Appendix EE

Traffic and Transportation

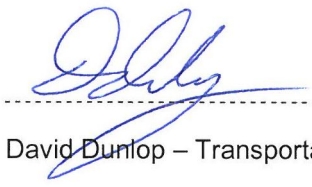
Peka Peka to Otaki
Traffic Impact Assessment

Peka Peka to Otaki
Traffic Impact Assessment

Prepared By

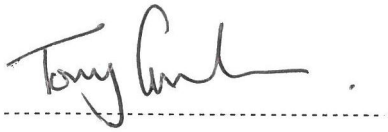
Natasha Elliott – Traffic Engineer

Reviewed By



David Dunlop – Transportation Team Leader

Approved for Release By



Tony Coulman – Team Leader

Opus International Consultants Limited
Wellington Office
Level 9, Majestic Centre, 100 Willis Street
PO Box 12 003, Wellington 6144,
New Zealand

Telephone: +64 4 471 7000
Facsimile: +64 4 471 1397

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Contents

Executive Summary

This Traffic Impact Assessment (TIA) has been undertaken to evaluate the traffic effects (including public transport, pedestrian and cycling impacts) and performance of the preferred option for the Peka Peka to Otaki Expressway.

The current network is subject to safety concerns supported by the high number of crashes between Peka Peka and Otaki, while delay, congestion and journey time variability through Otaki impacts on the effectiveness and efficiency of SH1 as a strategic route. There are also a number of existing safety and operational issues which exist along the corridor, these include; accessibility to properties, eight at grade rail crossings, limited provision for walking and cycling, and high volumes of traffic and freight through the urban and retail area of Otaki.

A project specific Peka Peka to Otaki North (PP2ON) SATURN model was developed in 2010 and has been used to assess the Do Minimum and Option traffic networks.

Network traffic volumes on the Expressway in 2026 for the preferred option between Peka Peka and Otaki Gorge Rd is forecast to be just under 19,000 vehicles per day (vpd). Between Otaki and the ramps to the north of Otaki the demand drops to less than 12,000 vpd. North of Otaki demand increases to approximately 17,000 vpd. Forecast traffic volumes on the New Local Arterial (existing SH1) with the Expressway constructed are significantly reduced compared to the Do Minimum. There is also a reduction in the percentage of heavy vehicles on the Local Arterial in the preferred option compared to the Do Minimum. With regard to traffic volumes on the local roads with the preferred option, there is a significant reduction in demand on Otaki Gorge Rd while there is a slight reduction on Old Hautere and Gear Rd.

In terms of journey times, there are travel time savings of approximately 2 minutes and 40 seconds for trips travelling the entire length of the study area on the Expressway in either direction. With the Expressway built, there is a small increase in travel time between Peka Peka and the Te Horo town centre in School Rd due to the reduced speed limit to 80km/h and going around and over the overbridge.

All new intersections perform very well based on a 2026 design year, with each having an overall LOS (Level of Service) of A or B and average delay per vehicle of no more than 7 seconds. The longest average delay on the worst performing movement is 11 seconds.

One of the major problems with the current SH1 corridor through Otaki is the congestion, delay, and journey time variability associated with travel in weekends and holiday periods. The proposed bypass of Otaki will address the current problems experienced in Otaki as those people wishing to stop will not impact through traffic. Although the true number of people wishing to stop in Otaki following construction of the proposed Expressway is not known, the fact that approximately 50% of traffic currently coming into and out of Otaki does not have Otaki as a destination or wish to stop in Otaki, it is assumed that the proposed Expressway will significantly reduce congestion and improve safety and accessibility for pedestrians in the Otaki Railway precinct.

Modelling completed to date has focused on weekdays; however there is recognition of significant demands occurring on holidays and weekends. Further work is needed to understand the implication of weekend and holiday demands.

The construction of the Expressway results in some properties losing direct access to existing roads (especially existing SH1). Changes to local property access arrangements may result in some residents having to travel further to reach their destination. However, the new access arrangements are much safer with no direct access onto SH1 and a five of the eight existing railway level crossings being removed.

Assessment using the Wellington Transport Strategy Model (WTSM) has shown that the project will have minimal impact on the provision of passenger transport in the region.

Access to the Otaki railway station will be improved for pedestrians, cyclists and motor vehicles due to enhanced linkages north and south of the station, and the removal of through traffic from the Otaki Railway Area.

Facilities for pedestrians and cyclists have been incorporated into the project for all proposed cross corridor connections and local road linkages, while further work is planned as part of the SH1 Revocation project to confirm the exact location of the north / south off road facility. This will include a shared use path the length of the project.

Given that SH1 is a key strategic corridor between Wellington and the rest of the North Island and an important linkage in the local road network on the Kapiti Coast it will be critical to manage the effects of construction to avoid significant disruption, delay, congestion and transport user frustration. This corridor will need to be maintained as operational during peak times and any diversions or delays kept to a minimum. An assessment of the construction effects will need to be completed and form part of the traffic management plan for the project.

It can be concluded that the proposed project will provide significant benefit to transport users in Kapiti and trips to and from Wellington. The creation of a second north / south corridor will provide improve safety, reliability and efficiency, while also providing increased resilience and opportunity to the transport network.

1 Introduction

This traffic impact assessment (TIA) has been undertaken to evaluate the traffic effects and performance of the preferred option for the Peka Peka to Otaki Expressway. This TIA has been produced to support the draft assessment of environmental effects (AEE) that has been developed for Scheme Assessment Report Addendum (SARA) phase of the project. It is anticipated that a full TIA will be developed as part of the Notice of Requirement (NoR) and associated planning documents, which include the full AEE.

This TIA should be read in conjunction with the information included in the SARA and does not repeat all of the information contained within the SARA. The focus of this report is on the traffic effects associated with the project, while also briefly picking up on the public transport, pedestrian and cycling impacts associated with the project. A Travel Demand Management (TDM) checklist has also been developed for the PP2O project (refer Appendix H of the SARA).

This report has been structured to include:

- Project Description
- Problem Description
- Traffic Modelling Approach
- Journey Times
- Intersections and Ramps Performance
- Local Road and Property Access
- Other Road Users
- Construction Effects
- Proposed Mitigation
- Conclusions
- Recommendations

The team has worked closely with stakeholders and the community to develop transport solutions which seek to provide significant benefits to road users and the community. As a result the traffic effects of the project are largely positive; however there is also recognition that some local road and private property accesses have been modified by the project.

2 Project Description

The planned upgrading of State Highway 1 between Peka Peka and Otaki North is "part of the Wellington Northern Corridor Road of National Significance (RoNS) – a planned four-lane expressway from Wellington Airport to Levin."

SH1 is the major route in and out of Wellington, linking the centres of Palmerston North, Wanganui and Levin with Wellington. By improving transport networks through the Kapiti Coast, this project will contribute to economic growth and productivity.

Currently the Peka Peka to North Otaki section of SH1 has a relatively poor and worsening safety record. It also experiences high levels of congestion during peak periods, weekends and holiday periods. This congestion is compounded by a high proportion of local traffic, and an increasing level of shopping-generated parking and pedestrian movements in the Otaki urban area. A bypass of Otaki, and the provision of a high-standard highway through the area will increase the efficiency of movements between Wellington and the North, will ease local congestion, improve safety, and will facilitate local, regional and national economic development.

The scope of this project is therefore to construct a high quality four-lane expressway bypassing the township of Otaki and the settlement of Te Horo. Together with the MacKays to Peka Peka section to the south, it forms the Kapiti Expressway and when both sections are completed will provide a superior transport corridor providing much improved, reliable and safer journeys through the Kapiti Coast.

The project seeks to safeguard for double tracking of the main trunk rail line and also involves the relocation of the track through Otaki in order to accommodate the proposed expressway.

3 Problem Description

The problem description has been described in the SARA and has not been repeated in this TIA.

4 Modelling Approach

A project specific SATURN model was created for this project in 2010, however more recently the MacKays to Peka Peka (M2PP) project team updated the Kapiti Transport Model (KTM) to include the entire Kapiti Expressway area. The PP2O project team has undertaken testing using the M2PP SATURN Model however there remains concern about the level of validation of this model in the PP2O project area.

For the purposes of this draft TIA, the PP2O project specific model has been utilised as the tool in which to undertaken network traffic assessment. A copy of the Validation and Forecasting report has been attached as part of Appendix K of the SARA and is considered fit for the purpose of assessing this project and the inter-relationship between the PP2O and M2PP projects.

The land use matrices utilised for this assessment have used what is known as the 'development scenario', which includes medium growth from the WTSM model and the inclusion of the Riverbank Road development and those trips associated with additional development in Paraparaumu town centre, Waikanae North and approximately 50% of the Aerodrome development. This will ensure the design has sufficient capacity to accommodate the forecast demand as development occurs.

NZTA and GWRC are currently working on different land use scenarios in order to better understand the potential effects on transport associated with wider economic development and changes in growth. These scenarios will not only look at a medium and high growth projection, they will also seek to understand the potential impact specifically resulting from the Wellington Northern RoNS in terms of land use, economic growth and resulting travel demands.

The Peka Peka to Otaki North (PP20N) SATURN model has been used to model both the Do Minimum and Preferred Option.

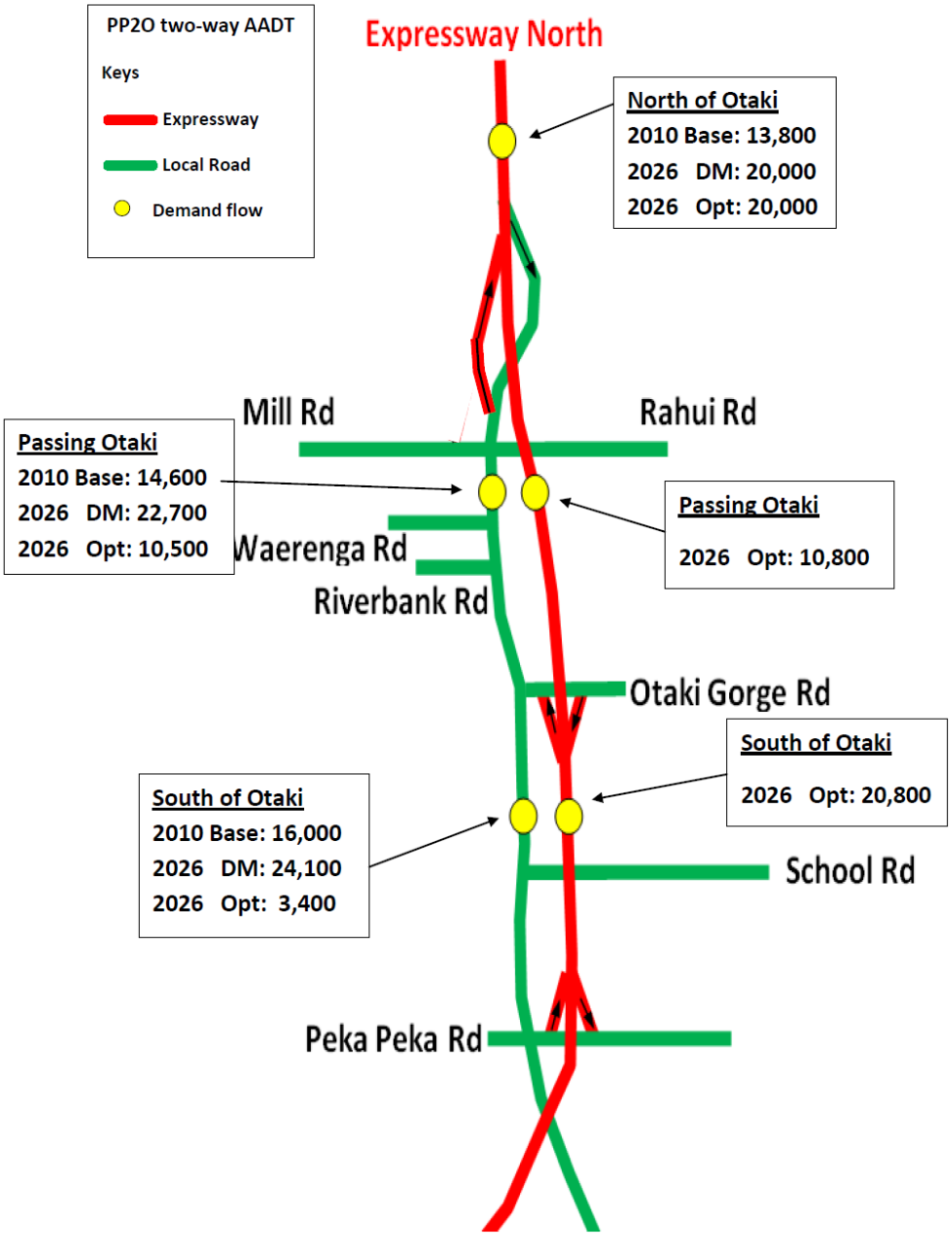
In addition to modelling the network in SATURN, key intersections have been modelled using Sidra. Traffic demands from SATURN have been used for the Sidra modelling. Since the Sidra models are for concept design of new intersections they are not calibrated and use default Sidra settings.

All modelling completed to date has focused on weekdays; however there is recognition of significant demands occurring on holidays and weekends. Further work is needed to understand the implications of the weekend and holiday demands.

5 Traffic Volumes

Traffic volumes for 2026 have been extracted from the SATURN model for the preferred option and the do minimum scenario. Figure 5.1 summarises the traffic volumes on key links for the 2010 base, Do Minimum (DM) and Preferred Option. Further detail is provided in the following sections.

Figure 5.1: Summary of Traffic Volumes on Key Links



5.1 Network Traffic Volumes

Table 5.1, below, summarises the forecast traffic volumes on the Expressway in 2026 for the preferred option. Between Peka Peka and Otaki Gorge Road the Expressway is forecast to carry just under 21,000 vehicles per day. Between Otaki Gorge Road and the ramps to the north of Otaki the demand drops to less than 11,000 vehicles per day. North of Otaki demand increases to approximately 20,000 vehicles per day. There are no traffic volumes for the Do Minimum between Peka Peka and Otaki since the Expressway is not constructed in this scenario.

Table 5.1: 2026 Expressway Traffic Volumes

Link	Direction	Do Minimum					Preferred Option				
		AM	IP	PM	AADT	HCV %	AM	IP	PM	AADT	HCV %
North of Taylors Road	NB	631	635	766	9,839	29%	631	635	766	9839	29%
	SB	763	654	760	10,309	33%	763	654	760	10309	33%
	Two-way	**1,395**	**1,289**	**1,526**	**20,148**	31%	**1395**	**1289**	**1526**	**20148**	31%
Otaki on-ramp	NB						275	321	306	4724	43%
Otaki off-ramp	SB						322	319	321	4822	48%
North of Otaki on-ramp	NB						638	642	777	9958	29%
	SB						451	344	447	5609	19%
	Two-way						**1089**	**986**	**1224**	**15567**	25%
North of Mill Road	NB						363	321	471	5234	16%
	SB						451	344	447	5609	19%
	Two-way						**814**	**665**	**918**	**10843**	18%
North of Riverbank Road	NB						363	321	471	5234	16%
	SB						451	344	447	5609	19%
	Two-way						**814**	**665**	**918**	**10843**	18%
North of Otaki Gorge Road	NB						363	321	471	5234	16%
	SB						451	344	447	5609	19%
	Two-way						**814**	**665**	**918**	**10843**	18%
Otaki Gorge off-ramp	NB						379	306	397	4950	47%
Otaki Gorge on-ramp	SB						367	319	347	4963	44%
North of School Road	NB						742	627	868	10183	31%
	SB						818	662	793	10572	31%
	Two-way						**1560**	**1289**	**1661**	**20755**	31%
Mary Crest	NB						742	627	868	10183	31%
	SB						818	662	793	10572	31%
	Two-way						**1560**	**1289**	**1661**	**20755**	31%
North of Peka Peka Road	NB						742	627	868	10183	31%
	SB						818	662	793	10572	31%
	Two-way						**1560**	**1289**	**1661**	**20755**	31%

The traffic volumes on the New Local Arterial (existing SH1 in the Do Minimum) are summarised in Table 5.2, below for 2026. In the Do Minimum scenario demand is highest to the south of Peka Peka Road with approximately 25,000 vehicles per day. Demands get progressively lower heading north along the route with approximately 21,400 vehicles per day on the current SH1 south of Te Manuao Road. In the preferred option with the Expressway constructed demands on the Local Arterial are significantly reduced compared to Do Minimum.

Table 5.2: 2026 New Local Arterial (former SH1) Traffic Volumes

Link	Direction	Do Minimum					Preferred Option				
		AM	IP	PM	AADT	HCV %	AM	IP	PM	AADT	HCV %
South of Te Manuao Rd	NB	663	677	834	10,512	28%	39	46	70	734	14%
	SB	817	689	796	10,879	31%	381	357	362	5,449	42%
	Two-way	**1,480**	**1,367**	**1,630**	**21,391**	30%	**420**	**403**	**432**	**6,183**	39%
North of Mill Road	NB	663	677	834	10,512	28%	300	356	363	5,280	41%
	SB	817	689	796	10,879	31%	366	346	349	5,271	43%
	Two-way	**1,480**	**1,367**	**1,630**	**21,391**	30%	**666**	**702**	**712**	**10,551**	42%
North of Riverbank Road	NB	702	685	922	10,856	27%	353	381	470	5,873	36%
	SB	933	739	904	11,874	28%	444	373	362	5,751	38%
	Two-way	**1,635**	**1,424**	**1,826**	**22,730**	27%	**798**	**754**	**832**	**11,624**	37%
North of Otaki Gorge Road	NB	872	760	998	12,175	28%	509	439	527	6,942	37%
	SB	928	793	924	12,501	29%	477	449	498	6,933	37%
	Two-way	**1,800**	**1,552**	**1,923**	**24,676**	29%	**985**	**888**	**1,026**	**13,875**	37%
North of School Road	NB	853	741	989	11,905	30%	111	113	121	1,722	24%
	SB	920	776	899	12,247	30%	102	113	125	1,713	27%
	Two-way	**1,773**	**1,516**	**1,888**	**24,152**	30%	**212**	**227**	**246**	**3,434**	25%
Mary Crest	NB	851	729	1,025	11,844	29%	109	102	157	1,660	19%
	SB	941	771	917	12,274	29%	123	109	140	1,735	16%
	Two-way	**1,792**	**1,500**	**1,942**	**24,118**	29%	**232**	**211**	**297**	**3,395**	17%
North of Peka Peka Road	NB	847	726	1,027	11,804	29%	112	106	165	1,735	22%
	SB	943	768	914	12,239	29%	131	114	143	1,813	19%
	Two-way	**1,790**	**1,494**	**1,940**	**24,043**	29%	**243**	**220**	**308**	**3,548**	20%
South of Peka Peka Road	NB	872	761	1,105	12,396	28%	727	612	855	9,959	30%
	SB	1,003	811	971	12,953	27%	805	646	777	10,338	30%
	Two-way	**1,875**	**1,572**	**2,075**	**25,350**	27%	**1,533**	**1,258**	**1,632**	**20,297**	30%

The traffic volumes on the local roads in 2026 for the Do Minimum and Preferred Option scenarios are summarised in Table 5.3, below. Between the Do Minimum and Preferred Option there is very little change in the traffic volumes on the local roads.

The overbridge at Te Horo (School Road) carries over 3,500 vehicles per day in 2026 while the overbridge at Otaki Gorge carries over 6,000 vehicles per day.

There is also a reduction in the number of heavy vehicles on the Local Arterial in the Preferred Option compared to the Do Minimum; however the percentage mix remains largely the same.

Table 5.3: 2026 Local Road Traffic Volumes

Link	Direction	Do Minimum					Preferred Option				
		AM	IP	PM	AADT	HCV %	AM	IP	PM	AADT	HCV %
Otaki Gorge Rd	WB	51	37	41	595	9%	51	37	41	595	9%
	EB	29	36	58	574	10%	29	36	59	575	10%
	Two-way	**80**	**73**	**99**	**1,169**	9%	**80**	**73**	**100**	**1,170**	**9%**
Old Hautere Rd	WB	27	20	22	320	10%	27	20	22	320	10%
	EB	16	19	31	310	12%	16	19	31	310	12%
	Two-way	**43**	**39**	**53**	**630**	11%	**43**	**39**	**53**	**630**	**11%**
Overbridge at Otaki Gorge Rd	WB						52	40	44	641	4%
	EB						387	357	418	5,575	40%
	Two-way						**440**	**398**	**462**	**6,216**	36%
School Rd	WB	32	24	27	388	11%	32	24	27	388	11%
	EB	21	24	37	377	13%	21	24	37	377	13%
	Two-way	**53**	**48**	**64**	**764**	12%	**53**	**48**	**64**	**765**	**12%**
Gear Rd	WB	73	98	129	1,494	17%	73	98	129	1,494	17%
	EB	106	95	98	1,465	20%	106	95	99	1,467	20%
	Two-way	**180**	**193**	**228**	**2,959**	19%	**180**	**193**	**229**	**2,961**	**19%**
Overbridge at School Rd	WB						104	121	155	1,863	16%
	EB						126	117	135	1,826	19%
	Two-way						**230**	**239**	**290**	**3,688**	17%
Rahui Rd	WB	189	114	112	1,862	16%	189	114	112	1,863	16%
	EB	88	102	191	1,691	13%	89	102	191	1,693	13%
	Two-way	**277**	**216**	**302**	**3,553**	15%	**277**	**216**	**302**	**3,556**	15%

5.2 Intersection/Ramp Volumes

In addition to the link volumes above, turning movement demands for the following key intersection in the study area have been extracted from SATURN:

- Mill Road/ New Arterial (former SH1)/ Rahui Road roundabout.
- North Otaki Northbound On Ramp/ New Arterial (former SH1) priority T intersection.
- New Arterial (former SH1)/ Otaki Gorge Road Overbridge roundabout.
- Otaki Gorge Northbound Off Ramp/ Otaki Gorge Road Overbridge priority T intersection.
- Otaki Gorge Southbound On Ramp/ Otaki Gorge Road Overbridge priority T intersection.
- Otaki Gorge Road/ Old Hauture Link Road priority T intersection.

2026 demands for both the AM and PM peak periods for light and heavy vehicles have been extracted from the model for the listed intersections. The demands are summarised in Appendix A.

6 Journey Times

Journey times for four key origin and destination pairs have been extracted from the model. These origin and destination pairs are:

(a) SH1 south (Peka Peka) and SH1 north; both northbound and southbound direction.

(b) SH1 south (Peka Peka) and retail area near Arthur Street in Otaki; both northbound and southbound direction.

(c) SH1 north and retail area near Arthur Street in Otaki; both northbound and southbound direction.

(d) SH1 south (Peka Peka) and Te Horo town centre in School Road; both northbound and southbound direction.

The SH1 south and SH1 north demands are associated with trips starting or ending beyond the study area on the Expressway. Therefore, the southern extent of the study area at Peka Peka was used for SH1 south, while the northern extent of the study area (to the north of Taylors Road) was used for SH1 north.

For motorists travelling to Te Horo there is no direct route via the Expressway. Motorists travelling from the south have two options: exit the Expressway at Poplar Avenue, Kapiti Road or Te Moana Rd and complete the remainder of their journey on the local arterial or alternatively motorists can remain on the Expressway to the ramps at Otaki Gorge Road and loop back via the local arterial to Te Horo. The traffic modeling shows that motorists prefer to exit the Expressway at Poplar Avenue and travel on the local arterial to Te Horo since this is about 13 seconds faster than using the Expressway to the Otaki Gorge Ramps and back tracking to Te Horo.

The PM peak travel time for each of the origin destination pairs were extracted from SATURN for the Do Minimum and preferred option and are summarised in Figure 6.1 and Table 6.1 below. There is minimal difference in the travel time between the different time periods. Therefore, the analysis will only focus on the PM peak when considering the travel time performance of the scheme.

Figure 6.1: 2026 PM Peak Travel Time Comparison

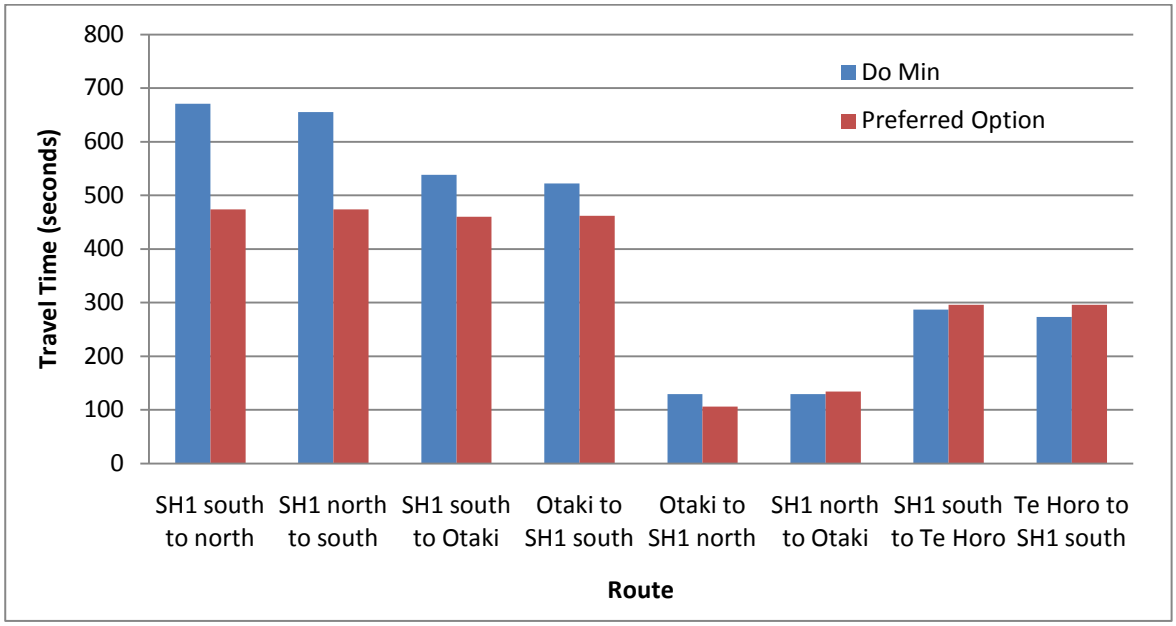


Table 6.1: 2026 PM Peak Travel Time Comparison

Travel Time Route		Northbound			Southbound		
		Do Minimum	Preferred Option	Difference	Do Minimum	Preferred Option	Difference
(a) SH1 south and SH1 north	Time (m:s)	11:11	07:54	03:17	10:55	07:54	03:01
	Dist (km)	13.3	13.1	0.1	13.3	13.1	0.1
(b) SH1 south andretail area near Arthur Street in Otaki	Time (m:s)	08:58	07:40	01:18	08:42	07:42	01:00
	Dist (km)	11.1	11.2	0	11.1	11.2	-0.1
(c) SH1 north and retail area near Arthur Street in Otaki	Time (m:s)	02:09	01:46	00:23	02:09	02:14	-00:05
	Dist (km)	2.1	2.1	0	2.1	2.2	-0.1
(d) SH1 south and Te Horo town centre in School Road	Time (m:s)	04:47	04:56	-00:9	04:33	04:56	-00:23
	Dist (km)	6.2	6.4	-0.1	6.2	6.4	-0.1

There is a travel time savings of over 3 minutes for trips travelling the entire length of the study area on the Expressway in either direction. Motorists also save about a minute when travelling between Peka Peka to the retail area in Otaki near Arthur Street with the Expressway. The Expressway saves 23 seconds when travelling from Otaki to the northern end of the study area. However, when travelling southbound from the northern end of the study area to Otaki the trip will take an additional 5 seconds.

With the Expressway built, there is a small increase in the travel time between Peka Peka and the Te Horo town centre in School Road. This analysis has assumed that in both the Do Minimum and Preferred Option motorists travel via the new local arterial (former SH1) since the modelling has shown that this route is preferred by motorists. This assumption

has been support by modeling work undertaken using the M2PP model when combined tests have been undertaken.

For motorists to access School Road in the preferred option they must go around and over the overbridge and since the speed limit on the local arterial is reduced to 80km/h compared to a speed limit of 100km/h on the former SH1 in the Do Minimum there is a slight increase in the travel time. It takes motorists approximately 10 to 25 seconds longer to travel between Peka Peka and School Road in Te Horo in the preferred option compared to the Do Minimum.

Although there is a small increase in journey time for some local residents, this has been based upon the assumption that the Existing SH1 will have a reduced speed limit of 80km/hr. If the existing speed limit is retained through further discussions with KCDC, the change in travel time may improve due to the reduction in vehicles using the local road. Irrespective of the outcome, the changes in travel time are not considered to be significant and these will be offset by significant improvements in safety.

7 Intersection/ Ramp Performance

The performance of the intersections listed in Section 5.2, above, has been assessed using SIDRA. The Mill Road/ Rahui Road roundabout is the only intersection in the list which currently exists. All the other intersections will be formed as a result of the construction of the Expressway. Table 7.1, summarises the performance of the Mill Road/ Rahui Road roundabout for the Do Minimum and preferred option scenarios while The tables show the overall LOS and delay for along with the LOS and delay for the worst performing movement at each intersection. Appendix B contains a summary of the SIDRA modelling outputs.

Table 7.1: Mill Road/ New Arterial (former SH1)/ Rahui Rd 2026 Performance Summary

Scenario	Movement	Period	LOS	Delay	Further Information
Do Minimum	Overall	AM	A	7.0	
		PM	A	8.5	
	Worst	AM	B	12.6	Right turn from Rahui Rd to SH1
		PM	B	15.9	Right turn from Mill Rd to SH1
Preferred Option	Overall	AM	A	6.9	
		PM	A	7.6	
	Worst	AM	B	10.9	Right turn from Rahui Rd to existing SH1
		PM	B	11.4	Right turn from Mill Road to existing SH1

There is a slight improvement in the performance of the roundabout at the intersection of Mill Road and the New Arterial/ old SH1 with the construction of the Expressway. The overall average delay is reduced less than 1 second per vehicle while the delay for the worst movement is reduced by up to 5 seconds.

Table 7.2 summarises the performance of the new intersections resulting from the construction of the Expressway.

Table 7.2: 2026 Performance Summary for New Intersections

Location	Movement	Period	LOS	Delay	Further Information
North Otaki NB On Ramp / New Arterial	Overall	AM	A	2.8	
		PM	A	2.9	
	Worst	AM	A	7.9	Right turn from New Arterial East (to On Ramp)
		PM	A	8.4	
New Arterial / Otaki Gorge Rd Overbridge	Overall	AM	A	6.8	
		PM	A	6.7	
	Worst	AM	B	10.6	Right Turn from New Arterial
		PM	B	10.5	
Otaki Gorge NB Off Ramp/ Otaki Gorge Rd Overbridge	Overall	AM	A	3.6	
		PM	A	3.7	
	Worst	AM	A	8.2	Right and left turn Off Ramp to Overbridge
		PM	A	7.8	
Otaki Gorge SB On Ramp/ Otaki Gorge Rd Overbridge	Overall	AM	A	7.2	
		PM	A	6.7	
	Worst	AM	A	9.5	Right turn Overbridge to On Ramp
		PM	A	9.0	
Otaki Gorge Rd/ Old Hauture Link Rd	Overall	AM	A	2.7	
		PM	A	2.8	
	Worst	AM	A	7.6	Right turn Otaki Gorge Rd to Old Hauture Link Rd
		PM	A	7.3	

All the new intersections perform very well with each having an overall LOS of A and average delay per vehicle of 7 seconds or less. The longest average delay on the worst performing movement is 11 seconds which corresponds to a LOS of B.

8 Weekend and Holiday Traffic

One of the major problems with the current SH1 corridor through Otaki is the congestion, delay and journey time variability associated with travel in weekends and holiday periods. This project has utilised data from previous investigations and assessment to look at improvements for Otaki to understand the extent of the problem and determine whether the solutions proposed will address the problems currently experienced in Otaki.

The proposed bypass of Otaki will address the current problems experienced in Otaki as those people wishing to stop will not impact on through traffic. Although the true number of people wishing to stop in Otaki following the construction of the proposed expressway is not truly known, traffic and customer surveys suggest that between 80 and 90% of people currently stopping in Otaki will continue to stop.

The fact that approximately 50% of traffic currently coming into and out of Otaki does not have Otaki as a destination or wish to stop in Otaki, it is assumed that the proposed expressway will significantly reduce congestion and improve safety and accessibility for pedestrians in the Otaki Railway Retail area.

The full RoNS project would also see the extension of the Expressway to the north (to Levin); however the programme for this section of the Wellington RoNS is beyond the PP2O section. As a result, it is possible that traffic congestion during holiday weekend may still exist north of Otaki as the expressway merges down from two lanes to one. Based on current traffic volumes which peaked at approximately 1050 vehicles per hour on a Friday afternoon of (Labour Weekend 2008 and 2009) this would not create a merge problem; however travel patterns over recent years have been modified to avoid congestion and delays associated with Otaki. These travel patterns could result in more people wanting to travel at the same time (e.g. after work on a Friday of a long weekend), thus impacting on the merge capacity north of Otaki.

Further modeling work and data collection is planned as part of the assessment of environmental effects (AEE) phase of the project to assess this impact and better understand the differences in traffic demands, travel patterns and driver behavior associated with weekend and holiday periods.

9 Local Road and Property Access

The construction of the Expressway results in some properties losing direct access to existing roads (especially the existing SH1). Details of the properties which are impacted and the options for maintaining access to these properties are discussed in the SARA.

Changes to the local property access arrangements may result in some residents having to travel further to reach their destination. However, the new access arrangements are much safer with no direct access onto SH1 and a large number of the rail crossings being removed.

Currently there are 8 railway level crossings within the study area. As part of this project, five of these level crossings will be closed. They are:

- School Road, grade separation provided
- Property access opposite Te Waka Road, alternative access provided
- Stevens property access, alternative access provided
- Old Hauture Road, alternative access provided
- Rahui Road, grade separation provided

Three existing level crossings will be retained. They are Sampson property access, Mary Crest and the Winstones Crossing. As per the existing situation, the Winstones crossing will only be used for oversized loads.

10 Other Road Users

For the purposes of this assessment, other road users include pedestrians, cyclists and passenger transport. It is anticipated that bus services will use the new local arterial in a similar way that buses currently utilise the existing SH1. Should long distance bus services wish to utilise the proposed Expressway there will be good access to and from Otaki to avoid back tracking and minimise delay to passengers.

Assessment using the Wellington Transport Strategy Model (WTSM) has shown that the project will have minimal impact on the provision of passenger transport in the region.

There have been allowances to enable the double tracking of the railway should there be a desire in the future to extend frequent passenger rail services to Otaki. Currently the Otaki station is well utilised by commuters to and from Wellington. Access to the station will be improved for pedestrians, cyclists and motor vehicles due to the enhanced linkages north and south of the station, and the removal of through traffic from the Otaki Railway Retail Area.

As appropriate, facilities for pedestrians and cyclists have been incorporated into the project. The project team is working with KCDC to develop facilities for pedestrians, cyclists and equestrians which will be completed as part of the SH1 Revocation project. This will include a shared use path the length of the project.

It is proposed that a 2.5 metre path for pedestrians and cyclists will be added to the north-east side of the existing Otaki River Bridge. The new over bridge structures in Te Horo and to the North of Otaki will also both have a 2.5 metre wide path for pedestrians and cyclists.

Although pedestrian and cycle numbers are low in the project area, access between Old Hautere Road and Te Horo will be impacted by the project. Facilities will be projected adjacent to the proposed link road between Otaki Gorge Road and Old Hautere Road which will improve the linkage to and from Otaki; however pedestrians and cyclists will need to travel an additional 1.8km than they currently travel. Although the weekday surveys conducted for the project indentified only one pedestrian movement coming out of Old Hautere Road (2010), based on average walk/cycle distances (New Zealand Household Travel Survey 2006 – 2009), it is possible that up to 6 people per day could wish to walk of cycle from properties on Old Hautere Road. Using this data, adults leaving Old Hautere Road would get to Mary Crest (4.8km); however children (1.7/2.1km) would not get to Te Horo. Also (from Statistics NZ), 4.7% of Kapiti walked or cycled to work in 2006 census (963/20445). This equates to 66 people in the Otaki Forks Mesh block. The proportion of homes on Old Hautere Road is 10% of the Otaki Forks Mesh block (50/555), therefore 6 people could be expected to walk or cycle to work from Old Hautere assuming they work in Te Horo (in reality the demand is expected to be almost non-existent).

11 Construction Effects

State Highway 1 is a key strategic corridor between Wellington and the rest of the North Island in addition to being an important linkage in the local road network on the Kapiti Coast. As a result it will be critical to manage the effects of construction to avoid significant disruption, delay, congestion, and transport user frustration. It is important to recognise that this corridor will need to be maintained operational during peak times and any diversions or delays kept to a minimum during construction.

A detailed assessment of the construction effects on traffic has not been completed at this point in time. As the project progresses, the assessment will need to be completed and form part of the traffic management plan for the project. The following items should be considered as part of the assessment of construction effects:

- Road closures including their duration, identification of alternative roads and ensuring the public are informed. If the road closures are extensive additional modelling of the impact of these road closures may be required.
- The use of SH1 for construction vehicles and the mass haul of earthworks within the project area.
- Local access for all property owners.
- Pedestrian and cyclist disruption and severance.
- Construction machinery, along with associated construction activities will cause delays and potential safety hazards for motorists.

It is anticipated that the contractor will produce construction management plans and associated temporary traffic management plans which would be submitted to NZTA for approval prior to construction works starting.

12 Possible Mitigation

Given the positive effects the proposed project will have on transport and the effort taken by the project team to enhance the provision of transport to those in the project area, there is limited need for additional mitigation. However, the following are a list of possible mitigation that could be considered by NZTA and local transport providers beyond those measures which are directly related to the project:

- As the project progresses and changes occur prior to construction, a pre and post construction road safety audit will need to be completed.
- Development of a construction management plan and associated temporary traffic management plans for the construction of the project.
- Active management of traffic during construction and limited disruption to peak time through traffic movements.
- Publicity to encourage awareness of construction and post construction accessibility.
- Signage and information for motorists, cyclists and pedestrians to improve way finding and new access provision.

13 Conclusions

Currently the existing SH1 is serving a diverse range of motorists with conflicting needs and requirements. As a result the project area is subject to high numbers of crashes, congestion, delay, journey time variability, accessibility constraints, and limited provision for pedestrians, cyclists and equestrian users.

The creation of the Expressway, New Local Arterial and local road linkages will improve network performance by enabling motorists to use a road appropriate to their journey type and length. With the Expressway constructed, traffic volumes on the New Local Arterial are significantly lower than existing and the Do Minimum scenario. This enables the New Local Arterial fulfill its function of providing access and connectivity within the district and region.

In the preferred option all links and intersections perform well and have sufficient capacity. The construction of the Expressway results in improved journey times for most journeys through and within the study area.

Safety is significantly improved with the high quality design standards being proposed for the Expressway, the removal of 5 at grade rail crossings and the significant reduction of traffic on the Local Arterial.

The reduction in traffic through Otaki will also significantly improve accessibility, safety, pedestrian/cycle facilities and access to public transport. This project will also improve parking provision and access to and from the side streets.

Each of the proposed local road linkages across the Expressway will include provision for pedestrians/cyclists and a new clip on facility is proposed for the existing Otaki River Bridge. This facility and the provision of pedestrian, cycle and equestrian facilities over the length of the project should be located within the corridor of the New Local Arterial, however further work is required as part of the SH1 revocation process to confirm the exact location and details.

The only reduction is accessibility for vehicles, pedestrians and cyclists is associated with Old Hautere Road to Te Horo and the south, however there is little or no evidence to suggest that there is a demand and the proposed linkage between Old Hautere Road and Otaki Gorge Road will improve provision northbound and across the existing main trunk rail line.

It can be concluded that this project will result in significant improvement in transport provision between Wellington and the rest of the North Island, those movements in and around the Kapiti District and local accessibility.

The project also provides significant opportunity to provide for enhanced rail provision in the future, while indentifying enhancements to walking, cycle and equestrian facilities for locals, commuters, tourists, and recreational users.

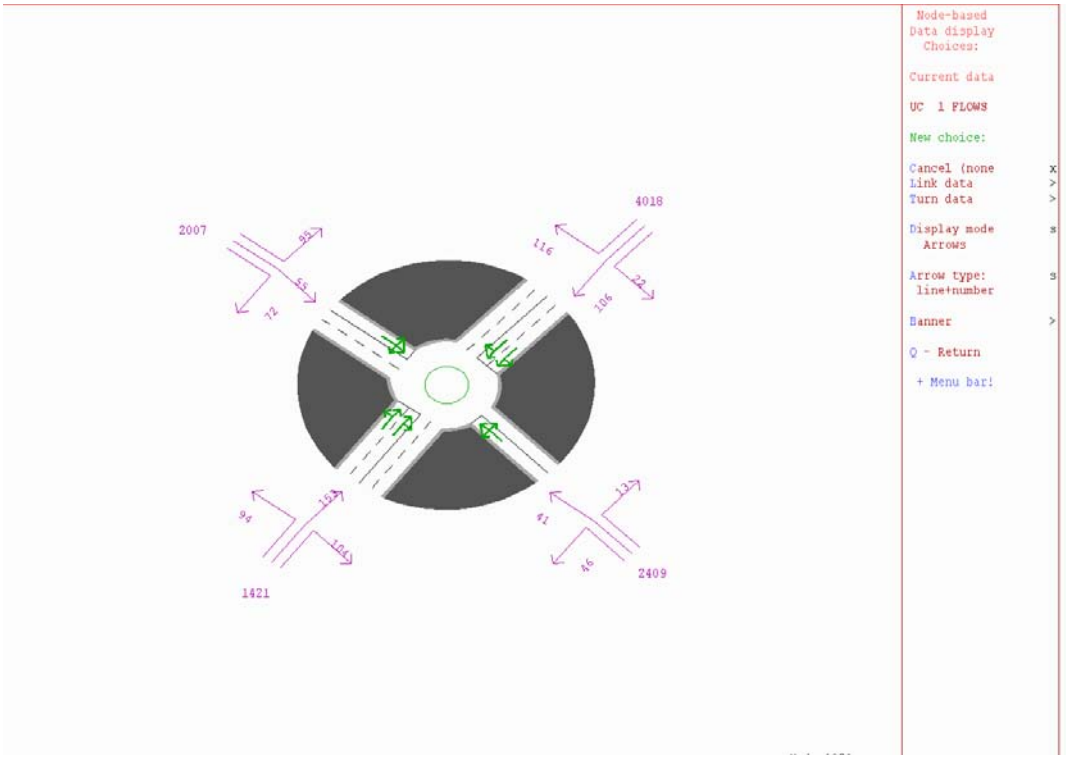
14 Recommendations

It is recommended that this initial TIA developed to accompany the SARA for the project should be enhanced as part of the AEE phase of the project.

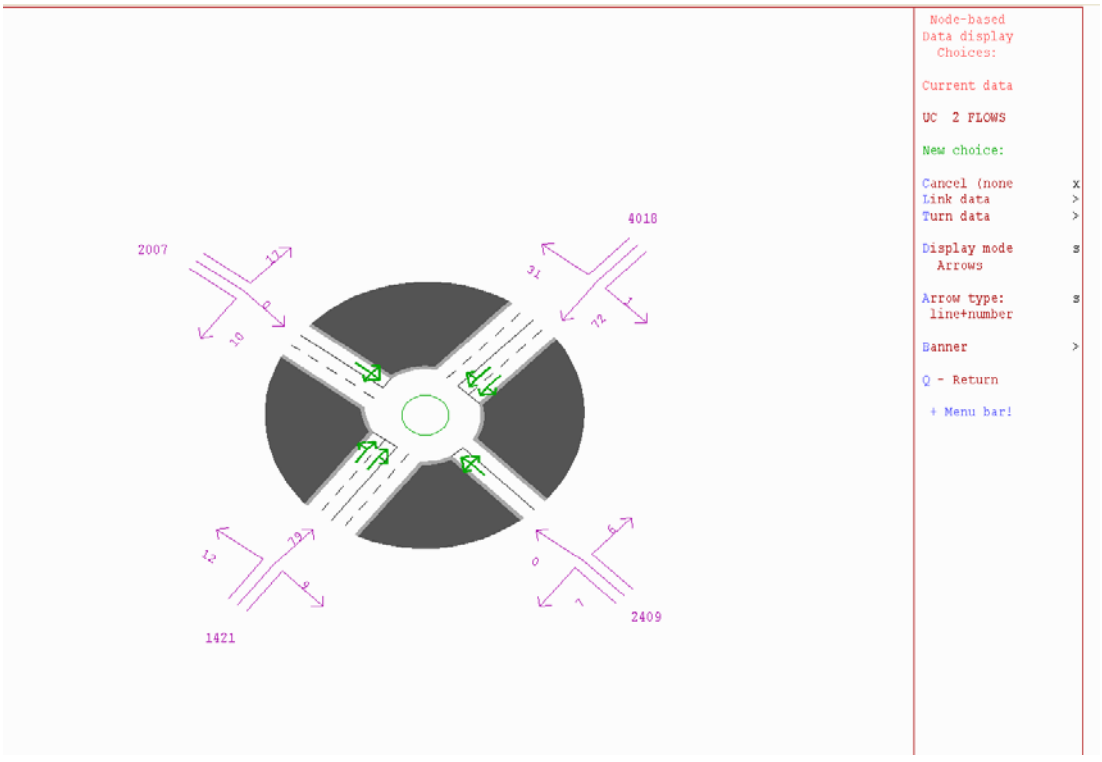
The analysis in this TIA is all based on weekday traffic demands and performance. Due to the nature of the study area, there are significant demands associated with weekends and public holidays. It is recommended that further work to understand the performance of the study area in weekends and quantify the benefits associated with this time period should be undertaken.

APPENDIX A:

Intersection and Ramp Demands from SATURN



Mill Rd RAB –UC1 (lights) 2026 PM –Preferred Option – Sc2



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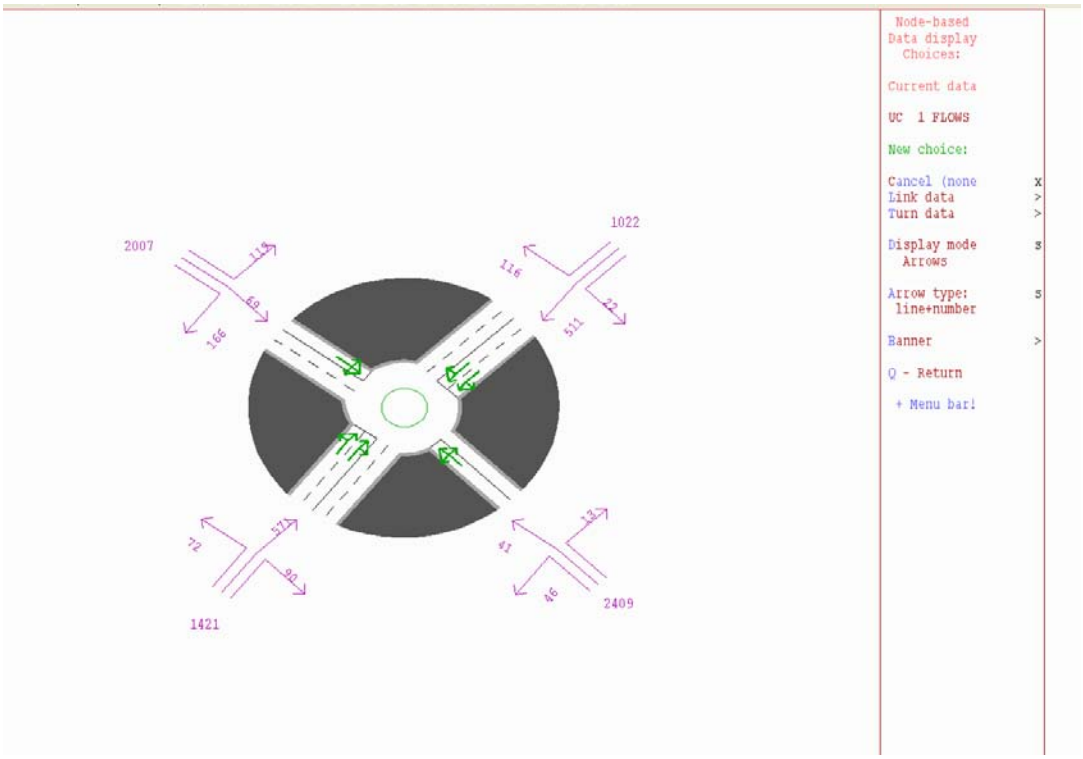

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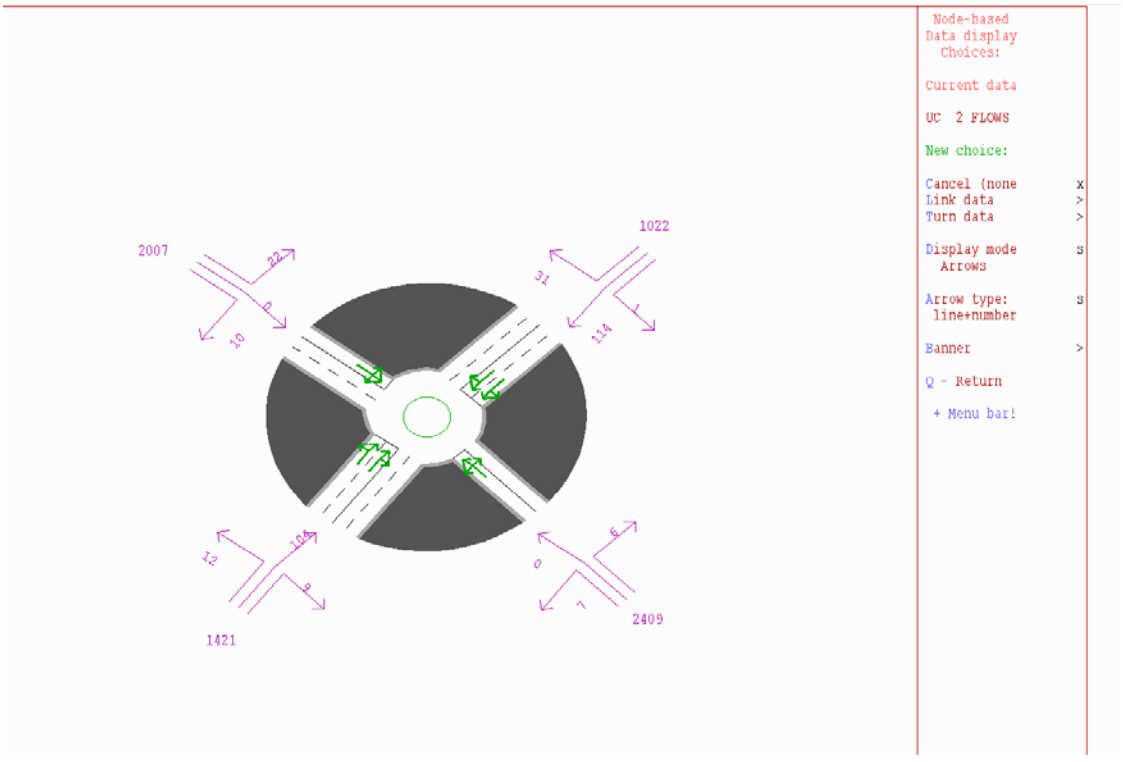

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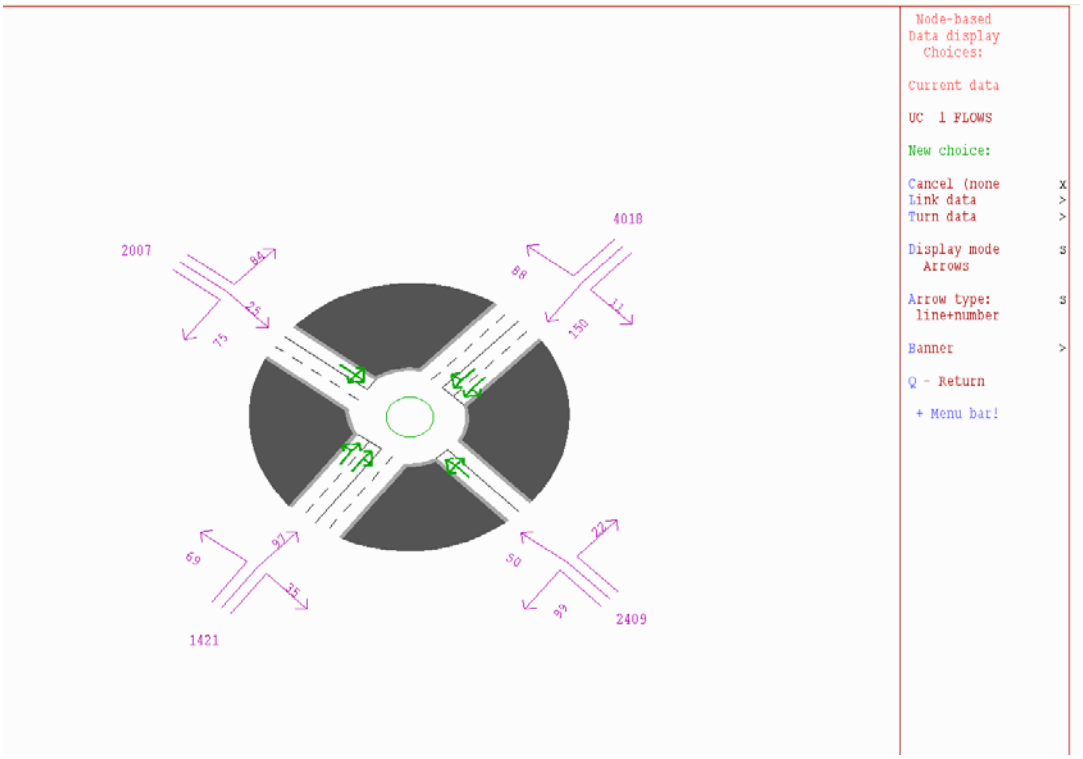

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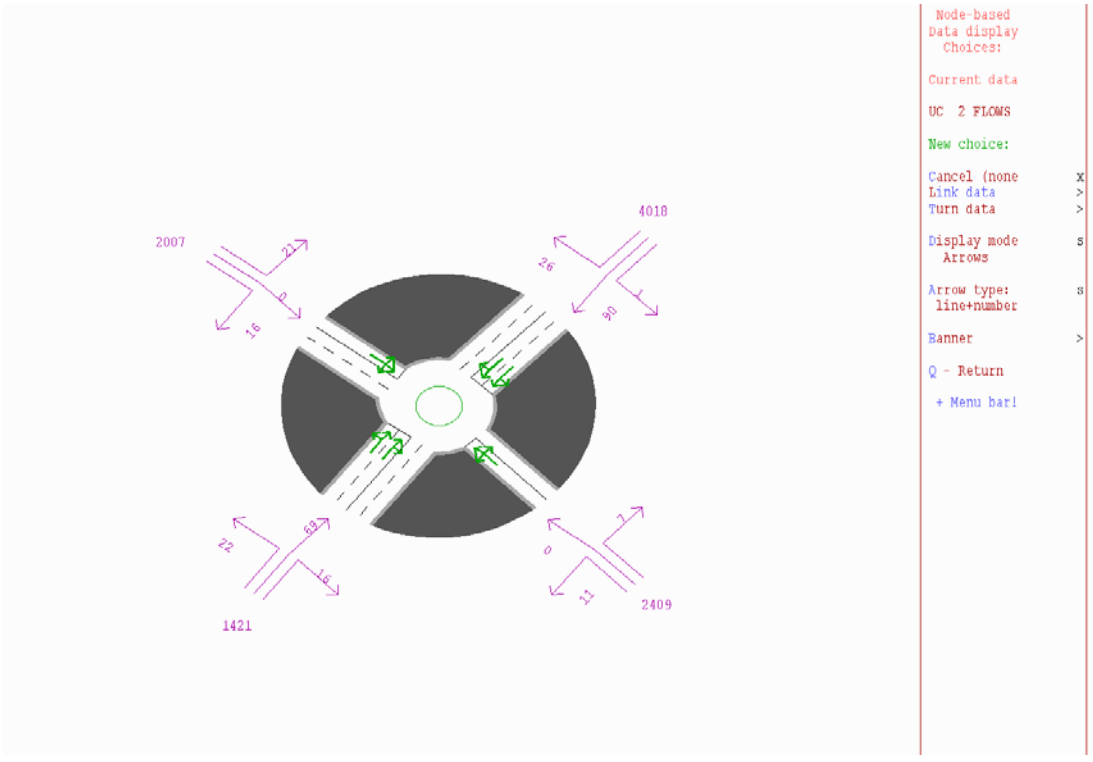

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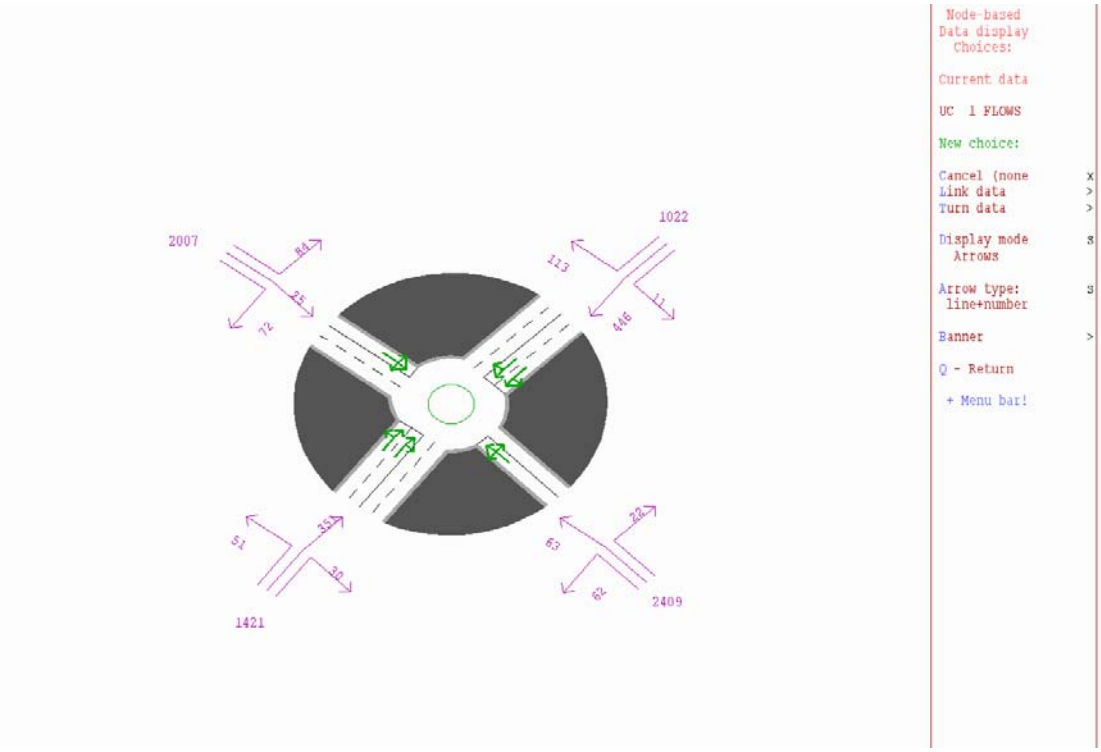

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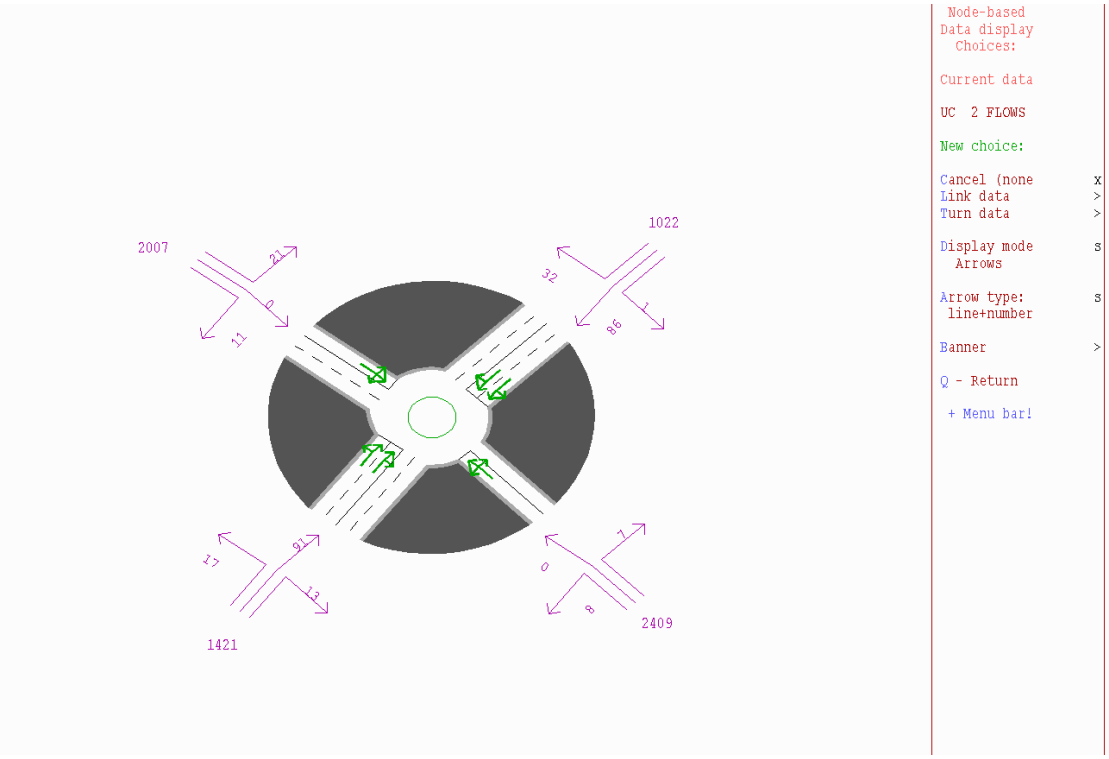

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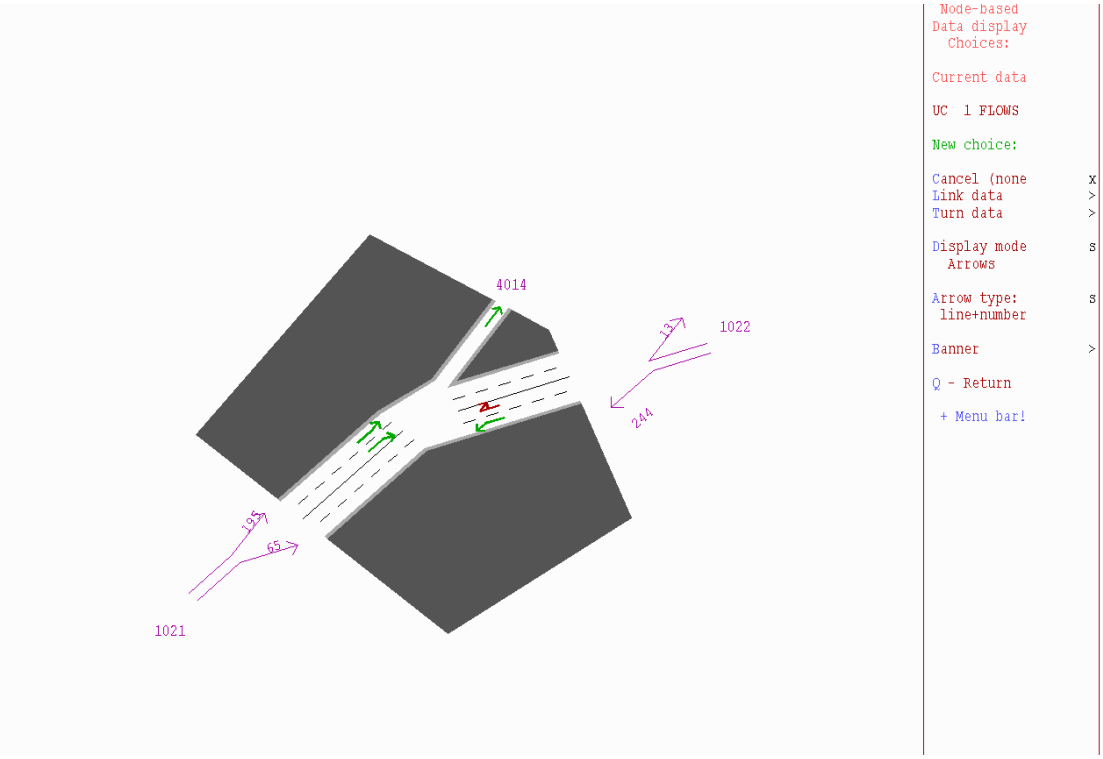
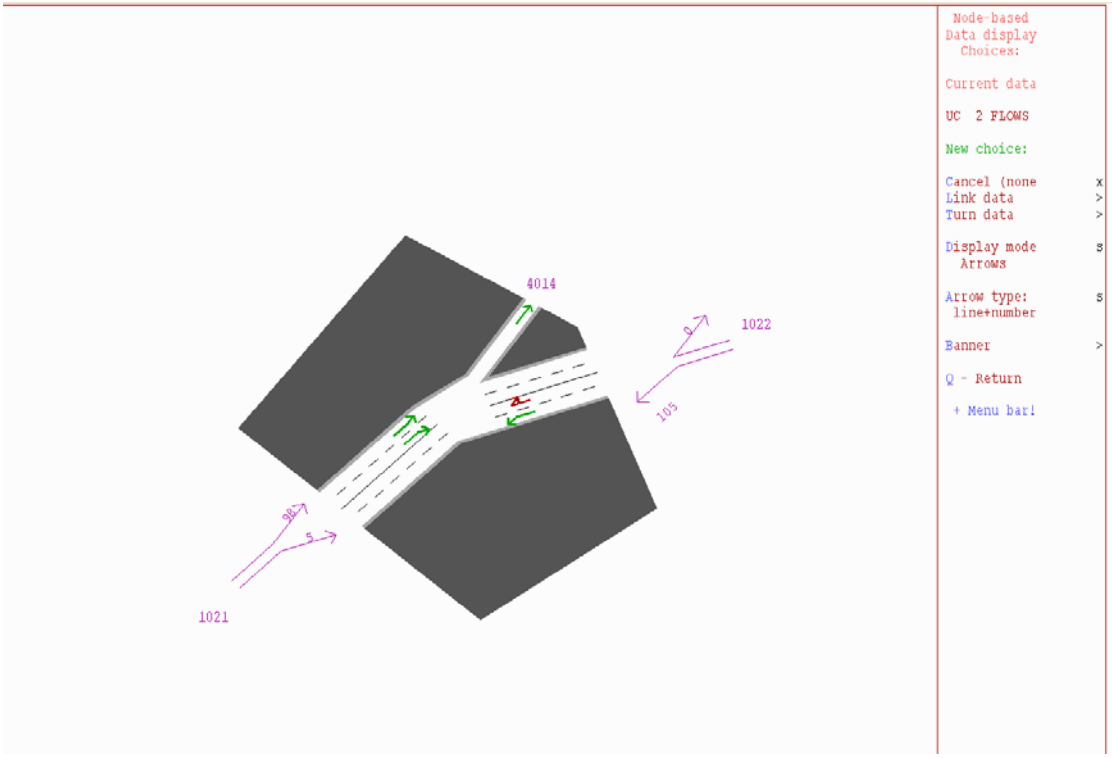


Otaki NB On Ramp/ New Local Arterial –UC1 (lights) 2026 PM –Preferred Option – Sc2



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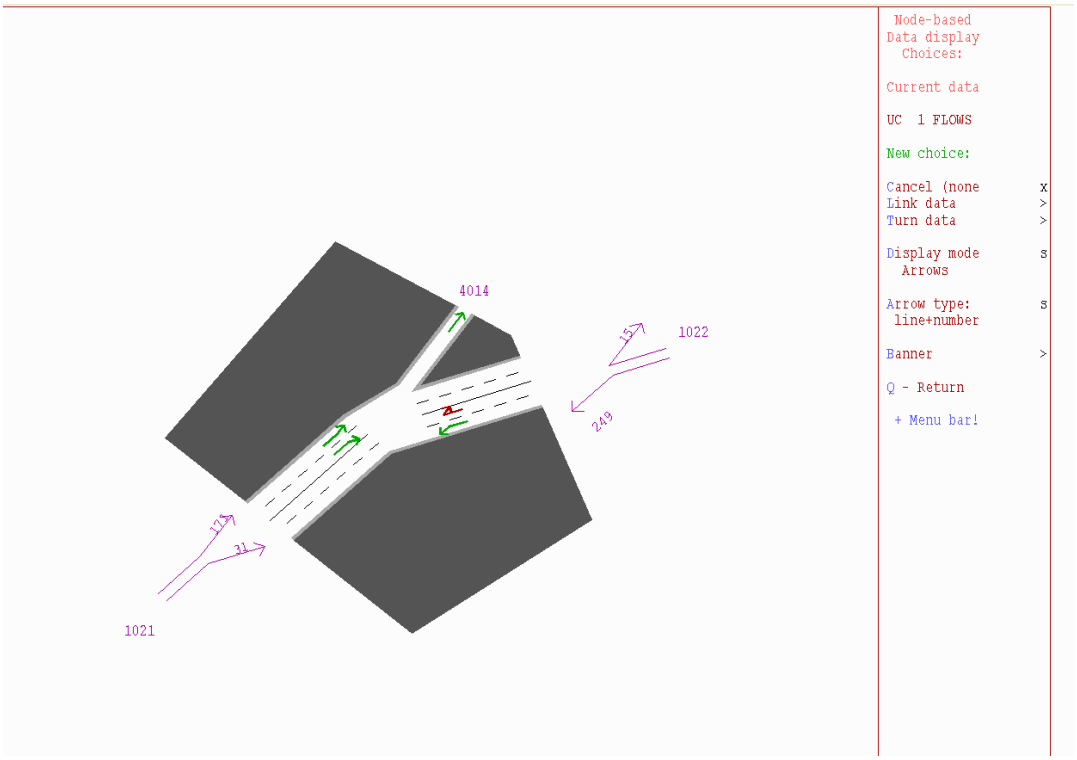

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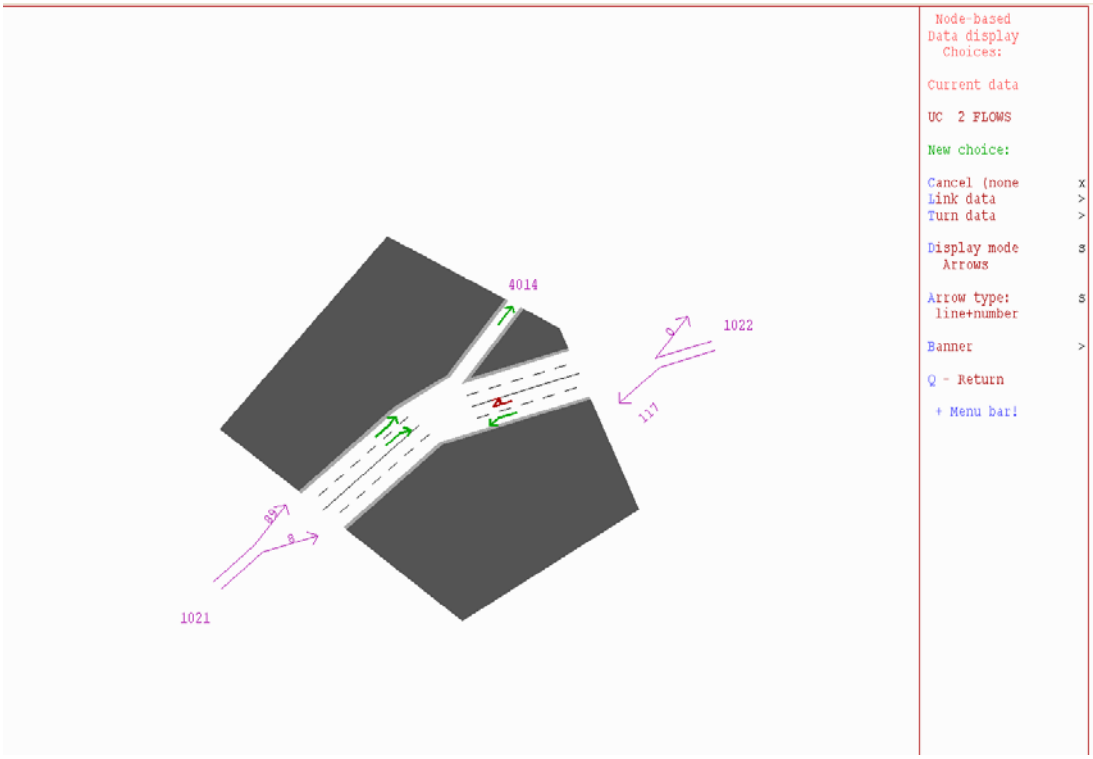

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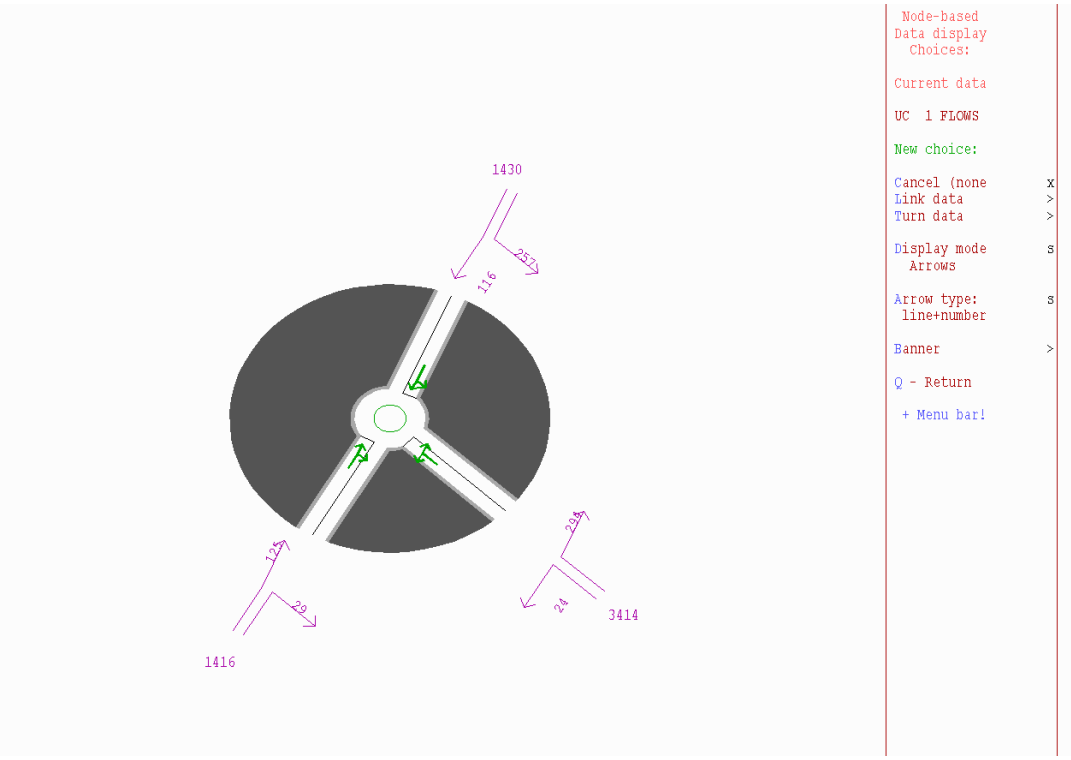

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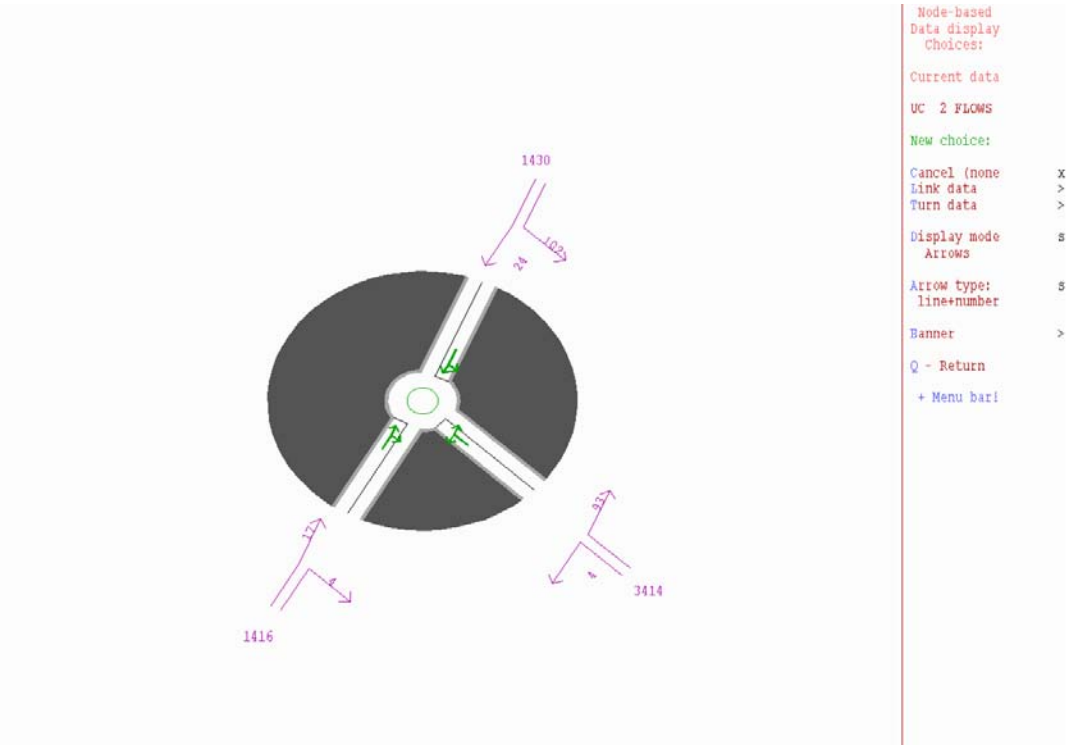

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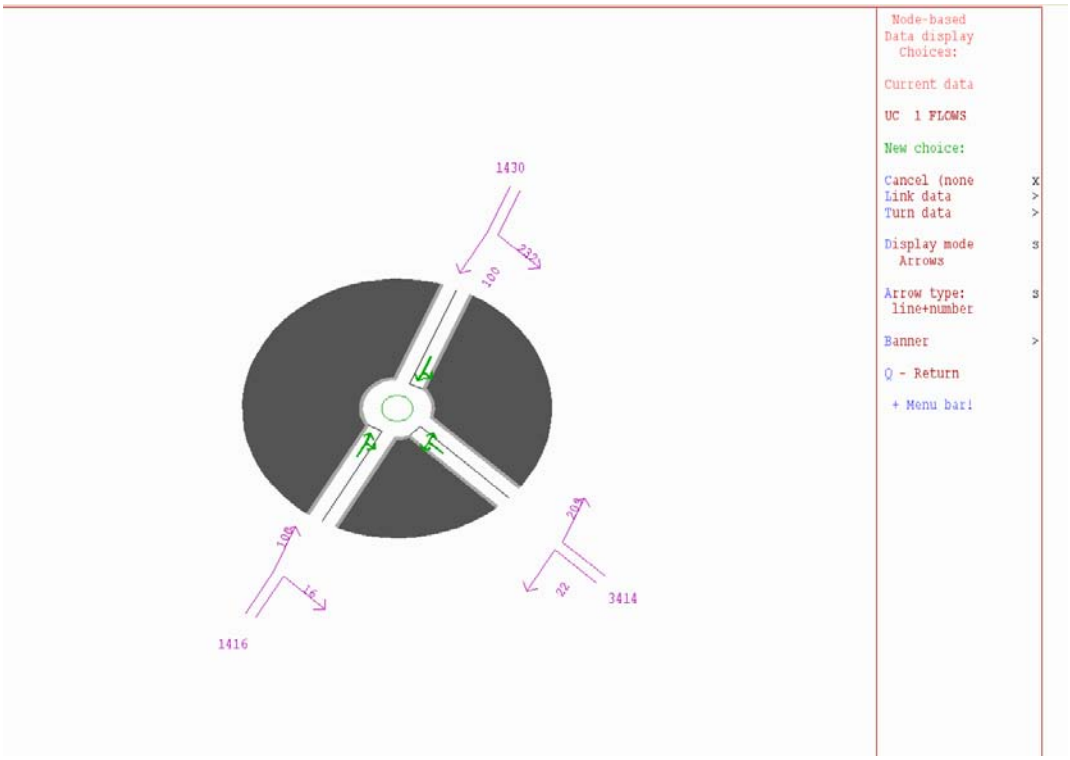
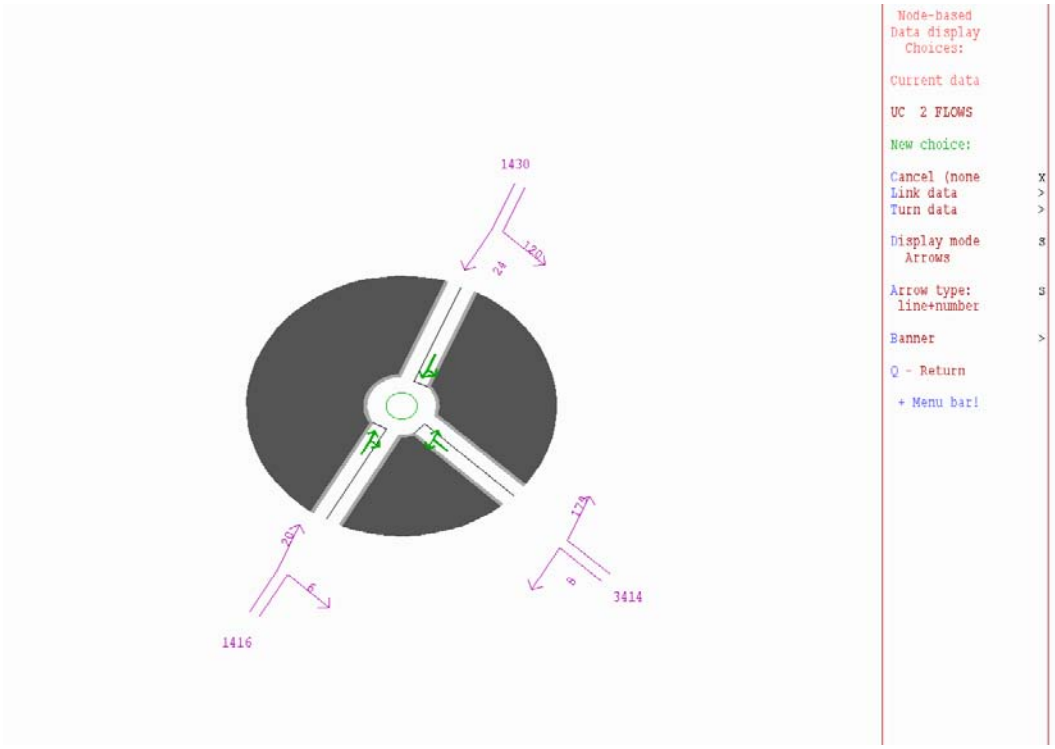


Otaki Gorge Overbridge/ New Local Arterial –UC1 (lights) 2026 AM –Preferred Option – Sc2



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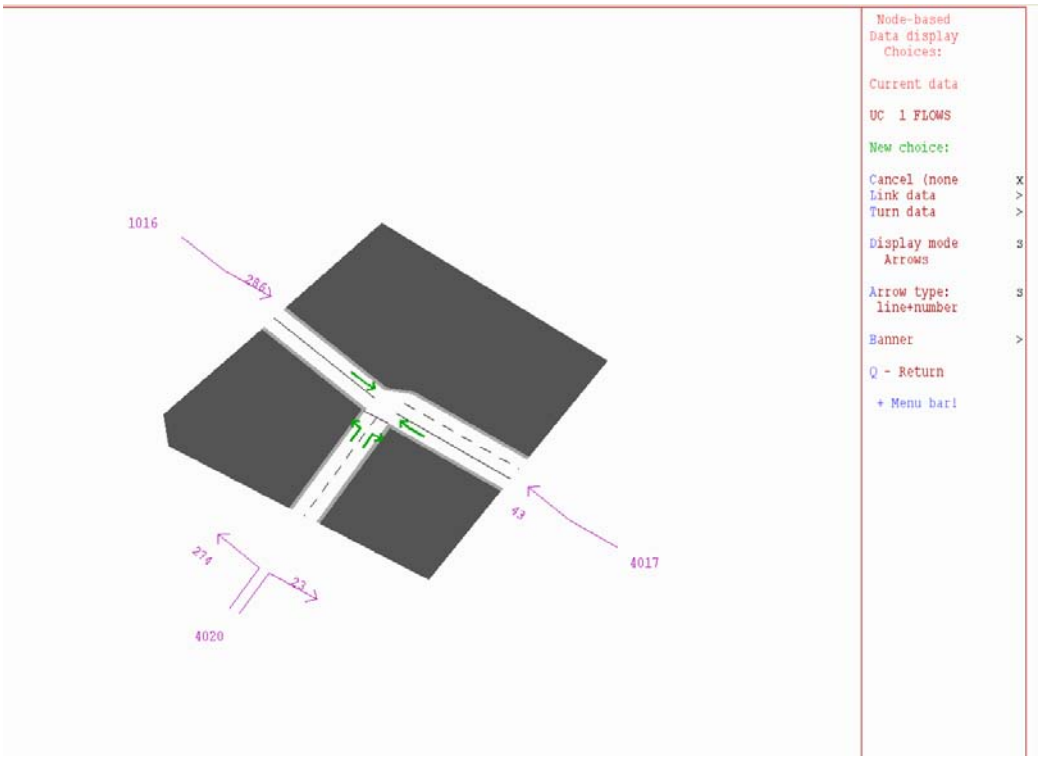

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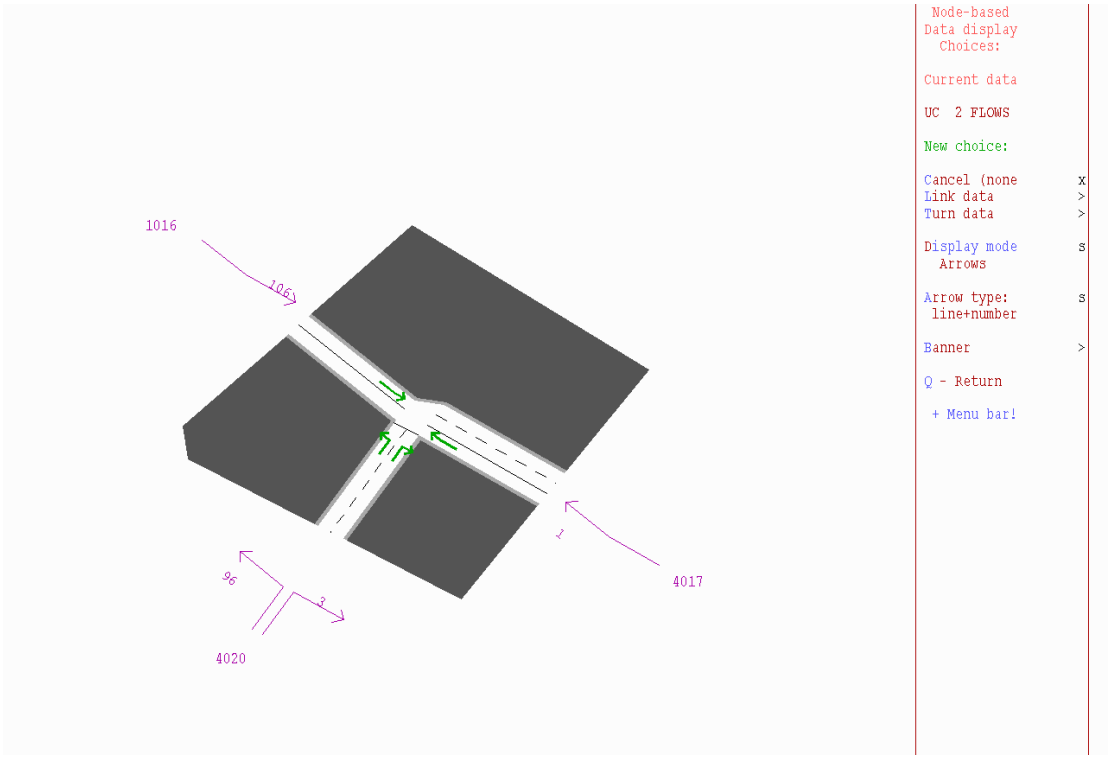

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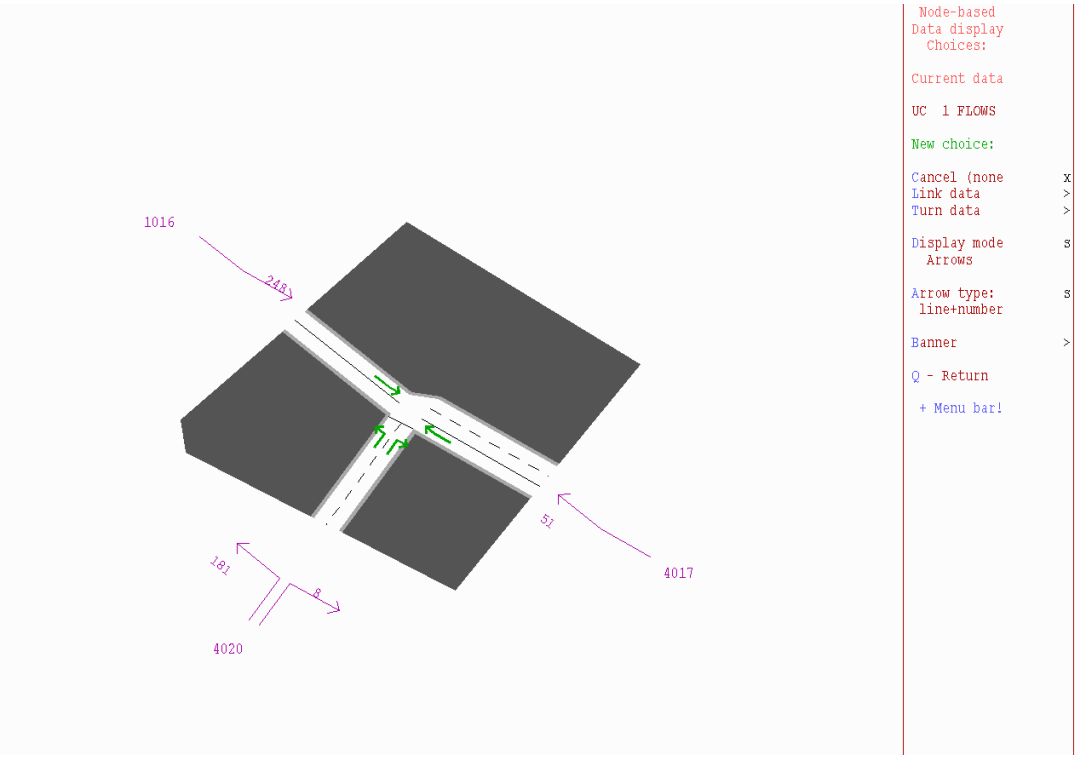

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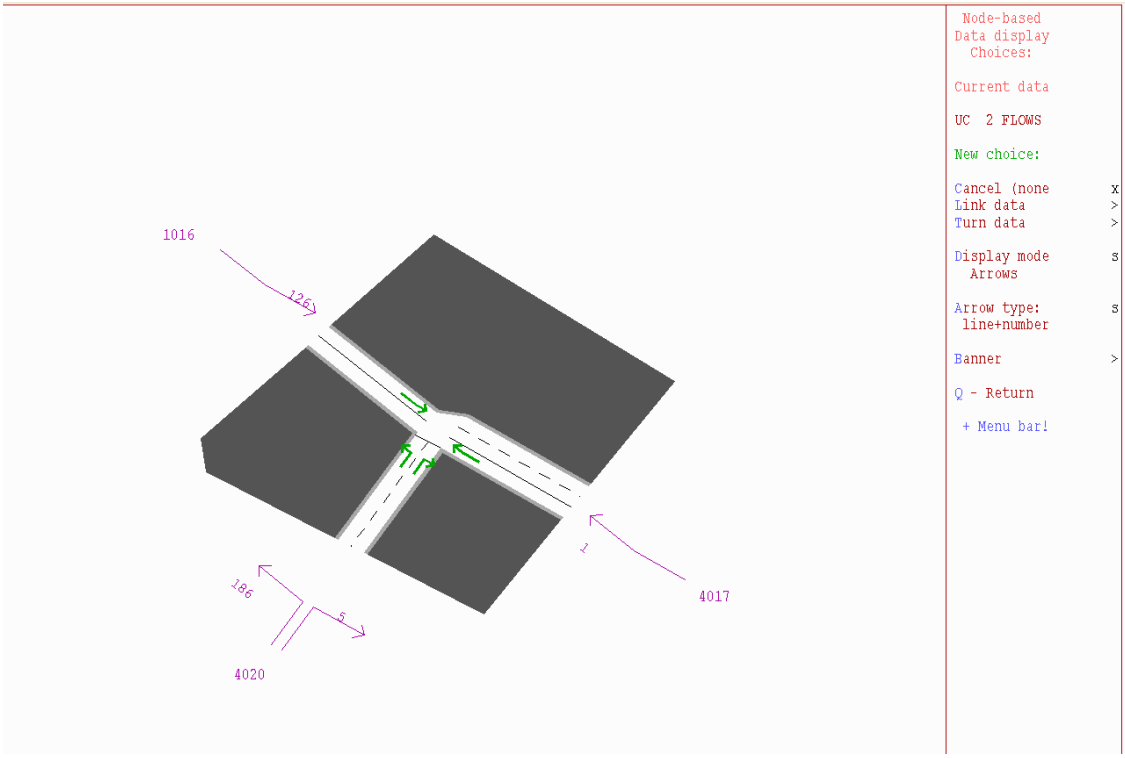

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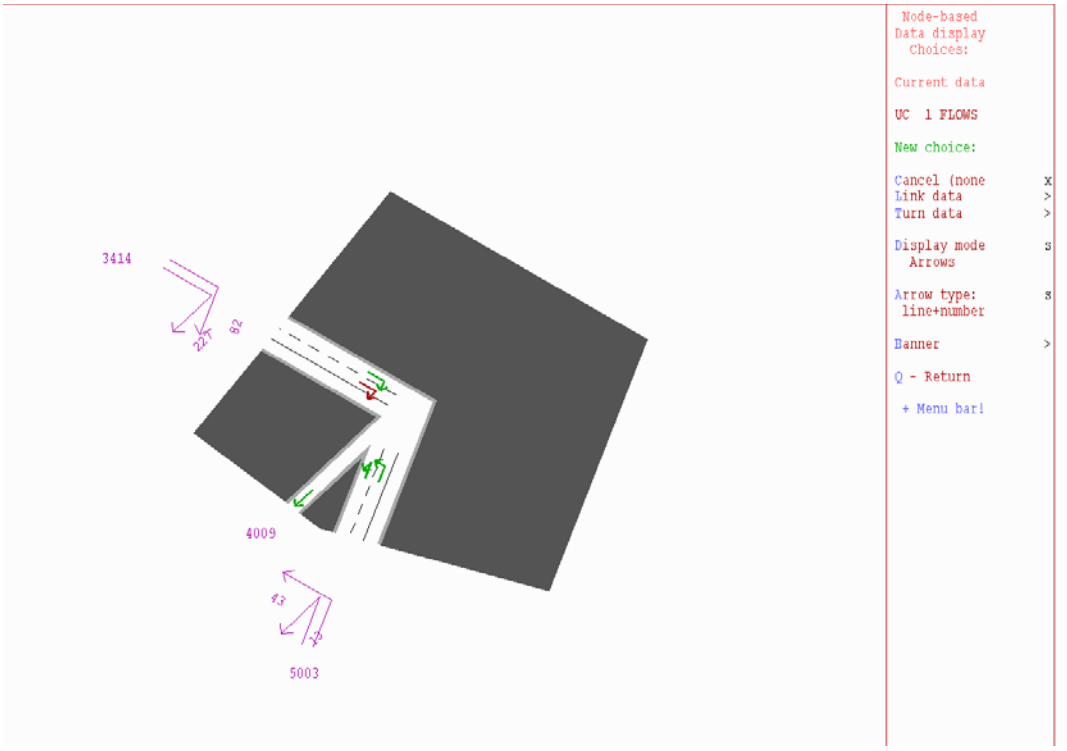

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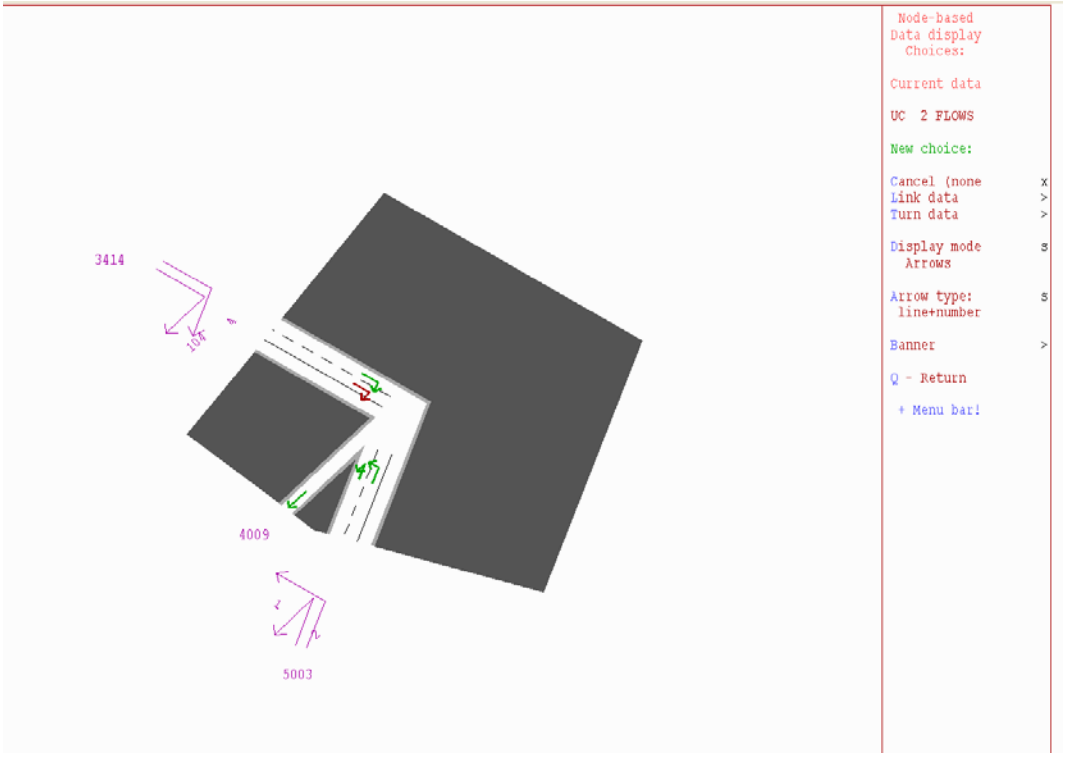

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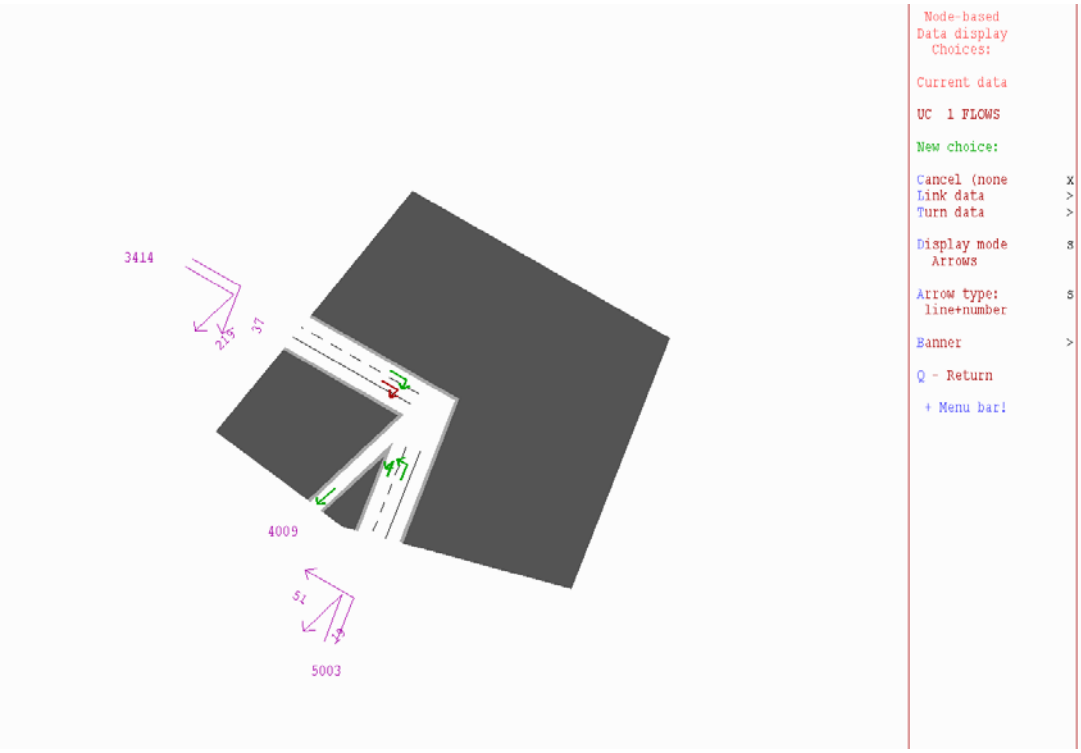

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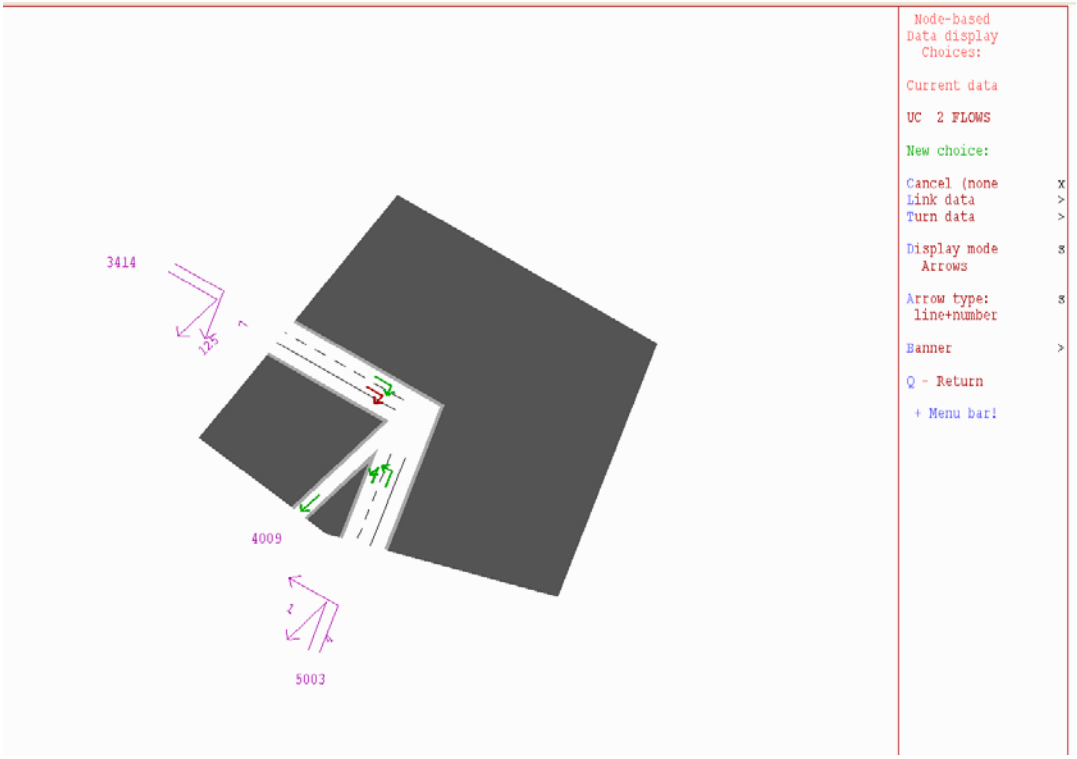

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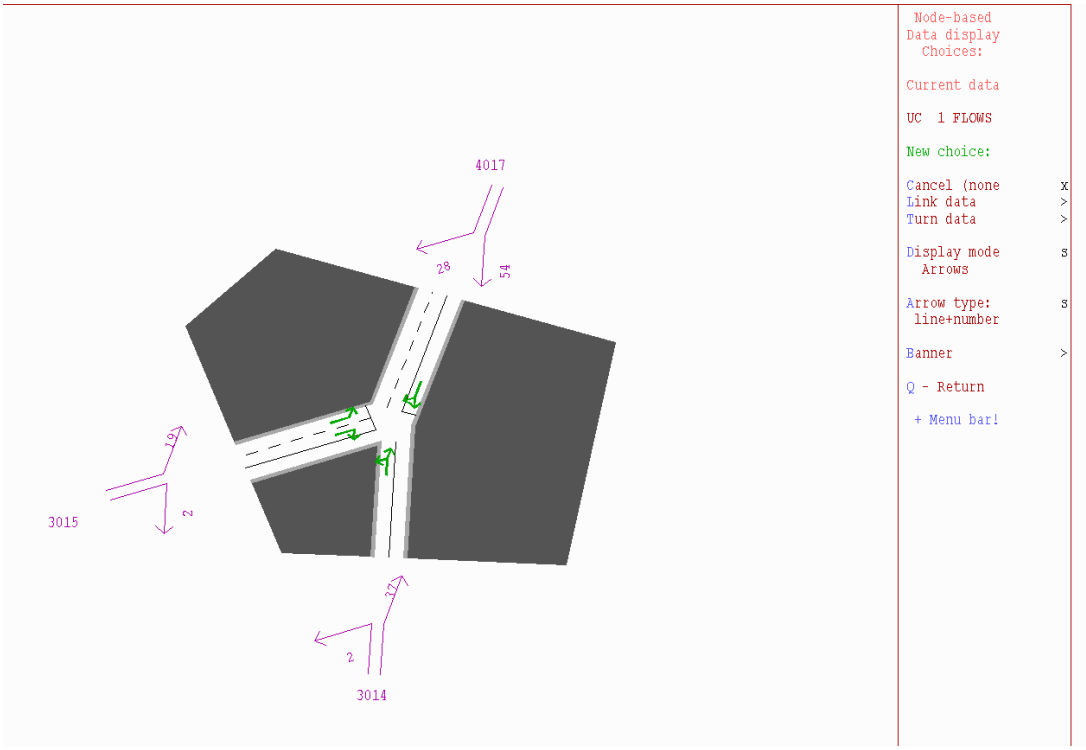
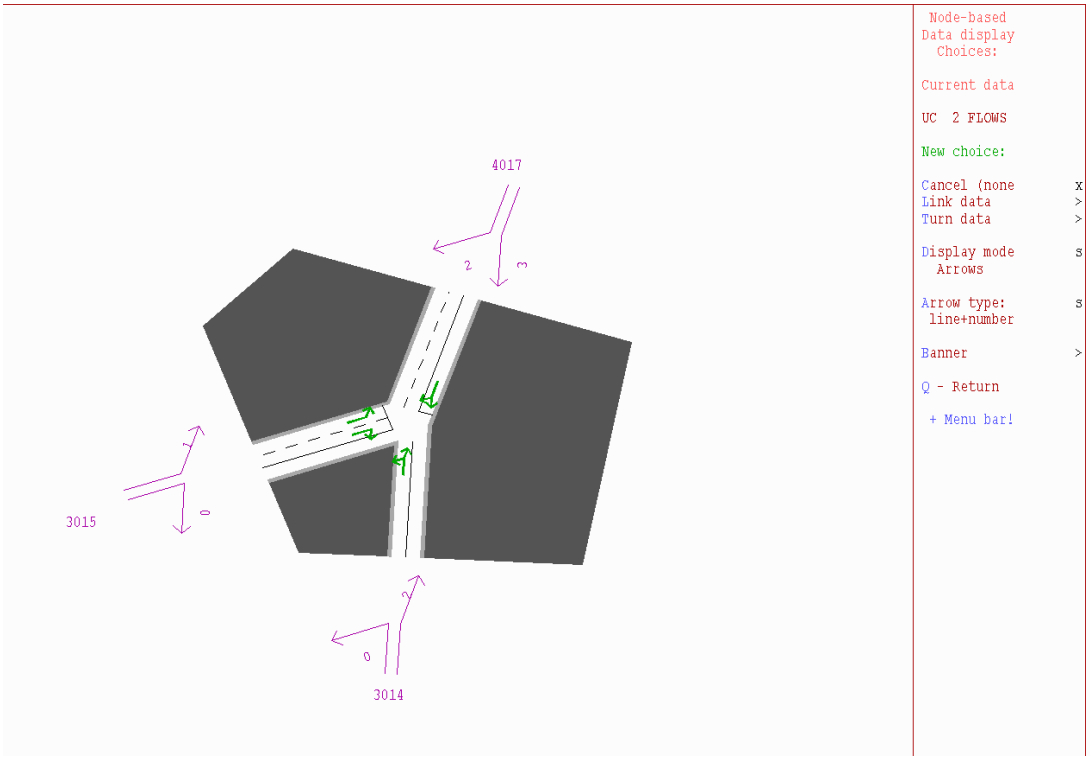


Otaki Gorge Rd/ Old Hautere Rd link –UC1 (lights) 2026 PM –Preferred Option – Sc2



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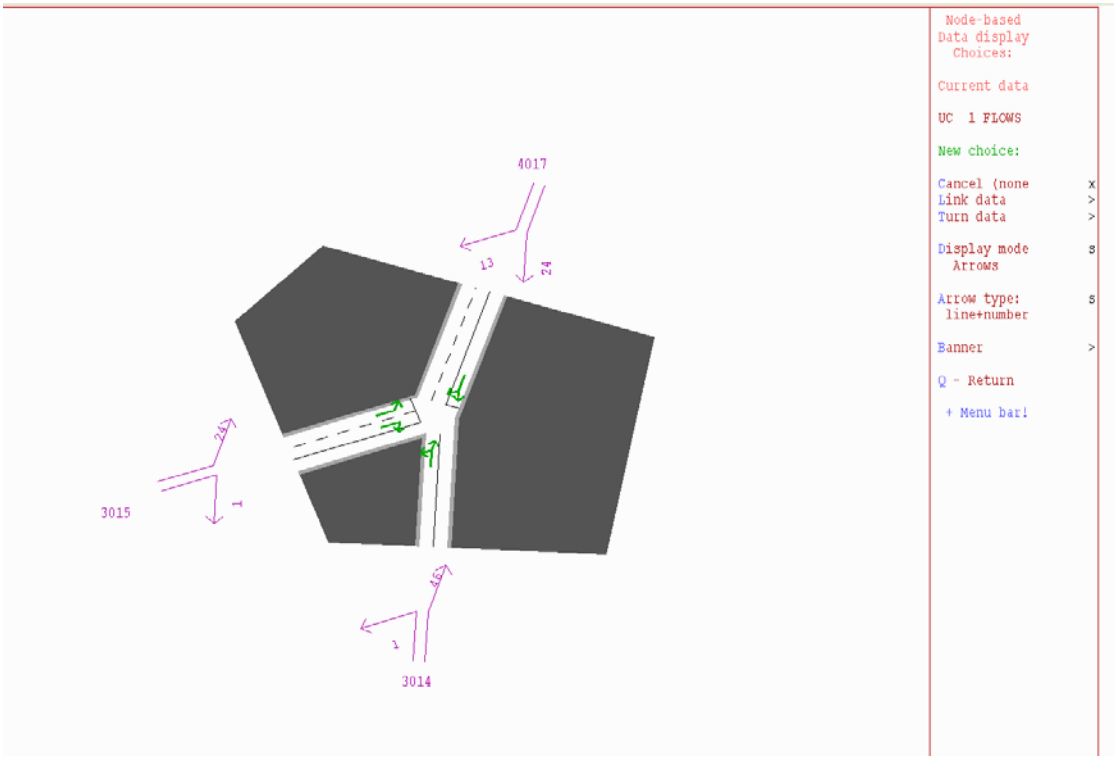

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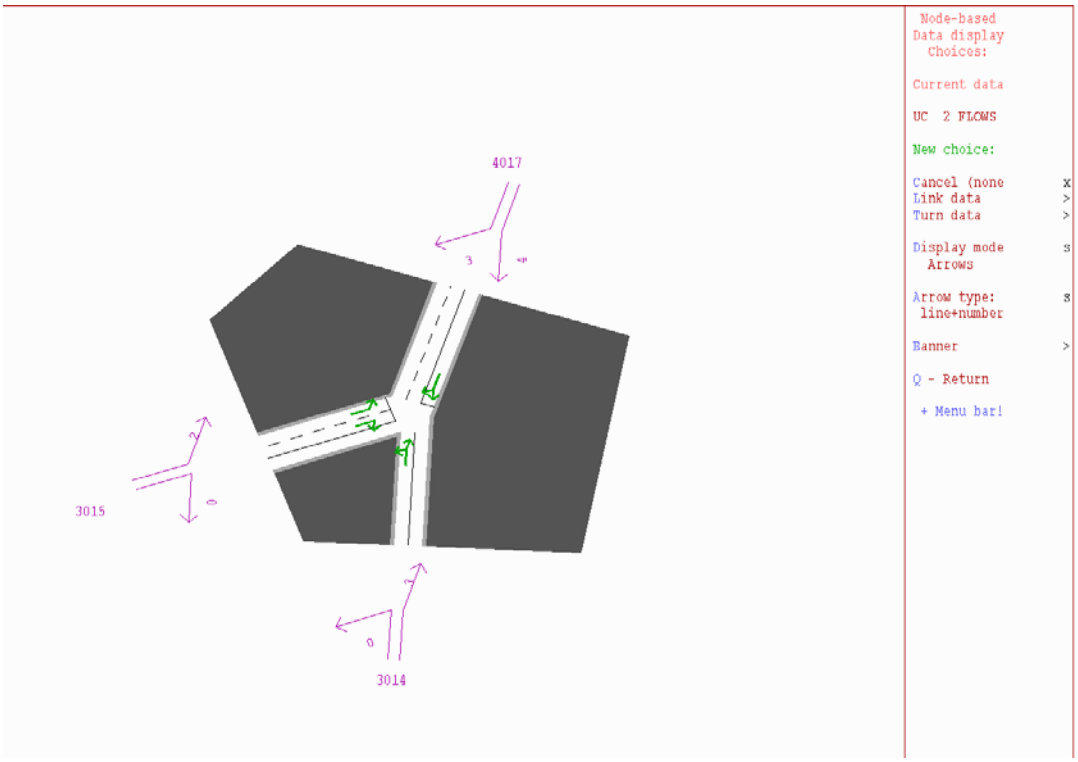

Otaki Gorge Rd/ Old Hautere Rd link –UC2 (HCVs) 2026 AM –Preferred Option – Sc2

APPENDIX B:

SIDRA Intersection Model Results

MOVEMENT SUMMARY

Site: Mill Rd RAB - 2026 AM Do Min

Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Rahui											
1	L	69	6.1	0.227	8.5	LOS A	1.0	7.6	0.63	0.79	41.7
2	T	66	0.0	0.227	7.6	LOS A	1.0	7.6	0.63	0.75	41.9
3	R	27	13.7	0.227	12.6	LOS B	1.0	7.6	0.63	0.92	39.4
Approach		163	4.9	0.227	8.8	LOS A	1.0	7.6	0.63	0.80	41.4
East: SH1 North											
4	L	13	8.3	0.162	7.3	LOS A	0.9	6.5	0.39	0.64	42.8
5	T	515	8.8	0.391	5.3	LOS A	2.8	21.0	0.41	0.48	43.2
6	R	136	12.4	0.391	10.0	LOS B	2.8	21.0	0.42	0.74	41.0
Approach		663	9.5	0.391	6.3	LOS A	2.8	21.0	0.41	0.54	42.7
North: Mill											
7	L	99	11.1	0.260	7.7	LOS A	1.3	9.4	0.58	0.72	41.9
8	T	26	0.0	0.260	6.8	LOS A	1.3	9.4	0.58	0.67	42.0
9	R	82	7.1	0.260	11.7	LOS B	1.3	9.4	0.58	0.84	39.8
Approach		207	8.1	0.260	9.2	LOS A	1.3	9.4	0.58	0.76	41.0
West: SH1 South											
10	L	63	14.3	0.130	8.3	LOS A	0.6	5.0	0.47	0.65	42.1
11	T	417	11.5	0.352	5.8	LOS A	2.3	17.5	0.48	0.55	42.8
12	R	38	17.8	0.352	10.6	LOS B	2.3	17.5	0.49	0.80	40.9
Approach		518	12.3	0.352	6.5	LOS A	2.3	17.5	0.48	0.58	42.6
All Vehicles		1552	9.8	0.391	7.0	LOS A	2.8	21.0	0.48	0.61	42.3

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
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 used.

MOVEMENT SUMMARY

Site: Mill Rd RAB - 2026 PM Do Min

Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Rahui											
1	L	52	7.1	0.194	9.7	LOS A	1.0	7.1	0.72	0.85	40.7
2	T	43	0.0	0.194	8.8	LOS A	1.0	7.1	0.72	0.82	40.9
3	R	17	18.8	0.194	13.9	LOS B	1.0	7.1	0.72	0.95	38.6
Approach		112	6.1	0.194	10.0	LOS A	1.0	7.1	0.72	0.85	40.4
East: SH1 North											
4	L	25	4.2	0.229	9.0	LOS A	1.3	9.6	0.60	0.75	41.7
5	T	598	10.0	0.551	7.1	LOS A	4.7	35.5	0.69	0.69	41.7
6	R	138	11.8	0.551	11.8	LOS B	4.7	35.5	0.72	0.83	40.1
Approach		762	10.2	0.551	8.0	LOS A	4.7	35.5	0.69	0.71	41.4
North: Mill											
7	L	137	8.5	0.580	12.0	LOS B	4.2	30.9	0.81	1.00	38.7
8	T	73	0.0	0.580	11.1	LOS B	4.2	30.9	0.81	0.99	38.8
9	R	180	2.9	0.580	15.9	LOS B	4.2	30.9	0.81	1.06	36.9
Approach		389	4.3	0.580	13.7	LOS B	4.2	30.9	0.81	1.02	37.8
West: SH1 South											
10	L	82	7.7	0.196	7.8	LOS A	1.1	8.0	0.47	0.65	42.4
11	T	662	8.3	0.529	5.7	LOS A	4.4	32.9	0.55	0.56	42.4
12	R	99	4.8	0.529	10.4	LOS B	4.4	32.9	0.56	0.76	40.9
Approach		844	7.8	0.529	6.5	LOS A	4.4	32.9	0.55	0.59	42.2
All Vehicles		2107	7.9	0.580	8.5	LOS A	4.7	35.5	0.66	0.73	41.0

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
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 used.

MOVEMENT SUMMARY

Site: Mill Rd RAB - 2026 AM
Expressway

Test 1
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Rahui											
1	L	110	5.3	0.199	5.2	LOS A	0.9	6.6	0.49	0.55	43.3
2	T	53	0.0	0.199	5.0	LOS A	0.9	6.6	0.49	0.53	43.3
3	R	27	13.7	0.199	10.9	LOS B	0.9	6.6	0.49	0.89	40.9
Approach		189	5.0	0.199	6.0	LOS A	0.9	6.6	0.49	0.59	42.9
East: SH1 North											
4	L	12	0.0	0.096	7.3	LOS A	0.5	3.8	0.39	0.66	43.1
5	T	205	23.1	0.212	4.6	LOS A	1.2	9.8	0.38	0.42	43.9
6	R	106	12.9	0.212	10.0	LOS B	1.2	9.8	0.38	0.74	41.1
Approach		323	18.9	0.212	6.5	LOS A	1.2	9.8	0.38	0.53	42.8
North: Mill											
7	L	99	11.1	0.213	7.1	LOS A	1.2	9.0	0.47	0.60	42.3
8	T	26	0.0	0.213	5.8	LOS A	1.2	9.0	0.47	0.53	42.5
9	R	87	9.6	0.213	10.6	LOS B	1.2	9.0	0.47	0.70	40.3
Approach		213	9.1	0.213	8.4	LOS A	1.2	9.0	0.47	0.63	41.5
West: SH1 South											
10	L	84	13.8	0.096	7.3	LOS A	0.4	3.4	0.39	0.58	42.4
11	T	138	26.2	0.171	5.8	LOS A	0.9	7.7	0.39	0.50	43.2
12	R	45	18.6	0.171	10.4	LOS B	0.9	7.7	0.39	0.76	40.9
Approach		268	21.0	0.171	7.1	LOS A	0.9	7.7	0.39	0.57	42.5
All Vehicles		994	14.7	0.213	6.9	LOS A	1.2	9.8	0.42	0.58	42.5

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
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 used.

MOVEMENT SUMMARY

Site: Mill Rd RAB - 2026 PM
Expressway

Test 1
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Rahui											
1	L	52	7.1	0.118	5.0	LOS A	0.5	3.8	0.46	0.52	43.5
2	T	43	0.0	0.118	4.7	LOS A	0.5	3.8	0.46	0.51	43.5
3	R	17	18.8	0.118	10.8	LOS B	0.5	3.8	0.46	0.86	41.0
Approach		112	6.1	0.118	5.8	LOS A	0.5	3.8	0.46	0.57	43.1
East: SH1 North											
4	L	24	2.2	0.099	8.0	LOS A	0.5	3.9	0.47	0.67	42.5
5	T	149	25.4	0.219	5.2	LOS A	1.2	10.0	0.46	0.48	43.2
6	R	138	11.8	0.219	10.5	LOS B	1.2	10.0	0.46	0.73	40.7
Approach		312	17.6	0.219	7.8	LOS A	1.2	10.0	0.46	0.61	42.0
North: Mill											
7	L	109	8.2	0.267	7.8	LOS A	1.6	11.7	0.58	0.68	41.9
8	T	58	0.0	0.267	6.6	LOS A	1.6	11.7	0.58	0.62	42.0
9	R	81	6.5	0.267	11.4	LOS B	1.6	11.7	0.58	0.76	40.0
Approach		248	5.7	0.267	8.7	LOS A	1.6	11.7	0.58	0.69	41.3
West: SH1 South											
10	L	105	6.0	0.121	7.3	LOS A	0.6	4.3	0.42	0.60	42.3
11	T	203	20.5	0.269	5.8	LOS A	1.6	12.7	0.43	0.51	42.9
12	R	114	4.1	0.269	10.2	LOS B	1.6	12.7	0.43	0.74	40.8
Approach		422	12.5	0.269	7.3	LOS A	1.6	12.7	0.43	0.60	42.1
All Vehicles		1094	11.7	0.269	7.6	LOS A	1.6	12.7	0.48	0.62	42.0

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
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 used.

MOVEMENT SUMMARY

Site: N Otaki NB On Ramp 2026 AM

North Otaki Northbound On Ramp / New Arterial
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: New Arterial -East											
11	T	324	19.0	0.187	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
12	R	16	0.0	0.012	7.9	LOS A	0.0	0.3	0.37	0.61	41.7
Approach		339	18.1	0.187	0.4	NA	0.0	0.3	0.02	0.03	49.5
West: New Arterial -West											
4	L	227	20.6	0.168	6.9	LOS A	0.9	7.4	0.08	0.60	43.0
5	T	37	11.4	0.168	0.1	LOS A	0.9	7.4	0.08	0.00	48.7
Approach		264	19.4	0.168	6.0	NA	0.9	7.4	0.08	0.52	43.7
All Vehicles		603	18.7	0.187	2.8	NA	0.9	7.4	0.05	0.24	46.8

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

MOVEMENT SUMMARY

Site: N Otaki NB On Ramp 2026 PM

North Otaki Northbound On Ramp / New Arterial
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: New Arterial -East											
11	T	312	17.7	0.178	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
12	R	15	7.1	0.012	8.4	LOS A	0.1	0.4	0.42	0.63	41.5
Approach		327	17.2	0.178	0.4	NA	0.1	0.4	0.02	0.03	49.5
West: New Arterial -West											
4	L	257	20.1	0.204	6.9	LOS A	1.2	9.3	0.08	0.62	43.1
5	T	71	3.7	0.204	0.1	LOS A	1.2	9.3	0.08	0.00	48.7
Approach		328	16.5	0.204	5.4	NA	1.2	9.3	0.08	0.49	44.2
All Vehicles		655	16.9	0.204	2.9	NA	1.2	9.3	0.05	0.26	46.7

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

MOVEMENT SUMMARY

Site: New Arterial/ Otaki Gorge Rd Overbridge 2026 AM

New Arterial (old SH1)/ Otaki Gorge Rd Overbridge
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: New Arterial (former SH1) South											
2	T	116	9.1	0.133	5.0	LOS A	0.6	4.6	0.45	0.52	43.5
3	R	20	15.8	0.133	10.6	LOS B	0.6	4.6	0.45	0.83	41.0
Approach		136	10.1	0.133	5.9	LOS A	0.6	4.6	0.45	0.57	43.1
East: Otaki Gorge Road Overbridge											
4	L	27	15.4	0.319	5.7	LOS A	1.8	15.8	0.35	0.46	43.1
6	R	306	29.9	0.319	10.3	LOS B	1.8	15.8	0.35	0.64	40.4
Approach		334	28.7	0.319	9.9	LOS A	1.8	15.8	0.35	0.62	40.6
North: New Arterial (former SH1) North											
7	L	307	20.5	0.303	5.0	LOS A	2.0	15.8	0.13	0.44	44.5
8	T	118	10.7	0.303	3.7	LOS A	2.0	15.8	0.13	0.33	45.3
Approach		425	17.8	0.303	4.6	LOS A	2.0	15.8	0.13	0.41	44.7
All Vehicles		895	20.7	0.319	6.8	LOS A	2.0	15.8	0.26	0.51	42.8

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
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 used.

MOVEMENT SUMMARY

Site: New Arterial/ Otaki Gorge Rd Overbridge 2026 PM

New Arterial (old SH1)/ Otaki Gorge Rd Overbridge
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: New Arterial (former SH1) South											
2	T	141	6.4	0.163	5.0	LOS A	0.8	5.7	0.46	0.52	43.4
3	R	33	6.5	0.163	10.5	LOS B	0.8	5.7	0.46	0.83	41.0
Approach		173	6.4	0.163	6.0	LOS A	0.8	5.7	0.46	0.58	42.9
East: Otaki Gorge Road Overbridge											
4	L	27	7.7	0.322	5.4	LOS A	1.9	14.6	0.35	0.47	43.0
6	R	358	13.7	0.322	9.9	LOS A	1.9	14.6	0.35	0.64	40.4
Approach		386	13.2	0.322	9.6	LOS A	1.9	14.6	0.35	0.63	40.6
North: New Arterial (former SH1) North											
7	L	324	16.6	0.326	4.9	LOS A	2.2	17.0	0.17	0.45	44.3
8	T	135	9.4	0.326	3.7	LOS A	2.2	17.0	0.17	0.33	45.0
Approach		459	14.4	0.326	4.6	LOS A	2.2	17.0	0.17	0.41	44.5
All Vehicles		1018	12.6	0.326	6.7	LOS A	2.2	17.0	0.29	0.52	42.6

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
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 used.

MOVEMENT SUMMARY

Site: Otaki Gorge NB Off Ramp
2026 AM

Otaki Gorge NB Off Ramp/ New Local Arterial
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Otaki Gorge NB Off Ramp											
1	L	288	33.9	0.366	8.2	LOS A	1.8	16.5	0.22	0.58	42.4
3	R	11	23.8	0.366	8.2	LOS A	1.8	16.5	0.22	0.74	42.2
Approach		299	33.6	0.366	8.2	LOS A	1.8	16.5	0.22	0.58	42.4
East: Otaki Gorge Rd Overbridge East											
5	T	55	1.9	0.028	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		55	1.9	0.028	0.0	NA	0.0	0.0	0.00	0.00	50.0
West: Otaki Gorge Rd Overbridge West											
11	T	327	20.3	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		327	20.3	0.190	0.0	NA	0.0	0.0	0.00	0.00	50.0
All Vehicles		682	24.6	0.366	3.6	NA	1.8	16.5	0.10	0.26	46.3

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

MOVEMENT SUMMARY

Site: Otaki Gorge NB Off Ramp
2026 PM

Otaki Gorge NB Off Ramp/ New Local Arterial
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Otaki Gorge NB Off Ramp											
1	L	339	14.9	0.385	7.7	LOS A	2.0	15.4	0.18	0.57	42.4
3	R	26	6.1	0.385	7.8	LOS A	2.0	15.4	0.18	0.72	42.3
Approach		365	14.3	0.385	7.7	LOS A	2.0	15.4	0.18	0.58	42.4
East: Otaki Gorge Rd Overbridge East											
5	T	46	2.3	0.024	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		46	2.3	0.024	0.0	NA	0.0	0.0	0.00	0.00	50.0
West: Otaki Gorge Rd Overbridge West											
11	T	357	15.6	0.202	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		357	15.6	0.202	0.0	NA	0.0	0.0	0.00	0.00	50.0
All Vehicles		768	14.2	0.385	3.7	NA	2.0	15.4	0.09	0.28	46.1

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

MOVEMENT SUMMARY

Site: Otaki Gorge Rd/ Old Hautere Link Rd 2026 AM

Otaki Gorge Road/ Old Hauture Link Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Otaki Gorge Rd East											
21	L	1	0.0	0.027	6.5	LOS A	0.2	1.1	0.08	0.86	43.3
22	T	50	3.2	0.027	0.1	LOS A	0.2	1.1	0.08	0.00	49.0
Approach		51	3.1	0.027	0.2	NA	0.2	1.1	0.08	0.02	48.8
North West: Otaki Gorge Rd North											
28	T	27	7.7	0.034	0.6	LOS A	0.2	1.6	0.22	0.00	47.0
29	R	15	10.3	0.034	7.6	LOS A	0.2	1.6	0.22	0.77	42.7
Approach		43	8.6	0.034	3.1	NA	0.2	1.6	0.22	0.27	45.4
South West: Old Hauture Link Rd											
30	L	26	4.0	0.024	6.7	LOS A	0.1	0.6	0.14	0.57	42.8
32	R	1	0.0	0.024	7.0	LOS A	0.1	0.6	0.14	0.66	42.6
Approach		27	3.8	0.024	6.7	LOS A	0.1	0.6	0.14	0.57	42.8
All Vehicles		121	5.2	0.034	2.7	NA	0.2	1.6	0.14	0.23	46.1

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

MOVEMENT SUMMARY

Site: Otaki Gorge Rd/ Old Hautere Link Rd 2026 PM

Otaki Gorge Road/ Old Hauture Link Road
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South East: Otaki Gorge Rd East											
21	L	2	0.0	0.023	6.5	LOS A	0.1	0.9	0.12	0.82	43.2
22	T	40	2.6	0.023	0.1	LOS A	0.1	0.9	0.12	0.00	48.5
Approach		42	2.5	0.023	0.4	NA	0.1	0.9	0.12	0.04	48.2
North West: Otaki Gorge Rd North											
28	T	58	2.7	0.067	0.5	LOS A	0.4	3.1	0.19	0.00	47.3
29	R	31	3.4	0.067	7.3	LOS A	0.4	3.1	0.19	0.77	42.8
Approach		89	3.0	0.067	2.8	NA	0.4	3.1	0.19	0.27	45.6
South West: Old Hauture Link Rd											
30	L	21	5.0	0.021	6.8	LOS A	0.1	0.5	0.12	0.57	42.9
32	R	2	0.0	0.021	7.0	LOS A	0.1	0.5	0.12	0.67	42.6
Approach		23	4.5	0.021	6.8	LOS A	0.1	0.5	0.12	0.58	42.8
All Vehicles		154	3.1	0.067	2.8	NA	0.4	3.1	0.16	0.25	45.9

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

MOVEMENT SUMMARY

Site: Otaki Gorge SB On Ramp
2026 AM

Otaki Gorge SB On Ramp/ Otaki Gorge Road Overbridge
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Otaki Gorge Rd East											
4	L	18	11.8	0.067	7.9	LOS A	0.1	0.6	0.42	0.60	42.2
5	T	55	1.9	0.028	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		73	4.3	0.067	2.0	NA	0.1	0.6	0.10	0.15	47.8
West: Otaki Gorge Overbridge West											
11	T	43	8.6	0.023	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
12	R	296	22.2	0.557	9.5	LOS A	2.5	20.7	0.50	0.60	41.1
Approach		339	20.5	0.557	8.3	NA	2.5	20.7	0.44	0.52	42.0
All Vehicles		412	17.6	0.557	7.2	NA	2.5	20.7	0.38	0.46	43.0

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

MOVEMENT SUMMARY

Site: Otaki Gorge SB On Ramp
2026 PM

Otaki Gorge SB On Ramp/ Otaki Gorge Road Overbridge
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Otaki Gorge Rd East											
4	L	46	2.3	0.147	7.5	LOS A	0.2	1.4	0.41	0.61	42.3
5	T	15	7.1	0.008	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		61	3.4	0.147	5.7	NA	0.2	1.4	0.31	0.47	43.9
West: Otaki Gorge Overbridge West											
11	T	88	2.4	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
12	R	294	18.6	0.521	9.0	LOS A	2.2	17.8	0.72	0.41	40.6
Approach		382	14.9	0.521	6.9	NA	2.2	17.8	0.56	0.31	42.5
All Vehicles		443	13.3	0.521	6.7	NA	2.2	17.8	0.52	0.33	42.7

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