1314	5.0	0.552	6.4	NA	1.3	9.8	0.31	0.51	0.48	43.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39 West_2024 BS_PM_Non-Holiday]

Network: N101 [SH23 & SH39_2024 BS_PM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SH23														
11	T1	561	5.0	561	5.0	0.294	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	194	5.0	194	5.0	0.137	5.2	LOS A	0.3	1.9	0.36	0.56	0.36	36.4
Approach		755	5.0	755	5.0	0.294	1.3	NA	0.3	1.9	0.09	0.14	0.09	47.6
North: SH39														
1	L2	299	5.0	299	5.0	0.923	40.2	LOS E	8.2	59.8	0.60	1.80	2.85	11.6
3	R2	161	5.0	161	5.0	0.923	62.4	LOS F	8.2	59.8	0.60	1.80	2.85	25.5
Approach		460	5.0	460	5.0	0.923	48.0	LOS E	8.2	59.8	0.60	1.80	2.85	18.1
West: SH23														
4	L2	66	5.0	66	5.0	0.123	4.6	LOS A	0.0	0.0	0.00	0.16	0.00	47.9
5	T1	162	5.0	162	5.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	48.3
Approach		228	5.0	228	5.0	0.123	1.3	NA	0.0	0.0	0.00	0.16	0.00	48.1
All Vehicles		1443	5.0	1443	5.0	0.923	16.2	NA	8.2	59.8	0.24	0.67	0.96	33.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39 East_2044 BS_AM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS_AM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39														
1	L2	285	5.0	285	5.0	0.664	17.2	LOS C	3.2	23.0	0.41	1.09	0.90	31.3
3	R2	54	5.0	54	5.0	0.664	55.5	LOS F	3.2	23.0	0.41	1.09	0.90	38.0
Approach		339	5.0	339	5.0	0.664	23.3	LOS C	3.2	23.0	0.41	1.09	0.90	32.8
East: SH23														
4	L2	19	5.0	19	5.0	0.011	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	107	5.0	107	5.0	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		126	5.0	126	5.0	0.057	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.1
West: SH23														
11	T1	706	5.0	676	5.0	0.354	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	297	5.0	284	5.0	0.229	4.9	LOS A	0.4	3.1	0.28	0.54	0.28	43.2
Approach		1003	5.0	960[N1]	5.0	0.354	1.5	NA	0.4	3.1	0.08	0.16	0.08	47.7
All Vehicles		1468	5.0	1426[N1]	5.1	0.664	6.6	NA	3.2	23.0	0.15	0.37	0.27	43.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 101 [SH23 & SH39 West_2044 BS_AM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS_AM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SH23														
11	T1	118	5.0	118	5.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	276	5.0	276	5.0	0.947	61.5	LOS F	3.9	28.7	0.99	1.89	3.99	11.3
Approach		394	5.0	394	5.0	0.947	43.1	NA	3.9	28.7	0.69	1.33	2.79	18.2
North: SH39														
1	L2	229	5.0	229	5.0	1.229	246.5	LOS F	17.1	124.7	1.00	4.27	11.07	2.6
3	R2	63	5.0	63	5.0	1.229	286.2	LOS F	17.1	124.7	1.00	4.27	11.07	8.1
Approach		293	5.0	293	5.0	1.229	255.1	LOS F	17.1	124.7	1.00	4.27	11.07	3.9
West: SH23														
4	L2	368	5.0	368	5.0	0.615	4.7	LOS A	0.0	0.0	0.00	0.17	0.00	47.6
5	T1	773	5.0	773	5.0	0.615	0.1	LOS A	0.0	0.0	0.00	0.17	0.00	47.9
Approach		1141	5.0	1141	5.0	0.615	1.6	NA	0.0	0.0	0.00	0.17	0.00	47.8
All Vehicles		1827	5.0	1827	5.0	1.229	51.1	NA	17.1	124.7	0.31	1.08	2.37	20.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39 East_2044 BS_PM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS_PM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39														
1	L2	309	5.0	309	5.0	0.875	33.1	LOS D	3.7	26.8	0.91	1.74	3.07	26.2
3	R2	31	5.0	31	5.0	0.875	64.1	LOS F	3.7	26.8	0.91	1.74	3.07	33.9
Approach		340	5.0	340	5.0	0.875	35.9	LOS E	3.7	26.8	0.91	1.74	3.07	27.2
East: SH23														
4	L2	92	5.0	92	5.0	0.051	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	642	5.0	642	5.0	0.340	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		734	5.0	734	5.0	0.340	0.6	NA	0.0	0.0	0.00	0.07	0.00	49.1
West: SH23														
11	T1	171	5.0	120	5.0	0.063	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	397	5.0	278	5.0	0.497	12.8	LOS B	1.1	8.1	0.75	1.03	1.15	37.4
Approach		567	5.0	398[N1]	5.0	0.497	8.9	NA	1.1	8.1	0.52	0.72	0.80	40.4
All Vehicles		1641	5.0	1471[N1]	5.6	0.875	11.0	NA	3.7	26.8	0.35	0.63	0.93	39.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 101 [SH23 & SH39 West_2044 BS_PM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS_PM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SH23														
11	T1	715	5.0	715	5.0	0.375	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	237	5.0	237	5.0	0.178	5.5	LOS A	0.3	2.5	0.42	0.60	0.42	36.1
Approach		952	5.0	952	5.0	0.375	1.4	NA	0.3	2.5	0.10	0.15	0.10	47.6
North: SH39														
1	L2	365	5.0	365	5.0	1.868	801.2	LOS F	74.4	542.8	1.00	7.82	18.67	0.8
3	R2	219	5.0	219	5.0	1.868	828.6	LOS F	74.4	542.8	1.00	7.82	18.67	2.9
Approach		584	5.0	584	5.0	1.868	811.4	LOS F	74.4	542.8	1.00	7.82	18.67	1.6
West: SH23														
4	L2	83	5.0	83	5.0	0.153	4.6	LOS A	0.0	0.0	0.00	0.16	0.00	47.9
5	T1	201	5.0	201	5.0	0.153	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	48.2
Approach		284	5.0	284	5.0	0.153	1.4	NA	0.0	0.0	0.00	0.16	0.00	48.1
All Vehicles		1820	5.0	1820	5.0	1.868	261.4	NA	74.4	542.8	0.38	2.61	6.05	5.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39 East_2044 BS+D (400 dwellings_AM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS+D (400 dwellings)_AM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39														
1	L2	285	5.0	285	5.0	0.696	19.5	LOS C	3.6	25.9	0.43	1.15	1.06	29.9
3	R2	54	5.0	54	5.0	0.696	61.0	LOS F	3.6	25.9	0.43	1.15	1.06	36.9
Approach		339	5.0	339	5.0	0.696	26.1	LOS D	3.6	25.9	0.43	1.15	1.06	31.5
East: SH23														
4	L2	19	5.0	19	5.0	0.011	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	115	5.0	115	5.0	0.061	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
Approach		134	5.0	134	5.0	0.061	0.7	NA	0.0	0.0	0.00	0.07	0.00	49.1
West: SH23														
11	T1	775	5.0	709	5.0	0.371	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	297	5.0	272	5.0	0.221	5.0	LOS A	0.4	3.0	0.28	0.54	0.28	43.2
Approach		1072	5.0	980[N1]	5.0	0.371	1.4	NA	0.4	3.0	0.08	0.15	0.08	47.8
All Vehicles		1544	5.0	1453[N1]	5.3	0.696	7.1	NA	3.6	25.9	0.15	0.38	0.30	42.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 101 [SH23 & SH39 West_2044 BS+D (400 dwellings) _AM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS+D (400 dwellings)_AM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SH23														
11	T1	125	5.0	125	5.0	0.066	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	276	5.0	276	5.0	1.362	366.7	LOS F	8.2	60.0	1.00	4.55	13.43	2.3
Approach		401	5.0	401	5.0	1.362	252.2	NA	8.2	60.0	0.69	3.13	9.24	4.5
North: SH39														
1	L2	229	5.0	229	5.0	1.662	626.0	LOS F	32.7	238.8	1.00	5.94	16.83	1.1
3	R2	68	5.0	68	5.0	1.662	663.6	LOS F	32.7	238.8	1.00	5.94	16.83	3.6
Approach		298	5.0	298	5.0	1.662	634.6	LOS F	32.7	238.8	1.00	5.94	16.83	1.7
West: SH23														
4	L2	414	5.0	414	5.0	0.676	4.8	LOS A	0.0	0.0	0.00	0.18	0.00	47.6
5	T1	841	5.0	841	5.0	0.676	0.2	LOS A	0.0	0.0	0.00	0.18	0.00	47.8
Approach		1255	5.0	1255	5.0	0.676	1.7	NA	0.0	0.0	0.00	0.18	0.00	47.7
All Vehicles		1954	5.0	1954	5.0	1.662	149.6	NA	32.7	238.8	0.29	1.66	4.46	9.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39 East_2044 BS+D (400 dwellings) _PM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS+D (400 dwellings)_PM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39														
1	L2	309	5.0	309	5.0	0.991	66.2	LOS F	6.7	48.7	0.98	2.41	5.28	17.8
3	R2	31	5.0	31	5.0	0.991	99.1	LOS F	6.7	48.7	0.98	2.41	5.28	25.9
Approach		340	5.0	340	5.0	0.991	69.2	LOS F	6.7	48.7	0.98	2.41	5.28	18.8
East: SH23														
4	L2	92	5.0	92	5.0	0.051	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	46.6
5	T1	711	5.0	711	5.0	0.376	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
Approach		802	5.0	802	5.0	0.376	0.6	NA	0.0	0.0	0.00	0.06	0.00	49.2
West: SH23														
11	T1	178	5.0	108	5.0	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	397	5.0	241	5.0	0.486	13.9	LOS B	1.0	7.4	0.78	1.03	1.17	36.6
Approach		575	5.0	350[N1]	5.0	0.486	9.6	NA	1.0	7.4	0.54	0.71	0.81	39.9
All Vehicles		1717	5.0	1492[N1]	5.8	0.991	18.3	NA	6.7	48.7	0.35	0.75	1.39	34.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

MOVEMENT SUMMARY

Site: 101 [SH23 & SH39 West_2044 BS+D (400 dwellings) _PM_Non-Holiday]

Network: N101 [SH23 & SH39_2044 BS+D (400 dwellings)_PM_Non-Holiday]

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

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Aver. Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: SH23														
11	T1	783	5.0	783	5.0	0.410	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	237	5.0	237	5.0	0.181	5.5	LOS A	0.3	2.5	0.43	0.61	0.43	36.0
Approach		1020	5.0	1020	5.0	0.410	1.3	NA	0.3	2.5	0.10	0.14	0.10	47.7
North: SH39														
1	L2	365	5.0	365	5.0	2.606	1463.6	LOS F	103.7	757.1	1.00	9.01	22.25	0.5
3	R2	264	5.0	264	5.0	2.606	1484.3	LOS F	103.7	757.1	1.00	9.01	22.25	1.6
Approach		629	5.0	629	5.0	2.606	1472.3	LOS F	103.7	757.1	1.00	9.01	22.25	1.0
West: SH23														
4	L2	88	5.0	88	5.0	0.160	4.6	LOS A	0.0	0.0	0.00	0.16	0.00	47.9
5	T1	208	5.0	208	5.0	0.160	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	48.2
Approach		297	5.0	297	5.0	0.160	1.4	NA	0.0	0.0	0.00	0.16	0.00	48.1
All Vehicles		1946	5.0	1946	5.0	2.606	477.0	NA	103.7	757.1	0.38	3.01	7.25	3.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SH23 / SH39 – Single Lane Roundabout Configuration

MOVEMENT SUMMARY

Site: 101 [SH23 & SH39_2024 BS_AM_Non-Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	31	5.0	0.206	2.5	LOS A	1.2	8.8	0.35	0.31	0.35	48.0
2	T1	203	5.0	0.206	1.8	LOS A	1.2	8.8	0.35	0.31	0.35	49.7
3	R2	43	5.0	0.206	8.2	LOS A	1.2	8.8	0.35	0.31	0.35	50.7
Approach		277	5.0	0.206	2.9	LOS A	1.2	8.8	0.35	0.31	0.35	49.6
East: SH23												
4	L2	15	5.0	0.105	3.1	LOS A	0.6	4.5	0.48	0.38	0.48	47.5
5	T1	85	5.0	0.105	2.4	LOS A	0.6	4.5	0.48	0.38	0.48	49.1
6	R2	22	5.0	0.105	8.7	LOS A	0.6	4.5	0.48	0.38	0.48	50.1
Approach		122	5.0	0.105	3.6	LOS A	0.6	4.5	0.48	0.38	0.48	49.1
North: SH39												
7	L2	6	5.0	0.310	6.1	LOS A	2.3	17.1	0.85	0.71	0.85	45.9
8	T1	182	5.0	0.310	5.4	LOS A	2.3	17.1	0.85	0.71	0.85	47.4
9	R2	49	5.0	0.310	11.8	LOS B	2.3	17.1	0.85	0.71	0.85	48.4
Approach		238	5.0	0.310	6.8	LOS A	2.3	17.1	0.85	0.71	0.85	47.5
West: SH23												
10	L2	284	5.0	0.753	5.8	LOS A	10.0	73.2	0.80	0.71	0.91	46.5
11	T1	608	5.0	0.753	5.1	LOS A	10.0	73.2	0.80	0.71	0.91	48.1
12	R2	60	5.0	0.753	11.5	LOS B	10.0	73.2	0.80	0.71	0.91	49.1
Approach		953	5.0	0.753	5.7	LOS A	10.0	73.2	0.80	0.71	0.91	47.7
All Vehicles		1589	5.0	0.753	5.2	LOS A	10.0	73.2	0.71	0.62	0.77	48.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2024 BS_PM_Non-Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	80	5.0	0.338	6.0	LOS A	2.5	18.3	0.83	0.71	0.83	46.4
2	T1	173	5.0	0.338	5.3	LOS A	2.5	18.3	0.83	0.71	0.83	47.9
3	R2	24	5.0	0.338	11.7	LOS B	2.5	18.3	0.83	0.71	0.83	49.0
Approach		277	5.0	0.338	6.1	LOS A	2.5	18.3	0.83	0.71	0.83	47.6
East: SH23												
4	L2	74	5.0	0.586	6.4	LOS A	5.6	41.1	0.81	0.78	0.93	46.5
5	T1	502	5.0	0.586	5.7	LOS A	5.6	41.1	0.81	0.78	0.93	48.0
6	R2	22	5.0	0.586	12.0	LOS B	5.6	41.1	0.81	0.78	0.93	49.0
Approach		598	5.0	0.586	6.0	LOS A	5.6	41.1	0.81	0.78	0.93	47.9
North: SH39												
7	L2	12	5.0	0.360	3.0	LOS A	2.5	18.0	0.49	0.43	0.49	47.0
8	T1	287	5.0	0.360	2.3	LOS A	2.5	18.0	0.49	0.43	0.49	48.6
9	R2	161	5.0	0.360	8.7	LOS A	2.5	18.0	0.49	0.43	0.49	49.6
Approach		460	5.0	0.360	4.6	LOS A	2.5	18.0	0.49	0.43	0.49	48.9
West: SH23												
10	L2	66	5.0	0.215	2.9	LOS A	1.4	10.1	0.46	0.36	0.46	47.7
11	T1	162	5.0	0.215	2.2	LOS A	1.4	10.1	0.46	0.36	0.46	49.3
12	R2	37	5.0	0.215	8.5	LOS A	1.4	10.1	0.46	0.36	0.46	50.4
Approach		265	5.0	0.215	3.2	LOS A	1.4	10.1	0.46	0.36	0.46	49.0
All Vehicles		1600	5.0	0.586	5.1	LOS A	5.6	41.1	0.66	0.60	0.71	48.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2024 BS_AM_Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	35	5.0	0.244	2.7	LOS A	1.5	10.9	0.40	0.33	0.40	47.8
2	T1	236	5.0	0.244	2.0	LOS A	1.5	10.9	0.40	0.33	0.40	49.5
3	R2	51	5.0	0.244	8.3	LOS A	1.5	10.9	0.40	0.33	0.40	50.6
Approach		321	5.0	0.244	3.1	LOS A	1.5	10.9	0.40	0.33	0.40	49.5
East: SH23												
4	L2	17	5.0	0.127	3.3	LOS A	0.8	5.7	0.54	0.41	0.54	47.3
5	T1	99	5.0	0.127	2.6	LOS A	0.8	5.7	0.54	0.41	0.54	48.9
6	R2	25	5.0	0.127	9.0	LOS A	0.8	5.7	0.54	0.41	0.54	49.9
Approach		141	5.0	0.127	3.8	LOS A	0.8	5.7	0.54	0.41	0.54	48.9
North: SH39												
7	L2	7	5.0	0.445	8.3	LOS A	3.9	28.7	0.99	0.96	1.05	45.2
8	T1	211	5.0	0.445	7.6	LOS A	3.9	28.7	0.99	0.96	1.05	46.7
9	R2	57	5.0	0.445	13.9	LOS B	3.9	28.7	0.99	0.96	1.05	47.6
Approach		275	5.0	0.445	8.9	LOS A	3.9	28.7	0.99	0.96	1.05	46.8
West: SH23												
10	L2	326	5.0	0.901	12.6	LOS B	21.7	158.1	1.00	1.09	1.49	43.4
11	T1	702	5.0	0.901	11.9	LOS B	21.7	158.1	1.00	1.09	1.49	44.8
12	R2	69	5.0	0.901	18.3	LOS B	21.7	158.1	1.00	1.09	1.49	45.7
Approach		1098	5.0	0.901	12.5	LOS B	21.7	158.1	1.00	1.09	1.49	44.4
All Vehicles		1835	5.0	0.901	9.7	LOS A	21.7	158.1	0.86	0.89	1.16	45.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2024 BS_PM_Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	94	5.0	0.457	8.1	LOS A	4.0	29.0	0.94	0.93	1.02	45.7
2	T1	200	5.0	0.457	7.4	LOS A	4.0	29.0	0.94	0.93	1.02	47.2
3	R2	27	5.0	0.457	13.8	LOS B	4.0	29.0	0.94	0.93	1.02	48.1
Approach		321	5.0	0.457	8.2	LOS A	4.0	29.0	0.94	0.93	1.02	46.8
East: SH23												
4	L2	85	5.0	0.729	10.5	LOS B	9.7	71.2	0.95	1.06	1.32	44.7
5	T1	579	5.0	0.729	9.8	LOS A	9.7	71.2	0.95	1.06	1.32	46.2
6	R2	25	5.0	0.729	16.1	LOS B	9.7	71.2	0.95	1.06	1.32	47.1
Approach		689	5.0	0.729	10.1	LOS B	9.7	71.2	0.95	1.06	1.32	46.0
North: SH39												
7	L2	14	5.0	0.429	3.4	LOS A	3.2	23.1	0.56	0.46	0.56	46.8
8	T1	334	5.0	0.429	2.6	LOS A	3.2	23.1	0.56	0.46	0.56	48.4
9	R2	184	5.0	0.429	9.0	LOS A	3.2	23.1	0.56	0.46	0.56	49.4
Approach		532	5.0	0.429	4.9	LOS A	3.2	23.1	0.56	0.46	0.56	48.7
West: SH23												
10	L2	77	5.0	0.258	3.1	LOS A	1.8	12.8	0.52	0.39	0.52	47.5
11	T1	187	5.0	0.258	2.4	LOS A	1.8	12.8	0.52	0.39	0.52	49.1
12	R2	43	5.0	0.258	8.7	LOS A	1.8	12.8	0.52	0.39	0.52	50.1
Approach		307	5.0	0.258	3.4	LOS A	1.8	12.8	0.52	0.39	0.52	48.8
All Vehicles		1849	5.0	0.729	7.1	LOS A	9.7	71.2	0.77	0.76	0.91	47.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_AM_Non-Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	38	5.0	0.263	2.8	LOS A	1.6	12.0	0.42	0.34	0.42	47.7
2	T1	249	5.0	0.263	2.1	LOS A	1.6	12.0	0.42	0.34	0.42	49.4
3	R2	54	5.0	0.263	8.4	LOS A	1.6	12.0	0.42	0.34	0.42	50.5
Approach		341	5.0	0.263	3.2	LOS A	1.6	12.0	0.42	0.34	0.42	49.4
East: SH23												
4	L2	19	5.0	0.142	3.4	LOS A	0.9	6.5	0.56	0.43	0.56	47.2
5	T1	107	5.0	0.142	2.7	LOS A	0.9	6.5	0.56	0.43	0.56	48.8
6	R2	28	5.0	0.142	9.1	LOS A	0.9	6.5	0.56	0.43	0.56	49.8
Approach		155	5.0	0.142	4.0	LOS A	0.9	6.5	0.56	0.43	0.56	48.8
North: SH39												
7	L2	8	5.0	0.532	11.5	LOS B	5.3	38.4	1.00	1.05	1.19	43.7
8	T1	223	5.0	0.532	10.8	LOS B	5.3	38.4	1.00	1.05	1.19	45.0
9	R2	63	5.0	0.532	17.2	LOS B	5.3	38.4	1.00	1.05	1.19	45.9
Approach		295	5.0	0.532	12.2	LOS B	5.3	38.4	1.00	1.05	1.19	45.2
West: SH23												
10	L2	368	5.0	1.014	43.0	LOS D	55.2	402.8	1.00	2.05	3.08	32.2
11	T1	773	5.0	1.014	42.3	LOS D	55.2	402.8	1.00	2.05	3.08	32.9
12	R2	75	5.0	1.014	48.6	LOS D	55.2	402.8	1.00	2.05	3.08	33.4
Approach		1216	5.0	1.014	42.9	LOS D	55.2	402.8	1.00	2.05	3.08	32.7
All Vehicles		2006	5.0	1.014	28.6	LOS C	55.2	402.8	0.87	1.49	2.15	37.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_PM_Non-Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	99	5.0	0.563	12.4	LOS B	5.8	42.1	1.00	1.09	1.25	43.5
2	T1	212	5.0	0.563	11.7	LOS B	5.8	42.1	1.00	1.09	1.25	44.8
3	R2	31	5.0	0.563	18.1	LOS B	5.8	42.1	1.00	1.09	1.25	45.7
Approach		341	5.0	0.563	12.5	LOS B	5.8	42.1	1.00	1.09	1.25	44.5
East: SH23												
4	L2	92	5.0	0.858	18.6	LOS B	16.9	123.0	1.00	1.38	1.86	40.8
5	T1	642	5.0	0.858	17.8	LOS B	16.9	123.0	1.00	1.38	1.86	42.0
6	R2	28	5.0	0.858	24.2	LOS C	16.9	123.0	1.00	1.38	1.86	42.8
Approach		762	5.0	0.858	18.2	LOS B	16.9	123.0	1.00	1.38	1.86	41.9
North: SH39												
7	L2	15	5.0	0.480	3.6	LOS A	3.7	27.2	0.61	0.50	0.61	46.6
8	T1	352	5.0	0.480	2.9	LOS A	3.7	27.2	0.61	0.50	0.61	48.1
9	R2	219	5.0	0.480	9.2	LOS A	3.7	27.2	0.61	0.50	0.61	49.1
Approach		585	5.0	0.480	5.3	LOS A	3.7	27.2	0.61	0.50	0.61	48.5
West: SH23												
10	L2	83	5.0	0.283	3.2	LOS A	2.0	14.5	0.55	0.41	0.55	47.3
11	T1	201	5.0	0.283	2.5	LOS A	2.0	14.5	0.55	0.41	0.55	49.0
12	R2	46	5.0	0.283	8.8	LOS A	2.0	14.5	0.55	0.41	0.55	50.0
Approach		331	5.0	0.283	3.6	LOS A	2.0	14.5	0.55	0.41	0.55	48.7
All Vehicles		2019	5.0	0.858	11.1	LOS B	16.9	123.0	0.81	0.91	1.18	45.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_AM_Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	43	5.0	0.312	3.0	LOS A	2.0	14.9	0.47	0.37	0.47	47.6
2	T1	289	5.0	0.312	2.3	LOS A	2.0	14.9	0.47	0.37	0.47	49.2
3	R2	62	5.0	0.312	8.7	LOS A	2.0	14.9	0.47	0.37	0.47	50.2
Approach		395	5.0	0.312	3.4	LOS A	2.0	14.9	0.47	0.37	0.47	49.2
East: SH23												
4	L2	21	5.0	0.169	3.7	LOS A	1.1	8.0	0.60	0.46	0.60	47.0
5	T1	124	5.0	0.169	3.0	LOS A	1.1	8.0	0.60	0.46	0.60	48.6
6	R2	32	5.0	0.169	9.3	LOS A	1.1	8.0	0.60	0.46	0.60	49.6
Approach		177	5.0	0.169	4.2	LOS A	1.1	8.0	0.60	0.46	0.60	48.6
North: SH39												
7	L2	11	5.0	0.589	12.6	LOS B	6.3	45.7	1.00	1.10	1.26	43.1
8	T1	258	5.0	0.589	11.9	LOS B	6.3	45.7	1.00	1.10	1.26	44.5
9	R2	73	5.0	0.589	18.3	LOS B	6.3	45.7	1.00	1.10	1.26	45.3
Approach		341	5.0	0.589	13.3	LOS B	6.3	45.7	1.00	1.10	1.26	44.6
West: SH23												
10	L2	420	5.0	1.213	204.0	LOS F	179.1	1307.1	1.00	6.01	10.00	13.5
11	T1	887	5.0	1.213	203.3	LOS F	179.1	1307.1	1.00	6.01	10.00	13.6
12	R2	85	5.0	1.213	209.6	LOS F	179.1	1307.1	1.00	6.01	10.00	13.7
Approach		1393	5.0	1.213	203.9	LOS F	179.1	1307.1	1.00	6.01	10.00	13.6
All Vehicles		2305	5.0	1.213	126.0	LOS F	179.1	1307.1	0.88	3.89	6.36	19.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_PM_Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	116	5.0	0.709	20.3	LOS C	9.0	65.7	1.00	1.27	1.57	39.9
2	T1	245	5.0	0.709	19.6	LOS B	9.0	65.7	1.00	1.27	1.57	41.0
3	R2	35	5.0	0.709	25.9	LOS C	9.0	65.7	1.00	1.27	1.57	41.8
Approach		396	5.0	0.709	20.3	LOS C	9.0	65.7	1.00	1.27	1.57	40.7
East: SH23												
4	L2	105	5.0	1.108	127.7	LOS F	80.3	586.4	1.00	3.97	7.10	18.7
5	T1	737	5.0	1.108	127.0	LOS F	80.3	586.4	1.00	3.97	7.10	18.9
6	R2	32	5.0	1.108	133.3	LOS F	80.3	586.4	1.00	3.97	7.10	19.1
Approach		874	5.0	1.108	127.3	LOS F	80.3	586.4	1.00	3.97	7.10	18.9
North: SH39												
7	L2	18	5.0	0.574	4.2	LOS A	5.0	36.8	0.71	0.56	0.72	46.2
8	T1	408	5.0	0.574	3.5	LOS A	5.0	36.8	0.71	0.56	0.72	47.7
9	R2	246	5.0	0.574	9.9	LOS A	5.0	36.8	0.71	0.56	0.72	48.7
Approach		673	5.0	0.574	5.9	LOS A	5.0	36.8	0.71	0.56	0.72	48.0
West: SH23												
10	L2	97	5.0	0.340	3.5	LOS A	2.5	18.2	0.61	0.44	0.61	47.1
11	T1	233	5.0	0.340	2.8	LOS A	2.5	18.2	0.61	0.44	0.61	48.7
12	R2	54	5.0	0.340	9.1	LOS A	2.5	18.2	0.61	0.44	0.61	49.8
Approach		383	5.0	0.340	3.8	LOS A	2.5	18.2	0.61	0.44	0.61	48.5
All Vehicles		2325	5.0	1.108	53.6	LOS E	80.3	586.4	0.85	1.94	3.24	29.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_AM_Non-Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	38	5.0	0.266	2.9	LOS A	1.7	12.1	0.44	0.35	0.44	47.7
2	T1	249	5.0	0.266	2.2	LOS A	1.7	12.1	0.44	0.35	0.44	49.3
3	R2	54	5.0	0.266	8.5	LOS A	1.7	12.1	0.44	0.35	0.44	50.4
Approach		341	5.0	0.266	3.2	LOS A	1.7	12.1	0.44	0.35	0.44	49.3
East: SH23												
4	L2	19	5.0	0.149	3.4	LOS A	0.9	6.9	0.56	0.43	0.56	47.2
5	T1	115	5.0	0.149	2.7	LOS A	0.9	6.9	0.56	0.43	0.56	48.8
6	R2	28	5.0	0.149	9.1	LOS A	0.9	6.9	0.56	0.43	0.56	49.8
Approach		162	5.0	0.149	3.9	LOS A	0.9	6.9	0.56	0.43	0.56	48.8
North: SH39												
7	L2	8	5.0	0.535	11.4	LOS B	5.3	38.7	1.00	1.05	1.19	43.7
8	T1	223	5.0	0.535	10.7	LOS B	5.3	38.7	1.00	1.05	1.19	45.0
9	R2	68	5.0	0.535	17.1	LOS B	5.3	38.7	1.00	1.05	1.19	45.9
Approach		300	5.0	0.535	12.2	LOS B	5.3	38.7	1.00	1.05	1.19	45.2
West: SH23												
10	L2	414	5.0	1.106	110.8	LOS F	111.0	810.3	1.00	3.82	6.02	20.3
11	T1	841	5.0	1.106	110.1	LOS F	111.0	810.3	1.00	3.82	6.02	20.6
12	R2	75	5.0	1.106	116.4	LOS F	111.0	810.3	1.00	3.82	6.02	20.8
Approach		1329	5.0	1.106	110.7	LOS F	111.0	810.3	1.00	3.82	6.02	20.5
All Vehicles		2133	5.0	1.106	71.5	LOS F	111.0	810.3	0.88	2.62	4.03	26.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_PM_Non-Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	99	5.0	0.658	20.0	LOS B	7.8	57.0	1.00	1.22	1.49	40.0
2	T1	212	5.0	0.658	19.3	LOS B	7.8	57.0	1.00	1.22	1.49	41.1
3	R2	31	5.0	0.658	25.6	LOS C	7.8	57.0	1.00	1.22	1.49	41.9
Approach		341	5.0	0.658	20.1	LOS C	7.8	57.0	1.00	1.22	1.49	40.9
East: SH23												
4	L2	92	5.0	0.986	48.0	LOS D	37.4	273.3	1.00	2.22	3.52	31.0
5	T1	711	5.0	0.986	47.3	LOS D	37.4	273.3	1.00	2.22	3.52	31.7
6	R2	28	5.0	0.986	53.7	LOS E	37.4	273.3	1.00	2.22	3.52	32.1
Approach		831	5.0	0.986	47.6	LOS D	37.4	273.3	1.00	2.22	3.52	31.6
North: SH39												
7	L2	15	5.0	0.520	3.7	LOS A	4.2	30.7	0.64	0.52	0.64	46.4
8	T1	352	5.0	0.520	3.0	LOS A	4.2	30.7	0.64	0.52	0.64	47.9
9	R2	264	5.0	0.520	9.3	LOS A	4.2	30.7	0.64	0.52	0.64	48.9
Approach		631	5.0	0.520	5.7	LOS A	4.2	30.7	0.64	0.52	0.64	48.3
West: SH23												
10	L2	88	5.0	0.293	3.2	LOS A	2.1	15.1	0.56	0.41	0.56	47.3
11	T1	208	5.0	0.293	2.5	LOS A	2.1	15.1	0.56	0.41	0.56	49.0
12	R2	46	5.0	0.293	8.9	LOS A	2.1	15.1	0.56	0.41	0.56	50.0
Approach		343	5.0	0.293	3.5	LOS A	2.1	15.1	0.56	0.41	0.56	48.7
All Vehicles		2145	5.0	0.986	23.9	LOS C	37.4	273.3	0.82	1.27	1.88	39.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_AM_Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	43	5.0	0.316	3.1	LOS A	2.1	15.1	0.49	0.38	0.49	47.5
2	T1	289	5.0	0.316	2.4	LOS A	2.1	15.1	0.49	0.38	0.49	49.1
3	R2	62	5.0	0.316	8.7	LOS A	2.1	15.1	0.49	0.38	0.49	50.2
Approach		395	5.0	0.316	3.5	LOS A	2.1	15.1	0.49	0.38	0.49	49.1
East: SH23												
4	L2	21	5.0	0.176	3.7	LOS A	1.2	8.4	0.61	0.45	0.61	47.0
5	T1	132	5.0	0.176	3.0	LOS A	1.2	8.4	0.61	0.45	0.61	48.6
6	R2	32	5.0	0.176	9.4	LOS A	1.2	8.4	0.61	0.45	0.61	49.6
Approach		184	5.0	0.176	4.2	LOS A	1.2	8.4	0.61	0.45	0.61	48.6
North: SH39												
7	L2	11	5.0	0.595	12.7	LOS B	6.3	46.2	1.00	1.10	1.27	43.1
8	T1	258	5.0	0.595	11.9	LOS B	6.3	46.2	1.00	1.10	1.27	44.4
9	R2	78	5.0	0.595	18.3	LOS B	6.3	46.2	1.00	1.10	1.27	45.3
Approach		346	5.0	0.595	13.4	LOS B	6.3	46.2	1.00	1.10	1.27	44.6
West: SH23												
10	L2	465	5.0	1.311	289.8	LOS F	248.1	1811.1	1.00	7.67	12.89	10.3
11	T1	956	5.0	1.311	289.1	LOS F	248.1	1811.1	1.00	7.67	12.89	10.4
12	R2	85	5.0	1.311	295.4	LOS F	248.1	1811.1	1.00	7.67	12.89	10.4
Approach		1506	5.0	1.311	289.7	LOS F	248.1	1811.1	1.00	7.67	12.89	10.4
All Vehicles		2432	5.0	1.311	182.2	LOS F	248.1	1811.1	0.89	5.00	8.29	14.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_PM_Holiday]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	116	5.0	0.700	20.0	LOS B	8.8	64.1	1.00	1.26	1.57	40.0
2	T1	245	5.0	0.700	19.3	LOS B	8.8	64.1	1.00	1.26	1.57	41.1
3	R2	35	5.0	0.700	25.6	LOS C	8.8	64.1	1.00	1.26	1.57	41.9
Approach		396	5.0	0.700	20.0	LOS C	8.8	64.1	1.00	1.26	1.57	40.9
East: SH23												
4	L2	105	5.0	1.276	269.3	LOS F	149.4	1090.6	1.00	6.26	11.93	11.0
5	T1	805	5.0	1.276	268.6	LOS F	149.4	1090.6	1.00	6.26	11.93	11.1
6	R2	32	5.0	1.276	274.9	LOS F	149.4	1090.6	1.00	6.26	11.93	11.1
Approach		942	5.0	1.276	268.9	LOS F	149.4	1090.6	1.00	6.26	11.93	11.0
North: SH39												
7	L2	18	5.0	0.616	4.8	LOS A	6.0	43.9	0.75	0.64	0.79	45.9
8	T1	408	5.0	0.616	4.1	LOS A	6.0	43.9	0.75	0.64	0.79	47.4
9	R2	292	5.0	0.616	10.4	LOS B	6.0	43.9	0.75	0.64	0.79	48.4
Approach		718	5.0	0.616	6.7	LOS A	6.0	43.9	0.75	0.64	0.79	47.8
West: SH23												
10	L2	102	5.0	0.350	3.5	LOS A	2.6	18.9	0.61	0.44	0.61	47.1
11	T1	240	5.0	0.350	2.8	LOS A	2.6	18.9	0.61	0.44	0.61	48.7
12	R2	54	5.0	0.350	9.1	LOS A	2.6	18.9	0.61	0.44	0.61	49.8
Approach		396	5.0	0.350	3.8	LOS A	2.6	18.9	0.61	0.44	0.61	48.4
All Vehicles		2452	5.0	1.276	109.1	LOS F	149.4	1090.6	0.86	2.87	5.17	20.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SH23 / SH39 – Dual Lane Roundabout Configuration

MOVEMENT SUMMARY

Site: 101 [SH23 & SH39_2024 BS_AM_Non-Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	31	5.0	0.206	2.5	LOS A	1.2	8.7	0.35	0.31	0.35	48.0
2	T1	203	5.0	0.206	1.8	LOS A	1.2	8.7	0.35	0.31	0.35	49.7
3	R2	43	5.0	0.206	8.2	LOS A	1.2	8.7	0.35	0.31	0.35	50.7
Approach		277	5.0	0.206	2.9	LOS A	1.2	8.7	0.35	0.31	0.35	49.6
East: SH23												
4	L2	15	5.0	0.026	3.3	LOS A	0.1	1.0	0.46	0.36	0.46	47.9
5	T1	85	5.0	0.065	2.1	LOS A	0.4	2.9	0.45	0.35	0.45	49.2
6	R2	22	5.0	0.065	8.3	LOS A	0.4	2.9	0.45	0.34	0.45	50.1
Approach		122	5.0	0.065	3.3	LOS A	0.4	2.9	0.45	0.35	0.45	49.2
North: SH39												
7	L2	6	5.0	0.288	6.1	LOS A	2.1	15.0	0.80	0.71	0.80	46.0
8	T1	182	5.0	0.288	5.4	LOS A	2.1	15.0	0.80	0.71	0.80	47.5
9	R2	49	5.0	0.288	11.8	LOS B	2.1	15.0	0.80	0.71	0.80	48.5
Approach		238	5.0	0.288	6.8	LOS A	2.1	15.0	0.80	0.71	0.80	47.7
West: SH23												
10	L2	284	5.0	0.247	3.5	LOS A	1.5	10.8	0.48	0.48	0.48	47.9
11	T1	608	5.0	0.442	2.4	LOS A	3.3	24.3	0.53	0.33	0.53	49.1
12	R2	60	5.0	0.442	8.7	LOS A	3.3	24.3	0.53	0.33	0.53	50.2
Approach		953	5.0	0.442	3.1	LOS A	3.3	24.3	0.52	0.38	0.52	48.8
All Vehicles		1589	5.0	0.442	3.6	LOS A	3.3	24.3	0.52	0.41	0.52	48.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2024 BS_AM_Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	35	5.0	0.243	2.7	LOS A	1.5	10.8	0.39	0.33	0.39	47.9
2	T1	236	5.0	0.243	2.0	LOS A	1.5	10.8	0.39	0.33	0.39	49.5
3	R2	51	5.0	0.243	8.3	LOS A	1.5	10.8	0.39	0.33	0.39	50.6
Approach		321	5.0	0.243	3.1	LOS A	1.5	10.8	0.39	0.33	0.39	49.5
East: SH23												
4	L2	17	5.0	0.031	3.5	LOS A	0.2	1.3	0.51	0.39	0.51	47.8
5	T1	99	5.0	0.078	2.2	LOS A	0.5	3.6	0.50	0.37	0.50	49.0
6	R2	25	5.0	0.078	8.5	LOS A	0.5	3.6	0.50	0.36	0.50	49.9
Approach		141	5.0	0.078	3.5	LOS A	0.5	3.6	0.50	0.37	0.50	49.0
North: SH39												
7	L2	7	5.0	0.386	7.5	LOS A	3.0	21.9	0.91	0.86	0.91	45.5
8	T1	211	5.0	0.386	6.8	LOS A	3.0	21.9	0.91	0.86	0.91	47.0
9	R2	57	5.0	0.386	13.2	LOS B	3.0	21.9	0.91	0.86	0.91	48.0
Approach		275	5.0	0.386	8.2	LOS A	3.0	21.9	0.91	0.86	0.91	47.2
West: SH23												
10	L2	326	5.0	0.294	3.8	LOS A	1.8	13.4	0.54	0.53	0.54	47.7
11	T1	702	5.0	0.525	2.7	LOS A	4.3	31.7	0.62	0.37	0.62	48.8
12	R2	69	5.0	0.525	9.1	LOS A	4.3	31.7	0.62	0.37	0.62	49.8
Approach		1098	5.0	0.525	3.4	LOS A	4.3	31.7	0.59	0.42	0.59	48.5
All Vehicles		1835	5.0	0.525	4.1	LOS A	4.3	31.7	0.60	0.47	0.60	48.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2024 BS_PM_Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	94	5.0	0.416	7.5	LOS A	3.2	23.5	0.88	0.85	0.90	45.9
2	T1	200	5.0	0.416	6.8	LOS A	3.2	23.5	0.88	0.85	0.90	47.5
3	R2	27	5.0	0.416	13.2	LOS B	3.2	23.5	0.88	0.85	0.90	48.5
Approach		321	5.0	0.416	7.6	LOS A	3.2	23.5	0.88	0.85	0.90	47.1
East: SH23												
4	L2	85	5.0	0.176	5.1	LOS A	1.1	8.0	0.68	0.58	0.68	47.2
5	T1	579	5.0	0.438	3.9	LOS A	3.6	26.3	0.76	0.51	0.76	48.3
6	R2	25	5.0	0.438	10.2	LOS B	3.6	26.3	0.77	0.49	0.77	49.2
Approach		689	5.0	0.438	4.3	LOS A	3.6	26.3	0.75	0.51	0.75	48.2
North: SH39												
7	L2	14	5.0	0.427	3.4	LOS A	3.1	22.7	0.55	0.46	0.55	46.8
8	T1	334	5.0	0.427	2.6	LOS A	3.1	22.7	0.55	0.46	0.55	48.4
9	R2	184	5.0	0.427	9.0	LOS A	3.1	22.7	0.55	0.46	0.55	49.4
Approach		532	5.0	0.427	4.9	LOS A	3.1	22.7	0.55	0.46	0.55	48.7
West: SH23												
10	L2	77	5.0	0.070	3.2	LOS A	0.4	2.9	0.46	0.43	0.46	47.9
11	T1	187	5.0	0.156	1.9	LOS A	1.0	7.5	0.46	0.32	0.46	49.2
12	R2	43	5.0	0.156	8.3	LOS A	1.0	7.5	0.46	0.32	0.46	50.2
Approach		307	5.0	0.156	3.1	LOS A	1.0	7.5	0.46	0.35	0.46	49.0
All Vehicles		1849	5.0	0.438	4.8	LOS A	3.6	26.3	0.67	0.53	0.67	48.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2024 BS_PM_Non-Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	80	5.0	0.319	6.0	LOS A	2.2	16.4	0.78	0.70	0.78	46.5
2	T1	173	5.0	0.319	5.3	LOS A	2.2	16.4	0.78	0.70	0.78	48.1
3	R2	24	5.0	0.319	11.7	LOS B	2.2	16.4	0.78	0.70	0.78	49.1
Approach		277	5.0	0.319	6.1	LOS A	2.2	16.4	0.78	0.70	0.78	47.7
East: SH23												
4	L2	74	5.0	0.142	4.5	LOS A	0.8	6.1	0.61	0.52	0.61	47.4
5	T1	502	5.0	0.355	3.3	LOS A	2.7	19.5	0.67	0.43	0.67	48.7
6	R2	22	5.0	0.355	9.6	LOS A	2.7	19.5	0.67	0.42	0.67	49.6
Approach		598	5.0	0.355	3.7	LOS A	2.7	19.5	0.66	0.44	0.66	48.5
North: SH39												
7	L2	12	5.0	0.359	3.0	LOS A	2.4	17.7	0.48	0.43	0.48	47.0
8	T1	287	5.0	0.359	2.3	LOS A	2.4	17.7	0.48	0.43	0.48	48.6
9	R2	161	5.0	0.359	8.7	LOS A	2.4	17.7	0.48	0.43	0.48	49.6
Approach		460	5.0	0.359	4.6	LOS A	2.4	17.7	0.48	0.43	0.48	48.9
West: SH23												
10	L2	66	5.0	0.058	3.0	LOS A	0.3	2.4	0.42	0.40	0.42	48.1
11	T1	162	5.0	0.130	1.8	LOS A	0.8	6.0	0.41	0.31	0.41	49.3
12	R2	37	5.0	0.130	8.2	LOS A	0.8	6.0	0.41	0.31	0.41	50.4
Approach		265	5.0	0.130	3.0	LOS A	0.8	6.0	0.41	0.33	0.41	49.2
All Vehicles		1600	5.0	0.359	4.2	LOS A	2.7	19.5	0.59	0.47	0.59	48.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_AM_Non-Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	38	5.0	0.263	2.8	LOS A	1.6	11.9	0.42	0.34	0.42	47.8
2	T1	249	5.0	0.263	2.1	LOS A	1.6	11.9	0.42	0.34	0.42	49.4
3	R2	54	5.0	0.263	8.4	LOS A	1.6	11.9	0.42	0.34	0.42	50.5
Approach		341	5.0	0.263	3.2	LOS A	1.6	11.9	0.42	0.34	0.42	49.4
East: SH23												
4	L2	19	5.0	0.035	3.6	LOS A	0.2	1.5	0.53	0.41	0.53	47.7
5	T1	107	5.0	0.087	2.3	LOS A	0.6	4.2	0.53	0.38	0.53	48.9
6	R2	28	5.0	0.087	8.6	LOS A	0.6	4.2	0.53	0.37	0.53	49.8
Approach		155	5.0	0.087	3.7	LOS A	0.6	4.2	0.53	0.38	0.53	48.9
North: SH39												
7	L2	8	5.0	0.466	10.2	LOS B	4.2	30.4	0.98	1.00	1.10	44.3
8	T1	223	5.0	0.466	9.5	LOS A	4.2	30.4	0.98	1.00	1.10	45.8
9	R2	63	5.0	0.466	15.8	LOS B	4.2	30.4	0.98	1.00	1.10	46.7
Approach		295	5.0	0.466	10.9	LOS B	4.2	30.4	0.98	1.00	1.10	45.9
West: SH23												
10	L2	368	5.0	0.337	4.0	LOS A	2.2	16.0	0.57	0.56	0.57	47.6
11	T1	773	5.0	0.585	3.0	LOS A	5.2	37.6	0.67	0.40	0.67	48.5
12	R2	75	5.0	0.585	9.3	LOS A	5.2	37.6	0.67	0.40	0.67	49.6
Approach		1216	5.0	0.585	3.7	LOS A	5.2	37.6	0.64	0.45	0.64	48.3
All Vehicles		2006	5.0	0.585	4.6	LOS A	5.2	37.6	0.64	0.51	0.66	48.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_PM_Non-Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	99	5.0	0.500	10.8	LOS B	4.6	33.7	0.96	1.01	1.14	44.3
2	T1	212	5.0	0.500	10.1	LOS B	4.6	33.7	0.96	1.01	1.14	45.7
3	R2	31	5.0	0.500	16.5	LOS B	4.6	33.7	0.96	1.01	1.14	46.6
Approach		341	5.0	0.500	10.9	LOS B	4.6	33.7	0.96	1.01	1.14	45.3
East: SH23												
4	L2	92	5.0	0.205	5.5	LOS A	1.3	9.8	0.73	0.63	0.73	47.0
5	T1	642	5.0	0.512	4.7	LOS A	4.7	34.6	0.84	0.62	0.87	47.9
6	R2	28	5.0	0.512	11.1	LOS B	4.7	34.6	0.85	0.62	0.89	48.8
Approach		762	5.0	0.512	5.1	LOS A	4.7	34.6	0.82	0.62	0.85	47.8
North: SH39												
7	L2	15	5.0	0.478	3.6	LOS A	3.7	26.7	0.60	0.50	0.60	46.6
8	T1	352	5.0	0.478	2.9	LOS A	3.7	26.7	0.60	0.50	0.60	48.1
9	R2	219	5.0	0.478	9.2	LOS A	3.7	26.7	0.60	0.50	0.60	49.1
Approach		585	5.0	0.478	5.3	LOS A	3.7	26.7	0.60	0.50	0.60	48.5
West: SH23												
10	L2	83	5.0	0.077	3.3	LOS A	0.5	3.3	0.48	0.45	0.48	47.9
11	T1	201	5.0	0.170	2.0	LOS A	1.2	8.5	0.49	0.33	0.49	49.0
12	R2	46	5.0	0.170	8.4	LOS A	1.2	8.5	0.49	0.33	0.49	50.1
Approach		331	5.0	0.170	3.2	LOS A	1.2	8.5	0.48	0.36	0.48	48.9
All Vehicles		2019	5.0	0.512	5.8	LOS A	4.7	34.6	0.73	0.61	0.77	47.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_AM_Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	43	5.0	0.312	3.0	LOS A	2.0	14.8	0.47	0.37	0.47	47.6
2	T1	289	5.0	0.312	2.3	LOS A	2.0	14.8	0.47	0.37	0.47	49.2
3	R2	62	5.0	0.312	8.7	LOS A	2.0	14.8	0.47	0.37	0.47	50.3
Approach		395	5.0	0.312	3.4	LOS A	2.0	14.8	0.47	0.37	0.47	49.2
East: SH23												
4	L2	21	5.0	0.042	3.9	LOS A	0.2	1.8	0.57	0.44	0.57	47.5
5	T1	124	5.0	0.105	2.6	LOS A	0.7	5.2	0.58	0.40	0.58	48.7
6	R2	32	5.0	0.105	8.9	LOS A	0.7	5.2	0.58	0.40	0.58	49.6
Approach		177	5.0	0.105	3.9	LOS A	0.7	5.2	0.58	0.41	0.58	48.7
North: SH39												
7	L2	11	5.0	0.695	23.8	LOS C	8.7	63.9	1.00	1.27	1.59	38.3
8	T1	258	5.0	0.695	23.1	LOS C	8.7	63.9	1.00	1.27	1.59	39.3
9	R2	73	5.0	0.695	29.5	LOS C	8.7	63.9	1.00	1.27	1.59	40.0
Approach		341	5.0	0.695	24.5	LOS C	8.7	63.9	1.00	1.27	1.59	39.4
West: SH23												
10	L2	420	5.0	0.401	4.4	LOS A	2.8	20.3	0.65	0.62	0.65	47.4
11	T1	887	5.0	0.697	4.7	LOS A	8.4	61.5	0.80	0.67	0.90	47.9
12	R2	85	5.0	0.697	11.1	LOS B	8.4	61.5	0.80	0.67	0.90	48.9
Approach		1393	5.0	0.697	5.0	LOS A	8.4	61.5	0.75	0.65	0.83	47.8
All Vehicles		2305	5.0	0.697	7.5	LOS A	8.7	63.9	0.73	0.68	0.86	46.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS_PM_Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	116	5.0	0.708	23.4	LOS C	9.4	68.4	1.00	1.31	1.68	38.6
2	T1	245	5.0	0.708	22.7	LOS C	9.4	68.4	1.00	1.31	1.68	39.7
3	R2	35	5.0	0.708	29.1	LOS C	9.4	68.4	1.00	1.31	1.68	40.3
Approach		396	5.0	0.708	23.5	LOS C	9.4	68.4	1.00	1.31	1.68	39.4
East: SH23												
4	L2	105	5.0	0.262	6.3	LOS A	1.9	13.6	0.81	0.72	0.81	46.6
5	T1	737	5.0	0.655	8.0	LOS A	8.4	61.7	0.97	0.98	1.20	47.1
6	R2	32	5.0	0.655	14.8	LOS B	8.4	61.7	0.99	1.02	1.26	47.9
Approach		874	5.0	0.655	8.1	LOS A	8.4	61.7	0.95	0.95	1.16	47.1
North: SH39												
7	L2	18	5.0	0.571	4.2	LOS A	4.9	35.9	0.70	0.56	0.71	46.2
8	T1	408	5.0	0.571	3.5	LOS A	4.9	35.9	0.70	0.56	0.71	47.8
9	R2	246	5.0	0.571	9.8	LOS A	4.9	35.9	0.70	0.56	0.71	48.8
Approach		673	5.0	0.571	5.8	LOS A	4.9	35.9	0.70	0.56	0.71	48.1
West: SH23												
10	L2	97	5.0	0.093	3.5	LOS A	0.6	4.1	0.52	0.48	0.52	47.7
11	T1	233	5.0	0.204	2.2	LOS A	1.5	10.6	0.54	0.35	0.54	48.8
12	R2	54	5.0	0.204	8.6	LOS A	1.5	10.6	0.54	0.35	0.54	49.9
Approach		383	5.0	0.204	3.4	LOS A	1.5	10.6	0.54	0.38	0.54	48.7
All Vehicles		2325	5.0	0.708	9.3	LOS A	9.4	68.4	0.82	0.81	1.02	46.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_AM_Non-Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	38	5.0	0.266	2.9	LOS A	1.6	12.0	0.43	0.35	0.43	47.7
2	T1	249	5.0	0.266	2.2	LOS A	1.6	12.0	0.43	0.35	0.43	49.3
3	R2	54	5.0	0.266	8.5	LOS A	1.6	12.0	0.43	0.35	0.43	50.4
Approach		341	5.0	0.266	3.2	LOS A	1.6	12.0	0.43	0.35	0.43	49.3
East: SH23												
4	L2	19	5.0	0.037	3.7	LOS A	0.2	1.5	0.54	0.41	0.54	47.7
5	T1	115	5.0	0.092	2.4	LOS A	0.6	4.4	0.53	0.38	0.53	48.9
6	R2	28	5.0	0.092	8.6	LOS A	0.6	4.4	0.53	0.37	0.53	49.8
Approach		162	5.0	0.092	3.6	LOS A	0.6	4.4	0.53	0.38	0.53	48.9
North: SH39												
7	L2	8	5.0	0.532	13.5	LOS B	5.3	38.4	1.00	1.09	1.24	42.7
8	T1	223	5.0	0.532	12.8	LOS B	5.3	38.4	1.00	1.09	1.24	43.9
9	R2	68	5.0	0.532	19.2	LOS B	5.3	38.4	1.00	1.09	1.24	44.8
Approach		300	5.0	0.532	14.3	LOS B	5.3	38.4	1.00	1.09	1.24	44.1
West: SH23												
10	L2	414	5.0	0.378	4.0	LOS A	2.6	18.6	0.60	0.57	0.60	47.5
11	T1	841	5.0	0.633	3.3	LOS A	6.2	45.3	0.71	0.45	0.73	48.4
12	R2	75	5.0	0.633	9.7	LOS A	6.2	45.3	0.71	0.45	0.73	49.4
Approach		1329	5.0	0.633	3.9	LOS A	6.2	45.3	0.67	0.49	0.69	48.2
All Vehicles		2133	5.0	0.633	5.2	LOS A	6.2	45.3	0.67	0.54	0.71	47.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_PM_Non-Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	99	5.0	0.583	16.4	LOS B	6.3	45.8	1.00	1.16	1.37	41.5
2	T1	212	5.0	0.583	15.7	LOS B	6.3	45.8	1.00	1.16	1.37	42.8
3	R2	31	5.0	0.583	22.1	LOS C	6.3	45.8	1.00	1.16	1.37	43.6
Approach		341	5.0	0.583	16.5	LOS B	6.3	45.8	1.00	1.16	1.37	42.5
East: SH23												
4	L2	92	5.0	0.234	5.9	LOS A	1.6	11.6	0.77	0.67	0.77	46.8
5	T1	711	5.0	0.584	6.2	LOS A	6.4	47.0	0.90	0.84	1.02	47.6
6	R2	28	5.0	0.584	12.7	LOS B	6.4	47.0	0.92	0.86	1.06	48.5
Approach		831	5.0	0.584	6.3	LOS A	6.4	47.0	0.89	0.82	1.00	47.6
North: SH39												
7	L2	15	5.0	0.517	3.7	LOS A	4.1	30.1	0.63	0.52	0.63	46.4
8	T1	352	5.0	0.517	3.0	LOS A	4.1	30.1	0.63	0.52	0.63	47.9
9	R2	264	5.0	0.517	9.3	LOS A	4.1	30.1	0.63	0.52	0.63	48.9
Approach		631	5.0	0.517	5.7	LOS A	4.1	30.1	0.63	0.52	0.63	48.3
West: SH23												
10	L2	88	5.0	0.082	3.3	LOS A	0.5	3.5	0.49	0.45	0.49	47.9
11	T1	208	5.0	0.176	2.0	LOS A	1.2	8.9	0.49	0.33	0.49	49.0
12	R2	46	5.0	0.176	8.4	LOS A	1.2	8.9	0.49	0.33	0.49	50.1
Approach		343	5.0	0.176	3.2	LOS A	1.2	8.9	0.49	0.36	0.49	48.9
All Vehicles		2145	5.0	0.584	7.3	LOS A	6.4	47.0	0.77	0.71	0.87	47.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_AM_Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	43	5.0	0.315	3.1	LOS A	2.1	15.0	0.48	0.38	0.48	47.5
2	T1	289	5.0	0.315	2.4	LOS A	2.1	15.0	0.48	0.38	0.48	49.1
3	R2	62	5.0	0.315	8.7	LOS A	2.1	15.0	0.48	0.38	0.48	50.2
Approach		395	5.0	0.315	3.5	LOS A	2.1	15.0	0.48	0.38	0.48	49.1
East: SH23												
4	L2	21	5.0	0.044	4.0	LOS A	0.3	1.9	0.58	0.44	0.58	47.5
5	T1	132	5.0	0.110	2.6	LOS A	0.7	5.4	0.58	0.40	0.58	48.7
6	R2	32	5.0	0.110	8.9	LOS A	0.7	5.4	0.58	0.40	0.58	49.6
Approach		184	5.0	0.110	3.8	LOS A	0.7	5.4	0.58	0.41	0.58	48.7
North: SH39												
7	L2	11	5.0	0.809	41.1	LOS D	12.6	92.2	1.00	1.47	2.04	32.6
8	T1	258	5.0	0.809	40.4	LOS D	12.6	92.2	1.00	1.47	2.04	33.4
9	R2	78	5.0	0.809	46.8	LOS D	12.6	92.2	1.00	1.47	2.04	33.8
Approach		346	5.0	0.809	41.9	LOS D	12.6	92.2	1.00	1.47	2.04	33.4
West: SH23												
10	L2	465	5.0	0.444	4.5	LOS A	3.2	23.3	0.67	0.63	0.67	47.3
11	T1	956	5.0	0.747	5.6	LOS A	10.3	75.5	0.84	0.78	1.00	47.7
12	R2	85	5.0	0.747	11.9	LOS B	10.3	75.5	0.84	0.78	1.00	48.7
Approach		1506	5.0	0.747	5.6	LOS A	10.3	75.5	0.79	0.74	0.90	47.7
All Vehicles		2432	5.0	0.809	10.3	LOS B	12.6	92.2	0.75	0.76	0.97	45.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
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 [SH23 & SH39_2044 BS+D (400 dwellings)_PM_Holiday_Two lane rounabout]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH39												
1	L2	116	5.0	0.839	48.0	LOS D	15.2	111.3	1.00	1.64	2.41	30.8
2	T1	245	5.0	0.839	47.3	LOS D	15.2	111.3	1.00	1.64	2.41	31.5
3	R2	35	5.0	0.839	53.7	LOS E	15.2	111.3	1.00	1.64	2.41	31.9
Approach		396	5.0	0.839	48.1	LOS D	15.2	111.3	1.00	1.64	2.41	31.3
East: SH23												
4	L2	105	5.0	0.300	6.8	LOS A	2.2	16.2	0.86	0.77	0.86	46.3
5	T1	805	5.0	0.748	11.5	LOS B	12.0	87.6	0.98	1.11	1.41	45.2
6	R2	32	5.0	0.748	18.7	LOS B	12.0	87.6	1.00	1.16	1.50	45.6
Approach		942	5.0	0.748	11.2	LOS B	12.0	87.6	0.97	1.07	1.35	45.3
North: SH39												
7	L2	18	5.0	0.612	4.7	LOS A	5.9	42.8	0.74	0.63	0.78	46.0
8	T1	408	5.0	0.612	4.0	LOS A	5.9	42.8	0.74	0.63	0.78	47.5
9	R2	292	5.0	0.612	10.4	LOS B	5.9	42.8	0.74	0.63	0.78	48.4
Approach		718	5.0	0.612	6.6	LOS A	5.9	42.8	0.74	0.63	0.78	47.8
West: SH23												
10	L2	102	5.0	0.098	3.5	LOS A	0.6	4.3	0.52	0.48	0.52	47.7
11	T1	240	5.0	0.209	2.2	LOS A	1.5	10.9	0.54	0.35	0.54	48.8
12	R2	54	5.0	0.209	8.6	LOS A	1.5	10.9	0.54	0.35	0.54	49.9
Approach		396	5.0	0.209	3.4	LOS A	1.5	10.9	0.54	0.38	0.54	48.7
All Vehicles		2452	5.0	0.839	14.6	LOS B	15.2	111.3	0.84	0.92	1.22	43.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.