

NZ Transport Agency Waka Kotahi

Tauriko West - Tupenga

Transport Assessment Report

July 2026





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Qualifications, Experience and Code of Conduct

Cameron Beswick Inder

My name is Cameron Inder. I am a Principal Traffic and Transportation Engineer at Bloxam Burnett & Olliver (BBO), a company of consulting engineers, project managers, planners and surveyors in Hamilton and Tauranga.

I hold a Bachelor of Engineering (Hons) from the University of Auckland and have 27 years' experience in traffic and transportation engineering. I am a Chartered Professional Engineer (CPEng) with Engineering New Zealand. I have extensive experience in transportation planning, modelling, and the design of urban and rural transport networks, with particular experience in large-scale infrastructure projects, intersection design, and the assessment of transport effects.

My experience relevant to this Project is as follows:

- I led all traffic and transportation assessments for Takitimu North Link Stage 2, authoring the Integrated Transport Assessment (ITA) and numerous supporting assessments, and contributing to concept design development for the future four-lane expressway, interchanges, and tie-ins to the existing SH2 at both termini, including the link to Takitimu North Link Stage 1.
- I led transportation assessments for the rezoning of 176 ha at Ohinewai (Comfort Group), supporting a manufacturing/industrial business park and 1,100 residential units. Provided expert witness evidence, participated in joint witness conferencing and stakeholder consultation, and presented evidence at the Commissioner hearing (2020). Continuing to lead transport planning and design as the development progresses.
- I led traffic and transport assessments for the proposed rezoning of 130ha north of Hamilton Airport. Responsibilities included ITA authorship, supplementary assessments, and concept design of new roundabout access at SH3/Raynes Road and SH21. Prepared and presented expert evidence for the public hearing. Integrated multi-modal planning, including a strategic bi-directional cycle connection to the Peacocke growth area.
- I project managed the design and delivery of two new rural intersections on SH34 and 400 m of new access road for an industrial business park funded through the regional Infrastructure Fund in 2022. I led and co-ordinated all design inputs from concept through to detailed design, wrote the contract documentation, led the construction procurement phase, and provided design support during construction. I also managed all stakeholder engagement with Waka Kotahi, NOC, Kawerau District Council, and safety auditors.
- Updated and extended the Te Rapa North VISSIM micro-simulation model for Hamilton City Council to assess network effects of a proposed Pak'nSave development. This included commissioning and analysing OD surveys, model calibration (2018 base), and future modelling (2031) with and without development scenarios.
- I led the traffic, walking, and cycling design for the Papamoa Eastern Interchange, including three signalised intersections. Delivered modelling and concept/preliminary design supporting a mode-neutral network, with strong emphasis on safe, fully separated walking and cycling infrastructure.
- I was the lead traffic design engineer for complex intersection modelling and design inputs for the Wairere Drive / Cambridge Road network and diamond interchange in Hamilton. The design integrated raised safety platforms (in collaboration with Waka Kotahi trials), full pedestrian/cycle crossings, and future bus priority, with connections to key cycle networks.



- I reviewed transportation assessments and provided expert advice for a Board of Inquiry hearing relating to a proposed prison expansion, including consultation with Waipā District Council and Waka Kotahi.
- I authored the Integrated Transport Assessment report for a private plan change for Hobbiton Movie Set Tours, assessing the transport effects of increasing permitted visitor numbers from 300,000 to 650,000 annually. I identified the required network and travel demand management responses to accommodate the significant visitor numbers, and I presented expert evidence for the applicant at the Commissioner-led hearing.
- I have extensive experience preparing Integrated Transport Assessments for resource consent applications and private plan changes, including regular attendance at hearings and provision of expert transportation evidence.

Although this Application is not before the Environment Court, I confirm that I have read the Code of Conduct for expert witnesses as contained in section 9 of the Environment Court Practice Note 2023. I agree to comply with that Code. My qualifications as an expert are set out above. I am satisfied that the matters which I address in this report are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

s9(2)(a)

July 2026



Table of contents

Qualifications, Experience and Code of Conduct	3
Glossary of Acronyms and Abbreviations.....	7
1. Executive summary	9
1.1 Project Overview.....	9
1.1.1 Predicted Future Traffic Volumes.....	9
1.1.2 Summary of Transportation Benefits	9
1.1.3 Improved Safety for all Transport Users.....	9
1.1.4 Support for Planned Regional Economic Growth	10
1.1.5 Improved Resilience and travel time reliability	10
1.1.6 Support Transport Mode Shift.....	10
1.1.7 Changes to Property Access	10
1.2 Potential Construction Effects.....	10
1.3 Overall Conclusion	11
2. Introduction.....	12
2.1 Purpose and scope	12
3. Overview of the Project from a Transportation Perspective	13
3.1 Project Description.....	13
3.2 Existing Transportation Environment	14
3.2.1 Future Growth Areas	14
3.3 Site Description and Location	15
3.4 Existing Road Network	16
3.4.1 State Highway 29 (SH29)	16
3.4.2 State Highway 29A (SH29A).....	18
3.4.3 State Highway 36 (SH36)	18
3.4.4 Local Roads	18
3.4.4.1 Redwood Lane, Ōmanawa Road, Belk Road, Cambridge Road, Cameron Road and Pyes Pā Road	19
3.4.4.2 Kaweroa Drive	19
3.5 Crash History.....	20
4. Transportation Benefits.....	22
4.1 Fundamental Inputs	22
4.2 Operational Effects.....	22
4.2.1 Network Performance	22
4.2.2 Improved Road Safety	24
4.3 Improved Corridor and Network Capacity	25
4.4 Level of Service	28
4.4.1 Network Links	28
4.4.2 Intersection Performance.....	29
4.5 Legal Speed Limits	35
4.6 Road Cross-Sections	37
4.6.1 SH29 offline	37
4.6.2 SH29A offline	38



4.7	Project Tie-ins to Existing Road Network.....	38
4.7.1	SH29 offline Western Tie-in.....	38
4.7.2	SH29 Offline – Takitimu Drive Tie-In.....	41
4.7.3	Takitimu Drive Interchange – SH29/SH36 Roundabout Tie-In	42
4.7.4	SH29A Offline Eastern Tie-In	42
4.7.5	SH29A Offline – SH29A Eastern Tie-In with the Local Road Network	43
4.8	Summary of Operational Benefits	44
5.	Potential Construction Effects	48
5.1	Traffic Generation	48
5.1.1	Heavy Vehicle Movements Associated with Bulk Earthworks.....	48
5.1.2	Heavy Vehicle Movements Associated with Aggregate Supply.....	49
5.1.3	Other Vehicle Movements.....	49
5.1.4	Total Traffic Generation.....	49
5.2	Site Access	50
5.3	Temporary Traffic Diversions	50
5.4	Construction Traffic Effects	51
6.	Conclusion	53
6.1	Operational Effects.....	53
6.2	Construction Effects	54
Appendix A – Tauriko RoNS Traffic Modelling, 28 July 2026		
Appendix B – Bulk Earthworks		



Glossary of Acronyms and Abbreviations

Acronym / Abbreviation	Term
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
BBO	Bloxam Burnett & Olliver
BOPRC	Bay of Plenty Regional Council
CAS	Crash Analysis System
CBD	Central Business District
CTMP	Construction Traffic Management Plan
DBC	Detailed Business Case
DM	Do Minimum
DSI	Death and Serious Injury
FTAA	Fast-track Approvals Act 2024
GVM	Gross Vehicle Mass
HCV	Heavy Commercial Vehicle
LILO	Left-in, left-out
LOS	Level of Service
LT	Left-Turn
MCA	Multi-criteria assessment
NZGTTM	New Zealand Guide to Temporary Traffic Management
NZTA	NZ Transport Agency Waka Kotahi
ONF	One Network Framework
PT	Public Transport
RCA	Road Controlling Authority
REWNACRTA	Redwood Enabling Works – Northern Access and Cambridge Road Intersections Technical Assessment – Traffic, dated November 2022
RoNS	Roads of National Significance
RT	Right-Turn
SAR	Substantive Application Report
SH	State Highway
SH29	State Highway 29
SH29A	State Highway 29A
SIDRA	Signalised Intersection Design and Research Aid
SSA	SH29 Proposed Upgrades at Tauriko West - Safe System Assessment Report, 23 February 2023
TA	Transport Assessment
TCC	Tauranga City Council
TCP	Tauranga City Plan
TMP	Traffic Management Plan
TMTE25	Gate 2 Toll Modelling and Transport Economics report, 19 February 2025
TNL 1	Takitimu North Link – Stage 1
TRTM26	Tauriko RoNS Traffic Modelling, 28 July 2026
TTSM23	Tauranga Transport Strategic Model, 2023



Acronym / Abbreviation	Term
TWRoNSIC25	Tauriko West Road of National Significance Investment Case, March 2025
UFTI	Urban Form and Transport Initiative
VHT	Vehicle Hours Travelled
VKT	Vehicle Kilometres Travelled
VPD	Vehicles per day
V/C	Volume-to-capacity ratio



1. Executive summary

1.1 Project Overview

This Transport Assessment (TA) has been prepared for the Tauriko West – Tupenga Project (the Project) for the NZ Transport Agency Waka Kotahi (NZTA). The Project comprises new offline state highway corridors for State Highway 29 (SH29) and State Highway 29A (SH29A), associated interchanges, local road connections, and supporting infrastructure to improve safety, network performance, freight efficiency and resilience, while enabling planned growth in Tauranga's Western Corridor. **Figure 3.3** (*Locality Map – Tauriko West Corridor*) illustrates the locality and context.

Key Project components include:

- A new four-lane median-divided SH29 corridor from the new Ōmanawa bridge to Takitimu Drive.
- Widening of Takitimu Drive Toll Road to four lanes.
- A new four-lane SH29A corridor from Takitimu Drive to east of Barkes Corner.
- Grade-separated interchanges at Redwood Lane, Takitimu Drive and Barkes Corner.
- New local road overbridges, stream bridges, and a safety upgrade at the SH29 / Ōmanawa Road intersection.
- Local road and intersection changes to support repurposing of the existing SH29 and SH29A corridors for local access and community connectivity.

1.1.1 Predicted Future Traffic Volumes

Future traffic effects have been assessed using the Tauranga Transport Strategic Model 2023 (TTSM23) for the 2035, 2048 and 2063 assessment years. The assessment considers the Project without tolling because any tolling decision will be made by the Minister of Transport in future.

The Project supports planned urban and employment growth in Tauriko West and the wider Western Corridor, including substantial future residential development and industrial expansion. In the 2048 with-Project scenario, the modelled daily volumes are approximately 31,730 vpd on SH29 offline, 27,130 vpd on SH29A offline and 49,150 vpd on Takitimu Drive. Traffic volumes on the existing SH29 and SH29A corridors are expected to reduce by approximately 56% and 37%, respectively, supporting their future local-road function. Heavy commercial vehicle volumes on the existing SH29 and SH29A corridors are also expected to reduce by approximately 81% and 59%, respectively.

1.1.2 Summary of Transportation Benefits

Overall, the assessment concludes that the Project will provide substantial operational benefits. These include a safer corridor through improved geometry, median separation, fewer vehicle movement conflict points, and reduced reliance on high-risk at-grade intersections. The operational effects of the Project are summarised below.

1.1.3 Improved Safety for all Transport Users

The Project is expected to significantly improve safety by providing new four-lane, median-barriered SH29 and SH29A offline corridors, supported by roadside barriers where required. Existing high-risk at-grade intersections will be replaced with grade-separated interchange arrangements at Redwood Lane, Takitimu Drive and Barkes Corner, reducing conflict points and the likelihood and severity of DSI crashes. Safety on the existing SH29 and SH29A corridors will also improve as traffic volumes, heavy vehicle exposure and operating



speeds reduce. The Project will provide substantial safety benefits for local traffic through reduced traffic speeds and volumes on the existing SH29 and SH29A corridors as local roads.

1.1.4 Support for Planned Regional Economic Growth

The Project supports planned regional economic growth by improving freight efficiency, inter-regional connectivity and access to the Port of Tauranga, Tauriko West and the wider western growth corridor. Additional high-volume lane capacity on SH29 offline, SH29A offline and Takitimu Drive will support reliable access to employment areas, industrial land and future housing growth, while enabling the existing corridors to better serve local access and land-use outcomes.

1.1.5 Improved Resilience and travel time reliability

The Project will improve travel time reliability by separating regional through-traffic and freight movements from local traffic, increasing strategic corridor capacity and reducing congestion. For the 2048 scenario, travel time savings of approximately 7–11 minutes (63–73%) are anticipated between Ōmanawa bridge and Takitimu North Link Stage 1 (TNL 1) roundabout, and 3–8 minutes (57–68%) between Ōmanawa bridge and Barks Corner.

1.1.6 Support Transport Mode Shift

Mode shift will be supported by reducing through-traffic and heavy vehicle exposure on the existing SH29 and SH29A corridors, allowing those corridors to function more appropriately as local roads. Walking and cycling connectivity will be improved through local road upgrades and shared path provision, particularly at Barks Corner, where the Project provides more legible connections across the corridor and to adjoining local paths.

1.1.7 Changes to Property Access

There will be no direct property access to the new state highway corridors. Local access will instead be maintained and improved through the existing SH29 and SH29A corridors, supported by grade-separated interchanges and local road tie-ins.

1.2 Potential Construction Effects

Construction of the Project will involve extensive haulage and temporary traffic management associated with works, which will be staged over a number of years. Project works are expected to generate a substantial number of heavy vehicle movements, which will be managed using standard traffic management tools to ensure safety and minimise disruption associated with temporary traffic diversions and site access arrangements.

Preliminary estimates indicate that peak construction activity could generate approximately 720 truck movements per day, with construction workforce travel generating approximately 200 light vehicle trips per day.

Multiple site access points are likely to be required from the existing road network to support construction staging, material movements and workforce access. These accesses will be confirmed through the Contractor's methodology and managed under a Construction Traffic Management Plan(s) (CTMP) that may include temporary reduced speed limits and changed road layouts in accordance with the New Zealand Guide to Temporary Traffic Management (NZGTTM). In addition, location-specific upgrades may be required to ensure site accesses are safe and fit for purpose to accommodate the high volume of heavy vehicle movements entering and exiting the site.



At Barks Corner, the existing pedestrian overbridge is expected to be removed during construction, meaning pedestrians and cyclists will need to use temporary at-grade crossing arrangements for approximately 3–4 years. Safe temporary crossing facilities and pedestrian/cycle connectivity will be managed through the construction staging and the CTMP.

1.3 Overall Conclusion

Based on the findings of this assessment, the Project is expected to deliver substantial operational transport benefits and align with NZTA's safety, reliability and resilience objectives. The construction phase will generate adverse transport effects associated with bulk earthworks haulage, aggregate supply, workforce travel, site access and temporary traffic diversions. These effects are expected to extend over an approximately ten-year construction period (including enabling works) and will be managed through appropriate construction traffic management and staging of works. Subject to these measures, construction transport effects are expected to be manageable, stage dependent and no more than minor in nature. The following measures will be implemented to ensure that outcome.

- A project-specific CTMP addressing construction traffic volumes, haul routes, workforce travel, site access, staging, internal haul roads, temporary diversions, pedestrian and cycle facilities, emergency access and public transport where relevant. The CTMP will include at least the following:
 - Identification of all proposed site access points, their expected duration of use, peak period and daily traffic volumes, (both site and public road traffic) including any temporary or permanent physical alterations required in connection with internal haul roads, staging areas, material supply routes and disposal routes.
 - Preparation and implementation of site-specific TMPs for all works affecting the public road network, including temporary speed limits, changed road layouts, access arrangements and temporary diversions (where required). TMPs will be prepared in accordance with the NZGTTM and provided to the relevant road controlling authority (RCA) prior to works commencing.
 - Design of site access arrangements to safely accommodate forecast construction and public road traffic volumes, with LIFO configurations preferred where practicable. Where right-turn access is required, appropriate traffic control or other physical works should be considered to maintain safety and network capacity.
 - Capacity and performance assessments for site accesses to public roads and temporary traffic arrangements, including predicted delays and queues for key turning movements during peak construction activity.
 - Measures that maximise the use of internal haul roads where practicable, maintain existing highway and local road capacity through temporary diversions as far as practicable, and avoid diverting state highway traffic onto local roads except for short durations or during off-peak periods.
 - Provision of temporary traffic management to enable safe and efficient movement of general traffic, emergency services, pedestrians and cyclists during all affected construction stages, with particular attention to safe temporary at-grade pedestrian and cycle crossing arrangements at Barks Corner.
 - RCA requirements for reinstating temporary access points once they are no longer required for construction.



2. Introduction

2.1 Purpose and scope

This TA has been prepared to support NZTA's substantive application for approvals under the Fast-track Approvals Act 2024 (FTAA). Approvals sought for the Project are described in the Substantive Application Report (SAR)¹.

This TA provides an assessment of the transportation effects associated with the proposed State Highway 29 (SH29 offline) and State Highway 29A (SH29A offline) in Tauriko West (the Project) during both the construction and operational phases.

This assessment covers the following:

- A description of the existing transportation environment.
- An overview of the Project from a transportation perspective.
- The transportation benefits of the Project.
- The potential impacts of the construction of the Project on the transportation network.
- Any methods required to manage construction effects.

¹ Tauriko West – Tupenga Substantive Application Report, dated July 2026



3. Overview of the Project from a Transportation Perspective

3.1 Project Description

The Project extends from Ōmanawa Road in the southwest to Barks Corner in the northeast and includes the construction of new offline four-lane corridors for SH29 and SH29A, together with associated grade-separated interchanges, local road connections, and supporting transport network improvements to improve safety, reliability and freight efficiency and to enable planned urban growth in Tauriko West. The Project extent is illustrated in **Figure 3.1**.

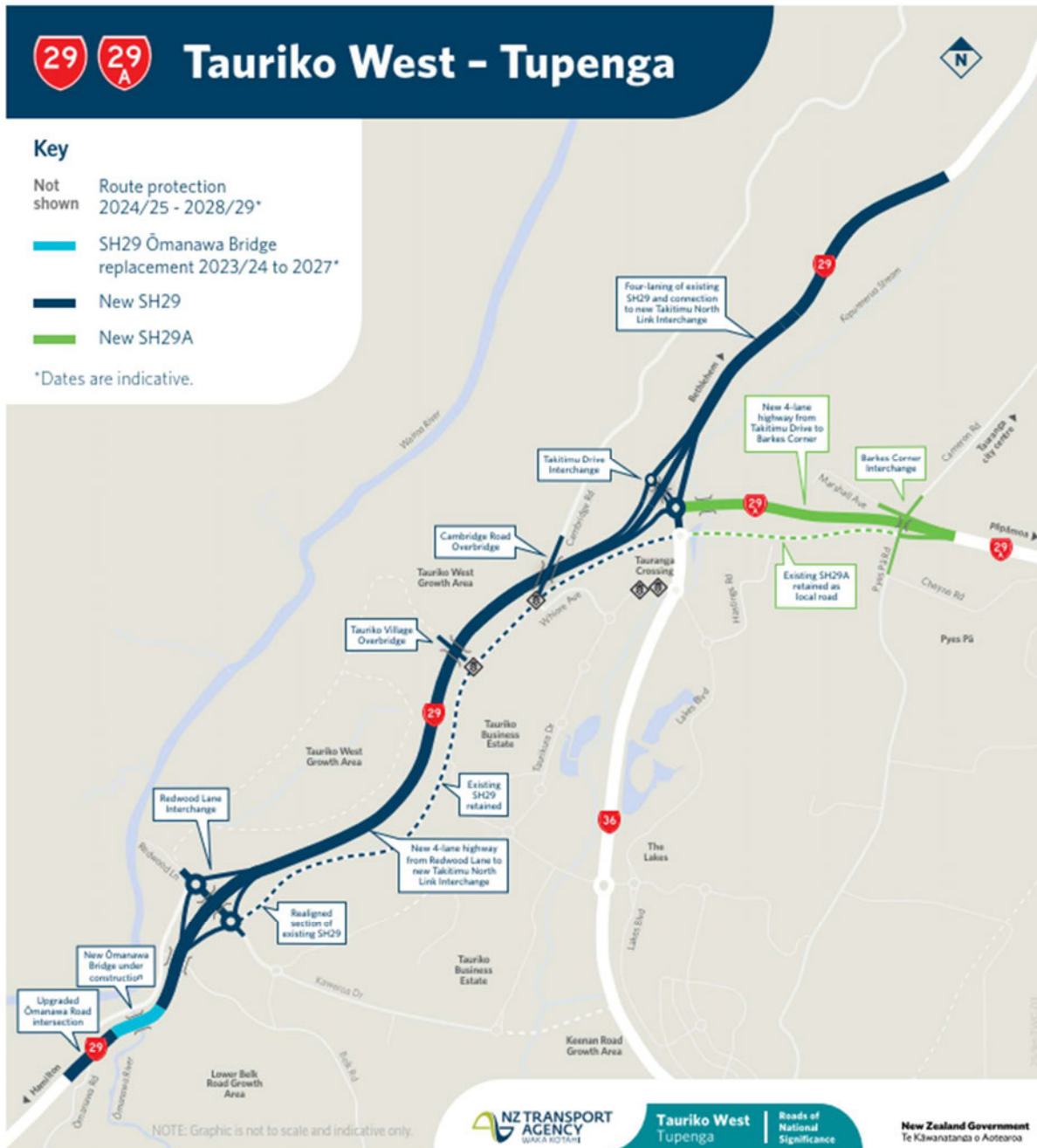


Figure 3.1 – SH29 offline and SH29A offline Corridors



The Project can be divided into four sections:

- Safety upgrade at the SH29 / Ōmanawa Road intersection;
- SH29 offline corridor, running generally parallel to the existing SH29 alignment. It is a greenfield route extending approximately 5.0 km from Ōmanawa Road to Takitimu Drive (but excluding the new Ōmanawa bridge that is currently under construction);
- Widening of the Takitimu Drive Toll Road to four lanes between SH36 and Takitimu North Link Stage 1 (TNL 1) roundabout; and
- SH29A offline corridor, running generally parallel to the existing SH29A alignment (an approximately 1.6 km greenfield route extending from Takitimu Drive to 200 m east of Barkes Corner, passing under Cameron Road).

The Project includes three new grade-separated interchanges:

- A diamond-style grade-separated interchange connecting SH29 to Redwood Lane and Kaweroa Drive;
- A diamond-style grade-separated interchange at Takitimu Drive, connecting SH29, SH29A and SH36; and
- A half-diamond (east facing ramps only) grade-separated interchange at Barkes Corner, connecting SH29A to Cameron Road and Pyes Pā Road.

The Project description is outlined in detail in the SAR. There will be no direct access to SH29 offline or SH29A offline other than at the grade-separated interchanges.

3.2 Existing Transportation Environment

3.2.1 Future Growth Areas

The Western Corridor of Tauranga has been identified through the Bay of Plenty Regional Policy Statement, SmartGrowth, the Tauriko Network Plan Programme Business Case, and UFTI as a key corridor for housing and urban development (including commercial and industrial) to support the growth of the city over the next 50 years²; (as shown in **Figure 3.2**).

The development of the Western Corridor will contribute significantly to addressing demand for housing and business land in an integrated manner across the Western Bay of Plenty sub-region. Based on the Tauriko West Road of National Significance Investment Case dated March 2025 (TWRoNSIC25), latest total land use figures show approximately 10,500 dwellings and approximately 11,500 jobs predicted by year 2048 and beyond within the Western Corridor.

Future growth in the Western Corridor is anticipated to generate up to 24,000 additional trips per day by 2048+, depending on mode share. The DBC 2023 found that even with the Enabling Works in place, without significant improvements and provision of multimodal access, development within the Western Corridor could become unviable, resulting in highly variable journey times, lost time and frustration. The transport network needs to be modified and enhanced to support the growth by improving multimodal accessibility, freight access, and addressing existing safety issues. The Project will deliver the capacity and safety improvements required.

² Tauriko Network Connections Detailed Business Case (DBC 2023)



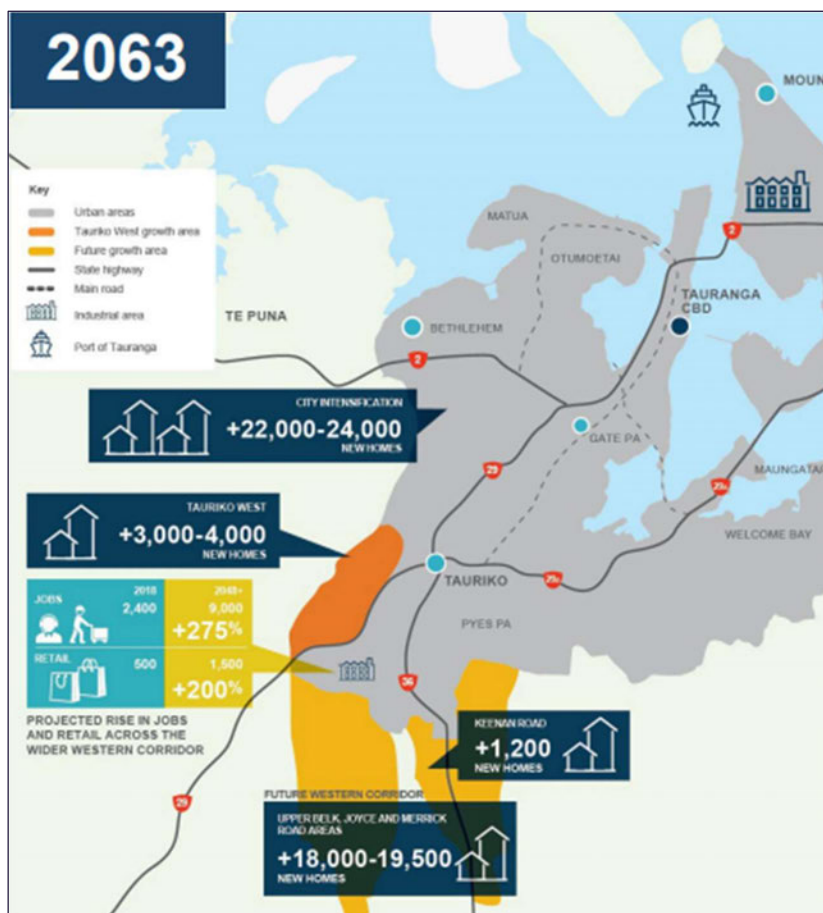


Figure 3.2 – Western Corridor Future Land Use (source: DBC, 2023)

3.3 Site Description and Location

The Project is in the Tauranga and Western Bay of Plenty districts. The general locality and extent of the Project are shown in Figure 3.3.

The Project location, shown by the red and white line, extends through the general areas of Redwood Lane, Takitimu Drive and Barkes Corner. The northern boundary of the Project site is located approximately 8 km south-west of Tauranga City Centre. The Project extends from the southern end of the Tauriko enabling works at Redwood Lane, past the tie-in with TNL 1, to the Cameron Road / Pyes Pā Road intersection at Barkes Corner. The existing SH29 and SH29A corridors lie adjacent to the Project alignment.





Figure 3.3 – Locality Map – Tauriko West Corridor

3.4 Existing Road Network

The existing network of roads within and surrounding the Project area, as shown in **Figure 3.4**, are:

- The existing SH29, SH29A and SH36 corridors which are administered by NZTA.
- Cambridge Road, Redwood Lane, Kaweroa Drive, Bell Road, Ōmanawa Road, Cameron Road, and Pyes Pā Road. These roads provide access to the Tauriko West and Pyes Pā townships, and are all administered by TCC.

3.4.1 State Highway 29 (SH29)

SH29 is classified as a Primary Arterial³ in the TCP and provides direct access to numerous rural residential, industrial and commercial properties. SH29 is classified according to NZTA's One Network Framework (ONF) as an Urban Connector⁴. The section between Ōmanawa bridge and Te Ara Hoia Drive has a posted speed limit of 100 km/h and changes to 70 km/h⁵ between Te Ara Hoia Drive and Cambridge Road. The section

³ Roads that form part of a network of nationally or regionally important arterial roads

⁴ https://spatial.nzta.govt.nz/apps/megamaps/?data_id=dataSource_2-SpeedManagementFramework-OneNetworkFramework%3A3849

⁵ <https://speedlimits.nzta.govt.nz/?views=Results>



between Cambridge Road and SH36 changes again to 100 km/h. **Figure 3.4** shows the existing road network speed limit.

NZTA estimates the road carries an ADT volume of approximately:

- 17,300 vpd with 16% HCV between Ōmanawa bridge and Cambridge Road.
- 25,100⁶ vpd with 7.5% HCV between Cambridge Road and the SH36.

Some enabling works have been undertaken, and some are currently under construction along SH29 to support growth in Tauriko West. These works include upgrades at Redwood Lane and in the Tauriko Village area, including the new northern access (Te Ara Hoia Drive) and Cambridge Road intersection improvements:

- The Redwood Lane enabling works⁷ comprise a new roundabout at the SH29 / Redwood Lane intersection, a connection to the Tauriko Business Estate via Kaweroa Drive, and a new shared path connection between Redwood Lane and Kaweroa Drive, including an underpass beneath SH29.
- The Tauriko Village enabling works⁸ currently under construction include a new signalised intersection at Te Ara Hoia Drive, widening of SH29 between Te Ara Hoia Drive and Cambridge Road, upgrade of the SH29 / Cambridge Road intersection to signals, and associated walking, cycling and public transport improvements. A section of Te Ara Hoia Drive has already been completed, with the remaining upgrades scheduled for completion in early 2027.

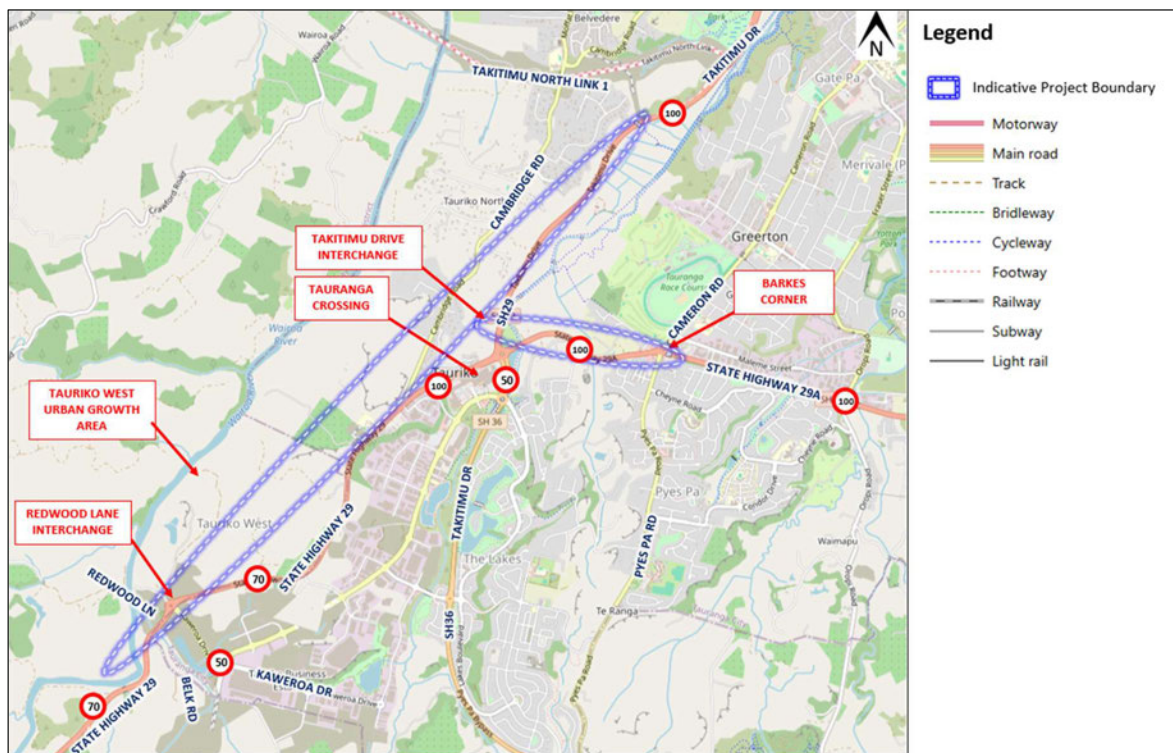


Figure 3.4 – Existing Road Network

⁶ <https://opendata-nzta.opendata.arcgis.com/>

⁷ <https://letstalk.tauranga.govt.nz/portals/14/data/tauriko-neighbourhood/tauriko-west/images/sh29-redwood-lane-intersection-upgrade-map.jpg>

⁸ <https://letstalk.tauranga.govt.nz/portals/14/data/tauriko-neighbourhood/tauriko-west/images/sh29-redwood-lane-intersection-upgrade-map.jpg>



3.4.2 State Highway 29A (SH29A)

SH29A is currently classified as a Primary Arterial in the TCP and a Transit Corridor according to NZTA's ONF. The posted speed limit is 100 km/h, reducing to 70 km/h near Barks Corner.

NZTA estimates the road carries an ADT volume of approximately 29,600 vpd with 7.5% HCV between SH36/SH29 roundabout and Barks Corner. **Figure 3.5** sets out the background traffic volumes.

3.4.3 State Highway 36 (SH36)

SH36 is currently classified as a Primary Arterial in the TCP and as an Urban Connector under NZTA's ONF. The section of the SH36 between SH29 and Taurikura Drive has a posted speed limit of 50 km/h and changes to 100 km/h south of the Taurikura Drive roundabout.

NZTA estimates the road carries an ADT volume of approximately 11,790 vpd with 11% HCV.

3.4.4 Local Roads

A summary of the main characteristics of the local roads is provided and discussed in the subsections to follow. **Figure 3.5** contains the existing traffic volumes for the local road network.

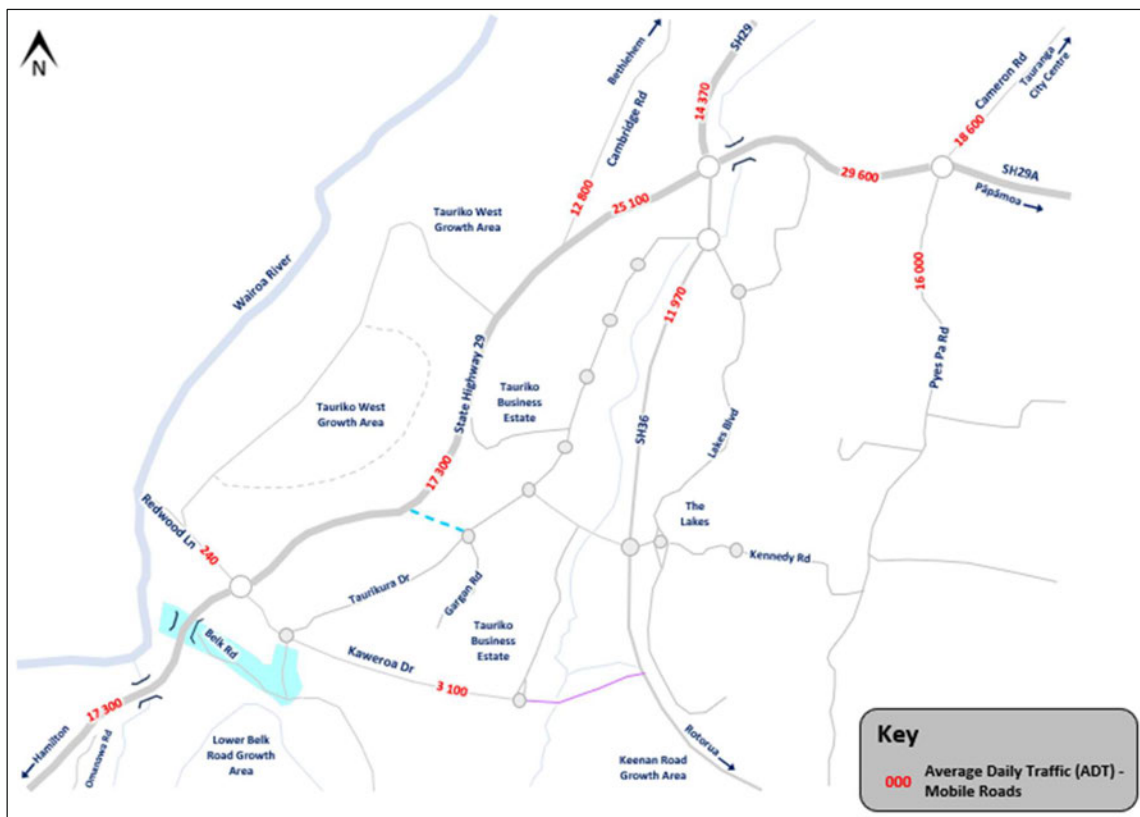


Figure 3.5 – Background Traffic Volumes



3.4.4.1 Redwood Lane, Ōmanawa Road, Belk Road, Cambridge Road, Cameron Road and Pyes Pā Road

Redwood Lane, Cambridge Road, Cameron Road and Pyes Pā Road are classified as Secondary Arterial Roads⁹ in the TCP, while Ōmanawa Road¹⁰ and Belk Road are shown as Local Roads¹¹. In NZTA's ONF, Redwood Lane and Belk Road are currently classified as rural roads, while Cambridge Road, Cameron Road and Pyes Pā Road are classified as urban connectors. Ōmanawa Road is classified as a rural connector road.

Redwood Lane is a two-lane, two-way road with an approximately 4.0 m wide sealed carriageway and a 100 km/h posted speed limit, however NZTA MegaMaps¹² indicate an operating speed of 31 km/h on this road reflecting its form and function. Mobile Road website estimates that the road carries an ADT volume of approximately 240 vpd with 6.5% HCV.

Cambridge Road is a two-lane, two-way road with an approximately 10.1 m wide sealed carriageway and a 60 km/h posted speed limit. Mobile Road website estimates that the road carries an ADT volume of approximately 12,800 vpd with 10.5% HCV.

Cameron Road is a two-lane, two-way road with an approximately 13.1 m wide sealed carriageway and a 50 km/h posted speed limit. Mobile Road website estimates that the road carries an ADT volume of approximately 18,600 vpd with 7% HCV.

Pyes Pā Road is a two-lane, two-way road with an approximately 13.7 m wide sealed carriageway and a 50 km/h posted speed limit. Mobile Road website estimates that the road carries an ADT volume of approximately 16,000 vpd with 5% HCV.

Belk Road is a two-lane, two-way road with an approximately 8.2 m wide sealed carriageway and a 100 km/h posted speed limit. Mobile Road website estimates that the road carries an ADT volume of approximately 1,200 vpd with 15.5% HCV. Belk Road has recently been closed as part of the Tauriko Business Estate development, so the volumes are not an accurate reflection of the road usage.

Ōmanawa Road is a two-lane, two-way road with an approximately 8.2 m wide sealed carriageway and an 80 km/h posted speed limit. Mobile Road website estimates that the road carries an ADT volume of approximately 1,400 vpd with 5% HCV.

3.4.4.2 Kaweroa Drive

Kaweroa Drive is classified as a Local Road in the TCP and classified according to NZTA's ONF as an Activity Street. It is a two-lane two-way road with an approximately 16 m wide sealed carriageway with a 6 m median island and a 50 km/h posted speed limit. Mobile Road website estimates that the road carries an ADT volume of approximately 3,100 vpd with 26.5% HCV.

A section of Kaweroa Drive connecting to the Redwood Lane roundabout has been constructed as part of Tauriko West enabling works and is now operational, providing an alternative access to the Tauriko Business Estate (and Belk Road) located east of the SH29.

⁹ Roads that cater for traffic movement between the major areas of the city

¹⁰ <https://eplan.westernbay.govt.nz/eplan/rules/0/31/0/0/0/1094>

¹¹ Roads that are intended to principally provide direct access to adjoining properties.

¹² https://spatial.nzta.govt.nz/apps/megamaps/?data_id=dataSource_2-SpeedManagementFramework-MeanOperatingSpeeds-Operating_Speeds%3A73012



3.5 Crash History

Data from the Crash Analysis System (CAS) operated by NZTA reveals that the existing road network within the influence of the Project corridor recorded 330 crashes over the six-year period from 2020 to 2025 inclusive. Of those, 14 Death and Serious Injury (DSI) crashes occurred, including two that resulted in fatalities.

Figure 3.6 summarises the crash data. The more severe crashes were associated with the State Highway environment, particularly at or near the major intersections and high-speed sections of SH29 and SH29A.

Of the 14 serious injury crashes recorded, five occurred on SH29 and five on SH29A. Four of the serious crashes occurred on local roads adjacent to the State Highway corridors.

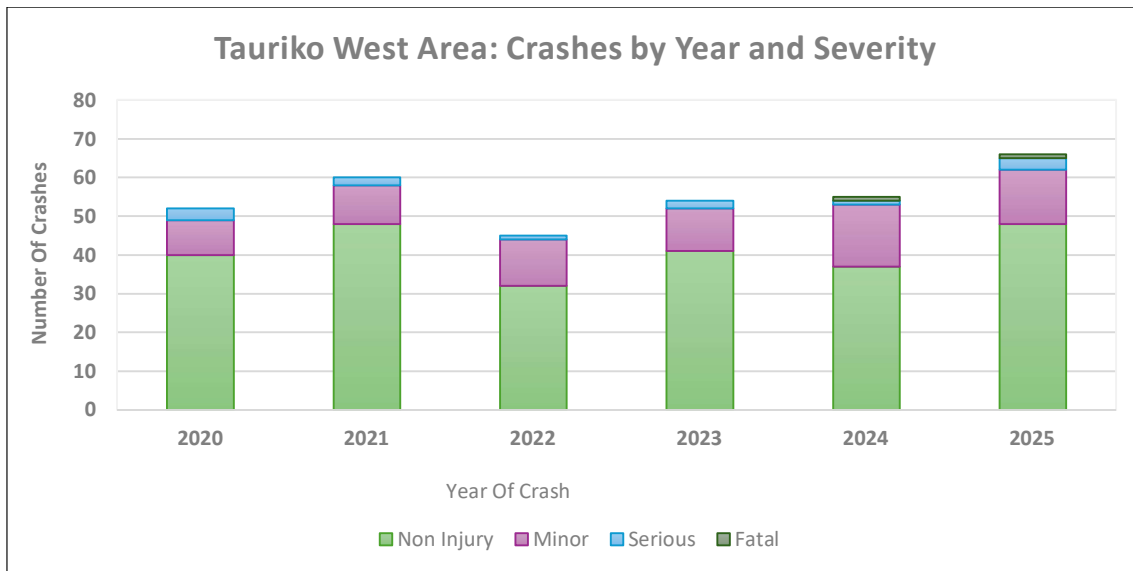


Figure 3.6 – Tauriko West Crash Data Record (2020-2025¹³)

Of the 330 crashes recorded, approximately 41% (135 crashes) occurred at or near state highway intersections including Redwood Lane, Cambridge Road, Takitimu Drive / SH36 and Barkes Corner. The data further shows that Barkes Corner and the Takitimu Drive/SH29/SH36 roundabouts account for a substantial proportion of intersection-related crashes, with approximately 75% of intersection crashes occurring at these two locations alone. A further 117 crashes (approximately 35%) occurred along the SH29 and SH29A corridors between these intersections. **Figure 3.7** presents a summary of crashes occurring at intersections and along the state highway corridors.

¹³ <https://cas.nzta.govt.nz/query-builder>, accessed on 24 February 2026



Tauriko West Area: Crashes Per State Highway & Intersection

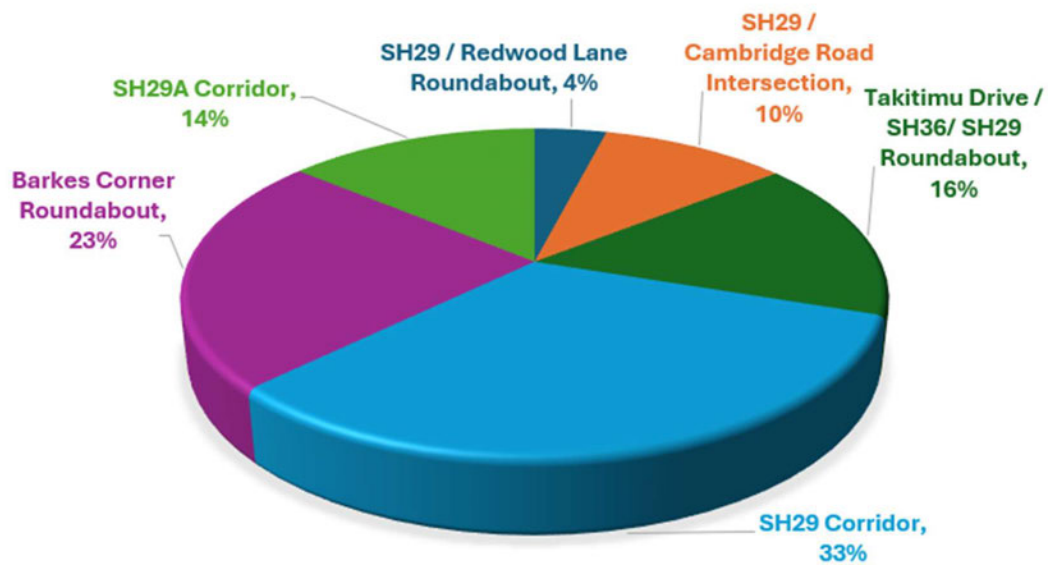


Figure 3.7 – Tauriko West Crash Data Record along SH29 and SH29A



4. Transportation Benefits

4.1 Fundamental Inputs

This TA relies on travel demand and traffic volume projections from the 2023 version of the Tauranga Transport Strategic Model (TTSM23) for model years 2035, 2048 and 2063. The use of this model version was endorsed by the Tauranga Modelling Partnership and NZTA¹⁴.

The TTSM outputs for the Project have been provided by NZTA to BBO for this assessment. BBO has not undertaken any strategic modelling for the Project but understands the TTSM was recalibrated and is fit for purpose, having been based on the latest available traffic count information from NZTA, TCC and BOPRC.

The Gate 2 Toll Modelling and Transport Economics report for the Tauriko SH29 offline and SH29A Improvements projects, dated 19 February 2025 (TMTE25)¹⁵ has been referenced in relation to the Project's transportation benefits, including travel time savings, reliability and safety of the network. This model was developed based on improvements to the SH29A, without the SH29A offline arrangement. The findings of this modelling assessment are provided in Section 4.2.1.

Traffic modelling assessments for the Project - Tauriko RoNS Traffic Modelling, dated 28 July 2026 (TRTM26), were subsequently updated in March 2026¹⁶, capturing the amendments to the Project scope between Takitimu Drive interchange and Barkes Corner.

BBO has also undertaken intersection modelling for this TA using the Signalised Intersection Design and Research Aid (SIDRA) Intersection 10 software, to assess the likely future performance and refine the design configuration of key intersections affected by the Project. The findings of our modelling assessment are provided in Section 4.4.2.

4.2 Operational Effects

4.2.1 Network Performance

Table 1 summarises the results from the TMTE25 modelling report by Beca for the 2035, 2048 and 2063 scenarios with the Project.

Table 1

Network Statistics and Transport Benefit Costs with the Project						
Year	Network Statistics			Transport Benefit Costs		
	Vehicle Hours Travelled (VHT, veh-hr/day)	Delays (veh-hr/day)	Crash Costs (\$M)	Total Travel Time Benefits (\$M) ¹⁷	Crash Saving Benefits (\$M)	Base Total Benefits (\$M)
2035	129,100 1	25,100 1	375.9 1	97	4.9	95.2
2048	154,300 1	33,100 1	441.4 1	161.9	6.2	166

¹⁴ Tauranga Transport Strategic Model TTSM23), dated 16 February 2024 by Beca

¹⁵ Tauriko SH29 offline and SH29A Improvements Project, Gate 2 Toll Modelling and Transport Economics report, dated 16 February 2025 by Beca

¹⁶ Tauriko RoNS Traffic Modelling for Consenting Design, dated 11 March 2026 by Beca

¹⁷ Total travel time benefits = Base travel time benefits + Congested Time benefits + Reliability Benefits



Table 1

Network Statistics and Transport Benefit Costs with the Project						
Year	Network Statistics			Transport Benefit Costs		
	Vehicle Hours Travelled (VHT, veh-hr/day)	Delays (veh-hr/day)	Crash Costs (\$M)	Total Travel Time Benefits (\$M) ¹⁷	Crash Saving Benefits (\$M)	Base Total Benefits (\$M)
2063	191,100.1	46,100.1	580.31	335.3	5.9	346.7

Compared with 2035, the 2048 scenario shows an increase in travel demand, with VKT and VHT rising by approximately 17% and 20%, respectively. Network delay increases by approximately 32% (around 8,000 veh-hr per day), and crash costs increase by approximately 17%.

By 2063, these increases intensify, with VKT and VHT approximately 42% and 48% higher than 2035, respectively. Network delay increases by approximately 84%, and crash costs by approximately 54%, indicating substantially worsening congestion and network performance over time.

Although network demand is forecast to increase significantly, the Project is expected to improve network performance by increasing capacity, improving route choice and reducing the rate of congestion growth. The key effects are summarised below:

- Congestion growth is mitigated but not eliminated. Congestion is still expected to increase over time, but at a slower rate than would occur without the Project.
- Travel time benefits are expected to increase over time as demand grows and the value of travel time savings increases. The Project improves capacity and operational efficiency by reducing travel times and providing improved route options.
- Network reliability benefits are expected to increase, although they remain a relatively small component of total benefits.
- Crash costs are still expected to increase overall due to higher traffic exposure; however, safety benefits are realised through infrastructure improvements that offset some of this increased risk.
- As network conditions become more constrained, with higher VHT and delays, the value of the Project benefits increases. This indicates that the benefits grow over time as the Project relieves increasingly severe congestion conditions.

TWRoNSIC25 indicates that the RoNS project scope does not include public transport (PT) infrastructure such as dedicated bus priority lanes on SH29A and SH36, although route protection for six lanes between SH29A and SH36, and a wider corridor at Barks Corner interchange has been retained to accommodate future growth.

Accordingly, the transport modelling incorporates existing and future PT routes at a network level; however, it does not assume a material uplift in PT patronage, as no dedicated bus priority measures or service enhancements are included in the tested scenarios. PT benefits are therefore minimal and reflect a business-as-usual outcome rather than a mode shift scenario.

Notwithstanding this, the diversion of through-traffic to SH29 Offline and the subsequent repurposing of the existing SH29 corridor, together with the provision for future PT infrastructure, presents a significant opportunity to establish a higher-functioning PT corridor within the Western Corridor.



Overall, the modelling indicates that the Project provides effective network improvements despite long-term travel-demand growth. It delivers meaningful benefits by reducing the rate of congestion growth, improving travel time outcomes and supporting more reliable network performance.

Any future tolling decision and effects thereof would be subject to a separate statutory process and have not been relied on for the assessment of transportation effects in this report.

4.2.2 Improved Road Safety

The Project has been designed in accordance with the latest RoNS guidance from the Government and incorporates central median and roadside barriers designed to meet the government's New Zealand Road Safety Objectives.

The Project, and the subsequent revocation of SH29 and SH29A to local roads will provide significant positive safety effects for road users on these roads and the communities that adjoin them, compared to the Do Minimum (DM) scenario. The positive safety benefits are summarised as:

- Significantly reduced likelihood of DSI crashes¹⁸ due to the new median divided highway being designed to modern high-speed geometric standards with central median and roadside barriers also designed to modern safety standards.
- Reduced likelihood of DSI crashes at key intersections associated with the Project due to adopting safe system design principles (i.e. reduced exposure, likelihood, and severity). This includes separating regional (state highway) high-speed traffic from local traffic movements via the SH29 and SH29A offline corridor sections.
- Reduced likelihood of DSI crashes at the SH29 / Ōmanawa Road intersection due to the sight distance improvements from realigning the SH29 approaches, channelisation of the right-turn out movement from Ōmanawa Road and banning right-turn movements into Ōmanawa Road.
- Replacing the existing Barks Corner five-arm roundabout that has insufficient capacity for existing traffic demands with a new grade-separated interchange that removes conflicts between state highway through-traffic and local road traffic.
- Designing for a safe and appropriate future speed environment for local roads affected by the Project. This includes the future existing SH29 and SH29A corridor intersections with the SH36 and Pyes Pā Road.

The Project has addressed the Safe System principles¹⁹ to ensure the road transport safety objectives of NZTA and the Government are met. The Project's safety benefits are considered significant in the context of the existing crash profile. As outlined in Section 3.5, 330 crashes were recorded within the Project corridor between 2020 and 2025, including 14 Death and Serious Injury crashes and two fatalities.

The crash history indicates an existing road safety deficiency associated with high traffic volumes, high operating speeds, heavy vehicle exposure, and conflicts between through and turning traffic at at-grade intersections.

The median-separated offline corridors, reduced exposure to high-risk turning and crossing movements, and separation of strategic and local traffic movements are expected to reduce crash frequency and severity relative to the DM scenario. Overall, the Project provides a safer network outcome than could be achieved through upgrades to the existing corridors alone.

¹⁸ Tauriko DBC Options Report by WSP, dated June 2023

¹⁹ 14-292-Embedding-the-safe-system-DL-WEB.pdf (nzta.govt.nz)



4.3 Improved Corridor and Network Capacity

Table 2 summarises the predicted ADT figures on the surrounding road network for the DM scenario and the Project. The results are based on traffic modelling outputs for the 2048 horizon year from Beca's Tauriko RoNS Traffic Modelling²⁰ (refer to Appendix A for the traffic demand projections). **Table 2** also presents the change in traffic volumes between the project scenarios, where:

- Red indicates an overall increase in the daily traffic demand²¹,
- Green indicates an overall decrease in the daily traffic demand, and
- Yellow indicates little to no change in the daily traffic demand.

Figure 4.1 shows the modelled 2048 and 2063 traffic volumes on the Project corridor and local road network.

Table 2

Estimated 2048 ADT Figures without the Project and with the Project			
Road Corridor	Predicted 2048 ADT (vpd)	Predicted 2048 ADT (vpd)	Change in Volume with the Project (vpd)
	Without the Project	With the Project	
State Highway 29 offline	-	31,730 vpd	-
Takitimu Drive south of TNL 1 Roundabout	28,600 vpd	49,150 vpd	20,550 vpd
State Highway 29A offline	-	27,130 vpd	-
Existing State Highway 29	20,760 vpd	13,700 vpd	7,060 vpd
State Highway 29 South of Ōmanawa bridge	21,600 vpd	21,800 vpd	200 vpd
Existing State Highway 29A	29,760 vpd	18,790 vpd	10,970 vpd
Existing State Highway 36	24,540 vpd	20,270 vpd	4,270 vpd
Cambridge Road	18,050 vpd	14,280 vpd	3,370 vpd
Cameron Road	16,970 vpd	21,180 vpd	4,210 vpd
Pyes Pā Road	13,960 vpd	15,310 vpd	1,350 vpd
Redwood Lane	8,810 vpd	10,950 vpd	2,140 vpd
Kaweroa Drive	13,870 vpd	14,940 vpd	1,070 vpd

The Project model predicts:

- Traffic volumes of 31,730 vpd on the SH29 offline between Redwood Lane interchange and Takitimu Drive interchange in 2048, increasing to 44,040 vpd by 2063, while the SH29A offline is predicted to carry 27,130 vpd in 2048, increasing to 30,920 vpd by 2063.
- Traffic volumes on Takitimu Drive are expected to increase to 49,150 vpd, representing a 72% increase in the 2048 scenario with the Project, while the 2063 scenario is expected to increase to 59,860 vpd, representing a 109% increase.

²⁰ Tauriko RoNS Traffic Modelling for Consenting Design Report – Traffic Flow Plots

²¹ Traffic demand refers to the volume of travel predicted by the traffic model, expressed as vehicle movements on the network



- Traffic volumes on the existing SH29 are anticipated to reduce by approximately 56% in 2048 with the Project, while volumes on the existing SH29A are anticipated to reduce by approximately 37%. HCV volumes on the existing SH29 and SH29A will reduce by 81% and 59% respectively.
- Traffic volumes on the existing SH29 south of Ōmanawa bridge are expected to remain largely unchanged in 2048 (approximately +1%), increasing by approximately 25% to 22,400 vpd by 2063.



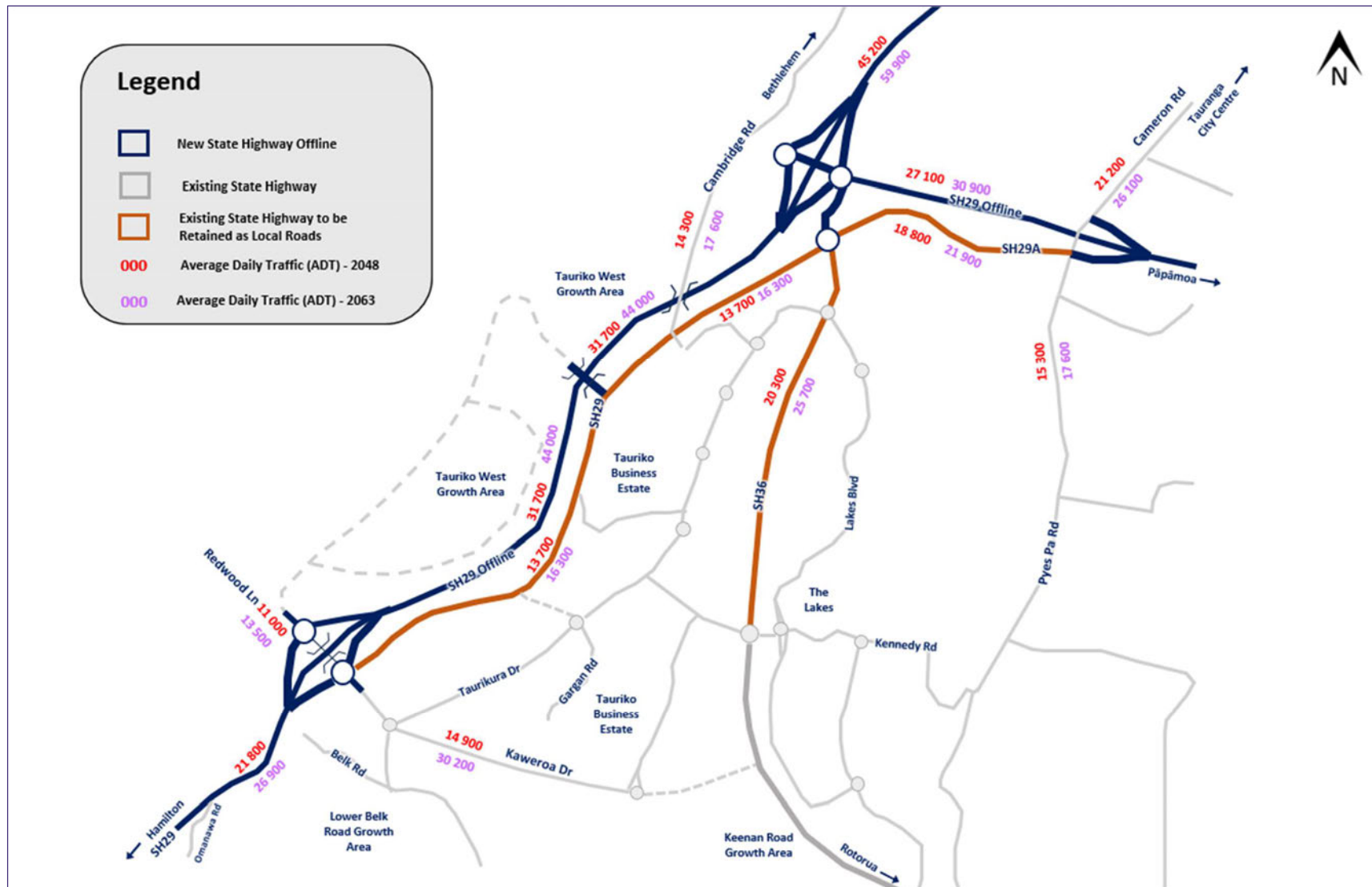


Figure 4.1 – SH29 offline and SH29A offline - 2048 and 2063 Traffic Volumes



4.4 Level of Service

Level of Service (LOS) is a high-level qualitative measure describing intersection delays and link volume-to-capacity ratios. LOS A represents volumes significantly less than capacity resulting in free-flow traffic conditions and minimal delays, while LOS F represents volumes exceeding capacity, resulting in extensive delays, queues and congestion.

4.4.1 Network Links

4.4.1.1 SH29 and SH29A

TRTM26 modelling indicates that:

- Without the Project, most of the existing SH29 corridor to Te Ara Hoia Drive would operate near capacity at LOS E based on 2048 growth projections. The eastbound section between SH29 / Cambridge Road and SH29 / SH36 would operate over capacity at LOS F, except between Te Ara Hoia Drive and Cambridge Road, which would operate at LOS C. Refer to **Table 3**.
- With the Project, the existing SH29 is expected to operate at LOS A to LOS D during both peak periods, except between SH29 / Cambridge Road and SH29 / SH36, where eastbound conditions improve from LOS F to LOS E.
- For SH29A between SH29 / SH36 roundabout and Barkes Corner, the 2048 DM scenario indicates LOS E eastbound and LOS F westbound during both peaks. With the Project, westbound performance improves to LOS E, while eastbound performance remains LOS E.

Table 3

Corridor Levels of Service for the Do Minimum and The Project 2048 Scenario					
Road Corridor	Do Minimum		The Project		Change in LOS
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	
SH29 Offline	-	-	LOS A - LOS B	LOS A - LOS B	New improved State Highway
Takitimu Drive	LOS C - LOS F	LOS B - LOS F	LOS C	LOS C	Significant improvement
SH29A Offline	-	-	LOS A - LOS B	LOS A - LOS B	New improved State Highway
Existing SH29	LOS B - LOS F	LOS B - LOS F	LOS B - LOS E	LOS B - LOS E	Minor improvement
SH29 South of Ōmanawa bridge	LOS E	LOS E	LOS E	LOS E	No change
Existing SH29A	LOS E - LOS F	LOS E - LOS F	LOS E	LOS E	Minor improvement
Existing SH36	LOS C - LOS E	LOS E - LOS F	LOS C - LOS E	LOS D - LOS E	Slight deterioration
Cambridge Road	LOS E	LOS E	LOS D - LOS E	LOS E	Minor improvement
Cameron Road	LOS C - LOS D	LOS C	LOS B - LOS D	LOS B - LOS E	Minor AM Peak improvement and minor PM Peak deterioration
Pyes Pā Road	LOS B - LOS C	LOS B - LOS C	LOS B - LOS E	LOS C - LOS D	Slight deterioration
Redwood Lane	LOS B - LOS D	LOS B - LOS D	LOS B - LOS D	LOS B - LOS D	No change
Kaweroa Drive	LOS B - LOS D	LOS C - LOS D	LOS B - LOS D	LOS B - LOS D	No change



4.4.1.2 SH29 offline

SH29 offline is expected to operate at LOS A to LOS B between the Redwood Lane and Takitimu Drive interchanges during both peak periods in the 2048 scenario. By 2063, performance is expected to reduce to LOS C in the peak direction and LOS B in the opposing direction. This remains indicative of good operating conditions, with the peak flow direction expected to reverse between the AM and PM peak periods.

The section between the Takitimu Drive interchange and the TNL 1 / Takitimu Drive roundabout is anticipated to operate at LOS C to LOS F during both peak periods under the 2048 DM scenario. With the Project, performance is expected to improve to LOS C in 2048 and reduce to an acceptable LOS D by 2063.

4.4.1.3 SH29A offline

SH29A offline is expected to operate at good LOS A to LOS B during both peak periods in the 2048 and 2063 scenarios.

LOS figures for the Do Minimum and the Project, 2048 and 2063 scenarios are provided in **Appendix B** of the TRTM26 report, which is included as **Appendix A** to this assessment.

Overall, the Project is expected to maintain or improve operational performance across most corridors compared with the DM scenario. Some corridors, including SH36 and Pyes Pā Road, may experience more variable peak-period performance; however, these effects are localised and do not materially affect the overall network outcome.

4.4.2 Intersection Performance

The performance of the main intersections within the Project area of influence has been analysed using the peak hour volumes for the 2048 scenario with the Project from the TRTM26 report.

4.4.2.1 Redwood Lane Interchange

The Redwood Lane interchange will comprise two roundabouts as shown in **Figure 4.2**. Traffic modelling for the 2048 forecast scenario indicates that satisfactory operational performance is expected at both roundabouts during the AM and PM peak hours. The critical approach will be from the existing SH29, which is predicted to operate with a degree of saturation of 0.59 and 0.55 during the AM and PM peak hour respectively.

A summary of intersection performance is provided in **Table 4** and **Figure 4.3** shows the 2048 AM peak hour and PM peak hour LOS per approach lane.





Figure 4.2 – SH29 / Redwood Lane Interchange

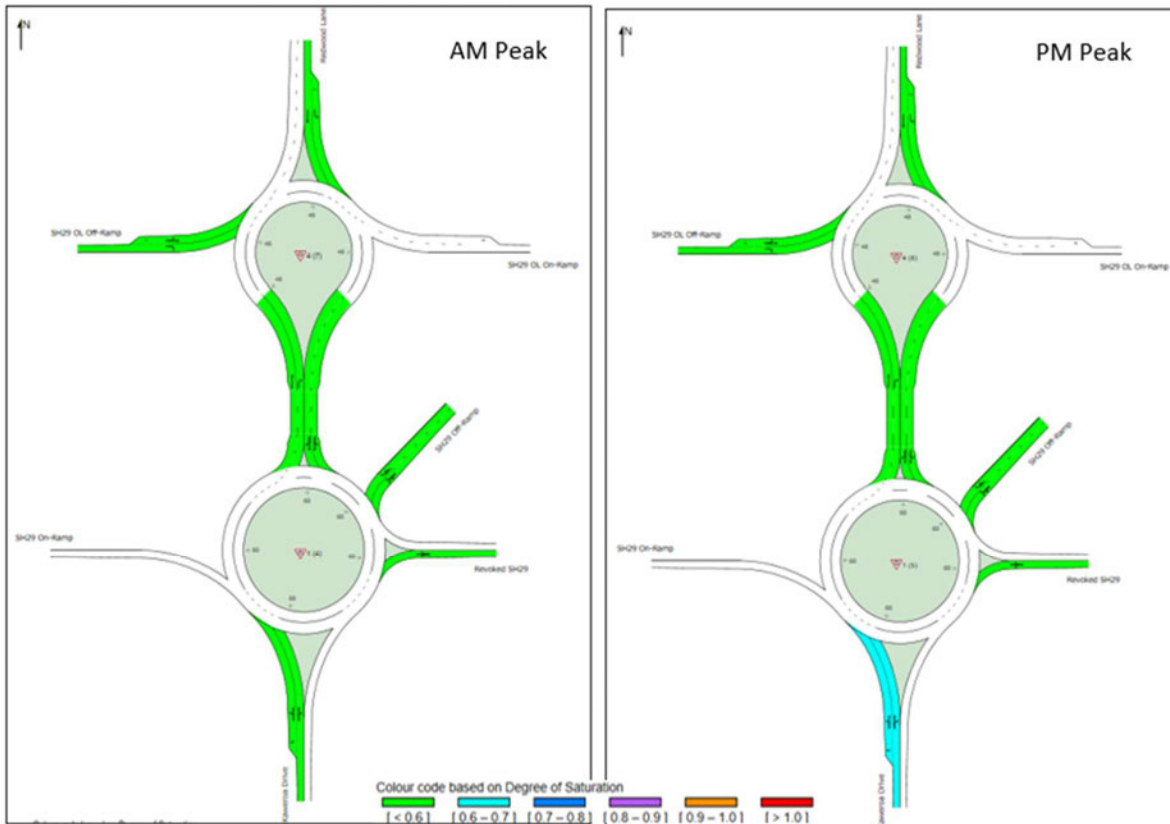


Figure 4.3 – SH29 / Redwood Lane Interchange – 2048 AM Peak and PM Peak Level of Service



Table 4

Traffic Modelling Results for 2048 Scenario							
Option		Western Interchange			Eastern Interchange		
		New SH29 On & Off Ramps / Redwood Lane Roundabout			Existing SH29 / New SH29 On & Off Ramps / Kaweroa Drive 5-leg Roundabout		
		Worst Vehicle Movement			Worst Vehicle Movement		
Investment Case	Peak Hour	V/C	Delays (sec / veh)	95% Back of Queue (m)	V/C	Delays (sec / veh)	95% Back of Queue (m)
	AM	0.44 Through from Redwood Lane (N)	9 Right-turn (RT) from SH29 Off Ramp (W)	8 Through from Redwood Lane (N)	0.59 Left-turn (LT) from SH29 Off Ramp (NE)	13 From Existing SH29 (E)	13 LT from SH29 Off Ramp (NE)
	PM	0.48 RT from Kaweroa Drive (S)	12 RT from SH29 Off Ramp (W)	8 Through from Redwood Lane (N)	0.55 From Existing SH29 (E)	13 RT from Existing SH29 (E)	13 LT from Kaweroa Drive (S)

4.4.2.2 Takitimu Drive Interchange

The design of the Takitimu Drive Interchange and its connection to the existing SH29/SH29A/SH36 roundabout was progressively refined through a multi-criteria assessment. The indicative design, including the arrangement of the interchange roundabouts and their connection to the existing roundabout, is shown in **Figure 4.4**.

The analysis results illustrate that all three roundabouts associated with the connection of SH29 offline corridor with SH29A offline corridor and SH36 are expected to operate satisfactorily during the AM and PM Peak periods. **Figure 4.5** and **Figure 4.6** provide the AM peak hour and PM peak hour LOS results respectively.

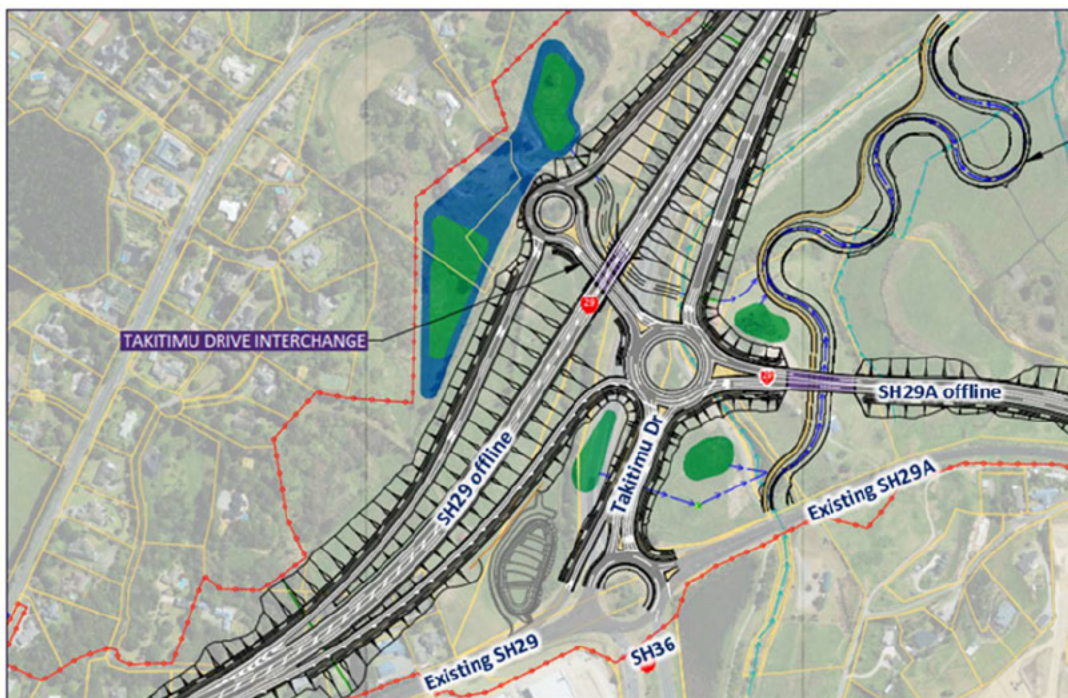


Figure 4.4 – Takitimu Drive Interchange



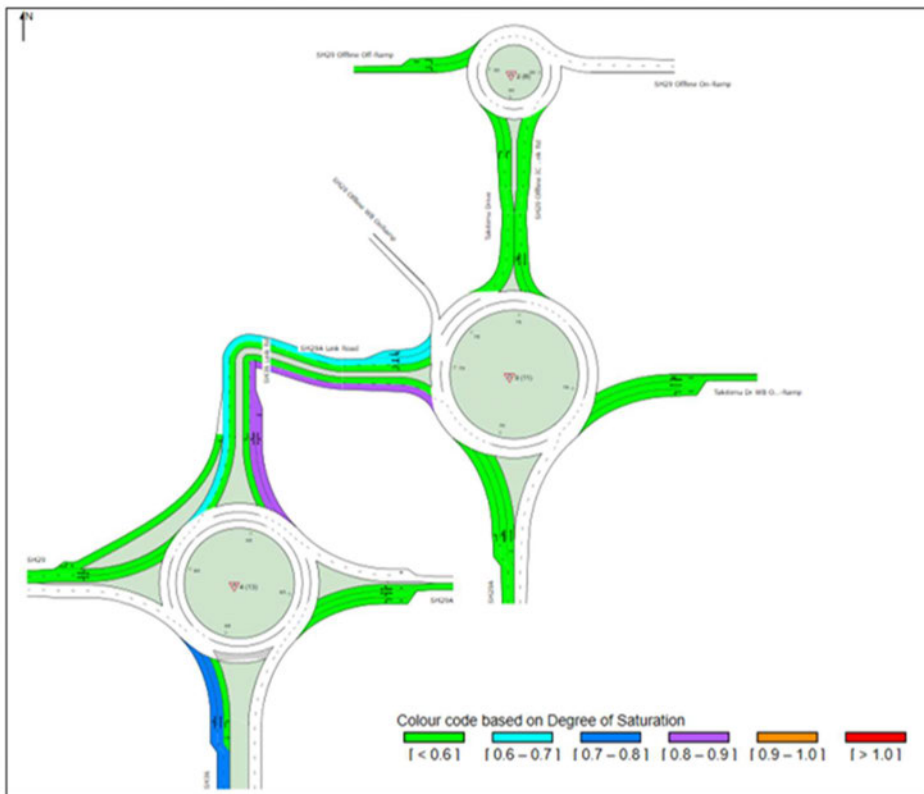


Figure 4.5 – Existing SH29/ SH36 roundabout and Takitimu Drive Interchange – 2048 AM Peak Hour Level of Service

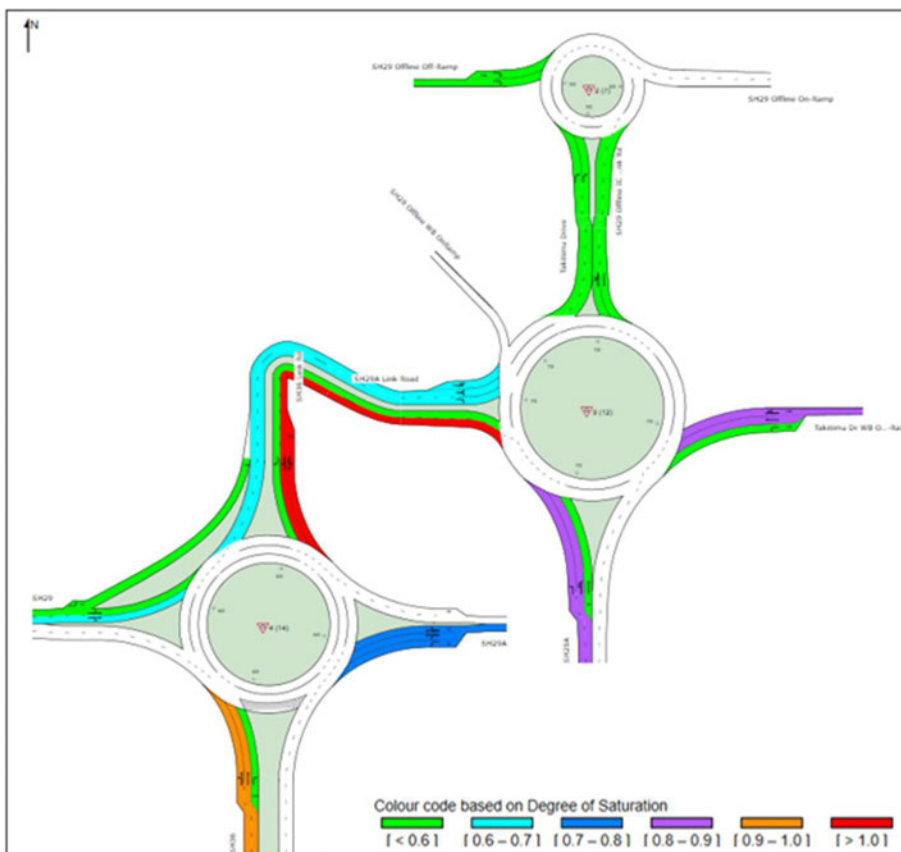


Figure 4.6 – Existing SH29 / SH36 roundabout and Takitimu Drive Interchange – 2048 PM Peak Hour Level of Service



The critical intersection movement is the SH36 northbound approach to the existing SH29 /SH29A /SH36 roundabout, where 95th percentile queues of 118 m during the PM peak are predicted. This is a significant improvement on the existing and DM PM peak performance for the same approach.

A summary of the worst vehicle movement performance for the interchange roundabouts and the existing SH29/SH36/SH29A roundabout is provided in **Table 5**.

Table 5

Traffic Modelling Results for 2048 Scenario							
Option		Northern Intersection			Southern Intersection		
		New SH29A / SH36 5-leg Roundabout			Existing SH29 / SH36 Roundabout		
		Worst Vehicle Movement			Worst Vehicle Movement		
3J	Peak Hour	V/C	Delays (sec / veh)	95% Back of Queue (m)	V/C	Delays (sec / veh)	95% Back of Queue (m)
	AM	0.69 LT from SH29A (S)	11 RT from Takitimu Drive Off-Ramp (E)	16 LT from SH29A (S)	0.84 LT & Through from SH36 (N)	13 RT from SH29A (E)	28 LT & Through from SH36 (N)
	PM	0.86 Through and RT from Takitimu Drive Off-Ramp (E)	25 RT from Takitimu Drive Off-Ramp (E)	34 Through from Takitimu Drive Off-Ramp (E)	1.0 LT and Through from SH36 (S)	44 Through from SH36 (S)	118 LT & Through from SH36 (S)

4.4.2.2 Barkes Corner

The proposed half-diamond interchange at Barkes Corner was also developed and refined through multi- criteria assessment and SIDRA modelling. The preferred layout is shown in **Figure 4.7** below and **Table 6** the summary SIDRA model results.

The indicative layout includes the following:

- A new SH29A offline corridor passing beneath the Cameron Road connection to Pyes Pā Road.
- Two coordinated signal intersections connecting Cameron Road, Pyes Pā Road, Maleme Road, Marshall Avenue and east-facing on and off ramps with SH29A.
- A shared walking and cycling path on the eastern side of Cameron Road overbridge connecting to Pyes Pā Road and Cameron Road paths.



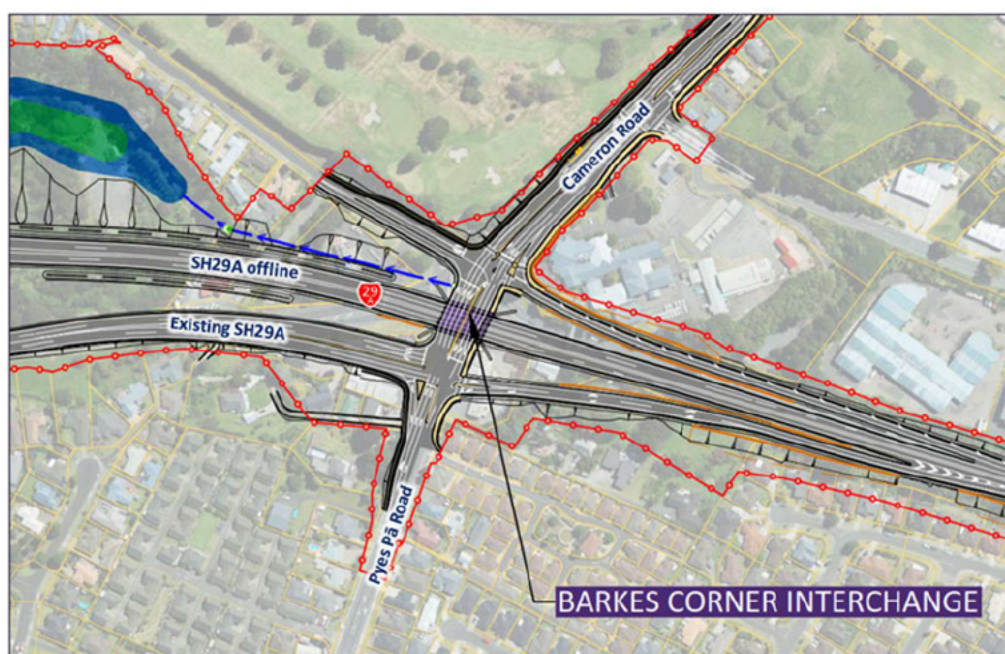


Figure 4.7 – SH29A / Cameron Road / Pyes Pā Road Interchange

Table 6

Traffic Modelling Results for 2048 Scenario										
Option		Maleme Road Intersection			Northern Intersection			Southern Intersection		
		Cameron Road / Maleme Road			Cameron Road/ Marshall Avenue / SH29A On Ramp			SH29A/ Pyes Pā Road / SH29A Off Ramp		
		Worst Vehicle Movement			Worst Vehicle Movement			Worst Vehicle Movement		
3H	Peak Hour	V/C	Delays (sec / veh)	95% Back of Queue (m)	V/C	Delays (sec / veh)	95% Back of Queue (m)	V/C	Delays (sec / veh)	95% Back of Queue (m)
	AM	0.55 Through from Cameron Rd (S) & RT from Maleme Rd (E)	60 RT from Maleme Rd (E)	79 Through from Cameron Rd (N)	0.61 Through from Cameron Rd (N) & RT from Maleme Rd (E)	65 RT from Cameron Rd (N)	98 Through from Cameron Rd (N)	0.85 Through from Pyes Pā Rd (S) & RT from Cameron Rd (N)	68 Through from Existing SH29A (W)	123 Through from Pyes Pā Rd (S)
	PM	0.50 Through from Cameron Rd (S) & RT from Maleme Rd (E)	64 RT from Maleme Rd (E)	60 Through from Cameron Rd (N&S)	0.83 Through from Cameron Rd (N) & RT from Marshall Ave (W)	70 RT from Cameron Rd (S)	128 Through from Cameron Rd (N)	0.72 RT from SH29A (W)	47 RT from SH29A Off Ramp (E)	50 Through from Cameron Rd (N)

The model results indicate that the interchange will operate with acceptable performance with the 2048 forecast AM and PM peak period traffic flows.



The figure consists of two side-by-side maps of the Cameron Rd corridor, labeled 'AM Peak' and 'PM Peak'. Each map shows the corridor from the top (North) to the bottom (South). The corridor is divided into segments by intersections: Cameron Rd/Maleme Rd, Cameron Rd/Marshall Ave, Cameron Rd/SH29A On-Ramp, and Cameron Rd/SH29A Off-ramp. The degree of saturation is indicated by color: green for low saturation (<0.6), cyan for low-medium (0.6-0.7), blue for medium (0.7-0.8), purple for medium-high (0.8-0.9), orange for high (0.9-1.0), and red for very high (>1.0). In the AM Peak map, the highest saturation is in the segment between Marshall Ave and SH29A On-Ramp. In the PM Peak map, the highest saturation is in the segment between SH29A On-Ramp and SH29A Off-ramp. A legend at the bottom explains the color code based on the Degree of Saturation.

AM Peak

PM Peak

Colour code based on Degree of Saturation

Colour	Degree of Saturation
Green	< 0.6
Cyan	$0.6 - 0.7$
Blue	$0.7 - 0.8$
Purple	$0.8 - 0.9$
Orange	$0.9 - 1.0$
Red	> 1.0

4.5 Legal Speed Limits

- 110 km/h on the new State Highway 29 offline expressway (RoNS standard).
- 100 km/h on the new State Highway 29A offline expressway (RoNS standard).
- 60 km/h on the existing SH29 and SH29A corridors, subject to location and environment.



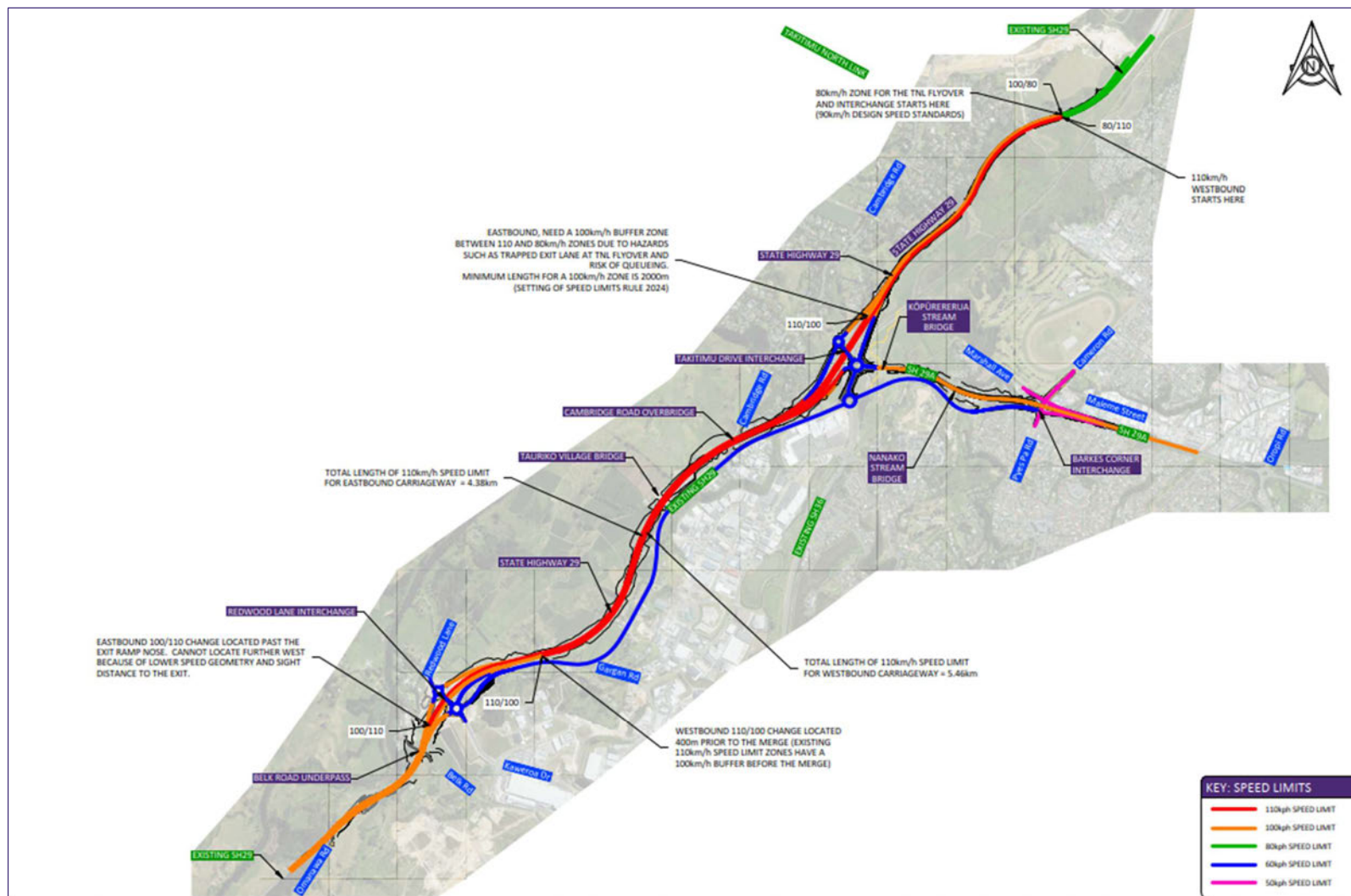


Figure 4.9 – Speed Limit Overview Plan



4.6 Road Cross-Sections

The Project will be a four-lane median-divided highway. A summary of the typical cross-section elements for the highway and local roads within the Project area is provided in subsequent sections. Design elements for local roads relate only to where the Project affects the local road.

4.6.1 SH29 offline

SH29 offline is planned as a four-lane carriageway with two lanes in each direction. Typical cross-sections for the SH29 offline are shown in **Figure 4.10** and **Figure 4.11**. The road is proposed to have the following geometric layout:

- 4 x 3.5 m traffic lanes.
- 3.0 m-4.05 m wide median.
- 1.5 m-3.05 m wide shoulders on both sides of the road.

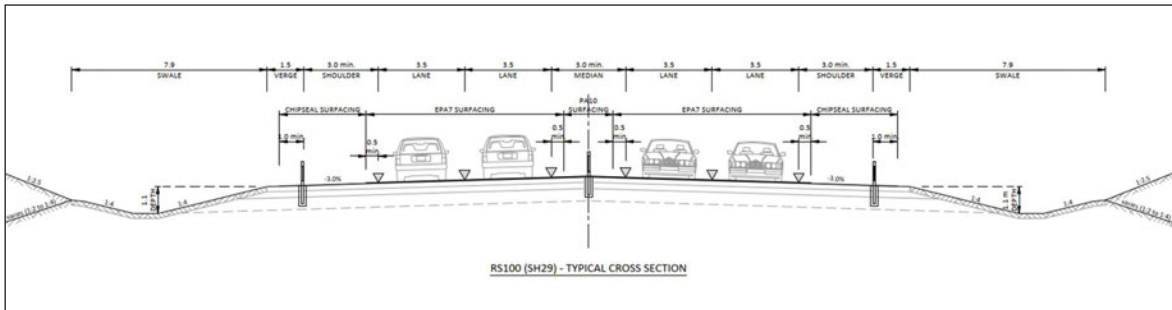


Figure 4.10 – SH29 offline Typical Cross Section

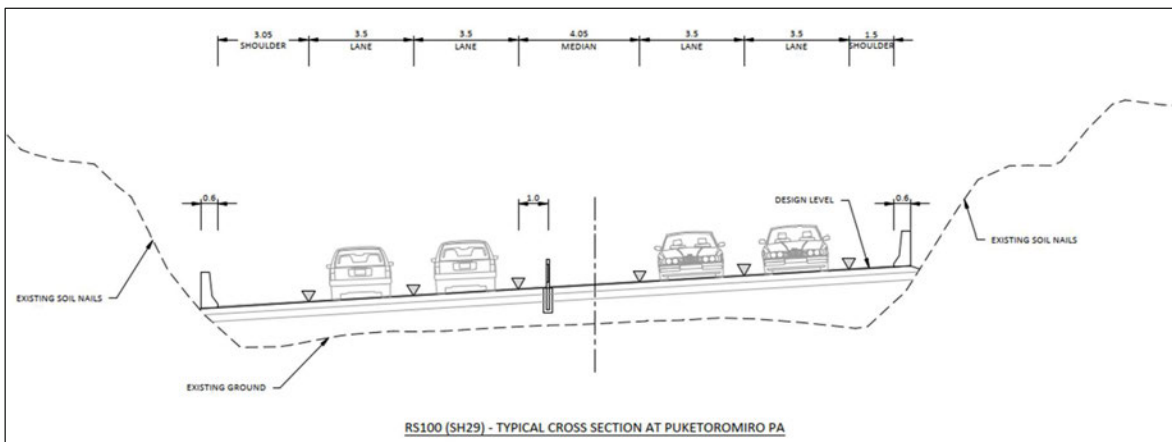


Figure 4.11 – SH29 offline Typical Cross Section 2



4.6.2 SH29A offline

SH29A is also planned to be a four-lane carriageway with two lanes per direction. A typical cross-section for SH29A offline is shown in **Figure 4.12** and is proposed to have the following geometric layout:

- 4 x 3.5 m wide traffic lanes.
- 1.5 m wide median.
- 1.5 m wide shoulders (left and right-hand side).

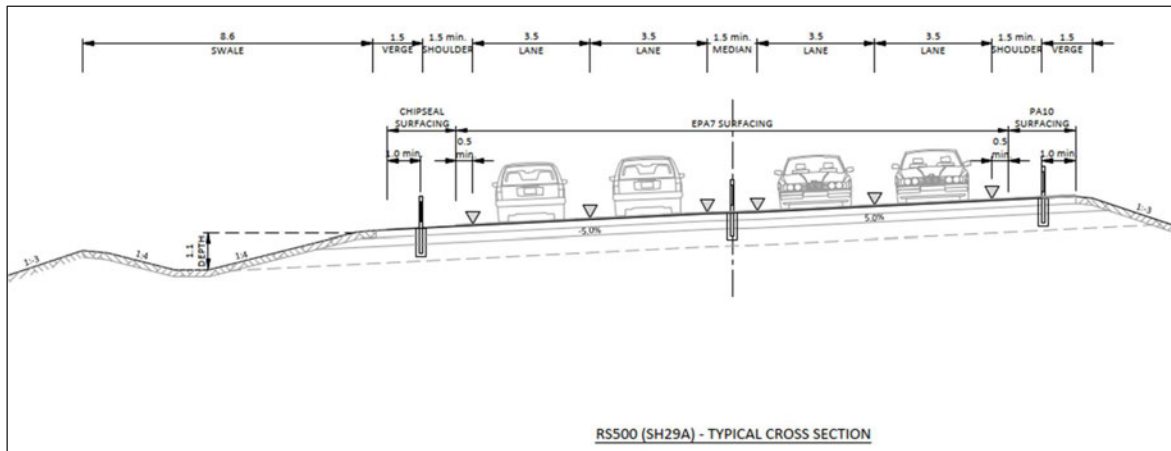


Figure 4.12 – SH29A offline Typical Cross Section

All affected local roads and intersections within the Project area of influence are designed in accordance with TCC's Infrastructure Development Code²² requirements, and where relevant, Austroads Guide to Road Design²³.

4.7 Project Tie-ins to Existing Road Network

4.7.1 SH29 offline Western Tie-in

This section outlines the design features and safety benefits associated with the components of the SH29 offline four into two-lane western tie-in, including the associated Ōmanawa Road intersection upgrade.

4.7.1.1 SH29 offline / Redwood Lane Interchange and Ōmanawa bridge

In the southbound direction, SH29 offline transitions from 110 km/h to 100 km/h approximately 400 m upstream of the Redwood Lane interchange as shown in **Figure 4.13**. This provides a clear and progressive speed reduction well in advance of the interchange and associated changes in road layout.

At the Redwood Lane interchange, the carriageway reduces from two lanes to a single through lane, with this lane reduction occurring within the 100 km/h speed environment. The speed transition is therefore completed before the lane drop, reducing speed variance and supporting safe and predictable merging behaviour.

Downstream of the interchange, an additional on-ramp lane merges into the single southbound SH29 offline lane, also within the 100 km/h speed environment, approximately 200 metres north of the Ōmanawa bridge.

²² <https://www.tauranga.govt.nz/council/strategies-and-plans/infrastructure-development-code/idc-pdf-version>

²³ <https://austroads.com.au/safety-and-design/road-design/guide-to-road-design>



This separation between the initial lane reduction and the downstream merge ensures that driver tasks are staged sequentially, rather than occurring simultaneously.

This arrangement is considered appropriate and safe since it:

- Provides sufficient advance distance for drivers to perceive and respond to the reduced speed environment.
- Ensures that lane reductions and merging manoeuvres occur at a reduced operating speed, rather than within the 110 km/h environment.
- Separates speed reduction, lane drop, and downstream merging into distinct driver tasks, reducing workload and the likelihood of abrupt braking or late lane changes.
- Provides a median barrier through all zones where vehicles merge.
- Aligns with Safe System principles by managing operating speeds prior to entering more constrained conditions downstream, including the bridge environment.

Overall, the southbound layout demonstrates a progressive and well-sequenced transition in both speed and lane configuration, supporting safe operation and reducing the likelihood and severity of crashes.

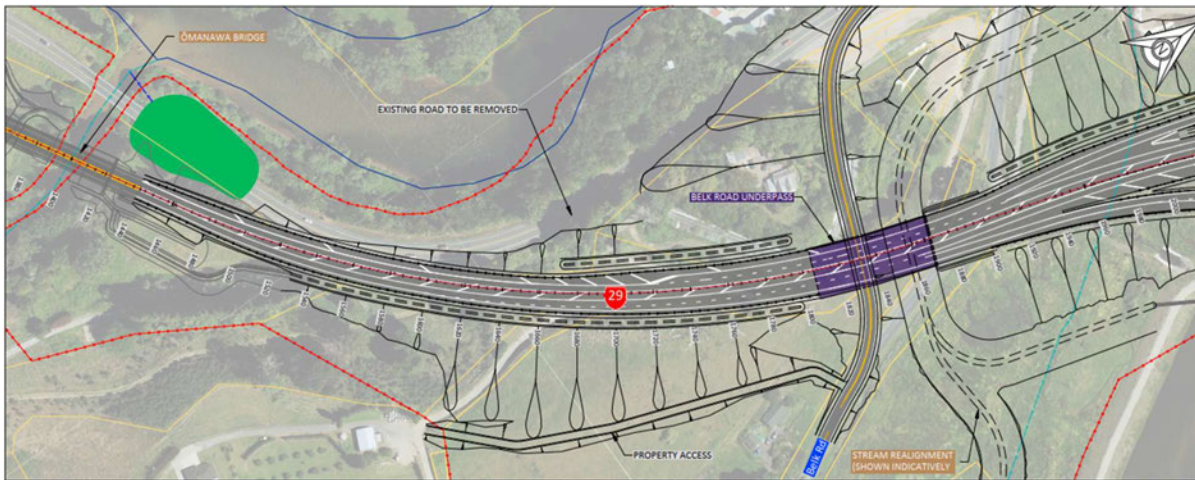


Figure 4.13 – SH29 offline / SH29 Road Tie-in

4.7.1.2 SH29 / Ōmanawa Road Intersection

The indicative design of the Ōmanawa Road intersection with SH29 offline addresses the critical safety deficiencies with the existing 'y' intersection configuration as shown in **Figure 4.14**. The upgrade provides the following safety benefits:

- Elimination of the right-turn into Ōmanawa Road. This reduces exposure to high-risk right-turn movements on the state highway. Eastbound vehicles can turn around at the Redwood Lane interchange and return to Ōmanawa Road with a left-turn.
- Channelisation of the right-turn out of Ōmanawa Road results in improved driver expectancy and manoeuvre separation.
- With no right-turn in, for drivers turning right out, the risk of confusion over priority while in the conflict zone with high speed through traffic is eliminated.
- Reduced vertical curvature of the highway improves sight distance at the SH29 / Ōmanawa Road intersection. This adjustment involves filling over the existing highway to a depth of around 3.0m.



- Improved intersection alignment reduces travel path conflict angles and reduces the time required for a large truck and trailer to turn left out of Ōmanawa Road.

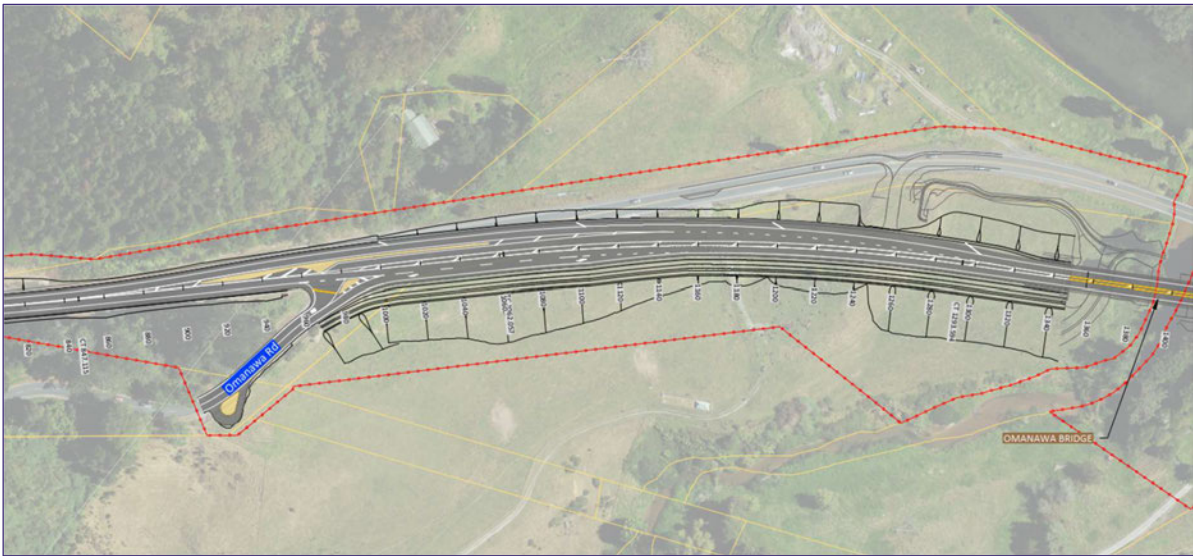


Figure 4.14 – SH29 offline / Ōmanawa Road Intersection Upgrade

4.7.1.3 SH29 Offline Western Tie-in

The tie-in between the SH29 offline and the existing SH29 is two lanes continuing to two lanes, refer **Figure 4.15**. The arrangement results in the following safety benefits:

- Elimination of merge and lane-drop risk. As the cross-section transitions from two lanes to two lanes, there is no lane drop or merge manoeuvre required. This removes a common high-risk condition associated with expressway tie-ins, particularly for heavy vehicles.
- Improved speed consistency by maintaining lane continuity supports more uniform operating speeds through the tie-in. Reduced speed variance lowers the likelihood of rear-end and side-swipe crashes.
- The absence of lane changes or merging simplifies driver decision-making at a critical transition point. This improves driver expectancy and aligns with Safe System principles by reducing exposure to complex manoeuvres and reducing driver workload.
- Roadside barrier treatment reduces the severity of loss-of-control or encroachment crashes at the transition.

The tie-in arrangement at Ōmanawa Road provides a net safety benefit by maintaining lane continuity through the transition from the SH29 offline corridor to the existing highway, thereby avoiding merge and lane-drop conditions. The simplified driver task, improved speed consistency and opportunity for barrier protection are expected to reduce crash risk relative to more complex tie-in forms.



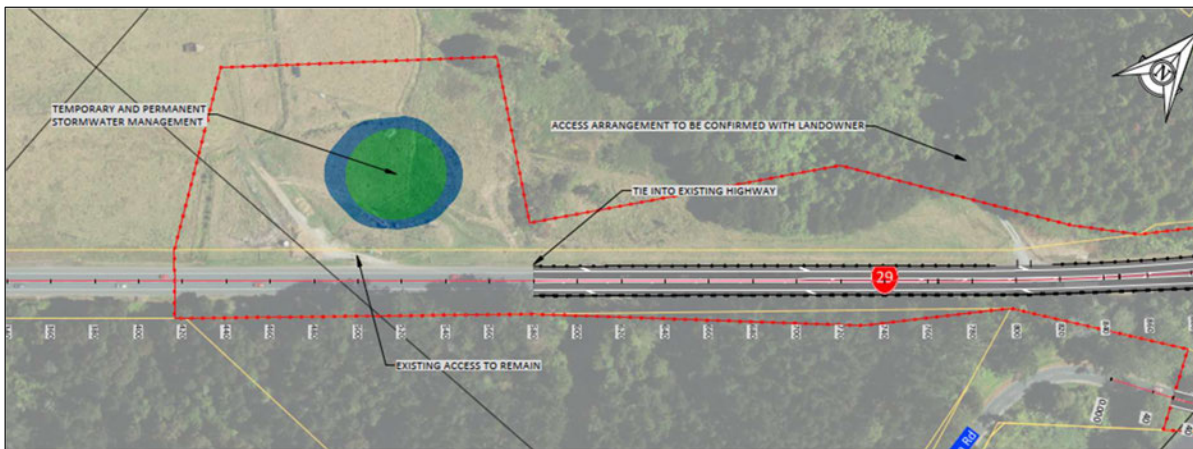


Figure 4.15 – SH29 offline / SH29 Road Tie-in

4.7.2 SH29 Offline – Takitimu Drive Tie-In

The tie-in from four lanes on Takitimu Drive to the TNL 1 interchange (under construction) at the northern project extent is shown in **Figure 4.16**. The two northbound lanes on Takitimu Drive diverge, with the left lane bypassing the roundabout to provide a continuous through-movement to the CBD and Port, while the right lane enters the roundabout enabling left-turns to TNL 1, and an alternative through movement to the CBD and Port.

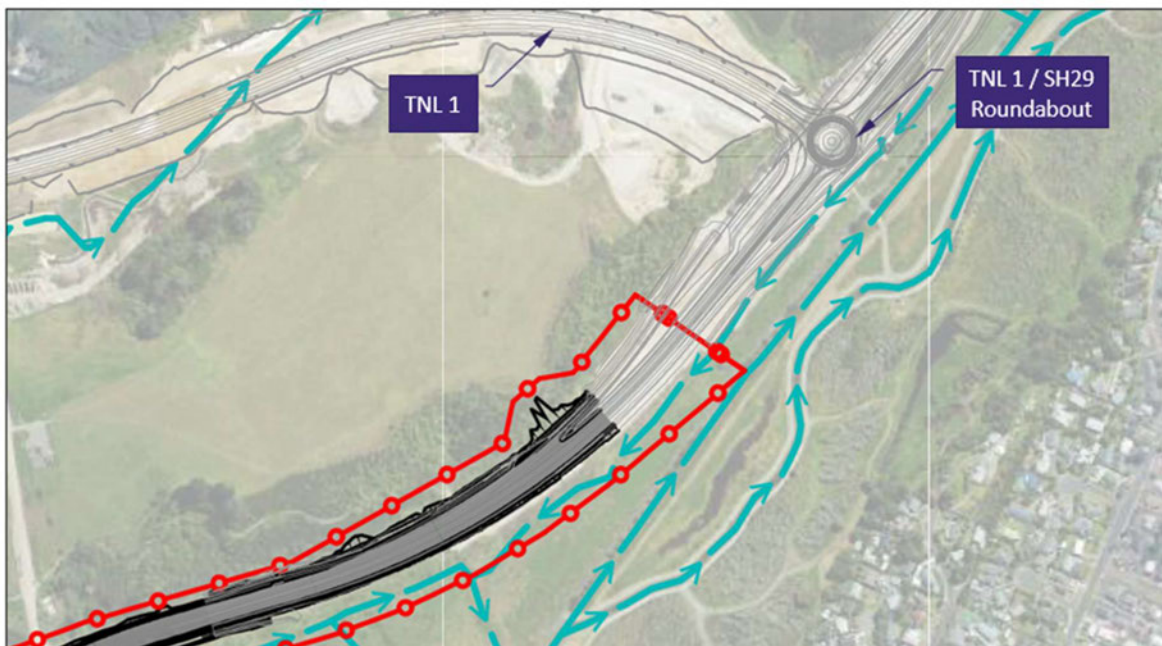


Figure 4.16 – SH29 offline - SH29/TNL 1 Tie-in

The modelling shows more HCVs will be heading to the Port than turning left onto TNL 1, which has the advantage that heavy vehicles in the left lane heading to the port do not need to change lanes. Vehicles that select the right lane can still go through to the Port of Tauranga and the CBD at the roundabout.

The Project provides approximately 1,500 m between the Takitimu Drive interchange and the diverge taper for the TNL 1 roundabout bypass lane. This distance is sufficient for the placement of guide signs and lane changing as needed.



Takitimu Drive north of the Takitimu Drive interchange is proposed to operate at 100 km/h, transitioning to 80 km/h at approximately 1 km downstream of the interchange. This provides a clear and progressive speed reduction well in advance of the diverge and TNL 1 roundabout.

4.7.3 Takitimu Drive Interchange – SH29/SH36 Roundabout Tie-In

The section of road between the existing SH29 / SH36 / SH29A roundabout and the Takitimu Drive southern interchange roundabout operates within a 60 km/h speed environment.

Although the close spacing of major intersections creates a high-complexity traffic environment, appropriate speed consistency, lane discipline, and queue management treatment align with Safe System principles and are therefore expected to maintain low crash severity while reducing the frequency of conflict.



Figure 4.17 – SH29 offline - SH29 / SH36 Roundabout Road Tie-in

4.7.4 SH29A Offline Eastern Tie-In

The tie-in between the SH29A offline and the existing SH29A east of Barkes Corner interchange is shown in **Figure 4.18**. The arrangement results in the following safety benefits:

- The tie-in is located approximately 1 km west of the Oropi Road roundabout to allow for progressive speed reduction for eastbound traffic.
- The SH29A westbound one-into-two lane diverge occurs after (west of) the exit ramp to maximise separation from the Oropi Road roundabout.
- The eastbound SH29A two-to-one lane merge also occurs west of the entry ramp, preventing overlapping merge and weave conflicts before the Oropi Road roundabout.



- A central median barrier is provided through to the end of the eastbound merge to reduce the risk of cross-median crashes in a high-speed transition area.
- The tie-in and ramp geometry are future proofed for the potential extension of SH29A four lanes east.

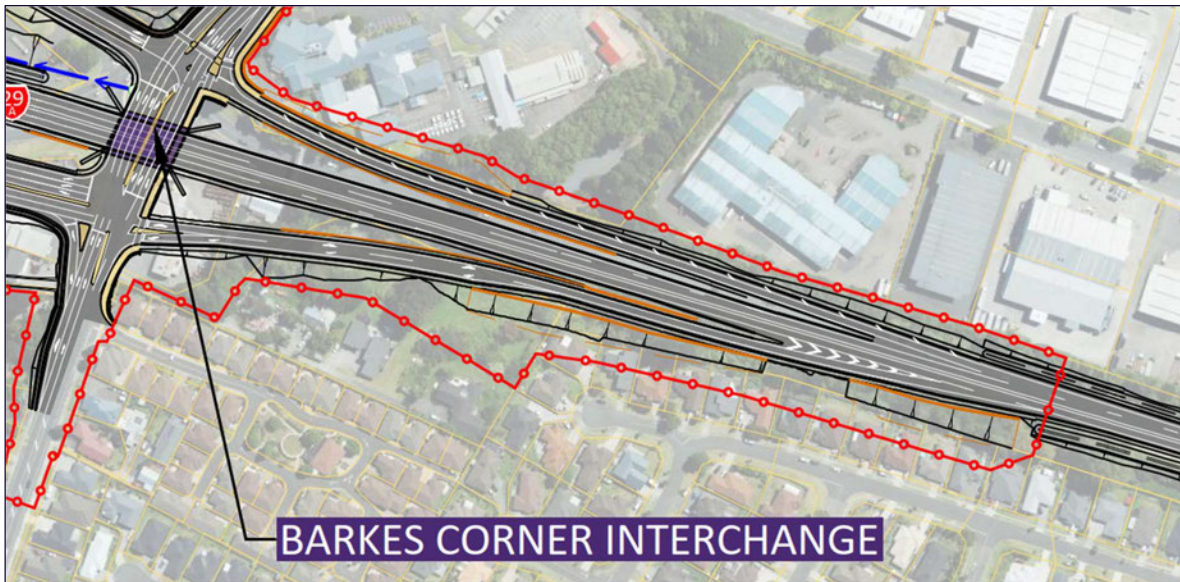


Figure 4.18 – SH29A offline - SH29A Eastern Tie-in

4.7.5 SH29A Offline – SH29A Eastern Tie-In with the Local Road Network

The tie-in between the SH29A offline and the existing local road network at the Barkes Corner interchange is shown in **Figure 4.19** and **Figure 4.20**. The arrangement results in the following safety benefits:

- Strategic SH29A through-traffic is separated from local access movements through the diversion of regional traffic to the offline corridor and the retention of the existing corridor for local access.
- Interaction between heavy vehicles and local road users is reduced, as a higher proportion of freight traffic is expected to be accommodated on the SH29A offline corridor.
- The existing multi-leg roundabout is replaced with coordinated signalised intersections, supported by grade-separated interchange arrangements and proposed speed limit reductions to 60 km/h and 50 km/h, reducing conflict points and supporting safer operating speeds²⁴.
- Driver expectancy is improved through clearer lane allocation, approach alignment and turning paths at Cameron Road, Pyes Pā Road, Marshall Avenue and Maleme Road.
- Pedestrian and cycle safety is improved through dedicated shared path provision across the Cameron Road overbridge, connections to local paths and more legible signalised crossing opportunities. The SSA indicates that the design option provides additional safety for pedestrians, cyclists, and motorcyclists with multiple lanes, wider shoulders and gentler road alignments.
- Access reliability and safety for adjacent side roads, properties and local destinations is improved through reduced through-traffic volumes and better gap availability.

²⁴ Tauriko DBC Safe System Assessment Report,



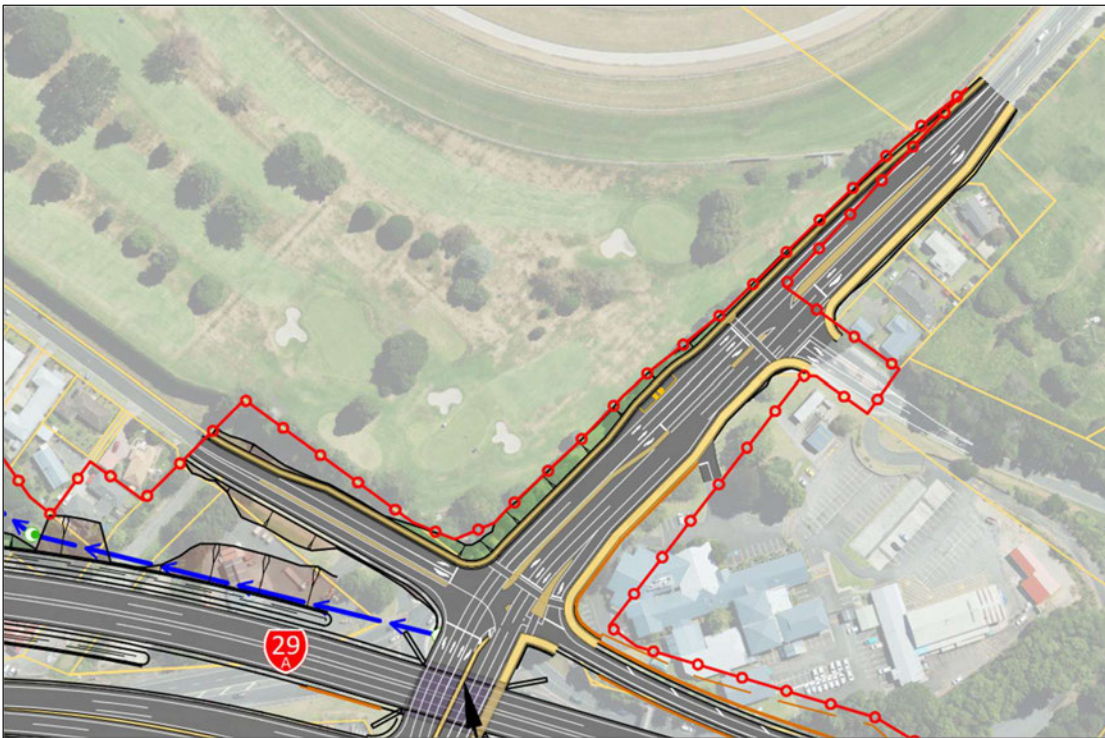


Figure 4.19 – SH29A offline / Marshall Avenue / Cameron Road Tie-in

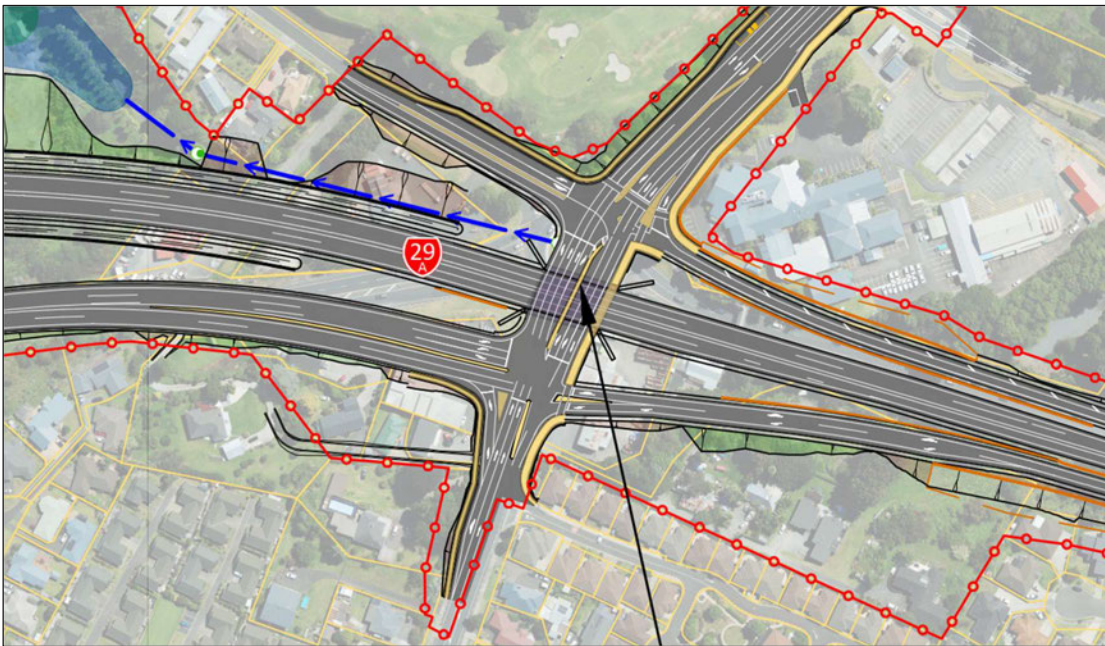


Figure 4.20 – SH29A offline - SH29A / Pyes Pā Road Tie-in

4.8 Summary of Operational Benefits

The transportation-related effects of the Project are expected to be predominantly positive for all road users and for the affected communities adjacent to the Project when it is complete. These positive effects are largely due to the significant volumes of traffic (including heavy freight movements) being redistributed from the existing SH29 and SH29A corridors that are currently shared with a high volume of local traffic



movements, to the new SH29 and SH29A offline corridors. The offline corridors provide a safer and more efficient highway for inter-regional transport and freight connections to and from the Port of Tauranga.

Overall, the Project will result in the following positive transportation effects:

Safety

- A significant reduction in the likelihood and severity of DSI through provision of a project-length, four-lane, central median-barriered highway, together with roadside barriers where required to mitigate loss-of-control crash outcomes.
- At-grade roundabouts are replaced with diamond-style grade-separated interchanges at SH29/Redwood Lane and SH29/Takitimu Drive, with a half-diamond interchange at the SH29A / Cameron Road / Pyes Pā Road, resulting in substantially safer intersection forms consistent with Safe System principles.
- Improvement in safety performance along the existing SH29 and SH29A corridors through reduced traffic volumes and lower operating speeds.
- Improved safety and accessibility for adjacent communities through the revocation of SH29 and SH29A as state highway corridors to function as local roads.
- Reduction in right-turn conflicts at the Ōmanawa Road intersection.

Efficiency, Reliability and Economic Productivity

- Additional high-volume lane capacity is provided on the new SH29 and SH29A offline corridors, directly improving freight efficiency, journey time reliability and inter-regional connectivity.
- SH29 offline and SH29A offline are expected to operate at good levels of service, with the existing SH29 and SH29A corridors generally improving compared with the DM scenario.
- Improved travel time reliability supports economic growth and productivity, including access to greenfield land required to accommodate future housing and industrial development within the Western Corridor.
- Significantly reduced traffic volumes on the existing SH29 corridor, resulting in improved safety, accessibility and local-road performance for surrounding communities.
- Travel time savings of approximately 7–11 minutes (63–73%) are expected between Ōmanawa bridge and TNL 1 for the 2048 scenario. Travel time savings of approximately 3–8 minutes (57–68%) are also expected between Ōmanawa bridge and Barkes Corner.
- The Project is expected to improve network performance by increasing capacity, improving route choice and reducing the rate of congestion growth. While network demand, VHT and delays are forecast to increase over time, the Project helps mitigate these increases and supports improved journey time reliability.
- Capacity released on the existing SH29 and SH29A corridors supports the transition of these routes to local road functions, enabling improved access, safety and land-use outcomes.

Access, Connectivity and Place

- Separates regional through-traffic from local movements, allowing the existing SH29 and SH29A corridors to function safely as local roads.
- Improves accessibility, safety and connectivity for communities adjacent to the existing corridor.
- Walking and cycling connectivity are supported through local road improvements and shared path provision, particularly at Barkes Corner.



- Maintains and enhances cross-corridor connectivity through grade-separated interchanges, supporting community connectivity and improved access to adjoining residential and industrial areas through local road tie-ins.

Resilience

- Network resilience is enhanced through provision of a safer and more efficient alternative route for freight and critical services.
- Retaining the existing SH29 and SH29A corridors as viable alternative routes during incidents, maintenance activities or emergency events.
- Climate-resilient infrastructure outcomes are supported, with provision for smart traffic management measures, including variable message signage, to manage incidents, reroute traffic and minimise network disruption.
- Reduced congestion and improved operating conditions support more effective emergency response during network incidents.

Overall Outcome

The Project delivers strong transport benefits by substantially improving safety, travel time reliability, freight efficiency and network resilience, while enabling long-term urban and economic growth in Tauriko West.

The combination of increased corridor capacity, separation of regional and local traffic, and replacement of high-risk at-grade intersections with grade-separated interchanges represents a fundamental and strategic improvement to the performance of the Western Bay of Plenty transport system.

The assessment of transportation effects in this report does not rely on the implementation of future tolling. Tolling, if implemented, would be considered separately by the Minister of Transport through a separate statutory process, involving public consultation, consideration of alternative routes and consideration of whether the tolling scheme is efficient and effective.

However, the modelling for the toll sensitivity test considered \$3.50 charges for light and \$7.00 for heavy vehicles. The volume of traffic diversion due to tolling may be very sensitive to the toll cost, so a range of toll charges could be expected to inform any future tolling decision.

A sensitivity test of the 2048 forecast scenario involving tolling of SH29 and SH29A offline sections, illustrates the following:

- Tolling could divert approximately 50% of traffic volume away from the SH29 offline corridor, back to alternative local-road routes.
- Tolling is forecast to increase traffic on the existing SH29 corridor by approximately 36%. HCV traffic is expected to be more sensitive to tolling, with an approximate 39% increase or diversion back to the existing SH29 corridor.
- Tolling is expected to have limited effect on SH29A offline volumes. This appears likely due to there being only one viable alternative route which involves travel through the Barkes Corner interchange intersections. This provides additional travel delays.

Overall, the sensitivity test indicates that tolling of SH29 offline has the potential to significantly influence route choice, particularly for local traffic but also for HCV movements on the SH29 corridor. While toll modelling predicts significantly reduced traffic volumes on SH29 offline, the effect of tolling the SH29A offline corridor is minor.



In general terms, tolling would reduce the key Project benefit of separating regional and freight traffic from local traffic movements, resulting in increased traffic volumes and congestion on the existing SH29 Corridor. However, the Project would continue to provide significant transport benefits.



5. Potential Construction Effects

The Project requires significant quantities of bulk earthworks materials to be transported to and from the site by heavy vehicles, additional heavy vehicle movements associated with the delivery of materials for the construction of structures, pavements, drainage and other works, and light traffic movements by construction staff. This traffic has the potential to cause the following effects on the surrounding road network:

- Travel time delays and congestion for vehicles.
- Increased risk of vehicle, pedestrian and cycle crashes.
- Environmental effects (noise, vibration, loss of amenity) on transport routes.
- Pavement damage on transport routes.

Temporary traffic diversions required to construct the interchanges also have the potential to cause delays on the network and will impact pedestrian and cycle routes.

The period over which these effects could be experienced is approximately ten years (including enabling works), or spread over a longer period if, as expected, construction is staged.

The following sections of this report provide more detail regarding the construction effects, along with management and mitigation measures.

5.1 Traffic Generation

5.1.1 Heavy Vehicle Movements Associated with Bulk Earthworks

The Project will involve bulk earthworks comprising approximately 2.2 million m³ of excavation and 3.1 million m³ of structural fill. While a proportion of excavated material will be suitable for reuse as structural fill, approximately 2.1 million m³ of imported fill is expected to be required. In addition, not all the surplus cut material can be disposed of within the boundaries of the designation, resulting in approximately 0.8 million m³ of waste material needing to be disposed of off-site.

The remainder of the bulk earthwork operations will generally be undertaken within the site using off-road earthmoving machinery and would not generally generate movements on the public road network.

Based on the above import and export quantities, and assuming 44 tonne gross vehicle mass (GVM) trucks with an approximate payload of 15 m³ per truck (approximately 18 m³ loose measure, or 28.5 tonnes), the bulk earthworks task would generate approximately 193,333 one-way truck and trailer movements. Allowing for return trips, and assuming no backloading, this equates to approximately 386,666 two-way truck and trailer movements on the surrounding road network over the earthworks period.

If the Project is constructed as a single contract, it is assumed that work at the various earthworks sites along SH29, SH29A and the interchanges will be undertaken in a sequence which spreads the import and export activities as evenly as possible over time, resulting in an earthworks duration of six construction seasons. If 100 working days per earthworks season is assumed, there would be 644 truck and trailer movements per day. Assuming a 10-hour day, approximately 64 truck and trailer movements per hour can be expected to access the site, or 1 truck and trailer movement per minute, on average. The peak number of hourly trips is likely to be much greater than the average value, as construction activities ebb and flow due to programming, resourcing, weather, and other factors.



These estimates represent average daily and hourly movements only. Actual peak-hour activity may vary and will depend on the Contractor's methodology, sequencing, resourcing, weather conditions, material availability and the final locations of borrow and disposal sites.

The location of off-site borrow and disposal sites is not known at present.

5.1.2 Heavy Vehicle Movements Associated with Aggregate Supply

Approximately 400,000 m³ of aggregates will be required for ground improvement, drainage and pavement construction, adding additional truck movements to the road network. Demand for aggregate will be spread evenly over the duration of construction, initially for pioneering work, haul roads, ground improvements and drainage, followed by pavement construction progressively as earthworks are completed in the various zones.

All imported aggregate material is likely to be transported to site using 44 tonne GVM trucks and 12 m³ payload (approximately 15 m³ loose measure, or 28.5 tonnes). This equates to approximately 33,333 truck and trailer movements (66,700 two-way truck and trailer movements) on the surrounding network over a duration of 6 to 8 years.

The above movements are likely to be spread over a greater number of working days per year than for truck and trailer movements associated with earthworks. Assuming six years and 200 days per year, approximately 56 daily truck and trailer movements per day would access the site during the pavement construction phase, averaging around 5–6 truck and trailer movements per hour over a 10-hour day (approximately 1 movement every 10 minutes).

There is a shortage of suitable aggregates for premium pavement construction in the Bay of Plenty. Pavement aggregates may need to be carted over SH29 from quarries in the Waikato.

5.1.3 Other Vehicle Movements

Additional heavy vehicle movements will be generated by delivery of water, materials, fuel, precast components for structures and the like, however these will be relatively few compared with movements addressed above. An allowance of 1 HCV per hour is assumed, resulting in 20 HCV two-way trips per day over a 10-hour day.

Light vehicle movements associated with trips to/from the site by the construction workforce would be in the order of 100 vehicle trips per hour during the morning and evening commuter peak periods.

5.1.4 Total Traffic Generation

Based on the preliminary estimates above, the Project could generate a total of 720 heavy vehicle movements per day during peak construction activity, comprising 700 truck and trailer movements per day associated with bulk earthworks haulage and aggregate deliveries, plus 20 other construction-related heavy vehicle movements. In addition, construction workforce travel could generate approximately 200 light vehicle trips per day, on average.

The actual daily movements and routes taken will depend on the contractor's methodology and supply contracts, and the locations of quarries and off-site borrow and disposal areas, which are not yet known.



5.2 Site Access

All roads adjoining the site have high traffic volumes, which, combined with the large number of construction traffic movements into and out of the site, have the potential for traffic delays and safety risks.

Site access points will be located to integrate with internal haul roads, staging areas for transfer of spoil to road trucks, routes to/from material supply and disposal sites and other aspects of the Contractor's construction methodology. Each access point will be specifically designed to minimise traffic delays and safety risks. Access locations have not been identified, as construction staging is not yet known.

Left-in, left-out only (LILO) access is preferred from a safety perspective and is feasible given that there are existing roundabouts at each end of both the SH29 and SH29A alignments. Traffic signals may also be considered but are likely to require widening of the road being entered to provide auxiliary lanes on the approaches to the signals to maintain capacity.

5.3 Temporary Traffic Diversions

The Redwood Lane, Takitimu and Barkes Corner interchanges straddle the existing state highways and require temporary diversions to be constructed to carry highway traffic through and around the work sites. Te Ara Hoia Drive, Cambridge Road, Cameron Road and Pyes Pā Road are also affected by construction and will require temporary diversions.

Construction staging and temporary works solutions can be identified for each location to ensure that they do not require highway or local road traffic to be diverted to other routes and to maintain lane capacity where practicable. However, temporary speed limits, narrowed lanes and worksite constraints are likely to result in localised travel time delays and congestion.

At Barkes Corner, the existing pedestrian bridge over SH29A just east of the Cameron Road roundabout will need to be removed early in the construction phase to facilitate temporary traffic diversions to construct the new interchange. This will sever the existing continuous pedestrian and cycling path between Pyes Pā Road and Cameron Road. It appears unlikely that a grade-separated crossing of SH29A for pedestrians can be retained through the construction phase due to the additional width required on SH29A to accommodate the rerouted traffic.

Instead, it is likely there will be several construction phases where temporary shared paths and at-grade signal crossings across the temporary traffic diversion lanes will be necessary to provide a safe and sufficiently practical pedestrian and cyclist connection between Pyes Pā Road and Cameron Road. These arrangements will remain in place until the new bridge and shared path are completed, at which point connectivity will be transferred to the permanent grade-separated facility, with signalised crossings provided across the associated entry and exit ramps.

Detailed staging and traffic management arrangements will be confirmed through the CTMP and supporting TMPs during detailed design. Construction staging will be required to maintain safe, continuous, and clearly legible pedestrian and cycle routes, with appropriate separation from construction activities and traffic where practicable. Signal control will be implemented where necessary to safely accommodate crossing movements while maintaining efficient traffic operations.

Alternative staging methodologies may be identified by the future construction contractor. However, any solution will be required to provide a safe and practical shared path facility that maintains the existing connectivity between Pyes Pā Road and Cameron Road.



5.4 Construction Traffic Effects

As outlined in Section 5.1.4, peak construction activity is expected to generate approximately 720 heavy vehicle movements per day. If evenly distributed across three access locations from SH29, SH29A and Takitimu Drive, this equates to approximately 240 heavy vehicle movements per day per access. **Table 7** summarises the estimated construction heavy vehicle demand and relative increase compared with the forecast HCV volumes on key corridors.

The Redwood Enabling Works – Northern Access and Cambridge Road Intersections Technical Assessment – Traffic, dated November 2022 (REWNACRTA), adopted a 3.2% per annum growth rate for the existing SH29 corridor west of Redwood Lane, including Tauriko Urban Growth Area traffic. This rate has been applied to the 2026 HCV volumes to estimate future HCV volumes on SH29, SH29A and Takitimu Drive.

Table 7

Estimated HCV Volumes and Construction Traffic Demand by Corridor					
Year	Traffic Component	Road Corridor			
		Existing SH29 East of Redwood Lane Roundabout	Existing SH29 West of Redwood Lane Roundabout	Takitimu Drive	Existing SH29A
2026	Current HCV (vpd)	2,477	2,700	2,041	2,222
2028	Future HCV volume (vpd)	2,638	2,876	2,173	2,366
	Construction HCV movements (vpd)	240	240	240	240
	Construction HCV as % of future HCV	9%	8%	11%	10%
2031	Future HCV volume (vpd)	2,900	3,161	2,389	2,600
	Construction HCV movements (vpd)	240	240	240	240
	Construction HCV as % of future HCV	8%	8%	10%	9%
2035	Future HCV volume (vpd)	3,289	3,585	2,709	2,950
	Construction HCV movements (vpd)	240	240	240	240
	Construction HCV as % of future HCV	7%	7%	9%	8%

Table 7 indicates that the estimated construction HCV movements would generally equate to approximately 7% to 11% of future HCV volumes on the assessed corridors. While this represents a relatively modest proportion of forecast corridor HCV volumes, the Project will still generate a substantial number of construction heavy vehicle movements in absolute terms. Accordingly, construction traffic has the potential to result in localised construction transport effects at site access points, temporary traffic management areas and locations where construction traffic interacts with general traffic, pedestrians and cyclists. Subject to appropriate construction traffic management, these effects are expected to be manageable and no more than minor in nature.



However, at a corridor level, effects on freight movements between Ōmanawa Road and the Port of Tauranga are expected to be limited. This is supported by the REWNACRTA, which indicates that the SH29 corridor is expected to experience improved operational performance, including reduced travel time variability and only minor increases in delay of less than one minute under future scenarios with Tauriko enabling works in place.

On this basis, the improved network is expected to be capable of accommodating the additional freight demand and construction traffic, subject to appropriate construction traffic management. Construction traffic effects will be managed through a CTMP, including measures to minimise disruption, maintain efficient traffic flow and support safe operation of the surrounding network.



6. Conclusion

6.1 Operational Effects

The Project is expected to deliver substantial positive transportation outcomes across the Western Bay of Plenty transport network by providing additional strategic capacity, improving travel time reliability, supporting freight efficiency, and enabling the existing SH29 and SH29A corridors to transition to a more appropriate local road function.

The Project is also expected to materially improve road safety by separating regional and freight traffic from local movements, providing median-divided offline corridors, reducing high-risk at-grade conflicts, and replacing key intersections with grade-separated interchange arrangements. These outcomes respond directly to the existing crash history and are consistent with Safe System principles.

The Project is expected to result in the following positive operational effects:

- Additional strategic lane capacity is provided on SH29 offline, SH29A offline and Takitimu Drive, improving inter-regional connectivity, freight efficiency, journey time reliability and access to the Port of Tauranga. These outcomes support economic growth and productivity by improving access to employment areas, freight routes and greenfield land for housing and employment growth in Tauriko West.
- Significant redistribution of traffic from the existing SH29 and SH29A corridors to the new SH29 offline and SH29A offline corridors, reducing the extent to which regional and freight traffic shares corridors with local movements, improving safety, accessibility and local-road function for communities and land uses adjacent to the existing corridors.
- The new offline corridors are expected to operate at good levels of service, with SH29 offline generally operating at LOS A to LOS B in 2048 and SH29A offline operating at LOS A to LOS B in both the 2048 and 2063 scenarios. The existing SH29 and SH29A corridors are also expected to operate more appropriately for their future local-road function compared with the Do Minimum scenario.
- Improved travel time reliability and network efficiency through additional highway capacity, improved vehicle throughput and reduced congestion. The 2048 modelling indicates travel time savings of approximately 7–11 minutes (63–73%) are anticipated between Ōmanawa bridge and TNL 1, and approximately 3–8 minutes (57–68%) between Ōmanawa bridge and Barkes Corner.
- Significantly reduced likelihood and severity of DSI crashes through provision of four-lane median-divided offline corridors, central median and roadside barrier treatment, safer tie-ins and grade-separated interchange arrangements at Redwood Lane, Takitimu Drive and Barkes Corner. These outcomes respond directly to the existing crash history and are consistent with Safe System principles.
- Improved access and connectivity by reducing traffic and HCV exposure on the existing SH29 and SH29A corridors, improving local accessibility and amenity for adjacent communities and land uses, and supporting walking and cycling connectivity through local road improvements and shared path provision, particularly through Barkes Corner.
- Enhanced network resilience through the provision of additional strategic corridor capacity and the retention of the existing SH29 and SH29A corridors as alternative routes during incidents, maintenance activities and emergency events. This supports more reliable freight and critical-service movement and provides flexibility for future maintenance or renewal works.
- Improved walking and cycling connectivity through local road improvements and shared path provision, particularly through the Barkes Corner interchange area and affected local road connections.



6.2 Construction Effects

Construction of the Project will generate adverse transportation effects associated with bulk earthworks haulage, aggregate supply, workforce travel, site access arrangements and temporary traffic diversions. These effects will occur over an extended construction period and will vary by stage, location and construction methodology.

Preliminary estimates indicate that peak construction activity could generate approximately 720 heavy vehicle movements per day, with approximately 200 light vehicle trips per day associated with the construction workforce. Earthworks import and export will comprise the dominant component, with approximately 386,666 two-way truck movements forecast over the earthworks period.

While these volumes are substantial, they are expected to be manageable through integrated planning of construction access, haulage routes, temporary diversions and traffic management measures. Temporary speed limits, changed road layouts and construction activities may result in localised delays and disruptions; however, these effects can be managed through a project-specific CTMP, supported by site-specific TMPs.

At Barkes Corner, temporary at-grade pedestrian and cycle crossing facilities will be required for approximately 3–4 years following removal of the existing pedestrian overbridge.

Overall, construction transport effects are expected to be temporary and stage dependent. Subject to the implementation of appropriate construction traffic management, staging and supporting conditions, these effects are expected to be no more than minor in nature.

Accordingly, the following traffic management measures are proposed.

- A project-specific CTMP addressing construction traffic volumes, haul routes, workforce travel, site access, staging, internal haul roads, temporary diversions, pedestrian and cycle facilities, emergency access and public transport where relevant. The CTMP will include the following as a minimum:
 - Identification of all proposed site access points, their expected duration of use, daily and peak-period traffic volumes.
 - Preparation and implementation of site-specific TMPs for all works affecting the public road network, including temporary speed limits, changed road layouts, access arrangements and temporary diversions. TMPs will be prepared in accordance with the NZGTTM and approved by the relevant RCA prior to works commencing.
 - Design of site accesses to safely accommodate forecast construction and public road traffic volumes, with LIFO configurations preferred where practicable. Where right-turn access is required, appropriate traffic control or other physical works should be considered to maintain safety and network capacity.
 - Capacity and performance assessments for site accesses and temporary traffic arrangements, including predicted delays and queues for key turning movements during peak construction activity.
 - Maximising the use of internal haul roads where practicable, maintaining existing highway and local road capacity through temporary diversions as far as practicable, and avoiding the diversion of state highway traffic onto local roads except for short durations or during off-peak periods.
 - Provision of temporary traffic management to enable safe and efficient movement of general traffic, emergency services, pedestrians and cyclists during all affected construction stages, with particular attention to safe temporary at-grade pedestrian and cycle crossing arrangements at Barkes Corner.
 - Confirmation of requirements for reinstating temporary access points with the relevant RCA once they are no longer required for construction.



Appendix A – Tauriko RoNS Traffic Modelling, 28 July 2026





Tauriko RoNS

Traffic Modelling for Consenting Design

Prepared for Waka Kotahi NZ Transport Agency

Prepared by Beca Limited

28 July 2026



Contents

1 Introduction.....1

2 Traffic Modelling.....2

2.1 Model Time Periods..... 2

2.2 Scenarios 2

2.3 Land Use and Toll Assumptions 9

3 Results10

3.1 Traffic Volume 10

3.2 Level of Service..... 11

4 Conclusion15

Appendices

- Appendix A – Traffic Flow Plots
- Appendix B – Level of Service Plots
- Appendix C – Journey Time
- Appendix D – Cordon Matrix
- Appendix E – Level of Service Information

Revision History

Revision N°	Prepared By	Description	Date
1	Ali Danesh	Draft Report for Client Review	11 March 2026
2	Ali Danesh	Final Report	28 July 2026

Document Acceptance

Action	Name	Signed	Date
Prepared by	Ali Danesh	s9(2)(a)	28 July 2026
Reviewed by	Zoe Chen		28 July 2026
Approved by	Matt Hickson		28 July 2026
on behalf of	Beca Limited		

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1 Introduction

New Zealand Transport Agency - Waka Kotahi (NZTA) has commissioned Beca Limited (BECA) to undertake traffic modelling for the Tauriko Road of National Significance (RoNS) Consenting Design using the Tauranga Transport Strategic Model (TTSM) (2023 model version).

The Route Protection and Specimen Design phase of the project has led to some alterations to the previous Investment Case design. NZTA would like 2048 and 2063 model runs undertaken to show the network performance of the Consenting Design (with and without tolls).

2 Traffic Modelling

2.1 Model Time Periods

The TTSM model is an average hour model (considers the average hour volume within the peak period) for the following time periods:

- AM peak: 7am to 9am.
- Interpeak (IP): 9am to 4pm.
- PM peak: 4pm to 6pm.

2.2 Scenarios

2.2.1 Overview

Two forecast years have been modelled; 2048 and 2063.

The TTSM scenarios that have been modelled are:

- **Do Minimum:** Road and public transport networks as per the standard TTSM23 Forecast Do Minimum scenarios plus the following road network assumptions:
 - **2048:** Improvements in Tauriko area as per the Tauriko Enabling Work network plan
 - **2063** - SH29 offline project and Cameron Road Bus lane project (MMS Stage 2) have been removed from the TTSM23 Forecast Do Minimum scenario
- **Consenting Design:** Do Minimum network with the Tauriko RONS Consenting Design (with SH29 Offline, Takitimu Drive 4-laning and SH29A Improvement projects).
- **Consenting Design with Toll:** The Consenting Design scenario with tolling on SH29 Offline of \$3.50 for light vehicles and \$7.00 for heavy vehicles.

A more detailed breakdown of the network assumptions for the Do Minimum scenario and the Consenting Design scenario for each modelled year is described in the following sections.

2.2.2 Do Minimum scenario

The key assumptions for the Do Minimum scenarios are:

Tauriko network

- 80kph on the revoked SH29 from Omanawa Road to Redwood Lane
- 80kph on the revoked SH29 from Redwood Lane to Tauriko Village
- 60kph through Tauriko Village
- 100 kph on the revoked SH29 from 100m east of Cambridge Road to SH36
- 100 kph on SH29A between Takitimu Drive/SH36 and Barkes Corner Intersections ¹
- Kaweroa Drive – 50 kph and one lane each direction
- Includes the Taurikura Drive link from Gargan Road to Kaweroa Drive
- Upper Belk Road connection to Kaweroa Drive in 2063

¹ This road was modelled as 80 kph road. This section of SH29A is narrow and curvy and drivers cannot make 100 kph.

- Excludes the Omanawa Road intersection upgrade
- Excludes the Gargan Road connection between the Taurikura Drive and the revoked SH29 (see **Figure 2-1**)

Wider area network

- TTSM 2023 Do Minimum assumptions for the wider area in 2048
- TTSM 2023 Do Something assumptions for the wider area in 2063
- Takitimu North Link (4 lane expressway, 110 kph) Stage 1 & 2 and revocation speed assumptions on the revoked SH2
- Excludes Cameron Road Bus lane project (MMS Stage 2) in 2063

Public transport

- 2024 PT routes (May 2024 version) from the Tauranga Bay Hopper Website
- Tauranga Crossing PT Hub
- TTSM23 Future year DS PT routes in Tauriko
- No bus lane from Whiore Avenue/Taurikura Drive to Takitimu Drive intersection

Wider area Tolls

- No toll on Takitimu Drive
- TNL Stage 1 or Stage 2 toll at \$3.10 peak and \$2.10 off peak and the TNL through movements (both Stage 1 and Stage 2) toll at \$3.10 peak and \$4.10 off peak

Figure 2-1 and **Figure 2-2** provide a visual representation of the 2048 and 2063 Do Minimum scenarios respectively.

2048 Do Minimum

Without Tauriko RoNS (SH29 Offline, Takitimu Toll Road 4-laning and SH29A Improvement Projects)

Tauriko network

- 100 Existing SH29A from SH29/Takitimu Drive/SH36 to Barkes Corner Intersection
- 100 Existing SH29 from Cambridge Road to SH36
- 60 Existing SH29 through Tauriko Village
- 80 Existing SH29 Tauriko Village to Omanawa Road
- Kaweroa Dr connection to SH36

Tauriko network exclusions

- No SH29 Offline project
- No SH29A Improvement project
- No Gargan Rd connection to SH29

Wider area network

- TISM 2023 Do Minimum assumptions for the wider area
- Revocation speed assumptions on existing SH2
- TNL Stage 1 & 2 (4 lane Expressway, 110kph)

Public Transport

- 2024 PT routes
- Tauranga Crossing PT Hub
- TTSM23 Future year DS PT routes in Tauriko
- No bus lane from Whiore Avenue/Taurikura Drive to Takitimu Drive intersection

Tolls

- No toll on Takitimu Drive
- Toll at \$2.10 for Off-peak and \$3.10 for Peak on Takitimu North Link

Belk Road underpass is not modelled in TTSM

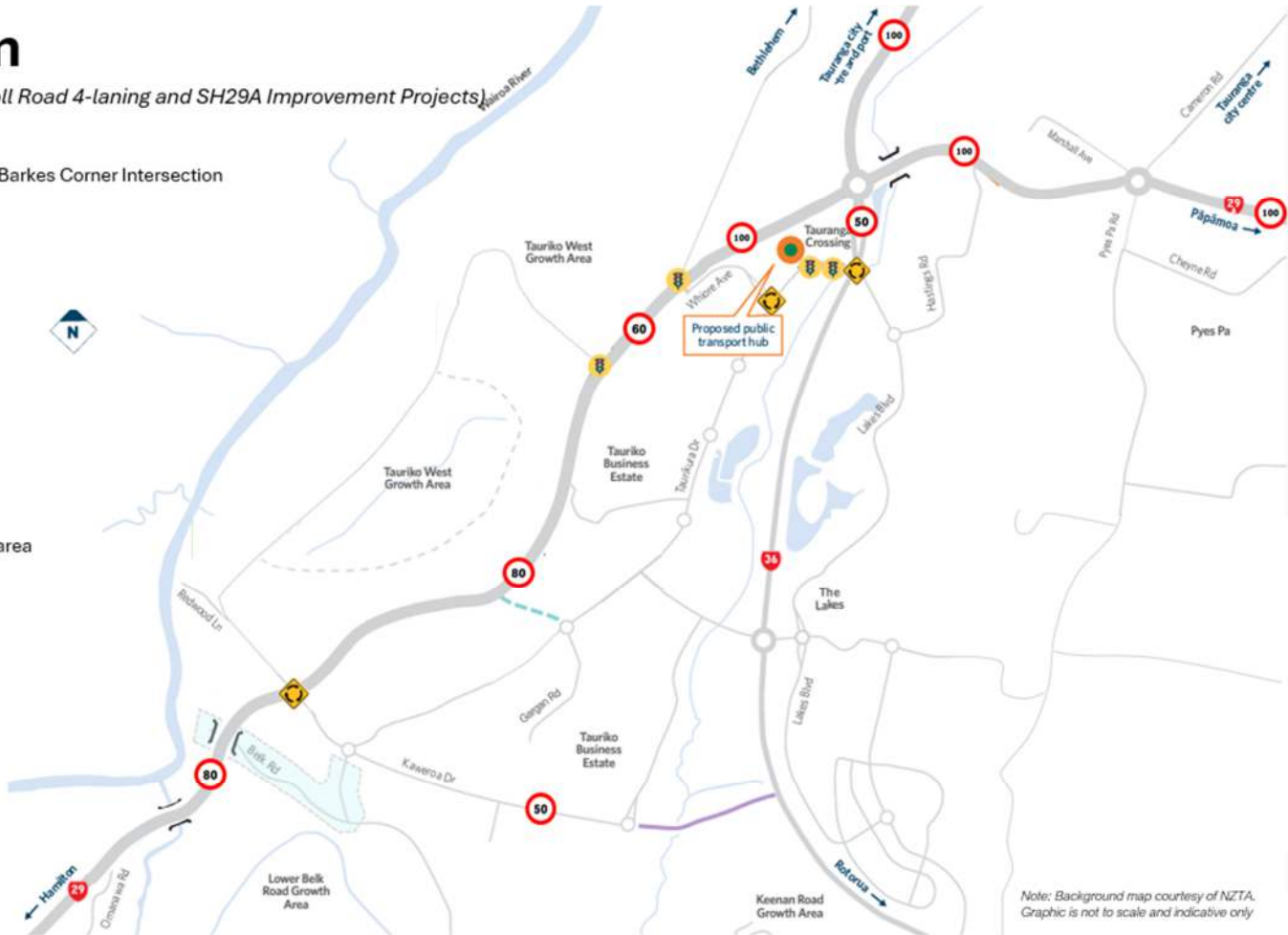


Figure 2-1: 2048 Do Minimum Scenario

2063 Do Minimum

Without Tauriko RoNS (SH29 Offline, Takitimu Toll Road 4-laning and SH29A Improvement Projects)

Tauriko network

-  Existing SH29A from SH29/Takitimu Drive/SH36 to Barkes Corner Intersection
-  Existing SH29 from Cambridge Road to SH36
-  Existing SH29 through Tauriko Village
-  Existing SH29 Tauriko Village to Omanawa Road
-  Kaweroa Dr connection to SH36
-  Upper Belk Road connection to Kaweroa Drive

Tauriko network exclusions

- No SH29 Offline project
- No SH29A Improvement project
-  No Gargan Rd connection to SH29

Wider area network

- TISM 2023 Do Something assumptions for wider area
- Revocation speed assumptions on existing SH2
- TNL Stage 1 & 2 (4 lane Expressway, 110kph)

Wider area network exclusions

- Cameron Road Bus lane (MMS2)

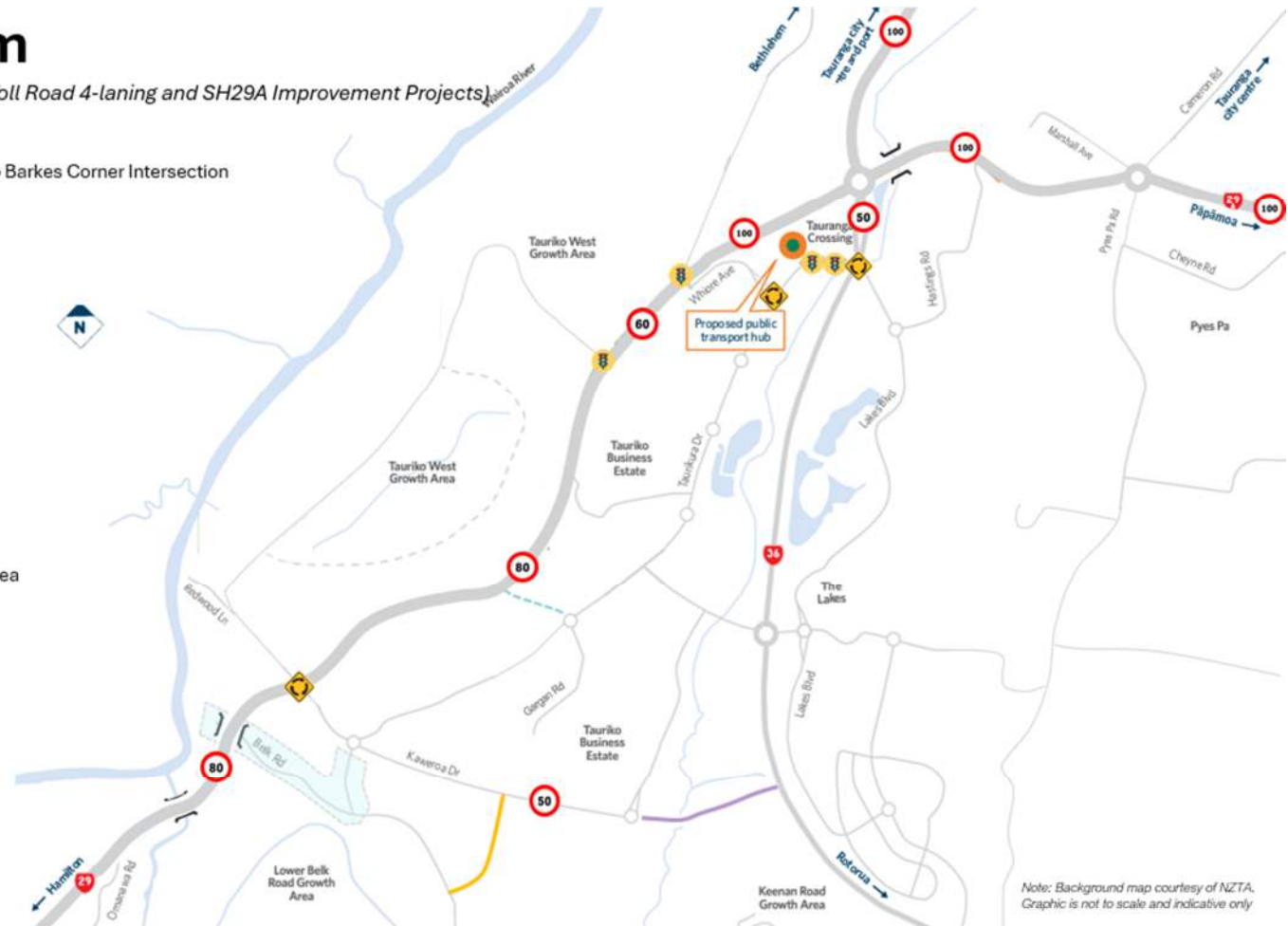
Public Transport

- 2024 PT routes
- Tauranga Crossing PT Hub
- TISM23 Future year DS PT routes in Tauriko
- No Bus lane From Whiore Avenue/Taurikura Drive to Takitimu Drive intersection

Tolls

- No toll on Takitimu Drive
- Toll at \$2.10 for Off-peak and \$3.10 for Peak on Takitimu North Link

 Belk Road underpass is not modelled in TISM



Note: Background map courtesy of NZTA. Graphic is not to scale and indicative only.

Figure 2-2: 2063 Do Minimum Scenario

2.2.3 Consenting Design scenario

The agreed assumptions for the Consenting Design Scenarios are:

Tauriko network

- SH29 project, 4 lane Offline, 110 kph
- Takitimu Drive 4 laning, 110kph to the TNL interchange, 80kph at the TNL interchange
- SH29A new 4 lane highway from Takitimu Drive to Barkes Corner, 100kph
- 100kph on SH29 from Omanawa Road to Redwood Lane
- 60 kph on the revoked SH29 from Kaweroa Drive to Cambridge Road
- 60 kph on the revoked SH29 from Cambridge Road to SH36
- 60 kph on the revoked SH29A between Takitimu Drive/SH36 and Barkes Corner Intersections
- Kaweroa Drive – 50 kph and one lane in each direction
- Includes the Taurikura Drive link from Gargan Road to Kaweroa Drive
- Upper Belk Road connection to Kaweroa Drive in 2063
- Excludes the Omanawa Road intersection upgrade
- Includes the Gargan Road connection between the Taurikura Drive and the revoked SH29

Wider area network

- TTSM 2023 Do Minimum assumptions for the wider area in 2048
- TTSM 2023 Do Something assumptions for the wider area in 2063
- Takitimu North Link (4 lane expressway, 110 kph) Stage 1 & 2 and revocation speed assumptions on the revoked SH2
- Excludes Cameron Road Bus lane project (MMS Stage 2) in 2063

Public transport

- 2024 PT routes (May 2024 version) from the Tauranga Bay Hopper Website
- Tauranga Crossing PT Hub
- TTSM23 Future year DS PT routes in Tauriko
- No bus lane from Whiore Avenue/Taurikura Drive to Takitimu Drive intersection

Wider area Tolls

- No toll on Takitimu Drive
- TNL Stage 1 or Stage 2 toll at \$3.10 peak and \$2.10 off peak and the TNL through movements (both Stage 1 and Stage 2) toll at \$3.10 peak and \$4.10 off peak

Figure 2-3 and **Figure 2-4** provide a visual representations of the 2048 and 2063 Consenting Design scenarios respectively.

With SH29 Offline, Takitimu Toll Road 4-laning, New SH29A Highway

- SH29 Offline project 4 general traffic lanes, 110kph
- SH29A new 4 lane highway, 100kph

- TISM 2023 Do Minimum assumptions for wider area
- Revocation speed assumptions on existing SH2
- TNL Stage1 & 2 (4 lane Expressway,110kph)

- 2024 PT routes
- Tauranga Crossing PT Hub
- TTSM23 Future year DS PT routes in Tauriko
- No Bus lane from Whiore Avenue/Taurikura Dr to Takitimu Dr

- No toll on Takitimu Drive
- Toll at \$2.10 for Off-peak and \$3.10 for Peak on TNL



With SH29 Offline, Takitimu Toll Road 4-laning, New SH29A Highway

- SH29 Offline project 4 general traffic lanes, 110kph

- No toll on Takitimu Drive
- Toll at \$2.10 for Off-peak and \$3.10 for Peak on Takitimu North Link



2.3 Land Use and Toll Assumptions

Land use and tolling assumptions are the same as documented in previous modelling report for the Tauriko RoNS Investment Case. Refer to 'Tauriko SH29 Offline and SH29A Improvement Project, Gate 2 Toll Modelling and Transport Economics report' report dated 19 February 2025 for details.

3 Results

Modelling outputs – including traffic volume plots, Level of Service (LOS) plots, Journey time, O-D cordon volume matrices, and journey time – have been provided separately to NZTA and are provided in **Appendix A** to **Appendix D**. This section presents the key findings. Specifically, it highlights changes in traffic volumes at key locations and summarises LOS performance within the project area.

3.1 Traffic Volume

Table 3-1 provides the Annual Average Daily Traffic (AADT) for both directions and percentage change compared to Do Minimum scenario for key locations in the study area. The location of these corridors is shown in **Figure 3-1**.



Figure 3-1: AADT count locations area

Table 3-1: AADT on key locations (vpd)

	Do Minimum	Consenting Design	Consenting Design with Toll
New SH29 Offline			
2048	N/A	31,800	15,800
% change vs DM		N/A	N/A
2063	N/A	44,000	27,400
% change vs DM		N/A	N/A
Revoked SH29 – Tauriko Village			
2048	31,500	13,700	21,300
% change vs DM		-56%	-32%
2063	35,600	16,600	22,700
% change vs DM		-53%	-36%
New SH29A			
2048	N/A	27,200	26,200
% change vs DM		N/A	N/A

	Do Minimum	Consenting Design	Consenting Design with Toll
2063	N/A	30,900	29,500
% change vs DM		N/A	N/A
Revoked SH29A			
2048	29,800	18,800	18,400
% change vs DM		-37%	-38%
2063	28,500	21,900	21,400
% change vs DM		-23%	-25%
Takitimu Drive			
2048	28,700	49,100	45,700
% change vs DM		+71%	+59%
2063	29,500	59,900	55,400
% change vs DM		+103%	+88%

The new SH29 Offline attracts around 31,800vpd in 2048 and around 44,000vpd under Consenting Design in both 2048 and 2063 respectively. This new infrastructure shift traffic away from the revoked SH29, which is expected to carry around 13,700vpd and 16,600vpd in 2048 and 2063 respectively. The introduction of the toll shifts more traffic from SH29 Offline to the revoked SH29 as drivers seek alternative routes. AADT on SH29 offline reduces by around 50% with the introduction of the toll.

The total screenline volume across SH29 offline and the revoked SH29 is slightly lower in the toll scenario as local traffic use alternative routes such as SH36 or other local roads to avoid the toll.

The new SH29A attracts around 27,200vpd in 2048 and around 30,900vpd in 2063 under Consenting Design. The revoked SH29A, whilst carrying less traffic than the Do Minimum scenario, continues to provide access to Cameron Road and the Tauriko area, and is expected to attract around 18,800vpd in 2048 and 21,900vpd in 2063. Traffic volumes on the new SH29A and the revoked SH29A are similar with and without the toll.

High quality plots showing the AADT, AM and PM peak hour volumes for the study area are provided in **Appendix A**.

3.2 Level of Service

The LOS plots for the study area for AM and PM peak have been produced for the Consenting Design and Consenting Design with Toll scenarios and are presented in figures below. **Figure 3-2** to **Figure 3-5** present the LOS plots for 2048 and **Figure 3-6** to **Figure 3-9** present the LOS plots for 2063.

High quality LOS plots covering the wider network are provided in **Appendix B**.

The size of each circle represents the magnitude of intersection delay, with larger circles indicating higher levels of delay. Refer to **Appendix E** for level of service criteria and colour banding.

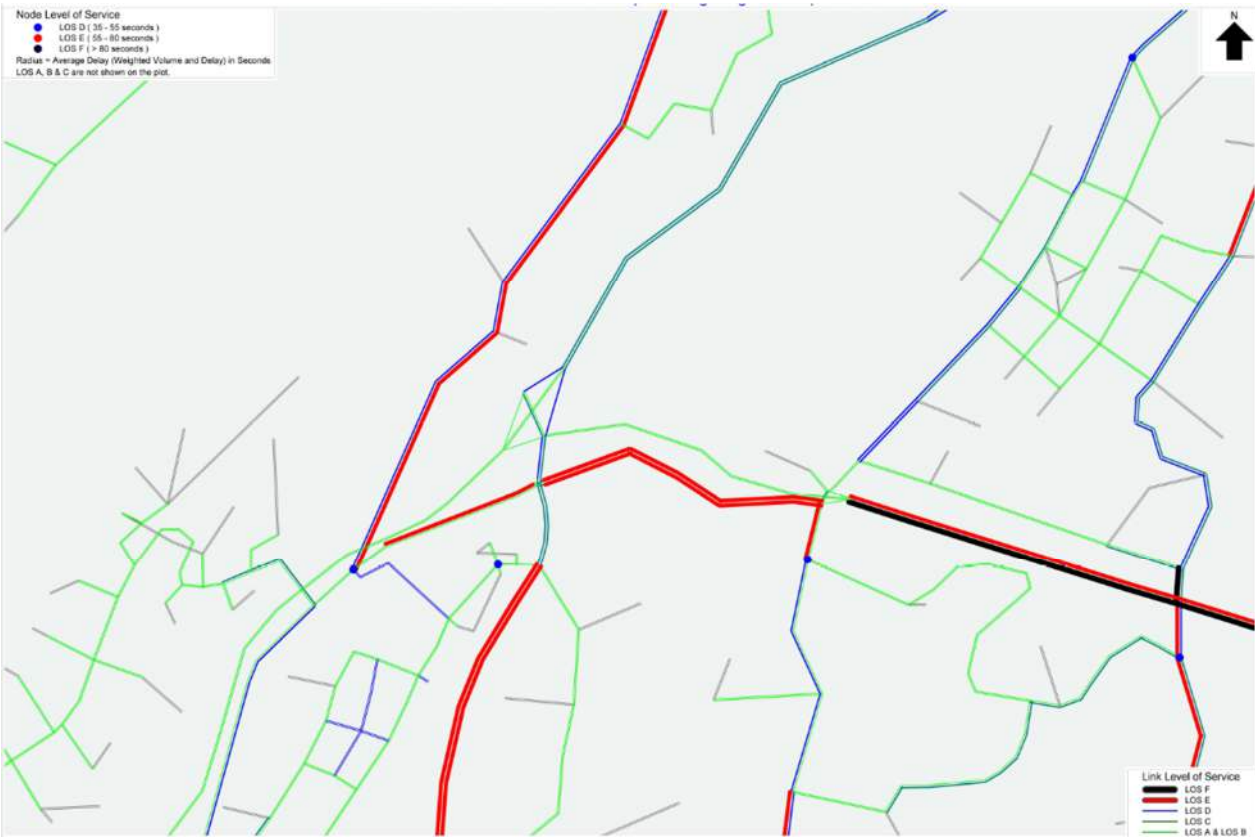


Figure 3-2: LOS for Year 2048 Consenting Design Scenario – AM peak



Figure 3-3: LOS for Year 2048 Consenting Design Scenario – PM peak

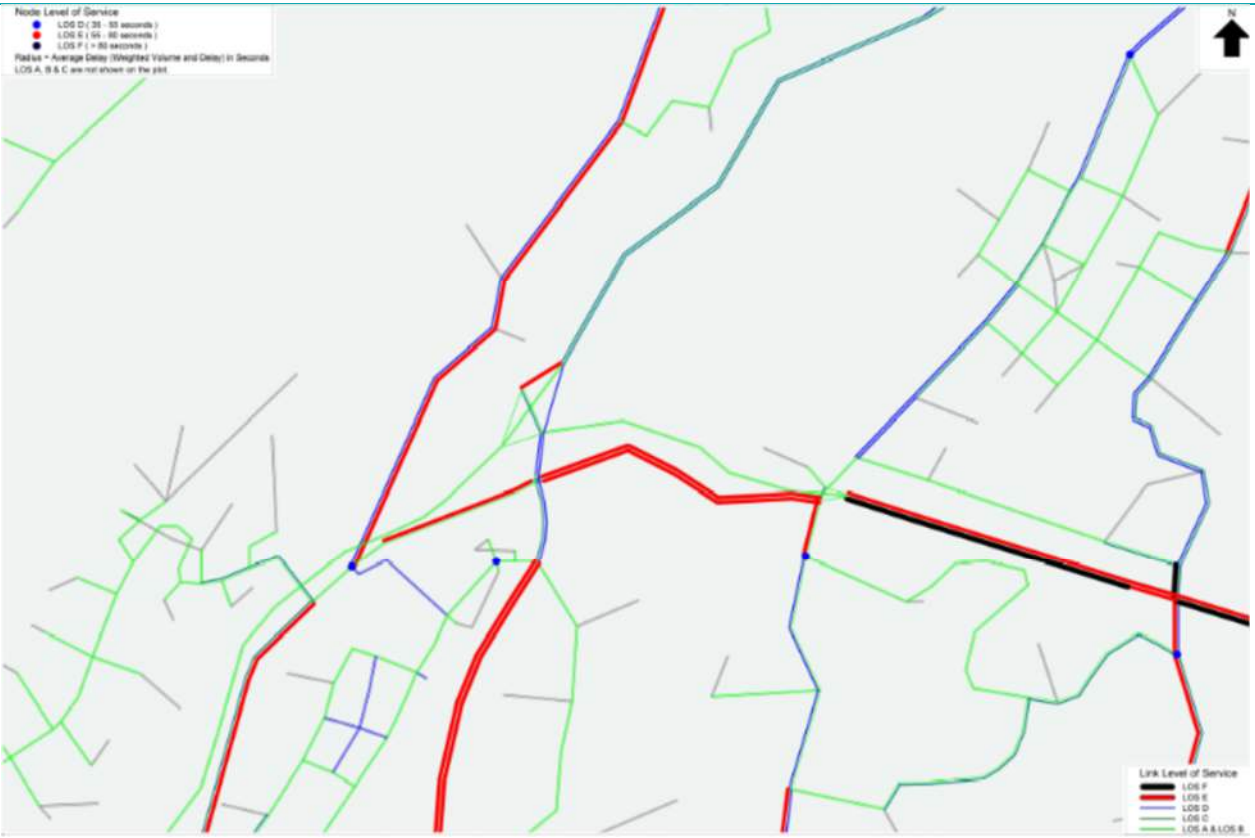


Figure 3-4: LOS for Year 2048 Consenting Design with Toll Scenario – AM peak

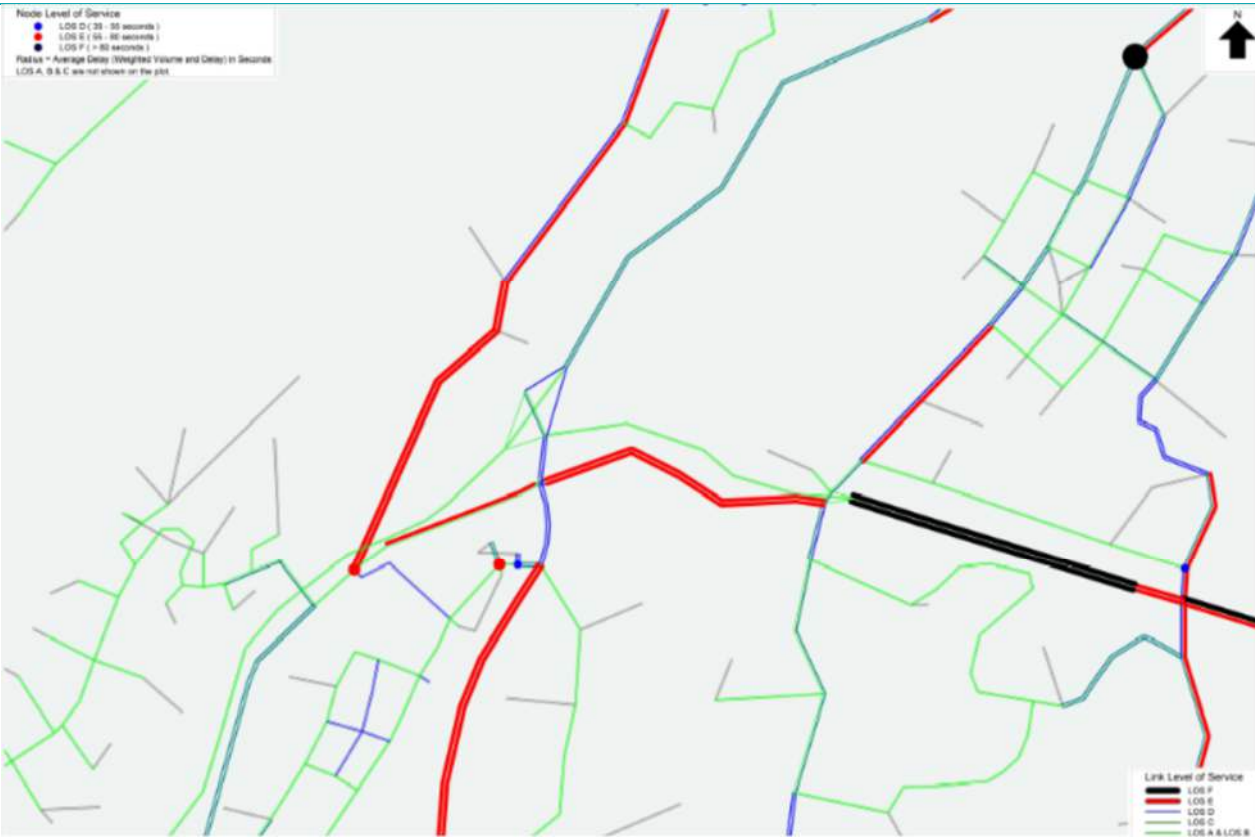


Figure 3-5: LOS for Year 2048 Consenting Design with Toll Scenario – PM peak

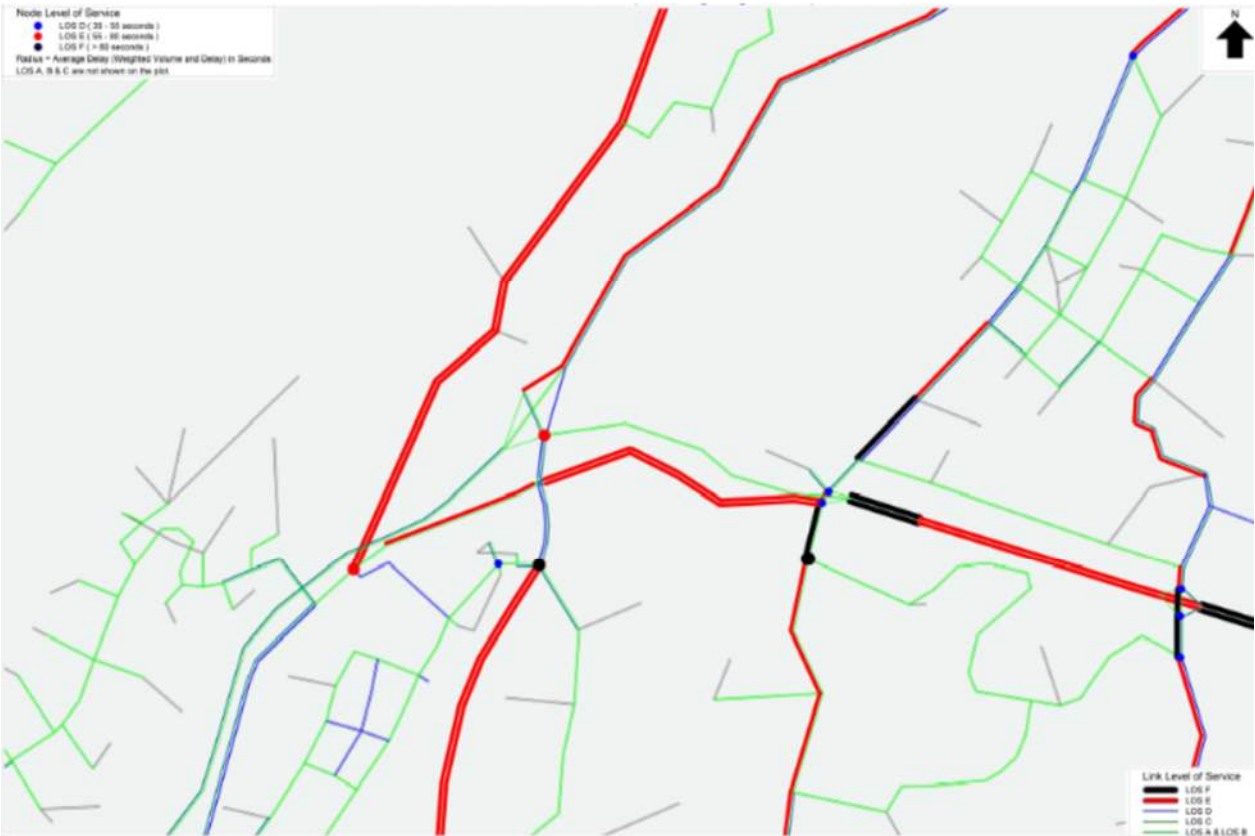


Figure 3-6: LOS for Year 2063 Consenting Design Scenario – AM peak

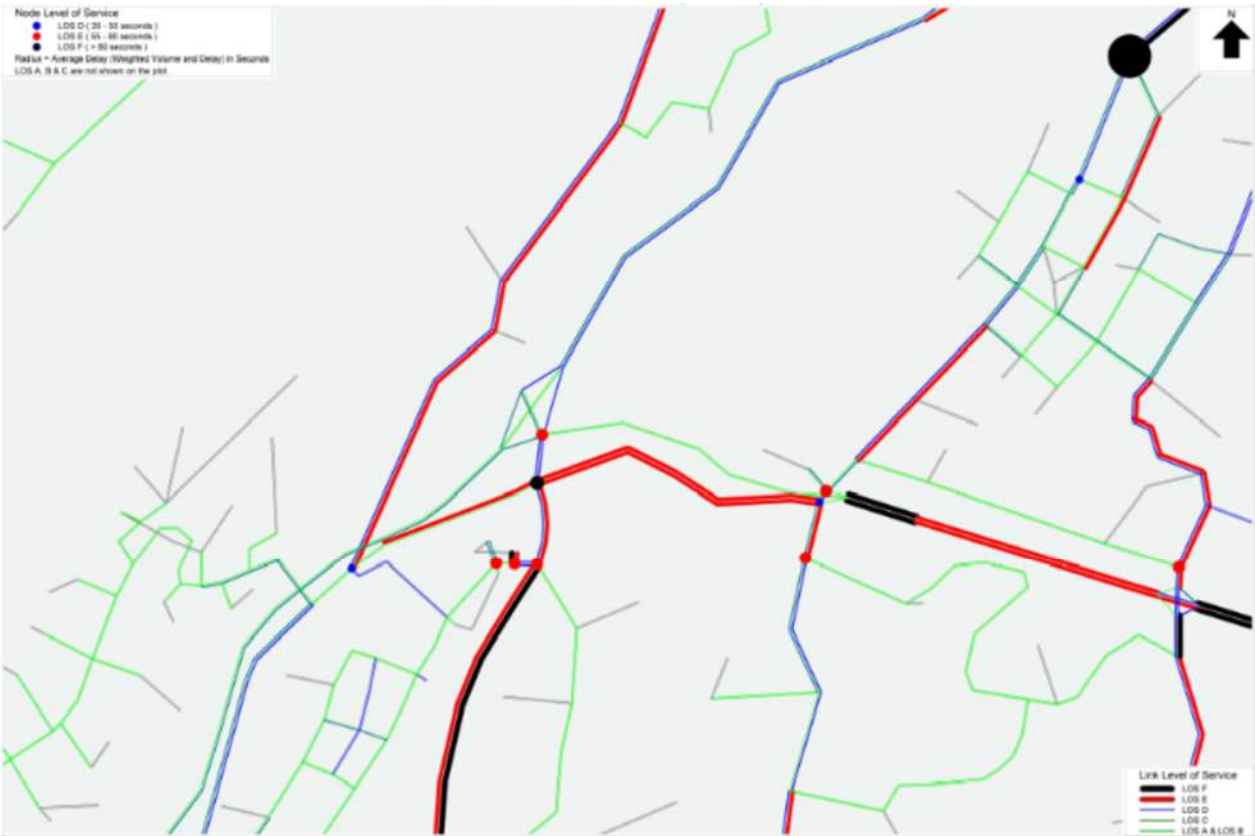


Figure 3-7: LOS for Year 2063 Consenting Design Scenario – PM peak

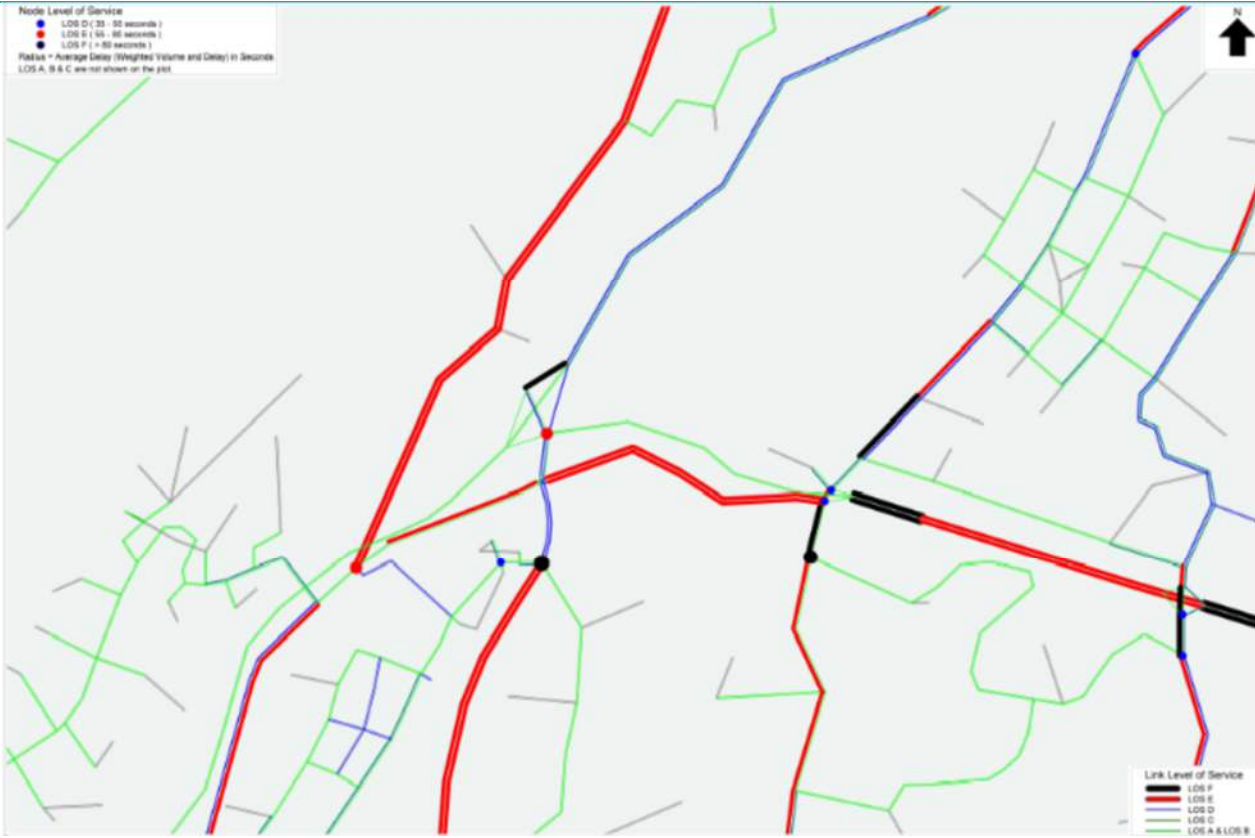


Figure 3-8: LOS for Year 2063 Consenting Design with Toll Scenario – AM peak

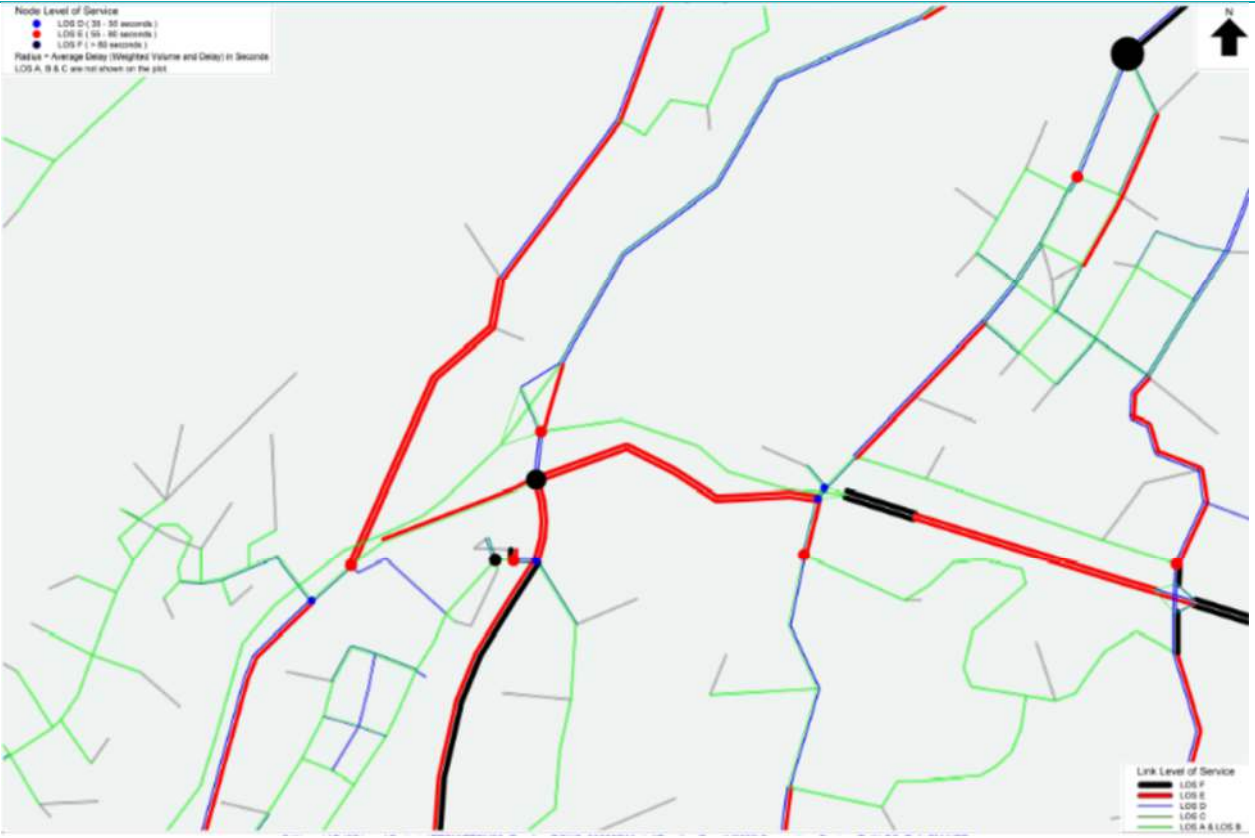


Figure 3-9: LOS for Year 2063 Consenting Design with Toll Scenario – PM peak

The following summarises the key findings from the LOS plots:

Year 2048

The key intersections, including the Takitimu Drive / SH29 / SH36 roundabout, the SH29 Offline / Takitimu Drive interchange, and Barkes Corner interchange signals operate at LOS D or better in both the with and without toll scenarios.

The new SH29A and SH29 offline perform well at LOS A or B. SH29A east of Barkes Corner is predicted to perform at LOS F as the Consenting Design scenario allows greater access to SH29A.

Some localised changes in performance are observed as a result of tolling, most noticeably in the AM peak. When the toll is applied, some traffic shifts to using the revoked SH29. The following impacts of the toll are observed in 2048:

- In the AM peak, the performance of the northbound on-ramp at the SH29 Offline / Takitimu Drive interchange reduces from LOS D to LOS E.
- The southbound movement on the revoked SH29 south of Tauriko Village also reduces from LOS D to LOS E in tolled scenario in both AM and PM peak.

Year 2063

In 2063, the SH29 Offline on-off ramps / Takitimu Drive / new SH29A roundabout operates at LOS E in all scenarios.

The Takitimu Drive / revoked SH29 / SH36 roundabout operates at LOS F during the PM peak under the Consenting Design scenario.

Similar trends are observed in 2063 with the introduction of the toll:

- In the AM peak, the performance of the northbound on-ramp at Takitimu Drive / SH29 Offline interchange reduces from LOS E to LOS F
- In the PM peak, the southbound off-ramp at the same interchange reduces from LOS D to LOS E.
- In the PM peak, the southbound direction of the revoked SH29 after the Tauriko Village reduces from LOS D to LOS E.
- In the PM peak, the Takitimu Drive / revoked SH29 / SH36 roundabout increases in delay in the toll scenario as more traffic use revoked SH29.

4 Conclusion

Transport modelling was undertaken using TTSM23 version to assess the performance of the network for the Tauriko RoNS Consenting Design for the 2048 and 2063 forecast years. The modelling included a Consenting Design scenario featuring the new SH29 Offline and new SH29A corridors, and a tolled version of the Consenting Design where toll was applied to SH29 Offline.

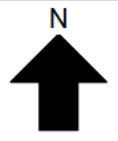
Results indicate that the new SH29 Offline and new SH29A attract significant traffic away from the existing SH29 and SH29A routes. The introduction of the toll then reduced the traffic volume on SH29 offline by around 50% compared to the no toll scenario.

In both forecast years, the new SH29 Offline and SH29A corridors operate particularly well (LOS A or B). However, some constraints are expected in the study area by 2063. The Takitimu Drive / SH29 Offline on-off ramps / SH29A roundabout show LOS E in 2063 in both peak periods, and the Takitimu Drive / revoked SH29 / SH36 operate at LOS F in 2063 during the PM peak.



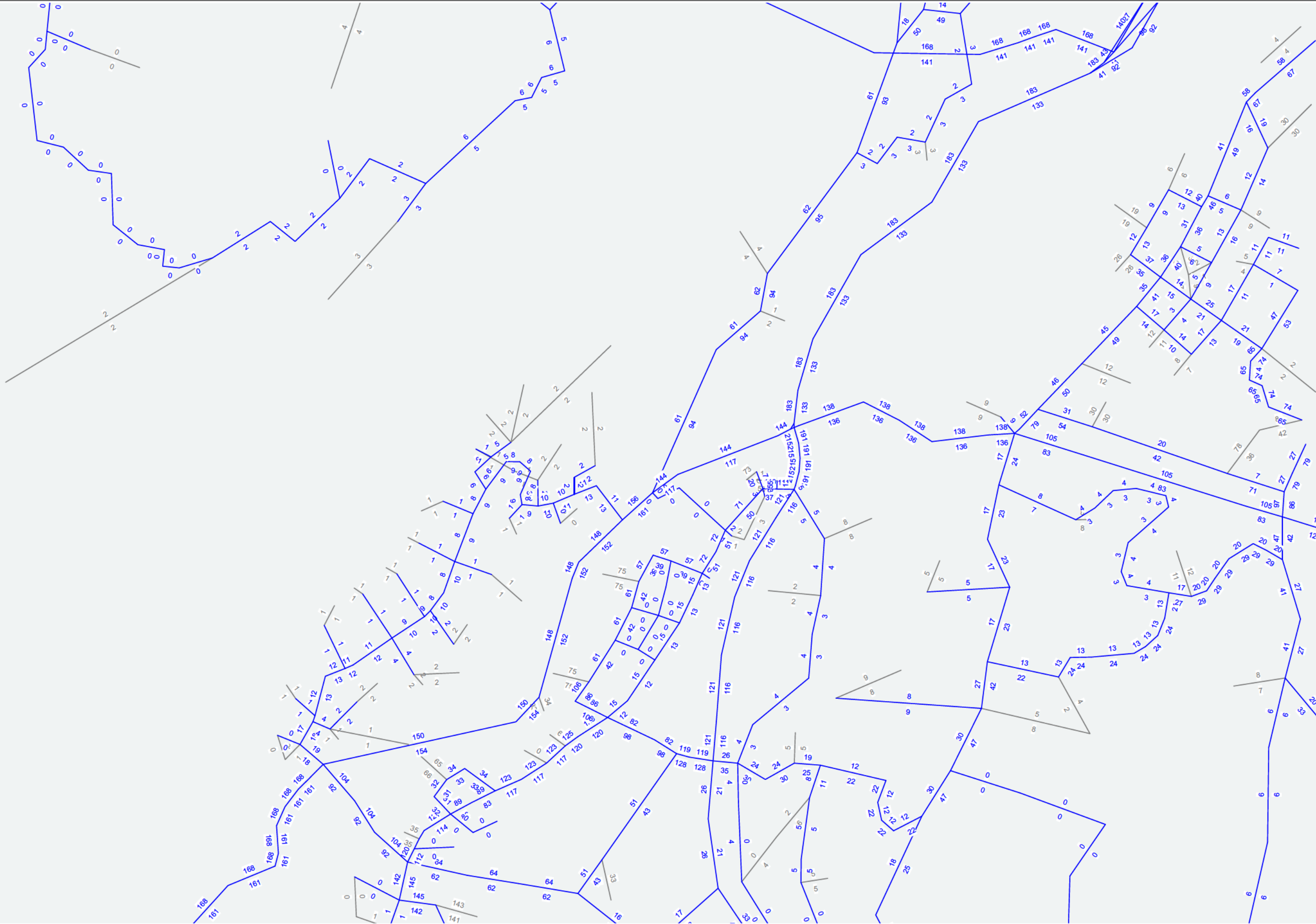
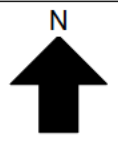
Appendix A –Traffic Flow Plots

Average One Hour AM Peak (7am-9am) Light Vehicles for Do Minimum scenario, Year 2048



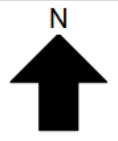
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Average One Hour AM Peak (7am-9am) Heavy Vehicles for Do Minimum scenario, Year 2048



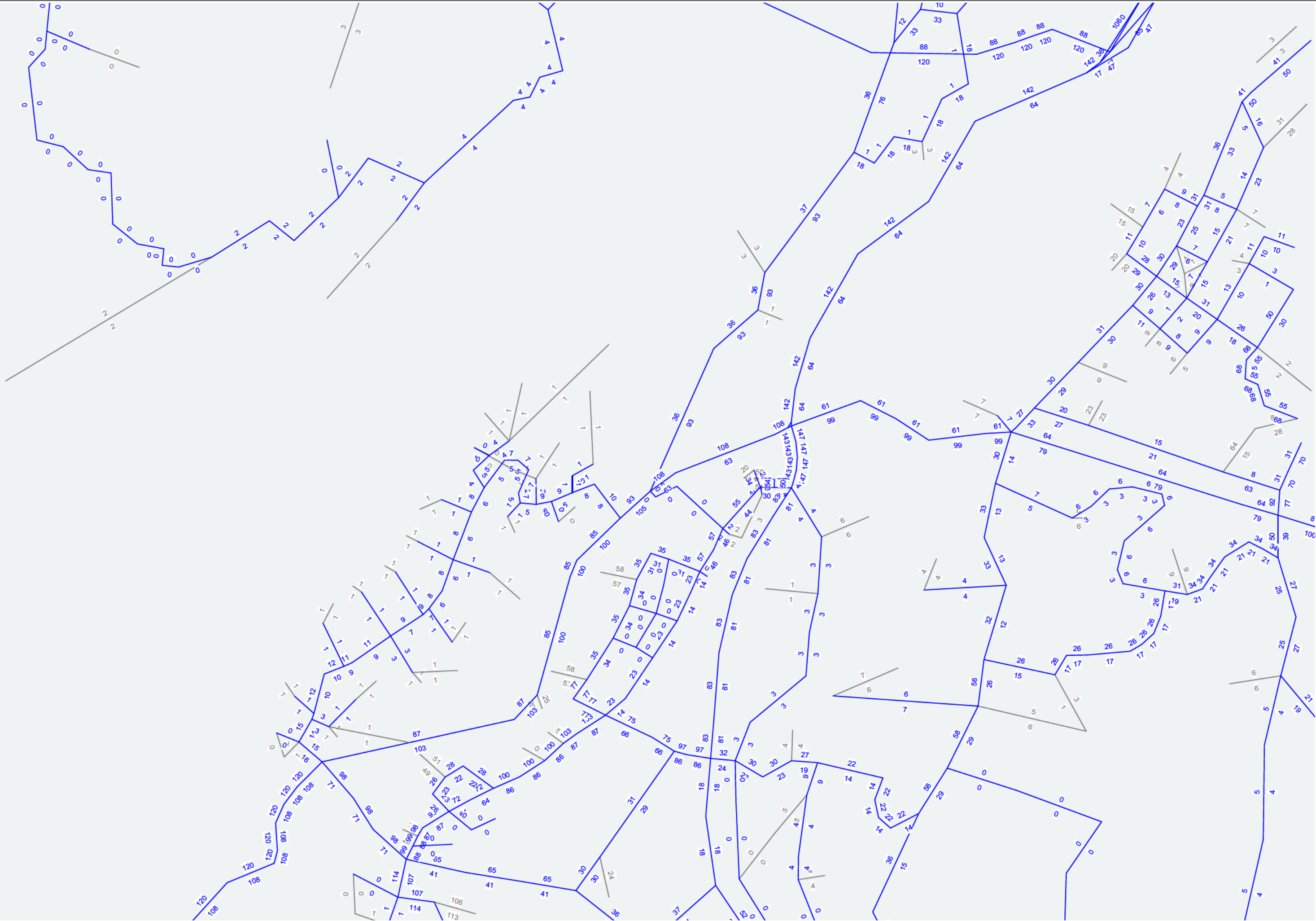
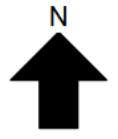
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Average One Hour PM Peak (4pm-6pm) Light Vehicles for Do Minimum scenario, Year 2048



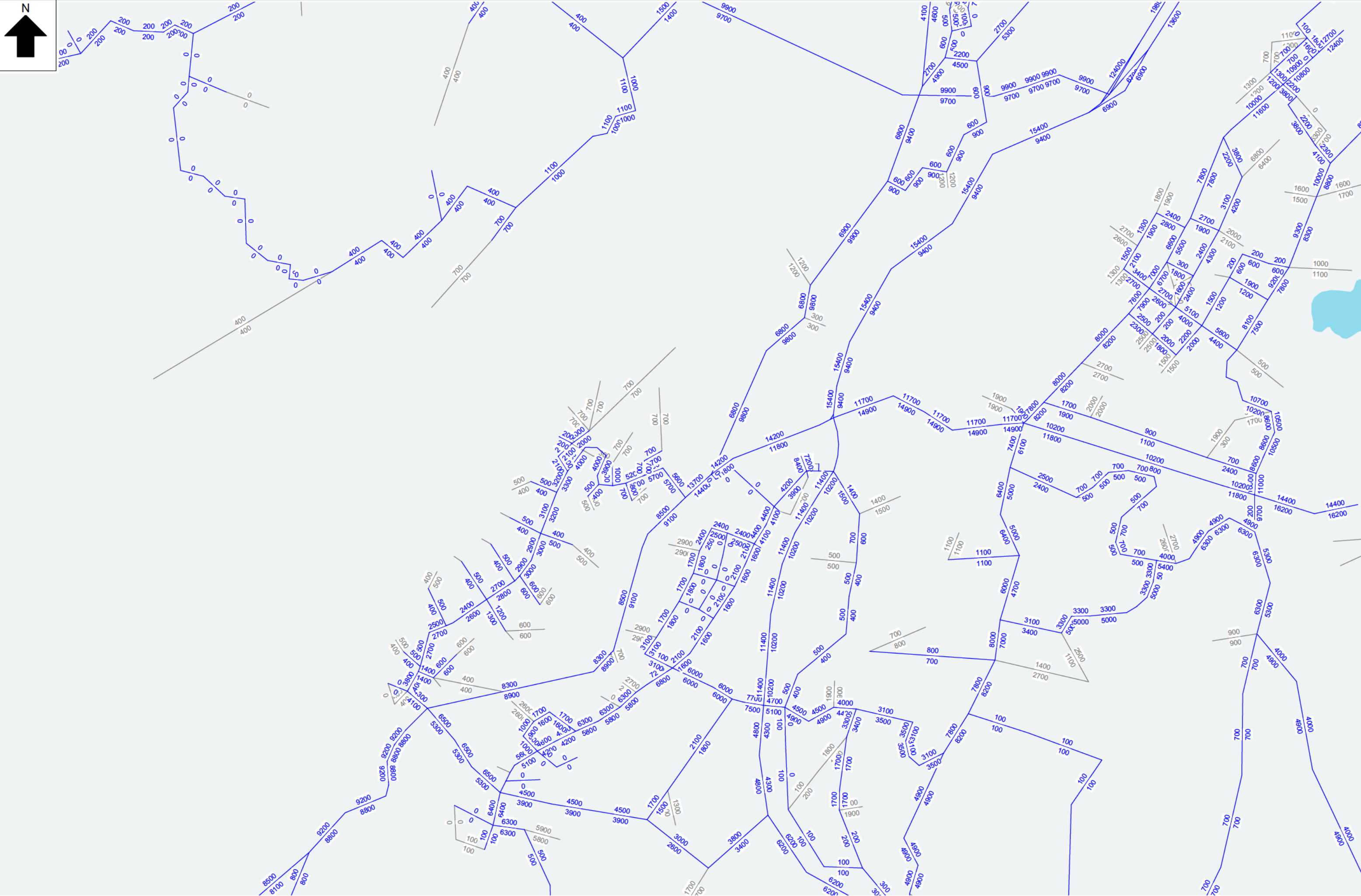
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Average One Hour PM Peak (4pm-6pm) Heavy Vehicles for Do Minimum scenario, Year 2048



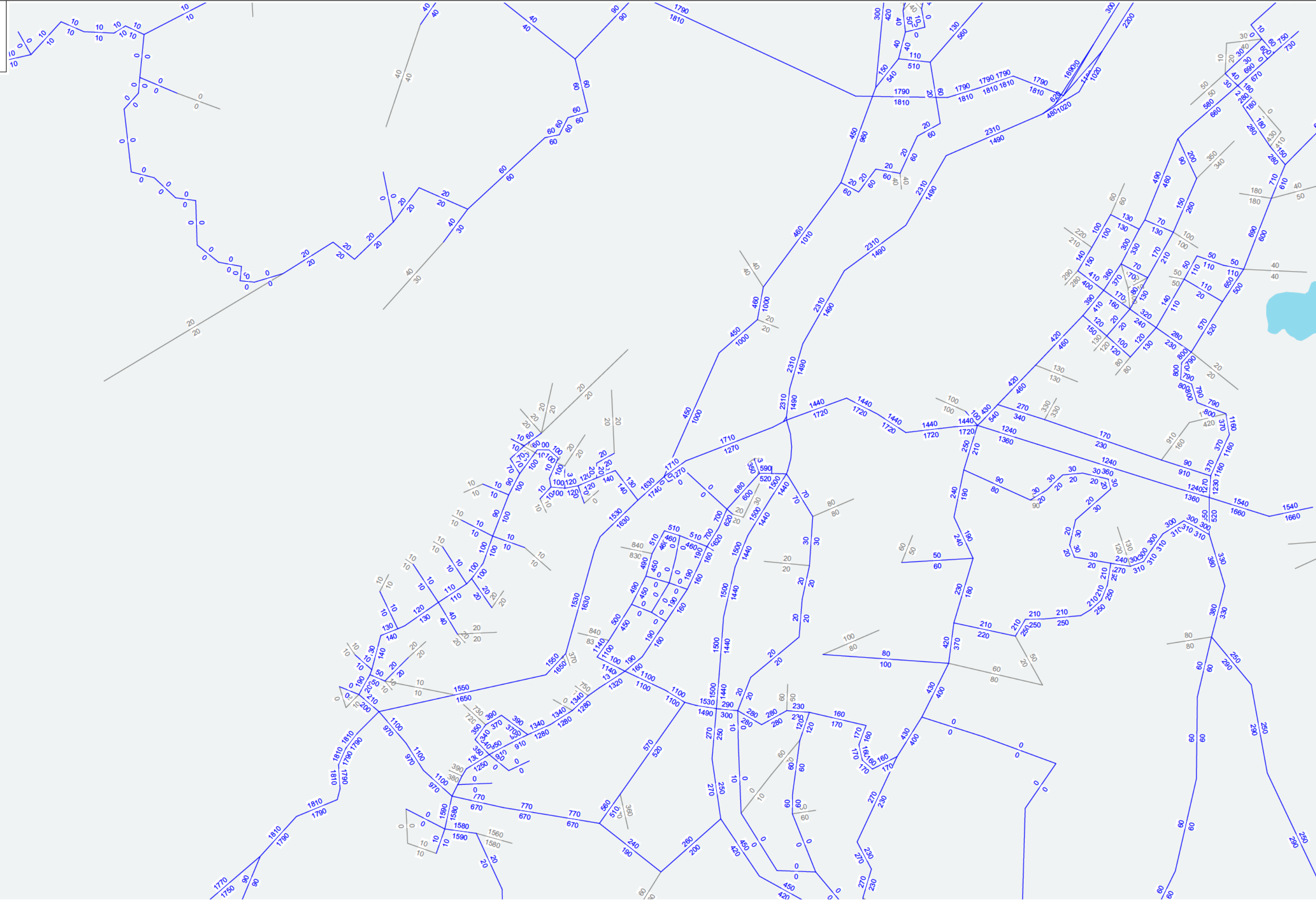
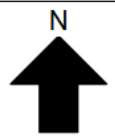
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Annual Average Daily Traffic (AADT) Light Vehicles for Do Minimum scenario, Year 2048



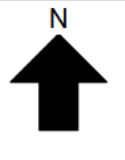
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Annual Average Daily Traffic (AADT) Heavy Vehicles for Do Minimum scenario, Year 2048



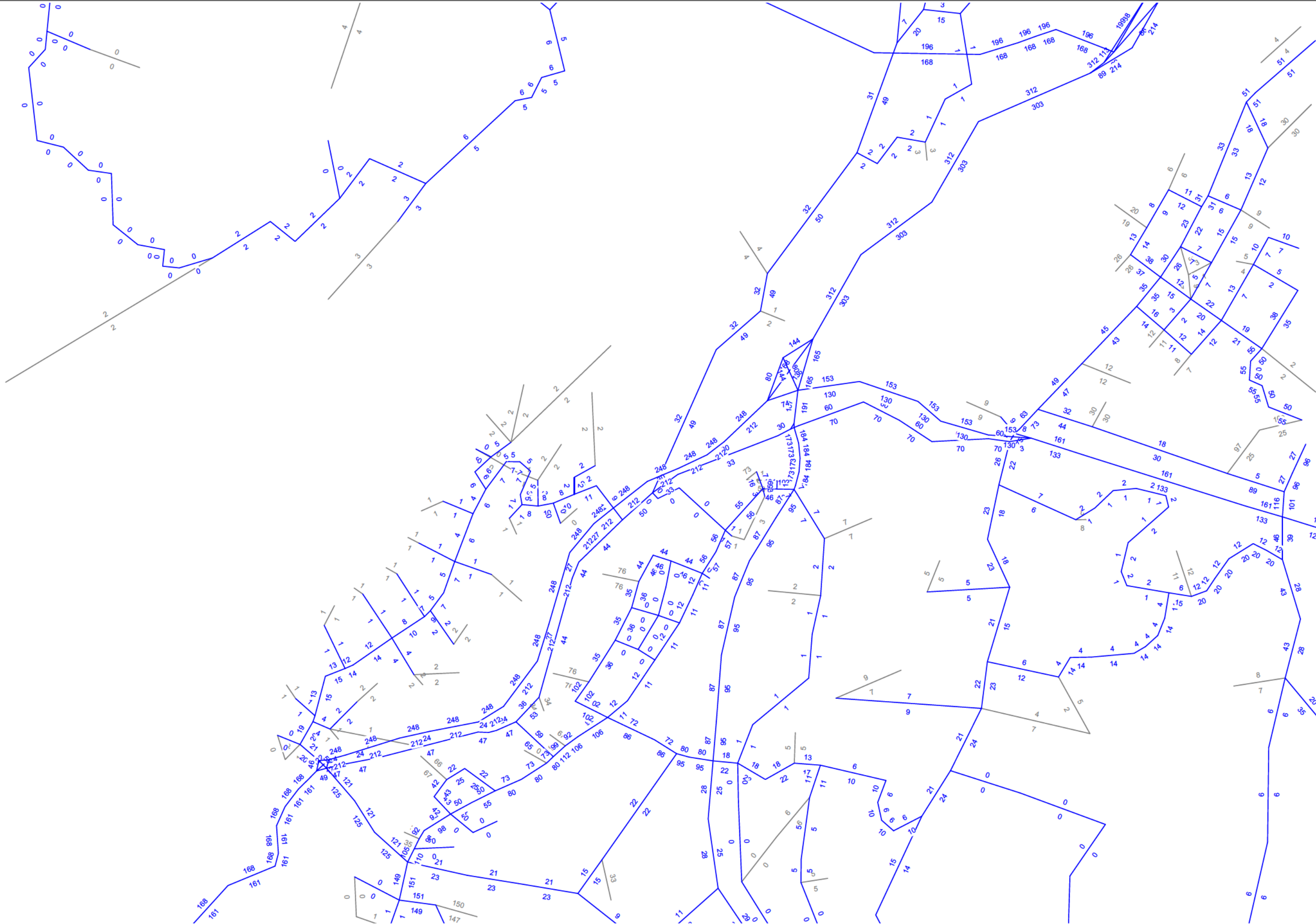
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Average One Hour AM Peak (7am-9am) Light Vehicles for Consenting Design scenario, Year 2048



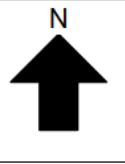
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Average One Hour AM Peak (7am-9am) Heavy Vehicles for Consenting Design scenario, Year 2048

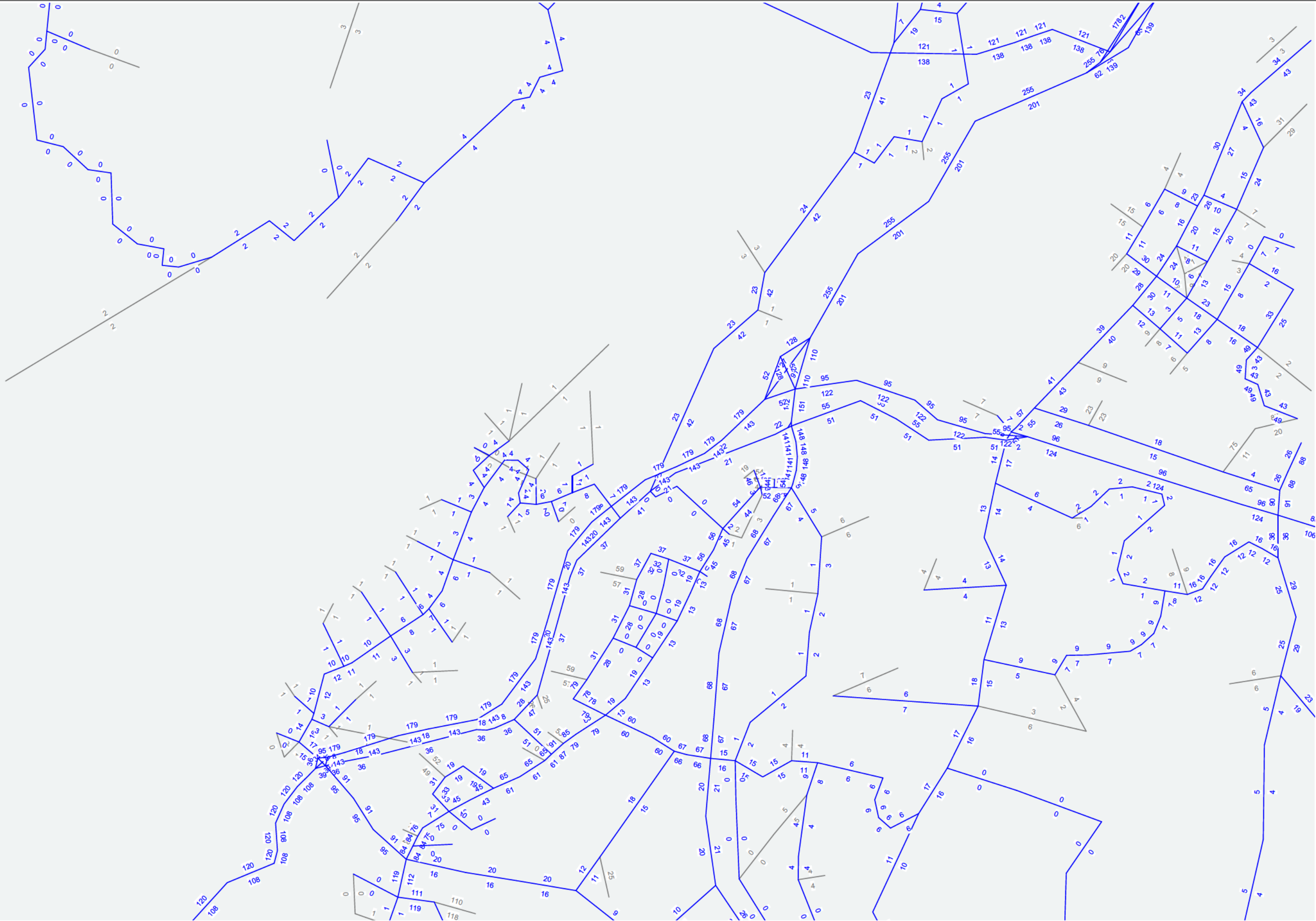


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Average One Hour PM Peak (4pm-6pm) Light Vehicles for Consenting Design scenario, Year 2048



Average One Hour PM Peak (4pm-6pm) Heavy Vehicles for Consenting Design scenario, Year 2048



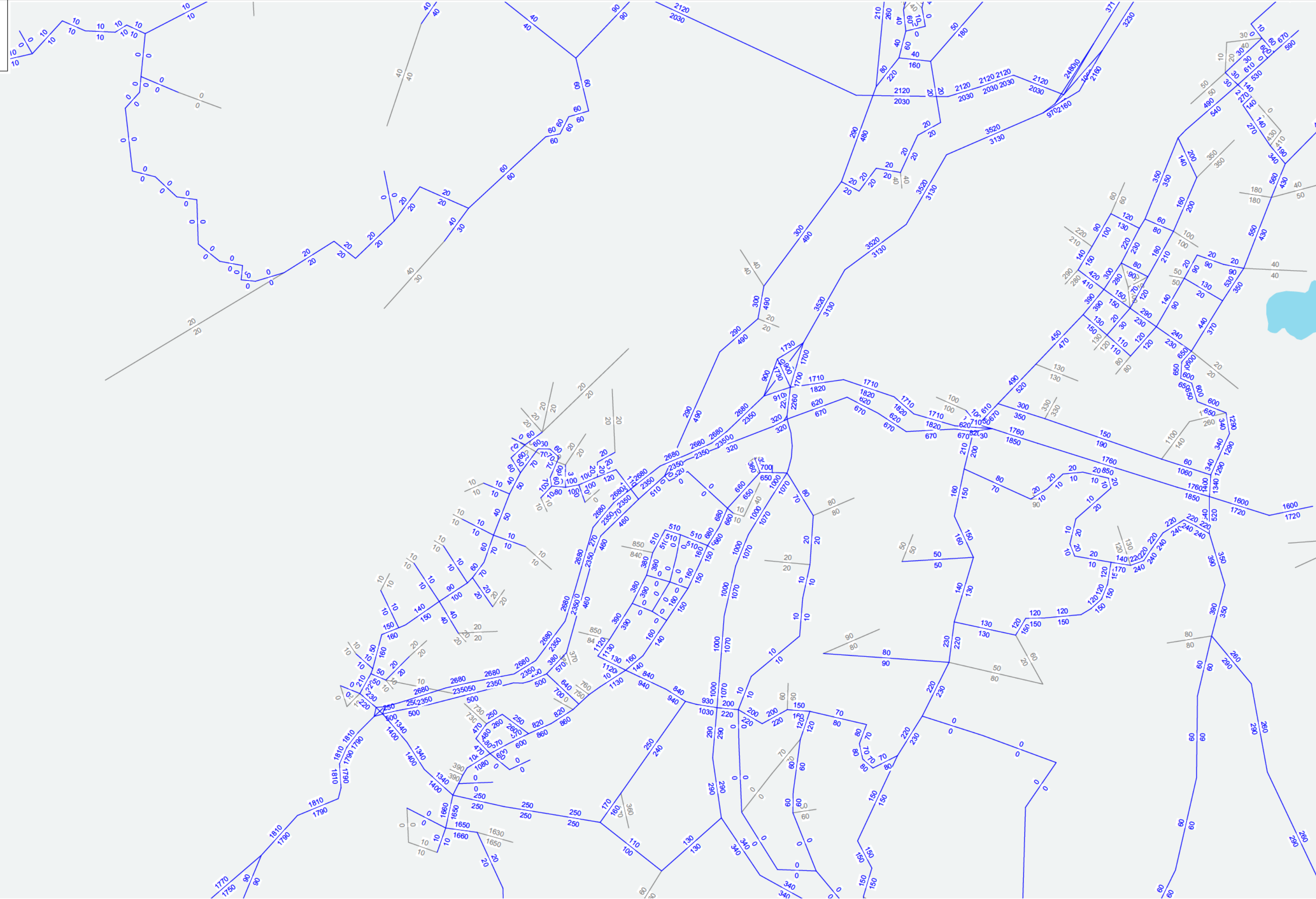
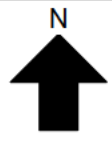
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Annual Average Daily Traffic (AADT) Light Vehicles for Consenting Design scenario, Year 2048



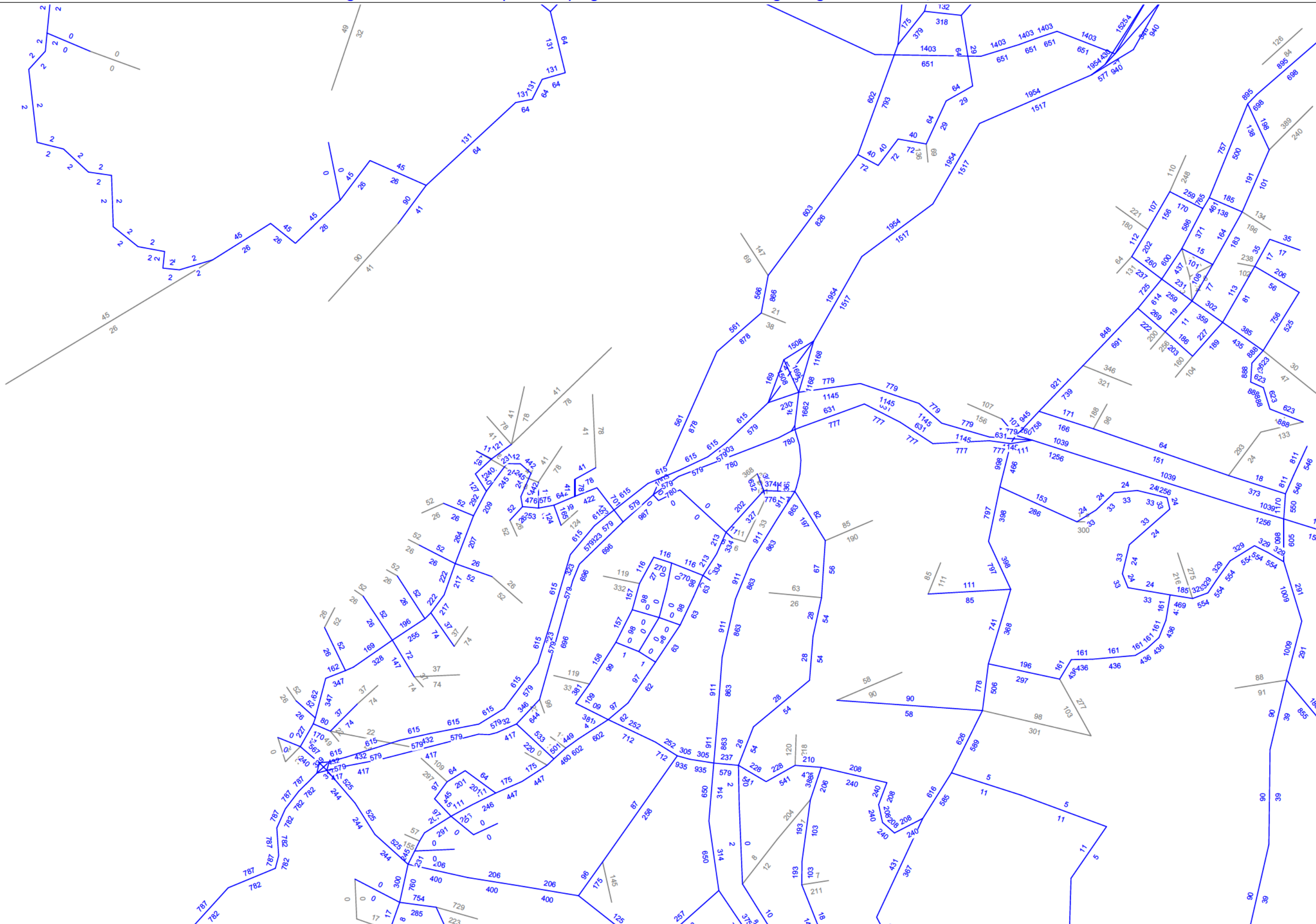
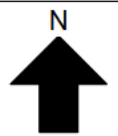
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Annual Average Daily Traffic (AADT) Heavy Vehicles for Consenting Design scenario, Year 2048



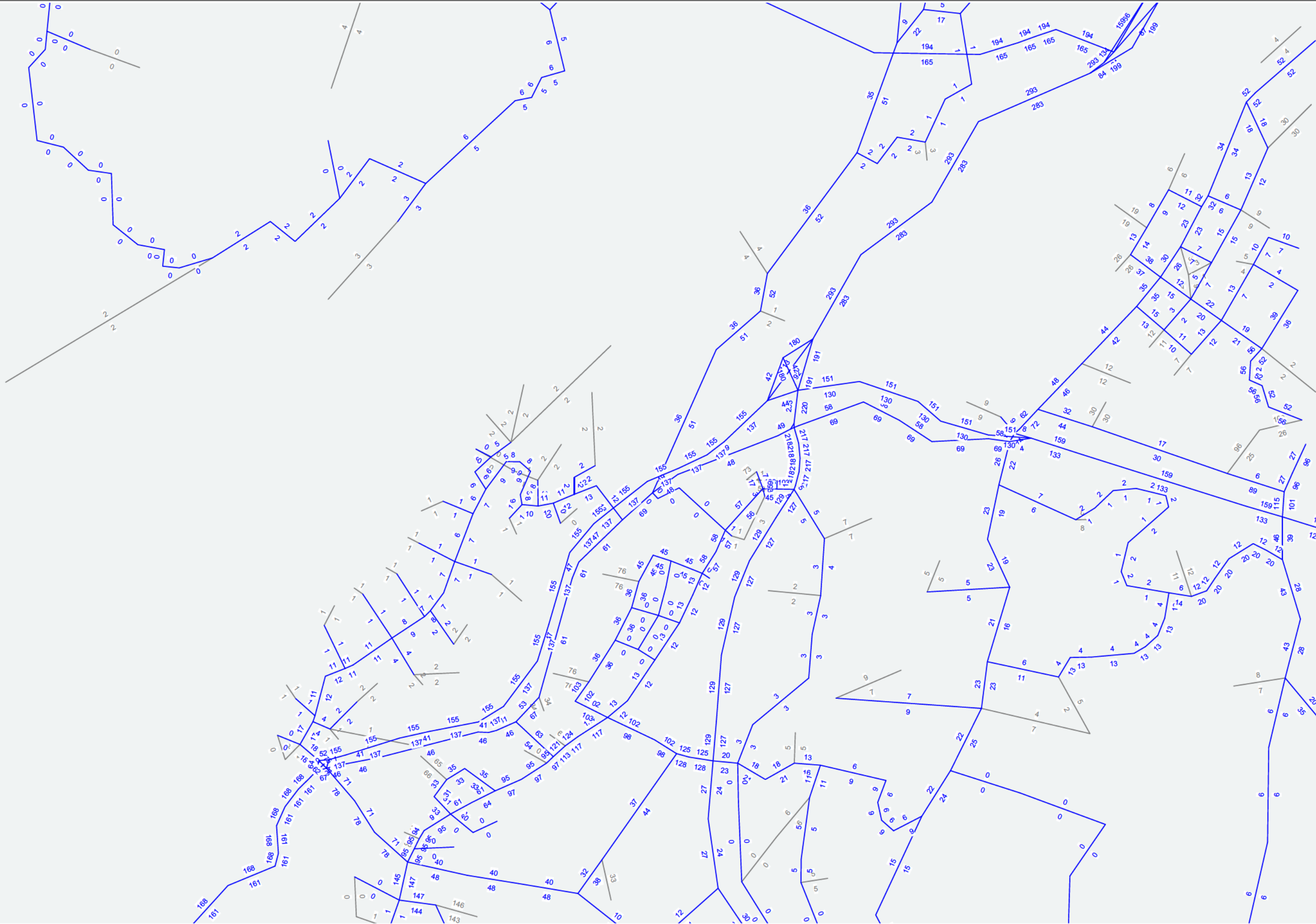
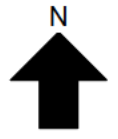
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\Consenting_Design\TOLL_ADT.NET

Average One Hour AM Peak (7am-9am) Light Vehicles for Consenting Design Toll scenario, Year 2048



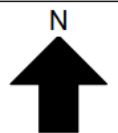
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\Consenting_Design_Toll\SL_Cordon\TOLL_ADT.NET

Average One Hour AM Peak (7am-9am) Heavy Vehicles for Consenting Design Toll scenario, Year 2048



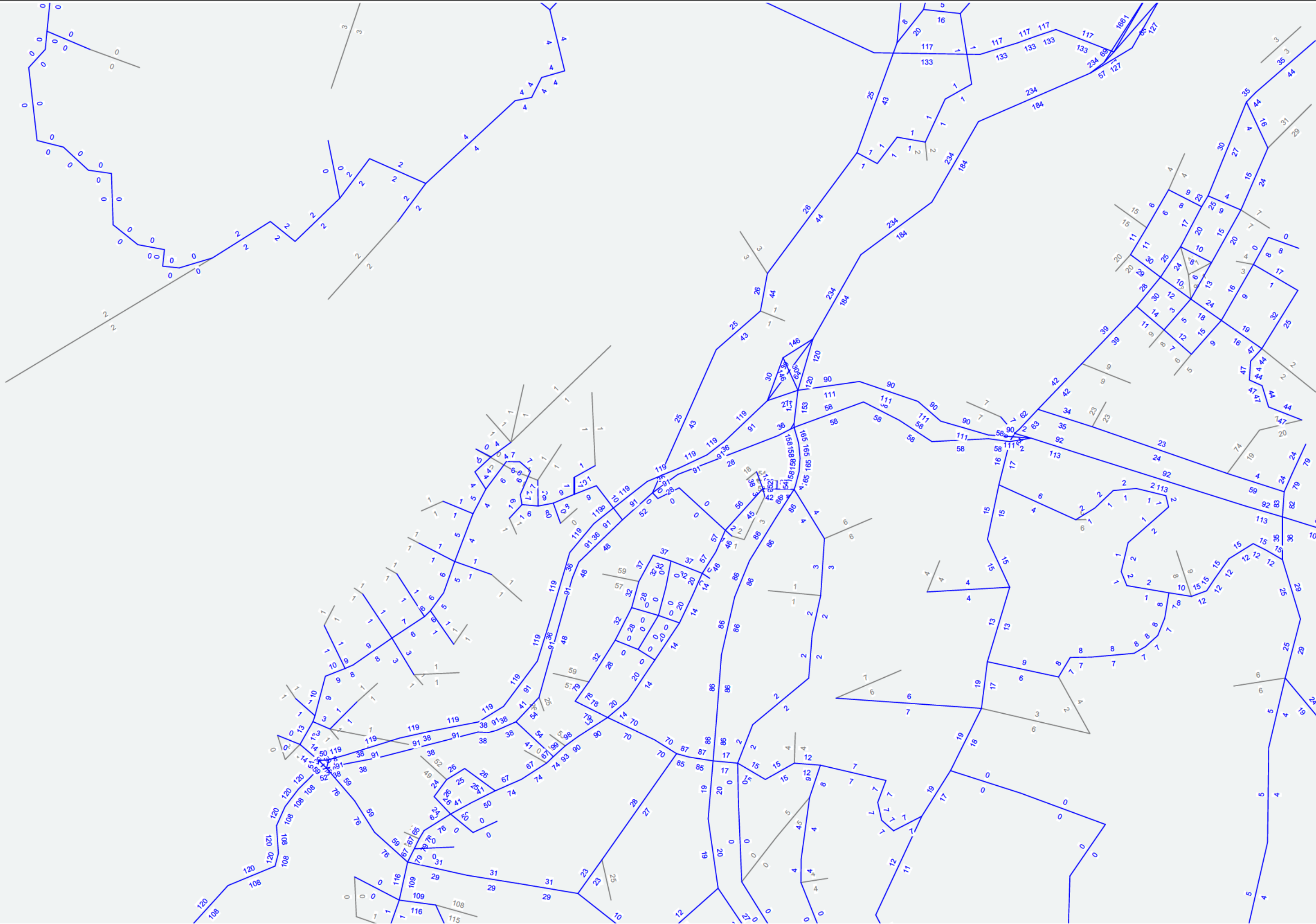
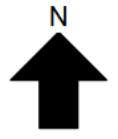
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\Consenting_Design_Toll\SL_Cordon\TOLL_ADT.NET

Average One Hour PM Peak (4pm-6pm) Light Vehicles for Consenting Design Toll scenario, Year 2048



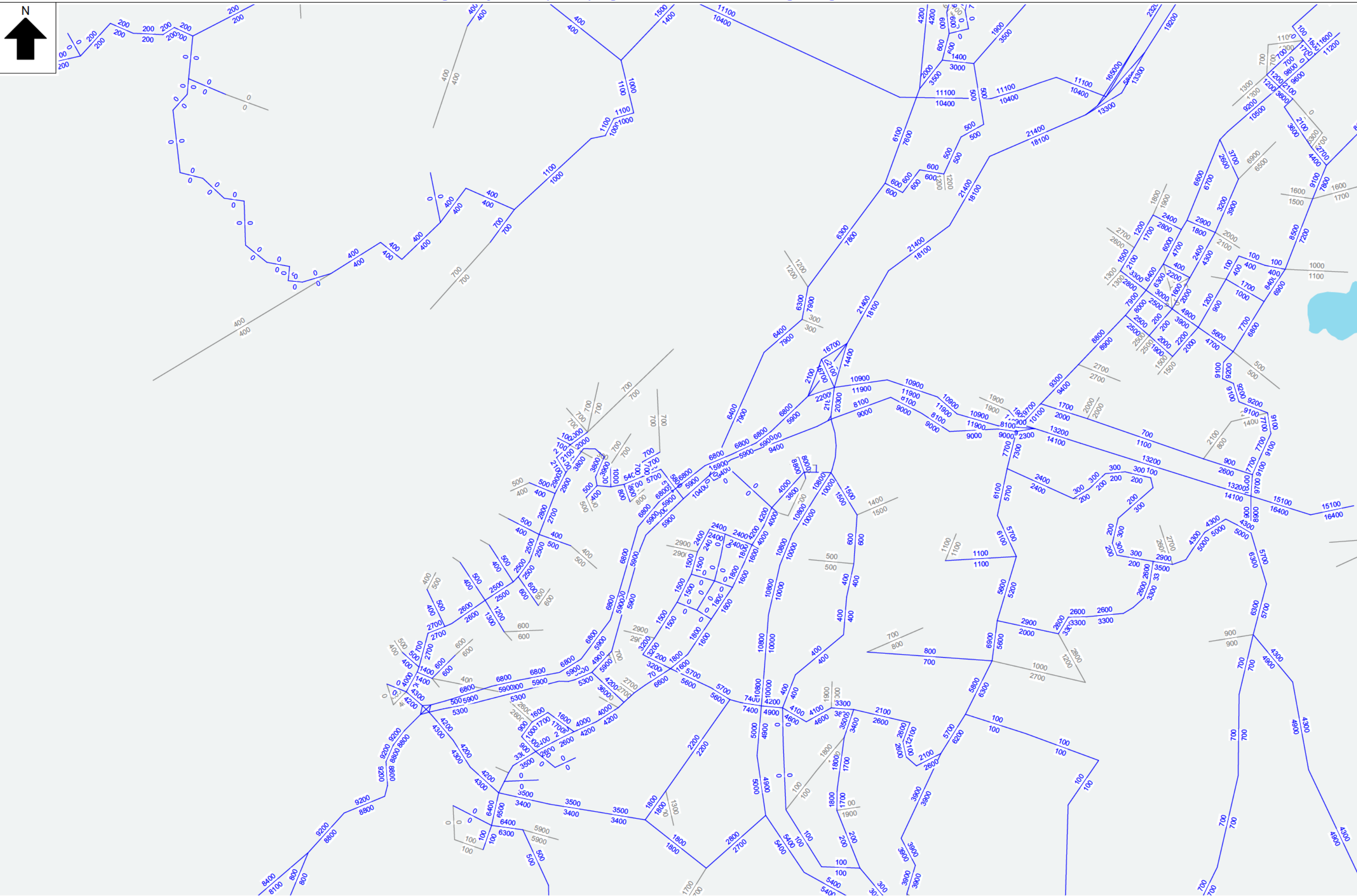
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Average One Hour PM Peak (4pm-6pm) Heavy Vehicles for Consenting Design Toll scenario, Year 2048



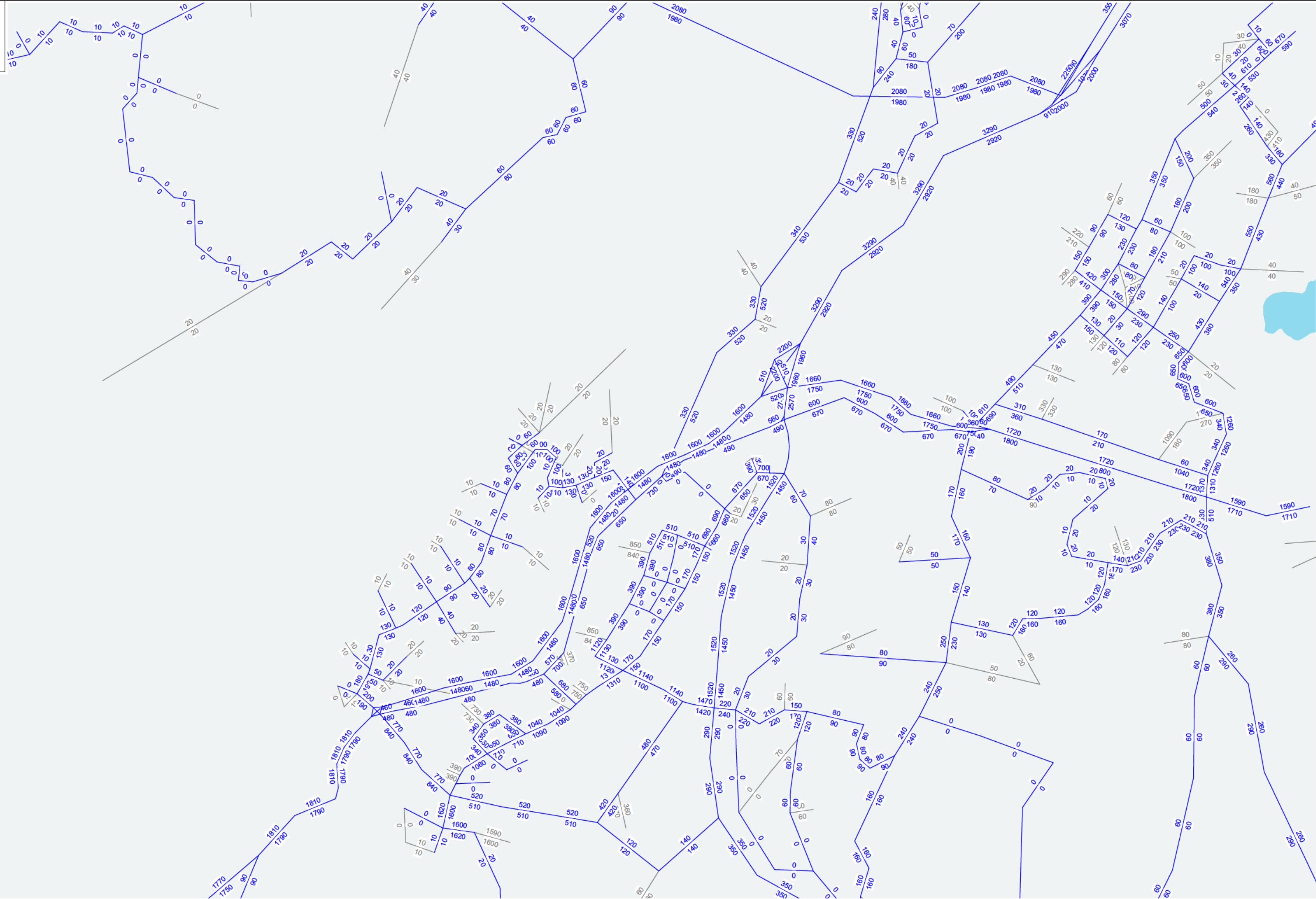
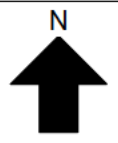
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Annual Average Daily Traffic (AADT) Light Vehicles for Consenting Design Toll scenario, Year 2048



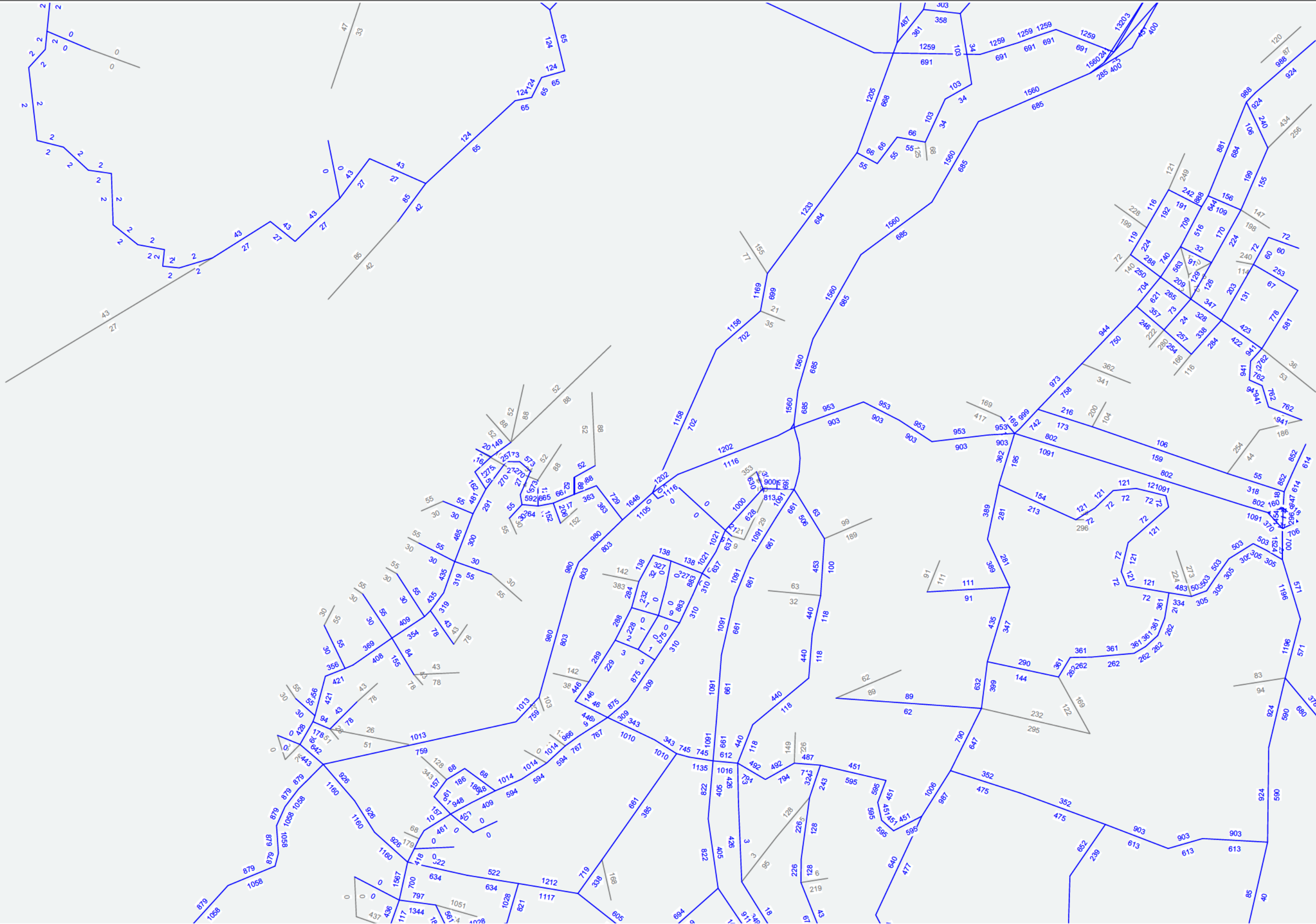
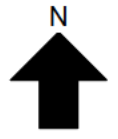
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\Consenting_Design_Tol\TOLL_ADT.NET

Annual Average Daily Traffic (AADT) Heavy Vehicles for Consenting Design Toll scenario, Year 2048



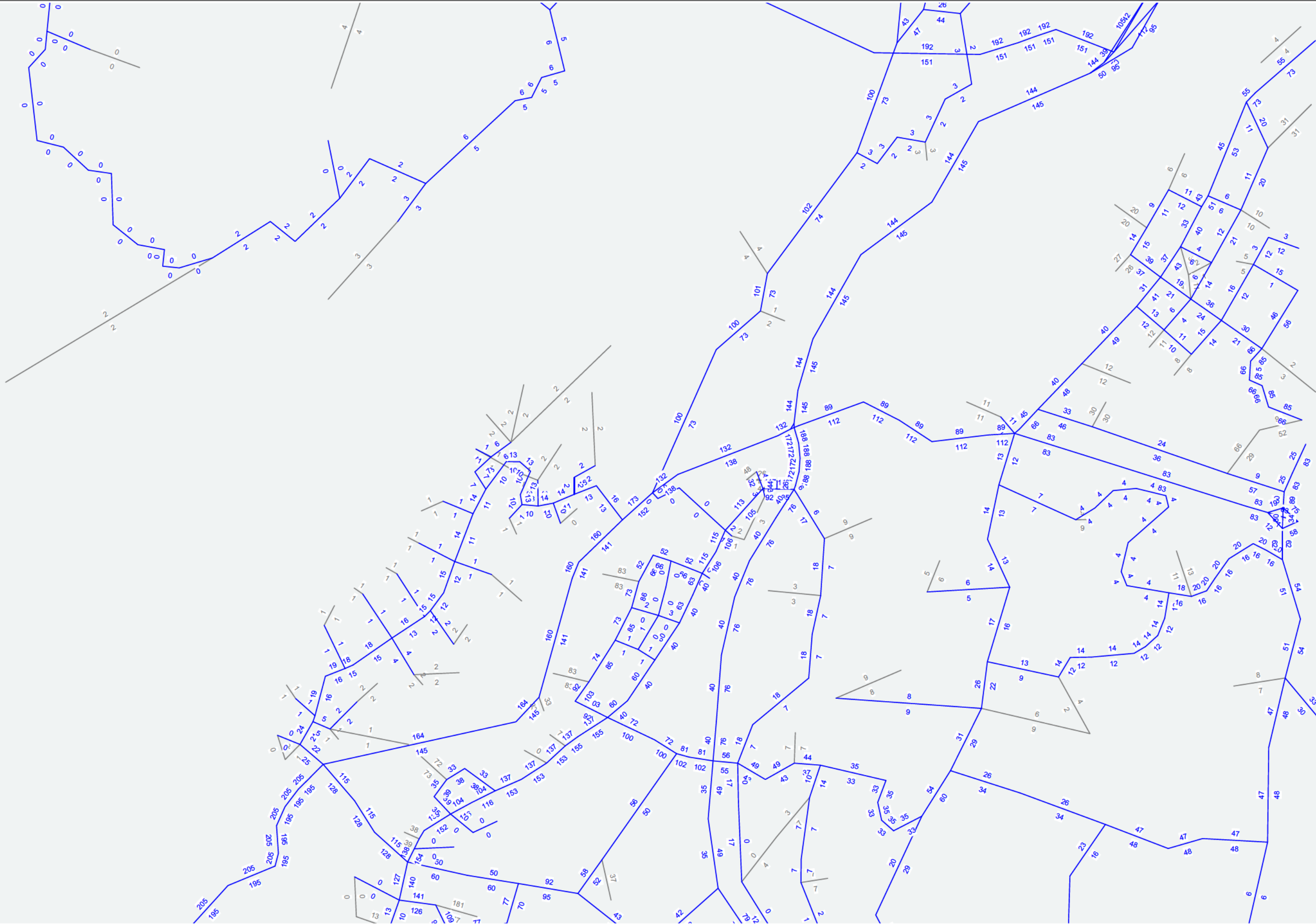
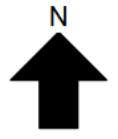
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\Consenting_Design_Tol\TOLL_ADT.NET

Average One Hour AM Peak (7am-9am) Light Vehicles for Do Minimum scenario, Year 2063



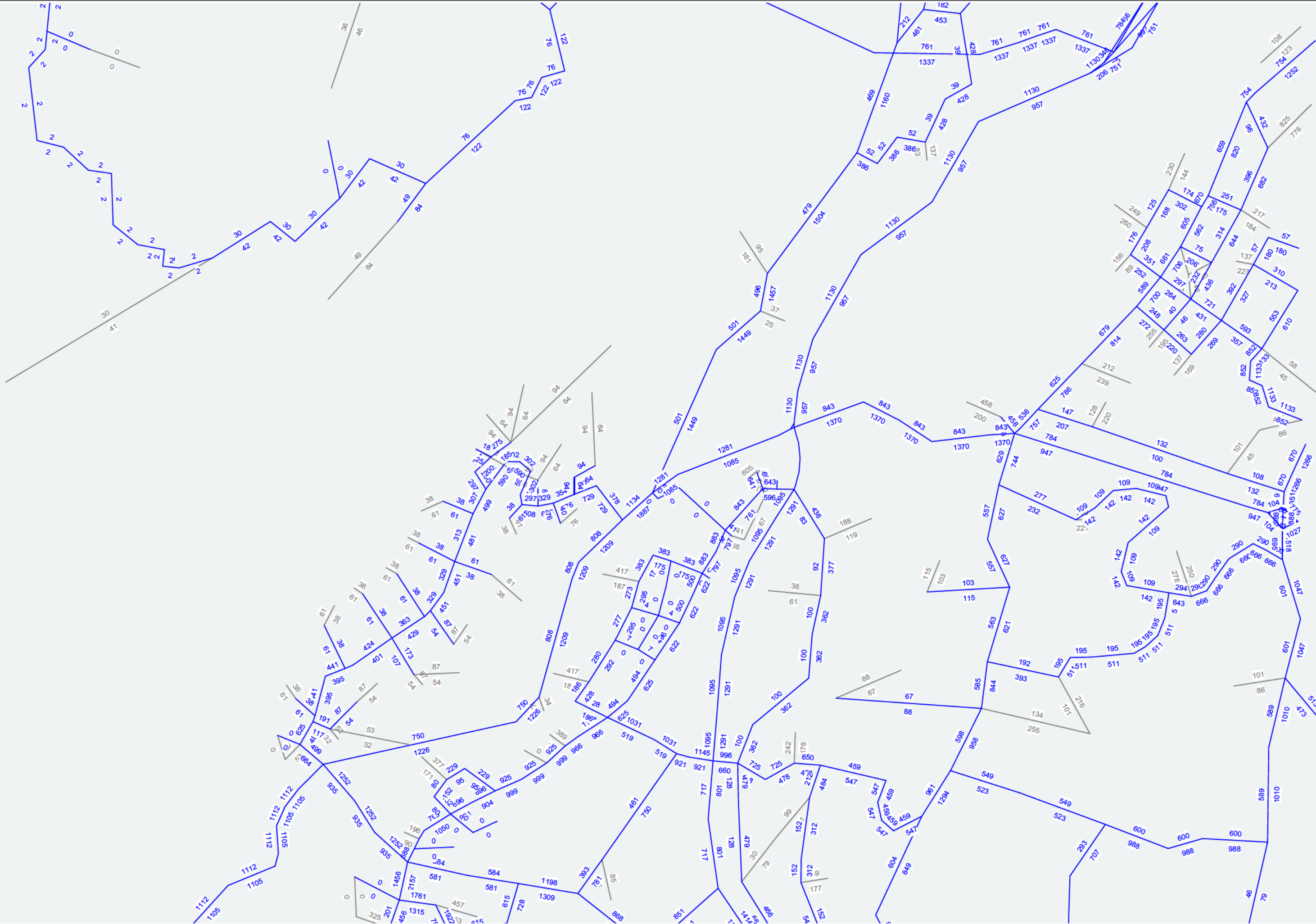
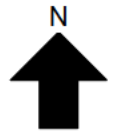
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Modell\Tauriko_Rons\Y2063\DM\Cordon\TOLL_ADT.NET

Average One Hour AM Peak (7am-9am) Heavy Vehicles for Do Minimum scenario, Year 2063



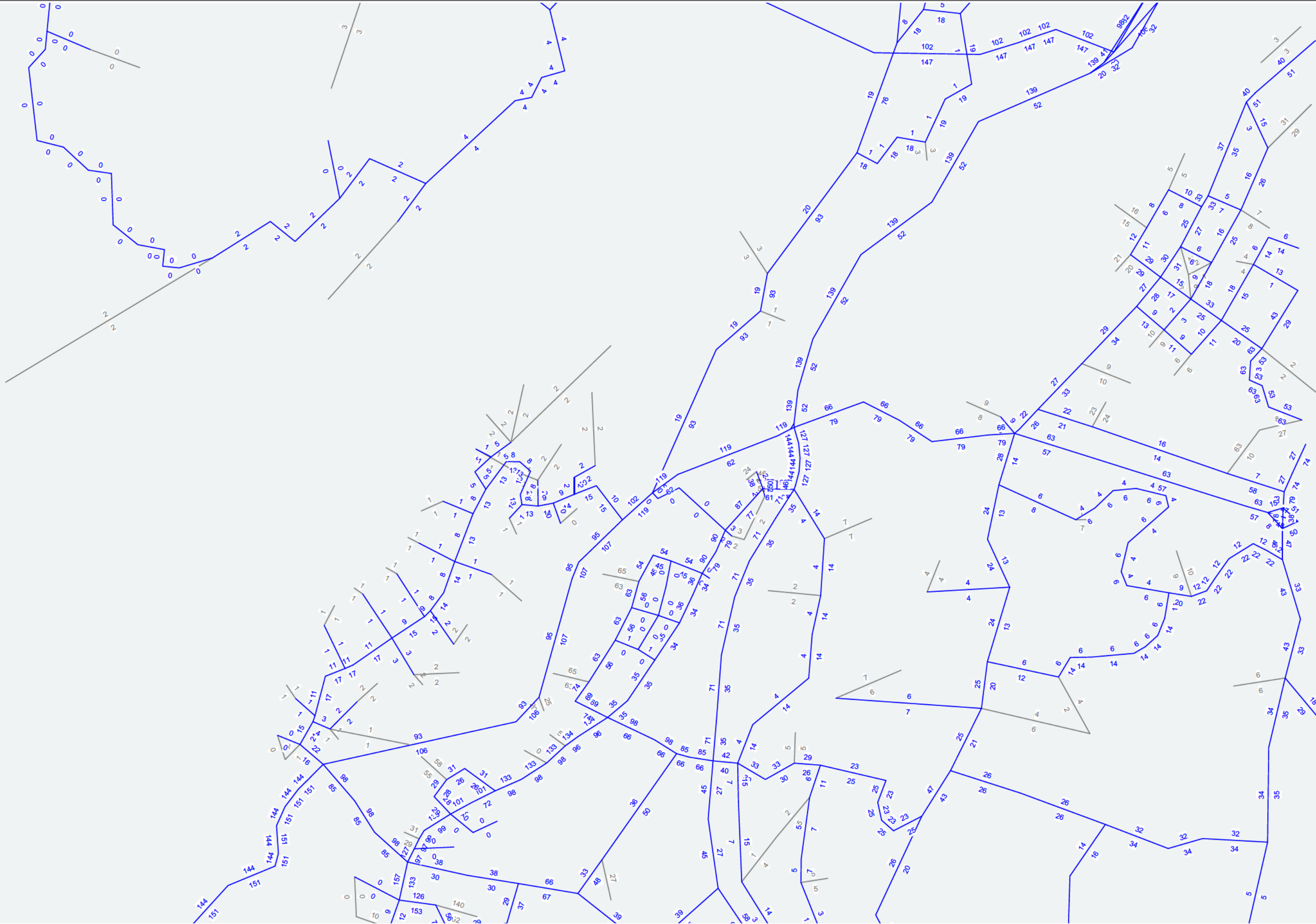
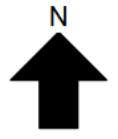
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\DM\Cordon\TOLL_ADT.NET

Average One Hour PM Peak (4pm-6pm) Light Vehicles for Do Minimum scenario, Year 2063



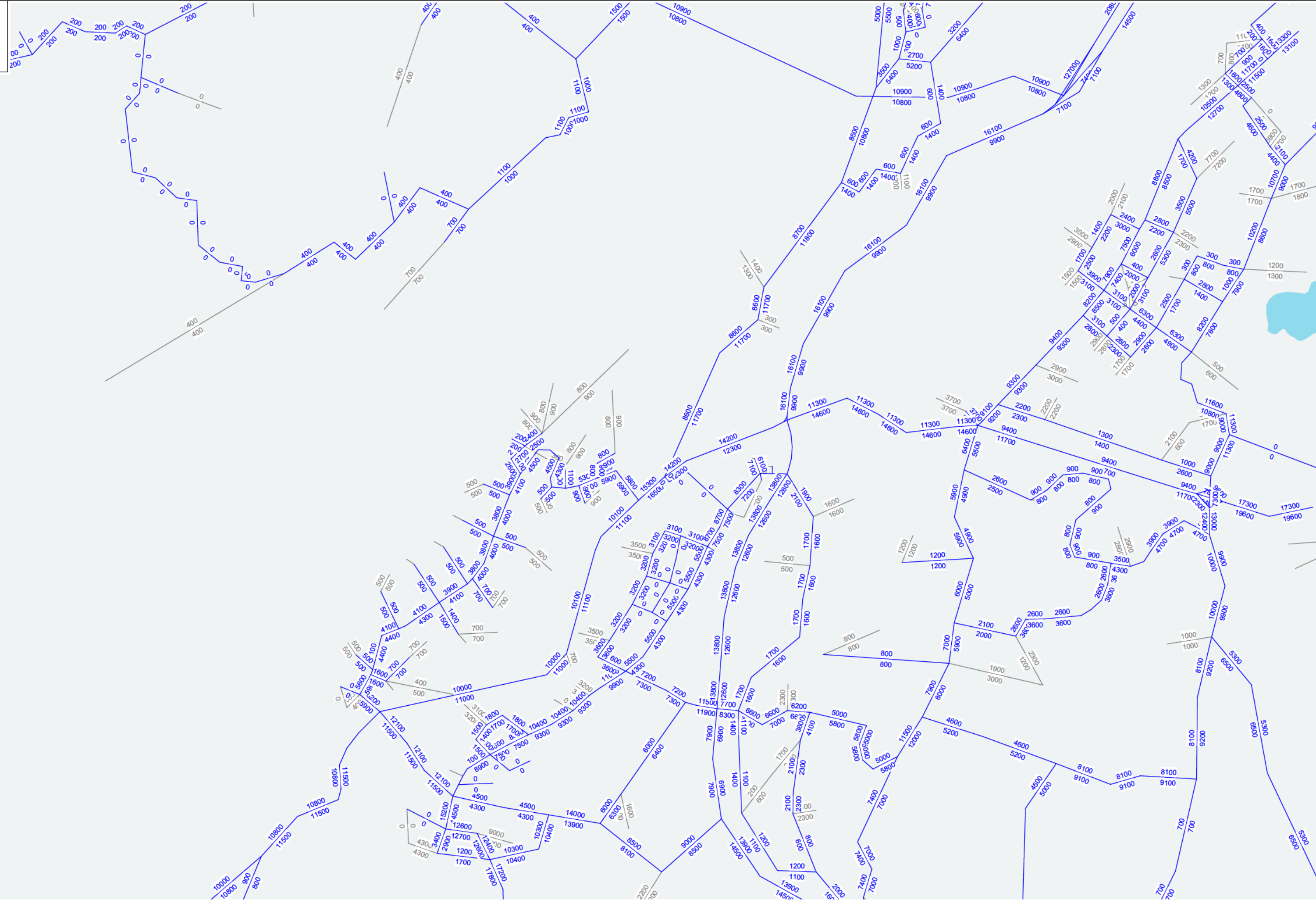
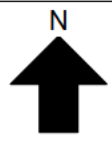
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\DM\Cordon\TOLL_ADT.NET

Average One Hour PM Peak (4pm-6pm) Heavy Vehicles for Do Minimum scenario, Year 2063



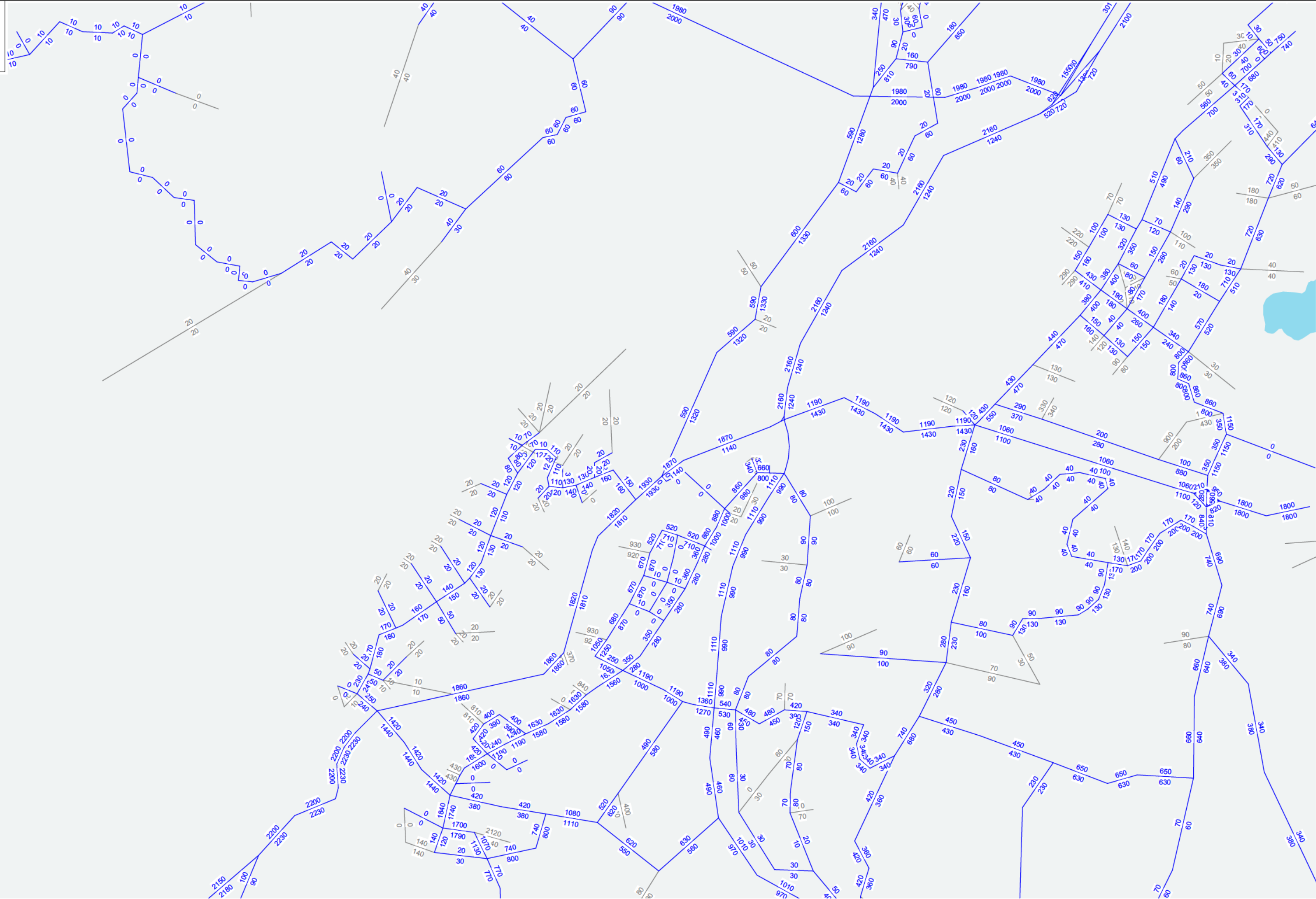
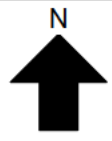
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\DM\Cordon\TOLL_ADT.NET

Annual Average Daily Traffic (AADT) Light Vehicles for Do Minimum scenario, Year 2063



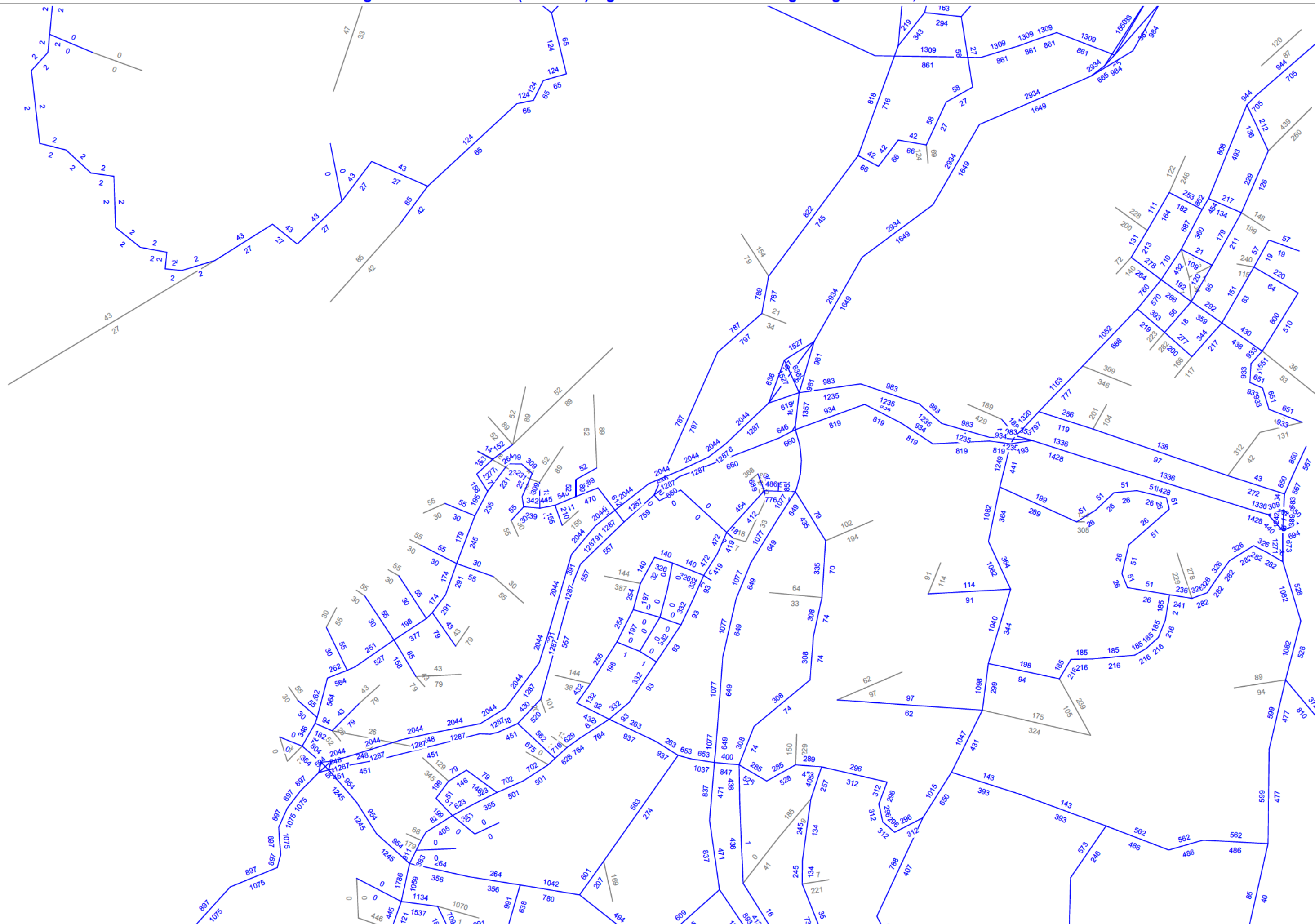
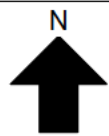
C:\Temp\TTSM\TTSM23_Tauriko_RONSModel\Tauriko_Rons\Y2063\DM\TOLL_ADT.NET

Annual Average Daily Traffic (AADT) Heavy Vehicles for Do Minimum scenario, Year 2063

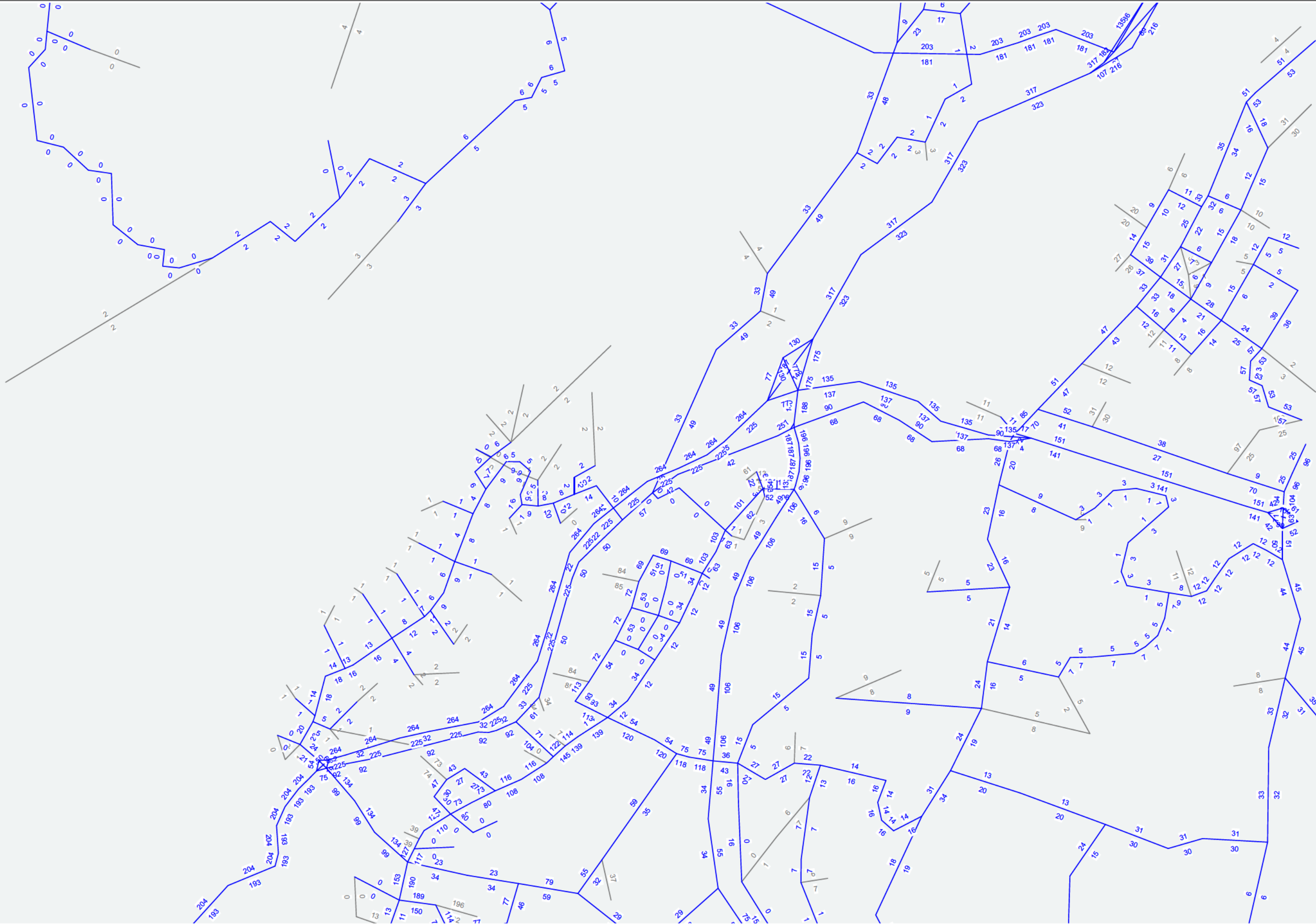


C:\Temp\TTSM\TTSM23_Tauriko_RONSModel\Tauriko_Rons\Y2063\DM\TOLL_ADT.NET

Average One Hour AM Peak (7am-9am) Light Vehicles for Consenting Design scenario, Year 2063

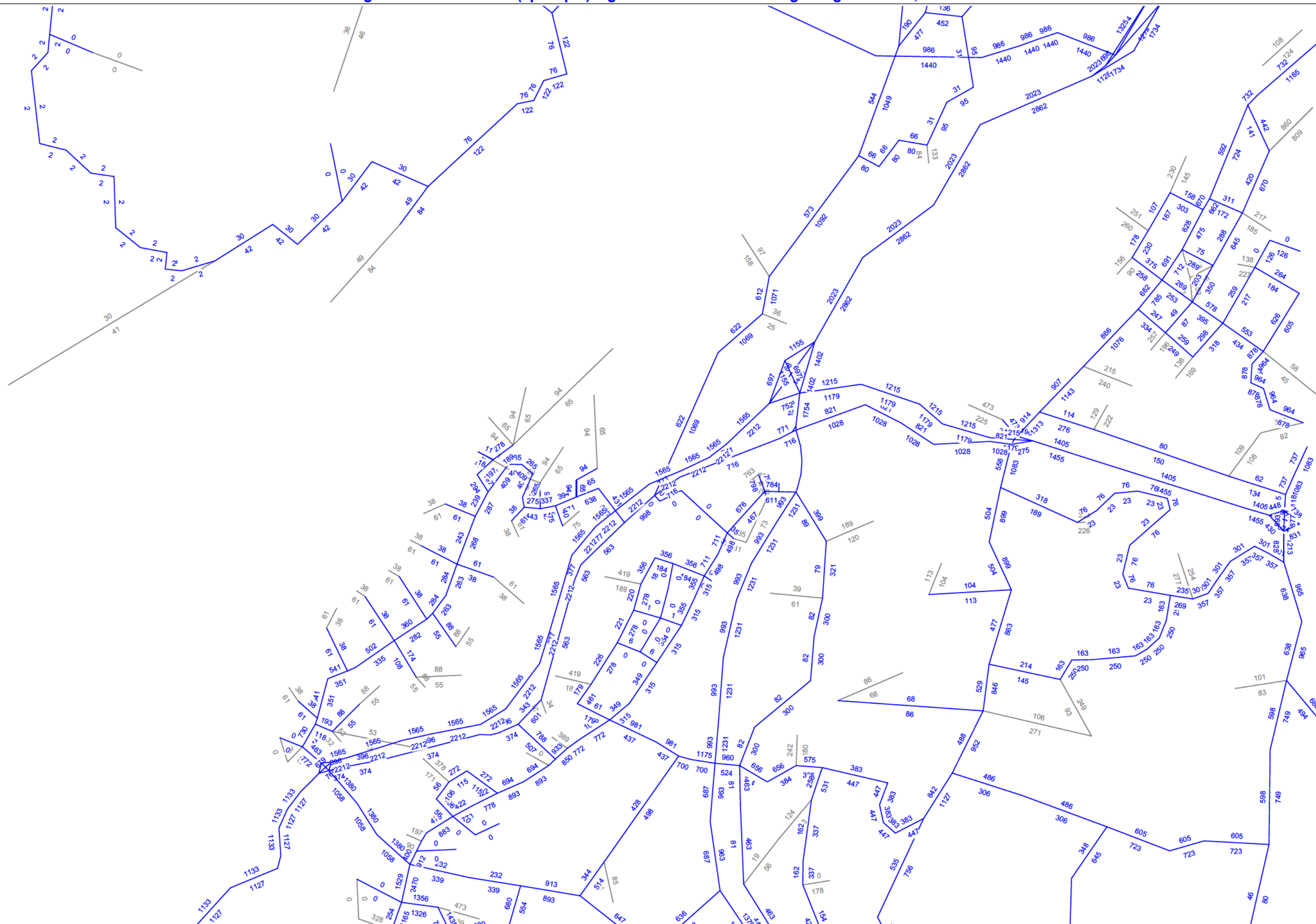
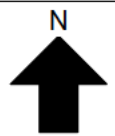


Average One Hour AM Peak (7am-9am) Heavy Vehicles for Consenting Design scenario, Year 2063



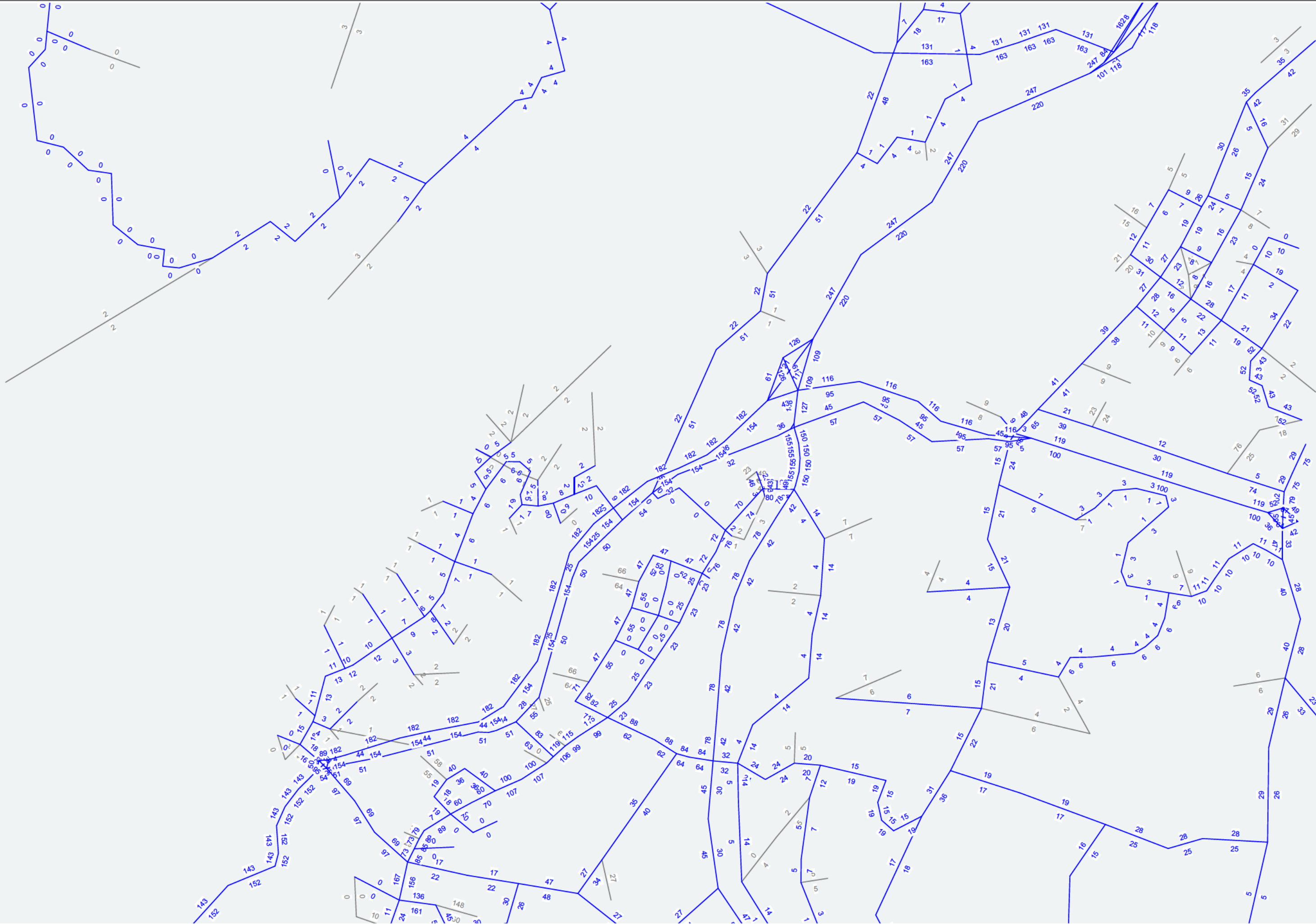
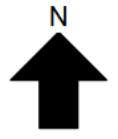
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design\SL_Cordon\TOLL_ADT.NET

Average One Hour PM Peak (4pm-6pm) Light Vehicles for Consenting Design scenario, Year 2063



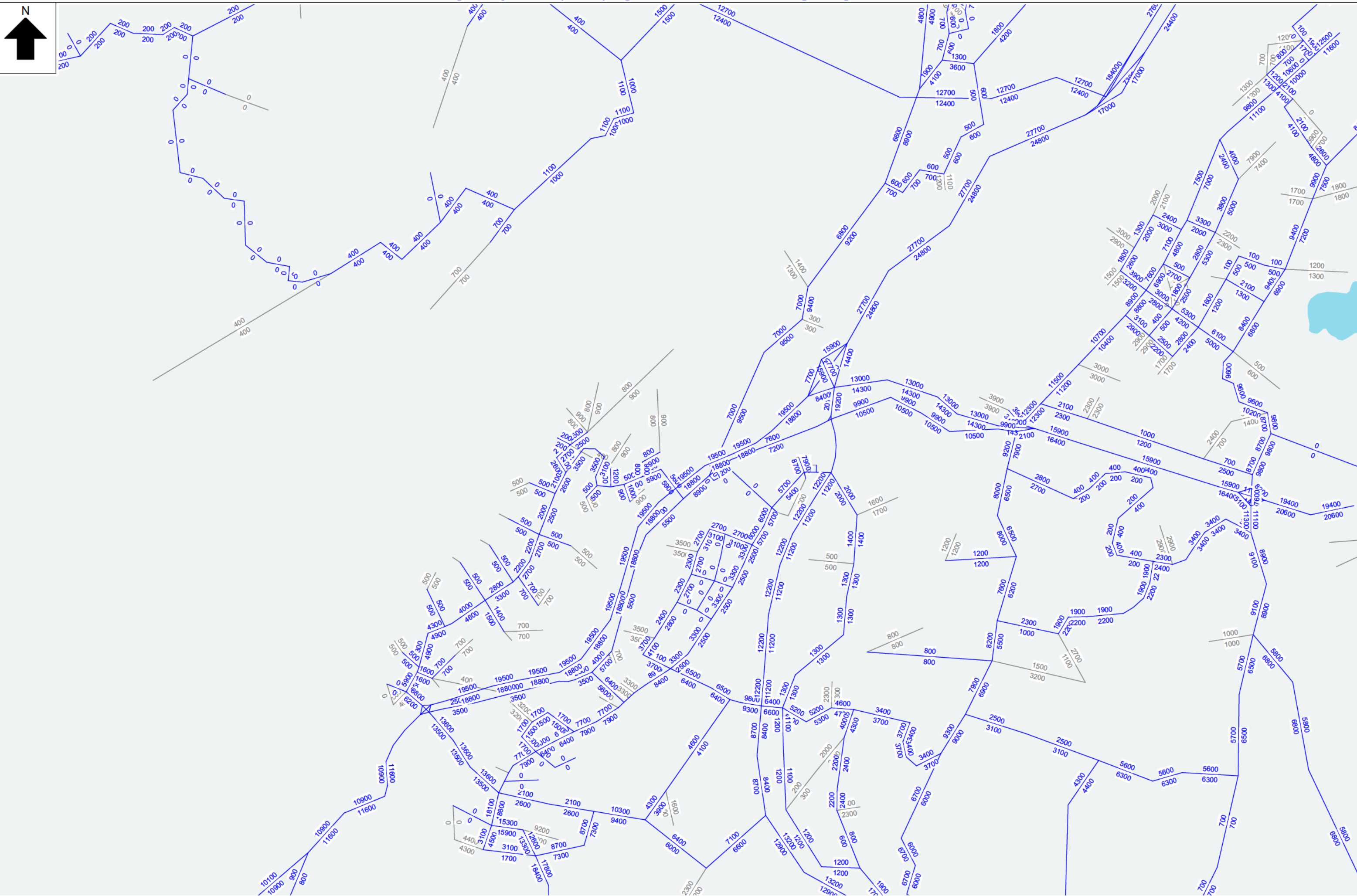
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Modell\Tauriko_Rons\Y2063\Consenting_Design\SL_Cordon\TOLL_ADT.NET

Average One Hour PM Peak (4pm-6pm) Heavy Vehicles for Consenting Design scenario, Year 2063



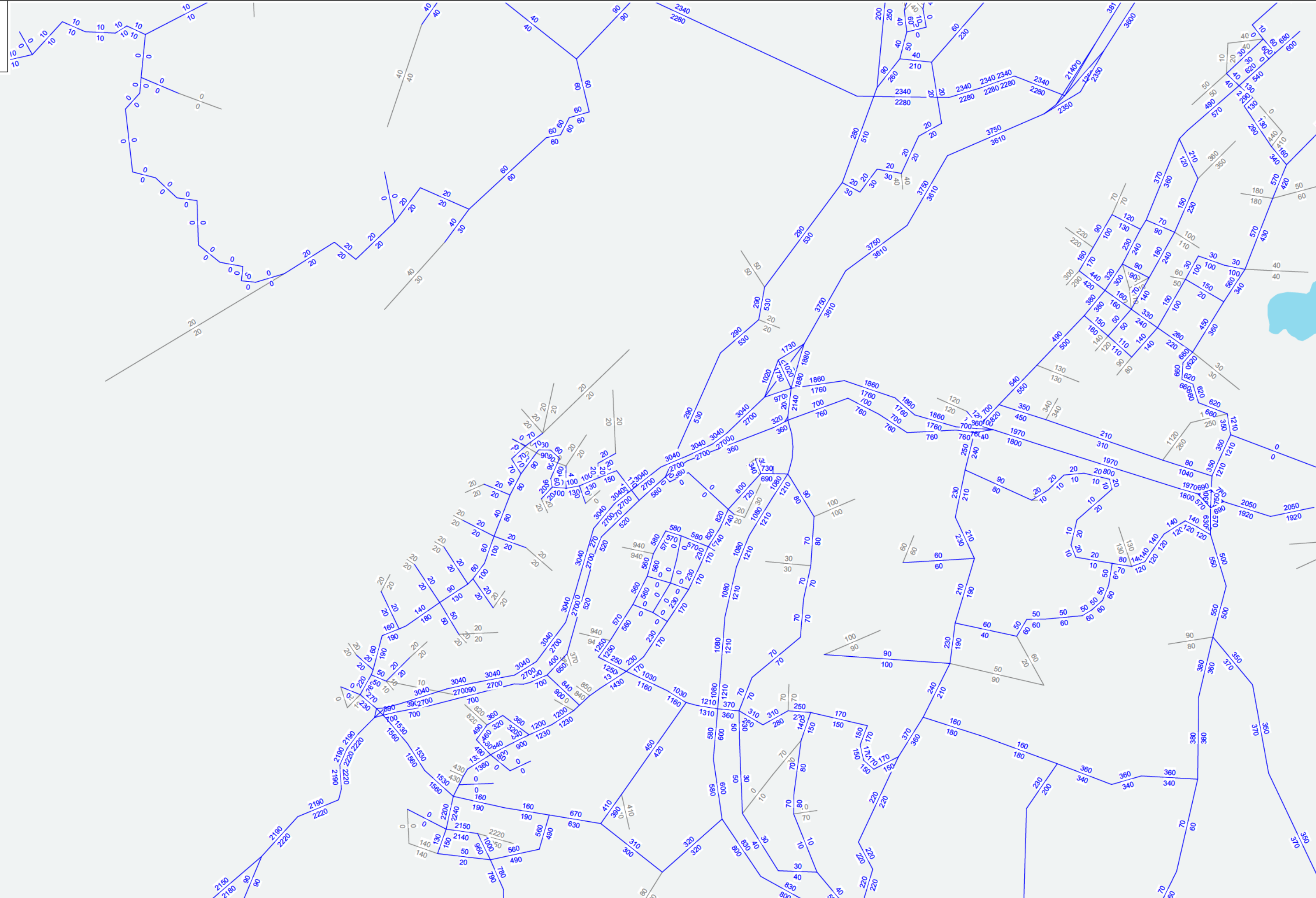
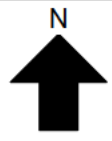
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design\SL_Cordon\TOLL_ADT.NET

Annual Average Daily Traffic (AADT) Light Vehicles for Consenting Design scenario, Year 2063



C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design\TOLL_ADT.NET

Annual Average Daily Traffic (AADT) Heavy Vehicles for Consenting Design scenario, Year 2063



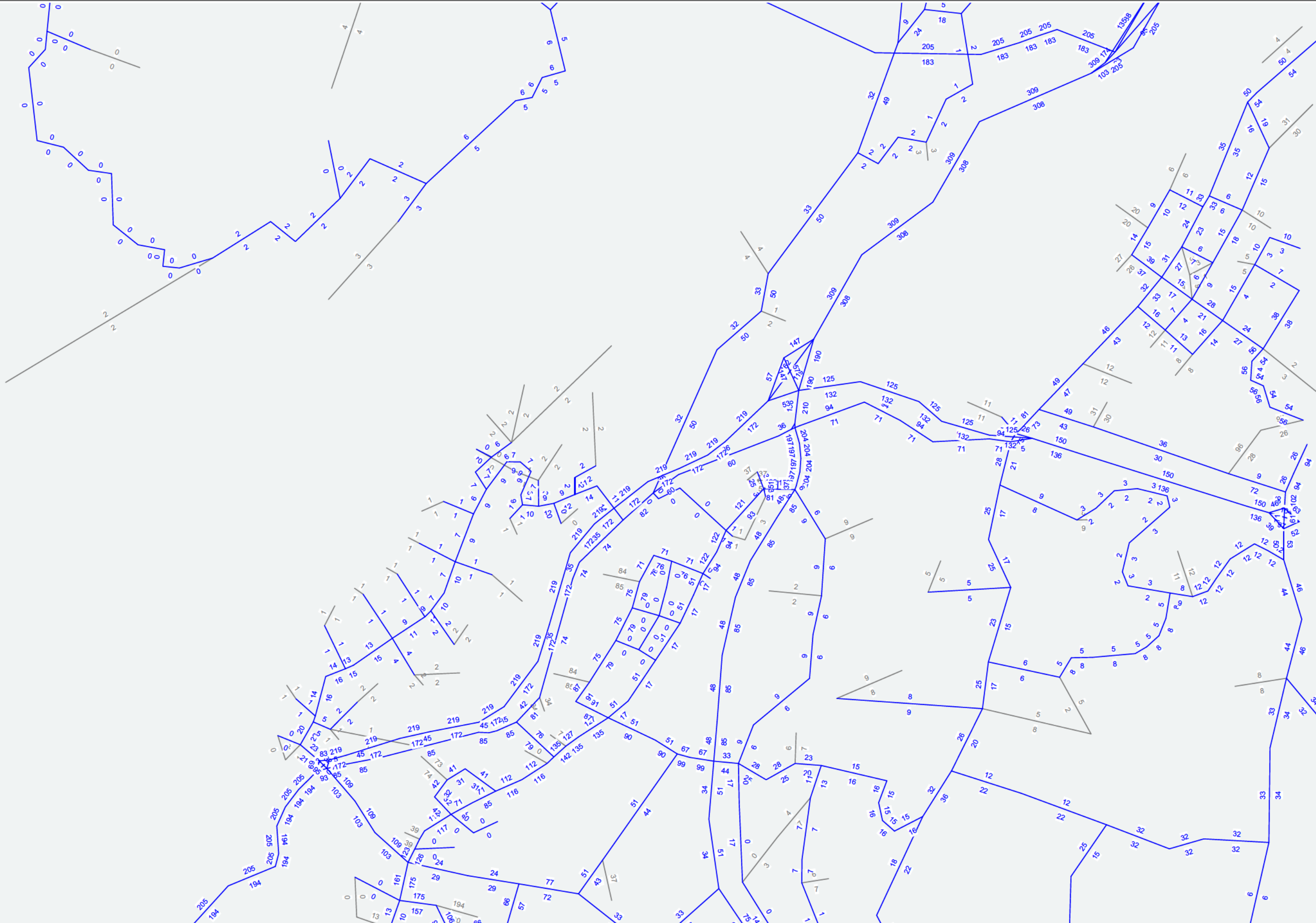
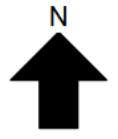
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design\TOLL_ADT.NET

Average One Hour AM Peak (7am-9am) Light Vehicles for Consenting Design Toll scenario, Year 2063



C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design_Toll\SL_Cordon\TOLL_ADT.NET

Average One Hour AM Peak (7am-9am) Heavy Vehicles for Consenting Design Toll scenario, Year 2063



C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design_Toll\SL_Cordon\TOLL_ADT.NET

Average One Hour PM Peak (4pm-6pm) Light Vehicles for Consenting Design Toll scenario, Year 2063

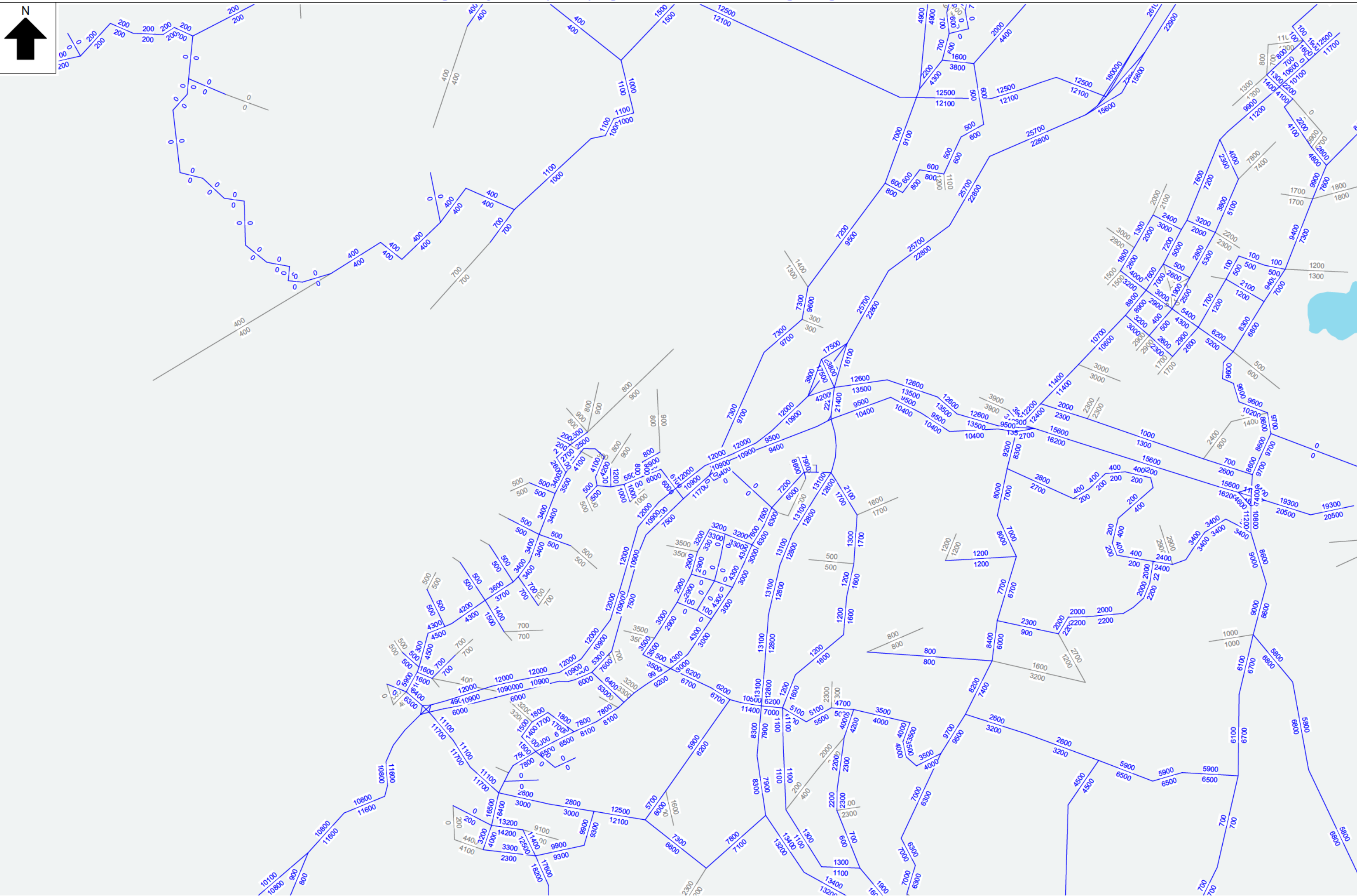


Average One Hour PM Peak (4pm-6pm) Heavy Vehicles for Consenting Design Toll scenario, Year 2063



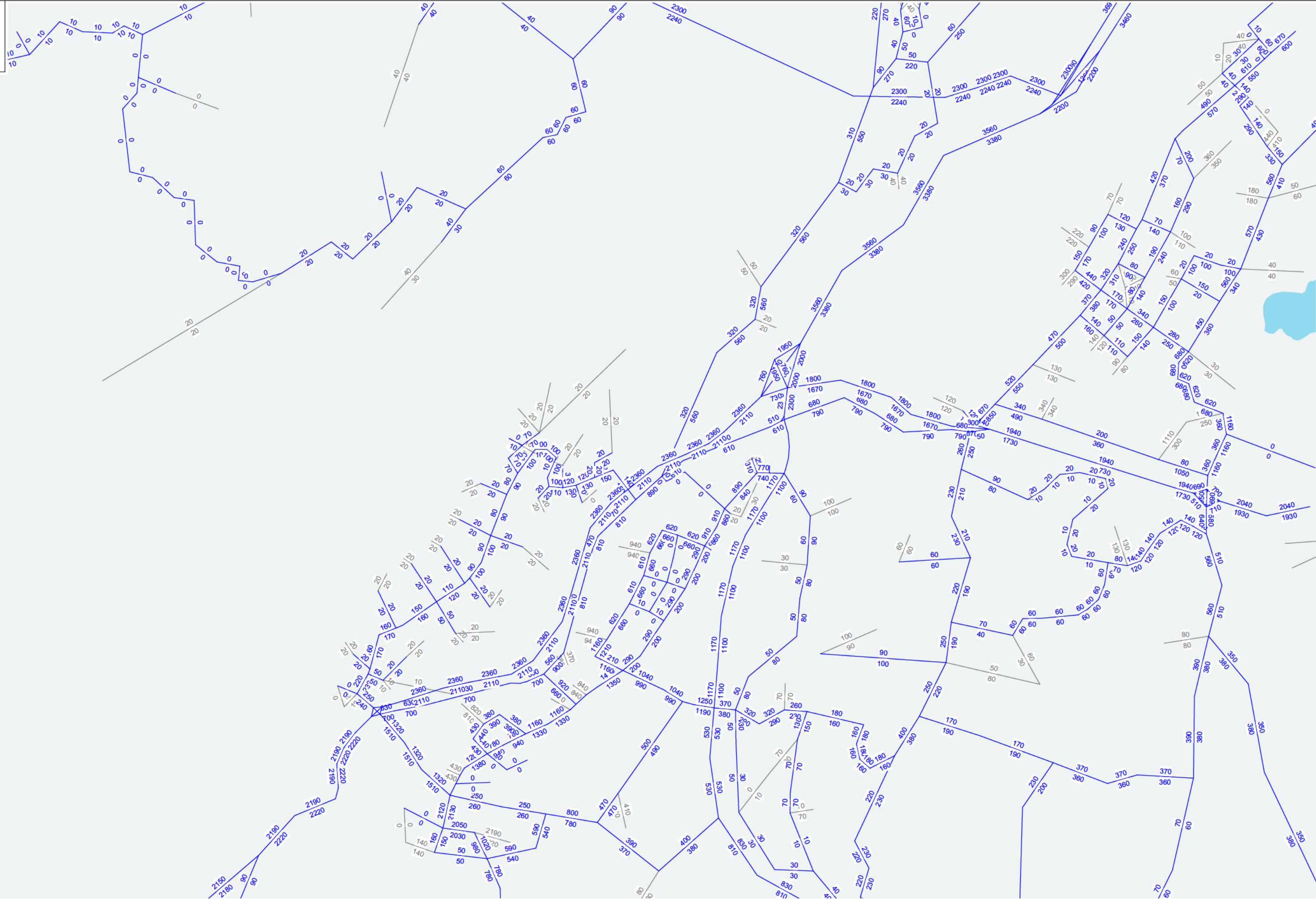
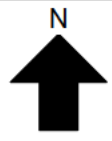
C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design_Toll\SL_Cordon\TOLL_ADT.NET

Annual Average Daily Traffic (AADT) Light Vehicles for Consenting Design Toll scenario, Year 2063



C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design_Tol\TOLL_ADT.NET

Annual Average Daily Traffic (AADT) Heavy Vehicles for Consenting Design Toll scenario, Year 2063



C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design_Tol\TOLL_ADT.NET

B

Appendix B –Level of Service Plots

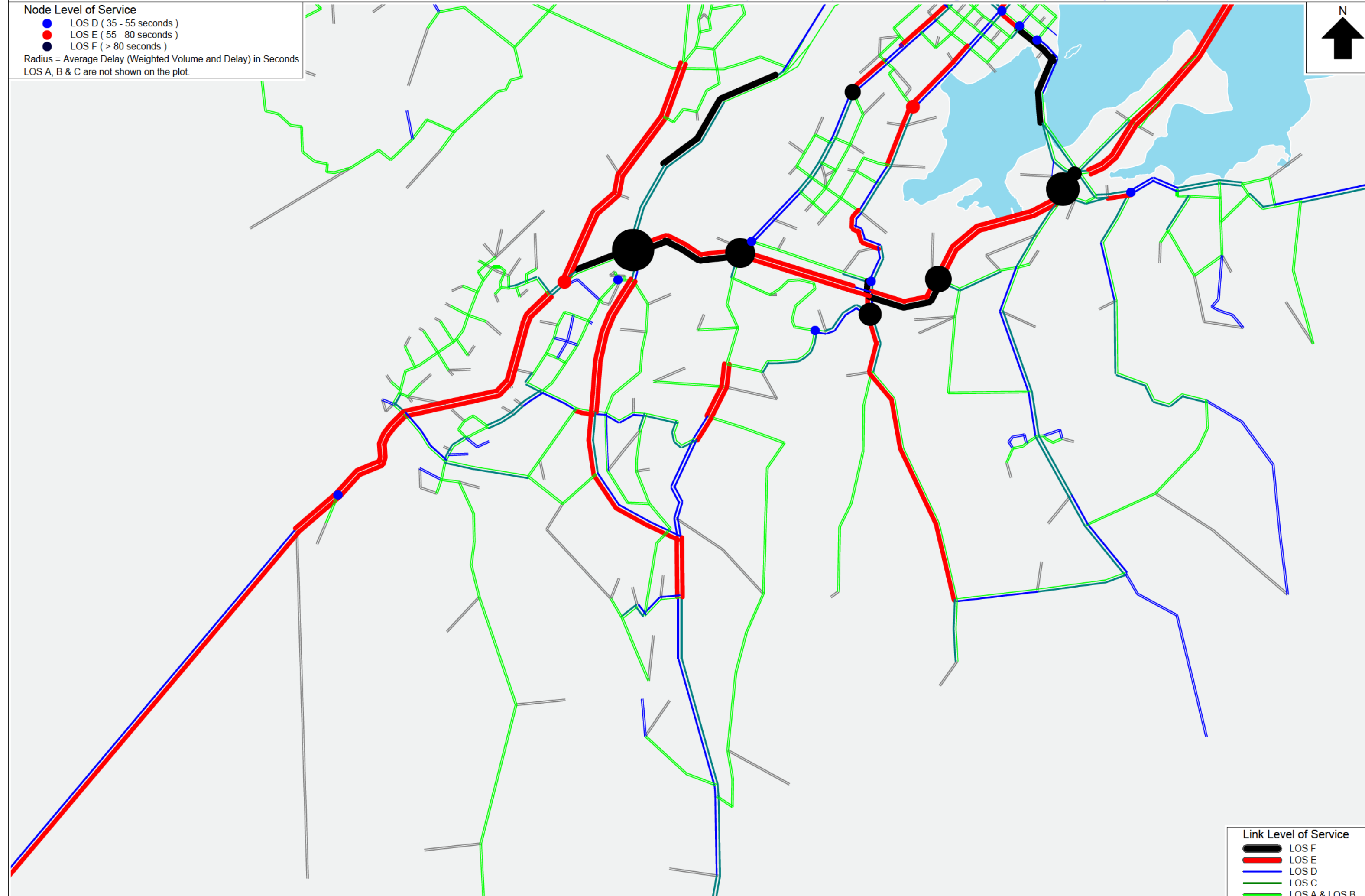
Level of Service for Tauriko RONS Y2048 (DM scenario) - Based on Average One Hour AM Peak (7am-9am)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds
LOS A, B & C are not shown on the plot.

N



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\DM\LOS_Toll_AM.NET

Level of Service for Tauriko RONS Y2048 (DM scenario) - Based on Average One Hour PM Peak (4pm-6pm)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds
LOS A, B & C are not shown on the plot.

N



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\DM\LOS_Toll_PM.NET

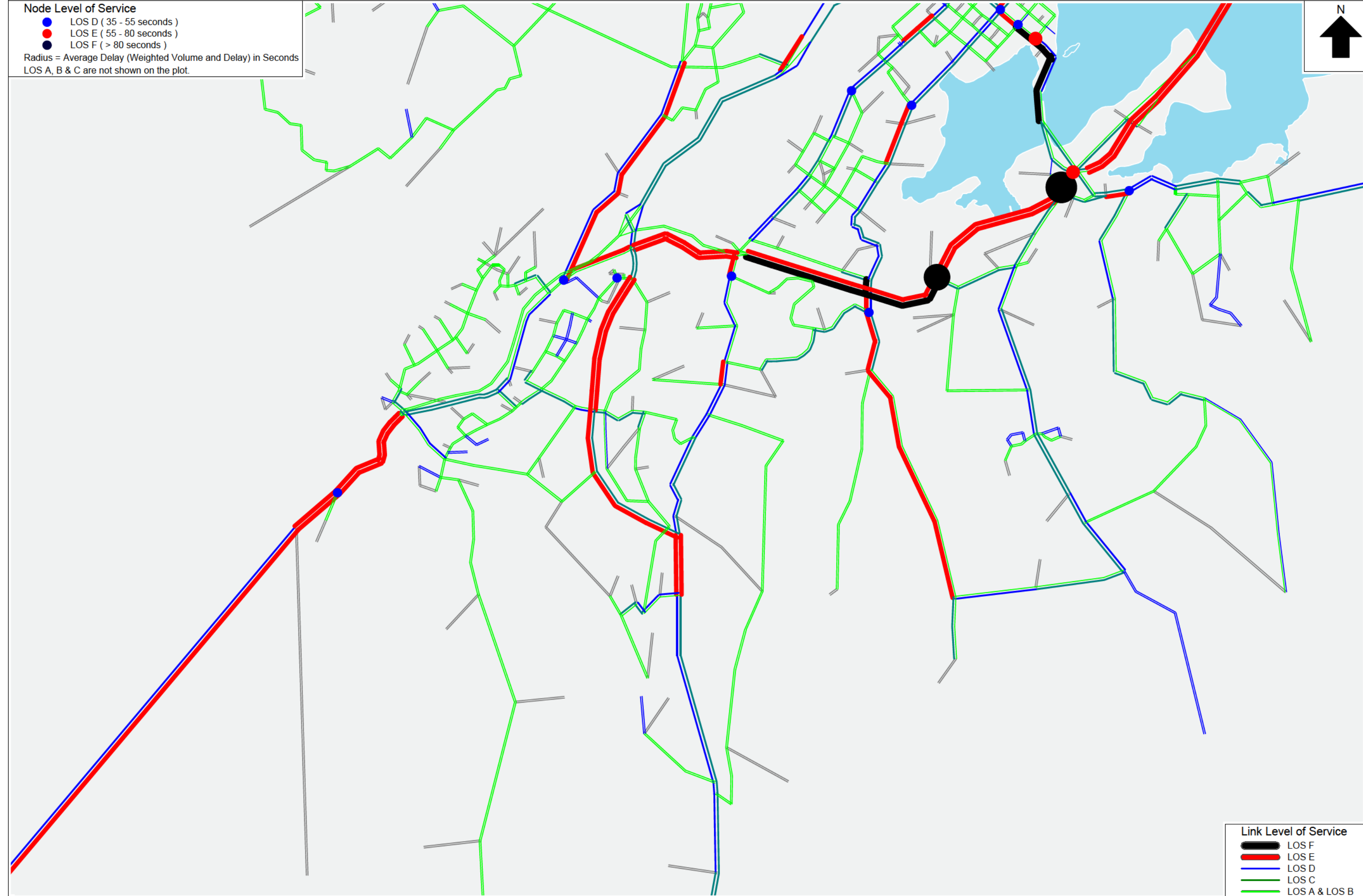
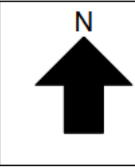
Level of Service for Tauriko RONS Y2048 (Consenting Design scenario) - Based on Average One Hour AM Peak (7am-9am)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds

LOS A, B & C are not shown on the plot.



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

Level of Service for Tauriko RONS Y2048 (Consenting Design scenario) - Based on Average One Hour PM Peak (4pm-6pm)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds
LOS A, B & C are not shown on the plot.

N



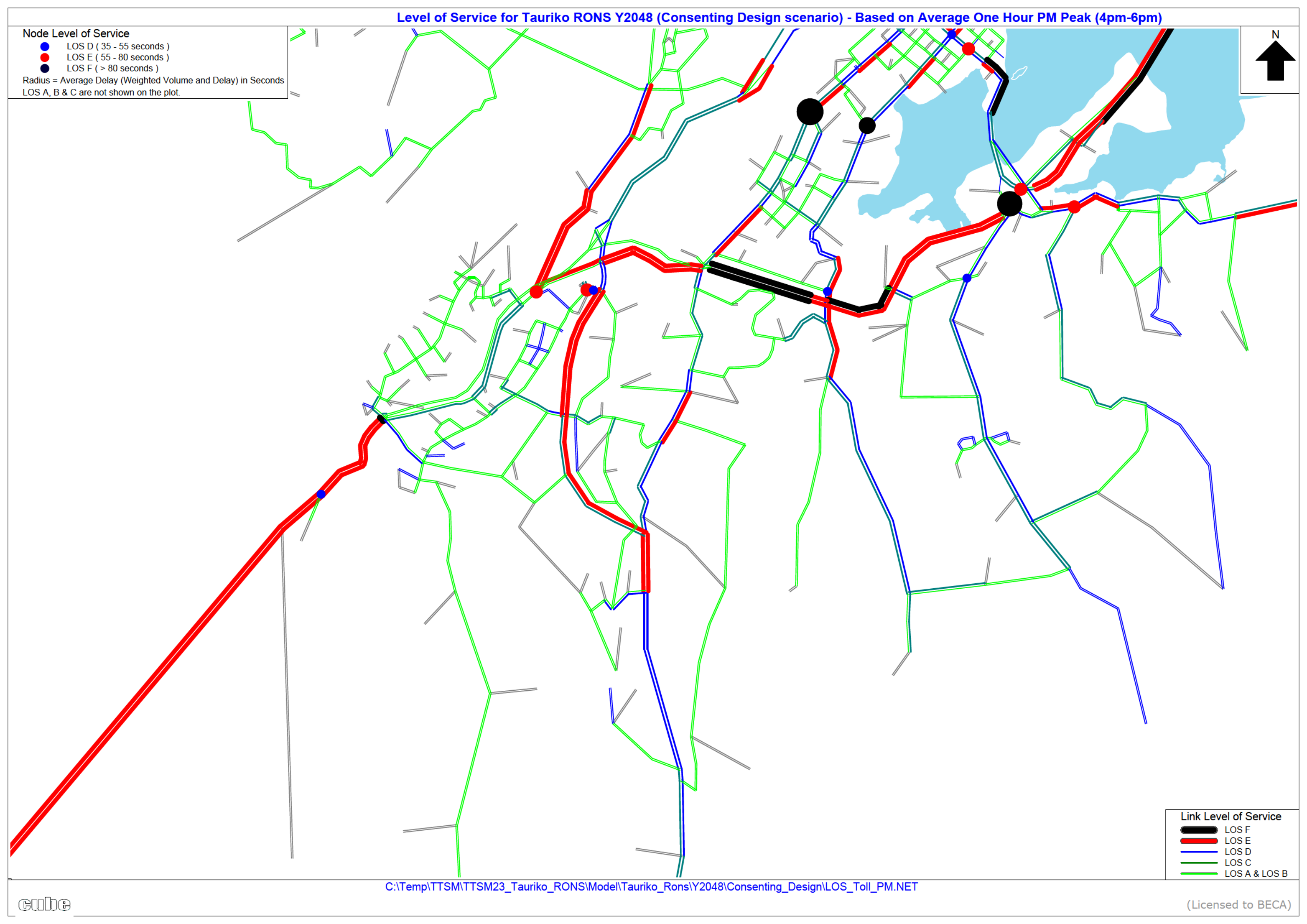
Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\Consenting_Design\LOS_Toll_PM.NET

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Level of Service for Tauriko RONS Y2048 (Consenting Design Toll scenario) - Based on Average One Hour AM Peak (7am-9am)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds
LOS A, B & C are not shown on the plot.

N



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2048\Consenting_Design_Toll\LOS_Toll_AM.NET

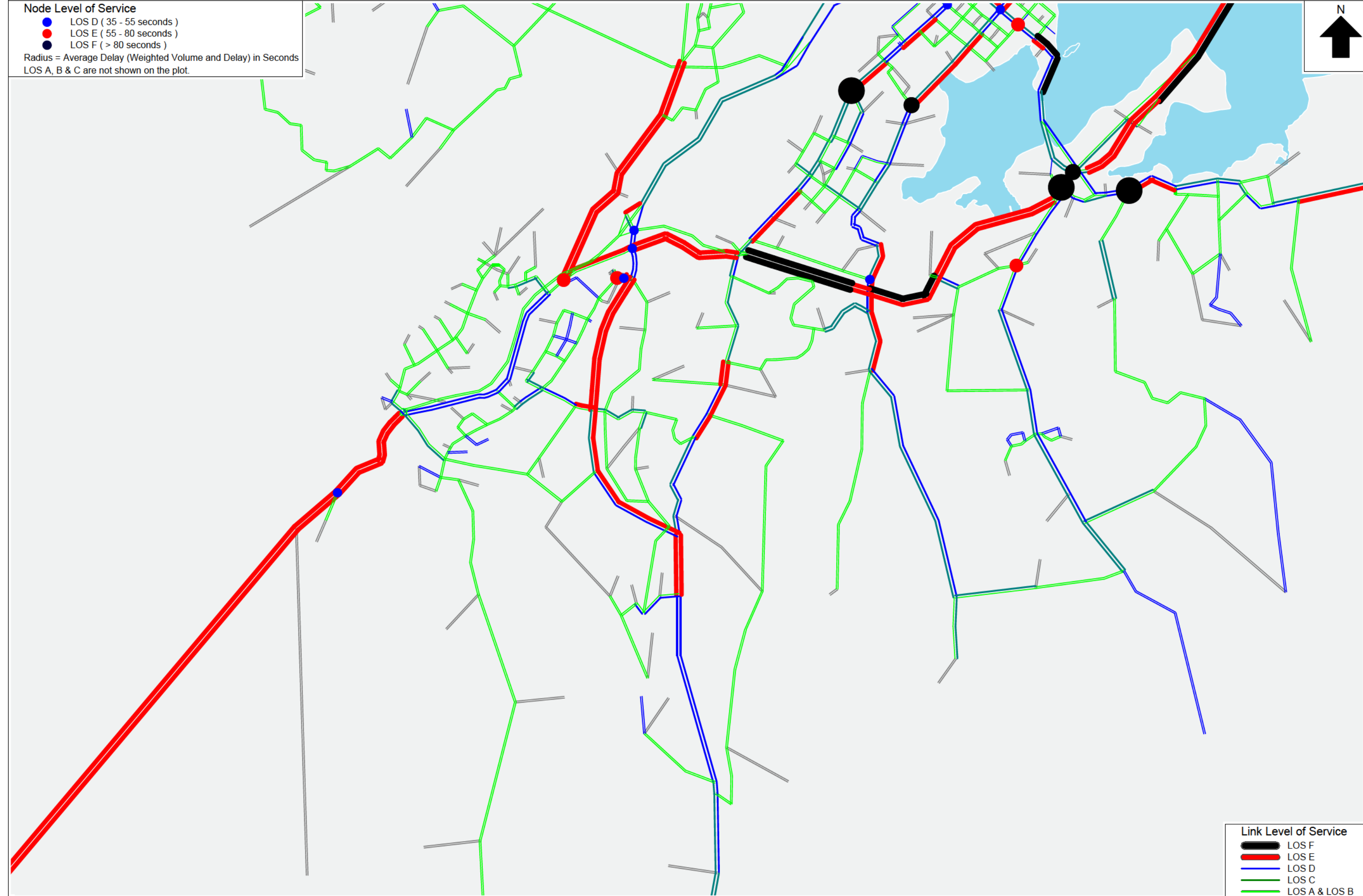
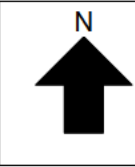
Level of Service for Tauriko RONS Y2048 (Consenting Design Toll scenario) - Based on Average One Hour PM Peak (4pm-6pm)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds

LOS A, B & C are not shown on the plot.



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

Level of Service for Tauriko RONS Y2063 (DM scenario) - Based on Average One Hour AM Peak (7am-9am)

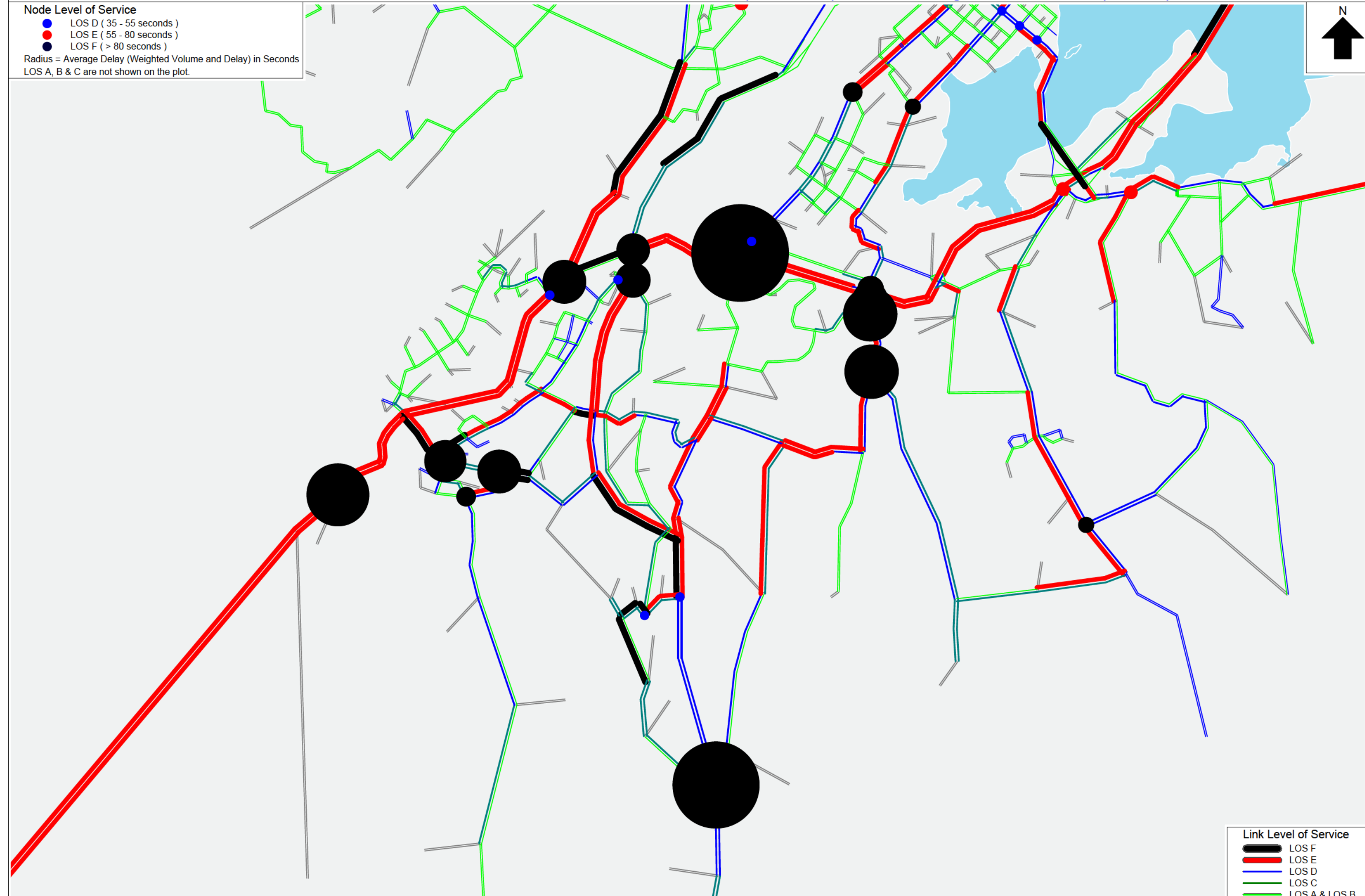
Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds

LOS A, B & C are not shown on the plot.

N



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\DM\LOS_Toll_AM.NET

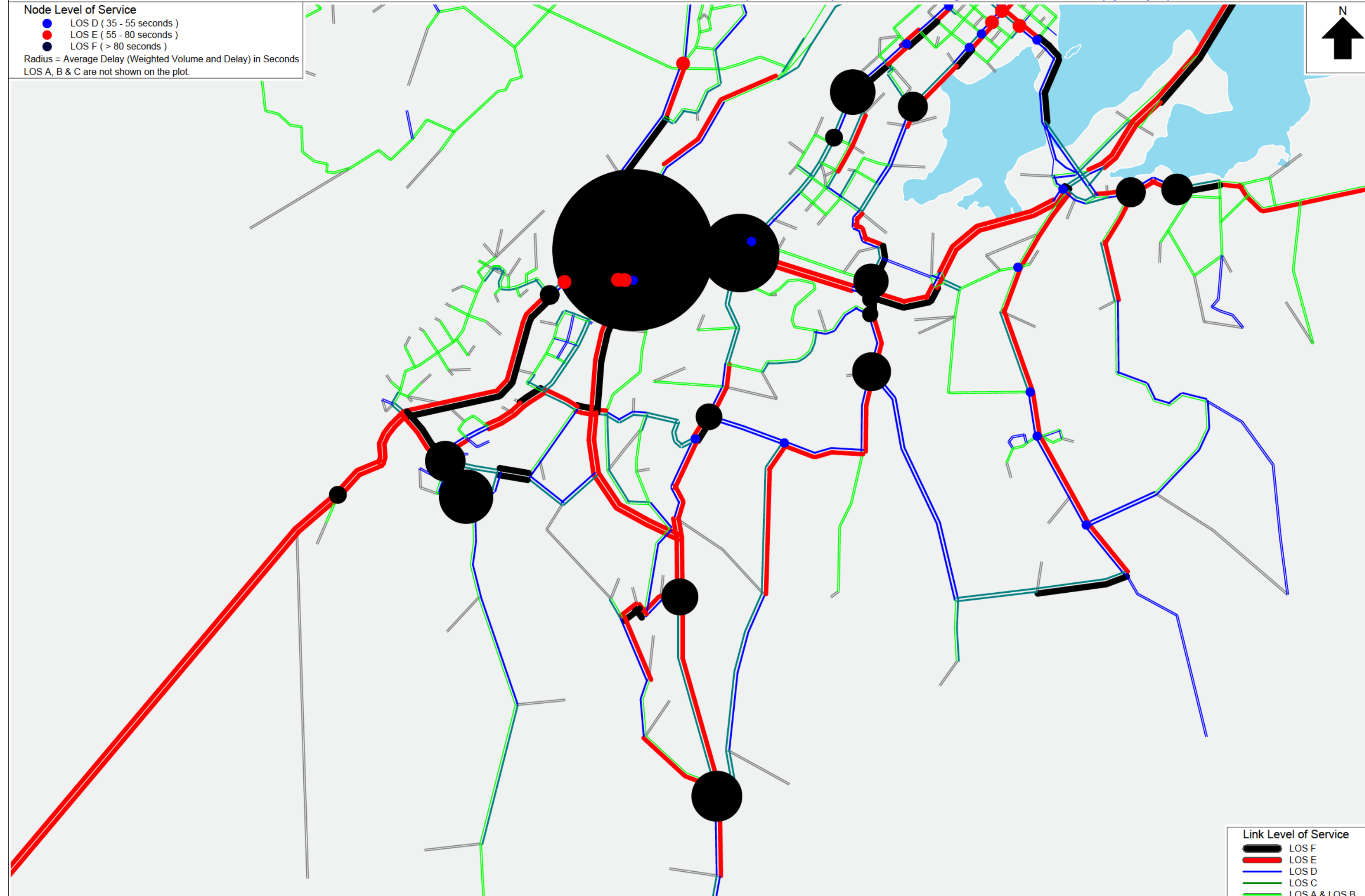
Level of Service for Tauriko RONS Y2063 (DM scenario) - Based on Average One Hour PM Peak (4pm-6pm)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds
LOS A, B & C are not shown on the plot.

N



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\DM\LOS_Toll_PM.NET

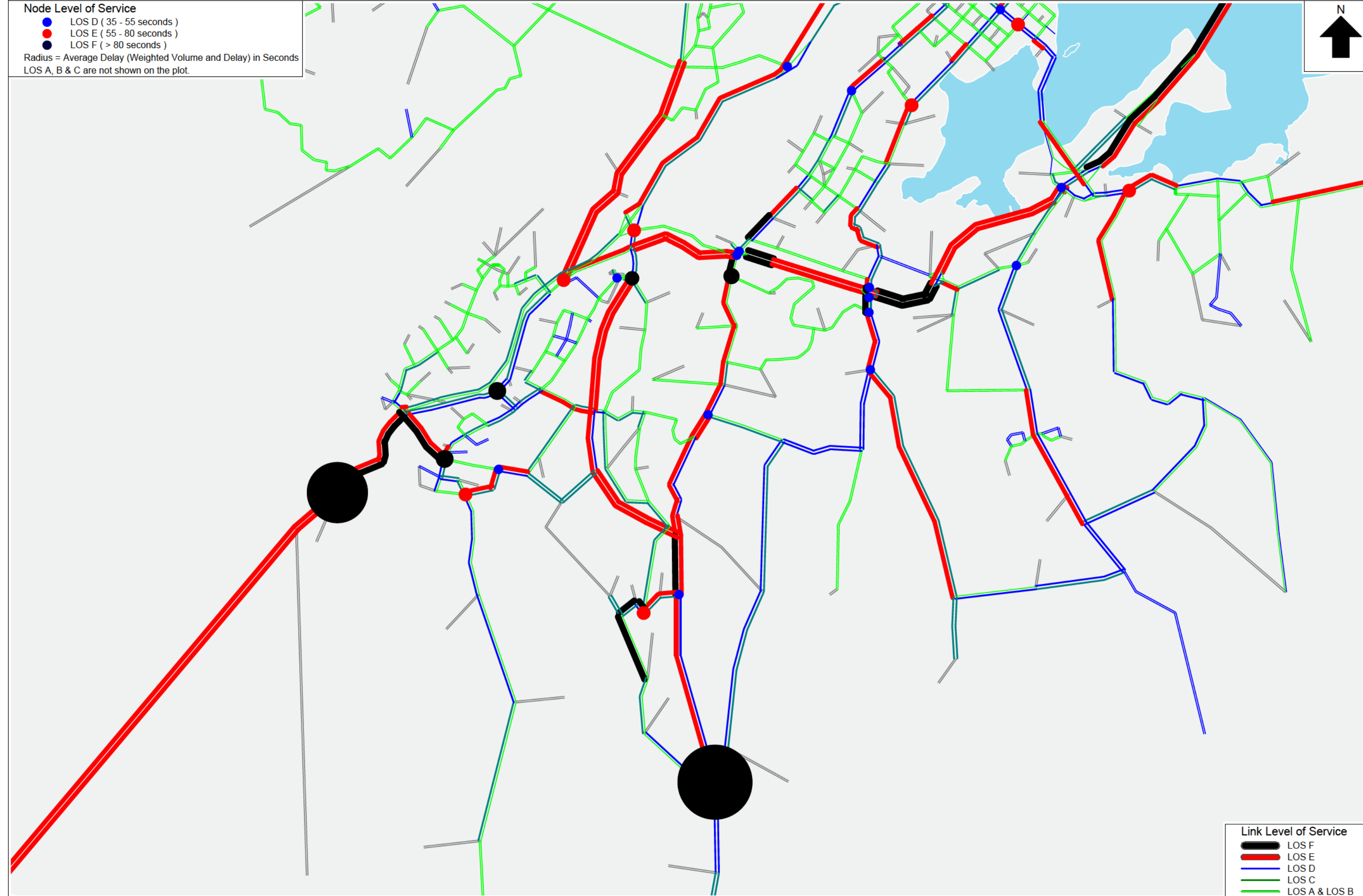
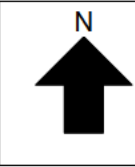
Level of Service for Tauriko RONS Y2063 (Consenting Design scenario) - Based on Average One Hour AM Peak (7am-9am)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds

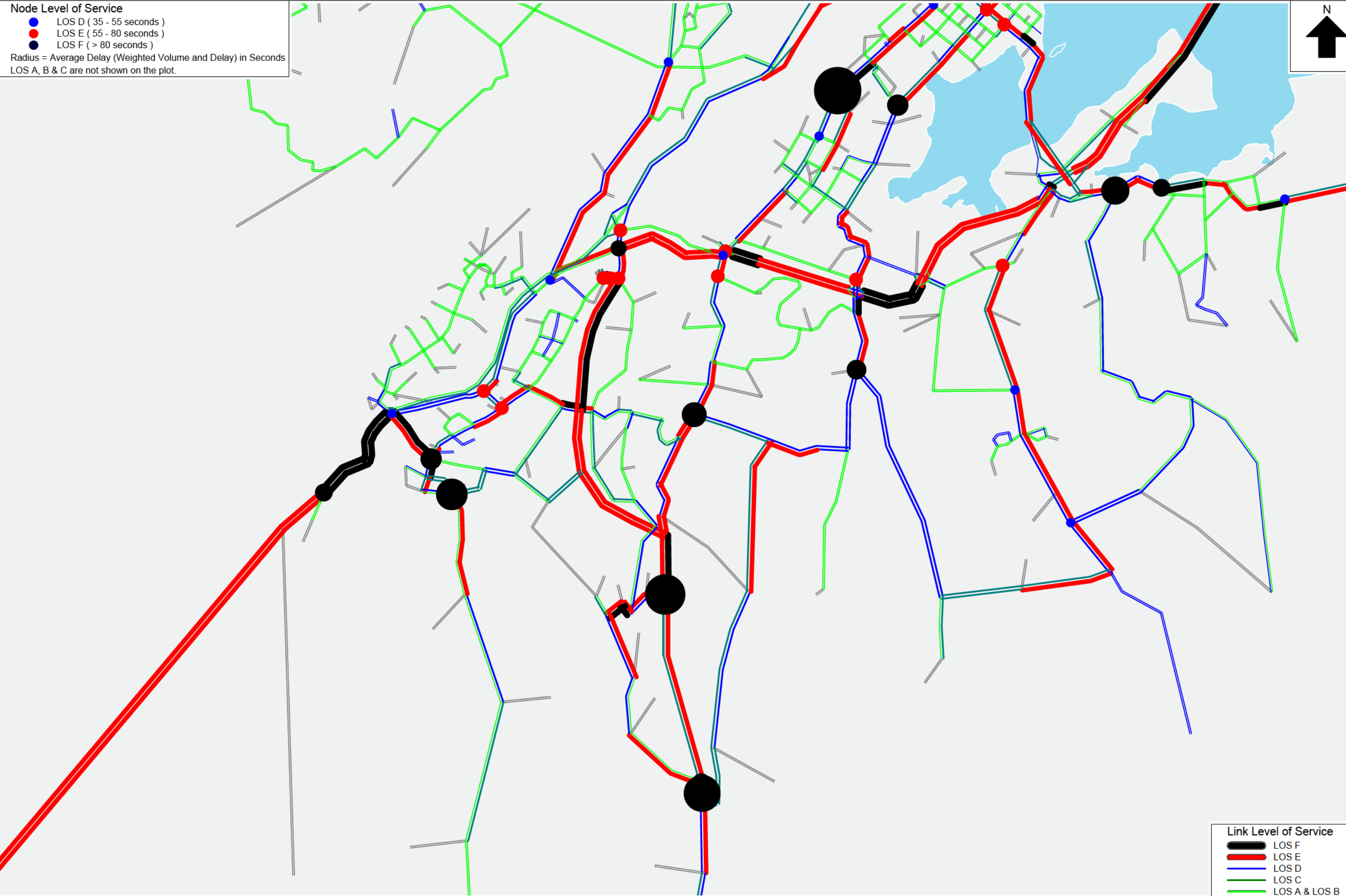
LOS A, B & C are not shown on the plot.



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

Level of Service for Tauriko RONS Y2063 (Consenting Design scenario) - Based on Average One Hour PM Peak (4pm-6pm)



C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design\LOS_Toll_PM.NET

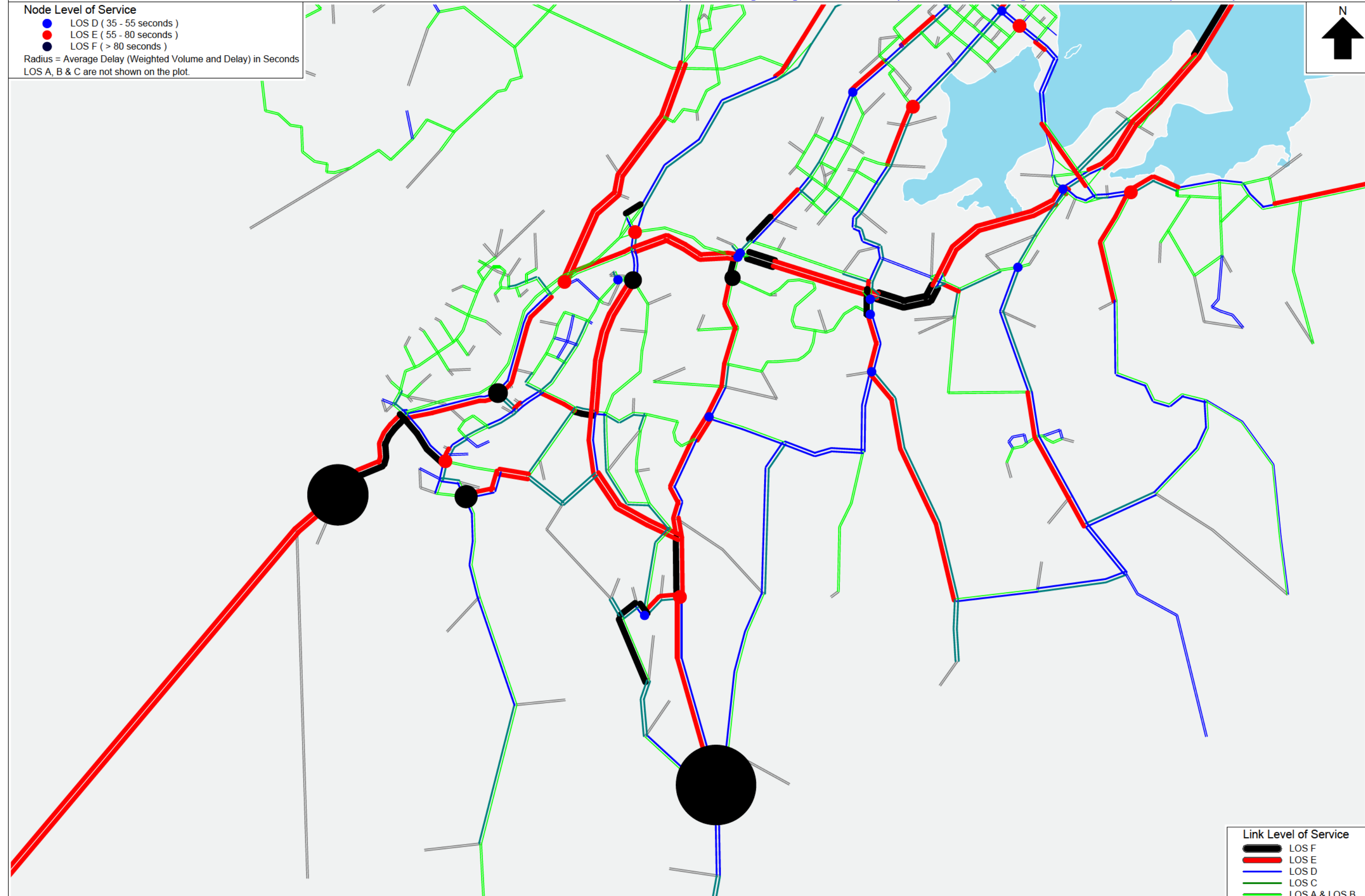
Level of Service for Tauriko RONS Y2063 (Consenting Design Toll scenario) - Based on Average One Hour AM Peak (7am-9am)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds
LOS A, B & C are not shown on the plot.

N



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C:\Temp\TTSM\TTSM23_Tauriko_RONS\Model\Tauriko_Rons\Y2063\Consenting_Design_Toll\LOS_Toll_AM.NET

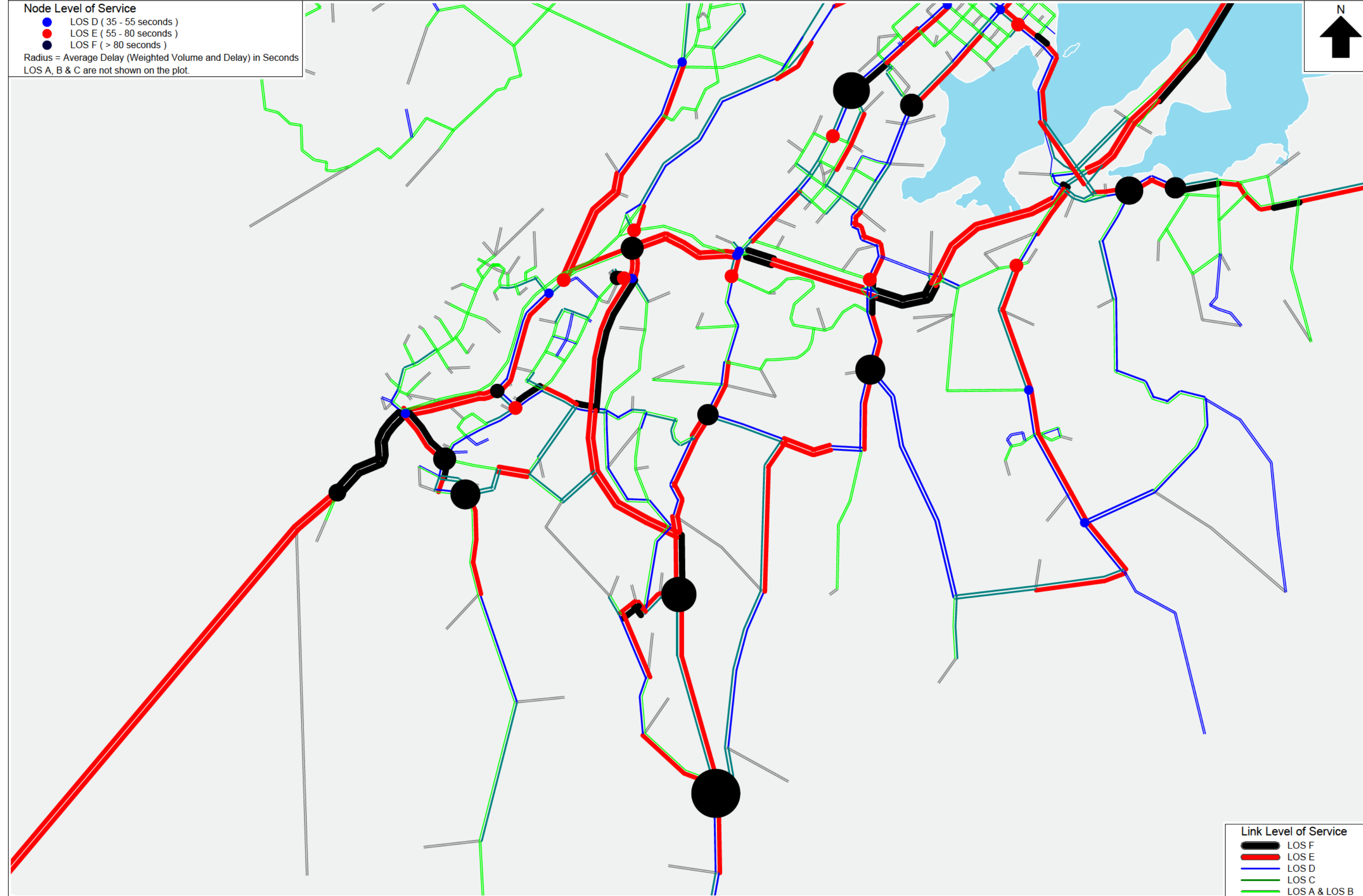
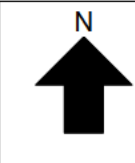
Level of Service for Tauriko RONS Y2063 (Consenting Design Toll scenario) - Based on Average One Hour PM Peak (4pm-6pm)

Node Level of Service

- LOS D (35 - 55 seconds)
- LOS E (55 - 80 seconds)
- LOS F (> 80 seconds)

Radius = Average Delay (Weighted Volume and Delay) in Seconds

LOS A, B & C are not shown on the plot.



Link Level of Service

- LOS F
- LOS E
- LOS D
- LOS C
- LOS A & LOS B

C

Appendix C – Journey Time

Journey time (min) Based on Average One Hour Peak

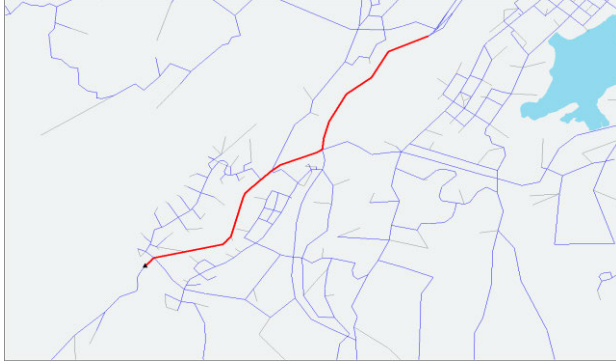
AM Peak = 7am-9am

PM peak = 4pm-6pm

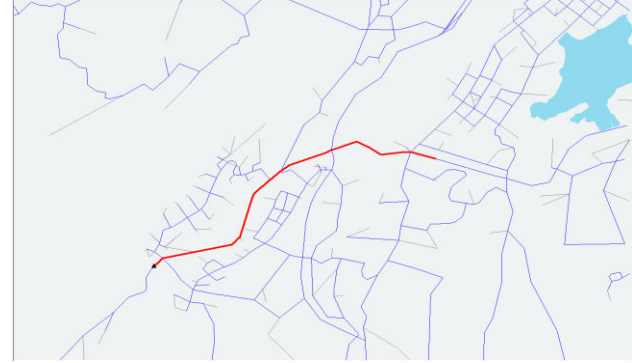
Year	Scenario	Peak	SH29 to TNL				SH29 to SH29A				SH29 to Cameron Rd			
			via existing SH29		via SH29 Offline		via existing SH29		via SH29 Offline		via existing SH29		via SH29 Offline	
			NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
2048	DM	AM	11.6	11.3			11.0	10.2			11.0	9.1		
		PM	10.4	14.2			13.6	9.3			13.4	14.2		
	Consenting Design	AM			3.8	3.8			4.2	4.2	8.0	8.1	5.8	6.4
		PM			3.8	3.8			4.4	4.0	8.8	8.1	6.4	6.3
	Consenting Design_Toll	AM			3.8	3.8			4.1	4.1	8.3	8.3	5.9	6.4
		PM			3.8	3.8			4.3	3.9	9.2	8.2	6.7	6.6
2063	DM	AM	20.5	11.3			20.5	11.1			20.4	8.8		
		PM	8.7	28.1			13.1	20.6			13.0	24.8		
	Consenting Design	AM			4.1	3.8			5.1	5.2	8.9	8.7	6.4	7.6
		PM			3.9	4.0			5.2	5.6	9.8	11.3	7.7	8.8
	Consenting Design_Toll	AM			4.0	3.8			4.9	5.0	9.2	8.9	6.3	7.8
		PM			3.8	3.9			5.1	5.2	10.3	11.8	8.4	9.5

Do Minimum

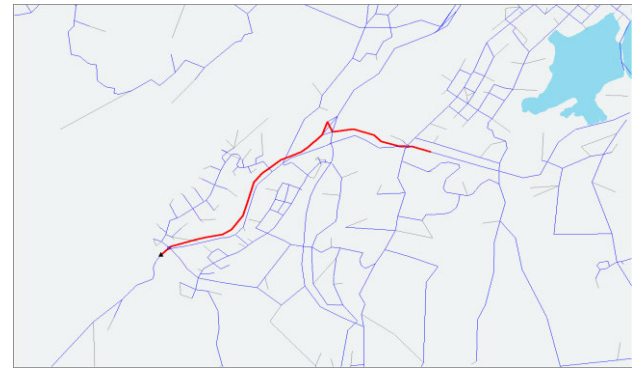
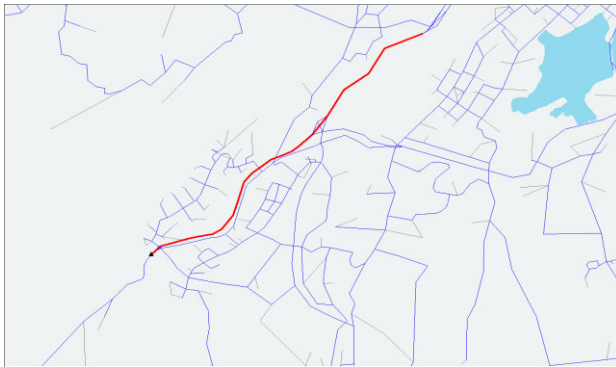
SH29 to TNL



SH29 to SH29A

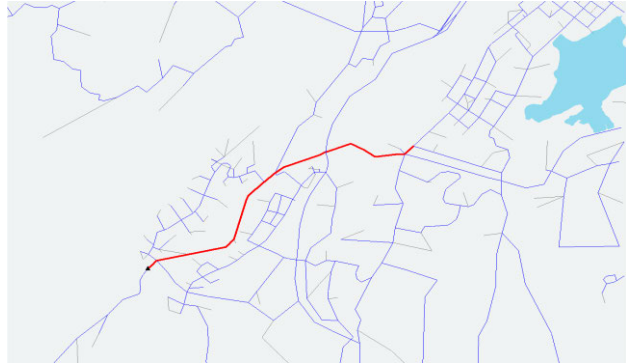


Consenting Design

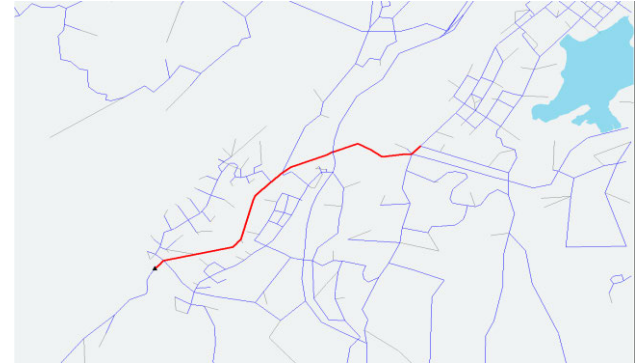


SH29 to Cameron Rd (via revoked SH29 in Consenting Design)

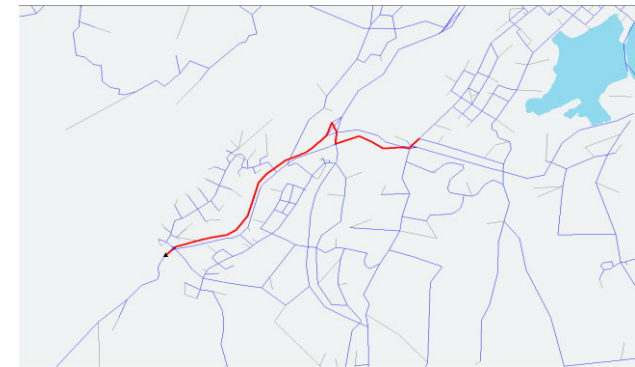
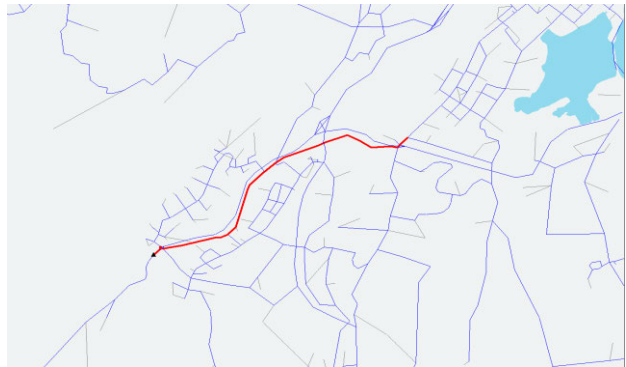
Do Minimum



SH29 to Cameron Rd (via SH29 Offline in DS)



Consenting Design





Appendix D – Cordon Matrix

AM Peak (Based on Average One Hour Peak 7am-9am)

Full Cordon Analysis - All Vehicles

48_DM													Total
	A	B	C	D1	D2	E	F	G	H	I	J	K	L
A		71	364	0	0	0	48	47	24	24	20	2	577
B	47		278	0	0	15	156	236	7	146	55	8	940
C	141	23		0	0	11	47	2	0	0	0	0	1,240
D1	0	0	0		0	0	0	0	0	0	0	0	0
D2	0	0	0	0		0	0	0	0	0	0	0	0
E	0	3	9	0			196	177	88	17	93	83	678
F	23	25	23	0	0		128	1	333	26	20	15	1,012
G	9	152	1	0	0	40	0		603	22	23	3	861
H	2	5	0	0	0	88	217	881		13	206	219	1,665
I	0	2	0	0	0	14	21	51	27		135	268	544
J	13	210	1	0	0	68	25	54	401	91		65	930
K	8	51	0	0	0	51	10	4	252	229	34		733
L	1	10	0	0	0	7	3	8	80	25	1	104	221
Total	244	941	888	0	0	420	723	1,460	1,771	425	682	833	8,573

48_Consenting_Design

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		59	158	73	0	0	21	228	24	6	96	32	3	701
B	48		123	78	0	0	49	399	12	6	189	40	6	951
C	69	96		0	0	0	0	176	0	69	21	5	438	
D1	35	63	0		0	58	42	36	0	0	0	0	0	234
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	0			136	127	54	24	93	68	6	589
F	14	74	0	260	0	108		2	240	43	79	32	10	863
G	52	369	336	0	0	53	2		743	68	161	51	21	1,901
H	11	9	0	0	0	26	161	846		27	241	143	20	1,485
I	5	10	8	0	0	29	52	147	55		205	143	58	1,001
J	46	234	220	0	0	61	67	323	339	24		18	0	1,362
K	13	33	41	0	0	52	22	38	202	223	36		63	728
L	1	6	6	0	0	4	5	23	40	19	0	104		209
Total	303	953	892	491	0	392	557	2,345	1,716	475	1,198	942	199	10,462

48_Consenting_Design_Toll

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		68	173	102	0	0	27	139	1	2	47	17	2	579
B	57		148	106	0	0	70	350	1	5	165	37	6	945
C	80	107		0	0	0	2	103	0	0	24	2	1	321
D1	45	85	0		0	51	45	10	0	0	1	0	0	237
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	0	0		146	173	56	26	131	83	8	702
F	17	107	0	281	0	108		2	225	48	77	31	10	901
G	28	314	169	0	0	71	1		832	68	194	49	26	1,752
H	1	1	0	0	0	29	155	893		28	283	158	24	1,572
I	2	6	0	0	0	31	51	148	55		217	431	58	1,000
J	18	205	97	0	0	80	67	343	445	66		22	0	1,343
K	8	38	7	0	0	58	20	35	247	222	35		63	732
L	1	6	1	0	0	4	5	21	40	19	0	102		199
Total	256	937	595	569	0	431	588	2,218	1,905	477	1,176	932	197	10,282

Full Cordon Analysis - All Vehicles

63_DM													Total
	A	B	C	D1	D2	E	F	G	H	I	J	K	L
A		87	438	0	0	1	46	46	11	16	12	1	659
B	67		368	0	0	6	199	273	11	111	39	3	1,076
C	357	542		0	0	32	261	46	0	0	2	1	1,240
D1	0	0	0		0	0	0	0	0	0	0	0	0
D2	0	0	0	0		0	0	0	0	0	0	0	0
E	0	4	13	0	0		263	176	148	2	77	50	738
F	15	175	194	0	0	89		6	269	2	6	3	755
G	7	166	1	0	0	34	0		567	2	6	3	818
H	6	20	0	0	0	122	471	1,129		9	410	248	2,441
I	0	2	0	0	0	2	1	6	6		154	165	346
J	8	189	0	0	0	48	9	11	271	14		338	955
K	6	48	1	0	0	40	3	3	254	119	35		633
L	1	14	0	0	0	6	3	2	59	11	2	93	188
Total	467	1,248	1,014	0	0	375	1,253	1,698	1,627	160	818	948	8,850

63_Consenting_Design

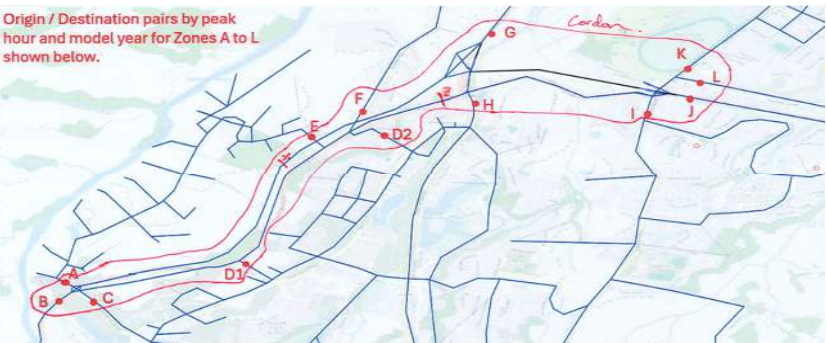
	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		65	213	71	0	0	23	269	25	8	107	32	4	816
B	46		175	81	0	0	47	457	11	13	214	36	7	1,086
C	134	223		0	0	5	28	710	0	0	214	11	1	1,336
D1	83	193	0		0	136	160	150	0	0	10	0	0	732
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	0	0		169	78	54	24	85	57	8	604
F	10	77	1	310	0	95		2	210	35	41	21	10	810
G	51	408	0	0	0	47	21		54	205	34	25	19	1,901
H	6	12	0	0	0	31	26	139		49	257	565	64	2,028
I	3	10	0	0	0	3	55	0	48		87	87	10	1,195
J	42	225	272	1	0	63	68	346	286	48		67	2	1,473
K	7	32	14	0	0	59	40	25	260	198	35		75	719
L	1	6	2	0	0	5	5	14	54	16	0	42		143
Total	383	1,260	1,085	601	0	478	809	3,221	1,666	434	1,459	1,155	293	12,844

63_Consenting_Design_Toll

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		71	271	67	0	0	31	181	4	3	64	16	2	730
B	52		219	92	0	0	1	411	2	6	193	29	6	1,081
C	200	266		0	0	4	85	606	0	0	132	5	2	1,281
D1	94	204	0		0	79	137	113	0	0	4	0	0	632
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	0	0		181	124	58	27	124	66	8	688
F	13	106	2	326	0	61		1	185	32	42	19	8	825
G	27	307	243	5	0	59	2		796	56	206	32	24	1,757
H	1	5	0	0	0	53	217	1,028		43	389	287	83	2,106
I	2	6	0	0	0	28	61	174	46		253	566	70	1,205
J	18	240	135	4	0	73	58	399	372	55		86	5	1,444
K	6	39	3	5	0	54	16	17	282	201	36		73	733
L	1	6	1	2	0	6	5	13	62	16	0	43		164
Total	414	1,262	875	619	0	447	843	3,066	1,807	439	1,443	1,148	281	12,635

Cordon Map

Origin / Destination pairs by peak hour and model year for Zones A to L shown below.



PM Peak (Based on Average One Hour Peak 4pm-6pm)

Full Cordon Analysis - All Vehicles
48_DM

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		57	211	0	0	0	19	17	0	10	5	0	0	321
B	85		33	0	0	8	147	296	1	2	143	34	3	1,049
C	341	270		0	0	25	143	0	0	0	0	0	0	785
D1	0	0	0		0	0	0	0	0	0	0	0	0	0
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	3	4	0	0		112	78	97	13	57	29	2	395
F	71	261	97	0	0	227		1	411	24	24	4	1	1,121
G	24	110	0	0	0	82	0	600	21	18	1	1	1	857
H	3	6	0	0	0	124	277	931		41	385	186	17	1,968
I	2	4	0	0	0	16	23	46	33		291	229	15	661
J	41	172	0	0	0	137	37	38	399	226		6	0	1,056
K	13	36	0	0	0	44	6	6	171	207	48		100	633
L	3	10	0	0	0	10	4	7	41	26	13	113		229
Total	583	930	644	0	0	671	767	1,427	1,754	561	991	608	139	9,075

48_Consenting_Design

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		47	84	41	0	0	11	93	35	6	49	20	1	388
B	71		109	71	0	0	55	455	19	12	220	49	6	1,060
C	146	124		0	0	0	1	385	0	2	201	43	5	905
D1	73	79	0		0	83	157	66	0	0	0	0	0	458
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	43	0		87	52	54	17	60	35	2	351
F	25	71	0	121	0	145		3	253	41	68	17	5	749
G	191	354	184	0	0	97	884		927	96	219	43	12	2,099
H	37	19	17	0	0	72	210	62		67	422	23	39	2,084
I	6	3	0	0	0	20	33	90	52		27	243	17	509
J	113	197	76	0	0	82	64	242	94	123		11	0	1,272
K	30	197	23	0	0	62	27	307	389	36	243		44	1,017
L	3	6	5	0	0	7	10	32	37	58	2	66		226
Total	696	946	461	275	0	569	656	2,367	2,048	804	1,313	850	131	11,116

48_Consenting_Design_Toll

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		55	91	78	0	0	15	41	1	0	20	7	0	307
B	83		125	106	0	0	93	376	2	4	211	42	5	1,048
C	178	143		0	0	2	54	223	0	0	93	3	1	704
D1	125	113	0		0	61	142	0	0	0	0	0	0	478
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	42	0		95	77	58	85	44	15	3	423
F	31	96	0	134	0	149		3	229	38	68	15	4	765
G	119	301	91	0	0	134	934		91	236	39	12	1	1,961
H	1	0	0	0	0	69	186	946		64	505	367	47	2,186
I	2	6	0	0	0	22	32	90	60		33	253	20	517
J	62	172	33	0	0	116	59	279	360	159		14	0	1,254
K	15	40	2	0	0	77	25	41	327	388	41		47	1,002
L	2	7	1	0	0	9	10	31	53	59	2	66		240
Total	618	933	344	360	0	639	711	2,141	2,024	821	1,304	852	140	10,886

Full Cordon Analysis - All Vehicles
63_DM

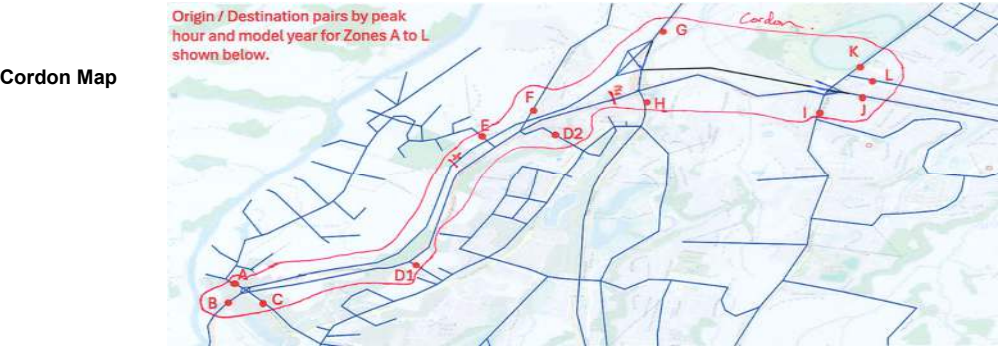
	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		111	356	0	0	0	12	12	16	2	6	3	0	520
B	96		572	0	0	10	97	241	33	15	148	33	4	1,250
C	418	400		0	0	13	130	19	0	0	0	0	0	1,001
D1	0	0	0		0	0	0	0	0	0	0	0	0	0
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	1	1	0	0		68	63	180	18	36	19	1	386
F	73	357	374	0	0	239		0	456	12	8	2	0	1,534
G	15	94	4	0	0	47	1		826	12	6	2	0	1,007
H	35	44	3	0	0	207	178	875		52	313	178	15	1,899
I	6	22	0	0	0	33	12	33	130		173	148	9	566
J	21	152	2	0	0	109	6	5	426	218		7	1	948
K	11	50	1	0	0	53	1	1	308	196	5		133	763
L	2	7	0	0	0	7	1	2	41	26	2	130		218
Total	676	1,248	1,314	0	0	735	508	1,251	2,417	559	698	524	164	10,092

63_Consenting_Design

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		52	142	92	0	0	10	81	28	7	58	8	1	479
B	73		178	199	0	0	50	393	29	18	298	24	4	1,266
C	203	170		0	0	12	66	430	3	1	244	14	2	1,145
D1	112	143	2		0	78	113	86	0	0	17	0	0	553
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	112	0		78	48	84	18	62	30	2	435
F	3	67	10	370	0	178		2	373	40	49	11	3	1,107
G	242	530	796	11	0	1,113		88	1,113	88	162	21	8	3,058
H	5	16	10	0	0	122	214	840		78	409	353	35	2,106
I	5	62	10	0	0	25	23	59	72		66	257	17	541
J	109	226	301	8	0	71	38	254	28	23		21	0	1,522
K	10	28	3	9	0	64	14	22	412	468	35		48	1,112
L	2	7	1	0	0	15	9	18	56	71	4	73		299
Total	782	1,262	1,447	806	0	629	617	2,214	2,492	1,020	1,422	812	120	13,621

63_Consenting_Design_Toll

	A	B	C	D1	D2	E	F	G	H	I	J	K	L	Total
A		63	231	111	0	0	10	39	4	2	25	3	0	488
B	86		217	239	0	0	71	343	11	11	263	16	2	1,259
C	152	194		0	0	11	131	296	7	1	154	3	1	1,051
D1	152	167	43		0	42	61	57	1	0	10	1	0	534
D2	0	0	0	0		0	0	0	0	0	0	0	0	0
E	0	0	0	0	0		88	67	92	19	84	30	2	471
F	23	90	45	350	0	183		2	345	33	49	8	3	1,130
G	191	468	607	13	0	80	1		1,180	71	265	11	3	2,893
H	5	19	12	0	0	151	221	898		81	427	384	45	2,242
I	2	8	6	1	0	23	21	36	64		81	269	17	528
J	84	220	218	7	0	83	29	275	319	248		22	0	1,506
K	5	21	15	8	0	64	11	14	417	465	40		46	1,108
L	1	5	4	4	0	15	7	14	97	75	4	75		301
Total	803	1,257	1,397	820	0	652	651	2,042	2,537	1,008	1,402	823	118	13,510





Appendix E – Level of Service Information

Level of service information

The criteria adopted for the LOS analysis is shown in **Table E-1**.

Table E-1: LOS Criteria for Link and Intersection Types

LOS	Intersection ³ (Weighted Average Delay, s)	Rural ⁴ (rolling) (V/C)	Rural (level) (V/C)	Freeway ⁵ (FFS<80) (V/C)	Freeway (FFS>80) (V/C)	Arterial ⁶ & Local (V/C)
A	< 10	< 0.04	< 0.05	< 0.26	< 0.30	< 0.26
B	10 - 20	0.04 - 0.15	0.05 - 0.17	0.26 - 0.40	0.30 - 0.48	0.26 - 0.43
C	20 - 35	0.15 – 0.30	0.17 – 0.33	0.40 – 0.60	0.48 – 0.70	0.43 – 0.62
D	35 - 55	0.30 – 0.46	0.33 – 0.58	0.60 – 0.85	0.70 – 0.90	0.62 – 0.82
E	55 - 80	0.46 – 0.90	0.58 – 1.00	0.85 – 1.00	0.90 – 1.00	0.82 – 1.00
F	> 80	> 0.9	> 1.00	> 1.00	> 1.00	> 1.00

³ HCM2000 Chapter16- Signalised Intersection.

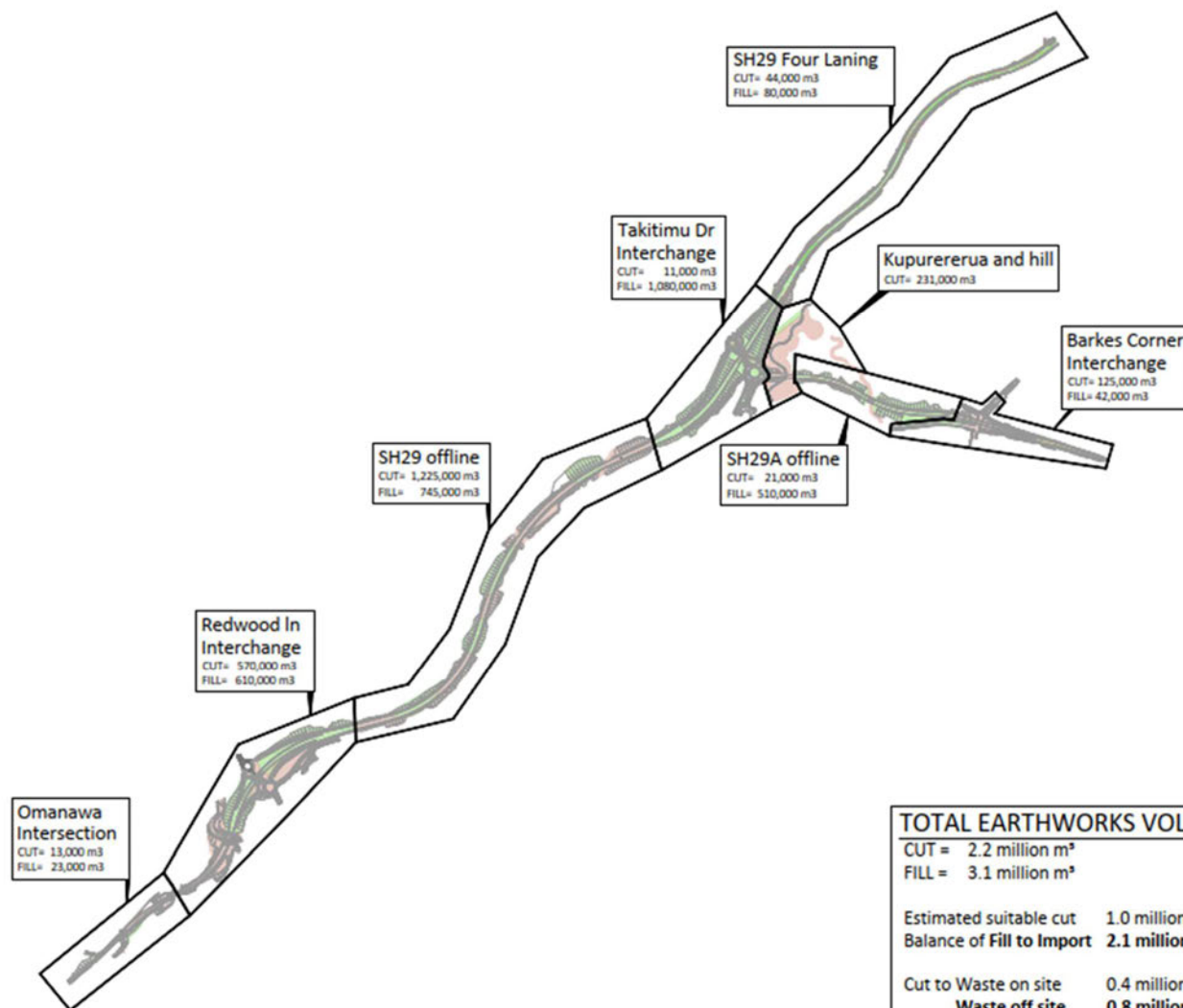
⁴ Austroad Part2- Roadway Capacity, 1988. Assumed 80% of sight distance length.

⁵ HCM2000 Chapter23- Basic Freeway Segment.

⁶ Technical paper “Performance Measures and Threshold Value for Northeast Ohio Areawide Coordinating Agency’s (NOACA’s) Congestion Management Process, NOACA, August 2007”

Appendix B – Bulk Earthworks





TOTAL EARTHWORKS VOLUME SUMMARY	
CUT =	2.2 million m ³
FILL =	3.1 million m ³
Estimated suitable cut	1.0 million m ³
Balance of Fill to Import	2.1 million m ³
Cut to Waste on site	0.4 million m ³
Waste off site	0.8 million m ³

