

Council Briefing Agenda

Date: Wednesday, 22 July, 2020

Time: 1:30 pm

Location: Council Chamber
Forum North, Rust Avenue
Whangarei

Elected Members: Her Worship the Mayor Sheryl Mai
(Chairperson)

Cr Gavin Benney

Cr Vince Cocurullo

Cr Nicholas Connop

Cr Ken Couper

Cr Tricia Cutforth

Cr Shelley Deeming

Cr Jayne Golightly

Cr Phil Halse

Cr Greg Innes

Cr Greg Martin

Cr Anna Murphy

Cr Carol Peters

Cr Simon Reid

For any queries regarding this meeting please contact
the Whangarei District Council on (09) 430-4200.

1. Apologies

2. Reports

2.1 Complete Streets Masterplan Update

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3. Closure of Meeting

2.1 Whangarei Complete Streets Masterplan and Streetscape Design Manual Update

Meeting: Council Briefing
Date of meeting: 22 July 2020
Reporting officer: Sonya Seutter (Senior Strategic Planner)

1 Purpose

The purpose of the briefing is to:

- Provide an overview of the Complete Streets Masterplan Document
- Provide an overview of feedback from business sector engagement
- Work through key/recurring issues
- Seek direction on a potential process for prioritisation of projects

2 Discussion

2.1 Whangarei Complete Streets Masterplan origins and overview

In adopting the City Centre Plan (December 2017) and City Core Precinct Plan (May 2019) Council set strategic direction around:

- **Pedestrians – safe and connected, better pedestrian crossings** (Whangarei City Centre Plan, pages 14-15 and Movement Network Transformational Move, pages 22-24)
- **Shift from at grade parking to parking buildings** (City Core Precinct Plan, pages 62-64)
- **Improved design and activation – i.e. ground floor activities, markets, tactical urbanism** (Whangarei City Centre Plan - Quality Design Transformational Move pages 30-32, City Core Precinct Plan Urban Design Driver 4, page 7)
- **Increase accessibility and connections to and around the city core** (City Core Precinct Plan Urban Design Driver 5, page 7)
- **Connecting the waterfront to the city core and vice versa** (City Core Precinct Plan, pages 38-42)
- **Design led approach to these improvements** (City Centre Plan Quality Design Transformational Move, pages 30-32)
- **A Complete Streets Masterplan (review of street parking, movement networks, design palette for streetscape improvements)**

The draft Whangarei Complete Streets Masterplan and Streetscape Design Manual (the Masterplan) was a key action from the City Core Precinct Plan, adopted by Council in 2019 (pages 12-37).

The Masterplan builds on the strategic direction set by council to provide a 30 year vision for the revitalization of public streets and places in our central city.

The design manual within the plan is a detailed technical/operational document for street furniture and materials infrastructure which will establish 'treatments' based on the classification of street.

The Masterplan and design manual have been developed in collaboration with our Infrastructure, Transport and Parks teams.

2.2 Elected member input into the plan making process

The Masterplan process began 14 months ago. Through this process there have been six briefings and workshops, as well as updates through operational reports to the Strategy, Planning and Development Committee.

These briefings provided guidance to staff to proceed with the Masterplan, based on a proposed "Option 4" scenario (along with associated transport modelling).

A Briefing on the 4 December provided an overview of the project to the new Council. The briefing on the 11 December provided more detailed discussion on specific elements of the plan, including parking and options for a Dent St overbridge.

Feedback from Elected Members was incorporated into the next draft of the Masterplan.

On 20 May 2020, elected members were provided a comprehensive overview of the components the Whangarei Complete Streets Masterplan.

2.3 North Chamber meeting

On 15 July 2020, in conjunction with the Chamber of Commerce, council staff presented information worked through with Councillors at the public briefing on 20 May.

There were approximately 50 people in attendance at the meeting. There was a generally positive reception to Council talking to the businesses about the plan, with several comments and questions were raised. A summary is provided below, and further detail will be provided at the meeting:

- Consideration for water features or fountains in the streetscape design.
- Dent Street is a major physical barrier, how can this be improved? Is there another way to reduce traffic and enhance the city and waterfront connection? Crossing Dent Street is unattractive because you cross to more car parking. Has Council considered elevating a pedestrian crossing over Dent Street to connect the city and waterfront?
- How do you accommodate for a growing population with coastal/rural living desirable options and therefore more people driving into town and will need to park their cars?
- Once tourism developments like Hundertwasser open how will tourists access the city and if they come by car where will they park?
- Need to think carefully about junction changes and removal of roundabouts and what impact this will have on traffic movements.
- What are the private business opportunities to support the delivery of this plan?
- Part of the solution is inner city living, what can businesses do to encourage this or work with Council to make this happen?
- How can we get this plan funded and delivered quickly? What projects have funding/partial funding? Are there opportunities for NZTA innovative streets funding?
- How will landowners be engaged as projects are planned and delivered?
- Support for more pedestrian friendly spaces to support businesses and make it safer and accessible for everyone.

- Think about what activities you want to encourage in the city core, more hospitality and mixed-use developments.

2.4 Key/recurring issues

The discussion with elected members at the 20 May Briefing highlighted some key/recurring issues. As a result staff prepared a report outlining the process to date, and considering the following:

- Impact on vehicle movements and traffic
- Car parking
- Dent Street pedestrian crossing
- Buses
- Cycleways and connectivity
- Street trees and maintenance

This response was provided from technical staff/consultants. However, it is acknowledged that there may not consensus / agreement on some points, and that for many the likely mechanism to resolve them will be through inclusion of funding in the 2021 - 2031 Long Term Plan (rather than the Masterplan which is a 30 year strategic document).

This information (included again as Attachment 1) was provided well in advance of this Briefing, along with draft Complete Street Masterplans to support elected members direction setting and decision making.

2.5 Potential process for 2021 – 2031 Long Term projects prioritisation

As the Masterplan is a 30-year vision / framework providing high level strategic direction, rather than a detailed design of what will happen on the ground, most elements will not be considered for design / delivery within the three to ten-year timeframe of the LTP.

While staff/technical analysis has been included in the draft plan direction will be required from elected members on which, if any, projects should be prioritised for consideration in the LTP.

The potential for a prioritisation process will be worked through with councillors at this Briefing.

3 Attachment

1. Report to Elected Members
Attachments 1 - 5

Whangarei Complete Streets Masterplan and Streetscape Design Manual

Report Back to Elected Members – 20 May 2020 Council Briefing

Purpose

The purpose of this report is to:

1. recap on the process Council has gone through to date, including the decisions made by and direction provided
2. identify and provide detail on the key issues and questions raised by Elected Members at the Council Briefing on 20 May 2020:
 - a. Impact on vehicle movements and traffic
 - b. Car parking
 - c. Dent Street pedestrian crossing
 - d. Buses
 - e. Cycleways and connectivity
 - f. Street trees and maintenance
3. Propose a process for councillors to identify priorities for the revitalisation of the city centre, noting that all projects won't be supported by all councillors

The last point is critical. As the Complete Streets Masterplan is a 30-year vision / framework providing high level strategic direction, rather than a detailed design of what will happen on the ground, most elements will not be considered for design / delivery within the three to ten-year timeframe of the 2021 – 2031 Long Term Plan (LTP). As such, councillor engagement, buy in and direction on which projects could be priorities for the LTP, is required.

Introduction

The Complete Streets Masterplan is a design led document, presenting a vision and a framework to deliver improvements to the streets in the city centre.

This vision originated with the Whangarei City Centre Plan, adopted by Council in December 2017. This plan initiated a shared strategic movement for change in the city centre and focused on key outcomes of what we want our city centre to become.

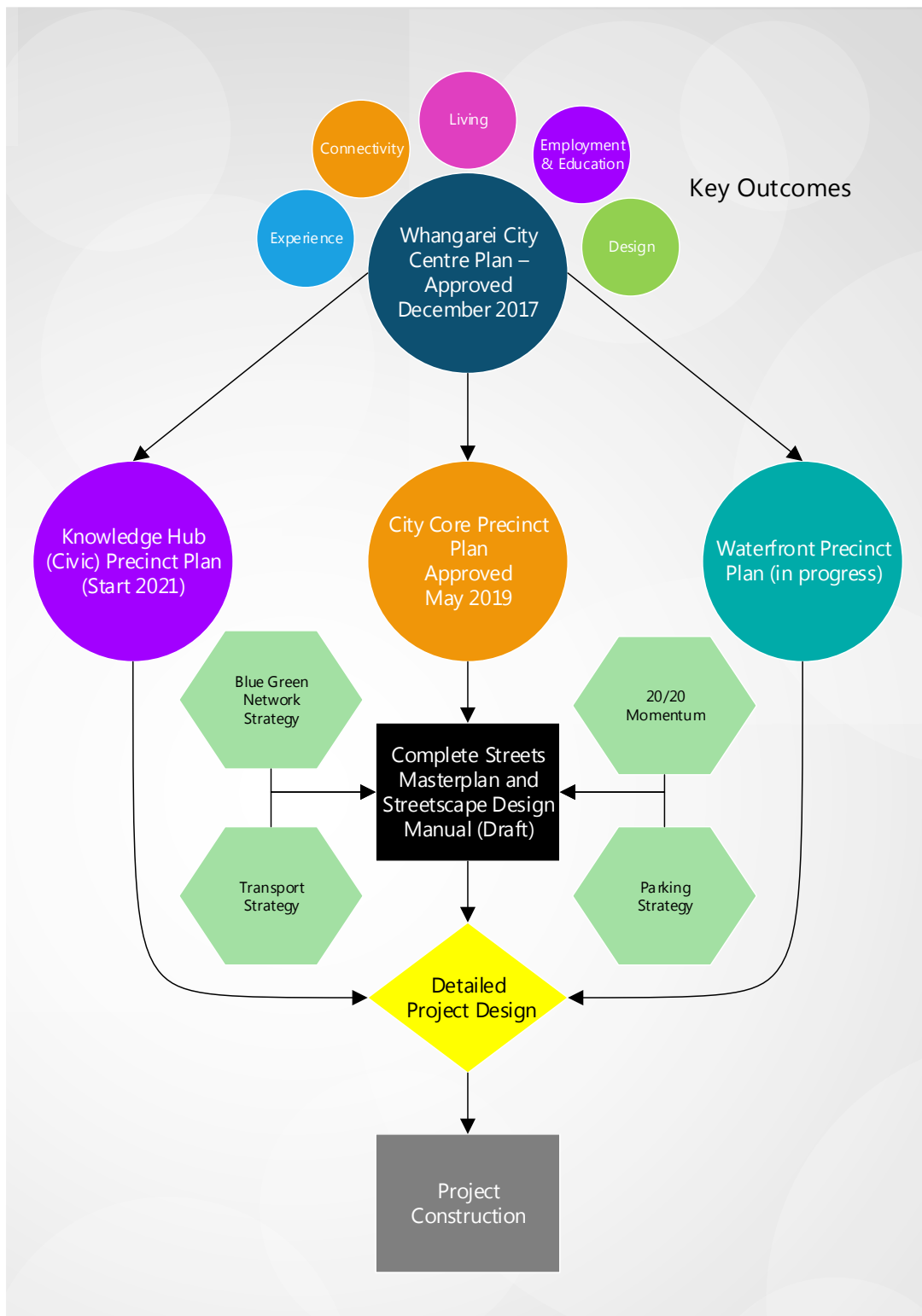
The key outcomes identified in the Whangarei City Centre Plan include:

- allowing for inner city living in a mixed use setting with businesses
- job creation, knowledge sharing, economic transactions,
- a range of retail opportunities and entertainment with safe and connected spaces
- an aesthetic setting including arts and cultural facilities that offer a unique and authentic experience.

While the City Centre Plan allowed for a high-level key outcomes and transformational moves to begin exploring the vision, the City Core Precinct Plan, adopted by Council in May 2019, allowed for the examination of identified

opportunities and provided solutions. A key action from the adopted City Core Precinct Plan (Action 1.01, scheduled to commence in the 2018/19 financial year) was to:

*Undertake a design-led Complete Streets Masterplan for the city core streets.
Review on-street parking, movement networks, crossings, roundabouts, traffic calming, vehicle direction, footpath width, street trees & plantings, pedestrian priority and crossings.*



Through this work, solutions identified within the City Core Precinct Plan have been further scrutinized and modelled to ensure we had a robust way forward to address the anticipated changes in the city centre.

The Complete Streets Masterplan is not a detailed design for the city, but rather a framework to the next steps of detailed design and implementation. It sets out design changes to our city centre streets to support the key outcomes of both Whangarei City Centre Plan and the City Core Precinct Plan.

It also aligns with other key strategic documents approved by Council including the Whangarei Transportation Network Strategy, Blue Green Network Strategy, Parking Strategy and Whangarei 20/20 Momentum.

The movement network plan, included in the masterplan, models current and future traffic flows with the current road network situation and the proposed masterplan changes.

A Constraints and Opportunities Analysis was fundamental in the creation of the solutions. These were worked through with councillors at the 16 May 2019 Council Briefing and are attached as **Attachment I**.

1. Recap of Decisions and Direction Setting

In adopting the City Centre Plan (December 2017) and City Core Precinct Plan (May 2019) Council has made decisions around:

- **Pedestrian focus– safe and connected, better pedestrian crossings** (Whangarei City Centre Plan, pages 14-15 and Movement Network Transformational Move, pages 22-24)
- **Shift from at grade parking to parking buildings** (City Core Precinct Plan, pages 62-64)
- **Improved design and activation – i.e. ground floor activities, markets, tactical urbanism** (Whangarei City Centre Plan - Quality Design Transformational Move pages 30-32, City Core Precinct Plan Urban Design Driver 4, page 7)
- **Increase accessibility and connections to and around the city core** (City Core Precinct Plan Urban Design Driver 5, page 7)
- **Connecting the waterfront to the city core and vice versa** (City Core Precinct Plan, pages 38-42)
- **Design led approach to these improvements** (City Centre Plan Quality Design Transformational Move, pages 30-32)
- **A City Centre capex budget** (2018 – 2028 LTP, \$1.2m in 2019/20)

- **A Complete Streets Masterplan (review of street parking, movement networks, design palette for streetscape improvements)** (City Core Precinct Plan, pages 12-37)

The Complete Streets Masterplan has also gone through a process engaging with Councillors over the past 12 months:

- **16 May 2019** – Introduction to Masterplan, Scope, Design Principles, Key Moves, Constraints, Opportunities, Dent Street
- **13 June 2019** – Isthmus/Flow in attendance – Four Movement Scenarios, Parking with comfort from elected members to proceed with more detail work on “scenario 4”.
- **4 December 2019** – Complete Streets Project Overview for New Elected Members
- **11 December 2019** – Detailed overview of parking and Dent Street crossing options
- **20 May 2020** – Overview presentation of the draft document

2. Key Issues

Below is an outline of the key issues identified on the 20 May 2020 Council Briefing. For each of the issues, detail is given on how the Complete Streets Master Plan responds.

a. Key Issue – Impact on Vehicle Movements and Traffic

Key feedback from elected members early on in this process was that the Complete Streets Masterplan needed to be supported by a robust evidence base and that any changes to the street network must be modelled to understand the impact on vehicle movements and traffic. In response, staff have ensured that each key change proposed by the Masterplan has been scrutinised independently through a traffic model. This has looked at the impacts both on today’s traffic volumes and vehicular movements as well as a future projected traffic volume.

Changes proposed in the Complete Streets Masterplan have been modelled by Flow Transportation Specialists and our inhouse Roding engineers who found that the complete streets model *“generally works well and reduces the overall delay for both AM and PM peaks compared to the base model”* (the status quo). While there remained some pinch points, engineers found *“better overall flow and improved pedestrian movements [and that the] package of work would be a sensible approach to progressively changing to the full CSM”*. Importantly, benefits remained while future traffic flows were modelled through to 2043 using assumptions adopted by Council under its Whangarei Transportation Network Strategy. This model was found to have overall **2043** traffic flows that were not significantly different from the 2020 Base model (i.e. current situation), particularly in the PM peak. The outcomes of modelling are included as **Attachment II**

The key changes proposed by the Complete Street Masterplan also align with the Whangarei Transportation Network Strategy. This strategy and the traffic modelling consider the wider impact of the changes on the transport network. This recognises that there are many people who live outside the Whangarei urban area and private vehicles to bring them into the city for work, services and education. The Complete Streets Masterplan supports the Whangarei Transportation Network Strategy and ensures that when the changes are made to these intersections, that they incorporate an aesthetic design and function for pedestrians and cyclists as well as vehicles and buses.

b. Key Issue – Car Parking

The approach to carparking has been a key issue for city centre planning which has been worked through the Whangarei City Centre Plan and City Core Precinct Plan. On street carparking has been investigated to ensure that carparks are improved within the city core – with some streets providing more carparks with improved access to these carparks.

As this has been a recurring point of discussion some comparative analysis of current carparking provision has been undertaken:

- Whangarei has around 10% of the city core (6.5ha) covered in ‘at grade parking’ but currently only one car parking building
- Comparable cities have 5 - 12%, and 3 – 4 multi story parking buildings to maximize space, and therefore more spaces
- High level comparisons;
 - Whangarei has 3,550 council-controlled car park spaces (central city and fringe area)
 - Wellington has 5,300 car park spaces
 - Hastings has ~2,300 council-controlled car park spaces
 - New Plymouth has ~ 800 off-street car park spaces
 - Nelson has 900 off-street car park spaces

Feedback from councillors has been that going forward 4,000 on and off-street carparks are required.

This section outlines the approach to carparking in adopted plans, along with options for Council to fund additional parking for up to 4,000 carparks through the next LTP, if that is the desired outcome.

Off-Street Car Parking

- The Complete Streets Masterplan acknowledges the need for car parking to enable those who cannot travel by other means to access our city centre
- Focus on off-street car parking capacity around the fringe of the city core

- Provide car parking buildings on our existing off-street car parking areas such as Water St or Forum North. The direction given in the City Core Precinct Plan (pages 62-68) states that carpark buildings be constructed in future as necessary on car parking within our ownership (triggered) rather than acquisition of new private property. However, the plan is non statutory and does not prevent Council from acquiring property. Potential new carpark building sites have been identified in the City Core Precinct Plan and by allocating funding in the LTP, a carpark building could be provided by either of the following two approaches (which would require elected member direction):
 1. Council to build and operate a car parking building. This would involve a capital cost (\$12 - \$25m dependant on design, site selection etc) and ongoing maintenance costs. There would be a ratepayer subsidy required for this, likely through targeted rates paid by those benefiting, as the revenue from the parking would not cover the costs.
 2. Council partner with or enable/promote a car parking building through a private operator. This option would have a lower capital cost (and lower ongoing maintenance costs) but would likely impact on wider car parking pricing (essentially the cost of Council parking would need to increase to market rates in order for the business model to be viable). At this stage it is unclear as to whether this is viable proposition, but funding could be allocated in the LTP to explore costs and viability as part of a full feasibility study, potentially alongside a private partner.

Although the exact number of spaces is dependent on the location and design of any car parking building (which would need to be worked through) – a three storey carpark could provide about 300 carparks at a cost of about \$12-15M and a five-storey carpark could provide 500 carparks at a cost of about \$20-25M.

Three potential sites are identified for parking buildings within the City Core Precinct Plan, which would bring the number of parking buildings in line with comparable cities. Funding to develop these through the LTP could result in up to 1,500 carparks.

On-Street Car Parking

- Retain on-street car parking
- Increase on-street car parking on streets that can accommodate more spaces without negatively impacting safety or accessibility.
- Some streets would see a reduction in spaces to accommodate improved pedestrian movements and public spaces
- Changes could be implemented over time as the capacity of off-street car parking is increased

- Information on carparking has been presented to councillors at Briefings on 13 June 2019 and 20 May 2020.

Summary of Council Controlled Carparking

An overview of on and off-street parking under the Complete Streets Masterplan is provided as **Attachment III**. This shows the removal of a total of 32 carparks over the 30-year life of the plan.

This results in 2,243 Council controlled carparks within the Complete Streets Masterplan boundary (which doesn't include the Town Basin, Forum North and Water Street carparks or carparks within the Hihiaua Peninsular). This increases to 3,550 when the central city area and fringe are included.

The development of three carparking buildings and redevelopment of the James / John Street carpark could increase the provision of Council controlled carparks in these areas to 3,979 and 5,786 respectively.

It is important to note that these figures do not include privately controlled carparks which, while for a dedicated purpose (i.e. shopping associated with Pak' n Save), significantly increase the actual availability of carparks.

c. Key Issue - Dent Street Pedestrian Crossing

The connection between the city core and the waterfront has been an issue for many years and since Dent Street was constructed in the late 1980s, the physical connection between the two areas has been disputed. Previous plans have addressed the disconnect in many ways, however, any changes made have not fixed the issue.

At present, Dent Street functions as a major arterial roadway, carrying vehicle traffic. This function will continue. Several pedestrian crossings exist along this roadway, and the CSMP proposes a major upgrade to the John Street crossing to facilitate the new town basin park amenity, but also the removal of lesser used crossings to help improve traffic flows. Upgrades to the footpaths on either side of Dent Street are proposed to facilitate a shared path connection on the water side and an opportunity for future business ventures on the city side and support the new town basin park.

A pedestrian overbridge was discussed in detail with Councillors at a briefing on 11 December 2019 (slides from the Briefing are included as **Attachment IV**). Five options were presented to elected members, including:

- Status quo
- Improved pedestrian crossing to align with the New Town Basin Park
- Pedestrian overbridge
- Building to building link
- Underpass

Following this briefing the approach taken in the Complete Streets Masterplan is to:

- Short term – improve the pedestrian crossing to support both the New Town Basin Park and an upgrading of John Street.
- Medium to Long term – investigate a building to building crossing of Dent Street, which is contingent on redevelopment of both sides of Dent Street.

The development of an overbridge would be a decision for Council. If Council wishes to progress this as a priority project, it is recommended that funding be include in the LTP to investigate options and undertake detailed design.

d. Key Issue - Buses

The location of the bus station was a key issue discussed through the City Core Precinct Plan. Council resolution determined that the buses be kept at Rose Street and the facility be upgraded, along with an investigation of future long terms options.

The Complete Street Masterplan aligns with this resolution as well as identifying possible alternative bus stop locations to support better connectivity to and within our city centre. The masterplan also allows for a future secondary bus hub to be developed on Robert Street if required in the future. This will require funding through the LTP. Future pedestrian connections are being planned to facilitate safe connections in all directions.

e. Key Issue – Cycleways and Connectivity

A key outcome identified by elected members early in the Complete Streets Masterplan process was to better connect our existing cycling infrastructure.

The proposed cycleway connections (**Attachment V**) across the city core are designed to facilitate commuting cyclists as well as recreational cyclists (shared paths). This includes:

- Proposed connection from library to Okara Park (Semenoff Stadium) via edge of Railway
- Proposed connection from Kamo Shared Path (Rust Avenue) to Okara along Cameron Street (cyclist dismount on pedestrian area)
- Proposed connection from Kamo Shared Path at Vinery Lane, along Dent Street through Reyburn Street to Okara and onwards
- Link to Blue Green Network

f. Key Issue - Street Trees and Maintenance

Practicality and achievability of the Complete Streets Masterplan has been a key consideration.

Input from our Parks Team has determined tree species and planting areas that could be successful, but this would be finalised through the detail design and project implementation phase.

The street trees proposed in the Complete Streets Masterplan are optional, and it is recognised that through the detailed design phase there are several factors that could limit the amount of tree planting. This can include underground services, footpath width, building verandas and soil conditions. Detailed design would involve the expertise of experts from across Council (as the process has to date) to ensure that the 'right tree is in the right place' based on actual conditions/constraints on the ground.

It is also acknowledged that trees in an urban area can be important infrastructure alongside other services to ensure prioritisation of their inclusion within the street upgrade works. These can help in stormwater temperature, air quality, biodiversity and provide shading.

The approach will be outlined in more detail in the next Briefing, with our Parks team being invited to work through any questions around maintenance.

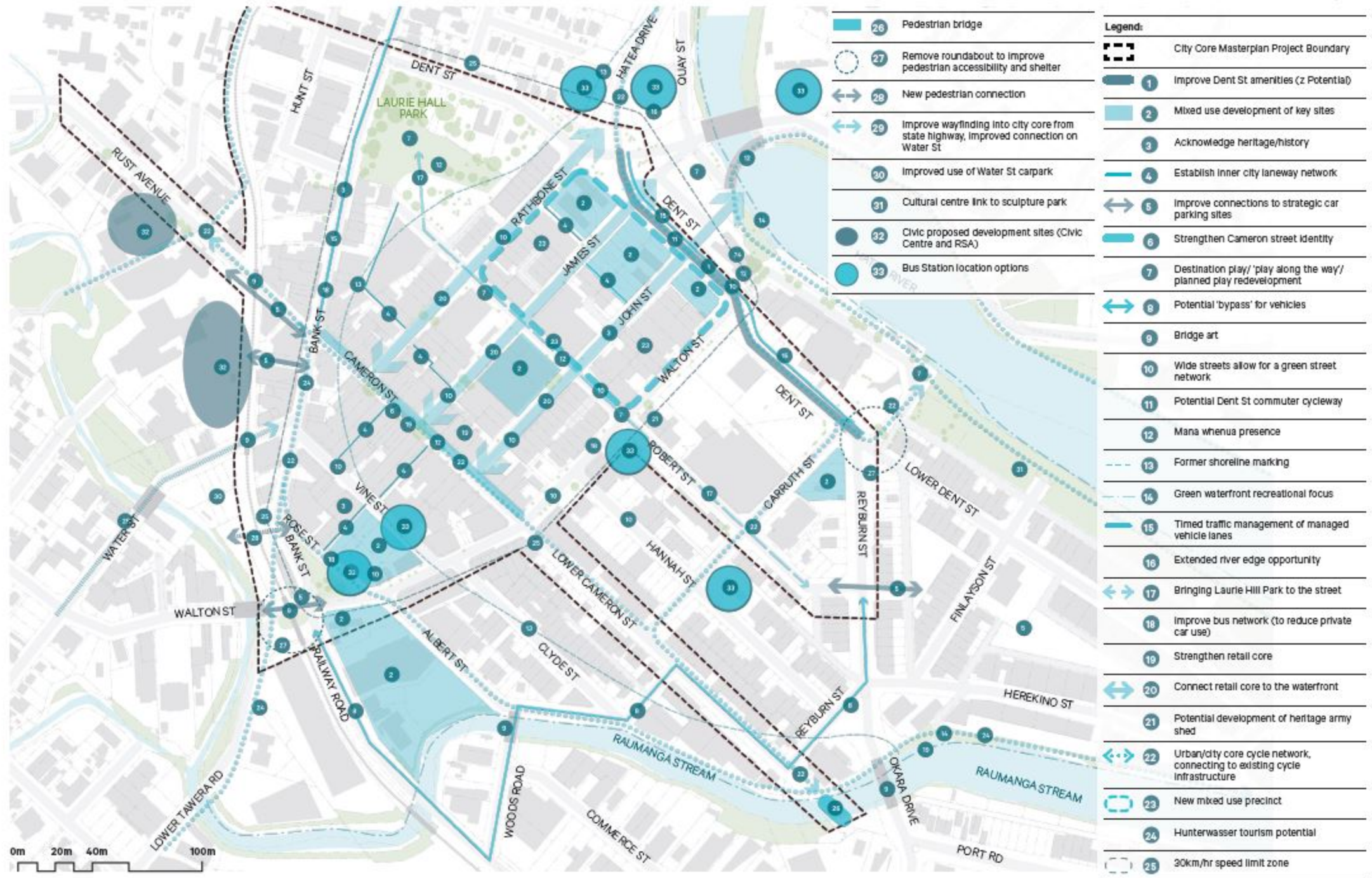
3. Next Steps - Focus for the Next Stage – Top 5 Projects?

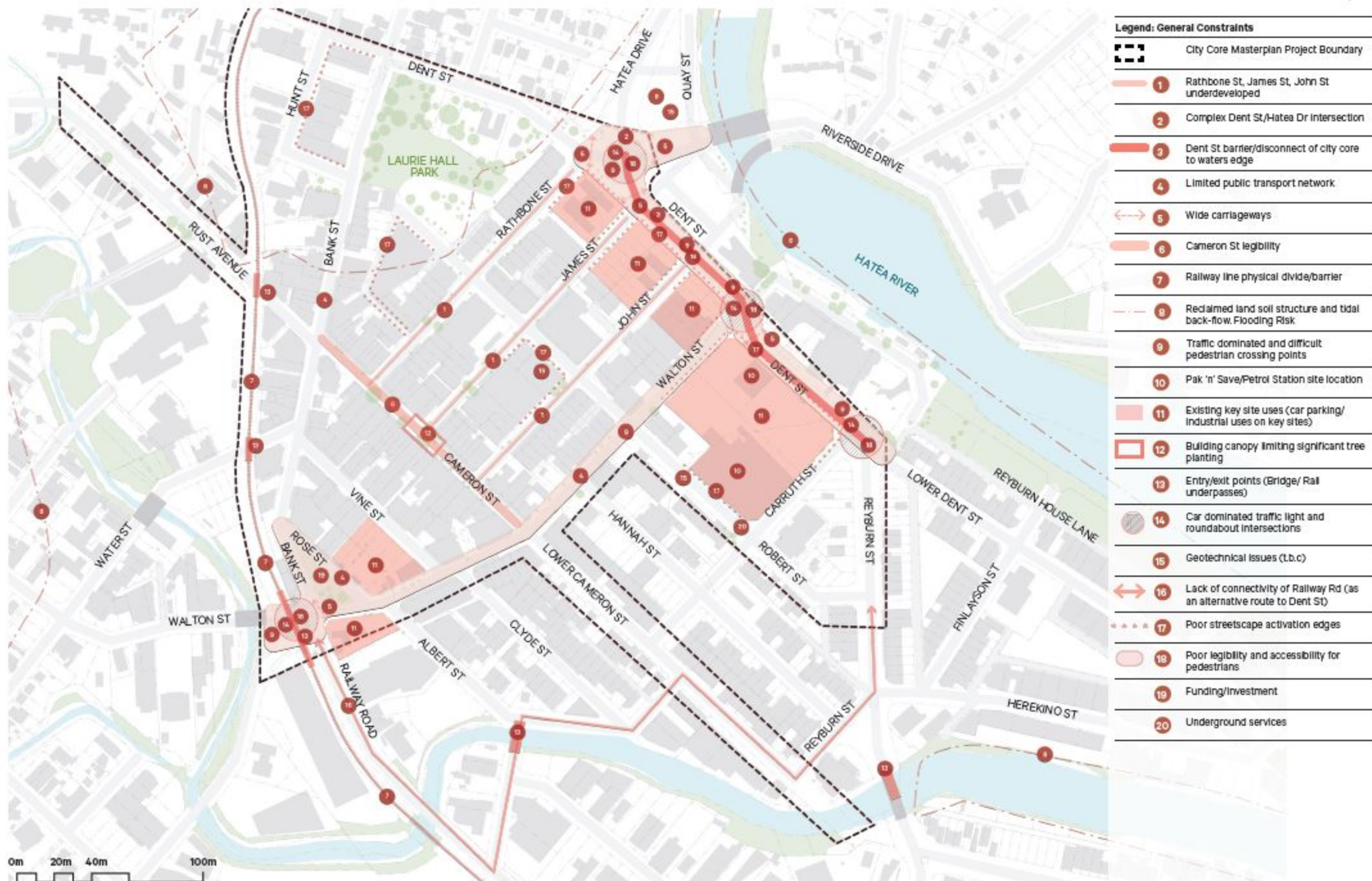
The Complete Streets Masterplan establishes a framework of projects. Due to the scale of the masterplan it is important to prioritise its implementation.

The additional benefit of prioritisation is that it enables discussion and budget allocation through the 2021 – 2031 Long Term Planning process. It also allows us to respond to additional funding if it becomes available through either the NZTA or Crown Infrastructure Partners.

A process for prioritisation will be worked through with councillors leading into the LTP.

7.2 Opportunities & Constraints Analysis.





The packages that we have modelled are described below:

Package 12 – Short term improvements to move towards the Complete Streets Masterplan (CSM). This package uses current traffic flows. This option includes the following:

- Removal of the Barnes Dance (diagonal) pedestrian phase from the Bank St signals (Bank/Water/Vine and Bank/Rust/Cameron signals) and replacement with parallel pedestrian movements (needed to make these intersections work properly)
- Signalisation of the Bank/Dent roundabout (at top of Fire Brigade Hill).
- Upgrade of the Dent/Hatea/Riverside signals to provide double diamond phasing.
- Upgrade of the Dent/John signalised pedestrian crossing to have “call ahead” phasing (pushing the pedestrian call button will “call ahead” to the second part of the crossing so pedestrians can effectively cross in one movement).
- Signalisation of the Robert/Walton intersection.
- One way system for John St.
- Pedestrians only for James St.
- Mid block pedestrian signals on Dent St near The Hub (Town Basin) and south of the Reyburn/Herekino/Okara roundabout.
- Removal of both pedestrian crossings across Dent St at the Dent/Walton signals (to be replaced by the improved Dent/John signals and the mid block signals at The Hub).
- Signalisation of the Rose St/Walton intersection for buses and pedestrians. This would require Albert St being reduced to a left in/left out.

Package 13 – CSM option which signalises the 5-finger roundabout at Bank/Walton/Tarewa (see screen shot attached). This package has been modelled with future traffic flows (year 2043) but taking into account the predicted 19% increase in mode shift. This package also had the following inclusions:

- Removal of the Barnes Dance (diagonal) pedestrian phase from the Bank St signals (Bank/Water/Vine and Bank/Rust/Cameron signals) and replacement with parallel pedestrian movements (needed to make these intersections work)
- Upgrade of the Dent/Hatea/Riverside signals to provide double diamond phasing.
- 4-laning of Reyburn St and Okara Dr
- Signalisation of the Reyburn/Herekino/Okara and Port/Okara roundabouts
- Extension of the right turn bay on Dent St at the Dent/Hatea/Riverside intersection (to stop excessive queuing down Dent/Reyburn St)
- 4-laning of Walton St from Cameron St to Dent St (to stop queuing going back into the Bank/Walton/Tarewa intersection)

Package 14 – CSM Alternate option which keeps the 5-finger roundabout, but closes the Railway Rd leg and signalises the Albert/Rose/Walton intersection (see screen shot attached). This package was modelled with future traffic flows (year 2043) but without any mode shift (to test sensitivity to mode shift). This option also included the bullet points from Package 13 above.

Package 15 – CSM Alternate option as per Package 14, and future traffic flows (year 2043), but with the predicted 19% mode shift. This option also included the bullet points from Package 13 above.

These packages have been compared to the base model (current network and current traffic flows) and the CSM model with current traffic flows.

The results show that:

- **Package 12** – Generally works well and reduces the overall delay for both AM and PM peaks compared to the base model. Some intersections may perform worse, but overall this is balanced by better overall flow and improved pedestrian movements. This indicates that this package of work would be a sensible approach to progressively changing to the full CSM.
- Out of the future traffic flow (year 2043) packages:
 - **Package 15** – Has the best overall traffic flows and is not significantly different from the base model (ie current situation), particularly in the PM peak. It has less delay than **Package 13**, which is mainly attributed to the difference between keeping or signalling the intersection at Bank/Walton/Tarewa (ie the 5-finger roundabout).
 - **Package 14** – Assumes no mode shift and is significantly worse than Package 15 in the PM peak. This is not surprising because it has to handle significantly more traffic flows. It is interesting to note that even with no mode shift, this option performs better than **Package 13** in the AM peak. This again is due to keeping the roundabout at the intersection at Bank/Walton/Tarewa (ie the 5-finger roundabout).

Therefore, the preferred future option when trying to balance the needs of all modes is **Package 15** (the CSM Alternate option).

I am happy to discuss if you have any queries.

Cheers

Mark Seakins

Roading Consultant
Whangarei District Council

Mobile: 0272 766 106



Memorandum

To	Mark Seakins	From	Sahan Lalpe
Copy	Bill Sissons	Reference	505082
Date	2020-04-13	Pages (including this page)	8
Subject	Whangarei Option Modelling Results – Package 12 to 15		

1 Introduction

This memo outlines the summary of the results (Level of Service and network statistic) and key observations made during the model runs.

This memo should be read alongside accompanying spreadsheet *Reported Intersection LOS summary_14042020.xlsx* and the video files of the model runs.

2 Results Summary

Intersection	AM						PM					
	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15
Dent Street/ Bank Street	B	B	C	D	C	C	D	C	D	D	D	D
Dent Street/ Riverside Drive	D	D	D	D	D	D	D	C	D	D	D	D
Dent Street/ Walton Street	B	B	B	B	B	B	D	B	C	C	C	C
Dent Street/ Carruth Street	A	B	A	B	B	B	E	B	D	D	C	C
Reyburn Street/ Okara Drive	A	B	B	B	B	B	D	C	E	C	C	C
Okara Drive/ Port Road	A	C	A	B	B	B	F	D	C	E	D	D
Bank Street/ Walton Street	C	A	B	F	C	C	C	B	E	F	F	D
Bank Street/ Cameron Street	E	D	D	E	E	D	F	E	D	E	E	E
Walton Street/ Cameron Street	B	B	B	C	B	B	D	C	C	E	C	C
Walton Street/ Robert Street	A	A	A	B	B	B	D	B	B	C	C	B
Bank Street/ Water Street	E	C	D	E	E	E	F	D	E	F	F	F
Bank Street/ Manse Street	D	C	C	E	D	D	C	C	C	D	D	C
Walton Street/ Rose Street/ Albert Street	A	A	A	C	B	B	C	C	C	E	C	C

	Delay Bracket	
	Signalised	Un-signalised
A	<10	<10
B	10 to 20	10 to 15
C	20 to 35	15 to 25
D	35 to 55	25 to 35
E	55 to 80	35 to 50
F	>80	>50

	AM						PM					
	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15
Total Travel Time	921.5	1066.4	860.0	1468.9	1164.9	1117.4	1602.9	1766.5	1210.0	1825.7	2078.9	1696.9
Total Travel Distance	21,067	21,166	21,426	22,049	23,612	23,117	24,682	24,764	24,508	25,595	27,554	26,317
Average speed (km/h)	28.1	24.0	29.4	21.9	25.4	26.0	22.1	19.9	25.1	19.5	19.6	21.3
Average delay (sec/km)	82.9	111.7	75.4	182.1	109.1	104.6	150.5	184.5	107.7	189.6	201.7	159.3
Unreleased vehicles	0.0	1.0	0.0	938.0	62.0	131.0	0.0	0.0	0.0	13.0	0.0	0.0

3 Model Observations

3.1 Package 12

3.1.1 Morning peak

No significant operational issues were observed. There were queue spikes from the right turn from Dent to Walton, which would queue back to the Dent/Riverside Drive intersection. These queues would dissipate within a few signal cycles. However, showed a recurring pattern within the models: Where queue from Dent/Walton propagates to Dent/Riverside, which then propagates to Bank/Dent.

The LoS and network results show improvement, when compared with Base results. Even the Riverside/Dent now sits within the lower end of LoS bracket (*the delay numbers can be seen in the accompanying spreadsheet*).

09:11:25



Figure 1: Busy section of the network – Package 12 example

3.1.2 Evening Peak

Similar to morning peak, no significant operational issues observed. The option is an improvement on the base case. It is difficult to pinpoint the differences in LoS between Package 12 and Complete Street Masterplan (CSM) option as the two had different demand sets. However, the performance is comparable. Overall network delay in Package 12 is less than previous CSM option.

3.2 Package 13

The capacity improvements previously discussed were implemented in Package 13 (also in Packages 14 and 15):

- Increasing the right turn bay from Dent to Riverside;
- Two lanes available for traffic travelling north between Cameron Street to Dent, albeit at Dent there is left and a right turn reducing the capacity to effectively one lane (a bottleneck). The logic here was to shift the queue further north by providing the additional capacity, and thereby improve the operation of Bank Street/Walton Street (or “5-finger roundabout”) intersection.

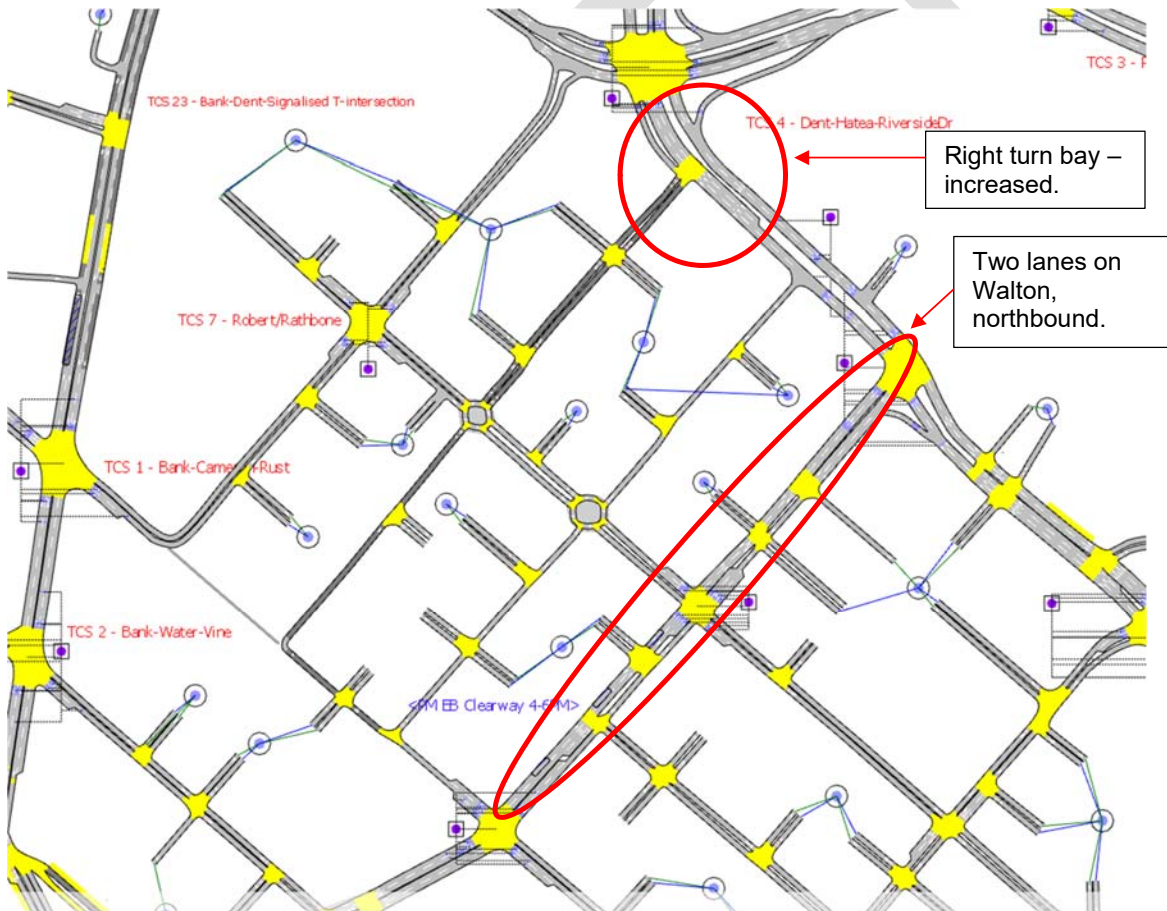


Figure 2: Capacity increases in Packages 13 – 15.

3.2.1 Morning Peak

The Bank Street/Walton Street intersection experiences more delay than previously (i.e. base and Package 12). This is an expected outcome of signalising the roundabout to a signalised intersection. From the base model it is an increase from C (15sec of delay per vehicle at intersection) to F (107sec of delay per vehicle at intersection). However, the best comparison to make is between this package at Package 15.

08:55:26

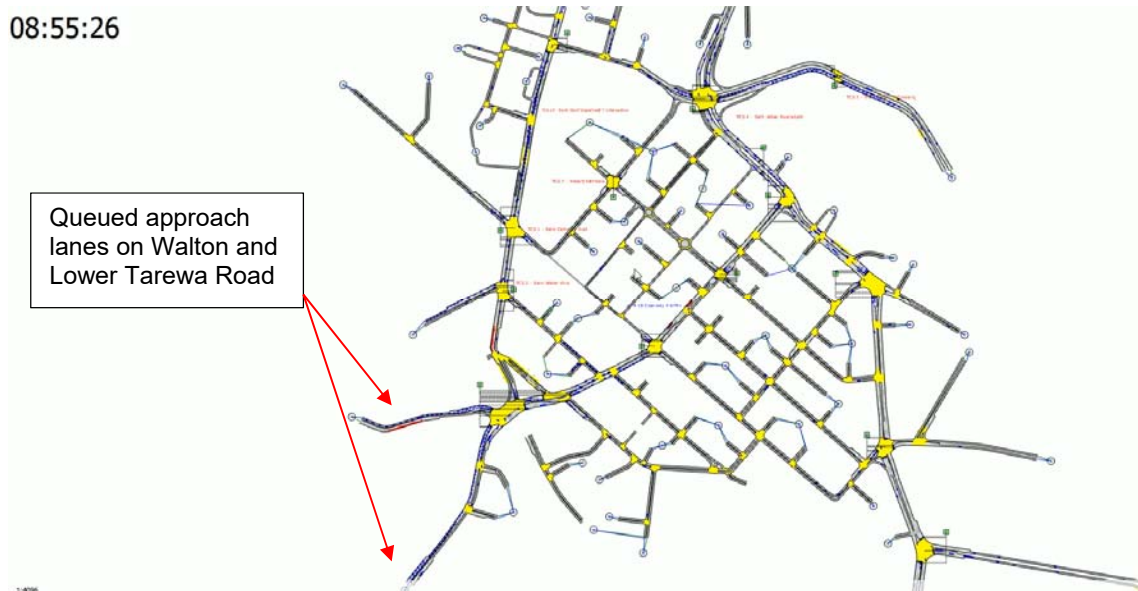


Figure 3: Off-network queues on approaches to Bank/Walton – Package 13 example

Because there is additional delay at the Bank Street/Walton Street intersection there was more traffic using Vine Street to avoid the Bank Street/Walton Street intersection. In the future this link should be made less attractive to avoid it being used as an alternative path for traffic to avoid Bank Street/Walton Street intersection. A potential shared space with limited parking, a space for gentrification.

09:41:17

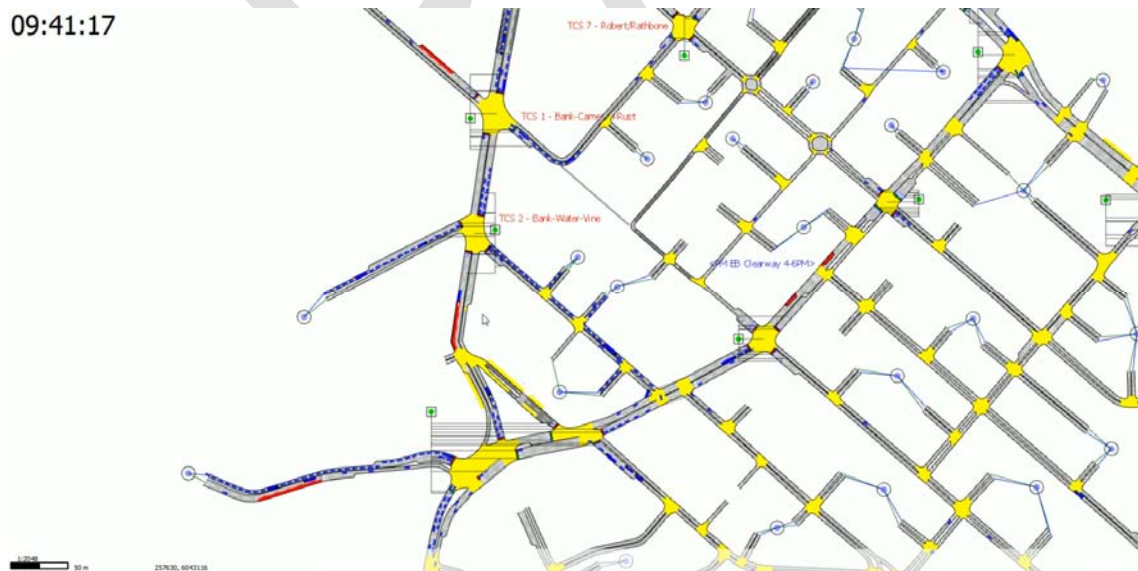


Figure 4: Vine street being more utilised – Package 13 example

3.2.2 Evening peak

Similar issue to morning peak with Vine being used as an alternative route. In the evening peak there is more traffic and there are more instances of this type of alternative routes being used. Railway Road

connection is severed at Bank Street/Walton Street intersection in Package 13 - 15. This results in alternative routes being used by traffic that used to take Railway Road and go through the Bank Street/Walton Street intersection. For example, more traffic was observed using Lower Cameron Street. Note that at this stage an extensive link analysis has not been undertaken to check the various differences on links.

17:35:28



Figure 5: Highlighting impact of Railway Road severance – Package 13 example

3.3 Package 14

3.3.1 Morning Peak

The roundabout works well, no significant operation issues of note and less traffic queued outside the network than Package 13.

3.3.2 Evening Peak

In the evening peak the Bank Street/Walton Street roundabout performs better than the signalised intersection in Package 13. While the summary results show them both operating at a LoS F, the delay is greater in Package 13 than 14 (127 vs 67 sec of delay per vehicle at intersection respectively).

There is a strain on the network with the increased demand, specially for the movements from east to west (or south east to north west). The use of alternative paths (or rat-running) due to increased delay on Dent Street corridor is a problem within the model, see Figure 6 below. The rat-running behaviour leads to congestion in areas of the modelled network that doesn't have the capacity to handle the sudden increase in additional traffic. In the model this can sometimes lead to a gridlock (a worse case scenario). This is unlikely to happen on reality; however it does highlight the need to be aware of this type of behaviour and have mitigations to reduce the attractiveness of these alternative routes.

In peak conditions when the network is saturated with daily commuters that are familiar with the network there is a higher probability of rat-running. As counter-intuitive as it may seem, staying on a main arterial route (e.g. Okara Drive > Reyburn Street > Dent Street > Bank Street as shown in Blue below) will benefit the overall network performance and reduce the delay.

The current model hits a good balance in simulating future driver behaviour. While no significant network issues were observed the rat-running is a consistent model behaviour that is observed when the key routes are congested. Once the traffic detours from the main routes, then the model finds it difficult to accommodate the influx of traffic into local streets like Vine Street, Robert Street.



Figure 6: The use of alternative paths – Package 14 example

Another example of the use of alternative routes within the model is what happens following the severance of Railway Road to make the 5-finger roundabout a 4-finger roundabout at Bank Street/Walton Street intersection. All alternative routes in the model being at Woods Road as the traffic is loaded onto the network from Woods Road. This is a model assumption, but this additional traffic can for example:

- Disperse into the network via Commerce Street, Okara Drive;
- Not go through the modelled network;

- Demand disappear once the link is severed.

The assumption aligns with the strategic model inputs but necessary to highlight the impact of this traffic at this stage because it tends to initiate congestion on the local streets such as: Albert, Clyde, Lower Cameron and Hannah Street.

3.4 Package 15

3.4.1 Morning Peak

The model operated well without any significant operational issues. The Bank Street/Walton Street roundabout performed well. The concerns raised above in Package 14 regarding rat-running also applies to this model, but because the demand is less network congestion as a result of rat-running wasn't as great in Package 15.

3.4.2 Evening Peak

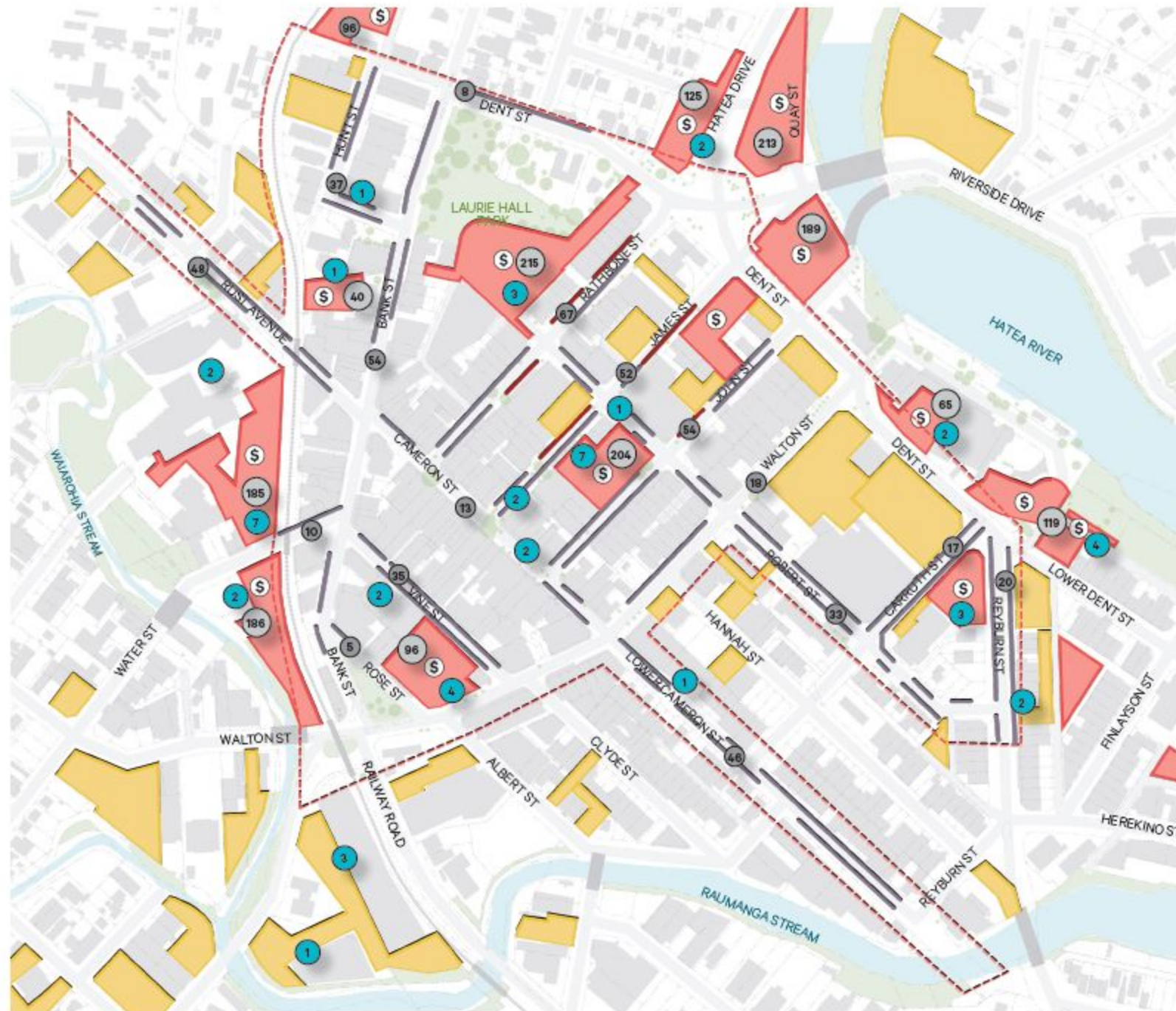
Performed well, was comparable to the base model in terms of performance.

Intersection	AM						PM					
	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15
Dent Street/ Bank Street	B	B	C	D	C	C	D	C	D	D	D	D
Dent Street/ Riverside Drive	D	D	D	D	D	D	D	C	D	D	D	D
Dent Street/ Walton Street	B	B	B	B	B	B	D	B	C	C	C	C
Dent Street/ Carruth Street	A	B	A	B	B	B	E	B	D	D	C	C
Reyburn Street/ Okara Drive	A	B	B	B	B	B	D	C	E	C	C	C
Okara Drive/ Port Road	A	C	A	B	B	B	F	D	C	E	D	D
Bank Street/ Walton Street	C	A	B	F	C	C	C	B	E	F	F	D
Bank Street/ Cameron Street	E	D	D	E	E	D	F	E	D	E	E	E
Walton Street/ Cameron Street	B	B	B	C	B	B	D	C	C	E	C	C
Walton Street/ Robert Street	A	A	A	B	B	B	D	B	B	C	C	B
Bank Street/ Water Street	E	C	D	E	E	E	F	D	E	F	F	F
Bank Street/ Manse Street	D	C	C	E	D	D	C	C	C	D	D	C
Walton Street/ Rose Street/ Albert Street	A	A	A	C	B	B	C	C	C	E	C	C

	Delay Bracket	
	Signalised	Un-signalised
A	<10	<10
B	10 to 20	10 to 15
C	20 to 35	15 to 25
D	35 to 55	25 to 35
E	55 to 80	35 to 50
F	>80	>50

	AM						PM					
	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15	Base	CSM	Pk 12	Pk 13	Pk 14	Pk 15
Total Travel Time	921.5	1066.4	860.0	1468.9	1164.9	1117.4	1602.9	1766.5	1210.0	1825.7	2078.9	1696.9
Total Travel Distance	21,067	21,166	21,426	22,049	23,612	23,117	24,682	24,764	24,508	25,595	27,554	26,317
Average speed (km/h)	28.1	24.0	29.4	21.9	25.4	26.0	22.1	19.9	25.1	19.5	19.6	21.3
Average delay (sec/km)	82.9	111.7	75.4	182.1	109.1	104.6	150.5	184.5	107.7	189.6	201.7	159.3
Unreleased vehicles	0.0	1.0	0.0	938.0	62.0	131.0	0.0	0.0	0.0	13.0	0.0	0.0

3.5 City Car Parking. Existing.



Generous provision and a variety of options for car parking are found within Whangārei city centre. Including a mix of free and paid, public and private, street and precinct based car parking.

Establishing the right balance of parking provision and spread while improving pedestrian amenity is challenging, with a strong desire, and a need in some cases to be able to park in close proximity to the destination.

Public, paid parking precincts are generally located to the perimeter of the city centre, with the exception of the central city car parking building and to the north along James Street.

Generally all the streets have kerb edge parking with the exception of Dent Street and the managed lanes along Bank and Walton streets. The central city car park encourages vehicle movement through the centre of the city and is inactive for pedestrians at street level.



Legend:

City Core Masterplan Project Boundary

Paid Parking

Public Off Street Parking

Private Off Street Parking

On Street Parallel Parking
(Inside Masterplan Project Boundary)

On Street Angled Parking
(Inside Masterplan Project Boundary)

Current Car Parking Numbers (2017 WDC Survey)

Public Off Street Parking 1733

On Street Parallel and Angled Parking 542

Mobility car parks 52

Indicative On Street Proposed Car Parking Numbers.



Creation of people-focussed streets as part of a transition from a car-dominated city to a multi-modal city results in reduction of parking provision to these streets. Potentially off-set by changes to other streets and spaces.

Legend:

[] City Core Masterplan Project Boundary

Existing On Street Car Parking Count

Proposed On Street Car Parking Count

Whangarei On Street Car Park Count

Street Name	Current Car Park Count	Proposed Master Plan Car Park Count	Car Park Difference
Bank St	54	54	0
Cameron St	13	6	-7
Carruth St	17	34	17
Dent St (North)	8	8	0
Hunt St	37	37	0
James St	52	0	-52
John St	54	18	-36
Lower Cameron St	46	49	3
Rathbone St	67	75	8
Reyburn St	20	32	12
Robert St (Walton-Laurie Hall Park)	25	26	+1
Robert St (Walton-Reyburn)	33	49	16
Rose St	5	0	-5
Rust Ave	48	48	0
Vine St	35	46	11
Walton St	18	18	0
Water St	10	10	0

Total On Street City Core Car Parking (Excluding Off Street Car Parking)

542	510	-32
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Note: This count excludes off street car parking, including the upgrade of Laurie Hall carpark and removal of John Street carpark building.

Status Quo

Option One

- Signalised intersections at Riverside/Hatea/Dent and Walton/Dent
- John Street signalised 2 stage pedestrian crossing.
- Some traffic backups at AM/PM peak lasting for approximately an hour both sides.
- Traffic flows throughout the day are generally good.
- Pedestrian crossings do not necessarily add to traffic delays as traffic jams are caused by vehicles.

Estimated Cost: \$0 (Plus ongoing maintenance/renewals)



Pros	Cons
No requirement from the budget to upgrade	Vehicle back ups at PM peak
Current pedestrian crossings are maintained which are familiar to the community	Vehicle traffic must stop to allow pedestrians to cross the street
	Vehicles use John Street, James Street and Walton Street to avoid Dent/Reyburn Street backups
	Does address the strategic outcome of the City Centre Plan / City Core Precinct Plan to create a better link between
	Pedestrians find the street difficult to cross and walk along

Improved pedestrian link Option Two

- Retain the four lanes on Dent Street (two north/two south)
- Construct a 4m shared path on the waterfront side, and up to 5m path on the city side
- Remove the central median (narrows street and ped crossing times)
- Upgrade the John Street pedestrian crossing to one stage signalised
- Remove the roundabout at Reyburn/Dent

Estimated Cost: \$ 2 - 3 million



Pros	Cons
Links to a shared path connection from north to south with potential funding from NZTA to construct a better connection for pedestrians (at grade, puffin) directly between the city core and new town basin park – no ramps or stairs	Cost to construct and remove centre median and services may be high Vehicle traffic must stop to allow pedestrians to cross the street
creates an opportunity for businesses with active frontages, alfresco dining, along Dent Street	Pedestrians will need to wait for the light phasing in order to cross safely
If the rest of the street network is improved as per the masterplan	
Aligns with design of the new town basin park	
Compatible with potential for a medium/long term building to building option	

Dent Street Over Bridge Option Three

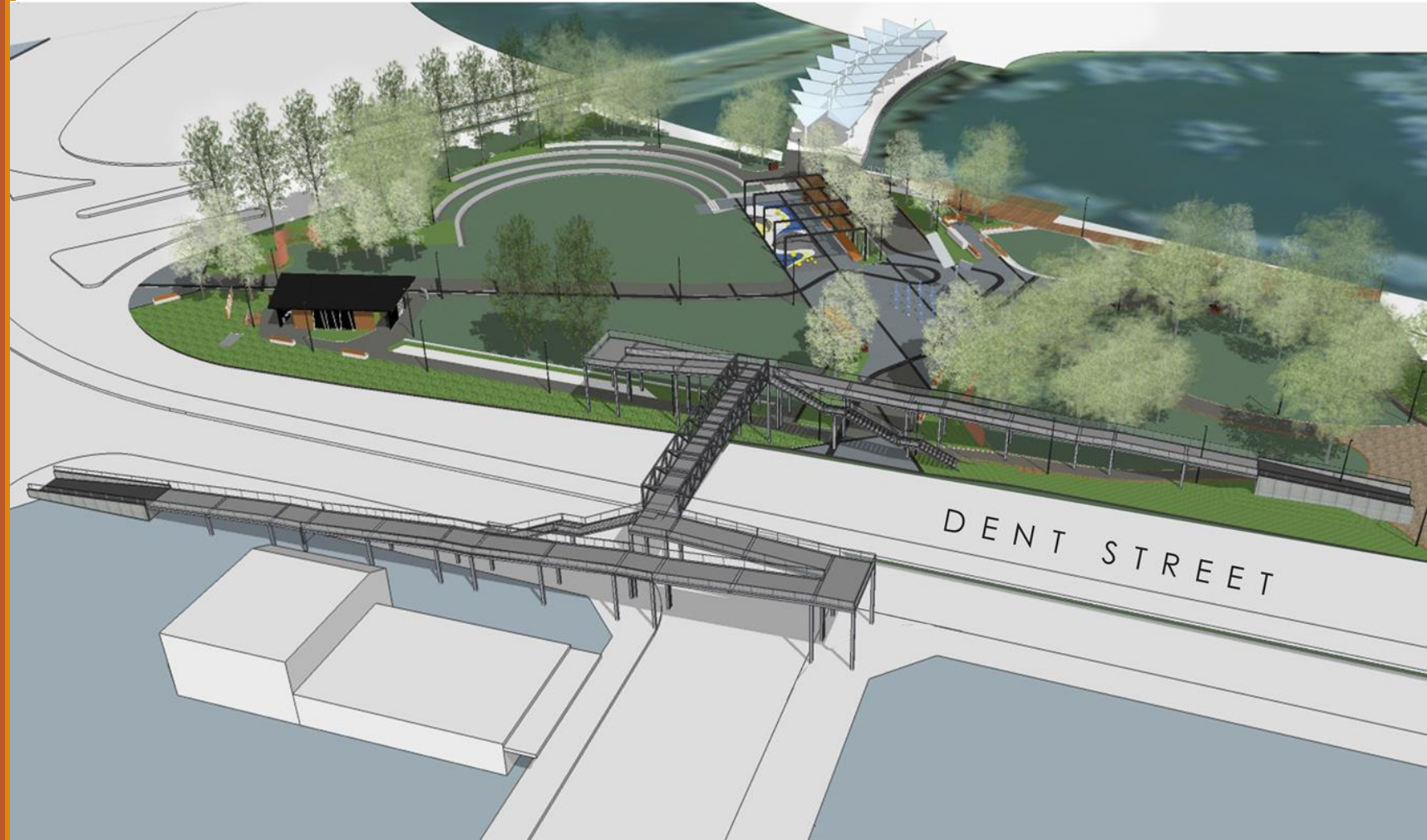
Will require long ramps to accommodate mobility users and the height for over dimension vehicles.

Each ramp would need to be a minimum of 102m long for 7.5m height (top of bridge) at 1 in 12 grade plus 1.2m long landings every 0.75m rise.

Approach ramps restrict property access along John Street or Dent Street and currently approach ramps would be detrimental to the New Town Basin Park development.

Suggest that ramps follow road right of way – would require narrowing of Dent Street to three lanes (two north, one south) to accommodate ramps and footpaths.

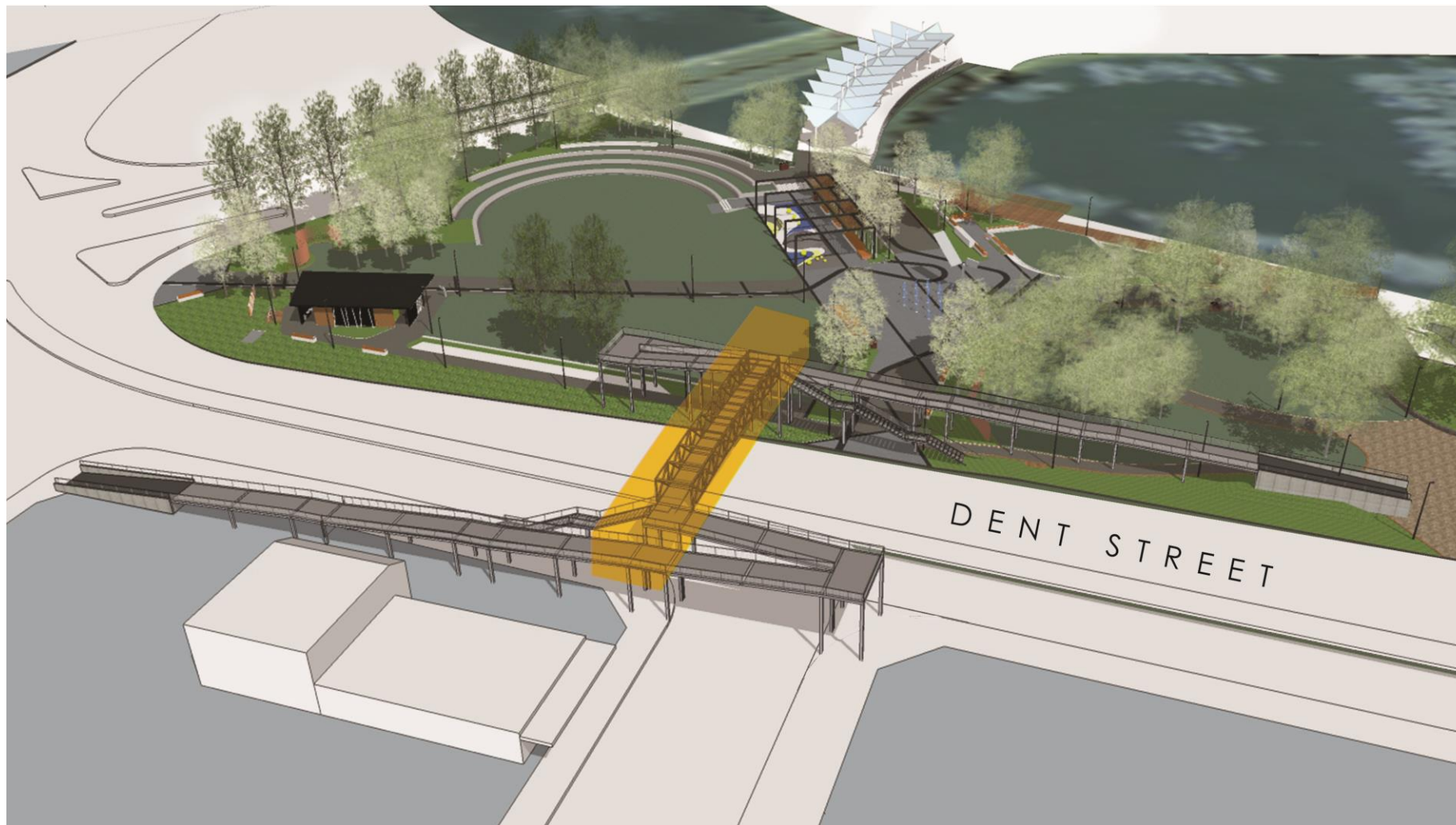
Estimated Cost \$4 - 5 million (a number of unknowns which could effect cost e.g. foundations/piles)



Dent Street Over Bridge

Pros:

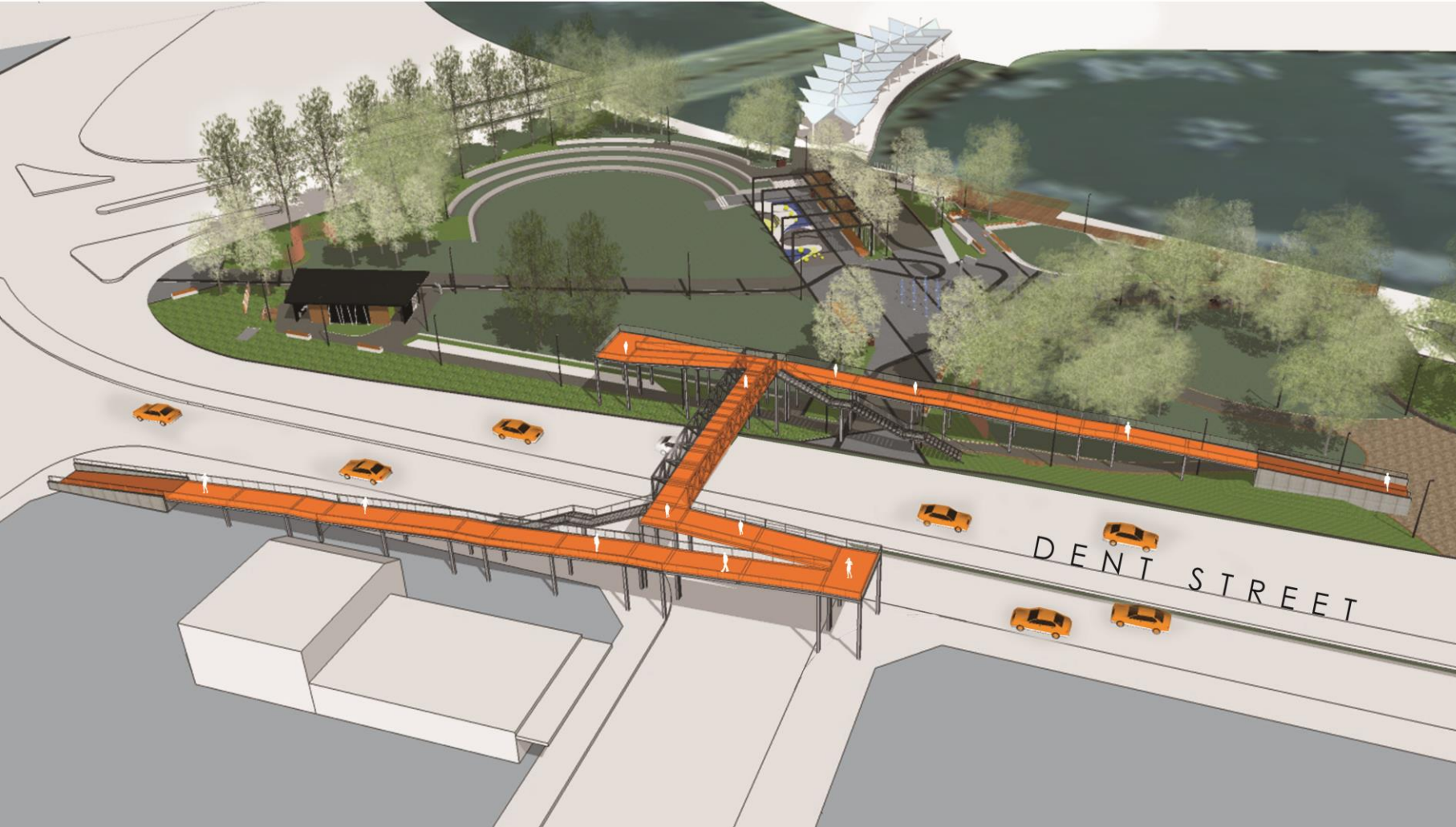
- Opportunity to create something iconic.
- Will come at an expense



Dent Street Over Bridge

Pros

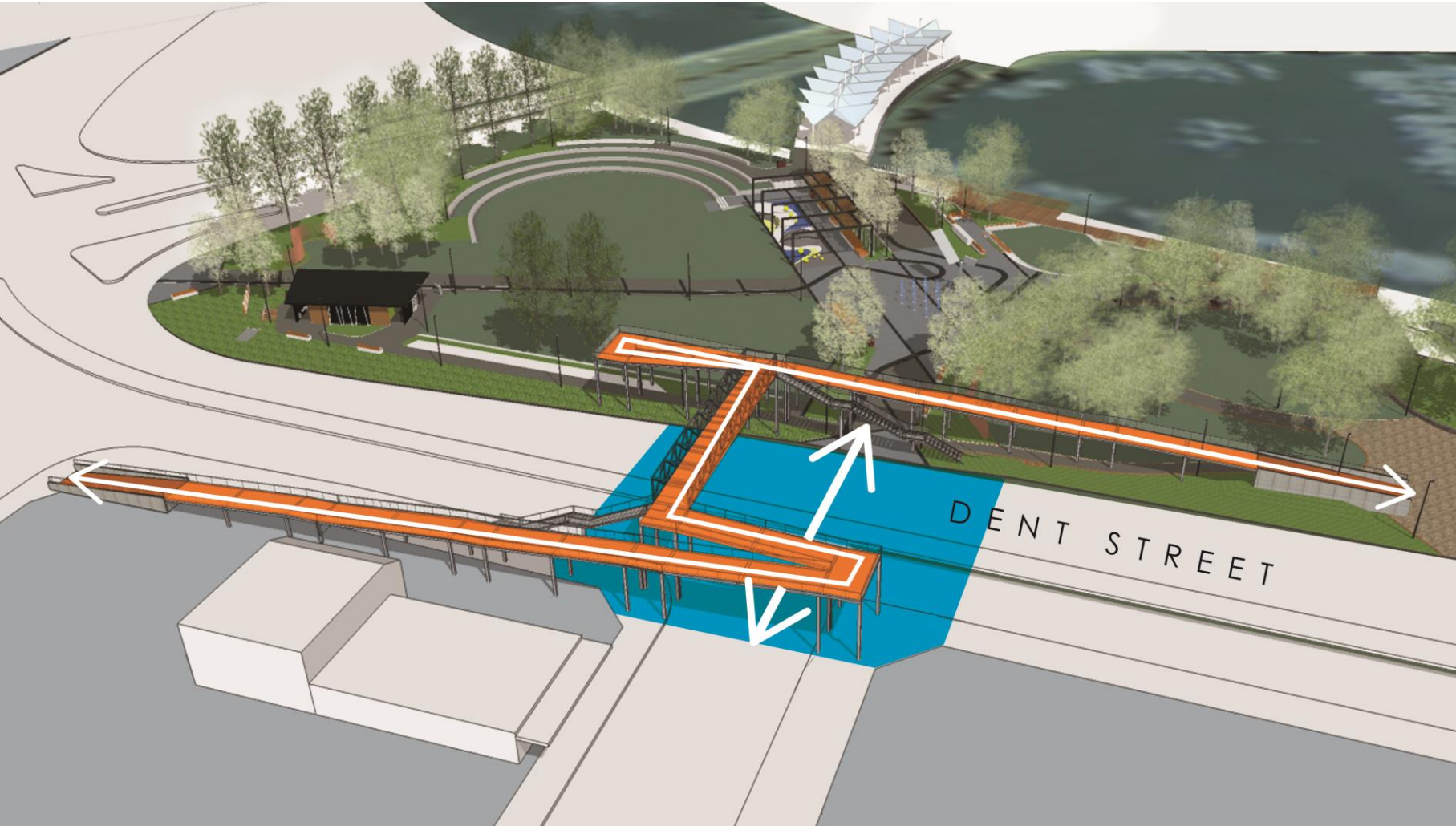
- Pedestrian and vehicle separation.
- Adds an element of safety for pedestrians.



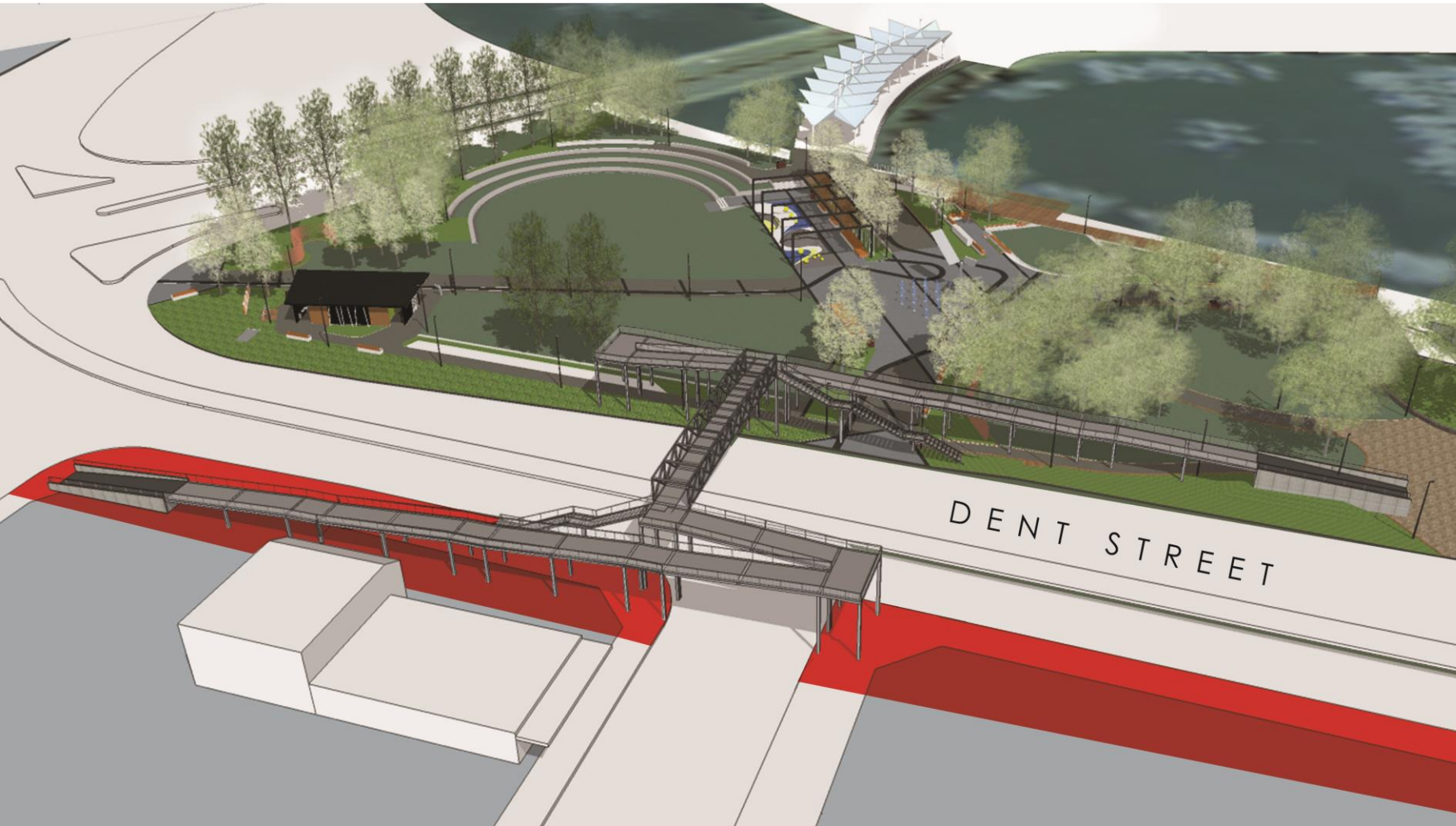
Dent Street Over Bridge

Cons

- Significantly further distance to travel
- 226m of distance to travel along the bridge vs 22m across the road.



Dent Street Over Bridge



Cons

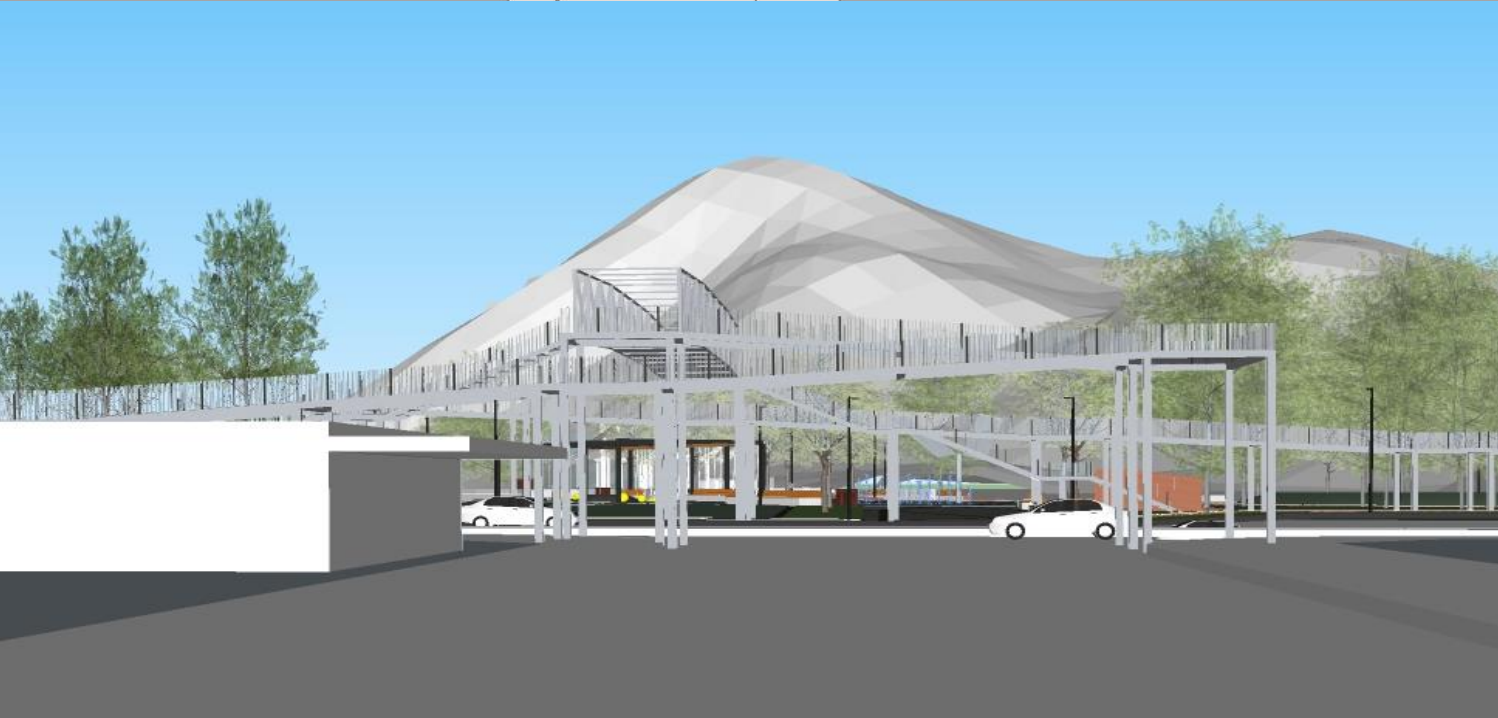
- Wherever the ramp falls will disrupt the opportunity for active frontages.
- Whether it be Dent Street, John Street or James Street.
- Require use of commercial land for the development
- May reduce the attractiveness of future development



Dent Street Over Bridge

Cons:

- New Town Basin Park will require a redesign (currently at procurement phase).
- Including the removal of some trees.
- Blocks views from John/James (depending in location) to Town basin, Hundertwasser and Parihaka (and vice versa)

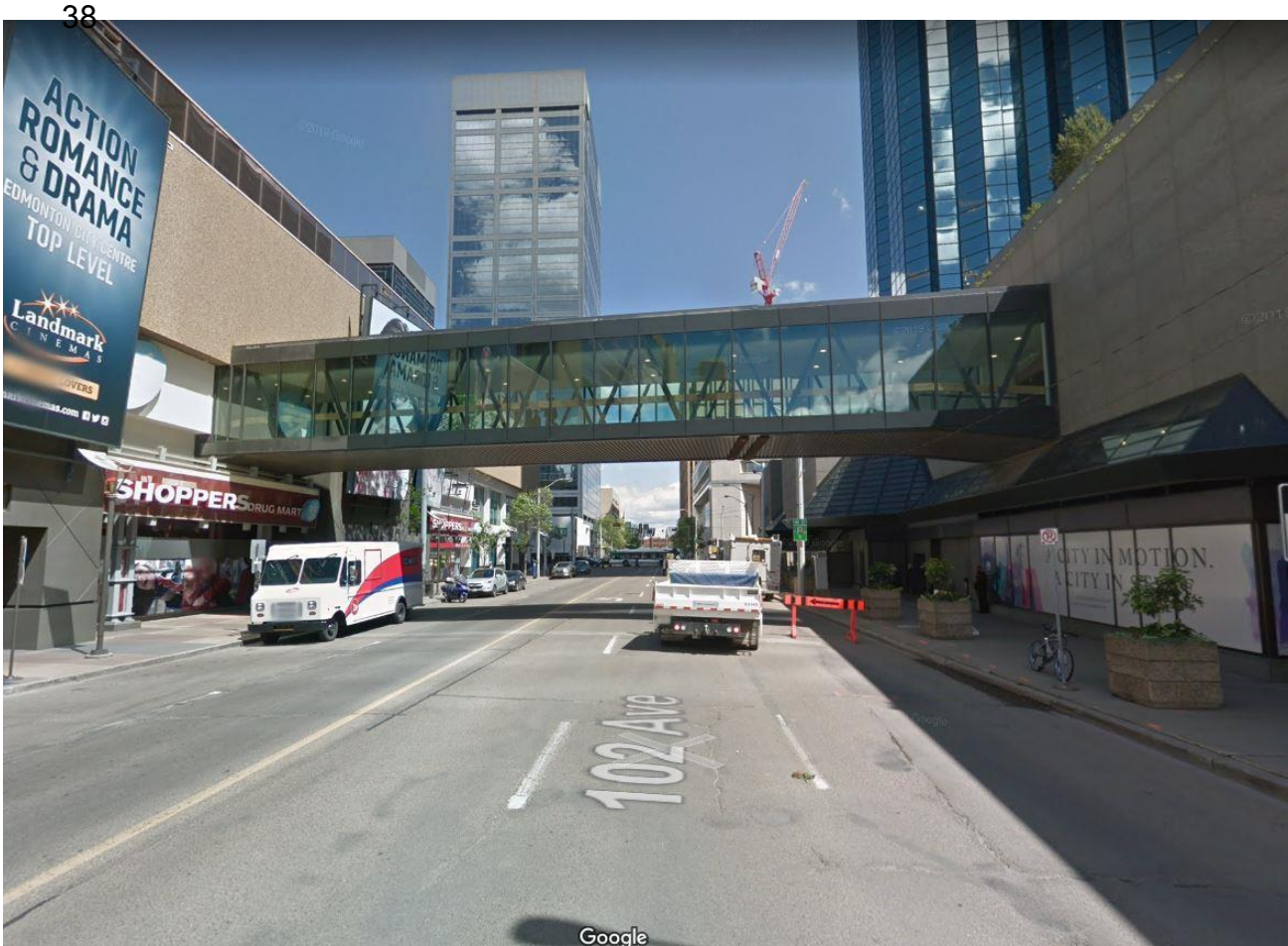


Building to Building

Option Four

- Above grade pedestrian crossings should be from a 3-storey building to building (as recommended in 2002)
- Suggest at the Town Basin to Park n Save site – potential redevelopment without impacting on public space (New Town Basin Park)
- The Hundertwasser and New Town Basin Park will not facilitate a building.
- This option depends on private development and new buildings constructed either side to facilitate the required 7.5m clearance.

Estimated Cost - \$2 - \$10m
depending on design/funding etc of private development



Pros	Cons
Pedestrians can cross Dent Street over a large bridge	Other pedestrian crossings must be maintained and would still stop vehicle traffic
New building in Town basin with new business opportunities	Cost could be high for over bridge – may put private developers off.
All weather link (protected from rain, wind etc)	Requires private development to work
Opportunity to incorporate icon architecture and compliment/enhance amenity of town basin and Hundertwasser	

Underpass Option Five

- Tunnel options generally cost about 3x more than a bridge option.
- A tunnel would require strict CPTED guidelines to ensure safety.
- The tunnel would require a great deal of length to go under Dent Street.
- John Street could be closed down to access the ramp and exclusively become a pedestrian only access, with the tunnel opening somewhere under the town basin.
- A flood proof, earthquake safe tunnel would be required.

Estimated Cost - \$5-\$10 - \$10 million



Pros

Pedestrians can cross Dent Street through a large underground tunnel

Pedestrians can connect easily to town basin without waiting at a crossing. Shorter distance to travel than the bridge

Improved design of underpasses (e.g. Auckland, Tauranga)

Cons

Geotech, flooding and structural factors adds to cost

CPTED issues, public perception about using underpasses

May require land purchase and impact on the design to New Town Basin Park

Dent Street Crossing Options - Summary

Option 1: Status Quo

- + Low cost
- Doesn't address strategic outcome
- Continues traffic issues/delays

Option 2: Improved pedestrian link

- + Integrates with New Town Basin Park
- + Short distance to travel for pedestrians
- + Traffic issues helped with other improvements in plan
- Pedestrians will need to wait in order to cross
- Cars will need to wait when pedestrians cross

Option 3: Overbridge

- + Separates cars and pedestrians - efficiency
- + Opportunity for iconic design
- Impacts on both town basin park/Hundertwasser and commercial property
- Longer distance for pedestrians to travel
- Cost unknowns – e.g. foundations

Option 4: Building to Building

- + Separates cars and pedestrians - efficiency
- + Opportunity for iconic design
- + All weather link
- Relies on a private development
- Other pedestrian crossing will likely need to be maintained
- Cost could be high which may put off developers

Option 5: Underpass

- + Separates cars and pedestrians
- + Direct link (more direct than a bridge)
- + Improved design in modern underpasses
- Geotech/flood issues will add to cost
- Public perception of underpasses
- Impact on town basin park and private development

Proposed Pedestrian and Cycle Movement.



Prioritising walking and cycling as active modes of transport is a key focus of the masterplan and the creation of a people-focussed city centre.

A walk-able city of high quality, high amenity, legible streets and public spaces is critical to creating a lively and vibrant Whangārei city centre.

The masterplan extends the Cameron Street pedestrian area along James Street and further along Cameron Street, supported by a one-way level surface John Street, creating people focused streets, strengthening connection between city and waterfront, increasing pedestrian priority and amenity. Creation of a 'waterfront to city stitch' along Dent Street provides widened footpaths and frequent crossing points for pedestrians.

Shared paths and dedicated cycle facilities are extended along Dent and Reyburn streets, with a green street linkage through the city along Robert Street. The network of laneways is extended in conjunction with strategic site redevelopment to improve connectivity and offer a point-of-difference from the other streets.

Legend:

 City Core Masterplan Project Boundary

Shared Path Movement

 Existing Shared Path

 Proposed Shared Path/Cycle Facility

Pedestrian Movement

 Pedestrian Only Street
(except service & emergency vehicles)

 Primary Pedestrian Movement Streets

 Pedestrian laneway

 Key Intersection Upgrade for Pedestrians

 30km/h speed limit