Planning | Surveying | Engineering | Environmental

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Subject: **Rotokauri Minor Arterial Road**
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Dear Joe

Introduction

The proposed project for which a fast-track application under the COVID-19 Recovery (Fast-track Consenting) Act 2020 is being applied for is the consenting and construction of:

- the Rotokauri Greenway;
- the Minor Arterial;
- the bulk watermain under the Minor Arterial and other roads;
- the wastewater rising main, and
- strategic wastewater pipeline and pump station.

The purpose of this project is to provide the necessary infrastructure pertaining to stormwater management and discharge along with critical roading connectivity to enable the residential development of the Rotokauri, a 'live' zoned residential growth cell in Hamilton north. The Rotokauri growth cell has a planned capacity of approximately 7,000 homes for approximately 20,000 people (noting this could increase with the recent proposed changed under HCC's Plan Change 12). Appropriate and necessary infrastructure is required to enable the balance of this growth cell. The key objective of this project is to design, consent and enable high-quality infrastructure that supports well-functioning urban development that can provide for the social, cultural and economic well-being of the community and wider Waikato region.

As highlighted above, there are two key components to this proposal, the Greenway and the Minor Arterial, which integrate and need to be designed and consented in parallel. Both pieces of infrastructure are critical features of the existing Rotokauri Structure Plan contained in the Hamilton City District Plan and certified Rotokauri Integrated Catchment Management Plan (ICMP).

The Greenway is a multi-functioning ecological corridor that will provide for stormwater management, open space and an active transport network, traverses a range of adjacent land use and offering a range of opportunities including ecological restoration, water runoff treatment recreational activities and cultural re-instatement. The Greenway will include a fluvial system of swales, artificial wetlands and ponds, with extensive planting of indigenous species along the length of the corridor. The approximately 4.7km length corridor will run between Lake Waiwhakareke (high

point) and Lake Rotokauri (low point) to effectively manage and attenuate stormwater within the area, treating stormwater prior to discharge to enhance the water quality and surrounding natural environments and ecosystems. The overarching purpose of the Greenway is to provide treatment, conveyance and storage of flows from Lake Waiwhakareke at the upper extent of the catchment) to Lake Rotokauri approximately 4km north. Construction of the Greenway includes major re-alignment and re-contouring of the existing Rotokauri Drain, as well as an upgrade to the culvert below Exelby Road and the construction of check dams in the lower reaches to assist in managing flows. The Greenway includes a 5 metre wide shared path on the southern side and a 3 metre wide secondary path on the north side.

The Minor Arterial is a key piece of enabling infrastructure that promotes a housing development within Rotokauri. The Minor Arterial extends 3.8km in length from Te Wetini Drive to the northern boundary of Hounsell Holdings land, including the collector road to the Chalmers Road underpass and the northern boundary of Hounsell Holdings land to the underpass that links to Te Kowhai East Road. It is noted that the extension of Chalmers Road passes under SH1C. This has been planned for as SH1C includes a bridge to allow for this extension. No changes are proposed to the current roading function or design of SH1C. Consultation with Waka Kotahi has previously been undertaken and aside from some detailed geotechnical and procedural matters, no issues have raised in relation to the extension of Chalmers Road.

Supporting three water infrastructure which is sized to cater for the wider catchment is also proposed which includes:

- the bulk watermain under the Minor Arterial;
- wastewater rising main;
- strategic wastewater pipeline, and
- pump station will also be included in the project.

The Minor Arterial will prioritise and enable active transportation with wide footpaths and separated cycleways, supported by planted medians to improve safety. There will be public transport connections provided, which will connect to the Rotokauri Transport Hub (1 kilometre east of Rotokauri), with bus stops along the length of the corridor.

Figure 1 below is the Structure Plan for Rotokauri as included within the District Plan. The line in orange represents the proposed minor arterial road. This matches the alignment of the minor arterial road identified within the structure plan.

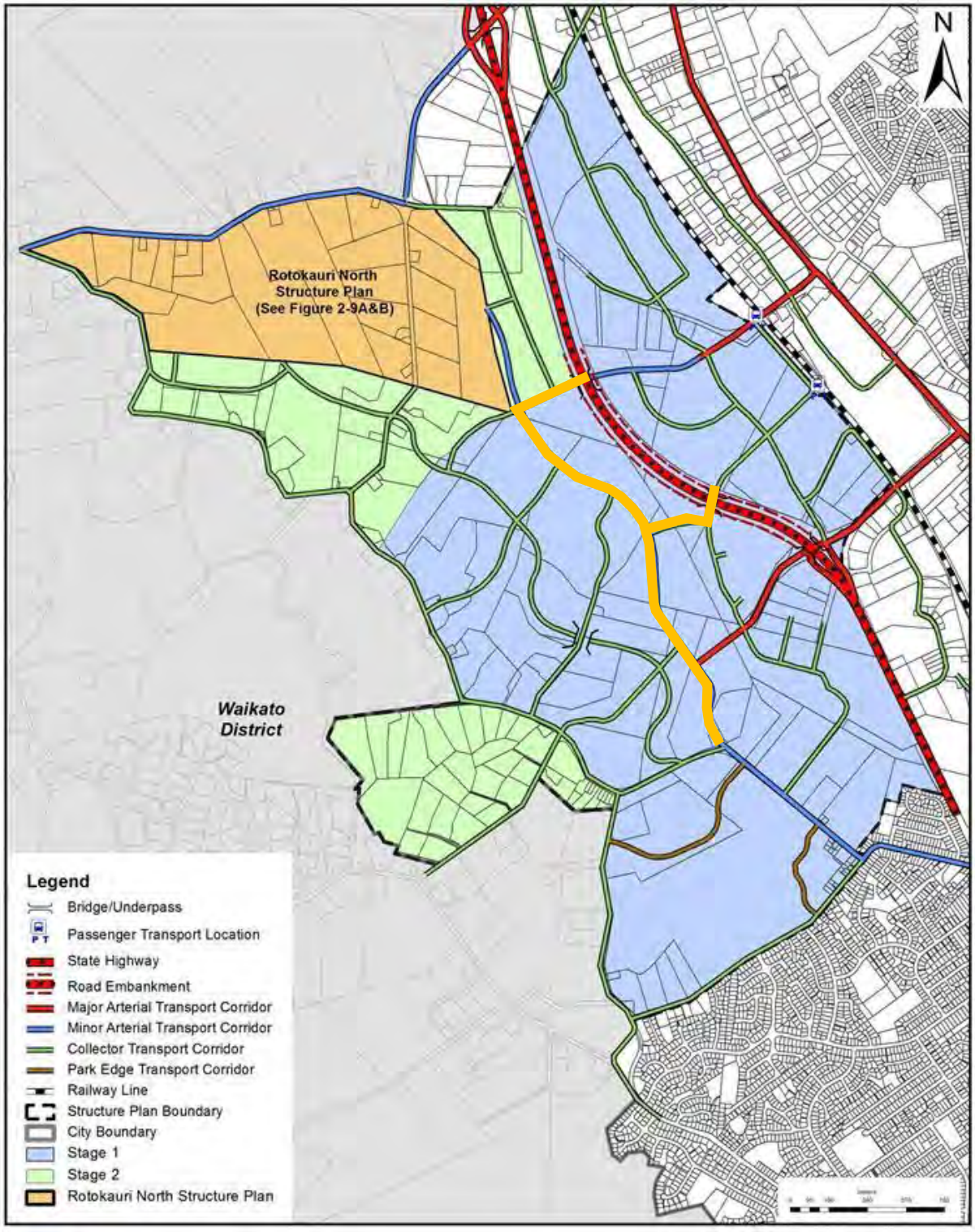


Figure 1: Rotokauri Structure Plan – Staging and Transport Network

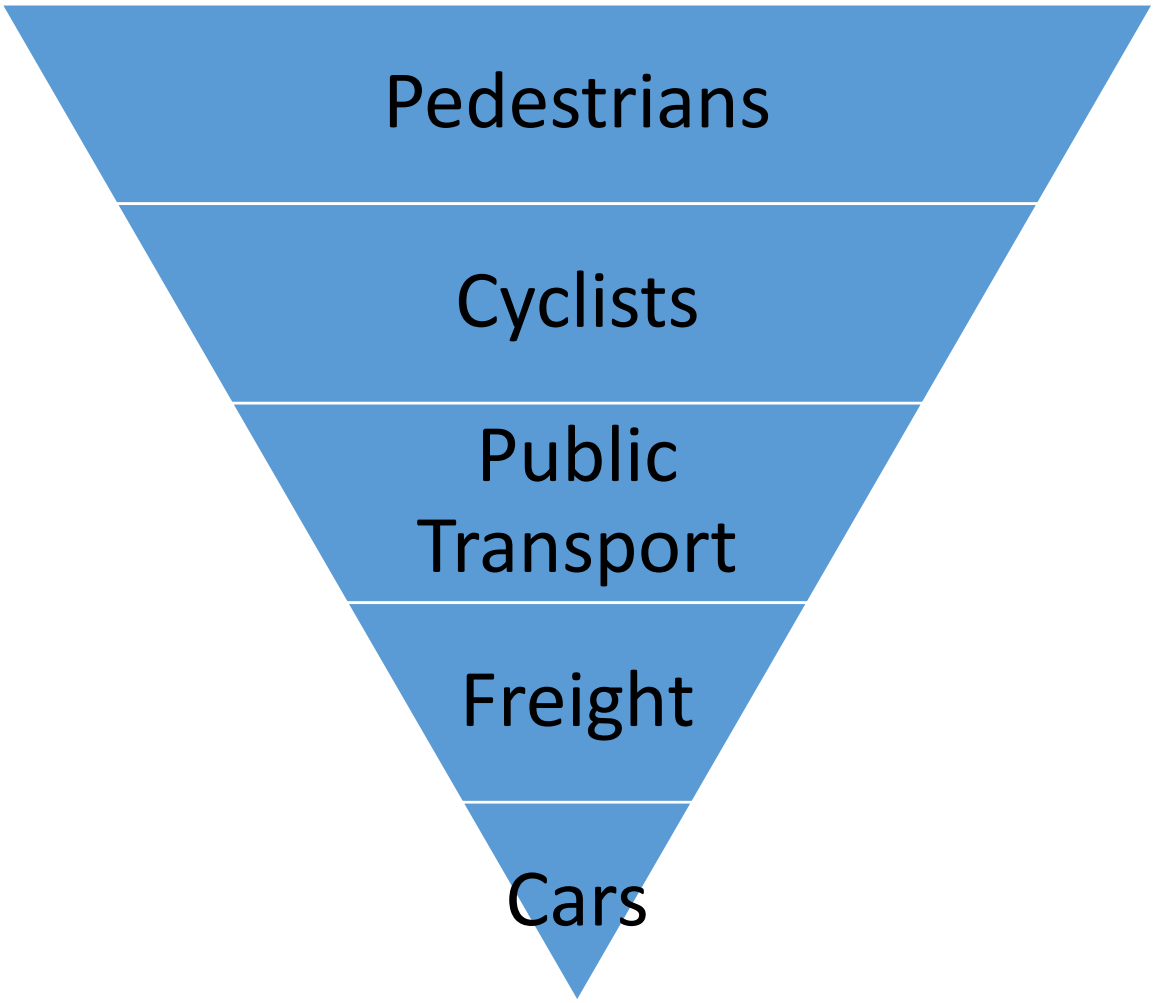
The Rotokauri structure plan was developed over 10 years ago. Since that time, the expected density of development has changed from traditional four-bedroom detached dwellings where cars were the only practical transport mode, to a more compact urban form with a variety of transport options. Most recently, the National Policy Statement on Urban Development (NPS-UD) has been released to enable a higher development density to make more efficient use of land resources. In addition, the NPS-UD has removed minimum car parking requirements which further enables land to be used more efficiently and supports future development no longer being dependant on prioritising

private vehicle movements. With these changes in transportation policy, the minor arterial road network within Rotokauri is being reviewed to ensure that its design is able to cater for the expected future land development patterns and that it aligns with the best-practice for transportation policy and planning. This change in focus also means that it is no longer solely a minor arterial road for traffic, but a minor arterial multi modal transport corridor supporting high volumes of movement by a range of travel modes.

Transport Corridor Design Ethos

Overview

The overarching theme and general best practice for transportation planning policy is focussed on reducing emissions from the transport system, minimising death and serious injury crashes and having a system that is affordable and efficient to construct and maintain. The overall ethos for the design of the transportation network is to establish a clear hierarchy of modes to support a sustainable transportation system in accordance with these overall themes. The hierarchy proposed is illustrated below:



- Pedestrians are located at the top of the hierarchy. This mode type generally has the lowest emissions of all transport modes.
- Cyclists are similar to pedestrians in that they have low emissions. Cyclists tend to travel at notably higher speeds than pedestrians and are able to share the road with other vehicles in appropriate circumstances.
- Public transport within Rotokauri will predominantly be provided by buses. The Rotokauri transport hub is located approximately 1km east of the Rotokauri growth cell and includes a number of bus stops to serve a high number of routes simultaneously as well as the Rotokauri train station. This will be the primary focus for public transport routes along the multi-modal minor arterial transport corridor and those branching off to serve the wider growth cell
- Freight vehicles are expected along the minor arterial multimodal corridor. Intersections will be designed to allow for their passage, without encouraging access into adjacent residential area other than for the provision of essential services such as refuse collection.
- Traditionally, new developments have assessed effects on the road network based on the capacity of the road and whether additional traffic would result in congestion. This 'predict and provide' approach is not considered sustainable both from an environmental and financial perspective. From the environmental perspective, private vehicles typically generate the greatest amount of pollution given the low occupancy rates of people per vehicle. From an economical perspective, the cost required to build wide roads that ensures a high level of service is often unaffordable

This mode hierarchy aligns with various transportation planning documents that seek to promote a sustainable transport system. The various transportation policy is described below.

Policy

Emissions Reduction Plan

The emissions reduction plan seeks to reduce the total emissions generated by New Zealand by 11.5 megatonnes of carbon dioxide equivalent between 2022 and 2025. This is the emissions equivalent of approximately 4.3 to 5.5 million petrol-based cars driving 10,000 kilometres a year. Transport is a key contributor to current emissions the steps proposed to reduce transport-based emissions includes:

- Improving travel choices and accessibility by providing people with more convenient, affordable and frequent buses and trains, as well as safer walkways and cycle lanes.

The transportation ethos for the Rotokauri minor arterial multimodal transport corridor and supporting networks promotes alternative transport modes with particular emphasis on giving priority to those modes with lower emission outputs.

Government Policy Statement

This Government Policy Statement on land transport (GPS) has four overarching themes:

- Preventing death and serious injuries
- Decarbonisation
- Better transport choices
- Improving freight connections

The mode hierarchy ethos for the Rotokauri multimodal transport corridor and supporting networks aligns with these values by promoting alternative transport mode choice that also typically have lower levels of carbon emissions. Slower vehicle speeds will also be encouraged to reduce the safety risk for more vulnerable road users. This will assist in enabling people to feel safe particularly when walking or cycling which are the modes with the greatest priority.

Access Hamilton

Hamilton's population is expected to grow by 260,000 people over the next 30 years. Access Hamilton is the transportation strategy to set out what the transport system needs be like to serve the community's needs now and into the future. This includes eight outcomes that the strategy aims to achieve:

- Everyone is safe and feels safe while using our streets and public spaces
- A low-emission transport system that is resilient against climate change
- Hamilton Kirikiriroa is a great place to live for everyone
- A healthy te awa o Waikato and natural sites which sustain abundant life and prosperous communities for all generations
- More people choose to travel on foot, by bike, by bus, or using micro-mobility devices such as scooters
- Hamilton Kirikiriroa is accessible for all because it has a city culture and heritage that is shared, protected and celebrated
- Hamilton Kirikiriroa is a great place for everyone to work and do business
- An adaptable, future-ready transport system that supports quality and compact urban form

A key part of the strategy is to enable more transport choices with particular emphasis on walking, cycling and public transport. It is also important that these road users feel safe while travelling. The ethos for the Rotokauri multimodal transport corridor and supporting networks aligns with Access Hamilton in terms of promoting walking, cycling and public transport over private vehicles. The roads will be designed to encourage a slower speed environment which helps to promote the safety of these road users. From an environmental perspective, Access Hamilton seeks to reduce transport emissions by 30% by 2030. Promoting forms of transport with lower emissions aligns with this goal.

District Plan

Plan Change 12 (PC12) for the District Plan has recently been released for consultation. While not operative, one of the features of PC12 is to consider the ASI Framework (Avoid-Shift-Improve) within the Transport Emissions: Pathways to Net Zero by 2050 (Green Paper) to reduce emissions related to the transport network. Three theme to achieve a reduction in transport emissions are as follows:

1. Change the way we travel
2. Improve our passenger vehicles
3. Supporting a more efficient freight system

Themes 2 and 3 relate to changing vehicle modes predominantly to low emissions vehicles (e.g. electric cars) or consolidating freight hubs. Theme 1 is the primary theme that relates to Rotokauri. The transportation ethos is to define a clear mode hierarchy that gives primary emphasis to pedestrians with less emphasis on cars or private vehicles. This is to enable and support changing the way people travel from the outset of development so that new residents are not reliant on private vehicle modes, potentially embedding private vehicles as the primary transport mode. In that sense, the proposed transport ethos aligns with the ASI framework and key themes of the Transport Emissions Pathway. By designing the Rotokauri minor arterial road as a multimodal transport corridor, this sets the benchmark for adjacent future development.

Intersections

Intersections are where there is the greatest conflict occurs between the various travel modes and is therefore where crashes are most likely to occur. In order reduce road safety risk, the intersection forms have been designed to reduce the number of conflict points and also reduce vehicle speeds. Major intersections are proposed to be raised, similar to what is under construction within the Ruakura growth cell, which will aid in reducing vehicle speeds.

Major intersections with adjoining collector or minor arterial roads are proposed as being signalised rather than being constructed as a roundabout to provide safe locations for pedestrians and cyclists. Signals can also be phased to give priority to bus routes to minimise their delay at the intersection rather than balancing delay across all vehicles.

Minor intersections with local roads are likely to be a mixture of be left-in/left-out only intersections, full turning movement priority intersections and roundabouts. This reduces the risk associated with right turning vehicles at intersections whilst balancing the need to provide for access into the adjacent growth cell areas from the minor arterial transport corridor.

A plan showing intersection forms and locations is provided in Figure 2.

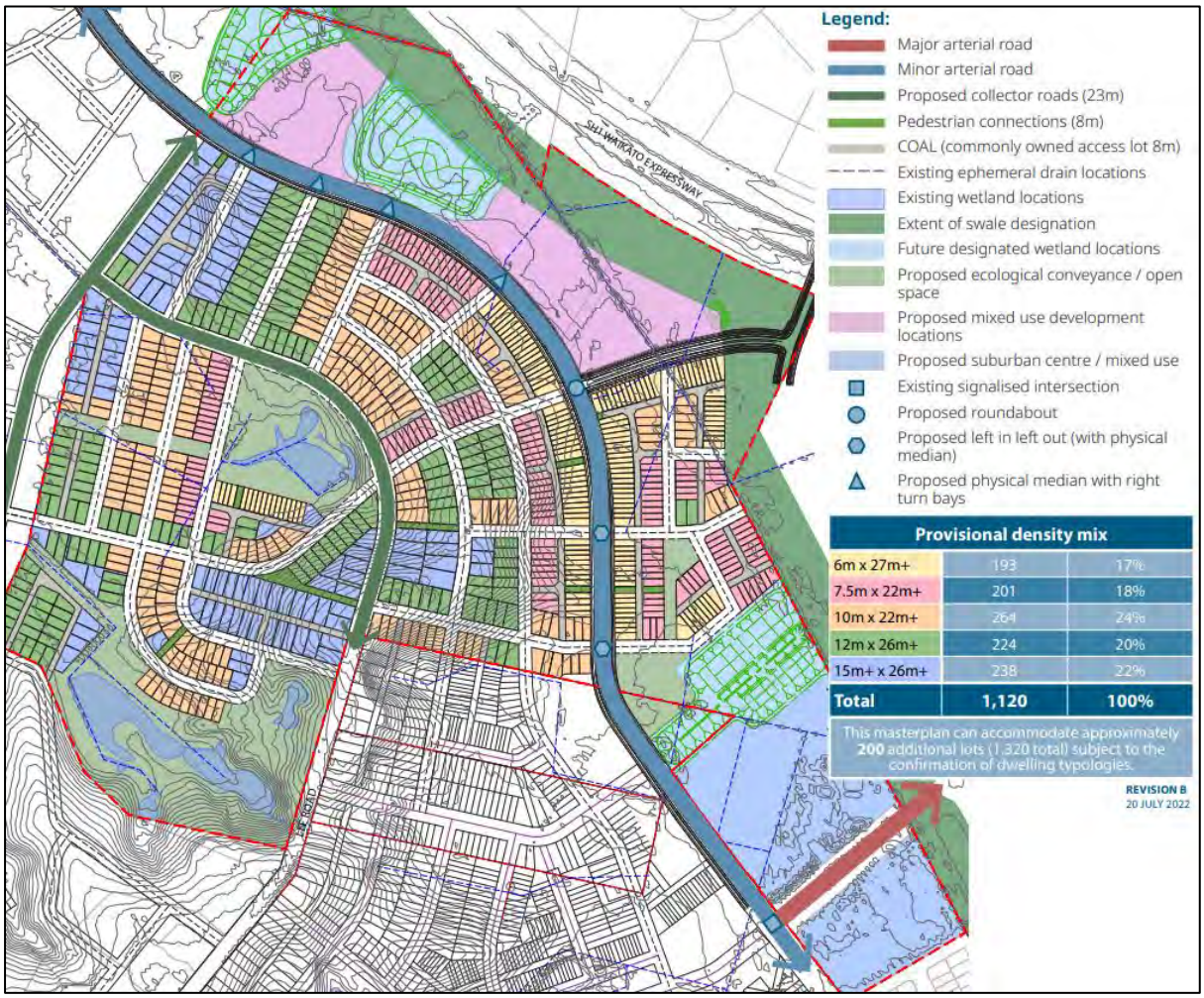


Figure 2: Minor Arterial Road Intersection Forms

Figure 3 below illustrates the natural flow of people from surrounding residential areas to the commercial node and links to the wider Hamilton area and demonstrates the combination of through movement function (along the corridor) and cross corridor function that need to be considered.

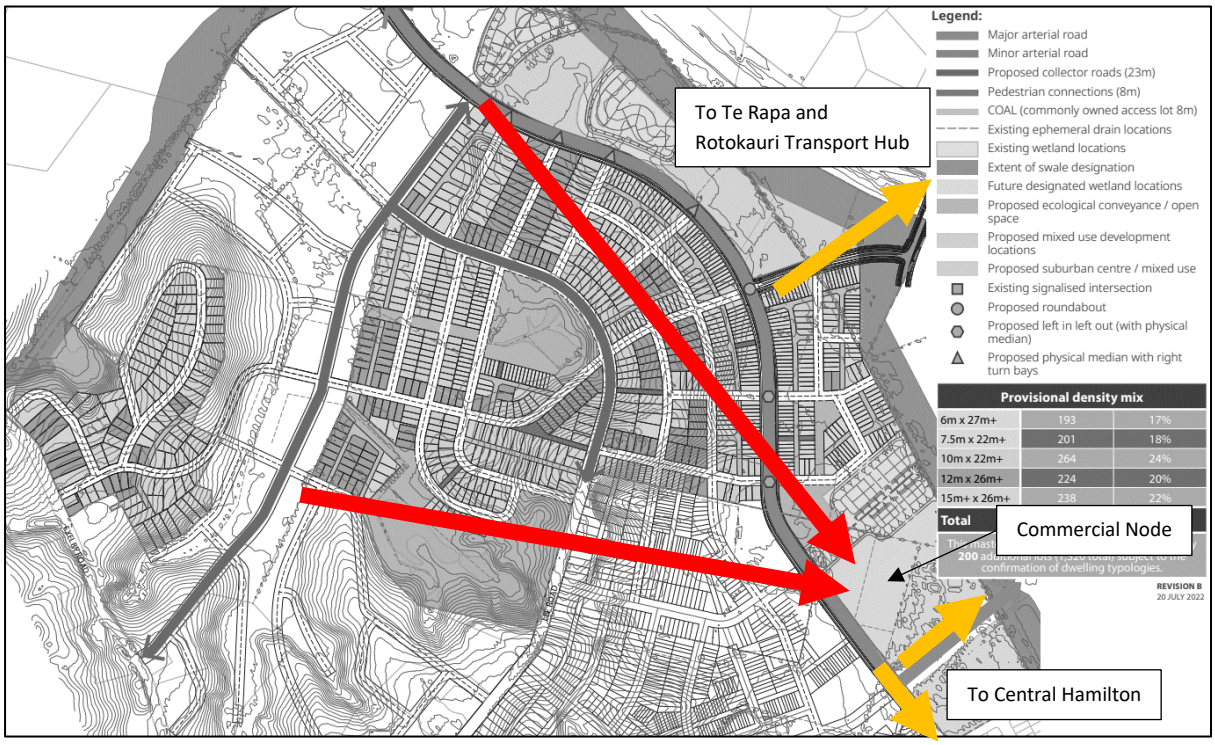


Figure 3: Overview Flow of People

Through Function

The multi-modal transport corridor has a minor arterial road function which is defined by the District Plan as having a primary movement function in comparison to local roads where the primary function is described as property access.

It is proposed for the minor arterial multimodal transport corridor to have a total road reserve width of 30m, and for connecting collector roads to be 23m wide and connecting local road to be 16m wide. This allows the higher order roads to provide separated areas for different mode types to support the through function as well as supporting wayfinding to and through the area.

In accordance with the mode hierarchy ethos, separate footpaths and cycle paths will be provided so that both modes have dedicated corridors within the wider road reserve. Where possible, additional traffic lanes may be provided however this would not be at the expense of reducing space for the other modes. As noted above, minor intersections may not include right turn movements which reduce side friction for through moving traffic which supports the through function of the corridor. Figure 4 below shows an example cross section of the road noting that this may vary along the length of the road.

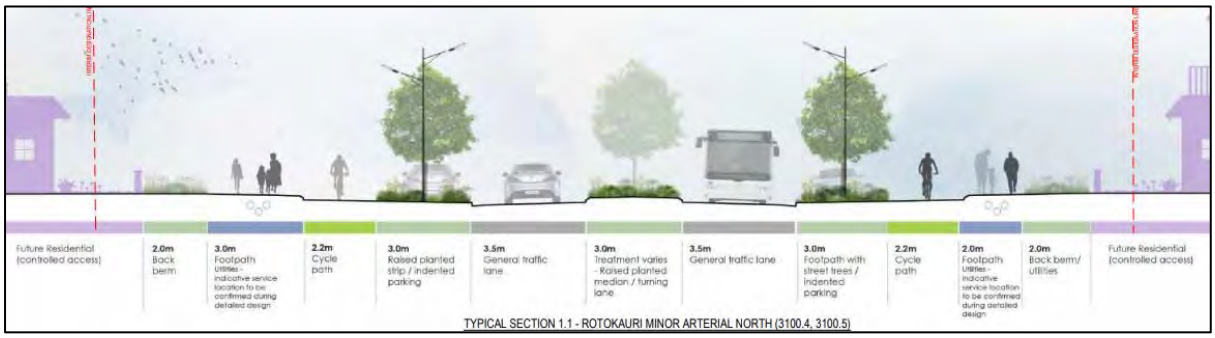


Figure 4: Potential Road Cross Section

Cross-Function

It is recognised that the multi-modal transport corridor has a cross-function, most notably pedestrians and cyclists looking to cross the road. This could include students crossing the road on the way to school, customers crossing to the commercial node or people crossing to the opposite bus stop. A raised planted median is likely to be provided along sections of the corridor. This is similar to raised median provided elsewhere within Hamilton. The raised median enables pedestrians to stage their crossing rather than attempting to cross the full carriageway at one time.

Pedestrian crossings can be provided at frequent locations along the corridor. These can include raised tables to improve road safety and reduce vehicle in accordance with current best practice design for pedestrian crossings.

Transportation Effects Assessment

The Waikato Regional Transport Model (WRTM) is a commonly used tool within the wider Waikato region to assess the traffic effects of significant development and infrastructure upgrades. In the case of the minor arterial multimodal corridor, it will enable analysis of the change in expected density and mode shift for the Rotokauri Structure Plan area.

The WRTM model is owned and maintained by local councils within the Waikato region including HCC. Initial consultation has been undertaken with Hamilton City Council and it has been agreed that WRTM is an appropriate tool for assessing the traffic effects of the proposed minor arterial transport corridor and ensuring that it is appropriately sized. Consultation will be ongoing to further refine the modelling methodology to ensure that a practical and cost-effective analysis is undertaken.

It is proposed to run both base and future scenarios, forecasting 10 and 20 years into the future. The model outputs will be used to identify intersections that are most affected by future development. The SIDRA modelling package is proposed to be used for this detailed analysis of individual intersections. Thresholds relating to changes in both level of service (LOS) and traffic volumes will be adopted to identify the critical intersections. The thresholds will be confirmed with HCC however are likely to be defined as follows:

- LOS E or above which represents delays in excess of 50 seconds
- Traffic volumes increase by more a GEH statistic of more than 5.

The approach of using thresholds that relate to both intersection capacity and change in traffic volumes is similar to the methodology that has been used for other projects involving WRTM analysis. The use of the GEH statistic, which is a form of the chi-squared statistic, is a common parameter used in model calibration to ensure that the modelled flows appropriately represent observed counts and is outlined within the Waka Kotahi Transport Model Development Guidelines. In this case it ensures that low volume roads that may have a high percentage difference from only a small increase in traffic are not overrepresented within the subsequent analysis.

The form and location of intersection along the multi-modal transport corridor road have been selected based on the transportation planning ethos of mode hierarchy. It is possible that the WRTM modelling may identify intersections that are likely to be congested. However, intersection upgrades may not be presented if such upgrades do align with the ethos for the multi-modal transport corridor road. As the overarching theme within the various transportation policy documents, private vehicle trips are not a priority.

With an increase in development density from what has been previously anticipated and a strong ethos promoting walking, cycling and public transport over private vehicles to support the increase in density, it is likely that the trip generation rates from the future dwellings would be less than traditional subdivision developments. Within WRTM, this can be modelled by either reducing household numbers or through the adjustment of trip generation rates.

The overall modelling methodology is summarised below:

1) HCC to confirm they are comfortable with the proposed locations and the principles of the form of intersections along the minor arterial road;
2) HCC to confirm they are comfortable with the proposed minor adjustments to the collector road alignment compared to the structure plan;
3) Agree LOS E and GEH parameter >5 as thresholds for intersection operation where SIDRA analysis is required;
4) Agree WRTM scope of work:
    a) Whether revised road network to reflect collector road connections is required
    b) How to address mode shift aspirations through modelling
    c) Confirm household numbers within Rotokauri model zones reflect increased density proposed as part of PC12 and if not, the scale of increase. This needs to work in tandem with any model changes to reflect mode shift aspirations.
    d) Confirm other land uses or network changes to include in modelling that reflects development or infrastructure upgrades beyond the Rotokauri area.
    e) 2031 and 2041 AM and PM peak period modelling or whether 2041 only is acceptable as a tool for confirming the scale of the minor arterial road project
    f) Required outputs
        i) Level of service plots
        ii) Volume difference plots
5) Assess intersections most affected within SIDRA environment.

The results from the modelling will feed into a Broad Integrated Transportation Assessment undertaken in accordance with Rule 25.14.4.3 of the Hamilton City District Plan that will accompany the consent application. This will include reference to the ethos for the multi-modal transport corridor road and demonstrate alignment with the various transportation policy documents and will include:

- **Background** - A description of the proposed activity, the purpose and intended use of the ITA, and an outline of any previous discussions with the relevant road controlling authorities
- **Existing land data** - A description of location, site layout, existing use and consents (if any), adjacent and surrounding land use
- **Existing transport data** - A description of the existing access and service arrangements and on-site car parking, the surrounding transport network (including hierarchy, traffic volumes, crash analysis, congestion and intersections) and the passenger transport modes, accessibility, walking and cycling networks.
- **Committed environmental changes** - Consideration of other developments and land use and transport network improvements (including passenger transport, walking and cycling)
- **Existing travel characteristics** - Details on the existing trip generation, modal split, and assignment of trips to the network
- **Proposal details** - A description of the proposal (including site layout, operational hours, vehicle access, on site car parking and drop off, and internal vehicle and pedestrian circulation). A description of any construction management matters. A description of what end of journey facilities are proposed
- **Predicted travel data** - A description of the trip generation, modal split, trip assignment to the network, trip distribution and trip type proportions of the proposal.
- **Appraisal of transportation effects** - An assessment of safety, efficiency, environmental, accessibility, integration and economic effects (including sensitivity testing).
- **Avoiding or mitigating actions** - Details of any mitigating measures and revised effects, including measures to encourage other modes.
- **Compliance with policy and other frameworks** - Review against District Plan objectives, policies and rules. Detailed assessment against Access Hamilton and associated action plans. Other relevant local, regional and national strategies or plans (e.g. Regional Land Transport Strategy, Regional Public Transport Plan)
- **Safety and Efficiency** - Any changes over the relevant assessment period to the predicted level of personal risk to individuals (safety) using the network and levels of service (efficiency) of the network
- **Discussion and conclusions** - An assessment of effects and conclusion of effects. Confirmation of the suitability of the location of the proposal
- **Recommendations** - Proposed conditions (if any)

CKL Team

CKL has significant experience working with public sector organisations, including district and regional councils, Auckland Transport, Kainga Ora and the Ministry of Education.

Judith Makinson is CKL's Transportation Engineering Manager. Judith has a strong technical background in development projects for private sector clients. She has over 20 years' experience in preparing Integrated Transportation Assessments, Travel Plans and feasibility studies for developments as well as developing transport masterplans for both the public and private sector. Judith is also an experienced project manager, leading a range of projects with multidisciplinary engineering inputs, placing a strong focus on client risk and project commerciality. She regularly acts an as expert witness and has also acted as an Independent Hearing Commissioner on behalf of Palmerston North City Council in relation to the Te Ahu a Turangi SH3 notification of requirement and the notification of requirement for a newly proposed Kiwirail Hub facility.

Michael Hall is our Senior Transportation Engineer. He will provide the key technical transportation engineering inputs to the project and will prepare all deliverables under Judith's leadership. He has over 9 years' experience in preparing Transportation Assessments in the context of Hamilton City, Auckland, and the wider Waikato region. Michael has significant traffic modelling experience and undertaking feasibility studies for developments ranging from small scale subdivisions to major new growth areas anticipated to accommodate over 100,000 people.

An example of some of the many significant projects where Judith and Michael have worked together.

<u>Rotokauri Rise Stages 6 – 8, Hamilton</u>

This project involved land located at the southern end of the Rotokauri minor arterial road corridor. It involved the provision of transport masterplanning input and preparation of an Integrated Transportation Assessment, particularly in relation to considering walking and cycling connectivity, suitability of proposed road cross sections to perform desired functions and network capacity assessment to support the development of around 800 residential lot development. This has specifically included the consideration of location and form of intersections to integrated with the existing road network and also consideration of the proposed road network in the context of the Structure Plan requirements, leading to an agreed variation though demonstration of suitability of proposals. This project used WRTM as the assessment tool to test the effects of road network changes and identified the form and scale of the major / minor arterial road intersection forming the southern connection point of the Rotokauri Arterial Road project.

<u>Lockerbie Estate, Morrinsville</u>

Lockerbie Estate is residential subdivision of approximately 2,000 dwellings on over 80ha to the north of Morrinsville. Transportation advice to support the masterplan of the subdivision was required including identifying upgrades to the surrounding road network and coordination with neighbouring subdivisions already in progress. A retirement village, local shops, a medical centre, and a childcare centre were also included in the subdivision to support the residential activities. Consideration was given to ensure that there was good pedestrian and cycling connectivity within the site especially for higher density areas.

Conclusion

The Rotokauri minor arterial multimodal transport corridor is being designed in accordance with a clear ethos around mode hierarchy. The mode hierarchy proposed algins with that within the various transportation policy documents includes the emissions reduction plan, GPS, Access Hamilton and the Transport Emissions: Pathways to Net Zero by 2050 (Green Paper) which itself is referenced by PC12 of the District Plan. Based on our experience and information received to date, it is concluded that there are no transport-related reasons why the following development could not proceed under a fast-track application process with referral that the effects can be managed with suitable conditions.

We trust this meets your requirements. Please do not hesitate to contact us if you have any questions or require any additional information.

Michael Hall
Senior Transportation Engineer

Judith Makinson
Transportation Engineering Manager

CKL